

Central Eyre Iron Project Mining Lease Proposal



Volume One

Declaration of Accuracy

1	Introduction.....	1-1
1.1	Iron Road Company Profile	1-1
1.1.1	History of the CEIP.....	1-3
1.1.2	Environmental Policy.....	1-4
1.2	Overview of the Proposed CEIP	1-4
1.2.1	Overview of Project Components	1-5
1.2.2	Overview of the Project Site and Locality	1-5
1.3	Statutory Approvals Process.....	1-7
1.3.1	State Approvals	1-7
1.3.2	Commonwealth Approvals.....	1-7
1.3.3	Objectives of the Mining Lease Proposal	1-7
1.3.4	Document Structure.....	1-8
2	Description of the Existing Environment	2-1
2.1	Overview of Local Communities	2-1
2.2	Proximity to Infrastructure and Housing	2-1
2.2.1	Housing and Services.....	2-2
2.2.2	Exempt Land and Waivers of Exemption	2-6
2.2.3	Utilities	2-9
2.2.4	Transport	2-11
2.3	Planning Framework	2-14
2.3.1	South Australia's Strategic Plan.....	2-14
2.3.2	Wudinna DC Development Plan	2-16
2.4	Topography and Landscape	2-20
2.5	Climate.....	2-22
2.5.1	Temperature and Rainfall.....	2-22
2.5.2	Wind	2-22
2.5.3	Natural Hazards.....	2-22
2.6	Geohazards	2-27
2.7	Proximity to Conservation Areas	2-32
3	Description of the Proposed Mining Operations	3-1
3.1	Overview of Mining Operation	3-1
3.1.1	Phases of Mining	3-1
3.1.2	Mining Operation	3-2
3.2	Reserves, Products and Market	3-5
3.2.1	Geological Environment	3-5
3.2.2	Reserves and Resources	3-9
3.2.3	Product and Market	3-11
3.3	Exploration Activities	3-12
3.4	Mining Description.....	3-16
3.4.1	Mining Method.....	3-16
3.4.2	Mining Schedule	3-18
3.4.3	Construction Phase Summary	3-22
3.4.4	Use of Explosives	3-23

3.4.5	Type of Equipment	3-26
3.4.6	Stockpiles.....	3-27
3.4.7	In-Pit Crushing and Conveying Plant Description.....	3-30
3.4.8	Ore Processing Facility Description	3-32
3.4.9	Concentrate Handling Facilities Description	3-36
3.4.10	Mine Dewatering.....	3-37
3.4.11	Process Water Requirements.....	3-38
3.5	Waste.....	3-42
3.5.1	Processing Wastes.....	3-42
3.5.2	Integrated Waste Landform	3-42
3.5.3	Industrial and Commerical Wastes.....	3-53
3.6	Supporting Surface Infrastructure	3-55
3.6.1	Site Access	3-55
3.6.2	Accommodation, Office and Maintenance Areas	3-58
3.6.3	Emergency Services.....	3-60
3.6.4	Public Roads, Services and Utilities	3-63
3.6.5	Visual Screening.....	3-65
3.6.6	Fuel and Chemical Storage	3-65
3.6.7	Site Security.....	3-66
3.6.8	Stormwater Management	3-68
3.7	Mine Completion	3-68
3.7.1	Surface Infrastructure and Buildings.....	3-69
3.7.2	Mine Pit	3-69
3.7.3	Integrated Waste Landform	3-72
3.7.4	Land Use Options.....	3-73
3.7.5	Native Vegetation Cover	3-76
3.8	Resource Inputs	3-76
3.8.1	Workforce and Hours of Operation.....	3-76
3.8.2	Energy Sources	3-77
3.8.3	Water Sources	3-78
4	Statutory Framework	4-1
4.1	Approvals Process.....	4-1
4.2	State Legislative Requirements	4-1
4.2.1	Mining Act 1971	4-1
4.2.2	Environment Protection Act 1993.....	4-2
4.2.3	Other State Legislation	4-3
4.3	Commonwealth Legislative Requirements.....	4-5
4.3.1	Environment Protection and Biodiversity Conservation Act 1999.....	4-5
4.3.2	Other Legislation	4-6
5	Stakeholder Consultation	5-1
5.1	Applicable legislation and standards	5-1
5.2	Applicable Legislation and Standards	5-1
5.3	Engagement and Consultation Approach.....	5-2
5.4	Stakeholders	5-3
5.5	Engagement Program	5-8
5.5.1	Community Information Sessions / Public Meetings	5-8
5.5.2	One-on-One Meetings.....	5-10
5.5.3	Focus Groups.....	5-10
5.5.4	Community Consultative Committee (CCC)	5-11

5.5.5	Talking Topic Round Table Sessions	5-13
5.5.6	Community Reference Groups	5-14
5.5.7	Survey	5-14
5.6	Identifying and Managing Benefits and Issues	5-17
5.6.1	Benefits Raised	5-17
5.6.2	Concerns Raised	5-17
5.6.3	Stakeholder Benefits and Issues Register	5-18
5.7	Conclusion	5-28
6	Assessment Methodology	6-1
6.1	Impact Assessment	6-2
6.1.1	Define Normal Project Activities and Design Elements	6-2
6.1.2	Identify Environmental Aspects Associated with Project Activities	6-2
6.1.3	Identify Potential Impact Events	6-2
6.1.4	Describe Source, Pathway, Receptor	6-3
6.1.5	Grouping of Impacts	6-3
6.1.6	Identify the Measures and Factors that will Limit Impacts	6-4
6.1.7	Undertake Studies to Measure the Residual Impact on Environmental, Social and Economic Values	6-4
6.1.8	Categorise Impact	6-4
6.1.9	Assess Whether the Impact is Acceptable	6-6
6.2	Risk Assessment	6-6
6.2.1	Identify Limitations in the Impact Assessment	6-7
6.2.2	Identify Level of Certainty in the Impact Assessment	6-7
6.2.3	Assess the Sensitivity to Change of any Assumptions	6-8
6.2.4	Categorise the Risk	6-9
6.2.5	Assess Whether the Risk is Acceptable	6-13
6.3	Outcomes and Criteria	6-13
6.4	Alignment with Ministerial Determination	6-15
7	Public Safety	7-1
7.1	Applicable Legislation and Standards	7-1
7.2	Assessment Method	7-2
7.3	Existing Environment	7-2
7.3.1	Geochemical Composition of Iron Concentrate and Waste Material	7-2
7.3.2	Fire Hazard	7-3
7.3.3	Geohazards	7-3
7.3.4	Summary of Key Environment Values	7-4
7.4	Context and Views of Affected Parties	7-4
7.5	Potentially Impacting Events	7-4
7.6	Control Measures to Protect Environmental Values	7-5
7.6.1	Design Measures	7-6
7.6.2	Management Strategies and Commitments	7-6
7.7	Impact and Risk Assessment	7-8
7.7.1	Unauthorised Access to Mine Site	7-8
7.7.2	Failure of Integrated Waste Landform	7-9
7.7.3	Collapse of mine viewing platform	7-9
7.7.4	Disturbance of Contaminated Land	7-9
7.7.5	Contamination of Soil or Groundwater	7-10
7.7.6	Fire Originating from the Area of the Proposed Mine Site	7-10
7.7.7	Onsite Emergency Services	7-10

7.7.8	Summary of Impacts and Risks	7-11
7.7.9	Justification and Acceptance of Residual Impact and Risk	7-11
7.8	Proposed Outcomes	7-12
7.9	Findings and Conclusion	7-14
8	Traffic	8-1
8.1	Applicable Legislation and Standards	8-1
8.2	Assessment Method	8-2
8.3	Existing Environment	8-4
8.3.1	Eyre Peninsula Highway Network	8-4
8.3.2	Local Road Network	8-7
8.3.3	Road Safety	8-12
8.3.4	Rail Network	8-12
8.3.5	School Bus Routes	8-12
8.3.6	Public Transport	8-12
8.3.7	Summary of Key Environmental Values	8-13
8.4	Context and Views of Affected Parties	8-15
8.5	Potentially Impacting Events	8-15
8.6	Control Measures to Protect Environmental Components	8-16
8.6.1	Design Measures	8-16
8.6.2	Management Strategies and Commitments	8-17
8.7	Impact and Risk Assessment	8-18
8.7.1	Traffic Capacity Impacts during Construction	8-18
8.7.2	Travel Time Delay from Module Transport	8-21
8.7.3	Traffic Capacity Impacts during Operation	8-24
8.7.4	Road Safety	8-27
8.7.5	Pavement Condition and Wear	8-27
8.7.6	Intersection Capacity	8-28
8.7.7	School Bus Operations	8-29
8.7.8	Altered Local Access from Road Closures and Road Realignment	8-31
8.7.9	Summary of Impacts and Risk	8-33
8.8	Justification and Acceptance of Residual Impact and Risk	8-34
8.9	Proposed Outcome(s) and Criteria	8-34
8.10	Findings and Conclusion	8-35
9	Aboriginal Heritage and Native Title	9-1
9.1	Applicable Legislation and Standards	9-1
9.2	Assessment Method	9-2
9.2.1	Aboriginal Heritage Survey	9-2
9.3	Existing Environment	9-4
9.3.1	Existing Information about Aboriginal Heritage	9-4
9.3.2	Aboriginal Connection with Land on the Eyre Peninsula	9-6
9.3.3	Native Title	9-6
9.3.4	Survey Findings	9-7
9.3.5	Summary of Key Environmental Values	9-8
9.4	Context and Views of Affected Parties	9-8
9.4.1	Consultation with the Barngarla	9-8
9.5	Potentially Impacting Events	9-8
9.6	Control Measures to Protect Environmental Components	9-9
9.6.1	Design Measures	9-9

9.6.2	Management Strategies and Commitments	9-9
9.7	Impact and Risk Assessment	9-10
9.7.1	Damage, Disturbance or Interference of Sites, Objects or Remains of Aboriginal Heritage Significance	9-10
9.7.2	Summary of Impacts and Risk	9-11
9.7.3	Justification and Acceptance of Residual Impact and Risk.....	9-12
9.8	Proposed Outcome(s) and Criteria	9-12
9.9	Findings and Conclusion	9-12
10	Non-Aboriginal Heritage.....	10-1
10.1	Applicable Legislation and Standards	10-1
10.2	Assessment Method	10-1
10.3	Existing Environment	10-2
10.3.1	Summary of Key Environmental Values	10-4
10.4	Context and Views of Affected Parties	10-6
10.5	Potentially Impacting Events	10-6
10.5.1	Non-Identified Heritage Values.....	10-6
10.5.2	Vibration at Warrambooo Cemetery.....	10-7
10.6	Control Measures to Protect Environmental Values	10-7
10.7	Impact and Risk Assessment.....	10-7
10.8	Proposed Outcome(s)	10-7
10.9	Findings and Conclusion	10-7
11	Native Fauna and Pest Species	11-1
11.1	Applicable Legislation and Standards	11-1
11.2	Assessment Method	11-2
11.2.1	Desktop Review	11-2
11.2.2	Field Surveys.....	11-3
11.3	Existing Environment	11-5
11.3.1	Regional Context	11-5
11.3.2	Habitat Condition and Diversity	11-5
11.3.3	Native Fauna Diversity.....	11-12
11.3.4	Conservation Significant Fauna	11-14
11.3.5	Lake Warrambooo Complex.....	11-19
11.3.6	Introduced Fauna and Pest Species.....	11-20
11.3.7	Summary of Key Environment Values	11-21
11.4	Context and Views of Affected Parties	11-22
11.5	Potentially Impacting Events	11-22
11.5.1	Altered Habitat at Adjacent Saltpans	11-23
11.6	Control Measures to Protect Environmental Values	11-25
11.6.1	Design Measures	11-25
11.6.2	Management Strategies and Commitments	11-25
11.7	Impact and Risk Assessment.....	11-27
11.7.1	Reduction of Habitat Through Vegetation Clearance	11-28
11.7.2	Direct or Indirect Mortality of Conservation Significant Fauna	11-29
11.7.3	Direct or Indirect Injury or Mortality of General Fauna	11-34
11.7.4	Increase in Feral and Pest Species Abundance	11-35
11.7.5	Altered Fauna Behaviour as a Result of Light.....	11-36
11.7.6	Altered Fauna Behaviour as a Result of Noise	11-36
11.7.7	Establishment of Microhabitats on Integrated Waste Landform	11-38

11.7.8	Establishment of Fauna Habitat Through Revegetation	11-38
11.7.9	Establishment of Fauna Habitat Through SEB.....	11-38
11.7.10	Weed Impacts to Fauna Habitat.....	11-39
11.7.11	Bushfire Impacts to Native Fauna	11-39
11.7.12	Summary of Impacts and Risks.....	11-40
11.7.13	Justification and Acceptance of Residual Impact and Risk.....	11-40
11.8	Proposed Outcome(s) and Criteria	11-41
11.9	Findings and Conclusion	11-42
12	Vegetation and Weeds	12-1
12.1	Applicable Legislation and Standards	12-1
12.2	Assessment Method	12-3
12.2.1	Desktop Review	12-3
12.2.2	Field Surveys.....	12-3
12.2.3	Condition	12-4
12.3	Existing Environment	12-6
12.3.1	Regional Context	12-6
12.3.2	Vegetation Type and Condition.....	12-9
12.3.3	Native Flora Diversity	12-21
12.3.4	Conservation Significant Flora.....	12-21
12.3.5	Lake Warramboe Complex.....	12-26
12.3.6	Heritage Agreement Area.....	12-29
12.3.7	Introduced Flora and Pest Species	12-30
12.3.8	Summary of Key Environment Values.....	12-32
12.4	Context and Views of Affected Parties	12-33
12.5	Potentially Impacting Events	12-34
12.5.1	Altered Habitat at Adjacent Salt Pans.....	12-34
12.6	Control Measures to Protect Environmental Values	12-35
12.6.1	Design Measures	12-35
12.6.2	Management Strategies and Commitments	12-35
12.7	Impact and Risk Assessment.....	12-38
12.7.1	Vegetation Clearance	12-39
12.7.2	Direct or Indirect Loss of Conservation Significant Flora	12-42
12.7.3	Impacts to Threatened Ecological Communities.....	12-45
12.7.4	Direct or Indirect Loss of Common Flora Species.....	12-45
12.7.5	Establishment of Habitat Through Environmental Offsets	12-45
12.7.6	Poor Revegetation and Rehabilitation (Including on the IWL) Results in Planned Future Ecological Values not Being Realised	12-46
12.7.7	Introduction and Spread of Weeds	12-47
12.7.8	Impacts to Native Vegetation as a Result of Pest and Feral Animals.....	12-48
12.7.9	Vegetation Stress or Loss Due to Dust Deposition from Mining Activities.....	12-49
12.7.10	Impacts to Regional Vegetation from Recreational Activities.....	12-50
12.7.11	Bushfire	12-50
12.7.12	Groundwater Impacts upon Vegetation within Hambidge WPA.....	12-51
12.7.13	Summary of Impacts and Risks.....	12-51
12.7.14	Justification and Acceptance of Residual Impact and Risk.....	12-52
12.8	Proposed Outcome(s) and Criteria	12-53
12.9	Findings and Conclusions.....	12-55

Volume Two

13	Soil and Land Quality.....	13-1
13.1	Applicable Legislation and Standards	13-1
13.2	Assessment Method	13-2
13.3	Existing Environment	13-2
13.3.1	Topsoil and Subsoil.....	13-2
13.3.2	Acid Sulfate Soils and Potential Acid-forming Material	13-7
13.3.3	Site Contamination.....	13-10
13.3.4	Dispersive Materials	13-11
13.3.5	Summary of Key Environment Values	13-11
13.4	Context and Views of Affected Parties	13-12
13.5	Potentially Impacting Events	13-12
13.6	Control Measures to Protect Environmental Values	13-13
13.6.1	Design Measures	13-13
13.6.2	Management Strategies and Commitments	13-14
13.7	Impact and Risk Assessment.....	13-16
13.7.1	Elevated Soil Salinity.....	13-16
13.7.2	Sediment Deposition	13-17
13.7.3	Contamination or Acidification of Soil Resources	13-18
13.7.4	Loss of Topsoil during Stockpiling	13-19
13.7.5	Soil Compaction.....	13-20
13.7.6	Contamination of Soil.....	13-21
13.7.7	Topsoil Loss from Erosion.....	13-21
13.7.8	Summary of Impacts and Risks.....	13-22
13.7.9	Justification and Acceptance of Residual Impact and Risk.....	13-23
13.8	Proposed Outcome(s) and Criteria	13-23
13.9	Findings and Conclusion	13-25
14	Waste Disposal and Management	14-1
14.1	Applicable Legislation and Standards	14-1
14.2	Assessment Method	14-2
14.3	Existing Environment	14-2
14.3.1	Waste on the Eyre Peninsula.....	14-2
14.3.2	Summary of Key Environment Values	14-5
14.4	Context and Views of Affected Parties	14-5
14.5	Potentially Impacting Events	14-5
14.6	Control Measures to Protect Environmental Values	14-6
14.6.1	Design Measures	14-6
14.6.2	Management Strategies and Commitments	14-6
14.7	Impact and Risk Assessment.....	14-7
14.7.1	Increased Waste Streams.....	14-8
14.7.2	Commercial Opportunities for the Provision of Waste Management Services	14-10
14.7.3	Handling of Waste Materials.....	14-11
14.7.4	Summary of Impacts and Risks.....	14-11
14.7.5	Justification and Acceptance of Residual Impact and Risk.....	14-12
14.8	Proposed Outcomes	14-12
14.9	Findings and Conclusion	14-13

15	Air Quality	15-1
15.1	Applicable Legislation and Standards	15-1
15.2	Assessment Method	15-2
15.3	Existing Environment	15-3
15.3.1	Existing Background Air Quality	15-3
15.3.2	Air Quality Receptors.....	15-7
15.3.3	Summary of Key Environmental Values	15-9
15.4	Context and Views of Affected Parties	15-11
15.5	Potentially Impacting Events	15-11
15.6	Control Measures to Protect Environmental Components	15-12
15.6.1	Design Measures	15-12
15.6.2	Management Strategies and Commitments	15-13
15.7	Impact and Risk Assessment.....	15-14
15.7.1	Air Quality Modelling.....	15-14
15.7.2	Dust Emissions during Construction.....	15-19
15.7.3	Dust Emissions during Operation	15-25
15.7.4	Dust Emissions following Closure	15-30
15.7.5	Nitrogen Oxide Emissions from Blasting	15-30
15.7.6	Impacts on Agricultural Values.....	15-33
15.7.7	Impacts on Native Vegetation.....	15-35
15.7.8	Summary of Impacts and Risks.....	15-36
15.7.9	Justification and Acceptance of Residual Impact and Risk.....	15-36
15.8	Proposed Outcome(s)	15-37
15.9	Findings and Conclusion	15-40
16	Noise	16-1
16.1	Applicable Legislation and Standards	16-1
16.1.1	Explanation of Noise Terms and Units	16-1
16.1.2	Noise Criteria	16-2
16.1.3	Noise Character Penalty	16-3
16.2	Assessment Method	16-3
16.3	Existing Environment	16-4
16.3.1	Existing Noise Environment.....	16-4
16.3.2	Sensitive Receivers	16-7
16.3.3	Summary of Key Environmental Values	16-7
16.4	Context and Views of Affected Parties	16-8
16.5	Potentially Impacting Events	16-8
16.6	Control Measures to Protect Environmental Values	16-9
16.6.1	Design Measures	16-9
16.6.2	Management Strategies and Commitments	16-9
16.7	Impact and Risk Assessment.....	16-10
16.7.1	Construction Noise	16-10
16.7.2	Operational Noise.....	16-14
16.7.3	Closure Noise.....	16-18
16.7.4	Summary of Impacts and Risks.....	16-19
16.7.5	Justification and Acceptance of Residual Impact and Risk.....	16-19
16.8	Proposed Outcome(s) and Criteria	16-19
16.9	Findings and Conclusion	16-21

17	Airblast and Vibration	17-1
17.1	Applicable Legislation and Standards	17-1
17.1.1	Blasting Criteria	17-1
17.1.2	Ground Vibration Criteria	17-2
17.2	Assessment Method	17-3
17.3	Existing Environment	17-3
17.3.1	Existing Noise and Vibration Sources	17-3
17.3.2	Sensitive Receivers	17-4
17.3.3	Summary of Key Environmental Values	17-4
17.4	Context and Views of Affected Parties	17-5
17.5	Potentially Impacting Events	17-5
17.6	Control Measures to Protect Environmental Components	17-6
17.6.1	Design Measures	17-6
17.6.2	Management Strategies and Commitments	17-6
17.7	Impact and Risk Assessment	17-6
17.7.1	Ground Vibration and Airblast from Blasting	17-7
17.7.2	Summary of Impacts and Risk	17-7
17.7.3	Justification and Acceptance of Residual Impact and Risk	17-8
17.8	Proposed Outcome(s) and Criteria	17-8
17.9	Findings and Conclusion	17-9
18	Surface Water	18-1
18.1	Applicable Legislation and Standards	18-1
18.2	Assessment Method	18-2
18.3	Existing Environment	18-3
18.3.1	Rainfall	18-3
18.3.2	Evaporation	18-3
18.3.3	Soil Permeability	18-4
18.3.4	Existing Drainage and Watercourses	18-4
18.3.5	Water Protection Areas	18-4
18.3.6	Water Users	18-4
18.3.7	Water Quality	18-5
18.3.8	Summary of Key Environment Values	18-5
18.4	Context and Views of Affected Parties	18-9
18.5	Potentially Impacting Events	18-9
18.6	Control Measures to Protect Environmental Values	18-10
18.6.1	Design Measures	18-10
18.6.2	Management Strategies and Commitments	18-11
18.7	Impact and Risk Assessment	18-12
18.7.1	Contamination of Surface Water	18-12
18.7.2	Disturbance to Existing Flow Regimes	18-13
18.7.3	Salinisation of Surface Water	18-14
18.7.4	Summary of Impacts and Risks	18-15
18.7.5	Justification and Acceptance of Residual Impact and Risk	18-15
18.8	Proposed Outcomes	18-15
18.9	Findings and Conclusion	18-16
19	Groundwater	19-1
19.1	Applicable Legislation and Standards	19-1
19.2	Assessment Method	19-2

19.3	Existing Environment	19-3
19.3.1	Hydrology	19-3
19.3.2	Geological setting	19-3
19.3.3	Regional Hydrogeology.....	19-4
19.3.4	Conceptual Hydrogeological Model	19-11
19.3.5	Potential for Acid and Metalliferous Drainage.....	19-12
19.3.6	Groundwater Receptors	19-12
19.3.7	Summary of Key Environmental Values	19-14
19.4	Context and View of Affected Parties.....	19-18
19.5	Potentially Impacting Events	19-18
19.5.1	Source, Pathway and Receptor Assessment	19-19
19.6	Control Measures to Protect Environmental Values	19-33
19.6.1	Design Measures	19-33
19.6.2	Management Strategies and Commitments	19-33
19.7	Impact and Risk Assessment.....	19-34
19.7.1	Impacts to agricultural production from groundwater level rise due to altered recharge from integrated waste landform	19-35
19.7.2	Summary of Impacts and Risks	19-35
19.7.3	Justification and Acceptance of Residual Impact and Risk.....	19-35
19.8	Proposed Outcomes	19-36
19.9	Findings and Conclusions.....	19-36

20 Visual Amenity.....20-1

20.1	Applicable Legislation and Standards	20-1
20.2	Assessment Method	20-2
20.2.1	Desktop Study.....	20-2
20.2.2	Site Visit and Photography	20-3
20.2.3	Landscape Context Analysis	20-3
20.2.4	Impact Assessment.....	20-5
20.3	Existing Environment	20-6
20.3.1	Topography.....	20-6
20.3.2	Vegetation	20-8
20.3.3	Landscape Types.....	20-11
20.3.4	Key Receptors.....	20-16
20.3.5	Summary of Key Environment Values	20-20
20.4	Context and Views of Affected Parties	20-20
20.5	Potentially Impacting Events	20-21
20.6	Control Measures to Protect Environmental Values	20-21
20.6.1	Design Measures	20-21
20.6.2	Management Strategies and Commitments	20-22
20.7	Impact and Risk Assessment.....	20-22
20.7.1	Visual Impact During Construction.....	20-23
20.7.2	Visual Impact During Operation	20-23
20.7.3	Visual Impact Post Closure	20-23
20.7.4	Light Spill	20-24
20.7.5	Weighted Viewpoint Assessment.....	20-25
20.7.6	Summary of Impacts and Risks.....	20-35
20.8	Proposed Outcomes and Criteria.....	20-36
20.9	Findings and Conclusion	20-37

21	Land Use and Tenure.....	21-1
21.1	Applicable Legislation and Standards	21-1
21.2	Assessment Method	21-2
21.3	Existing Environment	21-2
21.3.1	Primary Production and Agriculture.....	21-4
21.3.2	Nature Conservation	21-5
21.3.3	Mineral Exploration and Extraction.....	21-6
21.3.4	Townships and Residential Areas	21-8
21.3.5	Land Tenure.....	21-9
21.3.6	Future Land Use Change.....	21-9
21.3.7	Post Mining Land Use	21-10
21.3.8	Summary of Key Environmental Values	21-12
21.4	Context and Views of Affected Parties	21-12
21.5	Potentially Impacting Events	21-12
21.6	Control Measures to Protect Environmental Values	21-13
21.6.1	Design Measures	21-13
21.6.2	Management Strategies and Commitments	21-14
21.7	Impact and Risk Assessment.....	21-14
21.7.1	Reduced Area of Productive Land Available for Agriculture	21-15
21.7.2	Post Mining Land Use is Not Acceptable to Stakeholders.....	21-16
21.7.3	Loss of Stability of Integrated Waste Landform	21-16
21.7.4	Shading of Adjacent Agricultural Land	21-17
21.7.5	Summary of Impacts and Risks.....	21-20
21.8	Proposed Outcomes	21-20
21.9	Findings and Conclusion	21-22
22	Social Environment	22-1
22.1	Applicable Legislation and Standards	22-1
22.2	Assessment Method	22-1
22.2.1	Study Areas.....	22-2
22.2.2	Profiling the Existing Social Environment.....	22-3
22.2.3	Stakeholder Consultation and Engagement.....	22-3
22.2.4	Social Research	22-3
22.2.5	Impact Classification.....	22-3
22.3	Existing Environment	22-5
22.3.1	Local and Regional Communities	22-5
22.3.2	Population and Demography	22-7
22.3.3	Households and Families.....	22-11
22.3.4	Housing and Accommodation	22-13
22.3.5	Economy and Labour	22-22
22.3.6	Social Services and Facilities.....	22-28
22.3.7	Health Services	22-31
22.3.8	Social Character and Wellbeing.....	22-32
22.3.9	Quality of Life	22-32
22.3.10	Community Support	22-33
22.3.11	Transport Access and Mobility.....	22-36
22.3.12	Summary of Social Values	22-37
22.4	Context and Views of Affected Parties	22-38
22.5	Potentially Impacting Events	22-39
22.6	Control Measures to Protect Environmental Values	22-40
22.6.1	Design Measures	22-40

22.6.2	Management Strategies and Commitments	22-41
22.7	Impact and Risk Assessment	22-44
22.7.1	Employment and Business	22-44
22.7.2	Population and Social Services	22-48
22.7.3	Housing and Accommodation	22-55
22.7.4	Social Character and Wellbeing.....	22-57
22.7.5	Amenity, Access and Disturbance	22-61
22.7.6	Closure and post closure social impacts.....	22-64
22.7.7	Summary of Impacts and Risk	22-65
22.8	Justification and Acceptance of Residual Impact and Risk	22-66
22.9	Proposed Outcome(s) and Criteria	22-66
22.10	Findings and Conclusion	22-70

23 Economic23-1

23.1	Applicable Legislation and Standards	23-2
23.2	Assessment Method	23-3
23.2.1	Study Area	23-3
23.2.2	Profiling the Existing Economic Environment	23-5
23.2.3	Modelling to Identify Potential Impact And Benefits.....	23-5
23.3	Existing Environment	23-7
23.3.1	Overview of Existing Economic Environment in Regional and Local Study Area	23-7
23.3.2	Existing Economic Value and Job Numbers.....	23-8
23.3.3	Summary of Key Environment Values	23-10
23.4	Context and Views of Affected Parties	23-11
23.5	Potentially Impacting Events	23-11
23.6	Control Measures to Protect Environmental Values	23-11
23.6.1	Design Measures	23-11
23.6.2	Management Strategies and Commitments	23-12
23.7	Impact and Risk Assessment.....	23-13
23.7.1	Impact Assessment.....	23-14
23.7.2	Construction	23-14
23.7.3	Operations.....	23-17
23.7.4	Additional Impacts and Benefits	23-20
23.7.5	Summary of Impacts.....	23-21
23.7.6	Risk Assessment	23-22
23.7.7	Summary of Impacts and Risks.....	23-22
23.8	Proposed Outcome(s)	23-23
23.9	Findings and Conclusion	23-23

References

Glossary

List of Figures

Figure 1-1 Comparison of Iron Ore Projects in South Australia	1-4
Figure 1-2 CEIP Location and Infrastructure Components	1-6
Figure 2-1 Proximity of the Proposed Mining Lease Area to Townships.....	2-3
Figure 2-2 Housing within 5 km of the Proposed Mining Lease Area	2-5
Figure 2-3 Exempt Land Areas	2-8
Figure 2-4 Utilities Infrastructure	2-10
Figure 2-5 Transport Infrastructure.....	2-13
Figure 2-6 Proposed Mining Lease Area Zoning	2-19
Figure 2-7 Local Topography	2-21
Figure 2-8 Climatic Conditions.....	2-23
Figure 2-9 Seasonal Wind Roses (9am Wudinna).....	2-24
Figure 2-10 Seasonal Wind Roses (3pm Wudinna).....	2-25
Figure 2-11 South Australian Rainfall Deficiency 1 September to 30 November 2014.....	2-26
Figure 2-12 Stratigraphic correlations of Archaean to Mesoproterozoic iron-rich rocks in South Australia.....	2-28
Figure 2-13 Seismic Activity in South Australia	2-31
Figure 2-14 Conservation Areas.....	2-34
Figure 3-1 Mine Site Layout.....	3-3
Figure 3-2 Surface Geology of the Exploration Licence.....	3-7
Figure 3-3 Geological Age of CEIP Deposit	3-8
Figure 3-4 CEIP Orebody.....	3-9
Figure 3-5 Orebody Mineralisation Looking West.....	3-9
Figure 3-6 Aeromagnetic Response of Exploration Licence	3-14
Figure 3-7 Stages of Iron Road's Drilling Programmes	3-15
Figure 3-8 Simplified Mining Process Diagram	3-17
Figure 3-9 Indicative Progress of the Mine Pit at Year 5, 10, 15, 20, 25 and Post Closure	3-20
Figure 3-10 Indicative Progress of the IWL at Year 5, 10, 15, 20, 25 and Post Closure.....	3-21
Figure 3-11 Indicative Construction Schedule.....	3-22
Figure 3-12 Explosives Storage and Manufacturing Facility.....	3-25
Figure 3-13 Ore Processing Plant Layout.....	3-33
Figure 3-14 Simplified Process Flow Diagram for Ore Processing Facility.....	3-34
Figure 3-15 Predicted Average Annual Dewatering Rates during the 25 years of Mine Operation	3-38
Figure 3-16 Locations of Water Storage Dams.....	3-39
Figure 3-17 Proposed Dewatering Well Locations	3-40
Figure 3-18 Simplified Process Water Flow Diagram	3-41
Figure 3-19 Provisional Additional Waste Storage Locations.....	3-44
Figure 3-20 Conceptual IWL Cross-Section.....	3-48
Figure 3-21 Conceptual Design of the IWL (view from south-east to north-west)	3-49
Figure 3-22 Concept Landform Cover Profiles (from MWH 2015 in Appendix S)	3-50
Figure 3-23 Access Route to the Mine Site.....	3-57
Figure 3-24 Indicative Layout of Mine Site Camp (Source: DoricGroup).....	3-59
Figure 3-25 Mine Administration Areas, Emergency Services and Warehousing	3-61
Figure 3-26 Mine Maintenance Facilities	3-62
Figure 3-27 Existing Public Roads, Water Supply and Electricity Network.....	3-64
Figure 3-28 Site Fencing and Site Security.....	3-67
Figure 3-29 Definition of Terms of Instability (Source: DIR 1997).....	3-70
Figure 3-30 Required Stand-off Distances for Safety Bund Wall (Source: DIR 1997).....	3-70
Figure 3-31 Indicative Safety Bund Wall Offsets from Edge of Mine Pit	3-71
Figure 3-32 Predicted Pit Lake Level Post Closure.....	3-72
Figure 3-33 Final Post Mining Land Use within Proposed Mining Lease	3-74
Figure 3-34 Final Post Mining Cross Sections	3-75

Figure 5-1 Tailoring Engagement by Impact Level.....	5-4
Figure 6-1 Overview of Environmental Impact Assessment Methodology.....	6-14
Figure 8-1 Transport Assessment Study Area.....	8-3
Figure 8-2 Eyre Peninsula Transport Network.....	8-5
Figure 8-3 Proposed Mining Lease Area Local Road Network.....	8-10
Figure 8-4 Module Haul Route Local Road Network	8-11
Figure 8-5 Crash Rate per 100 Million Vehicle Kilometres Travelled (for Selected Sections of Roads)	8-14
Figure 8-6 Total Two-Way Vehicle Movements for Proposed Mine Site, Construction Year 1.....	8-19
Figure 8-7 Module Delivery and Diversion Routes	8-23
Figure 8-8 Total Two-Way Vehicle Movements per Segment of Road during Operation: Mining Operations	8-25
Figure 8-9 Key Intersections Analysed.....	8-30
Figure 8-10: Proposed Road Closures and Upgrades	8-32
Figure 9-1 Plan Excerpt from DSD-AAR Central Archive.....	9-5
Figure 10-1 Places of Non-Aboriginal Heritage Significance	10-5
Figure 11-1 Location of Survey Sites within the Proposed Mining Lease Area	11-4
Figure 11-2 Historical Threatened and Migratory Fauna Records of Proposed Mining Lease Area and Surrounds (labels only provided for EPBC listed fauna).....	11-18
Figure 12-1 Location of Survey Sites within the Proposed Mining Lease Area	12-5
Figure 12-2 IBRA Environmental Associations of the Eyre Peninsula.....	12-8
Figure 12-3 Vegetation Types of the Proposed Mining Lease Area	12-18
Figure 12-4 Vegetation Condition of the Proposed Mining Lease Area.....	12-20
Figure 12-5 Historic Threatened Flora Records of the Proposed Mining Lease Area and Surrounds.....	12-25
Figure 12-6 Vegetation Clearance within the Proposed Mining Lease Area	12-41
Figure 13-1 Soil Characteristics (from Jacobs 2014b and on-site investigations)	13-4
Figure 13-2 ASRIS Soil Landscape Map Units Occurring Within the Study Area (McKenzie et al. 2005)	13-5
Figure 13-3 Acid Sulfate Soils.....	13-9
Figure 14-1 Waste Management Hierarchy (Zero Waste SA 2004).....	14-2
Figure 14-2 Capacity of Existing Wudinna Landfill	14-9
Figure 15-1 Sensitive Receivers in the Vicinity of the Proposed Mine Site	15-10
Figure 15-2 Emission Source Locations: Construction Scenario (refer to Table 15 9 for emission source descriptions)	15-16
Figure 15-3 Emission Source Locations: Peak Operation Scenario (refer to Table 15 10 for emission source descriptions)	15-18
Figure 15-4 Predicted Maximum 24-Hour Average PM10 Concentrations – Construction Scenario	15-22
Figure 15-5 Predicted Maximum 24-Hour Average PM2.5 Concentrations – Construction Scenario	15-22
Figure 15-6 Predicted Annual Average PM2.5 Concentrations – Construction Scenario.....	15-23
Figure 15-7 Predicted Annual Average TSP Concentration – Construction Scenario.....	15-23
Figure 15-8 Predicted Annual Average Dust Deposition Levels (g/m ² /month) – Construction Scenario	15-24
Figure 15-9 Predicted Maximum 24-Hour Average PM10 Concentrations – Peak Operation Scenario	15-27
Figure 15-10 Predicted Maximum 24-Hour Average PM2.5 Concentrations – Peak Operation Scenario	15-27
Figure 15-11 Predicted Annual Average PM2.5 Concentrations – Peak Operation Scenario	15-28
Figure 15-12 Predicted Annual Average TSP Concentration – Peak Operation Scenario	15-28
Figure 15-13 Predicted Annual Average Dust Deposition Levels (g/m ² /month) – Peak Operation Scenario	15-29

Figure 15-14 Predicted Maximum Hourly Average Background NO ₂ Ground-Level Concentrations	15-32
Figure 15-15 Summary of Estimated Salt Store Contribution Over 25 Year Mine Life	15-35
Figure 16-1 Some Examples of Typical Sound Levels in dB(A).....	16-2
Figure 16-2 Location of Noise Loggers.....	16-6
Figure 16-3 Noise Data from Logger B.....	16-6
Figure 16-4 Distance from Sensitive Receivers to the Nearest Potential Noise Source.....	16-7
Figure 16-5 Predicted Construction Noise Contours for Proposed Mine Site (Scenario 1), Day L _{Aeq,15mins}	16-12
Figure 16-6 Predicted Construction Noise Contours for Proposed Mine Site (Scenario 1), Night L _{Aeq,15mins}	16-13
Figure 16-7 Predicted Operational Noise Contours for Proposed Mine Site (Scenario 3), Day L _{Aeq,15mins}	16-16
Figure 16-8 Predicted Operational Noise Contours for Proposed Mine Site (Scenario 3), Night L _{Aeq,15mins}	16-17
Figure 17-1 Distance from Sensitive Receivers to the Nearest Potential Noise and Vibration Source	17-4
Figure 18-1 Rainfall and Evaporation	18-3
Figure 18-2 Anticipated Soil Permeability (RPS 2015)	18-6
Figure 18-3 Surface Water Drainage	18-7
Figure 18-4 Proximity of Water Protection Areas	18-8
Figure 19-1 Project components, groundwater impact assessment study area and land use	19-6
Figure 19-2 Inferred groundwater flow direction in the Tertiary sediment aquifer	19-9
Figure 19-3 Inferred groundwater flow direction in the fractured rock aquifer.....	19-10
Figure 19-4 Proposed mine conceptual hydrogeological model (exaggerated z-axis).....	19-11
Figure 19-5 Potential groundwater receptors in the study area.....	19-15
Figure 19-6 Hydrogeological cross section mine site to Musgrave PWA. Groundwater drawdown denotes water table at end of mining.....	19-16
Figure 19-7 Inferred depth to water table within the proposed mining lease.....	19-17
Figure 19-8 Predicted average annual dewatering rates during the 25 years of mine operation	19-21
Figure 19-9 Predicted drawdown in the Tertiary aquifer at the completion of mining (base case, year 25)	19-23
Figure 19-10 Predicted drawdown in the fractured rock aquifer at the completion of mining (base case, year 25)	19-24
Figure 19-11 Predicted pit lake level post closure (base case scenario)	19-25
Figure 19-12 Predicted drawdown in the Tertiary aquifer 1000 years post closure (base case).....	19-26
Figure 19-13 Model uncertainty – extent of drawdown (1 m contour) in the Tertiary aquifer at the end of mining (year 25) (top) and 1000 years after closure (bottom)	19-28
Figure 19-14 Model uncertainty – extent of drawdown (1 m contour) in the fractured rock aquifer at the end of mining (year 25) (top) and 1000 years after closure (bottom)	19-29
Figure 19-15 Model uncertainty – predicted water levels in the pit post mine closure	19-30
Figure 19-16 Predicted zone of drawdown influence and receptor identification	19-32
Figure 20-1 Proposed Mining Lease LVIA Study Area.....	20-4
Figure 20-2 Vegetation Coverage	20-10
Figure 20-3 Landscape Types within the Study Area.....	20-12
Figure 20-4 Key Receptors within the Study Area	20-19
Figure 20-5 Proposed Mining Lease LVIA Viewpoint Locations.....	20-26
Figure 21-1 Land Use	21-3
Figure 21-2 Nature Conservation	21-7
Figure 21-3 Land Tenure and Restrictions.....	21-11
Figure 15-4 Extent of Shading Predicted to be Caused by Integrated Landform (summer)	21-18
Figure 15-5 Extent of Shading Predicted to be Caused by Integrated Landform (winter).....	21-19
Figure 22-1 Social Impact Assessment Process (adapted from Franks 2012)	22-2

Figure 22-2 Local Study Area	22-4
Figure 22-3 Historic and Predicted Population Change in Wudinna DC.....	22-5
Figure 22-4 Age Profile for Local and Regional Study Areas and South Australia, 2011	22-9
Figure 22-5 Age Profile in Local Townships and Suburbs and South Australia, 2011.....	22-10
Figure 22-6 Population Change in Local Study Areas and South Australia, 2001-2011	22-11
Figure 22-7 Household Types in Local Study Areas, Eyre Region and South Australia, 2011	22-12
Figure 22-8 Weekly Household Incomes in Local Study Areas, Eyre Region and South Australia, 2011	22-13
Figure 22-9 Median Residential House Sales Price in 2012.....	22-19
Figure 22-10 Monthly Room Occupancy Rates in Tourist Accommodation in Regional Centres, Eyre Peninsula Tourist Region and South Australia, April 2012 to March 2013	22-21
Figure 22-11 Approved Mines and Developing Projects in the Eyre Region.....	22-23
Figure 22-12 Unemployment Rate in Local Study Areas, Eyre Region and South Australia, December Quarter 2013.....	22-25
Figure 22-13 Top Employing Industries in Local Study Area, 2011	22-26
Figure 22-14 Existing Social Services in the Wudinna Township.....	22-30
Figure 22-15 Score on SEIFA Indices in Local Study Areas, 2011.....	22-34
Figure 22-16 Rates of Offending in Local Study Areas, Regional South Australia and South Australia by Victim-Reported and Police-Detected Offences, 2011.....	22-36
Figure 22-17 Travel Times to the Proposed Mine Site	22-51
Figure 22-18 Potential Changes in the Population of Wudinna DC as a Result of the CEIP and Flow-on Jobs	22-53
Figure 23-1 Local and Regional Study Areas.....	23-4

List of Plates

Plate 1-1 Exploration Activity at the Proposed CEIP Mine	1-3
Plate 2-1 Undulating Farmland within the Proposed Mining Lease Area (April 2014).....	2-20
Plate 2-2 Undulating Farmland within the Proposed Mining Lease Area (October 2011).....	2-20
Plate 2-3 View South Towards Hambidge Wilderness Protection Area (Darke Range in background).....	2-32
Plate 2-4 Darke Range Viewed from Federation Lookout	2-33
Plate 3-1 Coarse CEIP Magnetite Concentrate	3-12
Plate 3-2 Illustration of Excavator Feeding a Fully Mobile Crusher and Track Mounted Conveyor (Source: MMD)	3-16
Plate 3-3 Indicative Fully Mobile Crusher Stations (Source: MMD)	3-30
Plate 3-4 Example of an IWL Spreader	3-46
Plate 3-5 Example of Mobile Spreader Placing Material at the Toe of Slope.....	3-53
Plate 5-1 Iron Road Staff Meeting with Community Members.....	5-3
Plate 5-2 Example of Iron Road Website	5-16
Plate 5-3 Iron Road Discussing the CEIP with Community Members.....	5-28
Plate 9-1 Small Salt Lakes and Dunes within the Proposed Mining Lease	9-3
Plate 9-2 Magnetite Rocks Located Within the Proposed Mining Lease.....	9-7
Plate 10-1 View from Waddikee Rocks.....	10-3
Plate 10-2 Warramboe Cemetery.....	10-3
Plate 11-1 Habitat of Mixed Mallee Low Open Woodland.....	11-7
Plate 11-2 Habitat of Mixed Mallee and Boree Open Woodland with Low Very Open Shrubland.....	11-8
Plate 11-3 Habitat of Mixed Mallee with Patches of Tall and Low Open Shrubland.....	11-9
Plate 11-4 Habitat of Mixed Mallee Low Open Woodland, Open Shrubland and Spinifex Hummock Grassland.....	11-10
Plate 11-5 Habitat of Boree Low Open Woodland with Samphire Low Open Shrubland	11-11
Plate 11-6 Stellate Knob-tailed Gecko Located at Four out of Five Sites	11-13
Plate 11-7 EPBC Listed Migratory Bird Identified in Project Area; Rainbow Bee-eater (source: Darryl Bray)	11-14

Plate 11-8 Feral Fauna Presence on the Eyre Peninsula.....	11-21
Plate 11-9 Dead Boree and Samphire as a Result of Elevated Groundwater	11-24
Plate 12-1 Field Ecologist Collecting Floristic Data	12-4
Plate 12-2 Broad Landscape of the Eyre Mallee Subregion	12-6
Plate 12-3 Vegetation of Site 1 and the Adjacent Salinisation	12-10
Plate 12-4 Mixed Mallee and Boree Low Open Woodland	12-11
Plate 12-5 Site 3 within the South-West Corner of HA 869.....	12-12
Plate 12-6 Representative Habitat and Vegetation Condition at Site 4 (note salinisation adjacent to the site).....	12-13
Plate 12-7 Dying Boree Tall Shrubland with Samphire Low Open Shrubland	12-14
Plate 12-8 Saline Depression with Samphire (Brown-Head and Grey); Bare Patches are Seasonally Inundated.....	12-26
Plate 12-9 Sandy Rises and Shallow Lunettes with Bladder Saltbush and Samphire	12-27
Plate 12-10 Temporary Depression Fringed with Sparse Boree and Mallee.....	12-28
Plate 12-11 Dead and Senescing Boree and Mallee Populations Impacted by Elevated Groundwater	12-29
Plate 12-12 False Caper at Flora Site E	12-30
Plate 14-1 Wudinna Landfill.....	14-4
Plate 15-1 Example of Machinery-Generated Dust on Eyre Peninsula	15-4
Plate 15-2 E-BAM TSP Analyser Installed at Harry's	15-5
Plate 15-3 Dust Deposition Gauges at Crow's Nest.....	15-5
Plate 15-4 Vehicle-Generated Dust on Kimba Road.....	15-6
Plate 15-5 Truck-Generated Dust on Sealed Road	15-7
Plate 16-1 Logger A: near Murphy Road / Kimba Road Intersection	16-5
Plate 16-2 Logger B: near Lock Road, South of Kimba Road	16-5
Plate 18-1 Low Lying Saline Depression	18-5
Plate 20-1 Undulating Plains Near the Proposed Mine	20-7
Plate 20-2 Darke Range Viewed from Burtons Road, South of Wudinna Road	20-7
Plate 20-3 Typical Roadside Vegetation	20-8
Plate 20-4 Planted Township Vegetation Behind Buildings at Kyancutta	20-9
Plate 20-5 Flat to Gently Undulating Farmland (within the Proposed CEIP Mine).....	20-13
Plate 20-6 Grain Silos (Warrambo).....	20-13
Plate 20-7 Darke Range Viewed from Kirchner Road.....	20-14
Plate 20-8 Hambidge Wilderness Protection Area	20-15
Plate 20-9 Wudinna Viewed from Ballantyne Street.....	20-16
Plate 20-10 Warrambo Township Viewed from Barns Street	20-18
Plate 20-11 Lock Township Viewed from Tod Highway	20-18
Plate 20-12 Visual Representation of Proposed Mine Site from Viewpoint M02, Warrambo (present to Year 10).....	20-29
Plate 20-13 Visual Representation of Proposed Mine Site from Viewpoint M02, Warrambo (Year 15 to Year 25)	20-30
Plate 20-14 Visual Representation of Proposed Mine Site from Viewpoint M13, Lock Road (present to Year 10).....	20-31
Plate 20-15 Visual Representation of Proposed Mine Site from Viewpoint M13, Lock Road (Year 15 to Year 25)	20-32
Plate 20-16 Visual Representation of Proposed Mine Site from Viewpoint M14, Matthews Road near Groecke's Hill (present to Year 10)	20-33
Plate 20-17 Visual Representation of Proposed Mine Site from Viewpoint M14, Matthews Road near Groecke's Hill (Year 15 to Year 25).....	20-34
Plate 21-1 Farming Activity near Wudinna.....	21-4
Plate 21-2 Hambidge Wilderness Protection Area	21-5
Plate 21-3 Vegetation within HA 869	21-6
Plate 21-4 Exploration Drilling within EL 4849	21-6

Plate 22-1 Shops on the Main Street of Wudinna	22-6
Plate 23-1 Agriculture Currently Underpins the Local Economy on the Eyre Peninsula	23-8
Plate 23-2 The CEIP will Bring Strong Benefit to the Local Community	23-20

List of Tables

Table 1-1 Company Contact Details	1-2
Table 1-2 Iron Road Board of Directors and Senior Management	1-2
Table 1-3 MLP Structure	1-8
Table 2-1 Services and Facilities in Local Townships	2-4
Table 2-2 Exempt land within the Proposed Mining Lease boundary	2-6
Table 2-3 Strategic Alignment of CEIP	2-14
Table 2-4 State Strategic Framework	2-15
Table 2-5 Development Plan Policy Summary	2-16
Table 2-6 Local Strategic Framework	2-18
Table 2-7 Historical Significant Fire Events on Eyre Peninsula	2-27
Table 3-1 Key Characteristics of the Proposed Mining Lease	3-4
Table 3-2 CEIP Global Mineral Resource Estimate (27 February 2015)	3-10
Table 3-3 Iron Road Ore Reserve Summary (CEIP) (27 February 2015)	3-10
Table 3-4 Resource History	3-10
Table 3-5 Indicative Concentrate Specifications	3-11
Table 3-6 Stages of Resource Drilling by Iron Road	3-13
Table 3-7 Mining Schedule	3-19
Table 3-8 Explosives Storage and Manufacturing Facility Capacities	3-26
Table 3-9 Indicative Mobile Fleet	3-27
Table 3-10 Topsoil Temporary Storage Area	3-28
Table 3-11 Subsoil Stockpile Summary	3-29
Table 3-12 Mobile Primary Crusher Specifications	3-31
Table 3-13 Ore Processing Facility – Building Dimensions	3-35
Table 3-14 Preliminary Mine Waste Materials Inventory for the CEIP (MWH 2015 in Appendix S)	3-45
Table 3-15 Estimates of soil resource requirements for cover profile (from MWH 2015 in Appendix S)	3-50
Table 3-16 Indicative Waste Streams at the Proposed Mine Site	3-54
Table 3-17 Typical Mine Pit Wall Slope Angles (Coffey 2014)	3-70
Table 3-18 Horizontal Distance from Toe to Crest of Pit Slope	3-71
Table 3-19 Required Stand-off Distances from Mine Pit Edge to Safety Bund Wall	3-71
Table 3-20 Projected Peak Workforce at the Proposed Mine	3-77
Table 3-21 Electricity Use and Calculated GHG Emissions	3-77
Table 3-22 Diesel Use and Calculated GHG Emissions	3-77
Table 3-23 Expected Annual Water Usage for CEIP Mining Operations Post Start Up	3-79
Table 4-1 Activities of Environmental Significance	4-3
Table 4-2 Other State Legislation	4-3
Table 4-3 Other Commonwealth Legislation	4-6
Table 5-1 Levels of Impact	5-3
Table 5-2 Stakeholder Groups and Impact Level	5-5
Table 5-3 Overview of Community Information Sessions and Public Meetings	5-9
Table 5-4 Overview of Focus Groups	5-11
Table 5-5 Overview of CEIP CCC Meetings	5-12
Table 5-6 Talking Topic Details	5-13
Table 5-7 Overview of Local Government Briefings and Workshops	5-15
Table 5-8 Benefits and Issues Register	5-18
Table 6-1 Criteria for Categorising Residual Project Environmental Impacts and Benefits	6-5
Table 6-2 Criteria for Categorising Residual Project Economic / Social Impacts and Benefits	6-6
Table 6-3 Rating of Level of Certainty	6-8

Table 6-4 Risk Matrix	6-9
Table 6-5 Criteria for Categorising Consequence	6-10
Table 6-6 Criteria for Categorising Likelihood	6-12
Table 6-7 Terminology Used within EIA Compared with Ministerial Determination	6-15
Table 7-1 Historical Significant Fire Events on Eyre Peninsula	7-3
Table 7-2 Control and Management Strategies: Public Safety	7-7
Table 7-3 Impact and Risk Summary: Public Safety	7-11
Table 7-4 Outcomes and Measurement Criteria: Public Safety	7-12
Table 8-1 Level of Service Definitions	8-1
Table 8-2 Summary of Eyre Peninsula Highways	8-6
Table 8-3 Existing AADT and Percentage of Heavy Vehicles	8-7
Table 8-4 Local Road Network at Proposed Mine Site	8-8
Table 8-5 Control and Management Strategies: Traffic	8-17
Table 8-6 Predicated Level of Service within the Study Area: Construction	8-20
Table 8-7 Module Sizes	8-21
Table 8-8 Delay to Individual Motorists as a Result of Module Movements	8-22
Table 8-9 Level of Service within the Study Area: Operation	8-26
Table 8-10 Impact and Risk Summary: Traffic	8-33
Table 8-11 Outcomes and Assessment Criteria: Traffic	8-34
Table 9-1 Conditions Requested by the Barngarla and Iron Road's Response	9-8
Table 9-2 Control and Management Strategies: Aboriginal Heritage	9-9
Table 9-3 Impact and Risk Summary: Aboriginal Heritage	9-11
Table 9-4 Outcomes and Assessment Criteria: Aboriginal Heritage	9-12
Table 11-1 Fauna Species Diversity by Habitat Type across Proposed Mine site	11-12
Table 11-2 Likelihood of Occurrence Assessment: EPBC and NPW Fauna Species	11-15
Table 11-3 Introduced Fauna Species within the Proposed Mine site	11-20
Table 11-4 Control and Management Strategies: Native Fauna and Pest Species	11-26
Table 11-5 Summary of Impacts to Conservation Significant Fauna	11-31
Table 11-6 Impact and Risk Summary: Native Fauna and Pest Species	11-40
Table 11-7 Outcomes and Measurement Criteria: Native Fauna and Pest Species	11-41
Table 12-1 Summary of Site-Specific Vegetation Associations and Condition	12-15
Table 12-2 Summary of Condition of Vegetation across the Proposed Mining Lease Area	12-19
Table 12-3 Flora Species per Site across Proposed Mining Lease Area	12-21
Table 12-4 Likelihood of Occurrence Assessment for EPBC / NPW Flora Species within the Proposed Mining Lease Study Area	12-22
Table 12-5 Summary of Weeds (Field Results and /or Historical Records) within Proposed Mining Lease Area	12-31
Table 12-6 Control and Management Strategies: Vegetation and Weeds	12-36
Table 12-7 Summary of Clearance in Regional Context	12-39
Table 12-8 Estimated Clearance of Native Vegetation within Mine Site	12-40
Table 12-9 Summary of Impacts to Conservation Significant Flora	12-43
Table 12-10 Impact and Risk Summary: Vegetation	12-52
Table 12-11 Outcomes and Measurement Criteria: Vegetation and Weeds	12-53
Table 13-1 Ground model soil descriptions derived from borehole and geotechnical test pit information (Jacobs 2014c)	13-6
Table 13-2 Horizon Water Holding Capacities for Each Soil Profile as Described by DWLBC (2002) and Proportion (%) Expected Across the Waste Landform and Pit Areas	13-6
Table 13-3 Elemental Analysis	13-7
Table 13-4 Geochemical Assessment of Tailings	13-10
Table 13-5 Potential Site Contamination Issues	13-10
Table 13-6 Control and Management Strategies: Soil and Land Quality	13-14
Table 13-7 Impact and Risk Summary: Soil and Land Quality	13-22
Table 13-8 Outcomes and Assessment Criteria: Soil and Land Quality	13-23

Table 14-1 Existing Waste Management Facilities	14-3
Table 14-2 Control and Management Strategies: Waste Disposal and Management	14-7
Table 14-3 Per Capita Waste Generation at Comparable Mine Sites in South Australia	14-8
Table 14-4 Estimated Waste Arising from Proposed Mine Site	14-8
Table 14-5 Estimated Waste Streams of the Proposed Mine Site.....	14-8
Table 14-6 Impact and Risk Summary	14-12
Table 14-7 Outcomes and Assessment Criteria: Waste Disposal and Management	14-13
Table 15-1 Adopted Project Criteria for Gaseous Emissions from Locomotives (EPA 2006)	15-2
Table 15-2 Adopted Project Criteria for the Protection of Human Health from Airborne Particles (NEPC 2003)	15-2
Table 15-3 Adopted Project Criteria for Nuisance Dust (DEC 2005)	15-2
Table 15-4 Background Concentration Levels used in the Air Quality Assessment	15-6
Table 15-5 Sensitive Receivers	15-8
Table 15-6 Control and Management Strategies: Air Quality	15-13
Table 15-7 Summary of Dust Particle Emission Scenarios.....	15-15
Table 15-8 Scenario Inputs	15-15
Table 15-9 Emission Source Locations: Construction Scenario	15-17
Table 15-10 Emission Source Locations: Peak Operation Scenario.....	15-18
Table 15-11 Dust Results for Sensitive Receptors: Construction Scenario.....	15-21
Table 15-12 Dust Results for Sensitive Receptors: Peak Operation Scenario	15-26
Table 15-13 Results for Maximum NO ₂ at Sensitive Receptors (peak).....	15-31
Table 15-14 Impact and Risk Summary: Air Quality	15-36
Table 15-15 Outcomes and Assessment Criteria: Air Quality.....	15-38
Table 16-1 Noise Criteria Applicable to Sensitive Receivers within the Primary Production Zone and Settlement Zone	16-3
Table 16-2 Control and Management Strategies: Noise	16-9
Table 16-3 Typical Construction Equipment and Sound Power Levels for the Construction Scenario (Scenario 1)	16-11
Table 16-4 Predicted Noise Levels from Construction (Scenario 1) at the Nearest Sensitive Receivers.....	16-12
Table 16-5 Typical Operation Equipment and Sound Power Levels.....	16-14
Table 16-6 Predicted Noise Levels from Mine Operations at the Nearest Sensitive Receivers	16-16
Table 16-7 Impact and Risk Summary: Noise	16-19
Table 16-8 Outcomes and Assessment Criteria: Noise.....	16-20
Table 17-1 Ground Vibration and Airblast Criteria for Blasting.....	17-2
Table 17-2 Preferred and Maximum Vibration Values for Use in Assessing Human Responses to Vibration	17-2
Table 17-3 Control and Management Strategies: Blasting and Vibration.....	17-6
Table 17-4 Ground Vibration and Airblast for Blasting based on Various Blast Charges	17-7
Table 17-5 Impact and Risk Summary: Vibration	17-8
Table 17-6 Outcomes and Assessment Criteria: Vibration.....	17-8
Table 18-1 Control and Management Strategies: Surface Water	18-11
Table 18-2 Impact and Risk Summary: Surface Water	18-15
Table 18-3 Outcomes and Assessment Criteria: Surface Water.....	18-16
Table 19-1 Geological formations within the study area	19-3
Table 19-2 Summary of hydrogeological properties	19-7
Table 19-3 Summary of CEIP Mine water affecting activities and potential impact events	19-20
Table 19-4 Control and Management Strategies: Groundwater.....	19-33
Table 19-5 Impact and Risk Summary: Groundwater.....	19-35
Table 19-6 Outcomes and Assessment Criteria: Groundwater	19-36
Table 20-1 Summary of Landscape Types	20-11
Table 20-2 Control and Management Strategies: Visual Amenity	20-22

Table 20-3 Proposed Mining Lease LVIA Viewpoint Locations and Weighted Visual Amenity Impacts	20-27
Table 20-4 Impact and Risk Summary	20-35
Table 20-5 Outcomes and Assessment Criteria: Visual Amenity.....	20-36
Table 21-1 ELs and PELs Adjoining EL 4849 (as at September 2015)	21-8
Table 21-2 Proximity of Townships	21-8
Table 21-3 Existing Property Ownership	21-9
Table 21-4 Control and Management Strategies: Land Use and Tenure	21-14
Table 21-5 Impact and Risk Summary: Land Use and Tenure	21-20
Table 21-6 Outcomes and Assessment Criteria: Land Use and Tenure.....	21-21
Table 22-1 Demographic Profile of Local Study Areas, Eyre Region and South Australia, 2011 (ABS 2012a).....	22-8
Table 22-2 Profile of Private Dwellings in Local Study Areas, Eyre Peninsula Region and South Australia, 2011.....	22-14
Table 22-3 Profile of Private Dwellings in Local Townships and Suburbs in the Local Study Area, 2011.....	22-15
Table 22-4 Rental Vacancy Rate in the Eyre Region and Upper Spencer Gulf	22-16
Table 22-5 Building Approvals in Local and Regional Study Areas and South Australia, 2009-2010 to 2012-2013	22-16
Table 22-6 Median Housing Costs in Local and Regional Study Area and Townships, Eyre Region and South Australia, 2011	22-17
Table 22-7 House Sales and Median Sales Price in Regional Cities, Regional South Australia and South Australia	22-18
Table 22-8 Household Expenditure on Housing in Local Study Areas, Eyre Region and South Australia, 2011.....	22-19
Table 22-9 Tourist Accommodation in the Eyre Peninsula Tourist Region in the March Quarter 2013	22-20
Table 22-10 Tourist Accommodation in the Eyre Peninsula Tourist Region in the March Quarter	22-21
Table 22-11 Labour Force Status and Youth Engagement in Local Study Areas, Eyre Region and South Australia, 2011.....	22-24
Table 22-12 Labour Force Status in Regional Cities, 2011.....	22-24
Table 22-13 Employment by Industry in Regional Cities, 2011	22-26
Table 22-14 Registered Businesses in Local Study Areas, Eyre Region and South Australia, 2011	22-27
Table 22-15 Registered Businesses in Regional Cities, 2011	22-28
Table 22-16 Services and Facilities in Selected Local Townships	22-28
Table 22-17 Quality of Life in Local Study Areas, 2008	22-32
Table 22-18 Unpaid Work in Local Study Areas, Eyre Region and South Australia, 2011	22-33
Table 22-19 Perception of Safety in Local Study Areas, Eyre Peninsula, Regional South Australia and South Australia ¹ , 2010	22-35
Table 22-20 Access Indicators in Local Study Areas, Eyre Peninsula, Regional South Australia and South Australia	22-37
Table 22-21 Control and Management Strategies: Social Environment	22-41
Table 22-22 Impact and Risk Summary: Social Environment	22-65
Table 22-23 Outcomes and Assessment Criteria: Social Environment.....	22-67
Table 23-1 Regional, State and National Economic Impact of the CEIP, Construction and Operation Phases.....	23-1
Table 23-2 Key Findings Over the Life of the Mine.....	23-2
Table 23-3 Key Modelling Assumptions.....	23-6
Table 23-4 State, Regional and Local GRP and Employment in 2012/2013	23-8
Table 23-5 Control and Management Strategies: Economic Values	23-12
Table 23-6 Economic Impact of the CEIP, Construction and Operation Phases.....	23-14



Table 23-7 Breakdown of Spend During Construction	23-14
Table 23-8 CEIP Contribution to GDP / GSP and GRP (Value and %) (EconSearch 2015).....	23-15
Table 23-9 Predicted Employment Resulting from CEIP at a Regional and Local Study Area (Number and %) (EconSearch 2015).....	23-16
Table 23-10 Breakdown of Expenditure During Operations	23-18
Table 23-11 Predicted Contribution to GRP in Local Study Area (EconSearch 2015).....	23-18
Table 23-12 Predicted Employment Resulting from CEIP (EconSearch 2015)	23-19
Table 23-13 Summary of Impacts: Economic Assessment	23-21
Table 23-14 Impact and Risk Summary	23-22

Appendices Volume One

- Appendix A: Project Team and Contributors
- Appendix B: Ministerial Determination 006 Cross Check
- Appendix C: Impacts and Risks Register
- Appendix D: IAP2's Public Participation Spectrum
- Appendix E: CEIP Community Consultative Committee Terms Of Reference
- Appendix F: CEIP Community Consultative Committee Outcome Expectations
- Appendix G: Community Survey June 2015
- Appendix H: Hydrology and Surface Water Study
- Appendix I: Traffic Impact Assessment

Appendices Volume Two

- Appendix J: Ecological Survey
- Appendix K: Combined Background Air Quality and Air Quality Impact Assessment
- Appendix L: Noise and Vibration Assessment
- Appendix M: Mine Water Management – Numerical Groundwater Flow Model
- Appendix N: Mine Groundwater Impact Assessment
- Appendix O: Mine Pit Lake Assessment
- Appendix P: Viewpoint Assessments

Appendices Volume Three

- Appendix Q: Social Impact Assessment
- Appendix R: Economic Impact Assessment
- Appendix S: Conceptual Integrated Landform Design for Rehabilitation and Closure



This page has been left blank intentionally.