



# Duralie Open Pit Modification Environmental Assessment

## TABLE OF CONTENTS



## TABLE OF CONTENTS

1	INTRODUCTION	1-1	3.2.7	Coal Mining, Handling and Transportation	3-2
1.1	BACKGROUND	1-1	3.2.8	Waste Rock Management	3-2
1.2	THE MODIFICATION	1-1	3.3	EXISTING INFRASTRUCTURE	3-5
1.3	SITE LOCATION AND TENURE	1-5	3.4	WATER MANAGEMENT	3-5
1.4	STRUCTURE OF THIS EA	1-8	3.4.1	Water Supply and Demand	3-5
1.5	CONSULTATION	1-8	3.4.2	Water Management System	3-5
1.5.1	State Government Agencies	1-8	3.4.3	Revised Site Water Balance	3-5
1.5.2	Local Councils	1-9	3.5	FINAL VOIDS	3-6
1.5.3	Public Consultation	1-9	3.6	WASTE MANAGEMENT	3-6
1.5.4	Community Initiatives and Involvement	1-9	3.7	MANAGEMENT OF DANGEROUS GOODS	3-6
2	EXISTING DURALIE COAL MINE OPERATIONS	2-1	3.8	WORKFORCE	3-6
2.1	COAL RESOURCE AND GEOLOGICAL FEATURES	2-1	3.9	CONSTRUCTION ACTIVITIES	3-6
2.2	MINING OPERATIONS	2-1	4	ENVIRONMENTAL ASSESSMENT	4-1
2.2.1	DCM Open Pits	2-3	4.1	NOISE	4-1
2.2.2	Mining Schedule	2-3	4.1.1	Background	4-1
2.2.3	Mining Method	2-3	4.1.2	Potential Impacts	4-3
2.2.4	Mine Progression	2-3	4.1.3	Mitigation Measures, Management and Monitoring	4-6
2.2.5	Mine Fleet	2-3	4.2	AIR QUALITY	4-6
2.2.6	Overburden Drill and Blast	2-3	4.2.1	Background	4-6
2.2.7	Coal Mining, Handling and Transportation	2-4	4.2.2	Potential Impacts	4-7
2.2.8	Waste Rock Management	2-4	4.2.3	Mitigation Measures, Management and Monitoring	4-7
2.3	EXISTING INFRASTRUCTURE	2-5	4.3	GROUNDWATER	4-9
2.3.1	Main Infrastructure Area	2-5	4.3.1	Background	4-9
2.3.2	Water Management Infrastructure/ Storages	2-5	4.3.2	Potential Impacts	4-12
2.3.3	Rail Infrastructure	2-5	4.3.3	Mitigation Measures, Management and Monitoring	4-13
2.3.4	Electricity Supply and Distribution	2-5	4.4	SURFACE WATER	4-13
2.3.5	Other Supporting Infrastructure and Services	2-5	4.4.1	Existing Environment	4-13
2.4	WATER MANAGEMENT	2-5	4.4.2	Potential Impacts	4-14
2.4.1	Water Supply and Demand	2-5	4.4.3	Mitigation Measures, Management and Monitoring	4-15
2.4.2	Water Management System	2-6	4.5	FLORA ASSESSMENT	4-15
2.5	FINAL VOIDS	2-9	4.5.1	Background	4-15
2.6	WASTE MANAGEMENT	2-9	4.5.2	Potential Impacts	4-19
2.6.1	Sewage Treatment and Disposal	2-9	4.5.3	Impact Avoidance and Mitigation Measures	4-20
2.7	MANAGEMENT OF DANGEROUS GOODS	2-9	4.5.4	Biodiversity Offset Strategy	4-20
2.8	WORKFORCE	2-10	4.6	TERRESTRIAL FAUNA	4-26
2.9	ENVIRONMENTAL MONITORING AND MANAGEMENT	2-10	4.6.1	Background	4-26
3	MODIFICATION DESCRIPTION	3-1	4.6.2	Potential Impacts	4-27
3.1	COAL RESOURCE AND GEOLOGICAL FEATURES	3-1	4.6.3	Impact Avoidance and Mitigation Measures	4-28
3.2	MINING OPERATIONS	3-1	4.6.4	Biodiversity Offset Strategy	4-28
3.2.1	Mining Schedule	3-1	4.7	ABORIGINAL HERITAGE	4-28
3.2.2	DCM Open Pits	3-1	4.7.1	Background	4-28
3.2.3	Mining Method	3-2	4.7.2	Potential Impacts	4-31
3.2.4	Mine Progression	3-2	4.7.3	Mitigation Measures, Management and Monitoring	4-32
3.2.5	Mine Fleet	3-2	4.8	LAND RESOURCES	4-32
3.2.6	Overburden Drill and Blast	3-2	4.8.1	Background	4-32
			4.8.2	Potential Impacts	4-35

**TABLE OF CONTENTS (continued)**

4.8.3	Mitigation Measures, Management and Monitoring	4-35	6.2	NSW GOVERNMENT POLICY	6-4
4.9	VISUAL CHARACTER	4-35	6.2.1	Strategic Regional Land Use Plan	6-4
4.9.1	Previous Assessment	4-35	6.2.2	Aquifer Interference Policy	6-4
4.9.2	Potential Impacts	4-36	6.3	PLANS, LICENCES AND AGREEMENTS THAT REQUIRE REVISION	6-4
4.9.3	Mitigation Measures, Management and Monitoring	4-42	6.3.1	Project Approval Conditions	6-4
4.10	OTHER ENVIRONMENTAL ASPECTS	4-42	6.3.2	Management/Monitoring Plans	6-5
4.10.1	Blasting	4-42	6.3.3	Mining Operations Plan	6-5
4.10.2	Greenhouse Gas Emissions	4-43	7	REFERENCES	7-1
4.10.3	Non-Aboriginal Heritage	4-43	8	ABBREVIATIONS, ACRONYMS AND GLOSSARY	8-1
4.10.4	Road Transport	4-44	8.1	ABBREVIATIONS AND ACRONYMS	8-1
4.10.5	Aquatic Ecology	4-44	8.2	GLOSSARY	8-2
4.10.6	Hazard and Risk	4-44			
4.10.7	Socio-Economic Benefits	4-44			
5	REHABILITATION STRATEGY	5-1			
5.1	EXISTING DCM REHABILITATION	5-1			
5.1.1	Rehabilitation Principles	5-1			
5.1.2	Rehabilitation Objectives	5-1			
5.1.3	Rehabilitation Management Plan	5-1			
5.1.4	Existing DCM Rehabilitation	5-2			
5.2	REHABILITATION CONCEPTS FOR THE DCM INCORPORATING THE MODIFICATION	5-2			
5.2.1	Final Landform and Revegetation Concepts	5-4	Table 1-1	Summary Comparison of Approved DCM and the Modification	
5.2.2	Weismantel and Clareval Open Pits	5-4	Table 3-1	Indicative Mine Schedule	
5.2.3	Waste Rock Emplacement	5-4	Table 4-1	Existing Project Approval Noise Limits and Maximum Predicted Noise Levels for the Modification	
5.2.4	Coal Shaft Creek	5-7	Table 4-2	Catchment Area Summary	
5.2.5	Water Management Infrastructure	5-7	Table 4-3	Changes to Contributing Catchment of Local Creeks	
5.2.6	Site Infrastructure	5-7	Table 4-4	Existing Impact Mitigation Measures at the DCM Relevant to Flora and Fauna	
5.3	INTEGRATION WITH THE MODIFICATION OFFSET STRATEGY	5-7	Table 4-5	Offset Strategy Completion Criteria	
5.3.1	Existing Biodiversity Offset	5-7	Table 4-6	Clearance of each Plant Community Type within the Modification Disturbance Area	
5.3.2	Proposed Biodiversity Offset	5-7	Table 4-7	Revised Biodiversity Offset Strategy for the Modification	
5.4	MINE CLOSURE AND LEASE RELINQUISHMENT	5-9	Table 4-8	Quantification of Native Plant Community Types in the Modification Disturbance Area and Proposed Biodiversity Offset Area	
5.4.1	Rehabilitation Completion Criteria	5-9	Table 4-9	Quantification of Broad Fauna Types in the Modification Disturbance Area and Proposed Biodiversity Offset Area	
5.5	CONCEPTUAL REHABILITATION DOMAINS	5-9	Table 4-10	Habitat for Threatened Fauna Species – Existing and Proposed Offset Strategies	
6	STATUTORY CONTEXT	6-1	Table 4-11	Reconciliation of the Proposed Biodiversity Offset Strategy against OEH Offset Principles	
6.1	GENERAL STATUTORY CONSIDERATIONS	6-1	Table 4-12	Summary of the DEP Aboriginal Heritage Consultation/Survey Programme	
6.1.1	EP&A Act and Section 75W Modification	6-1	Table 4-13	Known Aboriginal Heritage Sites at the DCM and Surrounding Area	
6.1.2	Other Legislation	6-2	Table 4-14	Archaeological Significance of Aboriginal Heritage Sites within ML 1646 or ML 1427	
6.1.3	Commonwealth Legislation	6-3	Table 4-15	Soil Landscapes of the DCM	
6.1.4	Environmental Planning Instruments	6-4	Table 4-16	Visual Impact Matrix	

**TABLE OF CONTENTS (continued)****LIST OF TABLES (continued)**

Table 4-17	Locations of Visual Simulations
Table 4-18	Summary of Visual Assessment
Table 5-1	Approved DCM Short-term, Medium-term and Long-term Rehabilitation Objectives
Table 5-2	Rehabilitation Completion Criteria

**LIST OF FIGURES**

Figure 1-1	Regional Location
Figure 1-2	Modification General Arrangement
Figure 1-3a	Relevant Land Ownership Plan
Figure 1-3b	Relevant Land Ownership List
Figure 2-1	Existing General Arrangement
Figure 2-2	Water Management Schematic
Figure 2-3	Environmental Monitoring Sites
Figure 3-1	Indicative General Arrangement Year 2015
Figure 3-2	Indicative General Arrangement Year 2018
Figure 4-1	Dust, Blast and Noise Monitoring Sites
Figure 4-2	Year 2015 Night-time L <sub>Aeq(15minute)</sub> Operational Noise Contours
Figure 4-3	24-Hour PM <sub>10</sub> Air Quality Contours Project Only
Figure 4-4	Groundwater Monitoring Sites
Figure 4-5	Groundwater Level Responses for the Alluvium and Upper Durallie Road Formation
Figure 4-6	Plant Community Types
Figure 4-7	Fauna Habitat and Threatened Species Record
Figure 4-8	Aboriginal Heritage Sites Identified at the Duralie Coal Mine and Surrounds
Figure 4-9	Land and Soil Capability Mapping
Figure 4-10	Visual Simulation Locations
Figure 4-11	Existing View and Visual Simulation – Johnsons Creek Road
Figure 4-12	Existing View and Visual Simulations – Martins Crossing Road
Figure 4-13	Existing View and Visual Simulations – The Bucketts Way
Figure 5-1	General Arrangement Post-mining
Figure 5-2	Conceptual Cross-Sections of the Gloucester Basin Post-mining
Figure 5-3	Conceptual Final Landform and Rehabilitation Domains

**LIST OF PLATES**

Plate 5-1	Duralie Coal Mine Rehabilitation
-----------	----------------------------------

**LIST OF ATTACHMENTS**

Attachment 1	Existing Project Approval
Attachment 2	Aquifer Interference Policy and Water Licensing Addendum

**LIST OF APPENDICES**

Appendix A	Noise and Blasting Assessment
Appendix B	Air Quality Assessment
Appendix C	Groundwater Assessment
Appendix D	Surface Water Assessment
Appendix E	Flora Assessment
Appendix F	Fauna Assessment
Appendix G	Visual Assessment
Appendix H	Aboriginal Cultural Heritage Assessment