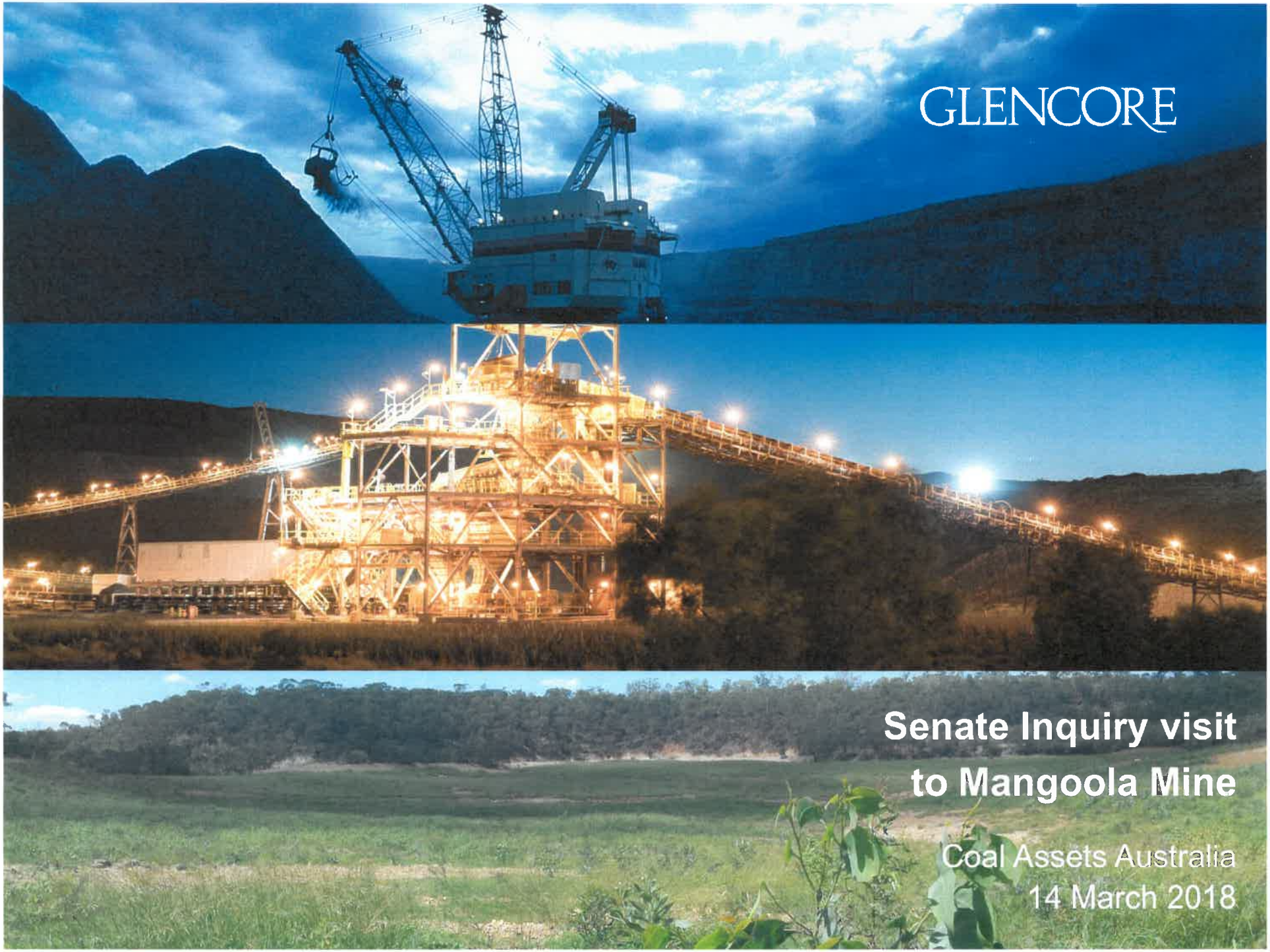

GLENCORE
Senate Inquiry visit
to Mangoola Mine
Coal Assets Australia
14 March 2018

Presentation Outline and Agenda for the Day

Presentation

- Glencore Coal in Australia
- Our Approach to Rehabilitation
- Overview of Mangoola operations and rehabilitation processes

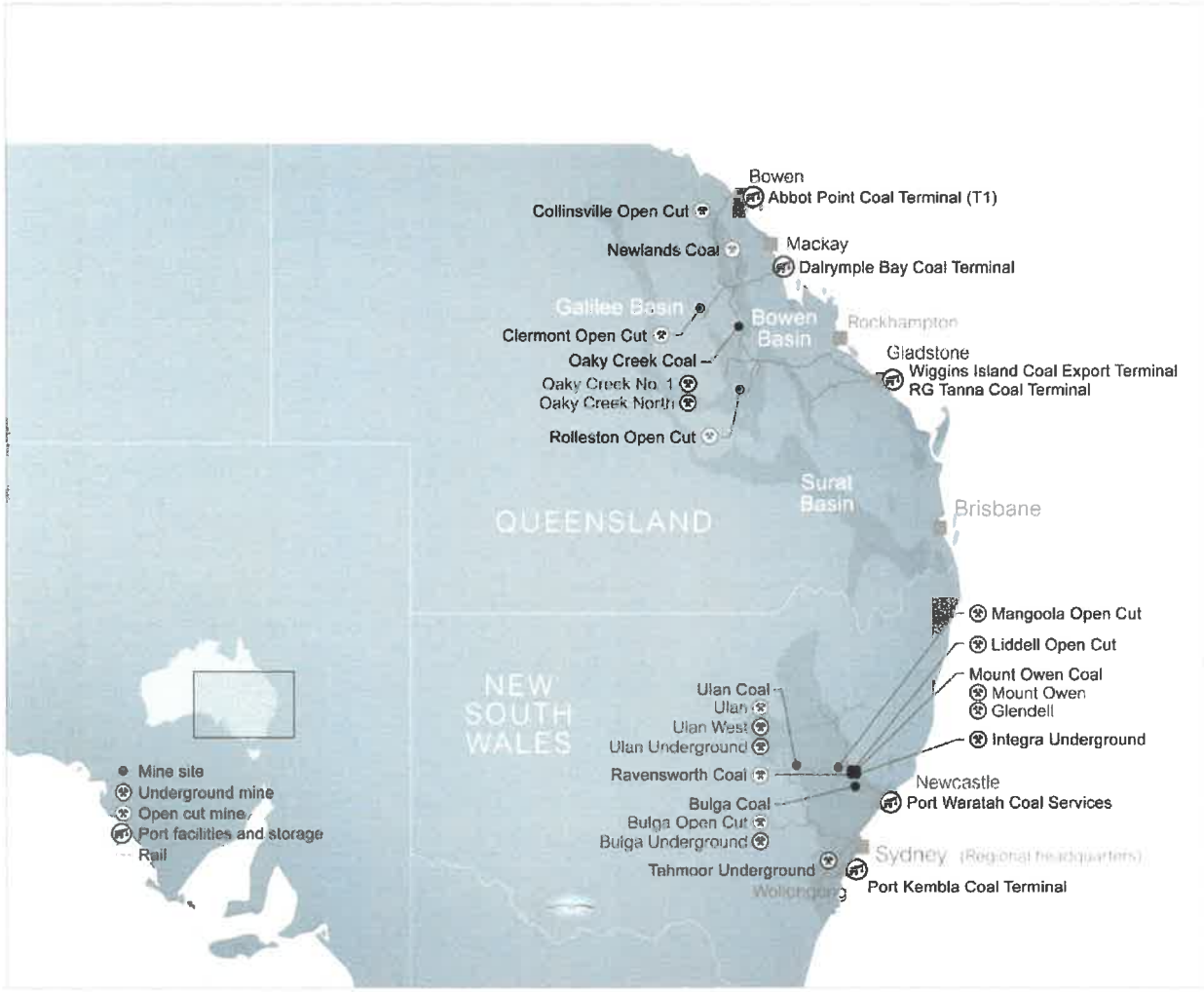
Visit

- Field visit of Mangoola mine and rehabilitation

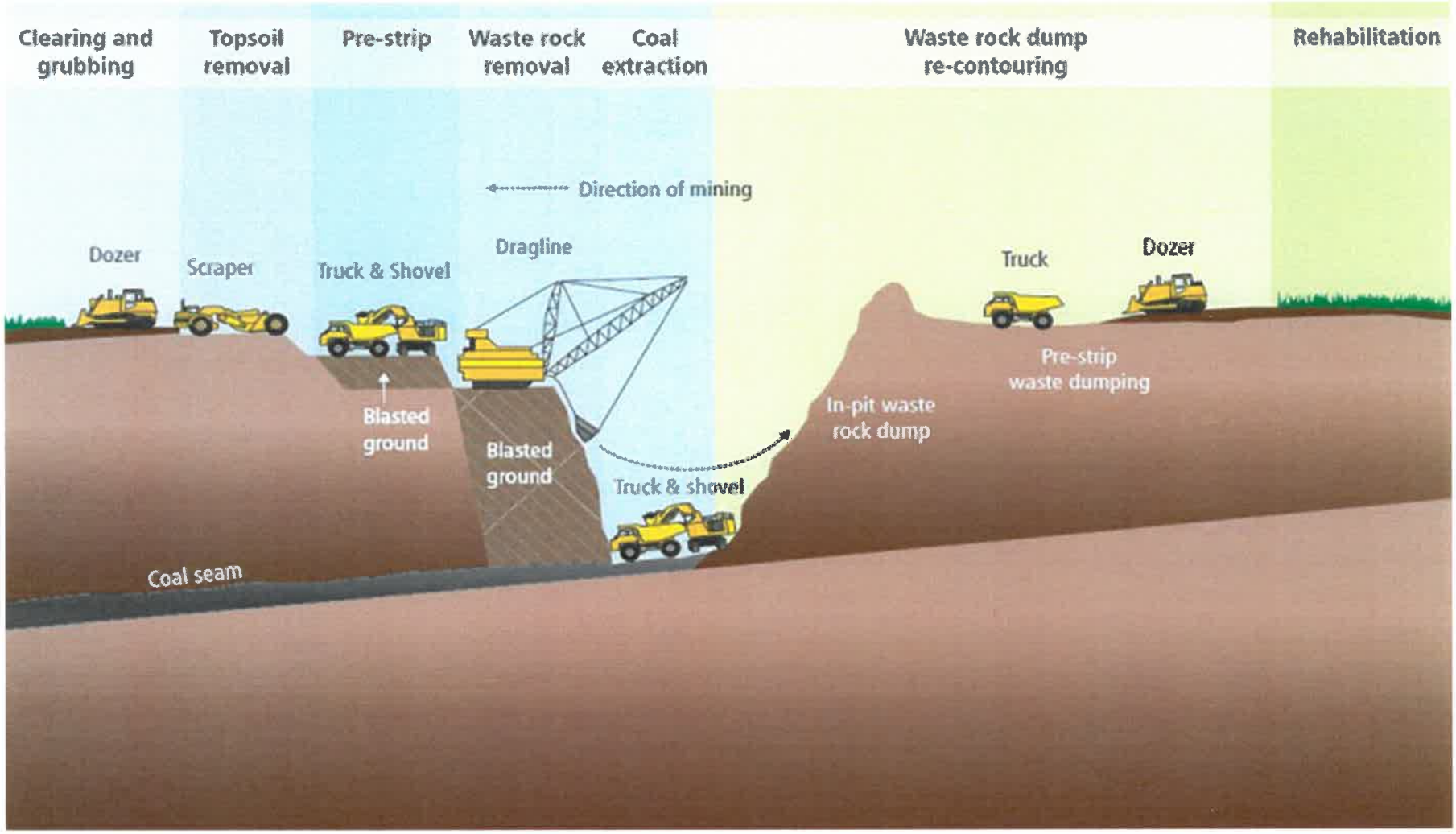
Pasture rehabilitation at Liddell open cut mine

Coal: overview

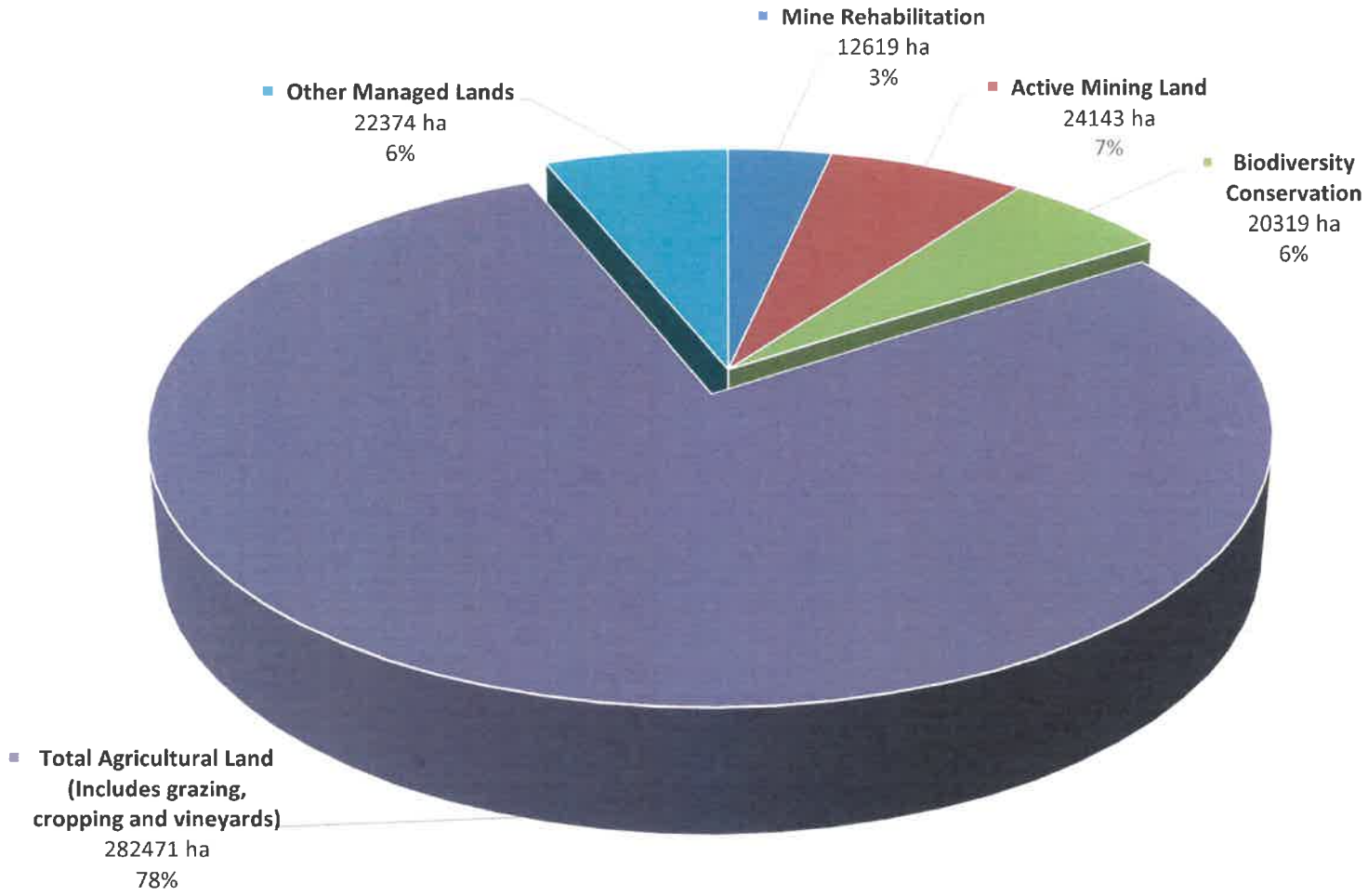
In 2017 we contributed $7.2 billion to the economy and employed more than 7,600 people



Open Cut Coal Mining and Rehabilitation Process



Glencore Coal Australia – Land use



Rehabilitation Drivers

- Strong internal focus and expectations in all areas of sustainable development but in particular rehabilitation
- We recognise the increasing community and government expectations
- Progressive rehabilitation makes good business sense
- Reduces other impacts such as air quality and water management
- Reduction of liability at the cessation of mining
- Demonstration of sustainable post mining land use
- Ability to obtain future approvals

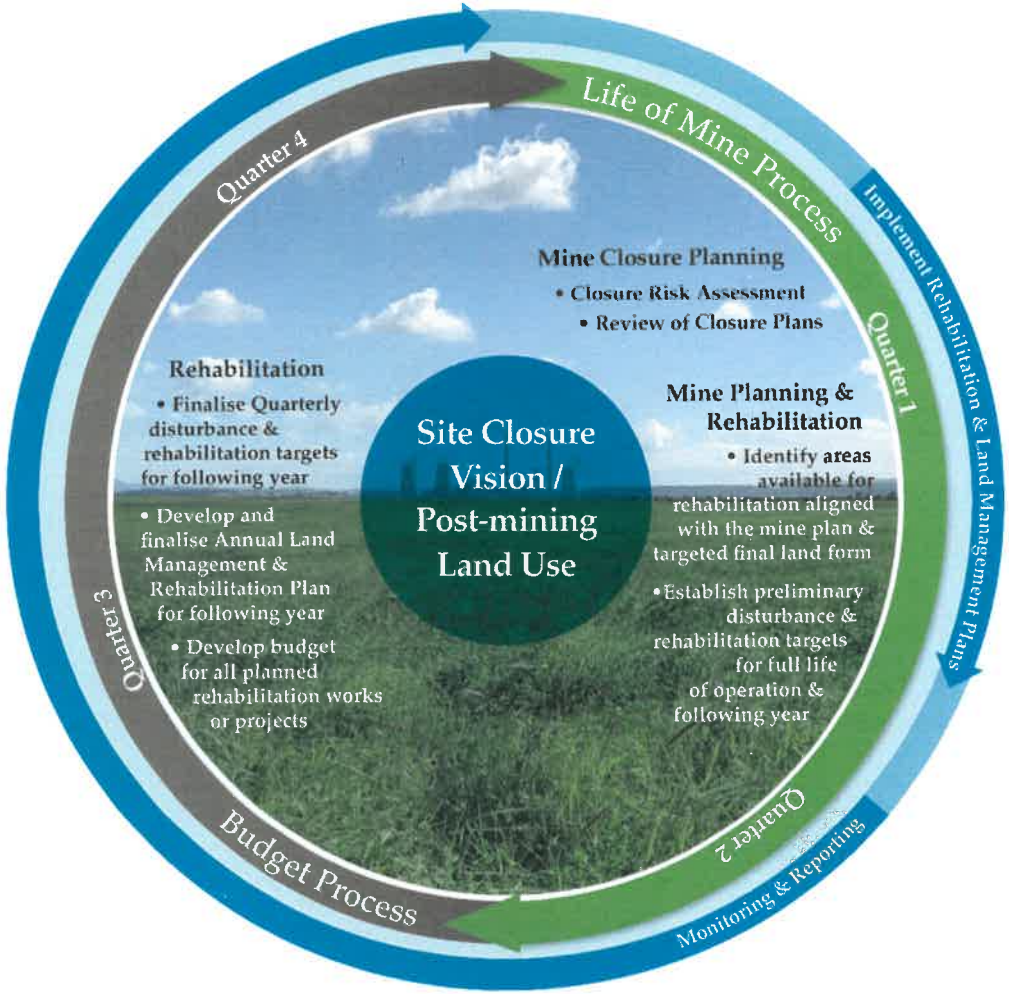
Cattle grazing trial at Liddell mine

Rehabilitation at Westside mine

Our Approach

- **Systematic-** underpinned by robust system documents
- **Planned-** Life of Mine and annual planning process
- **Integrated-** into business planning and day to day mining operations
- **Budgeted-** equipment, $, people
- **Performance Monitoring-** monthly tracking, use of GIS, routine inspections, KPI's, site rehabilitation monitoring programs

Integrating Rehabilitation into Business Planning



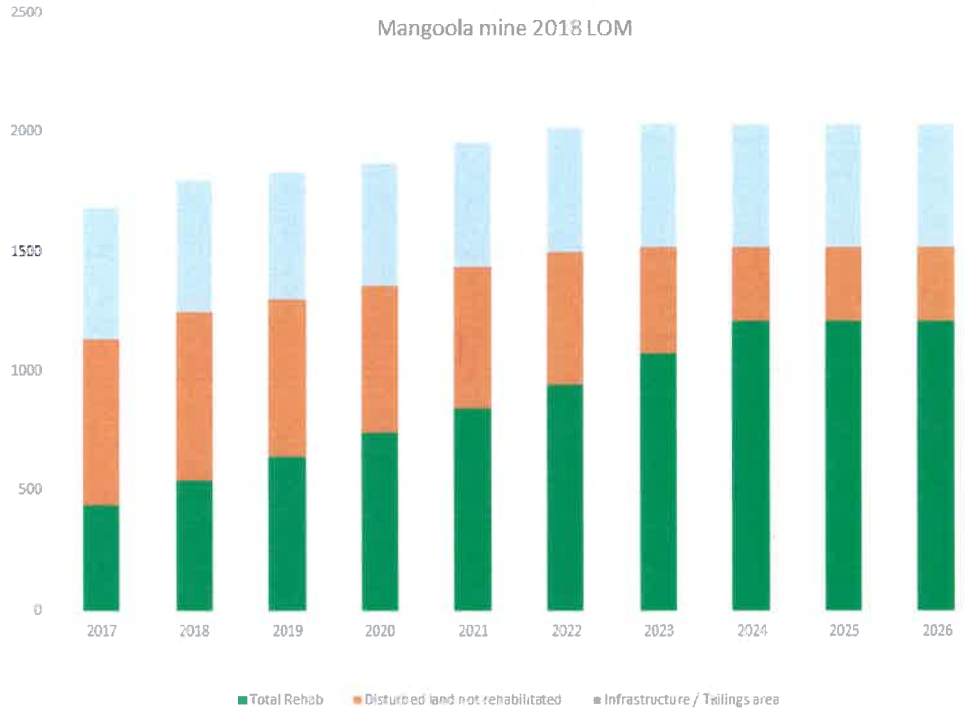
Multidisciplinary Skills - Rehabilitation Success

- Mine rehabilitation technically complex
- Internal skills coupled with external specialists
- Skills linked to final land use

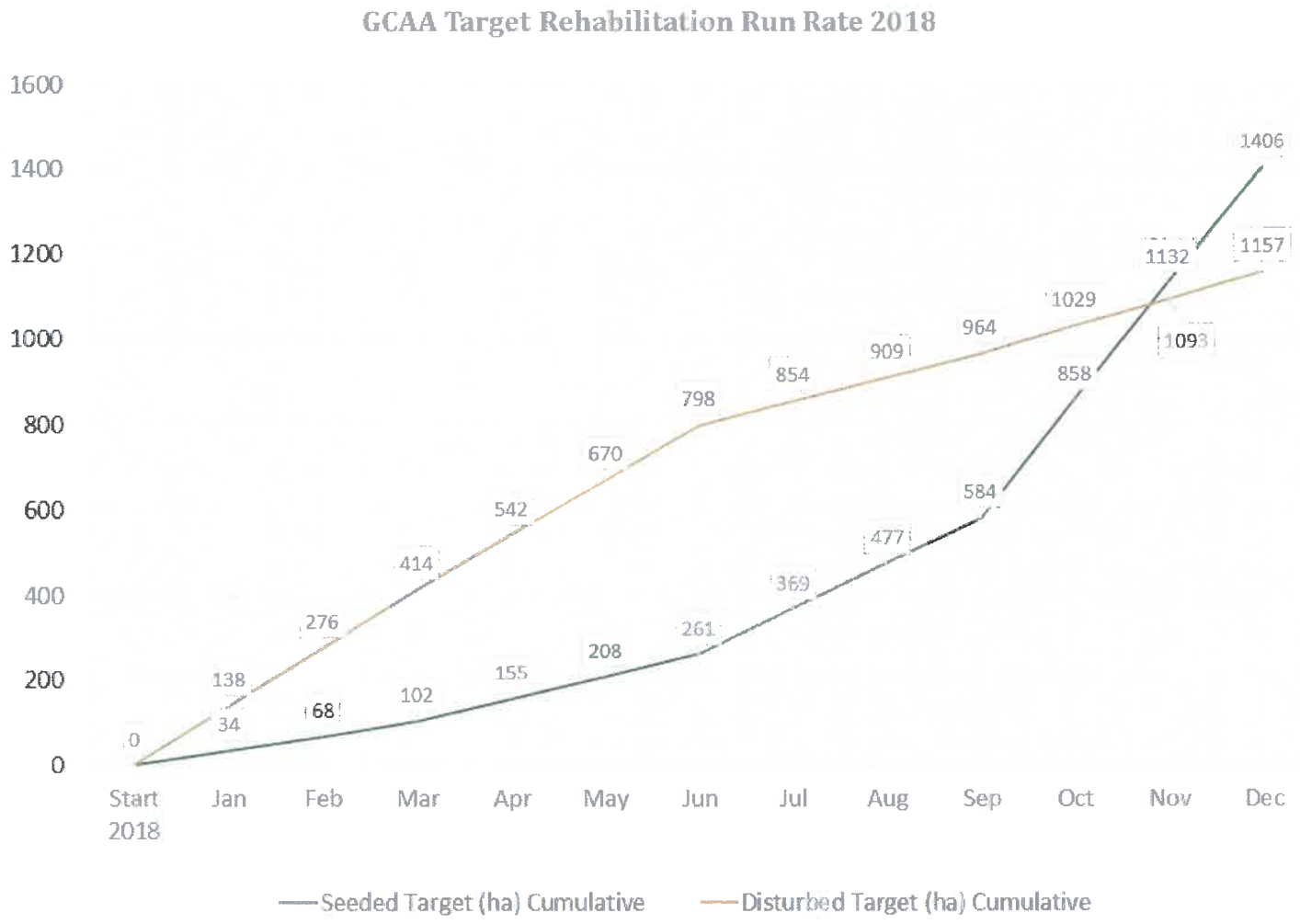
- Soil Scientists
- Ecologists
- Botanists
- Mining Engineers
- Civil Engineers
- Surveyors
- Operators
- Weed sprayers
- Horticulturalists
- Agronomists
- Vertebrate pest control

Annual Rehabilitation & Land Management Plan

- In relation to land disturbance and rehabilitation the ARLMP includes:
  - Final landform plan, including location of any final voids
  - Quarterly targets for the next budget year
  - Annual target estimates through to the end of the mine life to show progressive reduction in disturbed land

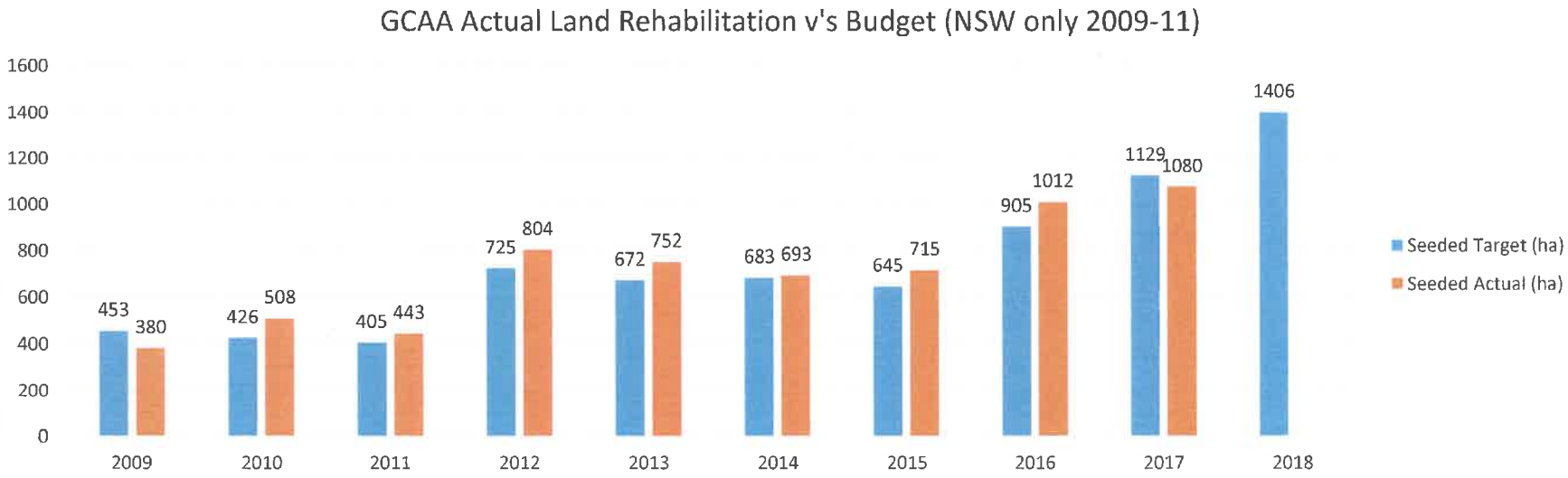


Assessing Rehabilitation Performance



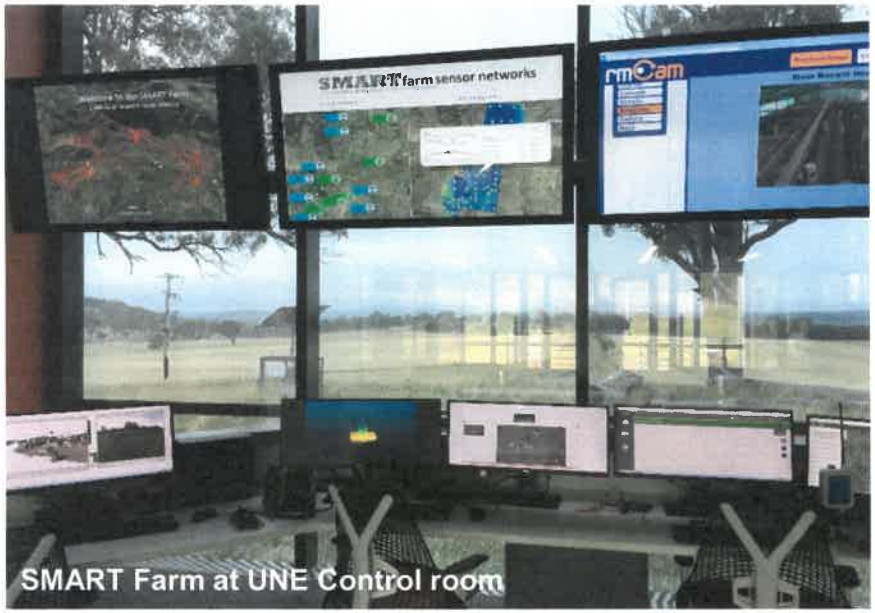
Summary of Performance

- Observed improvements resulting from improved rehabilitation planning and focus:
  - Greater co-operation between mining departments
  - Changes to dumping schedules and materials placement to bring rehabilitation forward
  - Greater awareness of the importance of rehabilitation across our business
  - Improved outcomes on the ground, establishment of more challenging rehabilitation targets and adoption of more progressive rehabilitation design principles



Benchmarking

- Looking outside of our industry
- Participation in domestic and international forums
- Engagement with academics and experts

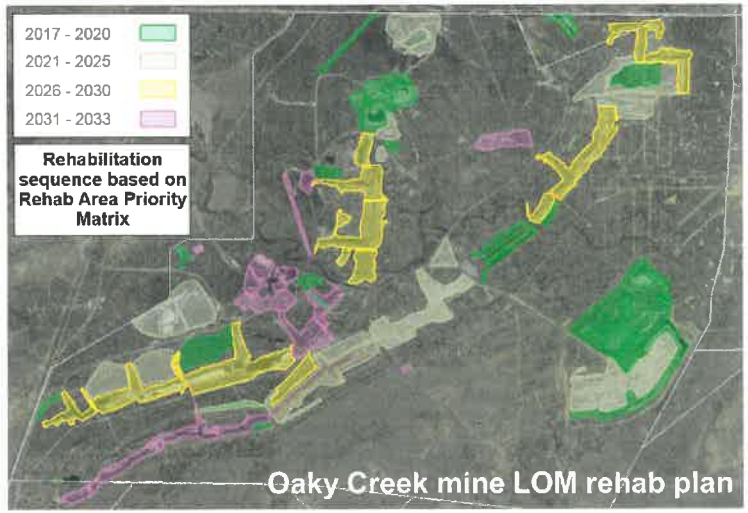


SMART Farm at UNE Control room

UNE SMART Farm

Challenges and Opportunities

- Given the age of some of our operations and the changing expectations on rehabilitation requirements we do still have some challenges to address some legacy issues at some of our Queensland sites
- We are developing plans for each of our operations to progressively rehabilitate the site in a timely fashion
- These plans have been incorporated into the sites Life of Mine Plans which are reviewed on an annual basis
- Contemporary mines have a much greater focus on progressive rehabilitation



Oaky Creek mine LOM rehab plan


Progressive Rehabilitation at Clermont Mine 2017

Focus Going Forward

- Develop further cost effective process to allow Glencore sites to assess critical processes associated with safety, stability and sustainability of rehabilitation over large areas
- Increase our ability to identify conditions (quality) and change over time to inform targeted intervention (eg. repairs and maintenance, modify practices) as required
- Produce summary reports for each site to show how rehabilitation is trajecting towards completion criteria year on year and identifying areas for intervention
- These activities will support further applications for Certification of Mine Rehabilitation and provide confidence in the quality of rehabilitation

Rehabilitation Scorecard – Rolleston Mine

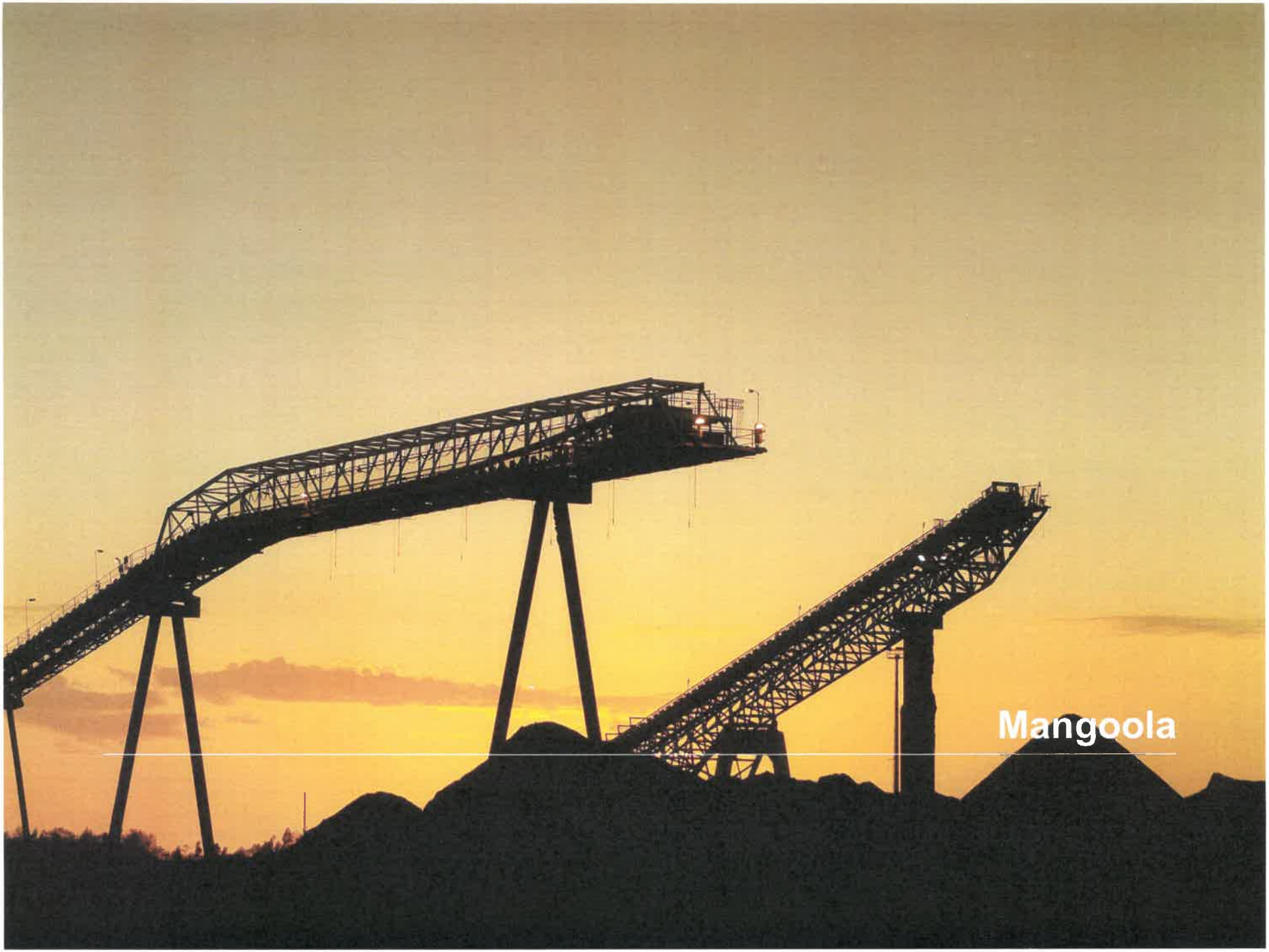
Rehabilitation – Mt Owen Mine

Rehabilitation – Newlands Mine

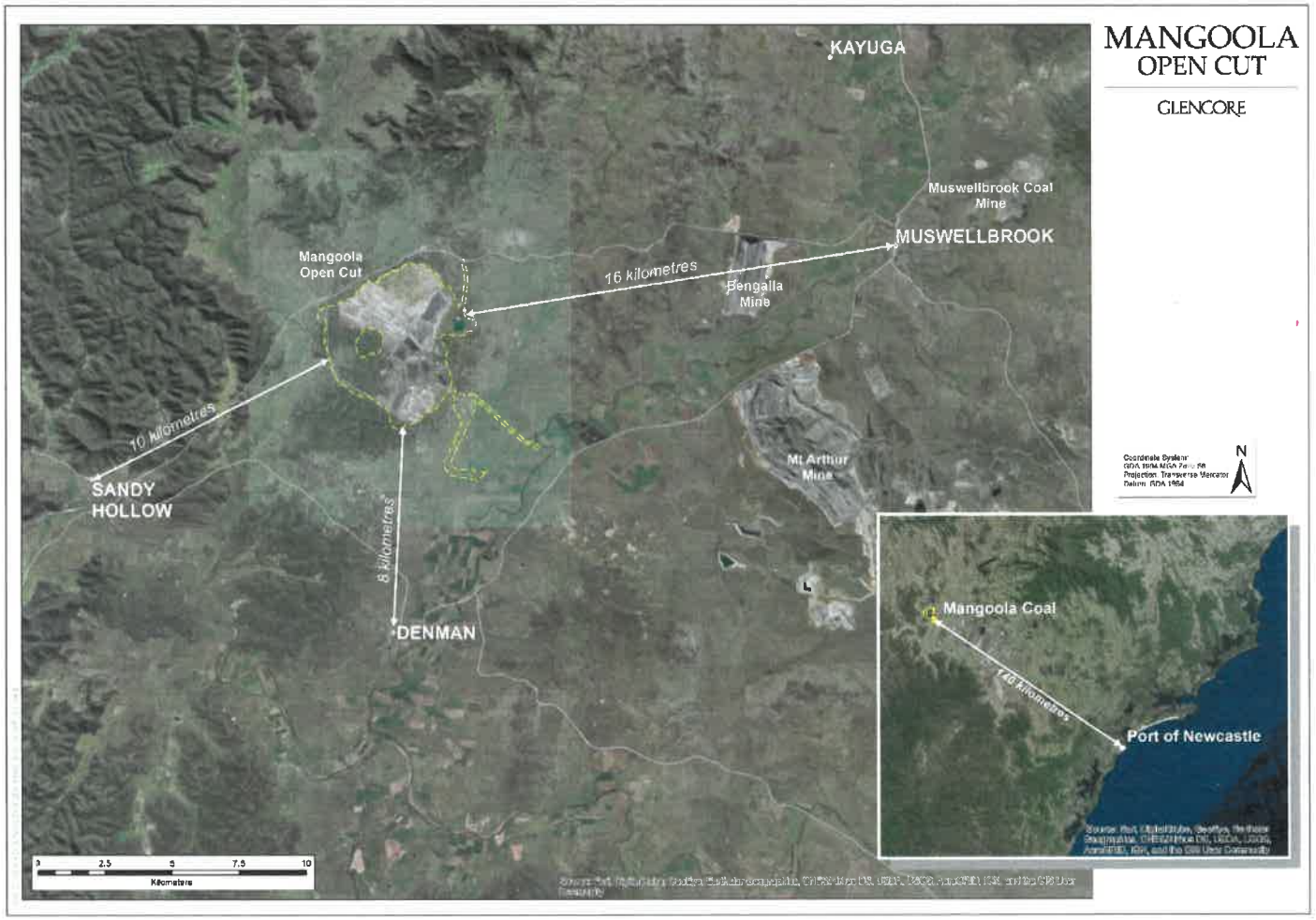
Certified Rehabilitation at Newlands Mine 2017

Rehabilitation at Mangoola mine

The public view from Ridgeland's Road of progressive rehabilitation at Mangoola mine


Mangoola

Mangoola Overview



The Tour


MANGOOLA
OPEN CUT
GLENCORE
Wybong Road
Wybong PO Road
Wybong Road
3rd Tour Stop
Rehabilitation
2nd Tour Stop
Rehabilitation
1st Tour Stop
View Mining Operations
Start of Tour
Administration Building
0
0.5
1
1.5
2
Kilometers
N

Mining Operations

Earning Our Licence to Operate

- Committed to Sustainable Development
  - Consultation is continually undertaken to seek feedback- CCC, face to face meetings, phone calls, emails
  - Allowing people to view our on ground performance is key to obtaining our Social License to Operate
  - We minimise our impacts on the environment and the community- Noise, Air Quality, Blasting, Water, Biodiversity, Rehabilitation, Visual Amenity
- We support the communities in which we operate through funding, partnering and volunteering in the community
- We seek out local people when recruiting

Denman Men's Shed Nest box partner program

Denman Recreation Centre $3.4 million through Mangoola VPA

Sound Attenuated Machinery to reduce noise emissions from machinery

Pre and Post Mining Land Use

- Environmental Assessment studies carried out to determine the nature and quality of the existing landscape
- Post mining land use agreed to through the approval process encompassing community and government consultation; with approval containing c detail on the Performance Criteria to achieve final land use
- Mining lease and *Mining Act 1992* specifies security deposit requirements
- In NSW, mining operations and certain mining purposes must be carried out in accordance with a Mining Operations Plan (MOP)
- GCAA ARLMP process ensures planning is in place to meet statutory requirements

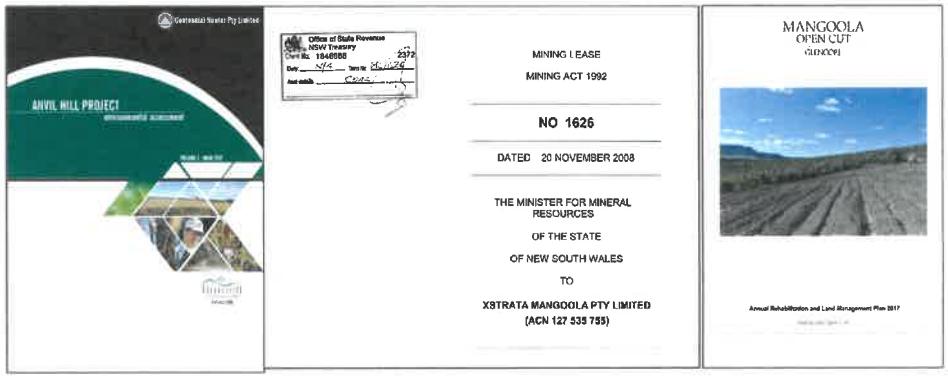
REHABILITATION

Rehabilitation Objectives

58. The Proponent must rehabilitate the site to the satisfaction of the Executive Director Mineral Resources. The rehabilitation must comply with the objectives in Table 12, and be consistent with the conceptual rehabilitation plans in Appendix 5.

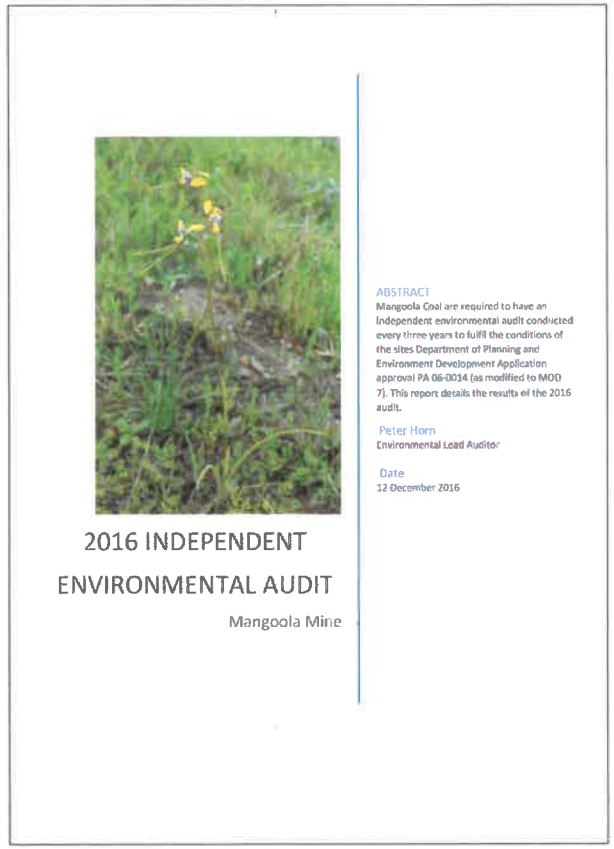
Table 12: Rehabilitation Objectives

Feature	Objective
Mine site (as a whole)	• Safe, stable and non-polluting • Final landforms designed to incorporate natural micro-relief and natural drainage lines • Restore self-sustaining ecosystems, including establishing: ○ appropriate native woodland species; and ○ at least 700 hectares of native grassland; in the final rehabilitated landscape
Final voids	• Designed as long term groundwater sinks and to maximise groundwater flows across back-filled pits to the final void • Minimise to the greatest extent practicable: ○ the size and depth of final voids ○ the drainage catchment of final voids ○ any high wall instability risk ○ risk of flood interaction for all flood events up to and including the Probable Maximum Flood
Anvil Creek realignment	• Restore self-sustaining ecological and hydrological function of the creek
Surface infrastructure	• To be decommissioned and removed, unless the Executive Director Mineral Resources agrees otherwise
Community	• Ensure public safety • Minimise the adverse socio-economic effects associated with mine closure



Compliance and Assurance

- **Extensive internal and external assurance us undertaken on rehabilitation. These include:**
  - Performance against targets in each site's ARLMP is reviewed monthly
  - Annual rehabilitation walkover inspection
  - Bi-annual flora and fauna monitoring and reporting (meeting targets, Species diversity/abundance)
  - Independent Compliance Audits
  - Inspections by Government departments – DPE, DRG, EPA
  - Public Reporting – website, Annual Review
  - Security Deposits
  - CCC Visits
  - Incident Reporting



2016 INDEPENDENT ENVIRONMENTAL AUDIT

Mangoola Mine

ABSTRACT

Mangoola Coal are required to have an independent environmental audit conducted every three years to fulfil the conditions of the sites Department of Planning and Environment Development Application approval PA 06-0014 (as modified to MOD 7). This report details the results of the 2016 audit.

Peter Horn
Environmental Lead Auditor

Date
12 December 2016

Environmental management of the Mangoola Coal Mine has been very good through the audit period with a reduction in complaints, excellent quality rehabilitation and a reduction in the number of non-compliances since the previous Independent Environmental Audit.

There is some room for improvement in some areas, though these are considered generally minor and readily addressed.

Sharing our Learnings – our community and beyond

- We are proud to showcase our operations
- We have increased our tours of the mine and rehabilitation areas
- Over 600 people view our operations per year:
  - Government regulators
  - Elected Representatives
  - Rehab specialists – domestic and international
  - Rehab students (Uni)
  - School groups
  - General community members
  - Near neighbours
  - Journalists and media
  - Other mining companies


The Singleton Argus

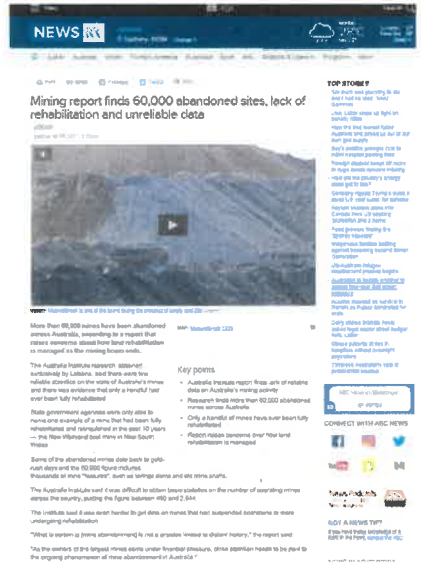
At Glencore's Mangoola mine rehabilitation is a top priority

Louise Nichols

Mine rehabilitation may sound like one of those boring topics up there with say the state of our national accounts however, in both cases they will have an impact on all of us

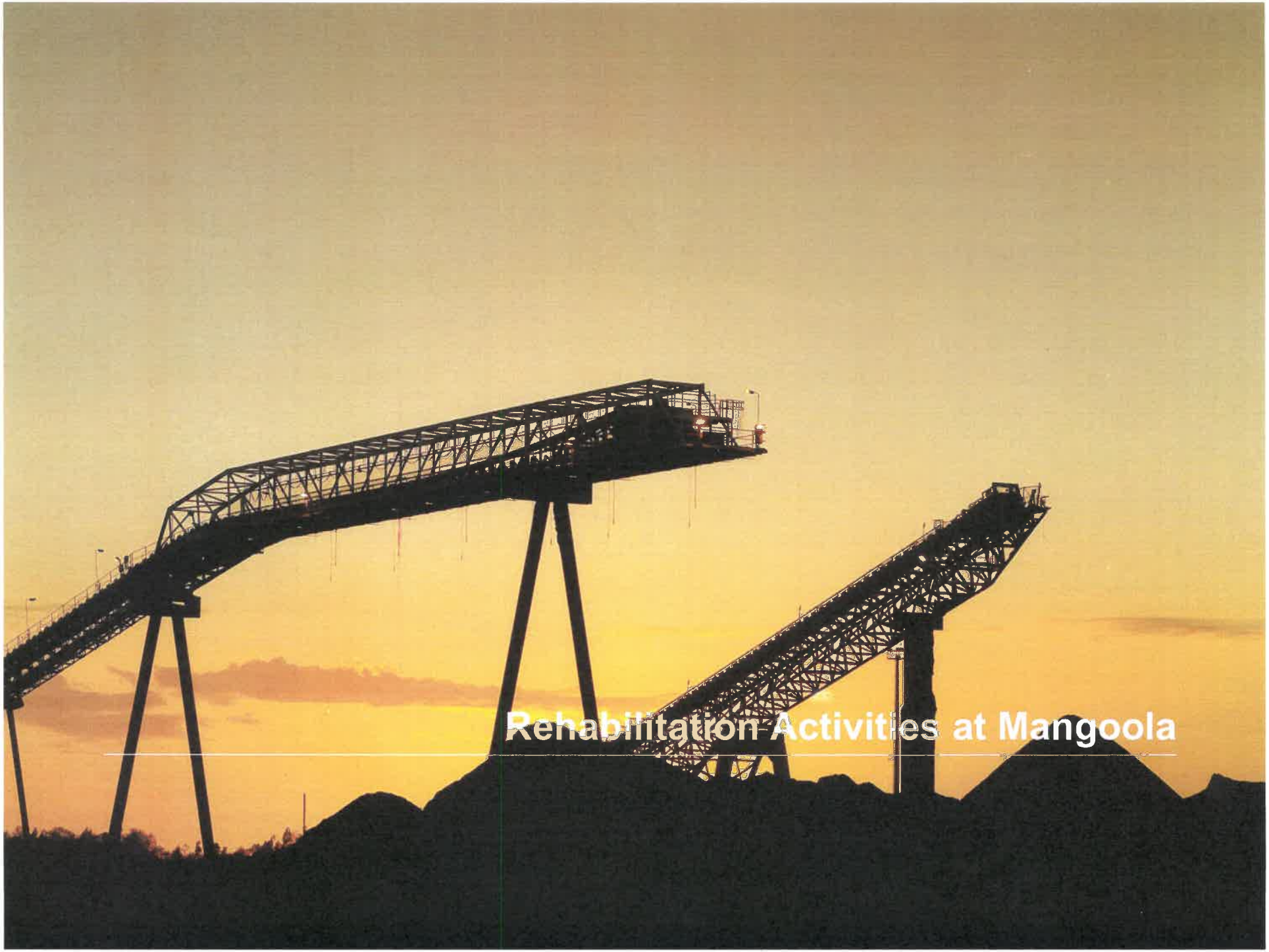
Looking across to Mangoola Mine showing cleared land adjacent to mine about to undergo rehab. Also pictured is rehabilitated land. In the background is Arrvl Hill.

WHAT'S HAPPENING IN SINGLETON


NEWS

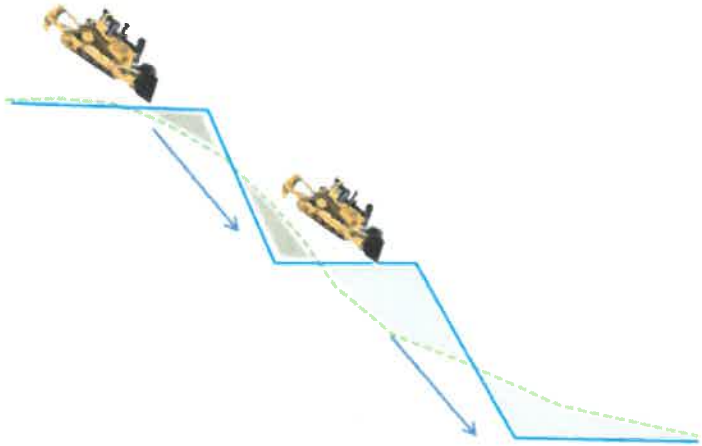
Mining report finds 60,000 abandoned sites, lack of rehabilitation and unreliable data

Key points


Rehabilitation Activities at Mangoola

Creating Final Landform

- GPS guided Dozers used to create final landform to DTM design
- Several small lifts



Topsoil Management

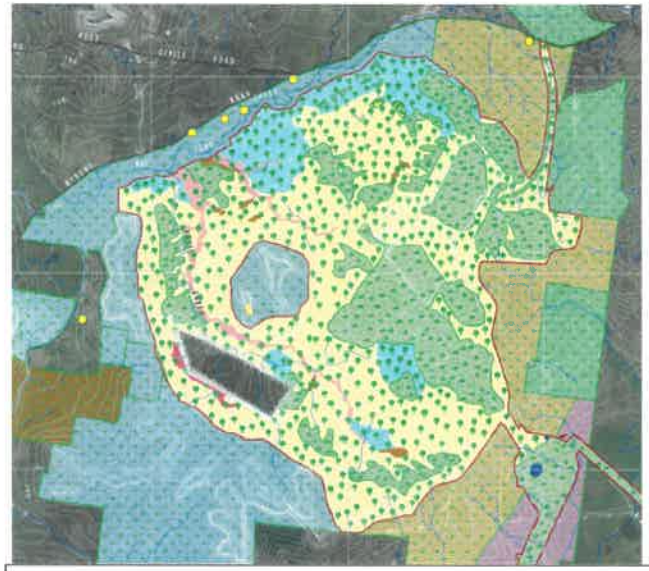
- Includes mulched vegetation
- Limits on height and storage time to maintain natural seed bank and biological functioning
- Strip and direct placement is preferred
- Cover crop
- Weed management
- Placed in landform- 100mm topsoil thickness including mulch
- Valuable resource – topsoil balance to be maintained

Gypsum and ripping

- Ripping on contours for erosion control – avoid preferential flow paths
- No fertilisers used – native flora intolerance
- Gypsum to breakup clay particles and increase nutrient intake

Stag tree habitat installation

Seeding and Planting - Determining Vegetation Communities



Legend

- Mangoola Project Area
- Aboriginal Cultural Heritage Offset Area
- Habitat Enhancement Offset Area
- Sustainable Agriculture Offset Area
- Northern Corridor
- Western Corridor
- Road
- Railway
- Contour Line
- Drainage line
- Historic Heritage Site
- Final Void

Secondary Domain:

- C - Rehabilitation - Grassland
- E - Rehabilitation - Woodland
- F - Rehabilitation - Forest
- J - Conservation and Biodiversity Offset Area

Vegetation Communities:

- Forest Redgum Riparian Woodland
- Grassland
- Ironbark Woodland Complex
- Paperbark Woodland
- Sheltered Grey Gum Woodland
- Slaty Box Woodland
- Spotted Gum Open Forest
- Weeping Myall Woodland

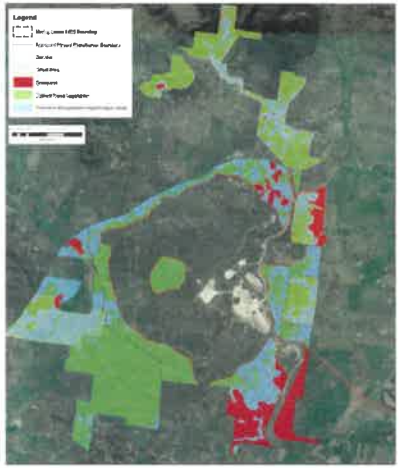
- Agreed at project approval stage
- Based on surrounding local ecological communities

Seeding

- Hand seeding to achieve fine detail in targeted vegetation communities

Ecological initiatives and Biodiversity Offset areas

- 3,033ha of Biodiversity Offsets designed to link to surrounding land and rehabilitation areas
- 1400 nest boxes installed since 2011
- Translocation program in place



Rehabilitation area maintenance

Ongoing rehabilitation works include:

- Selective weed management - early in process to help natives compete
- Erosion monitoring and control
- Access track maintenance
- Flora and fauna surveys
- Infill planting of targeted flora species
- Vegetation thinning


End