

Table of Contents



TABLE OF CONTENTS

EXECUTIVE SUMMARY

1	Introduction	1-1
1.1	Introduction	1-1
1.2	Project Overview	1-1
1.3	Project Site	1-1
1.4	The Proponent	1-2
1.5	Project Need and Objectives	1-2
	1.5.1 Project Need	1-2
	1.5.2 Project Objectives	1-3
1.6	Status of Regulatory Approvals	1-3
	1.6.1 Northern Territory Approval Process	1-3
	1.6.2 EPBC Act Approval Process	1-3
1.7	EIS Document	1-4
	1.7.1 Purpose of EIS Document	1-4
	1.7.2 EIS Preparation	1-4
	1.7.3 EIS Structure	1-5
	1.7.4 How to Read the EIS	1-6
	1.7.5 How to Make a Submission on the EIS	1-6
1.8	Acknowledgements	1-6
2	Regulatory Framework	2-1
2.1	Introduction	2-1
2.2	Key Environmental Approvals	2-1
	2.2.1 Commonwealth EPBC Act	2-2
	2.2.2 Northern Territory Environmental Assessment Act	2-2
	2.2.3 Northern Territory Mining Management Act	2-3
	2.2.4 Process for Obtaining Key Environmental Approvals	2-3
2.3	Secondary Environmental Approvals	2-5
2.4	Other Approvals	2-9
	2.4.1 Overview	2-9
	2.4.2 Minerals Titles Act	2-10
	2.4.3 Aboriginal Land Rights Act	2-10
	2.4.4 Northern Territory Aboriginal Sacred Sites Act	2-10
3	Project Description	3-1
3.1	Introduction	3-1
3.2	Project Overview	3-1
3.3	Project Setting	3-1
	3.3.1 Groote Eylandt	3-1
	3.3.2 Project Location	3-3
	3.3.3 Natural Features	3-3
	3.3.4 Land Ownership and Land Tenure	3-3
	3.3.5 Land Use	3-3
	3.3.6 Sensitive Receptors	3-5

3.4	Mineral and Petroleum Tenements	3-5
3.5	Geology and Resource Utilisation	3-6
3.5.1	Exploration History	3-6
3.5.2	Regional Geology	3-7
3.5.3	Local Stratigraphy	3-7
3.5.4	Manganese Ore	3-9
3.6	Existing Operations	3-9
3.6.1	Location	3-10
3.6.2	Mining and Rehabilitation Method	3-10
3.6.3	Ore Processing	3-10
3.6.4	Ore Transport	3-11
3.6.5	Tailings and Middlings	3-11
3.6.6	Infrastructure and Utilities	3-12
3.7	Eastern Leases Project	3-12
3.7.1	Proposed Mining Activities	3-12
3.7.2	Equipment Fleet	3-13
3.7.3	Ore Processing and Transport	3-13
3.7.4	Tailings and Middlings	3-14
3.7.5	Infrastructure and Utilities	3-14
3.7.6	Mine Planning	3-16
3.7.7	Operating Hours	3-17
3.7.8	Construction Activities	3-17
3.7.9	Project Development Schedule	3-17
3.8	Workforce and Accommodation	3-18
3.8.1	Existing Mine	3-18
3.8.2	Project Construction Phase	3-18
3.8.3	Project Operations Phase	3-19
3.8.4	Project Decommissioning Phase	3-19
3.9	Traffic and Transportation	3-19
3.9.1	Road Network	3-19
3.9.2	Site Access	3-19
3.9.3	Transportation on Public Access Roads	3-19
3.9.4	Transportation on Mine Haul Roads	3-20
3.9.5	Relocation of Unsealed Road to Dalumba Bay	3-21
3.9.6	Emerald River Road Overpass	3-21
3.10	Project Alternatives and Justification	3-22
3.10.1	Project Alternatives	3-22
3.10.2	Project Justification	3-26
3.10.3	Consequences of Not Proceeding with the Project	3-26
4	Environmental Risk Assessment	4-1
4.1	Introduction	4-1
4.2	Methodology	4-1
4.2.1	Introduction	4-1
4.2.2	Establishment of Context	4-2
4.2.3	Risk Identification, Analysis and Evaluation	4-3
4.2.4	Risk Treatment	4-5
4.3	Environmental Risk Assessment	4-6

5	Consultation	5-1
5.1	Introduction	5-1
5.2	Regulatory Requirements	5-1
5.3	Consultation Objectives	5-1
5.4	Consultation Process Overview	5-1
5.4.1	Phase 1 – Stakeholder Identification	5-2
5.4.2	Phase 2 – Endorsement of Consultation Process	5-2
5.4.3	Phase 3 – Issue Scoping	5-2
5.4.4	Phase 4 – SIA Consultation	5-2
5.4.5	Phase 5 – Issue Response Consultation	5-2
5.5	Stakeholder Identification	5-3
5.5.1	Project Stakeholders	5-3
5.6	Endorsement of Consultation Process	5-4
5.7	Issue Scoping and SIA Consultation	5-4
5.7.1	Communication Tools	5-5
5.7.2	Key Consultation Activities	5-5
5.7.3	Summary of Groote Eylandt Stakeholder Participation	5-8
5.7.4	EIS Consultation Limitations	5-9
5.8	Findings of Consultation Program	5-9
5.8.1	Findings of Consultation with Government	5-9
5.8.2	Findings of Consultation with the ALC	5-11
5.8.3	Findings of Consultation with Aboriginal Participants	5-13
5.8.4	Findings of Consultation with All Stakeholders	5-14
5.9	Issue Response Consultation	5-18
5.10	Future Consultation	5-18
5.10.1	EIS Feedback Consultation	5-18
6	Mine Rehabilitation and Closure	6-1
6.1	Introduction	6-1
6.2	Rehabilitation at the Existing Mine	6-1
6.2.1	Statutory Requirements and Corporate Guidelines	6-1
6.2.2	Rehabilitation Objectives	6-1
6.2.3	Rehabilitation Techniques	6-2
6.2.4	Monitoring and Remediation	6-3
6.2.5	Rehabilitation Status	6-4
6.3	Project Rehabilitation	6-5
6.3.1	Introduction	6-5
6.3.2	Topsoil Management	6-5
6.3.3	Overburden Geochemistry	6-7
6.3.4	Rehabilitation Methods	6-10
6.3.5	Mine Closure and Decommissioning	6-10
7	Terrestrial Ecology	7-1
7.1	Introduction	7-1
7.2	Overview of Project Site	7-1
7.3	Overview of Regulatory Requirements	7-1
7.3.1	Key Regulatory Requirements of the Federal Government	7-1
7.3.2	Key Northern Territory Legislation and Guidelines	7-2

7.4	Methodology	7-4
7.4.1	Desktop Assessment	7-4
7.4.2	Field Surveys	7-4
7.4.3	Additional Surveys	7-6
7.4.4	Likelihood of Occurrence Assessment	7-6
7.5	Results	7-6
7.5.1	Vegetation Structure and Connectivity	7-6
7.5.2	Vegetation Communities	7-7
7.5.3	Flora Species	7-8
7.5.4	Fauna Species	7-9
7.5.5	Habitat Preferences of Threatened Fauna Species	7-10
7.6	Impact Assessment	7-12
7.6.1	Overview	7-12
7.6.2	Direct Impacts	7-12
7.6.3	Indirect Impacts	7-14
7.6.4	Impacts on Vegetation Communities	7-16
7.6.5	Impacts to Threatened Flora Species	7-18
7.6.6	Impacts to Threatened Fauna Species	7-18
7.7	Impact Mitigation	7-19
7.7.1	Measures to Avoid Impacts	7-19
7.7.2	Measures to Mitigate Impacts	7-19
7.7.3	Offsets	7-22
8	Aquatic Ecology	8-1
8.1	Introduction	8-1
8.2	Overview of the Project Site	8-1
8.3	Regulatory Requirements	8-1
8.3.1	EPBC Act	8-1
8.3.2	Territory Parks and Wildlife Conservation Act	8-1
8.3.3	Fisheries Act	8-2
8.3.4	Legislation Related to Environmental Offsets	8-2
8.4	Methodology	8-2
8.4.1	Desktop Study	8-2
8.4.2	Field Surveys	8-2
8.4.3	Likelihood of Occurrence Assessment	8-3
8.5	Results	8-4
8.5.1	Overview	8-4
8.5.2	Aquatic Flora	8-4
8.5.3	Macroinvertebrates	8-5
8.5.4	Vertebrates	8-5
8.5.5	Threatened Species	8-5
8.6	Impact Assessment	8-7
8.6.1	Overview	8-7
8.6.2	Open Cut Mining	8-7
8.6.3	Watercourse Crossings	8-7
8.6.4	Potential Impacts on Water Quality	8-7
8.6.5	Changes in Groundwater Levels	8-8
8.6.6	Erosion and Sedimentation	8-8
8.6.7	Spread of Weeds and Pest Animals	8-9
8.6.8	Potential Impact to Threatened Species	8-9

8.7	Impact Mitigation	8-9
8.7.1	Measures to Avoid Impacts	8-9
8.7.2	Minimising Impacts	8-9
8.7.3	Monitoring and Management Plans	8-10
9	Groundwater	9-1
9.1	Introduction	9-1
9.2	Scope of Work and Methodology	9-1
9.3	Groundwater Regime	9-2
9.3.1	Quaternary Sediments	9-3
9.3.2	Laterite	9-3
9.3.3	Lateritic Clay	9-4
9.3.4	Marine Claystone	9-4
9.3.5	Cretaceous Sandstone	9-5
9.3.6	Proterozoic Basement	9-5
9.4	Groundwater Assessment	9-6
9.4.1	Overview of Mining Activities	9-6
9.4.2	Overview of Impacts	9-6
9.4.3	Overview of Modelling	9-7
9.4.4	Impact on Existing Groundwater Users	9-8
9.4.5	Impact on Watercourses	9-8
9.4.6	Impacts on Groundwater Dependent Ecosystems	9-9
9.4.7	Cumulative Impacts	9-9
9.4.8	Impacts on Groundwater Quality	9-10
9.5	Monitoring	9-10
9.6	Groundwater Licensing and Reporting	9-12
10	Surface Water	10-1
10.1	Introduction	10-1
10.2	Surface Water Setting	10-1
10.2.1	Regional Catchment Setting	10-1
10.2.2	Drainage Setting	10-2
10.2.3	Surface Water Use and Environmental Values	10-4
10.2.4	Surface Water Quality	10-5
10.3	Mine Planning and Surface Water Management	10-6
10.3.1	Project Overview	10-6
10.3.2	Project Planning Process	10-6
10.3.3	Mine Planning Design Principles	10-7
10.4	Water Management Strategies	10-8
10.4.1	Quarry Water	10-9
10.4.2	Runoff from Areas Disturbed by Mining Activities	10-10
10.4.3	Runoff from Areas Undisturbed by Mining Activities	10-11
10.5	Water Management System	10-11
10.5.1	Water Supplies	10-12
10.5.2	Water Demands	10-12
10.5.3	Mine Water Dams	10-13
10.5.4	Operational Modelling Method	10-13
10.5.5	Water Balance	10-14
10.6	Impact Assessment	10-20

10.7	Monitoring	10-24
10.7.1	Water Management System Monitoring Program	10-24
10.7.2	Receiving Environment Monitoring Program	10-25
10.8	Management Plans	10-25
10.8.1	Water Management Plan	10-25
10.8.2	Erosion and Sediment Control Plan	10-25
10.9	Water Licensing	10-26
11	Climate	11-1
11.1	Introduction	11-1
11.2	Regional Climatic Patterns	11-1
11.3	Climate Statistics	11-1
11.3.1	Temperature	11-2
11.3.2	Rainfall	11-2
11.3.3	Relative Humidity	11-3
11.3.4	Winds	11-3
11.4	Extremes of Climate	11-4
12	Air Quality	12-1
12.1	Introduction	12-1
12.2	Project Setting and Sensitive Receptors	12-1
12.3	Air Quality Aspects	12-2
12.4	Regulatory Requirements	12-2
12.5	Meteorology	12-3
12.6	Existing Air Quality	12-3
12.7	Prediction Methodology	12-4
12.7.1	Selection of Representative Project Years	12-4
12.7.2	Estimation of Emissions	12-4
12.7.3	Dispersion Modelling	12-4
12.8	Impact Assessment	12-5
12.8.1	PM ₁₀	12-5
12.8.2	Total Suspended Particulate Matter	12-5
12.8.3	Dust Deposition	12-6
12.8.4	Cumulative Dust Impacts	12-6
12.9	Dust Mitigation and Monitoring	12-6
12.10	Greenhouse Gases	12-7
12.10.1	Greenhouse Gas Emissions	12-7
12.10.2	Greenhouse Gas Mitigation Strategies	12-7
13	Noise and Vibration	13-1
13.1	Introduction	13-1
13.2	Project Site and Sensitive Receptors	13-1
13.3	Existing Noise Environment	13-2

13.4	Regulatory Requirements	13-2
13.4.1	Mining and Construction	13-2
13.4.2	Sleep Disturbance	13-3
13.4.3	Low Frequency Noise	13-3
13.4.4	Road Traffic Noise	13-4
13.4.5	Blasting	13-4
13.5	Prediction Methodology	13-4
13.5.1	Operational Noise Sources	13-4
13.5.2	Selection of Representative Project Years	13-4
13.5.3	Weather Conditions	13-5
13.6	Impact Assessment	13-5
13.6.1	Mine Noise	13-5
13.6.2	Cumulative Impacts	13-6
13.6.3	Sleep Disturbance	13-7
13.6.4	Low Frequency Noise	13-7
13.6.5	Construction Noise	13-8
13.6.6	Road Traffic Noise	13-8
13.6.7	Blasting	13-8
13.7	Mitigation Measures	13-9
13.7.1	Noise	13-9
13.7.2	Blasting	13-9
14	Visual Amenity	14-1
14.1	Introduction	14-1
14.2	Project Setting	14-1
14.3	Project Overview	14-1
14.4	Viewing Locations	14-2
14.5	Visual Assessment	14-2
14.6	Mitigation	14-3
15	Socio-economics	15-1
15.1	Introduction	15-1
15.2	Regulatory Framework	15-1
15.3	Project Setting	15-1
15.4	Methodology	15-2
15.4.1	Identification of the SIA Study Area	15-2
15.4.2	Profiling of the Socio-economic Environment	15-2
15.4.3	Identification and Assessment of Potential Socio-economic Impacts	15-2
15.5	Existing Social Environment	15-3
15.5.1	Governance Arrangements	15-3
15.5.2	Alyangula Social Environment	15-4
15.5.3	Angurugu and Umbakumba Social Environment	15-7
15.6	Existing Mining Operation	15-11
15.6.1	Workforce Employment and Accommodation	15-11
15.6.2	Local Aboriginal Employment	15-11
15.6.3	Royalty Arrangements	15-12
15.6.4	Anindilyakwa Land Council Royalty Benefits	15-14
15.6.5	Social Performance and Investment	15-14

15.7	Project Characteristics	15-15
15.7.1	Construction Phase	15-16
15.7.2	Operations Phase	15-16
15.7.3	Decommissioning Phase	15-16
15.7.4	Workforce Employment and Accommodation Arrangements	15-16
15.8	Potential Impacts and Mitigation Measures	15-16
15.8.1	Monitoring and Reporting	15-21
16	Archaeology	16-1
16.1	Introduction	16-1
16.2	Cultural Setting	16-1
16.3	Overview of Regulatory Requirements	16-2
16.3.1	Environment Protection and Biodiversity Conservation Act	16-2
16.3.2	Aboriginal and Torres Strait Islander Heritage Protection Act	16-2
16.3.3	Northern Territory Heritage Act	16-2
16.3.4	ICOMOS Burra Charter	16-2
16.4	Archaeological Assessment	16-3
16.4.1	Scope	16-3
16.4.2	Methodology	16-3
16.4.3	Field Survey Results	16-4
16.4.4	Assessments of Significance	16-5
16.5	Impact Assessment and Mitigation	16-7
16.5.1	Direct Impacts	16-7
16.5.2	Indirect Impacts	16-7
16.6	Management Measures	16-8
16.6.1	Introduction	16-8
16.6.2	Further Site Survey	16-8
16.6.3	Management Plans	16-9
16.6.4	Unexpected Finds	16-9
17	Non-mining Waste	17-1
17.1	Introduction	17-1
17.2	Waste	17-1
17.2.1	Regulatory Requirements	17-1
17.2.2	Existing Waste Management System	17-2
17.2.3	Waste Inventory	17-3
17.2.4	Waste Reporting	17-5
17.3	Land Contamination	17-5
17.3.1	Introduction	17-5
17.3.2	Regulatory Requirements	17-5
17.3.3	Contaminated Land History	17-6
17.3.4	Contamination Prevention and Control	17-6
18	Health and Safety	18-1
18.1	Introduction	18-1
18.2	Overview of Existing Health, Safety and Risk Management System	18-1
18.2.1	Health, Safety and Risk Management System	18-1

18.3	Preliminary Hazard Analysis	18-3
18.3.1	Overview	18-3
18.3.2	Surrounding Land Use and Sensitive Receptors	18-4
18.3.3	Key Project Hazards	18-4
18.3.4	Natural Hazards	18-7
19	Environmental Management Plan	19-1
19.1	Introduction	19-1
19.2	Project Overview	19-1
19.2.1	Mining Interests	19-1
19.3	Environmental Management	19-1
19.3.1	Environmental Management Structure	19-1
19.3.2	Environmental Policy and Standards	19-2
19.3.3	Environmental Record	19-2
19.3.4	Mining Management Plan	19-2
19.3.5	Environmental Incident Reporting	19-2
19.3.6	Community Complaints	19-3
19.3.7	Review and Auditing	19-3
19.3.8	Environmental Training and Education	19-3
19.4	Project Environmental Management	19-4
19.4.1	Overview	19-4
19.4.2	Environmental Management Framework	19-4
19.4.3	Mine Rehabilitation and Closure	19-5
19.4.4	Biodiversity	19-11
19.4.5	Groundwater	19-13
19.4.6	Surface Water	19-15
19.4.7	Air Quality	19-21
19.4.8	Noise and Vibration	19-23
19.4.9	Visual Amenity	19-25
19.4.10	Socio-economics	19-26
19.4.11	Archaeology	19-27
19.4.12	Non-mining Waste	19-29
19.4.13	Health and Safety	19-31
19.5	Project Environmental Commitments	19-34
19.5.1	Commitments Register	19-35
20	References	20-1
21	Glossary	21-1
22	Abbreviations	22-1
23	EIS Study Team	23-1
24	Guide to the Terms of Reference	24-1

LIST OF TABLES

Table 1-1	Proponent Contact Details
Table 2-1	Key Project Approvals
Table 2-2	Other Relevant Environmental Legislation
Table 3-1	Sensitive Receptors
Table 3-2	Mineral and Petroleum Tenements on Groote Eylandt
Table 3-3	Annual Ore and Overburden Production for the Project (Million Dry Tonnes)
Table 3-4	Estimated Quantities of Consumables Required over the Life of the Project
Table 3-5	Summary of Project Alternatives
Table 4-1	Environmental Setting
Table 4-2	Ratings for the Assessment of Consequence Levels
Table 4-3	Ratings for the Assessment of Likelihood
Table 4-4	Risk Assessment Matrix
Table 4-5	Environmental Risk Assessment
Table 5-1	Preliminary Stakeholder List
Table 5-2	Government Consultation Summary
Table 5-3	Key Issues Raised at Government Meetings
Table 5-4	Key Issues Raised by the ALC
Table 5-5	Key Issues Raised at Stakeholder Meetings on Groote Eylandt
Table 6-1	General Rehabilitation Objectives
Table 6-2	Completion Criteria Classification Codes
Table 6-3	Summary of Soil Mapping Units
Table 6-4	Maximum Topsoil Available for Reuse
Table 7-1	Terrestrial Ecology Surveys – Survey Effort
Table 7-2	Key Habitats within the Project Site
Table 7-3	Habitat Preferences of Threatened Species Found on the Project Site
Table 7-4	Key Habitats Cleared within the Project Disturbance Footprint
Table 7-5	Available Habitat on Groote Eylandt
Table 7-6	Management of Indirect Impacts
Table 8-1	Aquatic Species Listed from the EPBC Act Protected Matters Search Tool
Table 9-1	Groundwater Monitoring Program
Table 10-1	Median Annual Water Balance
Table 10-2	Dam Capacities
Table 10-3	Contingency Discharge Water Quality Limits
Table 10-4	Summary of Potential Surface Water Impacts and Management Measures
Table 11-1	Summary of Climate Statistics
Table 11-2	Summary of the Wind Speed and Wind Direction
Table 12-1	Sensitive Receptors
Table 12-2	Applicable Ambient Air Quality Objectives
Table 12-3	Background Air Quality Levels Used for Assessment ($\mu\text{g}/\text{m}^3$)
Table 12-4	Predicted Concentrations of PM_{10} ($\mu\text{g}/\text{m}^3$)
Table 12-5	Predicted Concentrations of TSP ($\mu\text{g}/\text{m}^3$)
Table 12-6	Predicted Concentrations of Dust Deposition ($\text{g}/\text{m}^2/\text{month}$)
Table 12-7	Summary of Greenhouse Gas Emissions for the Life of the Project
Table 13-1	Sensitive Receptors
Table 13-2	NSW INP Intrusive Noise Criteria (LAeq,15min)
Table 13-3	Noise Amenity Criteria (LAeq)
Table 13-4	Predicted Project Noise Levels and Intrusive Criteria (LAeq,15min)
Table 13-5	Predicted Cumulative Noise Levels (LAeq,9hr) – Night
Table 13-6	Predicted Noise Levels and Sleep Disturbance Criteria (LAm _{ax})

Table 13-7	Predicted Blast Impacts to Residential Receptors
Table 15-1	Selected Demographic Characteristics– 2011 ABS Census
Table 15-2	Selected Demographic Characteristics – 2011 ABS Census
Table 15-3	Summary of Potential Socio-economic Impacts and Management Commitments
Table 15-4	Summary of Potential Socio-economic Benefits
Table 16-1	Summary of Sites Found within the Project Site
Table 17-1	Wastes Predicted to be Generated on the Project Site
Table 18-1	Sensitive Receptors
Table 19-1	Mining Interests
Table 19-2	Environmental Management Plans or Procedures Required for the Project
Table 19-3	General Rehabilitation Objectives
Table 19-4	Depth of Available Topsoil
Table 19-5	Completion Criteria Classification Codes
Table 19-6	Groundwater Monitoring Program
Table 19-7	Contingency Discharge Water Quality Limits
Table 19-8	Applicable Ambient Air Quality Objectives
Table 19-9	Sensitive Receptors
Table 19-10	Noise Criteria at Nearest Sensitive Receptors
Table 19-11	Wastes Predicted to be Generated on the Project Site
Table 19-12	Statement of Commitments for the Eastern Leases Project
Table 23-1	EIS Study Team
Table 23-2	EIS Study Team Qualifications and Experience
Table 23-3	Proponent Contributions to EIS Production

LIST OF FIGURES

Figure 1-1	Location Plan
Figure 1-2	Local Setting
Figure 2-1	Project Approval Process
Figure 3-1	Local Government Areas and Groote Eylandt Archipelago
Figure 3-2	Local Setting
Figure 3-3	Mineral Tenements
Figure 3-4	Conceptual Regional Geology Cross-section
Figure 3-5	Surface Geology
Figure 3-6	Indicative Stratigraphy of the Project Site
Figure 3-7	Manganese Orebody Extent within the Project Site
Figure 3-8	Existing GEMCO Mine
Figure 3-9	Open Cut Mining Operations Schematic
Figure 3-10	Existing GEMCO Mine – Mine Concentrator and Industrial Area
Figure 3-11	Production Process
Figure 3-12	Indicative Mine Layout – Project Year 3
Figure 3-13	Indicative Mine Layout – Project Year 9
Figure 3-14	Indicative Mine Layout – Project Year 13
Figure 3-15	Indicative Mine Layout – Final Landform
Figure 3-16	Road Network
Figure 6-1	Soil Investigation Sites and Soil Mapping Units
Figure 6-2	Depth of Available Topsoil
Figure 6-3	Geochemistry Sampling Sites
Figure 7-1	Terrestrial Flora Survey Sites

Figure 7-2 Terrestrial Fauna Survey Sites

Figure 7-3 Broad Habitat Types on Groote Eylandt

Figure 7-4 Vegetation Communities within the Project Site

Figure 7-5 Habitat Types and Threatened Fauna within the Project Site

Figure 7-6 Impacts on Habitat Types within the Project Site

Figure 8-1 Local Catchment Setting

Figure 8-2 Aquatic Survey Sites within the Project Site

Figure 8-3 Aquatic Ecology Impacts

Figure 9-1 Local Setting

Figure 9-2 Groundwater Monitoring Locations

Figure 9-3 Surface Geology

Figure 9-4 Conceptual Hydrogeology Cross-section

Figure 9-5 Local Drainage Setting

Figure 10-1 Regional Catchment Setting

Figure 10-2 Local Drainage Setting

Figure 10-3 Local Catchment Setting

Figure 10-4 Existing Site Drainage

Figure 10-5 Watercourse Drainage Design

Figure 10-6 Stage Drainage Plan – Northern Eastern Lease Project Year 3

Figure 10-7 Stage Drainage Plan – Northern Eastern Lease Project Year 9

Figure 10-8 Stage Drainage Plan – Northern Eastern Lease Project Year 13

Figure 10-9 Stage Drainage Plan – Southern Eastern Lease Project Year 9

Figure 10-10 Stage Drainage Plan – Southern Eastern Lease Project Year 13

Figure 10-11 Conceptual Water Management Schematic

Figure 11-1 Location of BoM Meteorological Station

Figure 12-1 Sensitive Receptors

Figure 12-2 Predicted 6th Highest 24-hour Average Ground-level Concentrations of PM₁₀ – Project Year 13 (Project in Isolation)

Figure 12-3 Predicted Annual Average Ground-level Concentrations of TSP – Project Year 13 (Project in Isolation)

Figure 12-4 Predicted Annual Average Ground-level Concentrations of Dust Deposition – Project Year 13

Figure 13-1 Sensitive Receptors and Noise Monitoring Locations

Figure 14-1 Local Terrain and Visual Receptors

Figure 14-2 View from R1 (Angurugu) to the Project Site

Figure 14-3 View from R2 (Yedikba) to the Project Site

Figure 14-4 View from R3 (Wurrumenbumanja) to the Project Site

Figure 14-5 View from R4 (Leske Pools Swimming Hole) to the Project Site

Figure 14-6 View from Lookout at Cave Paintings (Wurruwarrkbadenumanja) to the Project Site

Figure 15-1 Regional Setting

Figure 15-2 Local Setting

Figure 16-1 Land Systems of Groote Eylandt

Figure 16-2 Location of Survey Transects

Figure 16-3 Location of Archaeological Sites

Figure 16-4 Location of Archaeological Sites and Project Disturbance Footprint – Northern Eastern Lease

Figure 16-5 Location of Archaeological Sites and Project Disturbance Footprint – Southern Eastern Lease

Figure 17-1 Location of GEMCO's Waste Facilities

Figure 18-1 Location of Hazardous/Dangerous Materials Storage Facilities

Figure 19-1 Project Location and Sensitive Receptors

Figure 19-2 Groundwater Monitoring Sites

Figure 19-3 Project Surface Water Monitoring Sites

Figure 19-4 Location of Archaeology Sites

LIST OF DIAGRAMS

- Diagram 3-1 Project Mining Schedule
- Diagram 10-1 Conceptual Water Management System
- Diagram 15-1 Royalty Arrangements
- Diagram 19-1 Conceptual Water Management System

LIST OF GRAPHS

- Graph 4-1 Total Risk Ratings Before and After Mitigation
- Graph 4-2 Risk Ratings for Environmental Aspects
- Graph 5-1 Groote Eylandt Consultation Participants
- Graph 10-1 Probability of Quarry Water Release
- Graph 10-2 Median Quarry Water Inventory - Northern EL
- Graph 10-3 Median Quarry Water Inventory - Southern EL
- Graph 10-4 Annual External Water Supply Requirements
- Graph 11-1 Mean Minimum and Maximum Monthly Temperatures
- Graph 11-2 Mean Monthly Rainfall
- Graph 11-3 Relative Humidity Recorded at 9am and 3pm
- Graph 11-4 Wind Speed and Wind Direction

LIST OF PLATES

- Plate 6-1 View of 26 year-old Rehabilitation at the Existing Mine
- Plate 6-2 Photo-point Monitoring at Rehabilitation Site VMS3
- Plate 6-3 Photo-point Monitoring at Rehabilitation Site VMS22
- Plate 7-1 Example of Open Forest Habitat within the Project Site
- Plate 7-2 Example of Woodland Habitat within the Project Site
- Plate 7-3 Example of Shrubland Habitat within the Project Site
- Plate 7-4 Example of Sandstone Woodland and Rock Outcrop Habitat within the Project Site
- Plate 7-5 Example of Riparian Habitat within the Project Site
- Plate 7-6 Example of Closed Forest (Rainforest) Habitat within the Project Site
- Plate 16-1 Site ELS03 – Rock Shelter with Art, Artefacts and Deposit
- Plate 16-2 Site ELS03 – Rock Shelter with Art, Artefacts and Deposit
- Plate 16-3 Site ELS04 – Rock Shelter with Art and Grinding
- Plate 16-4 Site ELS04 – Rock Shelter with Art and Grinding
- Plate 16-5 Site ELN05 – Rock Shelter with Art, Artefacts and Deposit
- Plate 16-6 Site ELN05 – Rock Shelter with Art, Artefacts and Deposit
- Plate 16-7 Site ELN06 – Rock Shelter with Art
- Plate 16-8 Site ELN06 – Rock Shelter with Art
- Plate 16-9 Site ELN13 – Rock Shelter with Art and Deposit
- Plate 16-10 Site ELN13 – Rock Shelter with Art and Deposit
- Plate 16-11 Site ELS05 – Stone Artefact Scatter
- Plate 16-12 Site ELS14 – Manuport

LIST OF ATTACHMENTS

- Attachment 1-1 Environmental Scoping Assessment
- Attachment 5-1 EIS Stakeholder Consultation List
- Attachment 5-2 Community Information Sheet 1
- Attachment 5-3 Community Information Sheet 2
- Attachment 10-1 Summary of Baseline Surface Water Quality

LIST OF APPENDICES

VOLUME 2

- Appendix A Geochemistry Report
- Appendix B Soils Report

VOLUME 3

- Appendix C Terrestrial Ecology Report
- Appendix D Aquatic Ecology Report
- Appendix E Biodiversity Offsets Strategy

VOLUME 4

- Appendix F Groundwater Report
- Appendix G Surface Water Drainage Report
- Appendix H Baseline Surface Water Monitoring Report

VOLUME 5

- Appendix I Air Quality Report
- Appendix J Noise and Vibration Report
- Appendix K Socio-economics Report
- Appendix L Archaeology Report