

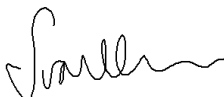

# NARRABRI GAS PROJECT

## Historic Heritage Management Plan

**0041-150-PLA-0007**

Date	Revision	Reason for Issue	Author	Checked	Approved
18 November 2022	0B	For approval	Onward Consulting	LD	TD

## Prepared by:

Title	Name	Signature	Date
Senior Environmental Manager	S. van der Meulen Onward Consulting		18 November 2022
Director	Mark Vile Onward Consulting		18 November 2022

## Reviewed by:

Title	Name	Signature	Date
Team Leader Environment - Approvals	Liz Dunlop		18 November 2022

## Approved by:

Title	Name	Signature	Date
Development Manager NSW	Todd Dunn		18 November 2022

This document has been prepared by Onward Consulting to comply with the Narrabri Gas Project conditions of consent and has relied upon the relevant information available at the time of writing and all findings, conclusions or recommendations contained herein are based thereon. This document is for the use of Santos Ltd and no responsibility will be taken for its use by other parties. Santos Ltd may, at its discretion, use this document to inform regulators and the public.



Onward document number:  
NGP-001Q-0B PLN



## Acronyms and abbreviations

Acronym	Description
ANU	Australian National University
CoC	Conditions of consent for the NGP SSD 6456
CSG	coal seam gas
DPE	NSW Department of Planning and Environment
DPIE	The former NSW Department of Planning, Industry and Environment
EIS	Narrabri Gap Project Environmental Impact Statement
EMP	environmental management plan
EMS	Environmental Management Strategy
EPA	NSW Environment Protection Authority
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i> (NSW)
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i> (Cth)
FCNSW	Forestry Corporation NSW
GIS	geographic information system
ha	hectare
HHMP	Historic Heritage Management Plan (this document)
IEA	Independent Environmental Audit
km	kilometre
LEP	local environmental plan
LGA	local government area
m	metre
mm	millimetre
NGP	Narrabri Gas Project
NP&W Act	<i>National Parks and Wildlife Act 1974</i> (NSW)
NPWS	NSW National Parks and Wildlife Service
NSW	New South Wales
PAL	Petroleum assessment lease under the PO Act
PEL	Petroleum exploration licence under the PO Act
PO Act	<i>Petroleum (Onshore) Act 1991</i> (NSW)
POEO Act	<i>Protection of the Environment Operations Act 1997</i> (NSW)
POEO Regulation	Protection of the Environment Operations (General) Regulation 2022
PPL	petroleum production lease under the PO Act
PPLA	petroleum production lease application under the PO Act
SMS	Santos Management System
SSD	State significant development
SUGAR	Sydney University Giant Air-shower Recorder



## Table of contents

<b>1. Introduction .....</b>	<b>1</b>
1.1 Narrabri Gas Project .....	1
1.1.1 Background .....	1
1.1.2 Current Project .....	1
1.2 Scope and purpose .....	2
1.3 Preparation of this Plan .....	3
1.4 Consultation .....	3
1.5 Structure of this Plan .....	4
1.6 Distribution .....	5
<b>2. Roles and responsibilities .....</b>	<b>6</b>
<b>3. Regulatory requirements and approvals .....</b>	<b>8</b>
3.1 Relevant legislation .....	8
3.2 Compliance conditions .....	8
3.2.1 Development Consent SSD 6456 .....	8
3.2.2 State legislation .....	9
3.3 EIS commitments .....	10
<b>4. Historic heritage sites and significance .....</b>	<b>11</b>
4.1 Timber extraction areas .....	13
4.1.1 Statement of significance - timber extraction areas .....	13
4.1.2 Statement of significance - Timber Extraction Area 12 .....	13
4.2 Sawmill sites .....	14
4.2.1 Statement of significance - Johnston's Albion Sawmill .....	14
4.2.2 Statement of significance - Cowallah parish map sawmill .....	14
4.3 Habitation and camping sites .....	14
4.3.1 Statement of significance - Cowallah Habitation Complex .....	15
4.3.2 Statement of significance - Hardy's Hut .....	16
4.3.3 Statement of significance - 1960s logging camp .....	16
4.3.4 Statement of significance - logging camps one to six .....	16
4.3.5 Statement of significance - logging camp seven .....	16
4.4 Timber loading ramps .....	16
4.4.1 Statement of significance - timber loading ramps .....	16
4.5 Logging tracks .....	17
4.5.1 Statement of significance - logging tracks .....	17

4.6	Other sites .....	17
4.6.1	Statement of significance – Sydney University Giant Air-shower Recorders .....	18
4.6.2	Statement of significance - artefact scatter and tank, stock loading facility and blazed trees 18	
4.6.3	Statement of significance - Oil well .....	19
4.7	Pilliga East logging cultural landscape .....	19
4.7.1	Statement of significance - Pilliga East logging cultural landscape .....	19
4.8	Siding Spring Observatory .....	20
<b>5.</b>	<b>Historic heritage management measures .....</b>	<b>21</b>
5.1	Field Development Protocol .....	21
5.1.1	Surface development exclusion areas .....	21
5.1.2	Management of previously unidentified heritage items during micro-siting .....	23
5.2	Unexpected finds procedure .....	24
5.3	Protection of heritage items located outside the approved disturbance area .....	24
5.4	Environmental inductions .....	24
5.5	Historic heritage database .....	24
5.6	Strategy for care, control and storage of relics .....	25
<b>6.</b>	<b>Incidents, non-compliances and complaints .....</b>	<b>26</b>
6.1	Incidents and non-compliances .....	26
6.2	Unpredicted impact protocol .....	26
6.3	Complaint management .....	27
<b>7.</b>	<b>Reporting, evaluation and review .....</b>	<b>28</b>
7.1	Annual Review .....	28
7.2	Independent environmental audits .....	28
7.3	Management Plan review and evaluation .....	28
7.4	Improvement measures .....	29
<b>8.</b>	<b>References .....</b>	<b>30</b>
<b>9.</b>	<b>Glossary .....</b>	<b>31</b>
	<b>Appendix A - Consultation records .....</b>	<b>33</b>
	<b>Appendix B - Compliance conditions relevant to this Plan .....</b>	<b>40</b>
	<b>Appendix C - Historic heritage assessment .....</b>	<b>45</b>

## Tables

Table 2.1 - Roles and responsibilities .....	6
Table 3.1 - EIS commitments relevant to historic heritage.....	10
Table 4.1 - Assessment of significance - timber extraction areas.....	13
Table 4.2 - Assessment of significance - sawmill sites .....	14
Table 4.3 - Assessment of significance - habitation and camping sites.....	15
Table 4.4 - Assessment of significance – timber loading ramps .....	17
Table 4.5 - Assessment of significance – other sites .....	18
Table 4.6- Assessment of significance – Pilliga East logging cultural landscape .....	19
Table 6.1 - Unpredicted impact protocol .....	26

## Figures

Figure 4.1 - Location of identified historic heritage sites .....	12
Figure 5.1 - Historic heritage surface exclusion areas .....	22

## 1. Introduction

### 1.1 Narrabri Gas Project

#### 1.1.1 Background

Resource exploration has been occurring in the north-western area of NSW since the 1960s; initially for oil, but more recently for coal and gas. Santos NSW Pty Ltd began exploring for natural gas from coal seams in north-western NSW in 2008 and is currently conducting coal seam gas (**CSG**) exploration and appraisal activities within Petroleum Exploration Licence (**PEL**) 238, Petroleum Assessment Lease (**PAL**) 2 and Petroleum Production Lease (**PPL**) 3, located in the Gunnedah Basin about 20 kilometres (**km**) south-west of the town of Narrabri. Activities in PAL 2 have focussed on the Bibblewindi and Bohena CSG pilots, whilst recent activities in PEL 238 have focussed on the Dewhurst and Tintfield CSG pilots.

The Narrabri Coal Seam Gas Utilisation Project (Wilga Park Power Station and associated infrastructure) operates under an existing Part 3A approval under the *Environmental Planning and Assessment Act 1979* (NSW) (**EP&A Act**). It was originally approved in 2008, with various modifications approved between 2011 and 2019. It encompasses a gas gathering system, a compressor and associated flare, a gas flow line from Bibblewindi to Wilga Park within a 10 metre (**m**) corridor with a riser at Leewood and an expansion of the existing Wilga Park Power Station from 12 to 40 megawatts.

#### 1.1.2 Current Project

On 30 September 2020 Santos NSW (Eastern) Pty Ltd (**Santos**) obtained consent for State significant development (**SSD**) 6456 to develop the Narrabri Gas Project (**NGP**) (**the Project**). Approval EPBC 2014/7376 under the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (**EPBC Act**) was granted on 24 November 2020.

The Project includes the progressive installation of up to 850 new gas wells on up to 425 new well pads over approximately 20 years and the construction and operation of gas processing and water treatment facilities. The Project area covers about 950 square kilometres (95,000 hectares) in size and the Project footprint will only directly impact about 1% of that area.

Four phases of development are defined under the consent, including:

- Phase 1 - exploration and appraisal;
- Phase 2 - construction activities for production wells and related infrastructure;
- Phase 3 - gas production operations; and
- Phase 4 - gas well and infrastructure decommissioning, rehabilitation and closure.

Phase 1 of the Project is defined in the consent as the phase of the development comprising ongoing exploration and appraisal activities in the Project area, including:

- seismic surveys;
- core and chip holes;
- construction and operation of pilot wells (up to 25 wells on up to 25 well pads across the Project area); and
- pilot well ancillary infrastructure, including access tracks, gas and water gathering lines, water balance tanks, safety flaring infrastructure, utilities and services, and environmental monitoring equipment including groundwater monitoring bores.

Santos plans to continue exploration and appraisal of the resource in the near term until a final investment decision can be made. The exploration and appraisal activities will include continued operation of Santos' existing wells, infrastructure and facilities in PEL 238 and PAL 2, and construction and operation of new core holes, pilot wells and supporting infrastructure permitted under Phase 1.

Santos' existing exploration and appraisal activities in PEL 238 and PAL 2 include:

- Tintsville Pilot;
- Bibblewindi East Pilot;
- Bibblewindi West Pilot;
- Dewhurst North Pilot;
- Dewhurst South Pilot;
- Dewhurst northern and southern flow lines;
- Leewood Water Management Facility including ponds, water treatment plant and irrigation area;
- Bibblewindi Facility including gathering system, water balance tank, compressor and flare; and
- Bibblewindi to Leewood buried gas pipeline.

These exploration and appraisal activities will continue as part of the NGP. The initial, new-appraisal Phase 1 scope is a relatively minor extension to these existing exploration and appraisal activities.

The Phase 1 scope is planned to include the construction and operation of:

- 4 coreholes;
- 6 pilot wells;
- 2 deep reservoir monitoring bore (converted coreholes);
- new shallow water monitoring bores;
- associated linear infrastructure;
- seismic surveys (length and location to be determined); and
- continued operation of Santos' existing exploration and appraisal activities, including workover activities.

The full definitions of the approved activities for Phases 2, 3 and 4 of the Project are provided in the consent. Further details regarding the staging of the works and the exact scope for each are as approved in the Field Development Plan.

## 1.2 Scope and purpose

A detailed historic heritage assessment was undertaken for the Narrabri Gas Project Environmental Impact Statement (EIS). A total of 53 sites of heritage potential were identified in the Project area, 21 of which were considered to have collective heritage significance, which includes the eight sites that were identified as having heritage significance in their own right.

The EIS was publicly exhibited for 90 days, during which government departments, agencies and the public was invited to make submissions. The (then) Heritage Council of NSW noted the following as part of its submission:

- there would be no physical impact on any heritage places listed on the State Heritage Register or the *Narrabri Local Environmental Plan 2012*;

- although a number of historic sites with potential heritage significance have been identified, the proposal aims to avoid physical disturbance to many of these sites, which is appropriate conservation and is supported; and
- although no archaeological sites are predicted to be impacted it is requested that an Unexpected Finds Protocol is implemented

The NSC also made a submission, although no substantive heritage issues were raised.

The (then) Department of Planning, Industry and Environment (**DPIE**) noted in its Assessment Report that both DPIE and the Heritage Division accepted that the Project was unlikely to result in any significant impact to historic heritage values of the region, including the Pilliga East Logging Cultural Landscape. DPIE recommended the following conditions:

- avoid the identified heritage items;
- appropriately manage any additional heritage items discovered during the Project; and
- prepare and implement a Historic Heritage Management Plan.

The EIS committed to avoiding impacts on all 21 sites that were identified as having heritage significance via the Field Development Protocol. This Historic Heritage Management Plan (**HHMP** or **Plan**) has been prepared to manage potential impacts of the Project on historic heritage and includes details of historic heritage items, procedures to avoid impacts and manage previously unidentified finds, development of a heritage database, and induction requirements.

The HHMP has been developed in accordance with the requirements of the SSD 6456 conditions of consent (**CoC**) B53, B61 and B62 and the relevant Heritage NSW guidelines and provides details on the management and mitigation of historic heritage during construction and operation of the full Project development to implement all reasonable and feasible measures to prevent, and if prevention is no reasonable and feasible, to minimise any negative effect on historic heritage. It outlines the obligations in relation to management of items of historic heritage throughout the entire Project area.

As required by CoC B62, Santos will implement the latest revision of this Plan once approved by the Planning Secretary.

### 1.3 Preparation of this Plan

This Plan has been prepared by Mr. Servaes van der Meulen and Mr. Mark Vile of Onward Consulting Pty Ltd, who are both accomplished environmental professionals with more than 20 years' experience each. Considering their individual and combined industry experience and expertise, both Servaes and Mark are deemed to be suitably qualified and experienced for the preparation of this Historical Heritage Management Plan, as required by CoC B61(a).

### 1.4 Consultation

As required by CoC B61(b), this HHMP has been prepared in consultation with Heritage NSW, Narrabri Shire Council (**Council**) and relevant landowners (i.e. Forestry Corporation of NSW [FCNSW]).

The comment received from Heritage NSW on the draft Plan (Revision B) related to the requirement to update the document to include an unexpected finds protocol.

Initial comments provided by Council predominantly centred around consultation and detailed analysis of cultural heritage significance. These and other items were discussed at a meeting with Council on 3 November 2021 after which the Plan was updated to reflect the discussion outcomes. No further comments were raised by Council.

The comments received from FCNSW related to a number of queries regarding local significance, and potential FCNSW assets built for fire-fighting purposes.

Records of consultation and responses to all comments are provided in Appendix A.

## 1.5 Structure of this Plan

The structure of this HHMP is as follows:

Section 1	Provides an introduction to the Project and the context, scope, purpose and objectives of this Plan
Section 2	Defines the roles and responsibilities of personnel involved with the NGP, including consultants, contractors and their subcontractors
Section 3	Outlines the statutory provisions relevant to the management of erosion and any sediment generated by development of the NGP
Section 4	Provides a summary of the historic heritage sites identified during the EIS including a statement of significance for each item of historic heritage potential
Section 5	Provides details of the key management strategies to minimise potential impacts on historic heritage including management of items found during micro-siting investigations, and a strategy for the care, control and storage of any relics salvaged in the Project area
Section 6	Details the actions required for incidents and non-compliances related to the management of historical heritage
Section 7	Describes the reporting, evaluation and review process and requirements of this HHMP
Section 8	References
Section 9	Glossary
Appendix A	Consultation records
Appendix B	Compliance conditions relevant to this Plan
Appendix C	Provides a detailed description of the historic heritage sites identified during the development of the EIS and a statement of significance for each item of historic heritage potential

## **1.6 Distribution**

A copy of the latest approved HHMP is available to all relevant Santos personnel via the Santos intranet. In accordance with consent condition D13, the latest copy can also be found on the Project website. Further, a controlled copy of this HHMP will be kept at the Santos' Operations Centre located at 300 Yarrie Lake Road in Narrabri. This is where operational and field staff commence and finish each workday. Note that any printed copies of this HHMP are uncontrolled.



## 2. Roles and responsibilities

All Santos employees and contractors involved in the Narrabri Gas Project are responsible for the environmental performance of their activities and for complying with all legal requirements and obligations. Project personnel will be required to comply with approval requirements of the activities they undertake and potential environmental impacts from all activities will be managed in accordance with the Project's relevant management plan(s).

In accordance with consent condition D1, the Environmental Management Strategy (**EMS**) sets out the roles, responsibilities, authorities and accountabilities of all key personnel involved in the environmental management of the Project, including the requirements and obligations in this HHMP. All roles, responsibilities and accountabilities have been assigned in accordance with Santos Management System *SMS-MS\_14 People Management Standard*.

The roles and responsibilities in Table 2.1 relevant to the implementation and management of the HHMP reflect those that are defined in the EMS.

**Table 2.1 - Roles and responsibilities**

Position	Responsibility
Area Manager, Arcadia, Scotia and Narrabri Operations	<ul style="list-style-type: none"> <li>Responsible for the operation of all gas transmission and electricity generation infrastructure.</li> <li>Ensure the environmental performance of the project is consistent with the conditions of approval Santos SMS.</li> <li>Responsible for legislative compliance, observation of contractual obligations and the maintenance of resources to achieve the main objectives of the HHMP.</li> </ul>
HSER Manager - Onshore	<ul style="list-style-type: none"> <li>Reports to the Executive Vice President Onshore Oil and Gas.</li> <li>Accountable to ensure awareness of the compliance requirements of the HHMP.</li> <li>Ensures adequate resources are available to advise on the implementation of the HHMP and to undertake assurance of compliance in its implementation.</li> </ul>
D&C Project Lead or D&C Manager	<ul style="list-style-type: none"> <li>Responsible for the drilling and development of the well to operational handover.</li> <li>Ensures the environmental performance of the Project is consistent with the conditions of approval and the Santos SMS during drilling &amp; completions activities.</li> <li>Responsible for legislative compliance, observation of contractual obligations and monitoring contractor risk controls and assurance activities to achieve the main objectives of the HHMP.</li> </ul>
Team Leader Narrabri Operations	<ul style="list-style-type: none"> <li>Reports to the Area Manager, Arcadia, Scotia and Narrabri Operations.</li> <li>Maintains accountability, either directly or by delegation, for the overall management of the Project site and the operation of Project components.</li> <li>Retains responsibility for the conveyance of the HHMP and its objectives to all employees and contractors entering site.</li> </ul>
Team Leader Environment - Onshore	<ul style="list-style-type: none"> <li>Reports to the HSER Manager - Onshore.</li> <li>Maintains responsibility for the implementation, maintenance and monitoring of compliance with the HHMP.</li> <li>Advises operations, development and drilling &amp; completions management on environmental issues.</li> <li>Reviews contractor HSE and EMP documentation (where applicable).</li> </ul>

Position	Responsibility
Environmental Advisor	<ul style="list-style-type: none"> <li>• Reports to the Team Leader Environment - Onshore.</li> <li>• Maintains accountability for the monitoring of compliance with the HHMP.</li> <li>• Advises operations field staff on environmental issues.</li> <li>• Responsible for assessing, developing and validating the implementation of erosion and sediment plans.</li> <li>• Undertakes site inspections.</li> </ul>
Construction Field Supervisor	<ul style="list-style-type: none"> <li>• Reports to the Construction Manager, Development.</li> <li>• Responsible for ensuring implementation of the HHMP during construction phase.</li> <li>• Communicates the HHMP compliance requirements during construction phase.</li> </ul>
Santos personnel and contractors	<ul style="list-style-type: none"> <li>• Undertake all activities in accordance with the HHMP.</li> <li>• Undertake site inspections as required.</li> <li>• Undertake all activities in accordance with the full suite of approved EMPs.</li> </ul>

### 3. Regulatory requirements and approvals

Santos conducts all its activities associated with the NGP in accordance with applicable Commonwealth and NSW State environmental, planning and natural resource legislation and all requirements of relevant statutory authorities. Legislative and regulatory obligations are generally recognised through the imposition of conditions on the development consent, permits, licences, leases or approvals (collectively referred to as 'approvals'). Santos maintains a register of relevant environmental legislative and regulatory requirements which is regularly reviewed and maintained.

#### 3.1 Relevant legislation

Santos statutory obligations relevant to historic heritage management are contained in:

- conditions of consent for the NGP SSD 6456;
- the *NSW Heritage Act 1977*;
- the EP&A Act; and
- Narrabri Local Environment Plan 2012.

Obligations relevant to this HHMP are described below.

#### 3.2 Compliance conditions

Compliance conditions associated with the following licence(s), lease(s) and consent(s) are relevant to this HHMP.

##### 3.2.1 Development Consent SSD 6456

There are a number of SSD 6456 consent conditions directly relevant to the HHMP. The key conditions are B53, B61 and B62, which are provided below. Table B1 in Appendix B specifies where each of the requirements of all the consent conditions relevant to historic heritage management are addressed in this Plan.

**Consent condition B53** states that Santos must ensure that the Project does not cause direct or indirect impact on the heritage items identified in Appendix 7 of the CoC. These are further addressed in Appendix C.

**Consent condition B61** states that prior to the commencement of Phase 1, Santos must prepare a Historic Heritage Management Plan for the Project to the satisfaction of the Planning Secretary. This plan must:

- (a) be prepared by a suitably qualified and experienced person/s;
- (b) be prepared in consultation with the Heritage NSW, Council and relevant landowners and in accordance with the relevant Heritage NSW guidelines;
- (c) identify all heritage items in the Project area and include a statement of significance for each item;
- (d) describe the measures to be implemented for:
  - (i) managing any heritage items identified or suspected during micro-siting investigations for the Field Development Plan;

- (ii) ensuring all workers receive suitable heritage inductions prior to carrying out any activities which may cause impacts to historic heritage, and that suitable records are kept of these inductions;
- (iii) undertaking photographic/archival recording of any items of heritage significance potentially impacted by the Project, prior to disturbance;
- (iv) protecting heritage items located outside the approved disturbance area; and
- (e) include a strategy for the care, control and storage of any relics salvaged in the Project area, both during the life of the Project and in the long term.

**Consent condition B62** states that Santos must implement the Historic Heritage Management Plan once approved by the Planning Secretary.

### 3.2.2 State legislation

#### Heritage Act 1977

The *Heritage Act 1977* (NSW) (**Heritage Act**) is used to regulate development impacts on the State's historical heritage assets. The Heritage Act defines a heritage item as:

*“a place, building, work, relic, moveable object or precinct”*

To assist with the management of the State's heritage assets, the NSW Heritage Act distinguishes between items of local and State heritage significance. Items that are assessed as having State heritage significance can be listed on the NSW State Heritage Register.

Archaeological features and deposits are afforded statutory protection by the ‘relics provisions’ of the Heritage Act. A relic is defined as:

*“any deposit, artefact, object or material evidence that relates to the settlement of the area that comprises NSW, not being Aboriginal settlement, and is of State or local heritage significance”*

Land disturbance or excavation that will, or is likely to, result in a relic being discovered, exposed, moved, damaged or destroyed is prohibited under the provisions of the Heritage Act, unless carried out in accordance with an Excavation Permit pursuant to section 140, or an Archaeological Exception under section 139 of the Heritage Act.

Section 4.41 of the EP&A Act outlines legislation and approvals that do not apply to SSDs. Of relevance to heritage approvals, under Section 89J of the EP&A Act the following do not apply to SSDs:

- an approval under Part 4, or an excavation permit under Section 139 of the Heritage Act.
- Division 8 of Part 6 of the Heritage Act, which relates to controlling and restricting harm to buildings, works, relics and places not subject to interim heritage orders or SHR listing.

#### Narrabri Local Environmental Plan 2012

Each local government area (**LGA**) is required to create and maintain a local environmental plan (**LEP**) that identifies and conserves historical heritage item. These items are protected under the EP&A Act. Heritage items within the Narrabri LGA are listed in Schedule 5 of the Narrabri LEP 2012. These items are subject to the planning controls and provisions set out in Clause 5.10 (Heritage Conservation) of the Narrabri LEP 2012. An examination of Schedule 5 indicated that no listed items are located in or within a two-kilometre buffer of the Project area.

### 3.3 EIS commitments

In EIS Chapter 31 and as updated in Appendix B to the Response to Submissions, Santos has committed to implement a number of measures pending Project approval and a final investment decision. The EIS commitments relevant to the management of historic heritage associated with the development have been listed Table 3.1, in accordance with consent condition D3(c) which states that Santos must ensure that (where relevant) the management plans include any relevant commitments or recommendations identified in the EIS. Note that in some instances a commitment may no longer be relevant due to the management plan structure required by the SSD 6456 consent conditions are different to the environmental management plan structure originally proposed in the EIS (and thus reflected in the actual commitment).

**Table 3.1 - EIS commitments relevant to historic heritage**

Number	EIS commitment relevant to general environmental management
1.1	Infrastructure will be sited in accordance with the Field Development Protocol to avoid or minimise potential impacts.
1.2	<p>A Project-wide environmental management strategy, comprising a number of sub-plans to be used throughout the planning and design, construction, operation and decommissioning and rehabilitation stages of the Project are described in Chapter 30 [of the EIS]. The sub-plans are<sup>1</sup>:</p> <ul style="list-style-type: none"> <li>• .....</li> <li>• Historic Heritage Management Plan;</li> <li>• .....</li> </ul>
1.3	A complaints management procedure will be implemented. This procedure will include investigation, reporting and reducing impacts as required.
12.2	<p>To preserve the assessed heritage significance of the Pilliga East Logging Cultural Landscape the following sites are surface development exclusion areas:</p> <ul style="list-style-type: none"> <li>• Cowallah Parish Plan Sawmill;</li> <li>• Logging Camp 7;</li> <li>• Cowallah Sites Complex; and</li> <li>• Hardy's Hut.</li> </ul> <p>Due to the similarities of the timber extraction areas and logging ramps across the Project area, if impacts are unavoidable at a site listed below, another site of the same type may be substituted as a surface development exclusion area without impacting the heritage significance:</p> <ul style="list-style-type: none"> <li>• Timber extraction areas 1, 2, 3, 4, 6, 10, 12, 18, 19 and 21; and</li> <li>• Timber loading ramp 1, 5, 6, 9 and ramp associated with timber extraction area 19.</li> </ul> <p>The following sites will also be surface development exclusion areas based on their heritage significance:</p> <ul style="list-style-type: none"> <li>• Pilliga 1 Oil Well; and</li> <li>• three SUGAR<sup>2</sup> pits - two located at the Leewood site and one located on the intersection of Plumb Road and No Name Road.</li> </ul>

As described in section 7 of this Plan and section 8 of the EMS, this Plan will be subject to regular evaluation and review. This will include the EIS commitments to ensure they remain current, applicable, and generally improve the environmental performance of the Project.

<sup>1</sup> Only the plans relevant to historic heritage have been listed. The full list of sub-plans is provided in the EMS section 3.5.

<sup>2</sup> SUGAR - Sydney University Giant Air-shower Recorder. Note that the Project commitments in Chapter 31 of the EIS erroneously list only two SUGAR pits. There are three SUGAR pits in total, at the locations as specified.

## 4. Historic heritage sites and significance

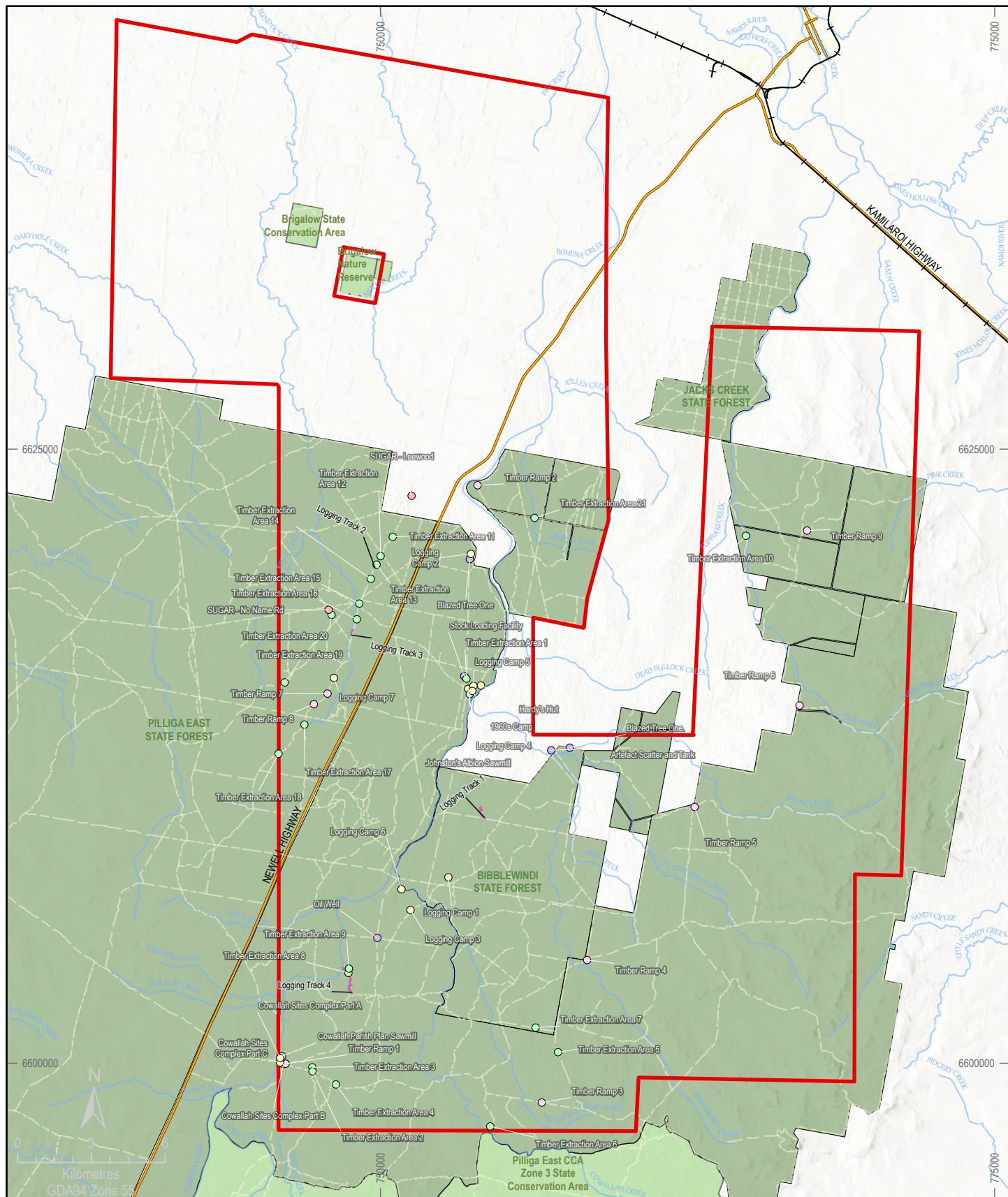
A detailed historic heritage assessment was undertaken for the EIS in accordance with the *Burra Charter* (ICOMOS, 2013), the *NSW Heritage Manual* (NSW Heritage Office and DUAP, 1996) and the *Statements of Heritage Impact* (NSW Heritage Office, 2002). During field surveys for the EIS, a total of 53 sites of heritage potential were identified in the Project area, of which 21 sites were identified as having collective heritage significance, which includes the eight sites that were identified as having heritage significance in their own right. The collection of these sites was identified as being of local heritage significance as part of a collection demonstrating the pattern and course of the development of logging in the forest area. There were six types of sites identified:

- timber extraction areas;
- sawmill sites;
- habitation and camping sites;
- timber loading ramps;
- logging tracks; and
- other sites.

The logging-related sites were identified as forming the Pilliga East Logging Cultural Landscape. A small number of sites unrelated to logging activities were also identified as holding heritage significance, including an oil well understood to have been installed in 1964 and ground pits that were used in the late 1960s to 1970s by the Sydney University physics community for recording of giant cosmic ray air showers (**SUGAR** pits). The Leewood property contains two SUGAR pits, with a third pit located at the intersection of Plumb Road and No Name Road.

The location of identified sites of heritage potential is shown in Figure 4.1 and details of these sites are provided as Appendix C. The following sections provide a statement of significance for each site with heritage potential as per the *Heritage Guidelines* (NSW Heritage Office, 2002) (**Heritage Guidelines**) in accordance with condition B61(c).





**Santos**

**ONWARD**  
CONSULTING

**LEGEND**

- NGP boundary
- Highway
- Roads and tracks
- Watercourse
- Railway
- State Forest
- Parks and reserves

**Historic heritage sites**

- Habitation Site
- Other Site
- Sawmill Site
- Sydney University Giant Air-Shower Recorder
- Timber Extraction Area
- Timber Loading Ramps
- Logging tracks

**NARRABRI GAS PROJECT**

Figure 4.1

Identified Historic Heritage Sites

## 4.1 Timber extraction areas

Table 4.1 assesses the significance of the timber extraction areas against NSW significance criteria and is followed by a statement of significance. Further information is provided in Appendix C.

**Table 4.1 - Assessment of significance - timber extraction areas**

Criteria	Collection of timber extraction areas	Timber Extraction Area 12
Historical significance State Heritage Register criteria (a)	Local historical significance	Local historical significance
Historical association significance State Heritage Register criteria (b)	No	No
Aesthetic significance State Heritage Register criteria (c)	No	No
Social significance State Heritage Register criteria (d)	No	No
Technical/research significance State Heritage Register criteria (e)	Local technical/research significance	Local technical /research significance
Rarity State Heritage Register criteria (f)	No	No
Representativeness State Heritage Register criteria (g)	No	Local representative significance

### 4.1.1 Statement of significance - timber extraction areas

As part of a collection, the timber extraction areas are of local historical and technical significance. The collection of timber extraction areas demonstrates the pattern of logging in the eastern Pilliga from the late 19<sup>th</sup> century to the present. The collection of timber extraction areas also shows the continuity of this process. The spatial mapping of these sites has the potential to provide insight into what areas were targeted during particular periods and how this varied over time with the introduction of new technology and improved transportation from the Pilliga.

### 4.1.2 Statement of significance - Timber Extraction Area 12

Timber Extraction Area 12 is of local significance as it meets the threshold for the historical, research and representative criteria. It is representative of a transient logging camp in the Pilliga forest as it demonstrates evidence of logging activities together with material culture relating to daily life. With regard to its research significance, the artefacts associated with the site have the ability to provide an insight into daily life in a logging camp and access to goods. The historical significance of Timber Extraction Area 12 is as part of a larger collection as described above. Timber Extraction Area 12 is of particular importance in this regard as the associated material culture enables a decade to be associated with the logging activities. As part of a collection of sites that spans the period of European exploitation of the region for timber, Timber Extraction Area 12 can demonstrate the course of domestic occupation of the Pilliga in association with the logging industry. Timber Extraction Area 12 is in contrast to the larger-scale operation evident at the Cowallah Habitation Complex (c. 1898) and is comparable to the Loggers Camp (c.1960s).



## 4.2 Sawmill sites

Table 4.2 provides a summary of the heritage significance of the two sawmill sites against NSW significance criteria and is followed by a statement of significance for each site. Further information is provided in Appendix C.

**Table 4.2 - Assessment of significance - sawmill sites**

Criteria	Johnston's Albion Sawmill	Cowallah parish map sawmill
Historical significance State Heritage Register criteria (a)	No	Local historical significance
Historical association significance State Heritage Register criteria (b)	No	No
Aesthetic significance State Heritage Register criteria (c)	No	No
Social significance State Heritage Register criteria (d)	No	No
Technical/research significance State Heritage Register criteria (e)	No	Local research significance
Rarity State Heritage Register criteria (f)	No	Potentially rare within the Eastern Pilliga
Representativeness State Heritage Register criteria (g)	No	No

### 4.2.1 Statement of significance - Johnston's Albion Sawmill

The Johnston's Albion Sawmill site is not of State or local significance. Disturbance of the site by other users of the area has removed its ability to contribute to an understanding of forestry activities in the Pilliga.

### 4.2.2 Statement of significance - Cowallah parish map sawmill

The Cowallah parish map sawmill site is of local historical and technical significance. Historically, it demonstrates the utilisation of the Pilliga forest for logging purposes. The site is indicative of the larger scale operators who worked in the forest, in contrast to the smaller logging teams at sites such as Timber Extraction Area 12. The site has the potential to yield significant new information not available from other sources regarding the extent of the operations at the site.

## 4.3 Habitation and camping sites

Table 4.3 provides a summary of the heritage significance of the habitation and camping sites against NSW significance criteria and is followed by a statement of significance for each site. Further information is provided in Appendix C.

**Table 4.3 - Assessment of significance - habitation and camping sites**

Criteria	Cowallah Habitation Complex	Hardy's Hut	1960s camp	Logging camps 1 to 6	Logging camp 7
Historical significance State Heritage Register criteria (a)	Local historical significance	No	No	Local historical significance	Local historical significance
Historical association significance State Heritage Register criteria (b)	No	No	No	No	No
Aesthetic significance State Heritage Register criteria (c)	No	No	No	No	No
Social significance State Heritage Register criteria (d)	No	No	No	No	No
Technical/Research significance State Heritage Register criteria (e)	Local research significance	Local research significance	No	Local research significance	Local technical significance
Rarity State Heritage Register criteria (f)	Potentially rare	No	No	No	No
Representativeness State Heritage Register criteria (g)	Local representative significance	No	No	No	No

#### 4.3.1 Statement of significance - Cowallah Habitation Complex

The Cowallah Habitation Complex is of local historical, research and representative significance. In association with the other logging camps in the Pilliga forest, the Cowallah Habitation Complex is of local historical significance. As part of a collection of sites that spans part of the period of European settlement, the Cowallah Habitation Complex can demonstrate the course of domestic occupation of the forest in association with its logging history. The logging camp contrasts with the small-scale operation evident at the c.1920s Timber Extraction Area 12 and the 1960s logging camp.

Detailed mapping and archaeological investigation of the Complex has the potential to yield significant new information that is not available from other sources regarding sawmill life in the Pilliga from the 1890s through to about the 1920s. The Part C dump in particular has the potential to yield information regarding domestic life, camp arrangements and access to goods and services. The Complex is representative of large habitation sites in the Pilliga forest occupied between the 1890s and the 1920s.

#### **4.3.2 Statement of significance - Hardy's Hut**

The site of Hardy's Hut is of research significance at a local level. Archaeological investigation of the area thought to have been the location of Hardy's Hut may provide insight into some of the earliest European occupiers of the Pilliga. Hardy's occupation was different from that of the logging camps as the Crowie parish map suggests Hardy was attempting to farm the land. Evidence of attempts to farm the Pilliga is not available from other sources and is of significance to the historical understanding of the local area.

#### **4.3.3 Statement of significance - 1960s logging camp**

The 1960s logging camp is not of State or local significance under any of the seven criteria.

#### **4.3.4 Statement of significance - logging camps one to six**

In isolation, no single logging camp is of State or local significance. However, as part of a collection of similar sites, they are of local historical and technical significance. The group of logging camps demonstrates the pattern of logging in the eastern Pilliga from the late 19<sup>th</sup> century to the present and shows the continuity of this process. The spatial mapping of these sites has the potential to provide insight into what areas were targeted during particular periods and how this varied over time with the introduction of new technology and improved transportation from the Pilliga.

#### **4.3.5 Statement of significance - logging camp seven**

Logging camp seven is of local historical, technical, and representative significance. As part of a collection of logger's habitation sites (the Cowallah Habitation Complex and Timber Extraction Area 12, for example) it is able to demonstrate the course of historical domestic occupation in the Pilliga from the 1890s through to the 1960s. The archaeological investigation of the site may contribute to an understanding of domestic life in the Pilliga during the 1960s. It is also representative of a 1960s logging camp occupied by a family unit as demonstrated by the cats-eye marble and foundation bottle.

### **4.4 Timber loading ramps**

Table 4.4 provides a summary of the heritage significance of timber loading ramps against NSW significance criteria and is followed by a statement of significance for each site. Further information is provided in Appendix C.

#### **4.4.1 Statement of significance - timber loading ramps**

The group of nine timber loading ramps is of local historical and technical significance. In association with the timber extraction areas, the timber loading ramps demonstrate the pattern of logging in the eastern Pilliga from the late 19<sup>th</sup> century to the present and the continuity of this process. The spatial mapping of these sites has the potential to provide insight into what areas were targeted during particular periods and how this varied over time with the introduction of new technology and improved transportation from the Pilliga.

Forestry Corporation of NSW has noted that the timber loading ramps may also have been built for the purpose of loading and unloading mobile plant for fire-fighting purposes.

**Table 4.4 - Assessment of significance – timber loading ramps**

Criteria	Collection of timber loading ramps
Historical significance State Heritage Register criteria (a)	Local historical significance
Historical association significance State Heritage Register criteria (b)	No
Aesthetic significance State Heritage Register criteria (c)	No
Social significance State Heritage Register criteria (d)	No
Technical/Research significance State Heritage Register criteria (e)	Local research significance
Rarity State Heritage Register criteria (f)	No
Representativeness State Heritage Register criteria (g)	Local representative significance as they demonstrate the principal characteristics of timber ramps.

## 4.5 Logging tracks

The Project area within the State forest is criss-crossed with unmapped logging tracks. Further information is provided in Appendix C.

### 4.5.1 Statement of significance - logging tracks

In association with the timber extraction areas, logging camps and timber ramps, the logging tracks have the potential to provide insight into the way in which loggers moved through the forest and are therefore of local research significance. Mapping the tracks would capture this research potential.

## 4.6 Other sites

Table 4.5 provides a summary of the heritage significance of the other identified sites against NSW significance criteria and is followed by a statement of significance for each site as required by the Heritage Guidelines. Further information is provided in Appendix C.

**Table 4.5 - Assessment of significance – other sites**

Criteria	Giant Air-shower Recorders	Artefact scatter and tank	Stock loading facility	Blazed trees	Oil well
Historical significance State Heritage Register criteria (a)	No	No	No	No	Local significance
Historical association Significance State Heritage Register criteria (b)	No	No	No	No	No
Aesthetic significance State Heritage Register criteria (c)	Local significance	No	No	No	No
Social significance State Heritage Register criteria (d)	State significance	No	No	No	No
Technical/Research Significance State Heritage Register criteria (e)	No	No	No	No	No
Rarity State Heritage Register criteria (f)	Local significance	No	No	No	No
Representativeness State Heritage Register criteria (g)	No	No	No	No	No

#### 4.6.1 Statement of significance – Sydney University Giant Air-shower Recorders

The SUGAR array is of State social significance, being held in high regard by the physics community. The research undertaken using the array provided important information regarding the size and direction of incoming giant cosmic ray air-showers. The array demonstrates a high degree of technical achievement, being both pioneering in the field of giant air- shower recording and also for the timing signal system developed to allow larger portions of the array to be interrogated at any one time.

The three liquid scintillation detectors from the SUGAR array are of State social significance, of technical significance and rare at a local level. The loss of integrity of the base station where data was recorded has degraded its technical and rarity significance to local, rather than State.

#### 4.6.2 Statement of significance - artefact scatter and tank, stock loading facility and blazed trees

The artefact scatter and tank, stock loading facility and blazed trees are not of State or local significance under any of the seven criteria.

### 4.6.3 Statement of significance - Oil well

The oil well is of local historical significance. It demonstrates the course and pattern of resource exploration in the local area.

## 4.7 Pilliga East logging cultural landscape

Table 4.6 provides a summary of the heritage significance of the Pilliga East logging cultural landscape against NSW significance criteria and is followed by a statement of significance for each site as required by the Heritage Guidelines. Further information is provided in Appendix C.

**Table 4.6- Assessment of significance – Pilliga East logging cultural landscape**

Criteria	Pilliga East logging cultural landscape
Historical significance State Heritage Register criteria (a)	Local historical significance
Historical association significance State Heritage Register criteria (b)	No
Aesthetic significance State Heritage Register criteria (c)	No
Social significance State Heritage Register criteria (d)	No
Technical/Research significance State Heritage Register criteria (e)	Local research significance
Rarity State Heritage Register criteria (f)	No
Representativeness State Heritage Register criteria (g)	Local representative significance

### 4.7.1 Statement of significance - Pilliga East logging cultural landscape

The Pilliga East cultural landscape is of historical, research and representative significance. The landscape demonstrates the patterns of logging activities in the Pilliga East forest and the different intensities and methods of logging from the 1890s to the present. The timber extraction areas, sawmill sites, logging camps, timber loading ramps, logging tracks and other sites associated with logging activities that are scattered across the landscape, can tell the story of logging in the Pilliga East. Further research may indicate the variations in methods and areas of extraction between the early operations and the later State operated activities.

The Pilliga East cultural landscape is of local research significance. The creation of a cultural landscape map of the timber extraction areas, sawmill sites, logging camps, timber loading ramps and logging tracks could provide insights into the pattern of logging in the forest.

The Pilliga East cultural landscape is of local representative significance as it contains all the sites characteristic of logging activities (timber extraction areas, sawmill sites, logging camps, timber loading ramps and logging tracks).

## 4.8 Siding Spring Observatory

The Siding Spring Observatory is one of the foremost international optical observatories in the world and is a principal location of Australian astronomical research (Christison, 2006). The observatory is located approximately 80 kilometres south-west of the southernmost point of the Project area, approximately 20 kilometres to the west of Coonabarabran. A description of the heritage values of the Siding Spring Observatory is provided in response to Commonwealth assessment requirements as the observatory is located on Commonwealth land.

The Siding Spring Observatory was established in the early 1960s and today is the largest optical observatory in Australia. The observatory is an operating research facility utilised by the local, Australian and international astronomy community. The site has more than 60 telescopes operated by local and international organisations and has been the location of important scientific research (Australian National University [ANU], 2009). The ANU controls the site and has recognised the heritage values of the observatory through its inclusion in the ANU Heritage Strategy 2010-2012 (ANU, 2009). The observatory is also a popular tourist attraction in the Warrumbungle region; having a visitor centre and a viewing gallery of the Anglo-Australian Telescope to cater for the tourists. As an operating research facility, public access to Siding Spring Observatory is restricted to daytime visits.

The Siding Spring Observatory is not subject to heritage listing. However, a heritage study prepared for the Warrumbungle Shire Council recommends the Siding Spring Observatory be nominated for inclusion on the State Heritage Register as a place of State significance (Christison, 2006). The study provides a statement of significance for the observatory based on an assessment against the NSW Heritage Council Criteria. The assessment concludes that the observatory has a high level of state historical, historical association, technical / research significance, rarity, representativeness and integrity and a moderate level of state aesthetic significance. It also has a high level of local significance (Christison, 2006).

## 5. Historic heritage management measures

Santos commits to protecting heritage items both within and outside the approved disturbance area. Potential impacts associated with the Project relevant to historical heritage are both direct disturbance due to construction and operation of project facilities and indirect impacts due to changes in the aesthetic environment of a site or impacts due to noise or vibration.

The nature of gas field planning is such that there is some flexibility available regarding the placement of gas field infrastructure including wells, gathering lines and access tracks. Based on the identification of siting constraints and subject to gas field operational requirements, it is possible to locate infrastructure to avoid or minimise impacts on sensitive receiver and areas, including items of historic heritage significance.

Sections 5.1 to 5.6 describe the proposed reasonable and feasible management measures to minimise potential impacts on historic heritage.

### 5.1 Field Development Protocol

Infrastructure for the Project will be sited in accordance with the Field Development Protocol. The Field Development Protocol applies for the life of the Project, for each stage of development throughout infrastructure planning and design, construction, operation, decommissioning and rehabilitation, and considers the following constraint features:

- sensitive receivers and amenity;
- conservation areas;
- water resources;
- biodiversity; and
- **heritage.**

Avoidance and minimisation of impacts are prioritised as part of the Field Development Protocol, in the first instance through exclusions, and then by siting of the infrastructure in accordance with the locational criteria.

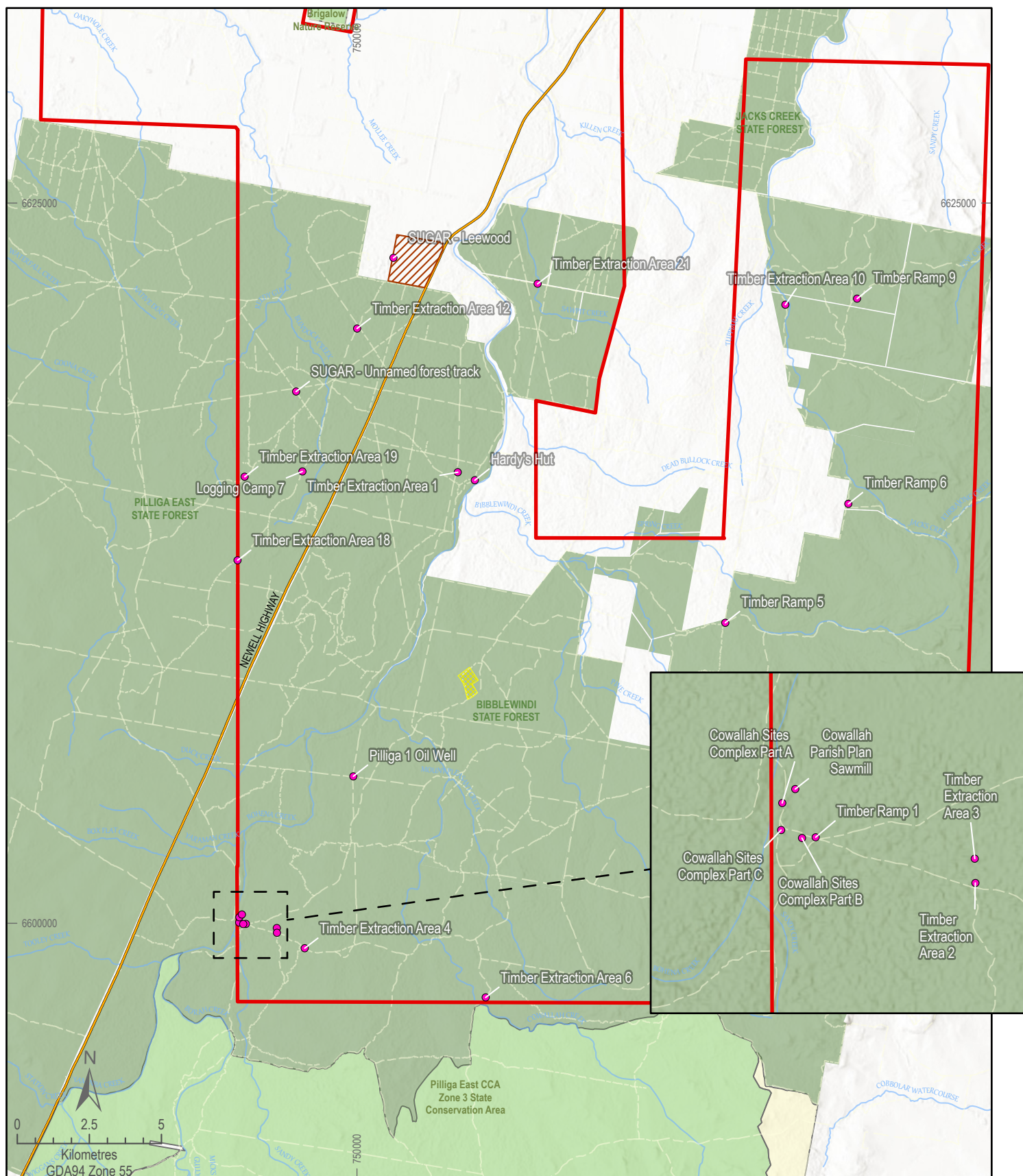
The Field Development Protocol will be implemented for all components of the Project including major infrastructure areas (i.e. Leewood, Bibblewindi, Bibblewindi to Leewood infrastructure corridor, Leewood to Wilga Park underground power) and the gas field development.

The key components of the Field Development Protocol in relation to management of historic heritage are the surface development exclusion areas (section 5.1.1) and the management of previously unidentified heritage items during micro-siting (section 5.1.2).

#### 5.1.1 Surface development exclusion areas

Impacts on all 21 sites with heritage significance that were identified during the EIS as having heritage significance will be avoided through implementation of the Field Development Protocol. The historic heritage surface exclusion areas are shown on Figure 5.1. By avoiding these sites, the heritage value of the Pilliga East Cultural Landscape would also be preserved by continuing to provide a representative collection of sites that are able to demonstrate a pattern of use within the east Pilliga for logging purposes.





**Santos**

**ONWARD**  
CONSULTING

**LEGEND**

- NGP boundary
- Leewood
- Bibblewindi
- Historic heritage sites (surface development exclusion zones)
- Highway
- Roads and tracks
- Watercourse
- State Forest
- Aboriginal areas
- Parks and reserves

**NARRABRI GAS PROJECT**

Figure 5.1

Historic Heritage Surface Exclusion Zones

As part of the Field Development Protocol, infrastructure will be sited and fenced off if within a 100 m buffer to avoid surface development at the following locations in order to preserve the assessed heritage significance of these sites (Figure 5.1):

- Cowallah Parish Plan Sawmill
- Logging camp seven
- Cowallah Sites Complex (Parts A, B and C)
- Hardys Hut
- Pilliga 1 Oil Well
- Sydney University Giant air-shower Recorder pits (two locations)

In addition, the two liquid scintillation detectors from the Sydney University Giant Air-shower Recorder at Leewood will continue to be protected by existing fencing.

Infrastructure will be sited to avoid surface development at the following locations to preserve the Pilliga East Cultural Heritage landscape:

- Timber extraction areas 1, 2, 3, 4, 6, 10, 12, 18, 19 and 21. (**Note:** these extraction areas are nominally listed as suggested sites to avoid surface disturbance. Due to the similarity of the timber extraction areas across the Project area, if impacts were unavoidable at one of the timber extraction areas listed above, an alternate timber extraction area not listed may be substituted without impacting the heritage significance of the overall collection of timber extraction areas).
- Timber loading ramps 1, 5, 6, 9 and the ramp associated with Timber Extraction Area 19. (**Note:** these timber loading ramps are nominally listed as suggested sites to avoid surface disturbance. However, as for the timber extraction areas, due to the similarity of the timber loading ramps across the Project area, if impacts were unavoidable at a timber loading ramp site listed above, another timber loading ramp not listed may be substituted without impacting the heritage significance of the collection of timber loading ramps).

### 5.1.2 Management of previously unidentified heritage items during micro-siting

Where previously unidentified items, sites or relics of potential historic significance are identified during micro-siting investigations for the Field Development Plan, the following procedure will be implemented:

- the location and a description (including photographs) of the item, site or relic will be recorded;
- where practicable, given the presence of other constraints (such as ecological or Aboriginal cultural heritage) and the locational criteria defined in CoC B1, the Project footprint will be re-designed to avoid the potential item, site or relic;
- where the footprint can be redesigned to avoid the item, site or relic, the find will be left in situ; and
- where the Project footprint is unable to be redesigned to avoid the item, site or relic, a qualified archaeologist will be engaged to investigate the heritage significance of the find in accordance with *Assessing Significance of Historical Archaeological Sites and 'Relics'* (NSW Heritage Office, 2009) and advise on appropriate measures for photographic/archival recording, salvage and/or destruction and any permits necessary under the Heritage Act.

## 5.2 Unexpected finds procedure

Where previously unidentified items, sites or relics of potential historic significance are discovered during construction activities, the following procedure will be implemented:

- work will cease in the area of discovery;
- if the area of discovery is in deposited material, then work will also cease in the area where the material originated;
- the person discovering the item or site will notify their supervisor who will confirm that work has ceased, and the area(s) is cordoned off with tape or similar;
- the supervisor will notify the Santos Team Leader Environment - Onshore or authorised delegate; and
- the Santos Team Leader Environment - Onshore, or their authorised delegate, will in turn:
  - engage a qualified archaeologist to advise on the nature, extent and heritage significance of the find;
  - notify Heritage NSW, DPE and any other relevant agency; and
  - implement management measures in consideration of recommendations from the qualified archaeologist.

## 5.3 Protection of heritage items located outside the approved disturbance area

Sites with heritage significance, within or adjoining the construction footprint will be fenced and appropriately signed prior to disturbance to prevent impacts during construction. The fencing and signage would be maintained for the life of the Project.

Signs attached to fencing may include (for example) the following words:

**ENVIRONMENTALLY SENSITIVE AREA  
NO UNAUTHORISED ENTRY / DO NOT DISTURB  
CONTACT SANTOS ENVIRONMENTAL REPRESENTATIVE**

## 5.4 Environmental inductions

All site-specific employee and contractor inductions (including those inductions for construction personnel) will include a historic heritage component. This will outline current protocols and responsibilities with respect to management of historic heritage for the Project. It will also provide an overview of the site types present, relevant legal obligations in relation to historic heritage, responsibility and duty of care of persons in relation to historic heritage, and procedures for reporting the identification of items or sites of historic heritage.

Santos will maintain an accurate record of all employee and contractor inductions in accordance with Condition B61(d)(ii) of the CoC.

## 5.5 Historic heritage database

Santos will maintain an internal Historic Heritage Sites Database for sites within the Project area, which contains the site name, GDA coordinates and whether a surface disturbance exclusion zone applies.

The information within this database will be saved as a layer in Santos' Geographic Information System (**GIS**) and made available to all relevant Santos staff and contractors. This layer will be referred to during field development planning to ensure that any disturbance works consider the location of known historic heritage sites.

The layer will be updated when new historic heritage sites are identified.

## 5.6 Strategy for care, control and storage of relics

Condition B61(e) requires a strategy to be included in this HHMP for the *care, control and storage of any relics salvaged in the Project area, both during the life of the development and in the long term.*

In accordance with NSW Heritage Office (2005 and 2009) it is preferable to maintain historic heritage sites in situ as the physical location of a heritage asset is part of its heritage significance.

As described in Section 5.1, disturbance from the Project will be avoided to all known sites with historic heritage significance. Protection of these sites will be undertaken as described in Section 5.3 (i.e. remain in situ and access restricted via fencing).

Where new items, sites or relics of historic significance are identified during the Project, they will preferentially be avoided and left in situ. Where previously unidentified items, sites or relics are unable to be avoided, a qualified archaeologist will be engaged to assess heritage significance, as described in section 5.1.2. and advise on appropriate management measures such as photographic/archival recording and/or salvage. If salvage is recommended, this would occur under the direct supervision of the qualified archaeologist.

The qualified archaeologist will also advise on the appropriate strategy for the care, control and storage of any relic salvaged in the Project area, both for the life of the Project and in the long term.

## 6. Incidents, non-compliances and complaints

### 6.1 Incidents and non-compliances

Incident reporting and non-compliance notification will be in accordance with CoC D6 and D7 respectively, as described in section 6 of the EMS. Santos will notify the DPE and any other relevant agency via the Major Projects Portal immediately after becoming aware of an incident.

Within 7 days of becoming aware of a non-compliance with the CoC, Santos will notify the Department of the non-compliance via the Major Projects Portal. This notice will set out the non-compliance, the reasons for the non-compliance (if known) and what actions have been taken, or will be taken, to address the non-compliance. A non-compliance which has been notified as an incident will not be notified as a non-compliance.

Where historical heritage-related incidents or non-compliances are identified, Santos will:

- take all reasonable and feasible steps to ensure that the incident or non-compliance ceases and does not reoccur;
- consider all reasonable and feasible options for remediation (where relevant) and submit a report to the relevant department(s) describing options and any preferred remediation measures or other courses of action; and
- implement remediation measures as directed by the relevant department(s).

### 6.2 Unpredicted impact protocol

It is considered unlikely that the Project construction and operation activities will result in any unpredicted or unforeseen impacts in relation to historical heritage management and the avoidance of historical heritage sites. However, in accordance with CoC D3(f), the following strategy outlined in Table 6.1 will be adopted in the event where there is an unpredicted impact on historical heritage items or sites.

**Table 6.1 - Unpredicted impact protocol**

Step	Strategy
1	Stop any groundwater disturbance works and implement immediate corrective actions to minimise the unpredicted impact
2	Review the unpredicted impact and consider the following: <ul style="list-style-type: none"> <li>• activities that may have triggered this event; and</li> <li>• relevant field development plan, permit to work (or similar) or monitoring data.</li> </ul>
3	Notify the relevant agencies and departments, as per section 6.1
4	If appropriate, commission an investigation by a qualified archaeologist
5	Based on the results of the investigation, develop the appropriate amendment and amelioration methods



Step	Strategy
6	<p>Implement the information from the investigation to review, and if necessary, update this Plan which will include any or all of the following:</p> <ul style="list-style-type: none"> <li>• a review the activities and actions that occurred or may have been taken prior to event;</li> <li>• a review and where required, revision and update of the historic heritage management measures and controls in section 5;</li> <li>• implement any relevant training based on the findings of the investigation and any revised management measures to avoid any recurrence of the unpredicted impact.</li> </ul>

### 6.3 Complaint management

Santos has a documented *Complaint Management Procedure* that is communicated to all relevant staff members. Complaints can be directed to Santos via phone or email 24 hours a day, 7 days a week. Contact details are publicly available on the Project website and are presented in Appendix D of the EMS.

All complaints are logged on a complaint form which includes the following details:

- date and time of the complaint;
- complainant details;
- details of the issue or complaint;
- actions taken to remediate the issue, if any;
- follow up actions required, if any;
- details of further liaison with complainant, if any; and
- closure date and time of the issue.

As per CoC D13, Santos maintains a complaints register which is updated as required and available on the Project website.

## 7. Reporting, evaluation and review

### 7.1 Annual Review

In accordance with condition D8 and as further described in section 8 of the EMS, Santos will review the performance of its historical heritage management for the previous calendar year and report the relevant results within the Annual Review, to the satisfaction of the Planning Secretary. The Annual Review will be submitted to the Department via the Major Projects Portal by the end of March each year and will at minimum provide the following information regarding:

- the effectiveness of the management measures to prevent, and if prevention is not reasonable and feasible, to minimise any impact to historical heritage items; and
- any historical heritage-related incidents or non-compliances.

Further, the annual review under consent condition D8 will review and assess a number of additional items. In summary these are:

- monitoring results and complaints;
- non-compliances and incidents;
- compliance with performance measures and indicators, including avoiding impacts on all 21 sites that were identified as having heritage significance;
- discrepancies between predicted and actual impacts; and
- measures to be implemented to improve environmental performance.

The Annual Review may also make recommendations for any additions, changes or improvements to the historical heritage management process.

### 7.2 Independent environmental audits

Within one year of commencement of Phase 1 and every three years thereafter, Santos will commission an Independent Environmental Audit (IEA) of the operation, to be conducted in accordance with CoC D9. The audit team will be led by a suitably qualified auditor and include experts in groundwater, well integrity, hazards, and any other fields specified by the Planning Secretary.

The IEA process is further described in section 8.3 of the EMS.

### 7.3 Management Plan review and evaluation

As required by CoC D4, Santos will review the suitability of existing strategies, plans and programs required under this consent, within two months of:

- (a) the submission of an incident report;
- (b) the submission of an Annual Review;
- (c) the submission of an Independent Environmental Audit;
- (d) the submission of a Field Development Plan;
- (e) the submission of a Groundwater Model Update; or
- (f) the approval of any modification of the conditions of SSD 6456.

This is to ensure the HHMP is updated on a regular basis and to incorporate any recommended measures to improve the environmental performance of the Project.

In view of the various conditions requiring annual reviews, suitability assessments and performance evaluations, this HHMP will be reviewed and, if necessary, updated in at least the following circumstances:

- in accordance with any direction from the NSW EPA or the Minister administering the PO Act;
- due to any significant change to the design or operation of the management processes as described herein. If there is ambiguity in relation to whether there is a significant change, Santos will consult with the Planning Secretary to determine whether the HHMP must be reviewed; and
- otherwise at intervals of no longer than one year.

The review history table in the front of this Plan provides the details of each review, conducted in accordance with condition D4.

As required by CoC D5, if the review under condition D4 determines that the strategies, plans and programs required under this consent require revision - to either improve the environmental performance of the development, cater for a modification or comply with a direction - then Santos will submit the revised HHMP to the Planning Secretary for approval within 6 weeks of the review.

Further details on the reporting, evaluation and review of the HHMP is provided in section 8 of the EMS.

## 7.4 Improvement measures

Consent condition D3(g) requires that this Plan includes a program to investigate and implement ways to improve the environmental performance of the Project over time; and CoC D3(i) states that the Plan is to include a protocol for the periodic review. The protocol for review is set out by consent conditions D8, D4 and D5, which have been addressed in sections 7.1 and 7.3 above.

Measures that may be implemented following review and evaluation may include the following:

- audit of historic heritage management system, reviewing historic heritage management measures;
- implementation of modifications to the historic heritage management system; and
- additional monitoring and inspections.

In accordance with CoC D13 and as described in section 6 of the EMS, all relevant monitoring data and associated reports will be made available on the Project website, for the duration of the Project. This information will be kept up to date.



## 8. References

AECOM (2016). *Historic Heritage Impact Assessment. Narrabri Gas Project Environmental Impact Statement - . Narrabri Gas Project*. Prepared for GHD on behalf of Santos Ltd.

Australian National University (2009). *Heritage Strategy 2010-2012*.

Christison, R (2006). *Report on the Community Base Heritage Study of the former Coonabarabran Shire, Warrumbungle Shire Council*.

GHD (2017). *Narrabri Gas Project Environmental Impact Statement*. Prepared for Santos Ltd.

ICOMOs (Australia) 2013. *The Burra Charter: The Australia ICOMOS Charter for Places of Cultural Significance*.

NSW Department of Environment Climate Change and Water (2010). *Cultural landscapes: A Practical Guide for Park Management*. DECCW.

NSW Heritage Branch (2009). *Assessing Significance of Historical Archaeological Sites and 'Relics'*.

NSW Heritage Office and Department of Urban Affairs and Planning (1996). *NSW Heritage Manual*.

NSW Heritage Office (2002). *Heritage Guidelines*.

NSW Heritage Office (2002). *Statements of Heritage Impact*.

## 9. Glossary

Term	Definition <sup>3</sup>
Alignment	The line or lines that describe a linear-infrastructure route; it defines how linear infrastructure (such as a road, access track or pipeline) will be located in relation to the features encountered along the route
Approved disturbance area	The disturbance areas shown in the EIS as modified by any approved Field Development Plan
Council	Narrabri Shire Council
Department	The NSW Department of Planning and Environment (DPE)
EIS	The Environmental Impact Statement titled Narrabri Gas Project Environmental Impact Statement, dated 31 January 2017, submitted with the development application, including the response to submissions and supplementary response to submissions, and the additional information provided to the Department in support of the application
Feasible	Means what is possible and practical in the circumstances
Gas compression facility	A facility that houses multiple compressor units, either nodal or hub compressors or a mixture of both used to increase the pressure of gas for the purpose of transmission; may be collocated with a gas treatment facility and/or water management facility
Gas field infrastructure	All Project-related infrastructure, excluding the Leewood facility, Bibblewindi facility and the road upgrades required under SSD 6456
Gas well	Pilot wells and production wells
Gathering lines	Pipelines used to transfer gas and produced water from wells
Incident	An occurrence or set of circumstances that causes or threatens to cause material harm and which may or may not be or cause a non-compliance
Linear infrastructure	Project related infrastructure of a linear nature including gas and water gathering lines, gas and water pipelines, access tracks, power lines, communication lines and other service lines
Major facilities	Leewood facility and Bibblewindi facility
Material harm	Material harm to the environment is defined in section 147 of the POEO Act
Minimise	Implement all reasonable and feasible mitigation measures to reduce the impacts of the Project
Mitigation	Activities associated with reducing the impacts of the development
Non-compliance	An occurrence, set of circumstances or development that is a breach of the SSD 6456 consent
Petroleum Assessment Lease 2 (PAL 2)	A PAL is required to hold the exclusive right to prospect for petroleum and to assess any petroleum deposit over a specified area of land in NSW. A lease allows the holder to maintain a title over a potential area, without having to commit to further exploration. The holder can, however, continue prospecting operations and to recover petroleum in the course of assessing the viability of commercial mining. PAL 2 is held by Santos NSW Pty Ltd.
Petroleum Exploration Licence 238 (PEL 238)	Before exploring for minerals or petroleum in NSW, an explorer must first obtain a Petroleum Exploration Licence (PEL) under the <i>Petroleum (Onshore) Act 1991</i> . An exploration licence gives the licence holder exclusive rights to explore for petroleum or specific minerals within a designated area but it does

<sup>3</sup> The majority of the definitions are as provided in the Development Consent for SSD 6456.

Term	Definition <sup>3</sup>
	not permit mining, nor does it guarantee a mining or production lease will be granted. PEL 238 is held by Santos NSW Pty Ltd.
Petroleum Production Lease 3 (PPL 3)	<p>A petroleum production lease gives the holder the exclusive right to extract petroleum within the production lease area during the term of the lease. PPL 3 is held by the following titleholders:</p> <ul style="list-style-type: none"> <li>• Santos QNT Pty Ltd;</li> <li>• Santos NSW (Hillgrove) Pty Ltd; and</li> <li>• Santos NSW (Eastern) Pty Ltd.</li> </ul>
Petroleum production lease application (PPLA)	<p>A petroleum production lease gives the holder the exclusive right to extract petroleum within the production lease area during the term of the lease. Development consent under the <i>Environmental Planning and Assessment Act 1979</i> must be in place before a petroleum production lease can be granted. Santos, on behalf of its then joint venture partner lodged four petroleum production lease applications under the PO Act in May 2014 for the Project area, being PPLAs 13, 14, 15 and 16. The ownership of the application is now held by Santos NSW Pty Ltd; and</p>
Pilot well	A well for gas and water extraction, for the purpose of exploration, appraisal and assessment of the gas field potential
Planning Secretary	Planning Secretary under the EP&A Act, or nominee
Project area	The area of approximately 95,000 hectares that encompasses the Project
Project footprint	The area of surface expression being about 1,000 hectares occupied by the infrastructure components of the Narrabri Gas Project
Project-related infrastructure	All infrastructure and other structures associated with the development. This includes linear infrastructure and non-linear infrastructure, surface infrastructure and subsurface infrastructure, major facilities, wells and well pads and other gas field infrastructure
Reasonable	Means applying judgement in arriving at a decision, considering mitigation benefits, cost of mitigation versus benefits provided, community views and the nature and extent of potential improvements
Rehabilitation	The restoration of land disturbed by the development to ensure it is safe, stable and non-polluting over the short, medium and long term
Unacceptable risk	The level of risk at which mitigation actions are deemed to be warranted.
Watercourse	A river, creek or other stream, including a stream in the form of an anabranch or tributary, in which water flows permanently or intermittently, regardless of the frequency of flow events: In a natural channel, whether artificially modified or not, or in an artificial channel that has changed the course of the stream. It also includes weirs, lakes and dams
Well	Pilot wells and production wells
Well pad	An area of up to 1 hectare in size upon which the gas wells are to be located, with the area decreasing to no more than 0.25 hectares following rehabilitation <sup>4</sup> , or other area as may be approved in the Field Development Plan

<sup>4</sup> Workover activities will be contained within the operational area of the well pad area of around 0.2 ha, with an additional laydown area that could be approximately 0.2 ha in size.

## Appendix A - Consultation records

# Santos

## Management Plan Consultation Feedback Form

**DOCUMENT TITLE:** Historic Heritage Management Plan (updated)

**STAKEHOLDER:** Heritage NSW

**CONSULTATION  
RELEASE DATE:** 16 September 2021

**COMMENTS DUE DATE:** 7 March 2022

General Feedback	
<b>Key Issues</b>	
<b>Suggestions for improvement</b>	The HHMP should be updated to include an unexpected finds protocol.

Section	Type	Specific Feedback <i>Detail specific issues with certain sections in the document</i>

# Santos

## Management Plan Consultation Feedback Form

**DOCUMENT TITLE:** Historic Heritage Management Plan

**STAKEHOLDER:** Forestry Corporation of NSW as relevant landowner

**CONSULTATION  
RELEASE DATE:** 16 September 2021

**COMMENTS DUE DATE:** 28 October 2021

General Feedback	
<b>Key Issues</b>	1. What are the co-ordinates of the blazed tree;
	2. What is the name of the State database which all of these sites are listed/have been reported to;
	3. The loading ramps your report describes are, in our local opinion, FCNSW assets built to load and unload mobile plant for fire-fighting purposes.
<b>Suggestions for improvement</b>	

Section	Type	Specific Feedback <i>Detail specific issues with certain sections in the document</i>
		<i>Re-evaluate the description that the ramps were historically used for log loading</i>

# Santos

## Management Plan Consultation Feedback Form

**DOCUMENT TITLE:** Historic Heritage Management Plan

**STAKEHOLDER:** Narrabri Shire Council

**CONSULTATION  
RELEASE DATE:** 16 September 2021

**COMMENTS DUE DATE:** 28 October 2021

General Feedback	
<b>Key Issues</b>	The scope and purpose of the study appears to have not been covered by the HHMP. I would suggest that additional historic heritage places may be in the study area. See notes below.
	From my knowledge of the area a number of key historic themes have been missed or incompletely analysed.
	There is no evidence of comparative analysis with other forestry areas.
<b>Suggestions for improvement</b>	The study would be strengthened by inclusion of some kind of analysis against Australian & NSW Historical Themes relevant to the area.
	Has any attempt been made to undertake a comparative analysis against other places recorded and assessed in the Pilliga and other Brigalow Belt State Forests?
	It would be good to see a thematic, or at least an outline history or timeline of the area, within the HHMP.
	<p>Gaps in relevant historic themes include:</p> <ul style="list-style-type: none"> <li>- Forestry. Predator-proof fences were erected along the boundaries of State Forests throughout the Pilliga. These have been studied in detail in the Pilliga East SCA and have been recorded in other areas of the Northern Plains. Has due diligence included such fences?</li> <li>- Forestry. Forestry Roads are a historically significant features of the Pilliga and other State Forests in the Brigalow Belt, defining important changes in forestry management. The significance ascribed to "logging tracks" does not consider this.</li> <li>- Forestry. Have forestry dams and tanks been considered in the study?</li> <li>- Pastoral. Evidence of the Arrarownie Pastoral Run has been identified on Yaminbah Creek, south of the study area and are likely on Borah Creek. Could not similar evidence be found elsewhere?</li> <li>- Pastoral. Is there evidence of Wangen Pastoral Run?</li> <li>- Transport. Travelling stock routes crossed the study area following Yaminbah &amp; Borah Creeks and on to Bohena Creek through the Parish of Cowallah. Watering places were important on these routes. Are such places in the study area?</li> </ul> <p>Has more detailed analysis of cultural heritage significance been undertaken? Have NSW State Heritage Inventory forms been prepared? Could these be included as appendices?</p>

# Santos

## Management Plan Consultation Feedback Form

Section	Type	Specific Feedback <i>Detail specific issues with certain sections in the document</i>
<i>eg Section 2</i>	<i>Legislative + Regulatory reqs./ Readability / Usability /</i>	<i>Further detail is required about when a report is required and how the report is to be submitted.</i>
1.2	Scope and purpose	Identification of the parishes included in the study would be useful and provide some clarity.
1.3	Consultation	Consultation with NPWS Narrabri and Baradine offices would have provided immense contextual information.
4.	Historic heritage sites and significance	This could include at least a timeline to provide context. Also inclusion of some kind of analysis against recognised historic themes would provide clarity around how the study achieved its scope and purpose.
4.	Figures 4.1, 4.2 & 4.3	These are unclear and difficult to read.



Table A1 - Summary of issues raised during consultation and how addressed

Stakeholder	Section #	Section heading	Comment	How addressed
Narrabri Shire Council	General	N/A	The scope and purpose of the study appears to have not been covered by the HHMP. I would suggest that additional historic heritage places may be in the study area. From my knowledge of the area a number of key historic themes have been missed or incompletely analysed. There is no evidence of comparative analysis with other forestry areas.	The Historic Heritage Management Plan was informed by a detailed Heritage Impact Assessment prepared as part of the EIS. The relevant historic themes and items within the project area were determined as part of that assessment. This was discussed with the council at a meeting on 3 November 2021 and the Historic Heritage Management Plan has been updated to provide contextual information on the assessment.
Narrabri Shire Council	General	N/A	The study would be strengthened by inclusion of some kind of analysis against Australian & NSW Historical Themes relevant to the area.	
Narrabri Shire Council	General	N/A	Has any attempt been made to undertake a comparative analysis against other places recorded and assessed in the Pilliga and other Brigalow Belt State Forests?	
Narrabri Shire Council	General	N/A	It would be good to see a thematic, or at least an outline history or timeline of the area, within the HHMP.	
Narrabri Shire Council	General	N/A	Gaps in relevant historic themes include: <ul style="list-style-type: none"> <li>Forestry. Predator-proof fences were erected along the boundaries of State Forests throughout the Pilliga. These have been studied in detail in the Pilliga East SCA and have been recorded in other areas of the Northern Plains. Has due diligence included such fences?</li> <li>Forestry. Forestry Roads are a historically significant features of the Pilliga and other State Forests in the Brigalow Belt, defining important changes in forestry management.</li> <li>The significance ascribed to "logging tracks" does not consider this.</li> <li>Forestry. Have forestry dams and tanks been considered in the study?</li> <li>Pastoral. Evidence of the Arrarownie Pastoral Run has been identified on Yaminbah Creek, south of the study area and are likely on Borah Creek. Could not similar evidence be found elsewhere?</li> <li>Pastoral. Is there evidence of Wangen Pastoral Run?</li> <li>Transport. Travelling stock routes crossed the study area following Yaminbah &amp; Borah Creeks and on to Bohena Creek through the Parish of Cowallah. Watering places were important on these routes. Are such places in the study area?</li> </ul>	
Narrabri Shire Council	General	N/A	Has more detailed analysis of cultural heritage significance been undertaken? Have NSW State Heritage Inventory forms been prepared? Could these be included as appendices?	
Narrabri Shire Council	1.2	Scope and purpose	Identification of the parishes included in the study would be useful and provide some clarity	
Narrabri Shire Council	1.3	Consultation	Consultation with NPWS Narrabri and Baradine offices would have provided immense contextual information.	
Narrabri Shire Council	4	Historic heritage sites and significance	This could include at least a timeline to provide context. Also inclusion of some kind of analysis against recognised historic themes would provide clarity around how the study achieved its scope and purpose.	
Narrabri Shire Council	4	Figures 4.1, 4.2 & 4.3	These are unclear and difficult to read.	
Forestry Corporation of NSW (as relevant landowner)	General	N/A	What are the coordinates of the blazed tree?	The blazed trees are not of State or local significance under any of the seven heritage significance criteria (refer to Table 24 of EIS Appendix O). No proposed mitigation measures are warranted. No coordinates are provided in the EIS Appendix O, Appendix A, which provides the coordinates of identified heritage sites recommended as 'surface development exclusion areas'

Stakeholder	Section #	Section heading	Comment	How addressed
Forestry Corporation of NSW (as relevant landowner)	General	N/A	What is the name of the State database which all of these sites are listed/have been reported to?	As stated in the DPIE Assessment Report, the heritage assessment for the Project identified a total of 53 sites of some heritage potential. Of these sites, 21 sites were assessed as having local heritage significance in their own right.  Since these sites have local significance only, they have not been reported to the NSW State Heritage Inventory.
Forestry Corporation of NSW (as relevant landowner)	General	N/A	The loading ramps your report describes are, in our local opinion, FCNSW assets built to load and unload mobile plant for fire-fighting purposes	The following text has been added to section 4.4.1 and Appendix B section 5: <i>It is possible that one or more of the loading ramps may have been built to load and unload mobile plant for fire-fighting purposes.</i>
Heritage NSW	General	N/A	The HHMP should be updated to include an unexpected finds protocol	The unexpected finds procedure is included in section 5.2 of the HHMP.

## Appendix B - Compliance conditions relevant to this Plan

**Table B1 - SSD 6456 consent conditions directly relevant to this Plan**

SSD 6456 consent conditions directly relevant to this Plan	Section reference
<b>Consent condition A1</b> In meeting the conditions of this consent, the Applicant must implement all reasonable and feasible measures to prevent and, if prevention is not reasonable and feasible, minimise any material harm to the environment that may result from the construction, operation or rehabilitation of the development.	Section 1.2
<b>Consent condition A5</b> The Applicant may only undertake the development in the following stages:	Section 1.1.2 Section 1.2
a) Phase 1, comprising ongoing exploration and appraisal activities;	
b) Phase 2, comprising construction activities for production wells and related infrastructure;	
c) Phase 3, comprising gas production operations; and	
d) Phase 4, comprising gas well and infrastructure decommissioning, rehabilitation and mine closure.	
<b>Consent condition A23</b> With the approval of the Planning Secretary, the Applicant may:	No staging or combining of HHMP proposed
a) prepare and submit any strategy, plan or program required by this consent on a staged basis (if a clear description is provided as to the specific stage and scope of the development to which the strategy, plan or program applies, the relationship of the stage to any future stages and the trigger for updating the strategy, plan or program	
b) combine any strategy, plan or program required by this consent (if a clear relationship is demonstrated between the strategies, plans or programs that are proposed to be combined);	
c) update any strategy, plan or program required by this consent (to ensure the strategies, plans and programs required under this consent are updated on a regular basis and incorporate additional measures or amendments to improve the environmental performance of the development); and	
d) combine any strategy, plan or program required by this consent with any similar strategy, plan or program required by a consent	
<b>Consent condition B1</b> The Applicant must ensure that petroleum mining operations in the Project area comply with the locational criteria in Table 1.	
<ul style="list-style-type: none"> <li>No disturbance of identified historic heritage items, as identified in Appendix 7 [of the CoC]</li> </ul>	Section 5.1.1 Appendix C
<ul style="list-style-type: none"> <li>No disturbance of other Aboriginal cultural heritage items and historic heritage items identified during the development, unless otherwise approved in a Field Development Plan</li> </ul>	Sections 5.1.1
<b>Consent condition B53</b> The Applicant must ensure that the development does not cause direct or indirect impact on the heritage items identified in Appendix 7 [of the CoC].	Section 5.1.1 Appendix C

SSD 6456 consent conditions directly relevant to this Plan	Section reference
<b>Consent condition B61</b> Prior to the commencement of Phase 1, the Applicant must prepare a Historic Heritage Management Plan for the development to the satisfaction of the Planning Secretary. This plan must:	This Plan
a) be prepared by a suitably qualified and experienced person/s;	Section 1.3
b) be prepared in consultation with the Heritage NSW, Council and relevant landowners and in accordance with the relevant Heritage NSW guidelines;	Section 1.4
c) identify all heritage items in the Project area and include a statement of significance for each item;	Section 4 and subsections Appendix C
d) describe the measures to be implemented for:	
(i) managing any heritage items identified or suspected during micro-siting investigations for the Field Development Plan;	Section 5.1.2
(ii) ensuring all workers receive suitable heritage inductions prior to carrying out any activities which may cause impacts to historic heritage, and that suitable records are kept of these inductions;	Section 5.4
(iii) undertaking photographic/archival recording of any items of heritage significance potentially impacted by the development, prior to disturbance;	Sections 5.1.2, 5.5 and 5.6
(iv) protecting heritage items located outside the approved disturbance area; and	Section 5
e) include a strategy for the care, control and storage of any relics salvaged in the Project area, both during the life of the development and in the long term.	Section 5.6
<b>Consent condition B62</b> The Applicant must implement the Historic Heritage Management Plan once approved by the Planning Secretary.	Section 1.2
<b>Consent condition D3</b> The Applicant must ensure that (where relevant) the management plans required under this consent include:	
a) summary of relevant background or baseline data;	Section 4
b) details of:	
(i) the relevant statutory requirements (including any relevant approval, licence or lease conditions);	Section 3
(i) any relevant limits or performance measures and criteria; and	Section 1.2
(ii) the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the development or any management measures;	Section 1.2
c) any relevant commitments or recommendations identified in the documents that together comprise the NGP EIS;	Section 3.3
d) a description of the measures to be implemented to comply with the relevant statutory requirements, limits, or performance measures and criteria;	Section 5
e) a program to monitor and report on the:	
(i) impacts and environmental performance of the Project; and	Section 5.1 Section 5.1.2

SSD 6456 consent conditions directly relevant to this Plan	Section reference
(ii) effectiveness of the management measures set out pursuant to paragraph (d);	Section 7.1
f) a contingency plan to manage any unpredicted impacts and their consequences and to ensure that ongoing impacts reduce to levels below relevant impact assessment criteria as quickly as possible;	Section 6.2
g) a program to investigate and implement ways to improve the environmental performance of the development over time;	Section 7.4
h) a protocol for managing and reporting any:	
(i) incident, non-compliance or exceedance of any impact assessment criterion and performance criterion	Section 6.1
(ii) complaint; or	Section 6.3
(iii) failure to comply with other statutory requirements; and	Section 6.1
i) a protocol for periodic review of the plan.	Section 7.3
<b>Consent condition D4</b> Within 2 months of: (a) the submission of an incident report; (b) the submission of an Annual Review; (c) the submission of an Independent Environmental Audit; (d) the submission of a Field Development Plan; (e) the submission of a Groundwater Model Update; or (f) the approval of any modification of the conditions of this consent, the Applicant must review the suitability of existing strategies, plans and programs required under this consent.:	Section 7.3
<b>Consent condition D5</b> If the review determines that the strategies, plans and programs required under this consent require revision – to either improve the environmental performance of the development, cater for a modification or comply with a direction - then the Applicant must submit the revised document to the Secretary for approval within 6 weeks of the review.  <b>Note:</b> <i>This is to ensure strategies, plans and programs are updated on a regular basis and to incorporate any recommended measures to improve the environmental performance of the development.</i>	Section 7.3
<b>Consent condition D6</b> The Applicant must notify the Department and any other relevant agencies via the Major Projects Portal immediately after it becomes aware of the incident. This notice must describe the location and nature of the incident.	Section 6.1
<b>Consent condition D7</b> Within 7 days of becoming aware of a non-compliance with the conditions of this consent, the Applicant must notify the Department of the non-compliance via the Major Projects Portal. This notice must set out the non-compliance, the reasons for the non-compliance (if known) and what actions have been taken, or will be taken, to address the non-compliance.  <b>Note:</b> <i>A non-compliance which has been notified as an incident does not need to also be notified as a non-compliance</i>	Section 6.1

SSD 6456 consent conditions directly relevant to this Plan	Section reference
<b>Consent condition D8</b> By the end of March each year, unless the Planning Secretary agrees otherwise, the Applicant must submit an Annual Review of the environmental performance of the development to the Department via the Major Projects Portal.	Section 7.1
<b>Consent condition D9</b> Within one year of commencement of Phase 1 and every 3 years thereafter, unless the Planning Secretary directs otherwise, the Applicant must commission and pay the full cost of an Independent Environmental Audit of the development.	Section 7.2
<b>Consent condition D13</b> From the commencement of Phase 1, until the completion of all rehabilitation required under this consent, the Applicant must:	
a) make copies of the following information publicly available on its website: <ul style="list-style-type: none"> <li>▪ the document/s listed in condition A2(c);</li> <li>▪ current statutory approvals for the development;</li> <li>▪ approved strategies, plans and programs;</li> <li>▪ detailed plans for the Phases of the development;</li> <li>▪ minutes of CCC and Advisory Group meetings;</li> <li>▪ regular reporting on the environmental performance of the development in accordance with the reporting requirements in any plans or programs approved under the conditions of this consent;</li> <li>▪ a comprehensive summary of the monitoring results of the development, reported in accordance with the specifications in any conditions of this consent, or any approved plans and programs;</li> <li>▪ a summary of the current phase/s and progress of the development;</li> <li>▪ contact details to enquire about the development or to make a complaint;</li> <li>▪ a complaint register, updated monthly;</li> <li>▪ a record of all incidents and non-compliances;</li> <li>▪ the Annual Reviews of the development;</li> <li>▪ audit reports prepared as part of any Independent Environmental Audit of the development and the Applicant's response to the recommendations in any audit report; and</li> <li>▪ any other matter required by the Planning Secretary; and</li> </ul>	Section 1.4 Section 6.2 Section 7.4
b) keep such information up to date.	Section 1.6 Section 7.4

## Appendix C - Historic heritage assessment



## 1. Historic heritage sites and significance

A detailed historic heritage assessment was undertaken for the EIS in accordance with the *Burra Charter* (ICOMOS, 2013), the *NSW Heritage Manual* (NSW Heritage Office and DUAP, 1996) and the *Statements of Heritage Impact* (NSW Heritage Office, 2002).

The historic heritage assessment firstly reviewed heritage registers for items within the Project area with heritage significance, the results of which are provided in Table C1.1.

**Table C1.1 - Heritage register search results**

Heritage Register Search	Result
World Heritage List	The heritage registers mandated by the <i>Environment Protection and Biodiversity Conservation Act 1999</i> (EPBC Act) were consulted and there are no sites within or adjacent to the Project area on those registers.
National Heritage List	The heritage registers mandated by the EPBC Act were consulted and there are no sites within or adjacent to the Project area on those registers.
Commonwealth Heritage List	The heritage registers mandated by the EPBC Act were consulted and there are no sites within or adjacent to the Project area on those registers.
Register of the National Estate (non-statutory though retained as a reference archive)	No items listed on the Register of the National Estate were identified within or adjacent to the Project area.
State Heritage Register	No items listed on the State Heritage Register were identified within or adjacent to the Project area.
Section 170 Registers of relevant Government Agencies, particularly the Forestry Corporation of NSW	No items listed on an agency Section 170 Register were identified within or adjacent to the Project area.
<i>Narrabri Local Environment Plan 2012</i>	Schedule 5 of the Narrabri Local Environment Plan 2012 contains a list of identified heritage items within the LGA. An examination of Schedule 5 indicated that no listed items are located in or within a two-kilometre buffer of the Project area.

During field surveys for the EIS, a total of 53 sites of heritage potential were identified in the Project area, of which 21 sites were identified as having collective heritage significance, which includes the eight sites that were identified as having heritage significance in their own right. The collection of these sites was identified as being of local heritage significance as part of a collection demonstrating the pattern and course of the development of logging in the forest area. There were six types of sites identified: timber extraction areas, sawmill sites, habitation and camping sites, timber loading ramps, logging tracks and other sites. These logging related sites were identified as forming the Pilliga East Logging Cultural Landscape. A small number of sites unrelated to logging activities were also identified as holding heritage significance including an oil well understood to have been installed in 1964 and ground pits that were used in the late 1960s to 1970s by the Sydney University physics community for the recording of giant cosmic ray air showers.

## 2. Timber extraction areas

### Description







#### Timber Extraction Areas

Surveys for the EIS identified 21 timber extraction areas. These are cleared areas next to a road or track that contain timber off-cuts and possibly other artefacts. Typically, the other artefacts were predominately kerosene or petrol tins or food tins but also included glass and ceramic.

#### Timber Extraction Area 12

Of all the timber extraction areas, only Timber Extraction Area 12 was assessed as being of local heritage significance in its own right. The concentration of activity at Timber Extraction Area 12 was on the western side of the road. However, there is also a small crescent shaped clearing on the eastern side of the road. On the western side is a larger, rectangular clearing, although some re-growth is evident. Various items were found scattered across the clearing, with a concentration in the north-eastern corner adjacent to the road. An analysis of the artefacts indicates the site dates to the late 1910s or early 1920s. Table C2.1 provides some details and images of items found at the site.

**Table C2.1 - Artefacts identified at Timber Extraction Area 12**

Item		Description	Item		Description
Bottle		Post 1916 green wine-style bottle with words embossed in an oval shield	Aerated water bottle		Codd-neck aerated drink bottle with four dimples. Body has vertical embossed lettering.
Lamp glass		Scalloped rim fragment from a liquid fuel lamp glass	Ceramic		Green under-glaze transfer printed foliage design on an earthenware plate fragment.
Solarised amethyst glass bottle		Embossed cylindrical flat-bottomed bottle of about 50 millimetres in diameter (c.1880 - c.1920).	Kerosene tins		At least two rectangular kerosene tins (post 1865). One was cut in half horizontally.

### Significance assessment

With the exception of Timber Extraction Area 12, none of the timber extraction areas were assessed as being of State or local heritage significance. However, as a group of similar sites, they meet the criteria for local historical and research significance (Table C2.2). Timber Extraction Area 12 is of heritage significance in its own right, although it also contributes to the group of timber extraction areas. Table C2.2 assesses the significance of the timber extraction areas against NSW significance criteria and is followed by a statement of significance as required by the *Heritage Guidelines* (NSW Heritage Office, 2001) (**Heritage Guidelines**).

**Table C2.2 - Assessment of significance - timber extraction areas**

Criteria	Collection of timber extraction areas	Timber Extraction Area 12
Historical significance State Heritage Register criteria (a)	Local historical significance	Local historical significance
Historical association significance State Heritage Register criteria (b)	No	No
Aesthetic significance State Heritage Register criteria (c)	No	No
Social significance State Heritage Register criteria (d)	No	No
Technical/Research significance State Heritage Register criteria (e)	Local technical / research significance	Local technical / research significance
Rarity State Heritage Register criteria (f)	No	No
Representativeness State Heritage Register criteria (g)	No	Local representative significance

#### **Statement of significance – Timber Extraction Areas**

As part of a collection, the timber extraction areas are of local historical and technical significance. The collection of timber extraction areas demonstrates the pattern of logging in the eastern Pilliga from the late 19<sup>th</sup> century to the present. The collection of timber extraction areas also shows the continuity of this process. The spatial mapping of these sites has the potential to provide insight into what areas were targeted during particular periods and how this varied over time with the introduction of new technology and improved transportation from the Pilliga.

#### **Statement of significance – Timber Extraction Area 12**

Timber Extraction Area 12 is of local significance as it meets the threshold for the historical, research and representative criteria. It is representative of a transient logging camp in the Pilliga forest as it demonstrates the principal characteristics. That is, it provides evidence of logging activities together with material culture relating to daily life. With regard to its research significance, the artefacts associated with the site have the ability to provide an insight into daily life in a logging camp and access to goods. The historical significance of Timber Extraction Area 12 is as part of a larger collection as described above. Timber Extraction Area 12 is of particular importance in this regard as the associated material culture enables a decade to be associated with the logging activities.

As part of a collection of sites that spans the period of European exploitation of the region for timber, Timber Extraction Area 12 can demonstrate the course of domestic occupation of the Pilliga in association with the logging industry. Timber Extraction Area 12 is in contrast to the larger-scale operation evident at the Cowallah Habitation Complex (c. 1898) and is comparable to the Loggers Camp (c.1960s).

## 3. Sawmill sites

### Description

#### Johnston's Albion Sawmill

Johnston's Albion Sawmill, used during the 1890s, is depicted on the Brigalow parish map as being located on the western side of Bohena Creek, just to the north of its intersection with Bibblewindi Creek. The sawmill has been heavily impacted by later use and modification. A substantial amount of material has been removed from the area, possibly for use in road building activities. The resultant embankments were used by trail bike riders and as protection by campers. These activities have severely impacted the visibility and preservation of the Johnston's Albion Sawmill site.

An intensive survey of the area identified a partial concrete foundation (Figure B3.1). The remains were out of context, appearing to have been moved by a grader or bulldozer and are currently located within a depression. The concrete foundation has been damaged, making its original size and shape difficult to determine. The surrounding area is scattered with material from the 1960s to the present, but no material culture of the Johnston's Albion Sawmill period was found.



**Figure C3.1 - Johnston's Albion Sawmill – partial concrete foundation**

#### Cowallah parish map sawmill

The Cowallah parish map sawmilling area is located to the east of Bohena Creek and to the north of Garlands Road. It presents as a rectangular cleared area, about 20 metres wide and about 140 metres long. The cleared area is oriented roughly north–south along Garlands Road. Surveys undertaken for the EIS discovered a scattering of material culture throughout the clearing, which is more concentrated in the south and becomes less so towards the northern portion. The northern extent of the site is devoid of material. This, together with the compacted nature of the ground, suggests the area was used either as a yard for livestock or as a storage area for processed timber.








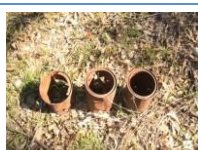




A stone foundation was located in an approximately central alignment along the length of the site. The foundation was similar to that identified at Johnston's Albion Sawmill. Unlike the latter example, the stone foundation was subject to fewer disturbances, although there was some degradation along the western edge. Dressed local stone was arranged in an 'L-shape', the void was filled with smaller, undressed stones and compacted earth. The entire foundation is about 1.2 metres square. Associated with the foundation are a metal box and a broken concrete object that looks like a drain. A second similar object was located to the east, in association with a depression.

A scatter of concrete fragments occurs along a 15-metre section of Garlands Road, between the sawmill and the Cowallah Habitation Complex site. The concrete appears to have been poured into an in situ mould. It was made with coarse-grained sand with a high quartz component, which has similar characteristics to the sands of Bohena Creek. The location of the concrete within the road and associated grader mounds suggests part of the site may have been damaged by the construction of Garlands Road. As well as the concrete, there is a scatter of artefacts along Garlands Road between Part A and a point opposite the sandstone foundation.

Some of the artefacts associated with the site are shown in Table C3.1. None of the items provides a specific date for the occupation of the Sawmill site. However, the material culture indicates the site may still have been in use during the 1920s.

**Table C3.1 - Artefacts identified at Cowallah parish map sawmill artefacts**

Item		Description	Item		Description
Vehicle part		Part of a vehicle	Enamel cup		An enamel cup with wire around the rim to create a handle.
Fry pan		Corroded fry pan.	Concrete drain		Concrete formed item possibly used for water management.
Billy can		Corroded billy can.	Bottle		Brown glass bottle with applied finish with blown off top
Earthenware fragments		Fragments. No decorative elements evident.	Tins		Three metal tins with pug top lids.
Kerosene tin		Kerosene tin with an embossed 'spider web' design on base.	Kerosene can		Kerosene tin with embossed lettering 'UNION/OIL/CO. LTD.' The can was cut in half.

## Significance assessment

Table C3.2 provides a summary of the heritage significance of the two sawmill sites against NSW significance criteria and is followed by a statement of significance for each site as required by the Heritage Guidelines.

**Table C3.2 - Assessment of significance – sawmill sites**

Criteria	Johnston's Albion Sawmill	Cowallah parish map sawmill
Historical significance State Heritage Register criteria (a)	No	Local historical significance
Historical association significance State Heritage Register criteria (b)	No	No
Aesthetic significance State Heritage Register criteria (c)	No	No
Social significance State Heritage Register criteria (d)	No	No
Technical/Research significance State Heritage Register criteria (e)	No	Local research significance
Rarity State Heritage Register criteria (f)	No	Potentially rare within the Eastern Pilliga
Representativeness State Heritage Register criteria (g)	No	No

### Statement of significance – Johnston's Albion Sawmill

The Johnston's Albion Sawmill site is not of State or local significance. Disturbance of the site by other users of the area has removed its ability to contribute to an understanding of forestry activities in the Pilliga.

### Statement of significance – Cowallah parish map sawmill

The Cowallah parish map sawmill site is of local historical and technical significance. Historically, it demonstrates the utilisation of the Pilliga forest for logging purposes. The site is indicative of the larger scale operators who worked in the forest, in contrast to the smaller logging teams at sites such as Timber Extraction Area 12. The site has the potential to yield significant new information not available from other sources regarding the extent of the operations at the site.

## 4. Habitation and camping sites

### Description

#### Cowallah Habitation Complex

Three distinct areas that are indicative of European habitation are associated with the Cowallah parish map sawmill are. However, these sites could not be directly correlated with the items marked on the 1883 Cowallah parish map ('hut and garden', 'hut' and 'house and yard') with any level of confidence. The areas are discussed below as Part A (hut and garden), Part B (hut) and Part C (house and yard). No archaeological evidence was found in the area marked as 'hut'. Part C contains two rubbish pits with no evidence of an associated structure. The parish map does not indicate a feature in the vicinity of Part C.

Part A is a cleared area on the bank of Bohena Creek, being located to the north of Garlands Road (Figure B4.1). The site has been used in more recent years by campers as evidenced by campfire sites, modern bottles and cans at the site. The historic elements of the site are a depression of about three by two metres, with a mound of sandstone stones. There is sufficient material to have formed a small fireplace. Associated with the depression and sandstone mound are some flat metal panels with attached flanges. The panels may have been from an oven similar to that found at Timber Extraction Area 17. Fragments of heat-affected blue and clear glass were also identified adjacent to the mound. There are a limited number of artefacts visible on the surface about 10 metres north of the mound. Artefacts included a small fragment of fine-grained refined earthenware from a teacup or saucer, an unrefined earthenware fragment with two underglazed blue rim bands, a teacup fragment of unrefined earthenware with no decoration and fragments of amethyst glass.

Part B of the site has a number of components, being two stone mounds with associated artefact scatter, non-indigenous plantings, and a depression that was interpreted as a well. There is no apparent order to the first stone mound but it may have once formed a fireplace. The second mound is a smaller scatter located about 10 metres north of the first mound. It is considered insufficient to have been a fireplace. The purpose of the stones is unclear. The artefacts associated with this area indicate it may have been a workshop, as the items are mechanical and industrial in nature. Scattered between the two areas are numerous glass, ceramic and metal artefacts. The glass fragments contain a range of colours and shapes; indicative of the period prior to the 1930s (Figure B4.2). The ceramic is largely unrefined earthenware with no decoration.



Figure C4.1 - Cowallah Habitation Complex (Part A)



Figure C4.2 Cowallah Habitation Complex -Part B (glass fragments)



Part C sits within the triangle of roads formed by Garlands, Beehive and Creighs roads. It presents as two depressions with a dense artefact scatter in and between the depressions. The depressions were interpreted as the rubbish dump for the Cowallah Habitation Complex. The range and extent of the artefacts visible on the surface are indicative of a well-preserved and extensive archaeological rubbish dump. The volume of material indicates the complex and sawmill may have been occupied by a large number of people or over an extended period of time.

## Hardy's Hut

A large stand of Aloe sp. plants was identified in the area between Bohena Creek Road and Bohena Creek. A large permanent billabong is present immediately to the west of this stand of Aloe sp. plants. The plants are located in the vicinity of where the Crowie parish map of 1883 places Hardy's Hut. A number of glass and metal artefacts were identified near the vicinity of this stand of plants during surveys in 2011. However, the previously identified artefacts could not be located during surveys in 2014. No evidence of the fences indicated on the Crowie parish map could be located.

## 1960s camp

This 1960s camp is located in the embankment adjacent to Johnston's Albion Sawmill. Based on the stratigraphic evidence visible during the site inspection, it appears as though a car was dumped during the use of the camp and this has later been impacted by the removal of earth from the area. Evidence of a small campfire was located beside the remains of the car, together with a ladies' vinyl purse, brown glass beer bottles, metal cans and tins, and glass soft-drink bottles (Figure B4.3).



**Figure C4.3 - 1960s camp site**

## Logging camps one to six

Logging camps one to six are described as follows:

- **Logging camp one** – a semi-cleared area scattered with worked timber and some tins.
- **Logging camp two** – a small scatter of kerosene tins was located during the survey. No other evidence of activity was noted.





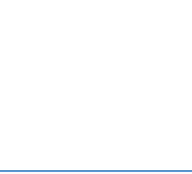



- **Logging camp three** – a small collection of artefacts was located during the survey, potentially related to logging activities.
- **Logging camp four** – a formed wooden sleeper with two more wooden sleepers scattered across the site were located during the survey. Artefacts included a fragment of undecorated plate / refined earthenware, a fragment of clear glass, a handle fragment and tin.
- **Logging camp five** – material located during the survey was more recent than the other camps, as evidenced by brown beer bottles and an Ovaltine tin. Other artefacts included a metal bucket, metal food-style tins, kerosene tins, soft-drink bottle and wine-style bottle.
- **Logging camp six** – material located during the survey included two kerosene tins. No cut timbers were found.

## Logging camp seven

Logging camp seven is located on the eastern side of Staffords Well Road, presenting as an irregularly shaped cleared area of about 15 by 20 metres. A feature associated with the camp is a rectangle of boards that have been laid on the ground. The rectangle covers an area of about three by 1.5 metres. Both ends of the boards are held in place with a metal bracket, which was nailed to the ground. This was interpreted as a type of outdoor patio area.

Table C4.1 contains images and information regarding a selection of the artefacts located at the site. Other material culture included the springs from a sofa, the metal mesh base of a bed, a metal laundry tub, food tins and cylindrical petrol / kerosene tins. There was a scatter of unrefined and refined earthenware, some of which had a yellow or green body. There was also some gilt-edge banded ware and plate marleys with moulded designs and scalloped rims. There were very few transfer-printed pieces which are indicative of the period after the 1910s. The forms covered the range of domestic necessities - plates, bowls, cups and saucers. However, the largest proportion of fragments appeared to come from teacups. The artefacts at the site indicate this was a family group - the presence of a pram frame and a cats-eye marble are indicative of children, while the make-up bottle suggests a woman also lived there. The diagnostic artefacts seem to indicate the site was occupied during the 1960s.

**Table C4.1 - Artefacts identified at Logging Camp Seven**

Item	Description	Item	Description
Pram	 Metal frame of a pram leaning against a tree.	Glass bottle	 Fragments of a glass bottle with an embossed sunburst pattern.
Bottle	 Clear glass, oval bottle with swirl pattern on neck. Embossed printing around heel	Ceramic	 Earthenware base of dinner plate with a green transfer maker's mark.
Tea pot	 Brown-bodied earthenware tea pot with a blue and cream wash around rim	Glass make up bottle	 Glass foundation make-up bottle with text.

## Significance assessment

Table C4.2 provides a summary of the heritage significance of the habitation and camping sites against NSW significance criteria and is followed by a statement of significance for each site as required by the Heritage Guidelines.

**Table C4.1 - Assessment of significance – habitation and camping sites**

Criteria	Cowallah Habitation Complex	Hardy's Hut	1960s camp	Logging camps 1 to 6	Logging camp 7
Historical significance State Heritage Register criteria (a)	Local historical significance	No	No	Local historical significance	Local historical significance
Historical association significance State Heritage Register criteria (b)	No	No	No	No	No
Aesthetic significance State Heritage Register criteria (c)	No	No	No	No	No
Social significance State Heritage Register criteria (d)	No	No	No	No	No
Technical/Research significance State Heritage Register criteria (e)	Local research significance	Local research significance	No	Local research significance	Local research significance
Rarity State Heritage Register criteria (f)	Potentially rare	No	No	No	No
Representativeness State Heritage Register criteria (g)	Local representative significance	No	No	No	No

### Statement of significance – Cowallah Habitation Complex

The Cowallah Habitation Complex is of local historical, research and representative significance. In association with the other logging camps in the Pilliga forest, the Cowallah Habitation Complex is of local historical significance. As part of a collection of sites that spans part of the period of European settlement, the Cowallah Habitation Complex can demonstrate the course of domestic occupation of the forest in association with its logging history. The logging camp is in contrast to the small-scale operation evident at the c.1920s Timber Extraction Area 12 and the 1960s logging camp.

Detailed mapping and archaeological investigation of the complex has the potential to yield significant new information that is not available from other sources regarding sawmill life in the Pilliga from the 1890s through to about the 1920s. The Part C dump in particular has the potential to yield information regarding domestic life, camp arrangements and access to goods and services. The Complex is representative of large habitation sites in the Pilliga forest occupied between the 1890s and the 1920s.

## Statement of significance – Hardy's Hut

The site of Hardy's Hut is of research significance at a local level. Archaeological investigation of the area thought to have been the location of Hardy's Hut may provide insight into some of the earliest European occupiers of the Pilliga. Hardy's occupation was different from that of the logging camps as the Crowie parish map suggests Hardy was attempting to farm the land. Evidence of attempts to farm the Pilliga is not available from other sources and is of significance to the historical understanding of the local area.

## Statement of significance – 1960s logging camp

The 1960s logging camp is not of State or local significance under any of the seven criteria.

## Statement of significance – Logging camps one to six

In isolation, no single logging camp is of State or local significance. However, as part of a collection of similar sites, they are of local historical and technical significance. The group of logging camps demonstrates the pattern of logging in the eastern Pilliga from the late 19<sup>th</sup> century to the present and also shows the continuity of this process. The spatial mapping of these sites has the potential to provide insight into what areas were targeted during particular periods and how this varied over time with the introduction of new technology and improved transportation from the Pilliga.

## Statement of significance – Logging camp seven









Logging camp seven is of local historical, technical and representative significance. As part of a collection of logger's habitation sites (the Cowallah Habitation Complex and Timber Extraction Area 12, for example) it is able to demonstrate the course of historical domestic occupation in the Pilliga from the 1890s through to the 1960s. The archaeological investigation of the site may contribute to an understanding of domestic life in the Pilliga during the 1960s. It is also representative of a 1960s logging camp occupied by a family unit as demonstrated by the cats-eye marble and foundation bottle.

## 5. Timber loading ramps

### Description

The loading ramps identified in the Project area follow a standard pattern. They are usually located at the intersection of two roads or tracks. Two suitably spaced trees are selected, and horizontal logs are stacked behind the trees to hold the earthen ramp that is then built behind it. Across the Project area, the number of horizontal logs shows minimal variation - between two and four logs. The loading ramps were not usually associated with timber extraction areas with the exception of timber extraction areas 11 and 19 as described above. Table C5.1 contains images and information regarding loading ramps identified in the Project area.

**Table C5.1 - Timber loading ramps**

Item		Description	Item		Description
1		Near intersection of Garlands, Beehive and Creigh's roads.	6		Intersection Dusgies Road and Duschke Link.
2		McCains Road, north of intersection with Sawpit Road.	7		On Stafford Well Road. Only one standing tree was used in the construction and the earthen ramp has collapsed.
3		Whirley Brook Trail. Appears to have been used in the last several years as one of the logs has been replaced and saw marks are fresh.	8		On Stafford Well Road.
4		Intersection of Beehive and Bibblewindi Creek roads.	9		On Chromite Road. Top log appears to have been recently replaced – the unweathered cut edge is evident in the adjacent image.
5		Intersection of Monument Road and Duschke Link			

### Significance assessment

Table C5.2 provides a summary of the heritage significance of timber loading ramps against NSW significance criteria and is followed by a statement of significance for each site as required by the Heritage Guidelines.

**Table C5.2 - Assessment of significance – timber loading ramps**

Criteria	Collection of timber loading ramps
Historical significance State Heritage Register criteria (a)	Local historical significance
Historical association significance State Heritage Register criteria (b)	No
Aesthetic significance State Heritage Register criteria (c)	No
Social significance State Heritage Register criteria (d)	No
Technical/Research significance State Heritage Register criteria (e)	Local research significance
Rarity State Heritage Register criteria (f)	No
Representativeness State Heritage Register criteria (g)	Local representative significance as they demonstrate the principal characteristics of timber loading ramps.

#### **Statement of significance – Timber loading ramps**

The group of nine timber loading ramps is of local historical and technical significance. In association with the timber extraction areas, the timber loading ramps demonstrate the pattern of logging in the eastern Pilliga from the late 19<sup>th</sup> century to the present and the continuity of this process. The spatial mapping of these sites has the potential to provide insight into what areas were targeted during particular periods and how this varied over time with the introduction of new technology and improved transportation from the Pilliga.

It is possible that one or more of the loading ramps may have been built to load and unload mobile plant for fire-fighting purposes.

## 6. Logging tracks

### Description

The Project area within the State forest is criss-crossed with unmapped logging tracks. The number and complexity of these features made it impracticable to identify and map all the tracks encountered during the survey. The following is a description of several that were of particular note:

- **Track one** – On the northern side of McFarlanes Road is a track that runs roughly north–south. The forest to the east of the track has been cleared, but there was no material culture evident.
- **Track two** – On the eastern side of Staffords Well Road is a bulldozer track, probably associated with the 2009 thinning works.
- **Track three** – On the western side of Staffords Well Road is a track that is too narrow to have been created by a vehicle. It was interpreted as being created by a horse pulling logs continuously along the same line. The track has resulted in the formation of a depression that has been subject to water erosion. The track follows a linear alignment, indicating it is of human origin, rather than a natural phenomenon.
- **Track four** – Off the end of Self Camp Road is a track running parallel to Bohena Creek. The track forms access for timber extraction areas eight and nine.

### Significance assessment

#### Statement of significance – Logging tracks

In association with the timber extraction areas, logging camps and timber ramps, the logging tracks have the potential to provide insight into the way in which loggers moved through the forest and are therefore of local research significance. Mapping the tracks would capture this research potential.

## 7. Other sites

### Description

#### Sydney University Giant Air-shower Recorder array

The Sydney University Giant Air-shower Recorder (**SUGAR**) array consisted of 54 stations. Each station consisted of pairs of liquid scintillation detectors (for detecting air showers) separated by 50 metres. The entire Sydney University Giant Air-shower Recorder covered an area of 100 square kilometres (Sydney University Physics Department, 2008) although the precise locations of the stations throughout the Pilliga are not available. The installation also originally included a base station to record data, and transmission tower; however, these are understood to have been demolished. Two of the liquid scintillation detectors were located during the survey. The first was adjacent to the existing produced water ponds on Leewood, while the second was located off No Name Road, near the intersection with Plumb Road. The liquid scintillation detectors consist of what presents as a 44-gallon drum half buried in the ground. The shaft of the liquid scintillation detector reaches approximately 1.5 m below the ground, before opening into a wider chamber underneath.

#### Artefact scatter and tank

This site is located on the northern side of Bibblewindi Creek, about 100 metres north-west of the intersection of Garlands and Bibblewindi Creek roads. Spread over an area of approximately one hectare is an assortment of rusted metal items, including car bodies and 44-gallon drums. A concrete tank and a small but deep dam are located in the north-western corner of the scatter. There is evidence, in the form of vertical supports, of a structure around the tank. Adjacent to the tank is a stack of cut sleepers. A gum tree has fallen over the sleepers, thereby, making their removal too difficult to effect. Several of the sleepers had dog spikes attached, indicating they were stacked for reuse. Associated with the site was a large stand of unidentified introduced vegetation.

#### Stock loading facility

A stock loading facility of pine timbers cut from the area is located adjacent to an unnamed track running parallel to Bohena Creek and Bohena Creek Road. The central section of the facility is roughly rectangular with a chute to herd animals through running towards the road. There was no other cultural evidence in the surrounding area.

#### Blazed trees

Two blazed trees were encountered during the site survey. One tree is located adjacent to a logging track that runs parallel to, and west of, Terra Delba Road. The blazed tree (an ironbark tree) had an area of bark removed. The letters 'F & I' had been blazed into the exposed hardwood. It is assumed that these initials likely stand for Forestry / ies Industry. The second blazed tree is located on the southern side of Monument Road. An oval area of bark around 300 by 120 mm in size was removed with an axe; the axe marks are evident in the exposed hardwood. No letters or symbols were blazed in the hardwood.

#### Oil well

An oil well is located on the north-eastern corner of the intersection of Oil Well and Nickel roads. It is the site of an oil exploration pit and an associated windmill base. All that remains of the windmill are four legs. The legs have been sawn off about 10 centimetres from ground level. In addition, some other artefact material including brown beer-bottle glass, metal bolts and other metal fragments was located. The oil well pit is a concrete lined pit approximately two metres by two metres in size and around 70 centimetres deep with a sign erected within the pit.



## Significance assessment

Table C7.1 provides a summary of the heritage significance of the other identified sites against NSW significance criteria and is followed by a statement of significance for each site as required by the Heritage Guidelines.

**Table C7.1 - Assessment of significance – other sites**

Criteria	Giant Air-shower Recorders	Artefact scatter and tank	Stock loading facility	Blazed trees	Oil well
Historical significance State Heritage Register criteria (a)	No	No	No	No	Local significance
Historical association significance State Heritage Register criteria (b)	No	No	No	No	No
Aesthetic significance State Heritage Register criteria (c)	Local significance	No	No	No	No
Social significance State Heritage Register criteria (d)	State significance	No	No	No	No
Technical/Research significance State Heritage Register criteria (e)	No	No	No	No	No
Rarity State Heritage Register criteria (f)	Local significance	No	No	No	No
Representativeness State Heritage Register criteria (g)	No	No	No	No	No

### Statement of significance – Sydney University Giant Air-shower Recorders

The Sydney University Giant Air-shower Recorder array is of State social significance, being held in high regard by the physics community. The research undertaken using the array provided important information regarding the size and direction of incoming giant cosmic ray air-showers. The array demonstrates a high degree of technical achievement, being both pioneering in the field of giant air-shower recording and also for the timing signal system developed to allow larger portions of the array to be interrogated at any one time. The two liquid scintillation detectors from the Giant Air-shower Recorder array are of State social significance, of technical significance and also rare at a local level. The loss of integrity of the base station where data was recorded has degraded its technical and rarity significance to local, rather than State.

### Statement of significance – Artefact scatter and tank, stock loading facility and blazed trees

The artefact scatter and tank, stock loading facility and blazed trees are not of State or local significance under any of the seven criteria.

### Statement of significance – Oil well

The oil well is of local historical significance. It demonstrates the course and pattern of resource exploration in the local area.



## 8. Pilliga East logging cultural landscape

### Description

A cultural landscape can be defined as an area where the patterns of settlement or use are visible in that landscape, together with a cultural awareness of the contribution of the settlement or use to cultural values, norms or attitudes towards the land (NSW Department of Environment, Climate Change and Water, 2010). A landscape is a continually changing unit, being the product of evolving relationships between nature, people, the past and present and the values that people place on these.

As discussed above, individually the majority of the timber extraction areas, logging camps, timber loading ramps and logging tracks are not of heritage significance. It is only when they are considered collectively that a sense of the scale and intensity of logging activities in the Pilliga can be appreciated. The timber extraction areas, sawmill sites, habitation sites, timber loading ramps and logging tracks clearly demonstrate a pattern of use within the east Pilliga for logging purposes. Further research regarding the spatial arrangement of the sites, together with the material culture contained within them, has the potential to yield information regarding the evolution of attitudes towards the Pilliga and the logging activities undertaken within it.

For the purposes of this assessment, the cultural landscape boundary is defined as the State forests within the Project area. The timber extraction areas, sawmills, habitation and camping site, timber loading ramps and logging tracks are elements that contribute to the cultural landscape.

### Significance assessment

Table C8.1 provides a summary of the heritage significance of the Pilliga East logging cultural landscape against NSW significance criteria and is followed by a statement of significance for each site as required by the Heritage Guidelines.

**Table C8.1 - Assessment of significance – Pilliga East logging cultural landscape**

Criteria	Pilliga East logging cultural landscape
Historical significance State Heritage Register criteria (a)	Local historical significance
Historical association significance State Heritage Register criteria (b)	No
Aesthetic significance State Heritage Register criteria (c)	No
Social significance State Heritage Register criteria (d)	No
Technical/Research significance State Heritage Register criteria (e)	Local research significance
Rarity State Heritage Register criteria (f)	No
Representativeness State Heritage Register criteria (g)	Local representative significance

## Statement of significance – Pilliga East logging cultural landscape

The Pilliga East cultural landscape is of historical, research and representative significance. The landscape demonstrates the patterns of logging activities in the Pilliga East forest and the different intensities and methods of logging from the 1890s to the present. The timber extraction areas, sawmill sites, logging camps, timber loading ramps, logging tracks and other sites associated with logging activities that are scattered across the landscape, can tell the story of logging in the Pilliga East. Further research may indicate the variations in methods and areas of extraction between the early operations and the later State operated activities.

The Pilliga East cultural landscape is of local research significance. The creation of a cultural landscape map of the timber extraction areas, sawmill sites, logging camps, timber loading ramps and logging tracks could provide insights into the pattern of logging in the forest.

The Pilliga East cultural landscape is of local representative significance as it contains all the sites characteristic of logging activities (timber extraction areas, sawmill sites, logging camps, timber loading ramps and logging tracks).