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Project Manager:	Justine Shales
Author(s):	Justine Shailes
Approved by:	
	Jeff Richardson
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EcOz Pty Ltd.
ABN: 81 143 989 039
Winlow House, 3rd Floor
75 Woods Street
DARWIN NT 0800
GPO Box 381, Darwin NT 0800



Telephone: +61 8 8981 1100
Facsimile: +61 8 8981 1102
Email: ecoz@ecoz.com.au
Internet: www.ecoz.com.au

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Executive Summary

Project overview

Sherwin Iron (NT) Pty Ltd (Sherwin) are seeking approval to mine within Mining Lease Application (MLA) 29584 in the Roper Gulf Shire of the Northern Territory. Sherwin plan to commence direct shipping ore (DSO) operations within the Sherwin Creek area (project area) known as Deposit C; this is called the Sherwin Creek Iron Ore Project (the project) and is the basis for this Environmental Impact Statement (EIS). Sherwin has interests in the area in addition to the currently proposed project, namely the Roper River Iron Ore Project which comprises six areas across three Exploration Leases (EL24101, EL24102 & EL26412).

The project is located in the Northern Territory 420 km south-east of Darwin and 150 km east of Mataranka via road. The project is linked to Darwin and Katherine by the Stuart Highway via the Roper Highway, which departs the Stuart Highway 10km South of Mataranka. The Roper Highway is a single lane sealed road, apart from the last 11km before the mine. The location of the project and additional exploration leases held by Sherwin is shown in Figure 0-1. Sherwin have submitted two additional MLA's for the 4.5 km haul road between the Roper Highway and run of mine (ROM) pad, and an area encompassing the accommodation village.

A decision was made to initially concentrate on the development of the high grade ore at Deposit C. The mineral resource estimate shows that there is a potential DSO resource in Deposit C of 18.2 Mt at 58.3%Fe. The life of the mine is expected to be six years.

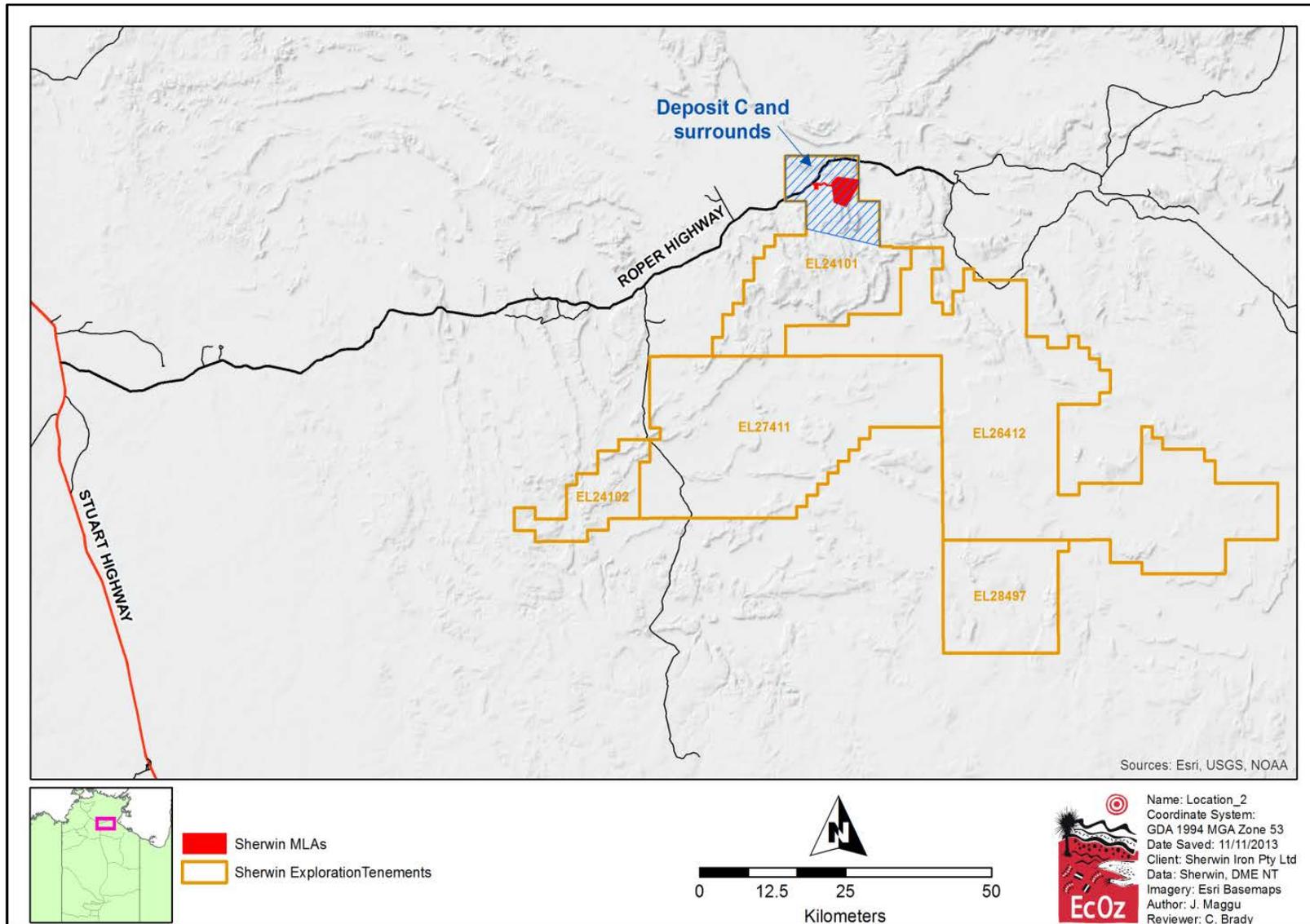


Figure 0-1. Map showing project location

Project justification and alternatives

The development of this project has seen the consideration of a range of project, and consequently environmental, alternatives. Project alternatives and options considered during the planning process and detailed further in Chapter 2 include:

- Not proceeding with the proposal
- Options for ore haulage and export including transport by road train to a rail siding, and then along rail to the Port of Darwin; transport by road train to a river head, and then transporting on a barge to a large shipping vessel; and transport by road train to the Port of Darwin.
- Site selection for mine components, to allow for the most efficient transport of ore, access to the mine and ore processing
- Mining methods and management of wastes, giving consideration to two principle alternatives for mining the ore: Standard drill and blast with dozer, excavator, and trucking; and continuous miner system with surface miner, loader, and trucking.
- Rehabilitation options to determine the most efficient and effective system to create a stable safe and sustainable ecosystem post mining. Alternatives within this method that required consideration included: Timing; placement of topsoil; placement of vegetation and seeds (through direct seeding or transplanting of seedlings); and depth of topsoil placement.
- Alternative sources of water giving consideration to pumping water direct from the Roper River; construction of a small earth dam in Sherwin Creek and creation of water dams (that could be internal, created through operations) to catch natural rainfall in the wet season, or the use of a groundwater source.
- Energy sources for power generation – two main options were considered: On-site power station or on-site power generators.
- Alternative processes available, two options were considered; whether crushing was to be undertaken on- or off-site
- Consideration of alternative environmental management measures for key risks/impacts.

The EIS process

This Environmental Impact Statement (EIS) provides the framework for considering the sustainability of environmental, social, cultural and economic impacts of the proposed mine in the context of legislative and policy requirements.

This report is the primary source of information for the government and the public to use to assess this project. The public will have the opportunity to review and provide comment to the Government during their assessment period. This EIS addresses the assessment Guidelines as proposed by the Australian and Northern Territory Governments (refer to Appendix A).

EIS scope

This EIS presents the results of a series of environmental, social and cultural assessments undertaken to generate baseline data and scope the impacts (positive and negative) and management implications for the proposed mine.

The main body of the EIS is structured into sections to conform to the Northern Territory Environmental Protection Authority (NTEPA) *Guidelines for the Preparation of an Environmental Impact Statement*. The guidelines have been attached as Appendix A. The Document Cross-reference (Appendix B) identifies where in the EIS document the relevant risks, requirements, assessment and management actions can be found.

Technical appendices providing detailed information on many aspects of the project are attached to the EIS as separate documents.

Specialist technical studies have been undertaken to support the development of the EIS including:

- Groundwater and surface water assessments and modelling
- Acid and metalliferous drainage assessments
- Fauna and flora surveys
- Aquatic survey
- Pest and weed assessments
- Social, economic and cultural assessments
- Traffic impact assessment
- Noise and dust monitoring
- Biting insect assessment
- Archaeological survey
- Soil survey
- Greenhouse gas emissions assessment

Public consultation

This EIS will be released for public comment. The process will be facilitated by the advertising of the public consultation process in the NT News, Katherine Times and The Australian Newspapers. Dates for submissions are included on the advertisements and available on the NTEPA website.

Copies of the document will also be made available on the NTEPA website, and a list of where hard copies are available is provided below:

- NT Environment Protection Authority, 2nd Floor, Darwin Plaza, 41 Smith Street Mall, Darwin
- Mines and Energy Information Centre, Department of Mines and Energy, 3rd Floor, Paspalis Centrepoint, 48 Smith Street Mall, Darwin
- Roper Gulf Shire office at Katherine (29 Crawford St)
- Northern Land Council, 45 Mitchell St, Darwin
- The Australian Government Department of Sustainability, Environment, Water, Population and Communities Library, John Gorton Building, Parkes, Canberra
- Northern Territory Library (NTL), Parliament House, Darwin.

Copies will also be made available at the following communities:

- Badawarrka
- Jilkminggan
- Minyerri
- Urapunga
- Ngukurr.

Project description

Sherwin intends to commence construction of required facilities and pre-strip of the proposed DSO pit immediately upon approval. This should allow for commencement of mining and crushing operations during the dry season of 2014, with 1.5 Mt of ore produced in 2014. Ore production rate will be increased to 2.0 Mtpa during 2014, increasing in successive years to a peak of 3.0 Mtpa in 2016/17. The operation is scheduled for completion of mining in 2019.

The high-grade iron ore suitable for DSO includes a combined Indicated DSO Resource of 40.9 Mt @ 57.8% iron (Fe) including Deposit C (18.2 Mt @ 58.3% Fe) and Deposits X and W (22.7 Mt @ 57.5% Fe).

For the development strategy of Deposit C within the Sherwin Creek Iron Ore Project, Sherwin has identified and optimised for three groups of deposits:

- HG (high-grade) ore at +57% Fe for DSO
- LG (low-grade) ore at +48% Fe, which can be beneficiated to 60% Fe product from current Metallurgical test work
- SG (sub-grade) at +40% Fe, which is currently not considered saleable.

In the initial stages, the project will involve the development of open pits to mine DSO at Sherwin Creek (Deposit C); the development of some infrastructure (workshops, office, laydown, magazine, drainage, etc.); an area for DSO stockpile at the mine (ROM); loading facility and stockpile at the Port of Darwin; sub-grade stockpile area and waste rock disposal area at the mine site; haul road between pit and stockpiles; service roads within the project; and accommodation village.

DSO will be mined, crushed, and stockpiled at a ROM stockpile, before it is transported by road train to the Port of Darwin. During mining, sub-grade ore will be mainly stockpiled while mine waste material will be used to construct roads, laydown area, and stockpile area. An out of pit waste dump will be built during the initial mining stages for each pit. However, as the pit progresses, in-pit waste dumps and stockpiles will be utilised to minimise the environmental footprint.

The DSO is to be transported by road train to Darwin. There is a 4.5 km access road from the operation to the Roper Highway, then 150 km along Roper Highway to the Stuart Highway near Mataranka, with a further 420 km to the Port of Darwin.

Infrastructure requirements

The mine camp is being established as part of the bulk sampling program is located approximately 3 km from the mine site and 0.8 km from the Roper Highway, adjacent to the mine access road. This area has been approved and cleared as part of the current bulk sampling operations.

The camp will accommodate a peak construction workforce of up to 150 personnel, and an operational workforce of approximately 100 personnel. The village will include supporting infrastructure including (but not limited to) offices, meeting room, sewerage storage and treatment, laundry, kitchen and sporting and recreational facilities.

Other infrastructure within the mining lease includes:

- An on-site landfill
- Bulk fuel storage
- Explosives storage
- Warehouse
- Administration office complex consisting of offices, meeting rooms, first aid and ablution facilities
- A sample preparation and laboratory facility

- Telecommunications.

Development schedule

The proposed development schedule is as follows.

Component	Timeframe
Proposed Construction Commencement	Early 2014
Proposed Operation Commencement	Q1 2014
Life of Mine	6 years
Estimated Year of Decommissioning	2019

Rehabilitation and decommissioning

Mined out areas will be filled to profile with waste and progressive rehabilitation carried out. Areas of the external waste dump not covered by the sub-grade stockpile will also be progressively rehabilitated.

Progressive in-pit dumping will produce a final landform with a surface near original topography for the majority of the pit area. The final stage of mining, at the northern end of the pit (scheduled for completion in 2019) will not be back-filled. Further information on the staging and timing of rehabilitation and mine closure is contained within Appendix J.

Topsoil stripped at the commencement of operations will be spread over the profiled in-pit and external waste dumps and over other disturbed areas as soon as practicable.

Re-vegetation (by direct seeding or transplanting of seedlings) will be carried out at the onset of the wet season allowing the prompt growth of native grasses to stabilise the topsoil and reduce wind and run-off erosion.

After final landforms have been created topsoil will be truck-dumped along the crest of the landform, for spreading over the face of the landform by dozer. The landform face will then be deep-ripped on contour, to prevent run-off along the rip-line during peak rain events. Deep-ripping will also provide a safe haven for seed stock.

The rehabilitated areas will be seeded with local native species. Local indigenous personnel will be consulted and engaged to carry out seed harvesting and seeding work. The skills, knowledge and operations of environmental and local indigenous personnel will be utilised for this re-vegetation.

Trials will commence in early rehabilitation areas to confirm that the material and methods proposed are suitable and effective.

A Draft Rehabilitation and Mine Closure Plan has been developed for Sherwin (refer to Appendix J). The draft plan is a preliminary document, developed to ensure that the rehabilitation and closure program is integrated into the mine plan and considered as part of the mining operation, rather than as a separate phase at the end of mine life.

Sherwin have identified that physical and financial resources will be provided to assist rehabilitation and closure, and the planning and studying of these activities from the beginning of operations.

Environmental considerations

The Roper River region experiences two distinct seasons, an almost dry rainless season from May to September and a wet season from November to March. Rainfall is concentrated during the wet season, with negligible rain during May to October. The wettest months are January and February with an average of 223 and 216 mm rain respectively. Temperatures range from an average maximum of 39.3 °C in November, to average minimum temperatures of 14.3 °C in July.

The average yearly evaporation greatly exceeds the average rainfall, which is typical for northern Australia. The Sherwin project occurs within areas subject to tropical cyclones. Typically, the cyclone period occurs from November to April. BoM predicts that the project may be exposed to between 0.1 and 0.2 tropical cyclones per year.

Prevailing winds are south-easterly during the dry season associated with high pressure cells in central Australia during that time. During the wet season, particularly December to early April, monsoonal weather from the northwest is more typical.

Project risk assessment

To fully understand the environmental risks that affect human health, the socio-cultural environment, and the natural environment from this development, a risk assessment process was developed and is presented in Chapter 3. The identification of risks was informed by the development of supporting technical documents prepared in support of this EIS.

Chapter 3 explores the human health, environmental, socio-economic and cultural risks of the project. The EIS Guidelines outline six key risks:

- Human health and safety
- Hydrology and water quality
- Terrestrial and aquatic biodiversity
- Rehabilitation and mine closure
- Aboriginal and historic cultural heritage
- Socio-economic.

A further key risk to transport was identified and included in the risk assessment.

Another six secondary risks (cumulative, bushfires, biting insects, noise and vibration, greenhouse gas and waste) were identified during the risk assessment process.

These risks were assessed in a risk management framework which was designed to delineate the effect of hazards on values and to quantify risk profiles for each hazard. Furthermore, this process quantifies the influence of mitigation measures.

This assessment found that most risks can be maintained with acceptable levels of consequence and likelihood with the mitigation measures outlined. Commitments to mitigate, manage and monitor risks are found in Appendix C.

Management of identified risks

For each key and secondary risk, a summary of the management/and or mitigation measure is included below. The Environmental Management Plan and subsidiary plans and documents provide greater detail. For each risk, it is assumed that relevant training and education will be provided to all personnel, contractors and visitors.

Key Risk	Management/Mitigation Summary
Human health and safety	<ul style="list-style-type: none"> - Food supplied by Sherwin Iron will be transported, stored and prepared in accordance with the NT <i>Food Act</i> and national Food Safety Standards. - Appropriate personal protective equipment and hygiene practices will be adhered to. - A water cart is to be used over high dust areas (e.g. internal haul road to ROM pad and around the mine site) and enforce speed limits on dirt tracks. - Noise reduction strategies and appropriate timing for blasting activities will be imposed. - Storage of hazardous materials in compliance with Australian Standards. - Treatment of potable water supplies. - Personnel education on avoidance of mosquito bites and other strategies as outlined in the Biting Insect Management Plan. - Staff training and inductions on potential wildlife hazards (e.g. snake bites). - Provision of fire safety and training. - Fitness for work policy. - Traffic and travel planning management. - Lighting as per AS1680 Interior Lighting and emergency lighting installed in accordance with the AS2293 Emergency Escape Lighting and Exit Signs for Buildings. - Australian Standards will be observed to when designing, installing and maintaining electrical systems.
Hydrology and water quality	<p>Hydrology</p> <ul style="list-style-type: none"> - Design and construction of creek crossings will incorporate appropriate engineering principles and natural flows will be maintained at all times. - Natural surface water flows will be maintained within the mine site area as far as practicable and where minor drainage diversions are required. - Surface water quality will not be affected by this development. - Proposed measures to manage any PAF materials that are encountered are outlined in Appendix G. - Monitoring and management of runoff will be undertaken in accordance with the Erosion and Sediment Control Plan (Appendix E) and Water Management Plan (Appendix F1). - Hazardous materials and wastes will be stored in appropriately labelled containers within purpose-built dangerous goods and chemical storage containers. Self-bunded, ventilated and compliant with AS1940-2004 Storage and Handling of Flammable and Combustible Liquids. - All sewage wastewater generated from the mine site and camp will be

	<p>treated to a high quality and recycled according to the Northern Territory Department of Health <i>Guidelines for Management of Recycled Water Systems</i> (2011).</p> <p>Groundwater</p> <ul style="list-style-type: none"> - All hydrocarbons and chemicals are to be stored in accordance with Australian Standard 1940: 2004 - PAF materials encountered during mining are to be stored/disposed of appropriately - Water quality parameters of bores supplying the camp will be measured against the Australian Drinking Water Guidelines (NHMRC/NRMMC 2011) - Water saving strategies will be implemented (i.e. minimise use, recycling of wastewater, use of polymers on roads to reduce requirements for dust suppression) - Operational controls for ground water exploitation will be set (i.e. sustainable safe yield, allowable drawdown and distance to zero drawdown)
Terrestrial and aquatic biodiversity	<p>Terrestrial</p> <ul style="list-style-type: none"> - Plan clearing so that vegetation removal is as minimal as possible. - Show clearing boundaries on maps. - Incorporate the commitments into the Mining Management Plan auditing process. - Enforced speed limits on the Roper Highway (80 km/h) with truck travelling in convoy. - Disturbance is to be retained within the approved clearing envelope and ensuring successful post-mining rehabilitation (Appendix J). - A Pest and Weed Management Plan (PWMP) will reduce the impact of pests and weeds on local biodiversity (through a reduction in habitat quality) (see Appendix I). <p>Aquatic</p> <ul style="list-style-type: none"> - Clearing of vegetation will not occur outside of Sherwin's approved boundaries. - Implementation of the Erosion and Sedimentation Plan (Appendix E). - Post-mining rehabilitation program as outlined in Appendix J.
Rehabilitation and mine closure	<p>It is intended that as much rehabilitation as possible will be undertaken progressively during the life of the mine.</p> <p>The draft RMCP (Appendix J) outlines strategies to mitigate the risk of rehabilitation failure including:</p> <ul style="list-style-type: none"> - Establishment of rigorous revegetation trials to refine best practice and maximise revegetation success. - Exclusion of fire from the progressively rehabilitated areas for a period of several years. - Establish quarantine and control measures in an attempt to maintain

	<p>the site as weed free.</p> <ul style="list-style-type: none"> – Erection of fences around the project area to exclude stock and feral animals. – Install erosion and sediment control measures to manage silt laden run-off during vegetation establishment. – Prevent impacts to surface and groundwater resources from potentially acid forming (PAF) materials. – Conduct ongoing monitoring and take corrective actions when necessary.
Aboriginal and historic cultural heritage	<ul style="list-style-type: none"> – Sherwin Iron will manage risk to Aboriginal sacred sites primarily through avoidance. – Grants of Authority Certificates that identify restricted work areas in the project area will ensure that all known Aboriginal sacred sites are identified and avoided. – Mining plans will be designed to ensure no ore is recovered from culturally sensitive or restricted areas and that no sacred sites will be directly impacted. – A Cultural Heritage Management Plan (CHMP) will be developed in consultation with the NLC and Aboriginal traditional owners to formalise these arrangements. A provisional CHMP can be found attached to this document (Appendix O3).
Socio-economic	<p>Management of socio-economic risk is primarily performed through the Social Impact Management Plan (SIMP), attached in Appendix K. It contains a series of four individual plans that link the identified key drivers of change (mining activities, population and influx) with the key interests identified through stakeholder consultations.</p> <p>The four plans are:</p> <ul style="list-style-type: none"> – Stakeholder Engagement Plan. – Community Cohesion and Safety Management Plan. – Community Development (Social Capital) Management Plan. – Community Development (Infrastructure) Management Plan.
Transport	<p>Ore will be secured in accordance with the Northern Territory Traffic Regulations, Australian Road Rules and the National Transport Commission's Load Restraint Guide.</p> <p>All drivers will have the appropriate licence, and are competent to operate assigned vehicles.</p> <p>Vehicles travelling along the Roper Highway will travel in convoys, and will have a lead vehicle to advise other road users of oncoming wide loads.</p> <p>Development of a Fatigue Management Plan for drivers.</p> <p>Drivers will be inducted, and trained with respect to the risks of fauna strike.</p> <p>Transport of dangerous goods will be in compliance with the <i>Transport of Dangerous Goods by Road and Rail (National Uniform Legislation) Act</i> and regulations.</p>

	<p>Sherwin Iron will install a weighbridge to ensure that no vehicles exceed their legal axle weight limit.</p> <p>Sherwin commits to upgrading the existing intersection between the Roper Highway and the Mine Site to the approval of the Department of Transport.</p> <p>Sherwin Iron and their contractors will only operate road trains during the period when the Roper Highway has non restricted opening of the road.</p> <p>Further mitigation measures are contained within Appendix L.</p>
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Impact offsets

Sherwin Iron is committed to developing a consultation process that will recognise all relevant stakeholders, so that a coordinated approach can be made to determine priorities for environmental offsets. Specifically this process will help to guide and rank the proposed Socio Cultural Offset Agreements.

In order to assess the options proposed for environmental offsets, Sherwin Iron has undertaken a comprehensive stakeholder consultation process as part of the environmental impact assessment process for the Sherwin Creek Iron Ore Project.

This initial consultation has resulted in the proposed Socio Cultural Offsets with Traditional Owners.

The intent of this offset program is to provide appropriate resources to mitigate the potential negative social and cultural impacts of mining. Specifically, Sherwin Iron is committed to respecting the legitimate rights and interests of Aboriginal people living in the area. Sherwin will provide resources for the development and maintenance of the following potential activities:

- Workforce development
- Business development
- Community investment

By making funds available for some or all of the above, Sherwin hopes to directly improve attitudes and overall way of life in communities that could be affected by the proposed development, and provide potential benefits far beyond the life of the mining activities.

This EIS formally begins the wider consultation aspect associated with informing all potential stakeholders of the proposed offsets and allowing informed comment and input.

Environmental Management Plan

The detail of the implementation of management of impacts is found in the Environmental Management Plan (Appendix D). The EMP specifically identifies management objectives and targets for all relevant environmental factors, and lists how monitoring and other actions can be used to minimise adverse impacts and maximise opportunities. The EMP identifies actions to result from non-compliance to assist in early identification of potential environmental harm and ensure that problems do not reoccur, as well as reporting and compliance auditing commitments.

Supporting the EMP is a number of subsidiary plans and documents including:

- Erosion and Sediment Control Plan
- Water Management Plan
- Groundwater Report
- AMD Assessment Report
- Terrestrial Fauna Report

- Flora Report
- Aquatic Fauna Report
- Pest and Weed Management Plan
- Rehabilitation and Mine Closure Plan
- Provisional Social Impact Management Plan
- Economic and Social Impact Assessment
- Stakeholder Consultation Report
- Traffic Management Plan
- Biting Insect Management Plan
- Archaeological Survey Report
- Cultural Heritage Management Plan
- Soil Survey Report
- Greenhouse Gas Emissions Report

Conclusions

One of the outcomes of the risk assessment and EMP planning processes are a suite of commitments (Appendix C) that Sherwin has obligated itself to meet to ensure that risks are mitigated to acceptable levels.

This EIS forms only part of the approvals process, which will result in additional commitments and recommendations from Government. Any company that proposes to undertake works that would cause “substantial disturbance” is required to have an Authorisation under the *Mining Management Act*. Consequently, Sherwin will be required to produce a Mining Management Plan (MMP) for approval prior to operations. The MMP will capture the commitments made through this EIS process and ensure that Sherwin continue to operate in an environmentally and culturally sensitive manner.