Tallawarra B Operational Environmental Management Plan (OEMP)

Tallawarra Power Station

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Glossary

Abbreviation	Meaning
COA	Condition of Approval
CSSI	Critical State Significant Infrastructure
DPE	Department of Planning and Environment
DPHI	Department of Planning, Housing & Infrastructure
EA	Environmental Assessment (SKM, 2009)
EMS	Environmental Management System
EP&A Act	*Environment Planning and Assessment Act 1979*
EPL	Environment protection licence
EWMS	Environmental Work Method Statement
HSSE	Health, safety, security and environment
HSE Specialist	Health, Safety and Environment Specialist
MEL	Minimum Environmental Load
Mod-1	Modification 1 to Major Project MP07-0124
Mod-2	Modification 2 to Major Project MP07-0124
Mod-3	Modification 3 to Major Project MP07-0124
NSW EPA	NSW Environment Protection Authority
OEMP	Operational environmental management plan
ONR	Operational Noise Review
Project Approval	Project Approval for Tallawarra B Power Station (MP07_0124-Mod-2)
PVMP	Plume Validation Monitoring Program
the project	Tallawarra B power station
the Secretary	Secretary of the Department of Planning and Environment
Unit 1	Operation areas associated with Tallawarra A
Unit 2	Operation areas associated with Tallawarra B
WSAC	Water sprayed air cooler

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1 Introduction

1.1 Site history

EnergyAustralia originally purchased the Tallawarra power station site to redevelop it for power generation. The 16ha site is located at Yallah Bay Road, Yallah, approximately 13 kilometres south of Wollongong, New South Wales. The site is located on the western foreshore bank of Lake Illawarra and on the lower southern slopes of Mount Brown, which rises to about 130m. The project is positioned in a historically disturbed location on the foundations of a former coal fired power station, which was decommissioned in 1989. The project land is owned by EnergyAustralia. The Tallawarra A power station commenced operation in January 2009.

Construction of the Tallawarra B power station commenced in March 2022 with operations commencing in October 2023. Once operational, the Tallawarra power station will be considered as one power station with two operational units. Tallawarra A as Unit 1 and Tallawarra B as Unit 2.

Table 1-1 below provides a historical timeline of significant events at the Tallawarra power station site, along with associated environmental impacts and controls.

Table 1-1 History of Tallawarra Power Station site

Significant historical dates	Description	Significant environmental impact / control
1954-1989	320MW Tallawarra coal fired power station.	-
1989-1999	Decommissioned site and majority of buildings demolished to ground level.	▪ Environment Impact Assessment completed in 1998; ▪ Pacific Power was granted development consent by Wollongong Council
2003	Pacific Power sold site to TXU (later rebranded to EnergyAustralia).	-
2006-2009	EnergyAustralia commences construction of the Tallawarra A power station.	▪ Construction Environmental Management Plan developed 2008; ▪ Site management plans developed for Asbestos, Water Quality, Air/Storm Water, Fish, Prawn and Jellyfish; ▪ Environment Protection Licence 555 issued.
2008	Tallawarra B power station project was declared as Critical State Significant Infrastructure (CSSI) by the then Minister for Planning.	-
2010	Tallawarra B power station project (MP07-0124) was granted approval by the then Minister for Planning.	-
2009-2012	Tallawarra A power station in operation	▪ Environmental Management Plan developed; ▪ ISO 14001 Certification obtained in 2012; and ▪ Expansion of Environmental Performance Program.
2012-2017	ISO Certification	ISO certification maintained by Tallawarra power station.
2016	Modification to Tallawarra B project approval (Mod-1)	Approval to extend the project's approval lapse date by five years to 21 December 2020.
2017	ISO Certification	Enterprise obtained ISO certification. Tallawarra Quality Management System integrated with Enterprise system.
2020	Modification to Tallawarra B project approval (Mod-2).	Approval to extend the project's approval lapse date by a further two years to December 2022 and amended several conditions of approval, including allowing for a single open cycle gas turbine to be used for the project.

Significant historical dates	Description	Significant environmental impact / control
2022	Construction of Tallawarra B power station begins.	
2024	Construction & commissioning of Tallawarra B is completed. Operations commence.	The Tallawarra B 320MW Open Cycle Gas Turbine (OCGT) is able to begin generating and powering the grid.

1.2 Scope of the OEMP

In accordance with condition 1.1, EnergyAustralia will carry out the project:

- In accordance with the Project Approval as modified (PA) (07_0124); and
- In accordance with written direction of the secretary.

In accordance with condition 1.2 EnergyAustralia shall comply with any reasonable requirement(s) of the Secretary arising from the Department's assessment of:

- any documents that are submitted in accordance with this approval; and
- the implementation of any actions or measures contained in these documents.

The scope of the OEMP covers the operations of Tallawarra Power Station Unit 2. The OEMP has been prepared to address:

- Project Approval as modified (PA 07_0124),
- Relevant clauses of the Environment Protection Licence 555 (EPL 555); and
- Relevant legislation, guidelines and Australian Standards.

The existing Environmental Management System (EMS) has been established for the operation of Unit 1. The EMS covers the environmental requirements of the development consent NO. D98/784. The existing EMS will also cover Unit 2 and this OEMP. Refer to Figure 3-1.

1.3 Objectives of the OEMP

The purpose of this OEMP is to provide a structured approach to the management of environmental issues during operation of Unit 2. In particular, this OEMP:

- Provides an operational framework to conduct operational activities in a manner that reduce, avoid or offset potential environmental, social, biological and physical consequences of operational activities,
- Highlights and manages potential environmental impacts identified at the planning stage,
- Ensures EnergyAustralia and its associated contractors are fully aware of their environmental responsibilities and are proactive in their approach to environmental management,
- Complies with relevant legislation; and
- Strives for continuous improvement in aspects of the project to enable new technologies and innovations to be implemented where practicable and feasible.

1.4 Structure of the OEMP

The OEMP has been prepared to be consistent with the *Environmental Management Plan Guideline* (DPIE, 2020). The conditions of PA 07_0124 that are relevant to the OEMP are provided in Appendix A. The PA 07_0124 applies to Unit 2 operational areas.

Section 1 describes the project background, purpose and structure of the OEMP,

Section 2 describes the overview of the project description,

Section 3 establishes the environmental management framework,

Section 4 describes the community consultation program; and

Section 5 establishes the sub-plans and outlines the environment monitoring and management detail for the project will be managed.

2 Project Description

2.1 Overview of the Project

The Tallawarra B project includes construction and operation of a gas fired power station and associated infrastructure, known as the Tallawarra Stage B Gas Turbine Power Station Project. The project was declared as Critical State Significant Infrastructure (CSSI) by the Minister for Planning on 26 February 2008 in accordance with section 5.13 of the *Environment Planning and Assessment Act 1979* (EP&A Act). The project approval (PA) 07-0124) was granted approval by the then Minister for Planning on 21 December 2010.

An approval modification (Mod-1) for extension of the lapse date was approved March 2016, which extended the PA lapse date by five years to 21 December 2020. A second approval modification (Mod-2) was approved by the Department of Planning, Industry and Environment (DPIE) in December 2020. Mod-2 extended the PA lapse date by a further two years to December 2022 and amended several conditions of approval, including allowing for an open cycle gas turbine to be constructed and operated. A third approval modification (Mod-3) was approved in August 2024 which allows for the use of up to 5% green hydrogen fuel mix and construction of the associated infrastructure.

Tallawarra is a gas fired power station that comprises of two units, Tallawarra A (Unit 1) and Tallawarra B (Unit 2). Unit 1 commenced operation in 2009 and is not included as part of this OEMP. Unit 2 is immediately adjacent to Unit 1 and commenced operations in June 2024.

Unit 2 comprises of the following key elements:

- a single-unit open cycle gas turbine (OCGT) with a maximum output of 320 megawatts (MW);
- High voltage switchyard (extension) comprising high voltage connection to the unit transformers and switchgear;
- Transmission line connection to the existing 132kV network;
- Connecting gas pipelines, gas metering and pressure reduction station;
- Potable/fire water tank;
- Demineralised water tank;
- Electrical module; and
- Emergency diesel generator.

2.2 Site locations and map

Figure 2-1 shows the extent of Tallawarra land boundary while Figure 2-2 shows the location and boundaries of Tallawarra A and Tallawarra B units within the context of Tallawarra Power Station.

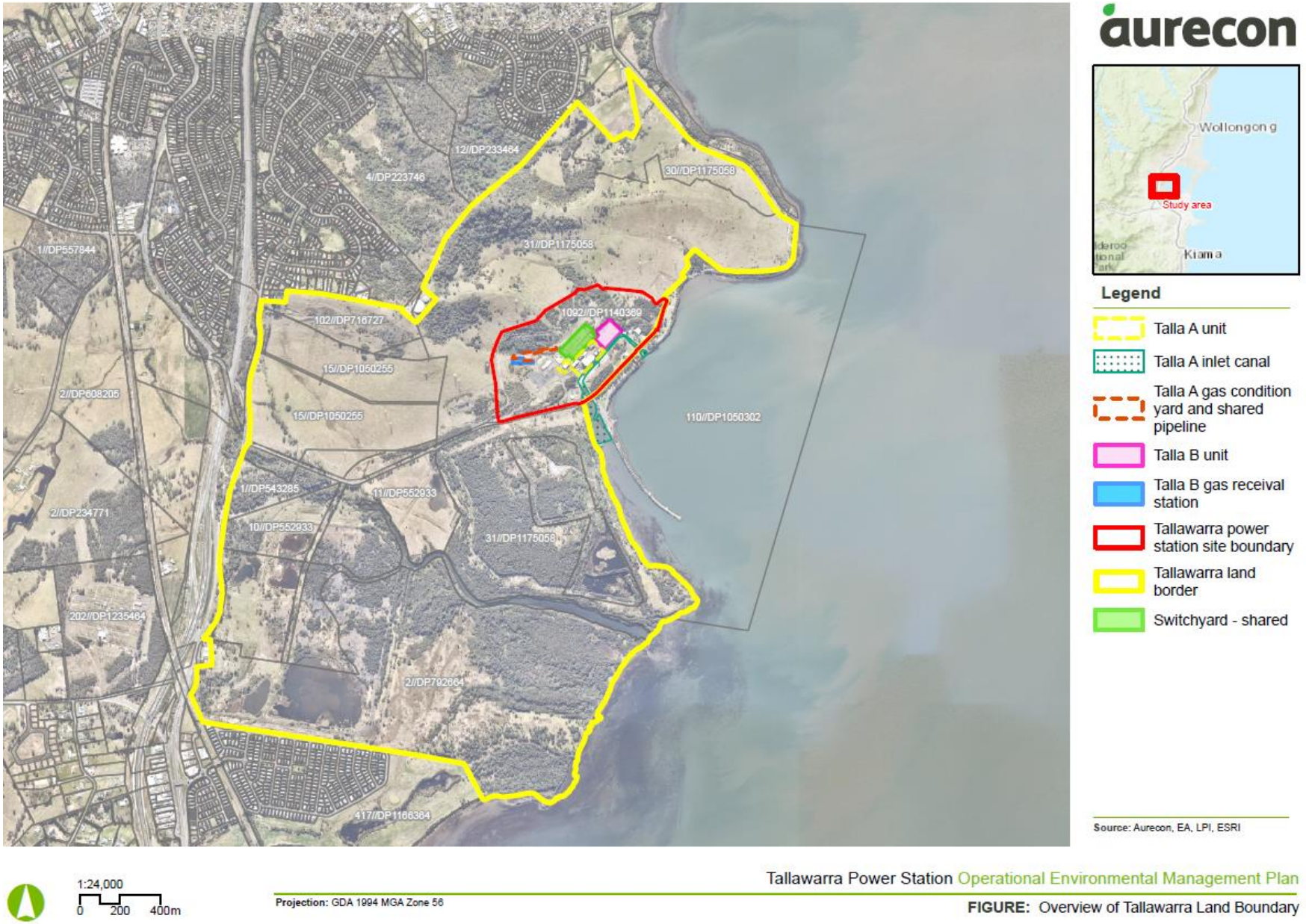

Figure 2-1 Overview of Tallawarra Land

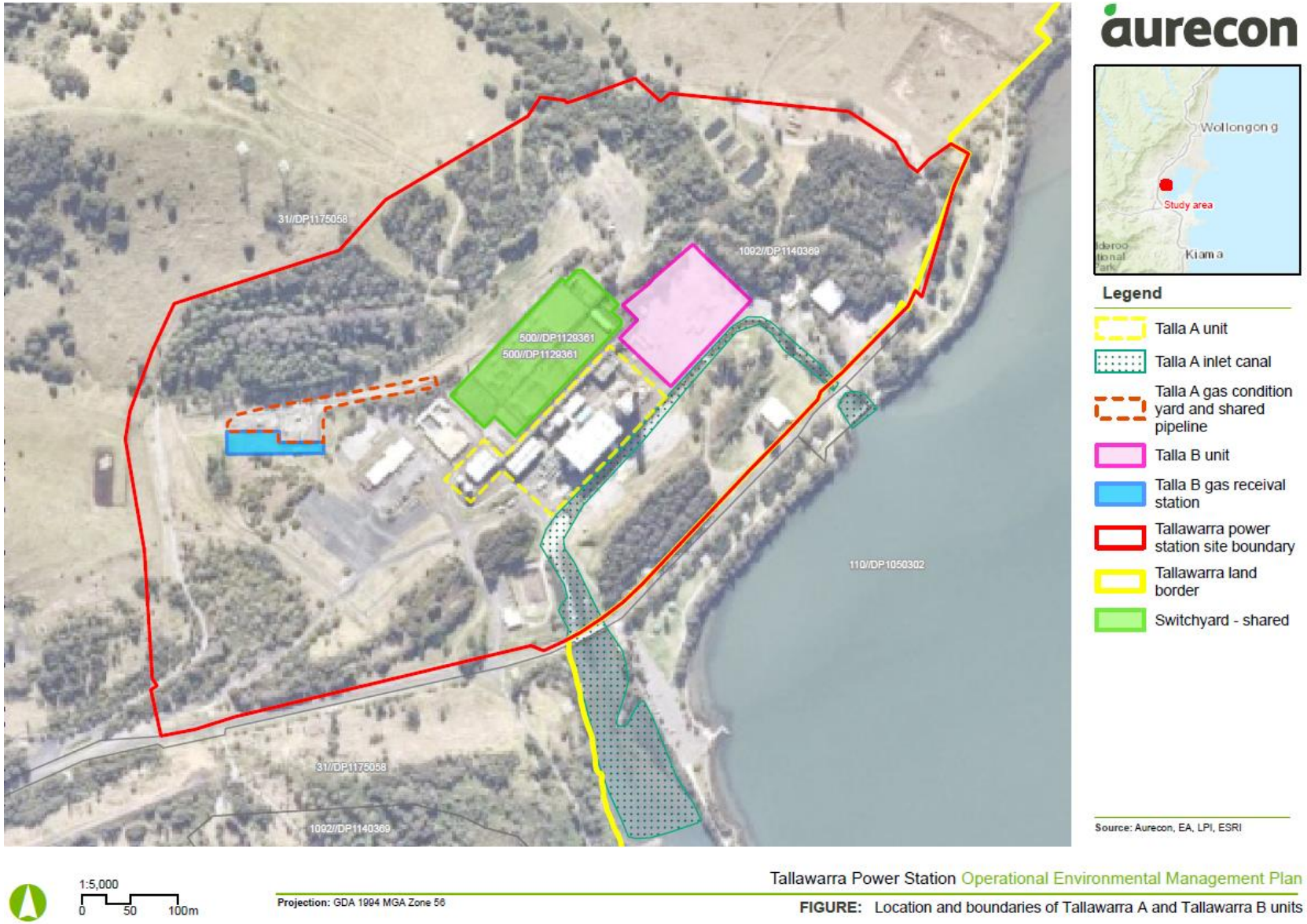

Figure 2-2 Tallawarra Power Station

3 Environment Management Framework

3.1 Environmental policy

This OEMP reflects the principles of EnergyAustralia's corporate ISO14001 Environmental Management System. The Environmental Management System is be based on the Plan, Do, Monitor and Review philosophy. EnergyAustralia's Health, Safety, Security and Environmental (HSSE) Policy prepared as part of their corporate Environmental Management System includes a commitment to manage its activities in such a way that reduces their environmental impact.

See Appendix B for a copy of the EnergyAustralia HSSE Policy.

3.2 Relationship to an existing environment management system

EnergyAustralia works under an Environmental Management System (EMS). The EMS is certified to ISO14001 and is integrated into the operations of Unit 1. This OEMP for Unit 2 will be integrated into the existing EMS, refer to Figure 3-1 for a detailed overview of the existing EMS and how it has been incorporated to manage and reduce environmental impacts.

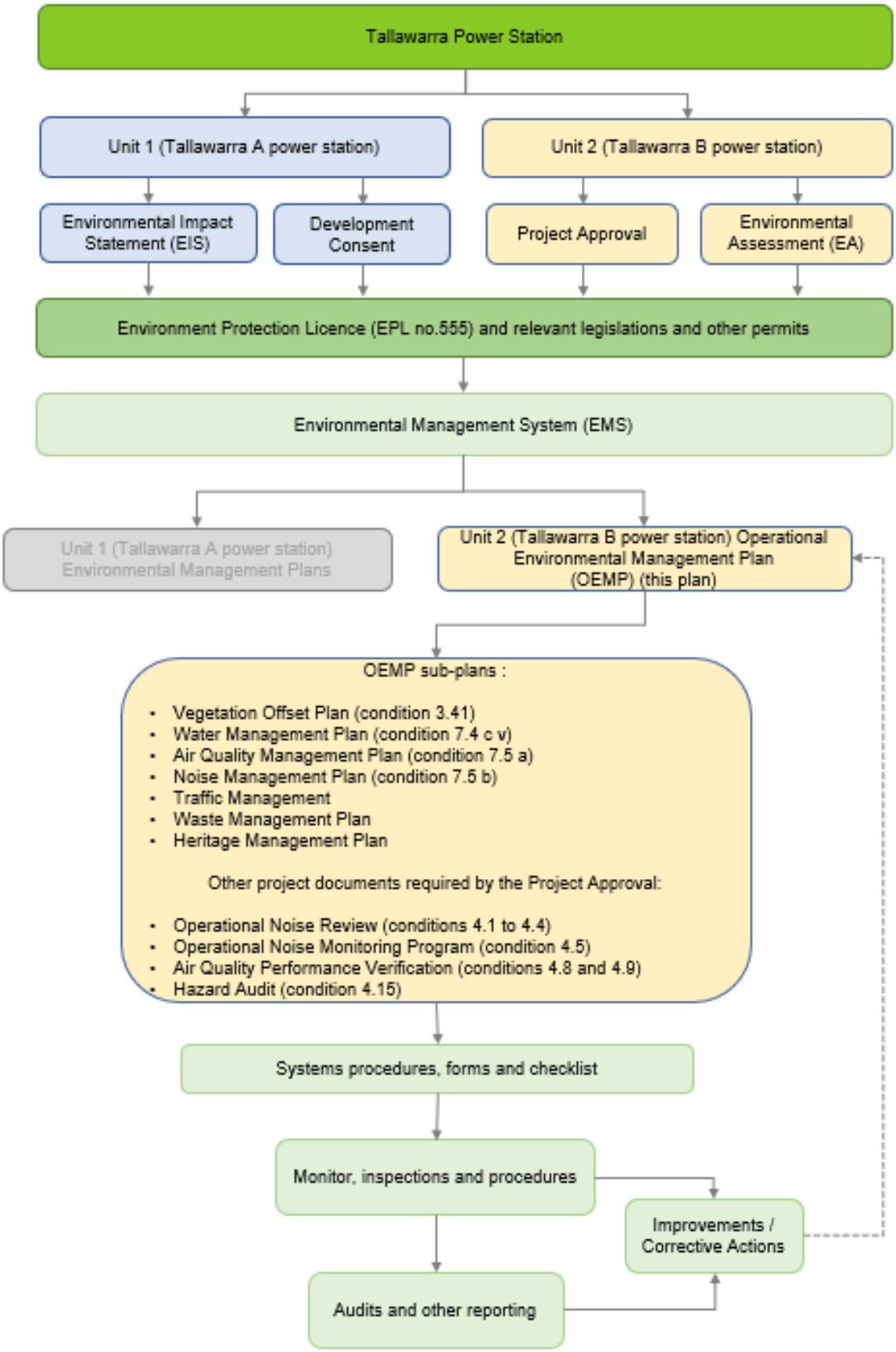

Figure 3-1 Environmental Management System Structure

3.3 Roles and responsibilities

The roles and responsibilities section provides the organisational structure outlining the key personnel involved in the environmental management of the project. Table 3-1 Roles and responsibilities includes the positions title/role and responsibility for the project.

Table 3-1 Roles and responsibilities

Role	Responsibilities
Asset Leader	The environmental responsibilities of the Asset Leader include: ■ ensure adequate resources are assigned to the site; ■ overall site responsibility for Health, Safety, Security and Environmental Compliance; ■ day to day management of the site; ■ ensures that environmental incidents requiring investigation are followed up and measures are effective; ■ liaison with EnergyAustralia and government authorities as required; and ■ ensure Leaders are completing training scheduling as per the Training Report received from the Business Operations Coordinator.
Site Leaders	The environmental responsibilities for Site Leader include: ■ ensure employees and contractors are provided with, and understand the known hazards associated with work, safety and the environmental requirements and the scope of work; ■ ensure there is compliance with statutory requirements, EPA Licence and conditions of Project Approval; ■ ensure employees are completing relevant environmental training as per the training matrix; ■ oversees environmental and operational activities and provides direction; and ■ ensuring environmental risk management is incorporated into work processes.
Health, Safety and Environment Specialist (HSE Specialist)	The environmental responsibilities of the HSE Specialist include: ■ review the OEMP annually, or as otherwise agreed with DPHI; ■ ensure that environmental obligations are met and prepare reports on compliance, including the annual compliance report; ■ obtain relevant environmental licences, permits and approvals; ■ manage environmental consultants and contractors; ■ consultation with regulatory agencies; ■ liaise with government agencies and relevant stakeholders; ■ supports the investigation of environmental incidents and near misses; and ■ maintain environmental documents.
All employees / subcontractors	The environmental responsibility of all employees and subcontractors include: ■ comply with HSSE procedures, including adopted procedures from approved environmental management systems; ■ conduct safe work observations; ■ report safety and environmental incidents; ■ comply with the requirements of the EMS the OEMP and sub-plans; ■ prepare activity specific Environmental Work Method Statement (EWMS) that comply with the Environmental Management Strategy and OEMP; ■ undertake activities in accordance with approved EWMS; and ■ maintain environmental records.

3.4 Legal compliance requirements

Legislation relevant to this OEMP and how it applies to the project is detailed in Appendix C.

The licenses and permits relevant to the project include:

- EnergyAustralia holds an EPL no.555 under Section 58(5) of the *Protection of the Environment Operations Act 1997* for the project site. The EPL covers the operational licence requirements for Tallawarra Power Station (Unit 1 and Unit 2); and

- license for the storage, transport and use of dangerous goods (required under the *Dangerous Goods Act 1974* and Dangerous Good Regulation 1999).

Copies of all relevant environmental licences and permits will be kept on-site.

Some licences or permits that may be held by subcontractors or external parties engaged by EnergyAustralia have not been specifically listed within the summary. Examples may include but not limited to:

- Licences for transporting certain waste types,
- An asbestos removal licence (Class A or Class B licence);
- Drivers of dangerous goods vehicles to hold a dangerous goods licence; or
- Licensed ecologists for threatened species handling.

3.5 Standard and guidelines

The OEMP has been prepared in accordance with the standard and guidelines listed, which include:

- ISO 14001 Environmental Management Systems – Requirements with Guidance for Use,
- NSW Department of Planning, Industry and Environment, 2020, *Compliance Reporting Post Approval Requirements*;
- NSW Department of Planning, Industry and Environment, 2020, *Post Approval Guidance Environmental Management Plan Guideline – Guideline for Infrastructure Projects*; and
- NSW Department of Planning, Industry and Environment, 2020, *Independent Audit Post Approval Requirements*.

3.6 Training and awareness

EnergyAustralia training for employees and subcontractors are outlined in the Business Management Manual. The business manual covers training, awareness and competency for environmental risks, impacts and controls. The manual confirms employees and contractors are adequately trained and can competently fulfil their responsibilities.

EnergyAustralia have site bulletins that are used to communicate safety and workplace information about specific work occurring onsite. The site bulletins address key features of the work, such as work start and completion date, location and site supervisor contact number. They may also include reference to exclusions zones, road closures and alternate routes. The site bulletins are displayed on notice boards around the power station.

3.7 Environmental risk assessment

EnergyAustralia has a risk assessment process in place to identify and analyse the environmental risks associated with the project. In addition, EnergyAustralia encourages all personnel take the action necessary to prevent harm to people, the environment or property.

EnergyAustralia has a risk register that documents the environmental aspects relating to the activities, products and services of the Tallawarra Power Station. The register should be reviewed at least annually. A review of the register should be triggered in response to a:

- significant Incident;
- new or modified process; and
- relevant Legislative/Licence/permit change.

Figure 3-2 and Figure 3-3 below provides an overview of the risk assessment process that EnergyAustralia will implement.

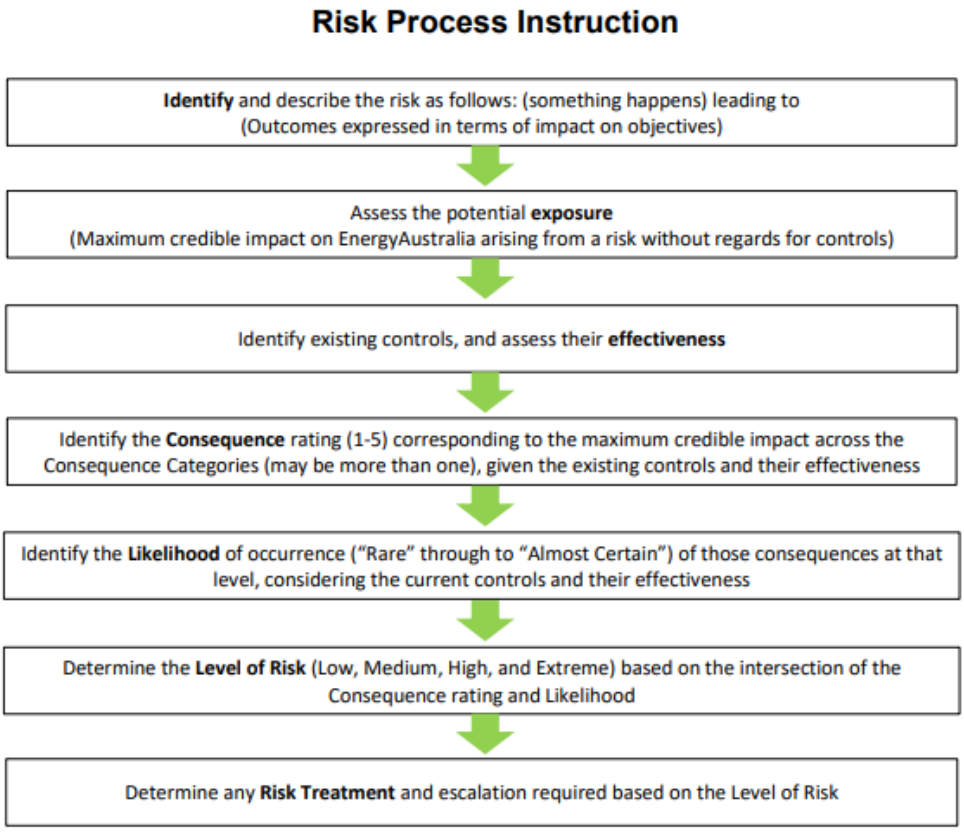

Figure 3-2 Risk Process Instruction

Consequence	Likelihood				
	A. Rare	B. Unlikely	C. Possible	D. Likely	E. Almost Certain
5. Critical	Medium	High	High	Extreme	Extreme
4. Major	Medium	Medium	High	High	Extreme
3. Moderate	Low	Medium	Medium	High	High
2. Minor	Low	Low	Low	Medium	Medium
1. Insignificant	Low	Low	Low	Low	Low

Level	Qualitative Measure	Frequency	Probability
E. Almost Certain	Already happened or is expected to occur in most circumstances	Once per month or more	90% or greater chance of occurrence
D. Likely	May probably occur in most circumstances	Once per year up to once per month	66% up to 90% chance of occurrence
C. Possible	Not unusual and might occur in the foreseeable future	Once in 3 years up to once per year	33% up to 66% chance of occurrence
B. Unlikely	Could occur at some time but unlikely in the foreseeable future	Once in 10 years up to once in 3 years	10% up to 33% chance of occurrence
A. Rare	Is expected to occur only in exceptional or extreme circumstances	Less than once in 10 years	Less than 10% chance of occurrence

Figure 3-3 Risk Assessment Consequence and Likelihood Table

Environmental mitigation, control and contingency measures will be put in place to minimise risk as a result of the above risk assessment process.

3.8 Environmental management measures

The sub plans contain measures to avoid and/or control the environmental impacts associated with the project. The controls provided in the sub plans would be used, where relevant, to:

- Control the occurrence of the identified environmental impacts,
- Protect the environment from harm;
- Satisfy the environmental requirements of the project and relevant agencies; and
- Comply with relevant environmental laws and regulations.

A range of monitoring, measurement and reporting activities are required to be undertaken throughout the Project. Environmental monitoring will be undertaken to manage risks.

To comply with condition 3.29 EnergyAustralia shall store and handle all dangerous goods, as defined by the Australian Dangerous Goods Code, strictly in accordance with:

a) all relevant Australian Standards;

b) for liquids, a minimum bund volume requirement of 110% of the volume of the largest single stored volume within the bund; and

c) the Environment Protection Manual for Authorised Officers: Bunding and Spill Management, technical bulletin (Environment Protection Authority, 1997).

In the event of an inconsistency between the requirements listed from a) to c) above, the most stringent requirement shall prevail to the extent of the inconsistency.

EnergyAustralia will ensure all external lighting associated with the project is mounted, screened, and directed in such a manner so as not to create a nuisance to the surrounding environment, properties and roadway. The lighting shall be the minimum level of illumination necessary and shall comply with *Australian Standard AS4282 1997 – Control of the Obtrusive Effects of Outdoor Lighting*.

3.9 Independent environmental audit

Independent audits carried out by EnergyAustralia will be conducted in accordance with the Departments Independent Audit Post Approval Requirements (May 2020) as required by Condition 5.9. EnergyAustralia will follow the process as it did in 2021 and will seek agreement from the Secretary in writing prior to the commencement of an independent audit. The independent auditing team as agreed to in writing by the secretary is included in Appendix F.

3.10 Site inspections

EnergyAustralia EMS includes various site inspections that are outlined in our management plans and work order system. The intention of these inspections are to ensure any issues, defective maintenance or preventative maintenance are responded to in a timely manner. Additionally, this is to ensure there is a feedback loop for continuous environmental improvement.

3.11 Environmental incident management

The notification and reporting process for environmental incidents is to be undertaken in accordance with:

- Conditions of Approval incident reporting requirements,
- EPL 555 requirements,
- EnergyAustralia Emergency Response Plan; and

- EnergyAustralia Pollution Incidents Response Management Plan.

3.11.1 Non-compliances and corrective actions

Environmental incidents will be documented, investigations conducted, and action plans established to prevent a reoccurrence of the event. An environmental investigation will follow the incident investigation procedures identified in the EnergyAustralia Emergency Response Plan and will include the following basic elements:

- Identifying the cause, extent and responsibility of the incident,
- Identifying and implementing the necessary corrective action,
- Identifying the personnel responsible for carrying out the corrective action,
- Implementing or modifying controls necessary to avoid a repeat occurrence of the incident,
- Recording any changes in written procedures required; and
- A plan to address relevant public authorities consultation requirements that result from the incident notification when required.

Project non-compliance notification requirements in accordance with the Project Approval are detailed within conditions 5.2 to 5.4 as follows:

- Condition 5.2 - The Secretary will be notified in writing via the Major Projects website within seven days after the Proponent becomes aware of any non-compliance.
- Condition 5.3 - A non-compliance notification will identify the development and the application number for it, set out the condition of approval that the development is non-compliant with, the way in which it does not comply and the reasons for the non-compliance (if known) and what actions have been, or will be, undertaken to address the non-compliance.
- Condition 5.4 - A non-compliance which has been notified as an incident does not need to also be notified as a non-compliance.

The above requirements would be implemented in relation to notification associated with project non-compliances.

3.11.2 Incident notification and reporting

In accordance with condition 5.1 of the Project Approval, the Secretary will be notified in writing via the Major Projects website immediately after the Proponent becomes aware of an incident. The notification will identify the development (including the application number and the name of the development) and set out the location and nature of the incident. Subsequent notification requirements must be given, and reports submitted in accordance with the requirements set out in Appendix 1 of the Project Approval.

Written incident notification requirements as detailed within the Project Approval are provided below.

Table 3-2 Incident notification and reporting requirements

Type	Details	Report	Frequency
Initial Written Incident Notification	Initial written incident notification requirements will be followed by EnergyAustralia as soon as they become aware of an incident.	Written notification via the Major Projects website which identifies the development (including the application number and the name of the development) and sets out the location and nature of the incident.	Immediately after the becoming aware of an incident

Type	Details	Report	Frequency
Written Incident Notification	Further written incident notification requirements will be followed by EnergyAustralia Seven days after becoming aware of the incident.	Written notification of an incident will: ■ identify the development and application number; ■ provide details of the incident (date, time, location, nature of the incident, a brief description of what occurred and why it is classified as an incident); ■ identify how the incident was detected; ■ identify when the proponent became aware of the incident; ■ identify any actual or potential non-compliance with conditions of approval; ■ describe what immediate steps were taken in relation to the incident; ■ identify further action(s) that will be taken in relation to the incident; and ■ identify a project contact for further communication regarding the incident.	Seven days after becoming aware of the incident
Incident Report	EnergyAustralia will provide the Secretary and any relevant public authorities (as determined by the Secretary) with a detailed report on the incident, and such further reports as may be requested.	The incident report will include: ■ a summary of the incident; ■ outcomes of an incident investigation, including identification of the cause of the incident; ■ details of the corrective and preventative actions that have been, or will be, implemented to address the incident and prevent recurrence; and ■ details of any communication with other stakeholders regarding the incident.	Within 30 days of the date on which the incident occurred or as otherwise agreed to by the Secretary

3.11.3 Emergency preparedness

EnergyAustralia has an established Emergency Response Plan and a Pollution Incidents Response Management Plan (PIRMP). These plans will be followed in case of an emergency. The emergency phoneline (02 4231 0810) is included in the induction and in the event of an emergency it can be dialled to alert the emergency response team.

The immediate actions in the event of an emergency are described in the Emergency Response Plan. When the Site Evacuation Alarm is actuated, an audible intermittent siren is heard around the plant. Red flashing beacons are located in high noise areas and on the roof of the Turbine Hall Building. All employees and contractors on sites are required to follow the actions below when the evacuation alarm is activated.

- STOP WORK,
- MAKE the workplace safe, if possible,
- ASSIST any injured persons where possible,
- SHUTDOWN all possible sources of ignition, electrical tools;
- PROCEED on foot to the Muster Point (with your visitors if applicable); and
- REPORT to the Muster Point Controller.

The primary Muster Point for On-shift EnergyAustralia Power Plant Technicians is the Operations Control Room.

3.12 Review and lodgement process

The OEMP will be regularly reviewed as part of the continual improvement process to make sure it remains current and relevant to the project. This review will be completed annually. EnergyAustralia will review, and where necessary, revise the document based on certain triggers being activated prompting a review.

In accordance with CoA 7.7, these triggers include reviewing the OEMP within 3 months, unless the Secretary agrees otherwise, of:

- The submission of an incident report under condition 5.1 of the Project Approval,
- The submission of an Independent Environmental Audit report under condition 5.11 of Project Approval,
- The approval of any modification to the conditions of Project Approval; or
- A direction from the Secretary under condition 1.3 of Project Approval.

EnergyAustralia will review and, if necessary, revise the studies, strategies or plans required under the CoA to the satisfaction of the Secretary. Where this review leads to revisions in any document, within 4 weeks of the review the revised document will be submitted to the Secretary for approval, unless otherwise agreed with the Secretary.

In accordance with condition 7.8 of the Project Approval, to ensure the studies, strategies and plans for the project are updated on a regular basis and incorporate any required measures to improve the environmental performance of the project, EnergyAustralia may submit revised studies, strategies or plans required for the project under the conditions of approval at any time.

EnergyAustralia utilises the compliance task function within Integrum to meet the specific timeframes and conditions of approval. Governance is in place to track progress and manage resources to meet the required timeframes.

4 Community and Stakeholder Engagement

4.1 Community consultation program

A Community Consultation Program (CCP) has been prepared to meet the CoA 6.5. The CCP will be implemented throughout the construction phase of the project and for at least the first 12 months of operation. The CCP includes:

- The general types of information on the timing, progress, construction, operation and environmental management of the project,
- The means by which the information would be provided to the community (for example, presented at regular meetings, published in regular newsletters etc),
- The spatial extent of the community to be consulted; and
- A mechanism through which the community can provide feedback to the Proponent in relation to the environmental management and impacts of the development.

4.2 Community Complaints and Access to Information

To comply with condition 6.2 of the Project Approval, EnergyAustralia will ensure that the following are available for community complaints for the life of the power station:

- A telephone number on which complaints about construction and operational activities at the site may be registered; 1800 574 947.
- A postal address to which written complaints may be sent; EnergyAustralia, Level 19, Two Melbourne Quarter, 697 Collins Street, Docklands VIC 3008
- An email address to which electronic complaints may be transmitted; Tallawarra.Community@energyaustralia.com.au.

Energy Australia has listed the community contact details to satisfy condition 6.2 on the webpage, The information is displayed on a sign at the entrance of the site and on the EnergyAustralia webpage. EnergyAustralia will publish the contact information in the newspaper circulating to the local area prior to commencement of operation.

Subject to confidentiality, EnergyAustralia will make all documents required under condition 6.4 of this approval available for public inspection upon request. EA will make sure the information is kept up to date, to the satisfaction of the Secretary.

4.3 Complaints Register

EnergyAustralia shall record details of all complaints received through the means listed in Section 4.2 above in an up-to-date Complaints Register. The Register will be provided to the Secretary upon request and record but not necessarily be limited to:

- the date and time of the complaint;
- the means by which the complaint was made (telephone, mail or email);
- any personal details of the complainant that were provided, or if no details were provided, a note to that effect;
- the nature of the complaint;
- any action(s) taken by the Proponent in relation to the complaint, including any follow-up contact with the complainant; and
- if no action was taken by the Proponent in relation to the complaint, the reason(s) why no action was taken.

5 Environmental Monitoring Plans

Environmental monitoring is designed to comply with regulatory requirements and the Project Approval and provide an ongoing analysis of the condition of the environment during operation. Monitoring results will be used to measure the effectiveness controls implemented on the site. Environmental monitoring is designed to assess potential impacts on the surrounding environment related to the project.

Specific monitoring requirements for weeds, soils and sediment, water, air and noise are outlined in the sub-plans of this OEMP (Section 5). It can be noted that operational noise criteria detailed within this OEMP applies cumulative to both Units 1 and 2.

5.1 Environmental sub plans

The following sub-plans are included in subsequent sections:

- Plume Validation Monitoring Program (included in Appendix J),
- Weeds and vegetation management,
- Vegetation offset plan (included in Appendix D),
- Soil erosion and sediment management,
- Water Management Plan,
- Air Quality Management Plan;
- Noise Management Plan;
- Traffic Management Plan;
- Waste Management Plan; and
- Heritage Management Plan

5.2 Plume validation monitoring program

The Plume Validation Monitoring Program (PVMP) addresses the requirement of Project Approval condition 1.6. The PVMP provides the details of the in-atmosphere plume monitoring methodology required to show that the plume complies with the plume velocity limits, and also a Trigger Action Response Plan (TARP) for the Tallawarra B unit. The PVMP was developed in consultation with the Civil Aviation Safety Authority (CASA) and Shellharbour City Council (SCC). Further details can be found within the PVMP itself (Appendix J).

5.3 Weeds and vegetation management

Project Approval condition 7.4 c) iii) requires ongoing measures to monitor and manage weeds. The Project conducts a weed control program annually across the power station and the surrounding lands in line with Biosecurity Act 2015 and South East Regional Strategic Weed Management Plan 2023-, governing the priorities in the region. The program is undertaken by the Illawarra District Weeds Authority (IDWA), that forms part of an ongoing weed control action plan to eradicate and/or contain State listed and local priority weeds that are considered to pose a significant biosecurity risk.

The IDWA provide a property inspection report for each inspection completed that outlines the actions required that EnergyAustralia must do to comply with the legislation. EnergyAustralia will use the IDWA inspection report as their action response plan as their ongoing measure to monitor and manage weeds at the power station as identified in Table 5-1

The following program (or similar) will continue to be implemented throughout the life of the project to ensure continued management of priority weeks through Tallawarra Power Station site and surrounding Tallawarra lands:

Table 5-1 - IDWA Priority weed management program for 2026 onwards

Month	Target Weeds	Zone / Location
January to May	Blackberry, Prickly Pear, Kei Apple (minor plants if detected)	**Zone 2** – Plant Buffer Paddock
February	General Weeds	**Zone 1** – Plant Site
March	Alligator Weed, Water Hyacinth	**Zone 3 / Zone 4** – Duck Creek / Ash Pond 3 Wetlands and Dam
March	General Weeds	**Zone 1** – Plant Site
March to April	Lantana	**Zone 4** – Ash Pond 3 and Wetlands
May	General Weeds	**Zone 1** – Power Station Site
August to October	Bitou Bush, Pampas Grass, African Boxthorn, Groundsel Bush, Coolatai Grass	**Zone 3 / Zone 4** – Ash Ponds 1, 2 and 3 / Ash Pond 3 Wetland area.
September	General Weeds	**Zone 1** – Plant Site
September to November	Kei Apple, Sticky Nightshade	**Zone 1 / 2 / 3 / 4** – All accessible areas.
October	General Weeds	**Zone 1** – Plant Site
December	General Weeds	**Zone 1** – Plant Site
December	Alligator Weed, Water Hyacinth	**Zone 3 / Zone 4** – Duck Creek / Ash Pond 3 Wetlands and Dam

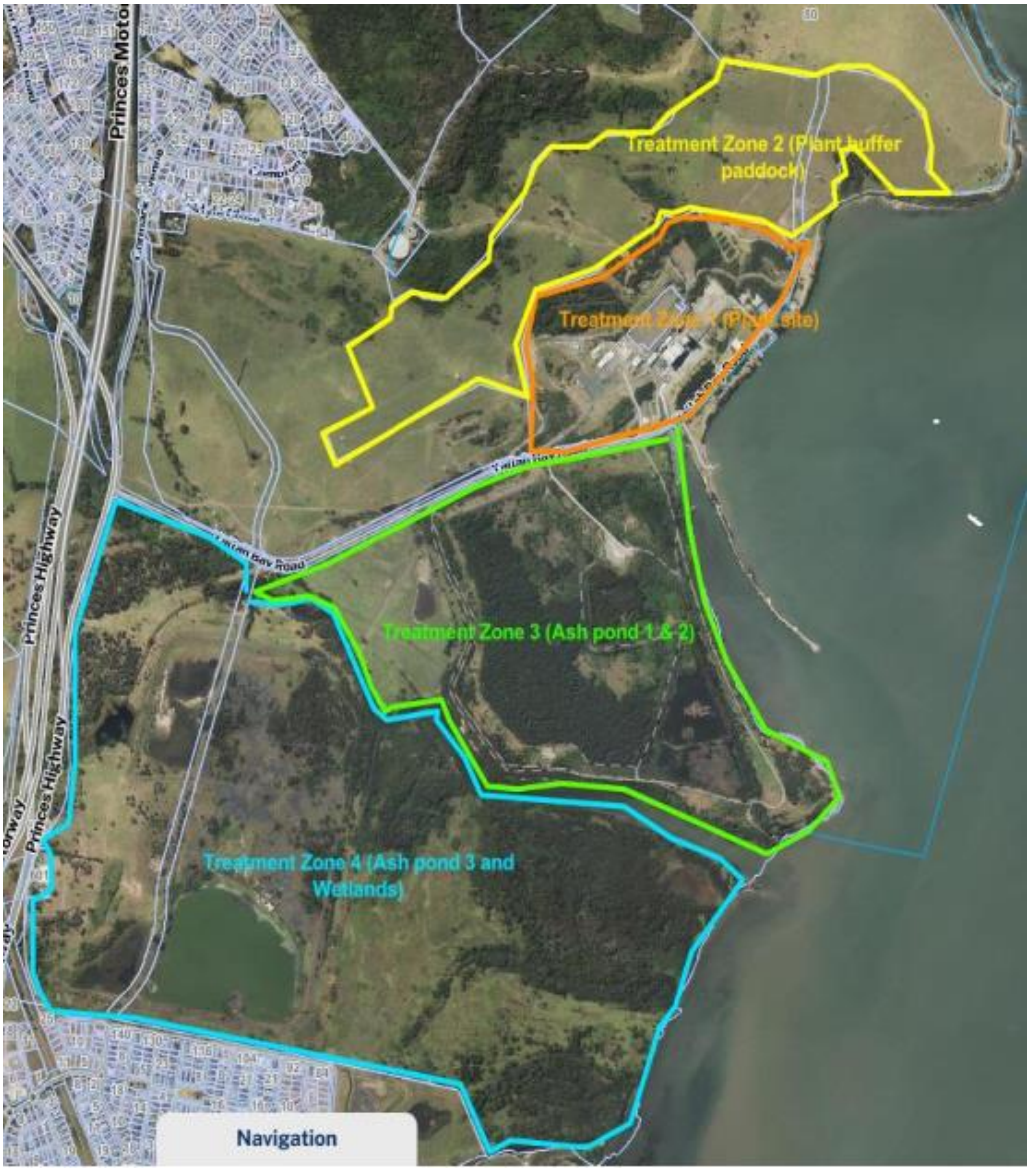

Figure 5-1 - IDWA 2026 and onwards weed management map of Tallawarra Power Station and Tallawarra Lands

Tallawarra Power Station has an estimated 1.26 hectares of Swamp Oak Floodplain Forest (as mapped by Aurecon, 2021), listed as an Endangered Ecological Community (EEC) under both the *Biodiversity Conservation Act 2016* (NSW) and the *Environment Protection and Biodiversity Conservation Act 1999*. Project Approval condition 3.38 requires that no disturbance occurs to Endangered Ecological Communities (EEC), including the Illawarra Subtropical Rainforest and Swamp Oak Floodplain Forest. The majority of the Swamp Oak Floodplain Forest is located outside of the main site boundary fence and is not regularly accessed as part of operational activities (Figure 5-2). The area is clearly identified and signposted. Works proposed in the area require a works permit before they can be undertaken. Any tree clearing or trimming also requires approval from the HSE Specialist or delegate before work can commence.

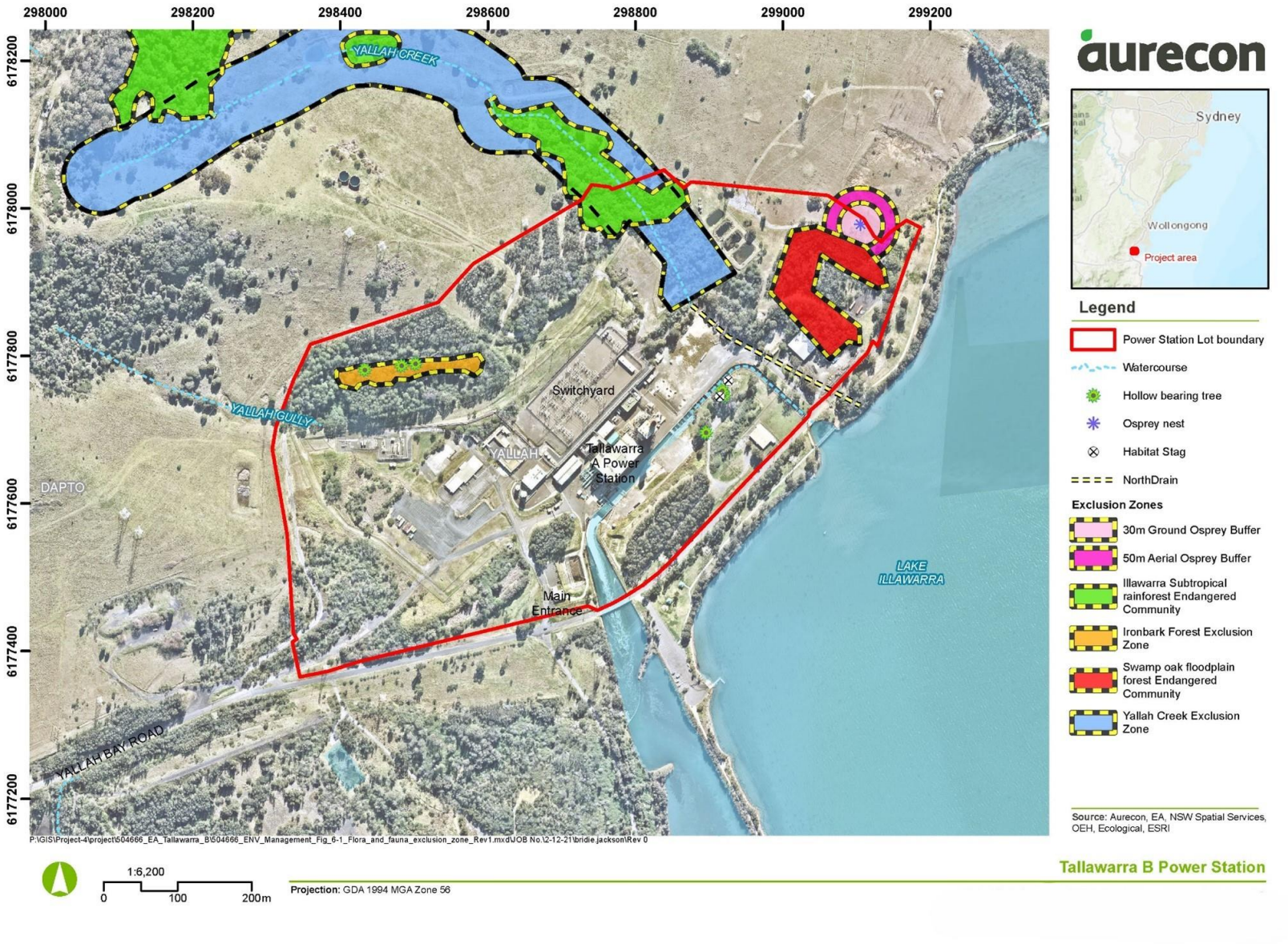

Figure 5-2 - Flora and fauna exclusion zones for the construction of the project

Table 5-2 - Environmental management measures relevant to weeds and vegetation

ID	Management measure	Where applicable	Responsibility	Source Document
General				
WE1	Annual Inspection of the Weed management Zones. EA will address any comments from IDWA Inspection report and satisfy the actions as required by the *Biosecurity Act 2015.*	Tallawarra Power Station	IDWA	Project Approval condition 7.4 c) iii
WE2	EEC boundary signage shall be inspected annually to confirm it is in place, structurally sound and legible. Any damaged or missing signage shall be replaced promptly.	Tallawarra Power Station	HSE Specialist	Project Approval condition 3.38
WE3	Prior to commencing any works within a mapped EEC boundary, the HSE Specialist must be consulted.	Tallawarra Power Station	HSE Specialist	Project Approval condition 3.38

5.4 Soil erosion and sediment management

The proposed long term operation activities are unlikely to require significant ground disturbance works and the ground is likely to remain undisturbed and relatively stable after rehabilitation activities. However, if in the unlikely event, significant ground disturbance is required, then controls are to be implemented as per the 'Blue Book' (*Managing Urban Stormwater: Soils and construction - Volume 1* (4th edition)) (NSW Government 2004).

Assessment of the vegetation offset site identified that soils are relatively stable with no significant erosion present. The proposed long-stem planting method does not require extensive ripping or disturbance of soil except at each individual planting point. Furthermore, the retention of groundcover in between each planting row will allow for sediment capture, as such sediment and erosion issues are expected to be minimal. Therefore, the implementation of erosion and sediment control features is not required and may lead to additional unnecessary disturbance if installed, provided that significantly soil disturbance does not occur.

If significant ground disturbance from vehicle tracks/augur holes or drainage line crossings significantly disturbs the soil, then sediment controls are to be implemented as per the 'Blue Book'.

5.5 Water Management Plan

5.5.1 Introduction

A Water Management Plan (WMP) has been prepared to address Project Approval condition 7.4 c) v. The purpose of this WMP is to provide a structured approach to the management of water impacts during operation of Unit 2. This plan defines the environmental management principles, processes, procedures, systems and tools to ensure effective environmental management of the site. The WMP will ensure that potential water quality impacts are minimised during the operation of the site.

5.5.2 Objectives

This plan outlines the objectives regarding water quality to achieve a discharge of clean storm water and treated water to the wetlands and Lake Illawarra. Table 5-3 outlines the objectives, targets and measurement tools to achieve minimal impact to Lake Illawarra.

Table 5-3 - Water monitoring objective and targets

Aspect	Objectives	Targets	Measurement tools
Water quality	To comply with conditions of approval and legislative requirements and ensure that water discharged offsite from operational activities does not cause environmental harm.	No sediment impacts to the surrounding environment and waterways as a result of the activities. No off-site water quality impacts as a result of inadequate onsite controls.	Audits, compliance reporting, monitoring results, site inspections and management reviews.

5.5.3 Water streams

Tallawarra Power Station uses a total water cycle approach for the management of water within the boundaries of the site. The approach incorporates the following water management system:

- Water supply (raw water and potable water);
- Water treatment (demineralised water);
- Potentially contaminated (reject water and oily water) water system; and
- Stormwater system.

The current configuration of the Unit 2 water management system is shown in **Figure 5-3**

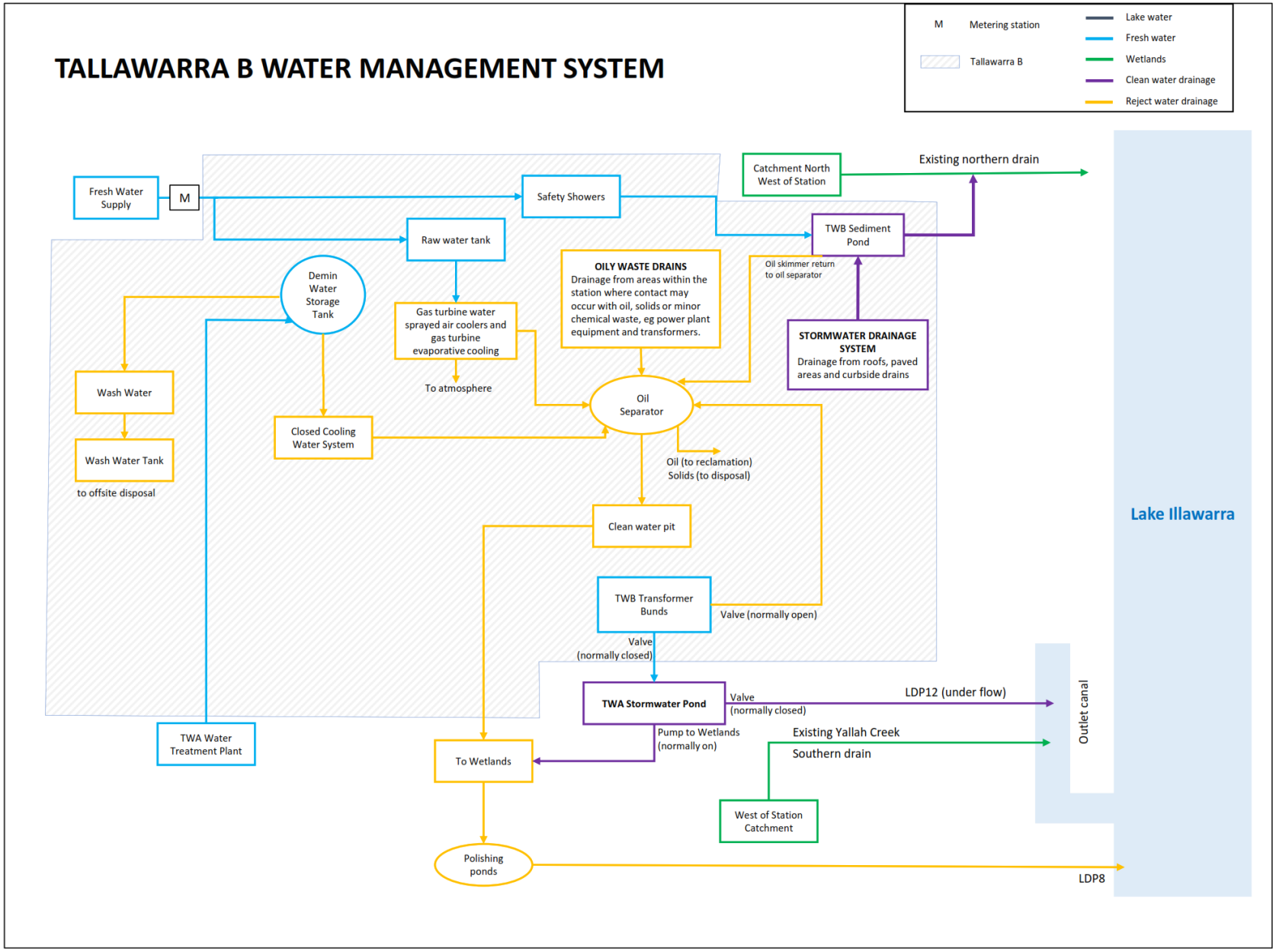

Figure 5-3 - Tallawarra B (Unit 2) Water Management System

5.5.4 Water supply (raw water and potable water)

Fresh water will be sourced from the existing Sydney Water supply system and used for power generation, ancillary services and domestic use. It is estimated that 225kL of freshwater per day will be consumed by Unit 2. Potable water will be distributed as service water, by a duty / standby pump arrangement, to the various consumers in the Plant, which include:

- Evaporative inlet air cooling water make-up,
- Water sprayed air cooler (WSAC),
- Water Bath Heaters supply; and
- Safety showers.

5.5.5 Stormwater

The topography of the existing site condition is relatively flat and uniformly graded from one corner to another diagonal corner. The stormwater system is designed to manage the AEP 5% storm event. The surface water management will be maintained at pre-construction levels using surface water management techniques and to ensure there are no adverse effects for adjoining land. The drainage system will utilise the internal road network (road pavement together with concrete kerb) as surface stormwater collection and allow close interval kerb side openings to let the collected stormwater flow into a road side drain. The kerb side openings where required will be designed to allow collected surface runoff to be drained into the drains as quickly as possible to avoid excessive water covering the road pavement.

The stormwater runoff shall be deemed to be free from hydrocarbon and chemical contamination. Stormwater that falls in bunded areas may be contaminated with hydrocarbons and will drain to the oily water treatment system. Stormwater drainage should go through the sediment pond except for flows from outside the development boundaries which are directed to flow around the site and back to the natural course downstream. The TWB sediment pond water will be discharged into the existing northern drain. An oil skimmer is installed at the TWB sediment pond and will divert detected oily water at the pond to the oil separator for treatment.

5.5.6 Wastewater, reject water and oily water management

Wastewater from pits and bunded areas that could be contaminated with oil, solids and chemicals, will be captured and sent to the oily water separator. An estimated volume of 24 kL/day of waste water could be produced. The predominant source originates from the Gas Turbine evaporative cooler. The drain systems on site will be segregated so the potentially contaminated water will be managed separately to stormwater. The oily water treatment will separate the oil from water and the oil will be transferred to a waste oil tank for pump out and removal from site. The treated water will be transferred to the wetlands and polishing pond system.

In the event of a transformer fire and the deluge system is activated, water from the transformer bunded areas, operators must operate three valves that will divert the water from the oily water separator and isolate the water at the TWA stormwater pond. If these valves are not operated, the water will overflow from the bunds and flow to the TWB retention pond and enter Lake Illawarra. TWA stormwater pond has the volume capacity to capture the water produced in the event of a transformer fire.

Washdown wastewater from the gas turbine will contain a mix of water detergent and oils. The wash wastewater is unable to be directed to the oily water treatment system due to the presence of detergents. The water is collected and directed to the dedicated wash water tanks.

The following dot points outline the process of managing reject water:

- Any oil and floating solids at the sedimentation pond will be skimmed off and sludge pumped out and appropriately deposited off site.
- Treated reject wastewater will be pumped to the water treatment wetland and polishing pond system, before discharging into Lake Illawarra near Wollingurry Point (EPL licence discharge point LDP8).

- Oil booms from the oil spill response kit will be implemented at the end of the outfall canal to collect oil and debris, as a further safeguard in the extremely unlikely event of an oil spill into the outfall canal. This measure is in line with the PIRMP.

5.5.7 Wetlands and polishing pond system

Treated process water from the power station will be directed to the wetland. The wetland is designed to treat an average of 41 kL/day. The wetland has been constructed with a clay lining to minimise seepage into the local groundwater. The purpose of the wetland and pond is to allow silt, nutrients and trace elements in the water flow to reduce to an acceptable level. Any overflow from the settling basins would enter Lake Illawarra at EPL LDP8 and will be managed in accordance with EPL555.The western catchment of the wetlands flows to ducks creek and the catchment north of the station flows to the existing northern drain. These catchments do not flow through to LDP8.

5.5.8 Unplanned water discharges

Stormwater runoff from the site is designed to enter the TWB retention pond and discharge to the existing northern drain. During heavy periods of rain, stormwater will continue to flow to the TWB retention pond. Unplanned water discharges will result in excessive water flooding and the unplanned water discharge through TWA stormwater pond and overflow is allowed to discharge from site at EPL identification point 12. This is activated by an underflow weir at the sediment stormwater retention pond south east corner that feeds into the outlet canal (Lake Illawarra). The discharge at EPL identification point 12 is associated with events where the volume and quality of the discharge is a function of the wet weather event. The unplanned discharge will be managed in accordance with EPL 555 requirements.

5.5.9 Flooding emergency response procedure

Section 5.5.5 addressed the stormwater AEP event. To prevent damage to builds, infrastructure and equipment, the following freeboards are installed:

- For the critical AEP 1% storm event, a 150mm freeboard shall be provided to all equipment bases (top of skid) or building floor levels (whichever is lower). The 150mm is measured from probable maximum flood (PMF) level which has been determined at 3.24m AHD.
- For the critical AEP 1% storm event there shall be no inundation of equipment or building floor level whichever is lower) of 3.39m AHD (3.24m + 0.15m).

In the event of a flooding emergency, the Emergency Response Plan will be followed. Refer to Section 3.11.3 for further details on emergency preparedness.

5.5.10 Environment measures

A range of environmental requirements will be implemented to manage water quality impacts. Specific water quality related measures are outlined in Table 5-4.

Table 5-4 - Environmental management measures relevant to water

ID	Management measure	Where applicable	Responsibility	Source Document
General				
W1	EnergyAustralia will comply with section 120 of the *Protection of the Environment Operations Act 1997* which prohibits the pollution of waters, unless where permitted in the Environment Protection Licence 555	Tallawarra Power Station	HSE Specialist	Project Approval condition 3.30 EPL 555
Stormwater management scheme				
W2	During heavy periods of rain, wet weather stormwater overflow is allowed to discharge from site at EPL identification point 12.	Tallawarra Power Station	HSE Specialist	EPL 555
W3	TWB settling basin will be used to remove coarse material from runoff water and minimise further sedimentation in Lake Illawarra.	Unit 2	HSE Specialist	Statement of Commitment no.4
W4	Runoff water quality (captured that report to the oil water separator) will be improved through the use of specially designed traps which will remove oil and grit from runoff water. This will enable recycling of the captured oil, and offsite disposal of the solids. The continued use of the existing constructed wetlands will further improve water quality through removal of excess nutrients and toxicants.	Unit 2	HSE Specialist	Statement of Commitment no.3
W5	Oil and grit traps will be used to capture stormwater runoff to improve water quality. Captured oil will be recycled, while captured solids will be taken offsite for disposal.	Unit 2	HSE Specialist	Statement of Commitment no.3
W6	An oil skimmer has been installed for the sediment pond. Oil spill response kits have been placed at the outfall canal.	Unit 2	HSE Specialist	Statement of Commitment no.5
Miscellaneous				
W7	Subject to any future development of Tallawarra Lands and the availability of sewer EnergyAustralia intend to connect to this system.	Tallawarra Power Station	HSE Specialist	Statement of Commitment no.6

5.6 Air Quality Management Plan

5.6.1 Introduction

An Air Quality Management Plan (AQMP) has been prepared to address Project Approval condition 7.5. The purpose of this AQMP is to provide an approach to manage air quality impacts during operation of the Unit 2. This plan defines the environmental management principles, processes, procedures, systems and tools for effective environmental management of the site. EnergyAustralia will ensure the stacks associated with the project be marked and lit in accordance with the requirements of the CASA.

Where aviation hazard lighting is recommended by CASA and/or AirServices Australia, all reasonable and feasible attempts shall be made to ensure that this lighting is designed and directed so as not to create a nuisance to the surrounding environment, properties and roadway.

5.6.2 Key air quality impacts

This plan outlines the appropriate controls are in place to avoid and/or minimise the following key potential aspects during the operational phase of the project include:

- Dust generation;
- Odour;
- Discharge to air;
- Mass emission limits; and
- Aviation safety.

Table 5-5 - Air quality objectives and targets

Aspect	Objectives	Targets	Measurement tools
Air quality	To comply with conditions of approval and legislative requirements and ensure that air quality from construction activities does not cause an environmental nuisance to sensitive receivers	No visual emissions of dust produced as a result of operational activities. Compliance with conditions of approval relating to air emission limits. No valid air quality complaints resulting from operational activities.	Audits, compliance reporting, monitoring results, complaints register, management reviews.

5.6.3 Greenhouse gas emissions

This plan outlines the appropriate controls are in place to avoid and/or minimise the following key potential aspects that could result in adverse impacts to air quality during the operational phase of the project include:

- Natural gas extraction,
- Combustion of natural gas at the power stations; and
- Operation of vehicles and plant emissions.

Table 5-6 below identifies the major sources of particulate and gaseous air pollutants along with emission scenarios and quantities of the emissions as required by condition 7.5 a i. These quantities were used as the input data for the air quality assessment undertaken by Katestone Environmental Pty Ltd (Katestone) (2020).

Table 5-6 - Major particulate and gaseous air pollutant source (Source: Table 11 of Katestone, 2020)

Pollutant	Emission scenario	Quantity
Emission concentrations		
NO_X	Maximum Load (100% Load)	50 mg/Nm3 (dry, 15% O2)
	Minimum Environmental Load (MEL)	50 mg/Nm3 (dry, 15% O2)
PM	100% Load	5 mg/Nm3 (dry, 15% O2)
	MEL	5 mg/Nm3 (dry, 15% O2)
Emission rates (total)		
NO_x	100% Load	35.8 g/s
	MEL	18.2 g/s
$PM_{2.5}$	100% Load	3.6 g/s
	MEL	1.8 g/s
PM_{10}	100% Load	3.6 g/s
	MEL	1.8 g/s

The potential for impacts on air quality will depend on a number of factors including plant type, fuel quality and ambient conditions. Primarily impacts will be dependent on the nature, extent and magnitude of operational activities and their interaction with the natural environment. The potential impacts to air quality during the operational phase of the project may include:

- Direct release of greenhouse gas emissions into the environment; and
- Health and safety impacts.

Katestone (2020) has considered the greenhouse gas impacts of the Project for Mod-2. It concluded that annual greenhouse gas emissions from the modified proposal are anticipated to be lower by 20% when compared to the two E-Class open cycle gas turbine in the original EIS.

5.6.4 Air Emissions and EPL 555 monitoring points

Discharge Limit

During operation of Unit 2, EnergyAustralia will ensure there are no exceedances in discharge limit at the applicable areas identified in Table 5-8.

EPL555 Identification Points (EPA ID)

Table 5-7 outlines the type and description of each monitoring point under EPL 555. Figure 5-4**Error! Reference source not found.** illustrates the location of EPA ID 13 (Unit 2 Stack) point at the site.

Table 5-7 - Environmental Protection Licence 555 Identification points

EPA ID No.	**Type of Monitoring Point**	**Description**
1	Discharge to utilisation area	Spray irrigation area
2	Effluent quality monitoring	Treated sewage sampling port in effluent line from the effluent collection pout to the utilisation area
3	Volume monitoring	Treated sewage volume monitoring via magnetic flow meter
4	Ambient water monitoring	Inlet waters to the Power Station
5	Discharge to waters, discharge quality monitoring	Cooling water discharge into the outlet canal downstream of the attemperation mixing zone
6	Ambient water monitoring	The waters of Lake Illawarra at the seagrass beds south of Wollingurry point.
7	Ambient water monitoring	The waters of Lake Illawarra at Koonawarra Bay
8	Discharge quality monitoring	Drain leading from the water treatment wetland just upstream of the discharge at Wollingurry Point
9	Discharge to air. Air emissions monitoring	Tallawarra Power Station Unit 1 Stack
11	Weather monitoring	Weather station
12	Wet weather discharge	Outlet pipe from the southeast corner of the Unit 1 (TWA) stormwater basin
13	Discharge to air. Air emissions monitoring	Tallawarra Power Station Unit 2 Stack

Figure 5-4 - Air quality monitoring locations and associated EPA identification numbers

The discharge limit only applies to the normal operation of a turbine and does not apply during the start-up and shutdown period. The limit continues to apply to other turbines if they are operational during these periods.

Start-up period is defined as the period which the plant is being brought up to normal operation following a period of inactivity. While shutdown period is defined as the period the plant is being taken out of service from normal operation to inactivity.

Table 5-8 - Maximum allowable discharge concentration limits

Pollutant	Unit of measure	100% limit	Reference conditions	Averaging Period	Where applicable
Nitrogen dioxide (NO_2) or nitric oxide (NO) or both, as NO_2 equivalent	ppm	25	Dry, 273°K, 101.3 kPa, 15% O_2	1-hour	EPA identification number 1 (according to Project Approval). EPA Identification no. 13 (according to EPL555)

Mass limit

EnergyAustralia will ensure the total cumulative load from the combined discharges of the Unit 1 and Unit 2 does not exceed the limits identified in Table 5-9. The mass limit will also apply to emissions during start-up and shut-down periods.

Table 5-9 - Maximum allowable mass limits

Assessable Pollutant	Load limit (tonnes per annum)
Nitrogen oxides	900

5.6.5 Air emissions management and controls

GT Model Based Control (MBC) is a control designed to improve the performance and operational flexibility of the gas turbine. The MBC uses real time modelling to calculate and maintain necessary boundary margins across the operational range of the Unit. MBC looks at the difference between target and measured feedback on key parameters with the use of logic, boundaries and sequence commands. An example of the MBC process is the start-up process of the Unit. When the Operator selects the 'STARTUP' on the control system, logic is activated, and the system continuously checks the plant boundaries throughout the start-up process. Certain boundary conditions must be satisfied otherwise the unit will not start. Therefore, the process for maximising the efficiency of the start-up (and shutdown) process is automated through the MBC.

The MBC is also used for combustion dynamics actually measures the dynamic boundaries in real time and feed the outputs to the MBC which then adjusts the combustion process to maintain the highest generating efficiency. The automated logic in the MBC provides pro-active measures in responding and reducing elevated emissions from the project.

The use of an automated control system to maximise efficiency in start-up and shut down processes, minimise greenhouse gas emissions per electricity generated and minimise gaseous and particulate emissions during the project will satisfy the conditions 7.5 a) I to 7.5 a) v. This technology has improved the performance of the turbine up to:

- a 50% reduction in start-up time and fuel consumption, significantly reduced start time variation and
- a 50% reduction in start-up emissions.

The OEM operation and maintenance manual defines maintenance activities to achieve efficient and reliable operation. EnergyAustralia will follow the regular maintenance regime to maintain plant and equipment to minimise the potential for leaks and fugitive emissions. EnergyAustralia will follow the OEM manual and maintenance activities to

- maximise generating efficiency per unit of electricity generated;
- minimise potential elevated air quality impacts for gaseous, particulate and fugitive emissions; and
- maintain efficient operation of the plant during start up and shut down periods.

The gas turbine has dry low NOx burners that have been designed for low NOx emissions to meet the discharge limit of 25 ppm. A continuous emissions monitoring system (CEMS) has been installed to monitor NOx emissions on a continuous basis. Further air quality controls are listed in Table 5-10.

Should an incident, process upset or other initiating factor lead to elevated air quality impacts, EnergyAustralia will follow the incident response and investigation procedure as outlined in section 3.9.

5.6.6 Review of Air Quality data

The NOx monitoring data collected by the CEMS will be reviewed monthly and published on EnergyAustralia website as required by EPL555. The monitoring data will be regularly (at least once per year) reviewed that compares the monitoring results against the predictions made in the Environment Assessment document listed under condition 1.1c.

5.6.7 Air quality monitoring

EnergyAustralia will undertake environmental monitoring of air quality as identified in Table 5-10.

Table 5-10 - Air Quality Monitoring Plan

Monitoring requirement	Location	Parameters (Unit of measure)	Frequency	Methodology	Reporting	Responsibility	CoA Reference
Air Quality Monitoring Plan	Unit 2 stack (EPA ID 13)	▪ Nitrogen Dioxide NO_2) or Nitic oxide (NO) or both, as NO_2 equivalent (ppm) ▪ Moisture (%) ▪ Oxygen (%) ▪ Temperature (°C) ▪ Velocity (m/s) ▪ Volumetric flow rate (m^3/s)	Continuous monitoring	Air monitoring will be undertaken: ▪ In accordance with Approved Methods for the *Sampling and Analysis of Air Pollutants in NSW* (EPA, 2022), or its latest version. ▪ Under maximum load as required by condition 4.7	Annual Compliance report to DPHI Annual Return report to NSW EPA.	Specialist stack testing consultant on behalf of Tallawarra	Condition 4.7 and 7.5

Air Quality Performance Monitoring Verification	Unit 2 stack	▪ Nitrogen Dioxide NO_2) or Nitic oxide (NO) or both, as NO_2 equivalent ▪ Moisture ▪ Oxygen ▪ Temperature ▪ Velocity ▪ Volumetric flow rate	One off performance verification monitoring. Within six months of the commencement of operation of the project, or as may be agreed or directed by the Secretary, and during a period in which the project is operating at both maximum design loads and under normal operating conditions.	▪ The assessment shall be undertaken strictly in accordance with the methods outlined in Approved Methods and Guidance for the Modelling and Assessment of Air Pollutants in New South Wales (EPA, 2017), or its latest version and shall include: ▪ a comparison of the results of the above air quality impact assessment and the predicted air quality impacts detailed in the Air Quality Assessment, Tallawarra B Permit Modification: Air Quality Assessment, EnergyAustralia, Katestone, dated June 2020; ▪ a comparison of the results of the air quality impact assessment and the impact assessment criteria detailed in *Approved Methods and Guidance for the Modelling and Assessment of Air Pollutants in NSW* (EPA, 2017), or its latest version; and	A report providing the results of the program shall be submitted to the Secretary and EPA within two months of completion of the testing program required under 4.8a) for both operating scenarios.	HSE specialist and stack testing consultant	Condition 4.8 and 4.9

Monitoring requirement	Location	Parameters (Unit of measure)	Frequency	Methodology	Reporting	Responsibility	CoA Reference
				▪ details of any entries in the Complaints Register relating to air quality impacts.			
Weather monitoring	Weather station	▪ Rainfall (mm) ▪ Wind speed @ 10 metres (m/s) ▪ Wind direction @ 10 metres (°) ▪ Temperature @ 2 metres (°C) ▪ Temperature @ 10 metres (°C) ▪ Sigma theta @ 10 metres (deg) ▪ Solar radiation (W/m^2) ▪ Additional requirements ▪ Siting ▪ Measurement	Continuous	Weather monitoring will be undertaken: In accordance with EPA *Ambient air monitoring guidance note* (EPA, 2022), or its latest version To the data averaging periods as required by the condition.	Annual Compliance report to DPHI Annual Return report to NSW EPA.	HSE Specialist	Condition 4.14

5.6.8 Environmental management measures

A range of environmental requirements and mitigation measures are identified in the Project Approval, Development Consent, EPL 555 and the EA will be implemented to minimise or manage air quality impacts.

Specific air quality related safeguards and management measures to address impacts associated with Tallawarra power station are outlined in Table 5-11.

Table 5-11 - Environmental management measures relevant to air quality

ID	Management measure	Where applicable	Responsibility	Source Document
General				
AQ1	The gas turbines will only operate on natural gas.	Tallawarra Power Station	Plant operator	EPL 555
Dust				
AQ2	Practicable dust management measures will be implemented, including cessation of relevant works where appropriate, such that emission of visible dust, including wind-blown and traffic-generated dust, is minimised during all operational activities.	Tallawarra Power Station	HSE Specialist	Project Approval Condition 3.19 EPL 555
Emissions				
AQ3	No exceedances to discharge limit for the pollutant parameters at the applicable areas as identified in Table 5-8	Tallawarra Power Station	Plant operator	Project Approval Condition 3.24
AQ4	The total cumulative load from the combined discharges of the Unit 1 and 2 power stations does not exceed the following limits: ▪ Nitrogen oxides – 900 tonnes/year	Tallawarra Power Station	Plant operator	Project Approval Condition 3.25 EPL 555
AQ5	A continuous NOx monitoring system will be installed on site to determine the annual NOx load.	Unit 2	HSE Specialist	Project Approval condition 7.5 Statement of commitment no.3
Odour				
AQ6	Any offensive odour, as defined under section 129 of the *Protection of the Environment Operations Act 1997*, will not be emitted beyond the project site boundary. Site inspections shall identify if offensive odour has a potential presence onsite. The HSE team will be notified.	Tallawarra Power Station	HSE Specialist	Project Approval condition 3.20 EPL 555
Monitoring				

ID	Management measure	Where applicable	Responsibility	Source Document
AQ7	The weather monitoring station will be installed at the location labelled as EPA identification number 11. Weather monitoring station will monitor for rainfall, wind speed, temperature, sigma, solar radiation and other parameters outlined in Table 5-11	Tallawarra Power Station	HSE Specialist	Project Approval condition 4.14
AQ8	An air quality performance verification program for Unit 2 will be undertaken to confirm the air emission performance and to compare against the relevant criteria limits within six months of the commencement of operation of the project and during the operation at both maximum design loads and under normal operating conditions.	Unit 2	HSE Specialist	Project Approval condition 4.8
AQ9	National Greenhouse and Energy Reporting will be undertaken and report on the ongoing monitoring of greenhouse gas emissions.	Unit 2	HSE Specialist	EPL 555 Statement of commitment no.6 and 7
AQ10	Annual monitoring results from the operating emission load of Unit 1 and 2 power station will be used to determine if emission offset is required. If the need for emission offset is required, the specific details of the relevant activities would be approved in accordance with the relevant sections of the *Protection of the Environment Operations Act 1997* (POEO Act).	Tallawarra Power Station	HSE Specialist Plant operator	Statement of commitment no.4
AQ11	As required by the Air Quality Performance Verification, In the event that results of the air dispersion modelling (as required under condition 4.8) indicates that the operation of the project, under maximum design loads or normal operating conditions, will lead to: a) greater point source emissions of air pollutants than permitted under Table 5-8; or b) greater ground-level concentrations of air pollutants than the impact assessment criteria detailed in Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales (EPA 2017); then EnergyAustralia shall provide details of remedial measures to be implemented to reduce point source emissions and/ or ground-level concentrations of air pollutants to no greater than permitted under the Project Approval as modified. Details of the remedial measures and a timetable for implementation shall be submitted to the EPA for approval within such period as the EPA may require, unless agreed otherwise by Secretary.	Unit 2	HSE Specialist	Project Approval condition 4.9

5.7 Noise Management Plan

5.7.1 Introduction

An operational noise management plan (NMP) has been prepared to address Project Approval condition 7.5. The purpose of this NMP is to manage the cumulative noise contribution from operating Unit 1 and Unit 2 to the ensure the background acoustic environment noise limits is not exceeded.

The definition for day, evening and night periods, throughout this plan, are to be taken as the following:

- Day: 7:00am to 6:00pm Mondays to Saturdays; 8:00am to 6:00pm Sundays and public holidays.
- Evening: 6:00pm to 10:00pm on any day.
- Night: 10:00pm to 7:00am Mondays to Saturdays; 10:00pm to 8:00am Sundays and public holidays.

5.7.2 Key potential noise impacts

Key aspects during the operational phase of the project include:

- Individual operation of Unit 1 or Unit 2,
- Cumulatively operation of the Unit 1 and Unit 2;
- Start up and shutdown of either Unit 1 or Unit 2; and
- Changes to local meteorological conditions which may exacerbate noise impacts.

Operational activities that will be carried out during operation of the plant that may influence noise include:

- Gas pipeline venting
- Operation of gas control valves during startup and shutdown

5.7.3 Objectives and targets

Table 5-12 contains the environmental objectives and targets relevant to noise management. These objectives and targets have been developed with the compliance requirements, contractual obligations, risks and opportunities taken into consideration.

Table 5-12 - Noise objectives and targets

Aspect	Objectives	Targets	Measurement tools
Noise	Comply with conditions of approval and to ensure that noise from operational activities does not cause environmental nuisance to sensitive receivers.	No valid noise complaints resulting from operational activities. Compliance with all conditions of approval relating to noise limits and noise management measures.	Audits, compliance reporting, monitoring results, complaints register, management reviews.
Complaints	Noise complaints are investigated and responded to appropriately.	To ensure all noise, vibration complaints are investigated and responded to appropriately	Audits, compliance reporting, monitoring results, complaints register, management reviews.

5.7.4 Operational Noise criteria

EnergyAustralia have prepared and will implement the noise monitoring program to assess compliance against the operational noise criteria stipulated in Table 5-13 and Table 5-14. The noise monitoring program shall be prepared in consultation with, and to the satisfaction of, the EPA. Noise monitoring is to be consistent with the guidelines provided in the Noise Policy for Industry (NSW EPA, 2017). These criteria

apply to cumulative noise generation from both Units 1 and 2. The location of these monitoring points is illustrated in Figure 5-5.
The weather station as identified in Figure 5-4 of the Air Quality Management Plan will record data and be used for determining meteorological conditions during noise monitoring. The noise limits set out in Table 5-13 and Table 5-14 do not apply under: wind speeds greater than 3 metres per second (measured at 10 metres above ground level); or under stability category G temperature inversion conditions; or under stability category F temperature inversion conditions and wind speeds greater than 2 metres per second at 10 metres above the ground.

The stability category temperature inversion conditions will be determined by the sigma-theta method outlined in the Noise *Policy for Industry* (NSW EPA, 2017).

Table 5-13 - Maximum Allowable Noise Limits Outside the Tallawarra Lands (CoA Table 1)

Location	Description	Day	Evening	Night	
		$L_{Aeq(15\ minute)}$	$L_{Aeq(15\ minute)}$	$L_{Aeq(15\ minute)}$	L_{Amax}
Locality T2 (A)	Any residence on Carlyle Close, Wollin Place, Coronet Place, and Crompton Street, in Koonawarra	35 dB(A)	35 dB(A)	35 dB(A)	45 dB(A)
Locality T4 (B)	Any residence on Wyndarra Way and Malonga Place in Koonawarra	35 dB(A)	35 dB(A)	35 dB(A)	45 dB(A)
Locality ML#9 (C)	Any residence on The Boulevarde, Park Crescent, Horsley Road and Newton Crescent in Oak Flats	38 dB(A)	38 dB(A)	38 dB(A)	45 dB(A)
Locality ML#10 (D)	Any residence on Reddall Parade and Henricks Parade in Mt Warrigal	38 dB(A)	38 dB(A)	38 dB(A)	45 dB(A)
Locality ML#11 (E)	Any residence in Haywards Bay	35 dB(A)	35 dB(A)	35 dB(A)	45 dB(A)

Notes: For the purpose of this table, ‘residence’ is defined as any residential dwelling existing at the date of this approval and any residential dwelling, once constructed, on land zoned R2 – Low Density Residential under the Wollongong Local Environmental Plan 2009 at the identified locality.

Table 5-14 - Noise Limits for Tallawarra Lands Residential Areas (CoA Table 2)

Locations	Day	Evening	Night	
	$L_{Aeq(15\ minute)}$	$L_{Aeq(15\ minute)}$	$L_{Aeq(15\ minute)}$	L_{Amax}
Most affected residence – proposed northern residential area	If the *Noise Policy for Industry* (NSW EPA, 2017) Modification Factors for Low Frequency Noise apply 40 dB(A), otherwise 38 dB(A)	If the *Noise Policy for Industry* (NSW EPA, 2017) Modification Factors for Low Frequency Noise apply 40 dB(A), otherwise 38 dB(A)	If the *Noise Policy for Industry* (NSW EPA, 2017) Modification Factors for Low Frequency Noise apply 40 dB(A), otherwise 38 dB(A)	50 dB(A)
Most affected residence – proposed central residential area	40 dB(A)	40 dB(A)	40 dB(A)	50 dB(A)
Most affected residence – proposed south-western residential area	41 dB(A)	41 dB(A	41 dB(A	51 dB(A

Notes: For the purpose of this table, 'residence' is defined as any residential dwelling once constructed, either prior to or post construction and operation of the power station, on land zoned R2 – Low Density Residential or R5 – Large Lot Residential under the Wollongong Local Environmental Plan 2009 within the proposed residential areas.

In instances where Modification Factors for Low Frequency Noise apply, noise monitoring is to include an assessment of modifying factors in accordance with Fact Sheet C of the Noise Policy for Industry 2017. This is where noise is assessed for annoying characteristics such as tonal, low frequency or intermittent noise and a penalty may be added to the measured noise level.

Figure 5-5 - Noise Monitoring Locations

5.7.5 Operational Noise review

In agreement with DPE (letter dated May 2023) EA agreed to undertake the Operational Noise Review (ONR) during the commissioning phase of the project, bringing forward the schedule of this activity (stated as within 90 days of commencement of operation in condition 4.1). The ONR methodology and reporting was undertaken as per condition 4.1 and has been prepared in consultation and to the satisfaction of the EPA. The report was submitted to the Secretary and the EPA within 90 days of completion of the monitoring. The report included, but not necessarily be limited to:

- a description of the methodologies for noise monitoring, including the location of monitoring sites and frequency of monitoring, documentation of the operational noise levels at the locations defined in Table 1 and Table 2 of this approval as ascertained by the noise monitoring program;
- an assessment of the noise performance of the project against the noise limits specified in Table 1 and Table 2 of this approval and the predicted noise levels as detailed in the report referred to under condition 1.1c) of this approval;
- details of the meteorological conditions prevailing during the monitoring; and
- details of any entries in the Complaints Register (condition 6.3) relating to noise impacts.

Once the operational noise levels have been confirmed, EnergyAustralia will notify landowners that are entitled to 'at-receiver' noise treatment and/or land acquisition rights. Confirmation of operational noise levels for the purpose of at-receiver' noise treatment and/or land acquisition rights means:

- the completion of the operational noise review; and
- implementation of any source controls required in the non-compliance report, where required; and
- monitoring of operational noise levels following the implementation of any source controls, where required.

5.7.6 Non-compliance report

Where Operational Noise Monitoring or ONR identifies any non-compliance with the noise criteria a non-compliance report will be prepared and submit to the Secretary for approval. The non-compliance report will include the following:

- an assessment of all reasonable and feasible physical and other mitigation measures for reducing noise at the source;
- identification of the preferred measure(s) for reducing noise at the source;
- evidence that the NSW EPA is satisfied that the proposed noise mitigation measures are acceptable; and
- location, type, timing and responsibility for implementation of the noise mitigation measure(s).

The non-compliance report will be prepared and submitted to the Secretary within 90 days of undertaking the noise monitoring which has identified the exceedances of the operational noise criteria, unless otherwise agreed to by the Secretary. EnergyAustralia will implement all reasonable and feasible mitigations measures in accordance with the requirements of the Secretary.

5.7.7 At- receiver noise criteria

Relevant additional noise mitigation criteria outside the Tallawarra Lands, as identified within Table 3 of the Project Approval as modified, is detailed within Table 5-15 below. Additional noise mitigation criteria for Tallawarra Lands residential areas, as identified within Table 4 of the Project Approval as modified, is detailed within Table 5-16 below.

Table 5-15 - Additional Noise MItigation Criteria Outside the Tallawarra Lands (CoA Table 3)

Locations	Description	Day	Evening	Night
		$L_{Aeq(15\ minute)}$	$L_{Aeq(15\ minute)}$	$L_{Aeq(15\ minute)}$
Locality T2 (A)	Any residence on Carlyle Close, Wollin Place, Coronet Place, and Crompton Street, in Koonawarra	40 dB(A)	40 dB(A)	40 dB(A)
Locality T4 (B)	Any residence on Wyndarra Way and Malonga Place in Koonawarra	41 dB(A)	41 dB(A)	41 dB(A)
Locality ML#9 (C)	Any residence on The Boulevarde, Park Crescent, Horsley Road and Newton Crescent in Oak Flats	41 dB(A)	41 dB(A)	41 dB(A)
Locality ML#10 (D)	Any residence on Reddall Parade and Henricks Parade in Mt Warrigal	40 dB(A)	40 dB(A)	40 dB(A)
Locality ML#11 (E)	Any residence in Haywards Bay	47 dB(A)	47 dB(A)	47 dB(A)

Table 5-16 - Additional Noise Mitigation Criteria for Tallawarra Lands Residential Area (CoA Table 4)

Locations	Day	Evening	Night
	$L_{Aeq(15\ minute)}$	$L_{Aeq(15\ minute)}$	$L_{Aeq(15\ minute)}$
Most affected residence – proposed northern residential area	43 dB(A)	43 dB(A)	43 dB(A)
Most affected residence – proposed central residential area	43 dB(A)	43 dB(A)	43 dB(A)
Most affected residence – proposed south-western residential area	44 dB(A)	44 dB(A)	44 dB(A)

5.7.8 Additional noise mitigation measures

If the at-receiver noise limits in Table 5-17 and Table 5-18 are still exceeded even after the implementation of reasonable and feasible measures and a written request from the landowner is received. EnergyAustralia will investigate reasonable and feasible at-receiver noise mitigation measures will be implemented in consultation with the landowner, to ensure the operational noise limits as specified in condition 3.5 are not exceeded. Noise mitigation measures may include:

- double glazing,
- insulation,
- air conditioning and or
- other building acoustic treatments at any residence on the land,

EnergyAustralia shall make a binding written offer to the landowner regarding the mitigation options that can be implemented at the property. If within three months of receiving this request from the landowner and the landowner cannot agree on the measures to be implemented, or there is a dispute about the implementation of these measures, then either party may refer the matter to the Secretary for resolution, whose decision shall be final. If the landowner refuses to accept the Proponent's offer within six months of the date of offer, the Proponent's obligations to provide additional mitigation measures at the property or land shall cease, unless otherwise agreed by the Secretary.

Any landowner that has agreed to, or property that has been the subject of, the application if additional noise mitigation measures under condition 3.7 of this approval waives the right to land acquisition, per condition 3.13, unless otherwise agreed by the Secretary. If an agreement exists between the landowner and

EnergyAustralia, CoA 3.7 to 3.10 do not apply if a negotiated agreement consistent with the requirements of Noise Policy for Industry (NSW EPA, 2017) exists between the Proponent and the landowner.

5.7.9 Land acquisition noise criteria

Relevant land acquisition criteria for residential receivers outside the Tallawarra Lands, as identified within Table 5 of the Project Approval as modified, is detailed within **Table 5-17** below. Relevant land acquisition criteria for Tallawarra Lands residential areas, as identified within Table 6 of the Project Approval as modified, is detailed within **Table 5-18** below.

Table 5-17 - Land acquisition criteria for residential receivers outside the Tallawarra Lands (CoA Table 5)

Locations	Description	Day	Evening	Night
		$L_{Aeq(15\ minute)}$	$L_{Aeq(15\ minute)}$	$L_{Aeq(15\ minute)}$
Locality T2 (A)	Any residence on Carlyle Close, Wollin Place, Coronet Place, and Crompton Street, in Koonawarra	43 dB(A)	43 dB(A)	43 dB(A)
Locality T4 (B)	Any residence on Wyndarra Way and Malonga Place in Koonawarra	44 dB(A)	44 dB(A)	44 dB(A)
Locality ML#9 (C)	Any residence on The Boulevarde, Park Crescent, Horsley Road and Newton Crescent in Oak Flats	44 dB(A)	44 dB(A)	44 dB(A)
Locality ML#10 (D)	Any residence on Reddall Parade and Henricks Parade in Mt Warrigal	43 dB(A	43 dB(A	43 dB(A
Locality ML#11 (E)	Any residence in Haywards Bay	50 dB(A)	50 dB(A)	50 dB(A)

Table 5-18 - Land acquisition criteria for Tallawarra Lands Residential Areas (CoA Table 6)

Locations	Day	Evening	Night
	$L_{Aeq(15\ minute)}$	$L_{Aeq(15\ minute)}$	$L_{Aeq(15\ minute)}$
Most affected residence – proposed northern residential area	46 dB(A)	46 dB(A)	46 dB(A)
Most affected residence – proposed central residential area	46 dB(A)	46 dB(A)	46 dB(A)
Most affected residence – proposed south-western residential area	47 dB(A)	47 dB(A)	47 dB(A)

5.7.10 Land acquisition

EnergyAustralia will provide written notification to all landowners that are entitled to land acquisition rights within 21 days of determining the landholdings to which land acquisition rights apply.

Landowner/property is not eligible for land acquisition in the following scenarios:

- In accordance with condition 3.13 of the Project Approval, if a landowner that has agreed to, or property that has been the subject of, the application of at-receiver noise treatment.
- In accordance with condition 3.16 of the Project Approval, if a landowner has already agreed to an offer of acquisition, or an offer of acquisition has been previously made and refused by the landowner, then the obligations to re-consider the landowner's request or property will cease, unless otherwise agreed by the Secretary.
- In accordance with condition 3.17 of the Project Approval, if a negotiated agreement that is consistent with the requirements of *Noise Policy for Industry* (NSW EPA, 2017) exists between the relevant landowner and EnergyAustralia.

EnergyAustralia will only acquire the land from the affected landowner upon receiving a written notification from the landowner requesting for acquisition of the land. Noting that the acquisition request can only be made within two years of the date of that landowner was notified of his/her acquisition rights.

5.7.11 Land acquisition binding offer

EnergyAustralia will make a binding written offer to the affected landowner with acquisition rights within three months of receiving the written acquisition request from the landowner. The binding offer will include the following:

- the current market value of the landowner's interest in the property at the date of this written request, as if the property was unaffected by the project subjected within the Project Approval, having regard to the following:
  - existing and permissible use of the land, in accordance with the applicable planning instruments at the date of the written request,
  - presence of improvements on the property and/or any approved building or structure which has been physically commenced at the date of the landowner's written request, and is due to be completed subsequent to that date;
- the reasonable costs associated with, including but not limited to:
  - relocating within the Wollongong or Shellharbour local government areas,
  - obtaining legal advice and expert advice for determining the acquisition price of the land, and the terms upon which it is required; and
- reasonable compensation for any disturbance caused by the land acquisition process.

If, at the end of the binding offer period, the landowner and EnergyAustralia cannot come to an agreement on the acquisition price of the land, and/or the terms upon which the land is to be acquired, then either party may refer the matter to the Secretary for resolution. Refer to Section 5.7.12 for the resolution of land acquisition if the matter is referred to the Secretary.

5.7.12 Land acquisition matter referred to the Secretary

After which the Secretary will make a request to the President of the NSW Division of the Australian Property Institute to appoint a qualified independent valuer or Fellow of the Institute, to consider submissions from the landowner and EnergyAustralia and determine a fair and reasonable acquisition price for the land, and/or terms upon which the land is to be acquired.

In accordance with condition 3.15, EnergyAustralia will bear the costs of any valuation or survey assessment requested by the independent valuer, or the Secretary and the costs of determination referred to above.

Within 14 days of receiving the independent valuer's determination, EnergyAustralia will make a written offer to purchase the land at a price not less than the independent valuer's determination. If the landowner refuses to accept this offer within six months of the date of the Proponent's offer, the Proponent's obligations to acquire the land shall cease, unless otherwise agreed by the Secretary.

5.7.13 Monitoring

This section provides the requirements for the ongoing noise program and operational noise review in accordance with the project approval conditions. For the purpose of ongoing noise monitoring and condition 4.3, noise from the project will be measured:

- at the most affected point within the residential boundary or at the most affected point within 30m of the dwelling where the dwelling is more than 30 m from the boundary;
- at one metre from the dwelling facade to determine compliance with the L_{Amax} noise limits outlined in Table 5-13 and Table 5-14; and

- in the case of the proposed residential areas within the Tallawarra lands, measured at the most affected point within each residential area.

Notwithstanding, should direct measurement of noise from the project be impractical, EnergyAustralia may undertake an alternative noise assessment method which is deemed acceptable by the EPA (refer to *Noise Policy for Industry* (NSW EPA, 2017)). Details of the proposed alternative noise assessment method must be submitted to the Secretary prior to undertaking the alternative noise assessment method.

The noise monitoring program is provided below in Table 5-19.

Table 5-19 - Noise Monitoring Program

Potential Impact	Location	Parameters	Frequency	Methodology	Reporting	Responsibility	CoA and OEMP Reference
Operational Noise Review	T2 (A) Any residence on Carlyle Close, Wollin Place, Coronet Place, and Crompton Street, in Koonawarra T4 (B) Any residence on Wyndarra Way and Malonga Place in Koonawarra ML#9 (C) Any residence on The Boulevarde, Park Crescent, Horsley Road and Newton Crescent in Oak Flats ML#10 (D) Any residence on Reddall Parade and Henricks Parade in Mt Warrigal ML#11 (E) Any residence in Haywards Bay (North) Most affected residence – proposed northern residential area (Central) Most affected residence – proposed central residential area (South) Most affected residence – proposed south-western residential area	▪ Laeq, ▪ LA10, ▪ LA90; and ▪ LAMax. Noise levels shall not exceed criterion stipulated in Table 5-13 and Table 5-14	A one off survey under design loads and normal operating conditions, within 90 days of the commencement of operation of the project. Operational Noise Review may be undertaken during the commissioning phase of the project. In the event this occurs, this will be undertaken as part of Project Approval condition 4.1 requirement.	Noise monitoring will be undertaken: ▪ in accordance with the *Noise Policy for Industry* (NSW EPA, 2017); ▪ via attended noise monitoring at the locations identified in Table 5-13 and Table 5-14 and as illustrated within Figure 5-5 ▪ attended noise monitoring will be undertaken for 15 minutes per location. ▪ Monitoring is undertaken at each of the locations for day, evening and night periods; and ▪ In instances where Modification Factors for Low Frequency Noise apply, noise monitoring is to include an assessment of modifying factors in accordance with Fact Sheet C of the Noise Policy for Industry 2017. This is where noise is assessed for annoying characteristics such as tonal, low frequency or intermittent noise and a penalty of 5 dB will be added.	Operational Noise Review report submitted to the Secretary and the EPA within 90 days of completion of the monitoring.	Specialist acoustic consultant on behalf of EnergyAustralia	4.1 4.2 and 4.3

Potential Impact	Location	Parameters	Frequency	Methodology	Reporting	Responsibility	CoA and OEMP Reference
Ongoing Operational Noise Monitoring	T2 (A) Any residence on Carlyle Close, Wollin Place, Coronet Place, and Crompton Street, in Koonawarra T4 (B) Any residence on Wyndarra Way and Malonga Place in Koonawarra ML#9 (C) Any residence on The Boulevarde, Park Crescent, Horsley Road and Newton Crescent in Oak Flats ML#10 (D) Any residence on Reddall Parade and Henricks Parade in Mt Warrigal ML#11 (E) Any residence in Haywards Bay (North) Most affected residence – proposed northern residential area (Central) Most affected residence – proposed central residential area (South) Most affected residence – proposed south-western residential area	▪ Laeq, ▪ LA10, ▪ LA90; and ▪ LAMax. Noise levels shall not exceed criterion stipulated in Table 5-13 and Table 5-14 attended noise monitoring will be undertaken for 15 minutes per location. Monitoring is undertaken at each of the locations for day, evening and night periods	▪ Annual basis throughout the life of the project, and ▪ Or following an exceedance of noise limits in Table 5-13 and Table 5-14; and ▪ or in response to a noise complaint.	Noise monitoring will: ▪ be undertaken in accordance with the *Noise Policy for Industry* (NSW EPA, 2017); ▪ be undertaken via attended noise monitoring at the locations identified in Table 5-13 and Table 5-14 and as illustrated within Figure 5-5. ▪ attended noise monitoring will be undertaken for 15 minutes per location. ▪ Monitoring is undertaken at each of the locations for day, evening and night periods ▪ include monitoring of operations that have the potential to cause offensive noise including, but not limited to, safety valve operation, blowdown operation and the operation of circuit breakers during the day, evening and night time periods; ▪ include monitoring of the effectiveness of any noise mitigation measures implemented under condition 3.6 of the Project Approval; and ▪ In instances where Modification Factors for Low Frequency Noise apply, noise monitoring is to include an assessment of modifying factors in accordance with Fact Sheet C of the Noise Policy for Industry 2017. This is where noise is assessed for annoying characteristics such as tonal, low frequency or intermittent noise and a penalty of 5 dB will be added..	Reports will be. Submitted to the Secretary and EPA within 28 days of completing the noise event. Reports will be required ▪ Annually ▪ In the event of an exceedance during the ongoing noise review; ▪ In response to a noise complaint; and/or ▪ Additional monitoring as deemed necessary by the Secretary	Specialist acoustic consultant on behalf of EnergyAustralia	4.5 4.6

5.7.14 Noise Management – Exceedance Protocol

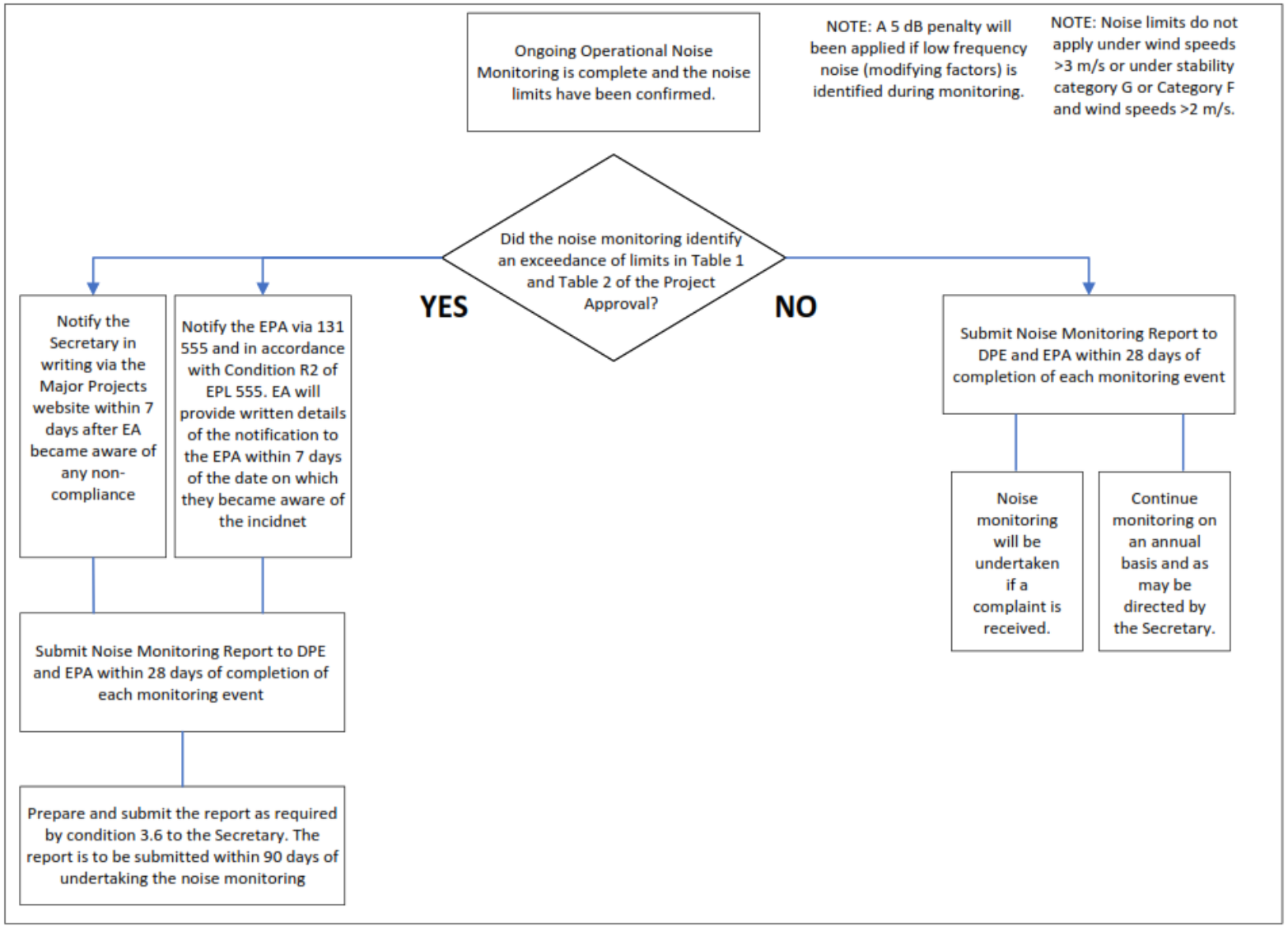

Figure 5-6 - Noise Exceedance Protocol

5.7.15 Noise reporting

Table 5-20 - Noise Reporting Requirements

Item	Reporting requirements	Responsibility	Timing
1	Operational noise review will be completed within 90 days of the commencement of operation of Unit 2. The Operational Noise Review will confirm the noise emission performance of the project. The Review shall be prepared in consultation with, and to the satisfaction of, the EPA.	HSE Specialist	A one-off survey, within 90 days of the commencement of operation of the project.
2	An annual report detailing the results of the operational noise monitoring will be prepared and submitted to the Secretary and the EPA within 28 days of completion of each noise monitoring event.	HSE Specialist	Annually
3	In accordance with condition 5.2 of the Project Approval as modified, the Secretary must be notified in writing via the Major Projects website within seven days after EnergyAustralia becomes aware of any non-compliance. Develop a non-compliance report and submit the report to the Secretary for approval in the event the result of the noise monitoring (including the Operational Noise Review) indicates the operational noise level exceeds the operational noise limits in accordance with condition 3.6 of the Project Approval as modified.	HSE Specialist	Notification within seven days after becoming aware of any non-compliance. A non-compliance report submitted within 90 days of undertaking the noise monitoring which has identified an exceedance, unless otherwise agreed to by the Secretary.
4	Written notification within 21 days to all landowners that are entitled and to which rights apply. This is applicable to: • at-receive noise treatment; and • land acquisition. Also refer to non-compliance requirements within Item 3 above in relation to exceedances of applicable noise limits.	HSE Specialist	Within 21 days of determining the landholdings to which the ‘at-receiver’ noise treatment rights apply. Also refer to non-compliance requirements within Item 3 above in relation to exceedances of applicable noise limits.
5	A binding written offer will be made to the affected landowners regarding the at-receiver noise treatment, or land acquisition options that can be implemented at the property.	HSE Specialist	As required

5.7.16 Environmental management measures

A range of environmental requirements and mitigation measures are identified in the Project Approval, Development Consent, EPL 555 and the EA will be implemented to minimise or manage water quality impacts.

Specific noise related safeguards and management measures to address impacts associated with Tallawarra power station are outlined in Table 5-21.

Table 5-21 - Environmental management measures relevant to noise

ID	Management measure	Where applicable	Responsibility	Source Document
General				
NV1	The project noise goals, developed in accordance with the Industrial Noise Policy (INP), will be adhered to during the operation of the Stage B CCGT plant.	Tallawarra Power Station	Plant operators	Statement of Commitment no.3
NV2	Any future development within the Tallawarra lands area will need to consider the operational noise emissions of the plant and implement design measures to minimise the impact of such emissions. Operational noise emissions monitoring will be undertaken during the operation phase to confirm current assumptions prior to the development of the proposed residential areas.	Any future development within Tallawarra lands area	Designers (of future development within Tallawarra lands area)	Statement of Commitment no.2
NV3	The start-up and shut down activities will be managed through the Tallawarra A *Operational Environmental Noise Management Plan* (Ref 7142037-02-01 Rev 2).	Tallawarra Power Station	Plant operators	Statement of Commitment no.3
Ongoing noise monitoring				
NV4	Tallawarra A and B power stations will be operated and maintained to ensure that the total cumulative noise emission from the combined operation of both power stations to the background acoustic environment does not exceed the noise criteria specified in Table 5-13 and Table 5-14	Tallawarra Power Station	HSE Specialist	Project Approval condition 3.5
NV5	Noise emissions from the operation of Tallawarra A and B power station must not exceed the noise criteria at the specific locations identified in Table 5-13 and Table 5-14	Tallawarra Power Station	HSE Specialist	EPL 555
NV6	Ongoing operational noise monitoring at the specified location in Section 5.7.4 will be undertaken to determine ongoing compliance against the respective operational noise criteria.	Tallawarra Power Station	HSE Specialist	Project Approval condition 4.6 EPL 555
NV7	Ongoing operational noise monitoring will be undertaken on an annual basis or when directed by the Secretary. The requirements for further ongoing annual noise monitoring will be determined by the Secretary based on the results collected.	Tallawarra Power Station	HSE Specialist	Project Approval condition 4.6
Operational noise review				

NV8	Within 90 days of the commencement of operation of Tallawarra B power station, unless otherwise agreed by the Secretary, EnergyAustralia will undertake an Operational Noise Review (ONR) to confirm the noise emission performance of the project.	Unit 2	HSE Specialist	Project Approval condition 4.1
NV9	The ONR is to be taken during the period when the power station is operating under design loads and normal operating conditions and be prepared in consultation and to the satisfaction of the EPA.	Unit 2	HSE Specialist	Project Approval condition 4.1
NV10	Once the operational noise levels have been confirmed, EnergyAustralia will notify landowners that are entitled to 'at-receiver' noise treatment and/or land acquisition rights (Refer to Section 7.4 and 7.5 for further details).	Unit 2	HSE Specialist	Project Approval condition 3.12 and 3.18
Reporting				
NV11	A report detailing the results of the operational noise monitoring will be prepared and submitted to the Secretary and the EPA within 28 days of completion of each noise monitoring event.	Tallawarra Power Station	HSE Specialist	Project Approval condition 4.5
NV12	Operational Noise Review report will be prepared detailing the result of the ONR. The report will be submitted to the Secretary and the EPA within 90 days of completion of the monitoring	Unit 2	HSE Specialist	Project Approval condition 4.4
NV13	A non-compliance report and submit the report to the Secretary for approval in the event result of the noise monitoring (including the Operational Noise Review) indicates the operational noise level exceeds the operational noise limits specified Table 5-13 and Table 5-14	Unit 2	HSE Specialist	Project Approval condition 3.6
Noise treatment at-receiver				
NV14	EnergyAustralia will provide written notification to all landowners that are entitled to 'at-receiver' noise treatment within 21 days of determining the landholdings to which 'at-receiver' noise treatment rights apply.	Unit 2	HSE Specialist	Project Approval condition 3.12
NV15	Upon receiving a written notification from the affected landowner unless that landowner has acquisition rights and have requested acquisition, EnergyAustralia will investigate and implement, in consultation with the landowner, reasonable and feasible at-receiver noise treatment if the noise generated by the combined operation of the Tallawarra A and B power stations exceeds the noise criteria specified Table 3 and 4 of the Project Approval at the specified locations even after the implementation of all reasonable and feasible at-source noise management identified in the operational noise monitoring report.	Unit 2	HSE Specialist	Project Approval condition 3.7
NV16	A binding written offer will be made to the affected landowner regarding the at-receiver noise treatment options that can be implemented at the property.	Unit 2	HSE Specialist	Project Approval condition 3.9
NV17	EnergyAustralia will bear the costs of the selected at-receiver noise treatment, including cost of implementation at an affected property or land.	Unit 2	HSE Specialist	Project Approval condition 3.8
NV18	If within three months of receiving the at-receiver noise treatment request from the affected landowner, EnergyAustralia and the affected landowner cannot agree on the treatment to be implemented or cannot agree on the implementation of these selected treatment, then either party may refer the matter to the Secretary for resolution. The Secretary's decision on the matter will be final.	Unit 2	HSE Specialist	Project Approval condition 3.9
Land acquisition				
NV19	EnergyAustralia will provide written notification to all landowners that are entitled to land acquisition rights within 21 days of determining the landholdings to which land acquisition rights apply	Unit 2	HSE Specialist	Project Approval condition 3.18

NV20	Upon receiving a written notification from the affected landowner requesting for acquisition of the land, EnergyAustralia will acquire the land from the affected landowner if the noise generated by the combined operation of the Tallawarra A and B power stations exceeds the noise criteria specified in Table 5 and 6 of the Project Approval at the specified locations even after the implementation of all reasonable and feasible at-source noise mitigation identified in the operational noise monitoring report.	Unit 2	HSE Specialist	Project Approval condition 3.13
NV21	A binding written offer will be made to the affected landowner with acquisition rights within three months of receiving the written acquisition request from the landowner.	Unit 2	HSE Specialist	Project Approval condition 3.14
NV22	If, at the end of the binding offer period, the landowner and EnergyAustralia cannot come to an agreement on the acquisition price of the land, and/or the terms upon which the land is to be acquired, then either party may refer the matter to the Secretary for resolution.	Unit 2	HSE Specialist	Project Approval condition 3.14

5.8 Traffic Management

Access to site is through the existing main access security gate, from Yallah Bay Road off the Princes Highway, Wollongong. There is sufficient designated parking areas available for all workers. No new facilities or parking areas are required to be constructed.

There may be a temporary increase in the number of heavy and light vehicles accessing the site during maintenance plant outage periods. No vehicles will be permitted to park at the public access foreshore parking.

5.9 Waste Management Plan

5.9.1 Introduction

A waste management plan has been prepared to satisfy Conditions of Approval 3.58 to 3.61. The purpose of the Waste Management Plan is to provide a structured approach to minimising waste generated and maximise reuse and recycling.

Key objectives include:

- Promote ecologically sustainable development through maximising efficient use, re-use, recovery, and
- recycling, of resources
- Separation of waste into classification groups (with specific attention to Non-hazardous and Hazardous
- categories)
- Dispose of all waste in line with classification and legal requirements

EnergyAustralia will prioritise the treatment, reuse and/or recycling on the project site of any waste oils, excavated soils, vegetation, slurries, sludges or other solid and liquid waste materials associated with the project, minimise the need for treatment or disposal of those materials outside the power station. The waste will be tracked and reported via EnergyAustralia's parent company Group Operations Information System (GOIS). GOIS provides tracking metrics and flags any variances which requires an explanation of the change. EA will use the GOIS system to track waste management onsite.

5.9.2 Classifying Waste

EnergyAustralia shall ensure that all liquid and/or non-liquid waste generated on the site is assessed and classified in accordance with Waste Classification Guidelines (EPA, 2009), or any superseding document.

Classifying waste (NSW EPA, 2014), classifies six types of waste:

1. Special
2. Liquid
3. Hazardous
4. Restricted solid
5. General solid (putrescible)
6. General solid (non-putrescible).

The 6-step process for classifying waste is outlined in

. Complete definitions and regulations can be found in Waste Classification Guidelines Part 1: Classifying waste (NSW EPA, 2014).

Table 5-22 - Six-step process for waste classification (NSW EPA, 2014)

Step	Process	Detail / Examples
1	Is it 'special waste'?	Special waste means any of the following: ■ Clinical and related waste, ■ Asbestos waste, ■ Waste tyres, or ■ Anything classified as special waste under an EPA gazettal notice.
2	Is it 'liquid waste'?	Liquid waste means any waste (other than special waste) that: ■ Has an angle of repose of less than 5 degrees above horizontal, ■ Becomes free flowing at or below 60 degrees Celsius or when it is transported, ■ Is generally not capable of being picked up by a spade or shovel, or ■ Is classified as liquid waste under an EPA gazettal notice.
3	Is the waste 'pre-classified'?	Pre-classified wastes are categorised as follows: ■ Hazardous waste, ■ Restricted solid waste, ■ General solid waste (putrescible), and ■ General solid waste (non-putrescible) (including building and demolition waste, garden waste, virgin excavated natural material and wood waste).
4	Is the waste 'hazardous'?	Hazardous wastes means any of the following: ■ Explosives ■ Gases ■ Flammable solids ■ Substances liable to spontaneous combustion ■ Substances which when in contact with water emit flammable gases ■ Oxidising agents and organic peroxide ■ Toxic substances ■ Corrosive substances
5	Undertake a chemical assessment	If a waste has not been classified under steps 1 - 4, it must be classified as 'hazardous waste' if it is a dangerous good under any of the classes or divisions of the *Transport of Dangerous Goods Code*.
6	Is the solid waste 'putrescible' or 'non putrescible'?	If chemical assessment shows waste as solid, further assessment is required to determine whether it is putrescible or non-putrescible. If this assessment does not take place, the waste must be classified as solid (putrescible).

5.9.3 Waste hierarchy

EnergyAustralia shall follow the EPA waste hierarchy when managing waste from its operations. The waste hierarchy is summarised in Table 5-23. EA shall, to the extent that is reasonable and feasible, maximise the treatment, reuse and/or recycling on the project site of any waste oils, excavated soils, vegetation, slurries, sludges or other solid and liquid waste materials associated with the project, to minimise the need for treatment or disposal of those materials outside the power station.

Table 5-23 - Waste Hierarchy

Ranking	Waste hierarchy	Description
1	Avoiding and reduce waste	The most preferred approach, it preserves resources, avoids the use of additional resources to manage waste that would have been generated, and aims to eliminate disposal costs.
2	Reuse material	Without further processing, avoids the costs of energy and other resources required for recycling.
3	Recycling	Processing waste materials to make the same, or different product. Recycling keeps materials in the productive economy and benefits the environment by decreasing the need for new materials and waste absorption.
4	Recover energy	Recover the energy from the material and feed it back into the economy where this is acceptable to the community.
5	Treat waste	If materials are inappropriate to reuse, recycle or recover, then treatment and stabilization will minimize their environmental or health impacts.
6	Disposal of waste	Some types of wastes, such as hazardous chemicals or asbestos, cannot be safely recycled and proper disposal is the most appropriate management option.

5.9.4 Handling, storage and disposal of waste

Waste material will be stored and handled in line with the relevant legislation and guidelines. EA shall not cause, permit or allow any waste generated outside the site to be received at the site for storage, treatment, processing, reprocessing, or disposal on the site, except as expressly permitted by a licence under the Protection of the Environment Operations Act 1997, if such a licence is required in relation to that waste.

When waste cannot be avoided, reused, recycled, or recovered, it must be disposed of correctly. All waste materials removed from the site shall only be directed to a waste management facility lawfully permitted to accept the materials. When waste is generated onsite and disposed of offsite, the waste will be:

- Separated into waste classifications;
- Transported by a licensed contractor; and
- Transported to an EPA approved waste management site that is lawfully permitted to accept the materials, a licensed recycling facility, or licensed landfill facility.

5.10 Heritage Management Plan

The purpose of the heritage management plan is to provide a structure approach to managing heritage artefacts and details the actions required when an unexpected item is found.

5.10.1 Archaeological sensitive areas

Niche Environment and Heritage has undertaken an Aboriginal heritage due diligence assessment (AHDDA) in 2021 for the area within and near Unit 2. The assessment recommended different management measures based on three tiers of low, moderate and high archaeological sensitive areas.

Figure 5-7**Error! Reference source not found.** shows the areas marked low, moderate and high archaeological sensitivity identified within the AHDDA (Niche, 2021). Table 5-24 outlines the management measures to be implemented at the respective archaeological sensitive areas during operation. If ground disturbance is required, a formal ground disturbance permit is required for any work being undertaken regardless of the archaeological sensitive area ranking.

Table 5-24 - Archaeological sensitive areas

Archaeological sensitive area	Description	Management measure
Low	The majority of the Project area is described as having low archaeological sensitivity (Niche 2021). Areas that have been previously disturbed generally have low Aboriginal cultural heritage potential archaeological sensitivity.	▪ The areas depicted as low archaeological sensitivity may proceed with caution without the need for further investigation. ▪ Should earthworks be undertaken outside the works areas assessed in AHDDA, further impact assessment will be undertaken prior to working in those areas. ▪ The relevant unexpected heritage procedures will be followed in the unlikely event that Aboriginal objects and/or features is encountered, or suspected human remains are encountered. Refer to Section 5.3.
Moderate	Undisturbed or moderately disturbed Project areas located generally north of the switchyard and generally to the east of the Project area, including within the Yallah Creek riparian areas are considered to have moderate archaeological sensitivity (Niche, 2021)	▪ Surface works involving direct replacement/upgrade of existing utilities may proceed with caution without further investigation. ▪ Any new ground disturbance, including disturbance beyond the depth of current subsurface utilities, will require further investigation and assessment in the form of an Aboriginal Cultural Heritage Assessment (ACHA). ▪ If the removal or upgrade of any existing utilities requires any additional ground disturbance outside the footprint of the existing utilities, this constitutes new ground disturbance and will require further assessment in the form of an ACHA. ▪ The relevant unexpected heritage procedures will be followed in the unlikely event that Aboriginal objects and/or features is encountered, or suspected human remains are encountered. Refer to Figure 5-8
High	Areas close to existing known AHIMS sites are identified as having high archaeological sensitivity (Niche, 2021).	▪ No works should take place without further assessment in the form of an ACHA.

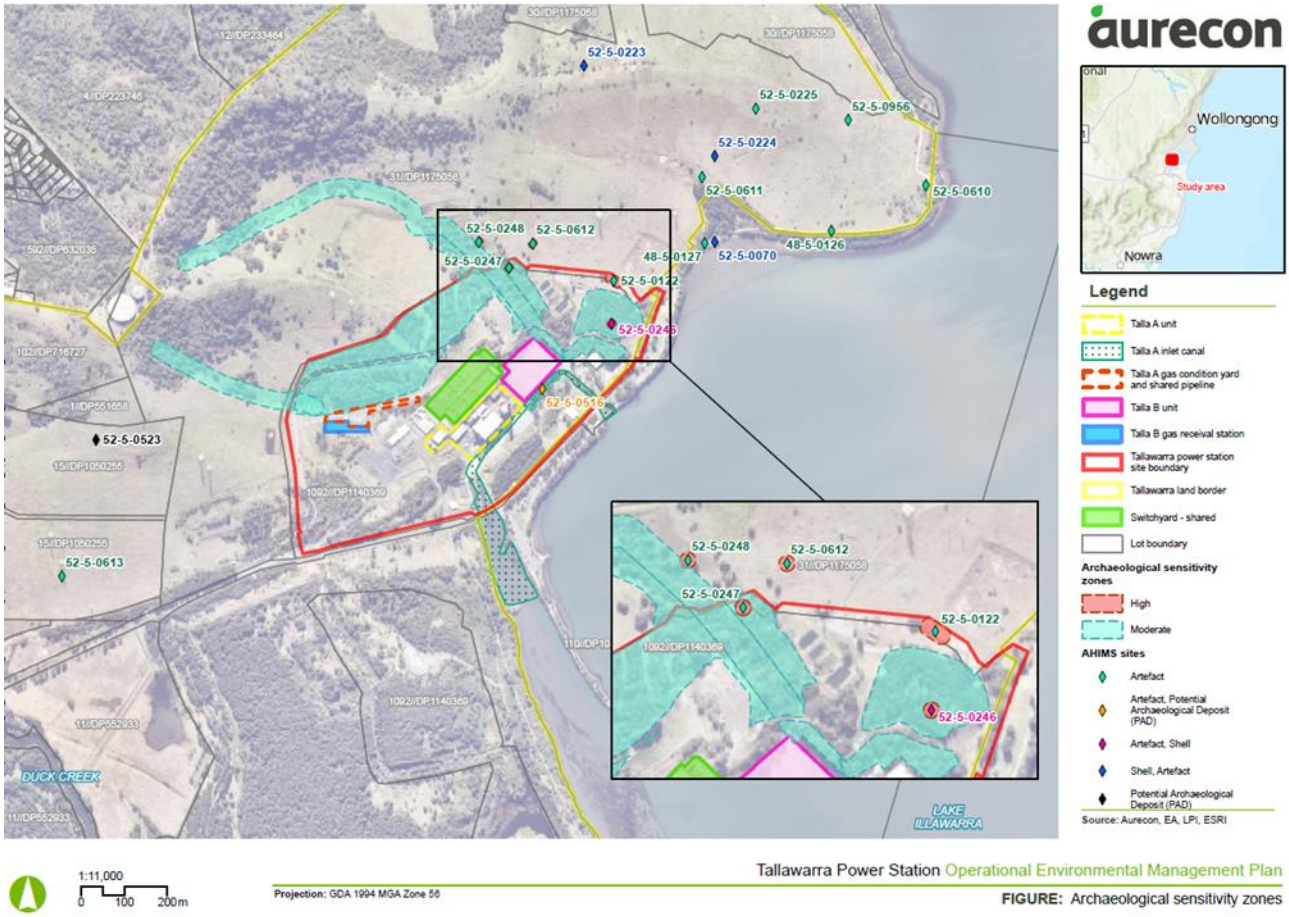

Figure 5-7 - Archaeological sensitive zones

5.10.2 Unexpected heritage finds procedure

In accordance with Condition of Approval 3.55, if suspected Aboriginal cultural heritage item is uncovered, the steps in Figure 5-8 must be followed. Figure 5-9 also must be followed if suspected non-Aboriginal cultural heritage item is uncovered.

Table 5-25 - Unexpected Finds

ID	Management measure	Where applicable	Responsibility	Source Document
General				
1.	Consultation with the relevant local Aboriginal community groups, government agencies and/or stakeholders, including Local Aboriginal Land Council, will be undertaken if any activities which impacts or has the potential to impact Aboriginal and/or non-Aboriginal heritage sites or objects.	Tallawarra Power Station	HSE Specialist	Statement of Commitments no.1
2.	No works should take place within the areas depicted as high archaeological sensitivity in Figure 5-7 without further assessment in the form of an Aboriginal Cultural Heritage Assessment (ACHA).	Tallawarra Power Station	HSE Specialist	Aboriginal Objects Due Diligence Assessment (Niche Environment and Heritage, 2021)
3.	Within the areas depicted as moderate archaeological sensitivity in Figure 5-7, any new ground disturbance, including disturbance beyond the depth of current subsurface utilities, will require further assessment in the form of an ACHA.	Tallawarra Power Station	HSE Specialist	Aboriginal Objects Due Diligence Assessment (Niche Environment and Heritage, 2021)
4.	All operational personnel will be inducted on the existing Aboriginal heritage features and site, as well as the potential to find previously unrecorded Aboriginal cultural heritage items, the Unexpected Heritage Finds Procedure (Refer to Figure 5-8Figure 5-8)	Tallawarra Power Station	HSE Specialist	Good practice
Unexpected finds				
10.	If at any time during operation, any potential Aboriginal or non-Aboriginal heritage objects or human remains is uncovered. Stop all works in the immediate vicinity of the finds and notify the Site Supervisor and HSE Specialist. The Unexpected Heritage Procedure detailed in Figure 5-8 will be followed.	Tallawarra Power Station	All personnel	Project Approval condition 3.55

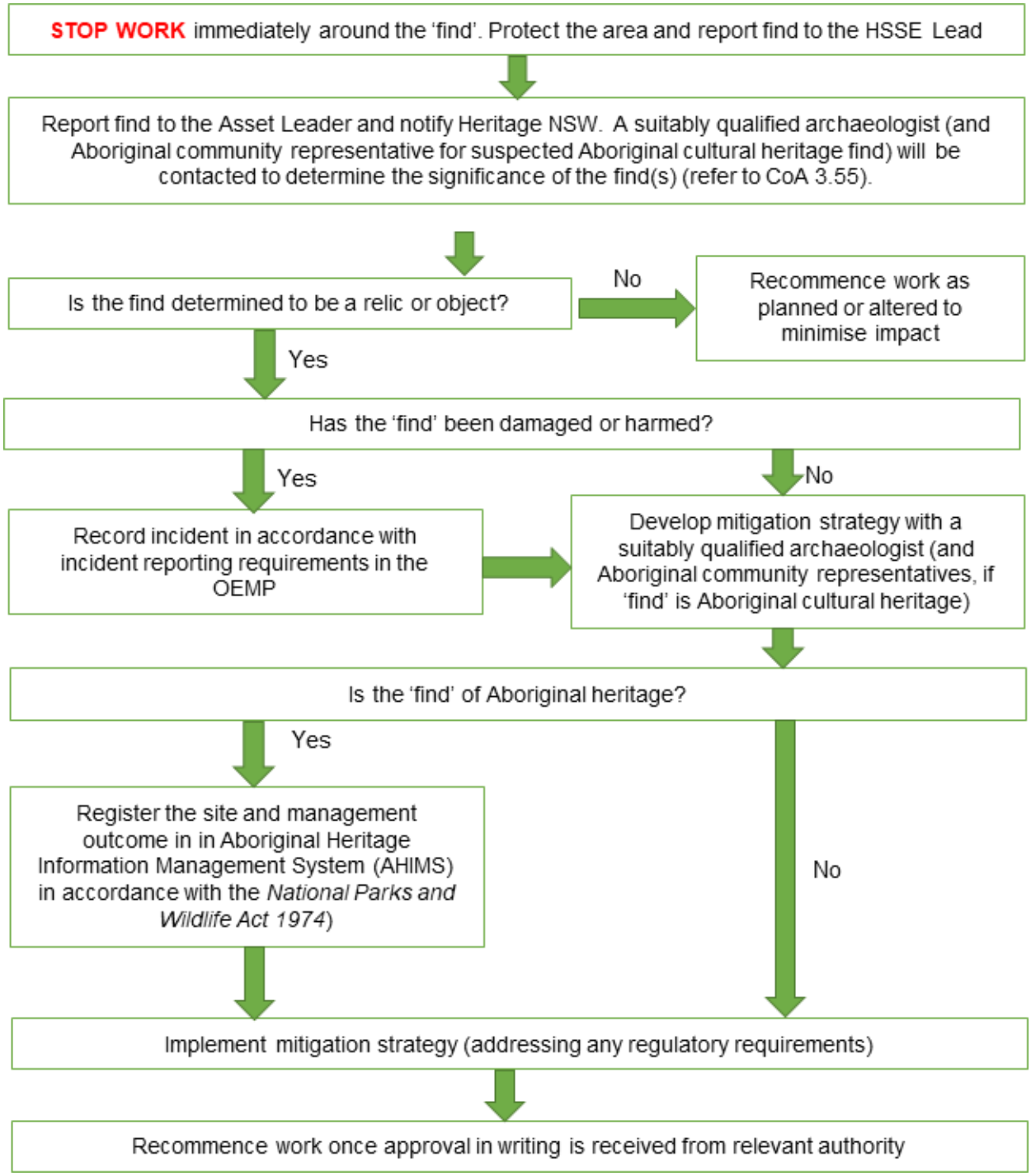

Figure 5-8 - Unexpected heritage finds procedure - suspected Aboriginal and non-Aboriginal cultural heritage items

5.10.3 Discovery of suspected human remains procedure

If suspected human remains are uncovered during the project, the steps in

must be actioned.

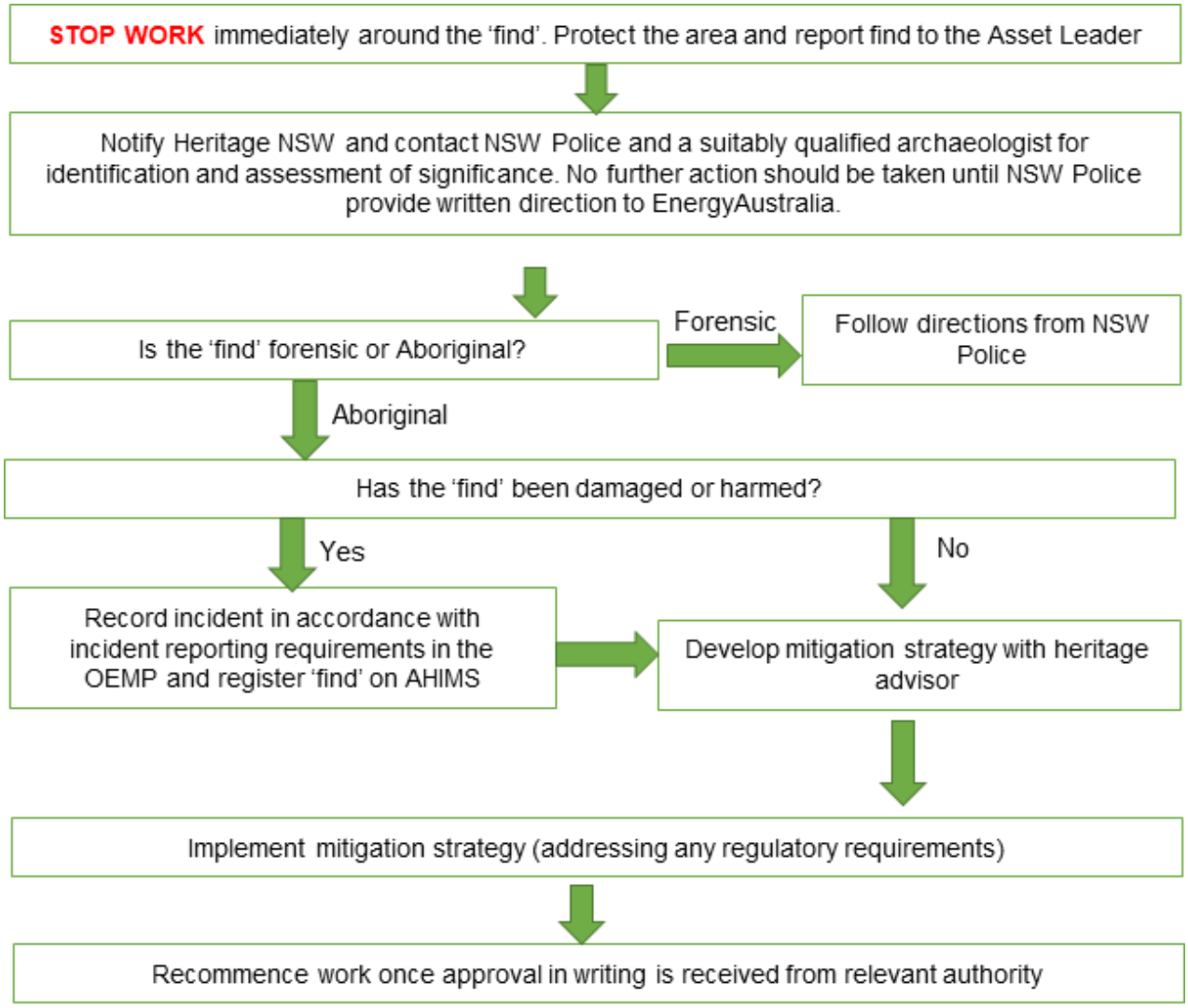

Figure 5-9 - Discovery of suspected human remains procedure

6 Compliance Reporting and Auditing

6.1 Reporting and Auditing Requirements and Actions

EnergyAustralia will complete the compliance reporting and auditing requirements as listed in Table 6-1.

Table 6-1 - Compliance Reporting and Auditing

Type	Details	Frequency	Responsibility	Receipt	CoA
Compliance Report	Compliance Reports of the project must be carried out in accordance with the Compliance Reporting Requirements outlined in the Compliance Reporting Post Approval Requirements (2020). An electronic copy of the relevant Compliance Report must be submitted to the Department via the Major Projects portal.	At intervals, no greater than 52 weeks from the date of commencement of operation (annually)	HSE Specialist	DPHI	5.5 5.6 4.7 4.5
Publish Compliance report to the EA website	Must make each Compliance Report publicly available within 60 days of submitting it to the Secretary, unless otherwise agreed by the Secretary.	Within 60 days of submitting it to the Secretary, unless otherwise agreed to by the Secretary	HSE Specialist	EnergyAustralia website	5.7
Cease submitting an operation compliance report	Notwithstanding the requirements of the Compliance Reporting Post Approval Requirements (2020), the Secretary may approve a request for ongoing annual operational compliance reports to be ceased, where it has been demonstrated to the Secretary's satisfaction that an operational compliance report has demonstrated operational compliance.	EA will only cease an operation compliance report if approved by the Secretary.	HSE Specialist	n/a	5.8
Air Quality Performance Verification Report	Air quality performance report detailing the air emission performance of Unit 2 power station and comparison against the relevant criteria limits.	within six months of the commencement of operation of the project; at both maximum design loads and under normal operating conditions	HSE Specialist Air Quality consultant	DPHI EPA NSW	4.8 4.9
Hazard Audit	Commission an independent, qualified person or team to undertake a comprehensive Hazard Audit of the project. Hazard Audits shall be carried out in accordance	Twelve months after the commencement of operation of the project, or within such period otherwise agreed by the Secretary.	HSE Specialist Independent hazard auditor	DPHI	4.15

	with the Department's publication Hazardous Industry Planning Advisory Paper No. 5 - Hazard Audit Guidelines.	Further Hazard Audits shall be undertaken every three years thereafter.	HSE Specialist Independent hazard auditor	DPHI	4.15
Independent environmental audit	Assess compliance with the OEMP, the Project Approval and any relevant legal and other requirements. EA will seek agreement from the Secretary in writing prior to the commencement of an independent audit. This will be completed prior to each IEA undertaken.	Within 26 weeks of the commencement of operation; and At intervals, no greater than 3 years or as otherwise agreed by the Secretary.	HSE Specialist	DPHI	5.9 5.10
Submission of independent environmental audit report	Review and respond to each Independent Audit Report and submit the response to the audit findings to the Secretary.	Within 2 months of undertaking the independent audit site inspection, or unless otherwise agreed by the Secretary	HSE Specialist Independent auditor	DPHI	5.12 a 5.12b 5.13
Initial and subsequent audit dates changes	The Secretary may require the initial and subsequent Independent Audits to be undertaken at different times to those specified in the Compliance Reporting Post Approval Requirements (2020), upon giving at least 4 weeks' notice (or timing) to EnergyAustralia of the date upon which the audit must be commenced.	As required by notification of the Secretary	HSE Specialist	DPHI	5.11
Publish Independent Audit report to the EA website	Must make each Independent Audit Report, and response to it, publicly available within 60 days of submission to the Secretary, unless otherwise agreed by the Secretary	Within 60 days of submitting it to the Secretary, unless otherwise agreed to by the Secretary	HSE Specialist	EnergyAustralia website	5.12 c
Cease undertaking environmental audit reports	Notwithstanding the requirements of the Independent Audit Post Approvals Requirements (2020), the Secretary may approve a request for ongoing independent operational audits to be ceased, where it has been demonstrated to the Secretary's satisfaction that independent operational audits have demonstrated operational compliance.	EA will only cease ongoing independent operational audits if approved by the Secretary	HSE Specialist	n/a	5.14
National Greenhouse Energy Reporting (NGERs)	The National Greenhouse and Energy Reporting Act 2007 (NGER Act) introduced a single national framework for reporting and disseminating company information about greenhouse gas emissions, energy production and energy consumption.	Annual	HSE Specialist	EPA NSW	-----

National Pollutant Inventory (NPi)	The National Pollutant Inventory (NPI) is tracking pollution across Australia. The NPI contains data on 93 substances that have been identified as important due to their possible effect on human health and the environment.	Annual	HSE Specialist	EPA NSW	-----
Annual Return	Details the results of all monitoring undertaken in the licensing period of the applicable EPL.	Annual	HSE Specialist	EPA NSW	-----

Appendices

Appendix A: Cross reference of Conditions of Approval

Appendix B: EnergyAustralia HSSE Policy

Appendix C: Legal compliance table

Appendix D: Vegetation Offset Plan

Appendix E: Environmental Representative Approval

Appendix F: Independent Audit

Appendix G: Project Approval

Appendix H: Agency Review Comments

Appendix I: DPE Letter – Aviation Impact Assessment

Appendix J: Plume Validation Monitoring Program (PVMP)

Appendix A: Cross reference of relevant compliance requirements

Table A- 1: Conditions of the Project Approval relevant to this OEMP and sub-plans

Condition number	Condition requirement	Where addressed
1.1	The project may only be carried out:	
	a) in compliance with the conditions of this approval granted with respect to the Tallawarra Stage B Gas Turbine Power Station Project (07_0124);	Section 1.2
	b) in accordance with all written directions of the Secretary; and	Section 1.2
	c) generally in accordance with the EA.	Section 1.2
1.3	The Proponent shall comply with any reasonable requirement(s) of the Secretary arising from the Department's assessment of:	
	a) any documents that are submitted in accordance with this approval; and	Section 1.2
	b) the implementation of any actions or measures contained in these documents.	Section 1.2
1.5	The project shall comprise a single-unit gas turbine power plant with a total nominal output of up to 400 megawatts operating in open cycle mode or a single unit gas turbine plant with a nominal output of 400 megawatts operating in combined cycle mode.	Section 2.1
1.6	Nothing in this approval permits the construction and operation of an open cycle gas turbine plant, unless the Proponent has submitted a report to the Secretary which demonstrates that operation of an open cycle gas turbine plant will not have an adverse impact on aviation safety. This report must be prepared in consultation with Shellharbour City Council, and its conclusions and recommendations must have been agreed to by the CASA prior to submission to the Secretary. The report must be approved by the Secretary before commencement of construction of an open cycle plant.	Section 5.2
1.7	The Proponent shall ensure that all licences, permits and approvals are obtained and maintained as required throughout the life of the project. No condition of this approval removes the obligation for the Proponent to obtain, renew or comply with such licences, permits or approvals. The Proponent shall ensure that a copy of this approval and all relevant environmental approvals are available on the site at all times during the life of the project.	Section 1.2, Section 3.4, Section 3.7 and **Error! Reference source not found.**
2.1	Natural gas is the only fuel approved for firing of the burner/turbine.	Table A-2
2.4	The Tallawarra Stage B combined cycle gas turbine power station shall not operate in cold start cycle at the same time as the Tallawarra Stage A combined cycle gas turbine power station, unless otherwise agreed to by the EPA and approved by the Secretary. A cold start is defined as the first 120 minutes following of power station operation after a period of more than 36 hours shut down.	Table A-2
2.5	Only biocides and antifouling chemicals assessed in the documents referred to in condition 1.1c), or otherwise approved by the EPA, and permitted, registered or approved for use by the Australian Pesticides and Veterinary Medicines Association, shall be used in the operation of the power station.	Section 3.8
3.19	The Proponent shall construct and operate the project in a manner that minimises dust emissions from the site, including wind-blown and traffic-generated dust. All activities on the site shall be undertaken with the objective of preventing visible emissions of dust from the site. Should such visible dust emissions occur at any time, the Proponent shall identify and implement all practicable dust mitigation measures, including cessation of relevant works, as appropriate, such that emissions of visible dust cease.	QA2 in **Error! Reference source not found.**
3.20	The Proponent shall not permit any offensive odour, as defined under section 129 of the Protection of the Environment Operations Act 1997, to be emitted beyond the boundary of the site.	QA6 in **Error! Reference source not found.**

<table>
<tr><th>Condition number</th><th>Condition requirement</th><th>Where addressed</th></tr>
<tr><td>3.22</td><td>For the purpose of this approval, air discharge/monitoring points are identified in Table 7.
Table 7 - Identification of Air Monitoring and Air Discharge Points<table><tr><th>EPA Identification Number</th><th>Type of Monitoring Point</th><th>Type of Discharge Point</th><th>Description of Location</th></tr><tr><td>1</td><td>Air emissions monitoring</td><td>Discharge to air</td><td>Stack Serving the Open Cycle Plant Turbine</td></tr><tr><td>2</td><td>Air emissions monitoring</td><td>Discharge to air</td><td>Stack Serving the Combined Cycle Plant Turbine</td></tr></table></td><td>Error! Reference source not found.</td></tr>
<tr><td>3.23</td><td>The Proponent shall ensure that the design and construction of the project includes sampling positions that comply with TM-1 as set out in Approved Methods for the Sampling and Analysis of Air Pollutants in NSW (EPA, 2016), or its latest version.</td><td>Error! Reference source not found.</td></tr>
<tr><td>3.24</td><td>The Proponent shall design, construct, operate and maintain the project to ensure that for each turbine stack discharge/monitoring point identified in Table 7, the concentration of each pollutant listed in Table 8 is not exceeded at that point. The condition only applies to the normal operation of a turbine and, to avoid any doubt, does not apply during the start-up and shut-down period for a turbine. The condition continues to apply to other turbines if they are operational during these periods.
Table 8 – Maximum Allowable Discharge Concentration Limits (Air)<table><tr><th>Pollutant</th><th>Unit of measure</th><th>100 percentile limit</th><th>Reference conditions</th><th>Averaging Period</th></tr><tr><td>Nitrogen dioxide (NO_2) or nitric oxide (NO) or both, as NO_2 equivalent</td><td>ppm</td><td>25</td><td>Dry, 273 K, 101.3 kPa, 15% O_2</td><td>1-hour</td></tr></table></td><td>Section 5.6.4
Error! Reference source not found.</td></tr>
<tr><td>3.25</td><td>The Proponent shall design, construct, operate and maintain the project to ensure that the total cumulative load of nitrogen dioxide or nitric oxide, or both as nitrogen dioxide, from the combined discharges from the Tallawarra Stage A and Tallawarra Stage B power stations does not exceed 900 tonnes per annum. This mass limit also applies to emissions during start-up and shut-down periods.</td><td>Section 5.6.4
Error! Reference source not found.</td></tr>
<tr><td>3.26</td><td>The stacks associated with the project must be marked and lit in accordance with the requirements of the CASA.</td><td>Section 5.6.1</td></tr>
<tr><td>3.29</td><td>The Proponent shall store and handle all dangerous goods, as defined by the Australian Dangerous Goods Code, strictly in accordance with:</td><td></td></tr>
<tr><td></td><td>a) all relevant Australian Standards;</td><td>Section 3.8</td></tr>
<tr><td></td><td>b) for liquids, a minimum bund volume requirement of 110% of the volume of the largest single stored volume within the bund; and</td><td>Section 3.8</td></tr>
<tr><td></td><td>c) the Environment Protection Manual for Authorised Officers: Bunding and Spill Management, technical bulletin (Environment Protection Authority, 1997).</td><td>Section 3.8</td></tr>
<tr><td></td><td>In the event of an inconsistency between the requirements listed from a) to c) above, the most stringent requirement shall prevail to the extent of the inconsistency.</td><td>Section 3.8</td></tr>
<tr><td>3.30</td><td>Except as may be provided by an Environment Protection Licence for the project, the Proponent shall comply with section 120 of the Protection of the Environment Operations Act 1997 which prohibits the pollution of waters.</td><td>Error! Reference source not found.</td></tr>
<tr><td>3.37</td><td>The project shall be designed, and employ surface water management techniques, such that existing runoff volumes along drainage lines from the site are maintained at pre-construction levels and there are no adverse effects to adjoining land as a result of flooding and runoff.</td><td>Section 5.5.5</td></tr>
<tr><td>3.38</td><td>The Proponent must ensure that there is no disturbance to the endangered ecological communities, including the Illawarra Subtropical Rainforest in the Sydney Basin Bioregion and the Swamp Oak Floodplain Forest of the NSW North Coast, Sydney Basin and South East Corner bioregions, during the construction and operation of the project.</td><td>Section 5.3</td></tr>
</table>

Condition number	Condition requirement	Where addressed
3.42	The Proponent shall establish a riparian zone consisting of local native plant species adjacent to Yallah Creek within the power station site boundary. The width of the riparian zone is to be a minimum of 50 metres on both sides of the creek, where practicable. All works and disturbance areas associated with the construction and operation of the project must be located outside of the riparian zone, including new transmission line poles.	Table A-1 Vegetation Offset Plan in Appendix D
3.43	The Proponent shall monitor and maintain the riparian zone along Yallah Creek (referred to in condition 3.42) throughout the life of the project.	Table A-1 Vegetation Offset Plan in Appendix D
3.52	The Proponent shall ensure that all external lighting associated with the project is mounted, screened, and directed in such a manner so as not to create a nuisance to the surrounding environment, properties and roadway. The lighting shall be the minimum level of illumination necessary and shall comply with *Australian Standard AS4282 1997 – Control of the Obtrusive Effects of Outdoor Lighting*.	Section 3.8
3.53	Where aviation hazard lighting is recommended by CASA and/or AirServices Australia, all reasonable and feasible attempts shall be made to ensure that this lighting is designed and directed so as not to create a nuisance to the surrounding environment, properties and roadway.	Section 5.6.1
3.54	The Proponent shall take all reasonable and feasible measures to avoid the sites known as Yallah Gully 1 (National Parks and Wildlife Services Site ID 52-5-0248), Yallah Gully 2 (National Parks and Wildlife Services Site ID 52-5-0247), Yallah Gully 3 (National Parks and Wildlife Services Site ID 52-5-0246) and Yallah Site 2 (National Parks and Wildlife Services Site ID 52-5-0122) during the construction of the project, and develop site-specific mitigation measures to ensure that they are not impacted by construction or operation of the power station and any associated infrastructure. If impacts are unavoidable, mitigation measures are to be negotiated with the Aboriginal community and Heritage NSW.	Section 5.10 **Error! Reference source not found.**
3.55	If during the course of construction or operation of the project the Proponent uncovers any previously unidentified Aboriginal cultural objects, all works likely to affect the object(s) shall cease in the immediate area to prevent any further impact to the find(s) and Heritage NSW informed. A suitably qualified archaeologist and Aboriginal community representatives shall be contacted to determine the significance of the find(s) and appropriate management measures. The Proponent shall register the site and management outcome in the Aboriginal Heritage Information Management System (AHIMS) in accordance with the National Parks and Wildlife Act 1974. Works are not to resume until approval in writing is received from Heritage NSW.	**Error! Reference source not found.** **Error! Reference source not found.**
3.58	All waste materials removed from the site shall only be directed to a waste management facility lawfully permitted to accept the materials.	Section 5.9 Section 5.9.4
3.59	The Proponent shall, to the extent that is reasonable and feasible, maximise the treatment, reuse and/or recycling on the project site of any waste oils, excavated soils, vegetation, slurries, sludges or other solid and liquid waste materials associated with the project, to minimise the need for treatment or disposal of those materials outside the power station.	Section 5.9.1
3.60	The Proponent shall not cause, permit or allow any waste generated outside the site to be received at the site for storage, treatment, processing, reprocessing, or disposal on the site, except as expressly permitted by a licence under the Protection of the Environment Operations Act 1997, if such a licence is required in relation to that waste.	Section 5.9.4
3.61	The Proponent shall ensure that all liquid and/or non-liquid waste generated on the site is assessed and classified in accordance with Waste Classification Guidelines (EPA, 2009), or any superseding document.	Section 5.9.2

<table>
<tr><th>Condition number</th><th>Condition requirement</th><th>Where addressed</th></tr>
<tr><td>4.7</td><td>The Proponent must monitor (by sampling and obtaining results by analysis) the pollutant concentrations or parameters specified in Table 10 at each of the turbine stack monitoring/discharge points described in Table 7 during operation. Monitoring must be undertaken during maximum load, using the specified sampling method, units of measure, and sample at the frequency in Table 10, unless otherwise agreed to by the EPA.
Table 10 – Periodic Pollutant/Parameter Monitoring (Air)
<table><tr><th>Pollutant/Parameter</th><th>Units of Measure</th><th>Frequency</th><th>Sampling Method</th></tr><tr><td>Nitrogen dioxide (NO_2) or nitric oxide (NO) or both, as NO_2 equivalent</td><td>ppm</td><td>Continuous</td><td>CEM-2 and US EPA Procedure 1</td></tr><tr><td>Moisture</td><td>%</td><td>Continuous</td><td>Special Method 1 and US EPA Procedure 1</td></tr><tr><td>Oxygen</td><td>%</td><td>Continuous</td><td>CEM-3 and US EPA Procedure 1</td></tr><tr><td>Temperature</td><td>°C</td><td>Continuous</td><td>TM-2 and US EPA Procedure 1</td></tr><tr><td>Velocity</td><td>m/s</td><td>Continuous</td><td>CEM-6 and US EPA Procedure 1</td></tr><tr><td>Volumetric flow rate</td><td>m^3/s</td><td>Continuous</td><td>CEM-6 and US EPA Procedure 1</td></tr><tr><td>Selection of sampling positions</td><td>-</td><td>-</td><td>TM-1</td></tr></table>
Note: For the purpose of the Table above, Special Method 1 means any moisture monitoring method approved in writing by the EPA and US EPA Procedure 1. The sampling methods are those specified in the Approved Methods for the Sampling and Analysis of Air Pollutants in NSW (EPA, 2016), or its latest version.</td><td>Error! Reference source not found.</td></tr>
<tr><td>4.8</td><td>Within six months of the commencement of operation of the project, or as may be agreed or directed by the Secretary, and during a period in which the project is operating at both maximum design loads and under normal operating conditions, the Proponent shall undertake a program to confirm the air emission performance of the project. The program shall include, but not necessarily be limited to:</td><td>Error! Reference source not found.</td></tr>
<tr><td></td><td>a) point source emission sampling and analysis subject to the requirements listed under condition 4.7 to determine compliance with the stack discharge concentration limits identified in condition 3.24;</td><td>Error! Reference source not found.</td></tr>
<tr><td></td><td>b) a comprehensive air quality impact assessment, using actual air emission data collected under a). The assessment shall be undertaken strictly in accordance with the methods outlined in Approved Methods and Guidance for the Modelling and Assessment of Air Pollutants in New South Wales (EPA, 2017), or its latest version</td><td>Error! Reference source not found.</td></tr>
<tr><td></td><td>c) a comparison of the results of the air quality impact assessment required under b) above, and the predicted air quality impacts detailed in the Air Quality Assessment, Tallawarra B Permit Modification: Air Quality Assessment, EnergyAustralia, Katestone, dated June 2020;</td><td>Error! Reference source not found.</td></tr>
<tr><td></td><td>d) a comparison of the results of the air quality impact assessment required under b) above, and the impact assessment criteria detailed in Approved Methods and Guidance for the Modelling and Assessment of Air Pollutants in NSW (EPA, 2017), or its latest version; and</td><td>Error! Reference source not found.</td></tr>
<tr><td></td><td>e) details of any entries in the Complaints Register (condition 6.3 of this approval) relating to air quality impacts.</td><td>Error! Reference source not found.</td></tr>
<tr><td></td><td>A report providing the results of the program shall be submitted to the Secretary and EPA within two months of completion of the testing program required under 4.8a) for both operating scenarios.</td><td>Error! Reference source not found.</td></tr>
<tr><td>4.9</td><td>In the event that results of the air dispersion modelling indicates that the operation of the project, under maximum design loads or normal operating conditions, will lead to:</td><td></td></tr>
</table>

<table>
<tr><th>Condition number</th><th>Condition requirement</th><th>Where addressed</th></tr>
<tr><td></td><td>a) greater point source emissions of air pollutants than permitted under Condition 3.24 of this approval; or</td><td>Error! Reference source not found. AQ11</td></tr>
<tr><td></td><td>b) greater ground-level concentrations of air pollutants than the impact assessment criteria detailed in Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales (EPA 2017);</td><td>Error! Reference source not found. AQ11</td></tr>
<tr><td></td><td>then the Proponent shall provide details of remedial measures to be implemented to reduce point source emissions and/ or ground-level concentrations of air pollutants to no greater than permitted under this approval. Details of the remedial measures and a timetable for implementation shall be submitted to the EPA for approval within such period as the EPA may require, unless agreed otherwise by Secretary.</td><td>Error! Reference source not found. AQ11</td></tr>
<tr><td>4.10</td><td>In the event that a combined cycle plant is constructed, the Proponent shall continuously monitor with a probe both the water temperature into the power station and the temperature of the combined cooling water discharge from the Tallawarra Stage A and B plants into the outlet canal, downstream of the attemperation mixing zone.</td><td>n/a plant is open cycle</td></tr>
<tr><td>4.11</td><td>In the event that a combined cycle plant is constructed, the Proponent shall continuously monitor the flow at the inlet waters to the power station and the flow of water discharged from the Tallawarra Stage A and B plants into the outlet canal, downstream of the attemperation mixing zone.</td><td>n/a plant is open cycle</td></tr>
<tr><td>4.12</td><td>In the event that a combined cycle plant is constructed, the Proponent shall monitor any relevant “assessable pollutants” as specified under the Load Based Licensing Scheme (under the Protection of the Environment Operations (General) Regulation 2009) in the combined cooling water discharge from the Tallawarra Stage A and B plants into the outlet canal, downstream of the attemperation mixing zone.</td><td>n/a plant is open cycle</td></tr>
<tr><td>4.13</td><td>In the event that a combined cycle plant is constructed, the Proponent shall monitor the pollutants specified in Table 11 in the blowdown discharge from the cooling tower system. Monitoring shall be undertaken on a daily basis for the first 30 days of post commissioning operations with the frequency of monitoring to be reviewed and specified by the Secretary following review of the monitoring results for the 30 day period. Daily monitoring is to continue until otherwise approved by the Secretary.
Note: Table 11 can be found in Project Approval 07_0124.</td><td>n/a plant is open cycle</td></tr>
<tr><td>4.14</td><td>The Proponent shall monitor the weather parameters in Table 12 on site in accordance with the specified sampling methods, units of measure, averaging periods and frequency.
Table 12 - Weather Monitoring
<table>
<tr><th>Parameter</th><th>Units of Measure</th><th>Frequency</th><th>Averaging Period</th><th>Sampling Method</th></tr>
<tr><td>Rainfall</td><td>mm</td><td>Continuous</td><td>1 hour</td><td>AM-4</td></tr>
<tr><td>Wind speed @ 10 metres</td><td>m/s</td><td>Continuous</td><td>15 minute</td><td>AM-2 & AM-4</td></tr>
<tr><td>Wind direction @ 10 metres</td><td></td><td>Continuous</td><td>15 minute</td><td>AM-2 & AM-4</td></tr>
<tr><td>Temperature @ 2 metres</td><td>°C</td><td>Continuous</td><td>15 minute</td><td>AM-4</td></tr>
<tr><td>Temperature @ 10 metres</td><td>°C</td><td>Continuous</td><td>15 minute</td><td>AM-4</td></tr>
<tr><td>Sigma theta @ 10 metres</td><td></td><td>Continuous</td><td>15 minute</td><td>AM-2 & AM-4</td></tr>
<tr><td>Solar radiation</td><td>W/m²</td><td>Continuous</td><td>15 minute</td><td>AM-4</td></tr>
<tr><td>Additional requirements
- Siting
- Measurement</td><td></td><td></td><td></td><td>
AM-1 & AM-4
AM-2 & AM-4</td></tr>
</table></td><td>Error! Reference source not found.</td></tr>
</table>

Condition number	Condition requirement	Where addressed
4.15	HAZARD AUDIT - Twelve months after the commencement of operation of the project, or within such period otherwise agreed by the Secretary, the Proponent shall commission an independent, qualified person or team to undertake a comprehensive Hazard Audit of the project. Further Hazard Audits shall be undertaken every three years thereafter. Hazard Audits shall be carried out in accordance with the Department's publication Hazardous Industry Planning Advisory Paper No. 5 - Hazard Audit Guidelines.	**Error! Reference source not found.**
5.1	INCIDENT NOTIFICATION, REPORTING AND RESPONSE - The Secretary must be notified in writing via the Major Projects website immediately after the Proponent becomes aware of an incident. The notification must identify the development (including the application number and the name of the development if it has one) and set out the location and nature of the incident. Subsequent notification requirements must be given, and reports submitted in accordance with the requirements set out in Appendix 1.	Section 3.11.2 **Error! Reference source not found.**
5.2	NON-COMPLIANCE NOTIFICATION - The Secretary must be notified in writing via the Major Projects website within seven days after the Proponent becomes aware of any non-compliance.	Section 3.11.1
5.3	A non-compliance notification must identify the development and the application number for it, set out the condition of approval that the development is non-compliant with, the way in which it does not comply and the reasons for the non-compliance (if known) and what actions have been, or will be, undertaken to address the non-compliance.	Section 3.11.1
5.4	A non-compliance which has been notified as an incident does not need to also be notified as a non-compliance.	Section 3.11.1
5.5	COMPLIANCE REPORTING - Compliance Reports of the project must be carried out in accordance with the Compliance Reporting Requirements outlined in the Compliance Reporting Post Approval Requirements (2020).	**Error! Reference source not found.**
5.6	Compliance Reports must be submitted to the Department in accordance with the timeframes set out in the Compliance Reporting Post Approval Requirements (2020), unless otherwise agreed to by the Secretary.	**Error! Reference source not found.**
5.7	The Proponent must make each Compliance Report publicly available within 60 days of submitting it to the Secretary, unless otherwise agreed by the Secretary.	**Error! Reference source not found.**
5.8	Notwithstanding the requirements of the Compliance Reporting Post Approval Requirements (2020), the Secretary may approve a request for ongoing annual operational compliance reports to be ceased, where it has been demonstrated to the Secretary's satisfaction that an operational compliance report has demonstrated operational compliance.	**Error! Reference source not found.**
5.9	Independent Audits of the project must be conducted and carried out in accordance with the Independent Audit Post Approval Requirements (2020).	**Error! Reference source not found.** Section 3.9
5.10	Proposed independent auditors must be agreed to in writing by the Secretary prior to the commencement of an Independent Audit.	**Error! Reference source not found.** Section 3.9
5.11	The Secretary may require the initial and subsequent Independent Audits to be undertaken at different times to those specified in the Compliance Reporting Post Approval Requirements (2020), upon giving at least 4 weeks' notice (or timing) to the Proponent of the date upon which the audit must be commenced.	**Error! Reference source not found.**
5.12	In accordance with the specific requirements in the Independent Audit Post Approval Requirements (2020), the Proponent must:	**Error! Reference source not found.**

Condition number	Condition requirement	Where addressed
	a) review and respond to each Independent Audit Report prepared under condition 5.11 or condition 5.13 of this approval where notice is given by the Secretary;	**Error! Reference source not found.**
	b) submit the response to the Secretary; and	**Error! Reference source not found.**
	c) make each Independent Audit Report, and response to it, publicly available within 60 days of submission to the Secretary, unless otherwise agreed by the Secretary.	**Error! Reference source not found.**
5.13	Independent Audit Reports and the Proponent's response to audit findings must be submitted to the Secretary within 2 months of undertaking the independent audit site inspection as outlined in the Independent Audit Post Approvals Requirements (2020), unless otherwise agreed by the Secretary.	**Error! Reference source not found.**
5.14	Notwithstanding the requirements of the Independent Audit Post Approvals Requirements (2020), the Secretary may approve a request for ongoing independent operational audits to be ceased, where it has been demonstrated to the Secretary's satisfaction that independent operational audits have demonstrated operational compliance.	**Error! Reference source not found.**
6.1	Subject to confidentiality, the Proponent shall make all documents required under condition 6.4 of this approval available for public inspection on request.	Section 4.2
6.2	Prior to the commencement of construction of the project, the Proponent shall ensure that the following are available for community complaints for the life of the project (i.e. construction and operation):	Section 4.2
	a) a telephone number on which complaints about construction and operational activities at the site may be registered; b) a postal address to which written complaints may be sent; and c) an email address to which electronic complaints may be transmitted.	Section 4.2
	The telephone number, the postal address and the email address shall be displayed on a sign near the entrance to the site, in a position that is clearly visible to the public, and which clearly indicates the purpose of the sign. The telephone number, postal address and email address shall be published in a newspaper circulating in the local area prior to the commencement of construction of the project and prior to the commencement of operation. The details shall also be provided on the website required by condition 6.4 of this approval.	Section 4.2
6.3	The Proponent shall record details of all complaints received through the means listed under condition 6.2 of this approval in an up-to-date Complaints Register. The Register shall record, but not necessarily be limited to:	Section 4.2

Condition number	Condition requirement	Where addressed
	a) the date and time of the complaint; b) the means by which the complaint was made (telephone, mail or email); c) any personal details of the complainant that were provided, or if no details were provided, a note to that effect; d) the nature of the complaint; e) any action(s) taken by the Proponent in relation to the complaint, including any follow-up contact with the complainant; and f) if no action was taken by the Proponent in relation to the complaint, the reason(s) why no action was taken. The Complaints Register shall be made available for inspection by the Secretary upon request. The Complaints Register for the project may be incorporated into an existing complaints handling system managed by the Proponent if it is demonstrated to meet the requirements of condition 6.3.	Section 4.2
6.4	Before the commencement of construction until the completion of all rehabilitation required under this approval, the Proponent must:	Section 4.2
	a) make the following information and documents (as they are obtained, approved or as otherwise stipulated within the conditions of this approval) publicly available on its website: • the EIS; • all current statutory approvals for the project; • all approved strategies, plans and programs required under the conditions of this approval; • the proposed staging plans for the project if the construction, operation or decommissioning of the project is to be staged; • regular reporting on the environmental performance of the project in accordance with the reporting requirements in any plans or programs approved under the conditions of this approval; • a comprehensive summary of the monitoring results of the project, reported in accordance with the specifications in any conditions of this approval, or any approved plans and programs; • a summary of the current phase and progress of the project; • contact details to enquire about the development or to make a complaint; • a complaints register, updated monthly; • the Annual Reviews of the project; • audit reports prepared as part of any Independent Environmental Audit of the project and the Proponent's response to the recommendations in any audit report; • any other matter required by the Secretary; and	Section 4.2
	b) keep such information up to date, to the satisfaction of the Secretary.	Section 4.2
6.5	At least one month prior to the commencement of construction of the project, or within such a period otherwise agreed by the Secretary, the Proponent shall prepare and implement a Community Consultation Program. The program shall be ongoing throughout the construction phase of the project and for at least the first 12 months of operation. The program shall include, but not necessarily be limited to:	Section 4.1

Condition number	Condition requirement	Where addressed
	a) the general types of information on the timing, progress, construction, operation and environmental management of the project; b) the means by which the information would be provided to the community (for example, presented at regular meetings, published in regular newsletters etc); c) the spatial extent of the community to be consulted; and d) a mechanism through which the community can provide feedback to the Proponent in relation to the environmental management and impacts of the development.	Section 4.1
	The Program shall be submitted for the approval of the Secretary, prior to the commencement of construction of the development.	N/A
7.4	The Proponent shall prepare an **Operation Environmental Management Plan** (OEMP) to detail an environmental management framework and the practices and procedures to be followed during operation of the project.	This document
	The Plan shall be consistent with Guideline for the Preparation of Environmental Management Plans (Department of Infrastructure, Planning and Natural Resources, 2004), or its latest version, and shall include, but not necessarily be limited to:	Section 3.5
	a) identification of all relevant statutory and other obligations that the Proponent is required to fulfil in relation to operation of the project, including all relevant approvals, licences, and permits;	This table A-1 Section 3.4 Section 3.5
	b) overall environmental policies, guidelines and principles to be applied to the operation of the project;	Section 3.1, App B and Section 3.4
	c) relevant standards to be applied to the project and details of how the environmental performance of the operation of the project will be monitored and managed to meet the standards. Environmental performance issues shall include, but not be limited to –	Section 3.5
	i) measures to monitor and maintain offset measures implemented in accordance with condition 3.41 of this approval,	Appendix D
	ii) methods to monitor and maintain revegetated areas (including riparian areas) during the establishment phase and long term,	Appendix D
	iii) ongoing measures to monitor and control the spread of weeds,	Section 5.3
	iv) ongoing measures to control soil erosion and sedimentation;	Section 5.4
	v) water management plan, prepared in consultation with the EPA, identifying clean water and dirty water (i.e. waste water streams) areas on site maps, waste water volumes, sources and pollutants, and details of the water management measures to be implemented to manage the specific pollutant streams and clean water runoff,	Section 5.5
	vi) procedures for planned and unplanned water discharges from the site, and	Section 5.5.8
	vii) emergency response procedures in the event of flooding	Section 5.5.9
	d) a description of the roles and responsibilities for all relevant employees involved in the operation of the project;	**Error! Reference source not found.**
	e) a means by which environmental performance can be periodically reviewed and improved, where appropriate and what actions will be taken to address identified potential adverse environmental impacts;	Section 3.10 Section 3.12
	f) Removed;	-

Condition number	Condition requirement	Where addressed
	g) management policies to ensure that environmental performance goals are met and to comply with the conditions of this approval; and	Section 5
	h) the environmental monitoring requirements outlined under conditions 4.5 to 4.14 of this approval, inclusive.	**Error! Reference source not found. Error! Reference source not found.**
	The Plan shall be submitted for the approval of the Secretary no later than one month prior to the commencement of operation of the project, or within such period otherwise agreed by the Secretary. Operation shall not commence until written approval has been received from the Secretary. The Proponent must implement the approved OEMP for the project.	Section 1.4
7.5	As part of the OEMP for the project, required under condition 7.4 of this approval, the Proponent shall prepare and implement the following Management Plans:	
	a) an **Air Quality Management Plan** in consultation with the EPA to outline measures to manage impacts from the project on local and regional air quality. The Plan shall include, but not necessarily be limited to -	Appendix H
	i) identification of all major sources of particulate and gaseous air pollutants that may be emitted from the project, being both point-source and diffuse emissions, including identification of the major components and quantities of these emissions,	Section 5.6.3 and **Error! Reference source not found.**
	ii) monitoring for gaseous and particulate emissions from the project,	**Error! Reference source not found.**
	iii) procedures for the minimisation of gaseous and particulate emissions from the project, including pro-active and reactive management and response mechanisms, with specific reference to measures to be implemented and actions to be taken to minimise and prevent potential elevated air quality impacts on surrounding land uses as a consequence of meteorological conditions, upsets within the project, or the mode of operation of the project at any time,	Section 5.6.5 **Error! Reference source not found.**
	iv) specific procedures for the management of generating efficiency and the minimisation of greenhouse gas emissions per unit of electricity generated,	Section 5.6.5 **Error! Reference source not found.**
	v) procedures aimed at maximising the efficiency of the start-up and shut-down cycles for the project,	Section 5.6.5
	vi) provision for regular review of air quality monitoring data, with comparison of results against the predictions made in the document listed under condition 1.1c) of this approval,	Section 5.6.5 **Error! Reference source not found.**
	vii) plans for regular maintenance of process equipment to minimise the potential for leaks and fugitive emissions, and	Section 5.6.5
	viii) a contingency plan should an incident, process upset or other initiating factor lead to elevated air quality impacts, whether above normal operating conditions or environmental performance goals/ limits; and	Section 5.6.5 **Error! Reference source not found.**

Condition number	Condition requirement	Where addressed
	b) a **Noise Management Plan** in consultation with the EPA to detail measures to mitigate and manage noise during operation of the project. The Plan shall include, but not necessarily be limited to -	
	i) identification of the noise limits specified under this approval,	**Error! Reference source not found. Error! Reference source not found. Error! Reference source not found. Error! Reference source not found. Error! Reference source not found.**
	ii) identification of operational activities that will be carried out and the associated noise sources,	Section 5.7.2
	iii) details of all management methods, procedures and mitigation measures that will be implemented to control individual and overall noise emissions from the site during operation,	Section 5.7.16
	iv) procedures for periodic consideration of noise impacts against the noise limits specified under this approval,	Section 5.7.14
	v) noise monitoring and reporting procedures, and	**Error! Reference source not found.**
	vi) procedures to generate suitable documentation for annual environmental auditing, that demonstrates that the noise limits specified under this approval are being met.	Section 5.7.13 and Section 5.7.15
7.7	Within 3 months, unless the Secretary agrees otherwise, of: a) the submission of an incident report under condition 5.1 of this approval; b) the submission of an Independent Environmental Audit report under condition 5.11 of this approval; c) the approval of any modification to the conditions of this approval; or d) a direction from the Secretary under condition 1.3 of this approval; the Proponent must review and, if necessary, revise the studies, strategies or plans required under the conditions of approval to the satisfaction of the Secretary. Where this review leads to revisions in any such document, then within 4 weeks of the review the revised document must be submitted to the Secretary for approval, unless otherwise agreed with the Secretary. *Note: This is to ensure the strategies, plans and programs are updated on a regular basis, and incorporate any recommended measures to improve the environmental performance of the project.*	Section 3.12

Condition number	Condition requirement	Where addressed
7.8	To ensure the studies, strategies and plans for the project are updated on a regular basis and incorporate any required measures to improve the environmental performance of the project, the Proponent may submit revised studies, strategies or plans required for the project under the conditions of approval at any time. With the agreement of the Secretary, the Proponent may also submit any study, strategy or plan required under the conditions of this approval on a staged basis. The Secretary may approve a revised strategy or plan required under the conditions of approval, or the stage submission of these documents, at any time. With the approval of the Secretary, the Proponent may prepare the revised or staged strategy or plan without undertaking consultation with all parties nominated under the applicable condition in this approval. *Notes:* *• While any study, strategy or plan may be submitted on a progressive basis, the Proponent must ensure that the existing operations on site are covered by suitable studies, strategies or plans at all times.* *• If the submission of any study, strategy or plan is to be staged, then the relevant study, strategy or plan must clearly describe the specific stage to which the study, strategy or plan applies, the relationship of this stage to any future stages, and the trigger for updating the study, strategy or plan.*	Section 3.12
1 Appendix 1	A written incident notification addressing the requirements set out below must be submitted to the Secretary via the Major Projects website within seven days after the Proponent becomes aware of an incident. Notification is required to be given under this condition even if the Proponent fails to give the notification required under condition 5.1 or, having given such notification, subsequently forms the view that an incident has not occurred.	**Error! Reference source not found.**
2 Appendix 1	Written notification of an incident must: a) identify the development and application number; b) provide details of the incident (date, time, location, a brief description of what occurred and why it is classified as an incident); c) identify how the incident was detected; d) identify when the Proponent became aware of the incident; e) identify any actual or potential non-compliance with conditions of approval; f) describe what immediate steps were taken in relation to the incident; g) identify further action(s) that will be taken in relation to the incident; and h) identify a project contact for further communication regarding the incident.	**Error! Reference source not found.**
3 Appendix 1	Within 30 days of the date on which the incident occurred or as otherwise agreed to by the Secretary, the Proponent must provide the Secretary and any relevant public authorities (as determined by the Secretary) with a detailed report on the incident addressing all requirements below, and such further reports as may be requested.	**Error! Reference source not found.**
4 Appendix 1	The Incident Report must include: a) a summary of the incident; b) outcomes of an incident investigation, including identification of the cause of the incident; c) details of the corrective and preventative actions that have been, or will be, implemented to address the incident and prevent recurrence; and d) details of any communication with other stakeholders regarding the incident.	**Error! Reference source not found.**

Condition number	Condition requirement	Where addressed

Table A- 2: Statement of Commitment (Source: Sinclair Knight Merz, July 2009)

Statement of Commitment	Where addressed
Environmental Management	
An operational environmental management plan (OEMP) will be prepared and implemented to guide operational activities. The OEMP will cover the following areas: ■ environmental management; ■ air and greenhouse; ■ noise; ■ hazard and risk; ■ water; ■ heritage; ■ ecology; ■ landscape and visual; ■ traffic and transport; ■ waste management; and ■ emergency response. Any plans and strategies contained in the OEMP will be developed in consultation with the relevant agencies.	This Plan. An OEMP have been prepared and will be developed in consultation the relevant agencies. Aspects of water, air and greenhouse, heritage, noise, traffic, and waste are addressed through the sub-plans in sections 5.5, 5.6, 5.7, 5.8, 5.9 and 5.10 respectively. All other aspects are addressed through EnergyAustralia's Environmental Management System as shown in Figure 3-1
The OEMP will require that regular monitoring and periodic performance reviews be undertaken of key performance criteria for noise during the operation of the site. Performance reviews will be undertaken against noise performance parameters established in the OEMP. The examination and interpretation of the results of such reviews will be undertaken by a suitably qualified professional and any agreed actions implemented within a reasonable timeframe.	Addressed in Section 5.7. Noise Management Plan.
The plant's hours of operation will be 24 hours 7 days per week.	Noted. Tallawarra Power Station can operate 24 hours 7 days a week
The site will preferentially use natural gas fuel for firing the power station turbines. Diesel fuel (OCGT only) shall only be used to manage fuel capacity or network system constraints, in the event of failure of existing major electricity generating facilities, failure of natural gas supplies, a State or regional system shutdown situation; if cessation of operation would otherwise lead to a loss or reduction in electricity necessary to maintain the required network supply security/reliability or at the direction of the National Electricity Market Operator.	The OCGT will not run on diesel fuel.
The Tallawarra Stage B project will not result in any permanent reduction or alteration of the existing foreshore access arrangements in the vicinity of the site	Noted. Foreshore access has not been impacted.
Air and Greenhouse	
The air and greenhouse proposal for the Stage B OCGT plant will be designed and implemented to ensure that the NSW DECC criteria for each pollutant identified in Tables 7-1 and 7-2 are not exceeded. As is the case with Tallawarra A (Tallawarra A Air Quality Management Plan), in the event of exceedances, DECC will be notified and remedial action undertaken.	No exceedances to the discharge limit identified in **Error! Reference source not found.**
In order to determine the annual NOx load, TRUenergy propose to install and operate a continuous NOx monitoring system at the site.	NO_x monitoring system is installed.

Statement of Commitment	Where addressed
The need or otherwise for offsets will be determined based on the annual monitoring results. Additionally, the need or otherwise will also be determined by; the actual operating data from Tallawarra A, the predicted operating data from Tallawarra B and finally by the actual operating data from Tallawarra B.	Annual monitoring of operational emission will be monitored.
TRUenergy has committed to avoid simultaneous cold starts of both Tallawarra A and Tallawarra B CCGTs as a potential exceedance of air emission parameters is indicated from the modelling of this operational scenario with currently available data. TRUenergy reserves the right to remodel and seek the ability to carry out this scenario in the event that improved emissions data becomes available.	Not applicable. CCGT is not proposed for Tallawarra B.
Ongoing monitoring of greenhouse gas emissions will be undertaken and reported in the proponent's Annual Environmental Report.	Noted. Greenhouse gas emissions will be reported in the National Greenhouse and Energy Reporting.
The proponent will continue to meet its requirements under the 'Greenhouse Challenge Plus Program' by maintaining its emissions inventory reporting and continuing development and implementation of action plans to achieve cost effective abatement.	
Noise	
The project noise goals listed in Table 7-17 (of the EA), developed in accordance with the Industrial Noise Policy (INP), will be adhered to during the operation of the Stage B OCGT plant.	Addressed in **Error! Reference source not found.** and **Error! Reference source not found.**
Any future development within the Tallawarra Lands area will need to consider the operational noise emissions of the plant and implement design measures to minimise the impact of such emissions. Operational noise emissions monitoring will be undertaken during the operation phase to confirm current assumptions prior to the development of the proposed residential areas.	Addressed in **Error! Reference source not found.**
The start up and shut down activities will be managed through the Operational Environmental Noise Management Plan developed for Tallawarra A, Ref 7142- 037-02-01 Rev 2.	Addressed in **Error! Reference source not found.**
Water	
The existing comprehensive routine monitoring program (as required for Tallawarra Stage A) will be used to monitor the water quality in Lake Illawarra.	Noted. Water monitoring routine for Tallawarra Stage A (Unit 1) will be followed.
The use of treated sewage effluent by the proponent for spray irrigation at the site will be managed in accordance with the existing environment protection licence conditions.	Noted. Treated sewage effluent will be managed in accordance with EPL 555.
Runoff water quality will be improved through the use of specially designed traps which will remove oil and grit from runoff water. This will enable recycling of the captured oil, and offsite disposal of the solids. The continued use of the existing constructed wetlands will further improve runoff water quality through removal of excess nutrients and toxicants.	Noted. Oil and grit traps will be used to capture stormwater runoff to improve water quality
Settling basins will be used to remove course material from runoff water and minimise further sedimentation in Lake Illawarra. The settling basins provided for Tallawarra Stage A may need to be enlarged or duplicated to cater for the increased runoff.	Sedimentation pond has been built to capture the runoff water. This pond will discharge to the existing northern drain.
The oil skimmer booms that are in place for the Tallawarra Stage A plant will be used on the outlet canal to provide extra protection in the event of an oil spill.	Oil boom were not installed for Tallawarra Stage A. Oil skimmer is installed for the sediment ponds and oil spill kits are located at the outfall canal.
Subject to any future development of Tallawarra Lands and the availability of sewer TRUenergy intent to connect to this system	Noted

Statement of Commitment	Where addressed
Ecology	
Monitoring of the revegetated areas will be undertaken to ensure they are functioning as designed.	Addressed in Section 5.3
Aboriginal Heritage	
Any identified or potential Aboriginal heritage sites remaining on the proponent's site will be protected in consultation with the relevant Local aboriginal Land Council (LALC)	Addressed in 5.10 Heritage Management Plan.
Visual Amenity	
The existing landscape planting for Tallawarra Stage A will be enhanced at key locations around the site.	Noted.
The existing earth mound to the east of the site will be elevated to screen the proposed power stations.	Noted.
Native vegetation will be planted on the mound. Vegetation will be retained on the north side of the site and planting will be maximised to reduce views of the site from the Tallawarra Lands area.	Noted.
Waste	
Waste management will be a component of the Operational EMP for the operational phase of the facility. It will ensure that initiatives for the sustainable management of waste are given consideration, including: • recycling facilities being provided to encourage the separation and recycling of all paper, aluminium, glass, and plastic products used during the operation of the site; and • domestic waste l being collected regularly and disposed of at licensed facilities as appropriate.	Addressed in 5.9 Waste Management Plan,
Where required, any asbestos, contaminated soil and spoil generated from the power station site and the previous power station foundations (subsurface) will be retained and contained on site in the existing DECC approved site asbestos repository established as part of the Tallawarra A approval.	Noted.

Appendix B: EnergyAustralia HSSE Policy

Health, Safety, Security and Environment Policy

EnergyAustralia[1] is one of Australia's largest energy companies, operating as both an energy retailer and energy generator.

EnergyAustralia is committed to meeting all of its health, safety, and environmental obligations and to providing a safe, healthy, and secure work environment for all people at our workplaces, and those affected by our operations. EnergyAustralia is also dedicated to the principles of sustainable development and environmental stewardship – the value of balancing our responsibility to meet the needs of our customers with the social, environmental, and economic needs of our people, communities and stakeholders.

We will sustain our commitment to our Health, Safety, Security and Environment (HSSE) performance through the proactive and systematic identification of hazards and management of risks to as low as reasonably practicable (ALARP). Through the application of ALARP risk management principles we will continually seek to eliminate all potential sources of workplace incidents, injuries, and ill health.

This policy applies to all of EnergyAustralia's workers, including employees and contractors. We will work together to manage our operations and associated activities in a safe, secure and sustainable manner. HSSE performance is the responsibility of all workers.

EnergyAustralia will:

- Commit to leading and accelerating the clean energy transformation for all;
- Comply with all applicable HSSE laws, regulations, and obligations;
- Minimise adverse impacts of our operations on the environment and community, including the prevention of pollution;
- Continue to identify and report hazards and risks and seek to eliminate them from our operations and activities;
- Establish, monitor and report on measurable HSSE targets, objectives and performance;
- Ensure that knowledge and learnings related to HSSE performance are shared within the workplace, community and industry;
- Consult with our workers and those with whom we share HSSE duties to identify hazards and improve safe work practices;
- Engage effectively with local communities;
- Promote and support initiatives to improve HSSE performance and ensure that continuous improvement is built into how we work;
- Provide sufficient resources, including supervision, training, instruction and information, to support all activities to ensure that HSSE risks are well understood and mitigated;
- Support and implement a HSSE Management System, including worker participation;
- Encourage behaviours which demonstrate a commitment to HSSE; and
- Empower all workers to protect themselves and others from injury.

Mark Collette
Managing Director, EnergyAustralia **March 2024**

[1] For the purpose of this policy, EnergyAustralia includes EnergyAustralia Holdings Limited, its wholly owned subsidiaries and controlled entities. This policy is reviewed every two years, or when business strategy, structure, practices or legislation changes, whichever occurs first.

Appendix C: Legal compliance table

Table A- 3: Legislation relevant to this OEMP and sub-plans

Legislation	Details and obligations	Application to the project	Approvals/ permit/ license required
Environmental Planning and Assessment Act 1979 and Regulation	Approval of the Minister required to carry out critical State significant infrastructure (CSSI). Comply with the conditions of the Infrastructure Approval and generally in accordance with the revised mitigation measures from the Response to DPHI Request for Information.	The project was declared a Major Project under section 75B(1)(a) of the *Environmental Planning and Assessment Act 1979*, because it is development of a kind described in clause 24 of Schedule 1 of *State Environmental Planning Policy (Major Development) 2005*. Tallawarra B power station project (MP07-0124) was granted approval on 21 December 2010 by the then Minister for Planning. On 20 November 2018, the project was made a critical State significant infrastructure (SSI) project by order under Clause 5 of Schedule 2 to the *Environmental Planning and Assessment (Savings, Transitional and Other Provisions) Regulation 2017*.	Planning Approval S07/01422
Protection of the Environment Operations Act 1997, and Amendment Act 2011 and 2014	Sets the statutory framework for managing environment quality in NSW with the objective of protecting, restoring and enhancing the quality of the NSW environment. Environment Protection Licences may be issued by the NSW EPA to regulate and authorise discharges to the environment for scheduled activities.	Under Schedule 1, 17 Electricity Generation of the POEO Act, the Project is considered a scheduled activity. Therefore, the Project requires an Environment Protection Licence (EPL) to operate under section 48 of the POEO Act.	Environment Protection Licence (EPL) has been obtained, licence #555. Operational requirements in the EPL must be complied with. The EPL would need to be modified prior to operation of the project.
Water Management Act 2000	Consolidates the *Water Act 1912* and the *Rivers and Foreshores Improvement Act*. The Act aims to provide sustainable and integrated management of the water sources of the State for the benefit of both present and future generations	The Project would not result in an increase in water demand, the volume of earthworks or drainage pathways that are already been approved. There would be no change in water management practices or to the risk of flooding during construction and operation.	Implementation of OEMP
Heritage Act 1977	Provides protection for the heritage items.	No known non-indigenous heritage items exist within the corridor. If unknown heritage items are discovered, the Unexpected Heritage Finds & Human Remains Procedure should be followed	Implementation of Tallawarra Heritage Management Plan
National Parks and Wildlife Act 1974 and Amendment Act 2001	Consolidates and amends the law relating to the establishment, preservation and management of national parks, historic sites and certain other areas and the protection of certain fauna, native plants and Aboriginal objects.	Several Aboriginal heritage artefacts are located within the area surrounding Tallawarra power station site.	Implementation of Tallawarra Heritage Management Plan

Legislation	Details and obligations	Application to the project	Approvals/ permit/ license required
Biodiversity Conservation Act 2016	Aims to maintain a healthy, productive and resilient environment for the greatest well-being of the community, now and into the future, consistent with the principles of ecologically sustainable development.	The BC Act is not directly applicable to the operational phase of the project. The approach to flora and fauna management and offsetting assumes that BAM / Biodiversity Conservation Act 2016 compliance is not required (as per EnergyAustralia legal advice)	Not applicable
Fisheries Management Act 1994	The objects of this Act include: (a) to conserve fish stocks and key fish habitats; (b) to conserve threatened species, populations and ecological communities of fish and marine vegetation; and (c) to promote ecologically sustainable development, including the conservation of biological diversity.	Under the approved project a permit is not required to carry out any activity in the vicinity of a water course. Consultation is required if damage is to occur to meet the requirements of the permit process.	Permit is not required. Monitor project changes for potential impacts to key fish habitat.
Pesticides Act 1999	Regulates and provides for the control and use of pesticides	Records will be kept of any use of pesticides on the project.	Implementation of OEMP
Biosecurity Act 2015	This Act provides a framework for the prevention, elimination and minimisation of biosecurity risks posed by a biosecurity matter. Under Part 3 of the Act, all persons are required to minimise biosecurity risks including through the control of noxious weeds on their land.	The location and extent of weeds within the study area has been surveyed through the Tallawarra Stage B Gas Turbine Power Station – Ecological Advice (EnergyAustralia 2021). Section 5.2 will prescribe the control measures to control weeds.	Implementation of OEMP
Contaminated Land Management Act 1997	Establishes processes for investigating and (where appropriate) remediating land areas where contamination presents a significant risk of harm to human health or some other aspect of the environment. The Act also sets out the role of OEH in the assessment of contamination and the supervision of the investigation, remediation and management of contaminated sites, and provides for the accreditation of site auditors.	This legislation regulates the investigation and remediation required. ▪ Where asbestos is identified, it is addressed according to the Tallawarra Asbestos Management Plan. ▪ Where other potential contamination is identified (i.e. PFAS).	Implementation of Tallawarra Asbestos Management Plan
Rural Fires Act 1997	Establishes the NSW Rural Fire Service and define its functions and to make provision for the prevention, mitigation and suppression of rural fires.	Approval will be sought from the Rural Fire Service prior to any burning, or any other activity that could cause a rural fire.	Consider if licence is required prior to undertaking burning activities
Dangerous Goods Act 1974 and Dangerous Goods Regulation 1999	Outlines requirements for the storage, transport and use of dangerous goods as prescribed by the Dangerous Goods Regulation 1999. Licenses sought from WorkCover.	Licenses required for the storage, transport, and use of prescribed goods, where relevant thresholds are exceeded	Consider if licence is required during transportation of dangerous goods.

Appendix D: Vegetation Offset Plan

Tallawarra B
Vegetation Offset Plan

Tallawarra Power Station

TQMS-ENV-M01-L02-A01 Version: 1.0

EnergyAustralia
LIGHT THE WAY

Tallawarra B Power Station

Vegetation Offset Plan

EnergyAustralia Tallawarra Pty Ltd

Reference: MP07_0124

Revision: 2.4

2022-12-14

EnergyAustralia

LIGHT THE WAY

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Contents

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Abbreviations

Abbreviation	Description
CoA	Conditions of Approval
EMS	Environmental Management Strategy
km	Kilometres
kV	Kilovolt
m	Metres
mm	Millimetres
MW	Megawatts
NSW	New South Wales
OCGT	Open Cycle Gas Turbine
PCT	Plant Community Type
RFS	Rural Fire Service
Sp	Species
Spp	Species (plural)

1 Introduction

1.1 Overview

The Tallawarra B Gas Turbine Power Station Project Approval 07_0124 was granted under Section 75J of the *Environment Planning and Assessment Act 1979*, Modification 2 dated December 2020. This vegetation offset plan is prepared under as part of Condition of Approval (CoA) 3.41 for the Tallawarra B 400-megawatt gas fired power station (the Project). This plan details the required compensatory planting requirements as specified in the project approval for vegetation offsetting. This plan identifies the project background, the assessment of the compensatory planting required and details of the site establishment requirements for the offset planting.

1.2 Responsibility for achieving plan

Energy Australia will be responsible for all activities and tasks associated with compensatory planting and meeting offset obligations. This includes all planning, site establishment, planting, monitoring and maintenance requirements as detailed in CoA 3.41.

The plan shall be implemented in accordance with the specified measures and timeframes, unless otherwise agreed to by the Secretary.

1.3 Project background

1.3.1 Project site and surrounds

The Project is located adjacent to the existing Tallawarra A Power Station on Yallah Bay Road, Yallah. The site is located on the western bank of Lake Illawarra and on the southern footslopes of Mount Brown, which rises to about 130 metres (m). The Project is positioned in a historically disturbed location on the foundations of a former coal power station, which was decommissioned in 1989. The land is owned by EnergyAustralia.

The Tallawarra Lands surrounding the site are currently leased for low density cattle grazing and comprise of undulating grassy slopes.

The location of the project is shown in Figure 1-1.

A security mechanism is required to monitor and maintain the final offset site in perpetuity. In discussion with the Biodiversity Conservation Trust and other relevant stakeholders, EnergyAustralia will investigate available security mechanisms, and implement the security mechanism within 12 months of the completion of compensatory planting.

1.3.2 Project summary

The project involves the construction and operation of an open cycle gas turbine (OCGT) power station and associated infrastructure including a new transmission line, new gas receival station infrastructure and new gas feeder pipeline infrastructure.

Construction of the project would require the temporary establishment of construction ancillary areas adjacent to the project site. This will include the use of some land associated with the Tallawarra A power station.

Following construction, disturbed areas will be rehabilitated, and landscaping will be established.

1.3.3 Security mechanism

A security mechanism is required to monitor and maintain the final offset site in perpetuity. In discussion with the Biodiversity Conservation Trust (BCT) and other relevant stakeholders, EnergyAustralia will investigate available security mechanisms, and will enter into either a Conservation Agreement or Stewardship Agreement with BCT. The proposed timeframe to implement the security mechanism will be within 36 months of the completion of compensatory planting, and is based on the following estimated timeframes:

- Confirm approach with BCT (3 months)
- Subdivision of property (9 months)
- Biodiversity assessment (6 months)
- Draft Agreement (3 months)
- Final approvals (4 months)
- Management/Contingency (8 months)

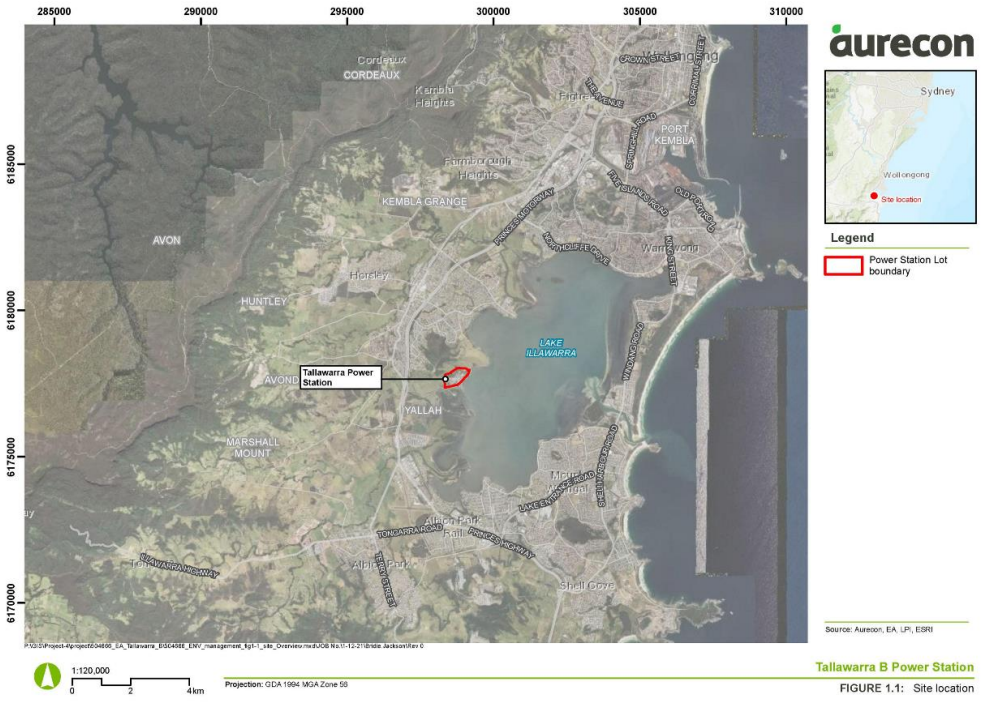

Figure 1-1 Site location

1.4 Purpose of this plan

This plan has been developed to meet legislative requirements as detailed via the Conditions of Approval (CoA) issued by the Minister of Planning. Furthermore, this plan will be produced in consideration of the statement of commitments listed as part of the environmental assessment of the Project.

All other relevant legislative requirements will be followed in accordance with the Project Environmental Management Strategy (EMS).

1.4.1 Conditions of approval

The removal of native vegetation is required as part of the Project and as such this Offset plan has been developed in accordance with Conditions of Approval (CoA) 3.41. Additionally, other CoA are considered in this Offset Plan to enable the objectives of this offset plan to be met, and the plan is also consistent with other CoAs. The Department of Planning, Industry and Environment's (DPIE) project approval conditions relevant to this EMS are listed in Table 1-1.

Table 1-1 Compliance with CoA

CoA #	CoA requirement	How addressed
3.38	The Proponent shall ensure that there is no disturbance to the endangered ecological communities, including the Illawarra Subtropical Rainforest in the Sydney Basin Bioregion and the Swamp Oak Floodplain Forest of the NSW North Coast, Sydney Basin and South East Corner bioregions, during the construction and operation of the project	Section 2.1 and FFMP
3.39	The Proponent shall mark the areas of endangered ecological communities with flagging tape or similar prior to commencing construction to ensure that there is no incursion into, or clearing of the areas.	Section 2.1 and FFMP
3.40	The Proponent shall ensure that clearing of native vegetation is limited to the minimal extent required for the construction of the project and shall undertake all reasonable and feasible measures to avoid the clearing of any threatened flora species. All cleared areas shall be stabilised with local native grasses and ground cover plants as soon as practicable to minimise soil erosion.	Section 2.3, 2.4, 3.10, 3.11, FFMP and SWMP
3.41	At least one month prior to the commencement of construction of the project, the Proponent shall develop a plan for offsetting the biodiversity impacts resulting from the removal of any native vegetation. The plan shall be submitted to the Secretary for approval and include as appropriate, but not necessarily be limited to:	This plan
	a) measures for encouraging the natural regeneration of locally native vegetation, including weed management measures as identified in condition 3.44	Section 2.5, 3.2, 3.9 and 4.4
	b) replanting/compensatory plantings (at a ratio of at least 2:1) and/or land offsets, and rehabilitation measures	Section 3.5
	c) measures for replacing specific habitat values impacted by the project (e.g. provision of roost/nest boxes where significant habitat trees such as hollow bearing trees are impacted)	Section 3.6
	d) a timeline for the implementation of the identified measures, including ongoing monitoring and maintenance	Section 4.4
	e) demonstration of how the plan would achieve the outcome of maintaining or improving biodiversity values in the local area; and	Section 2.4, 2.5, 3.2.1
	f) measures for monitoring and maintaining any offsets in perpetuity.	Section 4
	The plan shall be implemented in accordance with the specified measures and timeframes, unless otherwise agreed to by the Secretary.	Section 1.2
3.42	The Proponent shall establish a riparian zone consisting of local native plant species adjacent to Yallah Creek within the power station site boundary. The width of the riparian zone is to be a minimum of 50 metres on both sides of the creek, where practicable. All works and disturbance areas associated with the construction and operation of the project must be located outside of the riparian zone, including new transmission line poles.	Section 3.2 and FFMP

CoA #	CoA requirement	How addressed
3.43	The Proponent shall monitor and maintain the riparian zone along Yallah Creek (referred to in condition 3.42) throughout the life of the project.	Section 4, Appendix C and FFMP
3.44	The Proponent shall monitor all rehabilitated areas, offset areas, and riparian zones for weed infestation. Any infestations shall be actively managed to remove or minimise their spread.	Section 4 and FFMP

1.4.2 Statements of commitments

The Project Environmental Assessment, Chapter 9, provides a Statement of Commitments in relation to environmental impact mitigation, management and monitoring during construction and operation. Relevant statement of commitments for the purposes of this offset plan are as follows:

- The proposed disturbance footprint will be clearly defined on-ground, using temporary fencing, to avoid unnecessary vegetation and habitat removal.
- Appropriate weed management strategies will be implemented during construction to ensure they are not spread throughout the study area.
- Revegetation of earthwork areas will be conducted as soon as practicable during the construction phases.
- Monitoring of the revegetated areas will be undertaken to ensure they are functioning as designed.
- The existing landscape planting for Tallawarra Stage A will be enhanced at key locations around the site. The existing earth mound to the east of the site will be elevated to screen the proposed power stations. Native vegetation will be planted on the mound. Vegetation will be retained on the north side of the site and planting will be maximised to reduce views of the site from the Tallawarra Lands area.

1.5 Consultation

EnergyAustralia consulted with the Biodiversity Conservation Division (BCD) via email and an online meeting in early September 2021. BCD was provided with a draft version of the Flora and Fauna Management Plan and this Vegetation Offset Plan (including the draft Landscape Plan) prior to the meeting, and we discussed aspects of both plans and project with a BCD representative. BCD provided formal feedback on both the FFMP and Vegetation Offset Plan on 8 September which has been incorporated in this plan. Stakeholder consultation correspondence is provided in Appendix D.

1.6 Methodology

The development of this Offset Plan included the completion of three initial days of field survey (16 June, 17 June and 12 July 2021) to prepare a detailed inventory of native vegetation that will require clearing at all stages of the Project (including both construction and early works). Offset sites were determined through a field survey and desktop assessment of environmental conditions to determine their suitability. Additional field survey was undertaken on 30 September 2022 to revise the offset planting area to a more suitable area, based on the advice of the New South Wales (NSW) Rural Fire Service (RFS). The new planting area adjoins existing vegetation enhancing connectivity of vegetation in the north east of the site.

For the purposes of this plan, *native vegetation* is considered to be trees/shrubs and saplings of woody vegetation indigenous to Australia in accordance with growth forms as defined by the Biodiversity Assessment Methodology[1]. Given the nature of compensatory planting, this does not include ground cover species, vines, scramblers, or forbs as these species are difficult to quantify, and often do not have the long growth time required for woody species.

[1] See list of native species by growth form here:
https://www.lmbc.nsw.gov.au/bamcalc/app/assets/NativeSpeciesByGrowthFrom_PowerQuery.xlsx

Best efforts have been made to fully identify native species to the species level, to enable similar biodiversity values to be replaced. However, limitations such as the lack of fruiting material or restricted access to plant individuals (such as due to blackberry vine or safety considerations) only allowed some plants to be recorded to the Genus level. For the purposes of this plan, this is sufficient for the identification of native/non-native trees and associated compensatory planting.

2 Clearing area survey

2.1 Location and clearing extent

Clearing will be conducted for Project activities including:

- Site investigations
- Establishment of erosion and sediment control measures
- Development to the power station site
- Development of the gas receival station site
- Establishment of construction ancillary sites
- Establishment of the transmission line easements.

The areas where clearing is required for these facilities are shown as 'impact areas' within Figure 2-1 and consists of laydown areas and car parks, transmission line easement, and proposed pole locations. Further details of these sites are provided in Table 2-1.

No clearing areas are identified (or permitted) within areas of EEC or within the riparian exclusion zone. These areas must be marked off with flagging tape or similar prior to commencing construction to prevent incursion into, or clearing of the areas (as required by the Flora and Fauna Management Plan)

The location of clearing sites has been assessed as per the design dated on the 12th of July 2021. Variations of the design may occur between the initial assessment date and the beginning of construction such that purpose of these sites or required level of impact may change (e.g. proposed car park may instead be utilised for crib huts). Given the level of uncertainty around final design impacts, a conservative approach has been taken which assumes the complete removal of all native trees where assessed. This will have the benefit of allowing flexibility of the design and construction methodology in these areas.

Additional counts of impacted trees will be conducted at the time of clearing which may result in a lower count of impacted trees where changes to the design or construction methodology reduce the need for vegetation clearing. If so, then offset obligations may be less than described within this document. See Section 2.4 for recommendations and examples where required clearing can be reduced.

Alternatively, any additional clearing outside of the areas identified within Figure 2-1 and Table 2-1 has the potential to increase offset obligations and therefore will require further assessment in the form of a count of impacted trees and habitat values such as hollow bearing trees.

2.2 Existing environment

Previous ecological investigations (Aurecon, 2020) identified and mapped vegetation communities present within the site. Communities to be cleared are classified as:

- Planted natives and weeds
- Forest Red Gum and Paperbark mixed planting
- Acacia scrub
- Radiata pine forest
- Eucalypt and casuarina grassy woodland
- Scattered individual trees.

Locations of these communities are shown in Figure 2-1 and a description of each community is provided in Section 2.2.1 to 2.2.5.

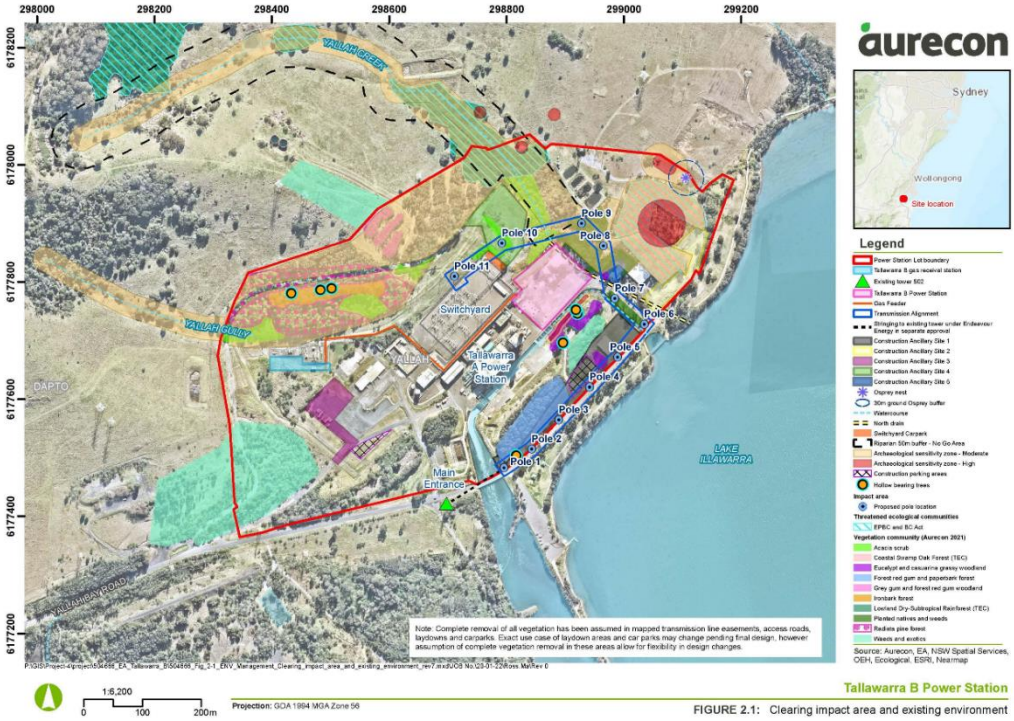

Figure 2-1 Clearing impact locations and environmental constraints

2.2.1 Planted natives and Weeds

This community is largely located adjacent to roadways and within the proposed transmission line easement. The community consists largely of an assortment of native vegetation that was most likely planted as part of Tallawarra Landscape Master Plan (URS, 2006) which has since been heavily invaded by an assortment of weed species, particularly within the understorey.

Whilst native species include some local endemic species such as Swamp Oak (*Casuarina glauca)* and Native Cherry (*Exocarpus cupressiformis*), many natives identified originate from outside the Illawarra region including Bottletree (*Brachychiton rupestris*) and Brush Box *(Lophostemon confertus)*. Lantana (*Lantana camara)* and Blackberry *(Rubus fruticosus*) are generally the most dominant weeds although other weed species such as Mickey Mouse Plant (*Ochna serrulate*) and invasive grasses such as Kikuyu (*Pennisetum clandestinum*) are also present. Examples of the community are shown in Figure 2-2 and Figure 2-3.

Figure 2-2 Typical vegetation (mixture of weeds and natives) between poles seven and eight.

Figure 2-3 Planted roadside trees between poles six and seven

2.2.2 Forest Red Gum and Paperbark mixed planting

This is a forest community with a canopy of about 5 – 10 metres high. It is dominated by Forest Red Gum (*Eucalyptus tereticornis*) and Prickly Leaved Paperbark (*Melaleuca styphelioides*), also with tea tree (*Leptospermum spp.*), Bottle Brush (*Callistemon salignus*), Swamp Mahogany (*Eucalyptus robusta*) and Coastal Grey Box (*Eucalyptus bosistoana*) (Figures 2-4 and 2-5).

This community does not correspond with a Plant Community Type (PCT) description as it is a mixed species planting (planted approximately 10 to 15 years ago) and is not a natural formation. However, it is similar to 'MU23 Coastal Grassy Red Gum Forest' (NPWS, 2002). The condition of the vegetation is moderate to high with minimal presence of weed species, although the high density of the tree plantings has resulted in tall thin-stemmed trees with little opportunity for a ground storey to be developed.

Figure 2-4 Typical representation of Forest Red Gum and Paperbark mixed planting at Construction Ancillary Site 1

Figure 2-5 Example of lack of groundcover within the Forest Red Gum Paperbark mixed planting.

2.2.3 Acacia scrub

This community is a scrubland formation with a canopy of about 3 – 5m high. It is a derived vegetation community resulting from colonisation by acacias and other colonising species following past clearing and disturbance of the original vegetation community (Figure 2-6 and Figure 2-7). Acacia species present include *Acacia mearnsii*, *A.longifolia, A.suaveolens.* The midstorey is generally dominated by large lantana shrubs (*Lantana camara)*. Other weed species identified in the understorey includes asparagus weed (*Asparagus spp.*), bitou bush (*Chrysanthemoides monilifera*), fireweed (*Senecio madagascariensis*), blackberry (*Rubus fruticosus*), balloon cotton bush (*Gomphocarpus physocarpus*), oxalis (*Oxalis spp.*), cassia (*Senna spp.*), olive (*Olea europena*) and passion vine (*Passiflora spp.*).

This community corresponds with the PCT 'MU56 Acacia scrub' (NPWS, 2002), and is noted to occur in combination with species common to rainforest and wet sclerophyll forest types.

Figure 2-6 Acacia scrub within Construction Ancillary Site 4

Figure 2-7 Acacia scrub within the switchyard car park area

2.2.4 Radiata pine forest

This is an open forest structure community dominated by exotic radiata pine (*Pinus radiata*) and with a canopy of about 10 – 15 metres high. In more open areas (less canopy cover), the midstorey is dominated by weed species including lantana (*Lantana camera*), cotoneaster (*Cotoneaster spp.*), small-leaved privet (*Ligustrum sinense*). Other weed species identified in the understorey include asparagus weed (*Asparagus spp.*), Bitou Bush (*Chrysanthemoides monilifera*), Fireweed (*Senecio madagascariensis*), blackberry (*Rubus fruticosus*), balloon cotton bush (*Gomphocarpus physocarpus*).

Although a mostly exotic community, occasional paperbarks (*Melaleuca stypheloides*) and acacias *(Acacia mearnsii*) are located within the mid storey, particularly directly adjacent to the road corridor of the existing access road.

2.2.5 Eucalypt and casuarina grassy woodland

This is an open woodland community with assorted eucalypt species including brown stringybark (*Eucalyptus capitellata*), spotted gum (*Corymbia maculata*), lemon scented gum (*Corymbia citriodora*), forest red gum (*Eucalyptus teriticornis*) and coast grey box (*Eucalyptus bosistoana*). There are several additional medium to large trees including willow bottlebrush (*Callistemon salignus*) and swamp oak (*Casuarina glauca*). The ground cover is dominated by couch grass (*Cynodon dactylon*) and other ground herbs including clovers (*Trifoloum spp.*), plantains (*Plantago spp.*), crabgrass (*Digitaria sanguinalis*), and flea bane (*Conyza spp.*).

2.2.6 Scattered individual trees

In some instances, individual trees that do not belong to any of the other identified communities are to be removed. This includes Red Bloodwood (*Corymbia maculata*), Forest Red Gum (*Eucalyptus tereticornis*) and Blackbutt (*E. pilularis*) and other non-surveyed trees that are conservatively assumed to be native species. It is uncertain if these trees are planted or natural regeneration, and they are generally surrounded by a non-native groundcover.

2.3 Native vegetation identified for removal

The survey of clearing areas identified an inventory of 805 native trees of various ages and sizes to be removed for the Project. A count of these trees at each project area is detailed in Table 2-1, with a detailed inventory of trees identified for removal provided in Appendix A.

Table 2-1 Vegetation inventory of clearing areas

Site location	Native vegetation to be removed
Construction ancillary site 1	502
Construction ancillary site 2	14
Construction ancillary site 3	20
Construction ancillary site 4	37
Construction ancillary site 5	32
Gas receival station	8
Switchyard carpark	16
Tallawarra B Power Station	16
Transmission line easement	160
Total	**805**

2.4 Opportunities for limiting clearing

In compliance with CoA 3.40, clearing of native vegetation is to be kept to the minimal extent necessary. Although the removal of up to 805 native trees is required, the selection of these sites was carefully chosen as the only remaining options due to environment, site access and geographic restraints within the Power Station boundary, with all other disturbed areas already being utilised for the purposes of the project.

However, the inventory of required cleared trees has taken a conservative approach and with it assumed that all native trees within identified laydown and transmission line easement sites will be removed. As such there may be opportunities at each location to retain vegetation and thus minimise required offsets whilst reducing safety and environmental risks. This includes:

Construction ancillary sites 1 - 5

Clearing for temporary works should only be undertaken where necessary. Detailed construction planning should be undertaken to ensure that all areas identified as construction laydown areas need to be cleared. In some cases, it may be feasible to reduce the area of construction ancillary sites, or to protect and retain stands of trees located within the extend of the mapped areas.

Transmission line easement

Clearing estimates have been based upon complete ground clearance of a 6-metre easement either side of the proposed transmission line. Depending on transmission line detailed design, reduced easement widths may be considered in consultation with Endeavour Energy. Some native vegetation may be able to be retained by pruning rather than clearing (in accordance with the relevant National powerline vegetation management requirements).

Where new poles are located within stands of vegetation, a conservative assessment of clearing to support access and pole installation of 100 square metres per pole has been made. Detailed construction planning should seek to minimise the clearing of vegetation for access and construction of new poles.

2.5 Rehabilitation and revegetation

As required within CoA 3.41(a) the regeneration of locally native vegetation and effective weed management is required in addition to the 2:1 compensatory planting ratio. This will be integral in areas where impacts to native vegetation have been identified (as detailed within Table 2-1) as this disturbance will result in the loss of native species, whilst providing the opportunity for further weed establishment. Therefore, effective rehabilitation is required following any disturbance.

The below requirements summarise how disturbed sites are to be rehabilitated such that biodiversity values of the area are maintained and enhanced. Additional details are provided within the associated Flora and Fauna Management Plan for the Project.

2.5.1 Landscaping plan

A separate Project landscaping plan has been prepared in consultation with Wollongong City Council. The landscaping plan seeks to manage the visual impacts of the Project and to optimise the landscaping and revegetation undertaken for the Project. This landscaping plan is not held to the same monitoring, maintenance, and performance requirements as this offset plan (as detailed in CoA 3.41). Therefore, activities conducted as part of the landscaping plan is not considered to contribute to the compensatory targets of this offset plan. The landscaping plan is found in Appendix E of the Flora and Fauna Management Sub Plan.

However, the landscaping plan presents an opportunity to encourage the long-term establishment and regeneration of native vegetation as required within CoA 3.41(a) whilst meeting visual amenity requirements. This is to be achieved using locally endemic species as identified within Appendix B.

2.5.2 Construction rehabilitation and weed management

Throughout all construction and early works activities, the following is to occur to enable weed species to be effectively controlled, and disturbed areas are able to be effectively rehabilitated:

- Washdown of vehicles, boots, and equipment prior to entering site and when moving between vegetated locations.
- Effective stockpile management and use of any weed free imported material to prevent weed invasion
- Reestablishment of disturbed areas with native and locally endemic groundcover species (as detailed within Section 3.11) as soon as practicable
- Active rehabilitation and removal of weed species within the construction site, riparian zones and amongst adjacent retained native vegetation within the Power Station Site Boundary.
- Separation of weed species from native species (weeds not to be used as mulch)
- No stockpiling of weed contaminated material
- Disposal of weed material at an appropriate waste facility
- Management of weed species, particularly the extensive infestation of WoNs such as Blackberry (*Rubus fruticosus*) and Lantana (*Lantana camara*) which are present within the riparian zone and underneath the proposed transmission line easement from pole 4 to 6 (Figure 2-1).

Following the completion of construction and the reestablishment of temporary laydown areas, weeds are to be continued to be suppressed as part of general maintenance of the Power Station Site. A current annual program of herbicide spraying of both priority weeds (such as *Lantana camara*) and other general weeds exists for Tallawarra Power Station and the surrounding Tallawarra Lands, with spraying in each area occurring throughout the year. It is recommended that this program continues, with additional effort placed upon the rehabilitated/landscaped areas to allow native vegetation to establish and thrive.

3 Compensatory planting plan

3.1 Landscaping plan

A separate Project landscaping plan has been prepared in consultation with Wollongong City Council. The landscaping plan seeks to manage the visual impacts of the Project and to optimise the landscaping and revegetation undertaken for the Project. This landscaping plan is not held to the same monitoring, maintenance, and performance requirements as this offset plan (as detailed in CoA 3.41). Therefore, activities conducted as part of the landscaping plan are not considered to contribute to the targets of this offset plan.

The landscaping plan is provided in the Flora and Fauna Management Sub Plan in Appendix E.

3.2 Location options

Four options were considered for the potential offset planting site: Yallah Creek south, Yallah Creek north, the Bowling Club Mound and Duck Creek. These sites were considered as they were on land owned by EnergyAustralia, were not likely to impact on current or future EnergyAustralia activities and were adjacent to known ecological communities or in areas where replanting would provide visual amenity. These options are discussed in detail below.

3.2.1 Option 1 – Yallah Creek south (preferred option)

The current preferred offset planting site is identified north of Tallawarra Power Station along the Yallah Creek drainage line (Figure 3-6). The area is very wet, with saturated soils, in a landscape of rainforest vegetation bordering the Yallah Creek drainage line. There has been historical grazing adjacent to Yallah Creek drainage line, resulting in an open grassy area and a transmission line cutting across the site. (Figure 3-1).

A minimum of 1.2 hectares would be required to accommodate the number of trees (~1770) to be planted. Utilisation of this area would require an access route maintained to the ponds. Buffer zones should be maintained around batters of the ponds and Aboriginal Cultural Heritage sites.

Figure 3-1. Yallah Creek south (preferred option) offset area.

This site is the preferred option and is referred to as 'the offset site' for the remainder of this offset plan. This site is the preferred option due to the following benefits:

- Offset site in this location would contribute to the development of a Yallah Creek riparian zone in line with CoA 3.42. Whilst this condition requires the establishment of a riparian zone specifically *within the power station site boundary*, riparian vegetation already extends right up to hardstand areas and there is limited opportunity for additional native vegetation planting within the site boundary (Figure 3-6). As such utilising area within the Tallawarra Lands area will allow for further contribution to the development of the Yallah Creek riparian zone, whilst meeting offset obligations and improving biodiversity values within the area.
- The location would not impact upon current and future planned EnergyAustralia activities
- Abundant space is present for the required replanting.
- Planting of appropriate species would provide connectivity between fragmented patches of the threatened ecological community *Illawarra Subtropical Rainforest in the Sydney Basin Bioregion* located along the Yallah Creek drainage line (Figure 3-2 and Figure 3-3). This would improve biodiversity values in the area by enhancing connectivity of existing patches, improving pathways, roosting and sheltering for terrestrial and arboreal fauna.

Whilst some weeds are present such as Spiny-Leaved Sow Thistle (*Sonchus asper*), the site does not contain the infestation of thick woody vegetation such as Lantana (*Lantana carmara*) and Blackberry (*Rubus fruiticosus*) that is present throughout the rest of the Tallawarra site. Therefore, required weeding at site preparation and establishment stage would be minimised (though post planting weed control is required).

Figure 3-2 Rainforest TEC located along Yallah Creek drainage line, north of the offset site.

Figure 3-3 Rainforest TEC along Yallah Creek drainage line, north of the offset site.

3.2.2 Option 2 - Yallah Creek north

Yallak Creek north is another potential offset planting site along the Yallah Creek drainage line (Figure 3-6). This area is currently used as a pasture site with active cattle grazing in the area. It consists of a mostly grassland groundcover along two drainage lines (Yallah Creek and a small drainage line tributary), with some pasture weeds such as Balloon Cotton Bush (*Gomphocarpus physocarpus*). One large, damaged Coral Tree (*Erythrina sp.*) is present at the edge of the vegetated *Illawarra Subtropical Rainforest* riparian zone, and is an identified weed[2]. If this site is selected, it is recommended that the tree, fallen logs and all branch materials are removed to prevent further establishment of the weed, which may cause competition with offset plantings if this site is selected.

During the field inspection a concrete dyke cutting across both drainage lines creating two bio-retention ponds (Figure 3-4) was identified. Common Eastern Froglet (*Crinia signifera*) was aurally observed during field inspection indicating that these ponds are suitable as frog habitat. It is recommended planting does not occur too close to this concrete dyke so tree roots do not damage its structural integrity in the future.

[2] See https://weeds.dpi.nsw.gov.au/Weeds/CockspurCoralTree#biosecurity

This area is located upon the 'Shellharbour' soil landscape. This landscape is characterised by rolling low hills with a volcanic sandstone geology. Previous soil surveys in the area[3] have characterised top soil in the area as heavy clay to sandy loam with a pH between 6.5 to 7.5. Field inspection of the area was conducted following 8mm of rain in the previous 24 hours which resulted in the ground within the drainage lines to become waterlogged, however the upper slopes away from the drainage lines remained relatively dry. Minimal erosion is present, except in areas where cattle have significantly disturbed the soil.

Non-native species observed during field survey include a single fox (*Vulpes vulpes*) and multiple cattle (*Bos taurus*). Whilst the fox will not affect revegetation, cattle have the potential to significantly impact planted seedlings through trampling or grazing. As such cattle access must be excluded from the establishment area with effective fencing for the first five years of establishment.

Figure 3-4 Bio-retention pond within drainage line

3.2.3 Option 3 – Bowling club mound

Discussions with EnergyAustralia identified that a small mound adjacent to the Bowling Club site (Figure 3-5) has the requirement within the Statement of Commitments to be raised and revegetated to meet visual amenity standards. Survey of this mound identified abundant weed species such as Lantana, Blackberry, Castor Oil Plant, Prickly Pear and Rhodes Grass. This would require substantial weed clearing into the long term. Additionally, there is known asbestos contamination issues within the soil in this mound which presents a significant environmental/safety hazard if disturbed.

As such, although this area requires revegetation for screening purposes, it is not suitable as a specific compensatory plantings offset site, due to the risks associated with weed competition, coupled with the hazardous materials present. However, if revegetated for screening purposes, eucalypt species such as Forest Red Gum and Coastal Grey Box, Spotted Gum or Coastal Grey Box could be considered as they can provide adequate screening, and are known to be present nearby and therefore may be more suited to site conditions. Although planting of vegetation in this location to meet screening objectives would require detailed consideration of its suitability based on the hazardous materials present, potential exposures in establishment, as well as consideration potential impacts of tree roots on capping materials.

[3] As provided through https://www.environment.nsw.gov.au/eSpade2Webapp

Figure 3-5 Former Bowling Club mound site

3.2.4 Option 4 – Duck Creek

A secondary potential offset site of Duck Creek, located south west of Tallawarra Power Station, has also been proposed by Energy Australia. However as the Yallah Creek offset set can fully meet the obligations of CoA 3.42, there is no need to establish a secondary offset site at Duck Creek. As such, the Duck Creek offset site should only be considered if other external factors prevent the use of Yallah Creek and only once appropriate site investigations have been undertaken.

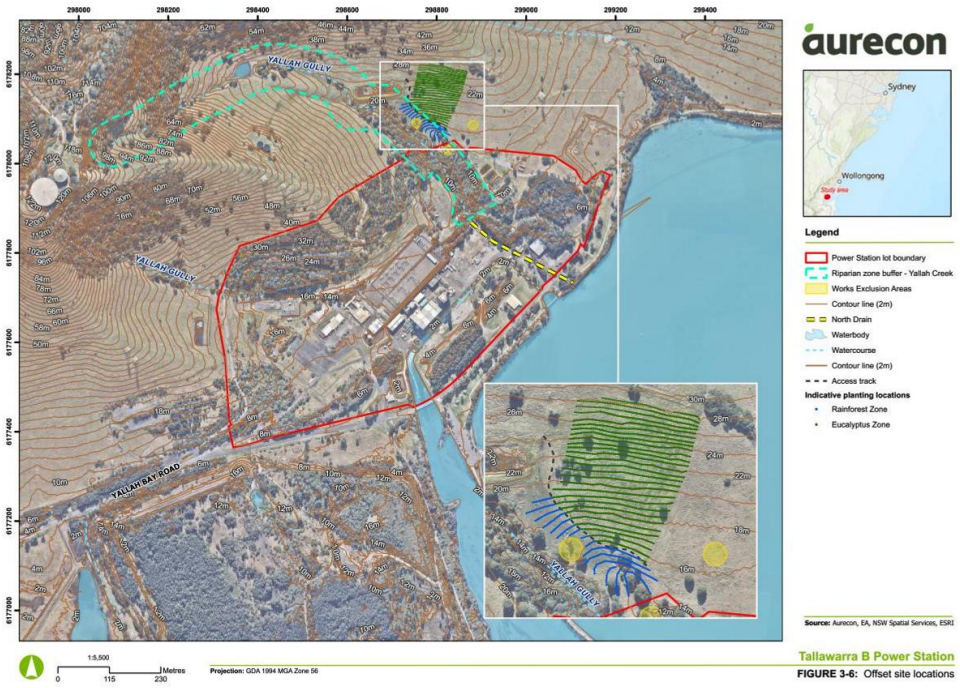

Figure 3-6 Proposed Yallah Creek Offset Site location and layout

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3.3 Aboriginal Cultural Heritage

Aboriginal objects due diligence assessment for the Tallawarra Power Station site has identified the Yallah Creek riparian zone as having a moderate archaeological sensitivity (Niche 2021). Therefore, as planting works will require new ground disturbance further assessment in the form of an Aboriginal Cultural Heritage Assessment will be required in accordance with the *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW* (OEH 2011). Additionally, Aboriginal community consultation will be required in accordance with *Aboriginal Cultural Heritage Consultation Requirements for Proponent 2010* (DECCW 2010).

Furthermore, all activities associated with this Offset Plan are to occur in accordance the Aboriginal Cultural Heritage Management Sub-Plan for the project .

It is noted that all areas of low archaeological sensitivity identified within Niche (2021) are highly disturbed or modified areas that would not be suitable as an offset site location. As such all suitable locations for the offset site that have been assessed as part of the Aboriginal Cultural Heritage due diligence have a moderate or high archaeological sensitivity. Alternative offsets sites not assessed as part of Niche (2021), such as Duck Creek, will also require due diligence assessment and possibly impact assessment.

3.4 Offsetting schedule

Activities associated with this offset plan will be conducted in accordance with the following schedule:

- Inventory of cleared native trees - initial inventory completed as of July 2021, to be updated once all vegetation clearance has been completed.
- Aboriginal Cultural Heritage assessment – 12 months prior to planting
- Sourcing of plants (including seed collection and propagation if required) – 12 to 18 months prior to planting
- Site preparation works – 3 weeks prior to planting
- Planting – to be conducted during appropriate seasonal and weather conditions
- Maintenance and monitoring – to be conducted in perpetuity following planting

Further details of offsetting activities are provided below in Sections 3.5 to 3.15. Additionally, the planting and maintenance schedule is summarised in Table 4-1. Specific monitoring requirements and maintenance requirements are discussed in Section 4.

3.5 Site plantings

The CoA requires a 2:1 compensatory offset planting for each tree removed. To verify the site planting requirements calculated in this Offset Plan, records must be kept by all contractors that undertake any form of vegetation clearing for the project. All vegetation clearing records must be provided to the HSSE Lead. Vegetation clearing records must include

- Area (square metres) of vegetation removed
- A map of the clearing area
- Date that the clearing was undertaken
- A count and type of any habitat features removed, including hollow bearing trees or stags
- A count of the native vegetation removed. Native vegetation is considered to be trees/shrubs and saplings of woody vegetation indigenous to Australia in accordance with growth forms as defined by the Biodiversity Assessment Methodology.

Subject to validation of the actual vegetation clearing undertaken for the Project, this Offset plan has identified a requirement to offset an estimated 805 trees to be removed. This relates to a minimum of 1,610 trees that require planting as a compensatory offset. Recognising the high costs of conducting additional replanting in subsequent years to replace trees that have not survived the initial planting, it is recommended that an additional 10% of trees are planted to account for potential mortality. As such the it is recommended that 1,771 trees be planted within the offset site. These quantities must be revised following the completion of clearing for the Project to ensure that the offset planting amounts are correct.

Tree selection is guided by those species that occur in surrounding vegetation communities as well as species which can be successfully grown in the area as detailed in local tree planting guides (E.g. **https://finder.growingillawarranatives.org/plants/finder** and **http://www.irbd.com.au/**). Using local species increases the chances that trees planted are better suited to the existing conditions, and more likely to successfully establish, avoiding costly follow up in-fill planting in subsequent years.

A broad mix of trees and shrubs are nominated to increase the value of the regrowth vegetation and over time allow for site seeding and secondary regeneration of a desirable species mix. Using a mixture of species will also create structural diversity in growth forms and potentially mitigate the risk of loss of one species from unpredicted changes (which may result in a total stand loss if a monoculture was planted).

To meet these revegetation objectives, the following planting zones are identified:

- Riparian Rainforest planting zone
  - Situated directly along the western side of the planting area and adjacent to the bank of Yallah Creek, to develop a riparian zone
  - Establishing a mixture of rainforest tree and shrub species consistent with the Plant Community Type (PCT) 1300: *Whalebone Tree - Native Quince dry subtropical rainforest on dry fertile slopes, southern Sydney Basin Bioregion*.
  - Planted to enhance biodiversity outcomes by planting seedlings in a location which will provide a vegetated link upstream and downstream of the offset site, to the existing fragmented patches of the threatened ecological community *Illawarra Subtropical Rainforest in the Sydney Basin Bioregion.*
  - Planting locally endemic species such as Whalebone Tree (*Streblus brunonianus*), Coffee Bush (*Breynia oblonifolia*) and Native Quince (*Alectryon subcinereus*) which are known to occur in the surrounding environment. This would have the benefit of allowing for the collection of native seeds in the surrounding area.
  - This community naturally has minimal groundcover due to the shading caused by the extensive middle and upper stratums of the community. As such the few species that do occur as groundcover consists largely of shade preferring ferns such as Necklace fern (*Asplenium flabellifolium*) and Sickle Fern (*Pellaea falcata*). These species are unlikely to become established until the community has reached a canopy cover close to benchmark conditions (Table 5-1) and exotic groundcovers have been outcompeted by overshading. Therefore, planting of these species is only recommended once community has reached benchmark conditions and where self-seeding of native groundcovers dispersed from adjacent rainforest areas has not occurred.
  - This community contains a high diversity of vine/scrambler species, however it is not recommended for these to be planted during initial plantings, as there will be insufficient mature vegetation to provide suitable climbing support. In some cases, the planting of these species may even smother tree plantings whilst they are small. Additionally, many of these species are common and are able to self-seed successfully without human intervention, such as the Silkpod Vine (*Parsonia straminea*) which spreads via airborne seeds. Therefore, it is likely that these species will colonise the offset area, once the zone approaches benchmark conditions.
- Eucalyptus planting zone
  - Situated on the outer bank of the riparian zone
  - Establishing a mixture of mostly Eucalypt species that also occur in surrounding PCTs such as *PCT 838: Forest Red Gum - Thin-leaved Stringybark grassy woodland on coastal lowlands, southern*

Sydney Basin Bioregion and *PCT 1326: Woollybutt - White Stringybark - Forest Red Gum grassy woodland on coastal lowlands, southern Sydney Basin Bioregion and South East Corner Bioregion*

- Will enhance habitat values (such as winter flowering gums, potential for developing hollows in the future, shelter and rough/loose bark habitat) associated with the removal of over 300 eucalypt plants adjacent to the existing powerstation, at a more natural location.
- Planting species such as Forest Red Gum (*Eucalyptus tereticornis*), Spotted Gum (*Corymbia maculata*), Woolybutt (*Eucalyptus longifolia*), Thin-leaved Stringybark (*Eucalyptus eugenoides*) and White Feather Honey-myrtle (*Melaleuca decora*) which are known to occur in surrounding environment and grow well with each other. This would have the benefit of allowing for the collection of native seeds in the surrounding area.
- Grassy groundcover species have consistent with this community has been recommended for rehabilitation purposes within Section 3.11. The introduction of native groundcover seeds, and the continued weed maintenance of the offset site will assist in developing a native understorey as canopy cover increases.

Recommended species suitable for planting within the Offset Site and for meeting the above revegetation objectives are provided in Appendix B. A combination of some or all these species can be used depending on plant sourcing ability. However, a greater diversity of the plantings will promote better biodiversity outcomes and lower risk of unsuccessful plantings if unexpected factors cause certain species to become unviable.

Furthermore, it is recommended particular emphasis is placed upon planting of key diagnostic species for each target PCT to achieve revegetation objectives. Therefore, the Eucalypt Zone should contain a sizeable proportion of Forest Red Gum (*Eucalyptus tereticornis*) and the Rainforest Zone should contain a sizeable proportion of Whalebone Tree (*Streblus brunonianus*).

Additional species not listed in Appendix B may be utilised if gathered from a local seed source within target PCTs (i.e. PCT 838, 1300 and 1326) provided that they are neither invasive species or high growth native species such as Sweet Pittosporum (*Pittosporum undulatum*) which have the potential to outcompete desired species.

3.6 Replacement of habitat values

The presence of habitat values has been considered during the species planting selection process as detailed in Table 3-1. Through planting of these species, it is likely that lost habitat will be largely replaced, or if not improved over existing lost vegetation.

Where possible, large woody debris created as a result of native tree removal should be retained and placed within the offset area to provide habitat for small fauna species such as snakes and lizards.

One small hollow (<40mm) was identified within a *Eucalyptus sp.* tree along the proposed powerline easement (pole 1 to 2) and therefore needs to be replaced with a nest box in accordance with CoA 3.41 (c). As this may be suitable roosting for microbat species such as the Little Bent-winged Bat (*Miniopterus australis*) which are known to occur in the local, a minimum of one nest box (to meet a one to one ratio of replacement) is to be installed in line with microbat nest box designs such as detailed in Franks and Franks (2006). Additional nest boxes can be installed if desired and economical.

Location of the nest box is best suited for installation amongst the retained eucalypt planted area north of the Bowling Club Site. Continued monitoring and maintenance of the nest box is to be undertaken to allow a nest box is repaired where required, not invaded by pest species, and determine whether it has been successfully utilised by native species. Monitoring and maintenance requirements for nest boxes are detailed in Table 3-2.

Table 3-1 Nest box monitoring and maintenance requirements

Habitat value	Purpose	Frequency	Responsibility
Nest box monitoring	To enable the success and viability of nest boxes. Nest box monitoring is to include the below details to assist in the identification of required corrective actions: – Name of observer – Date of observation – Assessment of nest box condition (E.g. structural integrity, evidence of rot/termite activity) – Evidence of fauna activity, including pest species such as European Honey Bees (*Apis mellifera*) and Common Myna (*Acridotheres tristis*)	Monitoring of nest boxes is to occur at least at least every six months during construction phase of the project. Upon completion of construction, monitoring can be reduced to once yearly for two years. Upon the second yearly inspection the need for additional inspection can be reviewed.	Energy Australia HSSE

3.7 Signage

Signs should be erected stating that the areas are a compensatory planting zone, it is a livestock exclusion zone and that no access is permitted by unauthorised persons.

No parking for vehicles is to occur in the compensatory planting areas except where used for planting maintenance works (e.g. for weeding)

3.8 Site preparation

Poor weed control is a major cause of failure in many revegetation campaigns (Rutherford et al., 2000). As such effective site preparation is essential to the success of the offset plan.

At least one month prior to planting and when weeds are actively growing, the offset site should be sprayed with a broad spectrum non residual glyphosate-based herbicide which has been manufactured for low aquatic toxicity to aquatic ecosystems (bioactive formulation). This is to only be conducted by a suitably qualified person under the NSW Pesticides Act (1999) and Workplace Health and Safety Act (2011). ChemCert AQF 3 Accreditation is classified as a suitable qualification. Any herbicide use is to be approved by Energy Australia prior to use.

Additionally, given the close proximity to the riparian corridor and the presence of the *Illawarra Subtropical Rainforest* TEC downstream of site, herbicide application must be conducted in accordance with *NSW Weed Control Handbook – A guide to weed control in non-crop, aquatic and bushland situations* (DPI, 2018). This includes measures such as:

- Spraying during appropriate weather conditions (low wind, temperature less than 28ºC)
- Use of appropriate spray equipment and nozzles that minimise down drift
- Maintaining a down-wind buffer zone
- Operating sprayers at appropriate height, angle, and pressure to minimise drift

Herbicide treatment is effective only on actively growing plants; therefore, spraying must occur approximately 7 days after rains of over 20 mm or when new growth of at least 50 mm is obvious.

The use of the long-stem planting method (as discussed in Section 3.12.4) will minimise the need for extensive ground ripping and weed management. As such herbicide use is to be restricted to spot spraying in one metre wide strips along the proposed planting contour lines to minimise weed presence that would directly interfere with plantings.

Once the weeds have been sprayed, ripping or digging of the soil must not commence for at least 21 days to enable the herbicide to penetrate the entire plant and reduce its viability.

Historical soil reports for the site[4] determined the topsoil pH to be 6.5 to 7.5 which is suitable for most plantings. Therefore, no additional soil ameliorates will need to be added.

3.9 Fencing

Given the presence of cattle within the offset site, livestock exclusion fencing is required to be placed around the compensatory planting areas and realigned and moved further east and north, to protect the site from both native and introduced herbivores and enable the planting area to be established and exclude cattle. Design of fencing is to consider potential livestock routes to allow for sufficient passage around the offset site and adjacent threatened ecological communities, so that surrounding land uses can be maintained.

Fencing material can be made from either conventional material (E.g. barbed wire) or electric fencing in accordance with availability, cost and desired maintenance schedule, provided that it is made secure enough to prevent livestock access to all planted seedlings. Choice of fencing material and design is to be decided upon by rehabilitation contractor and EnergyAustralia.

Fencing is to be installed prior to or during the site preparation phase. Exclusion fencing should be inspected during each monitoring period to check that no damage has occurred (see Table 4-1 for monitoring period schedule).

3.10 Erosion and sediment control

Assessment of the offset site identified that soils are stable with no active erosion. The proposed long-stem planting method (as detailed in Section 3.12.4) does not require extensive ripping or disturbance of soil except at each individual planting point. Furthermore, the retention of groundcover in between each planting row will allow for sediment capture, as such sediment and erosion issues are expected to be minimal. Therefore, the implementation of erosion and sediment control features is not required and may lead to additional unnecessary disturbance if installed, provided that significantly soil disturbance does not occur.

However, if significance ground disturbance from vehicle tracks/augur holes or drainage line crossings significantly disturb the soil, then sediment controls are to be implemented as per the 'Blue Book' (Managing Urban Stormwater: Soils and construction - Volume 1 (4th edition)) (NSW Government 2004). This will require the construction of sediment fencing on the lower contour slope below where plantings occur to prevent erosion of dug material into the adjacent waterway.

Sediment fencing is to be removed once disturbed ground has been stabilised by groundcover vegetation as confirmed during follow up monitoring event.

3.11 Groundcover seeding

Where required for stabilisation native groundcover seeds should be sowed into the soil to minimise loss of sediment and prevent out-competition of the native groundcover by invasive weeds. Groundcover species should be locally endemic and be consistent with the objectives of each planting zone (i.e. be consistent with target PCTs listed in Section 3.3. Species that would achieve these goals are:

- Common sedge (*Carex longebrachiata*) – **Eucalyptus Zone**
- Kangaroo grass (*Themeda australis*) – **Eucalyptus Zone**
- Commelina (*Commelina cyanea*) – **Eucalyptus Zone**
- Weeping Grass (*Microleana stipoides*) – **Eucalyptus Zone**
- Kidney Weed (*Dichondra repens*) – **Eucalyptus Zone**

[4] As per NSW Department Primary Industries and Environment eSpade data https://www.environment.nsw.gov.au/eSpade2Webapp

- Tussock grass (*Poa labillardieri*) – **Eucalyptus Zone**
- Bushy Hedgehog-grass (*Echinopogon caespitosus*) – **Eucalyptus Zone**
- Native Geranium (*Geranium homeanum*) – **Eucalyptus Zone**
- Basket Grass (*Oplosmenus hirtellus*) – **Eucalyptus and Rainforest Zone**

Additionally, Blue Flax-lilly (*Dianella longifolia*) seedlings can be included for planting within the Eucalyptus Zone for sediment and erosion control, whilst contributing to groundcover diversity.

A seed purity, providence and viability certification must be supplied by the revegetation contractor to Energy Australia and verified prior to seeding commencing. This certification must be included in the first site monitoring report.

This groundcover mix should also be also be considered for use in groundcover stabilisation and rehabilitation associated with Tallawarra B construction and all early works activities.

3.12 Planting

3.12.1 Plant sourcing

Where possible, plants should be sourced from locally genetic material rather than sourced from outside of the Illawarra region. Local suppliers such as Wollongong Botanic Garden GreenPlan Nursery or Jamberoo Native Nursery may be able to source such plants or alternatively seed can be collected from plants in the surrounding area (for example Mt Brown or within Tallawarra Lands area) and propagated. Native seed collection to only be conducted where a permit to pick or harm a threatened species or ecological community[5] has been obtained, as required under Part 2 of the *Biodiversity Conservation Act 2016*.

Plant sourcing is to occur at earliest convenience as sourcing and propagating could take upwards of 18 months depending on propagation/planting methods and stock availability.

3.12.2 Planting timing

Planting is to occur only after site preparation has been completed and there is suitable soil moisture (i.e. 50mm in the last two weeks). Additionally, planting is to occur preferably in autumn where there is less likelihood of extreme temperatures occurring or alternately in late winter -early spring (if soil moisture conditions are suitable and favourable conditions are forecast (ie not during drought or drier conditions). Given the climate data for the region, the optimal months for planting in order of most preferable include March, April, May, or August and early September (if suitable soil moisture is present).

3.12.3 Planting layout

A proposed approximate planting layout is shown in Figure 3-6. This planting layout has considered planting in rows at a spacing of 3m between trees and 3m between rows. Rows have been chosen to follow along the 2m contour line of the site (ie across the slope not downslope), as is best practice in revegetation projects.

The current planting layout is designed for approximately 1,300 planting points for trees, which leaves approximately 471 plantings remaining. It is recommended that these extra ~471 plantings consist of shrub planted randomly in between the 3-metre tree spacings to help develop the understorey shrub layer whilst outcompeting pasture weeds/grasses. Additionally, some species (such as *Acacias*) provide additional nutrients that will assist in the growth of surrounding species such as through nitrogen fixing. Suitable shrub species for this purpose include:

- Rainforest zone
  - Coffee Bush (*Breynia oblonifolia*)

[5] For further details see: https://www.environment.nsw.gov.au/licences-and-permits/wildlife-licences/licences-to-controlor-harm/licences-to-harm-threatened-species

- Maidens Wattle (*Acacia Maidenii*)
- Black Wattle (*Acacia mearnsii*)
- Native Cascarilla (*Croton verreauxii*)

- Eucalypt Zone
  - Two-veined Hickory (*Acacia binervata*)
  - Sickle Wattle (*Acacia falcata*)
  - Blackwood (*Acacia melanoxylon*)
  - White Feather Honey-myrtle (*Melaleuca decora*).

3.12.4 Planting method – long-stem planting

Long stick planting has shown success in achieving successful plant establishment, particularly along riparian zones where long stems are closer to permanent water (Rutherford et al., 2000; APS, 2010). Benefits of this method include:

- Seedlings are older and stronger at time of planting due to longer nursery period
- Deeply rooted soil ball is better insulated against changes in soil moisture and temperature. Therefore, mulch is not usually necessary.
- Seedlings are more stable once planted due to greater area of root binding. Protects against wind and soil/flood erosion
- No further watering or fertiliser is required once planted
- More difficult to pull out of ground, which may assist in the event livestock of other factors access the areas and attempt to pull out the seedlings.
- Extensive ripping of the soil and weeds is not normally required
- Protects against competition from invasive weeds

The key downside to this approach is that plants need to be grown in pots within a nursery environment for a period of 10 to 18 months. However, given the limited ongoing maintenance requirements, and the benefits which result in a greater survival rate, long-stem planting is considered to be the most appropriate planting method for the offset site.

This method does not require extensive ripping or tilling of the ground, and instead only requires auguring at individual planting sites. As the site has heavy clay soil, the use of a power tools such as a soil augur may result in the walls of the planting hole to be too smooth and thus restricting root penetration (APS, 2010). If this issue arises, then hole walls will need to be roughened slightly before planting of the tube stock.

Generally, for this method the deeper the planting hole is the better. As such depth of each hole is to be approximately 0.6 to 1 metre (dependent upon the height of each species at the time of planting). However, holes are to be shallower in the event the water table is reached, so as to not drown the plant.

For some species, the use of long-stem planting may not be practical from a supplier perspective or may not be effective (Long-stem planting is generally more effective with species that can propagate from cuttings). In these cases, the use of tube stock may be required. This is to be avoided where possible as the use of two separate planting methods will result in different maintenance regimes. As such this method is to be reserved to small shrubs which have a greater likelihood of establishment.

3.12.5 Tree guard installation

Although the benefits Long-stem generally reduce the need for tree guards, they will still provide protection against exotic herbivores such as cattle (*Bos taurus*) if they breach the exclusion fencing, and rabbits (*Oryctolagus cuniculus*) which are known to occur in the area. Furthermore, guards will provide additional

protection from wind, moisture stress and accidental damage during slashing. As such, given the increase of survival rates at a relatively low cost they are mandatory for this offset site.

It is recommended that corflute guards be used as they are a low cost but highly effect waterproof and UV stabilised guard that will unlikely need replacing during the establishment period. The use of two stakes per plantings will provide additionally stability to the guards and lower the likelihood of guards being dislodged (e.g. during high wind events).

3.12.6 Mulching

Mulch is not considered necessary for the offset site, especially if using tree guards and the Long-stem planting method which provides similar benefits of mulch through its deep planting of the root system. Additionally, issues of mould and rot may arise if mulch has consistent contact with woody stem of deep planted trees.

3.13 Fertilisation

Plant along with native tree fertiliser tablet for each tree/shrub planted to increase success rate of planting. As the long-stem planting method will be used, additional fertilisation is unlikely to be required unless further monitoring identifies areas poor growth.

3.14 Watering

At the time of planting each tree/shrub planted using the long-stem planting method will require at least two litres of water (more will be required if the subsoil is dry as per APS, 2020). Use of the long-stem planting method will negate the need for further watering except for during the extreme drought or extended heatwave conditions.

Any tube stock planted will need at least ten litres per tube stock in two five litre applications. Watering will need to occur once a week for a minimum of four weeks unless sufficient rain (over 50mm) has fallen within the preceding week.

3.15 Monitoring points

The use of traditional photo points in combination with aerial imagery monitoring of the offset area will be used to provide key snapshots of planting success. A six monthly to yearly interval (as specified in Table 4-1) would allow for the identification of canopy/understorey growth over time and tracking overall project success.

At least six on ground photo points are to be utilised (three within each zone) with photos taken from both outside and within the offset area. The locations of these photo points are to be determined at the time of planting and marked via GPS coordinates and a stake. Photos at these points are to be taken from the same location and orientation at each monitoring event to provide consistency and easy visualisation of change over time.

The use of aerial imagery in conjunction with on ground photo points will also assist in the mapping of long-term landscape change (i.e. if growth in vegetated areas is occurring) in an efficient manner. Preferably aerial/satellite imagery should be obtained from the one source to minimise variance associated with differences in photogrammetry technologies.

Additionally, general site walkovers should occur during monitoring periods with GPS tagged photographs of key features (i.e. areas of failure or areas of substantial growth) that would not otherwise be captured from stationary photo points.

4 Monitoring and maintenance

4.1 Weed and grass control

Spot spaying for weed and competing grass species will occur bi-annually for the first two years following compensatory plantings, then then every year.

A weed ground cover percentage of under 8% within proposed 1 metre planting rows should be considered an acceptable threshold. This allows for germination weed seed stock which may be present in the existing topsoil and seed imported through natural processes.

Given the exclusion fencing will prevent cattle from grazing grasses within the offset site, native and non-native groundcovers/ grasses between plantings may grow and raise fuel levels creating a fire hazard. As such regular inter-row mechanical slashing of natives and spot spraying of weeds should be conducted to keep fuel levels down until the tree canopy grows to provide sufficient shading that understorey grasses growth is limited. Any spraying or slashing activities will need to avoid damaging plantings.

4.2 Replacement planting

If plant losses of greater than 20% occur within the first 12 month period following plantings, then replanting will occur to achieve the required offset planting quota.

4.3 Monitoring works

Bi-annual monitoring will occur for the first two years following initial planting works. Annual monitoring will occur for the following third, fourth and fifth year following.

Monitoring will include but no be limited to:

- Number of plant stock survival/failure
- Health of plantings
- Percentage foliage cover
- Evidence and degree of native species recruitment
- Degree of predation by herbivores
- Quality of topsoil and moisture levels
- List of weed and grass species present
- Species list of non-planted native recruitment
- Density of weeds to natives
- Photographs taken at predefined photo point locations, and general GPS tagged photographs of key findings during site walkover
- Presence/absence of erosion
- Damage to fencing or evidence of failure to contain livestock permanently.
- Remove any tree guards (if used) once trees/shrubs are twice the height of the guard
- Maintenance and monitoring of any installed habitat sites such as nest boxes
- Review and storage of most recent aerial/satellite imagery of the site

An example monitoring checklist template has been provided in Appendix C to enable the above works are completed.

A short report outlining the findings of these monitoring events should be prepared and used to identify any corrective actions that are required.

4.4 Summary of establishment, monitoring and maintenance measures

A summary of establishment, monitoring and maintenance measures required for the successful establishment of the offset site is provided in Table 4-1. Frequency of monitoring and maintenance events have been considered in accordance with expected maintenance requirements of the long-stem planting method. However, frequency of monitoring and maintenance events can be increased if proposed schedule is found to not be achieving desired performance measures.

Table 4-1 Summary of establishment, monitoring and maintenance measures

Timing	Action
Up to 18 months prior to site preparation	**Plant sourcing:** ■ Engage native plant supplier to begin propagation of native seedlings.
Week one – Site preparation	**Signage:** ■ Erect 'restricted access' signage at offsetting site
	Fencing: ■ Erect livestock exclusion fencing around each planting area
	Weed and grass control: ■ Slash and spot spray for weeds and grasses in a strip along proposed planting contour line (Note: spraying must occur approximately 7 days after rains of over 20 mm or when new growth of at least 50 mm is obvious)
	Monitoring: ■ Review and store most recent aerial/satellite imagery of the site. ■ Damage to fencing or evidence of failure to contain livestock ■ Quality of topsoil and moisture levels
Week four – Planting (Not within 21 days following weed control)	**Erosion and sediment:** ■ Erect sediment fencing on the downward side slope at each planting area if significance soil disturbance occurs during planting
	Monitoring: ■ Monitoring works requirements as detail in Section 4.3
	Long-stem planting: ■ Conduct planting at offset site location
	Fertiliser: ■ Apply a slow release native fertiliser tablet for each tree/shrub planted
	Watering (if conditions require): ■ Water at least 2L per long stem planted tree/shrub ■ Water at least 10L per tube stock in two separate 5L applications
Site establishment complete	

Timing	Action
Month One to three	**Watering (if conditions require):** ▪ Monthly follow up watering if insufficient rainfall occurs (<100mm over a period of four weeks) or insufficient soil moisture
Six months following site establishment	**Weed and grass control:** ▪ Spot spraying and slashing as required. Accepted weed threshold <8%
	Replacement planting: ▪ Replace failed plantings if >20% of plantings fail
	Monitoring: ▪ Monitoring works requirements as detail in Section 4.3
12, 18 and 24 months following site establishment	**Weed and grass control:** ▪ Spot spraying and slashing as required. Accepted weed threshold <8%
	Replacement planting: Replace failed plantings if >20% of plantings fail (18 months after establishment)
	Monitoring: ▪ Monitoring works requirements as detail in Section 4.3
3, 4 and 5 years following site establishment	**Weed control:** Spot spraying as required. Accepted weed threshold <8%
	Monitoring: ▪ Monitoring works requirements as detail in Section 4.3
5 years following site establishment	**Final assessment:** ▪ A biological assessment is to be undertaken to determine if the compensatory planting areas are self-recruiting and viable. If so current monitoring and maintenance schedule can cease. If not found to be self-recruiting and viable, monitoring and maintenance works to continue annually until evidence of complete establishment native canopy species is evident and system is viable.
Annually from 6 years onwards in perpetuity	**Weed control:** ▪ Yearly spot spraying and slashing as required. Accepted weed threshold <8%
	Conservation: ▪ Continued protection of offset area in perpetuity. No clearing of this land is to occur without additional approvals and assessment.

5 Performance requirements and corrective actions

To enable the intent of this Offset Plan to be met, a number of performance requirements and corrective actions have been developed (refer to Table 5-1).

Table 5-1 Rehabilitation objects and performance criteria

Performance requirements	Acceptable solution	Corrective Action	Timing
Foliage cover to be increasing at each monitoring event until the following approximate benchmarks are achieved at maturity: **Rainforest Zone** 50% Tree foliage cover 75% Shrub foliage cover **Eucalypt Zone** 50% Tree foliage cover 20% Shrub foliage cover	Must meet performance requirement except in times of extreme environmental stress which may affect performance (i.e. major drought conditions)	Direct planting at rates great enough to achieve desired densities. Direct plantings to meet desired rates may be postponed in times of extreme environmental stress (e.g. major drought conditions) where conditions may not be conducive to the survival of new plantings.	Planting as part of initial planting works Foliage cover to be recorded during each monitoring event.
Survival rate of planted trees to be >80% (i.e > 1290 plantings)	Must meet performance requirement	Analysis of failure to occur (E.g. unsuitable species planted, extreme weather event, weed out competition, pest incursion) Additional planting to occur if planting mortality >20% in accordance with failure analysis	Survival rates to be determined at each monitoring event.
No sediment deposition into Yallah Creek	Sediment fencing only to be removed once topsoil is stabilised by native groundcover.	Sediment fences and other erosion control measures put in place and maintained as required	During site preparation. Sediment fencing to be inspected at each monitoring event and removed once monitoring event identifies stabilised topsoil.
Suitable number of flora species planted and expected to self-seed within required time frames.	Must meet performance requirement	Direct planting at rates great enough to achieve desired densities Control of weed species to reduce competition for native species	Planting as part of initial planting works Weed species to be controlled in perpetuity

Performance requirements	Acceptable solution	Corrective Action	Timing
No incidence of undesirable livestock incursion	Installation of livestock fencing	Livestock exclusion fencing to be maintained as required	Installation of fencing prior to or during site preparation Monitoring of fence line or evidence undesirable livestock incursion Maintenance of fencing in perpetuity
Installed habitat sites (e.g. nest/roost boxes) to be suitable for native species	Evidence of native species usage of habitat site Habitat site to be well maintained and free of pest species	Maintenance/repair of habitat sites as required Continued monitoring for native species usage throughout monitoring period	Installation during site preparation works Monitoring to occur during each monitoring event
Contiguous riparian zone is developed along Yallah Creek, connecting fragmented patches of *Illawarra Subtropical Rainforest* TEC	Planting of rainforest zone within chosen offset site location	Direct planting at rates great enough to achieve desired densities Control of weed species to reduce competition for native species	Planting as part of initial planting works Weed species to be controlled in perpetuity Fragmentation to rainforest patches to be monitored via aerial imagery during each monitoring event

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Appendix A
Native vegetation identified for removal

Species	Construction Ancillary Site 1	Construction Ancillary Site 2	Construction Ancillary Site 3	Construction Ancillary Site 4	Construction Ancillary Site 5	Tallawarra B Gas Receival Station	Switchyard Carpark	Tallawarra B Power Station	Transmission Line Easement
Native Cherry (*Exocarpos cupressiformis*)				1					20
Other									
Small leaved Lilly Pilly (*Syzygium luehmannii*)									1
Waterhousia (*Waterhousia floribunda*)									1
Tuckeroo (*Cupanioppsis anacardioides*)									2
Fig Sp. (Juvenile)									1
Rusty Fig (*Ficus rubiginosa*)									1
Water Gum (*Tristaniopsis laurina*)									2
Brush Box (*Lophostemon confertus*)									3
Sweet Pittosporum (*Pittosporum undulatum*)	5								2
Bottletree (*Brachychiton rupestris*)									1
Brush Cherry (*Syzygium australe*)									1
Silky Oak (*Grevillia robusta*)									2
Unidentified presumed native species	7	9	20	13	32	8		16	38
Area total	502	14	20	37	32	8	16	16	160
Total	**805**								

Appendix B
Site Planting List[6]

Species	Recommended planting location zone	Justification for use	Habitat values
Whalebone tree (*Streblus brunonianus*)	Rainforest riparian zone – Overstorey tree	▪ Slow growing, but able to self-seed upon establishment ▪ Species is a key species amongst adjacent rainforest community located upstream and downstream. Planting species along the riparian corridor will connect fragmented native community ▪ Is present along Yallah creek so known to be able to survive local conditions ▪ Able survive windblown slopes, such as those present along Mount Brown	▪ Produces fruit that is popular with numerous bird species
Guioa (*Guioa semiglauca*)	Rainforest riparian zone – mid-storey tree	▪ Associated with adjacent rainforest located upstream and downstream. Planting species along the riparian corridor will connect fragmented native community ▪ Recommended as useful for regenerating former rainforest sites, particularly due to its adaptability to a range of environments including amongst sclerophyll rainforest environments	▪ Dense canopy produces suitable nesting sites for a range of bird species which also feed on fruits.
Brush Wilga (*Geijera salicifolia*)	Rainforest riparian zone – Exposed outer edges of the rainforest	▪ Known to occur in close association with Whalebone tree within the surrounding Mt Brown area. ▪ Can tolerate drier conditions more than most rainforest species ▪ *Note*: Propagation from seed may be slow and unreliable. Additionally deer are highly attracted to the species and may kill the tree by rubbing of antlers along the trunk.	▪ Flowers attract insects and insect eating birds ▪ Produces fruits that are consumed by a wide range of native bird species.
Native Quince (*Alectryon subcinereus*	Rainforest riparian zone – Understorey shrub/Overstorey tree	▪ Highly adaptable plant that is able to grow along riparian corridor ▪ Species is a key species amongst adjacent rainforest community located upstream and downstream. Planting species along the riparian corridor will connect fragmented native community ▪ Will grow either as canopy species or an understorey rainforest species	▪ Fruits are eaten by bird species such as Green Catbird (*Ailuroedus crassirostris*)
Red Ash (*Alphitonia excelsa*)	Rainforest tree – intergrading plant between eucalypt and rainforest zones	▪ Associated with target rainforest community PCT 1300 ▪ Present in surrounding region such as Mt Brown ▪ Slow growing species, but it is a tough and hardy rainforest species that can withstand dry periods	▪ Fruits are eaten by a wide range of bird species ▪ Provides nectar which is consumed by flying foxes ▪ Produces shade and shelter for a range of fauna ▪ Larval food plant for the Small Green-banded Blue Butterfly (*Psychonotis caelius*)
Coffee Bush (*Breynia oblonifolia*)	Rainforest riparian zone and eucalypt zone – Understorey shrub	▪ Widespread and regenerates readily so is useful for sites without rainforest vegetation already present. ▪ Grows well as an understorey species and is suitable for shrub planting alongside larger trees.	▪ Produces fruit that is eaten by a range of bird species.
Grey Myrtle (*Backhousia myrtifolia*)	Rainforest riparian zone – Understorey shrub	▪ Associated with adjacent rainforest located upstream and downstream. Planting species along the riparian corridor will connect fragmented native community ▪ Useful for bush regeneration of rainforest creeks within the coastal plain	▪ Provides suitable habitat for small bird species who utilises the bushy habit of the shrub
Maiden's Wattle (*Acacia maidenii*)	Outer edge of Rainforest riparian zone – Overstorey tree. Eucalypt zone – Understorey tree	▪ Pioneering plant able to grow fast fix nitrogen and adapt to disturbed soil environments ▪ Species is a key species amongst adjacent rainforest community located upstream and downstream. Planting species along the riparian corridor will connect fragmented native community ▪ Does not grow in marshy boggy conditions, so would be suitable for planting along the outer edge the rainforest riparian zone	▪ Leaves a food source for a several native butterfly species ▪ Attracts seed eating and insectivorous birds such as the King Parrot
Cockspur Thorn (*Maclura cochinchinensis*)	Rainforest understorey shrub/climber Note: This species is to be planted sparingly due to possibility of overgrowing and limiting access for weed maintenance purposes	▪ Associated with target rainforest community PCT 1300 ▪ Present within surrounding areas such as Mount Brown ▪ Fast growing species that may assist in deterring larger unwanted animals such as deer and cattle due to large thorns	▪ Provides suitable replacement habitat for small bird species who may utilise invasive scramblers such as lantana or blackberry, which will be removed as part of weed management procedures throughout the area. ▪ Fruits are eaten by small birds and Flying Foxes

[6] Note: Plant species habitat values and environmental preferences provided as per https://finder.growingillawarranatives.org/plants/finder. Additionally plant species have been considered in accordance with previously identified species within the local area, as identified within http://www.irbd.com.au/

Species	Recommended planting location zone	Justification for use	Habitat values
Black wattle (*Acacia mearnsii*)	Rainforest zone – Understorey tree	▪ Pioneering plant able to grow fast fix nitrogen and adapt to disturbed soil environments ▪ Replaces the up to 38 individuals lost during clearing ▪ Associated with adjacent rainforest community located upstream and downstream. Planting species along the riparian corridor will connect fragmented native community ▪ Useful as a screen or windbreak for small and more sensitive species	▪ Cockatoos eat grubs within the bark ▪ Produces sap that sugar gliders feed on ▪ Flowers attract Two-spotted Line-blue butterfly (*Nacaduba biocellata*)
Two-veined Hickory (*Acacia binervata*)	Eucalypt Zone – Understorey tree	▪ Fast growing and short-lived pioneer species that grows well within a sclerophyll forest and along the edges of rainforests	▪ Larval plant for butterfly species ▪ Gum/sap accretions attracts sugar gliders ▪ Attracts seed eating birds and insects
Blackwood (*Acacia melanoxylon*)	Eucalypt Zone – Understorey tree	▪ Useful for bush regeneration within riparian and degraded areas ▪ Grows quickly and moderately long-lived ▪ Dead wood breaks down in the soil, providing nitrogen for adjacent plant species to utilise	▪ Seeds are eaten by parrot species ▪ Larval food plant for butterfly species
Sickle Wattle (*Acaica falcata*)	Eucalypt Zone – Understorey shrub	▪ Useful stabilising shrub ▪ Replaces the 117 individuals lost during clearing ▪ Fast-growing short-lived plant that can be used as a pioneer species.	▪ Food plant for a range of butterfly and insect species.
Prickly-leaved paperbark (*Melaleuca styphelioides*)	Rainforest riparian and Eucalypt zone – Understorey tree/Shrub	▪ Grows well in association with eucalypt species such as Forest Red Gum (*Eucalyptus tereticornis*) and Woollybutt (*Eucalyptus longifolia*) ▪ Will replace the 127 individuals lost during clearing ▪ Large examples of the species are already present at the offset site, showing suitability for environmental conditions	▪ Attracts nectar eating birds and butterflies, and produces seeds for seed eating birds
White Feather Honey-myrtle (*Melaleuca decora*)	Eucalypt zone – Understorey shrub/small tree	▪ Grows well with eucalypt species such as Forest Red Gum (*Eucalyptus tereticornis*) and Woollybutt (*Eucalyptus longifolia*) ▪ Suitable for heavy clay soils on coastal plain	▪ Produces nectar for flying foxes, birds and insects. ▪ Bark produces cracks and crevices for small fauna such as insects
Native Cascarilla (*Croton verreauxii*)	Rainforest riparian zone – Understorey shrub	▪ Useful pioneering shrub for regenerating rainforests, particularly at the integrate with between rainforest and sclerophyll eucalypt communities. ▪ Associated with adjacent rainforest community located upstream and downstream. Planting species along the riparian corridor will connect fragmented native community	▪ Produces fruit that is eaten by a range of bird species.
Hairy Clerodendrum (*Clerodendrum tomentosum*)	Intergrading between rainforest riparian zone and Eucalypt zone – Understorey shrub	▪ Associated with adjacent rainforest community located upstream and downstream. Planting species along the riparian corridor will connect fragmented native community ▪ Hardy plant useful for growing at the rainforest edge. Able to survive drought conditions and major root disturbance	▪ Larval butterfly food plant ▪ Produces fruits eaten by bird species such as the Satin Bowerbird (*Ptilonorhynchus violaceus*)
Forest Red Gum (*Eucalyptus tereticornis*)	Eucalypt zone	▪ Suitable tree for most bush revegetation projects ▪ Ideal to replace the over 180 species lost as part of the clearing	▪ Provides typical eucalypt habitat such as seeds, bird roosting sites and potential for developing hollows. Also produces nectar used by parrots, honey eaters and insects.
Woolybutt (*Eucalyptus longifolia*)	Eucalypt zone	▪ Identified as useful for bush regeneration projects on the coastal plain particularly alongside other Eucalypts ▪ Grows in a range of soil types but prefers clay soils	▪ Provides typical eucalypt habitat such as seeds, bird roosting sites and potential for developing hollows. Also produces nectar used by parrots, honey eaters and insects.
Thin-leaved Stringybark (*Eucalyptus eugenioides*)	Eucalypt zone	▪ Suitable for bush regeneration as it grows well in a range of soil types (from well drained loamy soils to poorly drained floodplains) ▪ Grows well in association with other species such as Forest Red Gum (*Eucalyptus tereticornis*). Woollybutt (*Eucalyptus longifolia*) and White Feather Honey-myrtle (*Melaleuca decora*)	▪ Provides typical eucalypt habitat such as seeds, bird roosting sites and potential for developing hollows. Also produces nectar used by parrots, honey eaters and insects. ▪ Stringybark provides cracks and crevices for small fauna species.
White Stringybark (*Eucalyptus globoidea*)	Eucalypt Zone	▪ Key species of target plant community PCT 1326 ▪ Grows well in mixed eucalypt plantings particularly alongside Forest Red Gum (*Eucalyptus tereticornis*). Woollybutt (*Eucalyptus longifolia*) and White Feather Honey-myrtle (*Melaleuca decora*) ▪ Known to grow in the surrounding Yallah region	▪ Provides typical eucalypt habitat such as seeds, bird roosting sites and potential for developing hollows. Also produces nectar used by parrots, honey eaters and insects. ▪ Stringybark provides cracks and crevices for small fauna species.

Species	Recommended planting location zone	Justification for use	Habitat values
Swamp Mahogany (*Eucalyptus robusta*)	Eucalyptus Zone	▪ Fast growing species that is able to grow in swampy waterlogged soils on the coast. ▪ Grows well in association with other Eucalypt species such as Forest Red Gum (*Eucalyptus tereticornis*) and Woolybutt (*Eucalyptus longifolia*)	▪ Winter flowering species providing nectar for fauna such as the Swift Parrot and the Grey-headed Flying Fox
Coastal Grey Box (*Eucalyptus bosistoana*)	Eucalyptus Zone	▪ Grows well in association with other Eucalypt species such as Forest Red Gum (*Eucalyptus tereticornis*) and Woolybutt (*Eucalyptus longifolia*) ▪ Fast growing species suitable for the coastal plain ▪ Replaces the up to 63 individuals which may be cleared during early works	▪ Provides typical eucalypt habitat such as seeds, bird roosting sites and potential for developing hollows. Also produces nectar used by parrots, honey eaters and insects.
Mutton Wood (*Myrsine variabilis*)	Eucalyptus Zone	▪ Associated with target plant community PCT 838 ▪ Suitable for bush regeneration projects due to resilient nature ▪ Known to be present in the surrounding Mt Brown region	▪ Attracts birds such as the Lewin's Honeyeater ▪ Larval food plant for the White-banded Line-blue Butterfly (*Nacaduba kurava*)

Appendix C
Monitoring checklist template

Monitoring Point #				**Recorder**	
Vegetation Zone	***Eucalypt / Rainforest***			**Date**	
Inspection Items	**Yes**	**No**	**N/A**	**Comments**	**Required action (if necessary)**
Photograph from photo point taken? *List of general comments as identified from photo point.*	☐	☐	☐		
Evidence of planting failure? *Count by species of failed plants.*	☐	☐	☐		
Are the plantings healthy? *Signs of disease/stress*	☐	☐	☐		
Area foliage cover *Area (m^2) of total foliage cover* *Area (m^2) of tree foliage cover*	☐	☐	☐		
Is there evidence of native species recruitment? *Provide count of native species seedlings.*	☐	☐	☐		
Evidence of predation by herbivores? *Count and list of species affected* *Possible herbivore (Rabbit, Cow, Deer, Wallaby, other)*	☐	☐	☐		

Monitoring Point #				Recorder	
Vegetation Zone	*Eucalypt / Rainforest*			Date	
Inspection Items	**Yes**	**No**	**N/A**	**Comments**	**Required action (if necessary)**
Quality of topsoil *Evidence of erosion. Any sediment flow into Yallah Creek* *Soil moisture level (wet to dry as per selected moisture probe scale)*	☐	☐	☐		
Are weed species present? *List weeds species present*	☐	☐	☐		
Density of weed species to natives *Ratio of weed species to natives in a 10m x 10m plot*	☐	☐	☐		
Evidence of livestock incursion? *Cattle or evidence of cattle such as footprints and scat within the offset area?* *Fence in good condition and in no need of repair?*	☐	☐	☐		
Have tree guards been removed (if necessary)?	☐	☐	☐		
Have any installed nest boxes been monitored? *Signs of disrepair?* *Evidence of usage by native species?* *Presence of invasive/pest species?*	☐	☐	☐		
Has most recent satellite imagery of the offset site been reviewed?	☐	☐	☐		

Appendix D
Agency Consultation Log

Agency	Date	Method	Actions and responses
Biodiversity and Conservation Division (BCD)	27-08-2021 to 30-08-2021	Email	▪ Email sent to BCD seeking consultation contacts and teleconference meeting ▪ Response from Vanessa Allen (Senior Conservation Planning Officer) stating that they would be happy to review flora and fauna management reports ▪ Offset Plan and Flora and Fauna management Plan provided to BCD for review prior to teleconference meeting.
Biodiversity and Conservation Division (BCD)	06-09-2021	Teleconference	▪ Teleconference with BCD discussing: – Overview of the Tallawarra B Power Station Project – Overview of the proposed environmental management framework for construction – Overview of the planning approval conditions relevant to BCS – Discussion on FFMP, general management procedures and offsets. – Next steps
Biodiversity and Conservation Division (BCD)	09-09-2021	Email – Written comments received	Written comments received from Vanessa Allen. Overall the proposed actions within the offset plan has been supported following update of the report as per BCD comments. Consultation comments/issues outlined below: ▪ ***Comment:*** *Further information on measures for encouraging the natural regeneration of locally native vegetation, including weed management, in accordance with CoA 3.41(a) is required. The Offset Plan only addresses weed management for the Yallah Creek offset area prior to planting. Existing native vegetation to be retained within the site could also benefit from weed management, particularly given disturbance resulting from new works will occur. These areas should be identified in the Offset Plan, including details on how weed management will be achieved to meet CoA 3.41 (particularly a,d,e,f).* – **Response:** Report has been updated to reflect this, particularly with the inclusion of Section 2.5 ▪ ***Comment:*** *Species list for replanting. Species list should be expanded. Use species inventory from Mount Brown as guide. Provide list as a reference in Appendix. Refer to http://www.irbd.com.au/ for nearby species lists.* – **Response:** Species planting list has been moved to Appendix B and additional species have been added including Brush Wilga, Red Ash, Grey Myrtle, Cockspur thorn, Hairy Cleodendrum, Swamp Mahogany, Coastal Grey Box, Mutton Wood. Additionally have added Kidney Weed and Tussock Grass to groundcover seeding suggestion. Have added further details regarding the absence of more groundcover/vine species within Section 3.5 ▪ ***Comment:*** *The Report states that seeds may be sourced from nearby vegetation at Mount Brown. Please be aware that a Biodiversity Conservation Licence is required for this. Refer to* ***https://www.environment.nsw.gov.au/licences-and-***

Species	Construction Ancillary Site 1	Construction Ancillary Site 2	Construction Ancillary Site 3	Construction Ancillary Site 4	Construction Ancillary Site 5	Tallawarra B Gas Receival Station	Switchyard Carpark	Tallawarra B Power Station	Transmission Line Easement
Eucalypts, Anophoras and Corymbias									
Forest Red Gum (*Eucalyptus tereticornis*)	181								
Red bloodwood (*Corymbia gummifera*)									
Coastal Grey Box (*Eucalytpus bosistoana*)	63								
Sydney Red Gum (Angophora costata)									4
Stringybark (*Eucalyptus eugenioides*)	9								
Swamp Mahogany (*Eucalyptus robusta*)	16								
Blackbutt (*Eucalyptus pilularis*)									
Grey Gum (*Eucalyptus punctata*)		3							3
Juvenile Eucalyptus (Possibly Grey Gum)									1
Spotted Gum (*Corymbia maculata*)									21
Tallowwood (*Eucalyptus microcorys*)									1
Bangalay (*Eucalytpus botryoides*)									1
Eucalyptus sp.									7
Acacias									
Sydney Golden Wattle (*Acacia longifolia*)	6			14			10		
Sickle Wattle (*Acacia falcata*)				4			4		
Sydney Green Wattle (*Acacia parramentensis*)				2					
Black wattle (*Acacia mearnsii*)				2			2		22
Sweet Wattle (*Acacia suaveolens*)				1					
Coastal Wattle (*Acacia Binerva*)									2
Acacia Sp. (Exact species unknown as access issue required survey from distance)									3
Melaleucas, Callisetmons and leptospermum									
Prickly-Leaved Paperbark (*Melaleuca styphelioides*)	113								
Willow Bottlebrush (*Callistemon salignus*)	16	2							2
Snow in Summer (*Melaleauca linariifolia*)	52								1
Tea Tree (*Leptospermum sp*)	15								1
Casuarina and Exocarpus									
Swamp Oak (*Casuarina glauca*)	6								16

			permits/wildlife-licences/licences-to-controlor- harm/licences-to-harm-threatened-species – **Response:** Added the requirement for licence ■ ***Comment:*** *The document states that traditional permanent photo points are unlikely to be effective given the size and shape of the area. We disagree and consider these should be included.* – **Response:** Requirement for traditional photo points has been added ■ ***Comment:*** *Replacement plantings occur if losses greater than 20% within 6 months. This should be increased to 12 months to ensure plants get through at least one summer.* – **Response:** Increased period from 6 months to 12 months as required.

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Appendix E: Environmental Representative Approval

Planning, Industry & Environment

Mr Paul Farnworth
Project Director
EnergyAustralia Pty Ltd
697 Collins Street
Docklands, VICTORIA, 3008

18/12/2020

Dear Mr Farnworth

Tallawarra B Power Station (MP07_0124)
Environmental Representative

I refer to your request (MP07_0124-PA-1) for the Planning Secretary's approval of a suitably qualified and experienced person to undertake the role of Environmental Representative for the Tallawarra B Power Station (MP07_0124).

Energy Australia has nominated Tony Hobbs as the Environmental Representative and Susannah Price as an alternate Environmental Representative, should Tony not be available.

The Department has reviewed the nominations and information provided and is satisfied that these experts are suitably qualified and experienced. Consequently, I can advise that the Planning Secretary approves the appointment of Tony Hobbs as the Environmental Representative for the Tallawarra B Power Station, with Susannah Price as nominated alternate.

If you wish to discuss the matter further, please contact Wayne Jones on 6575 3406.

Yours sincerely

Stephen O'Donoghue
Director
Resource Assessments
As nominee of the Planning Secretary

Appendix F: Independent Audit

Planning, Industry & Environment

Ms Amanda Jones
Level 19, Two Melbourne Quarter
697 Collins Street
Melbourne Victoria 3008
26/02/2021

Dear Ms Jones

Tallawarra B Power Station (MP07_0124)
Independent Environmental Audit

I refer to your letter of 19 February 2021 seeking approval of the audit team for the upcoming Independent Environmental Audit of Tallawarra B Power Station (the project), in accordance with Schedule 2, Condition 5.10 of project approval MP07_0124, as modified (the approval).

Having considered the qualifications and experience of the proposed audit team, the Secretary endorses the appointment of:

- Ms Shireen Baguley – Lead Auditor;
- Mr Steven Molino – Alternative Lead Auditor;
- Ms Rebecca O'Rourke – Assistant Auditor;
- Ms Jenni Kremer – Alternative Assistant Auditor,

to undertake the audit in accordance with Schedule 2, Condition 5.9 of the approval. This approval is conditional on the audit team being independent of the project.

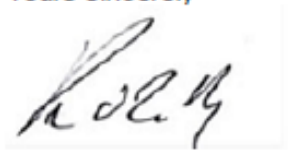
Please ensure this correspondence is appended to the Independent Audit Report.

The audit is to be conducted in accordance with the Department's Independent Audit Post Approval Requirements (May 2020). A copy of the requirements can be located at https://www.planning.nsw.gov.au/Assess-and-Regulate/About-compliance/Compliance-policy-and-guidelines/Independent-audit-post-approval-requirements. Auditors may wish to have regard to AS/NZS ISO 19011 Australian/New Zealand Standard: Guidelines for quality and/or environmental management systems auditing.

The Audit report, including the response to any recommendations contained in the Audit report and a timetable to implement the recommendations is to be submitted to the Secretary, with the Audit report.

Should you have any enquiries in relation to this matter, please contact Georgia Dragicevic, Senior Compliance Officer, on 4247 1852 or by email to Georgia.Dragicevic@planning.nsw.gov.au

Yours sincerely



Katrina O'Reilly
Team Leader - Compliance
Compliance
As nominee of the Planning Secretary

Appendix G: Project Approval

CONSOLIDATED APPROVAL

Project Approval

Section 75J of the *Environmental Planning and Assessment Act 1979*

I, the Minister for Planning, approve the project referred to in Schedule 1, subject to the conditions in Schedule 2.

These conditions are required to:

- prevent, minimise, and/or offset adverse environmental impacts;
- set standards and performance measures for acceptable environmental performance;
- ensure regular monitoring and reporting; and
- provide for the ongoing environmental management of the project.

The Hon. Tony Kelly MP
Minister for Planning

Sydney 2010 File No: S07/01422

The Department has prepared a consolidated version of the approval which is intended to include all modifications to the original determination instrument.

The consolidated version of the approval has been prepared by the Department with all due care. This consolidated version is intended to aid the approval holder by combining all approvals relating to the original determination instrument but it does not relieve an approval holder of its obligation to be aware of and fully comply with all approval obligations as they are set out in the legal instruments, including the original determination instrument and all subsequent modification instruments.

CONSOLIDATED APPROVAL

SCHEDULE 1

Application No: 07_0124

Proponent: EnergyAustralia Tallawarra Pty Ltd

Approval Authority: Minister for Planning

Land: Lot 109, DP 1050302, Yallah Bay Road, Yallah, Wollongong local government area.

Project: Construction and operation of a gas-fired power station and associated infrastructure, known as the Tallawarra Stage B Gas Turbine Power Station Project.

Major Project: The project was declared a Major Project under section 75B(1)(a) of the *Environmental Planning and Assessment Act 1979*, because it is development of a kind described in clause 24 of Schedule 1 of *State Environmental Planning Policy (Major Development) 2005.*

Critical Infrastructure: On 20 November 2018, the project was made a critical State significant infrastructure (SSI) project by order under Clause 5 of Schedule 2 to the *Environmental Planning and Assessment (Savings, Transitional and Other Provisions) Regulation 2017.*

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SUMMARY OF MODIFICATIONS

Application Number	Determination Date	Decider	Modification Description
07_0124-Mod-1	6 April 2016	Executive Director	MOD 1 - Lapse date extension of 5 years
07_0124-Mod-2	4 December 2020	Director	MOD 2 - Extension of Project approval lapse date and allow for construction and operation of a single-unit open cycle gas turbine power plant
07_0124-Mod-3	16 August 2024	Director	MOD 3 - Allow for use of up to 5% green hydrogen fuel mix and supporting infrastructure

KEY TO CONDITIONS

SCHEDULE 2

Act, the	*Environmental Planning and Assessment Act, 1979*
BCS	Biodiversity Conservation and Science Group of NSW Department of Climate Change, Energy, the Environment and Water
CASA	Civil Aviation Safety Authority
Conditions of Approval	Conditions contained in Schedule 2
Construction	All physical works associated with the development, including but not limited to demolition and removal of buildings or works, erection or installation of buildings and infrastructure, road upgrades, and the carrying out of works, but excluding pre-construction minor works
Council	Wollongong City Council
DCCEEW Water	Water Group within the NSW Department of Climate Change, Energy, the Environment and Water
Department, the	Department of Planning, Housing and Infrastructure
EA	*Tallawarra Stage B Gas Turbine Power Station Project, Environmental Assessment,* dated July 2009 and prepared by Sinclair Knight Merz, as amended by: • *Tallawarra Stage B Gas Turbine Power Submissions Report,* dated March 2010, and prepared by Sinclair Knight Merz; • Supplementary Submissions Report for the Tallawarra Stage B Gas Turbine Power, prepared by Sinclair Knight Merz comprising the following documents: ○ Letter dated 5 July 2010 from TRUenergy to the Department of Planning, *Submissions Report – Air Safety for Proposed Tallawarra Stage B Power Station, Yallah*; ○ Letter dated 5 July 2010 from Ambidji to TRUenergy, *Proposed Tallawarra Stage B Gas Fired Peaking Power Station – CASA Assessment of the OCGT and CCGT Applications*; ○ *Aeronautical Impact Assessment Tallawarra B Gas Peaking Power Station Wollongong, NSW. Closed Cycle Gas Turbine Plume Investigation*, prepared by the Ambidji Group and dated 29 March 2010; ○ *Aeronautical Impact Assessment Tallawarra B Gas Peaking Power Station Wollongong, NSW. Open Cycle Gas Turbine Revised Plume Investigation*, prepared by the Ambidji Group and dated 24 March 2010; • Modification application (MOD 1) - Letter dated 17 December 2015 from EnergyAustralia to the Department of Planning and Environment, Tallawarra B Power Station Extension of Permit (07_0124); • Modification application (MOD 2) - *Tallawarra Stage B Gas Turbine Power Station, Modification Environmental Assessment*, dated June 2020 and prepared by Aurecon; *Tallawarra Stage B Gas Turbine Power Station, Modification 2 Submissions Report*, dated September 2020 and prepared by Aurecon; and • Modification application (MOD 3) – *Tallawarra B Power Station Hydrogen Fuel Mix – MOD 3 Modification Report*, dated September 2023 and prepared by Environmental Resources Management Australia Pty Ltd, and *Tallawarra B Power Station Hydrogen Fuel Mix – MOD 3 Submissions Report*, dated December 2023 and prepared by Environmental Resources Management Australia Pty Ltd, and additional information provided by EnergyAustralia as listed in Appendix A of the Department's Assessment Report.

EPA	Environment Protection Authority
Heritage NSW	Heritage NSW – Aboriginal Cultural Heritage
Incident	An occurrence or set of circumstances that causes or threatens to cause material harm and which may or may not be a non-compliance
Material harm	Is harm that: • involves actual or potential harm to the health or safety of human beings or to ecosystems that is not trivial; or • results in actual or potential loss or property damage of an amount, or amounts in aggregate, exceeding $10,000 (such loss includes the reasonable costs and expenses that would be incurred in taking all reasonable and practicable measures to prevent, mitigate or make good harm to the environment)
Minimise	Implement all reasonable and feasible mitigation measures to reduce the impacts of the development
Minister, the	Minister for Planning and Public Spaces, or delegate
Mitigation	Activities associated with reducing the impacts of the project
Operation	When the power station commences contributing electricity to the grid but excluding commissioning activities.
Probable Maximum Flood	The largest flood that could conceivably occur at a particular location. At the project site, this equates to a relative level of 3.24 metres Australian Height Datum.
Project	The development described in the EA and as modified by the conditions of this approval.
Proponent	EnergyAustralia Tallawarra Pty Ltd, or any person carrying out any development to which this approval applies
Publicly Available	Available for inspection by a member of the general public (for example available on an internet site or at a display centre).
Reasonable/feasible	Consideration of best practice taking into account the benefit of proposed measures and their technological and associated operational application in the NSW and Australian context. **Feasible** relates to engineering considerations and what is practical to build. **Reasonable** relates to the application of judgement in arriving at a decision, taking into account mitigation benefits, cost of mitigation versus benefits provided, community views and nature and extent of potential improvements.
Secretary	Planning Secretary under the Act, or nominee
Secretary's Approval	A written approval from the Secretary and/or delegate
Site	Land to which Major Projects Application 07_0124 applies, as shown in Figure 1-2 of the *Tallawarra Stage B Gas Turbine Power Station, Environmental Assessment* prepared by Sinclair Knight Merz and dated July 2009.
Shut-down period	The period during which a turbine is being taken out of service from normal operation to inactivity.
Start-up period	The period during which a turbine is being brought up to normal operation following a period of inactivity.
Tallawarra Lands	The land within the Tallawarra Land Border, excluding land within the power station site boundary, as shown in Figure 1-2 of the *Tallawarra Stage B Gas Turbine Power Station, Environmental Assessment* prepared by Sinclair Knight Merz and dated July 2009.
TfNSW	Transport for NSW

1. ADMINISTRATIVE CONDITIONS

Terms of Approval

1.1 The project may only be carried out:
- a) in compliance with the conditions of this approval granted with respect to the *Tallawarra Stage B Gas Turbine Power Station Project* (07_0124);
- b) in accordance with all written directions of the Secretary; and
- c) generally in accordance with the EA.

1.2 The conditions of this approval and directions of the Secretary prevail to the extent of any inconsistency, ambiguity or conflict between them and the documents listed in condition 1.1c). In the event of an inconsistency, ambiguity or conflict between any of the documents listed in condition 1.1c), the most recent document prevails to the extent of any inconsistency, ambiguity or conflict.

1.3 The Proponent must comply with any reasonable requirement(s) of the Secretary arising from the Department's assessment of:
- a) any documents that are submitted in accordance with this approval; and
- b) the implementation of any actions or measures contained in these documents.

Limits of Approval

1.4 This approval will lapse if the Proponent does not physically commence the project by 21 December 2022.

1.5 The project must comprise a single-unit gas turbine power plant with a total nominal output of up to 400 megawatts operating in open cycle mode.

1.6 Nothing in this approval permits the construction and operation of an open cycle gas turbine plant, unless the Proponent has submitted a report to the Secretary which demonstrates that operation of an open cycle gas turbine plant will not have an adverse impact on aviation safety. This report must be prepared in consultation with Shellharbour City Council, and its conclusions and recommendations must have been agreed to by the CASA prior to submission to the Secretary. The report must be approved by the Secretary before commencement of construction of an open cycle plant.

1.6A No permanent storage of hydrogen is allowed on-site.

16.B No more than eight hydrogen trailers are allowed to access the site on any day.

16C No more than four hydrogen trailers with a total capacity of up to 2,228 kg of hydrogen gas are allowed on site at any given time, unless otherwise agreed by the Secretary.

1.6D Vehicles larger than the 19 m design vehicle are not allowed to use the intersection of Yallah Bay Road and the Princes Highway to turn into the site.

Statutory Requirements

1.7 The Proponent must ensure that all licences, permits and approvals are obtained and maintained as required throughout the life of the project. No condition of this approval removes the obligation for the Proponent to obtain, renew or comply with such licences, permits or approvals. The Proponent must ensure that a copy of this approval and all relevant environmental approvals are available on the site at all times during the life of the project.

1.8 The relevant provisions of section 188 of the *Environmental Planning and Assessment Regulation 2021* apply to this approval.

2. OPERATING CONDITIONS

Approved Fuels

2.1 Natural gas or natural gas blended with up to 5% hydrogen gas (by volume) are the only fuels approved for firing of the burner/turbine.

2.1A Hydrogen gas feeding to the burner/turbine must be supplied from renewable electricity only.

2.2 Removed.

2.3 Removed.

Mode of Operation

2.4 Deleted.

Approved Chemicals

2.5 Deleted.

3. SPECIFIC ENVIRONMENTAL CONDITIONS

Noise Impacts

Construction Noise

3.1 The Proponent must only undertake construction activities associated with the project that would generate an audible noise at any sensitive receivers during the following hours:

a) 7:00 am to 6:00 pm, Mondays to Fridays, inclusive;
b) 8:00 am to 1:00 pm on Saturdays; and
c) at no time on Sundays or public holidays.

This condition does not apply in the event of a direction from police or other relevant authority for safety reasons, or to prevent environmental harm, the loss of property or risk to life.

3.2 The hours of construction activities specified under condition 3.1 of this approval may be varied with the prior written approval of the Secretary. Any request to alter the hours of construction specified under condition 3.1 must be:

a) considered on a case-by-case basis;
b) accompanied by details of the nature and need for activities to be conducted during the varied construction hours; and
c) accompanied by written evidence demonstrating consultation with the EPA in relation to the proposed variation in construction times (including the consideration of any comments made by the EPA).

3.3 The Proponent must implement all reasonable and feasible mitigation measures with the aim of achieving the following construction noise and vibration goals:

a) where audible at any sensitive receivers, the $L_{Aeq\ (15minute)}$ noise level from construction activities should not exceed the rating background level by more than 10 dB; and
b) the vibration limits set out in the *Assessing Vibration: A Technical Guideline* (Department of Environment and Climate Change, 2006) for human exposure.

3.4 During construction, the Proponent must minimise noise emissions from plant and equipment, including bulldozers, cranes, graders, excavators and trucks, by installing and maintaining where reasonable and feasible, efficient silencers and low-noise mufflers (residential standard).

Operational Noise

3.5 The Proponent must design, construct, operate and maintain the project to ensure that the total cumulative noise contribution from the combined operation of the Tallawarra Stage A and

Tallawarra Stage B power stations to the background acoustic environment does not exceed the noise limits specified in Table 1 and Table 2.

Table 1 – Maximum Allowable Noise Limits Outside the Tallawarra Lands

Location	Day 7:00 am to 6:00 pm Mondays to Saturdays 8:00 am to 6:00 pm Sundays and public holidays	Evening 6:00 pm to 10:00 pm on any day	Night 10:00 pm to 7:00 am Mondays to Saturdays 10:00 pm to 8:00 am Sundays and public holidays	
	$L_{Aeq(15\ minute)}$	$L_{Aeq(15\ minute)}$	$L_{Aeq(15\ minute)}$	L_{Amax}
Locality T2 Any residence on Carlyle Close, Wollin Place, Coronet Place, and Crompton Street, in Koonawarra	35 dB(A)	35 dB(A)	35 dB(A)	45 dB(A)
Locality T4 Any residence on Wyndarra Way and Malonga Place in Koonawarra	35 dB(A)	35 dB(A)	35 dB(A)	45 dB(A)
Locality ML#9 Any residence on The Boulevarde, Park Crescent, Horsley Road and Newton Crescent in Oak Flats	38 dB(A)	38 dB(A)	38 dB(A)	45 dB(A)
Locality ML#10 Any residence on Reddall Parade and Henricks Parade in Mt Warrigal	38 dB(A)	38 dB(A)	38 dB(A)	45 dB(A)
Locality ML#11 Any residence in Haywards Bay	35 dB(A)	35 dB(A)	35 dB(A)	45 dB(A)

The localities set out in Table 1 are those described in Appendix E of the document listed in condition 1.1c). For the purpose of Table 1, "residence" is defined as any residential dwelling existing at the date of this approval and any residential dwelling, once constructed, on land zoned R2 - Low Density Residential under the *Wollongong Local Environmental Plan 2009* at the identified locality.

Table 2 - Noise Limits for Tallawarra Lands Residential Areas

Location	Day 7:00 am to 6:00 pm Mondays to Saturdays 8:00 am to 6:00 pm Sundays and public holidays	Evening 6:00 pm to 10:00 pm on any day	Night 10:00 pm to 7:00 am Mondays to Saturdays 10:00 pm to 8:00 am Sundays and public holidays	
	$L_{Aeq(15\ minute)}$	$L_{Aeq(15\ minute)}$	$L_{Aeq(15\ minute)}$	L_{Amax}
Most affected residence - proposed northern residential area	If the *Noise Policy for Industry* (NSW EPA, 2017) Modification Factors for Low Frequency Noise apply – 40 dB(A), otherwise 38 dB(A)	If the *Noise Policy for Industry* (NSW EPA, 2017) Modification Factors for Low Frequency Noise apply – 40 dB(A), otherwise 38 dB(A)	If the *Noise Policy for Industry* (NSW EPA, 2017) Modification Factors for Low Frequency Noise apply – 40 dB(A), otherwise 38 dB(A)	50 dB(A)
Most affected residence - proposed central residential area	40 dB(A)	40 dB(A)	40 dB(A)	50 dB(A)
Most affected residence - proposed south-western residential area	41 dB(A)	41 dB(A)	41 dB(A)	51 dB(A)

The proposed residential areas set out in Table 2 are those illustrated in Appendix A of the *Tallawarra Concept Plan Application – Preliminary Assessment Report* prepared by Don Fox Planning and dated June 2009. For the purpose of Table 2, "residence" is defined as any residential dwelling once constructed, either prior to or post the construction and operation of the power station, on land zoned R2 - Low Density Residential or R5 - Large Lot Residential under the *Wollongong Local Environmental Plan 2009* within the proposed residential areas.

If noise from an activity is substantially tonal, intermittent or impulsive in nature and contains major components within the low frequency range (as described in *Noise Policy for Industry* (NSW EPA, 2017)), 5 dB(A) must be added to the measured noise level when comparing the measured noise with the limits specified in Tables 1 and 2, in accordance with the requirements of the *Noise Policy for Industry* (NSW EPA, 2017).

The noise limits set out in Table 1 and Table 2 do not apply under: wind speeds greater than 3 metres per second (measured at 10 metres above ground level); or under stability category G temperature inversion conditions; or under stability category F temperature inversion conditions and wind speeds greater than 2 metres per second at 10 metres above the ground.

Stability category temperature inversion conditions are to be determined by the sigma-theta method referred to in the *Noise Policy for Industry* (NSW EPA, 2017).

The data to be used for determining meteorological conditions is that recorded by the meteorological weather station located at the Tallawarra Stage A power station.

3.6 Where operational noise monitoring (as required by either conditions 4.1 or 4.5 of this approval) identifies any non-compliance with the operational noise limits specified under condition 3.5 of this approval, the Proponent must prepare and submit to the Secretary for approval a report including, but not limited to:

a) an assessment of all reasonable and feasible physical and other mitigation measures for reducing noise at the source;
b) identification of the preferred measure(s) for reducing noise at the source;
c) evidence that the EPA is satisfied that the proposed noise mitigation measures are acceptable; and
d) location, type, timing and responsibility for implementation of the noise mitigation measure(s).

The report is to be submitted to the Secretary within 90 days of undertaking the noise monitoring which has identified exceedances of the operational noise criteria specified under condition 3.5, unless otherwise agreed to by the Secretary. The Proponent must implement all reasonable and feasible mitigation measures in accordance with the requirements of the Secretary.

Additional Noise Mitigation Measures

3.7 If, after the implementation of all reasonable and feasible source controls, as identified in the report required by condition 3.6, the noise generated by the combined operation of the Tallawarra Stage A and Tallawarra Stage B power stations exceeds the noise limits stipulated in Table 3 and Table 4 at the specified localities, upon receiving a written request from an affected landowner (unless that landowner has acquisition rights under condition 3.13 of this approval and has requested acquisition) the Proponent must investigate and implement reasonable and feasible at-receiver noise mitigation measures such as double glazing, insulation, air conditioning and or other building acoustic treatments at any residence on the land, in consultation with the landowner, to ensure that the noise limits specified in condition 3.5 of this approval are not exceeded.

Table 3 – Additional Noise Mitigation Criteria Outside the Tallawarra Lands

Location	Day 7:00 am to 6:00 pm Mondays to Saturdays 8:00 am to 6:00 pm Sundays and public holidays	Evening 6:00 pm to 10:00 pm on any day	Night 10:00 pm to 7:00 am Mondays to Saturdays 10:00 pm to 8:00 am Sundays and public holidays
	$L_{Aeq(15\ minute)}$	$L_{Aeq(15\ minute)}$	$L_{Aeq(15\ minute)}$
Locality T2 Any residence on Carlyle Close, Wollin Place, Coronet Place, and Crompton Street, Koonawarra	40 dB(A)	40 dB(A)	40 dB(A)
Locality T4	41 dB(A)	41 dB(A)	41 dB(A)

Location	Day 7:00 am to 6:00 pm Mondays to Saturdays 8:00 am to 6:00 pm Sundays and public holidays	Evening 6:00 pm to 10:00 pm on any day	Night 10:00 pm to 7:00 am Mondays to Saturdays 10:00 pm to 8:00 am Sundays and public holidays
	$L_{Aeq(15\ minute)}$	$L_{Aeq(15\ minute)}$	$L_{Aeq(15\ minute)}$
Any residence on Wyndarra Way and Malonga Place in Koonawarra			
Locality ML#9 Any residence on The Boulevarde, Park Crescent, Horsley Road and Newton Crescent in Oak Flats	41 dB(A)	41 dB(A)	41 dB(A)
Locality ML#10 Any residence on Reddall Parade and Henricks Parade in Mt Warrigal	40 dB(A)	40 dB(A)	40 dB(A)
Locality ML#11 Any residence in Haywards Bay	47 dB(A)	47 dB(A)	47 dB(A)

Table 4 - Additional Noise Mitigation Criteria for Tallawarra Lands Residential Areas

Location	Day 7:00 am to 6:00 pm Mondays to Saturdays 8:00 am to 6:00 pm Sundays and public holidays	Evening 6:00 pm to 10:00 pm on any day	Night 10:00 pm to 7:00 am Mondays to Saturdays 10:00 pm to 8:00 am Sundays and public holidays
	$L_{Aeq(15\ minute)}$	$L_{Aeq(15\ minute)}$	$L_{Aeq(15\ minute)}$
Most affected residence - proposed northern residential area	43 dB(A)	43 dB(A)	43 dB(A)
Most affected residence - proposed central residential area	43 dB(A)	43 dB(A)	43 dB(A)
Most affected residence - proposed south-western residential area	44 dB(A)	44 dB(A)	44 dB(A)

If noise from an activity is substantially tonal, intermittent or impulsive in nature and contains major components within the low frequency range (as described in *Noise Policy for Industry* (NSW EPA, 2017)), 5 dB(A) must be added to the measured noise level when comparing the measured noise with the limits specified in Tables 3 and 4, in accordance with the requirements of the *Noise Policy for Industry* (NSW EPA, 2017).

3.8 The Proponent must bear the costs of any additional at-receiver mitigation measures implemented at an affected property or land.

3.9 The Proponent must make a binding written offer to the landowner regarding the mitigation options that can be implemented at the property. If within three months of receiving this request from the landowner the Proponent and landowner cannot agree on the measures to be implemented, or there is a dispute about the implementation of these measures, then either party may refer the matter to the Secretary for resolution, whose decision must be final. If the landowner refuses to accept the Proponent's offer within six months of the date of offer, the Proponent's obligations to provide additional mitigation measures at the property or land must cease, unless otherwise agreed by the Secretary.

3.10 If a landowner has agreed to, or a property has been the subject of the application of, at-source noise mitigation measures under condition 3.7, the Proponent's obligations to re-consider the land or property under the requirements of condition 3.7 must cease, unless otherwise agreed by the Secretary.

3.11 The requirements of conditions 3.7 to 3.10 do not apply if a negotiated agreement consistent with the requirements of *Noise Policy for Industry* (NSW EPA, 2017) exists between the Proponent and the landowner.

3.12 The Proponent must provide written notice to all landowners that are entitled to rights under condition 3.7 within 21 days of determining the landholdings to which these rights apply. This

condition only applies where operational noise levels have been confirmed. For the purpose of this condition and condition 3.18, confirmation of operational noise levels means:

a) completion of the operational noise review required under condition 4.1 of this approval; and

b) implementation of any source controls, as required under condition 3.6 of this approval, should the operational noise review indicate noise levels in excess of the operational noise limits specified in condition 3.5; and

c) monitoring of operational noise levels, as per the requirements under condition 4.5 of this approval, following the implementation of any source controls.

Land Acquisition Criteria

3.13 If, after the implementation of all reasonable and feasible source controls, as identified in the report required by condition 3.6, the noise generated by the combined operation of the Tallawarra Stage A and Tallawarra Stage B power stations exceeds the noise limits specified in Table 5 and Table 6 at the specified localities, the Proponent must, upon receiving a written request for acquisition from the landowner, within two years of the date of that landowner being notified of his/her acquisition rights, acquire the land in accordance with the procedures in conditions 3.14 to 3.16 of this approval.

Any landowner that has agreed to, or property that has been the subject of, the application of additional noise mitigation measures under condition 3.7 of this approval waives the right to land acquisition.

Table 5 - Land Acquisition Criteria for Residential Receivers Outside the Tallawarra Lands

Location	Day 7:00 am to 6:00 pm Mondays to Saturdays 8:00 am to 6:00 pm Sundays and public holidays	Evening 6:00 pm to 10:00 pm on any day	Night 10:00 pm to 7:00 am Mondays to Saturdays 10:00 pm to 8:00 am Sundays and public holidays
	$L_{Aeq(15\ minute)}$	$L_{Aeq(15\ minute)}$	$L_{Aeq(15\ minute)}$
Locality T2 Any residence on Carlyle Close, Wollin Place, Coronet Place, and Crompton Street, Koonawarra	43 dB(A)	43 dB(A)	43 dB(A)
Locality T4 Any residence on Wyndarra Way and Malonga Place in Koonawarra	44 dB(A)	44 dB(A)	44 dB(A)
Locality ML#9 Any residence on The Boulevarde, Park Crescent, Horsley Road and Newton Crescent in Oak Flats	44 dB(A)	44 dB(A)	44 dB(A)
Locality ML#10 Any residence on Reddall Parade and Henricks Parade in Mt Warrigal	43 dB(A)	43 dB(A)	43 dB(A)
Locality ML#11 Any residence in Haywards Bay	50 dB(A)	50 dB(A)	50 dB(A)

Table 6 - Land Acquisition Criteria for Tallawarra Lands Residential Areas

Location	Day 7:00 am to 6:00 pm Mondays to Saturdays 8:00 am to 6:00 pm Sundays and public holidays	Evening 6:00 pm to 10:00 pm on any day	Night 10:00 pm to 7:00 am Mondays to Saturdays 10:00 pm to 8:00 am Sundays and public holidays
	$L_{Aeq(15\ minute)}$	$L_{Aeq(15\ minute)}$	$L_{Aeq(15\ minute)}$
Most affected residence - proposed northern residential area	46dB(A)	46dB(A)	46dB(A)
Most affected residence - proposed central residential area	46 dB(A)	46 dB(A)	46 dB(A)
Most affected residence - proposed south-western residential area	47 dB(A)	47 dB(A)	47 dB(A)

If noise from an activity is substantially tonal, intermittent or impulsive in nature and contains major components within the low frequency range (as described in *Noise Policy for Industry*

(NSW EPA, 2017)), 5 dB(A) must be added to the measured noise level when comparing the measured noise with the limits specified in Tables 5 and 6, in accordance with the requirements of the *Noise Policy for Industry* (NSW EPA, 2017).

3.14 Within three months of receiving a written request from a landowner with acquisition rights under condition 3.13 of this approval, the Proponent must make a binding written offer to the landowner based on:

(a) the current market value of the landowner's interest in the property at the date of this written request, as if the property was unaffected by the project which is the subject of the project application, having regard to the -
   i) existing and permissible use of the land, in accordance with the applicable planning instruments at the date of the written request, and
   ii) presence of improvements on the property and/or any approved building or structure which has been physically commenced at the date of the landowner's written request, and is due to be completed subsequent to that date;

(b) the reasonable costs associated with -
   i) relocating within the Wollongong or Shellharbour local government areas,
   ii) obtaining legal advice and expert advice for determining the acquisition price of the land, and the terms upon which it is required; and

(c) reasonable compensation for any disturbance caused by the land acquisition process.

However, if at the end of this period, the Proponent and landowner cannot agree on the acquisition price of the land, and/or the terms upon which the land is to be acquired, then either party may refer the matter to the Secretary for resolution.

Upon receiving such a request, the Secretary must request the President of the NSW Division of the Australian Property Institute to appoint a qualified independent valuer or Fellow of the Institute, to consider submissions from both parties, and determine a fair and reasonable acquisition price for the land, and/or terms upon which the land is to be acquired.

Within 14 days of receiving the independent valuer's determination, the Proponent must make a written offer to purchase the land at a price not less than the independent valuer's determination.

If the landowner refuses to accept this offer within six months of the date of the Proponent's offer, the Proponent's obligations to acquire the land shall cease, unless otherwise agreed by the Secretary.

3.15 The Proponent must bear the costs of any valuation or survey assessment requested by the independent valuer or the Secretary and the costs of determination referred to above.

3.16 If a landowner has already agreed to an offer of acquisition under the requirements of condition 3.13, or an offer of acquisition has been made under the requirements of condition 3.13 and refused by the landowner, the Proponent's obligations to re-consider the landowner's request or property under the requirements of condition 3.13 shall cease, unless otherwise agreed by the Secretary.

3.17 The requirements of conditions 3.13 to 3.16 do not apply if a negotiated agreement consistent with the requirements of *Noise Policy for Industry* (NSW EPA, 2017) exists between the Proponent and the relevant landowner.

3.18 The Proponent must provide written notice to all landowners that are entitled to rights under condition 3.13 within 21 days of determining the landholdings to which land acquisition rights apply. This condition only applies where operational noise levels have been confirmed in accordance with the definition in condition 3.12.

Air Quality Impacts

Dust Generation

3.19 The Proponent must construct and operate the project in a manner that minimises dust emissions from the site, including wind-blown and traffic-generated dust. All activities on the site must be undertaken with the objective of preventing visible emissions of dust from the site. Should such visible dust emissions occur at any time, the Proponent must identify and implement all practicable dust mitigation measures, including cessation of relevant works, as appropriate, such that emissions of visible dust cease.

Odour

3.20 The Proponent must not permit any offensive odour, as defined under section 129 of the *Protection of the Environment Operations Act 1997*, to be emitted beyond the boundary of the site.

Manufacturer's Performance Guarantee

3.21 Prior to the installation of any fuel burning equipment associated with the project, the Proponent must submit the manufacturer's performance guarantee for that equipment to the EPA. The documentation must demonstrate to the EPA's satisfaction that the equipment, when operating at design load, will comply with the air discharge limits specified in this approval under condition 3.24.

Air Discharge Points

3.22 For the purpose of this approval, air discharge/monitoring points are identified in Table 7.

Table 7 - Identification of Air Monitoring and Air Discharge Points

EPA Identification Number	Type of Monitoring Point	Type of Discharge Point	Description of Location
1	Air emissions monitoring	Discharge to air	Stack Serving the Open Cycle Plant Turbine
Deleted	Deleted	Deleted	Deleted

3.23 The Proponent must ensure that the design and construction of the project includes sampling positions that comply with TM-1 as set out in *Approved Methods for the Sampling and Analysis of Air Pollutants in NSW* (EPA, 2016), or its latest version.

Discharge Limits

3.24 The Proponent must design, construct, operate and maintain the project to ensure that for each turbine stack discharge/monitoring point identified in Table 7, the concentration of each pollutant listed in Table 8 is not exceeded at that point. The condition only applies to the normal operation of a turbine and, to avoid any doubt, does not apply during the start-up and shut-down period for a turbine. The condition continues to apply to other turbines if they are operational during these periods.

Table 8 – Maximum Allowable Discharge Concentration Limits (Air)

Pollutant	Unit of measure	100 percentile limit	Reference conditions	Averaging Period
Nitrogen dioxide (NO_2) or nitric oxide (NO) or both, as NO_2 equivalent	ppm	25	Dry, 273 K, 101.3 kPa, 15% O_2	1-hour

Mass Limits

3.25 The Proponent must design, construct, operate and maintain the project to ensure that the total cumulative load of nitrogen dioxide or nitric oxide, or both as nitrogen dioxide, from the combined discharges from the Tallawarra Stage A and Tallawarra Stage B power stations does

not exceed 900 tonnes per annum. This mass limit also applies to emissions during start-up and shut-down periods.

Aviation Safety

3.26 The stacks associated with the project must be marked and lit in accordance with the requirements of the CASA.

Hazards and Risk

Pre-Construction Hazards Studies

3.27 Prior to the commencement of construction of 07_0124-Mod-3, other than preliminary works outside the scope of the hazard studies, or as otherwise agreed by the Secretary, the Proponent must prepare the following studies to the satisfaction of the Secretary:

a) a **Fire Safety Study** for the site, covering relevant aspects detailed in the Department's publication *Hazardous Industry Planning Advisory Paper No. 2 – Fire Safety Guidelines* and the New South Wales Government's *Best Practice Guidelines for Contaminated Water Retention and Treatment Systems*. The Study must include a strict maintenance schedule for essential services and other safety measures. The Study must meet the requirements of the Fire and Rescue NSW;

b) a **Hazard and Operability Study (HAZOP)** for the site, chaired by an independent, qualified person or team that is endorsed by the Secretary prior to the commencement of the study. The Study must be carried out in accordance with the Department's publication *Hazardous Industry Planning Advisory Paper No. 8 – HAZOP Guidelines* and must be accompanied by a program for the implementation of all recommendations made in the report. If the Proponent intends to defer the implementation of a recommendation, justification must be included;

c) a **Final Hazard Analysis** for the site prepared in accordance with the Department's *Hazardous Industry Advisory Paper No.6 – Guidelines for Hazard Analysis*. The Final Hazard Analysis must include a cumulative risks assessment for Tallawarra A (D98/784 and SSD-60938959) and the project; and

d) a **Construction Safety Study**, prepared in accordance with the Department's *Hazardous Industry Planning Advisory Paper No. 7 – Construction Safety Study Guidelines*. For developments in which the construction period exceeds six months, the commissioning portion of the Construction Safety Study may be submitted two months prior to commencement of construction.

Pre-Commissioning Hazards Studies

3.28 No later than two months prior to the commencement of commissioning of 07_0124-Mod-3, or as otherwise agreed by the Secretary, the Proponent must prepare updated documents for the following plans and systems to the satisfaction of the Secretary:

a) a comprehensive **Emergency Plan** and detailed emergency procedures for the project. The Plan must be prepared in accordance with the Department's publication *Hazardous Industry Planning Advisory Paper No. 1 – Industry Emergency Planning* Guidelines;

b) a comprehensive **Safety Management System** for the site, covering all on-site operations and any associated transport activities involving hazardous materials. The System must clearly specify all safety-related procedures, responsibilities and policies, along with details of mechanisms for ensuring adherence to safety procedures. Records must be kept on-site and must be available for inspection by the Secretary upon request. The Safety Management System must be developed in accordance with the Department's publication *Hazardous Industry Planning Advisory Paper No. 9 – Safety Management*; and

c) an **Emergency Services Information Package** for the site, in accordance with the Fire and Rescue NSW's *Fire Safety Guideline – Emergency services information package and tactical fire plans.*

3.28A The Proponent must submit to the Secretary and NSW Rural Fire Service Illawarra District Office a **Fire Management Plan** for the site that is prepared in consultation with the NSW Rural Fire Service Illawarra District Office and include:

a) 24- hour emergency contact details including alternative telephone contact for the site;
b) site infrastructure, fire fighting water supply, access and internal road plans;
c) construction of Asset Protection Zones (APZ) and their continued maintenance; and
d) location of hazards (physical, chemical and electrical) that may impact on firefighting operations and procedures.

Dangerous Goods

3.29 The storage, handling, and transport of dangerous goods for the development must be carried out in accordance with the relevant Australian Standards, including and not limited to *AS1940* and *AS1596*, and the *Australian Code for the Transport of Dangerous Goods by Road and Rail*.

Water Quality and Soil Impacts

3.30 Except as may be provided by an Environment Protection Licence for the project, the Proponent must comply with section 120 of the *Protection of the Environment Operations Act 1997* which prohibits the pollution of waters.

3.31 Soil and water management controls must be employed to minimise soil erosion and the discharge of sediment and other pollutants to lands and/or waters during construction activities, in accordance with Landcom's (2006) *Managing Urban Stormwater: Soils and Construction*.

3.32 Deleted.

3.33 Deleted.

Hydrology

3.34 The Proponent must utilise existing crossings over Yallah Creek and must avoid constructing temporary watercourse crossings for heavy vehicles and machinery.

3.35 The Proponent must ensure that any construction activities within 40 metres of the bank of Yallah Creek, and any other watercourses, are consistent with *Controlled Activity Guidelines* (Department of Water and Energy, 2008) including, but not limited to, 'In-stream Works', 'Outlet Structures', 'Riparian Corridors', 'Vegetation Management Plans', and 'Watercourse Crossings', or any guidelines which supersede these documents.

3.36 The Proponent must ensure that the project is designed, sited and constructed so that it is not subject to inundation by floodwaters up to or at a level of the Probable Maximum Flood, nor does it exacerbate flooding on adjacent land.

Where the Proponent can demonstrate to the satisfaction of the Secretary that it is not reasonable and feasible to design to the Probable Maximum Flood, the Proponent may nominate an alternative design flood level for the approval of the Secretary. The alternative flood level must be developed using a risk-based approach and in consultation with Wollongong City Council.

3.37 The project must be designed, and employ surface water management techniques, such that existing runoff volumes along drainage lines from the site are maintained at pre-construction levels and there are no adverse effects to adjoining land as a result of flooding and runoff.

Flora and Fauna Impact

3.38 The Proponent must ensure that there is no disturbance to the endangered ecological communities, including the Illawarra Subtropical Rainforest in the Sydney Basin Bioregion and

the Swamp Oak Floodplain Forest of the NSW North Coast, Sydney Basin and South East Corner bioregions, during the construction and operation of the project.

3.39 The Proponent must mark the areas of endangered ecological communities with flagging tape or similar prior to commencing construction to ensure that there is no incursion into, or clearing of the areas.

3.40 The Proponent must ensure that clearing of native vegetation is limited to the minimal extent required for the construction of the project and must undertake all reasonable and feasible measures to avoid the clearing of any threatened flora species. All cleared areas must be stabilised with local native grasses and ground cover plants as soon as practicable to minimise soil erosion.

3.41 At least one month prior to the commencement of construction of the project, the Proponent must develop a plan for offsetting the biodiversity impacts resulting from the removal of any native vegetation. The plan must be submitted to the Secretary for approval and include as appropriate, but not necessarily be limited to:

a) measures for encouraging the natural regeneration of locally native vegetation, including weed management measures as identified in condition 3.44;
b) replanting/compensatory plantings (at a ratio of at least 2:1) and/or land offsets, and rehabilitation measures;
c) measures for replacing specific habitat values impacted by the project (e.g. provision of roost/nest boxes where significant habitat trees such as hollow bearing trees are impacted);
d) a timeline for the implementation of the identified measures, including ongoing monitoring and maintenance;
e) demonstration of how the plan would achieve the outcome of maintaining or improving biodiversity values in the local area; and
f) measures for monitoring and maintaining any offsets in perpetuity.

The plan must be implemented in accordance with the specified measures and timeframes, unless otherwise agreed to by the Secretary.

3.42 The Proponent must establish a riparian zone consisting of local native plant species adjacent to Yallah Creek within the power station site boundary. The width of the riparian zone is to be a minimum of 50 metres on both sides of the creek, where practicable. All works and disturbance areas associated with the construction and operation of the project must be located outside of the riparian zone, including new transmission line poles.

3.43 The Proponent must monitor and maintain the riparian zone along Yallah Creek (referred to in condition 3.42) throughout the life of the project.

3.44 The Proponent must monitor all rehabilitated areas, offset areas, and riparian zones for weed infestation. Any infestations must be actively managed to remove or minimise their spread.

Lake Ecology

3.45 Deleted.

3.46 Deleted.

3.47 Deleted.

3.48 Deleted.

Visual Amenity Impacts

3.49 The Proponent must undertake landscaping works to reduce the visual impact of the power station from residences along the foreshore, prior to the commencement of operation of the project. Vegetation used in landscaping works must comprise local native species.

3.50 The Proponent must minimise the use of reflective building elements and maximise the use of building materials and treatments which visually complement the surrounding landscape.

3.51 The Proponent must ensure that the power station is consistent in design (including materials, finishes and colours) with the Tallawarra Stage A power station.

3.52 The Proponent must ensure that all external lighting associated with the project is mounted, screened, and directed in such a manner so as not to create a nuisance to the surrounding environment, properties and roadway. The lighting must be the minimum level of illumination necessary and must comply with *Australian Standard AS4282 1997 – Control of the Obtrusive Effects of Outdoor Lighting.*

3.53 Where aviation hazard lighting is recommended by CASA and/or AirServices Australia, all reasonable and feasible attempts must be made to ensure that this lighting is designed and directed so as not to create a nuisance to the surrounding environment, properties and roadway.

Aboriginal Heritage Impacts

3.54 The Proponent must take all reasonable and feasible measures to avoid the sites known as Yallah Gully 1 (National Parks and Wildlife Services Site ID 52-5-0248), Yallah Gully 2 (National Parks and Wildlife Services Site ID 52-5-0247), Yallah Gully 3 (National Parks and Wildlife Services Site ID 52-5-0246) and Yallah Site 2 (National Parks and Wildlife Services Site ID 52-5-0122) during the construction of the project, and develop site-specific mitigation measures to ensure that they are not impacted by construction or operation of the power station and any associated infrastructure. If impacts are unavoidable, mitigation measures are to be negotiated with the Aboriginal community and Heritage NSW.

3.55 If during the course of construction or operation of the project the Proponent uncovers any previously unidentified Aboriginal cultural objects, all works likely to affect the object(s) must cease in the immediate area to prevent any further impact to the find(s) and Heritage NSW informed. A suitably qualified archaeologist and Aboriginal community representatives must be contacted to determine the significance of the find(s) and appropriate management measures. The Proponent must register the site and management outcome in the Aboriginal Heritage Information Management System (AHIMS) in accordance with the *National Parks and Wildlife Act 1974*. Works are not to resume until approval in writing is received from Heritage NSW.

3.56 Where ground disturbance is proposed (for example excavation or removal of vegetation) in the vicinity of Yallah Creek, prior to commencing construction, the Proponent must undertake further archaeological surveying and assessment with the aim of identifying any Aboriginal cultural heritage values which may be impacted by the project. The Proponent must ensure monitoring by Local Aboriginal Land Council representatives during such works.

Traffic and Transport Impacts

3.57 Upon determining the haulage route(s) for construction vehicles associated with the project, the Proponent must commission an independent, qualified person or team to undertake a **Road Dilapidation Report** for Yallah Bay Road. The report must assess the current condition of the road and describe mechanisms to restore any damage that may result due to traffic and transport related to the construction of the project. The Report must be submitted to the relevant road authority for review prior to the commencement of haulage.

The Proponent must ensure that any measures to restore or reinstate roads affected by the project are undertaken in a timely manner, in accordance with the requirements of and to the satisfaction of the relevant road authority, and at the full expense of the Proponent. In the event of a dispute between the parties with respect to the extent of restorative work that may be required under this condition, any party may refer the matter to the Secretary for resolution. The Secretary's determination of any such dispute must be final and binding on the parties.

Waste Generation and Management

3.58 All waste materials removed from the site must only be directed to a waste management facility lawfully permitted to accept the materials.

3.59 The Proponent must, to the extent that is reasonable and feasible, maximise the treatment, reuse and/or recycling on the project site of any waste oils, excavated soils, vegetation, slurries, sludges or other solid and liquid waste materials associated with the project, to minimise the need for treatment or disposal of those materials outside the power station.

3.60 The Proponent must not cause, permit or allow any waste generated outside the site to be received at the site for storage, treatment, processing, reprocessing, or disposal on the site, except as expressly permitted by a licence under the *Protection of the Environment Operations Act 1997*, if such a licence is required in relation to that waste.

3.61 The Proponent must ensure that all liquid and/or non-liquid waste generated on the site is assessed and classified in accordance with *Waste Classification Guidelines* (EPA, 2009), or any superseding document.

4. ENVIRONMENTAL MONITORING AND AUDITING

Operational Noise Review

4.1 Within 90 days of the commencement of operation of the project, or as may be agreed by the Secretary, and during a period in which the project is operating under design loads and normal operating conditions, the Proponent must undertake an **Operational Noise Review** to confirm the noise emission performance of the project. The Review must be prepared in consultation with, and to the satisfaction of, the EPA.

4.2 Noise monitoring is to be consistent with the guidelines provided in the *Noise Policy for Industry (NSW EPA, 2017)* and must include attended noise monitoring at the receiver locations identified in Table 1 and Table 2. The noise assessment must include monitoring of operations that have the potential to cause offensive noise including, but not limited to, safety valve operation, blowdown operation and the operation of circuit breakers during the day, evening and night time periods at the locations defined in condition 3.5 of this approval.

4.3 For the purpose of assessment of noise emissions, noise from the project must be:

a) measured at the most affected point within the residential boundary or at the most affected point within 30 metres of the dwelling where the dwelling is more than 30 metres from the boundary;

b) measured at one metre from the dwelling facade to determine compliance with the L_{Amax} noise limits specified in Table 1 and in Table 2 of this approval; and

c) in the case of the proposed residential areas within the Tallawarra Lands, measured at the most affected point within each residential area.

Notwithstanding, should direct measurement of noise from the project be impractical, the Proponent may employ an alternative noise assessment method deemed acceptable by the EPA (refer to *Noise Policy for Industry* (NSW EPA, 2017). Details of such an alternative noise assessment method accepted by the EPA must be submitted to the Secretary prior to the implementation of the assessment method.

4.4 A report providing the results of the Operational Noise Review must be submitted to the Secretary and the EPA within 90 days of completion of the monitoring. The report must include, but not necessarily be limited to:

a) a description of the methodologies for noise monitoring, including the location of monitoring sites and frequency of monitoring;
b) documentation of the operational noise levels at the locations defined in Table 1 and Table 2 of this approval as ascertained by the noise monitoring program;
c) an assessment of the noise performance of the project against the noise limits specified in Table 1 and Table 2 of this approval and the predicted noise levels as detailed in the report referred to under condition 1.1c) of this approval;
d) details of the meteorological conditions prevailing during the monitoring; and
e) details of any entries in the Complaints Register (condition 6.3 of this approval) relating to noise impacts.

Ongoing Operational Noise Monitoring

4.5 The Proponent must prepare and implement an **Operational Noise Monitoring Program** to assess ongoing compliance against the operational noise limits set out in condition 3.5 of this approval. The noise monitoring program must be prepared in consultation with, and to the satisfaction of, the EPA. Noise monitoring is to be consistent with the guidelines provided in the *Noise Policy for Industry* (NSW EPA, 2017) and must include, but not be limited to:

a) noise monitoring at the locations specified in Table 1 and Table 2 of this approval, in accordance with the requirements of condition 4.3 of this approval;
b) attended noise monitoring;
c) monitoring of operations that have the potential to cause offensive noise including, but not limited to, safety valve operation, blowdown operation and the operation of circuit breakers during the day, evening and night time periods; and
d) monitoring of the effectiveness of any noise mitigation measures implemented under condition 3.6 of this approval, against the noise limits specified in condition 3.5 of this approval.

A report providing the results of the program must be submitted to the Secretary and the EPA within 28 days of completion of each monitoring event.

The monitoring program must form part of the Operational Noise Management Plan referred to in condition 7.5 of this approval.

4.6 Ongoing noise monitoring must be undertaken by the Proponent on an annual basis and as may be directed by the Secretary. The requirements for ongoing annual noise monitoring will be determined by the Secretary based on the results collected.

Air Quality Monitoring

4.7 The Proponent must monitor (by sampling and obtaining results by analysis) the pollutant concentrations or parameters specified in Table 9 at each of the turbine stack monitoring/discharge points described in Table 7 during operation. Monitoring must be undertaken during maximum load, using the specified sampling method, units of measure, and sample at the frequency in Table 9, unless otherwise agreed to by the EPA.

Table 9 – Periodic Pollutant/Parameter Monitoring (Air)

Pollutant/Parameter	Units of Measure	Frequency	Sampling Method
Nitrogen dioxide (NO_2) or nitric oxide (NO) or both, as NO_2 equivalent	ppm	Continuous	CEM-2 and US EPA Procedure 1
Moisture	%	Continuous	Special Method 1 and US EPA Procedure 1
Oxygen	%	Continuous	CEM-3 and US EPA Procedure 1
Temperature	°C	Continuous	TM-2 and US EPA Procedure 1

Pollutant/Parameter	Units of Measure	Frequency	Sampling Method
Velocity	m/s	Continuous	CEM-6 and US EPA Procedure 1
Volumetric flow rate	m^3/s	Continuous	CEM-6 and US EPA Procedure 1
Selection of sampling positions	-	-	TM-1

Note:
For the purpose of the Table above, Special Method 1 means any moisture monitoring method approved in writing by the EPA and US EPA Procedure 1. The sampling methods are those specified in the Approved Methods for the Sampling and Analysis of Air Pollutants in NSW (EPA, 2016), or its latest version.

Air Quality Performance Verification

4.8 Within six months of the commencement of operation of the project, or as may be agreed or directed by the Secretary, and during a period in which the project is operating at both maximum design loads and under normal operating conditions, the Proponent must undertake a program to confirm the air emission performance of the project. The program must include, but not necessarily be limited to:

a) point source emission sampling and analysis subject to the requirements listed under condition 4.7 to determine compliance with the stack discharge concentration limits identified in condition 3.24;
b) a comprehensive air quality impact assessment, using actual air emission data collected under a). The assessment must be undertaken strictly in accordance with the methods outlined in *Approved Methods and Guidance for the Modelling and Assessment of Air Pollutants in New South Wales* (EPA, 2017), or its latest version;
c) a comparison of the results of the air quality impact assessment required under b) above, and the predicted air quality impacts detailed in the Air Quality Assessment, Tallawarra B Permit Modification: Air Quality Assessment, EnergyAustralia, Katestone, dated June 2020;
d) a comparison of the results of the air quality impact assessment required under b) above, and the impact assessment criteria detailed in *Approved Methods and Guidance for the Modelling and Assessment of Air Pollutants in NSW* (EPA, 2017), or its latest version; and
e) details of any entries in the Complaints Register (condition 6.3 of this approval) relating to air quality impacts.

A report providing the results of the program must be submitted to the Secretary and EPA within two months of completion of the testing program required under 4.8a) for both operating scenarios.

4.9 In the event that results of the air dispersion modelling indicates that the operation of the project, under maximum design loads or normal operating conditions, will lead to:

a) greater point source emissions of air pollutants than permitted under Condition 3.24 of this approval; or
b) greater ground-level concentrations of air pollutants than the impact assessment criteria detailed in *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales* (EPA 2017);

then the Proponent must provide details of remedial measures to be implemented to reduce point source emissions and/ or ground-level concentrations of air pollutants to no greater than permitted under this approval. Details of the remedial measures and a timetable for implementation must be submitted to the EPA for approval within such period as the EPA may require, unless agreed otherwise by Secretary.

Water Quality Monitoring

4.10 Deleted.

4.11 Deleted.

4.12 Deleted.

4.13 Deleted.

Weather Monitoring

4.14 The Proponent must monitor the weather parameters in Table 10 on site in accordance with the specified sampling methods, units of measure, averaging periods and frequency.

Table 10 - Weather Monitoring

Parameter	Units of Measure	Frequency	Averaging Period	Sampling Method
Rainfall	mm	Continuous	1 hour	AM-4
Wind speed @ 10 metres	m/s	Continuous	15 minute	AM-2 & AM-4
Wind direction @ 10 metres		Continuous	15 minute	AM-2 & AM-4
Temperature @ 2 metres	°C	Continuous	15 minute	AM-4
Temperature @ 10 metres	°C	Continuous	15 minute	AM-4
Sigma theta @ 10 metres		Continuous	15 minute	AM-2 & AM-4
Solar radiation	W/m²	Continuous	15 minute	AM-4
Additional requirements - Siting - Measurement				 AM-1 & AM-4 AM-2 & AM-4

Hazard Audit

4.15 Twelve months after the commencement of operation of the project, or within such period otherwise agreed by the Secretary, the Proponent must commission an independent, qualified person or team to undertake a comprehensive Hazard Audit of the project. Further Hazard Audits must be undertaken every three years thereafter. Hazard Audits must be carried out in accordance with the Department's publication *Hazardous Industry Planning Advisory Paper No. 5 - Hazard Audit Guidelines*.

5. COMPLIANCE REPORTING AND AUDITING

5.1 The Proponent must notify the Department within 24 hours of an incident occurring. The notification must be made using the Department's Major Projects website and address details of the incident including:

a) date, time and location of the incident;
b) a brief description of what occurred and why it has been classified as an incident;
c) a description of what immediate steps were taken in relation to the incident; and
d) identifying a contact person for further communication regarding the incident.

5.1A The Proponent must provide the Department with a subsequent incident report in accordance with Appendix 1.

Non-Compliance Notification

5.2 Within seven days of becoming aware of a non-compliance, the Proponent must notify the Department of the non-compliance within seven days of a non-compliance occurring. The notification must:

a) be in writing and must be submitted via the Department's Major Projects Website;
b) identify the development (including the development application number and name);
c) set out the condition of this consent that the development is non-compliant with, why it does not comply, the reasons for the non-compliance (if known); and

d) set out what actions have been, or will be, undertaken to address the non-compliance.

Note: A non-compliance which has been notified as an incident does not need to also be notified as a noncompliance.

5.3 Deleted.

5.4 Deleted.

Compliance Reporting

5.5 Compliance Reports of the project must be carried out in accordance with the Compliance Reporting Requirements outlined in the *Compliance Reporting Post Approval Requirements* (2020).

5.6 Compliance Reports must be submitted to the Department in accordance with the timeframes set out in the *Compliance Reporting Post Approval Requirements* (2020), unless otherwise agreed to by the Secretary.

5.7 The Proponent must make each Compliance Report publicly available within 60 days of submitting it to the Secretary, unless otherwise agreed by the Secretary.

5.8 Notwithstanding the requirements of the *Compliance Reporting Post Approval Requirements* (2020), the Secretary may approve a request for ongoing annual operational compliance reports to be ceased, where it has been demonstrated to the Secretary's satisfaction that an operational compliance report has demonstrated operational compliance.

Independent Environmental Audit

5.9 An independent environmental audit must be undertaken for the project. The audit must be:

a) undertaken within six months of commencing operations, and every three years thereafter, unless the Secretary directs otherwise;
b) led by a suitably qualified, experienced, and independent auditor whose appointment has been endorsed by the Secretary;
c) prepared in accordance with the *Independent Audit Post Approval Requirements* (NSW Government, 2020, or latest version); and
d) undertaken to the satisfaction of the Secretary, and an audit report must be submitted within two months of undertaking the independent audit site inspection, unless otherwise agreed by the Secretary.

5.10 Deleted.

5.11 Deleted.

5.12 In accordance with the specific requirements in the *Independent Audit Post Approval Requirements (2020)*, the Proponent must:

a) review and respond to each Independent Audit Report prepared under condition 5.9 of this approval where notice is given by the Secretary;
b) submit the response to the Secretary and any other NSW agency that requests it, together with a timetable for the implementation of the recommendations of the independent audit report;
c) implement the recommendations to the satisfaction of the Secretary; and
d) make each Independent Audit Report, and response to it, publicly available within 60 days of submission to the Secretary.

5.13 Deleted.

5.14 Deleted.

6. COMMUNITY INFORMATION, CONSULTATION AND INVOLVEMENT

6.1 Subject to confidentiality, the Proponent must make all documents required under condition 6.4 of this approval available for public inspection on request.

Complaints Procedure

6.2 Prior to the commencement of construction of the project, the Proponent must ensure that the following are available for community complaints for the life of the project (i.e. construction and operation):

a) a telephone number on which complaints about construction and operational activities at the site may be registered;
b) a postal address to which written complaints may be sent; and
c) an email address to which electronic complaints may be transmitted.

The telephone number, the postal address and the email address must be displayed on a sign near the entrance to the site, in a position that is clearly visible to the public, and which clearly indicates the purpose of the sign.

The telephone number, postal address and email address must be published in a newspaper circulating in the local area prior to the commencement of construction of the project and prior to the commencement of operation. The details must also be provided on the website required by condition 6.4 of this approval.

6.3 The Proponent must record details of all complaints received through the means listed under condition 6.2 of this approval in an up-to-date Complaints Register. The Register must record, but not necessarily be limited to:

a) the date and time of the complaint;
b) the means by which the complaint was made (telephone, mail or email);
c) any personal details of the complainant that were provided, or if no details were provided, a note to that effect;
d) the nature of the complaint;
e) any action(s) taken by the Proponent in relation to the complaint, including any follow-up contact with the complainant; and
f) if no action was taken by the Proponent in relation to the complaint, the reason(s) why no action was taken.

The Complaints Register must be made available for inspection by the Secretary upon request.

The Complaints Register for the project may be incorporated into an existing complaints handling system managed by the Proponent if it is demonstrated to meet the requirements of condition 6.3.

Access to Information

6.4 Before the commencement of construction until the completion of all rehabilitation required under this approval, the Proponent must:

a) make the following information and documents (as they are obtained, approved or as otherwise stipulated within the conditions of this approval) publicly available on its website:
   - the EA;
   - all current statutory approvals for the project;
   - all approved strategies, plans and programs required under the conditions of this approval;
   - the proposed staging plans for the project if the construction, operation or decommissioning of the project is to be staged;

- regular reporting on the environmental performance of the project in accordance with the reporting requirements in any plans or programs approved under the conditions of this approval;
- a comprehensive summary of the monitoring results of the project, reported in accordance with the specifications in any conditions of this approval, or any approved plans and programs;
- a summary of the current phase and progress of the project;
- contact details to enquire about the development or to make a complaint;
- a complaints register, updated monthly;
- the Annual Reviews of the project;
- audit reports prepared as part of any Independent Environmental Audit of the project and the Proponent's response to the recommendations in any audit report;
- any other matter required by the Secretary; and

b) keep such information up to date, to the satisfaction of the Secretary.

Community Consultation

6.5 At least one month prior to the commencement of construction of the project, or within such a period otherwise agreed by the Secretary, the Proponent must prepare and implement a Community Consultation Program. The program must be ongoing throughout the construction phase of the project and for at least the first 12 months of operation. The program must include, but not necessarily be limited to:

a) the general types of information on the timing, progress, construction, operation and environmental management of the project;
b) the means by which the information would be provided to the community (for example, presented at regular meetings, published in regular newsletters etc);
c) the spatial extent of the community to be consulted; and
d) a mechanism through which the community can provide feedback to the Proponent in relation to the environmental management and impacts of the development.

The Program must be submitted for the approval of the Secretary, prior to the commencement of construction of the development.

7. ENVIRONMENTAL MANAGEMENT

Environmental Representative

7.1 At least one month prior to the commencement of any site preparation and/or construction activities, or as otherwise agreed by the Secretary, the Proponent must nominate for the approval of the Secretary a suitably qualified and experienced Environmental Representative(s) independent of the design and construction personnel. The Proponent must engage the Environmental Representative(s) during all construction activities, or as otherwise agreed by the Secretary. The Environmental Representative(s) must be the Proponent's principal point of advice in relation to the environmental performance of the project and must have responsibility for:

a) overseeing the implementation of all construction environmental management plans and monitoring programs required under this approval, and advise the Proponent upon the achievement of these plans/programs;
b) considering and advising the Proponent on its compliance obligations against all matters specified in the conditions of this approval and the Statement of Commitments as referred to under condition 1.1c) of this approval, and permits and licences; and
c) having the authority and independence to recommend to the Proponent reasonable steps to be taken to avoid or minimise unintended or adverse environmental impacts, and, failing the effectiveness of such steps, to recommend to the Proponent that relevant activities are to be ceased as soon as reasonably practicable if there is a significant risk that an adverse impact on the environment will be likely to occur.

Construction Environmental Management Plan

7.2 The Proponent must prepare a **Construction Environmental Management Plan** (CEMP) to outline environmental management practices and procedures to be followed during construction of the project. The CEMP must be consistent with the *Guideline for the Preparation of Environmental Management Plans* (Department of Infrastructure, Planning and Natural Resources, 2004), or its latest version, and must include, but not necessarily be limited to:

a) a description of all activities to be undertaken on the site during construction including an indication of stages of construction;
b) statutory and other obligations that the Proponent is required to fulfil prior to and during construction including all approvals, consultations and agreements required from authorities and other stakeholders, and key legislation and policies;
c) details of how the environmental performance of the construction works will be monitored, and what actions will be taken to address identified potential adverse environmental impacts. In particular, the following environmental performance issues must be addressed in the Plan -
    i) measures to monitor and manage dust emissions in consultation with the EPA,
    ii) measures, prepared in consultation with Wollongong City Council, to reduce the visual impacts of the project, including landscape plans illustrating the proposed landscape planting and any embankment works,
    iii) measures, prepared in consultation with Wollongong City Council, for managing and reducing potential flooding; and
d) electricity transmission route alignment sheets identifying the exact location of the proposed transmission lines and the location of any threatened species, threatened species habitat and Aboriginal objects in the vicinity;
e) a description of the roles and responsibilities for key personnel involved in the construction of the project;
f) the issue-specific management plans required under condition 7.3 of this approval; and
g) complaints handling procedures during construction consistent with condition 6.2 of this approval.

The Plan must be submitted for the approval of the Secretary no later than one month prior to the commencement of any construction works associated with the project, or within such period otherwise agreed by the Secretary. Construction works must not commence until written approval has been received from the Secretary.

The Proponent must implement the approved CEMP for the project.

7.3 As part of the CEMP for the project, required under condition 7.2 of this approval, the Proponent must prepare and implement the following:

a) a **Noise Management Plan** to detail measures to mitigate and manage noise during construction works, consistent with the *Interim Construction Noise Guideline* (Department of Environment and Climate Change, 2009), or its latest version. The Plan must include, but not necessarily be limited to -
    i) procedures to ensure that all reasonable noise mitigation measures are applied during construction works,
    ii) details of construction activities (including construction traffic) and equipment that have the potential to generate noise and/or vibration impacts on sensitive receivers,
    iii) the construction noise and vibration objectives for the project and all reasonable and feasible noise and vibration mitigation measures that will be implemented to control construction noise and vibration impacts, particularly where the objectives are predicted to be exceeded,
    iv) procedures for assessing noise levels at sensitive receivers and compliance, and
    v) procedures for notifying sensitive receivers of construction activities that are likely to affect their noise and vibration amenity;

b) a **Traffic Management Plan** prepared in consultation with TfNSW, Wollongong City Council and emergency services to manage the construction traffic and access impacts of the project including, but not necessarily limited to -
   i) details of how construction of project infrastructure will be managed in proximity to local and regional roads,
   ii) details of traffic routes for heavy vehicles, including any necessary route or timing restrictions for oversized loads,
   iii) construction vehicle volumes (construction personnel, heavy vehicle movements and oversized loads),
   iv) measures to ensure traffic volume, acoustic and amenity impacts along construction vehicle routes are minimised,
   v) details of construction activities that would require disruption to traffic such as road closures and measures to minimise impacts,
   vi) a Construction Vehicle Code of Conduct to set driver behaviour controls to minimise impacts on land uses along haulage routes, and
   vii) evidence that all statutory responsibilities with regard to road traffic impacts have been complied with;

c) **Flora and Fauna Management Plan** to manage flora and fauna impacts during construction in consultation with the BCS. The Plan must include, but not necessarily be limited to:
   i) details of all impacted and potentially affected threatened flora and fauna species (including ecological communities) and specific management procedures for each of these species,
   ii) general management procedures for both the removal of redundant transmission lines and construction of new transmission lines within vegetated areas, including the procedures for clearing vegetation and minimising the extent of clearing, weed management and the rehabilitation of any disturbed vegetation, and
   iii) proposed revegetation and rehabilitation measures, including completion criteria and monitoring, for any cleared areas, offset areas, and riparian zones along Yallah Creek;

d) a **Soil and Water Management Plan** prepared in consultation with the DCCEEW Water, EPA and Wollongong City Council to detail measures to mitigate and manage soil erosion and the discharge of sediment and other pollutants to land and/or water during construction. The Plan must include, but not necessarily be limited to:
   a) identification of the construction activities that could cause soil erosion or discharge sediment or water pollutants from the site,
   b) a description of the management methods to minimise soil erosion or discharge of sediment or water pollutants from the site, including a strategy to minimise the area of bare surfaces and stabilise disturbed areas, and plan drawings showing the locations for sediment and erosion control measures,
   c) demonstration that the proposed erosion and sediment control measures will conform with, or exceed, the relevant requirements of *Managing Urban Stormwater: Soils and Construction* (Landcom, 2004),
   d) details on the installation, monitoring and maintenance requirements for each of the recommended measures for erosion and sediment control,
   e) details of stormwater overflow paths and measures for managing overflows,
   f) detailed drawings of any engineering structures such as sediment and evaporation ponds, including design standards and management regimes; and

e) **Aboriginal Cultural Heritage Management Plan** to manage potential Aboriginal cultural heritage impacts during construction in consultation with Heritage NSW. The Plan must include, but not necessarily be limited to:
   i) procedures for the management of any recorded sites within the project area including those required under condition 3.54 of this approval,
   ii) an Aboriginal Cultural Education Program for the induction of personnel and contractors involved in the construction of the project,
   iii) details of proposed further archaeological investigations and/or salvage projects prior to impact as required under condition 3.56 of this approval,
   iv) identification and management of previously unrecorded sties,

v) details of an appropriate keeping place agreement with local Aboriginal community representatives for any Aboriginal objects salvaged through the development process, and
vi) procedures for ongoing Aboriginal consultation and involvement.

Operation Environmental Management Plan

7.4 The Proponent must prepare an **Operation Environmental Management Plan** (OEMP) to detail an environmental management framework and the practices and procedures to be followed during operation of the project. The Plan must be consistent with *Guideline for the Preparation of Environmental Management Plans* (Department of Infrastructure, Planning and Natural Resources, 2004), or its latest version, and must include, but not necessarily be limited to:

a) identification of all relevant statutory and other obligations that the Proponent is required to fulfil in relation to operation of the project, including all relevant approvals, licences, and permits;
b) overall environmental policies, guidelines and principles to be applied to the operation of the project;
c) relevant standards to be applied to the project and details of how the environmental performance of the operation of the project will be monitored and managed to meet the standards. Environmental performance issues must include, but not be limited to –
   i) measures to monitor and maintain offset measures implemented in accordance with condition 3.41 of this approval,
   ii) methods to monitor and maintain revegetated areas (including riparian areas) during the establishment phase and long term,
   iii) ongoing measures to monitor and control the spread of weeds,
   iv) ongoing measures to control soil erosion and sedimentation;
   v) water management plan, prepared in consultation with the EPA, identifying clean water and dirty water (i.e. waste water streams) areas on site maps, waste water volumes, sources and pollutants, and details of the water management measures to be implemented to manage the specific pollutant streams and clean water runoff,
   vi) procedures for planned and unplanned water discharges from the site, and
   vii) emergency response procedures in the event of flooding;
d) a description of the roles and responsibilities for all relevant employees involved in the operation of the project;
e) a means by which environmental performance can be periodically reviewed and improved, where appropriate and what actions will be taken to address identified potential adverse environmental impacts;
f) Removed;
g) management policies to ensure that environmental performance goals are met and to comply with the conditions of this approval; and
h) the environmental monitoring requirements outlined under conditions 4.5 to 4.14 of this approval, inclusive.

The Plan must be submitted for the approval of the Secretary no later than one month prior to the commencement of operation of the project, or within such period otherwise agreed by the Secretary. Operation must not commence until written approval has been received from the Secretary.

The Proponent must implement the approved OEMP for the project.

7.5 As part of the OEMP for the project, required under condition 7.4 of this approval, the Proponent must prepare and implement the following Management Plans:

a) an **Air Quality Management Plan** in consultation with the EPA to outline measures to manage impacts from the project on local and regional air quality. The Plan must include, but not necessarily be limited to -

i) identification of all major sources of particulate and gaseous air pollutants that may be emitted from the project, being both point-source and diffuse emissions, including identification of the major components and quantities of these emissions,
ii) monitoring for gaseous and particulate emissions from the project,
iii) procedures for the minimisation of gaseous and particulate emissions from the project, including pro-active and reactive management and response mechanisms, with specific reference to measures to be implemented and actions to be taken to minimise and prevent potential elevated air quality impacts on surrounding land uses as a consequence of meteorological conditions, upsets within the project, or the mode of operation of the project at any time,
iv) specific procedures for the management of generating efficiency and the minimisation of greenhouse gas emissions per unit of electricity generated,
v) procedures aimed at maximising the efficiency of the start-up and shut-down cycles for the project,
vi) provision for regular review of air quality monitoring data, with comparison of results against the predictions made in the document listed under condition 1.1c) of this approval,
vii) plans for regular maintenance of process equipment to minimise the potential for leaks and fugitive emissions, and
viii) a contingency plan should an incident, process upset or other initiating factor lead to elevated air quality impacts, whether above normal operating conditions or environmental performance goals/ limits; and

b) a **Noise Management Plan** in consultation with the EPA to detail measures to mitigate and manage noise during operation of the project. The Plan must include, but not necessarily be limited to -
i) identification of the noise limits specified under this approval,
ii) identification of operational activities that will be carried out and the associated noise sources,
iii) details of all management methods, procedures and mitigation measures that will be implemented to control individual and overall noise emissions from the site during operation,
iv) procedures for periodic consideration of noise impacts against the noise limits specified under this approval,
v) noise monitoring and reporting procedures, and
vi) procedures to generate suitable documentation for annual environmental auditing, that demonstrates that the noise limits specified under this approval are being met.

Environmental Management Strategy

7.6 Prior to commencing construction, the Proponent must prepare an Environmental Management Strategy for the project to the satisfaction of the Secretary. This strategy must:
a) provide the strategic framework for environmental management of the project;
b) identify the statutory approvals that apply to the project;
c) describe the role, responsibility, authority and accountability of all key personnel involved in the environmental management of the project;
d) describe the procedures that would be implemented to:
- keep the local community and relevant agencies informed about the operation and environmental performance of the project;
- receive, handle, respond to, and record complaints;
- resolve any disputes that may arise;
- respond to any non-compliance;
- respond to emergencies; and

e) include:
- references to any strategies, plans and programs approved under the conditions of this approval; and
- a clear plan depicting monitoring to be carried out under the conditions of this approval.

Following the Secretary's approval, the Proponent must implement the Environmental Management Strategy.

Revision of Strategies, Plans and Programs

7.7 Within 3 months, unless the Secretary agrees otherwise, of:

a) the submission of an incident report under condition 5.1 of this approval;
b) the submission of an Independent Environmental Audit report under condition 5.9 of this approval;
c) the approval of any modification to the conditions of this approval; or
d) a direction from the Secretary under condition 1.3 of this approval;

the Proponent must review and, if necessary, revise the studies, strategies or plans required under the conditions of approval to the satisfaction of the Secretary.

Where this review leads to revisions in any such document, then within 4 weeks of the review the revised document must be submitted to the Secretary for approval, unless otherwise agreed with the Secretary.

Note: This is to ensure the strategies, plans and programs are updated on a regular basis, and incorporate any recommended measures to improve the environmental performance of the project.

Updating and Staging of Studies, Strategies and Plans

7.8 To ensure the studies, strategies and plans for the project are updated on a regular basis and incorporate any required measures to improve the environmental performance of the project, the Proponent may submit revised studies, strategies or plans required for the project under the conditions of approval at any time. With the agreement of the Secretary, the Proponent may also submit any study, strategy or plan required under the conditions of this approval on a staged basis.

The Secretary may approve a revised strategy or plan required under the conditions of approval, or the stage submission of these documents, at any time. With the approval of the Secretary, the Proponent may prepare the revised or staged strategy or plan without undertaking consultation with all parties nominated under the applicable condition in this approval.

Notes:

- *While any study, strategy or plan may be submitted on a progressive basis, the Proponent must ensure that the existing operations on site are covered by suitable studies, strategies or plans at all times.*
- *If the submission of any study, strategy or plan is to be staged, then the relevant study, strategy or plan must clearly describe the specific stage to which the study, strategy or plan applies, the relationship of this stage to any future stages, and the trigger for updating the study, strategy or plan.*

APPENDIX 1: INCIDENT NOTIFICATION AND REPORTING REQUIREMENTS

WRITTEN INCIDENT NOTIFICATION REQUIREMENTS

1. A written incident notification addressing the requirements set out below must be submitted to the Secretary via the Major Projects website within seven days after the Proponent becomes aware of an incident. Notification is required to be given under this condition even if the Proponent fails to give the notification required under condition 5.1 or, having given such notification, subsequently forms the view that an incident has not occurred.

2. Written notification of an incident must:
   a) identify the development and application number;
   b) provide details of the incident (date, time, location, a brief description of what occurred and why it is classified as an incident);
   c) identify how the incident was detected;
   d) identify when the Proponent became aware of the incident;
   e) identify any actual or potential non-compliance with conditions of approval;
   f) describe what immediate steps were taken in relation to the incident;
   g) identify further action(s) that will be taken in relation to the incident; and
   h) identify a project contact for further communication regarding the incident.

3. Within 30 days of the date on which the incident occurred or as otherwise agreed to by the Secretary, the Proponent must provide the Secretary and any relevant public authorities (as determined by the Secretary) with a detailed report on the incident addressing all requirements below, and such further reports as may be requested.

4. The Incident Report must include:
   a) a summary of the incident;
   b) outcomes of an incident investigation, including identification of the cause of the incident;
   c) details of the corrective and preventative actions that have been, or will be, implemented to address the incident and prevent recurrence; and
   d) details of any communication with other stakeholders regarding the incident.

Appendix H: Evidence of agency consultation

From: Tylah Batistuzo-Hale <tylah.batistuzo-hale@epa.nsw.gov.au>
Sent: Wednesday, 5 July 2023 10:30 AM
To: [redacted]@energyaustralia.com.au>
Cc: [redacted]@aurecongroup.com>; Greg Newman <Greg.Newman@epa.nsw.gov.au>
Subject: EPA Comments on Draft Operational Environmental Management Plan - Energy Australia - Tallawarra Power Station - EPL 555

Good morning [redacted]

The New South Wales Environment Protection Authority (EPA) have reviewed the proposed Operational Environmental Management Plan (OEMP) for Environment Protection Licence (EPL) 555, prepared by Aurecon on behalf of EnergyAustralia.

EnergyAustralia has consulted the EPA on the development of an OEMP, as per Items 7.5 (a), 7.5 (b) and 7.4 (c) (v) of the Project Planning Ministers Conditions of Approval, in addition to Condition E6.1 of EPL 555.

The EPA have assessed the proposed Noise Management Plan (Section 5.7 of the OEMP) and believe that the scope of the proposed Operational Noise Review appears reasonable. In order to definitively state that the proposed Operational Noise Review satisfies Condition 4.1-4.4 of the Project Approval (Application No. 07_0124), the EPA must first review the report generated upon its completion, in line with section 5.7.5 of the OEMP.

The EPA are in agreement with EnergyAustralia's proposed OEMP and offer no further comments.

Please consider this email EPA's formal response, thus satisfying the Minister's Conditions of Approval and Condition E6.1 of EPL 555.

Warm regards,

Tylah Batistuzo-Hale
Operations Officer
Regulatory Operations
NSW Environment Protection Authority
M 0484 667 749

Appendix I: DPE Letter – Aviation Impact Assessment

Department of Planning and Environment

Mr Ian Black
Tallawarra B Project Director
EnergyAustralia Pty Ltd (EnergyAustralia)

12 May 2023

Subject: Tallawarra B Power Station Project - Aviation Impact Assessment

Dear Mr Black

I refer to the following additional information provided by EnergyAustralia to the Department of Planning and Environment (the Department) based on the Tallawarra B Power Station Project (the project) final design (Version 3B) and satisfy condition 1.6 of the project approval:

- updated computational fluid dynamic (CFD) plume modelling for the project's Version 3B design (by Stacey Agnew Pty Ltd, dated 7 March 2023);
- independent expert review report to verify and validate the Version 3B CFD plume modelling (by Mr David Featherston, GHD Pty Ltd, dated 4 April 2023); and
- review of protection surfaces of the project's Aviation Impact Assessment (by Aviation Projects, dated 29 March 2023).

The Department has carefully reviewed the above listed information and notes that the Version 3V plume modelling report and the independent expert review report concluded that project would be able to meet CASA's requirements, as the Version 3B assessment was undertaken in accordance with:

- CASA's latest Advisory Circular (AC) 139.E-02v1.0, dated March 2023, including requirements set out in section 2.5 of the AC for commissioning of an independent review of the plume study for a stack design involving engineering modifications aimed to reduce the impact of the plume rise, such as any CFD modelling undertaken for the assessment; and
- CASA's previous advice (dated 29 March 2021) that a critical plume velocity (CPV) lower than 6.1 m/s by 700 feet above mean sea level (ft AMSL) would be required to be met to achieve an acceptable level of safety for aviation, accepting half of the maximum reported CFD vertical velocity at a horizontal plane is a reasonable and acceptable method for deriving the CPV.

CASA also provided advice (dated 30 March 2023 and 27 August 2021) (**Attachment A**) advising that an independent review should be commissioned. The Department notes that GHD has provided an independent review on the CFD modelling. If CASA provide any further advice we will provide this to EnergyAustralia.

Consistent with the Department's conditional approval of the Aviation Impact Assessment for the project (dated 17 September 2021), the Department considers that the project's Version 3B design satisfies condition 1.6 of the project approval, subject to EnergyAustralia providing the following information prior to operations, to the satisfaction of the Planning Secretary:

- a report confirming that all the mitigation measures and the inclusion of a plume symbol on aeronautical charts have been or would be implemented (noting that some measures can only be implemented after operations have commenced), as listed in Section 10 of the Aviation Impact Assessment (by Aviation Projects, dated 13 February 2020); and the supplementary review of protection surfaces;
- evidence of the performance guarantee test demonstrating that the plant achieves compliance with the CPV as outlined in the plume rise performance guarantee; and
- submission of an ongoing Plume Validation Monitoring Program to be implemented during operations, incorporating a trigger-action-response plan.

The Department also advises that this advice is in relation to condition 1.6 of the project approval only and does not constitute approval or amendment of any other conditions, including noise and air quality operational requirements or limits. EnergyAustralia must comply with the conditions of approval.

If you have any questions, please contact Mandana Mazaheri at Mandana.Mazaheri@planning.nsw.gov.au.

Yours sincerely

Stephen O'Donoghue
Director
Resource Assessments

Appendix J: Plume Validation Monitoring Program

Plume Validation Monitoring Program

Tallawarra B Power Station

EnergyAustralia

LIGHT THE WAY

PROJECT	Plume Validation Monitoring Program	**DATE**	6 November 2025
GROUP	Tallawarra B Power Station	**STATUS**	FINAL
AUTHOR	Ivan Currie	**REVISION**	E
COMPANY	EnergyAustralia	**FILE NUMBER**	
FILE NAME	Tallawarra B Plume Validation Monitoring Program		

Version History

Version	Date	Author	Reason
A	12 October 2023	Simon Welchman	Initial draft
B	3 November 2023	Ivan Currie	Draft revision
C	17 June 2024	Ivan Currie	Draft revision
D	8 July 2024	Ivan Currie	Finalised document
E	6 November 2025	Ivan Currie	Document review to reflect updated CIP TARP

Glossary

Units

°C	degrees Celsius
ft	feet
K	Kelvin
kg/s	kilogram per second
km	kilometre
m	metre
m/s	metres per second
MW	megawatt

Abbreviations

AC	Advisory Circular
AGC	Automatic Generation Control
AIA	Aviation Impact Assessment

AMSL	Height Above Mean Sea Level
CASA	Australian Government Civil Aviation Safety Authority
CFD	Computational Fluid Dynamics Model
CIP	Combined Influence Parameter
DCS	Distributed Control System
DPHI	NSW Department of Planning, Housing and Infrastructure (previously NSW Department of Planning and Environment)
EA	EnergyAustralia
NSW	New South Wales
PDD	Plume Dispersion Device
SCC	Shellharbour City Council
TAPM	The Air Pollution Model
TARP	Trigger Action Response Plan
TBPS	Tallawarra B Power Station

1. Introduction

1.1 Overview

Tallawarra B Power Station (TBPS) is a peak load gas-fired power station with a nominal output of up to 320 megawatts (MW) in open cycle. The power station was granted approval by the then NSW Department of Planning in 2010 following the completion of an Environmental Impact Statement (EIS).

The TBPS design includes an exhaust stack Plume Dispersion Device (PDD) to minimise the vertical velocity of the exhaust plume and, therefore, minimises the risk to the safety of aircraft using the nearby Shellharbour Airport. The PDD reduces the vertical velocity of the plume by splitting the exhaust stream into a number of smaller components that are discharged at or below horizontal. This has the effect of removing the initial momentum and reducing the buoyancy of the plume by entraining cool air into the plume and reduces overall plume height (compared to a vertical release without a PDD).

The approval of TBPS is subject to various conditions including the following, which requires EnergyAustralia to implement a Plume Validation Monitoring Program:

> *Submission of an ongoing Plume Validation Monitoring Program to be implemented during operations, incorporating a trigger-action-response plan.*

This document is the Plume Validation Monitoring Program in response to this condition. It includes the details of the in-atmosphere plume monitoring methodology required to show that the plume complies with the plume velocity limits, and also a Trigger Action Response Plan (TARP).

The existing conditional approval dated 22 March 2024 gave an extension for submission of the plume validation monitoring program from 1 April 2024 to 30 April 2024 to allow for further consultation with CASA on the in-atmosphere plume monitoring options and the proposed methodology for a fly-through option.

A further extension for the submission of the plume validation monitoring program to 30 July 2024 was granted on 2 May 2024 to allow EnergyAustralia to complete investigations for the selected fly-through plume monitoring method and provide a recommendation for a one-off validation exercise to be undertaken by the end of September 2024.

This document was updated in June 2024 to reflect the details of the in-atmosphere plume monitoring selected 'fly-through' option, as well as amending the alarm names associated with the TARP.

A further update has been completed in September 2025 to reflect the updated TARP. This review was initiated following observations that the previous TARP configuration may have excessively reduced the machine's load, potentially accelerating equipment wear and tear. These concerns were confirmed during the assessment. The revised TARP now reduces the machines load in a manner that decreases the wear and tear on equipment whilst operating within acceptable limits.

1.2 Consultation

Community and stakeholder engagement is an integral part of any EnergyAustralia project and TBPS, and the PDD in particular, are no exception. This has included an initial program of stakeholder engagement activities, alongside targeted site investigations to understand the specific environmental, cultural and social risks associated with development of the project. Meetings were held with CASA, SCC and interested stakeholders from 2018 to 2024.

During the project's construction, EnergyAustralia has designed and implemented a bespoke, dedicated engagement strategy specifically around the PDD which has targeted key stakeholders in the lead up to receiving approval under Condition 1.6 to install the PDD.

EnergyAustralia has invested significant time and effort in making information publicly available to ensure that an informed conversation about the PDD and aviation can be had. This includes multiple fact sheets and FAQ documents on the project's website on topics included the PDD and CASA Advisory Circulars.

A large portion of the engagement to date has been with the aviation community and Shellharbour City Council (SCC), given the project's close proximity to Shellharbour Airport. Given the importance of this stakeholder, SCC was provided with a number of briefings on the CFD modelling and GHD final report prior to its lodgment with DPE. The project team has continued regular engagement with SCC, Airport Management, and aviators at Shellharbour Airport.

During a meeting with DPHI and CASA on 11 April 2024, EnergyAustralia described its investigations and potential options for in-atmosphere plume monitoring and that the fly-through option was EnergyAustralia's preferred methodology. The fly-through option is generally supported by CASA. This fly-through option is explained in detail in Section 5.

The project team continues to undertake targeted engagement in order to satisfy condition 1.6 of the TBPS approval. A summary of all engagement on the PDD has been captured in an Engagement Summary Report.

2. Tallawarra B Power Station

2.1 Overview

TBPS is to the immediate east of EnergyAustralia's Tallawarra A Power Station (TAPS) on the western edge of Lake Illawarra, approximately 4.5km northeast of Shellharbour Airport, as shown in Figure 1.

Figure 1 Location of Tallawarra B Power Station

2.2 TBPS infrastructure

TBPS is a single F-Class open cycle gas turbine (OCGT). OCGT is proven technology that is commercially viable and suited to providing for peak load requirements, with high reliability and safety, good efficiency and environmental performance and able to perform fast start ups. EnergyAustralia estimates usage of the TBPS to average about 10 percent per annum.

The exhaust gases from the OCGT are discharged via a stack. The exhaust stack is fitted with a PDD to reduce the plume vertical velocity and consequently minimise the potential impacts to the safety of aircraft using the nearby Shellharbour Airport. The PDD is shown in Figure 2 and Figure 3.

The PDD design has 12 rectangular outlets with six discharging horizontally alternating with six discharging below horizontal (the top of the rectangular outlet is angled down 23° and the bottom is angled down 20°). Exhaust gases from the gas turbine will travel through the stack and discharge via the PDD outlets.

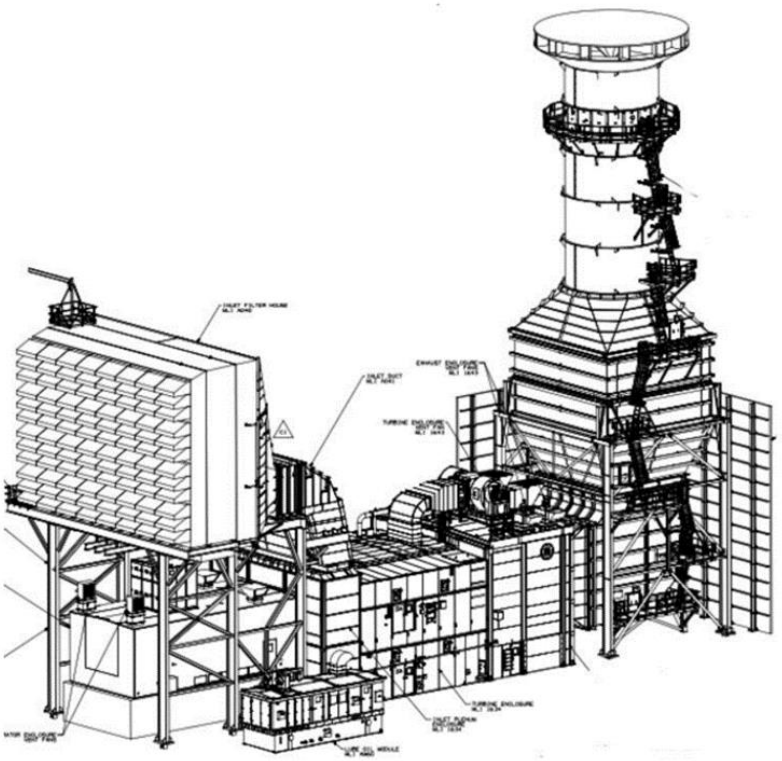

Figure 2 Tallawarra B Gas Turbine with PDD

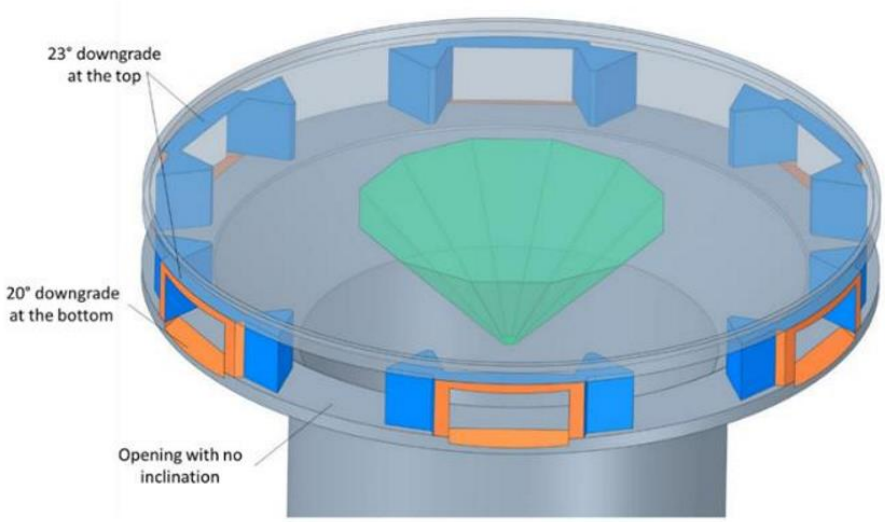

Figure 3 Tallawarra B Gas Turbine PDD design

2.3 Exhaust Characteristics

The TBPS gas turbine will operate as a peaker plant, providing additional capacity to the network during peak demand. The gas turbine will operate over a range of electricity generating loads (0-100%) and in varying ambient temperatures (-2°C to 45°C – exhaust mass flow will drop as ambient temperature increases). This will result in turbine exhaust plumes that have varying mass flow rates, temperatures, and velocities which, as a consequence, will affect the characteristics of the plume.

The TBPS PDD design was evaluated against CASA's aviation requirements using a single set of worst-case exhaust and atmospheric conditions that were chosen to represent the fastest exhaust plume to estimate worst-case potential impacts for aviation safety (PDD Design Point).

The PDD Design Point was selected as follows:

- 100% load – this generates the largest exhaust gas flow.
- Ambient conditions of 15°C
- Additionally, the exhaust mass flow and temperature were increased by an additional margin of safety so that the CIP of the PDD Design Point was above the range of ambient operating conditions from -2°C to 45°C.

The exhaust characteristics of the TBPS with PDD that have been used as input in the plume rise model are provided in Table 1. It is noted in this table that the values of the PDD exit temperature and mass flow rate were increased from the expected values by 0.9% and 1.3% respectively to provide an additional factor of safety in the design point exhaust characteristics (shown as orange square on Figure 4 - CIP graph).

Table 1 Tallawarra B Power Station design exhaust characteristics

Parameter	Units	Value
Site elevation AMSL	m	3.2
PDD exit height AMSL	m	48.2
Number of PDD outlets	#	12
Total PDD outlet area	m2	22.1
PDD outlet angle (from vertical)	°	90 113 (every 2nd opening)
PDD average outlet exit velocity	m/s	89.15
PDD Exit Temperature	°C	639.3[1]
Mass flow rate	kg/s	760.9[2]
Note: **[1] Increased by 0.9% to provide an additional safety margin** **[2] Increased by 1.3% to provide an additional safety margin.**		

Exhaust characteristics across the operating range of TBPS are shown in Table 2. These are used to calculate the Combined Influence Parameter (CIP), which is plotted in Figure 4. The CIP has been defined by GECL using the major factors that will influence plume rise. The CIP is calculated as follows:

$$CIP = \dot{M}.(T_e - T_a)$$

Where:

Ṁ is the exhaust mass flow from TBPS in kg/s

T_e is the exhaust temperature in °C

T_a is the ambient temperature in °C.

Table 2 shows the calculated CIP values for the expected operating range of the Tallawarra B unit. The values in the bottom left of Table 2 are the exhaust flow and exhaust temperature for the design point (shown as orange square on Figure 4 - CIP graph)

Table 2 Design exhaust characteristics across the operating range of the TBPS

100% Fuel Gas - NO H2																	
ESTIMATED PERFORMANCE 100% Fuel Gas - NO H2	Units	Case 1	Case 2	Case 3	Case 4	Case 5	Case 6	Case 7	Case 8	Case 9	Case 10	Case 11	Case 12	Case 13	Case 14	Case 15	
Load Condition	%	BASE	BASE	BASE	BASE	BASE	BASE	BASE	BASE	BASE	BASE	BASE	BASE	BASE	BASE	BASE	
Ambient Temperature	deg C	-2	-1	10	15	15	20	25	25	30	35	35	40	40	45	45	
Ambient Relative Humidity	%	70	70	60	60	60	70	70	70	40	30	50	50	20	20	20	
Evap. Cooler Status		Off	Off	Off	Off	On	Off	Off	On	Off	On	On	Off	Off	Off	On	**PDD**
Exhaust Flow	kg/s	759.1	758.6	753.7	751.4	752.0	749.8	748.3	747.7	749.6	742.8	740.6	704.8	700.4	666.8	741.4	**760.9**
Exhaust Temperature	deg C	618.8	619.8	629.2	633.4	631.1	635	636.6	636.6	636.3	647.3	649.2	652.9	650.1	657.2	648.8	**639.25**
	CIP (Fuel Gas) =	471273	470929	466705	464676	463290	461130	457647	457307	454456	454837	454900	431975	427307	408184	447634	**474992**

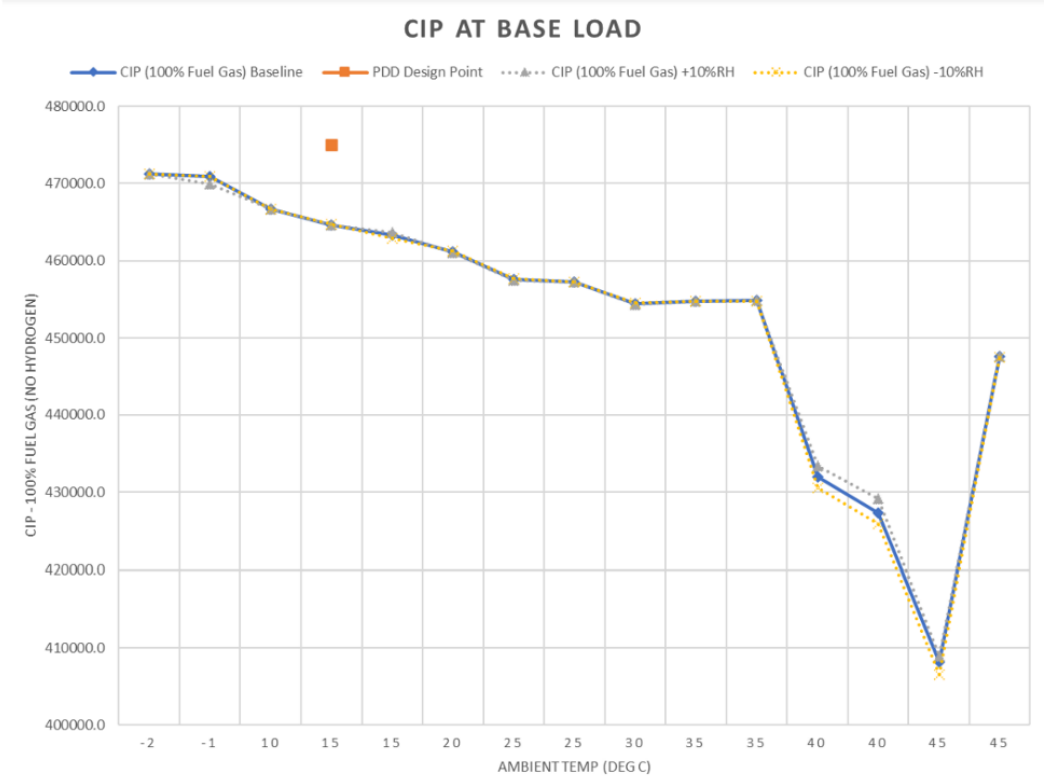

Figure 4 Tallawarra B Power Station – CIP at Base Load (GECL Design Basis)

Figure 4 shows that the PDD Design Point CIP (474,992 kg°C/s) is higher than the CIPs calculated across the operating range of the TBPS. If the TBPS CIP is below the PDD Design Point CIP, the vertical velocity of the plume will be less than the vertical velocity at the PDD Design Point. Real time CIP calculations will occur during operation using real ambient conditions.

2.4 Plume velocity characteristics at 700ft and above based on CFD modelling

Stacey Agnew was engaged by EnergyAustralia to review GECL's CFD modelling and to complete independent CFD modelling of the TBPS plume. Stacey Agnew's CFD modelling was subsequently peer reviewed by GHD.

The plume peak and average vertical velocity at 700 ft and 1,000 ft (AMSL) for the TBPS with PDD determined by CFD modelling commissioned by EnergyAustralia are provided in Table 3. In accordance with CASA's requirements, the peak vertical velocity that is calculated using a CFD model is divided by 2 to produce an average velocity for comparison with CASA's CPV of 6.1m/s.

Table 3 Plume peak and average velocity at 1,000 and 700 ft (AMSL) (GHD, 2023 and Stacey Agnew, 2023)

Scenario	Case	Peak/average plume vertical velocity (m/s)		
		700 ft	1,000 ft	> 1,000 ft
CFD 1	Previous (Stacey Agnew, 2020)	9.6 / 4.8	10.8 / 5.4	11.0 / 5.5
CFD 2	Calm wind	8.8 / 4.4	8.3 / 4.15	8.6 / 4.3
CFD 3	Hypothetical worst-case	10.1 / 5.05	11.6 / 5.8	11.9 / 5.95

The vertical velocity profile across the plume at heights of 700ft and 1,000 ft (AMSL) are shown in Figure 5 and Figure 6 for the CFD 1 scenario. The plume envelope is shown in Figure 7.

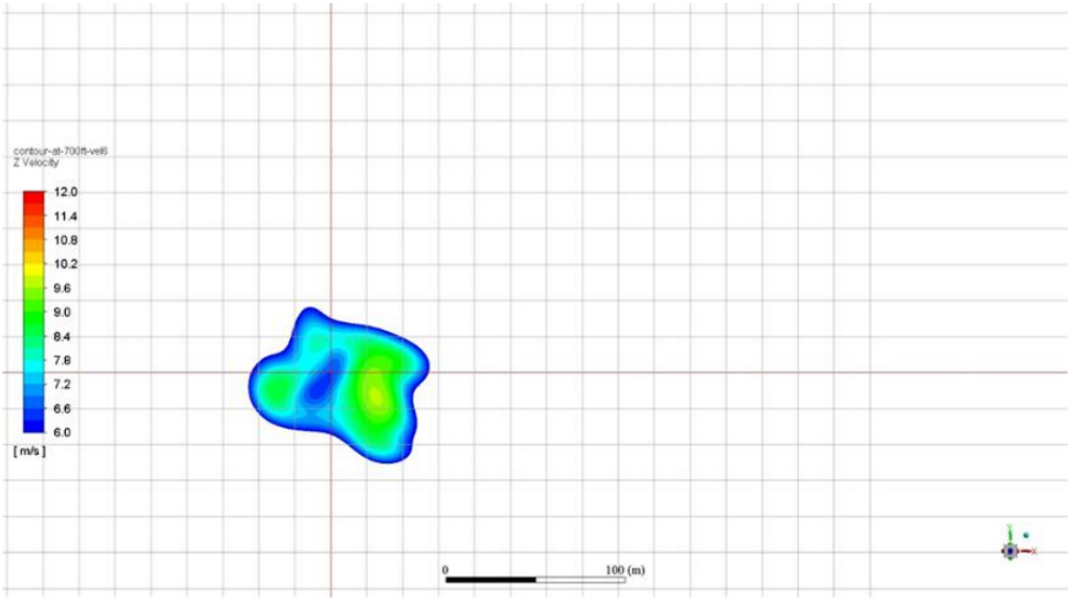

Figure 5 Vertical velocity in a horizontal plane at 700 ft (AMSL) from the TBPS with PDD (each grid is 20m x 20 m)

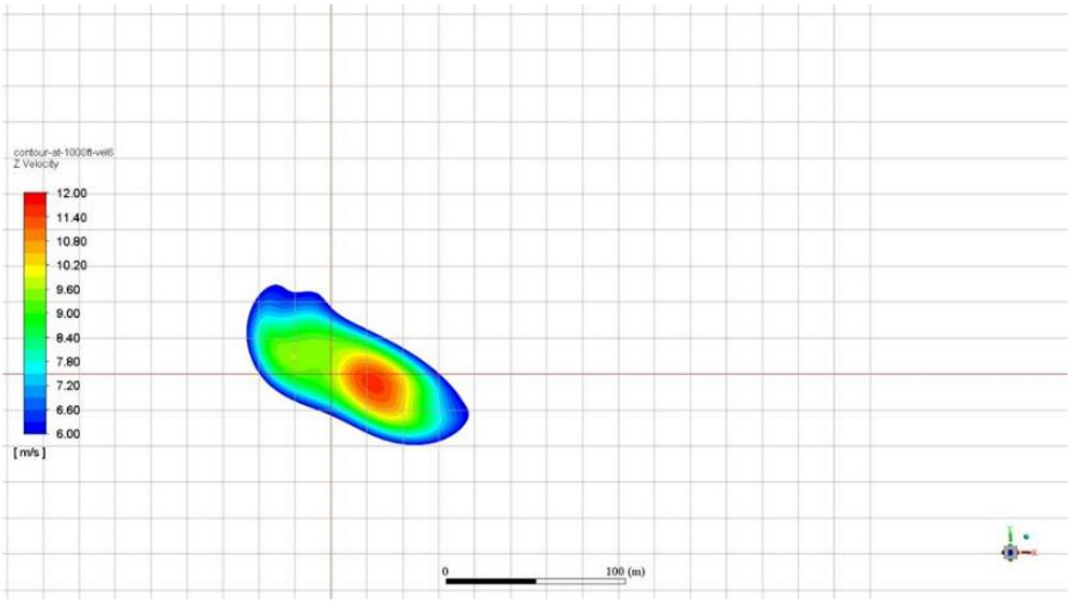

Figure 6 Vertical velocity in a horizontal plane at 1,000 ft (AMSL) from the TBPS with PDD (each grid is 20m x 20 m)

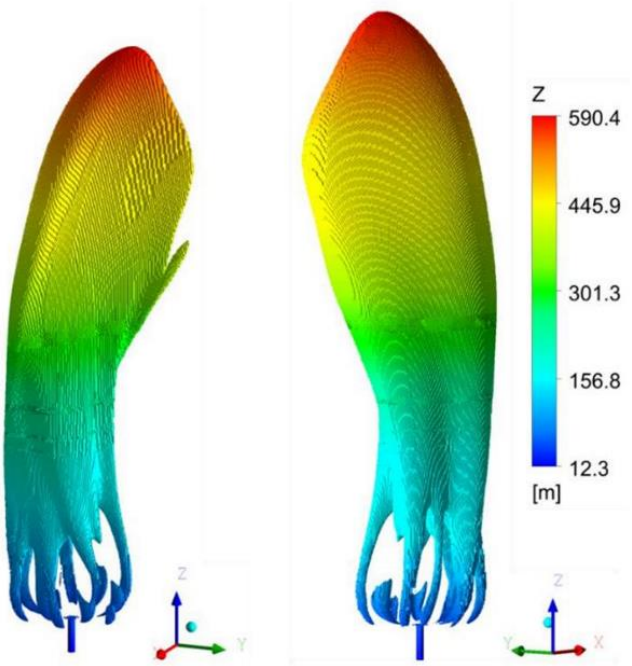

Figure 7 Plume envelope where the plume rise velocity is 6 m/s - colouring of the envelope depicts the plume height in metres

2.5 CASA response

In response to the TBPS, CASA wrote to DPHI on 27 August 2021 stating that the proposed TBPS would achieve an acceptable level of safety:

> *CASA notes that the design is first of type and based on the CFD modelling provided by Energy Australia, the plume rise velocity is expected to be below 6.1ms by 700ft AMSL Noting the information and conclusions provided in the latest EA report and based on an expectation that the final design and location will not change, CASA confirms it's previous advice that a plume rise velocity lower than 6.1ms by 700ft AMSL regardless of the plant design would achieve an acceptable level of safety for aviation.*

2.6 Mitigation measures

Whilst the TBPS meets CASA's requirements, EnergyAustralia has implemented the following measures to ensure the risk to aviation safety is further minimized:

- Implementing this plume validation monitoring program
- Alerting through AIP-ERSA (Aeronautical Information Package – En Route Supplement Australia via Airservices Australia)
- Alerting through marking and lighting
- Pilot awareness and operating procedures.

An Aviation Mitigation Activities Report (Aviation Projects, 2023) details EnergyAustralia's compliance with these commitments as per the Project approval requirements.

3. Relevant Approval and Contractual Conditions

Industrial facilities are primarily designed to ensure that exhaust gases are released such that they are adequately dispersed into the atmosphere and do not result in high concentrations of exhaust gases at ground-level. Typically, industrial facilities release exhaust gases vertically into the atmosphere from stacks. The higher the velocity and temperature of the release, the more buoyant the exhaust plume and the higher it can rise. Whilst this will lead to better dispersion of exhaust gases in the atmosphere, it also results in invisible exhaust plumes that have a potential to affect aviation safety.

CASA requires consideration of all potential hazards to the safe operation of aircraft, particularly when in proximity to airports.

Condition 1.6 of the Approval for the Tallawarra B Power Station states:

> *Nothing in this approval permits the construction and operation of an open cycle gas turbine plant, unless the Proponent has submitted a report to the Secretary which demonstrates that operation*

> *of an open cycle gas turbine plant will not have an adverse impact on aviation safety. This report must be prepared in consultation with Shellharbour City Council, and its conclusions and recommendations must have been agreed to by the CASA prior to submission to the Secretary. The report must be approved by the Secretary before commencement of construction of an open cycle plant.*

In response to this condition, EnergyAustralia submitted an Aviation Impact Assessment report known as the *Tallawarra B OCGT Aeronautical Impact Assessment* (AIA), which was completed in February 2020 in consultation with Shellharbour City Council.

The AIA, with its recommendations around aviation mitigation activities, was submitted to CASA and agreed to, before receiving approval from the DPHI Secretary.

To assess the potential hazard to aviation from industrial exhaust plumes, CASA developed an advisory circular (AC) for plume rise assessments. The TBPS was initially assessed under AC 139-5(3) Plume Rise Assessments (CASA, 2019).

AC 139-5(3) defines CPH as follows:

> *Means the height up to which the plume of critical velocity may affect the handling characteristics of an aircraft in flight.*

AC 139-5(3) defines CPV as follows:

> *A critical plume velocity of 6.1 m/s is the velocity at which a vertical plume rise can affect the handling characteristics of an aircraft in flight.*

AC 139-05 v3.0 was superseded by AC 139.E-02v1.0 in March 2023. Under Section 2.5.3 of the new AC, the critical plume velocity (CPV) of 6.1 m/s can be used to assess developments with engineering modifications (such as a PDD). The assessment is made using a CFD modelling approach and by dividing the peak vertical velocity (that is determined by CFD modelling) by 2 and comparing the resulting value with the CPV of 6.1 m/s.

If the vertical velocity is found to exceed the CPV of 6.1 m/s at any of the flight protection surfaces associated with an airport, CASA may determine the risk is unacceptable in which case the development cannot proceed or alternatively that mitigation measures may be required at the airport.

Potential mitigation measures at the airport include:

- Changes to Terminal Instrument Flight Procedures (TFP)
- Publication of the plume in AIP/charts
- Changes to air routes and lowest safe altitudes.

Under the AC, CASA does not rely upon the approval conditions of the industrial facility to ensure safe operation of aircraft. AC 139.E-02v1.0 and the preceding ACs relating to plume rise assessments do not suggest the imposition of monitoring or operating restrictions on plumes if their design is demonstrated to comply with the CPV. Consequently, the ACs do not provide a standard method for measuring the vertical velocity of the plume associated with an industrial facility.

Relevant contractual conditions are shown in the following Table 4.

Table 4 Tallawarra B - contractual conditions relating to plume velocity and the PDD

ID	Doc	Section / Item Reference	Requirement
1	Annexure A: Owner's Technical Specifications, 03May21	4.1.12, p. 57	The exhaust stack must be fitted with a PDD to reduce the Plume Vertical Velocity to meet condition 1.6 of the Government Approval.
2	Annexure A: Owner's Technical Specifications, 03May21	4.1.20, p. 60 - 63	The Contractor must design the gas turbine exhaust system to achieve the Plume Velocity Guarantee as detailed in Annexure I. Note: Section also contains additional, specific requirements pertaining to the PDD Depicts 6.1m/s at 650ft AMSL
	Annexure A: Owner's Technical Specifications, 03May21	8.1	General (Commissioning, Operations and Testing)
3	Annexure A: Owner's Technical Specifications, 03May21	8.6, p.134	Tests and inspections on Commercial Operation and Final Commercial Operation, and
4	Annexure A: Owner's Technical Specifications, 03May21	8.9, p.142	Plume Velocity Test
5	Annexure A: Owner's Technical Specifications, 03May21	Appendix I.3	Critical Documents for Review/Approval Note: Extracted pages reference specific PDD submissions that need to be made to EA; To include the submission requirements noted in Section 4.1.20, p. 60-63
6	Annexure A: Owner's Technical Specifications, 03May21	Appendix L, 1.6	Conditions of Approval
7	Annexure A: Owner's Technical Specifications, 03May21	Appendix T	Detailed Ambient Data for CFD modelling of PDD
8	Annexure I	Annexure I	Performance Guarantee Schedule Note: The Contractor guarantees that the average vertical velocity of the plume, induced by the gas turbine exhaust gas from the plume dispersion device, will not exceed 6.1 m/s at or above 700 ft AMSL under any operating condition of the New Plant and/or under any site ambient conditions.

4. Trigger Action Response Plan

4.1 Overview

There are three test procedures that will be conducted on the TBPS to determine compliance with the CPV of 6.1 m/s under the Trigger Action Response Plan (TARP), namely:

- Contract performance test procedure
- Ongoing performance review procedure
- CFD test procedure.

These test procedures are aligned with the contractual obligations between EnergyAustralia and GECL. These test procedures are described below. The outcome of testing that is conducted in accordance with the procedures is compared against the triggers that are specified in Section 4.3. The responses that will be implemented depending on the result of the test are specified in Section 4.4.

4.2 Test procedures

4.2.1 Contract performance test procedure

The contract with GECL requires a plume velocity test to be conducted to demonstrate that the vertical velocity complies with the limit of 6.1m/s above 650ft. Testing will be conducted in accordance with GE Plume Dispersion Device Design and Testing Methodology, which cites ASME PTC 22[1].

The contract test includes the following components:

(i) Measurement of exhaust gas condition:

- Exhaust mass flow calculated using Mark VI as follows:
  - Exhaust mass flow = Fuel flow + Compressor inlet mass flow – IBH mass flow + Water injection flow
- Exhaust temperature measured using field instrumentation (exhaust thermocouples).

(ii) Basis of gas turbine exhaust condition to meet plume velocity guarantee – data to be used as input to the CFD model to evaluate compliance with the Plume Velocity Performance Guarantee.

(iii) Determination of pass / fail for the guarantee – plume velocity computed using the CFD model with inputs measured / calculated and corrected as per correction curves supplied by GECL.

(iv) Determine the peak vertical velocity using the CFD model at 650ft and above. Divide the peak vertical velocity(s) by 2 to calculate the average vertical velocity and compare the resultant value(s) to the trigger in Section 4.3.

[1] ASME PTC 22-2023, Gas Turbines, Performance Test Codes, The American Society of Mechanical Engineers

All measurements and corrections are done per ASME PTC 22[2]. All tests to be completed at rated load and thermally stable condition.

The contract performance test was conducted on 25 March 2024 during the commissioning phase of TBPS, with two individual performance runs completed. Both runs produced CIP 'Pass' results for exhaust temperature and the exhaust flow of the gas turbine. The final Tallawarra B GT Exhaust Plume Velocity Validation Test Report was submitted to DPHI on 24 April 2024.

4.2.2 Ongoing performance review procedure

The ongoing performance review will involve measurement and storage of the following parameters in the TBPS historian:

Exhaust mass flow ($\dot{M}$)

Exhaust temperature (T_e)

Ambient temperature (T_a).

CIP will be calculated in the Distributed Control System (DCS) for each exhaust mass flow measurement (representing thermally stable conditions) using the following formula:

$$CIP = \dot{M}.(T_e - T_a)$$

Where:

$\dot{M}$ is the exhaust mass flow from TBPS in kg/s

T_e is the exhaust temperature in °C

T_a is the ambient temperature in °C.

On a continuous basis, the performance of the TBPS will be evaluated by assessing the CIP against the trigger level in Section 4.3.

4.2.3 CFD modelling procedure

CFD modelling will be conducted to determine the vertical velocity of the plume as part of the contract performance test and in circumstances where the CIP exceeds the trigger as described in the **Response Plan** in Section 4.4 to assess compliance with the vertical velocity trigger specified in Section 4.3 at elevations above 650ft.

CFD modelling under this TARP will be conducted in accordance with the following:

- CFD model configuration as per Stacey Agnew (6 July 2023)[3]

[2] ASME PTC 22-2023, Gas Turbines, Performance Test Codes, The American Society of Mechanical Engineers

[3] Stacey Agnew, 2023, Tallawarra B Power Station CFD Plume Modelling – GE Modified PDD Design Version 3B, Summary Report, 6 July 2023, Ref 2001

- Boundary conditions as per Stacey Agnew (6 July 2023) except meteorological data (see below)
- Geometric parameters of the stack and plume dispersion device (PDD) as per design version 3B
- Stack flow and outlet conditions – as determined by MarkVI Turbine Control
- Terrain: 30 x 30 km grid at 1 km resolution
- Meteorological data profiles (wind speed, wind direction and potential temperature from ground-level to 2000 m) either:
    - For contract performance test: according to CFD 1 conditions as per Stacey Agnew (6 July 2023); or
    - If triggered in the **Response Plan** by elevated CIP in the ongoing performance review: meteorology representative of prevailing conditions at the time of exhaust measurement.

4.3 Triggers

The following triggers are defined for this TARP:

- CIP triggers:
    - High: 472,000 kg.°C/s
    - High High: 474,000 kg.°C/s
- Critical plume velocity (CPV): average 6.1 m/s
- Proposal to modify the gas turbine in any way that would increase exhaust flow or temperature.

4.4 Response plan

The responses that will be implemented under this plan as a result of testing conducted under Section 4.2 and Section 4.2.2 and the triggers detailed in Section 4.2.3 are detailed in Appendix A.

- CIP triggers - Figure A1
- CFD trigger - Figure A2.

4.5 Timing and Reporting

Reporting to DPHI will be as follows:

- PDD Design Point CIP (474,992 kg.C/s) exceedances – as soon as possible following non-conformance and, as a minimum, within 48 hours of becoming aware of the exceedance

- CFD modelling – as required under this PVMP or in accordance with a direction from DPE
- Provision of non-compliance report – as required or in accordance with a direction from DPE
- Performance guarantee test report – within 2 weeks after completion.

4.6 Roles and responsibilities

Roles and responsibilities under this TARP are as follows:

- Site Leader is Accountable for compliance with the obligations under the PVMP
- Operations Leader is Accountable for the procedure which specifies the response to alarms, investigation process
- Operator is responsible for following the procedure and implementing the response to alarms and instigation of investigations.

5. In-atmosphere Plume Monitoring

Under the AC, CASA does not require monitoring or validation of plumes in operation. The AC does not rely upon approval conditions of the industrial facility to ensure safe operation of aircraft. Consequently, the ACs do not specify a standard method for plume validation or measuring the vertical velocity of the plume associated with an industrial facility. A similar approach is adopted in the United States.

EnergyAustralia's contract with GECL cites the contract test procedure detailed above, which uses direct measurement of the plume exhaust and CFD modelling (consistent with the methodology in CASA's AC and the basis of approval), that was independently verified to ensure that the vertical velocity requirements were met.

A number of technologies could be deployed to measure the vertical velocity of the plume induced by TBPS. These technologies include LiDAR, SoDAR, Radar, drone or unmanned aircraft, tethered blimp or balloon, and manned aircraft (fly through).

To evaluate these technologies for use in this PVMP, DPHI's requirements are relevant, namely:

> *Submission of an ongoing Plume Validation Monitoring Program to be implemented during operations, incorporating a trigger-action-response plan.*

Key specifications are as follows:

- The PVMP must be ongoing during operations of TBPS
- The PVMP must incorporate a trigger-action-response plan
- Measurement techniques must be relatable to EnergyAustralia's contract with GECL.

The technologies are summarised and compared in Appendix B.

After consultation with DPHI and CASA where it was established that both parties were technology agnostic for plume measurement, it was determined that in-stack measurement and the fly-through plume option were EnergyAustralia's preferred methods to demonstrate the vertical plume velocity for plume validation purposes and were deemed suitable applications for the Talla B plume validation obligation.

At the Shellharbour Airport Users briefing with pilots on 29th of April, the pilots were very clear in their support for fly-through. The pilots agreed that if we fly as per the proposal and find the results we expect, the issue of aviation safety will be proven to not be a concern.

5.1 Fly through plume measurement

EnergyAustralia has contracted Turbulence Solutions to undertake the fly-through plume measurement in 2024. Turbulence Solutions are based in Austria and are very experienced in measuring flow characteristics with airborne sensors and are the leading expert for inflight flow measurements, Turbulence Solutions and EnergyAustralia are very confident that in-flight data gathering from the horizontal perspective enables the pilot to focus on measurement below/at/above the inversion. This is not the case for ground based LiDar measurement.

EnergyAustralia believes both fly- through and Lidar solution will give us vertical velocity to a similar level of accuracy and prove compliance with development consent – however, only fly-through will address the actual community issue.

6. Review and revision

This plume validation monitoring program will be reviewed on an annual basis or more frequently if required and revised and updated as necessary. If revised as a result of the annual review, the revised plume validation monitoring program will be submitted to DPE.

7. References

ASME PTC 22-2023, Gas Turbines, Performance Test Codes, The American Society of Mechanical Engineers

Australian Government Civil Aviation Safety Authority Advisory Circular 139-05 v3.0, Plume rise assessments, January 2019

Australian Government Civil Aviation Safety Authority Advisory Circular 139.E-02 v1.0, Plume rise assessments, March 2023

Aviation Projects, Tallawarra B OCGT, Aviation Impact Assessment, Prepared for EnergyAustralia Developments Pty Ltd, Version 1.1, 13 February 2020

Aviation Projects, Tallawarra B Aviation Mitigation Activities, Prepared for EnergyAustralia Developments Pty Ltd, Version 1.0, 9 October 2023

GECL, Plume Dispersion Device – Design Basis, Tallawarra B Power Station, Revision F, 21 July 2023

GE, EnergyAustralia Tallawarra B Project, GE Plume Dispersion Device Design and Testing Methodology, 17 November 2020, Rev 1.

Stacey Agnew, Tallawarra B Power Station CFD Plume Modelling – GE Modified PDD Design Version 3B, Summary Report, 6 July 2023, Ref 2001

Appendix A

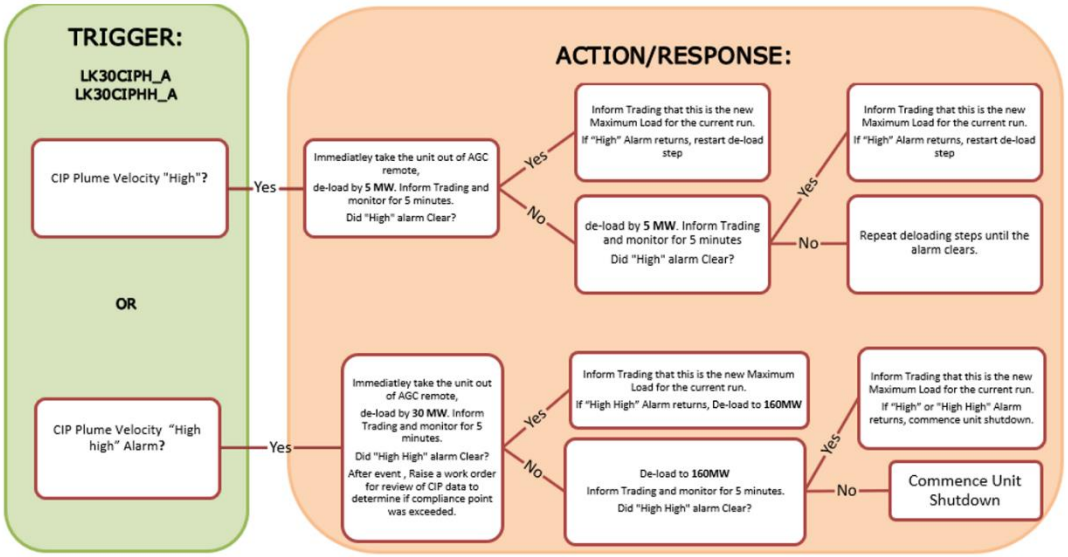

Figure A1 Combined Influence Parameter Trigger Action Response Plan

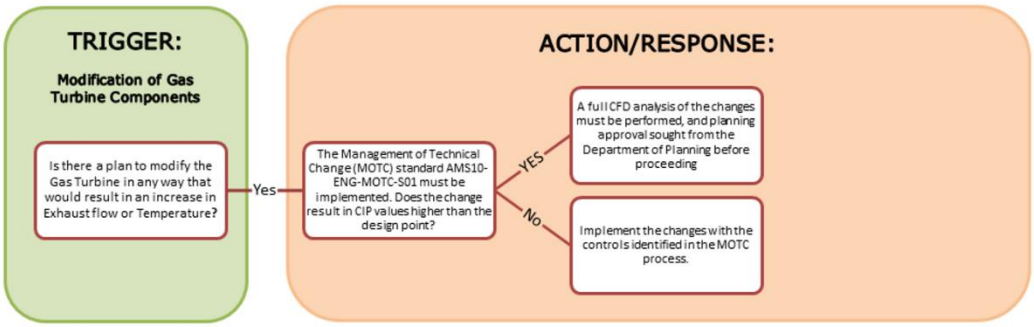

Figure A2 CFD exceeds 6.1m/s Trigger Action Response Plan

Appendix B

Comparison of alternative options to measure plume velocity

Method	Pro	Con
In stack measurement of exhaust	• Measurement is based upon the methodology approved by CASA and independently verified - direct measurement of planned versus approved parameters. • Real time results without post processing when in service. • Can make valid performance guarantee test without further modelling. • Simple measurement with equipment installed for normal power station operational control - no additional cost or reliability impact. • Functions independent of weather conditions. • Consistent with test procedure cited in contractual obligations between EnergyAustralia and GECL.	• Does not directly measure velocity at 700 ft or above.
LiDAR	• High sample density • Does not have geometry distortion. • Depending on the configuration, may be cheaper than a RADAR system	• Can be affected by heavy rain or low clouds. • Data will degrade in areas with high reflection. • Data requires post processing and can take time to analyze - not real time. • No international protocols to guide collection and analysis of data in the context of the AC and plume velocity. • Requires additional modelling to make valid performance guarantee test. Not readily applicable to a TARP. • Additional equipment, introduces reliability and availability issues. • Is not consistent with test procedure cited in contractual obligations between EnergyAustralia and GECL. • High costs
RADAR	• Is not sensitive to cloud, fog, or mist. Radar signals can penetrate through aerosol cloud droplets, which means data can be collected in adverse conditions. • Can penetrate insulators, such as rubber or plastic. • Can measure distance and velocity of a target, and whether or not an object is stationary. • Allows for repetitive coverage	• Very high costs • Beams are not target-specific. • Large objects close to the transmitter can saturate the receiver. • Objects and mediums in the air can interfere with the signal. • Signal can be interrupted by other signals in the area. • Users must be trained to interpret the data - will not provide automated real time feedback for operator action. • Limit of a radar signal is 200 ft • Requires additional modelling to make valid performance guarantee test. Not readily applicable to a TARP. • Additional equipment, introduces

Method	Pro	Con
		reliability and availability issues. • Is not consistent with test procedure cited in contractual obligations between EnergyAustralia and GECL.
SoDAR	• Potentially lower cost than radar or LiDAR • Hardware is simpler and more reliable. • Power consumption is low; they can operate from solar panels.	• Cannot operate if ambient acoustic noise is too high. • Slightly lower precision than LiDAR • They cannot operate very close to large obstacles. • Performance is dependent upon weather conditions due to the way sound is attenuated in the atmosphere. • Poorly designed systems can be affected by rain, which generates acoustic noise. • Requires additional modelling to make valid performance guarantee test. Not readily applicable to a TARP. • Additional equipment, introduces reliability and availability issues. • Is not consistent with test procedure cited in contractual obligations between EnergyAustralia and GECL.
Drone / unmanned	• Data collection can be very precise in terms of collection area and height of interest. • Flight location can change depending on needs on the day.	• Measurements are restricted to periods when the drone is aloft. • Requires a permit to operate; may not be permitted to fly at height within proximity to the airport or flight path. • Requires specialist skill to fly. • Drone-ready instrumentation options may be limited due to weight or balance restrictions. • Requires additional modelling to make valid performance guarantee test. Not readily applicable to a TARP. • Additional equipment, introduces reliability and availability issues. • Is not consistent with test procedure cited in contractual obligations between EnergyAustralia and GECL.
Tethered blimp / balloon	• A permit is not required to fly or launch a balloon. • Measurements can be precise; the instrumentation must simply be small and light enough to fly. • Requires significantly less skill to fly than other airborne systems.	• Measurements are restricted to periods when the balloon is aloft. • Measurements occur at one point only. It does not provide a complete vertical or horizontal profile of the atmosphere. • Presence of a balloon may interfere with the approach/landing pattern of nearby aircraft. • Requires additional modelling to make valid performance guarantee test. Not readily applicable to a TARP. • Additional equipment, introduces reliability and availability issues. • Is not consistent with test procedure cited in contractual obligations between EnergyAustralia and GECL.

Method	Pro	Con
Manned aircraft	• Data collection can be very precise in terms of collection area and height of interest. • Flight location can change depending on needs on the day	• Measurements are restricted to periods when the aircraft is aloft. • Requires a permit to operate at height within proximity to the airport or flight path. • Requires specialist skill to fly. • Requires additional modelling to make valid performance guarantee test.

EnergyAustralia
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