



ENVIRONMENTAL ASSESSMENT

Northparkes Mines Step Change Project

JULY 2013



VOLUME 1
Main Text





VOLUME 1 Main text

- 1.0 Introduction
- 2.0 Project Description
- 3.0 Planning Considerations
- 4.0 Stakeholder Consultation
- 5.0 Environmental Assessment
- 6.0 Statement of Commitments
- 7.0 Conclusion & Ecologically Sustainable Development
- 8.0 References
- 9.0 Abbreviations & Acronyms

VOLUME 2 Appendices 1 - 9

- 1 Schedule of Lands, Project Team & Statement of EA Authorship
- 2 Director-General's Requirements
- 3 Environmental Risk Analysis
- 4 Rehabilitation & Mine Closure
- 5 Agricultural Impact Assessment
- 6 Air Quality Impact Assessment
- 7 Noise Impact Assessment
- 8 Blasting Impact Assessment
- 9 Flora & Fauna Assessment

VOLUME 3 Appendices 10 - 16

- 10 Groundwater Impact Assessment
- 11 Surface Water Assessment
- 12 Traffic Impact Assessment
- 13 Aboriginal Cultural Heritage Assessment
- 14 Greenhouse Gas & Energy Assessment
- 15 Social Impact Assessment
- 16 Economic Assessment





**ENVIRONMENTAL ASSESSMENT
NORTHPARKES MINES STEP
CHANGE PROJECT**

July 2013



ENVIRONMENTAL ASSESSMENT

Northparkes Mines Step Change Project

July 2013

Prepared by
Umwelt (Australia) Pty Limited
on behalf of
North Mining Limited

Project Director: **Barbara Crossley**
Project Manager: **Tim Crosdale**
Report No. **2949/R10/FINAL**
Date: **July 2013**



Newcastle

75 York Street
Teralba NSW 2284

Ph. 02 4950 5322

www.umwelt.com.au

Executive Summary

Northparkes Mines (NPM) is seeking project approval under Part 3A of the *Environmental Planning and Assessment Act 1979* (EP&A Act) for the Northparkes Mines Step Change Project (the Project). NPM is an existing copper-gold mine located approximately 27 kilometres north-west of Parkes in the central west region of New South Wales (NSW). NPM has been operational since 1993 and has included the development of open cut and underground mining operations targeting a number of ore bodies, as well as associated ore processing and tailings storage infrastructure. The existing operations have been developed in accordance with a number of development consents and project approvals, the most recent of which being PA06_0026 (as modified), which provides for continued mining operations through to 2025.

The NPM Step Change Project

NPM lodged an application under Part 3A of the EP&A Act for the Project in 2011 which originally proposed a large scale expansion of existing operations for processing of up to 30 Million tonnes per annum (Mtpa), extension to underground mining operations and significant expansion of site infrastructure. Since the lodgement of the Project application, NPM have undertaken a detailed review of project design options to optimise the Project to maximise economic performance whilst minimising potential environmental impacts. In a fiscal climate where large scale mining projects have become increasingly difficult to develop, not just in Australia but internationally, a Project of the scale originally proposed is not considered viable at this time. On this basis the Project has been refined to adjust to market conditions and focus on capital and operational efficiencies.

Accordingly NPM are seeking approval for a Project which encompasses the continuation of underground block cave mining in two existing ore bodies, the development of underground block cave mining in the E22 resource, additional campaign open cut mining located in existing mining leases, augmentation to approved Tailings Storage Facilities (TSFs) and an extended mine life of seven years until 2032 at the approved ore processing rate of up to 8.5 Mtpa. The Project will be undertaken on land owned by NPM and within existing mining leases.

The Project also provides the opportunity for the integration, update and consolidation of existing approvals for underground mining, open cut mining and infrastructure within the Project Area. This process will include the surrender of the existing project approval PA06_0026 (as modified) and development consent DA11092 related to the Copper Knowledge Centre within 12 months following the granting of a Project Approval for this Project.

Benefits of the Project

The Project will result in significant benefits at a local, regional, State and national level. These benefits include:

- economic recovery of up to 8.5 Mtpa of ore over an extended mine life until end of 2032 (an additional seven years of mining operations to that currently approved);
- continued employment of approximately 700 full time equivalent (FTE) employees;
- capital expenditure of approximately AUS\$190 million over the life of the mine (LOM);

- the Project is anticipated to significantly contribute at a local, regional and state level in direct and indirect output, which includes the following annual contribution during peak production:
 - \$329 million in annual direct and indirect regional output or business turnover;
 - \$220 million in annual direct and indirect regional value added;
 - \$34 million in annual direct and indirect household income;
 - 470 direct and indirect jobs;
- contributions to the Commonwealth Government in the form of any Company tax payable (\$11 million present value) which is subsequently used to fund provision of government infrastructure and services across Australia and NSW, including the local and regional area;
- contributions to the NSW Government via royalties (\$12 million present value) which are subsequently used to fund provision of government infrastructure and services across the State, including the regional area; and
- significant export earnings for Australia.

Broad Overview of Environment and Social Impacts

This Environmental Assessment (EA) includes a detailed assessment of the potential environmental and social impacts of the Project and identifies the management, mitigation and offset measures that will be implemented as part of the Project. A summary of the key findings of the assessment process is provided in **Table 1**.

Table 1 – Summary of the Key Environmental and Social Impact Assessment Findings

Environmental/ Social Issue	Overview of Key Outcomes (After Proposed Management, Mitigation, Offsets)
Agricultural Impact	- The Project will result in the disturbance of approximately 117 hectares of potential farming land owned by NPM. - The removal of this potential farming land represents approximately 0.04 per cent of the estimate of annual average production in the Parkes Local Government Area (LGA). - NPM commits to the continued operation of farming activities on its land holdings for the life of the Project.
Air Quality	- Minimal contribution of predicted dust emissions to surrounding receiver areas. - No private residences predicted to exceed relevant long term (annual average) air quality criteria. - During periods of worst case background dust concentration levels the Project may result in exceedance of the relevant short term maximum air quality criteria on occasion, but expected to be less than two days per year at surrounding private residences. - NPM will undertake additional real time air quality monitoring to inform the management of operations in order to minimise impacts on surrounding areas.

Table 1 – Summary of the Key Environmental and Social Impact Assessment Findings (cont.)

Environmental/ Social Issue	Overview of Key Outcomes (After Proposed Management, Mitigation, Offsets)
Noise and Blasting	- Minimal contribution of predicted noise emissions to surrounding receiver areas. - During periods of worst case meteorological conditions and during construction, one private residence is likely to be subject to significant noise impacts and will likely have acquisition rights under the Project approval. NPM will undertake targeted real time monitoring during worst case periods during construction and implement a hierarchy of controls to mitigate potential significant impacts. - No private residences or other blast sensitive locations will be significantly impacted by proposed blasting practices associated with the Project.
Biodiversity	- Impact to identified ecological values has been avoided where practicable through Project design. - Two threatened ecological communities (TECs) will be impacted by the Project with total disturbance of approximately 38 hectares. The extent of disturbance on these TECs is not considered to constitute a significant impact. - The Project has the potential to have a significant impact on two threatened species, Pine donkey orchid and Sloane's Froglet, if confirmed that these species occur within the proposed disturbance area. - NPM has developed a comprehensive Biodiversity Offset Strategy, which includes the establishment of the 350ha Kokoda Offset Site, to maintain and enhance the biodiversity values of the region in the medium to long term.
Water Resources	- The existing water management system will be extended to include all areas of additional disturbance associated with the Project. - Water for operational uses will continue to be sourced from on site collection and externally through existing licences. - The Project is not predicted to have significant impacts on downstream water users in relation to surface water and groundwater resources.
Transport	- Detailed assessment of potential road transport impacts indicate the existing transport infrastructure will continue to operate satisfactorily during peak traffic generation periods. - All proposed road works have been designed to accommodate future traffic movements in accordance with relevant guidelines. Road works will be completed in consultation with Parkes Shire Council (PSC) and local landholders.
European Heritage	- No listed items of National, State or local Heritage Significance will be impacted. - NPM will continue to implement relevant mitigation and management measures from existing approvals.
Cultural Heritage	- Project will result in direct impact to up to four identified archaeological sites, including isolated finds or artefact scatters that will be managed in consultation with the Aboriginal community. - NPM has committed to the continued implementation of an updated Aboriginal Heritage Management Plan (AHMP) to mitigate and manage identified impacts within the Project Area.
Visual	The Project has a substantial buffer of mine owned land. Potential views to the Project are consistent with existing and approved operations.
Greenhouse Gas	A range of energy management initiatives have been investigated for the Project, which has been factored into Project design.

Table 1 – Summary of the Key Environmental and Social Impact Assessment Findings (cont.)

Environmental/ Social Issue	Overview of Key Outcomes (After Proposed Management, Mitigation, Offsets)
Waste	Any waste generated by the Project will be managed through NPM's existing waste management system.
Social Impact Assessment	- The Project will not alter the current operational and peak workforce of NPM operations and will not significantly impact on housing, accommodation and infrastructure within the local area. - NPM will continue to make substantial local and regional contributions due to employee spending, sourcing local suppliers (where practicable) and direct contributions. - NPM will continue to consult with a range of stakeholders including local Councils and the community in regards to ongoing operations.
Rehabilitation	The rehabilitation strategy for the Project aims to minimise environmental impacts throughout the life of the Project as well as upon completion of the Project.

Further details of the predicted environmental and social impacts of the Project are provided in the main text of the EA and associated technical reports. The EA includes commitments by NPM to the implementation of comprehensive management and mitigation measures to minimise and counterbalance the predicted impacts of the Project.

As discussed in the main text of the EA, the Project has been assessed against the objects of the EP&A Act, including the principles of ecologically sustainable development. This assessment has indicated that the Project is consistent with the objects of the EP&A Act, including the principles of ecologically sustainable development.

On this basis, it would be reasonable to consider that with the implementation of the management and mitigation measures proposed by NPM, the Project will result in a substantial net benefit to the NSW community.

TABLE OF CONTENTS

1.0	Introduction	1.1
1.1	History of Mining Operations	1.2
1.2	Site Context	1.4
1.2.1	Environmental Setting and Land Use	1.4
1.2.2	Land Ownership	1.5
1.2.3	Existing Environmental Management Systems and Performance Monitoring	1.5
1.3	Overview of Planning Approval Process and Director-General's Requirements	1.6
1.4	Project Team	1.12
1.5	Environmental Assessment Structure.....	1.13
2.0	Project Description.....	2.1
2.1	Need for the Project	2.1
2.2	Description of Existing and Approved Operations.....	2.2
2.2.1	Underground Operations	2.3
2.2.2	Open Cut Operations.....	2.4
2.2.3	Ore Stockpiling and Processing	2.4
2.2.4	Tailings Management	2.6
2.2.5	Waste Rock Management	2.7
2.2.6	Water Management, Use and Transport	2.7
2.2.7	Site Infrastructure	2.8
2.2.8	Ancillary Underground Infrastructure/Activities	2.8
2.2.9	Site Access.....	2.8
2.2.10	Service Infrastructure	2.8
2.2.11	Block Cave Knowledge Centre.....	2.9
2.2.12	Existing Conservation Area	2.9
2.3	The Project.....	2.9
2.3.1	Geological Setting and Resources Assessment	2.9
2.3.2	Key Features of the Step Change Project	2.13
2.3.3	Mining Operations	2.15
2.3.4	Ore Handling, Processing, Stockpiling and Transport	2.16
2.3.5	Tailing Storage Facilities	2.16
2.3.6	Waste Management	2.17
2.3.7	Water Management and Use.....	2.18
2.3.8	Site Infrastructure and Services Infrastructure	2.18
2.3.9	Site Access.....	2.18
2.3.10	Rehabilitation and Mine Closure	2.19
2.4	Consideration of Alternatives	2.25
3.0	Planning Considerations	3.1
3.1	Commonwealth Legislation	3.1
3.2	New South Wales Legislation.....	3.2
3.2.1	<i>Environmental Planning and Assessment Act 1979</i>	<i>3.2</i>

3.2.2	Other State Legislation	3.4
3.3	State Environmental Planning Policies	3.5
3.3.1	State Environmental Planning Policy 33 – Hazardous and Offensive Development (SEPP 33)	3.5
3.3.2	State Environmental Planning Policy 44 – Koala Habitat Protection	3.6
3.3.3	State Environmental Planning Policy - (Mining, Petroleum Production and Extractive Industries) 2007 (Mining SEPP)	3.6
3.3.4	State Environmental Planning Policy 55 - Remediation of Land (SEPP 55)	3.7
4.0	Stakeholder Consultation	4.1
4.1	Authority Consultation.....	4.1
4.2	Other Stakeholder Consultation.....	4.2
4.2.1	Community Consultation	4.2
4.2.2	Aboriginal Community Consultation	4.4
5.0	Environmental Assessment	5.1
5.1	Environmental Risk Analysis	5.1
5.2	Land Resources including Agricultural Impact Statement.....	5.2
5.2.1	Existing Land Resources.....	5.6
5.2.2	Impacts on Agricultural Resources.....	5.11
5.2.3	Impacts on Agricultural Enterprises.....	5.12
5.2.4	Mitigation Measures	5.13
5.3	Air Quality	5.14
5.3.1	Air Quality Criteria	5.14
5.3.2	Climate and Meteorology.....	5.16
5.3.3	Existing Monitoring and Management.....	5.16
5.3.4	Background Air Quality.....	5.16
5.3.5	Assessment Methodology	5.17
5.3.6	Air Quality Impact Assessment	5.18
5.3.7	Air Quality Management and Monitoring	5.20
5.4	Noise.....	5.20
5.4.1	Existing Noise Environment.....	5.20
5.4.2	Meteorological Conditions	5.21
5.4.3	Assessment Criteria	5.21
5.4.4	Operational Noise Modelling Scenarios	5.23
5.4.5	Predicted Noise Levels.....	5.24
5.4.6	Noise Impact Assessment.....	5.24
5.4.7	Management and Mitigation Commitments.....	5.26
5.5	Blasting	5.28
5.5.1	Proposed Blasting Practices.....	5.28
5.5.2	Blast Assessment Criteria	5.29
5.5.3	Blast Impacts	5.29
5.5.4	Blasting Management and Monitoring Commitments	5.30
5.6	Ecology	5.31
5.6.1	Impact Avoidance	5.31
5.6.2	Regional Ecological Context	5.32
5.6.3	Ecological Survey Methodology	5.33
5.6.4	Flora Results	5.34

5.6.5	Fauna Results	5.36
5.6.6	Regional Biodiversity Corridors	5.37
5.6.7	Ecological Impact Assessment.....	5.38
5.6.8	Ecological Management Commitments.....	5.41
5.6.9	Biodiversity Offset Strategy	5.42
5.7	Groundwater	5.47
5.7.1	Existing Groundwater Resources	5.47
5.7.2	Existing Groundwater Interactions	5.48
5.7.3	Methodology	5.49
5.7.4	Groundwater Impact Assessment	5.50
5.7.5	Groundwater Management and Monitoring Commitments	5.52
5.8	Surface Water	5.53
5.8.1	Existing Environment.....	5.53
5.8.2	Surface Water Resources Impacts.....	5.56
5.8.3	Surface Water Management and Monitoring Commitments	5.60
5.9	Traffic and Transport	5.60
5.9.1	Existing Traffic Network.....	5.60
5.9.2	Construction Traffic Impacts.....	5.62
5.9.3	Operational Traffic Impacts	5.64
5.9.4	Road Safety	5.64
5.9.5	Road Traffic Management Commitments.....	5.64
5.10	Aboriginal Cultural Heritage	5.65
5.10.1	Existing Cultural Heritage Management Mechanisms	5.65
5.10.2	Previous Archaeological Studies.....	5.66
5.10.3	Consultation Process.....	5.67
5.10.4	Survey Methodology	5.68
5.10.5	Survey Results	5.68
5.10.6	Significance Assessment.....	5.69
5.10.7	Aboriginal Heritage Impacts	5.69
5.10.8	Aboriginal Heritage Management Commitments	5.70
5.11	Historic Heritage.....	5.70
5.11.1	Identification of Listed Historic Heritage Items/Sites	5.70
5.11.2	Historical Context	5.71
5.11.3	Previous Historic Heritage Assessment	5.73
5.11.4	Identified Sites within the Project Area.....	5.73
5.11.5	Significance Assessment.....	5.74
5.11.6	Historic Heritage Impacts	5.74
5.11.7	Historical Heritage Management Commitments.....	5.74
5.12	Visual Amenity.....	5.76
5.12.1	Existing Visual Amenity	5.77
5.12.2	Visibility of the Project	5.77
5.12.3	Viewing Locations and Assessment Methodology	5.78
5.12.4	Visual Impact Assessment	5.79
5.12.5	Visual Management Controls	5.81
5.13	Greenhouse Gas and Energy Assessment	5.82
5.13.1	Greenhouse Assessment Policy Context	5.82
5.13.2	Methodology	5.82
5.13.3	Predicted Energy Consumption.....	5.83

5.13.4	Predicted Greenhouse Gas Emissions	5.83
5.13.5	Impact Assessment	5.84
5.13.6	Greenhouse Gas and Energy Management.....	5.85
5.14	Subsidence Management and Monitoring.....	5.87
5.14.1	Subsidence Management Strategies	5.88
5.14.2	Subsidence Monitoring Measures	5.88
5.15	Waste Management	5.89
5.15.1	Mineral Wastes	5.89
5.15.2	Non-Mineral Waste Management.....	5.92
5.16	Hazard	5.94
5.16.1	Hazardous Materials Management	5.94
5.16.2	Bushfire Hazard Management.....	5.97
5.17	Socio-Economic Assessment	5.99
5.17.1	Social Impact Assessment	5.99
5.17.2	Economic Impact Assessment	5.105
6.0	Statement of Commitments.....	6.1
7.0	Conclusion and Ecologically Sustainable Development.....	7.1
7.1	Objects of the <i>Environmental Planning and Assessment</i>	7.3
7.2	Ecologically Sustainable Development	7.4
7.2.1	The Precautionary Principle	7.4
7.2.2	Intergenerational Equity.....	7.5
7.2.3	Conservation of Biological Diversity	7.6
7.2.4	Valuation and Pricing of Resources	7.6
7.3	Project Justification	7.6
8.0	References	8.1
9.0	Abbreviations and Acronyms.....	9.1
9.1	Abbreviations	9.1
9.2	Glossary	9.4

FIGURES

1.1	Locality Map	1.1
1.2	Northparkes Mines Step Change Project.....	1.1
1.3	Existing and Approved Operations	1.2
1.4	Land Ownership and Existing Monitoring Locations	1.5
2.1	2011 Australian Copper Mine Production Table.....	2.1
2.2	Representative Cross Section of NPM Geology showing Main Reverses and Mining Areas.....	2.3
2.3	Typical NPM Block Cave Mining.....	2.3
2.4	Existing and Approved Material Stockpiles.....	2.4
2.5	Typical Ore Processing Schematic	2.5
2.6	Existing Water Supply Pipeline	2.7
2.7	Site Services and Infrastructure	2.8
2.8	Conceptual Mine Plan Stage 1.....	2.14
2.9	Conceptual Mine Plan Stage 2.....	2.14
2.10	Conceptual Mine Plan Stage 3.....	2.14
2.11	Conceptual Mine Plan Stage 4.....	2.14
2.12	Conceptual Mine Plan Cross Section Locations.....	2.15
2.13	Conceptual Mine Plan Cross Sections.....	2.15
2.14	Conceptual Mine Plan Cross Sections.....	2.15
2.15	Conceptual Mine Plan Cross Sections.....	2.15
2.16	Conceptual Cross Section Typical TSF Construction	2.17
2.17	Proposed Final Land Use.....	2.19
2.18	Final Tailings Landform Cross Sections	2.20
5.1	Existing Land Capability	5.9
5.2	Surrounding Land Use	5.9

5.3	Existing Maximum 24-hour Average PM10 Concentrations (µg/m3) ...	5.18
5.4	Existing Annual Average PM10 Concentrations (µg/m3)	5.18
5.5	Predicted Maximum 24-hour Average PM10 Concentrations (µg/m3).	5.18
5.6	Predicted Annual Average PM10 Concentrations (µg/m3)	5.18
5.7	Predicted Noise Impacts for Continued Existing Operations (Scenario 1) Under Southerly Drainage Flow and F Class Stability Conditions	5.24
5.8	Predicted Noise Impacts for Proposed Operations (Scenario 2) Under Southerly Drainage Flow and F Class Stability Conditions	5.25
5.9	Proposed Disturbance Area.....	5.31
5.10	2011/12 Flora Survey Effort.....	5.33
5.11	2011/12 Fauna Survey Effort Outside of Trapping Sites	5.33
5.12	Vegetation Communities of the Project Disturbance Area	5.34
5.13	Threatened and Migratory Fauna Locations.....	5.36
5.14	Kokoda Offset Site Regional Location.....	5.43
5.15	Vegetation Community Mapping – Proposed Kokoda Offset Site.....	5.43
5.16	Threatened Fauna Locations – Proposed Kokoda Offset Site.....	5.44
5.17	Conceptual Groundwater Model of the Northparkes Region.....	5.48
5.18	Existing Surface Water Environment	5.53
5.19	Modelled Flood Extents – 10 year, 20 year and 100 year ARI Critical Duration Design Storm Events	5.53
5.20	Approved Conceptual Water Management System	5.54
5.21	Approved Water Management System Schematic.....	5.54
5.22	Surface Water Monitoring Points	5.55
5.23	Long Term Water Usage Upper Lachlan.....	5.56
5.24	Proposed Conceptual Water Management System	5.56
5.25	Existing Road Network Surrounding Project Area	5.60
5.26	Aboriginal Archaeology Sites within Project Area.....	5.67

5.27	Previously Identified Heritage Items	5.73
5.28	Radial Analysis Locations	5.77
5.29	Existing and Proposed Landform Radial Analysis Location 1	5.78
5.30	Proposed TSF 3 Extension Radial Analysis Location 2	5.78
5.31	Existing and Proposed TSF Radial Analysis Location 3	5.78
5.32	Proposed Waste Stockpile Radial Analysis Location 4.....	5.78
5.33	Proposed Waste Dump Radial Analysis Location 5	5.78
5.34	Forecast Greenhouse Gas Emissions by Operation	5.83

APPENDICES

1	Schedule of Lands, Project Team and Statement of EA Authorship
2	Director-General's Requirements
3	Environmental Risk Analysis
4	Rehabilitation and Mine Closure
5	Agricultural Impact Assessment
6	Air Quality Impact Assessment
7	Noise Impact Assessment
8	Blasting Impact Assessment
9	Flora and Fauna Assessment
10	Groundwater Impact Assessment
11	Surface Water Assessment
12	Traffic Impact Assessment
13	Aboriginal Cultural Heritage Assessment
14	Greenhouse Gas and Energy Assessment
15	Social Impact Assessment
16	Economic Assessment