



# Santos

## Narrabri Coal Seam Gas Utilisation Project Operational Environmental Management Plan (Approval 07\_0023)

Document Number: 9055-650-PLA-002

Date	Rev	Reason for Issue	Reviewed	Endorsed	Approved
July 2009	1	Original prepared by Eastern Star Gas and approved by Department of Planning			
September 2014	2	Reformatted and minor amendments made to reflect Santos ENSW Standards	AJ	NV	KB
22/6/17	3	Revision of OEMP to keep it current	LJB		
21/12/17	4	Revision of OEMP taking into account DPE comments	RA		TD
28/06/18	5	Revision for generating greater than 12 MW- draft to DPE	RA		TD
5/12/2018	6	Revision of OEMP taking into account DPE comments	RA		TD
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NSW Department of Planning Approval Dec 2008 (Environmental Planning and Assessment Act 1979)

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## 1. Introduction

The Narrabri Coal Seam Gas Utilisation project was assessed as a major project under the Environment Planning and Assessment Act 1979 in December 2008 and has been subsequently modified on five occasions. It comprises the following components:

- a) Construction and operation of gas gathering systems at Bibblewindi and Bohena pilots ;
- b) Construction and operation of gas compression facilities at Bibblewindi and Bohena pilots;
- c) 32 kilometres of buried gas flow lines connecting to the Wilga Park gas fired power station;
- d) Staged expansion and operation of the Wilga Park power station from a capacity of 12 megawatts to 40 megawatts fuelled by gas from the Bibblewindi and Bohena pilots.

Wilga Park Power station is located north of the Pilliga Forest approximately 12 kilometres from Narrabri. Development consent for the construction and operation of the Wilga Park Power Station was issued to Narrabri Power Limited by Narrabri Shire Council in 2002. In 2008 approval was granted to expand the capacity of the power station to 40 Megawatts (as above). The power station, when operating, supplies electricity to the local 66kV network through a substation located adjacent to the power station.

The project approval (MP 07\_0023) was originally issued by the NSW Government Department of Planning to Eastern Star Gas Limited on 2 December 2008. Condition 6.3 of the approval required the proponent to prepare and implement an Operational Environmental Management Plan (OEMP). Eastern Star Gas Limited submitted the OEMP to the NSW Department of Planning on 1 July 2009 and was subsequently approved by the DOP on 14 July 2009.

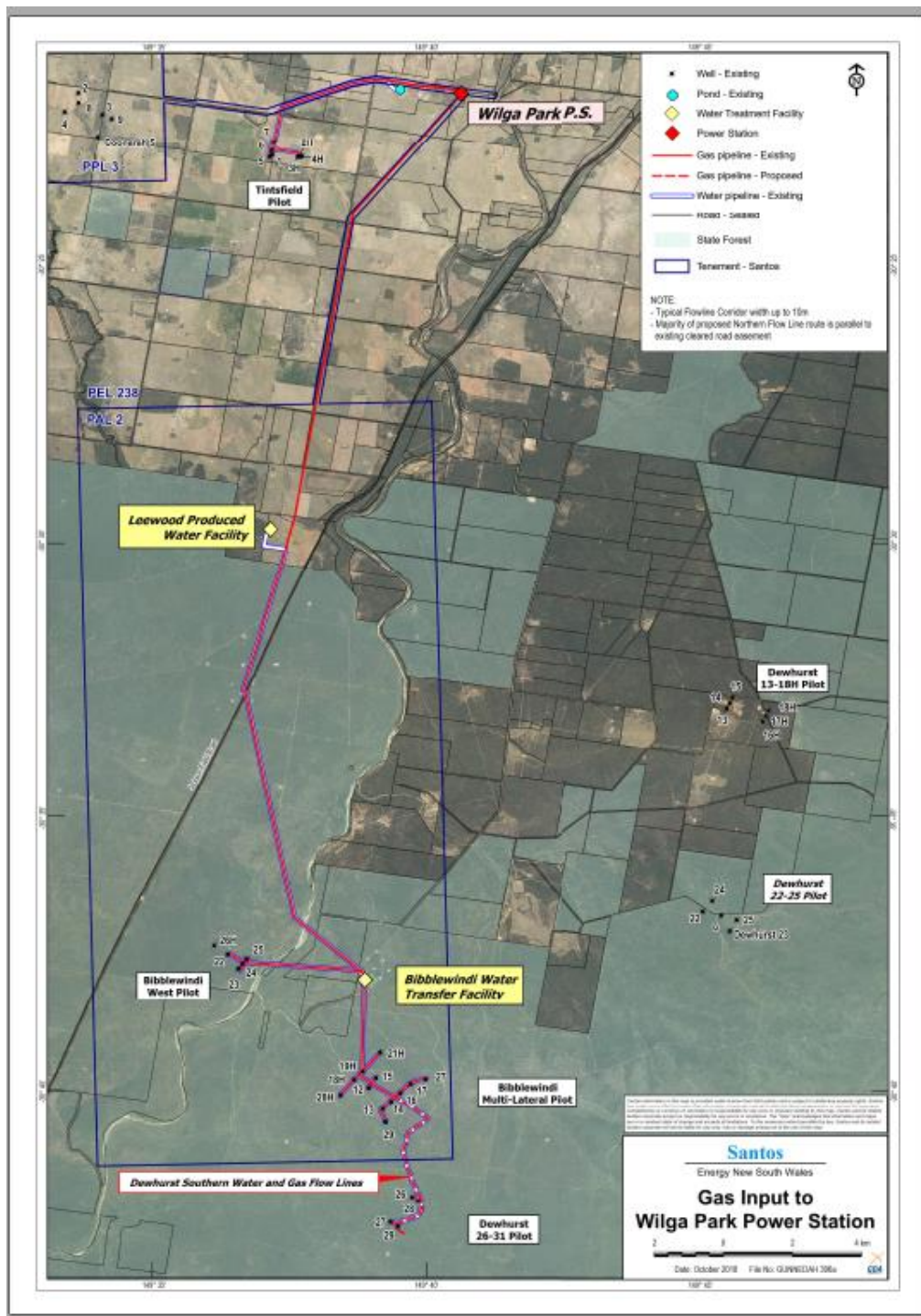
Under the project approval gas may only be received for beneficial use at the Wilga Park Power Station from the following wells:

- Wells located within Petroleum Assessment Lease 2;
- Tintsville pilot wells 2, 3, 4, 5, 6 and 7; and
- Dewhurst pilot wells 26, 27, 28, 29, 30 and 31.

The power station has never operated at a capacity of greater than 12MW since it was commissioned. It is currently planned that during 2018, the generator capacity will exceed the 12MW threshold, triggering a number of conditions within the approval. This document and subsequent revisions will address the current and additional requirements that need to be carried out at the Narrabri Gas Project site. When the power station has the capacity to generate electricity at greater than 30 MW, it will trigger licensing under the Protection of the Environment Operations Act 1997.

This OEMP will be reviewed and if necessary revised in accordance with approval Condition 6.

Figure 1: Narrabri Gas Utilisation Project Locality Plan (left), Bibblewindi West, Bibblewindi East and Dewhurst South Pilots within the Pilliga and Tintsfeld Pilot .



## 2. Purpose

The purpose of the Operations Environmental Management Plan (OEMP) is to identify and detail the environmental management requirements, performance objectives and monitoring and reporting procedures for the Narrabri Coal Seam Gas Utilisation Project.

The OEMP also addresses the requirements of Condition 6.3 (a) to (h) of the project approval, issued by the Minister for Planning under the Environmental Planning and Assessment Act 1979, and which outlines matters to be incorporated into the Plan (refer Table 1 below).

**Table 1: Project Approval Condition 6.3 and 6.4**

Project Approval Condition 6.3 and 6.4	OEMP Section
<p><b>Condition 6.3:</b></p> <p>The Proponent shall prepare and implement an Operation Environmental Management Plan to detail the environmental management framework, practices and procedures to be followed during the operation of the project. The Plan shall include, but not necessarily be limited to:</p> <ul style="list-style-type: none"> <li>a) Identification of all statutory and other obligations that the proponent is required to fulfil in relation to operation of the project, including approvals, licences, approvals and consultations;</li> <li>b) A description of the roles and responsibilities for all relevant employees involved in the operation of the project;</li> <li>c) Overall environmental policies to be applied to the operation of the project;</li> <li>d) Standards and performance measures to be applied to the project, and a means by which environmental performance can be periodically reviewed and improved, where appropriate;</li> <li>e) Management policies to ensure environmental performance goals are met and to comply with the conditions of this approval;</li> <li>f) Specific details of how the following matters will be managed and monitored during operation: <ul style="list-style-type: none"> <li>I. measures to manage and monitor air quality in consultation with EPA to address the requirements of conditions 2.2 to 2.4 and 3.1 to 3.4;</li> <li>II. measures to manage and monitor noise and vibration in consultation with EPA to address requirements of conditions 2.5, 2.8 to 2.23 and 3.5;</li> <li>III. measures to manage and monitor site water including operational site water balance, storm water and waste water management;</li> <li>IV. measure to manage and monitor hazards including bushfire management; and</li> <li>V. measures to manage and monitor landscaping measures and ecology (including measures associated with the biodiversity offset package under condition 2.34 and any remnant vegetation onsite);</li> </ul> </li> <li>g) Details of land rehabilitation and decommissioning (including for the pipeline) upon completion of the project; and</li> <li>h) The environmental monitoring requirements outlined under conditions 3.1 to 3.6 of this approval, inclusive.</li> </ul> <p>The Plan shall be submitted for the approval of the Secretary no later than one month prior to the commencement of any construction works associated with the project, or within such period otherwise agreed by the Secretary. Operations shall not commence until written approval has been received from the Secretary.</p> <p><b>Condition 6.4:</b></p> <p>Within 3 months, unless otherwise agreed by the Secretary, of:</p> <ul style="list-style-type: none"> <li>a) the submission of an incident report under condition 7.1 below; or</li> <li>b) any modification to the conditions of this approval (unless the conditions require otherwise), the Proponent shall review, and if necessary revise, the Operation Environmental Management Plan required under condition 6.3, to the satisfaction of the Secretary. <p>Where this review leads to revisions in the Operation Environmental Management Plan, then within 4 weeks of the review the revised Operation Environmental Management Plan must be submitted for the approval of the Secretary, unless otherwise agreed with the Secretary.</p> <p><i>Note: This is to ensure the Operation Environment Management Plan is updated on a regular basis, and incorporates any recommended measures to improve the environmental performance of the project.</i></p> </li></ul>	<p>4 &amp; Various</p> <p>6</p> <p>5</p> <p>8</p> <p>5 &amp; 8</p> <p>8.1&amp;12.1.1</p> <p>8.2 &amp; 12.1.2</p> <p>8.3 &amp; 8.7</p> <p>8.4, 8.5 &amp; 8.6</p> <p>8.9</p> <p>10</p> <p>12</p> <p>9.2</p> <p>1 &amp; 3</p>

### 3. Objective

The primary objective of the OEMP is to ensure:

- a) that key environmental issues have been identified and proper management practices and procedures are in place to minimise environmental harm from the carrying out of the activity;
- b) that all people onsite are fully informed of their responsibilities and accountabilities about the environment; and
- c) activities are conducted in a manner consistent with industry and Santos Ltd standards and in compliance with relevant regulatory approvals and other statutory requirements.

Secondary objectives of the OEMP are to:

- a) encourage good environmental management practices through good planning and commitment to continuous improvement;
- b) identify roles and responsibilities of site personnel;
- c) outline environmental monitoring and reporting requirements and performance evaluation criteria;
- d) provide a framework to track, document and monitor compliance with statutory requirements and to ensure full compliance is achieved;
- e) establish response procedures for environmental incidents (including community complaints) and contingency planning to ensure effective remedial measures and/or corrective action is taken.

### 4. Legislative Framework

This OEMP has primarily been developed to meet the conditions of the project approval; however, there are a number of other general provisions in the NSW Protection of the Environment Operations Act 1997 which places duty of care type obligations on all persons in relation to managing impacts of their activities on the environment. Some of these key offence provisions, for which there are significant penalties, are listed below:

#### Section 115 Disposal of waste-harm to environment

*If a person wilfully or negligently disposes of waste in a manner that harms or is likely to harm the environment:*

- (a) the person, and
- (b) if the person is not the owner of the waste, the owner, are each guilty of an offence.

#### Section 116 Leaks, spillages and other escapes

(1) *If a person wilfully or negligently causes any substance to leak, spill or otherwise escape (whether or not from a container) in a manner that harms or is likely to harm the environment:*

- (a) the person, and
- (b) if the person is not the owner of the substance, the owner, are each guilty of an offence

#### Section 120 Prohibition of pollution of waters

*A person who pollutes any waters is guilty of an offence.*

#### Section 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.

#### Section 142A Pollution of land

*A person who pollutes land is guilty of an offence.*

Section 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."*



## 5. Santos' Health, Safety and Environment Policies

Santos Ltd's overarching corporate environmental policy statement is shown in Figure 2 below. Santos has also developed a comprehensive set of Health, Safety and Environment standards and procedures for the conduct of all company operations and which reflect and are in accord with the values and principles outlined in the corporate environment, health and safety policy.

The company-wide Santos Management System (SMS) provides a structured framework for environmental and safety practices across Santos' activities and operations. The SMS comprises three parts that underpin the EHS framework and describe requirements such as organisation structure, planning activities, responsibilities, resources, practices, procedures and processes for meeting the objectives of Santos' EHS policies. These are:

- Policies and Code of Conduct;
- Management Standards – documents that define the requirements necessary to ensure that risks are systematically managed;
- Procedures, Technical Standards, Processes and Tools – documents that detail how to manage the risks of specific hazards to as low as reasonably practicable.

The standards are further supported by Business Unit/Function and asset/activity procedures, tools, guidelines and practices specific to work being undertaken and this OEMP has been developed to align with Santos' SMS.



Figure 2: Santos Environment Health and Safety Policy

# Environment, Health and Safety



## Policy

### Our Commitment

Santos is committed to a workplace where we all go home without injury or illness and manage the impact of our operations on the environment.

### Our Actions

We will:

1. implement a structured and systematic approach to environmental, health and safety management and monitor its effectiveness
2. include environmental, health and safety considerations in business planning and decision-making processes
3. understand and manage the impact of our operations on the environment
4. comply with all relevant environmental, health and safety laws
5. promote a strong and consistent safety culture across all aspects of business
6. work pro-actively and collaboratively with our stakeholders and the communities in which we operate
7. set, measure and review objectives and targets which drive continuous improvement
8. report publicly on our environmental, health and safety performance

### Governance

The Environment Health Safety & Sustainability Committee is responsible for reviewing the effectiveness of this policy.

This Policy will be reviewed at appropriate intervals and revised when necessary to keep it current.

Kevin Gallagher

Managing Director & CEO

Status: APPROVED

Document Owner:	Naomi James, Executive Vice President, EHS & Governance		
Approved by:	The Board	Version:	1

APPROVED 28 October 2016

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## 6. Roles and Responsibilities

Position Role	Responsibility
<b>Manager –NSW Operations</b>	Overall responsibility for the operation of all gas transmission and electricity generation infrastructure and to ensure the environmental performance of the project is consistent with the conditions of the project approval and existing Santos Ltd policies on Health, Safety and Environment. Overall responsibility for legislative compliance, contractual obligations and resourcing to achieve the objectives of the OEMP.
<b>Field Environmental Advisor(s)</b>	Ensure the relevant activity or work is conducted in a manner that complies with approval requirements and/or in accordance with this OEMP. Ensure there is a proper training and awareness program conducted for contractor personnel. Ensure/monitor compliance with the requirements of this guidance document, and any approval conditions.
<b>Principal Advisor Compliance</b>	Accountable to the Manager Operations Energy NSW for ensuring compliance with requirements of the OEMP and approval conditions. Investigate complaints and environmental incidents and ensure the appropriate remedial actions are taken including notification and monitoring and reporting requirements. Manage complaints and incident upwards as soon as practicable. Responsible for reporting to Government as required under the approvals and the OEMP. Responsible for the requirement under condition 6.1 of the OEMP to have an independent and suitably qualified experienced environmental representative to assist in the environmental management of the project.

## 7. Land Use

The gas flow line corridor between the Bibblewindi Coal Seam Gas (CSG) Pilot and the Wilga Park Power Station traverses two main land use classifications, namely approximately 14 km within lands designated Crown Lands State Forest under the Forestry Act 1916 and 18 km within lands designated Zone 1a (General Rural) under the Narrabri Local Environment Plan 1992.

The distinction between these land use zones is clearly shown on Figure 3.

The creation of a zone for community conservation area, within which the southern portion of the Project area is situated, permits the continued exploration for and assessment of petroleum resources.

## 8. Environmental Issues and Management

### 8.1. Air Quality

The atmospheric dispersion modelling carried out in the assessment used the “Ausplume Gaussian Plume Dispersion Model Software (version 6.0)”, developed by EPA in Victoria. The impact of NO<sub>2</sub> emissions released from Wilga Park Power Station was assessed at the eight closest residential receptors to the station using two methods of calculating NO<sub>2</sub>; one a highly conservative approach, and one which seeks to represent NO<sub>2</sub> chemistry more closely. The predicted results of the modelling indicate that for both methods the NO<sub>2</sub> concentrations to be below the health based project goals of 246 µg/m<sup>3</sup> (1-hour maximum) and 62 µg/m<sup>3</sup> (annual average) at all residential receptors.

Minor localised emissions of dust could be experienced during construction of any new CSG flow lines from the gas fields to the power station. However, due to the large buffer distance between the power station and the nearest residence and the low density of residences along the pipeline route, these impacts, if they arise, can be managed through good dust management practices.

Considering the above air quality modelling results, it is concluded that the Narrabri Coal Seam Gas Utilisation Project (including any proposed upgrade to the Wilga Park Power Station) should neither have a detrimental health impact upon the surrounding residential receptors nor cause an air pollution nuisance. Air quality monitoring will be undertaken in accordance with approval MP 07\_0023 once the power station's generation exceeds 12MW.

Key Issue(s)/Approval Requirements	Source	Management Action/Mitigation Measure
Air emissions from each generator exhaust stack not to exceed 450 mg/m <sup>3</sup> nitrogen dioxide (NO <sub>2</sub> ) or nitric oxide (NO) or both. (Approval condition 2.4)	Power generators or turbines up to a total combined maximum capacity of 12 megawatts	<p>The generators are to be operated in accordance manufacturers manuals</p> <p>Daily inspections to ensure there are no visual emissions from the exhaust stacks.</p> <p>Within 90 days of the commencement of operation of the power station at a capacity greater than 12MW, and at every subsequent stage new generation is added, point source emission sampling will be undertaken to confirm the air quality emissions from the power station and confirm compliance with Condition 2.4. Note point source emission sampling will also be undertaken annually to comply with Condition 3.1. Point source emission sampling will be undertaken as outlined in Section 12.1.1.</p> <p>In the event that the point source emission sampling identifies stack discharge concentrations greater than the limits in Condition 2.4, then Santos will prepare a Point Source Emission Report and submit to the Department within 2 months from completion of sampling. The Point Source Emission Report will include the following:</p> <ul style="list-style-type: none"> <li>• Details of remedial measures to reduce the point source emissions levels to below the limits.</li> <li>• A timeline to implement the remedial measures.</li> <li>• Details of entries into the complaints register relating to air quality.</li> </ul> <p>Santos consulted with the NSW EPA as required by Condition 6.3(f)(i) on measures to monitor and manage air quality. Appendix A contains Santos' letter to the EPA and their response in Appendix B. The facility will require licensing under the Protection of the Environment Operations Act 1997 when the generation capacity exceeds 30MW. The EPA recommendations will be considered further at that time. (Approval condition 2.3)</p>
Air emissions not to pose an aviation hazard and vertical exhaust velocity not to exceed 4.3 metres/sec.	Power generators or turbines up to a total combined maximum	Ensure that before the capacity of the power station exceeds 12 megawatts, power station design details to be provided the Commonwealth

Key Issue(s)/Approval Requirements	Source	Management Action/Mitigation Measure
Approval condition 2.30	capacity of 12 megawatts	Departments of Defence and the Civil Aviation Safety Authority. <b>Action completed as confirmed in letter from DPE on 6 September 2018.</b> (Approval condition 2.30)
Nuisance dust emissions	Access tracks and roads Other disturbed areas	Control dust using water as suppressant

## 8.2. Noise and Vibration

A noise impact assessment was undertaken in August 2007 for the Narrabri Gas Utilisation Project. The main potential for noise impacts associated with the project identified in the assessment was any upgrade of the Wilga Park Power Station from 10MW to 40MW nominal capacity.

The Wilga Park Power Station originally comprised twelve (12) 1MW Jenbacher gas reciprocating engine driven generators and associated transformer and switchyard facilities. Each generator set is enclosed in a 12 m<sup>3</sup> shipping container which is fully lined with acoustic material cover by perforated sheet metal. Acoustic louvers are fitted to ventilation openings and doors are fully sealed with rubber gaskets.

In 2009-2010, 4 x 3MW new generators were brought onto the site and are operational. Eight of these 1MW generator sets were removed in 2011 for operational reasons.

It is planned that the Wilga Park Power Station will commence generating above 12MW in December 2018 to a maximum output of 16MW. The next stage of increase in generating capacity is planned to occur in April 2019 when it will have the capacity for a maximum output of 22MW. Any increase in capacity beyond 22MW will not occur until after the determination of the Narrabri Gas Project State Significant Development application.



Figure 4: Residences located around the Wilga Park Power Station



Santos maintains a spreadsheet of land owners which is reviewed and updated annually.

Noise emissions from the site, construction activities and vehicle movements associated with the project were assessed against the then Department of Environment and Climate Change criteria. The assessment has found no exceedance of the noise criteria during any period (day, evening, night) under adverse weather conditions for noise propagation at any residential receiver.

The initial expansion will be to take the power station capacity to 16MW generating capacity, by using the 4 x 3MW units and the 4 x 1 MW units currently on site. Any subsequent expansion will involve bringing additional generators to the site.

Modelling of the noise associated with the power station expansion concluded that no additional monitoring will be required in accordance with the approval. Validation monitoring will be undertaken within 90 days of the power station exceeding 12MW and at each subsequent stage that generation is added in accordance with the conditions of approval and in the event of noise complaints being received by neighbours as explained in the table.

Key Issue(s)/Approval Requirements	Source	Management Action/Mitigation Measure
<p>Construction noise that will result in an audible noise at a residential premise must only be undertaken during the following hours:</p> <ul style="list-style-type: none"> <li>a) 7:00 am to 6:00 pm Monday to Friday (incl.)</li> <li>b) 8:00 am to 1:00 pm Saturday.</li> <li>c) At no time on Sundays or public holidays.</li> </ul> <p>(Approval condition 2.6)</p>	<p>Any future expansion of the power station or maintenance work</p> <p>Constructing new water and gas flow lines.</p>	<p>Ensure that construction work that is likely to give rise to an audible noise at a residential premise is undertaken within the stipulated times in the approval.</p> <p>If it is necessary to undertake construction work outside the specified hours prior written approval to be obtained from the Secretary.</p> <p>(Approval condition 2.7)</p>



<p>Operational noise from the power station with a capacity <u>greater than 12 megawatts</u> must not cause noise when measured at a residential premise must not exceed:</p> <ul style="list-style-type: none"> <li>▪ an <math>L_{Aeq}</math> (15 minute) 35 dBA; and</li> <li>▪ during night periods an <math>L_{A1}</math> of 45 dBA</li> </ul> <p>Note: The noise limits above only apply under wind speeds up to ms-1 (measured 10 metres above ground level), or under temperature inversion conditions of up to 3°C/100 metres and winds speeds of up to 2m/s at 10 metres above the ground. (Approval condition 2.8)</p>	<p>Power generators/turbines with total combined maximum capacity of greater than 12 megawatts</p>	<p>Within 90 days of the commencement of operation of the WPPS at a capacity greater than 12 MW, and at every subsequent stage new generation capacity is added a noise monitoring program will be undertaken to confirm the noise emissions from the WPPS and confirm compliance with Condition 2.8 and 2.9. This monitoring will be undertaken with the power station operating at full generation capacity. Additionally, summer and winter monitoring will be undertaken in the first twelve months of exceeding 12 MW generation capacity, and after each stage of an increase in power generation. Past this period, if no monitoring has been undertaken in the preceding 12 months and a noise complaint is registered by a neighbour, noise monitoring will be undertaken to confirm compliance with condition 2.8</p> <p>Direct noise measurements will be undertaken at all of the locations identified in Condition 2.8 of the Planning Approval when direct measurements are practical. The Noise Policy for Industry (EPA, 2017) states that 'direct measurements at receiver locations are effective when the compliance location is dominated by noise from the industrial premises under investigation'. When the WPPS is the dominant noise source at the receiver, operator attended measurements will be undertaken based on the methodology provided in Section 12.1.2. Consultation with the EPA in accordance with Condition 6.3(f)(ii) was conducted with regard to methodology (Appendix A and Appendix B).</p> <p>. Where the noise limits in condition 2.8 cannot be complied with all reasonable and feasible noise abatement measures at source are to be implemented. These measures would depend on the source of the problem noise and could include:</p> <ul style="list-style-type: none"> <li>• enhanced silencers upstream of the stacks</li> <li>• shrouding around cooling fans</li> <li>• modifications to the cooling fan configuration</li> <li>• modification to the engine exhaust louvres to the generation buildings.</li> </ul> <p>These and other measures would be considered in the event of noise limits in condition 2.8 not being met.</p> <p>Approval conditions 2.8 to 2.15 (inclusive) outline these requirements in full.</p> <p>Should the noise monitoring identify exceedances to Condition 2.8 and 2.9 then the requirements in Condition 2.10 to 2.23 will be implemented as appropriate. In the case of vacant land, the processes outlined in conditions 2.16 to 2.23 will be followed.</p>
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Key Issue(s)/Approval Requirements	Source	Management Action/Mitigation Measure
Ensure the vibration resulting from the construction and operation of the project at a capacity of more than 12 megawatts does not exceed the preferred vibration values for low probability of adverse comment presented in <i>Assessing Vibration: A Technical Guideline</i> (DECC, February 2006), at any affected residential dwelling) (Approval condition 2.5 )	Power generators/ turbines with total combined maximum capacity of greater than 12 megawatts	Condition 6.3(f)(ii) requires consultation with the EPA on measures to monitor and manage noise and vibration. Appendix A contains Santos' letter to the EPA, That letter proposed no vibration monitoring. Appendix B contains EPA's letter to Santos which did not provide comment with regard to noise and vibration.

### 8.3. Surface Waters and Stormwater Management

Disturbed and/or exposed soils cleared of protective ground cover are potentially subject to erosion and structural degradation as a result of construction activities, stormwater runoff and wind. While erosion and sedimentation are natural processes accelerated erosion occurs on construction sites and to this end a proper and effective Erosion and Sediment Control Plan has been implemented that provides the necessary strategies and procedures to minimise any adverse environmental impacts to land and waterways.

Key Issue(s)/Approval Requirements	Source	Management Action/Mitigation Measure
Potential to release contaminated stormwater and sediment to waterways during wet weather.	Disturbed areas such as well lease pads, pipeline easements and work sites	Ensure that an effective Erosion and Sediment Control Plan or similar has been developed and is being implemented. (Refer Document Number 0011-650-TEM-001 Rev1 on Team Binder) Minimise the area of land disturbance when planning for a new development. Diversion bunds or drains to be constructed around proposed disturbance areas to direct clean stormwater around them. Soil stockpiles to be located away from watercourses and with measures in place to secure the stockpile to prevent soil loss during wet weather and windblown dust. Stabilize and rehabilitate disturbed areas as soon as is reasonably practical to do so following completion of works. Erosion and sediment control devices to be properly maintained and remain effective until the disturbed area is rehabilitated.
Potential for the discharge sediment and other pollutants to land or waters during construction activities  (Approval condition 2.25)	Construction activity involving land disturbance	Ensure activity is carried out in accordance with Landcom's Managing Urban Stormwater: Soils and Conservation. (Refer Document Number 0011-650-TEM-001 Rev1 on Team Binder) (Ref: <a href="http://www.environment.nsw.gov.au/resources/water/BlueBookVol1.pdf">http://www.environment.nsw.gov.au/resources/water/BlueBookVol1.pdf</a> ) (Approval condition 2.25)

Key Issue(s)/Approval Requirements	Source	Management Action/Mitigation Measure
Water quality impacts on waterways	Provision of linear infrastructure (e.g. pipelines and tracks) where creeks and watercourses crossings are needed	<p>Waterway crossings will be designed by a suitably qualified person, consistent with the NSW Guidelines for Controlled activities (July 2012).</p> <p>DPI Fisheries to be consulted in planning the construction methodology for waterway crossings.</p> <p>Open trenching works in, or within 20 metres of, watercourses to not be undertaken during significant rainfall events.</p> <p>Construction activities are not to impede lateral water flows.</p> <p>Waterway crossings will be rehabilitated such that the natural flow of water is unimpeded and stream bank stability is maintained to prevent erosion.</p> <p>This rehabilitation work must be completed within 3 months of the completion of waterway crossing works and to the satisfaction of the Secretary. (Approval condition 2.26)</p>

#### 8.4. Hazards – Wilga Park Power Station

The potential hazards and risks to the environment from the operation of the power station are spillage from the receipt, storage and use at the site of the three following potentially hazardous materials

- a) Lubricating Oil
- b) Coolant Additive
- c) Corrosion Inhibitor

These materials are contained and handled within appropriate enclosures, either in the internal storage facility within the workshop (coolant additives) or the bunded oil storage areas.

Appropriate spill kits are available on site to manage any spills released directly or indirectly to the environment in the unlikely event a spillage occurs. It is noted that all three products are not classified as dangerous goods under the Australian Code for Transportation of Dangerous Goods by Road and Rail.

Key Issue(s)/Approval Requirements	Source	Management Action/Mitigation Measure
Spillage of hazardous materials and/or chemicals to the environment	Hazardous material and/or chemicals used at the power station	<p>Ensure that hazardous material and chemicals are stored within impervious bunds or bunded areas in accordance with the relevant Australian Standards. (Approval condition 2.29)</p> <p>Readily accessible spill kits to be made available.</p>

#### 8.5. Hazards – Operation of Gas Flow Line

Table 2 below summarises potential hazards and risks relating to the operation of the gas flow line.

The consequence for each hazard/threat has been considered from public, employee, environmental and economic perspectives in the risk assessment with mitigation strategies incorporated into project design, construction and operations planning.

**Table 2: Summary of Hazards and Risks - Gas Flow Line (Appendix 3 of EIS)**

Hazard	Hazard Frequency	Consequence/Risk Rating
Third Party Interference	Unlikely	Severe/Low
Fracture of Flow Line	Remote	Severe/Low
Overpressure of Flow Line	Improbable	Minor/Low

Hazard	Hazard Frequency	Consequence/Risk Rating
Escape of Flammable Contents	Remote	Severe/Low
Pipe Exposure at Road Crossing	Improbable	Minor/Low
Pipe Exposure at Creek Crossing	Improbable	Minor/Low

The pipeline has been designed and constructed to a high standard and in accordance with relevant Australian Standards which ensures its integrity during operation and minimises hazard risk to the greatest extent practicable. The pipeline easement is inspected at least quarterly and integrity testing is carried out in accordance with the manufacturers' recommendations.

## 8.6. Hazard – Bushfires

Santos Ltd has developed a specific Operations Bushfire Management Plan (Ref: 7099-650-PLA-0011 1 October 2016 on SharePoint) for its Narrabri Coal Seam gas project that is designed to provide clear direction for Santos' Energy NSW operations on preventative measures to minimise the risk of ignition along with management and response measures in the event a bushfire in the area of its operations.

The high standard of the design, construction and maintenance of the pipeline to ensure its integrity is also an important factor in recognising that the risk of bushfire from a leak/vent of gas is negligible.

Key Issue(s)/Approval Requirements	Source	Management Action/Mitigation Measure
Prevention of Bushfires and Management of Bushfire Threat	Bushfire threat to Santos assets and the broader community area	<p>Ensure that the Bushfire Management Plan has identified all the potential fire risks associated with its operation and that the business unit is fully prepared and able to appropriately respond in the event of a bush fire.</p> <p>Ensure that all staff are aware of their responsibilities under the Plan and that they are properly trained to respond to bush fire incidents and emergencies</p> <p>A fire tanker with a capacity of not less than 400 litres is to be on standby at all times together with adequate devices and appliance to prevent or retard the spread of fire.</p> <p>No open burning to be carried out without the consent of the local fire authority and landholder.</p> <p>CSG wells will be remotely isolated if well will be impacted by fire.</p> <p>Firebreaks/asset protection zones to be provided and maintained at critical infrastructure</p> <p>Ensure compliance with relevant statutory requirements for bushfire management.</p>

## 8.7. Waste

Only small quantities of solid and liquid waste are currently being generated by this project and coming mainly from the operation of the power station. This waste is typically waste oils, coolants and general domestic waste.

Key Issue(s)/Approval Requirements	Source	Management Action/Mitigation Measure
Proper disposal of solid and liquid wastes generated by the project	Wilga Park Power Station	Develop and implement a Waste Management Plan for the project based on the waste reduction hierarchy of avoid, reuse, recycle, recover, treat and dispose ( <a href="#">Ref: Document Number 0011-650-PLA-0002-Rev.2 ENSW Operations Waste Management Plan Feb 2014 on Team Binder</a> )
		<p>Any liquid and/or non-liquid waste for processing, resource recovery or disposal at the premises to be assessed and classified in accordance with the EPA Waste Classification Guidelines, prior to despatch from the site. (Approval condition 2.28)</p> <p>Ensure no wastes are received at the site from sources outside the site. (Approval condition 2.27).</p> <p>Ensure all waste generated on site is not disposed of at the site. (Approval condition 2.27)</p> <p>Regulated waste will be collected by licensed contractors for off-site disposal.</p> <p>General and recyclable waste will be transported and disposed off-site at appropriate and lawful facilities.</p> <p>Appropriate waste/recycling receptacles will be provided and will include covered rubbish bins for disposal of domestic waste.</p> <p>Manage on-site sewage treatment and disposal in accordance with the requirements of Narrabri Shire Council</p>

## 8.8. Pests and Weeds

Without appropriate mitigation strategies in place, there is potential for weed species to be spread along the gas flow line corridor during any construction activity involving land disturbance. For the scope of this project, a weed is defined as being any plant species that is growing where it should not be and is not limited to noxious or declared weeds.

Key Issue(s)/Approval Requirements	Source	Management Action/Mitigation Measure
Weeds being transferred from “dirty” to “clean” areas within the project area.	Mobile plant equipment and vehicles used in construction activities	<p>A proper and effective Weed/Pest Management Plan has been developed and being implemented.</p> <p>Plant equipment and vehicles are properly cleaned and maintained in accordance with the Pest Management Plan to minimise the risk of weed transfer</p> <p>Plant equipment and vehicle wash down should result in the removal of all soils, mud and vegetative matter and in accordance with Santos’ internal wash down and inspection procedures.</p> <p>(<a href="#">Refer Document Number 0011-650-PLA-0001-Rev.0 ENSW Operations Pest Plant Management Plan June 2013 on Team Binder</a>)</p>

## 8.9. Landscape and Ecology

Field surveys prior to the construction of the pipeline identified three native communities dominating PAL 2 and hence the area covered by the project area. The communities are:

- a) *Corymbia trachyphloia*-*Eucalyptus dwyeri* Woodland;
- b) *Eucalyptus crebra* Dry Open Forest; and
- c) Pilliga Box *Eucalyptus pilligaensis* Dry Open Forest.

Figure 5 presents the locations of each of the three vegetation communities within the gas flow line corridor and Table 3 summarises the structure and principal flora types within these vegetation communities.

### 8.10. Site Water Balance

Steam turbines are not used in the Wilga Park Power Station for power generation, therefore no water is required for operation.

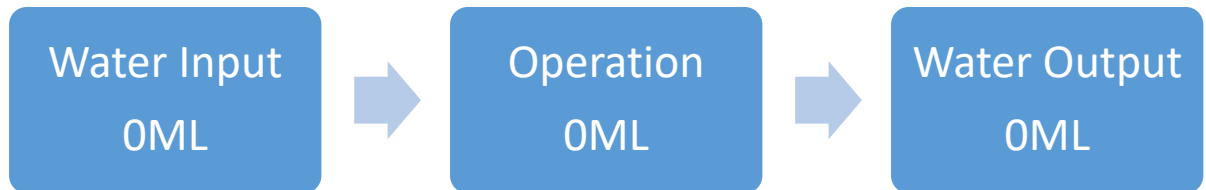




Figure 5: Gas Flowline Corridor Vegetation Communities





**Table 3: Summary of Dominant Vegetation Communities in Project Area**

Vegetation Community	Summary
Corymbia trachyphloia-Eucalyptus dwyeri Woodland	Either or both Brown bloodwood & Dwyers Red Gum are present. Bloodwood dominates because of its taller stature; Dwyer red gum is typically 'mallee' in form. Midstratum includes Allocasuarina gymnanthera, Aotus mollis, Brachyloma daphnoides, Calytrix tetragona, Dodonea peduncularis, Grevillea floribunda and Homoranthus flavescens. Ground layer typically sparse with Actinotus helianthii, Helichrysum collinum, Shoenus ericatum and various Aristida spp. Community is typically sparse & open stands of bloodwood $\geq 20\text{m}$ and red gum to $\geq 15\text{m}$ . Mid density stands of heath shrubs or white cypress (scattered saplings). Ground layers typically sparse. Found in the Bibblewindi area on poor sandy soils with good drainage
Eucalyptus crebra Dry Open Forest	Narrow leaved Ironbark is always present and usually dominant. Other common species include White pine Callitris glaucophylla and bull oak Allocasuarina luehmannii. Midstratum of hopbushes Dodonea spp, Calytrix tetragona, wattles Acacia spp, and broom bitter pea Daviesia genistifolia. Ground layer most diverse, with mat-rushes Lomandra spp, sawsedge Gahnia aspera, flax lily Dianella longifolia, wild onion Bulbine semibarbata, Laxmannia gracilis, Calandrinia spp, Goodenia spp, bluebells Wahlenbergia spp, cutleaf daisy Brachycome multifida and the fern Cheilanthes austrotenuifolia very common. Open stands of narrow leaved ironbark at around 20m tall with or without white cypress and bull oak over the midstratum with scattered stands or sparse individual sclerophyllous shrub. Sparse to mid-dense ground layer of forbs, grasses and graminoids. Community occurs on silty sand with adequate drainage
Pilliga Box Eucalyptus pilligaensis Dry Open Forest	Pilliga box Eucalyptus pilligaensis is the dominant species, and Bull oak is common. White cypress and Narrow leaved ironbark are less common. Mid stratum vegetation is very sparse or absent. Ground layer vegetation is dominated by grasses such as Paspalum distans and Eragrostis sterilis elsewhere. Other common species include burr-daisy Calotis cuneifolia, bluebells Wahlenbergia spp, the grassy sedge Carex inversa, saw sedge Gahnia aspera, and mat-rushes Lomandra spp. This community typically consists of mature trees over occasional stands of coppice and dense regrowth and sparse grasses and forbs. This community occurs in the southern part of the Study Area, often on darker silty soils. No Threatened species were detected in this community in the Study Area. The community is potential habitat for the Threatened species Diuris tricolor, Polygala linariifolia, and Rulingiaproscumbens. This community is classified as Pilliga Outwash Dry Sclerophyll Forests (Keith 2004) or Type 193 White Cypress Pine – Box (Forestry Commission 1989). It is not listed as Endangered under the TSC Act or EPBC Act.

The open agricultural lands between the East Pilliga State Forest and the Wilga Park Power Station is either improved pasture or cropping paddocks and has not been subject to a specific flora survey effort as there was no need to modify or remove existing vegetation to facilitate the installation of the Bibblewindi - Wilga Park gas flow line for these areas.

Key Issue(s)/Approval Requirements	Source	Management Action/Mitigation Measure
Land disturbance and vegetation clearing is limited as far as practicable  (Approval condition 2.33)	Land disturbance and vegetation clearing during construction activities	When vegetation clearing activities are undertaken maximise the retention of significant vegetation and mature trees.  (Approval condition 2.33)
Offset package (agreed to by Namoi Catchment Authority and OEH to be provided by Santos Ltd) as a compensatory habitat package.  (Approval condition 2.34) <i>Note: The environmental values of the offset area will need to be maintained and/or enhanced until such time ownership of the land is transferred to the NSW Govt.</i>	Warialda Offset (DP751132)	Ensure offset area is securely fenced to prevent access by stock

Key Issue(s)/Approval Requirements	Source	Management Action/Mitigation Measure
Visual impacts of development to be minimised  (Approval condition 2.37)	Planning new development	Urban design and landscaping measures to be developed and implemented and report provided to the Secretary DPE prior to the commencement of construction activities.  Action completed as confirmed in letter from Department on 8 December 2008
The presence of previously unidentified Aboriginal objects in the course of construction activity.  (Approval condition 2.35)	Land Disturbance and Construction Activities	Work to cease immediately. OEH to be notified in accordance with the <i>National Parks and Wildlife Act 1974</i> and works not to recommence until written authorisation or otherwise is received from OEH (Approval condition 2.35)
The presence of previously unidentified historical relics in the course of construction activity.  (Approval condition 2.36)	Land Disturbance and Construction Activities	Work to cease immediately and the Heritage Office notified in accordance with the <i>Heritage Act 1977</i> .  Work only to commence with the written approval of the Heritage Office (Approval condition 2.36)

## 9. Contingency Planning and Incident Management

### 9.1. Emergency and Incident Management

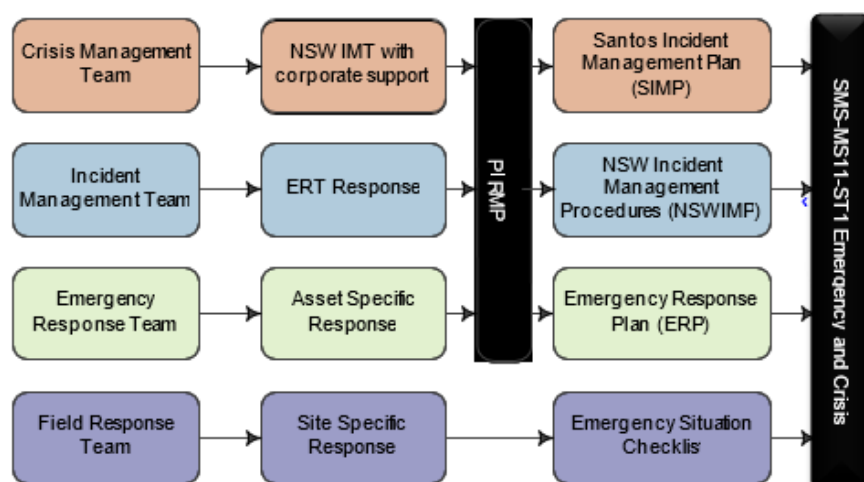
During the operational phase, the Santos Management System (SMS) provides guidance and direction for managing all environmental incidents and complaints. All incidents, hazards/near misses and complaints are categorized according to SMS requirements, with immediate internal notification to respective management levels commensurate with severity and level of environmental harm caused or threatened.

Santos has developed the following key documents relating to emergency and incident management:

- Management Standard SMS-MS11-ST1 Emergency and Crisis Management.
- Management Standard SMS-MS11-ST2 Incident Reporting, Investigation and Learning.
- NSW Incident Management Plan.
- NSW Emergency Response Plan.
- Narrabri Gas Project Pollution Incident Response Management Plan (PIRMP).

Santos' system of emergency response is detailed in Figure 6 Emergency Response Framework.

Figure 6: Emergency Response Framework



The above documents are located on the Santos intranet site 'Discover' and electronically in centrally located files.

All incidents including environmental incidents, near misses, non-conformance events and complaints are recorded electronically and managed through the Santos' EHS Toolbox in the Incident Management System (IMS) and Audit and Inspection Manager (AIM).

EHS Incident and near misses are investigated to identify the causal factors and associated underlying systemic weaknesses (root causes).

SMS-MS11-ST2 Incident Reporting, Investigation and Learning outlines the process in which to determine the correct level of incident investigation. For significant incidents, the Tap Root investigation process is used.

## 9.2. Environmental Incident Reporting

Statutory obligations for environmental incident reporting are included within:

- The Environment Planning and Assessment Act 1979 approval conditions.
- The Protection of the Environment Act 1997

The Santos SMS provides the mechanism for managing incidents. All incidents, hazards / near misses are categorized according to SMS requirements, with immediate internal notification to respective management levels commensurate with severity. This process is illustrated in Figure 7 below.

Condition 7.1 of MP 07\_0023 requires the Secretary to be notified of any incident with actual or potential significant off-site impacts on people or the biophysical environment within **12 hours** of becoming aware of the incident. Written details of the incident are to be provided to the Secretary within seven days of the date on which the incident occurred.

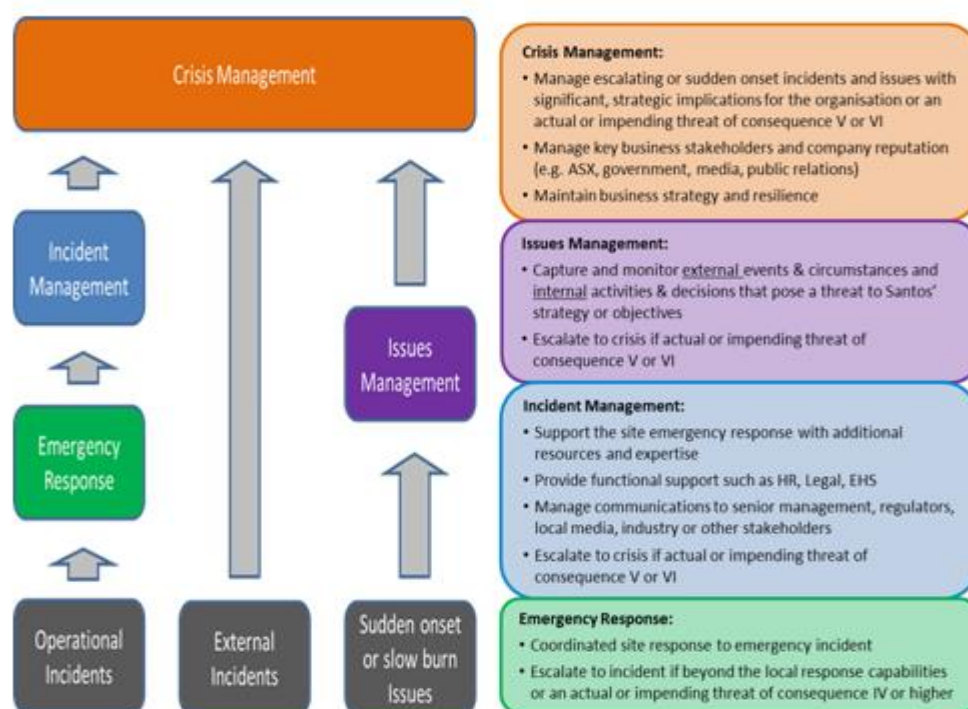
For incidents causing or threatening to cause material harm, Santos is required by its EPL, PEL and the POEO Act to immediately notify the respective agencies EPA, DRE as well as NSW Health, WorkCover NSW, Local Council and Fire and Rescue NSW). EPL Condition R2.1 requires that the notification must be made by the telephoning the Environment Line service on 131 555.

In accordance with Section 147 of the POEO Act, harm to the environment is material harm if:

- it involves actual or potential harm to the health or safety of human beings or to ecosystems, that is not trivial, or
- it results in actual or potential loss or property damage of an amount, or amounts in aggregate, exceeding \$10,000 (including the reasonable costs and expenses that would be incurred to prevent, mitigate or make good harm to the environment).

As with the MP07-0023, PEL and EPL all require that a written report on the incident is provided to the relevant agencies within 7 days of the date of the incident.

Figure 7: ENSW Incident Reporting Procedure



## 10. Rehabilitation and Decommissioning

A ten (10) metre wide pipeline corridor linking the Bibblewindi and the Bohena CSG pilots and the Wilga Park Power Station has been constructed that has required the removal of most of the vegetation within the 10m wide corridor for the length of the flow line at those locations where the pipeline route:

- occurs within the forested zone; and cannot make use of existing roads and access tracks; or
- has been located upon the cleared lands but still required some modification or removal of vegetation in situ.

The buried flow line has line of sight markers at regular intervals and/or where it passes below fence lines, roads and other utilities.

Prior to the commencement of the Bibblewindi to Wilga Park gas flow line installation in 2009, brush (including logs from felled trees) and topsoil were removed from the easement separately and stockpiled within the easement corridor. Following installation, the topsoil was first reinstated followed by the brush to allow for natural rehabilitation existing native species. A three (3) metre section of the easement was not reinstated to allow for access along the corridor. This is required for the ongoing access to the gas flow line for maintenance purposes.

During 2013 and 2014 Santos Ltd constructed a water pipeline within and along the existing easement to transfer stored associated water in the Bibblewindi ponds to the newly constructed dams at the new Leewood Water Facility. The same methodology described above was implemented with disturbed areas resulting from the construction works being reinstated in a timely manner. Decommissioning of pipeline systems will be carried out in accordance with Australian Standard (AS) 2885.

## 11. Training and Awareness

An Environmental Training and Awareness Program has been developed by Santos Ltd for the operation of the Narrabri Gas Project.

The program for staff and contractors consists of level 1 & 2 on-line induction courses which contains key information on the environmental issues related to the operation of the project and includes the following components:

- Santos Ltd Environment, Health and Safety Policy;

- Responsibilities of Santos Personnel;
- Management structure and role definition;
- Records management;
- External contractor requirements;
- Operating conditions and environmental controls
- Noise management;
- Waste management;
- Bushfire management; and
- Emergency response procedures.

In addition, for staff and contractors going to site it is a requirement to undertake a Level 3 Induction on site and prior to commencing any work. This induction contains site specific information on significant EHS hazards and controls implemented to minimise risk as well as site specific emergency response protocols. The Level 3 Induction is specific to the Narrabri Gas field and includes the requirement for mandatory compliance with environmental approvals plans and procedures by all personnel working on the Project.

Santos Corporate Human Resources maintains the system of recording successful completion of Level 1 and Level 2 EHS inductions. The project maintains a system to record successful completion of Level Three inductions. Santos contractors will maintain a system that records all contractor personnel inductions and training competencies to demonstrate relevant EHS competencies, including those required by legislation.

## 12. Monitoring and Reporting

### 12.1. Statutory Approval Reporting Requirements

In the Final Statement of Commitments for the EIS, the proponent committed to providing an Annual Environmental Management Report to DPE within two months of the anniversary of the commencement of site activities. The due date for that report is recorded in ComTrack.

Although the conditions of approval did not require such a report, the commitment is binding under condition 1.1 of the approval.

#### 12.1.1. Air Quality Monitoring

Monitoring of air pollution parameters at each generator stack discharge point is required to be undertaken under the approval conditions when the capacity of the power station exceeds 12 megawatts as per Table 4 below, and in accordance with the Approved Methods for the Sampling and Analysis of Pollutants in New South Wales (DEC 2007), unless otherwise agreed to by EPA.

**Table 4:** Approved Methods for the Sampling and Analysis of Pollutants in NSW

Pollutant/Parameter	Units of Measure	Method	Frequency
Nitrogen dioxide (NO <sub>2</sub> ) or nitric oxide (NO), or both (as NO <sub>2</sub> )	mgm-3	TM 11	<p>Upon the commencement of operation of the Power Station at a capacity of more than 12 megawatts and annually thereafter. Santos consulted with the NSW EPA regarding the monitoring methods (Appendix A). Monitoring will be undertaken in accordance with the following:</p> <ul style="list-style-type: none"> <li>The measurement location will be at the exhaust stack discharge point of each gas generator in accordance with the Approved Methods for the Sampling and Analysis of Air</li> </ul>
Velocity	ms-1	TM-2	
Volumetric flow rate	m <sup>3</sup> s-1	TM-2	
Temperature	oC	TM-2	
Moisture content in stack gases	%	TM-22	
Dry gas density	kgm-3	TM-23	
Molecular weight of stack gases	g.gmol-1	TM-23	
Oxygen	%	TM-25	

			<p>Pollutions in New South Wales (DECC, 2007).</p> <ul style="list-style-type: none"> <li>• The pollutant concentrations and emission parameters measured will include all parameters specified in Condition 3.1.</li> <li>• Measurements will be undertaken when the WPPS is operating under normal operating conditions of the new generation capacity that is being assessed.</li> </ul>
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### 12.1.2. Noise Monitoring

Requirement/Approval Condition	Frequency/ Timing
<p>Undertake a program to confirm the noise emission performance of the project. The program shall include, but not necessarily be limited to:</p> <ul style="list-style-type: none"> <li>a) noise monitoring consistent with the guidelines provided in the <i>New South Wales Industrial Noise Policy (EPA, 2000)</i>, to assess compliance with the maximum allowable noise contributions specified in Table 2 of condition 2.8 of this approval in relation to the locations specified in condition 2.8: and</li> <li>b) details of any entries in the Complaint Register relating</li> <li>c) to noise impacts.</li> <li>d) (Condition 3.5 of this approval)</li> </ul> <p>A report providing the results of the program shall be submitted to the Secretary and the EPA</p>	<p>Within 90 days of the commencement of operation of the WPPS at a capacity greater than 12MW, and at every subsequent stage new generation capacity is added a noise monitoring program will be undertaken to confirm the noise emissions from the WPPS and confirm compliance with 2.8 and 2.9 of the approval. Additionally, summer and winter monitoring will be undertaken in the first twelve months of exceeding 12 MW generation capacity, and after each stage of an increase in power generation. Past this period, if no monitoring has been undertaken in the preceding 12 months and a noise complaint is registered by a neighbour, noise monitoring will be undertaken to confirm compliance with condition 2.8 All noise monitoring will be undertaken in accordance with the Noise Policy for Industry (EPA, 2017):</p> <ul style="list-style-type: none"> <li>• Measurements will be undertaken using a NATA calibrated Type 1 Sound Level Meter (SLM)</li> <li>• Field calibration checks will be performed at the start and finish of the measurement session and all results discarded if variance is greater than +/-0.5 dB</li> <li>• The SLM will be paused during any significant extraneous events not generated by the WPPS. The WPPS is a continuous noise source and the difference between the LAeq and LA90 is expected to be small, as such the LA90(15min) will be used as the assessment parameter to ensure extraneous noise is excluded.</li> <li>• One-third octave levels will be recorded and used to exclude insect noise should it be prevalent at the time of monitoring</li> <li>• The LAeq(15min) measurements will be set to linear averaging</li> </ul>



	<ul style="list-style-type: none"> <li>• The LAmax and LA90(15min) measurements will be set to Fast response</li> <li>• The C-weighting levels will be measured to confirm if the WPPS is subject to low frequency modification factors as per Condition 2.9</li> <li>• Measurements will be undertaken when the WPPS is operating under normal operating conditions of the new generation capacity that is being assessed</li> <li>• Wind speed, direction and meteorological conditions prevailing during the monitoring period will be recorded with an onsite weather station</li> <li>• Monitoring will be undertaken during the night time period</li> <li>• Monitoring will be undertaken over three consecutive nights to account for variations in meteorological conditions</li> </ul> <p>In the event that direct noise measurements are impractical the Noise Policy for Industry Section 7 will be used for guidance to monitor performance as follows:</p> <ul style="list-style-type: none"> <li>• Direct attended measurements will be undertaken at intermediate locations</li> <li>• A detailed noise model will be prepared using the CONCAWE algorithm implemented in SoundPlan and based on near field noise source measurements at the WPPS.</li> <li>• The noise model will be calibrated and validated at the intermediate locations</li> <li>• The model will consider adverse meteorological conditions for assessment of compliance with Condition 2.8</li> </ul> <p>A noise monitoring report will be prepared and submitted to the Department and the EPA within 28 days of completion of the monitoring program required under the approval. The noise monitoring report will include:</p> <ul style="list-style-type: none"> <li>• Details of entries into the complaints register relating to noise</li> <li>• The reporting requirements of the Noise Policy for Industry (EPA, 2017) Section 7.1.3.</li> </ul>
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### 12.1.3. Hazard Audit Reporting

Requirement/Approval Condition	Frequency/Timing
Commission and submit for approval a Hazard Audit Report for the Project to the Secretary in accordance with condition 3.6 of the approval	<p>Within 90 days of, and for each of the following events:</p> <ul style="list-style-type: none"> <li>▪ the commencement of the operation of the power station using CSG from the Bibblewindi and Bohena pilots; and</li> </ul>



	<ul style="list-style-type: none"> <li>the commencement of operation of the power station at a capacity of more than 12 megawatts; and</li> <li>the commencement of operation of the power station at a capacity of more than 40 megawatts.</li> </ul>
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#### 12.1.4. Landscape and Ecological Monitoring

Requirement/Approval Condition	Frequency/Timing
Monitoring disturbed areas for the presence of, and the control of introduced weeds as a result of Santos Ltd activities in the project area.	Monitoring for weeds to be undertaken regularly during construction activities and for previously disturbed areas on a semi-regular basis during operations or as specified in individual land holder agreements.

## 12.2. Santos Ltd Compliance

An internal environmental inspection schedule has been developed for the Wilga Park Power Station and associated flow lines using a program called ComTrack. The frequency of workplace inspections is determined using a risk based approach and for this project involves bi-annual inspections of the power station. A reminder is issued to the person assigned to undertaking the inspections, and his supervisor. The inspections are carried out by a Santos environmental advisor using a comprehensive compliance checklist.

The checklist contains all of the obligations from the conditions of approval, as well as all commitments made in the EIS.

The inspections are stored in ComTrack and any work required which is identified by these inspections is tracked through Santos' EHS Toolbox.

## 13. APPENDIX A

11 May 2018

NSW EPA  
Mark Clyne  
Head of Operations  
Gas Regulation,  
NSW Environment Protection Authority

Our ref: 21/22483  
Your ref: 221738

Dear Mark

### **Wilga Park Power Station Consultation obligations with the EPA for Project Approval 07\_0023**

#### **1 Introduction**

Santos NSW (Eastern) Limited (Santos) is the operator of the Wilga Park Power Station (WPPS) which was approved in 2008. The Department of Planning and Environment (Department) Minister's condition of approval (Conditions) for the project required the preparation of an Operational Environmental Management Plan (OEMP) in Condition 6.3. The OEMP has been updated and reviewed by the Department on several occasions since 2009.

##### **1.1 Intention of this letter**

Project Approval 07\_0023 places standards on the proponent with regard to air, noise and vibration, once the WPPS is operating above 12 MW capacity. The WPPS is currently operating under a 12 MW capacity however Santos intend to increase capacity above 12 MW. Prior to increasing capacity Santos will update the OEMP in accordance with the requirements of Condition 6.3 with respect to the proposed measures to manage and monitor air quality, noise and vibration, in consultation with the NSW Environment Protection Authority (EPA). The existing OEMP contemplates operating above 12MW, but only addresses consultation with the EPA and does not include any specifics on the proposed measures to air quality, noise and vibration.

The WPPS is currently operating under a 12 MW capacity however Santos intend to increase capacity above 12 MW. Prior to increasing capacity Santos will update the OEMP to include any consultation with the NSW Environmental Protection Authority (EPA) with respect to the proposed measures to manage and monitor air quality, noise and vibration.

The following documents are appended for convenience to assist this consultation process with the EPA:

- The Planning Approvals and Conditions (Appendix A)
- The latest version of the OEMP (4 May 2018) (Appendix B)
- The email from the Department (27 November 2017) with comments for consideration on the OEMP (Appendix C) with regards to consulting with the EPA

It is requested that the EPA review the information contained within this letter and provide comment as you consider appropriate with regard to the measures to monitor and manage air quality, noise and vibration.

## **2 Proposed Monitoring Approach**

The monitoring approach in this section is proposed to be included in the OEMP.

### **2.1 Air quality Monitoring**

#### **2.1.1 Point source emission sampling**

Within 90 days of the commencement of operation of the WPPS at a capacity greater than 12 MW, and at every subsequent stage new generation capacity is added, point source emission sampling will be undertaken to confirm the air quality emissions from the WPPS and confirm compliance with Condition 2.4. Note point source emission sampling will also be undertaken annually to comply with Condition 3.1. Point source emission sampling will be undertaken as follows:

- The measurement location will be at the exhaust stack discharge point of each gas generator in accordance with the *Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales (DECC, 2007)*.
- The pollutant concentrations and emission parameters measured will include all parameters specified in Condition 3.1.
- Measurements will be undertaken when the WPPS is operating under normal operating conditions of the new generation capacity that is being assessed.

In the event that the point source emission sampling identifies stack discharge concentrations greater than the limits in Condition 2.4, then Santos will prepare a Point Source Emission Report and submit to the Department within 2 months from completion of sampling. The Point Source Emission Report will include the following:

- Details of remedial measures to reduce the point source emissions levels to below the limits.
- A timeline to implement the remedial measures.
- Details of entries into the complaints register relating to air quality.

#### **2.1.2 Air quality impact assessment**

Within 90 days of the commencement of operation of the WPPS at a capacity greater than 40 MW an air quality impact assessment will be undertaken in accordance with the *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales (DECC, 2005)* using the point source emission sampling undertaken at the capacity above 40 MW.

In the event that the air quality impact assessment indicates ground-level concentration above the ground-level concentration levels predicted in the documents contained within Condition 1.1, then an Air Quality Impact Assessment Report will be prepared and submitted to the Department within 2 months

from completion of the air quality impact assessment. The Air Quality Impact Assessment Report will include the following:

- Details of reasonable and feasible remedial measures to reduce the ground-level concentration levels to below the ground-level concentration levels predicted in the documents contained within Condition 1.1
- Details of remedial measures to reduce the ground-level concentration levels to below the limits detailed in the *Approved Methods for the Modelling and Assessment of Air Pollutions in New South Wales (DECC, 2005)*
- A timeline to implement the remedial measures
- Details of entries into the complaints register relating to air quality

## 2.2 Noise Monitoring

Within 90 days of the commencement of operation of the WPPS at a capacity greater than 12 MW, and at every subsequent stage new generation capacity is added a noise monitoring program will be undertaken to confirm the noise emissions from the WPPS and confirm compliance with Condition 2.8 and 2.9.

Direct noise measurements will be undertaken at all of the locations identified in Condition 2.8 of the Planning Approval when direct measurements are practical. The Noise Policy for Industry (EPA, 2017) states that '*direct measurements at receiver locations are effective when the compliance location is dominated by noise from the industrial premises under investigation*'. When the WPPS is the dominant noise source at the receiver, operator attended measurements will be undertaken based on the following method which is in accordance with the Noise Policy for Industry (EPA, 2017):

- Measurements will be undertaken using a NATA calibrated Type 1 Sound Level Meter (SLM)
- Field calibration checks will be performed at the start and finish of the measurement session and all results discarded if variance is greater than +/-0.5 dB
- The SLM will be paused during any significant extraneous events not generated by the WPPS. The WPPS is a continuous noise source and the difference between the  $L_{Aeq}$  and  $L_{A90}$  is expected to be small, as such the  $L_{A90(15min)}$  will be used as the assessment parameter to ensure extraneous noise is excluded.
- One-third octave levels will be recorded and used to exclude insect noise should it be prevalent at the time of monitoring
- The  $L_{Aeq(15min)}$  measurements will be set to linear averaging
- The  $L_{Amax}$  and  $L_{A90(15min)}$  measurements will be set to Fast response
- The C-weighting levels will be measured to confirm if the WPPS is subject to low frequency modification factors as per Condition 2.9
- Measurements will be undertaken when the WPPS is operating under normal operating conditions of the new generation capacity that is being assessed

- Wind speed, direction and meteorological conditions prevailing during the monitoring period will be recorded with an onsite weather station
- Monitoring will be undertaken during the night time period
- Monitoring will be undertaken over three consecutive nights to account for variations in meteorological conditions

In the event that direct noise measurements are impractical the Noise Policy for Industry Section 7 will be used for guidance to monitor performance as follows:

- Direct attended measurements will be undertaken at intermediate locations
- A detailed noise model will be prepared using the CONCAWE algorithm implemented in SoundPlan and based on near field noise source measurements at the WPPS.
- The noise model will be calibrated and validated at the intermediate locations
- The model will consider adverse meteorological conditions for assessment of compliance with Condition 2.8

A noise monitoring report will be prepared and submitted to the Department and the EPA within 28 days of completion of the monitoring program. The noise monitoring report will include:

- Details of entries into the complaints register relating to noise
- The reporting requirements of the Noise Policy for Industry (EPA, 2017) Section 7.1.3.

Should the noise monitoring report identify exceedances to Condition 2.8 and 2.9 then the requirements in Condition 2.10 to 2.23 will be implemented as appropriate.

### 2.3 Vibration Impacts

The WPPS infrastructure does not include any equipment which generates significant vibration therefore vibration resulting from operation of the WPPS above 12 MW will not exceed the preferred vibration values in *Assessing Vibration: A Technical Guideline (DECC, February 2006)* at any affected residential dwelling.

As such measures to manage and measure operational vibration from the WPPS after increasing capacity above 12 MW have not been proposed.

Sincerely  
GHD Pty Ltd



**Evan Milton**

Principal Engineer - Air, Noise and Vibration Manager  
02 9239 7205

## 14. APPENDIX B

**From:** Mark Clyne <[Mark.Clyne@epa.nsw.gov.au](mailto:Mark.Clyne@epa.nsw.gov.au)>

**Sent:** Monday, 25 June 2018 1:55 PM

**To:** Evan Milton <[Evan.Milton@ghd.com](mailto:Evan.Milton@ghd.com)>

**Subject:** RE: Wilga Park Power Station planning approval requirement

Hi Evan

I understand that John Padovan provided you with verbal advice last week. Attached below is comments from the EPA Air & Noise Branches. As you would be aware the Wilga Park Power Station in its current state although approved to 40 Megawatt does not have the capacity to produce at or more than 30 Megawatt which is the threshold which requires an Environment Protection Licence. Therefore the EPA is not the Appropriate Regulatory Authority (ARA). Having said that, I also understand that there is a condition on the Santos development approval which requires consultation with the EPA. I have listed below comments from the EPA in relation to your enquiry.

### Air

Noting we don't approve management plans, TA-Air offers the following two comments below:

1. At each stage of electricity generation capacity expansion (pre-commissioning of additional fuel burning equipment at the premises), the proponent should benchmark the proposed combustion plant and operating configuration to demonstrate that all reasonable and feasible best practice air emission controls are adopted.
2. Prior to the total premises electricity generation capacity exceeding 30 MW-thermal, the proponent should evaluate the feasibility of continuous emission monitoring for NOx.

### Noise

EPA notes that the proposed operating capacity of the Wilga Park Power Station is below the 30 megawatt threshold in Schedule 1 of the Protection of the Environment Operations Act 1997. For the proposal as presented in the Letter, EPA is consequently not the appropriate regulatory authority for this project and does not require the proponent to hold an Environment Protection Licence.

EPA notes the requirement for implementation of all feasible and reasonable noise mitigation measures in Section 2.8 of the project approval. EPA does not have any comments on the noise and vibration aspects of the Letter or the Operational Environmental Management Plan for the project.

I hope this Information is of assistance to you. If you have any further enquiries please contact me.

Regards

**Mark Clyne**

Head of Operations

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