Feral Fauna

Fauna surveys undertaken on the Mt Jackson Range in 2000, 2004, 2005 and 2006 have confirmed the presence of introduced fauna including the European rabbit *Oryctolagus cuniculus,* feral cat *Felis catus*, camel *Camelus dromedarius*, dingo/feral dog *Canis lupus*, European red fox *Vulpes vulpes*, goat *Capra hircus* and house mouse *Mus musculus* (Ecologia 2001; Bamford 2009). Similar to the impacts on the other native fauna identified above, clearing of native vegetation for the Mt Jackson J1 Deposit proposal is unlikely to significantly impact these feral fauna species.

Cliffs and DEC have undertaken a coordinated feral animal control program for the region since approximately 2004, including the Mt Jackson J1 Deposit proposal area. This program is undertaken in accordance with an agreement with DEC (Cliffs 2003d) under the provisions of Statement 627 (WA Minister for Environment 2003). This feral animal control program is aimed at long-term reduction and control of dog, cat and fox populations with an ultimate aim of allowing native fauna translocations as part of an expanded Western Shield program (DEC 2008d). The implementation area of the feral animal control program is contained in Figure 3-27.

As the feral fauna control program in the Mt Jackson J1 Deposit proposal area is ongoing under the existing and ongoing agreement with DEC under Statement 627 (Cliffs 2003d), specific management actions or commitments for feral animal control as part of the Mt Jackson J1 Deposit proposal are not considered necessary.

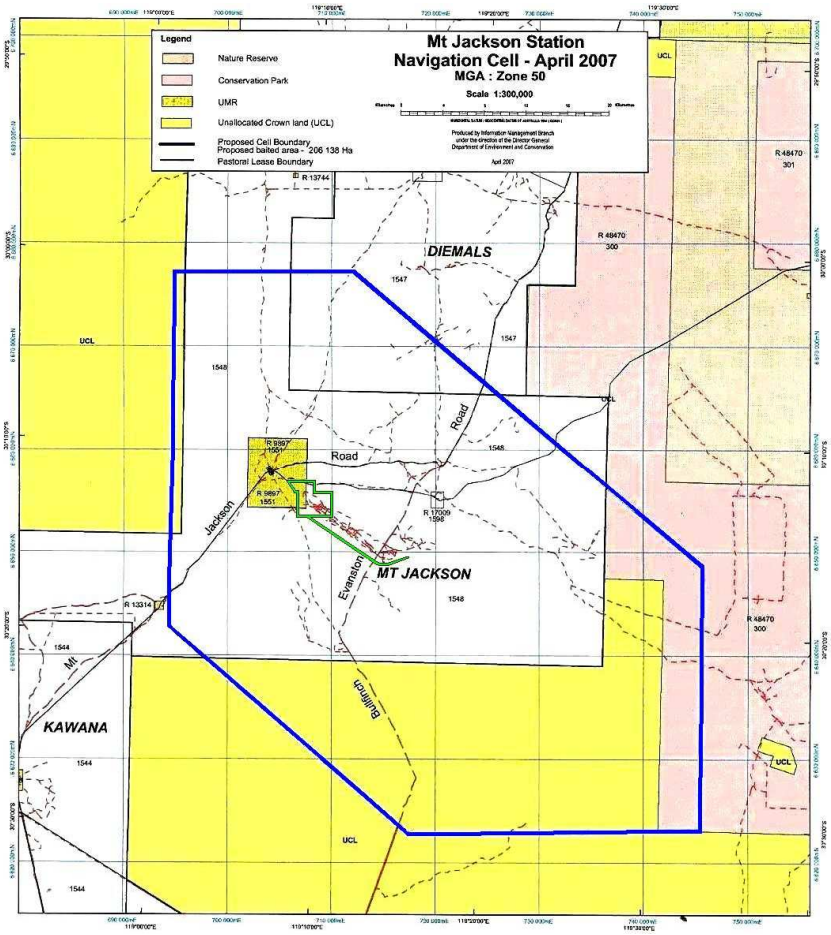

Figure 3-27 Feral fauna control area in the Mt Jackson Range region. The boundary of the feral fauna control area is identified in blue. The location of the Mt Jackson J1 Deposit proposal is identified in green. Source: Adapted from DEC (2008d).

3.2.5 Management Actions

Protection of Fauna Habitat

Based on the fauna investigation results, Cliffs has designated a number of biodiversity areas for the protection of fauna habitat within the Mt Jackson J1 Deposit mine area. In particular, the biodiversity areas will ensure the maintenance of habitat for Malleefowl *L. ocellata,* Tree-stem Trapdoor Spider *A. castellum*, and the millipedes *Antichiropus* sp. nov. Mt Jackson and *Atelomastix* sp. Mt Jackson. The identification and demarcation of the biodiversity areas is considered a key management action by Cliffs for the protection and retention of fauna habitat within the Mt Jackson J1 Deposit mine area during mine development and post-mining.

Management of Fauna

Management of fauna impacts at Cliffs' existing mines at the Mt Jackson Range, Windarling Range and the Koolyanobbing Range are undertaken in accordance with Environmental Operating Procedure EOP06 Fauna (Cliffs 2007b; Appendix 17), which forms part of Cliffs' ISO:14001-certified EMS. Environmental Operating Procedure EOP06 Fauna contains a range of management actions including:

1. Prohibition of domestic pets within mine areas;
2. Prohibition of off-road vehicle use;
3. Prohibition of capturing or harm to native fauna;
4. Reporting and recording of native fauna mortalities;
5. Recording of feral fauna sightings;
6. Trapping of feral cats;
7. Fencing of water supply dams to exclude fauna, with fauna egress matting installed to assist with fauna escape in the event of access; and
8. Education and training of mine operational staff on fauna matters.

Cliffs will implement Environmental Operating Procedure EOP06 Fauna (Cliffs 2007b; Appendix 17) to ensure that impacts to fauna are appropriately managed for the Mt Jackson J1 Deposit proposal.

Further to the above, in adopting a precautionary approach that the trapdoor spider present on the Mt Jackson Range is the Specially Protected Fauna (*Schedule 1 - fauna that is rare or likely to become extinct*) *A. castellum*, Cliffs will also seek and obtain the licence from DEC under *Wildlife Conservation Regulations 1970* (WA) for the taking of *A. castellum* individuals prior to the Mt Jackson J1 Deposit proposal impacting *A. castellum.*

Specially Protected Fauna

As identified previously, Cliffs undertakes annual monitoring of *L. ocellata* mounds and habitat across the Mt Jackson Range in accordance with its environmental approval for the Mt Jackson J2 and J3 Deposit mines (WA Minister for the Environment 2003). No additional management or monitoring of *L. ocellata* is considered necessary for implementation of the Mt Jackson J1 Deposit proposal.

As identified previously, Cliffs is currently undertaking a genetic assessment of *A. castellum* species in collaboration with the Western Australian Museum (Dr Mark Harvey) and in consultation with DEC. No additional management or monitoring of *A. castellum* is considered necessary for implementation of the Mt Jackson J1 Deposit proposal.

3.2.6 Commitments

Cliffs makes the following commitments for the protection and management of fauna for the Mt Jackson J1 Deposit proposal:

1 Biodiversity Areas

1-1 Cliffs will not undertake mining activities within the biodiversity areas.

1-2 Cliffs will install and maintain stock fencing and sign-posting along the internal mine boundaries of the biodiversity areas during mine operations.

1-3 Cliffs will seek agreement with DEC on any changes to the boundaries of the biodiversity areas (increases or decreases) that may arise from changes to the known flora values, fauna values, heritage values, geological values, operational requirements or government requirements.

2 Fauna Management

2-1 Cliffs will implement the following procedure for the management of fauna during mine operations, decommissioning and rehabilitation:

a. Environmental Operating Procedure EOP06 Fauna (Cliffs 2007b; Appendix 17).

3 *Wildlife Conservation Regulations 1970* (WA)

3-1 Prior to impacting individuals of the Tree-stem Trapdoor Spider *Aganippe castellum*, Cliffs will obtain a permit under r17 of the *Wildlife Conservation Regulations 1970* (WA) from the Department of Environment and Conservation.

A consolidation of Cliffs' commitments for the Mt Jackson J1 Deposit proposal is contained in Chapter 7.

3.2.7 Conclusion

As identified by the above assessment, implementation of the proposal is expected to have a non-significant impact on fauna. The potential impacts to fauna can be adequately managed through the implementation of biodiversity areas to protect fauna habitat, and through implementation of Cliffs' Environmental Operating Procedure for fauna. Accordingly, EPA's objective for this factor can be met.

3.3 Conservation Reserves

3.3.1 Potential Issue

The Helena and Aurora Range Conservation Park and the Mount Manning Range Nature Reserve are located from approximately 25km east of the Mt Jackson J1 Deposit. The Mt Jackson J1 Deposit proposal is not located within these conservation reserves.

A westwards extension to the Helena and Aurora Range Conservation Park and the Mount Manning Range Nature Reserve to form the Die Hardy/Jackson/Windarling Ranges Nature Reserve has been recommended by EPA and DEC (EPA 2007a; DEC & DMP 2007). The Mt Jackson J1 Deposit haul road is partially located within this recommended reserve extension area.

EPA has further recommended an area for investigation of potential future conservation reserves west of the recommended Die Hardy/Jackson/Windarling Ranges Nature Reserve (EPA 2007a). The Mt Jackson J1 Deposit haul road and mine area is partially located within this recommended investigation area.

A new conservation planning model known as the Great Western Woodlands has also been proposed for the region (Wilderness Society 2008). The Mt Jackson J1 Deposit proposal is wholly located within the proposed Great Western Woodlands.

This section provides an assessment of the potential impacts of the Mt Jackson J1 Deposit proposal on the environmental values of the existing and recommended conservation reserves.

3.3.2 EPA Objective

The EPA's objective for conservation areas is:

- To protect the environmental values of areas identified as having significant environmental attributes (EPA 2004a).

3.3.3 Legislation, Guidelines, Standards and Approvals

- *Environmental Protection Act 1986* (WA);
- *Conservation and Land Management Act 1984* (WA);
- *Land Administration Act 1997* (WA);
- Strategic Review of the Banded Iron Formation Ranges of the Midwest and Goldfields (DEC & DMP 2007); and
- Advice on areas of highest conservation value in the proposed extensions to Mount Manning Nature Reserve - EPA Report No. 1256 (EPA 2007a).

3.3.4 Environmental Impact Assessment

Legislative Framework and Planning Objectives for Yilgarn Conservation Reserves

Conservation reserves in Western Australia are established under the *Conservation and Land Management Act 1984* (WA) and are vested with the Conservation Commission of WA. In the Yilgarn region, conservation reserves are operationally managed by DEC in accordance with the Goldfields Regional Management Plan (DEC 1994) agreed between DEC and the WA Minister for the Environment.

Conservation reserves are divided into specific categories, which include (among others) conservation parks and nature reserves. More specifically, reserves may be classified under the *Land Administration Act 1997* (WA) into 'Class A' (highest protection), 'Class B', or 'Class C' (lowest protection). The category and classes of land each may allow, or not allow, specified activities to be conducted within the boundaries of a reserve.

For the Yilgarn region, EPA has an overarching planning objective to *achieve outcomes that promote both reasonable environmental protection and orderly resource development* (EPA 2007a). This objective recognises that conservation and mining objectives can occur concurrently within the Yilgarn region. This objective also recognises the need for both conservation and mining to be considered within the conservation reserve planning process as a result of the recognised resource prospectivity of the Yilgarn region. A similar approach has been recognised in other environmental planning documents, with DEC (DEC & DMP 2007) recognising the Mt Jackson Range as a high biodiversity and landscape value area which has a potential to conserve part of the range for conservation as well as having areas available for resource development.

With regards to the recommended changes to the conservation reserve system by EPA (EPA 2007a) and DEC (DEC & DMP 2007), the current WA Government has not endorsed the recommended extensions (EPA 2009c; EPA 2009d). Despite this, EPA (2007a) and DEC (DEC & DMP 2007) have outlined overarching principles and recommendations for environmental protection within the Yilgarn Region, including a predisposition against development activity that would result in an increased threat category to any fauna species, flora species or ecological community, as well as protection of between 15% to 30% of ironstone ranges in their entirety.

Impacts on Conservation Reserves

The Helena and Aurora Range Conservation Park and the Mount Manning Range Nature Reserve have a combined area of more than 295,000ha (EPA 2007a). Both the Helena and Aurora Range Conservation Park and the Mount Manning Range Nature Reserve are classified as 'Class C' reserves, however have been recommended by DEC and EPA for future reservation to 'Class A' reserves (DEC & DMP 2007; EPA 2007a). The environmental values of the Mount Manning Range Nature Reserve have long been recognised; being listed on the Register of the National Estate in 1978 (DEWHA 2008b).

As identified by Figure 3-28 and 3-29, the Mt Jackson J1 Deposit proposal does not occur within any existing conservation reserve. The Helena and Aurora Range Conservation Park and the Mount Manning Range Nature Reserve are located approximately 25km east and 29km east, respectively, from the Mt Jackson J1 Deposit. The eastern end of the Mt Jackson J1 Deposit haul road is approximately 19km from the western boundary of the Helena and Aurora Range Conservation Park and 26km from the western boundary of the Mount Manning Range Nature Reserve. Due to the separation distance (minimum 19km), the Mt Jackson J1 Deposit proposal will not impact the environmental values of these existing conservation reserves.

Impacts on EPA/DEC-Recommended Conservation Reserves

As identified by Figures 3-29 and 3-30, EPA and DEC have recommended a westwards extension of the Helena and Aurora Range Conservation Park to include parts of the Mt Jackson Range and the Windarling Range; an area termed the Die Hardy/Jackson/Windarling Ranges Conservation Park (EPA 2007a; DEC & DMP 2007).

The Mt Jackson J1 Deposit haul road will impact approximately 13ha of the EPA/DEC-recommended Die Hardy/Jackson/Windarling Ranges Conservation Park. The Mt Jackson J1 Deposit mine area will not impact the EPA/DEC-recommended Die Hardy/Jackson/Windarling Ranges Conservation Park.

The known flora values of the EPA/DEC-recommended Die Hardy/Jackson/Windarling Ranges Conservation Park within the vicinity of the Mt Jackson J1 Deposit proposal include the flora species Jackson Tetratheca *Tetratheca harperi* (DRF), *Bossiaea* sp. Jackson Range (P1), *Beyeria rostellata* (P1), *Lepidosperma ferricola* (P1), *Lepidosperma jacksonense* (P1), *Jacksonia jackson* (P1), *Stenanthemum newbeyi* (P3), *Spartothamnella* sp. Helena & Aurora Range (P3), *Eucalyptus formanii* (P4) and *Daviesia purpurascens* (P4) (refer Figure 3-1 in Section 3.1). As identified in Section 3.1, the Mt Jackson J1 Deposit haul road has been designed to minimise impacts to these known flora values, with non-significant impacts to part of one population of *Lepidosperma jacksonense* (P1), part of one population of *Spartothamnella* sp. Helena & Aurora Range, and parts of populations of *Daviesia purpurascens* (P4).

The known fauna values of the EPA/DEC-recommended Die Hardy/Jackson/Windarling Ranges Conservation Park in the vicinity of the Mt Jackson J1 Deposit proposal include the fauna species Malleefowl *Leipoa ocellata* and the Tree-stem Trapdoor Spider *Aganippe castellum* (refer Section 3.2). The Mt Jackson J1 Deposit haul road has been located to minimise impacts to interpreted Malleefowl *Leipoa ocellata* habitat and with no impact to any Malleefowl mound. The potential impact to Tree-stem Trapdoor Spider *Aganippe castellum* is more difficult to determine (due to their cryptic nature), however, is expected to be minimal due to avoidance of mid-slope habitats and the large population occurring across the Mt Jackson Range. As identified in Section 3.2, the Mt Jackson J1 Deposit proposal is not expected to have a significant impact on *L. ocellata* or *A. castellum*.

Further to the above, the portion of the Mt Jackson J1 Deposit haul road within the EPA/DEC-recommended Die Hardy/Jackson/Windarling Ranges Conservation Park contains existing infrastructure, comprising of Cliffs' Mt Jackson J2 and J3 Deposit mines and haul road (>104ha of clearing) and the public Bullfinch-Evanston Road. The Mt Jackson J1 Deposit haul road will have a similar operational nature to this existing infrastructure at this location.

Due to both the minimisation of impacts to environmental values and the area being subject to existing infrastructure impacts, the Mt Jackson J1 Deposit haul road is not expected to significantly impact the environmental values of the EPA/DEC-recommended Die Hardy/Jackson/Windarling Ranges Conservation Park or alter the type of impacts currently present within this area.

Impacts on EPA-recommended Future Investigation Areas

The EPA has recommended future investigations areas for potential conservation reserves, including a westwards extension from the recommended Die Hardy/Jackson/Windarling Ranges Conservation Park (EPA 2007a). As identified by Figure 3-30, approximately 38ha of the Mt Jackson J1 Deposit haul road and approximately 200ha of the Mt Jackson J1 Deposit mine area is overlapped by the EPA-recommended investigation area.

It is understood that the purpose of this EPA-recommended investigation area is for future environmental research and land planning, with a view that if this area contains significant environmental values, then EPA and/or DEC would seek its inclusion into the conservation estate. The basis for this investigation area appears to arise from it being directly adjacent to the recommended Die Hardy/Jackson/Windarling Ranges Conservation Park and an assumption that this area may contain similar flora and fauna values.

There are no current recommendations from EPA or DEC for inclusion of this area into the conservation estate as the further investigations have yet to be undertaken/completed. As there are no current recommendations to include this area into the conservation estate and the impacts to the environmental values of this areas area have previously been assessed (refer Sections 3.1 and 3.2), no further assessment of the potential impacts of the Mt Jackson J1 Deposit proposal on this future investigation area is considered necessary.

Impacts on Proposed Great Western Woodlands

The conventional conservation planning model of placing designated areas into reserves is not without criticism, with some conservationists stating that conservation can only be successful when it occurs across all land tenures and with involvement from all stakeholders. This alternate conservation management perspective is based on moving *beyond core protected areas and into managing the whole landscape… where nodes of human activity are carefully managed for their conservation impacts* (Wilderness Society 2008). This approach also appears consistent with the principles of the National Strategy for the Conservation of Australia's Biological Diversity (Commonwealth of Australia 1996) which recognizes and recommends the need for *sympathetic management of all other areas, including agricultural and other resource production systems*, in addition to the protection of core conservation areas. This approach for broader management of this region has been proposed under the banner of the 'Great Western Woodlands' (Wilderness Society 2008), an area which has subsequently been nominated for inclusion on the National Heritage List (DEWHA 2008c) and has been supported in-principle as an environmental priority by the new Western Australian Government (Liberal Party of Australia 2008a; Liberal Party of Australia 2008b).

The location of the Great Western Woodlands is identified in Figure 3-31. The Great Western Woodlands covers a range of land tenures across a 16,000,000ha area, including unallocated crown land, conservation reserves, pastoral activities and mining tenements. The Mt Jackson J1 Deposit is located entirely within the proposed Great Western Woodlands. The core principle for management of the Great Western Woodlands is for cooperative management of the environmental values of a mixed-use landscape, which includes mining. It is accepted by the proponents for the Great Western Woodlands that, generally speaking, mining is not a significant threat to the environmental values of the Great Western Woodlands, and in fact, mining companies can play an important role in managing the potential significant environmental threats such as fire, feral fauna and weeds (refer to Sections 3.1 and 3.2) (pers. com. Dr A Watson of Wilderness Society to S Hawkins of Globe Environments, September 2008).

The Mt Jackson J1 Deposit proposal will involve an impact of up to 605ha, being less than 0.004% of the total area of the Great Western Woodlands. As the area of impact will be confined, and the impacts on the identified environmental values (refer Sections 3.1 and 3.2) and the identified social values (refer Sections 4.1 to 4.3) are expected to be non-significant, the Mt Jackson J1 Deposit proposal is not expected to result in a significant impact to the environmental or social values of the Great Western Woodlands.

Conservation beyond Conservation Reserves

A matter commonly considered in environmental impact assessments is whether specific flora or fauna values are protected within conservation reserves (e.g. EPA 2007a; DEC & DMP 2007; EPA 2009c; EPA 2009d). This position appears founded on a presumption that conservation can only be achieved through protection within conservation reserves, and subsequently, discounts the presence of flora or fauna located beyond the boundaries of conservation reserves. Although protection of all flora and fauna values within conservation reserves may be desirable, this approach may not be necessary, or practicable.

All flora and fauna in Western Australia is afforded protection under the *Environmental Protection (Clearing of Native Vegetation) Regulations 2004* (WA) and the *Wildlife Conservation Act 1950* (WA), with special protection afforded to flora and fauna of conservation significance further available under the *Wildlife*

Conservation Act 1950 (WA) and the *Environment Protection and Biodiversity Conservation Act 1999* (C'th). Accordingly, conservation reserves simply provide an additional level of protection to that provided by other legislation. This is contrary to any presumption that flora and fauna not located within conservation reserves is not protected.

Based on protection afforded to flora and fauna, it is appropriate for environmental impact assessments to consider the protection of flora and fauna values both within, and outside of, formal conservation reserves. Accordingly, whether the flora and fauna values identified on the Mt Jackson Range are represented in the formal conservation reserve system is not a relevant consideration for assessment of the Mt Jackson J1 Deposit proposal.

3.3.5 Management Actions

Management actions in relation to flora and fauna values are identified in Sections 3.1 and 3.2. No additional management actions are proposed as the Mt Jackson J1 Deposit proposal is not expected to have a significant impact on the environmental values of any existing or recommended conservation reserve.

3.3.6 Commitments

Environmental commitments in relation to flora and fauna values are identified in Sections 3.1 and 3.2. No additional commitments are proposed as the Mt Jackson J1 Deposit proposal is not expected to have a significant impact on the environmental values of any existing or recommended conservation reserve.

3.3.7 Conclusion

As identified by the above assessment, implementation of the Mt Jackson J1 Deposit proposal will not have a significant impact on existing or recommended conservation reserves. Accordingly, EPA's objective for this factor can be met.

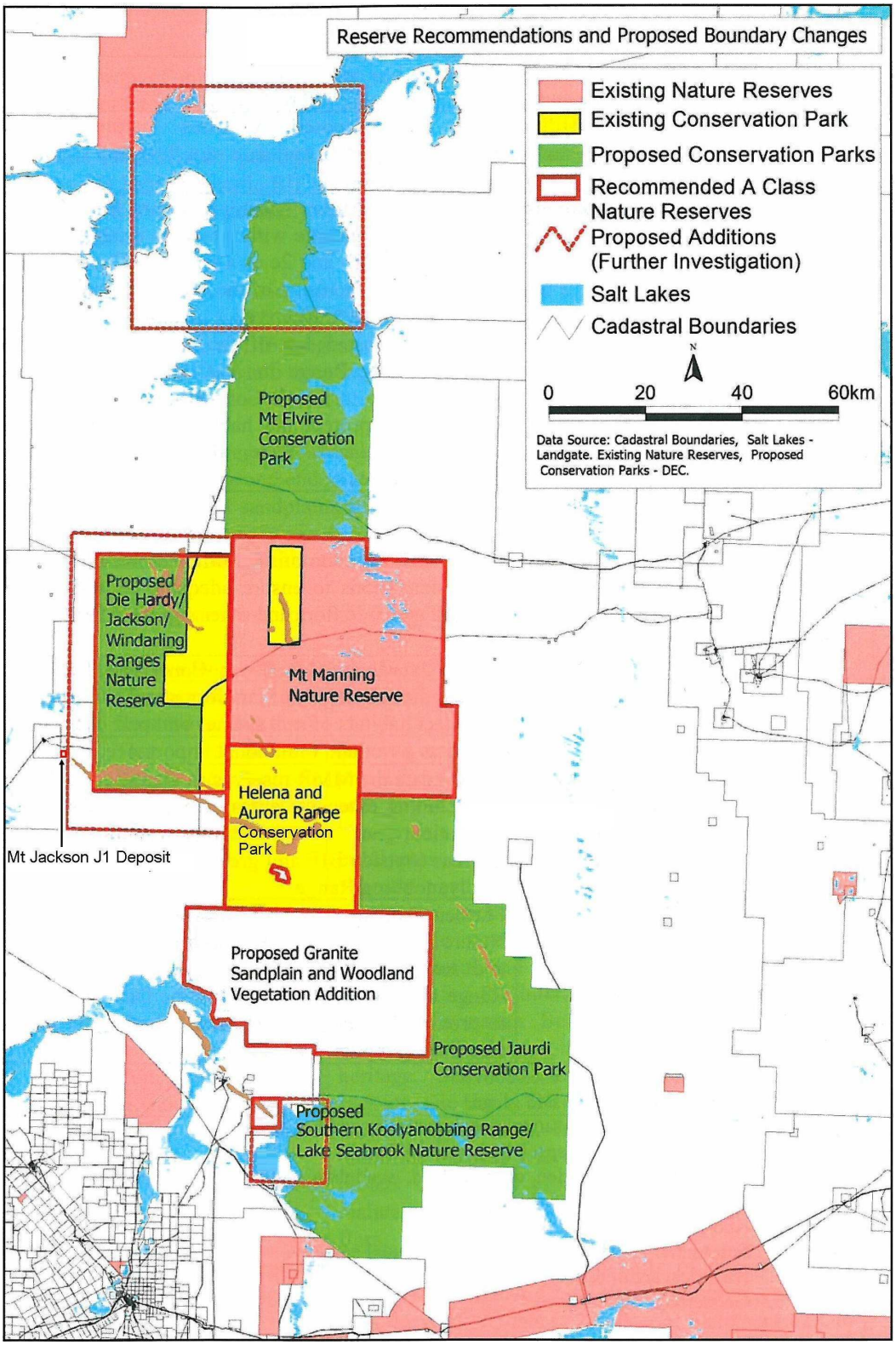

Figure 3-28 Conservation reserves, EPA/DEC-recommended conservation reserves and EPA-recommended investigation areas in the Yilgarn region. The approximate location of the Mt Jackson J1 Deposit is indicated. Source: adapted from EPA (2007a).

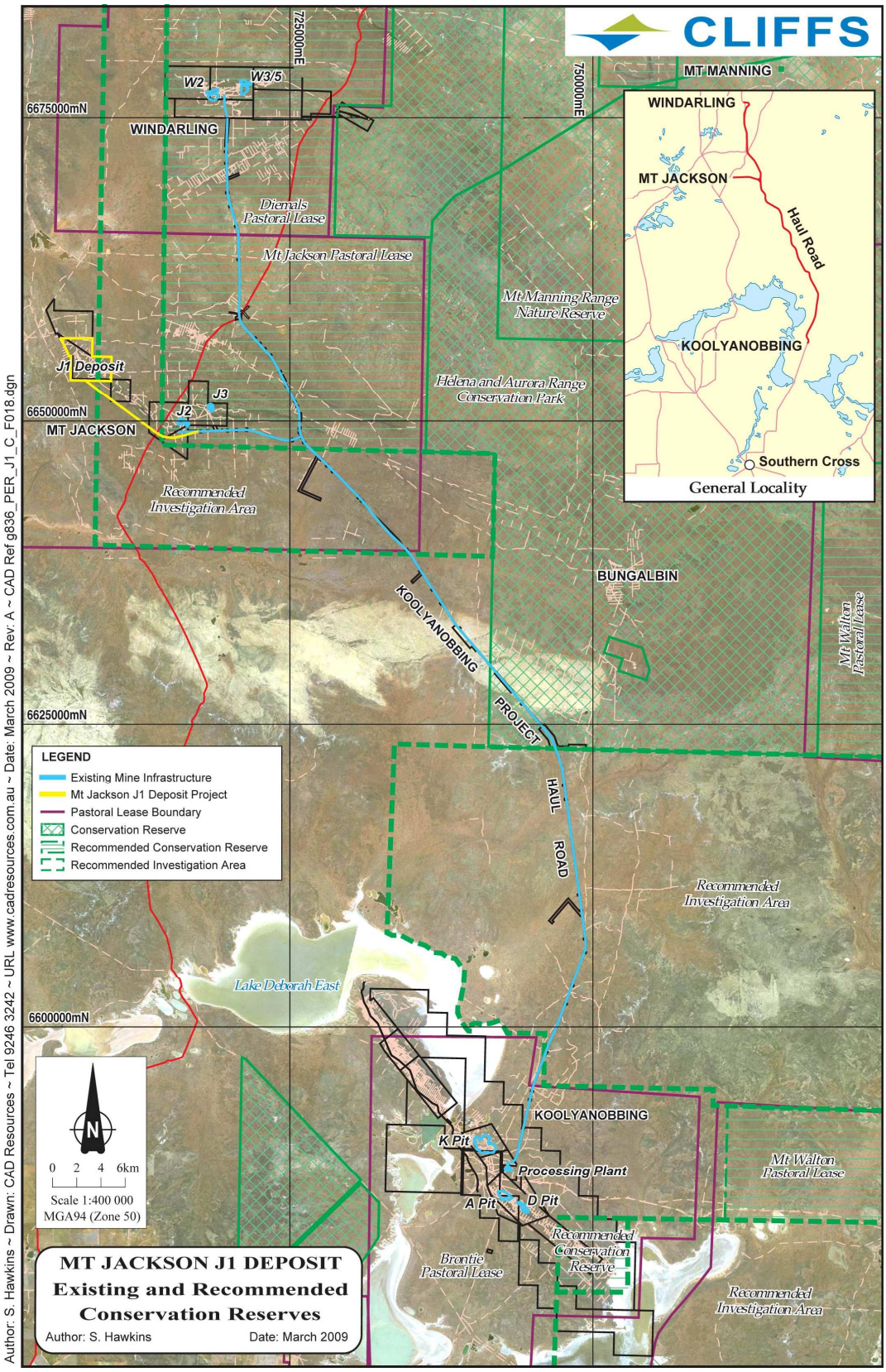

Figure 3-29 Conservation reserves, EPA/DEC-recommended conservation reserves and EPA-recommended investigation areas in the vicinity of the Mt Jackson J1 Deposit proposal. The proposal is not located within any existing conservation reserve. Part of the haul road is within a DEC/EPA-recommended conservation reserve, and part of the haul road and the mine area is located within an EPA-recommended future investigation area. Data source: EPA (2007a).

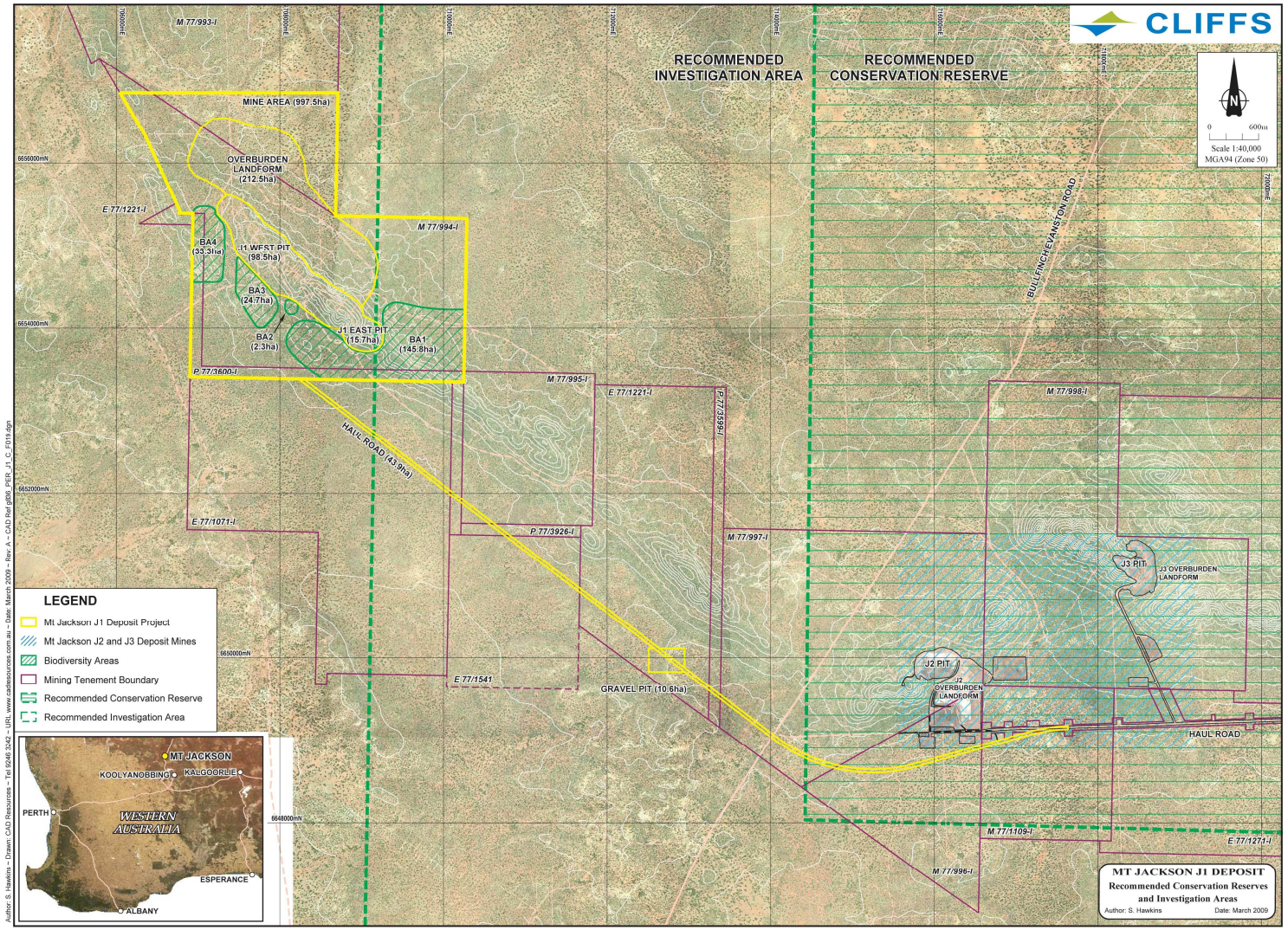

Figure 3-30 EPA/DEC-recommended conservation reserves and EPA-recommended investigation areas in the vicinity of the Mt Jackson J1 Deposit proposal. The proposal is not located within any existing conservation reserve. Part of the haul road is within a recommended conservation reserve, and part of the haul road and the project area is located within a recommended future reserve investigation area. Data source: EPA (2007a).

Figure 3-31 The Great Western Woodlands. The concept of the Great Western Woodlands is based on environmental management of a mixed-use landscape of multiple land tenures. Data source: Dr A Watson, Wilderness Society (2008).

3.4 Groundwater

3.4.1 Potential Issue

Groundwater will be abstracted for operational water supply and in dewatering of the J1 West Pit to enable dry-floor mining below the natural groundwater level. The abstracted groundwater will be used for dust suppression and other mining activities. The abstraction of groundwater will temporarily lower the natural groundwater elevation during mine operations.

This section provides an assessment of the potential impacts of the Mt Jackson J1 Deposit proposal in relation to groundwater use and modelling, groundwater dependent vegetation and groundwater contamination.

3.4.2 EPA Objective

The EPA's objective for water is:

- To maintain the quantity of water so that existing and potential environmental values, including ecosystem maintenance, are protected (EPA 2004a).

The EPA's objective for water quality is:

- To ensure that emissions do not affect environment values or the heath, welfare and amenity of people and land uses by meeting statutory requirements and acceptable standards (EPA 2004a).

3.4.3 Legislation, Guidelines, Standards and Approvals

- *Rights in Water and Irrigation Act 1914* (WA);
- Licence to Take Water under the *Rights in Water and Irrigation Act 1914* (WA) GWL154459 (DoW 2008);
- Operating Strategy for Water Supply Borefield - Koolyanobbing Project Northern Haul Road Network and Minesite Facilities (Cliffs 2008h);
- EPA Guidance Statement 17: Guidance Statement for Remediation Hierarchy for Contaminated Land (EPA 2000a); and
- Environmental Notes on Mining: Waste Rock Dumps (DMP 2001).

3.4.4 Environmental Impact Assessment

Legislative and Management Framework for Groundwater

Groundwater in Western Australia is regulated by DoW under the *Rights in Water and Irrigation Act 1914* (WA). The Mt Jackson J1 Deposit proposal is located within the proclaimed Goldfield Groundwater Management Area (Deborah sub-area) and a licence is required from DoW for its abstraction and use. Groundwater in this area is predominantly hypersaline, with the current beneficial use of the groundwater being for mine operations (DEC 2008a).

Cliffs' existing mine operations at the Mt Jackson Range and the Windarling Range have Groundwater Licence GWL154459 issued by DoW (DoW 2008) for groundwater supply. The groundwater licence stipulates a range of conditions for management of the groundwater resource, including compliance with an Operating Strategy (Cliffs 2008h). Cliffs also manages its groundwater abstraction in accordance with Environmental Operating

Procedure EOP07 Groundwater (Cliffs 2008i; Appendix 18) which forms part of Cliffs' ISO:14001-certified EMS. The Groundwater Licence, Operating Strategy and Environmental Operating Procedure EOP07 Groundwater contain a range of management actions including:

1. monthly recording of groundwater abstraction volumes;
2. monthly visual recording of vegetation around groundwater production wells to identify any vegetation impacts;
3. biannual recording of static water levels in production wells;
4. annual water quality monitoring (salinity);
5. construction, maintenance and monitoring of water facilities to prevent groundwater loss;
6. annual review of groundwater levels to determine impacts on the groundwater resource and any required changes to the abstraction rates or abstraction locations;
7. fencing of water storage dams to prevent fauna access, with fauna egress matting to allow for fauna escape in the event of fauna access; and
8. annual reporting of groundwater monitoring results to DoW.

The Mt Jackson J1 Deposit proposal will require dewatering of an estimated 0.63GL/y for mine operations (Rockwater 2007b). Cliffs will apply to DoW to amend GWL154459 to include the Mt Jackson J1 Deposit proposal area. This amendment under the *Rights in Water and Irrigation Act 1914* (WA) will be undertaken in parallel with the *Environmental Protection Act 1986* (WA) assessment process.

Groundwater Quality and Groundwater Modelling of Mine Dewatering

Groundwater investigations have confirmed that the groundwater salinity of the Yilgarn area can vary significantly over relatively short distances. The groundwater salinity of the Mt Jackson J1 Deposit is between approximately 200mg/L to 6000mg/L (average approximately 5000mg/L), being significantly lower than the salinity concentrations recorded at the Windarling Range (20,000mg/L to 29,000mg/L) and towards the Koolyanobbing Range (18,000mg/L to 39,000mg/L) (Rockwater 2003; Rockwater 2007a). Groundwater at the Mt Jackson J1 Deposit occurs at approximately 417m AHD (Rockwater 2007b).

The Mt Jackson J1 Deposit ore resource occurs both above and below the 417mAHD natural groundwater level. The design of the J1 West Pit is based on accessing 23Mt of ore above the groundwater table and 10Mt of ore located below the groundwater table. Accordingly, dewatering of the J1 West Pit is required to lower the groundwater level to enable dry-floor mining. Dewatering of the J1 East Pit will not be required as mining will only occur above the groundwater table.

Numerical modelling of the groundwater dewatering required for the J1 West Pit was undertaken based upon field groundwater pumping tests and the mine pit design (Rockwater 2007a). The groundwater model produced identifies that a dewatering rate of approximately 20L/s (0.63GL/y) will be required during the first 5 years of mine operation, with the volume reducing to 10L/s (0.32GL/y) for the following 3 years of mine operation, and to 5L/s (0.16GL/y) for the final 2 years of mine operation. The groundwater abstraction rates are based on reducing the groundwater level gradually over the mine life. For a volume comparison, 0.56GLy and 0.38GL/y of groundwater was abstracted and used at Cliffs' existing Windarling Range mine operations in 2006 and 2007 respectively (Cliffs 2008j).

Dewatering of the J1 West Pit will create a cone of depression of approximately 700ha (including the 114ha area of the J1 West Pit and the J1 East Pit), of which less than 45ha beyond the mine pits will have a groundwater drawdown greater than 10m. The groundwater drawdown will be greatest near the mine pits and predominantly contained within Cliffs' mining leases. The modelled groundwater drawdown is depicted in Figure 3-32.

The abstracted groundwater will be used for dust suppression and other mining activities. The volume of groundwater abstracted will be managed to Cliffs' operational needs; with no shortfall or excess in groundwater volumes expected. No significant impacts are expected from the use of groundwater for dust suppression due to the low salinity of the groundwater and the implementation of the approved groundwater management practices (refer also to Section 3.5 on groundwater use for dust suppression).

The impacts of dewatering during mine operations are expected to be temporary, with the groundwater within the cone of depression area expected to recover following the cessation of mining and dewatering. Based on the groundwater modelling undertaken for the operational Windarling Range W2 Pit based on long-term groundwater abstraction data (Rockwater 2007c), the groundwater within the J1 West Pit can be expected to recover to approximately 50m to 70m lower than the pre-mining level. This will create a permanent surface water feature at approximately 350m AHD to 370mAHD (10m to 30m water depth).

As a result of the changes to the geology arising from mine pit development, the J1 West Pit will act as a groundwater sink (Rockwater 2007b). As such, the surrounding groundwater is expected to gradually flow into the J1 West Pit, with minimal movement of groundwater from within the J1 West Pit into the surrounding aquifer. The lowered groundwater level within the J1 West Pit, being approximately 50m to 70m lower than the pre-mining level, is expected to be confined to the J1 West Pit and an area immediately surrounding the J1 West Pit and with no long-term changes to the regional groundwater.

The water quality within the J1 West Pit is expected to have a similar salinity to the surrounding groundwater during initial years following mine decommissioning. The salinity concentration of the water within the J1 West Pit is expected to increase over several decades due to the combination of high evaporation (removal of fresh water) and the infiltration of saline groundwater; with the salinity concentration eventually reaching a stable equilibrium. The final salinity concentration of the surface water within the J1 West Pit is not currently known, however, in any event the final salinity concentration will be confined only to the J1 West Pit and with no impact the groundwater quality of the surrounding aquifer.

Based on the groundwater modelling and interpretation identified above, the groundwater abstraction and dewatering required for the J1 West Pit can be summarised as a localised and temporary reduction of the groundwater elevation during mine operations, with no long-term significant changes to regional groundwater hydrology, regional groundwater quality or regional groundwater levels.

It is acknowledged that the numerical groundwater modelling has accuracy limitations (conservatively within ±50%) that arise from limited groundwater pumping and monitoring data. The modelling is, however, sufficiently accurate and appropriate for the purposes of determining the overall likely impact of the proposal on groundwater hydrology and groundwater quality for the purposes of an environmental impact assessment. Improved groundwater pumping and monitoring data to improve the accuracy of the groundwater model will be obtainable from the first years of groundwater abstraction during mine operations, which could enable the production of a more accurate groundwater model. Cliffs does not propose further groundwater modelling as refinement of the groundwater model is not expected to significantly change the currently modelled outcome.

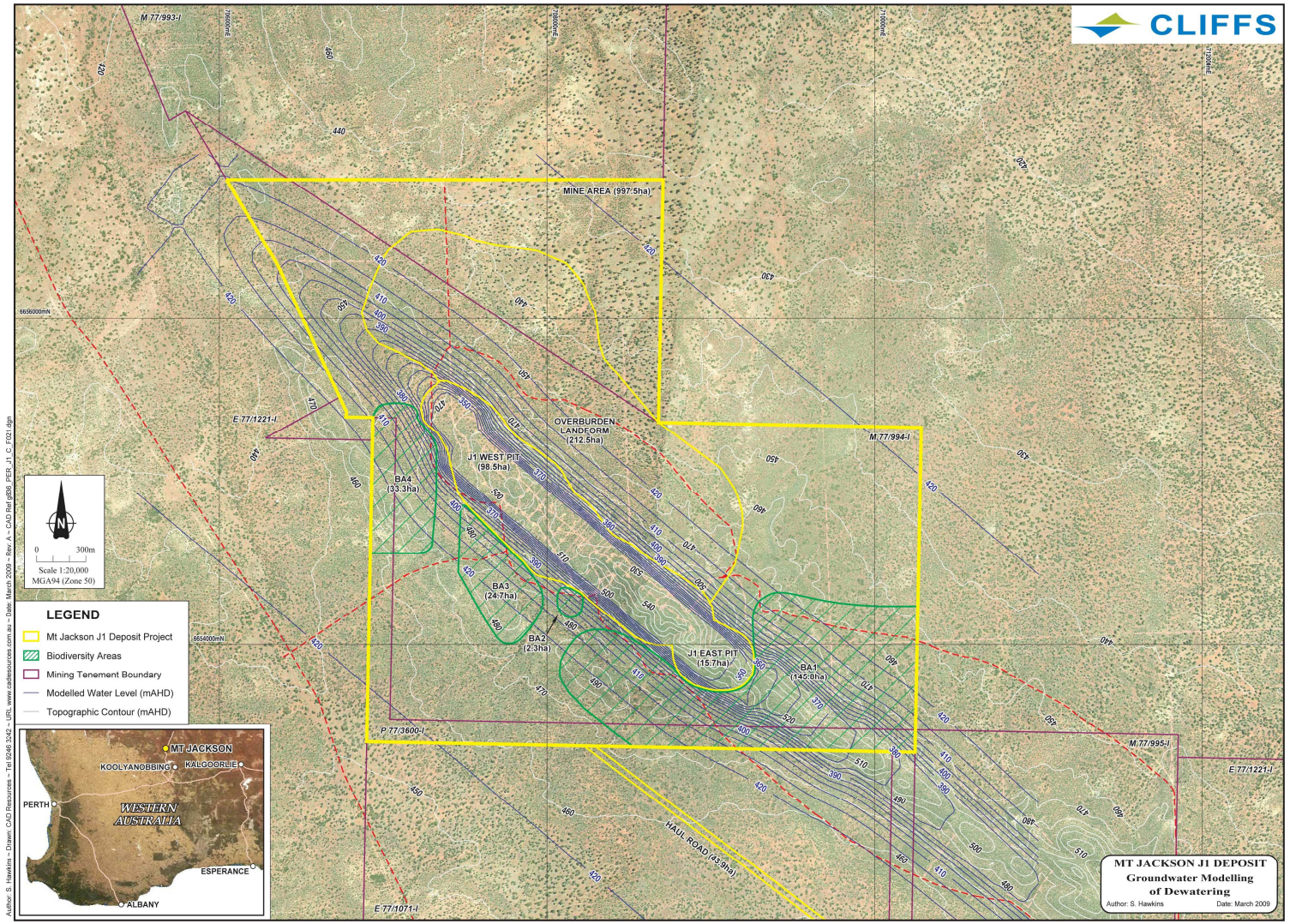

Figure 3-32 Groundwater model for the Mt Jackson J1 Deposit proposal. The model provides an assessment of the drawdown as at the final year of mining. The drawdown is greatest near the mine pits and along the Mt Jackson Range. The groundwater is expected to recover to near pre-mining levels following the completion of mining. (Source: adapted from Rockwater 2007b).

Dewatering Impacts on Vegetation

As identified in Rockwater (2007b), groundwater at the Mt Jackson J1 Deposit occurs at an elevation of approximately 417mAHD. The dewatering will create a cone of depression of approximately 700ha, of which less than 45ha beyond the mine pits will have a groundwater drawdown greater than 10m. Groundwater drawdown will be greatest near the mine pits and predominantly contained to within Cliffs' mining leases.

Most of the Mt Jackson Range lies at an elevation of between approximately 480m AHD to 550m AHD. The surrounding plain within the area of the cone of depression (i.e. within approximately 400m of the mine pit) lies at an elevation of between approximately 470mAHD to 480mAHD (refer Figure 3-32). Accordingly, based upon the 417mAHD natural groundwater level, the land within the area to be impacted by groundwater dewatering is located at between approximately 50m to 130m above the natural groundwater level.

As identified by Figure 3-6, the dominant flora species within the cone of depression (excluding the mine pits) are:

- *Eucalyptus* species including *Eucalyptus corrugata, Eucalyptus ebbanoensis, Eucalyptus transcontinentalis* and *Eucalyptus dendrosheath*;
- *Acacia* species including *Acacia effusifolia, Acacia* sp. Mt Jackson and *Acacia* sp. narrow phyllode;
- *Casuarina pauper*; and
- *Allocasuarina acutivalvis.*

The 50m to 130m depth to groundwater is beyond the reach of the root systems of these dominant species and therefore these species will not impacted by groundwater drawdown from dewatering. For species of the genus *Eucalyptus*, although it may be possible for roots of this genus to extend beyond 50m to reach groundwater (subject also to soil/rock structure of the site), water supply to species of this genus would predominantly occur through lateral roots sourcing water from within the soil profile. This conclusion is supported, in part, by the biannual vegetation monitoring undertaken during 2006 to 2009 at Cliffs' Mt Jackson Range and Windarling Range mine operations where similar dominant vegetation adjacent to groundwater abstraction sites has not shown a decline in health (pers. com. D Martin, Cliffs' Environmental Superintendent to S Hawkins of Globe Environments, March 2009). Accordingly, lowering of the groundwater table for operation of the Mt Jackson J1 Deposit proposal is not expected to result in a reduction in vegetation health within the area of groundwater drawdown.

Acid Mine Drainage impacts to Groundwater

Overburden material may contain sulphur, which has the potential to oxidise and form a sulphuric acid leachate. Acid leachates can, in turn, cause the release of metals bound to the overburden material. If allowed to escape into the environment, acid leachates have the potential to contaminate the groundwater[1] through a change in groundwater acidity and contamination with metals.

Overburden with a sulphur content below 0.3% is regarded as non-acid forming due to the oxidation rate being too low to result in acidification (Soregaroli & Lawrence 1997 in G Campbell & Associates 2002). Overburden with a sulphur content above 0.3% is regarded as potentially acid-forming, with acid formation being subject to the reactivity status (oxidation and form) of the sulphur.

[1] Impacts of acid leachates on surface water are not relevant for the Mt Jackson J1 Deposit proposal due to the typically low rainfall of the region and the absence of natural surface water features in the vicinity of the Mt Jackson J1 Deposit proposal (refer to Chapter 2).

Cliffs' existing mine operations at the Mt Jackson Range, Windarling Range and the Koolyanobbing Range have not shown any physical indication of acid leachate formation to date (pers. com. N Payne of Cliffs Geology to S Hawkins to Globe Environments, July 2008).

Approximately 6.6% (3,920,000m^3) of the overburden material within the Mt Jackson J1 Deposit has a sulphur content exceeding 0.3% (based on 9,314 samples (Cliffs 2008 unpublished data)). As this volume includes both reactive sulphides (potentially acid forming) and non-reactive sulphates (non-acid forming), this estimate is regarded as conservative. As the iron ore removed from the Mt Jackson J1 Deposit is predominantly oxidised (having been converted to goethite from iron pyrite over geological timeframes), the overburden material to be excavated is similarly expected to be predominately oxidised (non-reactive); thereby supporting a position of low-risk of acid leachate formation within the overburden landform.

In accordance with Cliffs' current management practices, and DMP (2001) and DEWHA (1997) guidance on management of overburden landforms, Cliffs will dispose, isolate and contain overburden material with a sulphur content above 0.3% within the centre of the Mt Jackson J1 Deposit overburden landform, with a minimum non-acid forming soil/rock buffer of 5m (below, above and surrounding) to ensure that any acid leachate, if formed, will be buffered and isolated from the groundwater in order to prevent groundwater contamination.

The above management approach is consistent with the approach accepted by EPA for the management of acid mine drainage for recently assessed resource development projects (refer EPA 2008d; EPA 2008e; EPA 2008f). For the Mt Jackson J1 Deposit proposal, the risk of acid leachates forming and contaminating the groundwater is low due to the low regional rainfall (refer Section 2.1), significant depth to groundwater, and the low percentage of overburden material with a sulphur content exceeding 0.3%. Accordingly, the implementation of the acid mine drainage practices identified above will be sufficient to manage the low risk of acid leachate formation from the overburden landform contaminating the surrounding groundwater aquifer.

A similar low-risk also exists for unexcavated material within the J1 West Pit forming an acid leachate and affecting the pH of the surface water within the J1 West Pit. Based on a the proportionate estimate of 6.6% of material having a sulphur content exceeding 0.3%, and the expectation that this material will be predominantly oxidised (non-reactive), the potential for acid leachate formation which could affect the pH of the surface water within the J1 West Pit is also expected to be low. Advice from Cliffs' specialist environmental geochemists regarding the potential for modelling of the risk and expected long-term pH of the surface water within the J1 West Pit has confirmed that although such modelling is possible to attempt, the modelling outcomes are unlikely to have the desired degree of accuracy due to speculation on a number of host variables which are not accurately known prior to mining (pers. com. Environmental Geochemistry International Pty Ltd to Cliffs' Geology, June 2009). Irrespective of the degree of risk or the validity of modelling such a scenario, it is primarily important to note that should the pH of the surface water within the J1 West Pit be different to that of the surrounding groundwater, the changes to the surface water pH within the J1 West Pit will be confined to the pit itself and with no impact to the surrounding groundwater aquifer.

3.4.5 Management Actions

Groundwater Management and Monitoring

Groundwater at Cliffs' existing mine operations at the Mt Jackson Range and the Windarling Range is regulated by DoW under Groundwater Licence GWL154459 (DoW 2008), an Operating Strategy (Cliffs 2008h) and Environmental Operating Procedure EOP07 Groundwater (Cliffs 2008i; Appendix 18). The Groundwater Licence GWL154459, Operating Strategy and Environmental Operating Procedure EOP07 Groundwater contain a range of management actions including:

1. monthly recording of groundwater abstraction volumes;
2. monthly visual recording of vegetation around groundwater production wells to identify any vegetation impacts;
3. biannual recording of static water levels in production wells;
4. annual water quality monitoring (salinity);
5. construction, maintenance and monitoring of water facilities to prevent groundwater loss;
6. annual review of groundwater levels to determine impacts on the groundwater resource and any required changes to the abstraction rates or abstraction locations;
7. fencing of water storage dams to prevent fauna access, with fauna egress matting to allow for fauna escape in the event of fauna access; and
8. annual reporting of groundwater monitoring results to DoW.

Cliffs proposes this groundwater management framework will also be appropriate for the Mt Jackson J1 Deposit proposal. Accordingly, following amendment of Groundwater Licence GWL154459 to include the Mt Jackson J1 Deposit proposal, Cliffs will apply the Operating Strategy and Environmental Operating Procedure EOP07 Groundwater to the management of groundwater for the proposal.

The groundwater production bores within the Mt Jackson J1 Deposit will be monitored biannually in accordance with Cliffs' Operating Strategy (Cliffs 2008h) and Environmental Operating Procedure EOP07 Groundwater (Cliffs 2008i; Appendix 18). In addition, Cliffs will also install a minimum of 4 groundwater wells (along strike and across strike of the Mt Jackson J1 Deposit) to allow for monthly monitoring of groundwater levels. Monthly monitoring of the groundwater levels will allow for regular confirmation of the groundwater drawdown response against the predictions of the groundwater model during mine operations, and for an informed management response to modify the groundwater abstraction rate in the event that the groundwater response differs from the modelled predictions.

During early consultation on the Mt Jackson J1 Deposit proposal, DoW (via EPA, as identified in Cliffs 2009b) identified a potential concern regarding the potential for saline groundwater used in dust suppression to impact adjacent areas of native vegetation. Vegetation impacts from the use of saline groundwater have been recorded in the Goldfields Region of Western Australia (refer to Bertuch & van Etten 2004) with the key influencing factors for impacts being the groundwater salinity, vegetation type, irrigation method and drainage design. Monthly vegetation monitoring undertaken by Cliffs' site-based Environmental Advisors at locations adjacent to mine operations and the haul road has not identified significant vegetation impacts from groundwater used in dust suppression; likely as a result of drainage designs using culverts and sumps to control surface water movement, controlled irrigation used in dust suppression (spray bar and management of spray pressure (refer Cliffs 2008k; Appendix 19) and moderate groundwater salinities (900mg/L to 62,000mg/L (Rockwater 2003)). Having regard to the comparatively low salinity of the Mt Jackson J1 Deposit groundwater (5,000mg/L (Rockwater 2007b)) and that similar irrigation and drainage controls will be implemented, the use of saline groundwater for dust suppression at the Mt Jackson J1 Deposit proposal is not expected to impact native vegetation.

Acid Mine Drainage

In accordance with Cliffs' current management practices and the DMP (2001) and DEWHA (1997) guidance on management of overburden landforms, Cliffs will dispose, isolate and contain overburden material with a sulphur content above 0.3% within the centre of the overburden landform with a minimum non-acid forming soil/rock buffer of 5m (below, above and surrounding) to ensure that any acid leachate, if formed, will be buffered and isolated from the groundwater in order to prevent potential contamination.

3.4.6 Commitments

Cliffs makes the following commitments for management of the Mt Jackson J1 Deposit proposal:

1 Groundwater Management

1-1 Cliffs will implement the following procedure for the management of groundwater during mine operations, decommissioning and rehabilitation:
   a. Environmental Operating Procedure EOP07 Groundwater (Cliffs 2008i; Appendix 18).

1-2 Within 12 months following the commencement of groundwater dewatering, Cliffs will install a minimum of 4 groundwater monitoring wells (along strike and across strike of the Mt Jackson J1 Deposit).

1-3 Cliffs will undertake monthly monitoring of the groundwater levels within the groundwater monitoring wells during groundwater dewatering.

2 *Rights in Water and Irrigation Act 1914* (WA)

2-1 Cliffs will ensure that management of groundwater at the Mt Jackson J1 Deposit complies with:
   a. *Rights in Water and Irrigation Act 1914* (WA);
   b. Groundwater Licence GWL154459 under the *Rights in Water and Irrigation Act 1914* (WA); and
   c. Operating Strategy for Water Supply Borefield - Koolyanobbing Project Northern Haul Road Network and Minesite Facilities (Cliffs 2008h)

   in consultation with the Department of Water.

3 Acid Mine Drainage Management

3-1 Cliffs will manage overburden material with a sulphur content greater than 0.3% by isolating and containing that material within the centre of the overburden landform (consistent with DMP (2001)) and encapsulation within a minimum of 5m of non-acid forming material (below, above and surrounding).

A consolidation of Cliffs' commitments for the Mt Jackson J1 Deposit proposal is contained in Chapter 7.

3.4.7 Conclusion

Groundwater abstraction for the Mt Jackson J1 Deposit proposal will result in localised and temporary reduction of the groundwater elevation during mine operations, with no long-term significant changes to regional groundwater quality or vegetation health. The risk of impacts to the groundwater system can be adequately managed to meet EPA's objective through implementation of Cliffs' commitments for groundwater. Accordingly, EPA's objective for this factor can be met.

3.5 Dust

3.5.1 Potential Issue

Mining is inherently a dust generating activity due to the need for blasting, excavation, loading and transport of ore and overburden. Dust has the potential to affect the health and amenity of people and the environment. This section provides an assessment of the potential dust impacts of the Mt Jackson J1 Deposit proposal.

3.5.2 EPA Objective

The EPA's objective for air quality is:

- To ensure that emissions do not adversely affect environment values or the health, welfare and amenity of people and land uses by meeting statutory requirements and acceptable standards (EPA 2004a).

3.5.3 Legislation, Guidelines, Standards and Approvals

- *Environmental Protection Act 1986* (WA);
- National Environment Protection (Ambient Air Quality) Measure (NEPC 2003);
- Dust Control: Best Practice Environmental Management in Mining (DEWHA 1998);
- EPA Guidance Statement 18: Prevention of Air Quality Impacts from Land Development Sites (EPA 2000b);
- Air Quality Modelling Guidance Notes (DEC 2006);
- Groundwater Licence GWL154459 issued under the *Rights in Water and Irrigation Act 1914* (WA) (DoW 2008);
- Operating Strategy for Water Supply Borefield - Koolyanobbing Project Northern Haul Road Network and Minesite Facilities (Cliffs 2008h);
- Koolyanobbing Expansion Project Dust Management Plan (Cliffs 2003e).

3.5.4 Environmental Impact Assessment

Identification of Dust Receptors

The *National Environment Protection (Ambient Air Quality) Measure* (NEPC 2003) identifies the national guideline for acceptable ambient air quality particulates for the protection of human health. There are no areas of permanent human occupation near the Mt Jackson J1 Deposit proposal; the nearest occupied residence is located greater than 50km from the Mt Jackson J1 Deposit proposal area. Accordingly, an assessment of dust impacts on human receptors is not considered further.

There is no standard or guideline for particulate deposition impacts on flora. Flora has been documented as a sensitive dust receptor (refer to Farmer (1993) for an extensive literature review). Dust has the potential to settle on vegetation, which in turn, has the potential to reduce the intensity of light required for plant photosynthesis, influence gaseous exchange required for plant respiration, increase leaf temperature and increase plant transpiration (Farmer 1993; Hirano *et al.* 1995). As the Mt Jackson J1 Deposit proposal is surrounded by native vegetation, the potential dust impact to native vegetation requires consideration.

Dust Management at Cliffs' existing mine operations

Dust at Cliffs' existing mine operations on the Mt Jackson Range, Windarling Range and Koolyanobbing Range is managed in accordance with a Dust Management Plan (Cliffs 2003e). The Dust Management Plan was assessed and approved by DEC in 2003 for the Mt Jackson Range and the Windarling Range mine operations under Statement 627 (WA Minister for Environment 2003). The Dust Management Plan is supported by Environmental Operating Procedure EOP05 Dust Management (Cliffs 2008k; Appendix 19); which forms part of Cliffs' ISO:14001-certified EMS. Cliffs' Dust Management Plan and Environmental Operating Procedure EOP05 Dust Management contain a range of management actions to minimise dust generation and potential dust impacts, including:

- Staff training on dust management procedures and practices;
- Dust control measures including:
    - minimising vegetation clearing that could create dust-prone areas;
    - dampening of dust-prone areas (such as roads and stockpiles) with groundwater;
    - water sprays fitted to machinery;
    - restriction of vehicle speeds;
    - blasting techniques that produce minimal dust; and
    - progressive rehabilitation of disturbed areas;
- Visual monitoring of dust generated from pits and stockpiles; and
- Internal reporting of dust incidents, with external annual reporting to DEC and DMP (with subsequent review and audit by DEC and DMP).

Although it is recognised that dust cannot be eliminated from mine operations, the management actions contained in the Dust Management Plan and Environmental Operating Procedure EOP05 Dust Management are practical actions that reduce dust generation and potential dust impacts. These actions are consistent with the dust management actions implemented at mine operations throughout Western Australia.

As identified by Figure 3-33, dust monitoring undertaken at Cliffs' Windarling Range mine operations throughout the year (i.e. various meteorological conditions) by passive sampling (dust deposition gauges) indicates that dust is predominantly contained within 100m to 150m of a mine pit, with the greatest dust deposition generally occurring within the first 50m (Cliffs 2007c; Cliffs 2007d). Dry months (summer) produce the greatest mass of dust; approximately more than double the mass of wetter months (winter and spring). With regards to Cliffs' existing haul road, dust is visible on vegetation up to approximately 10m from the edge of the haul road (pers. obs. S Hawkins of Globe Environments, May 2008). This monitoring information from Cliffs' existing mine operations provides a sound basis for a realistic assessment of the potential impacts of dust from the Mt Jackson J1 Deposit proposal on adjacent native vegetation.

Flora mortalities have been recorded at Cliffs' existing mine operations. The cause of these mortalities is considered to be from a combination of dust, drought and exposure (landscape position). The long-term impact of dust on the vegetation at Cliffs' existing mines has yet to be determined as the impacts of drought and exposure are unable to be separated from the impacts of dust. Despite this, it can be concluded that dust is a contributing factor that has led to flora mortalities (pers. com. G Cockerton of Western Botanical to S Hawkins of Globe Environments, April 2008).

Physical monitoring of dust impacts on native vegetation within the mining areas is undertaken annually at Cliffs' Windarling Range mine operations for the DRF *Ricinocarpos brevis*. The monitoring indicates that this flora species continues to show annual new plant growth and flowering, even when subject to high dust deposition (pers. com. S McNee of Western Botanical to S Hawkins of Globe Environments, June 2008). This continued growth and flowering indicates continued health of this species even under unfavourable dust conditions. Although the flora species within the area of the Mt Jackson J1 Deposit proposal are different, the

results of the vegetation condition assessment indicate that some flora species can withstand dust deposition from mine operations without mortality.

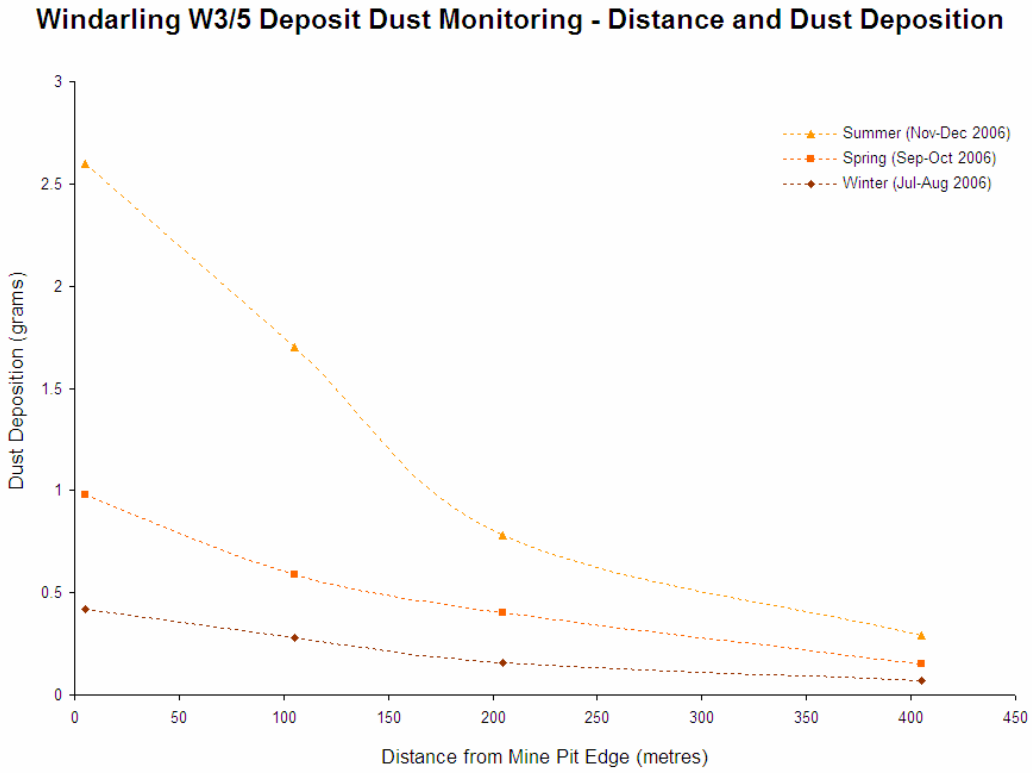

Figure 3-33 Dust monitoring results from Cliffs' Windarling Range W3/5 Deposit mine operations. The data identifies that dust deposition is greatest near the mine pit edge and with dust deposition declining with increased distance. Dust deposition during dry periods (summer) is approximately double the mass that occurs during wetter periods (winter and spring). The data was collected by passive sampling (dust deposition gauges) from fixed sampling points during mine operations occurring adjacent to the Windarling Range W3/5 Deposit mine pit edge. Source: adapted from Cliffs (2007d).

Assessment of Dust Impacts on Flora for the Mt Jackson J1 Deposit proposal

The potential for dust generation from mine operations is subject to a number of factors, being:

- Meteorological conditions;
- Nature of mine operations;
- Mine development stage;
- Mine layout; and
- Management actions to minimise dust generation.

Each of these factors is considered below:

Meteorological conditions

Rainfall and temperature are relevant factors affecting dust generation, with rainfall and soil moisture both assisting to suppress or minimise dust generation. The nearest active meteorological monitoring station for rainfall is located at Southern Cross[1], approximately 115km south of the Mt Jackson Range.

[1] Note: The 'Diemals' monitoring station ceased operation in 1994, and although closer to the Mt Jackson Range, is not considered appropriate to capture more recent changes in rainfall and temperature patterns arising from climate change.

The annual rainfall and temperature data for Southern Cross indicates the following trends (BoM 2008a):

- Rainfall occurs throughout the year (on average) with approximately 70 days of rainfall per year. The wettest months (>30mm) occur between May and August and the driest months (<20mm) occur between October and January; and
- Maximum temperatures (>30^{o}C) peak between December and March.

Based on dust monitoring undertaken by Cliffs at the Windarling Range mine operations, the periods of peak dust generation occur during dry months, with dry months generating approximately four times the dust mass of wet months (Cliffs 2007d).

Wind speed and wind direction are relevant factors in determining the likely direction that dust will move and be deposited. The nearest meteorological monitoring station for wind is located at 'Diemals', approximately 50km north of the Mt Jackson J1 Deposit. The annual wind speed and wind direction data for Diemals indicates the following trends (BoM 2008b):

- Between January to April winds are predominately in a north-east, east and south-east direction during both mornings and afternoons;
- Between July to October the wind direction is predominantly north-west, west and south-west during mornings only, with afternoon wind direction showing variable directions; and
- Periods of calm (no wind and wind <10km/hr) occur during the mornings between May to July, with the strongest winds occurring in the afternoons between July to November.

Accordingly, based on the rainfall, temperature and wind data, the following trends are considered likely to apply for the Mt Jackson J1 Deposit proposal:

- drier months (between January to April) will create the greatest dust generation with dust moving predominately in a north-east, east and south-east direction; and
- wetter months will have a reduced dust generation potential, with dust generation being lowest in mornings and moving in a north-west, west and south-west direction, and greatest in afternoons where the direction of dust transport will be variable.

Nature of mine operations

Due to similar environmental and geological conditions and similar mine operations, Cliffs' existing Windarling Range mine operations provide a sound basis for determining the likely dust emission sources for the Mt Jackson J1 Deposit proposal. The estimated dust emission sources from Cliffs' Windarling Range mine operations are identified in Figure 3-34 (Holmes Air Sciences 2008a; Holmes Air Sciences 2008b). As identified by Figure 3-34, mine operations involving overburden material contribute to approximately 66% of dust generated from mine operations. This contribution can be divided into haulage of overburden material (28%), wind erosion of the overburden landform (14%), loading of overburden (12%) and unloading of overburden (12%). Accordingly, dust management actions should be focussed largely on the management of overburden material in order to control the greatest proportion of dust generation.

Blasting is often thought to be a significant dust contributor due to a concentrated visual dust plume generated, however as identified by Figure 3-34, blasting contributes only approximately 1% of total dust emissions. The low overall contribution of blasting to dust generation is likely related to the

short duration and low frequency of blasting (typically 3 to 5 times per week (pers. com. E Kraft of Cliffs to S Hawkins to Globe Environments, October 2008)).

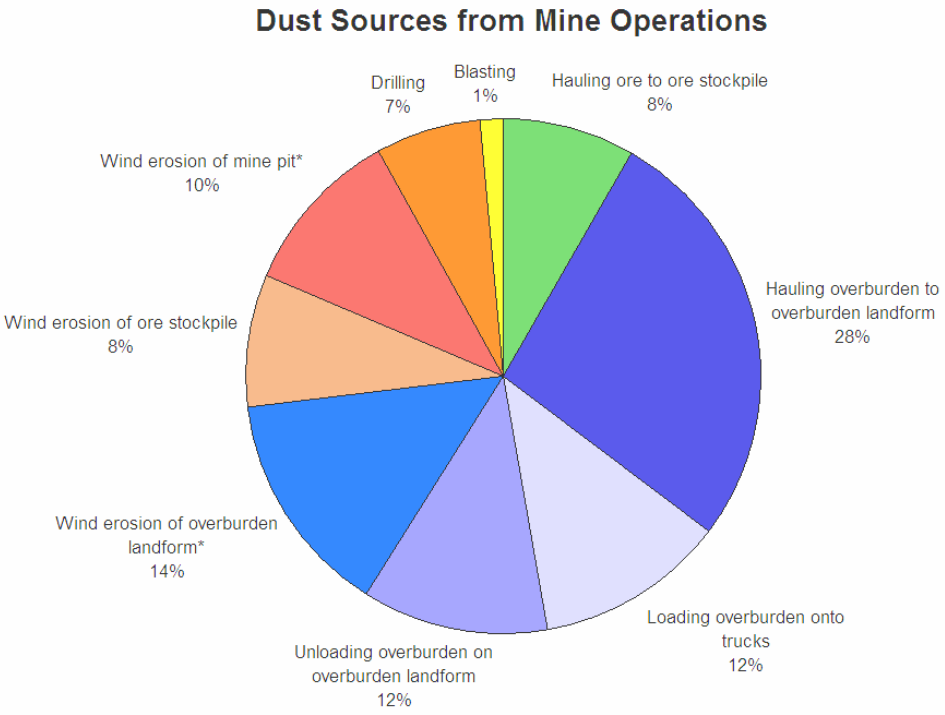

Figure 3-34 Dust source model for Cliffs' Windarling Range operations. The main sources of dust are from the loading, hauling and unloading of overburden material and from wind erosion of the overburden landform (66% combined). Note: Other dust sources that contribute <1% have been omitted from calculations for data clarity. Source: Adapted from data of Holmes Air Sciences (2008a; 2008b).

Mine Development Stage

The potential for dust generation is greatest in the period of initial mine development due to a focus on land clearing activities. As a mine develops, the potential for dust generation and dust impacts reduces a result of:

- reduced land clearing (mine operations occurring within cleared areas);
- increased ore:overburden stripping ratio, resulting in a reduced proportion of overburden material requiring management;
- increased pit wall height, resulting in a reduced potential for dust to escape over the crest of a mine pit; and
- increased retained soil moisture (for mining below the groundwater table), resulting in a reduced number of dry particles with the potential to generate dust.

Based on the above factors, it is considered likely that dust generation from the Mt Jackson J1 Deposit proposal will be greatest during initial mine operations, with reduced dust generation over the life of the mine.

The duration of mine operations will affect the dust impacts on flora. The Mt Jackson J1 Deposit proposal has a mine operational life of approximately 10 years, followed by decommissioning and rehabilitation works. The cumulative dust impacts on flora will be influenced by:

- Increasing mine pit depth over the life of the mine;
- Natural stabilisation of mine pit walls, the overburden landform and the haul road surfaces during mine life (i.e. reduced wind erosion with time);
- Progressive rehabilitation of cleared areas during mine life (with particular regard to progressive rehabilitation of the overburden landform); and
- Rainfall removing dust from flora.

Mine Layout

As identified in Sections 3.1 and 3.2, the mine layout for the Mt Jackson J1 Deposit proposal has been based primarily on the location of the ore resource (mine pits being fixed infrastructure) and the protection of areas containing the highest environmental values within biodiversity areas; resulting in other mine infrastructure being located within areas of lower environmental value. Although dust management was not a key consideration for the mine layout, the potential impact of dust emissions from the selected layout can be considered.

As the biodiversity areas have been designated to protect areas containing the highest environmental values, the impact of dust on these areas is of most concern. The biodiversity areas are located at approximately 90m distance from the crest of the J1 West Pit and 70m from the crest of the J1 East Pit. Based on the selected mine layout, the known meteorological conditions and the dominant dust generation sources identified above, dust generated from management of overburden material (which generates approximately 66% of dust) is not expected to result in a significant impact to flora within the biodiversity areas. The dust generated from the management of overburden within the mine pits and on the overburden landform is, on average, likely to be deposited in a north-east, east and south-east direction during high risk dust events (dry months) away from the biodiversity areas. Accordingly, the biodiversity areas are generally expected to be subject to lesser dust impacts from the dominant dust generation sources. The exception to this is the biodiversity area surrounding the J1 East Pit, which may be subject to dust deposition generated from the overburden landform for winds moving in a south-east direction.

Despite the above, it is reasonable to conclude that flora within the biodiversity areas will be subject to some dust deposition, particularly dust generated from the haulage of ore (8%) and wind erosion of ore stockpiles (8%) that will occur immediately to the south and west of the biodiversity areas, and from the variable afternoon winds that occur during lower-risk dust periods that may transport dust from the mine pits and overburden landform.

Based on the selected mine layout, the known meteorological conditions and the dominant dust generation sources identified above, the flora at greatest risk of dust impacts is located to the north-east, east and south-east of the overburden landform. The impacts to the flora values of these areas are unlikely to be regionally significant as the DEC-classified ‘priority’ flora species within these impact areas also occur in non-impact areas across the Mt Jackson Range (refer Figure 3-1).

Management actions to minimise dust generation

Although dust cannot be eliminated from mine operations, there are various practical management actions that can be implemented to reduce dust generation and subsequent dust impacts. Dust at Cliffs’ existing mine operations on the Mt Jackson Range, Windarling Range and the Koolyanobbing Range is managed in accordance with a Dust Management Plan (Cliffs 2003e). The Dust Management

Plan was assessed and approved by DEC in 2003 for the Mt Jackson Range and the Windarling Range mine operations under Statement 627 (WA Minister for Environment 2003) and is supported by Environmental Operating Procedure EOP05 Dust Management (Cliffs 2008k; Appendix 19). The Dust Management Plan and Environmental Operating Procedure EOP05 Dust Management contain a range of management actions for dust control, including:

- Staff training on dust management procedures and practices;
- Dust control measures including:
    - minimising vegetation clearing that could create dust-prone areas;
    - dampening of dust-prone areas (such as roads and stockpiles) with groundwater;
    - water sprays fitted to machinery;
    - restriction of vehicle speeds;
    - blasting techniques that produce minimal dust; and
    - progressive rehabilitation of disturbed areas;
- Visual monitoring of dust generated from pits and stockpiles; and
- Internal reporting of dust incidents, with external annual reporting to DEC and DMP (with subsequent review and audit by DEC and DMP).

The above dust management actions are consistent with the management actions used at mines throughout Western Australia. Cliffs has amended the Dust Management Plan to include the Mt Jackson J1 Deposit proposal (Cliffs 2009f; Appendix 8).

3.5.5 Management Actions

As identified above, Cliffs has amended the Dust Management Plan to include the Mt Jackson J1 Deposit proposal (Cliffs 2009f; Appendix 8). In order to ensure consistency of mine operations, Cliffs proposes to implement the amended Dust Management Plan and Environmental Operating Procedure EOP05 Dust Management (Cliffs 2008k; Appendix 19) to ensure that dust is appropriately managed for the Mt Jackson J1 Deposit proposal. The Dust Management Plan and Environmental Operating Procedure EOP05 Dust Management contain a range of management actions for dust control, including:

- Staff training on dust management procedures and practices;
- Dust control measures including:
    - minimising vegetation clearing that could create dust-prone areas;
    - dampening of dust-prone areas (such as roads and stockpiles) with groundwater;
    - water sprays fitted to machinery;
    - restriction of vehicle speeds;
    - blasting techniques that produce minimal dust; and
    - progressive rehabilitation of disturbed areas;
- Visual monitoring of dust generated from pits and stockpiles; and
- Internal reporting of dust incidents, with external annual reporting to DEC and DMP (with subsequent review and audit by DEC and DMP).

Implementation of the management actions contained in the Dust Management Plan and Environmental Operating Procedure EOP05 Dust Management will assist to minimise adverse dust impacts from mine operations on flora.

3.5.6 Commitments

Cliffs makes the following commitments for management of dust from the Mt Jackson J1 Deposit proposal:

1 Dust Management

1-1 Cliffs will implement the following plan and procedure for management of dust during mine operations, decommissioning and rehabilitation:

a. Dust Management Plan (Cliffs 2009f; Appendix 8); and

b. Environmental Operating Procedure EOP05 – Dust Management (Cliffs 2008k; Appendix 19).

A consolidation of Cliffs' commitments for the Mt Jackson J1 Deposit proposal is contained in Chapter 7.

3.5.7 Conclusion

As identified by the above assessment, implementation of the Mt Jackson J1 Deposit proposal will have a manageable and non-significant dust impact on native vegetation. Dust can be adequately managed through the management actions contained in the Dust Management Plan and Environmental Operating Procedure EOP05 Dust Management. Accordingly, EPA's objective for this factor can be met.

3.6 Decommissioning and Rehabilitation

3.6.1 Potential Issue

The Mt Jackson J1 Deposit proposal areas will require decommissioning and rehabilitation following the completion of mining. The manner in which a mining operation is decommissioned and rehabilitated has the potential to affect the long-term post-mining environmental values and land use. This section assesses decommissioning and rehabilitation for the Mt Jackson J1 Deposit proposal.

3.6.2 EPA Objective

The EPA's objective for decommissioning is:

- To ensure, as far as practicable, that rehabilitation achieves a stable and functioning landform which is consistent with the surrounding landscape and other environmental values (EPA 2004a).

The EPA's objective for land is:

- To maintain the integrity, ecological functions and environmental values of the soil and landform (EPA 2004a).

The EPA's objective for fauna is:

- To maintain the abundance, diversity, geographic distribution and productivity of fauna at species and ecosystem levels through the avoidance or management of adverse impacts and improvement of knowledge (EPA 2004a).

The EPA's objective for flora is:

- To maintain the abundance, diversity, geographic distribution and productivity of flora at species and ecosystem levels through the avoidance or management of adverse impacts and improvement of knowledge (EPA 2004a).

3.6.3 Legislation, Guidelines, Standards and Approvals

- *Mining Act 1978* (WA);
- *Environmental Protection Act 1986* (WA);
- *Mines Safety and Inspection Regulations 1995* (WA);
- EPA Guidance Statement 6: Guidance for the Assessment of Environmental Factors – Rehabilitation of Terrestrial Ecosystems (EPA 2006c);
- Hydrogeological Record Series Report No. 9: Mine Void Water Resource Issues in Western Australia (DoW 2003);
- Mine Closure and Completion: Leading Practice Sustainable Development Program for the Mining Industry (Department of Industry, Tourism and Resources 2006);
- Safety Bund Walls Around Open Pit Mines – Guideline (DMP 1997);
- Strategic Framework for Mine Closure (ANZMEC & AMI 2000);
- Koolyanobbing Expansion Project Preliminary Closure Plan (Cliffs 2003f); and

- Koolyanobbing Iron Ore Project Mt Jackson J1 Deposit Rehabilitation and Decommissioning Plan (Cliffs 2009g; Appendix 5).

3.6.4 Environmental Impact Assessment

Legislative Framework for Decommissioning and Rehabilitation of Mines

Mining in Western Australia is predominantly regulated under the *Mining Act 1978* (WA) administered by DMP. As part of a Mining Proposal under the *Mining Act 1978* (WA), a mining Proponent is required to outline the decommissioning and rehabilitation framework proposed. Bonds to cover the cost of decommissioning and rehabilitation are also administered under the *Mining Act 1978* (WA). Decommissioning is also regulated by DMP under the *Mines Safety and Inspection Regulations 1995* (WA), which includes a requirement for *precautions taken to prevent inadvertent access to open pit workings* following mine abandonment (refer Regulation 3.16).

Mine decommissioning and rehabilitation may also be regulated by DEC under the *Environmental Protection Act 1986* (WA) if the impacts of the mine are likely to be environmentally significant. In such cases, DEC (on behalf of the WA Minister for the Environment) must be satisfied with the manner in which a mine is decommissioned and rehabilitated.

Cliffs' Objective for Decommissioning and Rehabilitation

The Mt Jackson J1 Deposit proposal area is currently used for pastoral activities (grazing) under the Mt Jackson Pastoral Lease, covering an area of 160,180ha (Government of Western Australia 1967). The rate of grazing has not been intensive, as demonstrated by the retention of native vegetation within the proposal area.

The general objective for decommissioning and rehabilitation for any mining proposal is to return the land to a condition suitable and safe for its post-mining land use. For the Mt Jackson J1 Deposit proposal, Cliffs' objective is to decommission and rehabilitate the mine area with native vegetation to a condition suitable for continued pastoral use under the Mt Jackson Pastoral Lease[1].

Proposed Decommissioning and Rehabilitation Management

There are a number of factors to be considered in the decommissioning and rehabilitation of a mine. These factors are:

- Retention and/or removal of mine infrastructure;
- Investigation and remediation of contamination;
- Human safety;
- Fauna safety;
- Rehabilitation works and rehabilitation outcomes;
- Water quality;
- Long-term management; and
- Consideration of alternatives.

Each of these factors is assessed below for the Mt Jackson J1 Deposit proposal:

[1] The post-mining land use for the Mt Jackson J1 Deposit proposal area is pastoralism. In contrast, the future land use for Cliffs' existing Mt Jackson Range and Windarling Range mines is related to the EPA/DEC proposed conservation reserves.

Retention and Removal of Infrastructure

Mine infrastructure will need to be removed to enable rehabilitation works and the post-mining pastoral land use to occur. Cliffs will remove above-ground infrastructure from the mine area including buildings, machinery, roads, hazardous materials and equipment. This infrastructure will be re-used, recycled or disposed of (as appropriate).

Buried mine infrastructure, and mine infrastructure that has a foreseeable future use, will remain in situ. The haul road and an internal mine access road will be retained to enable long-term access for rehabilitation works, monitoring, maintenance and pastoral access. The haul road and the internal mine access road will be left in a safe condition for ongoing use by the Pastoral Leaseholder following the completion of decommissioning and rehabilitation works.

The removal of mine infrastructure and making safe of any retained infrastructure is consistent with the intent of the *Mines Safety and Inspection Regulations 1995* (WA) (refer Regulation 3.15).

Investigation and Remediation of Contamination

Mines often contain localised areas of contamination at the completion of mining. Contamination can occur though a variety of sources, such as from chemical or hydrocarbon spillages or leaks. Potentially contaminated areas will be investigated and remediated as part of mine decommissioning in order to ensure that the area is left in a suitable condition for the future land use.

Cliffs will investigate potentially contaminated areas within the Mt Jackson J1 Deposit mine area following the completion of mining. These areas will include:

- hydrocarbon (fuels and oils) storage areas;
- chemical and explosives storage areas;
- power generation facilities;
- equipment wash-down bays; and
- drainage sumps.

As the areas occupied by the above facilities form a small component of the mine operations, the volume of any contamination from these areas is expected to be small and manageable. Based on practices used at Cliffs' existing mine operations, remediation of contaminated areas will be undertaken by the excavation of contaminated material and deposition of that material into the overburden landform. The material deposited into the overburden landform will be subsequently capped with inert material to isolate and contain the contamination. The area of the excavation will be backfilled with uncontaminated material (such as inert overburden).

The above remediation practice is considered the most appropriate and feasible method for dealing with potentially contaminated areas and is consistent with practices employed at other mines in Western Australia. Accordingly, Cliffs proposes to use this remediation practice during decommissioning of the Mt Jackson J1 Deposit mine area.

Human Safety

The *Mines Safety and Inspection Regulations 1995* (WA) require that open mine pits be left in a condition that considers geotechnical aspects and *precautions taken to prevent inadvertent access to open pit workings* following mine abandonment. The operational method preferred by DMP to meet these requirements is to install an abandonment bund around the perimeter of open mine pits (DMP 1997).

In consideration of the mine pit design and the unweathered geological rock structure of the Mt Jackson J1 Deposit region (and in accordance with DMP (1997)), Cliffs will install a continuous abandonment bund around the mine pits at the completion of mining. The abandonment bund will be at least 2m in height with a 5m base width and located at a distance of 80m from the edge of the J1 West Pit and 60m from the edge of the J1 East Pit[1] to accommodate for potential future mine pit wall collapse (as calculated in accordance with DMP (1997)).

Fauna Safety

For previous proposals that involve mining below the groundwater table, EPA and DEC have expressed a concern that a feral fauna population could be sustained by permanent surface water within an open mine pit, with the feral fauna subsequently impacting the environmental values of the surrounding area through grazing on the native vegetation and/or predating on native fauna. In assessing recent resource development projects in Western Australia (e.g. EPA 2008d; EPA 2008e; EPA 2008f; EPA 2009e), EPA has recommended conditions that the proponent ensure that the surface water within abandoned mine pits "*does not cause significant environmental impacts … through attracting native fauna which may subsequently be harmed or fauna which may harm surrounding native vegetation"*; an approach subsequently endorsed by the WA Minister for the Environment (e.g. WA Minister for the Environment 2008c; WA Minister for the Environment 2008d). In 2003, DoW estimated that there were more than 150 mine pits operating below the groundwater in Western Australia (DoW 2003).

Based on the information above, the management of fauna interactions with the surface water of a mine pit is not unique to the J1 West Pit. Further, although a level of risk is recognised, such proposals have been approved due to the environmental risk and impacts being manageable.

There are currently numerous water sources in the Mt Jackson J1 Deposit proposal region, including the Mt Jackson Homestead (2km north-west), Marda Dam (12km east), Yacke Yackine Dam (17km south-west) and Pigeon Rocks (35km north), as well as a number of 'turkeys nest' dams at Cliffs' mine operations at the Windarling Range (25km north-east) and the Mt Jackson J2 and J3 Deposit mines (10km south-east). Despite the presence of these existing water sources, a significant sustained feral fauna population has not established in the Mt Jackson region. Accordingly, Cliffs considers the risk of the J1 West Pit sustaining a feral fauna population is low.

Although Cliffs considers the risk of sustaining a significant feral fauna population is low, Cliffs will apply a precautionary approach that meets the intentions of EPA and the WA Minister for the Environment through:

- installation of fauna exclusion fencing around the J1 West Pit; and
- implementation of a feral animal eradication and monitoring program.

Cliffs will apply the above management actions in an adaptive management approach; in that these management actions will be consecutively implemented if a significant feral fauna population is identified as being sustained by surface water within the J1 West Pit which could pose a threat to native flora or fauna.

[1] The biodiversity areas will not be impacted by abandonment bunding or mine pit wall collapse. The abandonment bunding will be located 80m from the J1 West Pit crest, with the biodiversity areas located at 90m from the J1 West Pit crest. The abandonment bunding will be located 60m from the J1 East Pit crest, with the biodiversity areas at located 70m from the J1 East Pit crest.

If it identified that a significant feral fauna population is sustained by surface water within the J1 West Pit that could pose a threat to native flora or fauna, Cliffs will install a continuous fauna exclusion fence around the perimeter of the J1 West Pit. The fence will be constructed of galvanised chain-wire mesh and have a minimum height of 1800mm; which Cliffs expects will be sufficient for the exclusion of dingo-/feral dog *Canis lupus*, goat *Capra hircus* and European red fox *Vulpes vulpes* from access to the surface water within the J1 West Pit. In order for the fauna exclusion fence to be annually maintained and periodically replaced (approximately every 25 years) in perpetuity[1], Cliffs will also establish a fund to ensure the annual monitoring, annual maintenance and periodic replacement of the exclusion fence can be undertaken in perpetuity. The inclusion of a financial provision for long-term decommissioning costs is consistent with the recommendations of the Commonwealth Department of Industry, Tourism and Resources (2006) and the Australian and New Zealand Minerals and Energy Council and the Australian Minerals Industry (2000).

If the fauna exclusion fence does not prevent a significant feral fauna population from be sustained by surface water within the J1 West Pit, Cliffs will subsequently undertake a feral animal eradication and monitoring program to reduce the feral fauna populations. The eradication program will include measures such as baiting, trapping and/or culling, with the success of the eradication program to be determined by monitoring the reduction in feral fauna populations. The feral animal eradication and monitoring program will be repeated in the event that feral fauna populations recover.

Cliffs' proposed adaptive management approaches for installing a fauna exclusion fence and implementation of a feral fauna eradication and monitoring program are considered practicable actions for addressing the low risk.

Rehabilitation Works and Rehabilitation Outcomes

Following the civil earthworks required for the removal of mine infrastructure, remediation of contaminated areas and the installation of safety bunding, the mine areas will be rehabilitated for the restoration of pastoral and environmental values.

Consistent with Cliffs' current rehabilitation works, rehabilitation for the Mt Jackson J1 Deposit proposal will include the following actions:

- deep ripping of hardstand areas for improved soil condition and drainage;
- respreading of stored topsoil and retained vegetation to provide seed and an appropriate microclimate for seed growth;
- spreading of seed collected during mine operations; and
- consideration of fertiliser application to provide nutrients for initial seed growth.

Cliffs will monitor the rehabilitation works annually to determine the success of the rehabilitation and any contingency actions that may be required. Such contingency actions may include re-seeding, planting of seedlings, irrigation and/or importing of alternate growth media.

[1] The fund value has been calculated in consideration of the current estimated costs for fencing installation and maintenance, with these values compounding, subject to conservative inflation rates (costs) and subject to interest rates (credits) to ensure the fund is self-sustaining in perpetuity. The fund value calculations are contained in Cliffs 2009f (Appendix 15).

The success of the rehabilitation works will be compared to performance indicators using 20m x 20m[1] representative quadrats, with the performance indicators to be achieved over 2 consecutive years[2]. Cliffs will apply the following performance indicators:

- ≥ 20% projected foliar cover (average, excluding weeds and native annual species[3]);
- ≥ 20 flora species per quadrat (pre-mining native species, excluding weeds); and
- ≤ 5% weed cover.

The above performance indicators have been developed specifically for the Mt Jackson J1 Deposit proposal based on the characteristics of the existing natural environment, the outcomes of previous rehabilitation works and advice from Cliffs' botanical consultants, Western Botanical. The development of site-specific performance indicators is considered more appropriate than a 'one size fits all' approach, and is consistent with the approach of ANZMEC & AMI (2000) and DITR (2006) which recommend that performance indicators should be specific to the mine being closed to reflect the unique environmental circumstances of the site, and are achievable. Examples of rehabilitations works at Cliffs existing Mt Jackson J2 and J3 Deposit mines are depicted in Figure 3-35 and Figure 3-36.

The weed performance indicator of ≤ 5% weed cover differs from the standard ≤ 10% weed cover recommended by EPA in recent resource development projects in Western Australia (e.g. EPA 2008d; EPA 2008e; EPA 2009e; EPA 2009f). Cliffs has proposed the lower weed cover performance indicator has been proposed due to the naturally low weed occurrence on the Mt Jackson Range and throughout the region due to low rainfall.

The projected foliar cover performance indicator of ≥ 20% differs from the ≥ 70% cover recommended by EPA in recent resource development projects (EPA 2008d; EPA 2008e; EPA 2009e). Similarly, the species diversity performance indicator of ≥ 20 flora species per quadrat differs from the ≥ 70% total species diversity recommended by EPA for recent resource development projects (EPA 2008g; EPA 2009f; EPA 2009g). The recent recommendations of EPA have related to either vegetation cover or species diversity, but not both. Cliffs has proposed performance indicators for both projected foliar cover and species diversity, to be applied together, due to each achieving separate outcomes; foliar cover relating to an outcome of land stability, and species diversity relating to outcomes for biodiversity and ecosystem structure.

With regards to projected foliar cover, Cliffs has proposed a ≥ 20% performance indicator. The ≥ 20% projected foliar cover performance indicator is based on the natural vegetation cover of the region generally being between approximately 20% to 40% cover (pers. com. G Cockerton of Western Botanical to S Hawkins of Globe Environments, March 2009) and demonstrated as achievable for mine rehabilitation at Cliffs Mt Jackson J2 and J3 Deposit mines (refer Figure 3-35 and Figure 3-36). Cliffs considers that a ≥ 20% vegetation cover performance indicator is an achievable target that is representative of the surrounding environment.

[1] 20m x 20m is the currently accepted quadrat size used in the Yilgarn region.

[2] 2 consecutive years has been included to ensure that the rehabilitation works meet the performance indicators for more than 1 year of monitoring.

[3] Annual native flora species are excluded from the vegetation cover calculations due to the cover provided by annual species being seasonal, not permanent.

Figure 3-35 Rehabilitation at the Mt Jackson J2 Deposit mine (Quadrat J2Q2), October 2008. The rehabilitation works identified has a species diversity of 30 species per quadrat and a projected foliar cover of 26%. All rehabilitated areas averaged 24 species per quadrat and averaged 29% projected foliar cover. Source: Western Botanical (2009).

Figure 3-36 Rehabilitation works at the Mt Jackson J3 Deposit mine (Quadrat J3Q1), October 2008. The rehabilitation works identified has a species diversity of 43 species per quadrat and a projected foliar cover of 25%. All rehabilitated areas averaged 47 species per quadrat and averaged 19% projected foliar cover. Source: Western Botanical (2009).

With regards to species diversity, Cliffs' has proposed a ≥ 20 flora species per quadrat performance indicator. Cliffs' ≥ 20 flora species per quadrat performance indicator is based on:

- the vegetation communities to be impacted naturally range between 12 to 36 species (Western Botanical 2009);
- ≥ 20 flora species per quadrat has been demonstrated as an achievable outcome for mine rehabilitation as evidenced by successful rehabilitation works at Cliffs' existing Mt Jackson J2 and J3 Deposit mine operations (Western Botanical 2009); and
- the number of species per quadrat is a readily measurable outcome, and can be used as a simple management tool to identify particular areas that may require additional rehabilitation works.

The total species diversity following rehabilitation will be the sum of all species within all quadrats.

Although Cliffs' proposed performance indicators differ from the performance indicators recommended by EPA in recent resource development projects, Cliffs' proposed performance indicators are expected to meet EPA's decommissioning objective of achieving a stable and functioning landform that is consistent with the surrounding landscape and other environmental values. Cliffs' proposed performance indicators have been based on the characteristics of the existing natural environment, the outcomes of previous rehabilitation works, advice from Cliffs' botanical consultants, are consistent with the approach recommended in ANZMEC & AMI (2000) and DITR (2006), and are achievable. This approach is also consistent with EPA Guidance Statement No. 6 (EPA 2006c) with regards to setting performance indicators which are attainable within realistic timeframes.

Cliffs' ≥ 20 flora species per quadrat performance indicator and the EPA-recommended ≥ 70% species diversity performance indicator are not entirely dissimilar, depending on the approach by which the EPA-recommended 70% species diversity performance indicator is applied. If the range in the number of flora species per quadrat (12 to 36 species as identified in Western Botanical 2009) is averaged (24 flora species), Cliffs' ≥ 20 flora species per quadrat performance indicator would equate to ≥ 83% flora species diversity; thereby exceeding the EPA-recommended ≥ 70% species diversity performance indicator (≥ 17 flora species per quadrat would equate to ≥ 70%). Alternatively, however, if the EPA-recommended 70% species diversity performance indicator is applied at a project level for which 234 flora species were identified on the Mt Jackson Range, a ≥ 70% species diversity performance indicator would require a total of 164 flora species within all rehabilitation works; which using the 54 flora species currently recorded across rehabilitation at Cliffs' Mt Jackson J2 and J3 Deposit mine operations (Western Botanical 2009) as a comparison lends to a conclusion that this is unlikely to be achievable for the Mt Jackson J1 Deposit proposal. Based on the above, Cliffs has proposed a set ≥ 20 flora species per quadrat performance indicator as it is founded on successful mine rehabilitation outcomes on the Mt Jackson Range, is likely to be achievable, is easily measurable, and is without a potential for misinterpretation.

Further to the above, EPA has also recommended a rehabilitation performance indicator of ≥ 65% species diversity for DEC-classified 'priority' flora species in assessment of recent resource development projects (e.g. EPA 2007g; EPA 2009g). Although DEC-classified 'priority' flora species have been recorded in Cliffs' rehabilitation works at the Mt Jackson J2 and J3 Deposit mines (*Jacksonia jackson* (P1), *Beyeria rostellata* (P1), *Austrostipa blackii* (P3) and *Stenanthemum newbeyi* (P3)), a specific performance indicator for DEC-classified priority flora species is not proposed by Cliffs as to the ability of any particular flora species to be rehabilitated is unpredictable; being dependent

on a number of variables including soil chemistry, soil structure, reproductive biology of the species, and climate. In addition, as the DEC-classified priority flora species list is subject to ongoing review and change[1], it is not considered appropriate to specify performance criteria based on the current list, which is subject to ongoing review and change, or alternatively, a future listing of which the species composition is unknown.

Cliffs does not propose performance indicators for vegetation structure or fauna. Inclusion of performance indicators for vegetation structure or fauna are not generally applied to resource development proposals in Western Australia (refer EPA 2008d; EPA 2008e; EPA 2009e; EPA 2009f) due to a reasonable expectation that a vegetation structure will be achieved through the setting and achievement of performance indicators for foliar cover and species diversity (as proposed above) which will include a range of flora species with different structural characteristics, and that fauna will recolonise rehabilitated areas over time and fauna recolonisation will be successional.

It is relevant to note that different qualities of rehabilitation can be expected depending on the landform type. For example, based on short-term (<5 years) rehabilitation results at Cliffs' existing mine operations, areas of flat land demonstrate an improved rehabilitation quality compared to areas of sloping land (such as on an overburden landform). It is understood that the differences in rehabilitation success can be largely attributed to the substrate material (e.g. overburden from within a mine pit) and surface water drainage. There is a subsequent long-term expectation that differences in the rehabilitation qualities of these different rehabilitated areas will reduce over time as the vegetation becomes established and species from adjacent non-impact areas gradually recolonise parts of the rehabilitation areas over time.

Water Quality

As identified in Section 3.4, the groundwater will recover following the cessation of dewatering and with the J1 West Pit forming a permanent surface water feature. The J1 West Pit will act as a groundwater sink, with groundwater moving into the J1 West Pit from the surrounding aquifer (Rockwater 2007b).

The salinity of the surface water within the J1 West Pit is expected to increase gradually over time (many decades) due to a combination of evaporation of fresh water from within the J1 West Pit and the infiltration of saline groundwater from the surrounding aquifer. No other significant changes to water quality are expected. As the J1 West Pit will act as a groundwater sink (not a source) no impacts to the regional groundwater quality are expected.

The change in salinity of the surface water within the J1 West Pit could be regarded, in isolation, as a significant change to the water quality. The only expected environmental impact of the change is positive, in that the surface water will become less potable for fauna consumption with time (which will be in addition to fauna exclusion actions identified above). As the impacts of the change are positive and there are no practicable management actions that can be implemented to counter the salinity change, Cliffs does not propose any long-term monitoring or management of the surface water of the J1 West Pit as part of the mine decommissioning strategy.

[1] The DEC-classified 'priority' flora species list is subject to frequent review and change. During 2007, 2008 and 2009, species recorded within the Mt Jackson J1 Deposit proposal area that were removed from the DEC list included *Eremophila* sp. Mt Jackson (formerly P1), *Acacia* sp. Mt Jackson (formerly P3), *Acacia cockertoniana* (formerly P3) and *Acacia acanthoclada* ssp. *glaucescens* (formerly P3), and species added to the list included *Bossiaea* sp. Jackson Range (P1) and *Dryandra arborea* (P4).

Long-term Management

The Mt Jackson J1 Deposit is located wholly within the Mt Jackson Pastoral Lease (Government of Western Australia 1967). As the current Pastoral Leaseholder, Cliffs is responsible for the long-term management of the land.

Following the completion of decommissioning and rehabilitation, Cliffs will retain responsibility for the land until such time as Cliffs relinquishes or transfers the Mt Jackson Pastoral Lease. At such time, if this occurs, the new Pastoral Lessee will assume responsibilities for the long-term land management as well as control of the fund for the fauna exclusion fence (if an exclusion fence is installed). The transfer of the fund will ensure that future leaseholders are funded in perpetuity to undertake the necessary monitoring, management and replacement of the fauna exclusion fence.

Contingency Actions

In the event that the decommissioning and rehabilitation performance indicators have not been achieved, appropriate contingency actions or strategies will need to be implemented to achieve the performance indicators. Such actions may include:

- review and further remediation of potentially contaminated areas;
- re-seeding;
- planting of seedlings;
- irrigation or rehabilitation areas; and/or
- importing alternative growth media.

Cliffs will implement the above contingency actions in the event that it is identified that the decommissioning and rehabilitation performance indicators are not being achieved.

Consideration of Alternatives – Backfilling of J1 West Pit

The J1 West Pit will contain permanent surface water following the completion of mining below the groundwater table. It is a previously expressed position of EPA and DEC that mine pits below the groundwater table should be backfilled, where practicable. Cliffs shares this view.

As identified in Section 1.6, backfilling of the exhausted J1 West Pit to prevent the formation of a permanent surface water feature would require backfilling of approximately 4,200,000m^3 of overburden material. This material would either need to be re-excavated from the overburden landform or be made available through the staging of mine development. As identified in Section 1.6, backfilling does not form part of the Mt Jackson J1 Deposit proposal due to impacts to resource efficiencies, operational efficiencies, potential resource development, and cost. Accordingly, backfilling of the J1 West Pit is not practicable.

Despite the above, if it is identified during mine development that backfilling through mine staging does not compromise resource efficiency, operational efficiency or potential resource development, and can be undertaken in a cost-effective manner, Cliffs will consider backfilling the J1 West Pit in order to minimise/prevent the formation of permanent surface water feature within the J1 West Pit.

3.6.5 Management Actions

Based on the information from the above assessment, Cliffs has prepared a Decommissioning and Rehabilitation Plan for the Mt Jackson J1 Deposit proposal (Cliffs 2009g; Appendix 5). The Decommissioning and Rehabilitation Plan includes the decommissioning and rehabilitation actions identified above, including:

1. Removal of above-ground mine infrastructure for reuse, recycling or disposal (as appropriate). Buried infrastructure and infrastructure that has a foreseeable use for pastoral land management activities (such as the haul road) will be retained;
2. Ripping of compacted areas and respreading of retained topsoil and retained vegetation for natural vegetation rehabilitation;
3. Monitoring of rehabilitation works;
4. Contingency actions in the event that decommissioning and rehabilitation does not achieve the performance indicators;
5. Identification and remediation of contaminated areas;
6. Installation of bunds for mine safety and stormwater control;
7. Contingency actions in the event that the decommissioning and rehabilitation performance indicators have not been achieved, such as review and further remediation of potentially contaminated areas, re-seeding, planting of seedlings, irrigation and/or importing alternative growth media;
8. Contingency of a feral fauna exclusion fencing of the J1 West Pit to prevent fauna access to the surface water of the J1 West Pit, including a financial provision for the installation, monitoring and maintenance, and periodic replacement of the fauna exclusion fence in perpetuity;
9. Contingency of a feral fauna eradication and monitoring program in the event that feral fauna populations become established as a result of the surface water within the J1 West Pit despite the presence of the fauna exclusion fence;
10. Annual reporting to DEC and DMP on rehabilitation and decommissioning; and
11. Provision to transfer the land management to the Pastoral Leaseholder following completion of decommissioning and rehabilitation for long-term land management.

3.6.6 Commitments

Cliffs makes the following commitments for decommissioning and rehabilitation of the Mt Jackson J1 Deposit proposal:

1 Decommissioning and Rehabilitation Management

1-1 Cliffs will implement the following plan for the management of decommissioning and rehabilitation during mine operations, decommissioning and rehabilitation:

a. Mt Jackson J1 Deposit Decommissioning and Rehabilitation Plan (Cliffs 2009g; Appendix 5).

A consolidation of Cliffs' commitments for the Mt Jackson J1 Deposit proposal is contained in Chapter 7.

3.6.7 Conclusion

As identified by the above assessment, the Mt Jackson J1 Deposit proposal infrastructure will be decommissioned and rehabilitated with native flora species following the completion of mining in order to restore the pastoral and environmental values. The decommissioning and rehabilitation management actions proposed, as detailed in the Decommissioning and Rehabilitation Plan (Cliffs 2009g; Appendix 5), are considered appropriate and consistent with current mining practice. Accordingly, EPA's objective for this factor can be met.

4 Social Impact Assessment

The intention of this section is to assess the main social issues associated with the Mt Jackson J1 Deposit proposal. Assessment of social impacts is consistent with the intent of the Western Australian Government's State Sustainability Strategy (Government of Western Australia 2003), the intent of both EPA Position Statement #6 – *Towards Sustainability* (EPA 2004b) and EPA Position Statement #7 – *Principles of Environmental Protection* (EPA 2004c), and in recognition that the WA Minister for the Environment, other decision making authorities and the public can have regard to social impacts.

4.1 Aboriginal Heritage and Native Title

4.4.1 Potential Issue

The Yilgarn Area is the traditional home of several recognised groups of Aboriginal people. It is understood that these Aboriginal people have physical and spiritual connections to the land dating back thousands of years. This section provides an assessment of the potential impacts of the proposal on Aboriginal Heritage and Native Title.

4.1.2 EPA Objective

The EPA's objective for heritage is:

- To ensure that changes to the biophysical environment do not adversely affect historical and cultural associations and comply with relevant heritage legislation (EPA 2004a).

The EPA does not have a stated objective for Native Title.

4.1.3 Legislation, Guidelines, Standards and Approvals

- *Aboriginal Heritage Act 1972* (WA);
- *Aboriginal and Torres Strait Islander Heritage Protection Act 1984* (C'th);
- *Native Title Act 1993* (C'th);
- *Environmental Protection Act 1986* (WA); and
- EPA Guidance Statement No. 41: Guidance for the Assessment of Environmental Factors - Assessment of Aboriginal Heritage (EPA 2004f).

4.1.4 Social Impact Assessment

Legislative Framework for Aboriginal Heritage

Matters of Aboriginal Heritage in Western Australia are managed by the Department of Indigenous Affairs (DIA) in accordance with the *Aboriginal Heritage Act 1972* (WA). The *Aboriginal Heritage Act 1972* (WA) provides a framework for the identification and protection of places and objects that have significance to persons of Aboriginal descent. The DIA retains a public register of Aboriginal Heritage sites.

The *Aboriginal Heritage Act 1972* (WA) prohibits interference with Aboriginal Heritage sites. The WA Minister for Indigenous Affairs may grant consent to a person to use land containing an Aboriginal Heritage site under Section 18 of the *Aboriginal Heritage Act 1972* (WA); which may include an authorisation to impact sites. Cliffs has obtained s18 consent from the WA Minister for Indigenous Affairs in 2003 for the mining of tenements covering the Mt Jackson J1 Deposit (WA Minister for Indigenous Affairs 2003).

Cliffs has confidential Heritage Protection Agreements with the Central West Goldfields People, Kalamaia Kabu(d)n People and the Ballardong People. The Heritage Protection Agreements define the agreed processes for Aboriginal heritage surveys.

Assessment of impacts on Aboriginal Heritage

The DIA register of Aboriginal Heritage sites identifies 44 sites on the permanent register within the Shire of Yilgarn. A further 61 recordings within the Shire of Yilgarn on the DIA register have either been lodged with DIA for assessment (33 records) or have been assessed by DIA and have insufficient information (28 records) (DIA 2009).

Archaeological and ethnographic Aboriginal Heritage surveys undertaken for the Mt Jackson J1 Deposit proposal (Artefaxion 2007; R & E O'Connor 2007) identified two potential heritage sites, being:

- Site ID 25820 *Curragibbin Hill West* (an artefact scatter); and
- Site ID 25821 *Curragibbin Hill Rockshelter*.

The *Curragibbin Hill West* artefact scatter and the *Curragibbin Hill Rockshelter* have been assessed by DIA and subsequently placed on the permanent register of Aboriginal Heritage sites under the *Aboriginal Heritage Act 1972* (WA) (DIA 2009).

Of the sites on DIA's permanent register, seven additional sites occur in the vicinity of the Mt Jackson J1 Deposit proposal, being:

- Site ID 5602 *Mt Jackson*;
- Site ID 20089 *J2rs Mt Jackson Rockshelters*;
- Site ID 20320 *Ky01*;
- Site ID 26856 *Rockhole – Mt Jackson haul road*;
- Site ID 26857 *Quarry – Mt Jackson haul road*;
- Site ID 26889 *J2 West Quarry 1*; and
- Site ID 26890 *J2 West Quarry 2*.

The information from the DIA register and the archaeological and ethnographic surveys undertaken has been used in mine planning. Mine planning has aimed to avoid and/or minimise the potential impacts on sites of Aboriginal Heritage, where possible, by locating infrastructure away from the known locations of registered and potential heritage sites. A list and description of the sites listed by DIA as occurring in the vicinity of the Mt Jackson J1 Deposit proposal is contained in Table 4-1. The locations of the sites listed by DIA as occurring in the vicinity of the Mt Jackson J1 Deposit proposal are identified in Figure 4-1.

DIA Site ID and Site Name	Is the area on the DIA permanent register of Aboriginal Heritage sites?	Is the area likely to be impacted by the proposal?
J2rs – Mt Jackson Rockshelters (Site ID 20089)	Yes.	No. This site is located approximately 2km from the proposal infrastructure.
Mt Jackson (Site ID 5602)	Yes.	No. This site is located approximately 2.2km from the proposal infrastructure.
Rockhole – Mt Jackson haul road (Site ID 26856)	Yes.	No. This site is located approximately 0.3km from the proposal infrastructure.
Quarry – Mt Jackson haul road (Site ID 26857)	Yes.	No. This site is located approximately 0.1km from the proposal infrastructure.
J2 West Quarry 1 (Site ID 26889)	Yes.	No. This site is located approximately 0.9km from the proposal infrastructure.
J2 West Quarry 1 (Site ID 26890)	Yes.	No. This site is located approximately 0.7km from the proposal infrastructure.
Ky01 (Site ID 20320)	Yes.	No. This site is located approximately 1.6km from the proposal infrastructure.
Ky27 J2 Boondine Hill (Site ID 20341)	No – DIA status is *lodged.*	No. This site is located approximately 0.8km from the proposal infrastructure.
Ky29 Jackson 3 (Site ID 20343)	No – DIA status is *lodged.*	No. This site is located approximately 1.5km from the proposal infrastructure.
Ky24 J2 Stone Arrangement (Site ID 20340)	No – DIA status is *insufficient information.*	No. This site is located approximately 0.9km from the proposal infrastructure.
Ky48 (Site ID 20362)	No – DIA status is *lodged.*	No. This site is located approximately 1.8km from the proposal infrastructure.
Ky47 (Site ID 20361)	No – DIA status is *lodged.*	No. This site is located approximately 2.7km from the proposal infrastructure.
Mt Jackson (Site ID 5599)	No – DIA status is *insufficient information.*	No. This site is located approximately 3.6km from the proposal infrastructure.
Ky04 (Site ID 20323)	No – DIA status is *insufficient information.*	No. This site is located approximately 4.4km from the proposal infrastructure.
Mt Jackson Ranges (Site ID 22944)	No – DIA status is *insufficient information*. The basis for this site is *mythological*.	Unable to be determined. DIA have mapped this site as occurring across the Mt Jackson Range. Specific information on the specific location or the specific purpose of this site is not publicly available from DIA.
Curragibbin Hill West (Site ID 25820)	Yes.	No. The Curragibbin Hill West artefact scatter has been protected within a biodiversity area.
Curragibbin Hill Rockshelter (Site ID 25821)	Yes.	Yes. The rockshelter is located in the area of the J1 West Pit and will be impacted by the proposal.

Table 4-1 Sites of Aboriginal Heritage listed by DIA in the vicinity of the Mt Jackson J1 Deposit proposal. The Mt Jackson J1 Deposit proposal will impact the registered Curragibbin Hill Rockshelter. The Mt Jackson J1 Deposit proposal will not impact the other eight Aboriginal Heritage sites on the DIA permanent register. Source: DIA (2009).

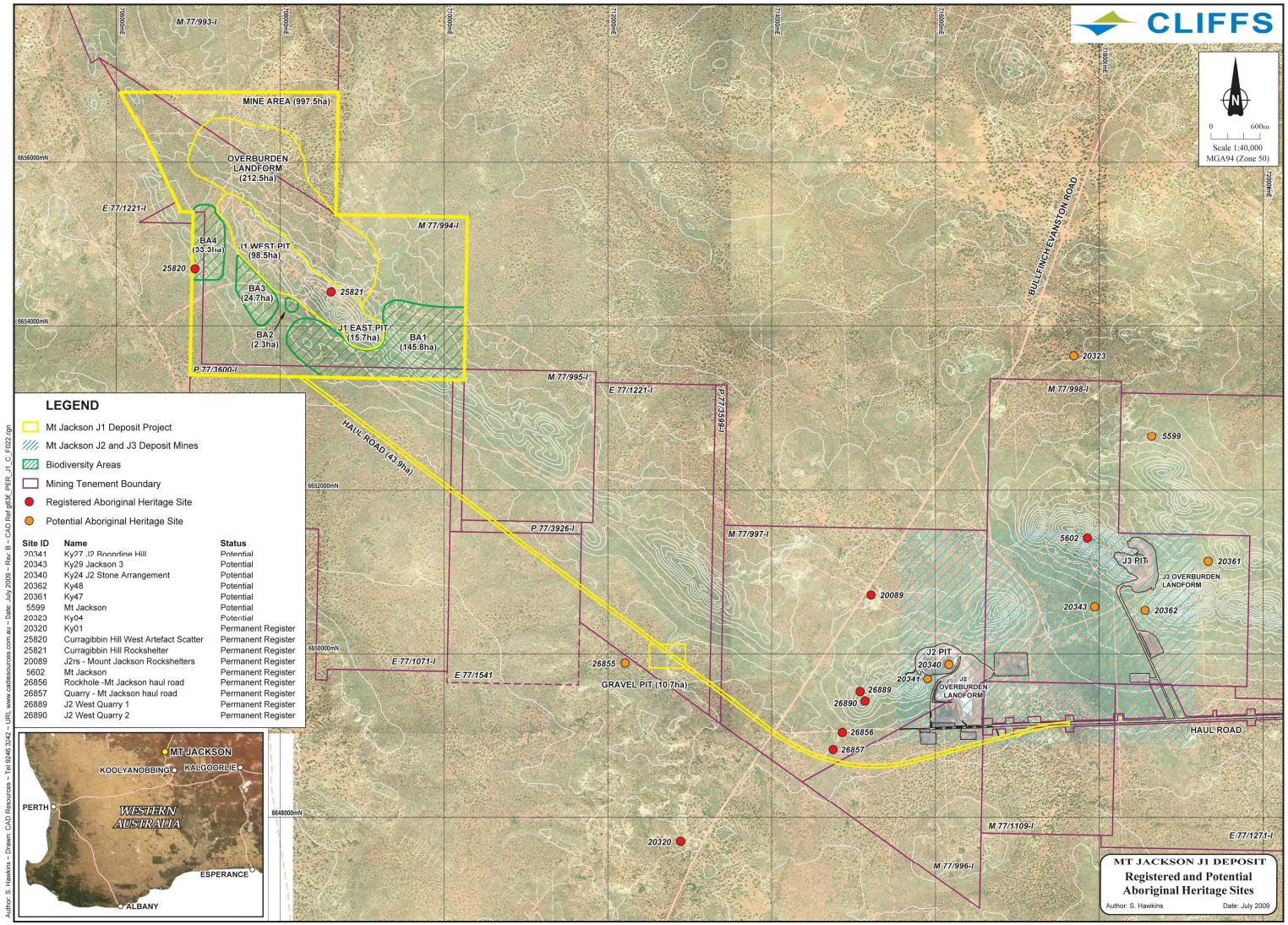

Figure 4-1 Registered and potential locations of Aboriginal Heritage in the vicinity of the Mt Jackson J1 Deposit proposal. The Mt Jackson J1 Deposit proposal will impact the registered Aboriginal heritage site *Curragibbin Hill Rockshelter*. Note: the lodged Site ID 22944 *Mt Jackson Ranges* is not mapped as it covers the whole of the Mt Jackson Range (including the Mt Jackson J1 Deposit proposal area). Source: DIA (2009).

Based on the information from Table 4-1 and Figure 4-1, the Mt Jackson J1 Deposit proposal may impact on:

- *Mt Jackson Ranges* (Site ID 22944); and
- *Curragibbin Hill Rockshelter* (Site ID 25821).

The impact of the Mt Jackson J1 Deposit proposal on each of these locations is assessed below:

Mt Jackson Ranges (Site ID 22944)

Mt Jackson Ranges (Site ID 22944) has been assessed by DIA as having "Insufficient Information" to place the area on the permanent register of Aboriginal Heritage sites under the *Aboriginal Heritage Act 1972* (WA). The DIA register identifies that the area referred to DIA for consideration covers approximately 84,000ha (approximately 80km long and 10.5km wide), including the entire Mt Jackson J1 Deposit proposal area. The basis for this area is *mythological*.

Specific information on the potential mythological values or the specific location (which may only form a part of the 84,000ha) is not publicly available from DIA. Accordingly, the potential for the proposal to impact on the potential heritage values of this area is unable to be assessed.

In the event that *Mt Jackson Ranges* becomes a registered site under the *Aboriginal Heritage Act* 1972 (WA), Cliffs' existing s18 consent (WA Minister for Indigenous Affairs 2003) will apply and a new consent will not be required for the mine areas (pers. com. P Thorley, DIA A/Assistant Director Heritage and Culture, to S Hawkins of Globe Environments, September 2008).

Curragibbin Hill Rockshelter (Site ID 25821)

The Curragibbin Hill Rockshelter is a naturally occurring rock overhang that was identified through surveys of the Mt Jackson J1 Deposit proposal area (Artefaxion 2007; R & E O'Connor 2007). The rockshelter is located in Mining Lease M77/994 at high elevation on the north-east side of the Mt Jackson Range. The rockshelter is a large rock overhang with an opening of approximately 15m width, approximately 3m height and extending for a depth of approximately 18m (Artefaxion 2009). A photograph of the Curragibbin Hill Rockshelter is shown in Figure 4-2. As identified by Figure 4-1, the Curragibbin Hill Rockshelter is located in the area of the proposed J1 West Pit.

The *Curragibbin Hill Rockshelter* was referred to DIA by Cliffs for consideration under the *Aboriginal Heritage Act 1972* (WA). The DIA has subsequently placed the Curragibbin Hill Rockshelter on the permanent register of Aboriginal Heritage sites under the *Aboriginal Heritage Act 1972* (WA).

The survey of the rockshelter identified that it contained three partly made boomerangs, four blades of jasperlite, two ironstone blades and one quartz adze (an axe-like tool) (R & E O'Connor 2007). As recorded by R & E O'Connor (2007), no recommendations were made for the protection of this rockshelter by the representatives of the Central West Goldfields People, Kalamaia Kabu(d)n People or the Ballardong People present at the survey.

Archaeological excavations were subsequently conducted by Artefaxion (2009) within the floor of the Curragibbin Hill Rockshelter (for the purpose of identifying the presence or absence of buried archaeological material) in consultation with the Central West Goldfields People, Kalamaia Kabu(d)n People, Ballardong People and with permission from DIA. The archaeological excavations identified two stone artefacts. Artefaxion (2009) concluded that the number of artefacts indicated that Aboriginal people probably used the Curragibbin Hill Rockshelter in a non-permanent (ephemeral or transitory) manner, and that the loss of the archaeological values from development of the Mt

Jackson J1 Deposit proposal have been sufficiently mitigated through the collection of archaeological materials and the recording of the site.

As the Curragibbin Hill Rockshelter occurs within the J1 West Pit, measures to avoid or minimise the impacts of the proposal on this rockshelter are not possible without a significant reduction in the resource to be mined. Accordingly, the Mt Jackson J1 Deposit proposal includes removal of this rockshelter. Cliffs has obtained consent from the WA Minister for Indigenous Affairs to undertake mining on the tenements covering the Mt Jackson J1 Deposit and the Curragibbin Hill Rockshelter (WA Minister for Indigenous Affairs 2003).

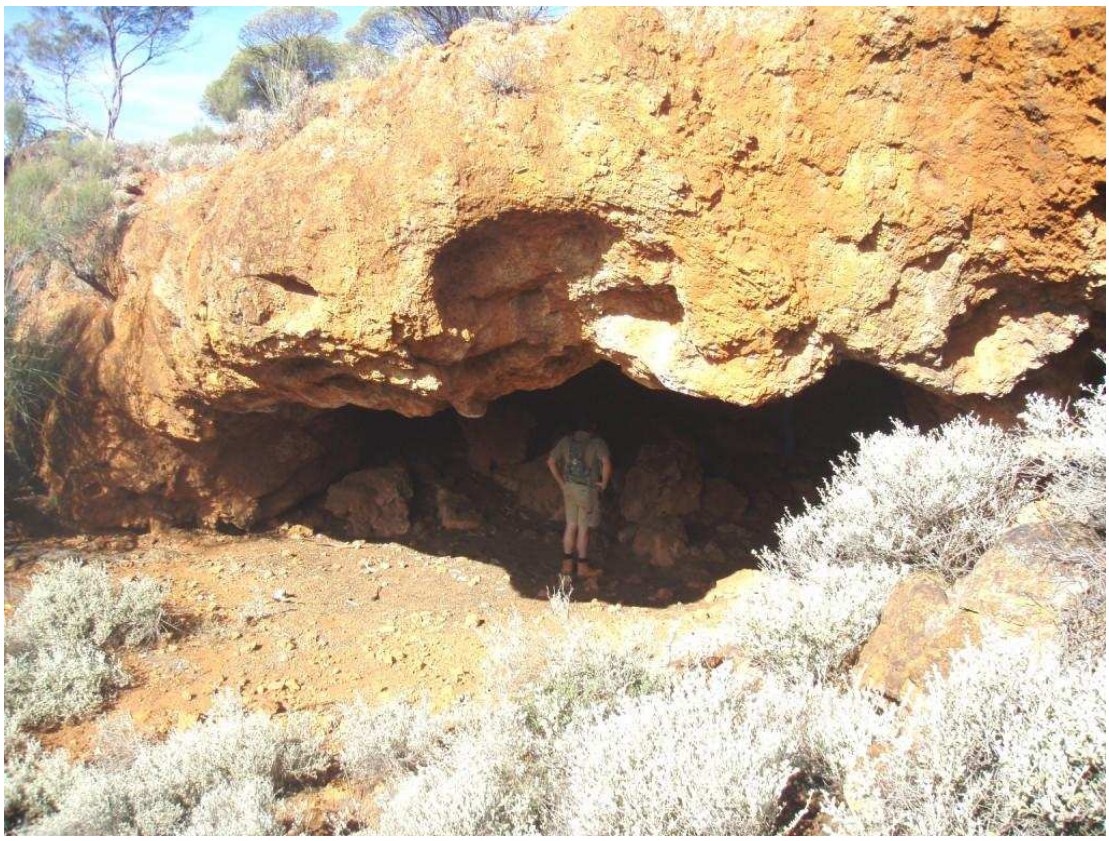

Figure 4-2 Photograph of the Curragibbin Hill Rockshelter (entrance) on the Mt Jackson J1 Deposit. Source: S Hawkins of Globe Environments, May 2008.

Legislative Framework for Native Title

Native Title is the recognition by Australian law that some Indigenous people have rights and interests to land that arise from their traditional laws and customs. The *Native Title Act 1993* (C'th) was passed following the decision of the High Court of Australia in *Mabo v Queensland (No.2) 1992* that the doctrine of *terra nullius* should not have been applied to Australia and that the common law of Australia should recognise Native Title (NNTT 2008c). Native Title may include rights and interests to live on an area, access and protect areas for traditional purposes, undertake activities (such as hunting and fishing) and/or the teaching of Aboriginal law and custom on an area. Native Title rights may be exclusive (occupy to the exclusion of all others) or non-exclusive (NNTT 2008c).

The Federal Court of Australia is responsible for the receipt, management and determination of Native Title applications in accordance with the *Native Title Act 1993* (C'th). The National Native Title Tribunal (NNTT) was established under the *Native Title Act 1993* (C'th) for the mediation and resolution of Native Title issues over land and waters under the direction of the Federal Court (NNTT 2008c).

Assessment of impacts on Native Title

The Mt Jackson J1 Deposit proposal area is subject to two separate Native Title claims; being:

- Central West Goldfields People; and
- Kalamaia Kabu(d)n People.

The two Native Title applications were lodged with the Federal Court of Australia between 1997 and 1999 (NNTT 2008a, NNTT 2008b). The location of the Native Title claim areas for the Central West Goldfields People and the Kalamaia Kabu(d)n People in relation to the Mt Jackson J1 Deposit proposal is depicted in Figure 4-3. As these applications have yet to be determined by the Federal Court of Australia (NNTT 2008a, NNTT 2008b), the Mt Jackson J1 Deposit proposal will not impact on any area of determined Native Title.

Despite Native Title not being determined, Cliffs maintains an ongoing dialogue with the Central West Goldfields People and the Kalamaia Kabu(d)n People. Where appropriate, consultation is also undertaken with their representative bodies, the South West Aboriginal Land and Sea Council and the Goldfields Land and Sea Council. Cliffs is committed to continuing this ongoing dialogue for implementation of the Mt Jackson J1 Deposit proposal.

The Native Title application of the Ballardong People formerly covered the Mt Jackson J1 Deposit proposal area, however, the application area was amended and no longer applies to the Mt Jackson J1 Deposit proposal area. The Gubrun Native Title application occurs within the region, however, is located outside of the Mt Jackson J1 Deposit proposal area. Despite the above, Cliffs maintains ongoing consultation with both the Ballardong People and Gubrun Native Title applicants.

Cliffs has confidential and unregistered Land Use Agreements with the Central West Goldfields People and the Ballardong People. The Land Use Agreements outline the manner in which consultation and negotiation is undertaken and seeks to provide benefits to all parties.

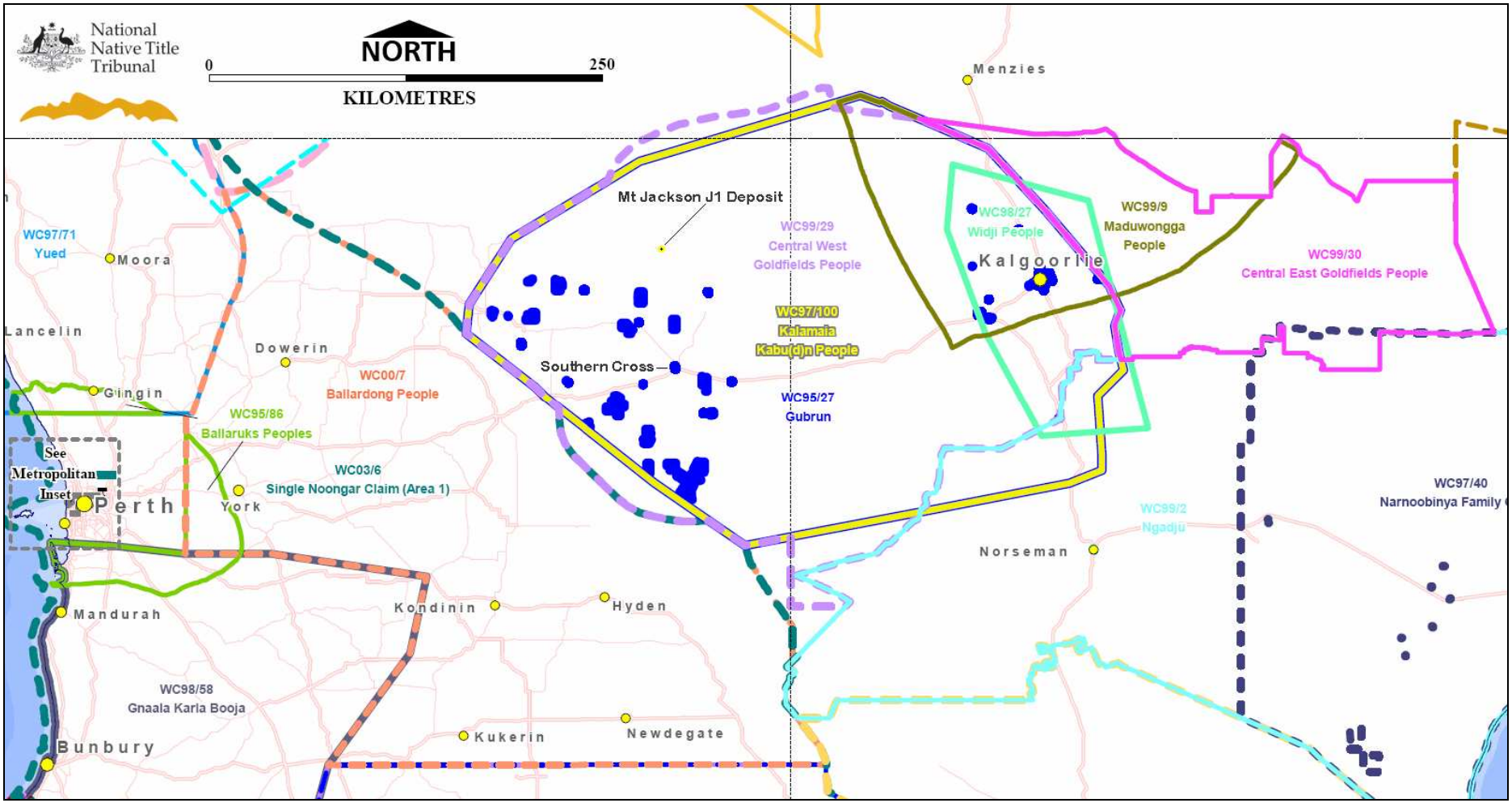

Figure 4-3 Native Title application areas for the Mt Jackson J1 Deposit proposal. The approximate location of the Mt Jackson J1 Deposit proposal is identified. The applications of the Central West Goldfields People and the Kalamaia Kabu(d)n People apply to the Mt Jackson J1 Deposit proposal area. Source: adapted from NNTT (2008d).

4.1.5 Management Actions

Management of Aboriginal Heritage at Cliffs' existing mines at the Mt Jackson Range, Windarling Range and the Koolyanobbing Range is undertaken in accordance with an Aboriginal Heritage Operating Procedure (Cliffs 2009h; Appendix 20). The Aboriginal Heritage Operating Procedure contains a range of management actions that include:

1. Use of site disturbance permits to provide a system to identify if ethnographic and/or archaeological Aboriginal Heritage surveys are required prior to vegetation clearing;
2. Where ethnographic and/or archaeological Aboriginal Heritage surveys are required, the surveys will be undertaken in consultation with the relevant traditional owners;
3. Monitoring of vegetation clearing to ensure that the clearing remains within designated clearing areas;
4. Avoidance of Aboriginal Heritage sites where practicable, with disturbance only permitted if approval from the WA Minister for Indigenous Affairs has been obtained under the *Aboriginal Heritage Act 1972* (WA);
5. Field marking and routine monitoring of Aboriginal Heritage sites to ensure that they are not inadvertently disturbed by mine staff;
6. If a potential matter of Aboriginal significance (artefacts or skeletal material) is identified during mine operations, mine operations within 20m of the identified location will cease and an archaeologist (and Police if skeletal material) will attend to determine its heritage significance; and
7. Reporting of identified or disturbed Aboriginal Heritage sites internally, and externally to DIA (subject to permission from the relevant traditional owners).

Cliffs will implement the Aboriginal Heritage Operating Procedure (Cliffs 2009h; Appendix 20) for the Mt Jackson J1 Deposit proposal to ensure that Aboriginal Heritage is appropriately managed.

No management actions are proposed with regards to Native Title as the proposal will not impact on any area of determined Native Title.

Cliffs will continue to routinely consult Native Title applicants in relation to mine operations. The confidential Heritage Protection Agreements and Land Use Agreements will also continue to apply to Cliffs ongoing mine operations.

4.1.6 Commitments

Cliffs makes the following commitments for protection and management of Aboriginal Heritage and Native Title for the Mt Jackson J1 Deposit proposal:

1 Biodiversity Areas

1-1 Cliffs will not undertake mining activities within the biodiversity areas.

1-2 Cliffs will install and maintain stock fencing and sign-posting along the internal mine boundaries of the biodiversity areas during mine operations.

1-3 Cliffs will seek agreement with DEC on any changes to the boundaries of the biodiversity areas (increases or decreases) that may arise from changes to the known flora values, fauna values, heritage values, geological values, operational requirements or government requirements.

2 *Aboriginal Heritage Act 1972* (WA)

2-1 Cliffs will comply with the requirements of the *Aboriginal Heritage Act 1972* (WA) in consultation with the Department of Indigenous Affairs, and (as appropriate) in consultation with traditional owners and their representatives.

3 Aboriginal Heritage Management

3-1 Cliffs will implement the following procedure for the management of Aboriginal Heritage during mine operations, decommissioning and rehabilitation:

a. Aboriginal Heritage Operating Procedure (Cliffs 2009h; Appendix 20).

4 *Native Title Act 1993* (C'th)

4-1 Cliffs will comply with the requirements of the *Native Title Act 1993* (C'th) in consultation with the National Native Title Tribunal, and (as appropriate) in consultation with Native Title applicants and their representatives.

A consolidation of Cliffs' commitments for the Mt Jackson J1 Deposit proposal is contained in Chapter 7.

4.1.7 Conclusion

As identified by the above assessment, the Mt Jackson J1 Deposit proposal will impact one registered Aboriginal Heritage site, the Curragibbin Hill Rockshelter, and Cliffs has obtained consent from the WA Minister for Indigenous Affairs to authorise these impacts. The Mt Jackson J1 Deposit proposal will not impact on any area of determined Native Title.

4.2 European Heritage

4.2.1 Potential Issue

Sites of European Heritage in Western Australia are identified and protected under the *Heritage of Western Australia Act 1990* (WA), and Local Government Municipal Heritage Inventories maintained under that Act. This section provides an assessment of the potential impacts of the Mt Jackson J1 Deposit proposal on European Heritage.

4.2.2 EPA Objective

The EPA's objective for heritage is:

- To ensure that changes to the biophysical environment do not adversely affect historical and cultural associations and comply with relevant heritage legislation (EPA 2004a).

4.2.3 Legislation, Guidelines, Standards and Approvals

- *Heritage of Western Australia Act 1990* (WA); and
- Shire of Yilgarn Municipal Heritage Inventory (Shire of Yilgarn 1997).

4.2.4 Social Impact Assessment

Matters of heritage in Western Australia are registered and protected under the *Heritage of Western Australia Act 1990* (WA). The Shire of Yilgarn maintains an inventory of heritage sites in accordance with the *Heritage of Western Australia Act 1990* (WA). The Shire of Yilgarn Municipal Heritage Inventory (Shire of Yilgarn 1997) identifies two recorded European Heritage sites occurring in the vicinity of the Mt Jackson J1 Deposit proposal, being:

- Mt Jackson Homestead; and
- Mt Jackson Graves and Cemetery.

One additional location in the vicinity of the Mt Jackson J1 Deposit proposal may be of potential European Heritage significance, being:

- Mt Jackson Townsite.

The location of the Mt Jackson Homestead, Mt Jackson Graves and Cemetery, and the Mt Jackson Townsite is identified in Figure 4-4.

The Heritage Council of WA has identified that there are no Heritage Agreements or Conservation Orders issued under the *Heritage of Western Australia Act 1990* (WA) for the Mt Jackson J1 Deposit proposal area (Heritage Council of WA 2008a).

The potential for the Mt Jackson J1 Deposit proposal to impact on these sites is identified below:

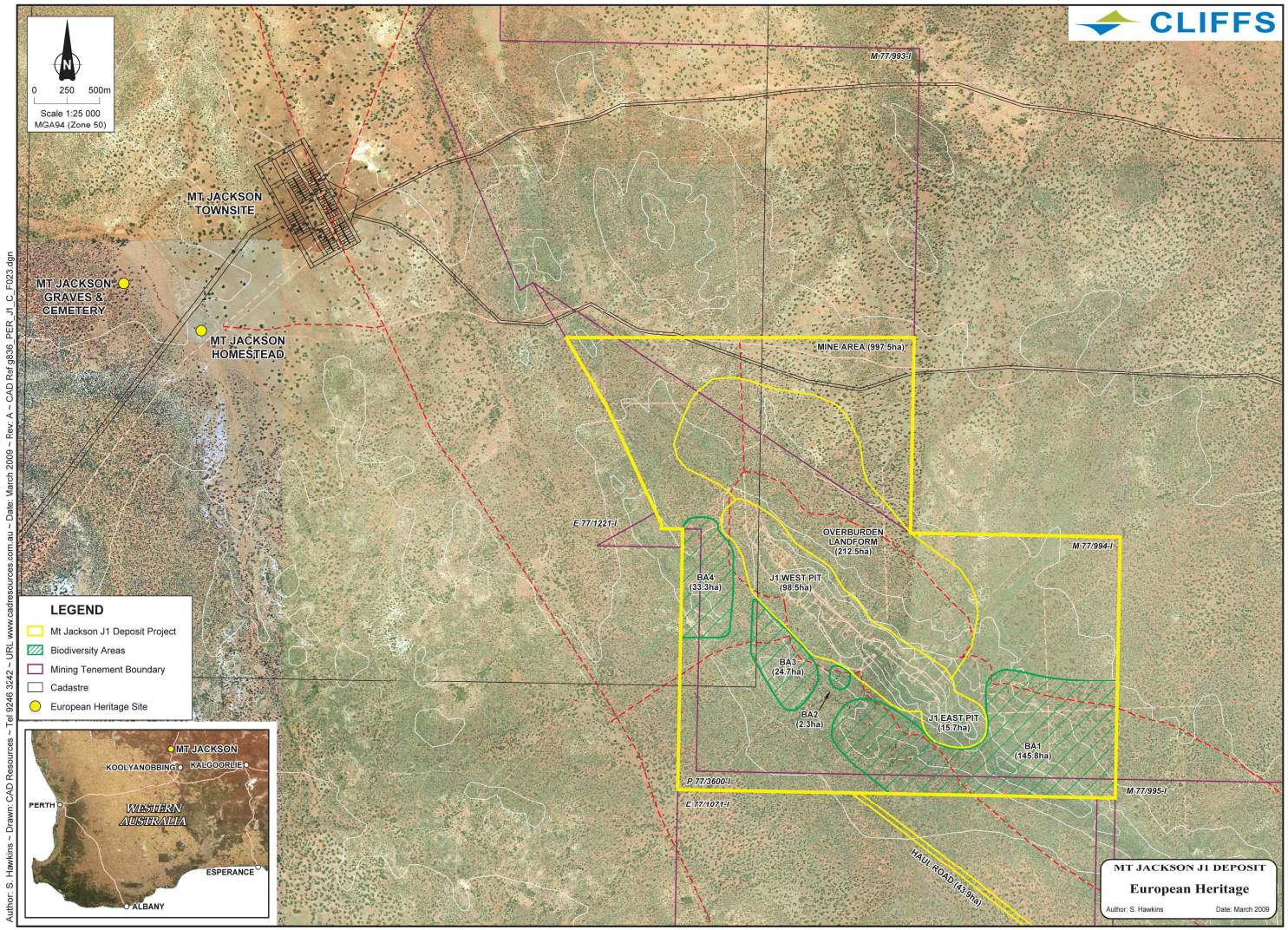

Figure 4-4 European Heritage sites in the vicinity of the Mt Jackson J1 Deposit proposal. The Mt Jackson Homestead and the Mt Jackson Graves and Cemetery are located approximately 3km and 3.5km (respectively) west of the Mt Jackson J1 Deposit proposal. The Mt Jackson Townsite is located approximately 2km west-north-west of the Mt Jackson J1 Deposit proposal.

Mt Jackson Homestead

The Mt Jackson Homestead is located approximately 3km west of the Mt Jackson J1 Deposit proposal. The homestead was constructed in approximately 1895 for the purposes of grazing, pastoralism and dairying and is of stone construction (Heritage Council of WA 2008b; Shire of Yilgarn 1997). Assessments of the Mt Jackson Station by Pastoral Lands Board of Western Australia in 2001 and the WA Department of Agriculture in 2004 both identified the condition of the Mt Jackson Homestead as 'derelict' (Pastoral Lands Board 2001; Department of Agriculture 2004).

No impact to the Mt Jackson Homestead is expected from implementation of the Mt Jackson J1 Deposit proposal due to the 3km separation distance.

Mt Jackson Graves and Cemetery

The Mt Jackson Graves and Cemetery is located approximately 3.5km west of the Mt Jackson J1 Deposit proposal. The graves and cemetery comprise of the burial site for approximately 7 people, with only two headstones remaining (Shire of Yilgarn 1997).

No impact to the Mt Jackson Graves and Cemetery is expected from implementation of the Mt Jackson J1 Deposit proposal due to the 3.5km separation distance.

Mt Jackson Townsite

The Mt Jackson Townsite is located approximately 2km west-north-west of the Mt Jackson J1 Deposit proposal. The Mt Jackson Townsite appears to have been designated for development (designated lots and roads), however review of aerial photography identifies that the Mt Jackson Townsite does not contain any structures or roads. The Mt Jackson Townsite is not recognised as a site of European Heritage.

No impact to the Mt Jackson Townsite is expected from implementation of the Mt Jackson J1 Deposit proposal due to the 2km separation distance and the absence of structures.

4.2.5 Management Actions

No management actions are proposed as the Mt Jackson J1 Deposit proposal will not impact on any registered or potential site of European Heritage.

4.2.6 Commitments

No commitments are proposed as the Mt Jackson J1 Deposit proposal will not impact on any registered or potential site of European Heritage.

4.2.7 Conclusion

As identified by the above assessment, implementation of the Mt Jackson J1 Deposit proposal will not impact on any known site of European Heritage. Accordingly, EPA's objective for this factor can be met.

4.3 Landscape and Tourism

4.3.1 Potential Issue

Changes to existing landforms have the potential to affect landscape and tourism values. The Mt Jackson J1 Deposit proposal will change part of the existing Mt Jackson Range through the creation of two mine pits and an overburden landform. This section provides an assessment of the potential impacts of the Mt Jackson J1 Deposit proposal on landscape and tourism values.

4.3.2 EPA Objective

The EPA's objective for visual amenity (as it may relate to landscape) is:

- To ensure that aesthetic values are considered and measures are adopted to reduce visual impacts on the landscape as low as reasonably practicable (EPA 2004a).

The EPA's objective for recreation (as it may relate to tourism) is:

- To ensure that existing and planned recreational uses are not compromised (EPA 2004a).

4.3.3 Legislation, Guidelines, Standards and Approvals

- Environmental Protection and Ecological Sustainability of the Rangelands in Western Australia (EPA 2004g);
- Environmental Notes on Mining: Waste Rock Dumps (DMP 2001);
- Mine Closure and Completion: Leading Practice Sustainable Development Program for the Mining Industry (Department of Industry, Tourism and Resources 2006); and
- Northern Yilgarn Conservation Reserves Management Plan Issues Paper (DEC 2008a).

4.3.4 Social Impact Assessment

Assessment of Impacts on Landscape and Tourism Values

As identified by EPA (2002c), assessment of landscape values is subjective, and therefore difficult to quantify in terms of values and contribution. It is therefore appropriate to consider landscape values at a regional level (i.e. the level at which landscapes occur) and assess any changes in terms of lost and/or retained landscape values.

Research has identified that, generally, visitors to Western Australia value *unique, natural experiences in an unspoilt, pristine environment* (Tourism WA 2008). Tourism values are inherently linked to the landscape values, environmental values, heritage values and land access (i.e. areas that can be accessed for unique natural and cultural experiences).

The potential impacts of the Mt Jackson J1 Deposit proposal on the landscape and tourism values are addressed separately below:

Landscape Values

The Mt Jackson Range covers an area of approximately 57,700ha (Gibson *et al.* 2007). The landscape of the Mt Jackson Range can be described as a linear and outcropped ironstone range located generally at a height of between approximately 480mAHD to 550mAHD (peak to 615mAHD), being nominally between 50m to 150m in height above the surrounding plain (Figure 4-5). The area has largely retained its naturalness due to limited pastoral and mining activities.

As identified by Figure 4-6, the Mt Jackson Range occurs within a larger region of linear and outcropped ironstone ranges, with ranges in the near vicinity including:

- Windarling Range (to 560mAHD, 23km north-north-east);
- Die Hardy Range (to 640mAHD, 38km north-north-east);
- Bungalbin Hill (to 680mAHD, 45km east-south-east); and
- Mt Manning Range (to 640mAHD, 52km north-east).

The environmental and landscape values of these other ranges are described in DEC (2008a) and EPA (2007a).

The Mt Jackson J1 Deposit proposal will involve a permanent and localised change to a portion of the Mt Jackson Range landscape through the excavation of two mine pits and the creation of an overburden landform. Computer generated 3-dimensional images of this section of the Mt Jackson Range with and without the Mt Jackson J1 Deposit mine pits and overburden landform are shown in Figures 4-7 and 4-8.

In accordance with DMP (2001), Cliffs has designed the overburden landform parallel to the existing Mt Jackson Range. The overburden landform has also been designed to a height of nominally 510mAHD, resulting in the overburden landform being no higher than the existing part or the retained adjacent parts of the Mt Jackson Range.

The Mt Jackson J1 Deposit proposal will have a permanent landscape impact will be approximately 0.57% (327ha; being the two mine pits and overburden landform) of the 57,700ha Mt Jackson Range area (Gibson *et al.* 2007). The cumulative landscape impact of Cliffs' mine operations on the Mt Jackson Range area (including the existing Mt Jackson J2 and J3 Deposit mine pits and overburden landforms) will be approximately 0.67% (386ha) of the Mt Jackson Range. Based on the above, the permanent impacts of the Mt Jackson J1 Deposit proposal (327ha; 0.57%) and the cumulative impacts (386ha; 0.67%) will not be significant. This view is supported by DMP (in DEC and DMP 2007 (page 41)) that *given that a large percentage of the support facilities will be located on the surrounding plains…. the overall impact area* (of an iron ore mine on an ironstone range) *would be small in the context of the overall extent of the range*.

It is further expected that the visual appearance of the Mt Jackson Range from adjacent ranges will also not be significant. The overburden landform may be distantly visible from the Windarling Range, Die Hardy Range and/or the Mt Manning Range during mine operations, however, due to the significant separation distances the visual impact is expected to be minimal. No permanent visual impact of the overburden landform from these ranges is expected following post-mining rehabilitation of the overburden landform.

With regard to specific geological features (such as monoliths, cliffs or caves) as they may relate to landscape values, the Curragibbin Hill Rockshelter may be regarded as a unique geological feature occurring on the Mt Jackson Range (refer also to Section 4.1). The Curragibbin Hill Rockshelter is the largest rockshelter currently identified on the Mt Jackson Range (from limited surveys), being

approximately 15m wide, 3m high and 18m deep. Although the Curragibbin Hill Rockshelter may be a unique geological feature and therefore may have intrinsic value (i.e. value for being its unique self), Cliffs considers it does not have a significant landscape value due to its isolation, access constraints (accessible only by persons able to hike or climb) and cryptic position resulting in it being largely unrecognisable in the landscape.

A landscape value more recently considered by EPA in development projects is *geoheritage*. In consideration of existing documented geological heritage sites in Western Australia (e.g. The Pinnacles, Wave Rock, Bungle Bungles, Jewel Cave, Mammoth Cave), the geology of the rockshelter and the presence of other caves on the Mt Jackson Range and other Yilgarn ranges, the Curragibbin Hill Rockshelter does not have significant geological heritage value.

Tourism Values

The Yilgarn Region forms part of an area described by Tourism WA as the *Golden Outback Region*, being the largest tourism region by area and including locations such as Kalgoorlie-Boulder and Esperance. As an indication of tourism activity, the Golden Outback Region contributes approximately 5% of direct tourism expenditure and approximately 5% of tourism employment in Western Australia (Access Economics 2007).

Approximately 80% of people visiting the Golden Outback Region are from within Western Australia, with 13% from interstate and 7% from overseas in 2007. Of the combined 93% of visitors from within Australia in 2007, 20% of persons (159,000 persons) are involved in a combination of bushwalking or visiting conservation reserve areas (Tourism WA 2007).

The Shire of Yilgarn (2008) lists its major tourism features as Baladjie Rock, Frog Rock, Karalee Dam, Hunts Soak, Golden Valley, New Zealand Gully Dam, Koolyanobbing, Bungalbin Range, Mt Palmer, Lake Koorkoordine, Government Dam, Turkey Hill and the Yilgarn History Museum. Mt Jackson is not listed by the Shire of Yilgarn as a major tourism feature.

Land access is a key consideration in determining the potential of an area for tourism. The Mt Jackson J1 Deposit proposal occurs within the privately held Mt Jackson Pastoral Lease. As the Mt Jackson J1 Deposit occurs within a privately held pastoral lease, this area cannot be regarded as a location for public tourism activities.

Lands designated for public access and public tourism, such as the Helena and Aurora Range Conservation Park (approximately 25km east) and the Mt Manning Range Nature Reserve (approximately 29km east), occur in close proximity to the Mt Jackson J1 Deposit (refer Figure 3-29). The Mt Jackson J1 Deposit proposal will not impact the tourism values of these existing tourism locations.

The future potential for tourism in the area of the Mt Jackson J1 Deposit proposal (which may or may not arise following a future change in land tenure or land ownership) is regarded as speculative, and therefore is not considered.

Based on the above information, the permanent landscape impacts of the Mt Jackson J1 Deposit proposal will be localised, and not significant due to other parts of the Mt Jackson Range and other ranges in the near vicinity having similar landscapes. The Mt Jackson J1 Deposit proposal area is not a public tourism location and implementation of the proposal will not affect the tourism values of existing adjacent tourism areas.

Accordingly, implementation of the Mt Jackson J1 Deposit proposal is not expected to have a significant impact on landscape or tourism values.

4.3.5 Management Actions

No management actions are proposed as the Mt Jackson J1 Deposit proposal will not result in significant impacts to landscape or tourism values.

4.3.6 Commitments

No commitments are proposed as the Mt Jackson J1 Deposit proposal will not result in significant impacts to landscape or tourism values.

4.3.7 Conclusion

As identified by the above assessment, implementation of the Mt Jackson J1 Deposit proposal is not expected to result in significant impacts to landscape or tourism values. Accordingly, EPA's objective for this factor can be met.

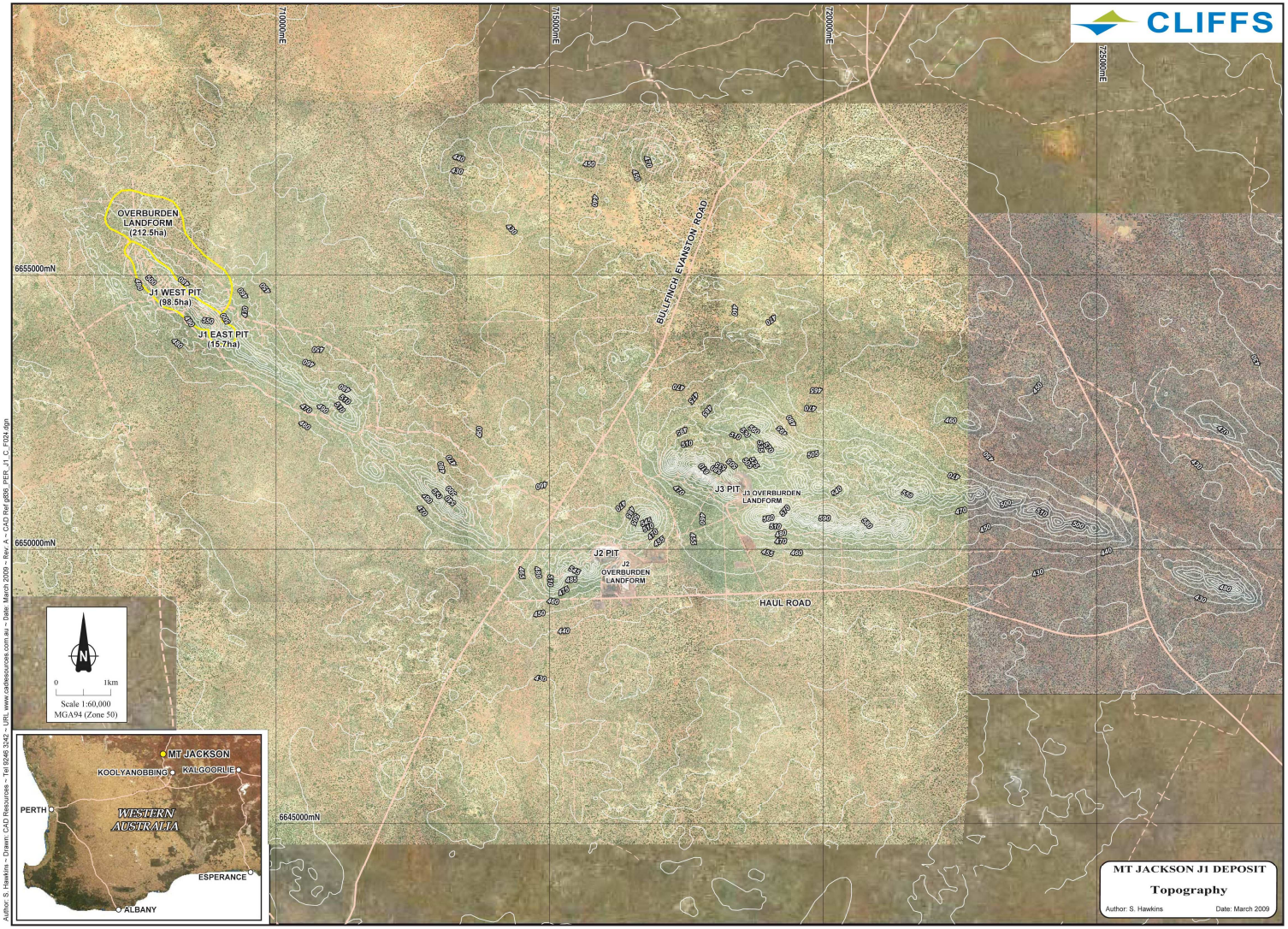

Figure 4-5 Topography of the Mt Jackson Range. The Mt Jackson J1 Deposit proposal will remove a section of the Mt Jackson Range of an existing topography of between 480mAHD and 550mAHD, and create a parallel overburden landform that will have a nominal height of 510mAHD.

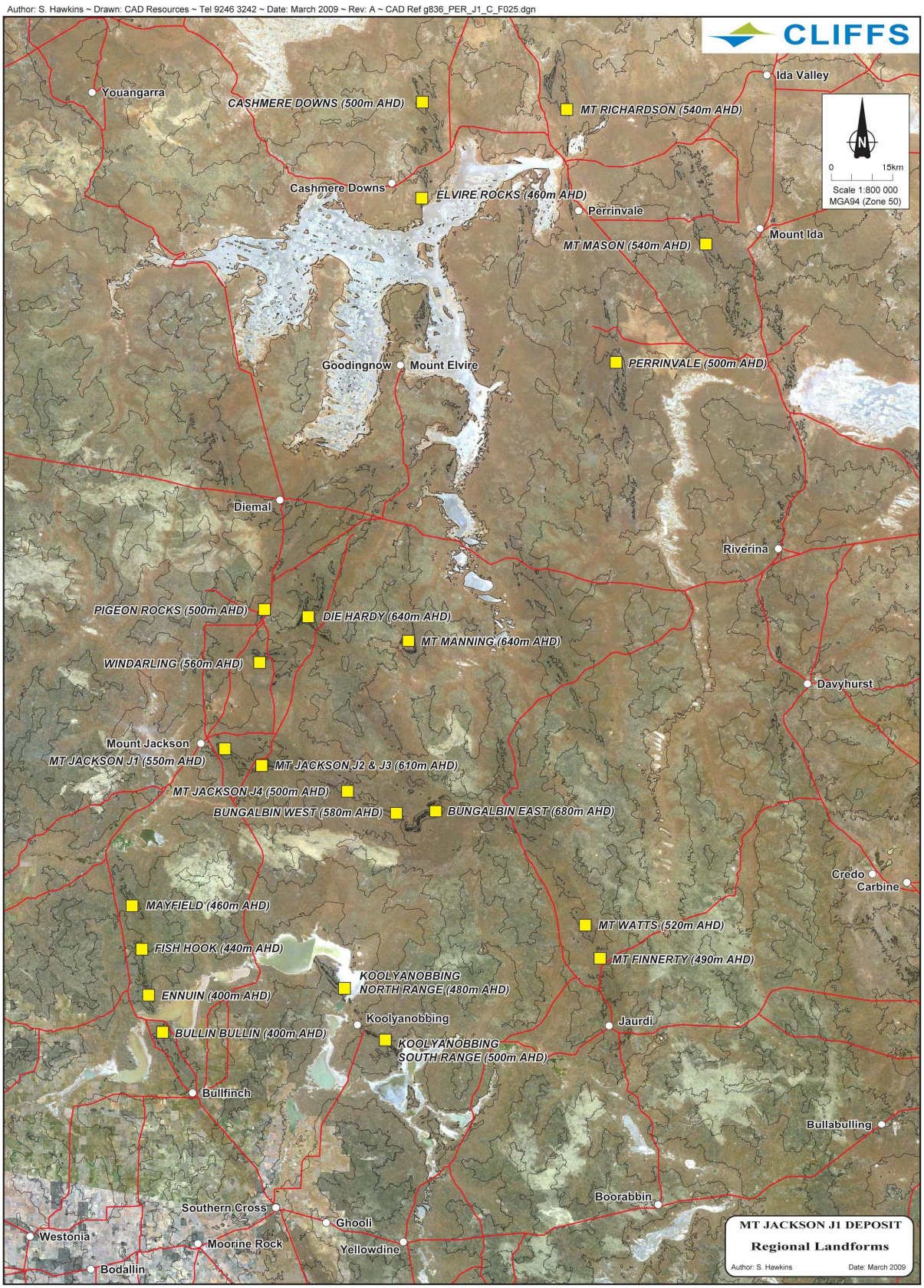

Figure 4-6 Regional landforms in the vicinity of the Mt Jackson Range. A number of ranges occur in the vicinity of the Mt Jackson J1 Deposit proposal.

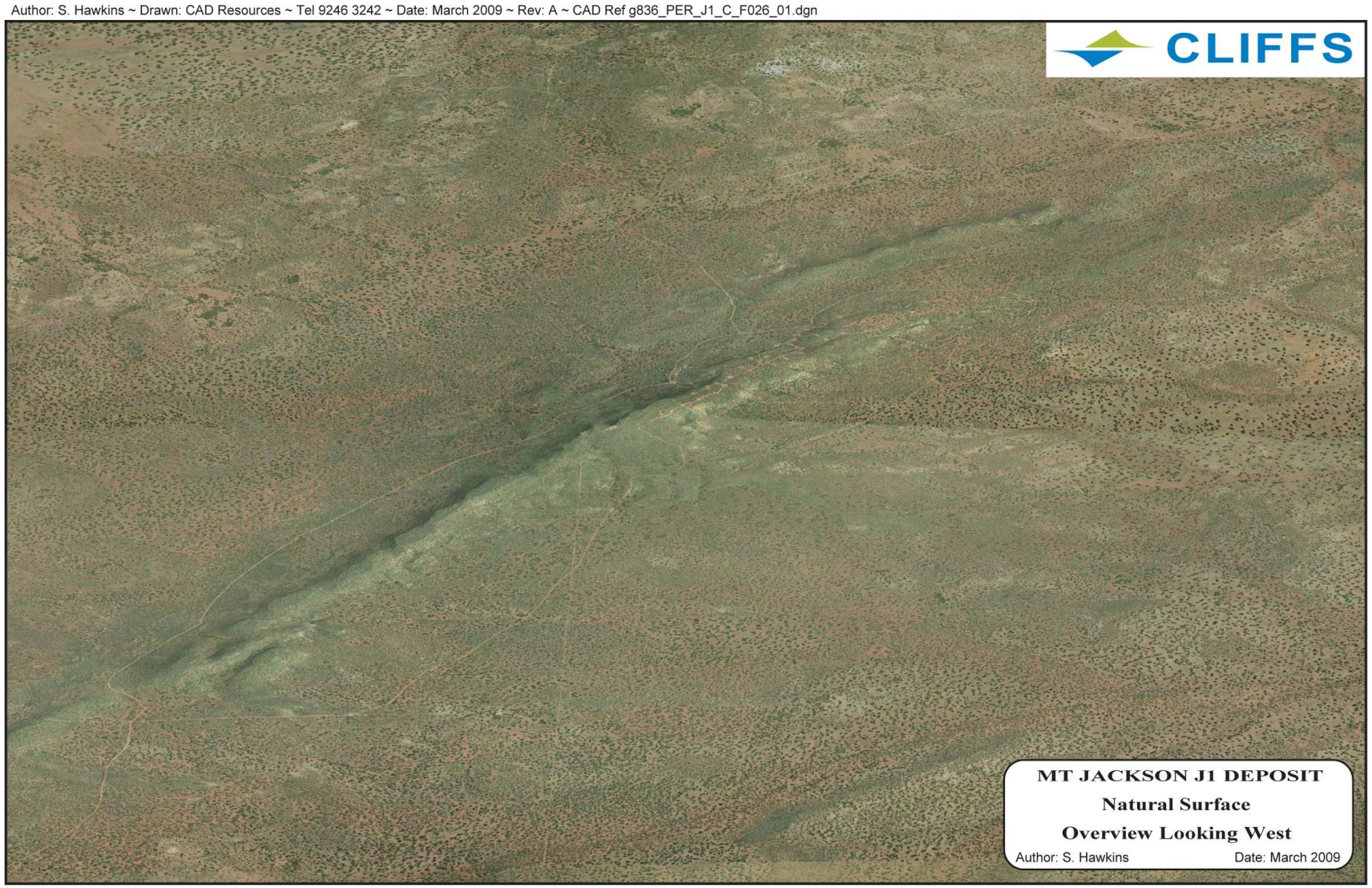

Figure 4-7 Aerial 3-dimensional computer image of the Mt Jackson Range. Note: Only the western end of the Mt Jackson Range in the vicinity of the Mt Jackson J1 Deposit proposal is shown.

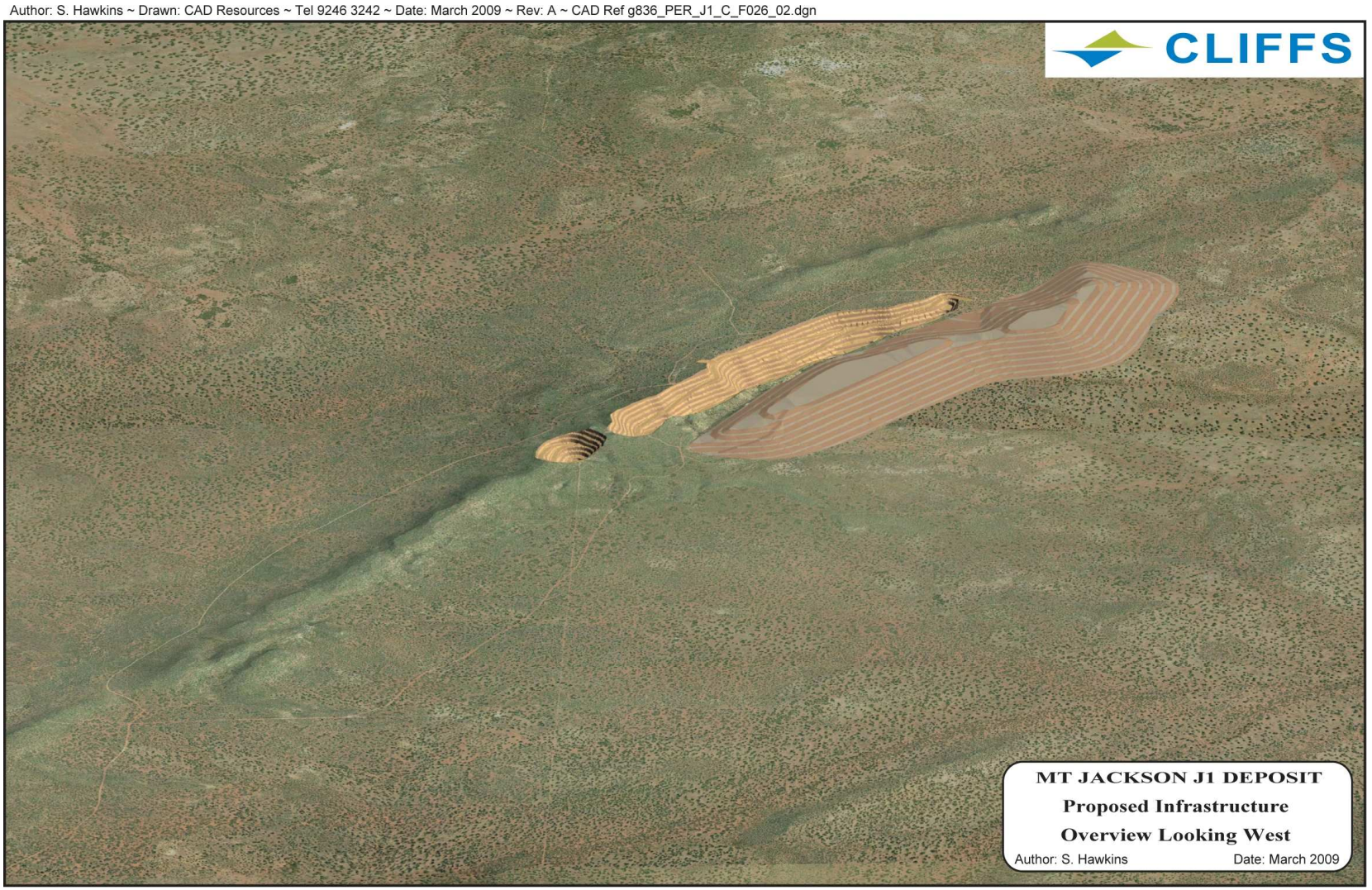

Figure 4-8 Aerial 3-dimensional computer image of the Mt Jackson Range at the completion of mining. Note: Only the mine pits and the overburden landform (shown not rehabilitated) are illustrated as only these proposal components will have a permanent visual landscape impact. Operational areas are not illustrated due to the landscape impacts being temporary and without impacting land elevation.

5 Economic Impact Assessment

The intention of this section is to assess the main economic issues associated with the Mt Jackson J1 Deposit proposal. Assessment of economic impacts is consistent with the intent of the Western Australian Government's State Sustainability Strategy (Government of Western Australia 2003), the intent of both EPA Position Statement #6 – *Towards Sustainability* (EPA 2004b) and EPA Position Statement #7 – *Principles of Environmental Protection* (EPA 2004c), and in recognition that the WA Minister for the Environment, other decision making authorities and the public can have regard to economic impacts.

5.1 Commonwealth, State and Regional Economies

5.1.1 Potential Issue

The Mt Jackson J1 Deposit proposal has the potential to generate income for the Western Australian and Commonwealth Governments from mining royalties and taxation, and generate employment and economic activity in the Shire of Yilgarn, Shire of Esperance, and in other parts of the Western Australian economy. This section assesses the economic impacts of the Mt Jackson J1 Deposit proposal on the Commonwealth, Western Australian and regional economies.

5.1.2 EPA Objective

Not applicable.

5.1.3 Legislation, Guidelines, Standards and Approvals

Not applicable.

5.1.4 Economic Impact Assessment

The Economic Importance of Iron Ore

Iron ore is of importance to the Western Australian economy due to the scale of projects and the mass of iron ore resources (DTF 2008a). With regards to investment in 2008, the WA Department of Treasury and Finance stated that a *favourable investment outlook is underpinned by the expected strong demand and prices for Western Australia's major commodity exports, including iron ore* (DTF 2008b).

In 2007, iron ore accounted for an estimated A$9.5billion value of Western Australian exports to China (being more than 60% of total exports to China) and approximately 40% of the 10.7% increase in total export growth (DTF 2008a). Iron ore also accounted for approximately 38% of Western Australian exports to Japan during 2007 (DTF 2008a).

Irrespective of the global financial economic downturn that commenced during 2008/2009, iron ore prices and iron ore demand remain economically sound; both currently and in the long-term. Continued economic benefit to the economy from iron ore will be largely dependent on existing iron ore producers obtaining access to iron ore resources.

Direct Economic Value of the Mt Jackson J1 Deposit proposal

The Mt Jackson J1 Deposit proposal will involve the production of an estimated 33 million tonnes of iron ore. The Mt Jackson J1 Deposit is Cliffs' single largest ore reserve (Cliffs 2008b) and will be Cliffs' single largest contributor to ore production during the next decade (Cliffs 2008 unpublished long-term production model). Based on a conservative value of A$50 per tonne[1], the Mt Jackson J1 Deposit proposal has a conservative estimated gross value of A$1.65billion.

Cliffs pays income taxes to the Commonwealth Government and mining royalty payments to the Western Australian Government. Based on the known ore volume, ore type (45% lump ore and 55% fines ore), current royalty rates (7.5% of revenue for lump ore and 5.6% of revenue for fines ore) and a conservative value of the ore per tonne (A$50/tonne), the direct gross economic value to government from implementation of the Mt Jackson J1 Deposit is estimated at:

- A$570million to the Commonwealth Government; and
- A$105million to the Western Australian Government.

Based on the above figures, the combined direct economic benefit to the Commonwealth and Western Australian Governments from implementation of the Mt Jackson J1 Deposit proposal will be approximately A$675million.

Indirect Economic Value of the Mt Jackson J1 Deposit proposal

The indirect economic value of the Mt Jackson J1 Deposit proposal is more complex, in that the economic benefits are generated though the purchasing of goods and services from regional businesses, economic investment in regional businesses, and employment.

The Mt Jackson J1 Deposit proposal will form part of Cliffs' existing Koolyanobbing Iron Ore Project. The Koolyanobbing Iron Ore Project mine operations occur predominantly within the Shire of Yilgarn and the Shire of Esperance. The indirect economic benefit of the Koolyanobbing Iron Ore Project to the Shire of Yilgarn, the Shire of Esperance and the Western Australian economy is summarised below:

Shire of Yilgarn

The Koolyanobbing Iron Ore Project mine operations are of significance to the Shire of Yilgarn, with iron ore operations at Koolyanobbing commencing in the 1960s and leading to the establishment of the Koolyanobbing townsite (Shire of Yilgarn 2008). Cliffs is currently the only iron ore producer within the Shire of Yilgarn and the operations account for approximately 50% of all economic activity generated by mining within the Shire (ABS 2006, based on 2003 data).

The economic value of the Koolyanobbing Iron Ore Project to the Shire of Yilgarn occurs through the employment of mine staff and the purchase of goods and services generated within the Shire and surrounding areas. The purchase of goods and services, in turn, generates employment and economic activity. Local employment, in turn, assists to maintain the viability of local businesses through maintaining a critical population mass to demand the provision of such goods and services.

Between 1991 and 2006 the Shire of Yilgarn population reduced by approximately 36%. This reduction appears largely due to a move away from agriculture, with an approximately 29% reduction

[1] The 2008 Australian benchmark price for iron ore exceeded A$100 per tonne; being more than double the A$50 per tonne price used in this economic assessment. This conservative A$50 per tonne price has had regard to the projected reductions in the Australian benchmark price for iron ore during 2009, as well as any potential future market uncertainty beyond that period. As the long-term Australian benchmark price for iron ore is expected to significantly exceed A$50 per tonne, the total economic value of the proposal, royalties, taxation, and direct and indirect expenditure are expected to be greater than the economic value identified in this assessment.

in persons employed in agriculture between 1991 and 2006 (ABS 2002; ABS 2007a). Approximately 16% (120 persons) of the current 750 person working population of the Shire of Yilgarn are employed in ore mining (ABS 2007a), of which a proportion are Cliffs mine staff.

The maintenance and growth of mining within the Shire of Yilgarn is considered integral to reducing and/or reversing the current population movement out of the Shire of Yilgarn. The Mt Jackson J1 Deposit proposal will provide employment opportunities to people within the Shire of Yilgarn.

Shire of Esperance

Ore from the Koolyanobbing Iron Ore Project is exported through the Esperance Port located within the Shire of Esperance. The Esperance Port Authority (EsPA) directly employs approximately 100 people (pers. com. N Mathews of EsPA to S Hawkins of Globe Environments, October 2008), equating to approximately 2% of the nearly 6000 employed persons within the Shire (ABS 2007b).

Iron ore is the main commodity (by tonnage) exported through the Esperance Port, accounting for approximately 76% of all import and export activity[1] (EsPA 2007). In the 2006-2007 financial year, the gross economic revenue for EsPA was approximately A$32.5million, which includes more than A$14million spent within the Goldfields-Esperance Region (EsPA 2007).

Cliffs is currently the only iron ore producer exporting through the Esperance Port. Accordingly, continued economic benefit for the Esperance Port, employees of EsPA and regional businesses supplying goods and services is inherently linked to maintaining Cliffs' iron ore exports. Accordingly, long-term economic security for these components of the Esperance region will rely on Cliffs obtaining access to new ore resources such as the Mt Jackson J1 Deposit.

Western Australian Economy

Cliffs' mine operations support employment and business activity throughout Western Australia. In 2007, Cliffs' direct contribution to the Western Australian economy through the purchase of goods and services and employment was approximately A$400million[2] (Cliffs 2008l). Based on an economic multiplier analysis (as recommended by ECS 2008), the indirect economic benefit to the Western Australian economy is estimated at a further A$400million (i.e. total of A$800million direct and indirect economic activity).

Having regard to the value of employment identified above, direct and indirect employment for Cliffs' mine operations is estimated at more than 800 people. This estimate includes more than 500 people in mine operations, 100 people in business management and business development, more than 100 people in rail transport, and approximately 70 people at the Esperance Port.

As the Mt Jackson J1 Deposit is Cliffs' single largest ore reserve (Cliffs 2008b) and will be Cliffs' single largest contributor to ore production during the next decade (Cliffs 2008 unpublished long-term production model), continued employment and economic activity from Cliffs' mine operations will rely on Cliffs obtaining access to the Mt Jackson J1 Deposit.

[1] The proportional contribution of iron ore exports for 2008/2009, and beyond, is expected to be higher due to the cessation of lead carbonate exports through the Esperance Port from March 2007.

[2] Value includes payments to suppliers and employees for Cliffs' Koolyanobbing Iron Ore Project and Cockatoo Island operations, excludes taxation and royalty payments to the Commonwealth and Western Australian Governments, and excludes indirect employment and economic activity.

Economic Impact of Not Implementing the Mt Jackson J1 Deposit proposal

As identified above, the continuation of economic benefits from the Koolyanobbing Iron Ore Project will rely on Cliffs obtaining access to new ore resources, such as the Mt Jackson J1 Deposit. If the Mt Jackson J1 Deposit proposal is not implemented, the economic benefits identified above would be forgone.

5.1.5 Management Actions

No management actions are proposed as the Mt Jackson J1 Deposit proposal will result in an economic benefit.

5.1.6 Commitments

No commitments are proposed as the Mt Jackson J1 Deposit proposal will result in an economic benefit.

5.1.7 Conclusion

Implementation of the Mt Jackson J1 Deposit proposal will result in a direct economic benefit to the Commonwealth Government, Western Australian Government, and the Western Australian economy through payments of royalties and taxation, and through direct and indirect employment and purchase of goods and services. The Mt Jackson J1 Deposit will be an important regional development for generating and maintaining employment and economic activity within the Shire of Yilgarn, the Shire of Esperance and the broader Western Australian economy.

6 Consultation

As part of planning for the Mt Jackson J1 Deposit proposal, Cliffs has identified a number of key stakeholders. These stakeholders include both government and non-government organisations.

Consultation is a fundamental component of an impact assessment process. Consultation is also consistent with the supporting principles of accountability and transparency that EPA considers are relevant for environmental protection (EPA 2004a).

Details of the consultations undertaken for the Mt Jackson J1 Deposit proposal are identified below.

6.1 Government Organisations Consulted

6.1.1 Environmental Protection Authority

The Mt Jackson J1 Deposit proposal was referred to EPA on 29 August 2008 (Cliffs 2008c) under s38(1) of the *Environmental Protection Act 1986* (WA). Subsequently, EPA reviewed the proposal information submitted and set a level of assessment at a Public Environmental Review on 1 October 2008 (EPA 2008c).

A meeting between Cliffs and EPA (Dr R Claudius and Ms H Dagnall of EPA Service Unit) was held on 12 November 2008 regarding the Environmental Impact Assessment processes, with specific discussion on the Environmental Scoping Document and environmental studies.

On 5 March 2009 Cliffs provided EPA (including supporting staff from DEC) a briefing on the Mt Jackson J1 Deposit proposal. Further, EPA (Ms H Dagnall) inspected the Mt Jackson J1 Deposit proposal area with Cliffs and DEC on 29 April 2009.

Consultation between EPA and Cliffs on the Mt Jackson J1 Deposit proposal is ongoing through the environmental assessment and approvals processes under the *Environmental Protection Act 1986* (WA).

6.1.2 Department of Environment, Water Heritage and the Arts

The Mt Jackson J1 Deposit proposal was referred to the DEWHA on 5 September 2008 under s68(2) of the *Environment Protection and Biodiversity Conservation Act 1999* (C'th) (Cliffs 2008d). This followed informal consultation on the proposal with DEWHA (Mr D Rhind) undertaken by Cliffs during May 2008. The referral was made due to the presence of the Malleefowl *Leipoa ocellata* as a species of National Environmental Significance.

On 17 October 2008 DEWHA advised that the Mt Jackson J1 Deposit proposal would be assessed as a 'Controlled Action' under the *Environment Protection and Biodiversity Conservation Act 1999* (C'th) for potential impacts to *L. ocellata* (DEWHA 2008a). The assessment process determined was an 'Assessment on Preliminary Documentation'.

Consultation between DEWHA and Cliffs on the Mt Jackson J1 Deposit proposal is ongoing through the environmental assessment and approvals processes under the *Environment Protection and Biodiversity Conservation Act 1999* (C'th).

6.1.3 Department of Environment and Conservation

Cliffs provided DEC (Ms S Thomas and Mr D Pickles) with a presentation overview of the Mt Jackson J1 Deposit proposal on 25 August 2008. The presentation focussed on the scientific research undertaken (flora and fauna), mine planning, environmental factors and environmental approvals processes to date. The DEC expressed appreciation for the opportunity to consider the proposal during the early planning stages with no significant concerns raised.

DEC was also consulted (via EPA) during November/December 2008 on the draft Environmental Scoping Document, through the briefing to EPA held on 5 March 2009 (Ms S Thomas and Mr N Woolfrey), and consulted on Cliffs' draft EIA (PER) document (via EPA) during April/May 2009. As part of consultation with DEC on the draft EIA (PER) document, on 18 June 2009 and 24 June 2009 Cliffs and DEC (Ms S Thomas, Mr D Coffey, Mr B Durant and Mr N Caporn) met to discuss the assessment approach and assessment outcomes relating specifically to troglofauna and millipedes.

Further, DEC (Ms S Thomas, Mr D Pickles, Ms J Jackson and Mr D Coffey) inspected the Mt Jackson J1 Deposit proposal site with Cliffs and EPA on 29 April 2009.

Consultation between DEC and Cliffs on the Mt Jackson J1 Deposit proposal is ongoing through the environmental assessment and approvals processes under the *Environmental Protection Act 1986* (WA).

6.1.4 Department of Mines and Petroleum

Cliffs provided DMP (Ms R De Bari) with a presentation overview of the Mt Jackson J1 Deposit proposal on 25 August 2008. The presentation focussed on the scientific research undertaken (flora and fauna), mine planning, environmental factors and environmental and mining approvals processes to date. DMP expressed appreciation for the opportunity to consider the proposal during the early planning stages with no significant concerns raised.

DMP was also consulted (via EPA) during November/December 2008 on the draft Environmental Scoping Document and during April/May 2009 on the draft EIA (PER) document.

Consultation between DMP and Cliffs for the Mt Jackson J1 Deposit proposal is ongoing with regards to obtaining approval of a Mining Proposal under the *Mining Act 1978* (WA), and through the environmental assessment and approvals processes under the *Environmental Protection Act 1986* (WA).

6.1.5 Department of Water

Informal consultation with the Department of Water (Mr A Thorburn) on the Mt Jackson J1 Deposit proposal commenced in May 2008 regarding the availability of groundwater and the approvals processes. DoW confirmed that the Goldfields Groundwater Management Area (Deborah Sub-area) was not fully allocated and there was sufficient water available if an additional allocation was required for the Mt Jackson J1 Deposit proposal.

The DoW (Mr M Ong) was offered a briefing on the Mt Jackson J1 Deposit proposal on 14 November 2008 with regards to the proposal's groundwater requirements and impacts. DoW requested that the process commence with Cliffs to submit a request for a licence change and supply supporting information, and a briefing could subsequently be held, if required by DoW.

DoW was also further consulted (via EPA, as identified in Cliffs 2009b) during November/December 2008 on the draft Environmental Scoping Document and during April/May 2009 (via EPA) on the draft EIA (PER) document.

Consultation between DoW and Cliffs for the Mt Jackson J1 Deposit proposal is ongoing with regards to an amendment to Cliffs' existing groundwater licence under the *Rights in Water and Irrigation Act 1914* (WA).

6.1.6 Shire of Yilgarn

Informal consultation with the Shire of Yilgarn (Ms W Dallywater) on the Mt Jackson J1 Deposit proposal commenced in September 2008. On 2 December 2008, Cliffs provided a presentation on the Mt Jackson J1 Deposit proposal to the Shire of Yilgarn (Mr A Seiler and Mr R Bosenberg). The presentation and discussions focussed on the proposed mine infrastructure and mine design considerations in relation to flora, fauna and heritage. On 3 December 2008 a phone briefing on the Mt Jackson J1 Deposit proposal to the Shire of Yilgarn (Ms W Dallywater) was provided to discuss the detailed mine planning issues in relation to flora, fauna, conservation reserves, groundwater and heritage. Generally, the Shire advised that it supported Cliffs' plans to expand its existing mine operations and that it appeared matters considered relevant to the Shire had been adequately considered in mine planning.

The Shire of Yilgarn was also consulted (via EPA) during November/December 2008 on the draft Environmental Scoping Document and during April/May 2009 on the draft EIA (PER) document.

Consultation between the Shire of Yilgarn and Cliffs on the Mt Jackson J1 Deposit proposal is ongoing through the environmental assessment and approvals processes under the *Environmental Protection Act 1986* (WA).

6.1.7 Department of Indigenous Affairs

Cliffs met with the Department of Indigenous Affairs to discuss the Mt Jackson J1 Deposit proposal on 17 September 2008 (Ms P Thorley), 2 February 2009 (Ms P Thorley), 17 February 2009 (Ms P Thorley and Ms M Schwede) and 14 May 2009 (Ms P Thorley, Ms M Schwede and Ms T Butler). The meetings focussed on the potential impacts on registered heritage sites, sites currently under assessment by the Aboriginal Cultural Materials Committee, archaeological and ethnographic surveys undertaken and proposed, avoidance and protection of registered and potential sites in mine planning, existing s18 approval held by Cliffs and consultation with Native Title applicants. The DIA expressed appreciation for the opportunity to consider the proposal during the early planning stages with no significant concerns raised due to Cliffs existing s18 consent for the Mt Jackson J1 Deposit proposal area and Cliffs ongoing dialogue with Native Title applicants.

DIA (Ms M Schwede) was also consulted (via EPA, as identified in Cliffs 2009b) during the period of November/December 2008 on the draft Environmental Scoping Document and during April/May 2009 (via EPA) on the draft EIA (PER) document.

Consultation between DIA and Cliffs on the Mt Jackson J1 Deposit proposal is ongoing through the environmental assessment and approvals processes under the *Environmental Protection Act 1986* (WA).

6.1.8 Conservation Commission

The Conservation Commission was contacted on 30 October 2008 with an offer for a briefing with regards to the potential impacts of the Mt Jackson J1 Deposit proposal on existing and proposed conservation reserves. The Conservation Commission (Ms K Boxall) requested that the matter be referred to DEC (Mr N Caporn) to manage on their behalf.

DEC (Mr N Caporn) was contacted on 30 October 2008 (telephone message) and 31 October 2008 (email) with regards to the offer for a briefing to the Conservation Commission on the Mt Jackson J1 Deposit proposal. No response from DEC (on behalf of the Conservation Commission) was received in relation to Cliffs' offer for a briefing.

Further consultation between the Conservation Commission and Cliffs on the Mt Jackson J1 Deposit proposal is not currently proposed.

6.1.9 Heritage Council of Western Australia

Written consultation on the Mt Jackson J1 Deposit proposal with the Heritage Council of WA (Ms P O'Connor) was undertaken during August 2008 with regards to identifying any registered European heritage sites. The Heritage Council advised that there were no heritage agreements or conservation orders under the *Heritage of Western Australia Act 1990* (WA) in the Mt Jackson J1 Deposit area (Heritage Council 2008a).

Further consultation between the Heritage Council and Cliffs on the Mt Jackson J1 Deposit proposal is not currently proposed.

6.2 Non-Government Organisations Consulted

6.2.1 Community Reference Group

The Koolyanobbing Community Reference Group (CRG) was formed in 2004 to provide review and comment on the environmental aspects of Cliffs' existing Mt Jackson Range and Windarling Range mine operations. The CRG includes members of:

- DEC;
- DMP;
- DEWHA;
- Shire of Yilgarn;
- Malleefowl Preservation Group;
- Wildflower Society of Western Australia;
- Windarling Preservation Group;
- Yilgarn Land Conservation District Committee;
- Gubrun Native Title applicants;
- Toodyay Naturalists Club;
- Pastoral representatives; and
- Community representatives.

Cliffs provided a presentation overview on the Mt Jackson J1 Deposit proposal at the CRG meeting of 18 September 2008. The presentation focussed on the scientific research undertaken (flora and fauna) and subsequent mine planning to date. The CRG was also advised that the environmental impact assessment process includes a public consultation period and that CRG members could contact Cliffs if they had any

additional queries on the proposal. The CRG expressed their appreciation for the opportunity to consider the Mt Jackson J1 Deposit proposal, with no significant concerns raised.

Cliffs provided a further briefing on the Mt Jackson J1 Deposit proposal at the CRG meeting of 19 March 2009. The briefing updated CRG members on the status of environmental surveys, mine planning and the environmental assessment processes.

Consultation with CRG on the Mt Jackson J1 Deposit proposal will be ongoing through meetings of the CRG and through the environmental assessment and approvals process under the *Environmental Protection Act 1986* (WA).

6.2.2 Central West Goldfields People

The Central West Goldfields People were consulted on the Mt Jackson J1 Deposit proposal in March and April 2007 through the ethnographic Aboriginal Heritage survey of the proposal area and were represented by Mr D Sambo, Ms E Sambo, Ms Y Sambo and Ms G Sambo (R & E O'Connor 2007). The Central West Goldfields People were also consulted in December 2008 as part of the archaeological survey of the Curragibbin Hill Rockshelter and were represented by Mr D Sambo and Ms E Sambo (Artefaxion 2009).

As identified in R & E O'Connor (2007), the Central West Goldfields People requested that the location identified as the Curragibbin Hill West artefact scatter (DIA Site ID 25820) be left undisturbed. In accordance with the wishes of the Central West Goldfields People, this area will be protected within a biodiversity area (refer Figure 4-1). As identified also in R & E O'Connor (2007), the Central West Goldfields People made no requests in relation to the Curragibbin Hill Rockshelter (DIA Site ID 25821) or the Mt Jackson Ranges (DIA Site ID 22944).

Consultation with the Central West Goldfields People on Cliffs existing and proposed mine operations is expected to be ongoing.

6.2.3 Kalamaia Kabu(d)n People

The Kalamaia Kabu(d)n People were consulted on the Mt Jackson J1 Deposit proposal in April 2007 through the ethnographic Aboriginal Heritage survey of the proposal area (R & E O'Connor 2007) and were represented by Mr B Champion[1] and Mr J Champion. The Kalamaia Kabu(d)n People were also consulted in December 2008 as part of the archaeological survey of the Curragibbin Hill Rockshelter and were represented by Mr B Champion[1] and Mr T Champion (Artefaxion 2009).

As identified in R & E O'Connor (2007), the Kalamaia Kabu(d)n People requested that the location identified as the Curragibbin Hill West artefact scatter (DIA Site ID 25820) be left undisturbed. In accordance with the wishes of the Kalamaia Kabu(d)n People, this area will be protected within a biodiversity area (refer Figure 4-1). As identified also in R & E O'Connor (2007), the Kalamaia Kabu(d)n People made no requests in relation to the Curragibbin Hill Rockshelter (DIA Site ID 25821) or the Mt Jackson Ranges (DIA Site ID 22944).

Consultation with the Kalamaia Kabu(d)n People on Cliffs existing and proposed mine operations is expected to be ongoing.

[1] Also a member of both the Gubrun Native Title Claimant Group and the Community Reference Group.

6.2.4 Ballardong People

The Ballardong People's Native Title application area does not include the Mt Jackson J1 Deposit proposal area, however, Cliffs maintains ongoing consultation with the Ballardong People on Aboriginal Heritage and Native Title matters. The Ballardong People were consulted on the Mt Jackson J1 Deposit proposal in April 2007 through the ethnographic Aboriginal Heritage survey of the proposal area and were represented by Ms J Nelson, Mr D Nelson, Mr A Hayden and Mr M Hayden (R & E O'Connor 2007). The Ballardong People were also consulted in December 2008 as part of the archaeological survey of the Curragibbin Hill Rockshelter and were represented by Mr R Pickett and Mr C Hayden (Artefaxion 2009).

As identified in R & E O'Connor (2007), the Ballardong People requested that the location identified as the Curragibbin Hill West artefact scatter (DIA Site ID 25820) be left undisturbed. In accordance with the wishes of the Ballardong People, this area will be protected within a biodiversity area (refer Figure 4-1). As identified also in R & E O'Connor (2007), the Ballardong People made no requests in relation to the Curragibbin Hill Rockshelter (DIA Site ID 25821) or the Mt Jackson Ranges (DIA Site ID 22944).

Consultation with the Ballardong People on Cliffs existing and proposed mine operations is expected to be ongoing.

6.2.5 The Wilderness Society Australia Inc.

The Wilderness Society is the advocate body for the Great Western Woodlands in which the Mt Jackson J1 Deposit proposal is located. The Wilderness Society (Dr A Watson) was briefed on the Mt Jackson J1 Deposit proposal on 3 November 2008. The presentation included details of the proposal planning and design, flora and fauna survey results, Aboriginal Heritage surveys and conservation reserves. The Wilderness Society expressed its views regarding the potential for mining companies to become involved in management of the entire landscape (beyond Cliffs' tenement boundaries), opportunities to seek agreement with the WA Government on conservation reserves, opportunities for indigenous employment during mine operations and post-mining (such as in long-term management of the pastoral lease), and agreement with Native Title applicants.

Consultation between the Wilderness Society and Cliffs on the Mt Jackson J1 Deposit proposal, as well as Cliffs existing mine operations and the Great Western Woodlands, is expected to be ongoing.

6.2.6 Conservation Council of Western Australia

The Conservation Council (Mr T Nicol) was briefed on the Mt Jackson J1 Deposit proposal on 3 November 2008. The presentation included details of the proposal planning and design, flora and fauna survey results, Aboriginal Heritage surveys and conservation reserves.

The Conservation Council expressed its views regarding the need for the WA Government to implement the EPA/DEC-recommended conservation reserves, the need for mining companies to backfill all mine pits, the need for indigenous employment and the need for agreement with Native Title applicants. The Conservation Council also expressed interest in the troglofauna survey, which at that time, the survey had identified the presence of troglofauna however no detail on the species or distribution was available.

Consultation between the Conservation Council and Cliffs on the Mt Jackson J1 Deposit proposal is expected to be ongoing through the environmental assessment and approvals process under the *Environmental Protection Act 1986* (WA).

6.2.7 Malleefowl Preservation Group

On 21 November 2008, Cliffs provided a presentation on the Mt Jackson J1 Deposit proposal to the Malleefowl Preservation Group. The presentation focussed on mine planning resulting from Malleefowl surveys undertaken by the Malleefowl Preservation Group and Bamford Consulting on the Mt Jackson Range between 2004 and 2008.

The Malleefowl Preservation Group expressed their appreciation for the opportunity to consider the proposal and to see how their survey work had been incorporated into mine planning. Generally, the Malleefowl Preservation Group was pleased that mine planning had sought to minimise its impacts on Malleefowl and to protect areas of the best quality Malleefowl habitat.

Consultation between the Malleefowl Preservation Group and Cliffs on the Mt Jackson J1 Deposit proposal, as well as Cliffs existing mine operations, is expected to be ongoing through the CRG and through the environmental assessment and approvals process under the *Environmental Protection Act 1986* (WA).

6.2.8 Wildflower Society of WA

On 24 September 2008, Cliffs made an offer to the Wildflower Society of Western Australia to provide a briefing on the Mt Jackson J1 Deposit proposal via the Society's CRG representative (Mr B Moyle).

The Wildflower Society (Mr B Moyle) was briefed on the Mt Jackson J1 Deposit proposal on 3 November 2008. The presentation included details of the proposal planning and design, flora and fauna survey results, Aboriginal Heritage surveys and conservation reserves. The Wildflower Society expressed its views regarding the need for the WA Government to implement the EPA/DEC-recommended conservation reserves and concerns regarding the quality of rehabilitation of Cliffs' existing overburden landform at the Windarling Range mine operations.

Consultation between the Wildflower Society and Cliffs on the Mt Jackson J1 Deposit proposal, as well as Cliffs existing mine operations, is expected to be ongoing through the CRG and through the environmental assessment and approvals process under the *Environmental Protection Act 1986* (WA).

6.3 Ongoing Consultation

6.3.1 Community Reference Group

Under Statement 627 issued by the Minister for the Environment (WA Minister for the Environment 2003), Cliffs has established and maintained the CRG since 2004. At Cliffs' presentation to CRG on 18 September 2008, Cliffs and CRG agreed that the Mt Jackson J1 Deposit proposal should be included within CRG's ongoing terms of reference. Accordingly, Cliffs makes the following commitments for ongoing community consultation via the CRG:

1 Community Reference Group

1-1 Cliffs will include the mine operations at the Mt Jackson J1 Deposit within the terms of reference of the Community Reference Group established under Statement 627 of 3 June 2003 (WA Minister for the Environment 2003).

1-2 Cliffs will support the functioning of the Community Reference Group throughout the duration of mine operations at the Mt Jackson J1 Deposit.

6.3.2 Government Agencies

Consultation with regulatory agencies including EPA, DEWHA, DEC, DMP, DoW and DIA is expected to be ongoing during the various environmental assessment and approvals processes. Consultation with these agencies during mine operations is also expected to be ongoing through annual compliance reporting provisions under the statutory approvals issued or managed by these agencies for the Mt Jackson J1 Deposit proposal.

6.4 Consultation Summary

The consultation undertaken to date has identified a range of views on the Mt Jackson J1 Deposit proposal. Generally, the groups consulted have:

- expressed their appreciation to Cliffs for the opportunity to be consulted on the proposal;
- advised of satisfaction that all relevant environmental issues were being considered by Cliffs in design and implementation (i.e. no issues had been missed);
- not identified any significant constraint or barrier that could likely result in the proposal being not being implemented; and
- expressed a desire for ongoing consultation with Cliffs on the proposal, as well as ongoing consultation on Cliffs' other mine operations.

7 Commitments

7.1 Environmental Commitments

As part of this impact assessment, Cliffs has made a number of environmental commitments for the management of environmental factors relevant to the Mt Jackson J1 Deposit proposal. Cliffs intends that these commitments will become legally binding in an implementation statement for the Mt Jackson J1 Deposit proposal under s45(5) the *Environmental Protection Act 1986* (WA). Cliffs has drafted its commitments in written text in the same manner as conditions imposed by the WA Minister for the Environment.

A consolidation of Cliffs' environmental commitments under the *Environmental Protection Act 1986* (WA) is listed below:

1 Biodiversity Areas

1-1 Cliffs will not undertake mining activities within the biodiversity areas.

1-2 Cliffs will install and maintain stock fencing and sign-posting along the internal mine boundaries of the biodiversity areas during mine operations.

1-3 Cliffs will seek agreement with DEC on any changes to the boundaries of the biodiversity areas (increases or decreases) that may arise from changes to the known flora values, fauna values, heritage values, geological values, operational requirements or government requirements.

2 Land Clearing Management

2-1 Cliffs will implement the following plans and procedures for the management of land clearing during mine operations, decommissioning and rehabilitation:

a. Land Clearing Management Plan (Cliffs 2009c; Appendix 12).
b. Environmental Operating Procedure EOP04 Clearing (Cliffs 2008e; Appendix 9).
c. Environmental Operating Procedure EOP13 Site Disturbance Permits (Cliffs 2007a; Appendix 10); and
d. Environmental Operating Procedure EOP14 Topsoil Management (Cliffs 2006; Appendix 11).

3 *Bossiaea* sp. Jackson Range Regional Survey and Taxonomic Study

3-1 Cliffs will undertake a regional survey of potentially suitable habitat for *Bossiaea* sp. Jackson Range within the near vicinity of the Mt Jackson Range prior to mining.

3-2 If additional populations are not identified by the regional survey that would result in the proposal clearing ≤10% of the known individuals, Cliffs will undertake a taxonomic study of *Bossiaea* sp. Jackson Range, in consultation with DEC, to document its taxonomic characteristics and determine its relationship to *Bossiaea atrata*. The taxonomic study will be completed within 12 months following the commencement of mine development. Subject to the results of the taxonomic study and subject to advice from DEC, a study of the genetics of *Bossiaea* sp. Jackson Range and *Bossiaea atrata* may also be undertaken if it will assist in determining the relationship between *Bossiaea* sp. Jackson Range and *Bossiaea atrata*.

4 Rehabilitation of *Bossiaea* sp. Jackson Range, *Spartothamnella* sp. Helena & Aurora Range and Community EeWH1 *Eucalyptus ebbanoensis* Woodland over Heath with *Calytrix* sp Paynes Find

4-1 Prior to land clearing and periodically during mine operations, Cliffs will collect seed (for subsequent use in rehabilitation) from areas of:

a. *Bossiaea* sp. Jackson Range;
b. *Spartothamnella* sp. Helena & Aurora Range; and
c. Community EeWH1 *Eucalyptus ebbanoensis* Woodland over Heath with *Calytrix* sp Paynes Find.

4-2 During initial mine development, Cliffs will collect and separately stockpile/store topsoil (for subsequent use in rehabilitation) from areas of:

a. *Bossiaea* sp. Jackson Range;
b. *Spartothamnella* sp. Helena & Aurora Range; and
c. Community EeWH1 *Eucalyptus ebbanoensis* Woodland over Heath with *Calytrix* sp Paynes Find.

4-3 During rehabilitation, Cliffs will undertake actions that seek to establish:

a. Populations of *Bossiaea* sp. Jackson Range;
b. Populations of *Spartothamnella* sp. Helena & Aurora Range; and
c. 20ha of native vegetation containing representative species of Community EeWH1 *Eucalyptus ebbanoensis* Woodland over Heath with *Calytrix* sp Paynes Find.

5 Weed Management

5-1 Cliffs will implement the following plan and procedure for the management of weeds during mine operations, decommissioning and rehabilitation:

a. Weed Management Plan (Cliffs 2009d; Appendix 6); and
b. Environmental Operating Procedure EOP16 Weed Management (Cliffs 2008f; Appendix 13).

6 Bush Fire Management

6-1 Cliffs will implement the following plan and procedure for the management of fire during mine operations, decommissioning and rehabilitation:

a. Bush Fire Management Plan (Cliffs 2009e; Appendix 7); and
b. Environmental Operating Procedure EOP03 Bushfire Management (Cliffs 2008g; Appendix 14).

7 Fauna Management

7-1 Cliffs will implement the following procedure for the management of fauna during mine operations, decommissioning and rehabilitation:

a. Environmental Operating Procedure EOP06 Fauna (Cliffs 2007b; Appendix 17).

8 Groundwater Management

8-1 Cliffs will implement the following procedure for the management of groundwater during mine operations, decommissioning and rehabilitation:

a. Environmental Operating Procedure EOP07 Groundwater (Cliffs 2008i; Appendix 18).

8-2 Within 12 months following the commencement of groundwater dewatering, Cliffs will install a minimum of 4 groundwater monitoring wells (along strike and across strike of the Mt Jackson J1 Deposit).

8-3 Cliffs will undertake monthly monitoring of the groundwater levels within the groundwater monitoring wells during groundwater dewatering.

9 Acid Mine Drainage Management

9-1 Cliffs will manage overburden material with a sulphur content greater than 0.3% by isolating and containing that material within the centre of the overburden landform (consistent with DMP (2001)) and encapsulation within a minimum of 5m of non-acid forming material (below, above and surrounding).

10 Dust Management

10-1 Cliffs will implement the following plan and procedure for management of dust during mine operations, decommissioning and rehabilitation:

a. Dust Management Plan (Cliffs 2009f; Appendix 8); and

b. Environmental Operating Procedure EOP05 Dust Management (Cliffs 2008k; Appendix 19).

11 Decommissioning and Rehabilitation Management

11-1 Cliffs will implement the following plan for the management of decommissioning and rehabilitation during mine operations, decommissioning and rehabilitation:

a. Mt Jackson J1 Deposit Decommissioning and Rehabilitation Plan (Cliffs 2009g; Appendix 5).

12 Community Reference Group

12-1 Cliffs will include the mine operations at the Mt Jackson J1 Deposit within the terms of reference of the Community Reference Group established under Statement 627 of 3 June 2003 (Western Australian Minister for the Environment 2003).

12-2 Cliffs will support the functioning of the Community Reference Group throughout the duration of mine operations at the Mt Jackson J1 Deposit.

No further environmental commitments under the *Environmental Protection Act 1986* (WA) are considered necessary for the management of environmental impacts for the Mt Jackson J1 Deposit proposal. Other environmental and social commitments that are managed under separate legislation are identified in Section 7.2.

7.2 Other Commitments

As part of this impact assessment, Cliffs has made a number of commitments relevant to legislation other than the *Environmental Protection Act 1986* (WA). Cliffs intends that these commitments will be implemented under the appropriate legislation or process. A consolidation of Cliffs' other commitments is listed below:

1 *Wildlife Conservation Regulations 1970* (WA)

1-1 Prior to impacting individuals of the Tree-stem Trapdoor Spider *Aganippe castellum*, Cliffs will obtain a permit under r17 of the *Wildlife Conservation Regulations 1970* (WA) from the Department of Environment and Conservation.

2 *Rights in Water and Irrigation Act 1914* (WA)

2-1 Cliffs will ensure that management of groundwater at the Mt Jackson J1 Deposit complies with:

a. *Rights in Water and Irrigation Act 1914* (WA);
b. Groundwater Licence GWL154459 under the *Rights in Water and Irrigation Act 1914* (WA); and
c. Operating Strategy for Water Supply Borefield - Koolyanobbing Project Northern Haul Road Network and Minesite Facilities (Cliffs 2008h)

in consultation with the Department of Water.

3 *Aboriginal Heritage Act 1972* (WA)

3-1 Cliffs will comply with the requirements of the *Aboriginal Heritage Act 1972* (WA) in consultation with the Department of Indigenous Affairs, and (as appropriate) in consultation with traditional owners and their representatives.

4 Aboriginal Heritage Management

4-1 Cliffs will implement the following procedure for the management of Aboriginal Heritage during mine operations, decommissioning and rehabilitation:

a. Aboriginal Heritage Operating Procedure (Cliffs 2009h; Appendix 20).

5 *Native Title Act 1993* (C'th)

5-1 Cliffs will comply with the requirements of the *Native Title Act 1993* (C'th) in consultation with the National Native Title Tribunal, and (as appropriate) in consultation with Native Title applicants and their representatives.

8 Conclusions

Cliffs proposes to expand the Koolyanobbing Iron Ore Project to include an additional mining operation at the Mt Jackson J1 Deposit on the Mt Jackson Range, approximately 100km north-north-west of Southern Cross in Western Australia. The Mt Jackson J1 Deposit contains approximately 33 million tonnes of iron ore with an expected mining-life of approximately 10 years. It is proposed that the Mt Jackson J1 Deposit proposal will be integrated into Cliffs' existing Koolyanobbing Iron Ore Project.

This impact assessment identifies that subject to implementation of the EMS, EMPs, EOPs and Cliffs' commitments for the proposal, the Mt Jackson J1 Deposit proposal will have:

- a non-significant negative impact on environmental factors;
- a non-significant negative to nil impact on social factors; and
- a positive impact on economic factors.

Accordingly, Cliffs considers that the Mt Jackson J1 Deposit proposal can be implemented to meet acceptable community objectives and standards.

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10 Appendices

Appendix 1 Cliffs' Environmental Policy (Cliffs 2009a).

Appendix 2 ISO 14001:2004 Environmental Management System Certification (NCS International 2009)

Appendix 3 Flora Survey Summary

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Appendix 9 Environmental Operating Procedure EOP04 – Clearing (Cliffs 2008e)

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Appendix 14 Environmental Operating Procedure EOP03 – Bushfire Management (Cliffs 2008g)

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Appendix 17 Environmental Operating Procedure EOP06 – Fauna (Cliffs 2007b)

Appendix 18 Environmental Operating Procedure EOP07 – Groundwater (Cliffs 2008i)

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Appendix 20 Aboriginal Heritage Operating Procedure (Cliffs 2009h)

Appendix 21 Consultation on draft EIA (PER) document

APPENDIX 1

Cliffs' Environmental Policy (Cliffs 2009a)

CLIFFS

ENVIRONMENTAL POLICY

Cliffs Asia Pacific Iron Ore Pty Ltd is a mining company that delivers iron ore feedstock for the manufacture of a wide range of goods in demand by modern society.

We will optimise the long term prospects of our operations through the balanced integration of environmental, social and financial aspects in our business planning and actions.

We will strive to achieve excellence in environmental management through minimising negative impacts and maximising the positive impacts on the natural and social environments that may arise from our operations.

The absolute minimum standard of performance we will accept is compliance with all applicable statutory requirements and regulations and fulfillment of any signatory obligations and commitments.

We will continually improve our environmental performance through a systematic approach to setting environmental objectives and targets, implementation of management and monitoring procedures and objective evaluation of performance against our targets. Our environmental initiatives will be appropriately resourced and supported by training and awareness programmes.

We acknowledge the expectations of all stakeholders in our operations for diligent environmental management and will fully and regularly communicate our environmental performance.

Duncan Price
Chief Executive Officer

Christopher Hunt
Chief Financial Officer

Colin Williams
Chief Operating Officer

Stewart Brown
GM Operations

Bill Hart
Vice President of Sales Marketing & Strategy

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APPENDIX 2

ISO 14001:2004 Environmental Management System Certification (NCS International 2009)

NCS INTERNATIONAL
CERTIFIED
ENVIRONMENTAL
MANAGEMENT SYSTEM
ISO 14001

Cliffs Asia Pacific Iron Ore Pty Ltd

Windarling/Mt Jackson Mine Sites and Haul Road

Windarling WA 6426

Operates a management system
that complies with the requirements of:

AS/NZS ISO 14001:2004

The Scope of Certification is:

Administration and management of mining operations at Windarling and Mount Jackson including the maintenance of the road to Koolyanobbing.

Date of Issue:	12 March 2009
Expiry Date:	31 May 2010
Certificate Number:	13881-02
Certification Number:	13881
Certification Date:	09 May 2007

On behalf of the board members

NCS International
JAS-ANZ
MEMBER OF MULTILATERAL RECOGNITION ARRANGEMENT
IAF

To confirm the currency of this certificate please email certificate@ncsi.com.au
This Certificate remains the property of NCS International Pty Limited ACN 078 659 211
A wholly owned subsidiary of The National Association of Testing Authorities, Australia ACN 004 379 748
Accreditation by the Joint Accreditation System of Australia and New Zealand (www.jas-anz.com.au\register)
Rev 03/08

APPENDIX 3

Flora Survey Summary

DATE	No. SURVEY DAYS	ACTIVITY	PERSONNEL
		2004 Surveys	
26-27 May 2004	2	Survey of *Beyeria* sp. Jackson Range and *Stenanthemum newbeyi* at Western Jackson Range	Nick Evelegh, Gemma McLean (nee O'Keefe), Lisa Chapelle (nee Ang) and Jonathon Lester
3 Aug 2004	1	J1 Drill pads/ *Calytrix* sp Paynes Find	Shapelle McNee and Gemma McLean
4 – 5 Aug 2004	2	Preliminary J1 veg. survey	Gemma McLean and Shapelle McNee
7 Sep 2004	1	J1 Drill pads (no. sig. spp.)	Gemma McLean
11 – 14 Sep 2004	4	J1 vegetation mapping no. 1	Geoff Cockerton and Shapelle McNee
29 Sep 2004	1	J1 Diamond drill pad (no. sig. spp.)	Gemma McLean
		2005 Surveys	
23 Mar 2005	1	J1 Drill pads (no. sig. spp.)	Geoff Cockerton
27 – 28 Jul 2005	2	J1 vegetation mapping no. 2 (1st proposed Haul Road)	Geoff Cockerton and Shapelle McNee
7 – 13 Sep 2005	3	J1 vegetation mapping no. 3 (1st proposed Haul Road east of Evanston Rd and south west corner of J1 Mine Area)	Shapelle McNee and Lisa Chapelle
		2006 Surveys	
12 – 15 Jun 2006	4	J1 soils assessment and training session with Doug Blandford	Landcare Holdings staff (~20 personnel)
11 Jul 2006	1	J1 vegetation quadrats no. 1 (incl. quadrats Q1 and Q2)	Geoff Cockerton, Gemma McLean, Sharyn Burgess and Shapelle McNee
12 - 13 Jul 2006	2	J1 vegetation mapping no. 4	Geoff Cockerton and Shapelle McNee
14 Jul 2006	1	Significant species infrastructure survey (*Calytrix* sp Paynes Find)	Shapelle McNee, Gemma McLean and Sharyn Burgess
27 July – 1 August 2007	6	Regional survey of *Calytrix* sp. Paynes Find	Shapelle McNee and Doug Lievense
8 Aug 2006	1	J1 vegetation mapping no. 5	Geoff Cockerton and Steven Cockerton
9 – 11 Aug 2006	3	Regional survey	Peter Smith and Sarah Smith
11 -12 Aug 2006	2	J1 vegetation mapping no. 6	Geoff Cockerton and Shapelle McNee

DATE	No. SURVEY DAYS	ACTIVITY	PERSONNEL
24 Aug 2006	1	J1 opportunistic floristic survey	Geoff Cockerton, Gemma McLean and Dr Wendy Thompson
25 – 29 Aug 2006	5	J1 vegetation quadrats no. 2	Geoff Cockerton, Ben Eckermann, Gemma McLean and Shapelle McNee
18 – 21 Sep 2006	4	J1 vegetation quadrats no. 3	Shapelle McNee, Gemma McLean and Ben Eckermann
22 Sep 2006	1	J1 drill pads	Gemma McLean and Ben Eckermann
16 – 17 Oct 2006	2	Soil Profiles Doug Blandford	Doug Blanford, Shapelle McNee and Colin Blair
24 – 25 Oct 2006	2	J1 vegetation mapping no. 7	Geoff Cockerton and Matt Steffel
1 Oct 2006	1	Waterbores on J1	Geoff Cockerton
		2007 Surveys	
25 – 27 Jan 2007	3	2nd proposed Haul Rd no. 1	Geoff Cockerton and Shapelle McNee
12 – 13 Feb 2007	2	2nd proposed Haul Rd no. 2	Shapelle McNee and Ben Eckermann
2-3 April 2007	2	J1 Drill pads	Gemma McLean
6 – 7 Jun 2007	2	J1 vegetation mapping no. 8 (Western Jackson Range South Hill)	Shapelle McNee, Gemma McLean and Ben Eckermann
13 – 15 Jul 2007	3	J1 RAB lines	Shapelle McNee and Susan Regan
Nov 2007	2	*Eucalyptus* survey within Portman Tenements	Shapelle McNee and Nathan McQuoid
		2008 Surveys	
11 – 18 Mar 2008	8	J1 significant species infrastructure survey no. 1	Shapelle McNee, Jill Symington, Lewis Trotter (Ben Eckermann and Helen Barwick 1 day)
18 – 19 Mar 2008	2	J1 vegetation mapping no. 9	Geoff Cockerton and Shapelle McNee
2 – 9 May 2008	8	J1 significant species infrastructure survey no. 2	Shapelle McNee, Lewis Trotter and Jill Symington

DATE	No. SURVEY DAYS	ACTIVITY	PERSONNEL
10 May 2008	1	J1 vegetation mapping no. 10	Geoff Cockerton and Shapelle McNee
27 – 30 May 2008	4	J1 significant species infrastructure survey no. 3	Shapelle McNee, Sharyn Burgess and Helen Barwick
2 Aug 2008	1	J1 significant species infrastructure survey no. 4	Shapelle McNee, Ben Eckermann and Sharyn Burgess
9 Sep 2008	1	J1 significant species infrastructure survey no. 5	Shapelle McNee and Abbey Majimbi
10 – 11 Sep 2008	2	Search for *Bossiaea* sp. Jackson Range (G Cockerton & S McNee 13614) (duricrust outcrops south of Western Jackson Range)	Sharyn Burgess and Abbey Majimbi
12 – 13 Sep 2008	2	J1 significant species infrastructure survey no. 5 continued	Shapelle McNee, Abbey Majimbi, Cheyne Jowett and Fiona Mayberry
15-18 Dec 2008	3	J1 vegetation mapping no. 11 and significant species survey	Shapelle McNee and Daniel Brassington
TOTAL No. days	**26**	**J1 vegetation mapping**	**54 person days**
TOTAL No. days	**10**	**J1 exploration program**	**15 person days**
TOTAL No. days	**24**	**J1 Mine Area intensive significant species search**	**77 person days**
TOTAL No. days	**10**	**J1 vegetation quadrats**	**34 person days**

APPENDIX 4

Flora Species List

FAMILY		FLORA SPECIES	CLASSIFICATION
7	Adiantaceae	*Cheilanthes distans*	
7	Adiantaceae	*Cheilanthes sieberi* ssp. *sieberi*	
18	Cupressaceae	*Callitris columellaris*	
31	Poaceae	*Amphipogon carcinus*	
31	Poaceae	*Aristida contorta*	
31	Poaceae	*Austrodanthonia caespitosa*	
31	Poaceae	*Austrodanthonia setacea*	
31	Poaceae	*Austrostipa blackii*	P3
31	Poaceae	*Austrostipa elegantissima*	
31	Poaceae	*Austrostipa nodosa*	
31	Poaceae	*Austrostipa platychaeta*	
31	Poaceae	*Austrostipa puberula*	
31	Poaceae	*Austrostipa scabra*	
31	Poaceae	*Austrostipa trichophylla*	
31	Poaceae	*Bromus madritensis* *	
31	Poaceae	*Brunonia australis*	
31	Poaceae	*Eragrostis dielsii*	
31	Poaceae	*Eriachne pulchella*	
31	Poaceae	*Monachather paradoxus*	
31	Poaceae	*Pentaschistis airoides?* *	
31	Poaceae	*Triodia scariosa*	
32	Cyperaceae	*Lepidosperma ferricola*	P1
32	Cyperaceae	*Lepidosperma jacksonense*	P1
54C	Dasypogonaceae	*Chamaexeros fimbriata*	
54E	Phormiaceae	*Dianella revoluta*	
54F	Anthericaceae	*Thysanotus manglesianus/patersonii*	
54F	Anthericaceae	*Thysanotus speckii*	
54F	Anthericaceae	*Xerolirion divaricata*	
54J	Colchicaceae	*Wurmbea densiflora*	
54J	Colchicaceae	*Wurmbea tenella*	
66	Orchidaceae	*Cyanicula amplexans*	
66	Orchidaceae	*Pterostylis* sp. Inland (A.C. Beauglehole 11880)	
70	Casuarinaceae	*Allocasuarina acutivalvis* ssp. *acutivalvis*	
70	Casuarinaceae	*Allocasuarina dielsiana*	
70	Casuarinaceae	*Allocasuarina eriochlamys* ssp. *eriochlamys*	
70	Casuarinaceae	*Casuarina pauper*	
90	Proteaceae	*Dryandra arborea*	
90	Proteaceae	*Grevillea acuaria* (Dagger-leaf form)	
90	Proteaceae	*Grevillea extorris*	
90	Proteaceae	*Grevillea nematophylla*	
90	Proteaceae	*Grevillea obliquistigma* ssp. *obliquistigma*	

FAMILY		FLORA SPECIES	CLASSIFICATION
90	Proteaceae	*Grevillea paradoxa*	
90	Proteaceae	*Hakea minyma*	
90	Proteaceae	*Hakea recurva* ssp. *arida / recurva*	
92	Santalaceae	*Exocarpos aphyllus*	
92	Santalaceae	*Santalum acuminatum*	
92	Santalaceae	*Santalum spicatum*	
97	Loranthaceae	*Amyema benthamii*	
97	Loranthaceae	*Amyema miquelii*	
105	Chenopodiaceae	*Atriplex bunburyana*	
105	Chenopodiaceae	*Atriplex nummularia*	
105	Chenopodiaceae	*Atriplex stipitata*	
105	Chenopodiaceae	*Atriplex vesicaria*	
105	Chenopodiaceae	*Atriplex bunburyana*	
105	Chenopodiaceae	*Dissocarpus paradoxus*	
105	Chenopodiaceae	*Enchylaena lanata*	
105	Chenopodiaceae	*Enchylaena tomentosa* var. *tomentosa*	
105	Chenopodiaceae	*Maireana carnosa*	
105	Chenopodiaceae	*Maireana georgei*	
105	Chenopodiaceae	*Maireana tomentosa* ssp. *tomentosa*	
105	Chenopodiaceae	*Maireana trichoptera*	
105	Chenopodiaceae	*Maireana triptera*	
105	Chenopodiaceae	*Rhagodia drummondii*	
105	Chenopodiaceae	*Sclerolaena cuneata*	
105	Chenopodiaceae	*Sclerolaena diacantha*	
105	Chenopodiaceae	*Sclerolaena drummondii*	
105	Chenopodiaceae	*Sclerolaena fusiformis*	
106	Amaranthaceae	*Ptilotus aervoides*	
106	Amaranthaceae	*Ptilotus carlsonii*	
106	Amaranthaceae	*Ptilotus divaricatus*	
106	Amaranthaceae	*Ptilotus drummondii*	
106	Amaranthaceae	*Ptilotus exaltatus*	
106	Amaranthaceae	*Ptilotus holosericeus*	
106	Amaranthaceae	*Ptilotus obovatus*	
110	Aizoaceae	*Gunniopsis intermedia*	
111	Portulacaceae	*Calandrinia* sp.	
111	Portulacaceae	*Calandrinia polyandra*	
131	Lauraceae	*Cassytha* sp. (LCS 13390)	
138	Brassicaceae	*Stenopetalum filifolium*	
143	Droseraceae	*Drosera* sp.	
143	Droseraceae	*Drosera macrantha*	
149	Crassulaceae	*Crassula* sp.	
152	Pittosporaceae	*Bursaria occidentalis*	
152	Pittosporaceae	*Cheiranthera filifolia* ssp. *filifolia*	

FAMILY		FLORA SPECIES	CLASSIFICATION
152	Pittosporaceae	*Pittosporum angustifolium*	
163	Mimosaceae	*Acacia acanthoclada* ssp. *glaucescens*	
163	Mimosaceae	*Acacia andrewsii*	
163	Mimosaceae	*Acacia aneura* broad flat phyllode twisted at tips	
163	Mimosaceae	*Acacia aneura* long flat narrow phyllode	
163	Mimosaceae	*Acacia aneura* mid-leaf short flat phyllode	
163	Mimosaceae	*Acacia cockertoniana*	
163	Mimosaceae	*Acacia colletioides*	
163	Mimosaceae	*Acacia effusifolia*	
163	Mimosaceae	*Acacia erinacea*	
163	Mimosaceae	*Acacia hemetelis*	
163	Mimosaceae	*Acacia prainii*	
163	Mimosaceae	*Acacia ramulosa* var. *ramulosa*	
163	Mimosaceae	*Acacia resinimarginea*	
163	Mimosaceae	*Acacia* sp Hybrid (*A.* sp. Mt Jackson (B Ryan 176) x *A. ramulosa*)	
163	Mimosaceae	*Acacia* sp. Mt Jackson (B Ryan 176)	
163	Mimosaceae	*Acacia* sp. narrow phyllode (BR Maslin 7831)	
163	Mimosaceae	*Acacia steedmanii*	
163	Mimosaceae	*Acacia tetragonophylla*	
164	Caesalpiniaceae	*Senna artemisioides* ssp. *filifolia*	
164	Caesalpiniaceae	*Senna pleurocarpa* var. *angustifolia*	
165	Papilionaceae	*Bossiaea* sp. Jackson Range (G Cockerton & S McNee 13614)	P1
165	Papilionaceae	*Bossiaea walkeri*	
165	Papilionaceae	*Daviesia benthamii* ssp. *acanthoclona*	
165	Papilionaceae	*Daviesia purpurascens*	P4
165	Papilionaceae	*Jacksonia jackson*	P1
165	Papilionaceae	*Medicago* sp. *	
165	Papilionaceae	*Mirbelia microphylla*	
165	Papilionaceae	*Templetonia sulcata*	
167	Geraniaceae	*Erodium cygnorum*	
173	Zygophyllaceae	*Zygophyllum apiculatum*	
173	Zygophyllaceae	*Zygophyllum eremaeum*	
173	Zygophyllaceae	*Zygophyllum iodocarpum*	
175	Rutaceae	*Phebalium canaliculatum*	
175	Rutaceae	*Phebalium lepidotum*	
175	Rutaceae	*Phebalium tuberculosum*	
175	Rutaceae	*Phebalium tuberculosum/laevigatum* intergrade	
175	Rutaceae	*Phebalium megaphyllum* (*Phebalium* sp. V TS leaf (G Cockerton & S McNee 13507) for vegetation quadrat analysis)	

FAMILY		FLORA SPECIES	CLASSIFICATION
175	Rutaceae	*Philotheca brucei* ssp. *brucei*	
175	Rutaceae	*Philotheca tomentella*	
175	Rutaceae	*Stenanthemum newbeyi*	P3
182	Tremandraceae	*Tetratheca harperi*	DRF
183	Polygalaceae	*Comesperma integerrimum*	
183	Polygalaceae	*Comesperma volubile*	
185	Euphorbiaceae	*Beyeria rostellata* (prev. *Beyeria* sp. Jackson Range (RJ Cranfield & P Spencer 7551))	P1
185	Euphorbiaceae	*Calycopeplus paucifolius*	
185	Euphorbiaceae	*Euphorbia drummondii*	
202	Stackhousiaceae	*Stackhousia muricata* ssp. annual (WR Barker 2172)	
207	Sapindaceae	*Dodonaea inaequifolia*	
207	Sapindaceae	*Dodonaea microzyga*	
207	Sapindaceae	*Dodonaea pinifolia*	
207	Sapindaceae	*Dodonaea rigida*	
207	Sapindaceae	*Dodonaea stenozyga*	
221	Malvaceae	*Abutilon cryptopetalum*	
221	Malvaceae	*Lawrencia repens*	
221	Malvaceae	*Sida calyxhymenia*	
221	Malvaceae	*Sida* sp. dark green fruits (S van Leeuwin 2260)	
221	Malvaceae	*Sida* sp. Golden calyces glabrous (HN Foote 32)	
223	Sterculiaceae	*Brachychiton gregorii*	
223	Sterculiaceae	*Hannafordia bissillii* ssp. *bissillii*	
223	Sterculiaceae	*Keraudrenia velutina* ssp. *velutina*	
226	Dilleniaceae	*Hibbertia eatoniae*	
226	Dilleniaceae	*Hibbertia* sp. *exasperata* group "scabrous leaf"	
243	Violaceae	*Hybanthus floribundus* ssp. *curvifolius* "filiform leaf"	
263	Thymelaeaceae	*Pimelea spiculigera* var. *thesioides*	
273	Myrtaceae	*Aluta appressa*	
273	Myrtaceae	*Baeckea elderiana*	
273	Myrtaceae	*Calothamnus gilseii*	
273	Myrtaceae	*Calytrix* sp. Paynes Find (F & J Hort 1188)	
273	Myrtaceae	*Eucalyptus celastrioides*	
273	Myrtaceae	*Eucalyptus corrugata*	
273	Myrtaceae	*Eucalyptus ebbanoensis* ssp. *ebbanoensis*	
273	Myrtaceae	*Eucalyptus ewartiana*	
273	Myrtaceae	*Eucalyptus formanii*	P4
273	Myrtaceae	*Eucalyptus kochii* ssp. *amaryssia*	
273	Myrtaceae	*Eucalyptus leptopoda* ssp. *leptopoda*	

FAMILY		FLORA SPECIES	CLASSIFICATION
273	Myrtaceae	*Eucalyptus longissima*	
273	Myrtaceae	*Eucalyptus loxophleba* ssp. *lissophloia*	
273	Myrtaceae	*Eucalyptus salmonophloia*	
273	Myrtaceae	*Eucalyptus salubris*	
273	Myrtaceae	*Eucalyptus dendrosheath* ms (*Eucalyptus* sp. Southern Goldfields (D Nicolle & M French DN 3652)	
273	Myrtaceae	*Eucalyptus transcontinentalis*	
273	Myrtaceae	*Eucalyptus yilgarnensis*	
273	Myrtaceae	*Leptospermum macgillivrayi*	P1
273	Myrtaceae	*Melaleuca hamata*	
273	Myrtaceae	*Melaleuca leiocarpa*	
273	Myrtaceae	*Rinzia carnosa*	
276	Haloragaceae	*Haloragis odontocarpa*	
276	Haloragaceae	*Haloragis trigonocarpa*	
288	Epacridaceae	*Leucopogon* sp. Clyde Hill (MA Burgman 1207)	
288	Epacridaceae	*Styphelia* sp. Bullfinch (M Hislop 3574)	
304	Apocynaceae	*Alyxia buxifolia*	
305	Asclepiadaceae	*Marsdenia australis*	
313	Lamiaceae	*Hemigenia* sp. Yalgoo (AM Ashby 2624)	
313	Lamiaceae	*Lachnostachys verbascifolia*	
313	Lamiaceae	*Prostanthera althoferi* ssp. *althoferi*	
313	Lamiaceae	*Prostanthera grylloana*	
313	Lamiaceae	*Prostanthera magnifica*	
313	Lamiaceae	*Spartothamnella* sp. Helena & Aurora Range (PG Armstrong 155-109)	P3
313	Lamiaceae	*Westringia cephalantha*	
315	Solanaceae	*Nicotiana occidentalis*	
315	Solanaceae	*Solanum ellipticum*	
315	Solanaceae	*Solanum lasiophyllum*	
315	Solanaceae	*Solanum nummularium*	
315	Solanaceae	*Solanum plicatile*	
326	Myoporaceae	*Eremophila alternifolia*	
326	Myoporaceae	*Eremophila caperata*	
326	Myoporaceae	*Eremophila clarkei*	
326	Myoporaceae	*Eremophila decipiens* ssp. *decipiens*	
326	Myoporaceae	*Eremophila eriocalyx*	
326	Myoporaceae	*Eremophila glabra*	
326	Myoporaceae	*Eremophila granitica* - lanceolate leaf form	
326	Myoporaceae	*Eremophila ionantha*	
326	Myoporaceae	*Eremophila latrobei* ssp. *latrobei*	
326	Myoporaceae	*Eremophila oldfieldii*	
326	Myoporaceae	*Eremophila oppositifolia*	

FAMILY		FLORA SPECIES	CLASSIFICATION
326	Myoporaceae	*Eremophila scoparia*	
326	Myoporaceae	*Eremophila serrulata*	
326	Myoporaceae	*Eremophila* sp. Mt Jackson (GJ Keighery 4372)	
329	Plantaginaceae	*Plantago drummondii*	
331	Rubiaceae	*Psydrax suaveolens*	
340	Lobeliaceae	*Lobelia* sp. small flowers (K.F. Kenneally 7705)	
341	Goodeniaceae	*Goodenia occidentalis*	
341	Goodeniaceae	*Goodenia pinnatifida*	
341	Goodeniaceae	*Velleia rosea*	
345	Asteraceae	*Actinobole* sp. (Q25/39)	
345	Asteraceae	*Angianthus* sp.	
345	Asteraceae	*Bellida graminea*	
345	Asteraceae	*Brachyscome iberidifolia*	
345	Asteraceae	*Calocephalus* sp.	
345	Asteraceae	*Calotis hispidula*	
345	Asteraceae	*Centaurea melitensis* *	
345	Asteraceae	*Cephalipterum drummondii*	
345	Asteraceae	*Erymophyllum ramosum*	
345	Asteraceae	*Lawrencella rosea*	
345	Asteraceae	*Millotia myosotidifolia*	
345	Asteraceae	*Olearia exiguifolia*	
345	Asteraceae	*Olearia humilis*	
345	Asteraceae	*Olearia muelleri*	
345	Asteraceae	*Olearia pimeleoides*	
345	Asteraceae	*Olearia stuartii*	
345	Asteraceae	*Podolepis canescens*	
345	Asteraceae	*Rhodanthe floribunda*	
345	Asteraceae	*Rhodanthe manglesii*	
345	Asteraceae	*Rhodanthe rubella*	
345	Asteraceae	*Rhodanthe* sp. *maryonii*	
345	Asteraceae	*Rhyncharrhena linearis*	
345	Asteraceae	*Scaevola spinescens* "narrow leaf form"	
345	Asteraceae	*Scaevola spinescens* "broad leaf form"	
345	Asteraceae	*Schoenia cassiniana*	
345	Asteraceae	*Schoenia filifolia*	
345	Asteraceae	*Trichanthodium skirrophorum*	
345	Asteraceae	*Vittadinia humerata*	
345	Asteraceae	*Waitzia acuminata* var. *acuminata*	

APPENDIX 5

Mt Jackson J1 Deposit Decommissioning and Rehabilitation Plan (Cliffs 2009g)

CLIFFS

KOOLYANOBBING IRON ORE PROJECT

MT JACKSON J1 DEPOSIT DECOMMISSIONING AND REHABILITATION PLAN

April 2009

Document History

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KOOLYANOBBING IRON ORE PROJECT

MT JACKSON J1 DEPOSIT

Decommissioning and Rehabilitation Plan

April 2009

1. Purpose of this Plan

Cliffs Asia Pacific Iron Ore Pty Ltd (Cliffs) operates the Mt Jackson J1 Deposit project as part of the Koolyanobbing Iron Ore Project. The Mt Jackson J1 Deposit project involves the construction and operation of an iron ore mine and haul road on the Mt Jackson Range in the Shire of Yilgarn, and includes the construction and operation of:

- a mine area, including
  - two mine pits;
  - one overburden landform;
  - materials stockpiles;
  - internal mine roads;
  - administration and operations buildings; and
- a haul road and gravel pit.

The regional location of the Mt Jackson J1 Deposit in relation to the Koolyanobbing Iron Ore Project is identified in Figure 1. An overview of the Mt Jackson J1 Deposit infrastructure and location is identified in Figure 2.

Decommissioning and rehabilitation are integral components of a mine lifecycle. The overarching intent of mine decommissioning and rehabilitation is to restore the mine area to a condition suitable for the future land use. Decommissioning and rehabilitation of the mine area will occur progressively during mine operations (e.g. constructed sections of the overburden landform) and post-mining.

Following the completion of mining at the Mt Jackson J1 Deposit, the mine area will be returned to its current pastoral use under the Mt Jackson Pastoral Lease (Government of Western Australia 1967). Accordingly, this Plan focuses on the actions of Cliffs to return the mine area to a condition suitable and safe for pastoral activities for long-term land management by the Pastoral Leaseholder.

For the purposes of this plan, decommissioning and rehabilitation have the following meaning and intent:

Decommissioning

- the removal of infrastructure that has no continued use;
- actions to make the site safe (including mine pit abandonment bunding); and
- remediation of potentially contaminated areas.

Rehabilitation

- the restoration of environmental values though a combination of actions that includes a combination of earthworks, seeding, planting, maintenance and/or monitoring.

As documented in Cliffs (2009a), the Mt Jackson Pastoral Lease provides habitat for native flora and fauna. Due to the low-intensity nature of the pastoral activities, native flora and fauna have coexisted within the Mt Jackson Pastoral Lease to date. Accordingly, this Plan for the Mt Jackson J1 Deposit project has a parallel focus of restoring the environmental values that are diminished by mine operations.

This Plan has been developed to meet Cliffs' environmental commitment made to implement the Decommissioning and Rehabilitation Plan (this document) as contained in the Environmental Impact Assessment (Public Environmental Review) for the Mt Jackson J1 Deposit (Cliffs 2009a). Cliffs' commitment stated:

Commitment 11

> ***11 Decommissioning and Rehabilitation Management***
> *11-1 Cliffs will implement the following plan for the management of decommissioning and rehabilitation during mine operations, decommissioning and rehabilitation:*
> *a. Mt Jackson J1 Deposit Decommissioning and Rehabilitation Plan (Cliffs 2009b; Appendix 5).*

This Plan will be integrated into Cliffs' Environmental Management System (EMS) which has been certified to the International Standards Organisation Standard 14001:2004. This Plan should also be read in conjunction with the following documents:

- *Environmental Impact Assessment (Public Environmental Review): Koolyanobbing Iron Ore Project Mt Jackson J1 Deposit* (Cliffs 2009a);
- *Northern Tenements Mining Environmental Management Plan* (Cliffs 2003);
- *Land Clearing Management Plan* (Cliffs 2009b);
- *Waste Management Plan* (Cliffs 2009c);
- *Weed Management Plan* (Cliffs 2009d); and
- *Topsoil Environmental Operating Procedure* (Cliffs 2006).

2. EPA Objectives

The Environmental Protection Authority (EPA) provides independent environmental advice to Government and establishing environmental policies, guidelines and objectives for environmental protection and management in Western Australia. The following EPA objectives (EPA 2004a) are relevant to decommissioning and rehabilitation of the Mt Jackson J1 Deposit operations:

Decommissioning

- *to ensure, as far as practicable, that rehabilitation achieves a stable and functioning landform which is consistent with the surrounding landscape and other environmental values.*

Land

- *to maintain the integrity, ecological functions and environmental values of the soil and landform.*

Flora

- *to maintain the abundance, diversity, geographic distribution and productivity of flora at species and ecosystem levels through the avoidance or management of adverse impacts and improvement of knowledge.*

Fauna

- *to maintain the abundance, diversity, geographic distribution and productivity of fauna at species and ecosystem levels through the avoidance or management of adverse impacts and improvement of knowledge.*

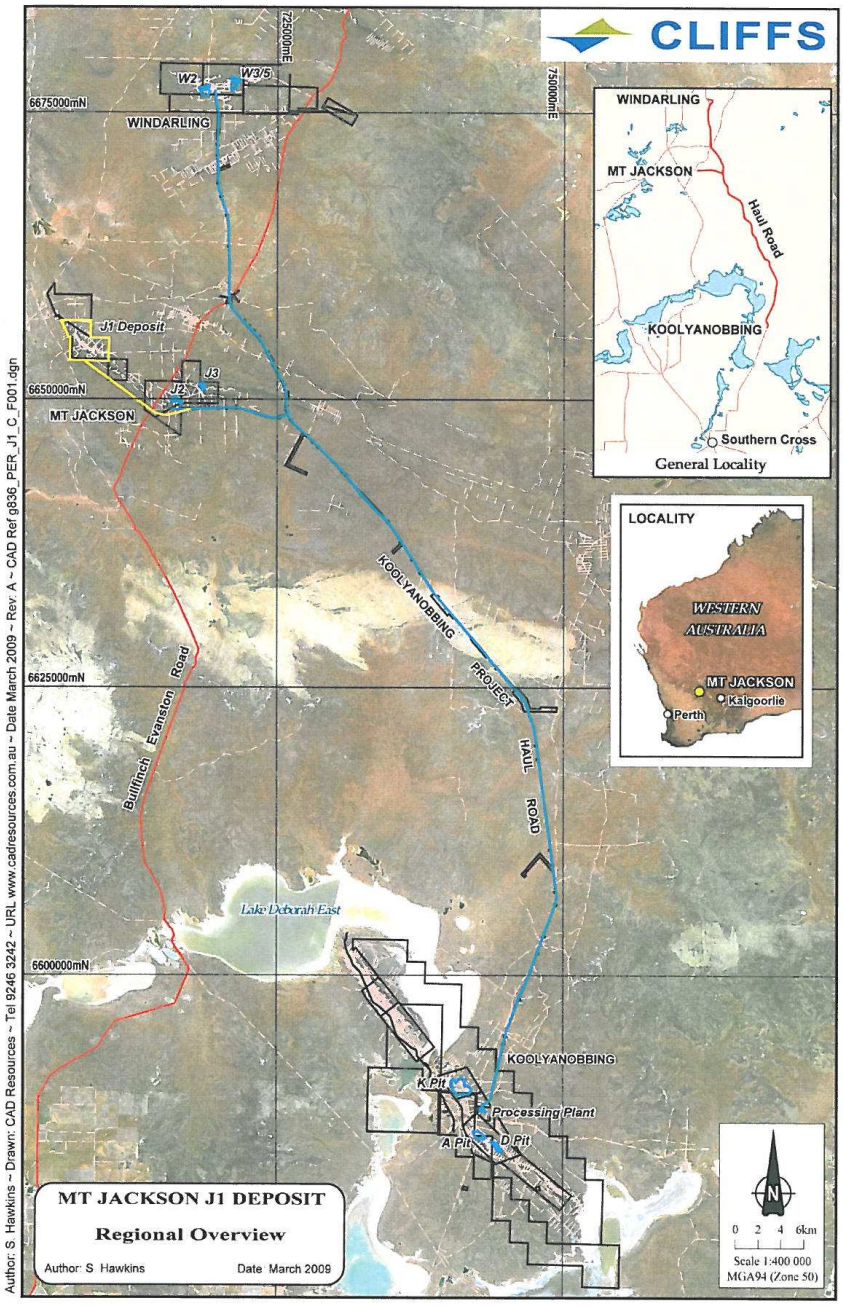

Figure 1. Regional Location of the Mt Jackson J1 Deposit proposal. The Mt Jackson J1 Deposit area is identified in yellow. The associated parts of the Koolyanobbing Iron Ore Project are identified in blue.

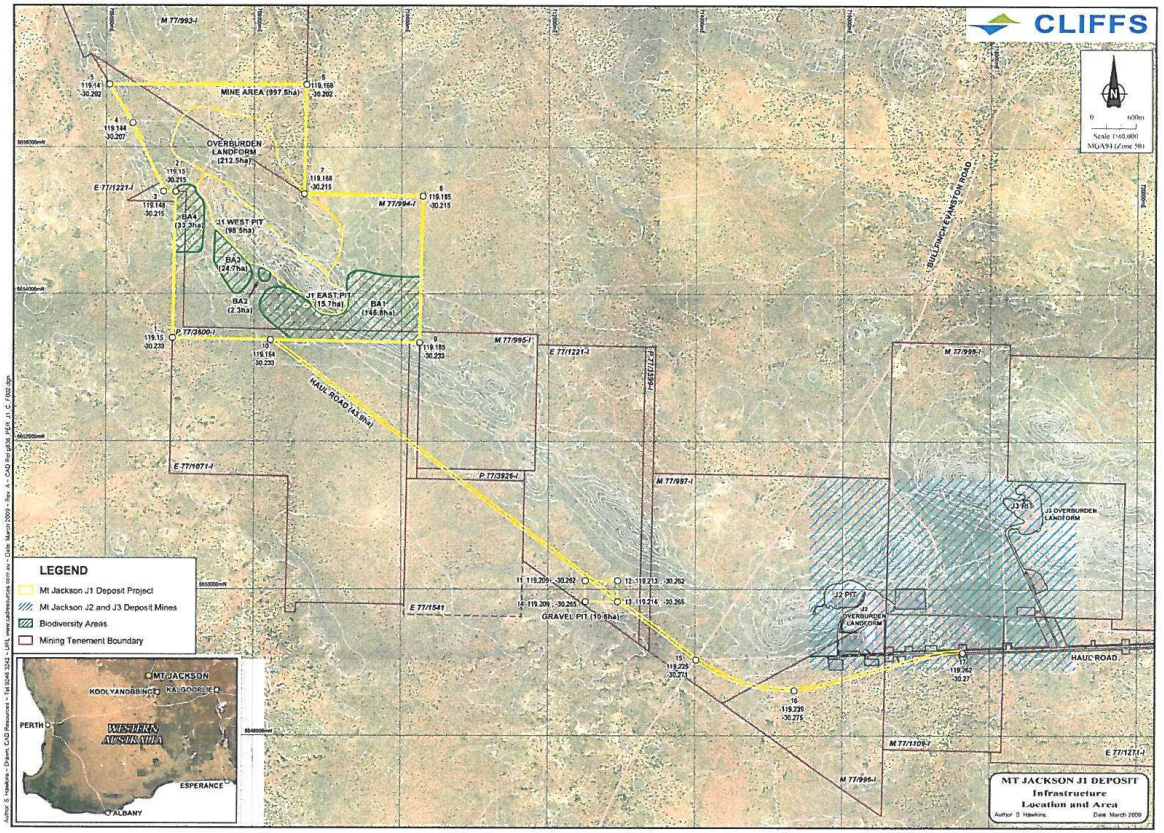

Figure 2. Overview of Mt Jackson J1 Deposit proposal locations and infrastructure. Note: The operational areas within the mine area are not specified.

3. Legislation, Standards and Guidelines

The following legislation, standards and guidelines are relevant to decommissioning and rehabilitation:

- *Environmental Protection Act 1986* (WA);
- *Mining Act 1978* (WA) and *Regulations 1981* (WA);
- *Contaminated Sites Act 2003* (WA);
- *Mines Safety and Inspection Act 1994* (WA) and *Regulations 1995* (WA);
- *Strategic Framework for Mine Closure* (Australian and New Zealand Minerals and Energy Council and the Australian Minerals Industry 2000);
- *Safety Bund Walls Around Abandoned Open Pit Mines – Guideline* (Department of Mines and Petroleum 1997);
- *Hydrogeological Record Series Report No. 9: Mine Void Water Resource Issues in Western Australia* (Department of Water 2003);
- *Mine Closure and Completion: Leading Practice Sustainable Development Program for the Mining Industry* (Department of Industry, Tourism and Resources 2006);
- *EPA Guidance Statement 6: Guidance for the Assessment of Environmental Factors – Rehabilitation of terrestrial ecosystems* (EPA 2006); and
- *Mt Jackson Pastoral Lease* (Government of Western Australia 1967).

4. Performance Indicators

Cliffs' performance indicators for decommissioning and rehabilitation for the Mt Jackson J1 Deposit proposal are:

Decommissioning

- Decommissioning leaves the mine area in a safe and stable condition for future pastoral landuse.

Rehabilitation

- Rehabilitation achieves a post-mining vegetation condition that will, in the future, likely support a self-sustaining native vegetation community that resembles the adjacent undisturbed vegetation as best as is practicable with the following attributes:
  - ≥ 20% projected foliar cover (excluding native annual species[1] and weed species);
  - ≥ 20 flora species (including native species, excluding weed species); and
  - ≤ 5% weed cover.

The rehabilitation performance indicators will be measured through representative 20m x 20m quadrats within rehabilitation areas. The rationale for the rehabilitation performance indicators is contained in Cliffs (2009a).

[1] Annual native flora species are excluded from the vegetation cover calculations due to the cover provided by annual species being seasonal and not permanent, however annual native flora species will be included in the species diversity calculations.

5. Management Actions

The following management actions will be undertaken for the decommissioning and rehabilitation of the Mt Jackson J1 Deposit proposal:

5.1 Topsoil Management and Seed Collection

a. Prior to land clearing and periodically during mine operations, seed collection will be undertaken within the mine area (and surrounding areas, if appropriate) to collect seed for rehabilitation works. The seed collection will have particular focus on collection of:
   i. *Bossiaea* sp. Jackson Range;
   ii. *Spartothamnella* sp. Helena & Aurora Range;
   iii. vegetation community EeWH1 *Eucalyptus ebbanoensis* Woodland over Heath with *Calytrix* sp. Paynes Find; and
   iv. other DEC-classified priority flora species (a listing which may change from time to time).

b. During land clearing activities for mine development, topsoil will be collected and managed in accordance with Environmental Operating Procedure EOP14 Topsoil Management. Topsoil from areas of *Bossiaea* sp. Jackson Range, *Spartothamnella* sp. Helena & Aurora Range, EeWH1 *Eucalyptus ebbanoensis* Woodland over Heath with *Calytrix* sp. Paynes Find, and other priority species, will each be stockpiled/stored separately with signs identifying their species/community origin.

5.2 Decommissioning:

a. Above ground infrastructure (such as buildings) that have no foreseeable use will be removed from the mine area for re-use, recycling or disposal (as appropriate). Above ground infrastructure that has a foreseeable use for pastoral activities will be retained onsite and left in a safe condition.

b. Buried infrastructure (such as telecommunications cabling and groundwater wells) will be left in-situ. Groundwater wells left in-situ will be capped or plugged to prevent trapping of fauna.

c. Mining equipment and supplies (such as mechanical equipment and parts, hydrocarbons, containers) will be removed from the mine area for re-use, recycling or disposal (as appropriate).

d. The haul road will be retained for future access within the pastoral lease for the Pastoral Leaseholder, excepting portions of the haul road at the Bullfinch-Evanston Road intersection where nominally 50m to the east and west of the intersection will be ripped and rehabilitated to obscure the haul road from public view to minimise inadvertent public access.

e. One internal mine access road will retained from the haul road to the mine pits and the overburden landform (including around the mine pits and overburden landform) to allow for ongoing monitoring, maintenance and rehabilitation works.

f. Areas within the mine area identified as potentially contaminated (such as hydrocarbon storage areas) will be investigated for contamination and remediated (as appropriate). Contaminated materials will be excavated and disposed of to the overburden landform where the contaminated material will be capped and isolated.

g. A continuous earthen abandonment bund of a minimum 2m height and with a base width of nominally 5m will be constructed around the J1 West Pit and J1 East Pit at a minimum distance of 80m from the edge of the J1 West Pit and a minimum distance of 60m from the J1 East Pit[1]. With regards to the J1 West Pit, an earthen abandonment bund will not be constructed where the overburden landform provides an equivalent physical barrier capable of preventing inadvertent access.

h. A continuous earthen bund of nominally 1m height will be constructed around the base of the overburden landform at a distance of nominally 20m from the base of the overburden landform. The earthen bund will seek to contain any turbid surface water run-off from the overburden landform that may occur prior to the establishment of sufficient vegetation cover. The bund will not be constructed for the section of the overburden landform boundary that is directly adjacent to the J1 West Pit.

5.3 Rehabilitation

a. Mine areas will subject to rehabilitation, excepting the areas of retained infrastructure (as identified above) and the mine pits[2].

b. Rehabilitation actions will include:
   i. Compacted areas will be ripped along the contour to a depth of nominally 300mm using machinery in order to improve the soil conditions for revegetation and surface water infiltration. The compacted areas to be ripped include internal mine roads, hardstand infrastructure areas (for stockpiles and buildings) and the overburden landform;
   ii. Topsoil material and cleared vegetation (including tree trunks) collected during land clearing will be evenly respread over all ripped areas to enable native seed stored in the topsoil to naturally regenerate, and to provide fauna habitat;
   iii. Topsoil collected during land clearing from areas of *Bossiaea* sp. Jackson Range, *Spartothamnella* sp. Helena & Aurora Range, vegetation community EeWH1 *Eucalyptus ebbanoensis* Woodland over Heath with *Calytrix* sp. Paynes Find, and other areas of DEC-classified priority flora, will occur within defined rehabilitation areas;
   iv. Seed collected prior to mining and periodically during mining will be evenly respread over all ripped areas to enable native seed stored in the topsoil to naturally regenerate. The seed will be mixed with a bulking agent (such as white sand) to ensure an even distribution of seed. Seed collected from *Bossiaea* sp. Jackson Range, *Spartothamnella* sp. Helena & Aurora Range, vegetation community EeWH1 *Eucalyptus ebbanoensis* Woodland over Heath with *Calytrix* sp. Paynes Find, and other areas of DEC-classified priority will be used in rehabilitation areas where the collected topsoil of these species/community was spread; and
   v. A slow-release fertiliser (of a low phosphorus content (e.g. Osmocote® PLUS Native Gardens brand)) will be applied following the spreading of topsoil and seeding, subject to consideration of the risk associated with weed germination.

[1] The abandonment bund height and width are as per DMP (1997). The abandonment bund setbacks have been calculated by DumpSolver Pty Ltd (2009) in accordance with DMP (1997) and apply to the centreline of the abandonment bund to the edge of the mine pit.

[2] Mine pits will not be rehabilitated due to their construction of consolidated (unbroken) rock being unsuitable for rehabilitation and in anticipation of mine pit wall collapse over time towards the earthen abandonment bund (which would result in rehabilitation within mine pits being temporary only).

5.4 Monitoring

a. Following the undertaking of decommissioning and rehabilitation works, the condition of the rehabilitation will be monitored annually until the performance indicators are achieved. This monitoring will include:
   i. recording of flora and vegetation within a minimum of 15 representative 20m x 20m quadrats by an appropriately qualified botanist, with measurement of:
      1. flora species diversity;
      2. projected foliar cover; and
      3. weed cover.
   ii. photographic recording of rehabilitated areas to provide a visual record of rehabilitation growth, with particular photographic recording of the quadrat areas from fixed photographic points;
   iii. an assessment of the safety and stability of rehabilitated areas (including erosion); and
   iv. a written report documenting:
      1. synthesis of data measured within the quadrats and the photographic recordings of the rehabilitation works;
      2. an assessment of the safety and stability of rehabilitated areas;
      3. the progress towards, or achievement of, the performance indicators; and
      4. recommendations for management actions to assist in achieving the performance indicators (if applicable).

5.5 Achievement of Performance Indicators

a. The performance indicators will be determined as 'achieved' where the performance indicators are met over 2 consecutive years.

b. As areas of the mine will be progressively decommissioned and rehabilitated, determination of areas achieving the performance indicators will also be identified in a progressive manner. Accordingly, decommissioned and rehabilitated areas will be identified into areas based on their progress (i.e. areas that meet the performance indicators and areas which do not meet the performance indicators).

c. Cliffs will progressively seek agreement from the relevant Government departments for release of rehabilitation bonds (where applied) for decommissioned and rehabilitated areas that meet the performance indicators.

5.6 Contingency Actions

a. If it is identified post-decommissioning that the management actions have not achieved the decommissioning or rehabilitation performance indicators, Cliffs will identify and implement appropriate actions or strategies to achieve the performance indicators. Such actions may include:
   i. review and further remediation of potentially contaminated areas;
   ii. re-seeding with native vegetation collected from the Mt Jackson Range;
   iii. planting of seedlings;
   iv. irrigation of rehabilitation areas (such as using water sprays or water carts); and/or
   v. importing alternative growth media.

b. If it is identified during decommissioning and rehabilitation that feral fauna populations of dingo/feral dog *Canis lupus,* goat *Capra hircus* or European red fox *Vulpes vulpes* have formed a significant population that is sustained by surface water within the J1 West Pit, Cliffs will install an exclusion fence around the perimeter of the J1 West Pit for the exclusion of feral fauna (dingo/feral dog *Canis lupus,* goat *Capra hircus* and European red fox *Vulpes vulpes*) from the surface water within the J1 West Pit. The exclusion fence will be:
   i. constructed of galvanised 'chainwire' mesh between galvanised metal posts;
   ii. of a total height of nominally 1800mm, of which nominally 200mm will be buried into the ground to prevent access underneath the fence; and
   iii. positioned at not less than nominally 80m from the pit edge.

c. If a fauna exclusion fence is required to be constructed in accordance with 5.6(b), Cliffs will also establish a fund to cover the full cost of installation, annual monitoring, annual maintenance and periodic replacement of the exclusion fence. The following conditions will apply to the fund:
   i. the capital value invested will be subject to the year the fund is established in accordance with the capital values contained in Appendix 1 (i.e. A$1,017,614 in year 2021, or A$1,070,327 in year 2022, etc)[1], however, should be subject to review based on the any changes to economic projections at that time (i.e. changes to capital or maintenance requirements, or projected interest or consumer price index);
   ii. the fund will only be used for costs directly connected to the installation, annual monitoring, annual maintenance and periodic replacement of the exclusion fence;
   iii. the fund will be established and retained with a recognised Australian financial institution;
   iv. interest earned will be retained within the fund for the continued growth of the fund in perpetuity; and
   v. the fund will be bound to the Mt Jackson Pastoral Lease, for transfer to future Pastoral Leaseholders to ensure funding for the annual monitoring, annual maintenance and periodic replacement of the exclusion fence in perpetuity.

d. If it is identified during decommissioning and rehabilitation that feral fauna populations of dingo/feral dog *Canis lupus,* goat *Capra hircus* or European red fox *Vulpes vulpes* have formed a significant population that is sustained by surface water within the J1 West Pit despite the installation of fauna exclusion fencing, Cliffs will:
   i. implement a feral fauna eradication program, with management actions that may include (but not necessarily limited to) baiting, trapping and/or culling;
   ii. monitor of feral fauna populations by means which include track counts, and number of individuals trapped and/or culled;
   iii. implement the fauna eradication program and monitoring annually until it is demonstrated that the feral fauna populations have decreased to a level comparable with other regional locations; and
   iv. repeat actions (i) to (iii) in the event(s) that the feral fauna populations re-establish.

[1] Capital of the fund will be dependent on the year in which the fund is established (refer columns 2 and 3 of Appendix 1). The calculations are considered a reliable method of predicting future costs of installation, maintenance and replacement and are based on current values adjusted to account for long-term predictions of interest and the consumer price index.