Plan

UPS-ENV-PLN-001

Uranquinty Power Station Environmental Management Plan

Version:	12.0
Released:	17 June 2022
Document Owner:	GEN Senior Environmental Business Partner
Review Date:	17 June 2025

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Contents

1. Introduction

1.1 Purpose

The purpose of this Uranquinty Power Station (UPS) Environmental Management Plan (EMP) is to communicate site specific environmental management requirements to eliminate or minimise potential adverse environmental impacts and to develop positive environmental practices.

1.2 Objectives

Pursuant to section 80(4) of the Environmental Planning and Assessment Act 1979, the power station was developed in two stages which including the construction of two 150 MW gas turbines per stage. This document has been prepared with a focus on the operational phase (post completion of the development construction) and associated risks.

The key objectives are to:

- ensure all personnel understand their environmental responsibilities; and
- ensure operational activities are conducted in accordance with regulatory approvals and applicable legislation; and
- ensure Origin environmental policies and principles are applied to the site operations.

Further objectives are to:

- Encourage continuous environmental improvement;
- Define reporting requirements and provide a framework to track and monitor compliance with statutory requirements (as detailed in Section 13.2);
- Define monitoring and performance criteria for identifying potential environmental impacts and risks; and,
- Outline procedures for responding to environmental incidents and community complaints.

The management policies implemented on site to ensure that environmental performance goals are met, and operations are conducted in accordance with regulatory approvals are as follows:Table 1.1: Origin Management Policies and Standards

Title	Document ID
Origin HSE Policy	OT ID: 26004885
ORG-RMS-DIR-001 Origin Risk Management Directive	OT ID: 23947168
GEN-HSE-PRC-008 Generation's Workplace Risk Assessment Procedure	OT ID: 36204732
UPS-HSE-ERP-001 Uranquinty Power Station Emergency Response Plan	OT ID: 36030028
UPS-ENV-PRC-002 - UPS Stormwater / Evaporation Pond Water Blending Procedure	OT ID: 36038649
UPS-AMS-PRC-033 UPS CEMS Download and Data Management	OT ID: 36095226

Title	Document ID
UPS-AMS-PRC-025 UPS Weather Data Download and Data Management	OT ID: 36090964
UPS-AMS-PRC-022 UPS NOx Indicated Exceedance Procedure	OT ID: 36100997
UPS-AMS-PRC-021 PEMS Model Calculation and Data Management	OT ID: 36097398
UPS-AMS-PRC-006 Uranquinty Total NOx Discharge Calculation Procedure	OT ID: 36073926
Emergency Management Procedure	ORG-RMS-PRO-006
Origin HSE System Directive Element 10 Emergency Response	ORG-HSE-DVE-102
GEN Group Emergency Management Plan	GEN-HSE-GEMP
GEN Emergency Response Task Cards	GEN-HSE-FRM-050
UPS Bush Fire Management Plan	UPS-HSE-PLN-006
UPS HSE Management Plan	UPS-HSE-PLN-004
UPS Emergency Response Toolkit	UPS-HSE-GDL-005
UPS Gas Safety Operating Plan	UPS-AMS-PLN-007

1.3 Environmental Duty

The Environmental Duty under the NSW Protection of the Environment Act 1997 states:

"124 & 139 Operation of plant

The occupier of any premises who operates any plant (other than control equipment) at those premises in such a manner as to cause the emission of pollution from those premises is guilty of an offence if the pollution so caused, or any part of it, is caused by the occupier's failure:

(a) to maintain the plant in an efficient condition, or

(b) to operate the plant in a proper and efficient manner.

148 Pollution incidents causing or threatening material harm to be notified -

(1) Kinds of incidents to be notified

This Part applies where a pollution incident occurs in the course of an activity so that material harm to the environment is caused or threatened.

(2) Duty of person carrying on activity to notify

A person carrying on the activity must, immediately after the person becomes aware of the incident, notify each relevant authority of the incident and all relevant information about it."

2. Definitions

Definitions of terms used in this EMP:

Table 2.1: Definitions

Term	Definition
UPS	Uranquinty Power Station
dBA	Decibel in A-weighting scale.
EPA	NSW Environmental Protection Authority
DA	Development Approval
DPE	NSW Department of Planning and Environment
Other Appropriate Regulatory Authorities	As per POEOA, 1997 means – Ministry of Health, NSW WorkCover or NSW Fire & Rescue
EMR	Environmental Management Register
EPL	Environment Protection Licence
POEOA	NSW Protection of the Environment Operations Act, 1997
EP&A Act	NSW Environmental Planning & Assessment Act, 1979
EMP	Environmental Management Plan
ERP	Emergency Response plan
HSE	Health, Safety and Environment
MSDS	Material Safety Data Sheet
OpenText	Electronic content management system mandated by Origin
OCIS	Origin Collective Intelligence System
RCMS	Regulatory Compliance Management System
Source	Origin Energy's intranet site

3. Site Description

Table 2.2: Property description

Property	Description
Site Name	Uranquinty Power Station.
Site Ownership	Origin Energy Power Limited
Approximate location	The Uranquinty Power Station is located on Uranquinty Cross Road near Uranquinty, approximately 15km south-west of Wagga Wagga in New South Wales
Site Address	280 Uranquinty Cross Road, Uranquinty NSW 2652
Postal Address	PO Box 46 Uranquinty NSW 2652
Land Lot Description	Lot 782 on DP878179 and Lot 76 on DP754573, Parish of Yarragundry
Business Owner	Origin Energy Uranquinty Power Pty Ltd.
Local Authority	Wagga Wagga City Council
Land use zoning	Primary Production

3.1 General

The UPS is a gas fired power station in NSW. The plant output is generated by four open cycle gas turbines. While provision was made in the approvals stage to enable the site to operate on liquid fuel, the plant would require significant modifications in order to enable liquid fuel to be used as a primary generation fuel.

The Power Station is fuelled by natural gas that passes through the site at a pressure of up to 102 MPa.

The existing buried natural gas pipeline runs along the western side of the Plant and then diverts north-east between the Plant and switchyard. The natural gas enters the facility through a metering skid and a gas receiving station and is then directed to the gas turbines. Exhaust gases are dispersed via a stack, 35m in height, adjacent to each gas turbine building.

Process water is obtained from the town water reticulation system. Process water utilised for Power Augmentation must be treated via the demineralization plant to meet specifications. This Water Treatment process uses reverse osmosis technology with electrodeionization (EDI) to turn pure water into ultra pure water, water treatment wastes are pumped to the evaporation pond. Blowdown from the evaporation cooling system is also directed to the evaporation pond.

Approximately 1ML of the town water storage is held in reserve for firefighting purposes.

The basic components or structures involved in the facility are:

- gas pipelines and gas fuel filter and reduction station;
- gas turbine buildings, transformers and exhaust stacks;
- water storage and demineralization plant (reverse osmosis);
- power control centre/building;
- emergency diesel generators and minor distillate tanks; and
- fire control facilities.

Other support facilities include an office building, warehouse, workshop, storm water holding pond and evaporation ponds are also constructed adjacent to the Plant.

Refer also to the Site Layout Schematic – Appendix 1 which shows the key components or structures of the Power Station.

The Power Station is licenced by the NSW EPA for Electricity Generation at a scale of between >1000-4000 GWh.

Table 2.3: UPS plant and operations

Category	Description
Power Generating Capacity	The name plate of each unit is 152.93 MW.
Fuel	Natural Gas
Technology	4x Siemens SGT5-2000E turbines
Facility Footprint	35 ha
Plant Operating Mode	Manned & Remote Operation
Personnel	6
No Units	4

3.2 Site Locality

The Uranquinty Power Station is located on Uranquinty Cross Road near Uranquinty, approximately 15km south-west of Wagga Wagga in New South Wales. It covers a portion of Lot 782 on DP878179 and Lot 76 on DP754573, Parish of Yarragundry. The designated site area is 450m x 775m (35 Hectares).

The site is located on an intersection or crossover between an existing natural gas pipeline, which traverses local rural properties from south to north, and 132 kV electricity transmission lines. Direct access to the site is available from the sealed Uranquinty Cross Road. A disused railway line also runs along the southern boundary of this road corridor.

The map below shows the locality of the Power Station Site in relation to Wagga Wagga:

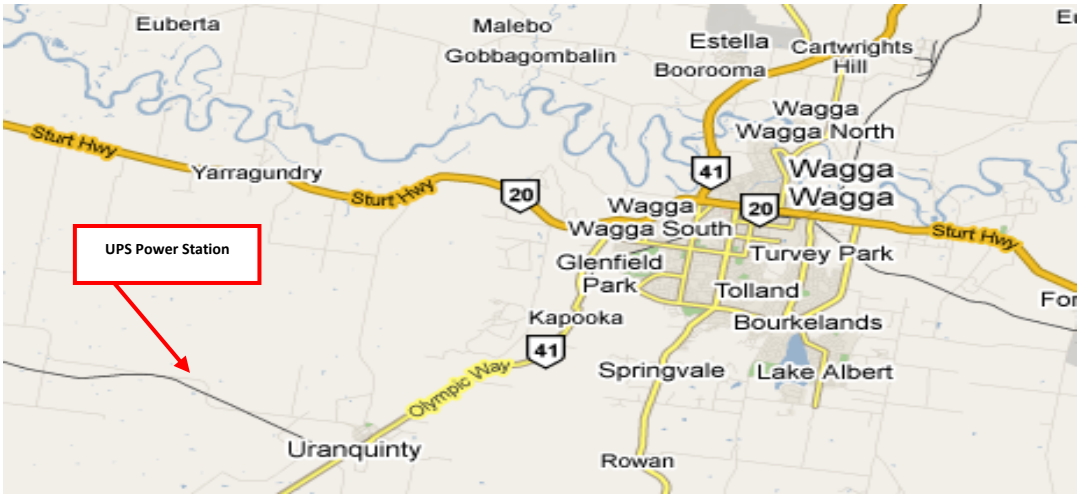


Figure 2.1 – Project site location in relation to Wagga Wagga

3.3 Environmental Context

Topography

The site is located on the catchment divide between the Sandy Creek drainage to the east and the Roping Pole Swamp drainage to the west.

Sandy Creek is an intermittent stream, which flows through Uranquinty Township and drains to the north to the Murrumbidgee River.

The general topography of the Uranquinty area consists of extensive, gently undulating plains at around RL 200 - 240 metres, 10 to 20 metres above the regional alluvial plain surface. The drainage lines identified in the area are sparse and shallow.

Climate

The typical average climate for the area is characterised by warm to hot summers (>10 days in January and February where maximum temperature exceed 30°C) and cool winters.

The average annual rainfall is 450 – 550 mm per year which predominantly falls in the winter months. Summer rainfall is highly variable and during dry periods can result in substantial curing of pastoral and grazing land. Summer storms are possible and are often associated with lightning strikes with potential to ignite cured vegetation.

The prevailing wind directions during the bushfire danger period (September to March) are strongly from the west to southwest with easterly influences associated with storm activity noticeable during Late Summer (January and February).

Access

Access to the facility is from Uranquinty Cross Road that is an all-weather road that connects to the Olympic Way Highway to the east of the site.

Vegetation

The vegetation structure on the site is typical of agricultural landscapes in the region. Only one vegetation type occurs on the UPS site, which is best described as exotic grassland with scattered trees. There has been extensive planting of the native species around the power station site, mainly during construction and again in 2015.

The roadside verge consists of Yellow Box and White Cypress Pine. The verge is narrow but contains several mature Yellow Box trees and some Acacia, particularly on the eastern side of the site.

Based on the remnant trees present, the UPS site would originally have been White Box, Yellow Box, Blakely's Red Gum Woodland which is an Endangered Ecological Community (EEC) in NSW. However, very few features of this original community now remain.

The vegetation on-site is of low conservation value. While the site contains trees indicative of the NSW EEC, the site is almost completely covered with exotic pasture species and weeds, with few features of the described community.

The roadside vegetation is of moderate conservation value. It contains a mixture of trees, regenerating trees, shrubs and native ground cover. Exotic species still dominate the ground cover, but the site provides important resources in a landscape widely cleared of native vegetation.

4. Environmental Management Structure

4.1 Origin HSE Management System

Origin has a Health Safety and Environmental Management System (HSEMS) which comprises of;

- HSE policy, (OT ID: 26004885) which describes Origin's high-level commitment to HSE;
- HSE Standards, which describe the minimum criteria that is to be achieved
- HSE Directives, which set out the minimum requirements for meeting the HSE standards;
- Site and company level Emergency Response and Crisis Management Plans; and
- Incident Management procedures;

These documents are available on 'Source' and 'Objective' Generation's document filing system.

4.2 Regulatory Compliance Register and eAMS

Environmental compliance obligations for Generation are managed in the Regulatory Compliance Register by the Energy Supply and Operations Environment and Community Team.

- The enterprise asset management system (eAMS) is also used for compliance obligations at UPS. Environmental requirements related to plant maintenance activities and routines are tracked in eAMS. The protocols for regular maintenance of process equipment to minimise the potential for leaks and fugitive emissions are documented in Section 14.2.1.

Our Health, Safety and Environment Policy

Our principle of due care

We care about the wellbeing of our people and our impact on the environment.

Our HSE aspiration

To conduct our business in a way that causes no harm to the health and safety of people and has no unforeseen impacts to the environment.

Our HSE actions

We all believe that our HSE aspiration is achievable and we embrace our responsibility for supporting it by:

Always mindful of risk

Recognising that risk is present in every task we do and taking the time to identify and understand these risks and manage them safely and responsibly.

Enabled and accountable

Taking ownership and using our authority, resources, systems and competencies to manage the risks associated with our work. We stop work when confronted by an unknown hazard and proceed only when satisfied we can continue safely and responsibly.

Continuously learning

Being open and transparent about how well we are doing and relentless in learning from our experience to manage our risks. We work together effectively, welcome any feedback and recognise that we can always do better.

Our HSE Management System sets out how we implement this policy.

Frank Calabria
CEO
Origin Energy

11561.Nov19.All.OE

5. Roles and Responsibilities

All Origin personnel, contractors and visitors have a duty to work in a manner which does not present risk to themselves, others or the environment.

The following table outlines specific environmental responsibilities for UPS.

Table 5.1: Roles and responsibilities

Position	Role
General Manager, Generation	• Ensure Generation's environmental issues are dealt with responsibly and in accordance with legislative and internal requirements. • Provide guidance and support for high-risk activities.
Group Manager Asset Operations	• Ensure sites' environmental issues are dealt with responsibly and in accordance with legislative and internal requirements.
UPS Site Manager	• Ensure necessary environmental approvals are obtained and maintained. • Ensure that appropriate resources are made available to enable compliance with the requirements of the site environmental approvals and this EMP including. • Completion of environmental monitoring and reporting. • EMP review, update and implementation • Participate in environmental audits of the project, report non-conformances and take preventative and corrective actions as required. • Ensure all site personnel, are aware of their environmental responsibilities. • Participation in community engagement activities. • Ensure environmental training is presented and induction material updated. • Co-ordinate publication of environmental data Origins external web site
Environment Business Partner	• Provide advice and support on environmental management practices. • Participate in environmental audits and establish preventative and corrective actions as required. • Assist with obtaining and maintaining necessary environmental approvals
Environment Manager	• Lead the environment functional group to support and provide advice to site on environmental issues. • Liaise with regulatory authorities. • Ensure changes in environmental legislation are reviewed, communicated to the relevant stakeholders and implemented. • Assist with environmental hazard identification, risk assessment and environmental risk management programs.

Position	Role
	• Assist with obtaining and maintaining necessary environmental approvals
Contractors and visitors	• Undertake works in an environmentally responsible manner in accordance with legislative and internal requirements. • Report incidents or emergencies as soon as possible.

5.1 Environmental Representative

Condition 6.1 of the Development Approval (DA) requires a suitably qualified and experienced Environmental Representative(s) to be in place for UPS. The Environmental Representative will be employed on a full-time basis during the life of the development and needs to be approved by the Director General.

"The Environmental Representative shall be:

- the primary contact point in relation to the environmental performance of the development;
- responsible for all Management Plans and Monitoring Programs required under this consent;
- responsible for considering and advising on matters specified in the conditions of this consent, and all other licences and approvals related to the environmental performance and impacts of the development;
- responsible for the management of procedures and practices for receiving and responding to complaints;
- given the authority and independence to require reasonable and feasible steps be taken to avoid or minimise unintended or adverse environmental impacts, failing the effectiveness of such steps, to direct that relevant actions be ceased immediately should an adverse impact on the environment be likely to occur."

The nominated Environmental Representative is.

Incumbent:	Role:
Gemma Dobson	Group Health, Safety, Environment and Communities Manager – Generation

Any change to the nominated Environmental Representative, must be approved by the Director General for the Department of Planning and Environment (DPE).

Once DPE approval is obtained, the EPA, WWCC and the Community Participation Panel should also be advised of the change.

6. Environmental Legislation

Key legislation and guidelines relevant to UPS are:

- Environmental Planning & Assessment Act, 1979;
- Protection of the Environment Operations Act, 1997 and subordinate legislation
- NSW Industrial Noise Policy, January 2000.
- NSW waste classification guidelines, Part 1 – classifying waste, November 2014
- Approved methods for the Sampling and Analysis of Air Pollutants in New South Wales, January 2007

6.1 Environmental Approvals

As well as complying with relevant legislation and guidelines, all site activities must comply with the provisions set out in the environmental approvals.

UPS has two environmental approvals, a Development Approval (DA) and an Environmental Protection Licence (EPL). Details of the current approvals are in the table below. Refer to Appendix 5 for a summary of historical amendments.

Table 6.2: Environmental Approvals

Approval	Details
Development Approval DA-31-2-2004-i MOD10	Approval date: 10 June 2005 Commencement of operations: 1 January 2009 File number S03/01578
Environmental Protection Licence 12490	Licence version date: 13 September 2021 Anniversary date: 27 November

A hard copy of the DA and the EPL shall be kept on site or in electronic format at all times. A copy of the DA or environmental protection licence must be available for all Origin employees

The EPL shall be produced for inspection when requested by the Environment Protection Authority. It is also available on the EPA public register at:

http://www.environment.nsw.gov.au/

7. Risk Management

Risk management across all Generation sites is in accordance with Origin's Risk Management Directive, ORG-RMS-DIR-001 (OT ID: 23947168). This document outlines the relationship between the principles for managing risk, the framework in which it occurs, and the risk management process as it applies to Generation.

7.1 Risk Assessment

All personnel and contractors are responsible for completing a GenSafe, JSEA or formal risk assessment, where appropriate, prior to conducting any task, in accordance with GEN-HSE-PRC-008 Generation's Workplace Risk Assessment Procedure (OT ID: 36204732).

All sites maintain a register which include risks of an environmental nature. The Energy Market risk and compliance team facilitate the regular review and update of the risk registers. Actions are tracked for completion within the Origin Collective Intelligence System (OCIS).

8. Environmental Awareness Training

Environmental Awareness training shall be undertaken on an as needed basis and may include:

- Site induction;
- Overview of Origin Health Safety and Environment Policy and management system;
- Due Diligence;
- Environmental legislation;
- General environmental issues;
- Roles and responsibilities;
- Environmental management; and
- Operational management procedures for environmental aspects.

9. Complaints

9.1 Complaints Response Process

The site maintains the following for community complaints:

Table 9.1: Complaints notifications

Complaints notification channels	
Toll Free Phone Number (24 hours)	1800 677 315
Postal Address	PO Box 46 Uranquinty NSW 2652
Email Address:	uranquinty@originenergy.com.au
The complaint notification details above shall be available on Origin's internet site.	

The UPS toll free number is manned 24 hours a day. Complaints received will be directed to the on-call operator or Site Manager. The Site Manager shall be notified of all complaints received in relation to UPS.

All complaints will be investigated as soon as practicable. Origin aims to advise noise complainants within one hour and all other complainants within 24 hours that their complaint has been received and the action being taken to investigate.

If appropriate, a response will be provided within a further 24 hours for noise complaints and within 48 hours for all other complaints, to provide the complainant with feedback on actions taken or in progress or where no action is proposed the reasons for no action.

9.2 Complaint Records

Records of all complaints received by the site from a complainant shall be maintained in a Complaints Register.

Table 9.2: Environmental Representative

The Complaints Register shall record, but not be limited to;
the date and time, where relevant, 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 in relation to the complaint, including any follow-up contact with the complainant; and
if no action was taken in relation to the complaint, the reason(s) that no action was taken.

The Complaints Register shall be made available for inspection by the EPA and the Director-General upon request.

All complaints must be recorded in Origin's Collective Intelligence System (OCIS).

A current summary of the Complaints Register, without details of the complainants shall also be developed and maintained and made available to the public for inspection upon request.

10. Community Engagement

A UPS Community Committee (the Committee) was re-established in July 2014 and meets twice annually . The Committee is made up of:

- 3 x Community Representatives
- UPS Site Manager
- Origin Community Relations Business Partner, &
- Casual Observers welcome to attend meetings.

The aims of the UPS Community Committee are to:

- Provide a transparent forum through which UPS-related issues can be discussed.
- Provide a transparent forum through which Origin can relay information in relation to the UPS.
- Seek and capture community feedback in relation to UPS-related activities so that this information can be considered in decision-making processes.
- Ensure a greater understanding of community and stakeholder issues, subsequently allowing for a more effective response on behalf of Origin.

Specifically, the UPS Community Committee will:

- Receive and relay information in relation to the UPS, acting as a conduit between the community and the UPS.
- Receive updates from Origin on the UPS.
- Represent the community and communicate community sentiment to Origin in relation to UPS impacts and benefits.

- Work with Origin to identify and advise on social impact management and community development activities.

10.1 Community Access Document Register

Subject to confidentiality, the site shall make all documents required under the DA available for public inspection on request. This shall include provision of all documents at the site for inspection by visitors, and in an appropriate electronic format on the Generation internet site.

Documents will include but not be limited to:

- DA
- DECCW Licence
- EIS
- Water Management Strategy
- Statutory Monitoring

10.2 Web Reporting of UPS Environmental Data

As per the modified PEOA, 1997, the UPS will display all the environmental monitoring data results on the UPS external web site.

The data will be published on the web site within 14 working days of month end for data received.

11. Emergency Response Plan

Emergencies are unplanned incidents with the potential to harm people, property, the environment or Origin's interests, in which control is lost and immediate response action is required. An uncontrolled release of contaminants from the site may be an example of an environmental emergency.

12. Environmental Incidents

An Emergency Response Plan GEN-HSE-ERP-UPS for the Uranquinty Power Station (OT ID: 36030028) is in place. Detailed information relating to response procedures, responsibilities and contact details are included in this plan. The requirements of a Pollution Incident Response Management Plan (PRIMP) under the modified PEOA, 1997 are addressed within the UPS Emergency Response Plan. Remedial actions to be undertaken on site will be determined in line with the ERP. ERP includes the requirements of a PRIMP.

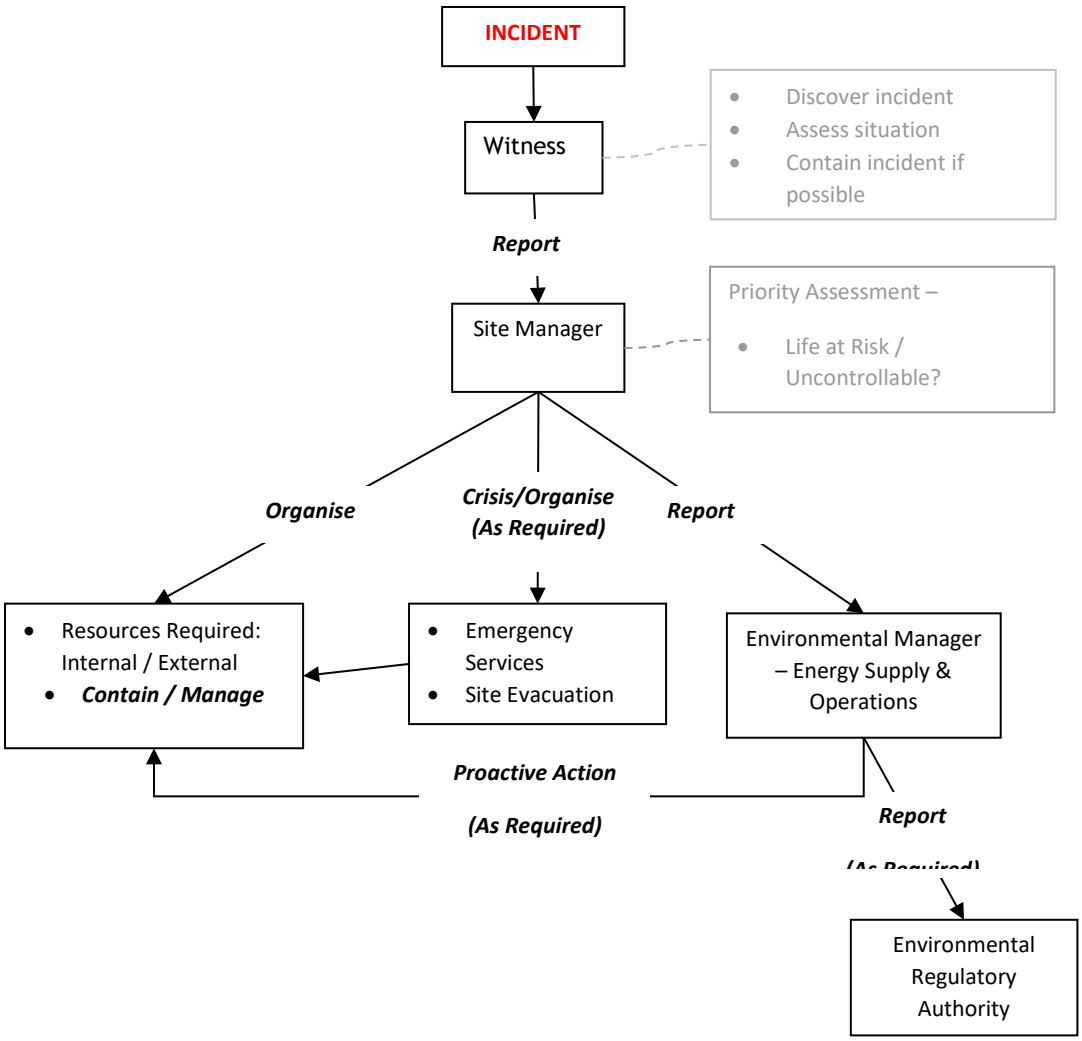
An Environmental Incident is an event which has the potential to cause environmental harm including a complaint relating to an incident.

Harm is defined in the POEO Act as

"any direct or indirect alteration of the environment that has the effect of degrading the environment and, without limiting the generality of the above, includes any act or omission that results in pollution".

Examples of events which may constitute an environmental incident include loss of containment resulting in the release of contaminates (oil, chemicals, dust, gas, bacteria etc) to land, water or air. Or the release of abnormal noise and light levels from sources on site during operations.

12.1 Roles in an environmental incident



12.2 Internal Environmental Incident Reporting

All environmental incidents/ near misses, regardless of actual or potential severity, must be reported to the site manager and E&C manager as soon as possible so that the requirement for external notification can be determined. The environmental incident will also be recorded in OCIS.

The person in control must ensure the scene of the incident and any evidence (including reference notes and photographs) are preserved as far as practicable until instructed otherwise by the Site Manager or the relevant statutory authorities (in the case of an incident that needs to be notified externally).

12.3 External Environmental Incident Reporting (Notification)

12.3.1 Notification of Environmental Harm

To determine whether an environmental incident needs to be notified to an external regulator, the POEO Act and conditions in the EPL and DA need to be considered as they are all applicable. Timeframes for notification under the POEO Act and the EPL are more stringent and centred around the definition of Environmental Harm, so an incident will be assessed against these criteria first for notification

Under Section 147 of the POEO Act the meaning of material harm to the environment is defined as:

(a) Harm to the environment is material if;

(i) It involves an actual or potential harm to the health or safety of human beings or to ecosystems that is not trivial, or

(ii) It results in actual or potential loss or property damage to an amount, or amounts in aggregate, exceeding $10,000 (or such other amount as is prescribed by the regulations), and

(b) 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.

Note: it does not matter if pollution did not go off site, pollution incidents contained on site that meet these criteria have to be notified.

Table 12.1:Notification under POEOA and EPL

Duty to notify pollution incidents		
Notify if:	Material Harm is caused or threatened (Section 148, POEO Act & Condition R2 EPL 12490)	
Timeframe	Verbal notification IMMEDIATELY Full written notification within 7 days of incident	
Information to provide in notification	"*(1) Relevant information required consists of –* *(a) the time, date, nature, duration and location of the incident* *(b) the location of the place where pollution is occurring or is likely to occur* *(c) The nature, the estimated quantity or volume and the concentration, of any pollutants involved, if known* *(d) The circumstances in which the incident occurred (including the cause of the incident, if known).* *(e) The action taken or proposed to be taken to deal with incident and any resulting pollution or threatened pollution, if known* *(f) Other information prescribed by the regulations"* *(2) The information required by this section is the information known to the person notifying the incident when the notification is required to be given"*	
Who to notify:	NSW EPA	131 555 or (02) 9995 555 if calling from outside NSW
	NSW DPE	(02) 9228 6111
	Wagga Wagga City Council	1300 292 442
	Other relevant authorities may include	
	Ministry of Health	(02) 9391 9000
	Safework NSW	131 050
	Fire and Rescue NSW	000 (Emergency) (02) 9265 2999 (Sydney Head office) (02) 6921 4375 (Wagga Fire Station)

12.3.2 Notification Under Development Approval

The requirement to notify is set out in Condition 7 of Development Approval DA-31-2-2004-i MOD 10.

Table 12.2:Notification under DA

Duty to Notify Pollution Incidents		
Notify if:	Incident has actual or potential significant OFF-SITE impacts on people or the biophysical environment (Condition 7.1, DA-31-2-2004-i MOD10)	
Timeframe	Within 12 hours of becoming aware of the incident followed by: Full written notification within 7 days of incident	
Information to provide in notification	Not prescribed in DA, refer Table 11.1	
Who to notify	NSW EPA	131 555 or (02) 9995 555 if calling from outside NSW
	NSW DPE– Director General.	(02) 9228 6111

13. Environmental Monitoring and Reporting

Monitoring and inspections are essential in determining how well the environmental management on-site is:

- addressing key plant and environmental risks;
- achieving policy and regulatory objectives;
- responding to identified incidents, non-compliances or non-conformance issues;
- keeping up-to-date with legislative and industry standards.

As set out in Environmental Protection Licence 12490 and the Development Approval DA-31-2-2004-i MOD10 conditions 4.1 to 4.9 the sites environmental limits are detailed in Section 13.1. As per the EPL and DA the compliance monitoring, sampling, inspections and reporting to be undertaken are detailed in Section 13.2.

13.1 Site Environmental Limits

Table 13.1:Air emission limits

Discharge points	Nitrogen dioxide (NO2) or Nitric Oxide (NO) or both as (NO2)	Reference Conditions
Units 1,2,3,4 stacks	51 (burning natural gas)	100 percentile limit mg/Nm^3 (i.e. dry,273k, 101.3 kPa 15% O^2)

Table 13.2:Noise limits

Residence	Day	Evening	Night	
	7am-6pm Mon-Sat 8am-6pm Sunday & PH	6pm – 10pm all days	10pm-7am Mon-Sat 10pm-8am Sunday & PH	
	LAeq(15 minute)	LAeq(15 minute)	LAeq(15 minute)	LA(1 minute)
Pine Grove	38	38	38	45
The Wardrobe	37	37	37	45
Wallace	37	37	37	45
Any other residence	35	35	35	45
Note: The noise levels do not apply while an agreement is in place with the respective neighbour, there is currently an agreement in place at Pine Grove, the Wardrobe, Wallace, and at three other neighbours.				

Table 13.3:Water limits

Source	Sample point	Conductivity 100 Percentile Limit (µs/cm)
Water released from overflow of stormwater pond	Stormwater pond overflow discharge point	800
Water irrigated on-site of blended water from stormwater and evaporation pond	Stormwater /evaporation pond irrigation pump.	800

13.2 Compliance Monitoring, Inspection and Reporting

Table 13.4:Compliance monitoring and sampling

Aspect	Details			Frequency
Air Quality	Stack emission testing – •			
	Parameter	Units of Measure	Sampling Method	
	NOx using	mgm^{-3}	CEM-2	Continuous (CEMS)
	Velocity	ms^{-1}	TM-2	Annual (Emissions testing by external party)
	Volumetric flow rate	m^3s^{-1}	TM-2	
	Temperature	C	TM-2	
	Moisture content in stack gasses	%	TM-22	
	Dry gas density	kgm^{-3}	TM-23	
	Molecular weight of stack gases	$g.gmol^{-1}$	TM-23	
	Carbon dioxide	%	TM-24	
	Oxygen	%	TM-25	
	Predictive Emission Monitoring System (PEMS) NOx calculation as per Work Procedure UPS-AMS-PRC-021 - PEMS Model Calculation & Data and Data Management			Following failure of CEMS Units
Meteorology	Monitoring for – •			
	Parameter	Units of Measure	Sampling Method	
	Temperature at 2 metres	C	AM-4	Continuous (15-minute average period)
	Temperature at 10 metres	C	AM-4	
	Wind speed at 10 metres	ms^{-1}	AM-2 and AM-4	
	Wind direction at 10 metres	°	AM-2 and AM-4	
	Sigma theta at 10 metres	°	AM-2 and AM-4	
	Solar Radiation	wm^{-2}	AM-4	
Stormwater pond overflow	Stormwater pond overflow discharge point •			
	Parameter	Units of Measure	Sampling Method	
	Chloride	mgm^{-3}		Daily (During any overflow from stormwater pond)
	Conductivity	μScm^{-1}		
	pH	ph		
	Sodium	mgm^{-3}		
	Total Suspended Solids	mgm^{-3}		

Aspect	Details			Frequency
Stormwater Pond and Evaporation Pond Water Blending	Blending to be undertaken as per Work Procedure UPS-EMT-PRC-002 - UPS Stormwater / Evaporation Pond Water Blending (OT ID: 36038649).			Prior to all water blending events
Irrigation of blended water from stormwater and evaporation pond	Stormwater/evaporation pond irrigation pump discharge point •			
	Parameter	Units of Measure	Sampling Method	
	Conductivity	μScm^{-1}	Representative sample	Weekly (during any irrigation of blended stormwater and evaporation pond water)
	pH	pH		
	Stormwater/evaporation pond irrigation pump discharge point •			
	Parameter	Units of Measure	Sampling Method	
	Chloride	mgm^{-3}	Representative sample	Monthly (during any irrigation of blended stormwater and evaporation pond water)
	Sodium	mgm^{-3}		
	Total Suspended Solids	mgm^{-3}		
	Hydrocarbons	mg/l		

Table 13.5:Data management and inspection

Aspect	Action	Frequency
Air Quality	Inspect CEMS System	Monthly
	Download CEMS data (refer UPS-AMS-PRC-033 UPS CEMS Download and Data Management (OT ID: 36095226))	Monthly
	A review of air quality data is undertaken when processing information required to be published on the UPS External Web Site.	Monthly
	Air quality monitoring data is compared with that which was assumed and predicted in the documents listed under DA condition 1.1	Annually
Meteorology	Inspect Continuous Meteorological Monitoring System	Monthly
	Continuous download & storage of data in Site DCS or if required manual download & file storage as per Work Procedure UPS-AMS-PRC-025 UPS Weather Data Download and Data Management (OT ID: 36090964).	Continuous

Aspect	Action	Frequency
Stormwater system	Inspect stormwater drains, stormwater pond, evaporation pond and irrigation equipment/areas	Monthly and prior to wet weather events
Hazardous Chemical Storage & oil water separator	Visually inspect chemical storage areas, lube skids and equipment for leaks/spills Visually inspect oil water separator operation.	Monthly
Noise emission	Qualitative Noise Checks	When plant or equipment is introduced to the site or new activities undertaken
Septic system	Visual inspection of the operation of overflow submersible pump	Fortnightly
	Visual inspection of waste tank level & arrange emptying when required	Monthly
	Visual inspect of transpiration trench area for – • Water pooling • Vegetation Maintenance	Monthly
	Septic system will be inspected by WWCC Officer annually to ensure efficient and safe operation.	Annual
Waste Disposal/ Recycling	Visually inspect bins and organise bin emptying before overflowing.	Weekly
On-site Landscaping	Inspect site screening works for: • Replanting requirements • Weed Control • Watering schedule • General maintenance	Monthly
Aboriginal Artefacts	Observe excavation works to detect Aboriginal artefacts	During excavation works

13.3 Reporting

The UPS environmental performance is measure via fortnightly site environmental inspections as well as monthly, annual and three yearly statutory reporting based on various regulatory standards and legislative requirements. The site generates standard internal operation documentation suitable to ensure compliance with all reporting requirements which are suitable for auditing purposes. The table below details the statutory reporting requirements for the site:

Table 13.6: Statutory environmental reporting schedule

Report	Reference:	To:	Reporting period	When:
Fortnightly Environmental Inspections	Internal	Origin	-	Fortnightly
Publish Environmental Monitoring Data	Modified POEOA, 1979	UPS External Web Site	Monthly	By 21st of every month (Within 14 working days of month end after data is received)
Annual Environmental Management Report	DA-31-2-2004-i: Section 7.3 (see below)	Department of Planning	1 January – 31 December	Annual before 31 March
EPA Annual Return	EPA Licence - 12490: Section R1.1	NSW EPA	27 November – 26 November of next year.	Annual Before 26 Jan of following year (Due 60 Days after 27 November annually)
Environmental Audit Report	DA-31-2-2004-i: Section 4.9	Department of Planning	1 January 2022 – 31 December 2023	Every 3 years. Next due in January 2024
Hazard Audit Report	DA-31-2-2004-i: Section 4.8	Department of Planning	1 January 2022 – 31 December 2023	Every 3 years. Next due in January 2024
National Greenhouse and Energy Reporting	National Greenhouse and Energy Reporting Act 2007	Clean Energy Regulator	Financial Year	Annual before 31 October
National Pollution Inventory	National Environment Protection (National Pollutant Inventory) Measure 1998	NSW EPA	Financial Year	Annual before 30 September

Report	Reference:	To:	Reporting period	When:
Reference • Calculate NOx annual emission totals reported in the EPA Annual Return and DPE Annual Report using UPS-AMS-PRC-006 Uranquinty Total NOx Discharge Calculation Procedure. • Annual Performance Reporting Requirement as set out in DA-31-2-2004-I Section 7.3 is as follow: ○ 7.3 The Applicant shall, throughout the life of the development, prepare and submit for the approval of the Director-General, an Annual Environmental Management Report (AEMR). The AEMR shall review the performance of the development against the Operation Environmental Management Plan (refer to condition 6.5 of this consent), the conditions of this consent and other licences and approvals relating to the development. The AEMR shall include, but not necessarily be limited to: - a) details of compliance with the conditions of this consent; - b) a copy of the Complaints Register (refer to condition 5.3 of this consent) for the preceding twelve-month period (exclusive of personal details), and details of how theses complaints were address and resolved; - c) identification of any circumstances in which the environmental impacts and performance of the development during the year have not been generally consistent with the environmental impacts and performance predicted in the documents listed under condition 1.1 of this consent, with details of additional mitigation measures applied to the development to address recurrence of these circumstances ; - d) results of all environmental monitoring required under this consent and other approvals, including interpretations and discussion by a suitably qualified person; and - e) a list of all occasions in the preceding twelve-month period when environmental performance goals for the development have not been achieved, indicating the reason for failure to meet the goals and the action taken to prevent recurrence of that type of incident.				

14. Management Plans for Key Environmental Aspects

The following environmental aspects have specific regulatory requirements in the DA or EPL and are considered to warrant specific actions to comply with these requirements and minimise environmental risks or the potential to generate community complaints.

- General requirements
- Air Quality
- Water quality and sediment control and
- Noise
- Visual Amenity
- Storage and handling of chemicals
- Heritage
- Waste
- Transport code of conduct

14.1 General requirements

Table 14.1: General Requirements

Element	General Requirements
Objectives	• Minimise potential for significant offsite environmental impacts from any activities of the site. • No community complaints
Controls	• all plant and equipment will be operated and maintained in accordance with the manufacturers recommendations to minimise the potential for leaks and fugitive emissions; and site staff will undertake all activities (including plant operation) in a manner which minimises discharges to the environment Specific attention will be paid to the operation and maintenance of the following plant and equipment • Gas turbines (start up and shutdown) • Continuous emissions monitoring system • Portable emissions monitoring system • Meteorological mast and data capture system • Oil water separator • Stormwater irrigation system • Stormwater and evaporation pond water blending pump • Water monitoring equipment • Septic system and septic irrigation • Septic irrigation transpiration area
Actions	• Cease operation of gas turbines if NOx emission limits are exceeded • Cease irrigation if stormwater or blended stormwater if conductivity limit is exceeded.
Records	All records required to be kept as part of the DA and EPL shall be kept by the site for a minimum of 6 years including: • All waste disposals records

14.2 Air Quality

The Power Station has been designed to ensure stack emissions can comply with regulatory licence and ambient air quality limits. To aid the dispersion of air emissions from site, emissions from the turbine stacks may only be:

(a) released to atmosphere from the top of the stacks at 35 metres in height; and

(b) directed vertically upwards without any impedance or hindrance.

The turbine manufacturers have guaranteed emissions levels of the Units to meet regulatory emission limits at operation above 50% load. An example of the typical emission characteristic for the units during operation is summarised in Table 13.1.

Table 14.2:Stack emission characteristics

Parameter	Units	Emissions per Unit
No of units operating	-	4
Fuel	-	Gas
Exit Velocity	m/s	40.6
Temperature	oC	552
NOx – Concentration Emission rate NO2/NOx ratio	Ppmvd @ 15%02 g/s -	25 21 0.1
CO emission rate	g/s	5.1
SO2	g/s	0.7
PM10	g/s	4.1

To ensure generating efficiency and the minimisation of green house gas emissions per unit of electricity generated, the following procedures will occur:

- Control set points will be implemented to ensure base operations are greater than 50% unit load.
- The units operate on an auto start up and auto shut down sequence at all times to ensure the fastest, most efficient plant starting and shut downs;
- Start-ups will occur in 'Diffuser Mode' which is a more stable process but higher NOx emissions, but the auto start up sequence will move the plant to 'Pre-Mix Mode' which will then run the plant during normal operations above 50% load for efficient operation and reduced NOx emissions.
- 'Pre-Mix Mode' is when air and gas is premixed before combustion to give a more efficient combustion.
- For shut downs, the operating system will automatically move the plant from 'Pre-Mix Mode' back to 'Diffuser Mode' for fastest and most efficient shut downs.
- Plant high NOx emission alarms are fitted to operational control panel for each Unit.
- The UPS has a 100 percentile limit (except for the 15min start-up & shutdown period) for NOx emissions. In events where NOx exceedances occur, the UPS Operators will follow the actions detailed as per Procedure UPS-AMS-PRC-022 UPS NOx Indicated Exceedance Procedure (OT ID: 36100997).

Modelling undertaken during and after the EIS demonstrate that there would not be a build up of air emissions that could adversely impact on the surrounding land use when

the station is in operation. Ensuring start up and shut down occurs in an efficient manner and the plant is operated above 50% load would minimise emissions to air. The diesel emergency generators and firefighting pump are expected to operate only in emergencies, for maintenance or for testing and power generation is not undertaken utilising Diesel. The emissions and odour risks arising from these diesel motors are considered insignificant due to their size and infrequent operation.

The potential for generation of dust from the site has been minimised as all UPS access roads are sealed, and unsealed areas are covered with blue stone or road base material so that there are no exposed soil areas within the site internal security fence. Construction areas outside of the site security fence have been rehabilitated to reduce dust generation through the implementation of a landscape management plan.

Table 14.3: Air Quality Management Plan

Element	Air Quality Management Plan
Sources	• Power station stacks • Emergency generators (diesel) • Firefighting pump (diesel) • Dust off roads • Dust off former construction areas • Odour from waste (refer Section 14.8 Waste)
Potential Impacts	• Exceedance of NOx limits • Dust and particulates from stacks, vehicle usage, and post-construction establishment of vegetation affecting the surrounding community
Objectives	• To ensure emissions are within the Air Quality limits contained in the DPE DA and EPA Site Licence. • To ensure that dust resulting from the sites operations is minimised
Controls	• Maintain seal on all access roads and coverage of unsealed areas with blue stone or road base material. • Maintenance of rehabilitated construction areas outside of the site security fence will be undertaken as per Section 13.4 Visual Amenity Management Plan of this EMP. • Ensure Continuous Emission Monitoring System (CEMS) installed on each Unit is in operation at all times the units are running. If there is a fault with the CEMS, the Predictive Emissions Monitoring System (PEMS) is approved by EPA to estimate NOx emissions when the CEMS is down. Use of PEMS when CEMS in not in operation is only permitted for a maximum duration of 1 week per occasion and for a maximum of 4 weeks per unit per year. The PEMS is to be utilized only as detailed in Work Procedure UPS-AMS-PRC-021 PEMS Model Calculation and Data Management (OT ID: 36097398). • Alternatively – if the CEMS is faulty, the portable NOx analyser (which is the same type of analyser as the CEMS unit) may be used temporarily in place of the CEMS until the CEMS fault is fixed. • Origin has some of the best equipment in the generation field which include Siemens units with dry low NO_x. The management of

Element	Air Quality Management Plan
	generating efficiency and the minimisation of greenhouse gas emissions is undertaken through ongoing documented maintenance (see Section 14.2.1 for details) and equipment upgrades when necessary and reasonably practicable. Origin have recently increased PAG (Power Augmentation) capacity which further reduces NO_x at high loads during the summer months.
Monitoring	• The CEMs shall be working at all times the units are in operation • Annual stack testing (refer Section 12). • Visual dust monitoring daily (refer Section 12).
Corrective Action	If emission limits exceed during plant operation the following will occur: • Operators will follow Procedure UPS-AMS-PRC-022 UPS NOx Indicated Exceedance Procedure (OT ID: 36100997).
Reference	• UPS-AMS-PRC-022 UPS NOx Indicated Exceedance Procedure (OT ID: 36100997) • UPS-AMS-PRC-033 - UPS CEMS Download and Data Management (OT ID: 36095226) • UPS-AMS-PRC-006 Uranquinty Total NOx Discharge Calculation Procedure (OT ID: 36073926).

14.2.1 Maintenance Schedule

The protocols for regular maintenance of process equipment to minimise the potential for leaks and fugitive emissions is undertaken annual. The inspection and test plan (ref UPS-INSP-SGT5_2KE-01Y_-_Inspection_and_Test_Plan) forms the basis of the maintenance schedule and includes the following areas of review:

- Standard Activities
- Turbine Core
- Core engine (Turbine)
- Core engine (Compressor)
- Core engine (Combustor)
- Core engine
- Auxiliary system - turbine ventilation
- Auxiliary system - turbine exhaust
- Auxiliary system - NOX water injection
- Auxiliary system - natural gas
- Auxiliary system - lube and lifting oil
- Auxiliary system - inlet guide vane
- Auxiliary system - inlet air
- Auxiliary system - ignition gas
- Auxiliary system - hydraulic oil supply
- Auxiliary system - generator cooling water
- Auxiliary system - compressor blow off
- Corrective Activities

- Full unit overhauls and large-scale outages are undertaken in accordance with the Siemens operation manuals and are undertaken less frequently.

14.3 Water Quality and Sediment Control

The key water collection facilities on site and their capacities are summarised in the Table below. Water calculations are based on the average operational site usage and may vary depending on generation and weather conditions.

Table 14.4:Water and sediment sources

Source	Capacity	Throughput (estimated calcs)	Discharge guidelines
Storm water pond	15 ML	20 ML/year 1:100 year 72 hour storm event	See Table 13.4
Evaporation Pond	4 ML	1680 m^3/year (to evaporate 1:10 wet year rainfall) (A 1m freeboard would accommodate highest recorded annual rainfall of 988mm in 62 years).	Salt load of 11,160 kg/annum or 30.6 kg/day See Table 13.4
Admin Rainwater Tank	10,000 L	Volume based on annual rainfall	
Storage pit (input to oil water separator)	750,000 L	Volume based on annual rainfall	
Oil Water separator	NA	10,000 L/hr	Discharge of clean water at <10 mg/l of oil.
Stormwater irrigation system	N/A	27.3 ML/year	See Table 13.4
Exposed soil areas during landscaping works	N/A		Potential high suspended solids content.
Note: All water utilised for site operations is potable/ council water and is not extracted groundwater or recycled rainwater			

The surrounding properties are undulating farmland. The farming practices in the area are cattle & sheep grazing and annual cropping. The nearest stream/creek is approximately 3km from site. This creek is not a permanent flowing creek but a small creek that flows only in storm events. Clean water is uncontaminated storm water collected for reuse. Dirty waste water is contaminated storm water or process water for on-site clean-up or off-site disposal after treatment.

Figure 3 Site Stormwater Drainage and Direction of Flow and the site layout illustrates the direction of flow of storm water across the site.

14.3.1 Stormwater System and Stormwater Pond

Based on the Water Management Strategy, Amended April 2004 submitted to the EPA and DIPNR in 2004 during the approvals process (the WMS), the catchment area for the power station is estimated to be approximately 26,400m^2.

The storm water system is comprised of:

- A diversion bank around the inner security fence to divert clean storm water offsite to minimise the amount of storm water collected on-site.
- A series of storm water collection pits and underground storm water drains to direct storm water to the storm water pond.
- A 15ML stormwater pond and an irrigation system providing a throughput of 27.3ML/year. The stormwater pond and irrigation system combined would be able to accommodate a volume of 20ML/year which the volume required to prevent discharge from the site. This volume of 20ML/year would accommodate a 1:100 year, 72 hour storm event.
- All clean storm water from the site including water collected from roofs (except administration building) is directed to the storm water pond.
- Water from the stormwater pond is tested against the criteria set out in Section 13.2 validate it as suitable (clean) for irrigation purposes.
- In the event that the stormwater pond overflows water samples are collected and analysed against the parameters set out in Section 13.2 to ensure the water is suitable (clean) for offsite migrations as set out in the DA and EPL.
- If there is a requirement to blend the waster from the evaporation ponds into the stormwater pond then the appropriate guidelines are set out in Section 13.2 to determine acceptable parameters and associated concentrations.

14.3.2 Evaporation Pond

- The evaporation pond capacity is 4ML and has been sized to evaporate up to the 1:10 year wet year rainfall. If a 1m freeboard is maintained then this should be able to accommodate the highest recorded annual rainfall at Wagga Wagga AMO of 988mm in 62 years of record.
- The sites demineralisation plant is a reverse osmosis plant which is designed to remove dissolved solids out of the raw water supply. The demin plant has been designed to produce 20% waste water from raw water inputs. Waste water from the demin is piped directly to the demin evaporation ponds.
- Blowdown from the evaporation cooling system is also directed to the evaporation pond.
- Two demineralisation waste water evaporation ponds (One large pond with two evaporations areas with a half-height divider) have been sized and constructed onsite. The ponds have been sized taking into account demin waste water produced and evaporation capacity within the Wagga Wagga region. The ponds are fully lined with a 5mm poly liner.

14.3.3 Administration Building Rainwater Tank

Rainwater is collected off the site administration building roof in a 10,000L tank. The water is used in the buildings toilets as flush water.

14.3.4 Chemical Oil Storage Areas, Storage Pit and Oil Water Separator

The site has been designed so all chemical and oil storage areas including the

- lube oil,
- diesel fuel
- transformer oil storage tanks
- Maintenance work shop
- dedicated oil/chemical store; and
- All areas within the turbine enclosure are contained within bunded areas and drain to the oil/water separator collection pit.

The oil water separator system is comprised of a 750,000 litre concrete storage pit, sump pump and oil water separator. Short term failure of the oil water separator will not be a critical issue to the operation of the plant because:

- The oil water collection pit has been sized to hold bund discharge water from rain fall events for up to 5 days.
- The oil water separator has no moving parts and consists of a series of screens and baffles. As long as the separator is well maintained and screens cleaned regularly as per the maintenance program the separator will be relatively issue free.
- The oil water pit pump is not a specialised pump and is comprised of readily available or interchangeable parts/equipment so extended delays are not anticipated in regard to failure of the oil water sump pump.
- Wastewater/oil from the oil water separator is collected from site and disposed of at an appropriate waste handling facility. Clean water is discharged into the stormwater pond which is analysed as per the relevant criteria set out in Table 13.4.

14.3.5 Stormwater irrigation system

Storm water reuse will be undertaken by irrigation of on-site landscaping areas and on-site pasture irrigation.

- The amount of collected storm water required to be re-used through the sites irrigation system is 20 mega-litres per annum. The actual irrigation capacity of the irrigation system is 27.3 ML to ensure overcapacity of irrigation availability.
- The sites irrigation system has been designed to fully re-use the sites collected storm water.
- Excess water above the requirements of the landscape plantings will be irrigated on to pasture on the west side of the Power Station.
- The on-site irrigation design and layout is detailed in Appendix 2.

14.3.6 Sediment control

- The Power Station has been built so all access roads are sealed, and all exposed areas have been covered with blue stone or road base material.
- Rehabilitation of construction areas outside of the site security fence has been undertaken by implementing the Visual Amenity Management Plan detailed in Section 13.5

Table 14.5: Water Quality and Sediment Control Management Plan

Element	Water quality and sediment control management plan
Sources	• Water and sediment sources are outlined in Table 13.2.
Potential Impacts	• Waste water, irrigation water, chemicals, oils or sediment entering surrounding properties used for farming. • land degradation from soil erosion or inappropriate irrigation practices • Chemicals or oils contaminating the site storm water pond.
Objectives	• To minimise the risk of contamination of surface water, groundwater and storm water through leaks or spills of chemicals / polluting substances during the operation of the Power Station. • Ensure storm water and process water works are appropriately designed, constructed and maintained throughout operations. • To achieve objectives in the WMS submitted and approved by the DPE and EPA during the development approval process. • Minimise erosion of sediment. • Provide permanent erosion and sediment control measures • Surface waters are not impacted upon by contaminated storm water leaving the site • No degradation of paddocks receiving irrigation.
Controls	Controls for each aspect of water and sediment will be undertaken by: **Storm water pond:** The operating philosophy for the stormwater pond is to • Maximise the stormwater pond storage capacity before the start of each winter (wettest part of year) by reducing the pond level. • Maintain a minimum of 7.5ML in the summer months to provide fire fighting water supply for the Rural Fire Service – in winter this will be maintained at 30-40% of capacity • The storm water pond is permitted to overflow provided the discharge and monitoring requirements detailed in Section 12 are met. However, the primary objective is to prevent any uncontrolled overflow from the stormwater pond by managing the stormwater pond water through irrigation. **Oil & Chemicals Spill Control:** • Store flammable and combustible liquids eg diesel and as per Section 13.6 Storage and Handling Chemicals and Oils. • Site personnel will be trained in spill response strategies and spill kit use using the UPS Spill Response & Cleanup Procedure. • Ensure spill kits are stocked and available in readily accessible locations. **Evaporation Dam Control:** • UPS is approved to blend evaporation pond water with storm water for as a measure to minimise the potential for an uncontrolled flow of evaporation pond water into the storm water pond and off site. Blending and irrigation is permitted provide blending is undertaken as per Work Procedure UPS-EMT-PRC-002 – UPS Stormwater / Evaporation Pond Water Blending (OT ID: 36038649) and blended discharge complies with

<table>
<tr><th>Element</th><th>Water quality and sediment control management plan</th></tr>
<tr><td></td><td>
the limits and sampling requirements set out in Section 12 of this EMP and

Clean out evaporation pond as required.
Dispose solids or salts from pond as per Section 13.8 Waste Management Plan.

<u>Irrigation System:</u>

Irrigation limits and monitoring requirements are detailed in Section 13.
The irrigation system is a fully automated process.
The irrigation system runs off an automatic irrigation controller. The controller will be reset each month to adjust the irrigation rate to meet the changing weather conditions from autumn into summer and late summer.
The irrigation controller will be reset each month. An irrigation schedule has been developed for the site and is detailed below in Table 13.3 Irrigation Scheduling.

Pasture growth in the pasture irrigation area will be managed by stock grazing. The Site Manager will enter into an agreement with a local farmer to access the area west & north of the Power Station for stock grazing.

In the event that water quality at the irrigation point exceeds the conductivity limit or the guideline values below, irrigation shall cease immediately until cause of the high levels are investigated and rectified.

Guideline for irrigated water
<table>
<tr><td>Parameter</td><td>Internal guidelines</td></tr>
<tr><td>pH</td><td>6.5-9.5</td></tr>
<tr><td>Total suspended solids</td><td>100ppm</td></tr>
<tr><td>Hydrocarbons</td><td>No visual oil <10mg/l</td></tr>
</table>
<u>Sediment:</u>

Minimising disturbance of vegetation and topsoil
Limiting movement of vehicles through approved access points only

</td></tr>
</table>

Figure 3 – Site Stormwater Drainage Direction of Flow

Uranquinty Power Station

Google Earth – Clean & Dirty Water Areas (NTS)

Date created: 10 June 2022

Table 14.6:Site Stormwater Irrigation Schedule and calcultations

Western Mound						
Planting Dimensions		**Evaporation**		**Irrigation Hours/Month Required**	**Irrigation Hours/Week**	**Total Water Use**
Width	50 m	October	146 mm	7.2 Hrs/Mth	1.8 Hrs/Week	124,260.16 L
Length	417 m	November	213 mm	10.5 Hrs/Mth	2.6 Hrs/Week	181,283.66 L
Irrigation Type:		December	295 mm	14.5 Hrs/Mth	3.6 Hrs/Week	251,073.62 L
External Drippers		January	310 mm	15.2 Hrs/Mth	3.8 Hrs/Week	263,840.07 L
Dripper Spacing	2.5 m	February	263 mm	12.9 Hrs/Mth	3.2 Hrs/Week	223,838.51 L
Line Spacing:	5 m	March	214 mm	10.5 Hrs/Mth	2.6 Hrs/Week	182,134.76 L
Number of Rows	13	**Total**	**1441 mm**			**1,226,430.78 L**
Dripper Output:	8 l/hr	**Water Application (mm)**		**Evaporation Correction Factor**		
Drippers per Tree	1	Dripper Radius	0.5 m	0.5		
Drippers per Line:	167	Surface Area	0.785 m2			
Total Drippers:	2168	Water application	10.19 mm/hr		**1.23**	**Megalitres**
Water Output per Line:	1334 l/hr					
Total Water Output:	289 l/min					
Total Water Output:	17,347 l/hr					

Southern Mound						
Planting Dimensions		**Evaporation**		**Irrigation Hours/Month Required**	**Irrigation Hours/Week**	**Total Water Use**
Width	80 m	October	146 mm	7.2 Hrs/Mth	1.8 Hrs/Week	59,826.42 L
Length	173 m	November	213 mm	10.5 Hrs/Mth	2.6 Hrs/Week	87,281.01 L
Irrigation Type:		December	295 mm	14.5 Hrs/Mth	3.6 Hrs/Week	120,882.15 L
External Drippers		January	310 mm	15.2 Hrs/Mth	3.8 Hrs/Week	127,028.70 L
Dripper Spacing	2.5 m	February	263 mm	12.9 Hrs/Mth	3.2 Hrs/Week	107,769.51 L
Line Spacing:	5 m	March	214 mm	10.5 Hrs/Mth	2.6 Hrs/Week	87,690.78 L
Number of Rows	26	**Total**	**1441 mm**			**590,478.57 L**
Dripper Output:	8 l/hr	**Water Application (mm)**		**Evaporation Correction Factor**		
Drippers per Tree	1	Dripper Radius	0.5 m	0.5		
Drippers per Line:	-	Surface Area	0.785 m2			
Total Drippers:	1044	Water application	10.19 mm/hr		**0.59**	**Megalitres**
Water Output per Line:	- l/hr					
Total Water Output:	139 l/min					
Total Water Output:	8,352 l/hr					

Switch Yard Area						
Planting Dimensions - Triangle		**Evaporation**		**Irrigation Hours/Month Required**	**Irrigation Hours/Week**	**Total Water Use**
Width	60 m	October	146 mm	7.2 Hrs/Mth	1.8 Hrs/Week	2,865.25 L
Length	90 m	November	213 mm	10.5 Hrs/Mth	2.6 Hrs/Week	4,180.13 L
Irrigation Type:		December	295 mm	14.5 Hrs/Mth	3.6 Hrs/Week	5,789.38 L
External Drippers		January	310 mm	15.2 Hrs/Mth	3.8 Hrs/Week	6,083.75 L
Dripper Spacing	2.5 m	February	263 mm	12.9 Hrs/Mth	3.2 Hrs/Week	5,161.38 L
Line Spacing:	5 m	March	214 mm	10.5 Hrs/Mth	2.6 Hrs/Week	4,199.75 L
Number of Rows	12	**Total**	**1441 mm**			**28,279.63 L**
Dripper Output:	8 l/hr	**Water Application (mm)**		**Evaporation Correction Factor**		
Drippers per Tree	1	Dripper Radius	0.5 m	0.5		
		Surface Area	0.785 m2			
Total Drippers:	50	Water application	10.19 mm/hr		**0.03**	**Megalitres**
Total Water Output:	7 l/hr					
Total Water Output:	400 l/hr					

Pasture Irrigation Area						
Dimensions		**Evaporation**		**Irrigation Hours/Month Required**	**Irrigation (each sprinkler) Hours/Week**	**Total Water Use**
Width	105 m	October	146 mm	14.1 Hrs/Mth	3.5 Hrs/Week	2,529,450.00 L
Length	165 m	November	213 mm	20.5 Hrs/Mth	5.1 Hrs/Week	3,690,225.00 L
Irrigation Type:		December	295 mm	28.4 Hrs/Mth	7.1 Hrs/Week	5,110,875.00 L
Turf Sprinklers		January	310 mm	29.8 Hrs/Mth	7.5 Hrs/Week	5,370,750.00 L
Sprinkler Spacing	15 m	February	263 mm	25.3 Hrs/Mth	6.3 Hrs/Week	4,556,475.00 L
Number of Rows	10.000	March	214 mm	20.6 Hrs/Mth	5.1 Hrs/Week	3,707,550.00 L
Number per Row	6.000	**Total**	**1441 mm**			**24,965,325.00 L**
Number of Sprinklers	60	**Water Application (mm)**		**Evaporation Correction Factor**		
Output per Sprinkler:	50 l/min	Surface Area	17325 m2	1.0		
Output per Sprinkler:	3000 l/hr	Surface Area	1.7325 hectares		**24.97**	**Megalitres**
Total Water Output:	300.000 l/hr					
Total Water Output:	180,000 l/hr	Water application	10.39 mm/hr			

Total Water Use per Annum	26.78 Megalitres

14.4 Noise

The Power Station has been designed and constructed to minimise plant noise emissions from the BOP & turbine operation by:

- The turbine and generator housed in noise controlling building;
- Diffuser and bottom half of stack enclosed in noise controlling structure;
- Additional baffles added inside stack to reduce stack emission noise;
- Noise insulation surrounding turbine casings, and
- Insulated and sealing access doors into turbine building.

The Noise Mitigation and Remediation Strategy was developed in 2009 in consultation with EPA and DPE (formerly DPIE) and subsequently approved by DPE. It sets out remediation strategies including investigations of mitigating noise at the source, and shorter term strategies including agreements with identified neighbours.

In addition to the Noise Management Plan, Origin has recently submitted an application for a Cooperative Research Centre Project (CRC – P) grant, which is a collaboration between Origin Energy, The University of Adelaide, and Sonus.

This project aims to develop a new technology that can be fitted to existing or new exhaust stacks. The device, for which UA has submitted a provisional patent, controls sound as it exits the exhaust stack. The device redirects the sound upwards and therefore away from nearby communities, reducing noise impacts. It does not attempt to muffle the sound.

The project builds on work by all three partners. Origin Energy and Sonus have worked together in noise measurements and noise control strategies for 15 years. UA consults to Origin to advise of current and new research on noise control solutions, and has regularly worked with Sonus in the past 15 years.

The project will move the new device from Technology Readiness Level (TRL) 4 to TRL 7 (noting it will reach TRL 5 at Milestone 3 and TRL 6 at Milestone 5). The device will be tested on an Origin-owned 28MW gas-fired turbine. We will assess the cost versus expected benefit of the technology when applied to assets in Origin's portfolio, in particular larger assets like the turbines at Uranquinty Power Station. Upon completion of this project, a review of the outcomes versus this OEMP will be undertaken to ensure any opportunities for improvement are identified and actioned, if practicable.

Element	Noise Management Plan
Sources	• Turbine operation • Diesel generator • Maintenance activities • Fire pump house • Staff transport and equipment transport (Refer Section 13.10 Transport Code of Conduction).
Potential Impacts	• Noise from site activities affecting the surrounding community
Objectives	• Comply with noise limits of the DA and EPL set out in Section 12. • Minimise noise impacts on the surrounding community from the sites operations
Controls	**General activities** • The units operate on an auto start up and auto shut down sequence at all times to ensure the fastest, most efficient plant start up and shut downs; • The plant will operate under operational procedures including operating checklists, and ensuring all doors, vents, louvers are closed as required during operation to limit the releases of noise from the generator/turbine enclosures. • Noise risk management at UPS uses real time and forecast weather data in conjunction with the Plant Manager to avoid situations where weather conditions can exacerbate noise risk. If generation is required during these periods, discussion will occur between trading and the Power Station manager who will approve or reject the request and in turn will communicate with the local community. **Maintenance activities** Minimisation of noise from maintenance activities will be undertaken on-site by: • Programming routine maintenance activities so they occur on weekdays during normal working hours wherever possible; • Ensuring all operators or contracted maintenance personnel working on plant on weekends, during evenings or at night time understand the noise management issues on-site and complete their work with no noise impacts on the sites near neighbours. • The Site Manager/ Community Relations Advisor communicating to the local community through the Community Participation Program any upcoming major outages or maintenance programs that may mean new on-site activities, increased transport to site or any additional planned noise sources
Noise complaint management	In the event of a noise complaint follow the process in the 'Uranquinty Power Station, Operational Noise Procedure, October 2017', Sonus S3139C123 attached in Appendix 4. The complaint shall be entered as an incident in OCIS.

14.4.1 Noise monitoring and reporting

The site infrastructure is maintained in accordance with the information provided above (14.2.1 and table 14.4). Noise monitoring frequency is determined by our maintenance schedule and undertaken when new plant or equipment is introduced to the site or new activities are undertaken on-site. Furthermore, noise monitoring is undertaken following any major maintenance outages or generator overhauls. All noise assessments are documented for auditing purposes.

In accordance with DA-31-2-2004I MOD10 condition 3.12D Origin has entered into appropriate legal agreements with the relevant stakeholder to minimise noise impacts and associated risk.

In the event of a noise complaint Origin follows the process set out in in the 'Uranquinty Power Station, Operational Noise Procedure, October 2017', Sonus S3139C123 attached in Appendix 4. This procedure provides the appropriate steps for the management of a noise compliant as well as a method for the measurements of noise during periods of testing pursuant to condition 3.12E b) of DA-31-2-2004I MOD10. Section 4 nd 5 of the Operation Noise Procedure set out the following:

- Stack noise measurement and noise logging procedure which highlight the method to determine any change in noise from the UPS over time;
- Appropriate equipment for the procedure and associated calibrations;
- An equipment set up schematic;
- Methodology for the analysis of data; and
- Meteorological considerations.

14.5 Visual Amenity

14.5.1 Site Design and On-site Lighting

Low reflective materials on buildings and neutral colour tones on buildings and plant have been used to blend in with the surrounding landscape.

A site lighting plan has been developed that provides adequate on-site lighting to meet OH&S requirements but minimise off-site lighting impacts. The lighting plan has limited lighting under lumi-trol and most lighting is manually operated. The plan also allows selected areas of plant to be lit up as required leaving the rest of the site unlit.

Spot lights are only utilised in limited use areas and the majority of external lights are down lights.

14.5.2 On-site Landscape Plan

An on-site landscaping plan has been implemented for the site. The plan was developed to restore former construction areas and to support the Off-site Screen Planting undertaken to provide a visual barrier to near neighbours of the UPS.

The main aspects of the On-Site Landscape Plan presented in Appendix 3 includes:

- Retention of all existing vegetation on-site;
- Use of endemic native vegetation to screen the development at both the middle and broad scale to aid in camouflaging the structures at distances;
- Implementation of native endemic tree/ shrub plantings to the east, west and south of the site;
- Additional planting of native endemic vegetation along the road way into the site.

- The car park is located within the sites internal security fence and away from landscaped areas All landscaped areas are fenced off to prevent encroachment of vehicles.
- Origin has a third-party contractor which conducts fortnightly inspections of landscaped areas on the site and undertake the appropriate work required to ensure the site is maintained and in a tidy, healthy state. All work undertaken is documented for reporting or auditing purposes as required.

All landscape plans were included within the original OEMP submitted to the DPE ahead of operations as per the requirements set out in the DA. This OEMP was approved and implemented onsite. Subsequently audit documents were submitted to DPE detailing compliance with the DA in relation to landscaping and off-site screen planting as follows:

- Golder Associates; "Environmental Compliance Audit – Uranquinty Power Station, Wagga Wagga NSW" (2010)
- Golder Associates; "Annual Environmental Compliance External Audit" (2015)

14.5.3 Off-site Screen Planting

Off-site screen planting as per the DA was completed in October 2007 for the properties who nominated for screening works. Under the DA, selected existing residential properties within 3 km of the site could have nominated to have screen plantings undertaken on their properties prior to January 2012. No further properties nominated within this timeframe.

Origin's responsibility for the maintenance (watering, pruning and replacement of dead vegetation) of these screening areas was concluded in October 2012 after the required 5 years.

Table 14.7: Visual Amenity Management Plan

Element	Visual Amenity Management Plan
Sources	• Visual impact of Power station and Switch Yard • Roadways • On-site lighting causing off-site impacts
Potential Impacts	• Negative visual impacts on amenity for the surrounding community.
Objective	• To minimise visual impacts on the Immediate, Middle and Broad view distances • To ensure on-site lighting does not affect near neighbours
Controls	• All shrubs and tree plantings will be protected from vehicle encroachment and stock grazing by appropriate fencing. • On site and offsite vegetation will be monitored and maintained with programmed maintenance including irrigation, pruning and weed control as required.

14.6 Storage and Handling of Chemicals

Table 14.8: Chemical and Oils Management Plan

Element	Chemicals and Oils Management Plan
Sources	• Generating units • Transformers • Hazardous Goods Store • Emergency Generators (Diesel) & Fire Fighting Pump (Diesel)
Potential Impacts	• Release of water contaminated with spilled chemicals. • Fuel source for onsite fires. • Land contamination • Generation of contaminated wastes.
Objectives	• ensure the storage, handling and use of chemicals, oils and diesel does not cause pollution of the environment or harm to persons. • No chemical/oil spills outside of designated storage or spill containment areas
Controls	• The site shall maintain a register of hazardous substances held on site and have access to material safety data sheets for these substances • Storage of flammable and combustible liquids such as fuels and oils shall comply with AS1940. • Storage and handling of chemical substances will be in accordance with AS 3780. • Bunds and storage facilities will be maintained to ensure design capacity is available. • Ensure spill kits and emergency response equipment are available at appropriate locations across the site to clean up spills and leaks. • Site personnel will be trained in appropriate spill response strategies and spill kit use. • Any spills shall be rendered harmless and arrangements made for appropriate collection and disposal, including cleaning materials, absorbents and contaminated soils in accordance with Section 13.8 Waste Management Plan of this EMP.

14.7 Heritage

Table 14.9: Heritage Management Plan

Element	Heritage Management Plan
Sources	• UPS site
Potential Impacts	• Heritage objects found on site are inappropriately dealt with. • It should be noted that in heritage & artifact assessments for the EIS found that there is a low potential for heritage objects or artifacts to occur on-site.
Objectives	• To ensure that any indigenous or non-indigenous heritage objects found on site are treated appropriately and in accordance with the relevant legislation.
Controls	• Due care will be taken during earthworks and disturbance of land by all staff. • If a heritage object is found, immediately stop work on the area and advise the Site Manager. • Appropriate specialists may need to be engaged to assess the find and notify the administering authority.

14.8 Waste

Table 14.8: Waste Management Plan

Element	Waste Management Plan
Sources	• General waste from office and kitchen Regulated wastes including • Oily rags, waste oils and chemical, used spill absorbent materials • Evaporative pond residue • Sewerage • Waste water (refer Section 13.3 water quality and sediment control)
Potential Impacts	• Contamination of land or water resources through inappropriate waste disposal methods. • Inefficient use of resources resulting in excessive waste generation • Litter of site or water through poor waste containment practices on site. • Odour affecting community
Objectives	• No adverse impacts on land, water or the community from inappropriate containment or disposal of waste
Controls	**Recycling** • A recycling program has been implemented on site. Opportunities to improve recycling will be reviewed during EMP review and include waste streams such as paper, cardboard, waste oils, plastic chemical containers and scrap metal. **General waste**

Element	Waste Management Plan
	• General waste unable to be recycled will be stored in appropriate receptacles and removed weekly? • No burning of waste is permitted on site at any time **Green waste** • Green waste from landscape maintenance activities will be reused on site where possible of disposed of uncontaminated to the greenwaste section of the Wagga Wagga City Council (WWCC) landfill • No burning of green waste is permitted on site at any time **Regulated waste** • Regulated waste such as waste oil, chemicals, contaminated soil and spill clean up materials and adsorbents shall only be transported from site by companies licenced to do so. • Regulated wastes shall only be disposed at a facility licenced to accept such wastes (consultation with the authority may be needed to identify the appropriate facility). **Sewage** • Sewage from site treated through an on-site septic treatment facility and irrigated over the transpiration area • Transpiration area is fenced off from vehicle and stock access.

14.9 Transport Code of Conduct

Table 14.9: Transport Code of Conduct

Element	Transport Code of Conduct
Sources	• Personnel transport to and from Power Station • Transport deliveries to site
Potential Impacts	• Disturbance of neighbouring residences and the community of Uranquinty by movement of transport vehicles to and from site.
Objectives	• Operate light and heavy vehicles in a manner which minimises impacts of noise, lighting, traffic congestionand emissions on the community. • Manage vehicles to and from site in a manner which takes into consideration road safety and congestion on local roads.
Controls	The following controls have been prepared in consultation with the guidelines presented by the City of Wagga Wagga*: • All vehicles arriving on site must at a minimum be maintained/serviced in line with the NSW Road Transport (Vehicle Registration) Regulation 2017 or National Heavy Vehicle Regulator. • Heavy vehicles shall only be permitted to enter and leave the site between 7.00am and 7.00pm on any day. This will ensure drivers avoid travelling through built-up areas late at night or at times of high traffic flows in the surrounding community; This condition does not apply in the event of a direction from police or other relevant authority for safety reasons. • Access route to the site for delivery vehicles, including heavy vehicles, will be limited to Uranquinty Cross Road via the Sturt Highway at Uranquinty. • The site induction for site personnel and regular delivery drivers will cover: ○ Appropriate heavy vehicle access routes. ○ The need to observe speed zones, especially the 50km speed zones through Uranquinty and the 100k speed zone along Uranquinty Cross Road. ○ The need to ensure appropriate behaviour on community roads as follows: - Drivers of a vehicle must not use a hand-held mobile phone unless legally parked. - Seatbelts must be worn by all occupants in a vehicle. - You must drive on the left side of two-way roads. - You must not drive above the speed limit. - Do not drive if you have consumed alcohol or drugs. - Do not drive a vehicle when tired. - Always be aware of the possibility of wildlife and stock on the road ○ The need to ensure that noise levels are kept to a minimum especially through the township of Uranquinty and into the Power Station site. • Loads entering or leaving site will be suitably covered to ensure loads are secure.

15. Documentation

15.1 EMP Review and Amendments

The EMP will be reviewed every 3 years to ensure that environmental practices on site are up to date with legislative requirements and industry practice.

The EMP swill be amended where there is a change to plant or processes onsite which affect how the site complies with the requirements of the DA and EPL or where there is a change to plant or processes which increases or is likely to increase the environmental impacts expressly provided for by the DA and EPL.

In accordance with Condition 6.5 of the DA and as per the clarification provided in the letter from the Department of Planning, Industry and Environment, any amendment shall be submitted to the Department of Planning, Industry and Environment and written approval obtained prior to implementation of any changes to the plan.

15.2 Records Management

Hardcopies of records required to demonstrate operation in accordance with this EMP, the DA and EPL for UPS are filed on site. Electronic copies are in OpenText.

The minimum retention period for records is set out below. Where any doubt exists in relation to the minimum period of retention of a particular record type, it is to be retained indefinitely.

Table 15.1: Records Management

Retention Period	Record Description / Type
6 years	• All environmental records • Incident or investigation reports of any kind • Induction and training records of any kind
30 years	• Risk assessment, atmospheric/environmental monitoring, EPA or DPE correspondence, related records
Indefinitely	• Operational manuals for the Power Station plant • Drawings relating to Power Station plant design
Note: Under the Protection of Environment Operations (Waste) Regulation 2014, Section 33, Waste records shall be retained for at least 6 years after the record is made.	

16. Document Control

Author (To whom any changes are to be recommended)	
Position	**Incumbent**
Uranquinty Power Station Plant Manager	Paul Olsen
Stakeholders and other contributors	
Position	**Incumbent**
Senior Environment and Community Business Partner	Jarryd Lavery

Reviewed by		
Position	**Incumbent**	**Review date**
Community Relations Business Partner	Tania Carlos	18/10/2021

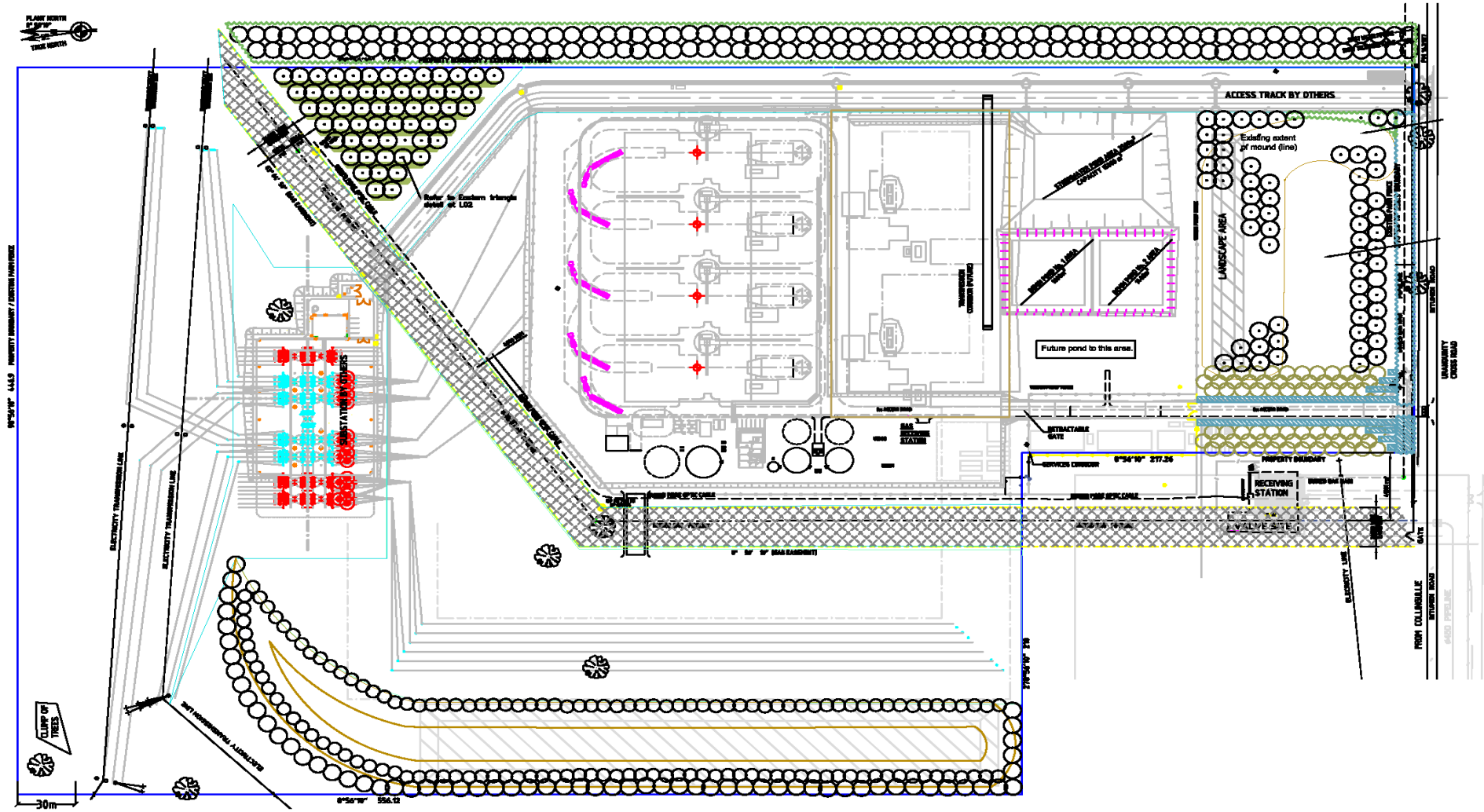
Approved by		
Position	**Incumbent**	**Approval date**
Uranquinty Power Station Plant Manager	Paul Olsen	17/06/2022
Group Manager, Energy Markets Environment & Community	Gemma Dobson	17/06/2022

History			
Date	**Author**	**Version**	**Nature of change**
18/10/2008	Guy Corbett	1.0	Edits to meet DOP&I Requirements
28/07/2009	Ian Smith	2.0	Update to reflect Origin format and procedure identification
29/10/2009	Ian Smith	3.0	Updated to noise management section, project description to reflect operations
21/01/2010	Ian Smith	4.0	Incorporation of comments from DOP&I
8/11/2011	Guy Corbett	5.0	Annual EMP review & update
17/08/2012	Guy Corbett	6.0	Annual EMP review & update as part of MOC UPS/047
25/06/2013	Guy Corbett	7.0	Annual EMP review & update
30/01/2014	Guy Corbett	8.0	Annual EMP review & update
10/02/2015	Guy Corbett	9.0	Annual EMP review & update
07/09/2016	Paul Olsen	10.0	Annual EMP review & update
26/10/2017	Paul Olsen	11.0	Annual EMP review & update, 2017 UPS Operational Noise Procedure
24/10/2018	Marianne Gibbons	11.1	Inclusion of the CRC-P Noise Reduction Research Project
08/10/2021	Jarryd Lavery	11.2	EMP review & update

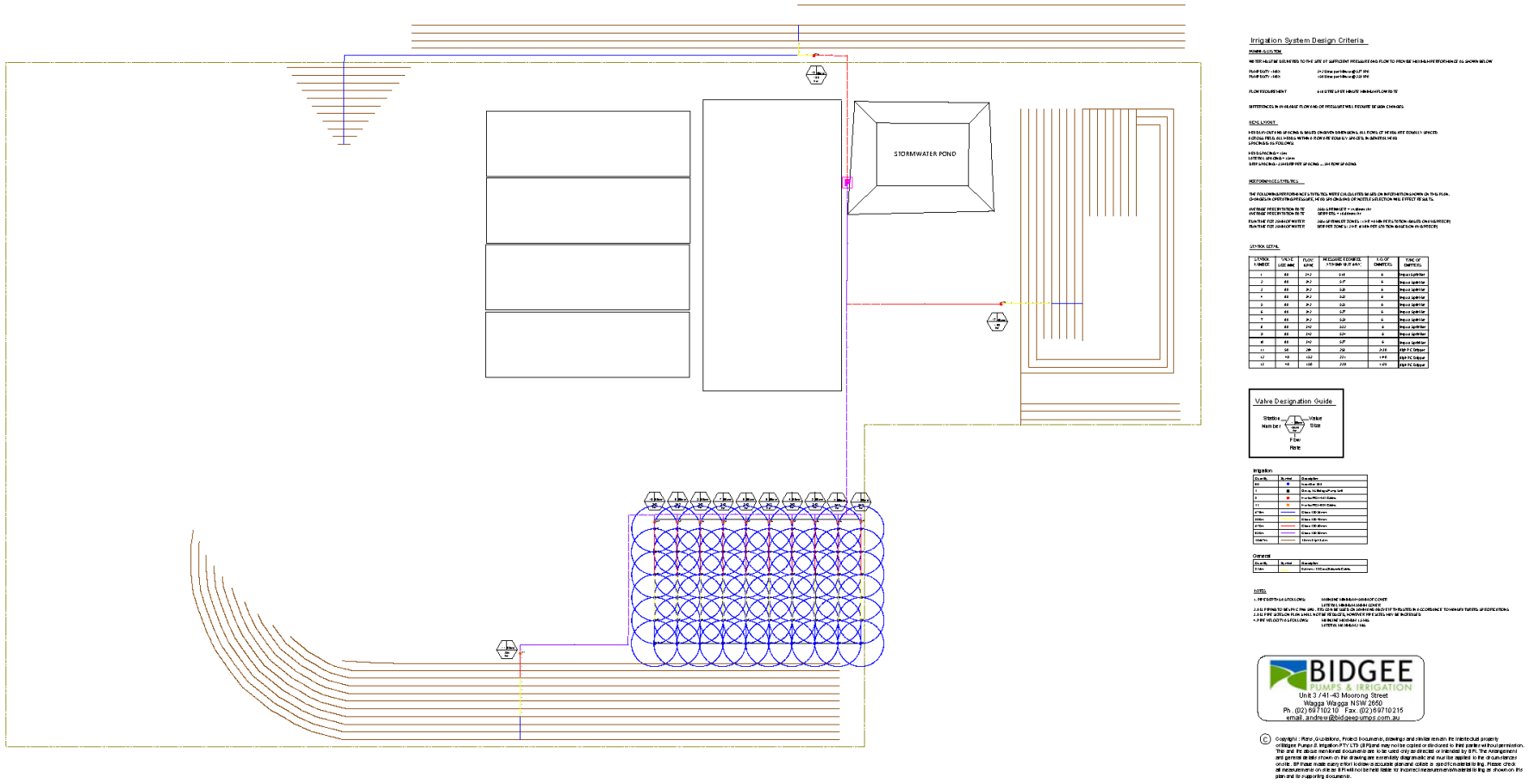
04/04/2022	GEN IM	11.3	Change only to Controlled Document Number – formerly GEN-HSE-EMP-UPS
17/06/2022	Jarryd Lavery	12.0	Major Change: following comments from DPE

Related Documents	
Title	**Document ID**
Origin HSE Policy	OT ID: 26004885
ORG-RMS-DIR-001 Origin Risk Management Directive	OT ID: 23947168
GEN-HSE-PRC-008 Generation's Workplace Risk Assessment Procedure	OT ID: 36204732
UPS-HSE-ERP-001Uranquinty Power Station Emergency Response Plan	OT ID: 36030028
UPS-ENV-PRC-002 - UPS Stormwater / Evaporation Pond Water Blending Procedure	OT ID: 36038649
UPS-AMS-PRC-033 UPS CEMS Download and Data Management	OT ID: 36095226
UPS-AMS-PRC-025 UPS Weather Data Download and Data Management	OT ID: 36090964
UPS-AMS-PRC-022 UPS NOx Indicated Exceedance Procedure	OT ID: 36100997
UPS-AMS-PRC-021 PEMS Model Calculation and Data Management	OT ID: 36097398
UPS-AMS-PRC-006 Uranquinty Total NOx Discharge Calculation Procedure	OT ID: 36073926
Review Requirements	
This document is next due for review 17 June 2025 by the UPS Plant Manager.	
Controlled Document Location	
OpenText ID: 35928659	

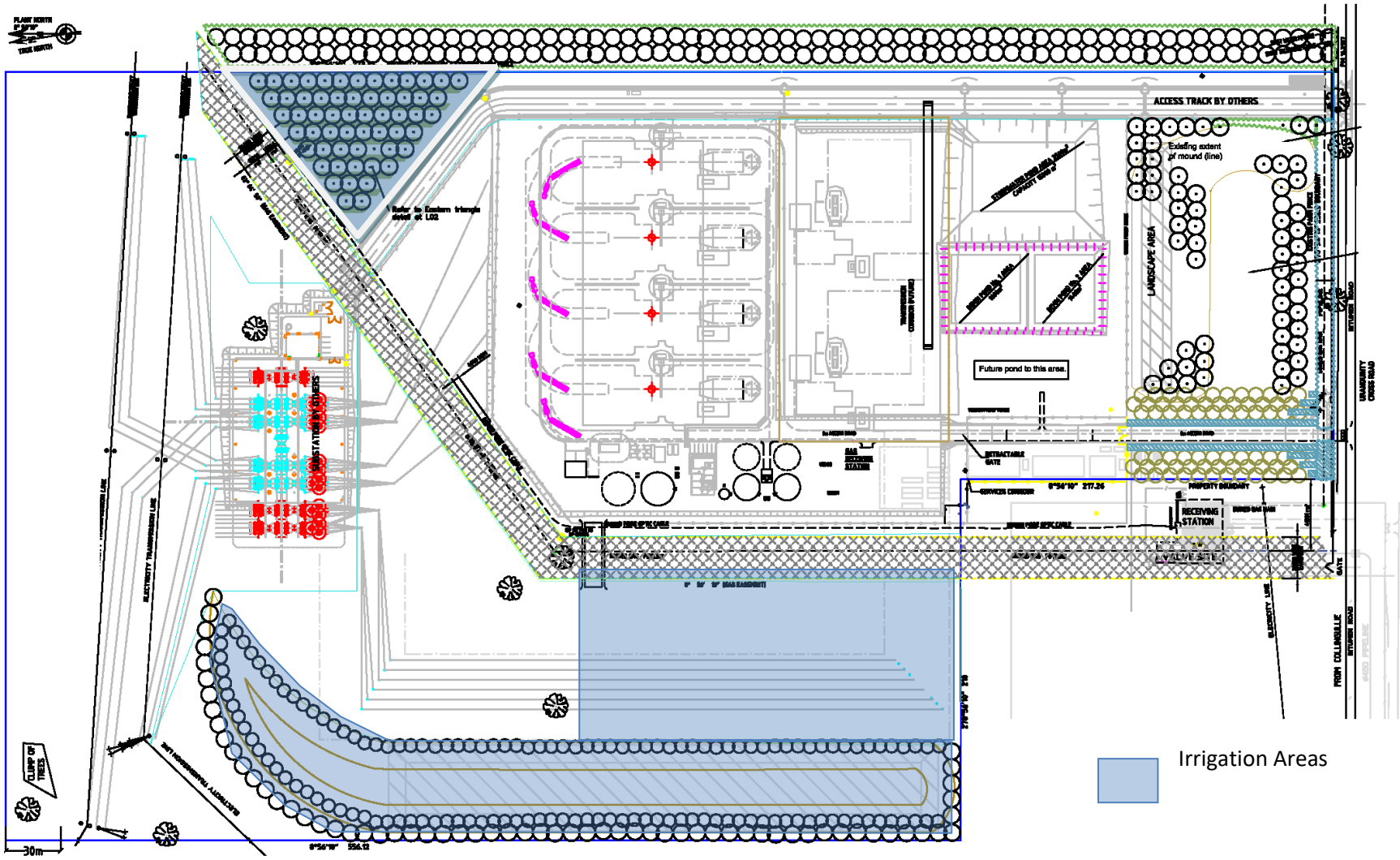
17. Appendix 1. Site Layout Schematic



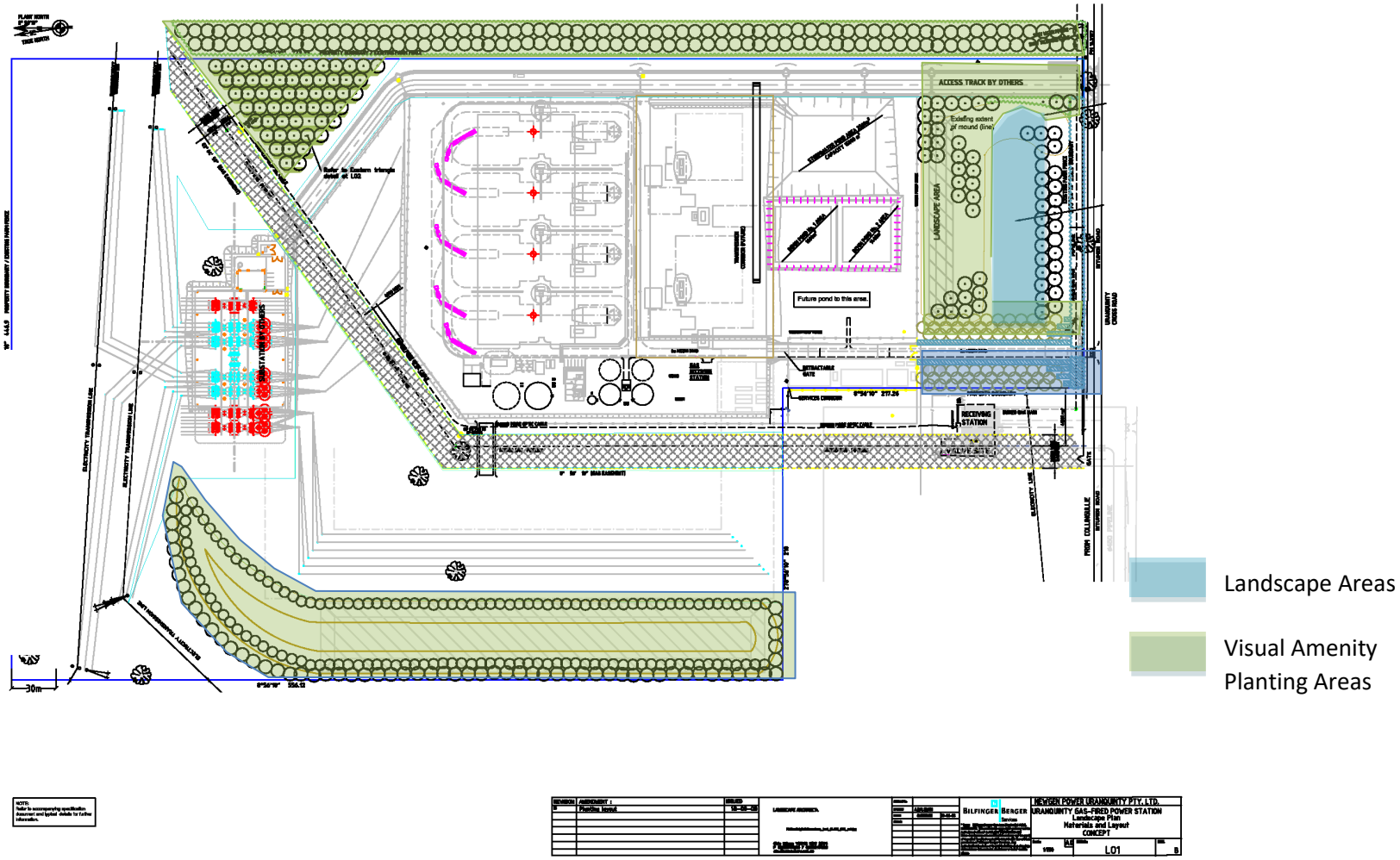
18. Appendix 2. Site Irrigation Layout



19. Appendix 2a. Irrigation Reuse Areas



20. Appendix 3. Site Landscape Plan



21. Appendix 4 – Operational Noise Procedure

Note: Appendix 4 has been added to PDF version (published)

URANQUINTY POWER STATION

OPERATIONAL NOISE PROCEDURE

October 2017

sonus.

Chris Turnbull
Principal
Phone: +61 (0) 417 845 720
Email: ct@sonus.com.au
www.sonus.com.au

GLOSSARY

A weighting	Frequency adjustment representing the response of the human ear. The frequency weighting emphasises the noise in the mid frequency range where the human ear is best at hearing.
Ambient noise level	Noise level in the absence of the noise from the power station.
C weighting	Frequency adjustment emphasising the low frequency range.
dB(A)	A weighted noise level measured in decibels.
dB(C)	C weighted noise level measured in decibels.
L_{A90}	The A-weighted sound pressure level that is exceeded for 90 per cent of the time over which a given sound is measured.
L_{Aeq}	The A weighted equivalent continuous noise level – the level of noise equivalent to the energy-average of noise levels occurring over a measurement period.
L_{Ceq}	The C weighted equivalent continuous noise level

1 INTRODUCTION

The Uranquinty Power Station[1] (UPS) is an open cycle gas-fired power station located at Uranquinty Cross Road, and is operated to meet the State's need for power at various times. It has four gas turbines for electricity generation. The UPS is licensed by the Office of Environment and Heritage[2] (OEH).

The Development Consent for the UPS required a noise verification process after the commencement of operations of the UPS. That noise verification process was completed in 2009.

The Operational Environmental Management Plan (OEMP) for the UPS proposed monitoring following the completion of the noise verification process. Long term noise monitoring was conducted in a range of seasons and at a number of residences in various directions from the UPS, including some locations where residents had complained about the noise. The conclusion of the noise monitoring was that the noise was compliant with the Conditions of Development Consent and Environment Protection licence at all times when the contribution of noise from the UPS could be determined.

This noise monitoring procedure has been designed to formalise the procedure for future noise monitoring conducted in the event of a complaint regarding noise.

2 ASSESSMENT CRITERIA

The assessment criteria for environmental noise from the UPS are provided by the following:

- The Conditions of Development Consent (as modified)[1];
- The Conditions of the Environment Protection Licence (as modified)[2]; and
- The New South Wales *Industrial Noise Policy 2000*[3]; and
- The New South Wales *Noise Policy for Industry 2017*[4].

The noise limits in the Consent and Licence conditions (the Conditions) apply to residences. The limit is an adjusted contribution of noise from the UPS of 35 dB(A) at all but three residences, where a higher limit is prescribed. To determine the adjusted contribution of noise from the UPS, the noise level is measured at the residence and then adjusted for the contribution of noise from other sources, as well as adding penalties to account for any annoying characteristics of the noise such as low frequency (rumbling) or tonality (a single frequency such as a whistle).

The *Industrial Noise Policy 2000* has recently been superseded by the *Noise Policy for Industry 2017*. However, as it is specified in the Conditions of Development Consent and the Conditions of the Environment Protection Licence, *the Industrial Noise Policy 2000* still provides guidance regarding noise monitoring and the requirement for, and level of, any mitigation that might be required following the completion of the testing. Fact sheet C of the *Noise Policy for Industry 2017* is now used for the assessment of noise characteristics.

3 NOISE COMPLAINT EVALUATION AND RESPONSE

The following methodology is proposed to determine the action to be taken and the noise measurements to be conducted in the event of a noise complaint:

Complaint Receipt

The following procedure will be used in the event of a noise complaint:

1. Record all details to an electronic complaint log;
2. Record the following complainant details:
    - Location of the dwelling (if provided);
    - Contact details of the complainant (if provided);
    - The time of the complaint;
    - Confirmation that the complainant has been informed that the complaint will be logged but no further action will be taken if the location and contact details are not provided (if relevant).
3. Record the following noise source details:
    - What is the subjective description of the noise?
    - Does the noise relate to the typical operation of the power station?
    - Does the noise relate to the operation of the power station under certain weather conditions? If so, what are those weather conditions?; and
    - Does the noise relate to a new noise source that has not appeared previously during the typical operation of the power station?
    - Does the complaint relate to a perceived increase in noise over time?

A response to a noise complaint will be conducted in the following way:

Non-Operational Noise

1. Determine whether the issue is related to a non-operational noise source, such as a truck delivery or the noise associated with maintenance.
2. Where the noise source is still operating at the time of the complaint, consider any mitigation measures which could be taken immediately to reduce the noise.
3. Following the completion of the activity, which is the subject of the complaint, conduct a detailed assessment of any reasonable and feasible mitigation measures which could be taken to reduce the noise for any future similar activity.
4. Where further complaints are received following the implementation of all reasonable and feasible measures, the noise from the activity will be measured in accordance with the New South Wales *Industrial Noise Policy 2000* or the New South Wales *Noise Policy for Industry 2017* (as relevant).

Maintenance Issues or Mechanical Defects

1. Determine whether the issue is related to a maintenance issue or a mechanical defect based on either the:
    - information provided during the Complaint Receipt; or
    - discussion with operational employees; or
    - an inspection of the location during the conditions of the complaint;
2. Where the issue is related to a maintenance issue or a mechanical defect, rectify the issue and provide the complainant with a summary of the above investigations.

Typical Operation

1. Where the issue is not related to non-operational activity, a maintenance issue or a mechanical defect, review any noise monitoring previously conducted to determine:
    a) Whether compliance noise monitoring has been conducted at the dwelling; or
    b) Whether compliance noise monitoring has been conducted at a dwelling in the vicinity of the complainant that is closer to the nearest turbine;
2. In the circumstance where both 1a) and 1b) are not confirmed, proceed to Step 5;

3. In the circumstance where either 1a) or 1b) are confirmed, compare the operational status of the turbines, the weather conditions at the time of the complaint and any potential change in local conditions that might result in modified results such as the construction of structures, change in vegetation or the installation of pumps or air conditioning units. Where the power station is found to be operating consistently with the conditions of the operational noise compliance testing and there has been no change in the local conditions, provide the complainant with a summary of the above investigations and a copy of the operational noise compliance testing report, where that document has not been provided to the complainant previously.
4. Where the complaint relates specifically to a perceived recent change in noise, conduct measurements in accordance with Section 4, unless measurements have been conducted in accordance with this procedure in the time since the complainant indicated that the noise has increased.
5. In all other circumstances, conduct compliance testing at the location of the complaint in accordance with the procedure described in Section 5;
6. Provide a report into the noise measurements and actions to the complainant.

Review

1. A review of the Noise Complaint Evaluation and Response Plan and the Noise Complaints register will be conducted periodically. Any recommended modifications (including status quo) will be reported to all complainants and to the relevant authorities;
2. The report will include a summary of the complaints and the actions taken.

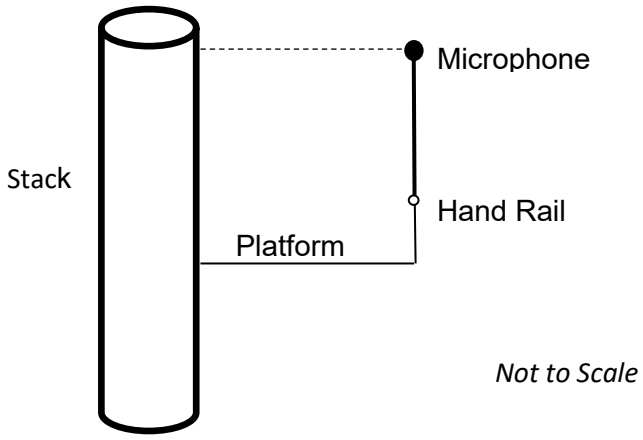
4 STACK NOISE MEASUREMENT PROCEDURE

This procedure provides a method to determine any change in noise from the UPS over time. The method involves the measurement of noise close to a stack exit for comparison with previous measurements.

The noise measurements will be conducted with Type 1, statistical sound level meters. Microphones will be protected with appropriate wind shields.

The equipment will have been acoustically calibrated by a NATA (or equivalent) test facility within the 2 years prior to the test date. On site calibrations will be performed with a Type 1 sound level calibrator prior to and at the completion of the noise measurements.

A Microphone shall be placed cross-wind of the stack at the height of the stack and at the line of the platform hand rail as shown in the sketch below to replicate previous noise measurements:



Previous noise monitoring has indicated that the noise emitted from the stack increases over the first two hours after startup. Therefore, the turbine will be operated at full load for a period of at least 2 hours.

The measured noise level will be compared with the levels measured previously at the equivalent position. Where the results indicate that the noise has increased beyond the bounds of measurement uncertainty, a procedure for an extensive monitoring campaign will be prepared and the monitoring will be conducted to determine compliance with the criteria of the Consent and Licence conditions.

5 NOISE LOGGING PROCEDURE

The loggers will monitor noise continuously (ie. on a 24 hour basis) over a period of eight weeks at the location of the complaint at the approximate time of year of the complaint. At the completion of the monitoring, the measured noise level, the presence of any character adjustments, the UPS operating parameters and the meteorological conditions will be correlated to determine the influence of the UPS on the noise level at each monitored location, under a range of operating and meteorological conditions.

The analysis will be conducted in the following way:

- At times when the operation of the UPS lifts the A-weighted noise at locations noticeably above the ambient noise level, the contribution of noise from the UPS will be determined by mathematically subtracting the measured equivalent noise without the UPS operating from the total equivalent noise level with the UPS operating.

- If the contribution of noise from the UPS cannot be determined using the equivalent (L_{Aeq}) descriptor, due to short term extraneous noise, the L_{A90} descriptor will be used where possible, due to the more "consistent" nature of the expected noise from the UPS over a 15 minute period in comparison to the potentially changing extraneous noise. In this case, the contribution of noise from the UPS will be determined by mathematically subtracting the measured L_{A90} noise level without the UPS operating from the total L_{A90} noise level with the UPS operating.

- If the L_{A90} and L_{Aeq} contribution of noise from the UPS cannot be distinguished from the ambient noise, the noise from the UPS would be deemed to be in compliance with the Conditions at this time if the ambient noise is no greater than 40 dB(A).

The analysis will therefore take into account:

- the measured noise levels relative to the Conditions;
- the meteorological conditions under which the noise levels were recorded;
- the frequency of occurrence of the UPS under those meteorological conditions, and
- the general principles of the *Industrial Noise Policy 2000*.

Based on the above, the analysis would identify any remediation considered appropriate for the residence and details of ongoing noise monitoring proposed.

Monitoring Equipment

The monitoring campaign will include Class 1 noise logging devices.

The devices will have a low noise floor and will be calibrated prior to and on completion of the logging. The loggers will record equivalent (L_{Aeq} and L_{Ceq}) and statistical noise levels (L_{A90} and L_{C90}) continuously every 15 minutes over the monitoring period.

Care will be taken to ensure interference with equipment does not occur, by means of obtaining permissions from residences and locking logger cases.

Weather

The noise from the UPS at residences is strongly influenced by the meteorological conditions. During the monitoring program, the operating parameters of each of the turbines will be recorded and meteorological conditions will be recorded by the UPS weather mast for correlation with the logged noise data. From the meteorological data and observations, the wind speed, wind direction and presence and strength of a temperature inversion (using observations of cloud cover, direct measurement of temperature lapse rate or sigma theta) will be determined.

REFERENCES

[1] Determination of A Development Application (DA-31-2-2004-i) for State Significant, Designated and Integrated Development Under Sections 80(4) and 80(5) of the *Environmental Planning and Assessment Act, 1979*, File Number S03/01578, in respect of Lot 782 DP 878179 and Lot 76 DP 754573, Parish of Yarragundry, County of Mitchell, Uranquinty, Wagga Wagga Local Government Area, Schedule 2, Sydney, 10 June 2005. The Consent has been modified on several occasions, including a change to noise limits [reference NSW Government Department of Planning File No: S03/01578, 6 July 2007,
Notice of Modification].

[2] Environment Protection Licence 12490 with the Department of Environment, Climate Change and Water NSW issued to Origin Energy Uranquinty Power Pty Ltd, Uranquinty Cross Road.

[3] New South Wales Environment Protection Authority, January 2000, *Industrial Noise Policy*

[4] New South Wales Environment Protection Authority, October 2017, *Noise Policy for Industry*

22. Appendix 5 – Historical amendments to environmental approvals

The following table provides a summary of the Department of Planning, Industry and Environment DA and modifications to date.

Table A5.1

Approval	Nature of approval	Relevant Authority	Date
DA-31-2-2004-i 600MW Gas-fired Power Station	Development Approval	NSW Department of Infrastructure Planning and Natural Resources	10/06/2005
DA MOD Stage 2 of development combined with stage 1	Modification	NSW Department of Infrastructure Planning and Natural Resources	8/08/2006
MOD-47-5-2007-i Change to operational noise limits	Modification	NSW Department of Planning	6/07/2007
MOD-66-12-2009 Administrative corrections to wording of DA	Modification	NSW Department of Planning	18/12/2008
DA-31-2-2004I MOD4 Application for the building of a storage shed onsite	Modification	NSW Department of Planning	14/07/2009
DA-31-2-2004I MOD5 Modification to preclude the application of noise limits where a noise agreement is in place or for residences which are authorised after a specified date (Refer Below)	Modification	NSW Department of Planning	11/12/2009
DA-31-2-2004I MOD6 Application for installation of 60 metre weather mast	Modification	NSW Department of Planning	13/8/10
DA-31-2-2004I MOD7 Modification to preclude the application of noise limits where a noise agreement is in place or for residences which are authorised after a specified date	Modification	NSW Department of Planning	27/8/10
DA-31-2-2004I MOD8 Clarification on Normal Operating Hours to allow for Noise Testing	Modification	NSW Department of Planning	21/9/10
DA-31-2-2004I MOD9 Modification of Water Treatment Plant and Water Recycling Project	Modification	NSW Department of Planning	12/11/10
DA-31-2-2004I MOD10 Construction & Operation of extended on-site storage shed	Modification	NSW Department of Planning	28/5/10

The modification to Development Approval DA-31-2-2004I MOD5 on the 11th December 2009 refers to noise limits at some residences in close proximity to the Power Station. As a result noise limits in the Consent and Licence do not apply at residents where an agreement is in place, or at residential dwellings authorised for construction after the date the Modification was approved.

The following table provides a summary of the Environmental Protection Licence and it's variations to date.

Table A5.2

Environmental Protection Licence 12490	Nature of approval	Relevant Authority	Date
Environment Protection Licence 12490	Environment Protection Licence	NSW Environment Protection Authority	27/11/2006
Notice 1088683 to vary the licence, generation capacity and operational noise limits	Licence variation	NSW Environment Protection Authority	03/07/2008
Notice 1090067 to vary the licence, generation capacity and operational noise limits	Licence variation	NSW Environment Protection Authority	18/07/2008
Notice 1090485 to vary the licence, generation capacity and operational noise limits	Licence variation	NSW Environment Protection Authority	22/07/2008
Notice 1109889 to vary the licence preclude the application of noise limits where a noise agreement is in place	Licence variation	NSW Environment Protection Authority	24/12/2009
Notice 1115626 to vary the licence allow for noise testing & additional water quality conditions for stormwater pond release and irrigation.	Licence variation	NSW Environment Protection Authority	23/9/2010
Notice 1126629 to vary the licence allow for relaxation of noise limits during prescribed noise testing.	Licence variation	NSW Environment Protection Authority	15/4/2011
Notice 1611689 NSW EPA three yearly audit and associated licence revision with minor administrative changes.	Licence variation	NSW Environment Protection Authority	12/9/2021

23. Appendix 6: Approval for Predictive Emission Modelling Use

Note: Appendix 6 has been added to PDF version (published)

Our reference: DOC09/45007 LIC07/2494-02
Contact: Chris Burton, 02 6022 0609

The General Manager, Power Development Projects
Origin Energy Uranquinty Power Pty Limited
PO Box 46
URANQUINTY NSW 2652.

Attention: Guy Corbett

Dear Mr Neumann

Re Proposed Predictive Emissions Monitoring System

I refer to your letter dated 9 November 2009 to the Department of Environment, Climate Change and Water (DECCW) seeking clarification about the proposed Predictive Emissions Monitoring System (PEMS). The PEMS has been proposed as an alternative monitoring system at the Uranquinty Power Station in the event of a failure of the Continuous Environmental Monitoring System (CEMS).

We note that the request for the use of the PEMS is for a maximum of 2 weeks per occasion with a maximum of 6 weeks per Unit per year. Given the limited predictive capacity of the PEMS we expect that the return to service of the CEMS when in fault will be a priority for the power station. It is understood that CEMS spares will be held on-site and a service contract for maintenance is in place to limit the downtime of the CEMS.

Based on the available information, we consider it is reasonable for the use of the PEMS for a maximum of 1 week per occasion and for a maximum of 4 weeks per Unit per year. The duration of PEMS use will be evaluated after twelve months to assess:

- The cause of the fault in the CEMS and the time for it to be repaired, and
- The progress in achieving a higher correlation between predicted and observed NOx by the PEMS model.

To clarify the use of the PEMS during startup, the model can be used and the Unit started without an operational CEMS in place. However, it should be recognised that the model does not predict the observed NOx during these periods and additional data should be collected with a view to further revisions of the PEMS to encompass the start-up and shut-down periods.

PO Box 544 Albury NSW 2640
Level 2, State Government Office Block
512 Dean Street Albury NSW
Tel: (02) 6022 0600 Fax: (02) 6022 0610
ABN 30 841 387 271
www.environment.nsw.gov.au