Title of Proposal - Narrabri Underground Mine Stage 3 Extension Project

Section 1 - Summary of your proposed action

Provide a summary of your proposed action, including any consultations undertaken.

1.1 Project Industry Type

Mining

1.2 Provide a detailed description of the proposed action, including all proposed activities.

Background

The Narrabri Mine is an existing underground coal mining operation situated in the Gunnedah Coalfield. The Narrabri Mine is located approximately 25 kilometres (km) south east of Narrabri and approximately 60 km north west of Gunnedah, within the Narrabri Shire Council (NSC) Local Government Area (LGA), in New South Wales (NSW) (Figure 1).

The Narrabri Mine is operated by Narrabri Coal Operations Pty Ltd (NCOPL), on behalf of the Narrabri Mine Joint Venture, which consists of Whitehaven Coal Limited's (Whitehaven's) wholly owned subsidiary Narrabri Coal Pty Ltd (70 percent [%]), Upper Horn Investments (Australia) Pty Ltd (7.5%), J-Power Australia Pty Limited (7.5%), EDF Trading Australia Pty Limited (7.5%), and Posco Daewoo Narrabri Investment Pty Limited and Kores Narrabri Pty Limited (7.5%).

The Narrabri Coal Mine Stage 2 Longwall Project was previously referred under the Commonwealth Environment Protection and Biodiversity Conservation Act, 1999 (EPBC Act) in 2009 and determined to be "a controlled action" (EPBC 2009/5003). Approval of the Narrabri Coal Mine Stage 2 Longwall Project was granted under the EPBC Act in January 2011 and has since been varied on five occasions.

The Narrabri Mine comprises 20 longwall panels, Longwalls 101 to 120 (Figure 2). Longwall mining is currently being undertaken in Longwall 108A, with extraction of Longwalls 101 to 107 complete. The pit top area incorporates the majority of the Narrabri Mine surface infrastructure, including the box cut, coal handling and preparation plant (CHPP), run of mine (ROM) and product coal stockpiles, rail loop and product coal load-out infrastructure. ROM coal is processed at the Narrabri Mine CHPP to produce a combination of part-washed (thermal) and washed (pulverised coal injection [PCI]) coal products. ROM coal is also bypassed through a crusher producing a sized thermal coal product. Product coal is then transported from site by rail. Coal rejects, including coarse rejects and dewatered and thickened fine rejects, are emplaced in a dedicated rejects emplacement.

NCOPL is seeking approval from the NSW Minister for Planning or the NSW Independent Planning Commission for a new Development Consent under the Environmental Planning and Assessment Act, 1979 (EP&A Act) for the Narrabri Underground Mine Stage 3 Extension Project.

Referral

This referral is for the Narrabri Underground Mine Stage 3 Extension Project (the Action) (Figure 3).

The Action is separate from, but related to, the controlled action approved under the EPBC Act Approval. The Action does not include the components and operations of the Narrabri Coal Mine Stage 2 Longwall Project approved under the EPBC Act Approval, whether or not those components or operations have been constructed or commenced, and whether or not components of the Narrabri Underground Mine Stage 3 Extension Project are to be carried out or occur within the approved area of the Narrabri Coal Mine Stage 2 Longwall Project.

The Action therefore excludes the continuation of mining operations and associated activities that are currently authorised by existing approvals. Despite the overlap of the Action with the existing approved underground mine footprint shown on Figure 3, the Action is separate to the controlled action approved under the EPBC Act Approval.

The Action would include the following activities (Figure 3):

• longwall mining in a southern extension of the existing underground mining area, including an extension to Longwalls 203 to 209 (previously Longwalls 112 to 118 for the Narrabri Mine Stage 2 Longwall Project) and mining of an additional longwall panel (Longwall 210);
• development of roadways within the Hoskissons Seam and adjacent strata to access mining areas in Longwalls 203 to 210;
• use of existing/approved roadways and drifts for personnel and materials access, ventilation, dewatering and other ancillary activities;
• development of additional surface infrastructure associated with mine ventilation and gas management, and other ancillary infrastructure above, and adjacent to, Longwalls 203 to 210;
• transport of product coal from site by the existing rail infrastructure;
• use of the existing/approved Namoi River water pipeline, sumps, pumps, pipelines, water storages and other water management infrastructure;
• progressive development of additional sumps, pumps, pipelines and other water management infrastructure;
• employment of the existing residentially based workforce;
• monitoring, rehabilitation and remediation of subsidence and other mining effects; and
• other associated minor infrastructure, plant, equipment and activities.

The Indicative Extent of the Proposed Action Area covers approximately 5,425 hectares (ha) (including the area of overlap with the existing approved Narrabri Mine). Within this area, surface infrastructure (e.g. associated with gas drainage for mine safety purposes and access roads) would be required necessitating the need to clear select areas of native vegetation. It is estimated, subject to detailed mine planning, that approximately 610 ha of land would need to be cleared for surface infrastructure.

The Action would also result in subsidence effects, the type and magnitude of which are dependent on a range of variables, including the mine geometry and topography, the depth of mining, the coal recovery from each seam, the nature of overlying strata and other geological factors. The subsidence impacts pertinent to the Action would extend slightly beyond the extent

of the proposed longwall layout due to the associated angle of draw.

1.3 What is the extent and location of your proposed action? Use the polygon tool on the map below to mark the location of your proposed action.

Area	Point	Latitude	Longitude
Indicative Area	1	-30.675587975102	149.76472508106
Indicative Area	2	-30.488198297538	149.7599185625
Indicative Area	3	-30.487902444306	149.91510044727
Indicative Area	4	-30.674997410286	149.9089206377
Indicative Area	5	-30.675587975102	149.76472508106

1.5 Provide a brief physical description of the property on which the proposed action will take place and the location of the proposed action (e.g. proximity to major towns, or for off-shore actions, shortest distance to mainland).

The Action is located approximately 25 km south-east of Narrabri and approximately 60 km north-west of Gunnedah, within the NSC LGA (Figure 1), in the New England North West Region of NSW. The Action is located in the New England North West Region of NSW, which includes the Namoi River valley and associated agricultural land uses and elevated, vegetated country managed as State Forests and National Parks (Figure 1).

The existing/approved land use in the Action area is characterised by a combination of mining and agricultural (sheep and cattle grazing, cereal production and horticulture) land uses, as well as the Pilliga East State Forest.

1.6 What is the size of the proposed action area development footprint (or work area) including disturbance footprint and avoidance footprint (if relevant)?

Approximately 610 ha of land would be cleared within the larger Action Area (5,425 ha).

1.7 Is the proposed action a street address or lot?

Street Address

10 Kurrajong Creek Road
Baan Baa NSW 2390
Australia

1.8 Primary Jurisdiction.

New South Wales

1.9 Has the person proposing to take the action received any Australian Government grant funding to undertake this project?

No

1.10 Is the proposed action subject to local government planning approval?

No

1.11 Provide an estimated start and estimated end date for the proposed action.

Start date 01/2020

End date 12/2045

1.12 Provide details of the context, planning framework and State and/or Local government requirements.

NSW Environmental Planning and Assessment Act, 1979

The NSW *Environmental Planning and Assessment Act, 1979* and the NSW *Environmental Planning and Assessment Regulation*, *2000* (EP&A Regulation) set the framework for planning and environmental assessment in NSW.

NCOPL will lodge a Preliminary Environmental Assessment that will provide a description of the Narrabri Underground Mine Stage 3 Extension Project to key State regulatory agencies, to initiate the preparation of the Secretary's Environmental Assessment Requirements (SEARs) in accordance with clause 3 of Schedule 2 of the EP&A Regulation. The SEARs will identify any further matters that will need to be addressed in the Environmental Impact Statement (EIS).

Other Leases, Licences and Approvals

Relevant leases, licences or approvals required under other NSW legislation would also be varied and/or obtained for the Action as required.

Under the NSW *Mining Act, 1992*, environmental protection and rehabilitation are regulated by conditions included in all mining leases, including requirements for a Mining Operations Plan,

submission of Annual Reviews and submission of Extraction Plans to reduce and manage potential impacts of subsidence.

NCOPL has recently lodged a Gateway Certificate Application in support of an application for a Gateway Certificate, pursuant to clause 17F of the Mining State Environmental Planning Policy.

1.13 Describe any public consultation that has been, is being or will be undertaken, including with Indigenous stakeholders.

Whitehaven and NCOPL regularly engage with the community through the following mechanisms:

(a) a dedicated website (http://www.whitehavencoal.com.au/);

(b) Narrabri Mine Community Consultative Committee (CCC) quarterly meetings (with meeting minutes provided on the website and emailed to interested stakeholders);

(c) community factsheets;

(d) media releases and other media activities;

(e) general community surveys and reports;

(f) a landholder relations program; and

(g) information days and mine open days.

Specific engagement completed to date in relation to the Action has included:

(a) Consultation with the CCC including:

(i) Provision of information and opportunities for discussion about the exploration program during 2016-2017.

(ii) A briefing and discussion on the Action in June 2017 including discussion of the potential impacts of the Action on social values.

(iii) An update on exploration and the Action approvals process in June 2018.

(iv) A briefing and discussion on the Action in September 2018, including presentation and

discussion of the proposed mine plan.

(v) A briefing and discussion on the Action in December 2018 with discussion of potential social impacts.

(b) A Conceptual Project Development Plan meeting with representatives of the NSW Division of Resources and Geoscience in June 2017.

(c) Discussions with landholders located above the proposed extended underground mining area.

(d) Briefings with NSW Department of Planning and Environment (DP&E) in July and September 2017 and November 2018.

(e) Briefing with Narrabri Shire Council in December 2018.

(f) Briefing with Narrabri Aboriginal Land Council and Gomeroi Narrabri Aboriginal Council (i.e. Registered Aboriginal Parties) in December 2018 and January 2019.

(g) Briefing with the Narrabri Chamber of Commerce in December 2018.

In addition, Dr Paul Frazier conducted interviews with landowners and property managers as part of the preparation of an Agricultural Impact Assessment.

A stakeholder engagement program has been developed for the Narrabri Underground Mine Stage 3 Extension Project. Key objectives of this program are to:

(a) engage with government and public stakeholders about the Narrabri Underground Mine Stage 3 Extension Project;

(b) seek input from key stakeholders, including individual landholders, on elements of the Narrabri Underground Mine Stage 3 Extension Project;

(c) recognise and respond to local interest or concerns regarding the Narrabri Underground Mine Stage 3 Extension Project; and

(d) continue the ongoing dialogue between NCOPL and stakeholders initiated through the development and operation of the Narrabri Mine.

Consultation will include, but not necessarily be limited to, the following government agencies and authorities:

(a) Commonwealth Department of the Environment and Energy (DEE);

(b) DP&E;

(c) Forestry Corporation of NSW;

(d) NSC;

(e) NSW Division of Resources and Geoscience;

(f) NSW Resources Regulator;

(g) NSW Office of Environment and Heritage (OEH) (including the National Parks and Wildlife Service and Heritage Branch);

(h) NSW Environment Protection Authority;

(i) NSW Department of Primary Industries (DPI) (including DPI Lands and Forestry, DPI Agriculture and DPI Fisheries);

(j) NSW Department of Industry – Water;

(k) NSW Health;

(l) Subsidence Advisory NSW;

(m) Transport for NSW (including the Roads and Maritime Services); and

(n) Registered Aboriginal Parties and the Local Aboriginal Land Councils.

1.14 Describe any environmental impact assessments that have been or will be carried out under Commonwealth, State or Territory legislation including relevant impacts of the project.

A Preliminary Environmental Assessment has been prepared to provide a description of the Narrabri Underground Mine Stage 3 Extension Project to key State regulatory agencies to initiate the preparation of the SEARs in accordance with clause 3 of Schedule 2 of the EP&A Regulation. The SEARs will identify any further matters that will need to be addressed in the EIS. The DP&E has not yet issued SEARs for the Narrabri Underground Mine Stage 3 Extension Project. The EIS will consider the potential impacts of the Narrabri Underground Mine Stage 3 Extension Project by addressing the SEARs (as revised) by the DP&E.

The Gateway Application has been lodged and can be accessed here:

http://www.mpgp.nsw.gov.au/index.pl?action=view_job&job_id=9882

1.15 Is this action part of a staged development (or a component of a larger project)?

No

1.16 Is the proposed action related to other actions or proposals in the region?

Yes

1.16.1 Identify the nature/scope and location of the related action (Including under the relevant legislation).

As detailed in response to 1.2 above, the Action is separate from, but related to, the controlled action approved under the EPBC Act Approval (Narrabri Coal Mine Stage 2 Longwall Project [EPBC 2009/5003]). In 2009 the Commonwealth Department of the Environment and Heritage declared that the Narrabri Coal Mine Stage 2 Longwall Project was a “Controlled Action”, and the EPBC Act Approval for mining Longwalls 101 to 120 was granted in January 2011. The Action involves the development of additional surface infrastructure for mining Longwalls 112 to 120.

Section 2 - Matters of National Environmental Significance

Describe the affected area and the likely impacts of the proposal, emphasising the relevant matters protected by the EPBC Act. Refer to relevant maps as appropriate. The interactive map tool can help determine whether matters of national environmental significance or other matters protected by the EPBC Act are likely to occur in your area of interest. Consideration of likely impacts should include both direct and indirect impacts.

Your assessment of likely impacts should consider whether a bioregional plan is relevant to your proposal. The following resources can assist you in your assessment of likely impacts:

• Profiles of relevant species/communities (where available), that will assist in the identification of whether there is likely to be a significant impact on them if the proposal proceeds;

• Significant Impact Guidelines 1.1 – Matters of National Environmental Significance;

• Significant Impact Guideline 1.2 – Actions on, or impacting upon, Commonwealth land and Actions by Commonwealth Agencies.

2.1 Is the proposed action likely to have ANY direct or indirect impact on the values of any World Heritage properties?

No

2.2 Is the proposed action likely to have ANY direct or indirect impact on the values of any National Heritage places?

No

2.3 Is the proposed action likely to have ANY direct or indirect impact on the ecological character of a Ramsar wetland?

No

2.4 Is the proposed action likely to have ANY direct or indirect impact on the members of any listed species or any threatened ecological community, or their habitat?

Yes

2.4.1 Impact table

Species	Impact
Androcalva procumbens; Cadellia pentastylis; Dichanthium setosum; Philotheca ericifolia; and Prasophyllum sp. Wybong (C.Phelps ORG	The Action is not likely to adversely or significantly impact these species. These species were not recorded during the recent

Species	Impact
5269).	surveys undertaken by ELA (in prep.), nor have they been recorded by any previous surveys in the Action area or surrounds. The nearest database records for these species are located approximately 10 km away (or further) from the Action area (ALA, 2018; OEH, 2019).
Coolabah Bertya (Bertya opponens)	Coolabah Bertya has been recorded in the Action area (Figure 5) (AMBS Ecology and Heritage [AMBS], in prep; Eco Logical Australia [ELA], in prep; FloraSearch, 2009). Previous flora surveys undertaken to the north of the Action area (and west of the Narrabri Mine) have recorded many Coolabah Bertya shrubs (FloraSearch, 2009; OEH, 2019, AMBS, in prep) (Figure 5). FloraSearch (2009) concluded that Coolabah Bertya was abundant in that location, numbering many tens of thousands of individual shrubs. The Action may have localised adverse impacts on individual Coolabah Bertya shrubs within the Action area owing to selective land clearance activities (e.g. for gas drainage facilities, service boreholes and access tracks) and potential subsidence impacts, however, the Action is not considered likely to have a significant impact on this species given that: (a) a single shrub of Coolabah Bertya was recorded during targeted surveys (ELA, 2016) suggesting a low abundance of this species in the Action area and other records are located right on the edge of the Action area in habitat that continues outside the Action area; and (b) the species is known to occur in large numbers outside the Action area, as demonstrated by the numerous records shown on Figure 5.
Spiny Peppercress (Lepidium aschersonii)	A total of 32 individual Spiny Peppercress plants were recorded in one location within the Action area during targeted surveys undertaken by ELA in 2017 and 2018 (ELA, in prep.) (Figure 5). This herb has also been recorded in a number of locations within the Mining Lease (ML) 1609, to the north of the Action area (ELA, 2016; AMBS, in prep) showing the species persisting after longwall subsidence has occurred. The impacts associated with the Action are likely to be consistent with that of the Narrabri Mine (i.e. selective land clearance activities for gas drainage facilities, service

Species	Impact
	boreholes and access tracks as well as potential subsidence impacts). The Action is not considered likely to have a significant impact on this species given that: (a) a total of 32 individual Spiny Peppercress plants were recorded in one location during targeted surveys (ELA, in prep.) suggesting a low abundance of this species in the Action area; and (b) monitoring at the Narrabri Mine is showing this species persisting after longwall subsidence has occurred (ELA, 2016).
Tylophora linearis	A total of 92 individual Tylophora linearis were recorded in numerous locations within the Action area during targeted surveys undertaken by ELA in 2017 and 2018 (ELA, in prep.) (Figure 5). The impacts associated with the Action are likely to be consistent with that of the Narrabri Mine (i.e. selective land clearance activities for gas drainage facilities, service boreholes and access tracks as well as potential subsidence impacts). The Action is not considered likely to have a significant impact on this species given that this species is known to occur in a number of locations throughout NSW, including 13 NSW conservation reserves and 11 NSW State Forests (Atlas of Living Australia [ALA], 2018; OEH, 2019).
Regent Honeyeater (Anthochaera phrygia); Curlew Sandpiper (Calidris ferruginea); Large-eared Pied Bat (Chalinolobus dwyeri); and Malleefowl (Leipoa ocellata).	The Action is not likely to adversely or significantly impact these species. These species were not recorded during the recent surveys undertaken by ELA (in prep.), nor have they been recorded by any previous surveys in the Action area or surrounds. The nearest database records for these species are located approximately 15 km away (or further) from the Action area (ALA, 2018; OEH, 2019).
Painted Honeyeater (Grantiella picta)	This species was not recorded within the Action area during targeted surveys undertaken by ELA in 2018 (ELA, in prep.). The Painted Honeyeater has previously been recorded at six locations during previous surveys approximately 1-2 km to the north of the Action area in 2017 (ELA, 2017) (Figure 6). The Painted Honeyeater is unlikely to be adversely or significantly impacted given that: (a) this species has not been recorded within the Action area; (b) the Painted Honeyeater is known to be strongly associated with the presence of

Species	Impact
	flowering mistletoes (DEE, 2018a), which were not recorded by ELA (in prep.) within the Action area; and (c) the potential habitat would be progressively and selectively cleared (e.g. for gas drainage facilities, service boreholes and access tracks) over the mine life (in the order of 23 years) followed by progressive rehabilitation to re connect habitat (ripping and seeding where necessary to supplement natural regeneration from the existing soil seed bank).
Corben's Long-eared Bat (Nyctophilus corbeni)	This species was recorded via harp traps within the Action area during targeted surveys undertaken by ELA in 2018 (ELA, in prep.). It was also recorded in 2009 surveys by Ecotone within the Action area (Figure 6). Additional records for this species occur approximately 1 km to the north of the Action area (Ecotone, 2009; OEH, 2019), 2 km to the south and 2 km to the south-west (ALA, 2018) (Figure 6). Despite the presence of this species within the Action area and surrounds, the Action is not likely to significantly adversely impact this species given that: (a) the potential habitat would be progressively and selectively cleared (e.g. for gas drainage facilities, service boreholes and access tracks) over the mine life (in the order of 23 years) followed by progressive rehabilitation to re-connect habitat (ripping and seeding where necessary to supplement natural regeneration from the existing soil seed bank); (b) potential subsidence associated with the Action (i.e. surface cracking) is only likely to result in typical crack widths of between 20 mm to 240 mm (Ditton Geotechnical Services, 2019) which is not likely to result in impacts to native vegetation that provides habitat for the Corben's Long-eared Bat to the extent that there would be a significant impact on the species; and (c) the potential habitat within the Action area is relatively common in the immediate surrounds and across the wider locality (as indicated by the numerous records of this species within the extent of the Pilliga East State Forest, Vickery State Forest and surrounding the town of Boggabri [ALA, 2018; OEH, 2019]).
Koala (Phascolarctos cinereus)	In 2009, Koala scats were identified during

Species	Impact
	previous survey work approximately 1-2 km north of the Action area (Ecotone, 2009). No Koalas (including any evidence of Koala presence) were recorded during the recent targeted surveys undertaken by ELA (in prep.) or during any other monitoring surveys undertaken within ML 1609. The Action is not likely to significantly adversely impact this species given that: (a) no evidence of the Koala has been recorded within the Action area, which suggests only a low occupation of Koala potentially uses the potential habitat; (b) the potential habitat would be progressively and selectively cleared (e.g. for gas drainage facilities, service boreholes and access tracks) over the mine life (in the order of 23 years) followed by progressive rehabilitation to re-connect habitat (ripping and seeding where necessary to supplement natural regeneration from the existing soil seed bank); (c) during operations, potential habitat would be fragmented for linear surface infrastructure (e.g. access tracks) and gas drainage bore holes, however after operations, the potential habitat would be re-connected due to rehabilitation/ natural regeneration; (d) potential subsidence associated with the Action (i.e. surface cracking) is only likely to result in typical crack widths of between 20 mm to 240 mm (Ditton Geotechnical Services, 2019) which is not likely to result in impacts to native vegetation that provides habitat for the Koala to the extent that there would be a significant impact on the species; and (e) the potential habitat within the Action area is common in the immediate surrounds and across the wider locality, including throughout the Pilliga East State Forest (ALA, 2018; OEH, 2019).
Superb Parrot (Polytelis swainsonii)	This species has not been previously recorded in the Action area. The Superb Parrot has previously been recorded at two locations approximately 3 km to the north of the Action area in 2009 (Ecotone Ecological Consultants [Ecotone], 2009) and at one location approximately 5 km east of the Action (OEH, 2019) (Figure 6). The Superb Parrot is unlikely to be adversely or significantly impacted given that: (a) the potential habitat would be

Species	Impact
	progressively and selectively cleared (for gas drainage facilities, service boreholes and access tracks) over the mine life (in the order of 23 years) followed by progressive rehabilitation to re-connect habitat (ripping and seeding where necessary to supplement natural regeneration from the existing soil seed bank); (b) potential subsidence associated with the Action (i.e. surface cracking) is only likely to result in typical crack widths of between 20 mm to 240 mm (Ditton Geotechnical Services, 2019) which is not likely to result in impacts to native vegetation that provides habitat for the Superb Parrot to the extent that there would be a significant impact on the species; and (c) potential habitat for this species is relatively common across the wider locality, thereby providing alternate habitat resources for this species.
Pilliga Mouse (Pseudomys pilligaensis)	This species was recorded at five locations within the Action area and surrounds during targeted surveys undertaken by ELA in 2018 (ELA, in prep.) (Figure 6). Additional records for this species occur approximately 2 km to the north of the Action area (Figure 6) (OEH, 2018; ALA, 2019; Ecotone, 2009). ALA (2018) shows that the distribution of this species extends to the Pilliga East State Forest, Pilliga Nature Reserve, Bibblewindi State Forest, Pilliga National Park and Pilliga State Conservation Area, with more than 200 records located across these areas. Despite the presence of this species within the Action area, the Action is not likely to significantly adversely impact this species, given that: (a) the potential habitat would be progressively and selectively cleared (e.g. for gas drainage facilities, service boreholes and access tracks) over the mine life (in the order of 23 years) followed by progressive rehabilitation to re connect habitat (ripping and seeding where necessary to supplement natural regeneration from the existing soil seed bank); (b) during operations, potential habitat would be fragmented for linear surface infrastructure (e.g. access tracks) and gas drainage bore holes, however after operations, the potential habitat would be re-connected due to rehabilitation/ natural

Species	Impact
	regeneration; (c) although surface cracking associated with the proposed longwall mine may result in an adverse impact to some individuals, these potential impacts would be greater in the eastern portion of the Action area (outside the Pilliga East State Forest), where the depth of cover is less (Ditton Geotechnical Services, 2019); and (d) the potential habitat within the Action area is relatively common in the immediate surrounds and across the wider locality (as demonstrated by the large number of records of this species within the surrounding locality [ALA, 2018; OEH, 2019]).
Australian Painted Snipe (Rostratula australis)	The Australian Painted Snipe has not been recorded during any surveys of the Action area or surrounds and only a single database record from 1992 (which has an accuracy of up to 10 km) is located approximately 5 km east of the Action area (Figure 6) (ALA, 2018). The Australian Painted Snipe generally inhabits shallow terrestrial freshwater (occasionally brackish) wetlands, including temporary and permanent lakes, swamps and claypan (DEE, 2018a). No potential habitat has been recorded within the Action area (ELA, in prep.) and as such, the Action would not significantly impact this species.
Coolibah - Black Box Woodlands of the Darling Riverine Plains and the Brigalow Belt South Bioregions	The Action is not likely to adversely or significantly impact this ecological community. Coolibah (Eucalyptus coolabah subsp. coolabah) or Black Box (Eucalyptus largiflorens) have not been recorded in the Action area or surrounds (ELA, in prep; Ecotone, 2009) and therefore this ecological community is unlikely to occur in the Action area.
Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia	The Action is not likely to significantly impact this ecological community. Previous surveys conducted by Ecotone (2009) mapped a woodland comprising Grey Box (Eucalyptus microcarpa) as present within the Action area within ML 1609. Additional surveys will be undertaken to confirm if this woodland meets the definition of the Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia. If this ecological community is present in the Action area, it occurs as modified and generally

Species	Impact
	disturbed (grazed) remnant patches on the eastern flat land (Ecotone, 2009).
Natural grasslands on basalt and fine-textured alluvial plains of northern New South Wales and southern Queensland	The Action is not likely to adversely or significantly impact this ecological community. The Natural grasslands on basalt and fine-textured alluvial plains of northern New South Wales and southern Queensland has not been recorded in the Action area or surrounds (ELA, in prep; Ecotone, 2009).
Weeping Myall Woodlands	The Action is not likely to adversely or significantly impact this ecological community. Weeping Myall has not been recorded in the Action area or surrounds (ELA, in prep; Ecotone, 2009) and therefore this ecological community is unlikely to occur in the Action area.
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Recent surveys conducted by ELA (in prep.) mapped the White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland vegetation community present within the Action area (Figure 5). This majority of this community did not include canopy trees and has been mapped as derived native grassland (i.e. not a woodland community) (ELA in prep.). The proposed Action is not likely to have a significant adverse impact on the White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland Critically Endangered Ecological Community (CEEC) given that the Action would be managed so as not to cause a reduction in the quality or integrity of White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland CEEC surrounding the Action area to the extent that there would be significant residual impacts to this community.

2.4.2 Do you consider this impact to be significant?

No

2.5 Is the proposed action likely to have ANY direct or indirect impact on the members of any listed migratory species, or their habitat?

No

2.6 Is the proposed action to be undertaken in a marine environment (outside Commonwealth marine areas)?

No

2.7 Is the proposed action to be taken on or near Commonwealth land?

No

2.8 Is the proposed action taking place in the Great Barrier Reef Marine Park?

No

2.9 Is the proposed action likely to have ANY direct or indirect impact on a water resource related to coal/gas/mining?

Yes

2.9.1 Impact table

Water Resource	Impact
Surface Water	The Action area is located in the Namoi River catchment, within the tributary catchments of Kurrajong Creek, Pine Creek and Tulla Mullen Creek (WRM, 2015) (Figure 6). A number of unnamed ephemeral tributaries also traverse the Action area in the south and south-east. There are no perennial watercourses in the Action area, the closest being the Namoi River (located approximately 5 km north-east of the Action area) (Figure 6). Kurrajong Creek originates near the south-western corner of the Action area and together with its tributaries, traverses the southern portion of the Action area, draining to Tulla Mullen Creek, which in turn drains into the Namoi River approximately 4 km upstream of the Turrawan gauging station. The total catchments areas of Pine and Kurrajong Creeks are 76 km2 and 62 km2 respectively (WRM, 2015). Kurrajong Creek and Pine Creek are ephemeral, generally flowing for short periods after significant rainfall events or protracted wet periods. Base flows in these creeks are insignificant (WRM, 2015). Existing/approved underground mining areas to the north of the Action area include Pine Creek and downstream sections of Kurrajong Creek

Water Resource	Impact
	and its tributaries (Figure 6). Water quality monitoring has been undertaken since 2009 along Pine Creek and Kurrajong Creek and their tributaries upstream and downstream of the Narrabri Mine (WRM, 2015). Samples are taken during or immediately following flow events and analysed for electrical conductivity, pH, total suspended solids, oil and grease and total organic carbon (WRM, 2015). There has been no significant difference in water quality observed between monitoring sites upstream and downstream of the Narrabri Mine since monitoring began (WRM, 2015). NCOPL would continue to implement the existing surface water management measures detailed in the approved Water Management Plan (URS Australia, 2013). There are no wetlands in the Action area. Impact Assessment Potential subsidence impacts as a result of the Action on Kurrajong Creek and ephemeral tributaries would be similar to those already experienced and/or predicted at the existing/approved Narrabri Mine. Following the implementation of remediation measures, during and following mining, it is expected that, consistent with identified impacts associated with the Narrabri Mine, there would be negligible diversion of surface water flows and negligible impact on downstream water quality associated with the Action. The Action would not result in the removal (i.e. change in extent) or diversion of Kurrajong Creek or Pine Creek. Consideration of the potential impacts against the Significant impact guidelines: Coal seam gas and large coal mining developments - impacts on water resources (DotE, 2013) concludes that the Project is unlikely to have a significant impact on groundwater resources (HydroSimulations, 2019). Beyond the existing approved impacts associated with Project Approval (08_0144), the Action is: • unlikely to directly or indirectly result in a substantial change in the hydrology of water resources; and • unlikely to directly or indirectly result in a substantial change in the water quality of water resources. Surface Water Monitoring and Water Management Plan NCOPL would continue to implement the existing surface water monitoring program

Water Resource	Impact
	detailed in the approved Water Management Plan (URS Australia, 2013). As part of this, NCOPL would implement monitoring and remediation measures to mitigate the potential subsidence impacts on the watercourses located within the Action area.
Groundwater	The hydrogeological regime of the Action area and surrounds comprises two main systems (CDM Smith, 2016): • a porous hard rock groundwater system that occurs throughout the stratigraphic sequence of Jurassic and Triassic formations and Permian coal measures; and • aquifers associated with the unconsolidated alluvial sediments of the Namoi River floodplain (i.e. the Upper Namoi Alluvial aquifer). HydroSimulations (2019) has recently prepared a preliminary groundwater assessment to accompany the Gateway Certificate Application that has been lodged by NCOPL. This technical report is attached to this referral. A description of the porous rock (Permian) and alluvial aquifer systems as well as the adjacent Jurassic sequence are provided below. Porous Rock (Permian) Groundwater System The Permian groundwater system within the Narrabri Mine area is continuous through the major geological formations. The various sedimentary rocks at the Narrabri Mine have low permeability due to their fine-grained nature, the predominance of cemented lithic sandstones and the common occurrence of a clayey matrix in the sandstones and conglomerates. The permeability of the groundwater system is related to the joint spacing and aperture width. Permeability of the rock units generally decreases with depth of burial as the joints tighten and become less frequent. The laminated fabric of the interbedded sandstone/siltstone/mudstone strata suggests that vertical hydraulic conductivities are significantly lower than horizontal hydraulic conductivities. Due to the laminar nature of the coal measures, groundwater flow generally occurs within, or along the boundaries between, stratigraphic layers. The permeability of the coal measures is generally low, with rock mass permeabilities more than two orders of magnitude lower than

Water Resource	Impact
	the unconsolidated alluvial aquifers. Within the coal measures, the most permeable horizons are the coal seams, which commonly have hydraulic conductivity one to three orders of magnitude higher than the siltstones, shales and sandstone units. The coal seams are generally more brittle and therefore more densely fractured than the overburden and interburden strata, which causes the higher permeability. Within the coal seams, groundwater flows predominantly through cleat fractures, although structure-related fracturing may play a role in local groundwater flow paths. One site has monitored salinity within the Hoskissons Seam: site P18 immediately east of the present mine. From 2009 to 2010 values were above 4,000 microsiemens per centimetre (µS/cm). Alluvial Groundwater System Groundwater flow patterns within the shallow alluvial aquifer reflect topographic levels and the containment of alluvium within the principal drainage pathways. Evidence from temporal groundwater monitoring hydrographs within the alluvium indicates that the shallow aquifer is responsive to rainfall recharge and it is likely that the alluvium plays an important role in supplying recharge to the underlying Permian strata as well as, in places, contributing to baseflow of the perennial surface water features. In some areas upward or lateral flow may occur from the Permian and Triassic rock, but downward leakage seems to be the more common behaviour. CDM Smith (2016) notes a smaller alluvial deposit named the Bohena Creek Alluvium to the west of the Action, with an average thickness of 6 m of "gravel and sand with clay lenses". This is not mapped as a "highly productive" groundwater source. No stygofauna were found in sampled bore waters. Sites monitoring groundwater salinity in the alluvium are all some distance (north and east) from the Narrabri Mine, located close to the Namoi River. Only spot readings are available at most of the sites and with one exception values are below 1,500 µS/cm. Jurassic Surat Basin Sequence The Narrabri Mine is located near the eastern margin of the Surat Basin, a sub-basin of the larger Great Artesian Basin

Water Resource	Impact
	(Aquaterra, 2009; Hydrosimulations, 2019). The Surat Basin stratigraphy in the vicinity of the Action includes Pilliga Sandstone, Purlawaugh Formation and Garrawilla Volcanics (Jurassic age units). Two sites monitor salinity in the Pilliga Sandstone which show generally low median salinity (Hydrosimulations, 2019). Four sites monitor salinity in the Purlawaugh Formation which show mid-range median values, although salinity values south-west of the existing mine are high (above 15,000 µS/cm) (Hydrosimulations, 2019). Seven sites monitor salinity in the Garrawilla Volcanics and show salinity in the range of 1,000 to 4,000 µS/cm, although one site has shown variable salinity from less than 2,000 to 10,000 µS/cm (Hydrosimulations, 2019). Groundwater Dependent Ecosystems (GDEs) Further information on GDEs is provided in Hydrosimulations (2019) (provided as an attachment to this referral). Impact Assessment Assessment of the potential impacts of underground mining (including likely fractured zone heights) confirms that connective fracturing is not likely to reach land surface or the surficial zone of tensile cracking where the Hoskissons Coal Seam is to be mined (HydroSimulations, 2019). Within the preliminary groundwater assessment, HydroSimulations (2019) concluded that: • Given that groundwater flow direction would not be significantly affected by the Action, except for the area limited to the vicinity of the mine, there is likely to be negligible impact on water quality for nearby water users, ecosystems or on the salinity of water in the Namoi River. • As there are no irrigated areas, and water for domestic and stock use is not sourced from groundwater in the Action area, there is no impact expected on groundwater use in the Action area (ELA, 2019). Furthermore, no impacts have been identified on highly productive groundwater in the context of the NSW Aquifer Interference Policy. The minimal harm considerations of the Aquifer Interference Policy were addressed in the Narrabri Mine Modification 5 Groundwater Assessment (HydroSimulations, 2015). The findings at that

Water Resource	Impact
	time remain consistent with the results of current modelling (HydroSimulations, 2019), which are: • No alluvial bores have a drawdown in excess of 2 metres (m) (the threshold for the Aquifer Interference Policy minimal harm consideration). • No Great Artesian Basin bores have a drawdown in excess of 2 m. • One bore (GW067626) in the Purlawaugh Formation is expected to have a drawdown in excess of 2 m. • One bore (GW966836) in the Garrawilla Volcanics is expected to have a drawdown in excess of 2 m. Consideration of the potential impacts against the Significant impact guidelines: Coal seam gas and large coal mining developments - impacts on water resources (DotE, 2013) concludes that the Project is unlikely to have a significant impact on groundwater resources (HydroSimulations, 2019). Beyond the existing approved impacts associated with Project Approval (08_0144), the Action is: • unlikely to directly or indirectly result in a substantial change in the hydrology of water resources; and • unlikely to directly or indirectly result in a substantial change in the water quality of water resources. Groundwater Monitoring and Water Management Plan Groundwater monitoring for the existing Narrabri Mine is undertaken in accordance with the Groundwater Monitoring Program (GWMP) within the approved Water Management Plan (URS Australia, 2013). The objectives of the GWMP are to establish baseline groundwater quality and water level data and to implement a program of data collection that provides a basis for assessing potential impacts of mining activities on the groundwater resources of the area. The groundwater monitoring network currently consists of more than 50 monitoring sites. Impacts on highly productive groundwater are not anticipated; however, groundwater level and quality monitoring would continue to be undertaken for the Action. Should unexpected impacts occur, the currently approved Water Management Plan (URS Australia, 2013) incorporates a Surface and Groundwater Response Plan which includes a process to deal with a complaint received in relation to loss of groundwater supply. NCOPL would continue

Water Resource	Impact
	to implement the approved Surface and Groundwater Response Plan (or latest approved version) for the Action. Water Licensing With respect to water licensing, under the Water Management Act, 2000, all water taken by aquifer interference activities is required to be accounted for within the extraction limits set by any relevant Water Sharing Plans (WSPs) (i.e. state water resource plans). Therefore, licensing under the Water Management Act, 2000 is required to account for any loss of water as a result of the Action from the coal seams and adjacent hardrock and alluvial aquifers. The Action is located within the Namoi Water Management Area and is subject directly (and indirectly) to the water sharing rules of the following WSPs under the Water Management Act, 2000: • Water Sharing Plan for the NSW Murray-Darling Basin Porous Rock Groundwater Sources 2011 (Gunnedah – Oxley Basin Murray Darling Basing [MDB] Groundwater Source); • Water Sharing Plan for the NSW Great Artesian Basin Groundwater Sources 2008 (Southern Recharge Groundwater Source); • Water Sharing Plan for the Upper and Lower Namoi Groundwater Sources 2003 (Upper Namoi Zone 5 Namoi Valley [Gins Leap to Narrabri] Groundwater Source); and • Water Sharing Plan for the Upper Namoi and Lower Namoi Regulated River Water Sources 2016 (Lower Namoi Regulated River Water Source). NCOPL currently holds adequate licences to account for the potential take of water associated with the Action in the Upper Namoi Zone 5 Namoi Valley (Gins Leap to Narrabri) Groundwater Source and Lower Namoi Regulated River Water Source (HydroSimulations, 2019). NCOPL also holds significant licence shares in the Gunnedah - Oxley Basin MDB Groundwater Source and Southern Recharge Groundwater Source. NCOPL would obtain additional licence shares as required to account for the potential take of water associated with the Action in the Gunnedah – Oxley Basin MDB Groundwater Source and the Southern Recharge Groundwater Source (HydroSimulations, 2019). Following completion of the Action, NCOPL

Water Resource	Impact
	would surrender any licence entitlements required to account for post-closure water takes in perpetuity.

2.9.2 Do you consider this impact to be significant?

No

2.10 Is the proposed action a nuclear action?

No

2.11 Is the proposed action to be taken by the Commonwealth agency?

No

2.12 Is the proposed action to be undertaken in a Commonwealth Heritage Place Overseas?

No

2.13 Is the proposed action likely to have ANY direct or indirect impact on any part of the environment in the Commonwealth marine area?

No

Section 3 - Description of the project area

Provide a description of the project area and the affected area, including information about the following features (where relevant to the project area and/or affected area, and to the extent not otherwise addressed in Section 2).

3.1 Describe the flora and fauna relevant to the project area.

Flora surveys have been conducted within the Action area and surrounds by ELA (in prep.). Survey techniques included full floristic vegetation integrity plots, searches for listed threatened ecological communities, and targeted searches for threatened species.

Fauna surveys and habitat assessments have been conducted within the Action area surrounds by ELA (in prep.). Survey techniques consisted of active searches, bird surveys, spotlighting, bat call detection, motion detection cameras, Koala Spot Assessment Technique, trapping (Elliott trapping, pitfall traps, funnel traps and harp traps) and cave searches (ELA, in prep.).

Threatened species and communities potentially impacted by the works to be undertaken within the Action area are summarised in Section 2.4.

Threatened ecological communities mapped within the Action area are shown on Figure 4.

Vertebrate fauna species located within the Action area and surrounds include amphibians, reptiles (including skinks, snakes and geckos), birds (both migratory and non-migratory) and mammals (ELA, in prep.).

A number of animal pests have been recorded in the Action area, including *Sus scrofa* (Pig), *Vulpes vulpes* (Red Fox), *Felis catus* (Cat), *Capra hircus* (Goat), *Lepus capensis* (Brown Hare) and (ELA, in prep.).

3.2 Describe the hydrology relevant to the project area (including water flows).

The Action area is located in the Namoi River catchment, within the tributary catchments of Kurrajong Creek, Pine Creek and Tulla Mullen Creek (WRM, 2015) (Figure 6). A number of unnamed ephemeral tributaries also traverse the Action area in the south and south-east.

There are no perennial watercourses in the Action area, the closest being the Namoi River (located approximately 5 km north-east of the Action area) (Figure 6).

Kurrajong Creek originates near the south-western corner of the Action area and together with its tributaries, traverses the southern portion of the Action area, draining to Tulla Mullen Creek, which in turn drains into the Namoi River approximately 4 km upstream of the Turrawan gauging station. The total catchments areas of Pine and Kurrajong Creeks are 76 km2 and 62 km2 respectively (WRM, 2015).

Kurrajong Creek and Pine Creek are ephemeral, generally flowing for short periods after significant rainfall events or protracted wet periods. Base flows in these creeks are insignificant (WRM, 2015).

3.3 Describe the soil and vegetation characteristics relevant to the project area.

Soils

Regional Australian Soil Classification mapping available from the OEH identifies Vertosols, Sodosols, Rudosols and Tenosols, Ferrosols, and Chromosols in the Action area (Soil Management Designs, 2019). There are no soil landscape maps from the NSW Government for the Action area (Soil Management Designs, 2019).

Vegetation

ELA (in prep.) identified 11 Plant Community Types (PCTs) that occur within the Action area and surrounds. They include:

(a) PCT 55 - *Belah woodland on alluvial plains and low rises in the central NSW wheatbelt to Pilliga and Liverpool Plains regions;*

(b) PCT 88 - *Pilliga Box - White Cypress Pine - Buloke shrubby woodland in the Brigalow Belt South Bioregion;*

(c) PCT 397 - *Poplar Box - White Cypress Pine shrub grass tall woodland of the Pilliga - Warialda region, Brigalow Belt South Bioregion;*

(d) PCT 401 - *Rough-barked Apple -red gum - cypress pine woodland on sandy flats, mainly in the Pilliga Scrub region;*

(e) PCT 404 - *Red Ironbark - White Bloodwood +/- Burrows Wattle heathy woodland on sandy soil in the Pilliga forests;*

(f) PCT 405 - *White Bloodwood - Red Ironbark - Black Cypress Pine shrubby sandstone*

woodland of the Pilliga Scrub and surrounding regions;

(g) PCT 406 - *White Bloodwood - Motherumbah - Red Ironbark shrubby sandstone hill woodland / open forest mainly in east Pilliga forests;*

(h) PCT 408 - *Dirty Gum (Baradine Gum) - Black Cypress Pine - White Bloodwood shrubby woodland on of the Pilliga forests and surrounding region;*

(i) PCT 432 - *Dwyer's Red Gum - Dirty (Baradine) Gum - cypress pine shrubby woodland of the Narrabri region of the Brigalow Belt South Bioregion;*

(j) PCT 434 - *White Box grass shrub hill woodland on clay to loam soils on volcanic and sedimentary hills in the southern Brigalow Belt South Bioregion; and*

(k) PCT 435 - *White Box - White Cypress Pine shrub grass hills woodland in the Brigalow Belt South Bioregion and Nandewar Bioregion.*

3.4 Describe any outstanding natural features and/or any other important or unique values relevant to the project area.

There are no outstanding natural features within the Action area.

3.5 Describe the status of native vegetation relevant to the project area.

Refer to Section 3.1.

3.6 Describe the gradient (or depth range if action is to be taken in a marine area) relevant to the project area.

The Narrabri Mine is located in the New England North West region of NSW, which includes the Namoi River valley and associated agricultural land uses and elevated, vegetated country managed as State Forests and National Parks.

Topography in the vicinity of the Action is characterised by the vegetated, hilly country of Jacks Creek State Forest and Pilliga East State Forest to the west, grading down to the alluvial plains associated with the Namoi River to the east.

Within the Action area, topography ranges from approximately 370 metres Australian Height Datum (m AHD) in the south-west to approximately 240 m AHD in the east.

3.7 Describe the current condition of the environment relevant to the project area.

The Action area contains significant areas of remnant native vegetation, areas of derived native grassland, and also contains areas of cleared land. The western portion of the Action area contains intact native vegetation which is dissected by fire trails and is contiguous with the native vegetation within the much larger Pilliga Forest to the west. The eastern portion of the Action area contains cleared agricultural land as well as remnant patches of woodland and derived native grassland (ELA, in prep.).

Three priority weed species listed under the NSW *Biosecurity Act, 2015* were identified within the Action area, namely African Boxthorn (*Lycium ferocissimum*), Prickly Pear (*Opuntia stricta*) and Silverleaf Nightshade (*Solanum elaeagnifolium*) (ELA, in prep.). These three species are also listed as Weeds of National Significance. In addition, non-listed weed species also occur across the Action area and surrounds.

A number of feral pests have also been recorded in the Action area and surrounds, including Pig (*Sus scrofa*), Red Fox (*Vulpes vulpes*), Cat (*Felis catus*), Goat (*Capra hircus*) and Brown Hare (*Lepus capensis*). (ELA, in prep.).

3.8 Describe any Commonwealth Heritage Places or other places recognised as having heritage values relevant to the project area.

There are no Commonwealth Heritage Places within the Action area or its surrounds (DEE, 2018b). Notwithstanding, an Aboriginal Cultural Heritage Assessment would be prepared as part of the EIS process.

3.9 Describe any Indigenous heritage values relevant to the project area.

No lands, places, buildings or structures listed on the State Heritage Register under the NSW *Heritage Act, 1977* occur within the Action area or surrounds. Notwithstanding, a Historic Heritage Assessment would be prepared as part of the EIS process.

3.10 Describe the tenure of the action area (e.g. freehold, leasehold) relevant to the project area.

Relevant land ownership for parcels of land within the Action area and surrounds are shown on Figure 4.

3.11 Describe any existing or any proposed uses relevant to the project area.

The existing/approved land use in the vicinity of the Narrabri Mine and the Action is characterised by a combination of mining and agricultural (sheep and cattle grazing, cereal production and horticulture) land uses, as well as the Pilliga East State Forest.

Minor surface disturbance areas that would be progressively rehabilitated include those associated with surface exploration activities, underground mine surface infrastructure (e.g. surface gas drainage works, service boreholes, access tracks), environmental monitoring and management activities (e.g. installation of monitoring equipment) and mine subsidence surface impacts. These areas would be rehabilitated to their agreed post-mining land use (e.g. agricultural use or native vegetation).

Section 4 - Measures to avoid or reduce impacts

Provide a description of measures that will be implemented to avoid, reduce, manage or offset any relevant impacts of the action. Include, if appropriate, any relevant reports or technical advice relating to the feasibility and effectiveness of the proposed measures.

Examples of relevant measures to avoid or reduce impacts may include the timing of works, avoidance of important habitat, specific design measures, or adoption of specific work practices.

4.1 Describe the measures you will undertake to avoid or reduce impact from your proposed action.

Potential impacts to threatened species and other Matters of National Environmental Significance (MNES) would be minimised and managed through the implementation of the measures described below.

Biodiversity

Potential impacts on biodiversity at the Narrabri Mine are managed in accordance with an approved Biodiversity Management Plan. The management measures implemented at the existing operations would continue for the Action.

Any vegetation clearing would follow the protocol outlined in the existing Biodiversity Management Plan, which includes:

(a) Pre-clearing surveys being undertaken by a qualified ecologist to identify if any threatened species, populations or communities (or their habitat) are present.

(b) Determining appropriate paths for access tracks and other disturbance with the aim of least impact on environmental values where possible.

(c) Relocating or re-orientating proposed disturbance if threatened species, populations or communities or their habitat are identified. If the relocation or re-orientation of the area to be disturbed is not practicable (for reasons of mine / operational safety), a qualified ecologist will relocate any fauna species residing within the area to be cleared.

In addition to the above, the existing terrestrial fauna monitoring programme would be expanded and used to assess the potential environmental consequences of the recorded subsidence impacts, including the nature and extent of impacts on flora and fauna habitats and evidence of impacts on terrestrial fauna. The implementation of management measures will be considered with regard to the specific circumstances of the subsidence impact (e.g. the location, nature and extent of the impact) and the assessment of the environmental consequence.

The Project will be assessed under the NSW *Biodiversity Conservation Act, 2016* and a biodiversity offset will be provided as a means of reducing impacts, if required.

Water Management

The site water management strategy for the Narrabri Mine is based on the containment and re-use of mine water while diverting upstream water around the Narrabri Mine. The approved water management system currently includes:

(a) up-catchment diversion structures;

(b) raw water storage dams;

(c) saline water storage dams;

(d) filtered water storage dams;

(e) brine storage dams;

(f) sediment dams;

(g) evaporation ponds;

(h) reverse osmosis plant;

(i) Namoi River water pipeline and pump station;

(j) Namoi River licensed discharge point; and

(k) other water transfer infrastructure (i.e. tanks, pumps and pipelines).

Water management at the Narrabri Mine is conducted in accordance with the Water

Management Plan (including discharge under the conditions of Environment Protection Licence 12789). The water management system is progressively developed, subject to its ongoing performance, prevailing climatic conditions and actual underground mine inflows.

Rehabilitation

Minor surface disturbance areas that would be progressively rehabilitated include those associated with surface exploration activities, underground mine surface infrastructure (e.g. surface gas drainage works, service boreholes, access tracks), environmental monitoring and management activities (e.g. installation of monitoring equipment) and mine subsidence surface impacts. These areas would be rehabilitated to their agreed post-mining land use (e.g. agricultural use or native vegetation).

Soil resource management practices would involve the stripping and stockpiling of soil resources prior to any mine-related disturbance. The objectives of soil resource management for the Action would be to:

(a) Identify and quantify potential soil resources for rehabilitation.

(b) Optimise the recovery of useable topsoil and subsoil during stripping operations.

(c) Manage topsoil and subsoil reserves so as not to degrade whilst stockpiled.

(d) Establish effective soil amelioration procedures to maximise the availability of soil for future rehabilitation.

(e) Take into account the need to provide soil conditions that minimise the risk of soil loss via wind and water erosion during and after rehabilitation.

Soil Management Designs (2019) has developed soil resource management measures that would be considered in the preparation of the EIS and Rehabilitation Management Plan for the Action.

4.2 For matters protected by the EPBC Act that may be affected by the proposed action, describe the proposed environmental outcomes to be achieved.

An assessment of potential impacts associated with the Action (outlined in Section 2) indicates that it will not significantly impact any MNES and is therefore not considered to be a controlled

action. Any residual impacts on MNES would be appropriately managed and / or mitigated through the implementation of relevant environmental plans or strategies to further minimise the impacts of the proposal.

Section 5 – Conclusion on the likelihood of significant impacts

A checkbox tick identifies each of the matters of National Environmental Significance you identified in section 2 of this application as likely to be a significant impact.

Review the matters you have identified below. If a matter ticked below has been incorrectly identified you will need to return to Section 2 to edit.

5.1.1 World Heritage Properties

No

5.1.2 National Heritage Places

No

5.1.3 Wetlands of International Importance (declared Ramsar Wetlands)

No

5.1.4 Listed threatened species or any threatened ecological community

No

5.1.5 Listed migratory species

No

5.1.6 Commonwealth marine environment

No

5.1.7 Protection of the environment from actions involving Commonwealth land

No

5.1.8 Great Barrier Reef Marine Park

No

5.1.9 A water resource, in relation to coal/gas/mining

No

5.1.10 Protection of the environment from nuclear actions

No

5.1.11 Protection of the environment from Commonwealth actions

No

5.1.12 Commonwealth Heritage places overseas

No

5.2 If no significant matters are identified, provide the key reasons why you think the proposed action is not likely to have a significant impact on a matter protected under the EPBC Act and therefore not a controlled action.

On the basis of the reasons provided in Section 2, the Action is not considered to be a controlled action as it is not likely to have a significant impact on:

(a) the World Heritage values of a declared World Heritage property;

(b) the National Heritage values of a National Heritage Place;

(c) the ecological character of a wetlands of international importance;

(d) a listed threatened species, community, or their habitat;

(e) a listed migratory species;

(f) the environment in a Commonwealth marine area;

(g) the environment on Commonwealth land;

(h) the environment from nuclear action;

(i) the Great Barrier Reef Marine Park; or

(j) a water resource, in relation to coal seam gas development and large coal mining development.

Section 6 – Environmental record of the person proposing to take the action

Provide details of any proceedings under Commonwealth, State or Territory law against the person proposing to take the action that pertain to the protection of the environment or the conservation and sustainable use of natural resources.

6.1 Does the person taking the action have a satisfactory record of responsible environmental management? Please explain in further detail.

NCOPL has a strong record in mine safety, environmental care and business operation. NCOPL conducts its mining operations in accordance with a range of regulatory consents, leases and licences.

After years of mining in the Northern Inland Region, Whitehaven and its subsidiaries (including NCOPL) have established and are committed to continue open and constructive dialogue with the local community and stakeholders.

6.2 Provide details of any past or present proceedings under a Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources against either (a) the person proposing to take the action or, (b) if a permit has been applied for in relation to the action – the person making the application.

N/A

6.3 If it is a corporation undertaking the action will the action be taken in accordance with the corporation's environmental policy and framework?

Yes

6.3.1 If the person taking the action is a corporation, please provide details of the corporation's environmental policy and planning framework.

Whitehaven has a documented Health, Safety and Environmental policy that applies to NCOPL, which states:

Whitehaven Coal intends to conduct business in a way that maintains a safe and healthy workplace for its workers, visitors and the surrounding community, and protects the environmental, community and cultural heritage values of the area throughout all stages of

exploration, development, operation, closure and associated activities.

Whitehaven Coal aims to:

Achieve zero workplace injuries and illnesses.Achieve zero environmental incidents.Maintain mutually beneficial relationships with the communities which host our operations.

Whitehaven Coal will strive to achieve these goals by:

Considering health, safety, environment and community (HSEC) matters when planning and undertaking work activities.Consulting and communicating HSEC matters in a fair and effective manner.Having processes in place for identifying and eliminating or minimising HSEC risks and impacts and sharing and applying learnings' in a timely manner.Working to continuously improve HSEC performance.Providing an effective injury management and return to work program for workers.Complying with applicable HSEC legal and other requirements.Providing workers with necessary HSEC information, instruction, training and supervision to enable effective performance of their work.Utilising HSEC resources and processes to implement and maintain the requirements of this Policy and associated management systems.

Responsibilities of Workers:

Workers have a responsibility to comply with applicable legislation, this policy and associated management systems. No work is to be undertaken without a clear understanding of a safe method that minimises the risk of injury or illness, plant or equipment damage, environmental, community or cultural harm.Workers must present for work in a fit and healthy state, take reasonable care for their own health and safety and have an obligation to take reasonable care for the health and safety of others.Workers must report any workplace incidents or injuries to their supervisors in a timely manner.Workers must also comply with any reasonable instruction given by Whitehaven Coal.

This policy applies to all workers and visitors at sites managed by Whitehaven Coal and its subsidiaries. Disciplinary action may be taken for a breach of this policy or associated management systems.

6.4 Has the person taking the action previously referred an action under the EPBC Act, or been responsible for undertaking an action referred under the EPBC Act?

Yes

6.4.1 EPBC Act No and/or Name of Proposal.

Narrabri Coal Mine, Stage 2 Longwall Project, Narrabri, NSW (EPBC 2009/5003).

Section 7 – Information sources

You are required to provide the references used in preparing the referral including the reliability of the source.

7.1 List references used in preparing the referral (please provide the reference source reliability and any uncertainties of source).

Reference Source	Reliability	Uncertainties
Atlas of Living Australia (2018) Spatial Database Records. Search Area: -30.11922 149.40185,-30.11922 150.12561,-30.99997 150.12561, -30.99997 149.40185. Accessed: March 2018.	Reliable source of information containing threatened species records, distribution and habitat requirement.	N/A
Aquaterra Pty Ltd (2009) Narrabri Coal Mine Stage 2 Longwall Project Hydrogeological Assessment. Report for Narrabri Coal Operations Pty Ltd, November 2009.	Assessment prepared for the Narrabri Coal Mine Stage 2 Longwall Project	N/A
Bureau of Meteorology (2019) Groundwater Dependent Ecosystems Atlas. Website: http://www.bom.gov.au/water/groundwater/gde/map.shtml Accessed: March 2018.	Reliable source of information containing mapping of groundwater dependent ecosystems.	N/A
CDM Smith (2016) Narrabri Gas Project Groundwater Impact Assessment. Report for Santos Limited, October 2016. Assessment prepared for the Narrabri Gas Project. N/A	Assessment prepared for the Narrabri Gas Project.	N/A
Department of the Environment (2013) Significant impact guidelines: Coal seam gas and large coal mining developments – impacts on water resources.	Published guideline prepared by the Commonwealth Department of the Environment and Energy.	N/A
Department of the Environment and Energy (2018a) Species Profiles and Threats Database. Website: http://www.environment.gov.au/cgi-	Reliable source of desktop information. Website of the Commonwealth Department of the Environment and Energy. Contains information on	N/A

Reference Source	Reliability	Uncertainties
bin/sprat/public/sprat.pl Accessed March 2018.	threatened species' distribution, population, life cycle, threats and habitat requirement.	
Department of the Environment and Energy (2018b) Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) Protected Matters Search. Search area: -30.62203 149.877424,-30.620786 149.81418,-30.539891 149.815262,-30.541446 149.877424 Data received: March 2018.	Well known database search suggested by the Commonwealth Department of the Environment and Energy to identify potentially occurring matters of national environmental significance.	N/A
Ditton Geotechnical Services Pty Ltd (2019) Narrabri Underground Mine Stage 3 Extension Project Gateway Application – Subsidence Assessment.	Assessment prepared for the Narrabri Underground Mine Stage 3 Extension Project	N/A
Eco Logical Australia (2016) Narrabri South Exploration Program - Flora and Fauna Impact Assessment. Prepared for Narrabri Coal Operations Pty Ltd.	Survey report.	N/A
Eco Logical Australia (2017) Narrabri Mine LW101-LW106: Biodiversity – 2016 Monitoring Report Volume 2 – Appendices. Prepared for Narrabri Coal Operations Pty Ltd. Survey report. N/A	Survey report.	N/A
Eco Logical Australia (2019) Narrabri Underground Mine Stage 3 Extension Project Agricultural Impact Assessment.	Assessment prepared for the Narrabri Underground Mine Stage 3 Extension Project	N/A
Ecotone Ecological Consultants (2009) Narrabri Coal Mine Stage 2 Longwall Project Flora and Fauna Impact Assessment. Prepared for Narrabri Coal Operations Pty Ltd.	Assessment prepared for the Narrabri Coal Mine Stage 2 Longwall Project	N/A
FloraSearch (2009) Narrabri Coal Mine EPBC Referral –	Assessment prepared for the Narrabri Coal Mine Stage 2	N/A

Reference Source	Reliability	Uncertainties
Supplementary Flora Survey and Assessment.	Referral	
HydroSimulations (2015) Narrabri Mine Modification - Groundwater Assessment.	Assessment prepared for the Narrabri Coal Mine Modification 5 Longwall Project	N/A
HydroSimulations (2019) Narrabri Underground Mine Stage 3 Extension Project Gateway Application – Preliminary Groundwater Assessment.	Assessment prepared for the Narrabri Underground Mine Stage 3 Extension Project	N/A
Office of Environment and Heritage (2019) Bionet Atlas Search for Area. Data received: March 2019.	Well known database search suggested by the New South Wales Office of Environment and Heritage to identify potentially occurring MNES.	N/A
O'Grady A.P, McNamara J, Welsh W.D, Holland K.L, Aryal S.K., Mount R.E. and Marston F.M., (2015), Description of the water-dependent asset register for the Namoi subregion. Product 1.3 for the Namoi subregion from the Northern Inland Catchments Bioregional Assessment. Department of the Environment, Bureau of Meteorology, CSIRO and Geoscience Australia, Australia	Reliable source of information prepared as part of the Commonwealth Government's bioregional assessments.	N/A
Soil Management Designs (2019) Narrabri Underground Mine Stage 3 Extension Project Gateway Application – Agricultural Resource Assessment.	Assessment prepared for the Narrabri Underground Mine Stage 3 Extension Project	N/A
URS Australia (2013) Narrabri Mine Water Management Plan.	Management Plan prepared for the existing operations at the Narrabri Mine.	N/A
WRM Water & Environment (2015) Narrabri Mine Modification 5 – Surface Water Assessment. Report prepared for Narrabri Coal Operations Pty Ltd. Appendix C of the Narrabri Mine Modification 5 Environmental Assessment.	Assessment prepared for the Narrabri Coal Mine Modification 5 Longwall Project	N/A

Section 8 – Proposed alternatives

You are required to complete this section if you have any feasible alternatives to taking the proposed action (including not taking the action) that were considered but not proposed.

8.0 Provide a description of the feasible alternative?

In addition to the alternative of not proceeding a number of alternatives were identified and explored in refining the scope and characteristics of the Action. The alternative of not proceeding would result in the loss of substantial economic benefits that would otherwise accrue locally or on a State and/or national level, including rates, royalties and taxes, community enhancement projects and the continuation of full-time mine workers and support staff. On this basis, NCOPL does not consider this option to be feasible.

The location of the Action has been determined by the presence of the coal resource able to be economically mined. The location of the Action also maximises the use of existing facilities and provides for the continuation of existing mining operations (i.e. thereby minimising new disturbance areas). Alternative locations for the Action therefore are not relevant for consideration.

8.1 Select the relevant alternatives related to your proposed action.

8.27 Do you have another alternative?

No

Section 9 – Contacts, signatures and declarations

Where applicable, you must provide the contact details of each of the following entities: Person Proposing the Action; Proposed Designated Proponent and; Person Preparing the Referral. You will also be required to provide signed declarations from each of the identified entities.

9.0 Is the person proposing to take the action an Organisation or an Individual?

Organisation

9.2 Organisation

9.2.1 Job Title

Director NCO Stage 3 Project

9.2.2 First Name

David

9.2.3 Last Name

Ellwood

9.2.4 E-mail

DEllwood@whitehavencoal.com.au

9.2.5 Postal Address

Locked Bag 1002
Narrabri NSW 2390
Australia

9.2.6 ABN/ACN

ABN

15129850139 - Narrabri Coal Operations Pty Ltd

9.2.7 Organisation Telephone

0267944184

9.2.8 Organisation E-mail

DEllwood@whitehavencoal.com.au

9.2.9 I qualify for exemption from fees under section 520(4C)(e)(v) of the EPBC Act because I am:

Not applicable

Small Business Declaration

I have read the Department of the Environment and Energy's guidance in the online form concerning the definition of a small a business entity and confirm that I qualify for a small business exemption.

Signature:..... Date: .....

9.2.9.2 I would like to apply for a waiver of full or partial fees under Schedule 1, 5.21A of the EPBC Regulations

No

9.2.9.3 Under sub regulation 5.21A(5), you must include information about the applicant (if not you) the grounds on which the waiver is sought and the reasons why it should be made

Person proposing the action - Declaration

I, David Ellwood, declare that to the best of my knowledge the information I have given on, or attached to the EPBC Act Referral is complete, current and correct. I understand that giving false or misleading information is a serious offence. I declare that I am not taking the action on behalf of or for the benefit of any other person or entity.

Signature: D.Ellwood Date: 5/4/19

I, David Ellwood, the person proposing the action, consent to the designation of Narrabri Coal Operations Pty Ltd as the proponent of the purposes of the action describe in this EPBC Act Referral.

Signature: D.Ellwood Date: 5/4/19

9.3 Is the Proposed Designated Proponent an Organisation or Individual?

Organisation

9.5 Organisation

9.5.1 Job Title

Director NCO Stage 3 Project

9.5.2 First Name

David

9.5.3 Last Name

Ellwood

9.5.4 E-mail

DEllwood@whitehavencoal.com.au

9.5.5 Postal Address

Locked Bag 1002
Narrabri NSW 2390
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9.5.6 ABN/ACN

ABN

15129850139 - Narrabri Coal Operations Pty Ltd

9.5.7 Organisation Telephone

0267944184

9.5.8 Organisation E-mail

DEllwood@whitehavencoal.com.au

Proposed designated proponent - Declaration

I, David Ellwood, the proposed designated proponent, consent to the designation of myself as the proponent for the purposes of the action described in this EPBC Act Referral.

Signature: D.Ellwood Date: 9/4/19

9.6 Is the Referring Party an Organisation or Individual?

Organisation

9.8 Organisation

9.8.1 Job Title

Director NCO Stage 3 Project

9.8.2 First Name

David

9.8.3 Last Name

Ellwood

9.8.4 E-mail

DEllwood@whitehavencoal.com.au

9.8.5 Postal Address

Locked Bag 1002
Narrabri NSW 2390
Australia

9.8.6 ABN/ACN

ABN

15129850139 - Narrabri Coal Operations Pty Ltd

9.8.7 Organisation Telephone

0267944184

9.8.8 Organisation E-mail

DEllwood@whitehavencoal.com.au

Referring Party - Declaration

I, David Ellwood, I declare that to the best of my knowledge the information I have given on, or attached to this EPBC Act Referral is complete, current and correct. I understand that giving false or misleading information is a serious offence.

Signature: D. Ellwood Date: 5/4/19

Appendix A - Attachments

The following attachments have been supplied with this EPBC Act Referral:

1. Figures (lo-res of figures submitted 26 March 2019).zip
2. Figures.zip
3. Indicative Extent of Proposed EPBC Action Area.zip
4. Preliminary Groundwater Assessment_Part 1 (lo-res).pdf
5. Preliminary Groundwater Assessment_Part 2 (lo-res).pdf
6. Preliminary Groundwater Assessment_Part 3 (lo-res).pdf