



**Narrabri Underground Mine
Stage 3 Extension Project**

Environmental Impact Statement

TABLE OF CONTENTS

EXECUTIVE SUMMARY	ES-1		1.6	DOCUMENT STRUCTURE	1-12
ES1	BACKGROUND	ES-1	2	PROJECT DESCRIPTION	2-1
ES2	THE PROJECT	ES-1	2.1	DESCRIPTION OF THE APPROVED NARRABRI MINE	2-1
	ES2.1 OVERVIEW OF THE EXISTING/APPROVED NARRABRI MINE	ES-1	2.1.1	Underground Mining Operations	2-1
	ES2.2 OVERVIEW OF THE PROJECT	ES-1	2.1.2	Pit Top Area	2-3
	ES2.3 PROJECT DEVELOPMENT ACTIVITIES	ES-5	2.1.3	Coal Handling, Processing and Transport	2-6
	ES2.4 UNDERGROUND MINING OPERATIONS	ES-7	2.1.4	Reject Management	2-6
	ES2.5 ROM COAL HANDLING AND PREPARATION	ES-11	2.1.5	Ventilation Infrastructure	2-7
	ES2.6 PRODUCT COAL HANDLING AND TRANSPORT	ES-11	2.1.6	Gas Management Infrastructure	2-7
	ES2.7 MANAGEMENT OF REJECT AND EXPLORATION WASTE MATERIAL	ES-11	2.1.7	Exploration Drilling	2-8
	ES2.8 WATER MANAGEMENT	ES-12	2.1.8	Mine Safety Pre-conditioning	2-8
	ES2.9 INFRASTRUCTURE AND SERVICES	ES-12	2.1.9	Site Water Management	2-8
	ES2.10 IMPACT REDUCTION AREA DEVELOPMENT FOOTPRINT	ES-12	2.1.10	Other Infrastructure and Supporting Systems	2-10
	ES2.11 WORKFORCE	ES-12	2.1.11	Workforce	2-11
ES3	ASSESSMENT PROCESS	ES-13	2.1.12	Rehabilitation and Remediation Activities	2-11
	ES3.1 NEW SOUTH WALES	ES-13	2.1.13	Environmental Monitoring and Management	2-12
	ES3.2 COMMONWEALTH	ES-13	2.2	PROJECT GENERAL ARRANGEMENT	2-12
	ES3.3 DETERMINATION	ES-13	2.3	COAL RESOURCE AND GEOLOGICAL FEATURES	2-16
ES4	ENGAGEMENT	ES-14	2.3.1	Stratigraphy and Seam Characteristics	2-18
ES5	KEY ENVIRONMENTAL ISSUES AND PROJECT MITIGATION	ES-14	2.3.2	Geological Features	2-18
	ES5.1 SUBSIDENCE	ES-14	2.3.3	Coal Resource and Resource Recovery	2-18
	ES5.2 WATER RESOURCES	ES-15	2.3.4	Spontaneous Combustion Potential	2-21
	ES5.3 LAND RESOURCES AND AGRICULTURE	ES-16	2.4	PROJECT SCHEDULE	2-21
	ES5.4 BIODIVERSITY	ES-17	2.5	PROJECT DEVELOPMENT ACTIVITIES	2-21
	ES5.5 AIR QUALITY AND NOISE	ES-17	2.5.1	Indicative Surface Development Footprint	2-23
	ES5.6 GREENHOUSE GAS EMISSIONS	ES-18	2.5.2	Development of Access and Supporting Infrastructure for Underground Mining Areas	2-24
	ES5.7 ABORIGINAL CULTURAL HERITAGE	ES-18	2.5.3	Mining Machinery Replacement and Upgrades	2-24
	ES5.8 ROAD TRANSPORT	ES-18	2.5.4	Services Corridors and Access Tracks	2-24
	ES5.9 ECONOMIC EFFECTS, SOCIAL AND COMMUNITY INFRASTRUCTURE	ES-18	2.5.5	Mine Ventilation Infrastructure	2-24
	ES5.10 REHABILITATION AND MINE CLOSURE	ES-19	2.5.6	Gas Management Infrastructure	2-26
	ES5.11 ENVIRONMENTAL MONITORING	ES-19	2.5.7	Exploration Boreholes	2-27
ES6	PROJECT ALIGNMENT WITH FUTURE OF COAL STATEMENT	ES-19	2.5.8	Service Boreholes	2-27
ES7	CONCLUSION	ES-22	2.5.9	Mine Safety Pre-conditioning	2-28
1	INTRODUCTION	1-1	2.5.10	Water Management System	2-29
	1.1 PROJECT SUMMARY	1-1	2.5.11	Coal Handling and Preparation Facility	2-29
	1.1.1 Purpose of This Report	1-1	2.6	UNDERGROUND MINING OPERATIONS	2-30
	1.1.2 Project Objectives	1-3	2.6.1	Mining Method	2-30
	1.1.3 Site Location and Tenure	1-3			
	1.1.4 Applicant	1-3			
	1.2 OVERVIEW OF THE APPROVED NARRABRI MINE	1-6			
	1.3 PROJECT INTERACTION WITH THE APPROVED NARRABRI MINE	1-7			
	1.4 SECRETARY'S ENVIRONMENTAL ASSESSMENT REQUIREMENTS	1-7			
	1.5 PROJECT CONSULTANTS	1-11			

TABLE OF CONTENTS (Continued)

2.6.2	Longwall Mining Layout	2-30	2.13	MANAGEMENT OF DANGEROUS GOODS	2-46
2.6.3	Indicative Mining Schedule	2-32	2.13.1	Transport	2-46
2.6.4	Underground Mine Access	2-32	2.13.2	Hydrocarbon Storage	2-47
2.6.5	Major Underground Equipment and Mobile Fleet	2-34	2.13.3	Explosives Storage	2-47
2.6.6	Mine Ventilation Systems	2-34	2.13.4	Other Dangerous Goods	2-47
2.6.7	Mine Safety Gas Management	2-34	2.14	REHABILITATION AND REMEDIATION ACTIVITIES	2-47
2.6.8	Mine Safety Pre-conditioning	2-35	2.14.1	Conceptual Final Landform Design	2-47
2.6.9	Water Management	2-35	2.14.2	Post-mining Land Use	2-48
2.6.10	Other Supporting Infrastructure	2-35	2.15	IMPACT REDUCTION AREA DEVELOPMENT FOOTPRINT	2-48
2.7	ROM COAL HANDLING AND PREPARATION	2-35	2.16	WORKFORCE	2-48
2.7.1	ROM Coal Sizing, Stockpiling and Transport	2-37	3	STRATEGIC CONTEXT	3-1
2.7.2	Coal Handling and Preparation Plant	2-37	3.1	REGIONAL STRATEGIC CONTEXT	3-1
2.8	PRODUCT COAL HANDLING AND TRANSPORTATION	2-37	3.2	PROJECT STRATEGIC CONTEXT	3-1
2.9	MANAGEMENT OF REJECT AND EXPLORATION WASTE MATERIAL	2-37	3.2.1	Project Area	3-1
2.9.1	CHPP Reject Material Production	2-37	3.2.2	Mining Tenements	3-1
2.9.2	Geochemical Characteristics of CHPP Reject Material	2-38	3.2.3	Existing/Approved Narrabri Mine Infrastructure	3-2
2.9.3	Exploration Waste from Other Whitehaven Exploration Activities	2-38	3.3	POTENTIAL CUMULATIVE INTERACTIONS WITH OTHER PROJECTS	3-2
2.9.4	Reject Management	2-38	3.4	KEY ENGAGEMENT OUTCOMES	3-4
2.10	WATER MANAGEMENT	2-38	3.5	RELEVANT STRATEGIC PLANNING DOCUMENTS	3-4
2.10.1	Project Site Water Management System	2-38	3.5.1	Development Control Plans	3-4
2.10.2	Groundwater Inflows	2-42	3.5.2	Strategic Statement on Coal Exploration and Mining In NSW	3-4
2.10.3	Water Consumption	2-42	3.5.3	New England North West Regional Plan 2036	3-6
2.10.4	Namoi River Discharge	2-43	3.5.4	Narrabri Shire Community Strategic Plan 2017–2027	3-7
2.10.5	Simulated Performance of the Site Water Management System	2-43	3.5.5	North West Local Land Services – Local Strategic Plan 2016–2021	3-7
2.11	INFRASTRUCTURE AND SERVICES	2-43	3.5.6	Climate Change	3-7
2.11.1	Surface Facilities	2-43	3.5.7	Other Relevant NSW Assessment Policies	3-10
2.11.2	Site Access	2-43	3.6	STRATEGIC NEED AND POTENTIAL BENEFITS OF THE PROJECT	3-10
2.11.3	Electricity Supply and Distribution	2-43	4	STATUTORY CONTEXT	4-1
2.11.4	Service Boreholes, Access Tracks and Services Corridors	2-44	4.1	EXISTING APPROVALS AND REGULATORY CONTROLS	4-1
2.11.5	Site Security and Communications	2-44	4.2	STATUTORY REQUIREMENTS FOR THE PROJECT	4-1
2.11.6	Namoi River Pump Station, Production Bore and Pipeline	2-44	4.2.1	Power to Grant Approval	4-1
2.12	WASTE MANAGEMENT	2-44	4.2.2	Permissibility	4-3
2.12.1	Production Wastes	2-45	4.2.3	Integrated Approvals	4-4
2.12.2	General Waste	2-45	4.2.4	EPBC Act Approvals	4-4
2.12.3	Hydrocarbons	2-45	4.2.5	Other Approvals	4-5
2.12.4	Sewage and Effluent	2-46	4.2.6	Approvals and Authorisations that are not Required for State Significant Development	4-6
2.12.5	Hazardous Waste	2-46	4.2.7	Preconditions to Grant of Approval	4-6
2.12.6	Other Waste	2-46	4.2.8	Mandatory Matters for Consideration	4-6

TABLE OF CONTENTS (Continued)

	4.2.9	Public Notification of the Development Application	4-16		6.6	LAND RESOURCES AND AGRICULTURE	6-48
5	ENGAGEMENT		5-1		6.6.1	Methodology	6-48
	5.1	ENGAGEMENT APPROACH	5-1		6.6.2	Existing Environment	6-49
	5.2	ENVIRONMENTAL IMPACT STATEMENT CONSULTATION	5-1		6.6.3	Assessment	6-51
	5.2.1	State Government Agencies	5-1		6.6.4	Mitigation Measures	6-56
	5.2.2	Local Government Agencies	5-8		6.7	TERRESTRIAL ECOLOGY	6-58
	5.2.3	Federal Government Agencies	5-8		6.7.1	Methodology	6-58
	5.2.4	Infrastructure Owners, Service Providers and Specialist Interest Groups	5-10		6.7.2	Existing Environment	6-60
	5.2.5	Neighbouring Landholders and Tenement Holders	5-11		6.7.3	Assessment	6-64
	5.2.6	Public Consultation	5-11		6.7.4	Mitigation Measures	6-73
	5.2.7	Aboriginal Community	5-13		6.7.5	Adaptive Measures	6-73
	5.2.8	Social Impact Assessment	5-14		6.7.6	Biodiversity Offset Strategy	6-73
	5.3	COMMUNITY INITIATIVES AND INVOLVEMENT	5-14		6.8	OPERATIONAL AND CONSTRUCTION NOISE	6-76
	5.3.1	Community Consultative Committees	5-14		6.8.1	Methodology	6-76
	5.3.2	Website and Community Call Line	5-14		6.8.2	Existing Environment	6-77
	5.3.3	Community Contact Points	5-15		6.8.3	Applicable Criteria	6-80
	5.3.4	Community Contributions, Programs and Sponsorships	5-15		6.8.4	Assessment	6-82
	5.3.5	Contractors and Suppliers	5-15		6.8.5	Mitigation Measures	6-88
	5.3.6	Public Reporting	5-15		6.8.6	Adaptive Measures	6-89
6	ASSESSMENT OF IMPACTS		6-1		6.9	AIR QUALITY	6-89
	6.1	ENVIRONMENTAL RISK ASSESSMENT	6-1		6.9.1	Methodology	6-89
	6.2	CLIMATE AND TOPOGRAPHY	6-1		6.9.2	Applicable Criteria	6-89
	6.2.1	Existing Environment	6-1		6.9.3	Existing Environment	6-90
	6.2.2	Assessment	6-7		6.9.4	Assessment	6-91
	6.3	SUBSIDENCE	6-7		6.9.5	Mitigation Measures	6-92
	6.3.1	Description of Subsidence Effects, Impacts and Consequences	6-7		6.10	VISUAL AND LANDSCAPE CHARACTER	6-94
	6.3.2	Subsidence Impacts Observed at the Existing Narrabri Mine	6-10		6.10.1	Methodology	6-94
	6.3.3	Assessment	6-11		6.10.2	Existing Environment	6-95
	6.3.4	Mitigation Measures	6-14		6.10.3	Assessment	6-97
	6.3.5	Adaptive Management	6-17		6.10.4	Mitigation Measures	6-99
	6.4	GROUNDWATER	6-17		6.11	ABORIGINAL CULTURAL HERITAGE	6-99
	6.4.1	Methodology	6-17		6.11.1	Methodology	6-99
	6.4.2	Existing Environment	6-18		6.11.2	Existing Environment	6-100
	6.4.3	Assessment	6-25		6.11.3	Assessment	6-105
	6.4.4	Licensing, Mitigation Measures and Monitoring	6-31		6.11.4	Mitigation Measures	6-105
	6.4.5	Adaptive Management	6-34		6.12	HISTORICAL HERITAGE	6-107
	6.5	SURFACE WATER	6-35		6.12.1	Methodology	6-107
	6.5.1	Methodology	6-35		6.12.2	Existing Environment	6-107
	6.5.2	Existing Environment	6-35		6.12.3	Assessment	6-108
	6.5.3	Assessment	6-43		6.12.4	Mitigation Measures	6-108
	6.5.4	Mitigation Measures and Monitoring	6-46		6.13	ROAD TRANSPORT	6-108
	6.5.5	Adaptive Measures	6-48		6.13.1	Methodology	6-108
					6.13.2	Existing Environment	6-109
					6.13.3	Assessment	6-111
					6.13.4	Mitigation Measures	6-113
					6.14	TRANSPORT NOISE	6-113
					6.14.1	Methodology	6-113
					6.14.2	Existing Environment	6-114
					6.14.3	Assessment	6-114
					6.14.4	Mitigation Measures	6-115
					6.14.5	Adaptive Measures	6-115
					6.15	ECONOMIC EFFECTS	6-115
					6.15.1	Methodology	6-115

TABLE OF CONTENTS (Continued)

6.15.2	Existing Environment	6-116	7.3.2	Considerations of the Project Against the Objects of the Environmental Protection and Biodiversity Conservation Act 1999	7-6
6.15.3	Assessment	6-116	7.3.3	Evaluation under Section 4.15(1) of the Environmental Planning and Assessment Act 1979	7-6
6.15.4	Mitigation Measures	6-118	7.3.4	Other Statutory Requirements	7-7
6.16	SOCIAL AND COMMUNITY INFRASTRUCTURE	6-118	7.3.5	Strategic Planning and Policy Objectives	7-7
6.16.1	Methodology	6-118	7.4	EVALUATION OF KEY IMPACTS AND BENEFITS	7-7
6.16.2	Existing Environment	6-119	7.4.1	Key Potential Impacts	7-7
6.16.3	Assessment	6-120	7.4.2	Key Potential Benefits	7-8
6.16.4	Mitigation Measures	6-124	7.4.3	Ecologically Sustainable Development Considerations	7-9
6.16.5	Adaptive Management	6-124	7.4.4	Consideration of the Consequences of Not Carrying Out the Project	7-15
6.17	GREENHOUSE GAS EMISSIONS	6-125	7.5	CONCLUSION	7-15
6.17.1	Methodology	6-125	8	REFERENCES	8-1
6.17.2	Quantitative Assessment of Potential Greenhouse Gas Emissions	6-125	9	ABBREVIATIONS, ACRONYMS AND GLOSSARY	9-1
6.17.3	Greenhouse Gas Emissions Reduction Targets	6-128	9.1	ABBREVIATIONS AND ACRONYMS	9-1
6.17.4	Project Greenhouse Gas Mitigation Measures	6-129	9.2	GLOSSARY	9-5
6.17.5	Adaptive Measures	6-129			
6.18	HAZARDS AND RISK	6-129			
6.18.1	Methodology	6-129			
6.18.2	Hazard Identification and Risk Assessment	6-130			
6.18.3	Hazard Prevention and Mitigation Measures	6-131			
6.19	GROUNDWATER DEPENDENT ECOSYSTEMS	6-132			
6.19.1	Methodology	6-132			
6.19.2	Existing Environment	6-133			
6.19.3	Assessment	6-141			
6.19.4	Mitigation Measures and Monitoring	6-145			
7	EVALUATION OF MERITS	7-1			
7.1	SUITABILITY OF THE SITE	7-1			
7.1.1	Mining Tenements	7-1			
7.1.2	Existing Narrabri Mine Infrastructure	7-1			
7.1.3	Access to Rail and Port Infrastructure and Markets	7-1			
7.1.4	Compatibility with Land Uses in the Vicinity of the Project	7-2			
7.2	CONSIDERATION OF FEASIBLE PROJECT DESIGN ALTERNATIVES	7-2			
7.2.1	Mine Subsidence-related Impacts	7-2			
7.2.2	Impacts Associated with Surface Infrastructure and Activities	7-4			
7.3	CONSIDERATION OF RELEVANT STATUTORY AND STRATEGIC PLANNING AND POLICY OBJECTIVES	7-6			
7.3.1	Consideration of the Project Against the Objects of the Environmental Planning and Assessment Act 1979	7-6			
7.3.2	Considerations of the Project Against the Objects of the Environmental Protection and Biodiversity Conservation Act 1999	7-6			
7.3.3	Evaluation under Section 4.15(1) of the Environmental Planning and Assessment Act 1979	7-6			
7.3.4	Other Statutory Requirements	7-7			
7.3.5	Strategic Planning and Policy Objectives	7-7			
7.4	EVALUATION OF KEY IMPACTS AND BENEFITS	7-7			
7.4.1	Key Potential Impacts	7-7			
7.4.2	Key Potential Benefits	7-8			
7.4.3	Ecologically Sustainable Development Considerations	7-9			
7.4.4	Consideration of the Consequences of Not Carrying Out the Project	7-15			
7.5	CONCLUSION	7-15			
8	REFERENCES	8-1			
9	ABBREVIATIONS, ACRONYMS AND GLOSSARY	9-1			
9.1	ABBREVIATIONS AND ACRONYMS	9-1			
9.2	GLOSSARY	9-5			

LIST OF TABLES

Table ES-1	Summary Comparison of the Existing/Approved Narrabri Mine and the Project
Table 1-1	Mining and Exploration Tenements
Table 1-2	Secretary's Environmental Assessment Requirements – Reference Summary
Table 1-3	Content Requirements of an EIS – Clause 7 of Schedule 2 of the EP&A Regulation
Table 2-1	Start and Finish Dates for Completed Longwalls to Date
Table 2-2	Summary Comparison of the Existing/Approved Narrabri Mine and the Project
Table 2-3	Indicative Mining Schedule
Table 2-4	Waste Types Likely to be Generated by the Project
Table 3-1	Potential Customer Country Current Nationally Determined Contributions
Table 4-1	Preconditions to Grant of Approval
Table 4-2	Mandatory Matters for Consideration
Table 5-1	Consultation Summary – NSW Department of Planning, Industry and Environment

TABLE OF CONTENTS (Continued)

Table 5-2	Consultation Summary – NSW Resources Regulator	Table 6-21	Application of the BAM to EPBC Act Listed Threatened Species and Communities
Table 5-3	Consultation Summary – NSW Biodiversity and Conservation Division	Table 6-22	Measures to Mitigate and Manage Potential Impacts
Table 5-4	Consultation Summary – Narrabri Shire Council	Table 6-23	Relative Scale of Various Noise Sources
Table 6-1	Bureau of Meteorology and Narrabri Mine Monitoring Station Locations and Periods of Record	Table 6-24	NPfI Project-specific Intrusive and Amenity Assessment Criteria for Operational Noise (dBA)
Table 6-2	Relevant Rainfall and Evaporation in the Vicinity of the Project	Table 6-25	Significance of Residual Noise Impacts and Potential Treatments
Table 6-3	Relative Humidity and Temperature in the Vicinity of the Project	Table 6-26	Noise Impact Assessment Methodology
Table 6-4	Climate Change Projections for Eastern Australia – Percentage Change in Rainfall	Table 6-27	Summary of Potential Operational Noise Exceedances at Privately-owned Receivers under Adverse Metrological Conditions
Table 6-5	Climate Change Projections for the New England North West Region, NSW – Percentage Change in Rainfall	Table 6-28	Air Quality Assessment Criteria for Concentrations of Suspended Particulate Matter
Table 6-6	Predicted Conventional Subsidence Effects for the Project Underground Mining Areas	Table 6-29	Annual Average and 24-hour Average Concentration at the Narrabri Mine
Table 6-7	Summary of Proposed Mitigation and Management Measures for Infrastructure Items	Table 6-30	Visual Impact Matrix
Table 6-8	Existing Water Licensing Summary for the Narrabri Mine	Table 6-31	Visual Sensitivity Levels
Table 6-9	Estimated Water Licensing Requirements for the Project	Table 6-32	Project Visual Impact Levels
Table 6-10	Water Access Licence Trading Statistics	Table 6-33	Aboriginal Heritage Sites Identified within the Project Area and Surrounds
Table 6-11	Existing and Proposed Changes to Local Creek Catchments	Table 6-34	Surveyed Estimated Traffic Volumes – 2019
Table 6-12	Overview of Land and Soil Capability Classes	Table 6-35	Predicted Project Two-Way Weekday Traffic Volumes
Table 6-13	Land Use Area in the Indicative Surface Development Footprint	Table 6-36	Predicted Cumulative Two-Way Weekday Traffic Volumes
Table 6-14	Summary of LSC Classes in the Indicative Surface Development Area within MLAs 1 and 2	Table 6-37	NSW Road Noise Policy Criteria for Residential Land Uses
Table 6-15	Summary of Soil Fertility Classes in the Indicative Surface Development Area within ML 1609	Table 6-38	Summary of Social Impact Assessment Stakeholder Engagement and Consultation
Table 6-16	Summary of Agricultural Resource Mitigation and Management Measures		
Table 6-17	Mapped Vegetation Communities		
Table 6-18	Summary of Measures to Avoid and Minimise Impacts on Biodiversity Values		
Table 6-19	Project Ecosystem Credit Requirements		
Table 6-20	Project Species Credit Requirements		

LIST OF FIGURES

Figure ES-1	Regional Location
Figure ES-2	Approved Narrabri Mine Indicative Underground Mining Layout
Figure ES-3	Existing Pit Top Layout
Figure ES-4	Project General Arrangement – Indicative Underground Mining Layout
Figure ES-5	Longwall Mining Method – Conceptual Cross-section and Plan

TABLE OF CONTENTS (Continued)

Figure ES-6	Project General Arrangement – Indicative Surface Development Footprint	Figure 6-10	Biophysical Strategic Agricultural Land in the Vicinity of the Project
Figure ES-7	Current and Proposed Environmental Monitoring Locations	Figure 6-11	Verified Biophysical Strategic Agricultural Land Within MLAs 1 and 2
Figure 1-1	Regional Location	Figure 6-12	Biodiversity Assessment Development Footprint
Figure 1-2a	Land Ownership	Figure 6-13	Vegetation Mapping
Figure 1-2b	Relevant Land Ownership List	Figure 6-14	Threatened Flora
Figure 1-3	Approved and Project General Arrangement	Figure 6-15	Threatened Fauna
Figure 2-1	Approved Narrabri Mine Indicative Underground Mining Layout	Figure 6-16	Threatened Fauna Species Listed Under the EPBC Act
Figure 2-2	Approved Narrabri Mine Indicative Surface Disturbance Footprint	Figure 6-17	Noise and Air Quality Monitoring Locations
Figure 2-3	Existing Pit Top Layout	Figure 6-18	Maximum Predicted Noise Level Year 4 – Night
Figure 2-4	Current Environmental Monitoring Locations	Figure 6-19	Maximum Predicted Noise Level Year 20 – Night
Figure 2-5	Project General Arrangement – Indicative Underground Mining Layout	Figure 6-20	Maximum Predicted Noise Level Year 21 – Night
Figure 2-6	Project General Arrangement – Indicative Surface Development Footprint	Figure 6-21	Maximum 24-hour Average PM ₁₀ Air Quality Contours – Year 4
Figure 2-7a	Regional Geology	Figure 6-22	Key Visual Viewpoints
Figure 2-7b	Regional Geology – Legend	Figure 6-23	Aboriginal Cultural Heritage Sites
Figure 2-8	Indicative Project Schedule	Figure 6-24	Local Road Network and Traffic Survey Locations
Figure 2-9	Longwall Mining Method – Conceptual Cross-section and Plan	Figure 6-25	Moree - Narrabri SA3 Region and Project Region
Figure 2-10	Project General Arrangement – Indicative Alternative Underground Mining Layout	Figure 6-26	Groundwater Dependent Ecosystems – Atlas Mapping
Figure 2-11	Indicative Coal Handling Schematic	Figure 6-27a	High Priority GDE Mapping – Water Sharing Plan for the Namoi Alluvial Groundwater Sources
Figure 2-12	Indicative Water Management Schematic	Figure 6-27b	High Priority GDE Mapping – Water Sharing Plan for the NSW MDB Porous Rock Groundwater Sources
Figure 2-13	Project Impact Reduction Area	Figure 6-27c	High Priority GDE Mapping – Water Sharing Plan for the NSW GAB Groundwater Sources
Figure 4-1	Planning Approval Process and Consultation Process for the Project	Figure 6-28	Aquatic Ecosystems
Figure 6-1	Meteorological and Regional Air Quality Monitoring Sites	Figure 6-29a	Review of High Priority GDE Mapping in Water Sharing Plans
Figure 6-2	Surface Topography	Figure 6-29b	Groundwater Drawdown at High Priority GDE Mapping in Water Sharing Plans
Figure 6-3	Water Sharing Plans	Figure 6-30a	Facultative GDEs Within AMBS Study Extent
Figure 6-4	Regional Groundwater Monitoring Network	Figure 6-30b	Groundwater Drawdown at Facultative GDEs Mapped by AMBS
Figure 6-5	Conceptual Geological Cross Section		
Figure 6-6	Privately-owned Bores with Predicted Drawdown Greater than 2 m		
Figure 6-7	Namoi Catchment		
Figure 6-8a	Local Watercourse and Drainage Features		
Figure 6-8b	Local Watercourse and Drainage Features Inset		
Figure 6-9	Receiving Water Monitoring Locations		

TABLE OF CONTENTS (Continued)
LIST OF PLATES

Plate ES-1	Narrabri Mine Box Cut and Drifts
Plate ES-2	Flat Terrain above Longwall 203
Plate ES-3	Photographs of Kurrajong Creek
Plate ES-4	Aboriginal Cultural Heritage Assessment Survey
Plate ES-5	NCOPL Employee
Plate 1-1	Existing Pit Top Layout
Plate 2-1	Narrabri Mine Box Cut and Drifts
Plate 2-2	Existing Pit Top Area
Plate 2-3	Existing Product Coal Stockpile
Plate 2-4	Existing Upcast Ventilation Infrastructure
Plate 2-5	Existing Namoi River Pump Station and Production Bore
Plate 5-1	November 2019 Community Newsletter Cover
Plate 6-1	Flat Terrain above Longwall 203
Plate 6-2	Photographs of Kurrajong Creek
Plate 6-3	Photographs of Tulla Mullen Creek Tributary 1
Plate 6-4	Garrawilla Volcanics – Intermediate Survey Site with BSAL Characteristics
Plate 6-5	ACHA Survey
Plate 6-6	Level Crossing at Kurrajong Creek Road

LIST OF APPENDICES

Appendix A	Subsidence Assessment
Appendix B	Groundwater Assessment
Appendix C	Surface Water Assessment
Appendix D	Biodiversity Development Assessment Report
Appendix E	Aboriginal Cultural Heritage Assessment
Appendix F	Historical Heritage Assessment
Appendix G	Agricultural Impact Statement
Appendix H	Noise and Blasting Assessment
Appendix I	Air Quality and Greenhouse Gas Assessment
Appendix J	Road Transport Assessment
Appendix K	Social Impact Assessment
Appendix L	Economic Assessment
Appendix M	Land Contamination Assessment
Appendix N	Environmental Geochemistry Assessment
Appendix O	Environmental Risk Assessment
Appendix P	Preliminary Hazard Analysis

LIST OF ATTACHMENTS

Attachment 1	Secretary's Environmental Assessment Requirements
Attachment 2	Cross Reference of Assessment Requirements
Attachment 3	Development Application Area and Real Property Descriptions
Attachment 4	Summary of Mitigation Measures
Attachment 5	Rehabilitation and Mine Closure
Attachment 6	Peer Review Letters
Attachment 7	Relevant Statutory Considerations
Attachment 8	Capital Investment Value Report
Attachment 9	Consent under Section 380AA of the Mining Act
Attachment 10	Public Notification
Attachment 11	Indicative Alternative Underground Mining Layout Review