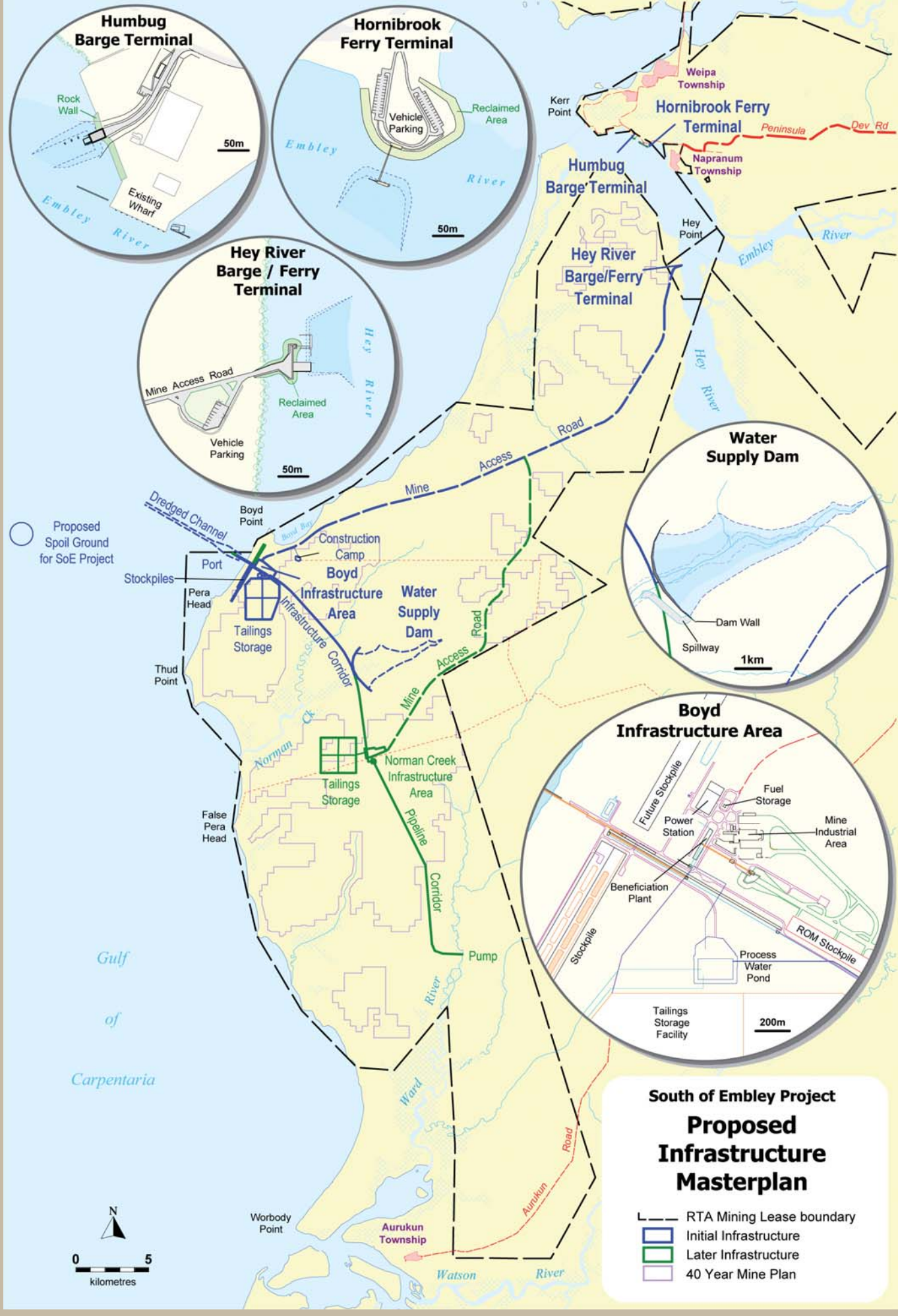
Rio Tinto Alcan

South of Embley Project

Environmental Impact Statement Summary

July 2011



Contents

Please be advised that this EIS summary may contain images of and/or reference to deceased persons.

RTA Weipa Pty Ltd, has submitted the South of Embley (SoE) Project Environmental Impact Statement (EIS) to the Queensland and Commonwealth Governments. The EIS contains details of environmental, social and economic assessments conducted for the Project, and identifies potential impacts and mitigation measures. This summary document has been prepared to assist interested stakeholders to understand the potential environmental, social and economic impacts of the Project and how Rio Tinto Alcan proposes to manage these.

South of Embley Project

Rio Tinto Alcan is currently mining the East Weipa and Andoom bauxite deposits located on Mining Lease ML 7024 north of the Embley River on the western side of Cape York Peninsula. Rio Tinto Alcan is also mining from the adjacent Ely bauxite deposit ML 7031. The current Rio Tinto Alcan Weipa operations employ approximately 871 full time employees and produced 18.6 million dry product tonnes (Mdpt) of bauxite in 2010.

The economic bauxite reserves are gradually depleting and with continuing demand for bauxite, Rio Tinto Alcan has undertaken extensive drilling programmes which have identified significant, economically mineable bauxite reserves south of the Embley River.

The SoE Project (the Project) consists of the construction and operation of a bauxite mine and associated processing facilities, barge and ferry terminals and a port. The Project involves a staged increase in production up to 50 million dry product tonnes per annum (Mdptpa). The initial production capacity is likely to be either 15 Mdptpa or 22.5 Mdptpa. The EIS has been prepared to assess the impacts of several different levels of production: a minimum of 15 Mdptpa, a maximum of 50 Mdptpa, and a nominal intermediate rate of 30 Mdptpa. The actual rates and timing of capacity expansions are subject to market conditions.

Project Proponent

The Project would be developed and operated by RTA Weipa Pty Ltd , which is a wholly-owned subsidiary of Rio Tinto Aluminium Limited. RTA Weipa Pty Ltd falls within the Rio Tinto Alcan product group, which is one of five product groups operated by the global mining group, Rio Tinto. Rio Tinto Alcan employs over 24,000 employees across six continents and in 27 countries. Rio Tinto Alcan's Bauxite & Alumina business is headquartered in Brisbane, Australia.

Rio Tinto Alcan has a record of responsible environmental management during 50 years of mining bauxite in the Weipa region. RTA Weipa Pty Ltd has not been the subject of any proceedings under a Commonwealth or State law for the protection of the environment. Rio Tinto Alcan has a Health, Safety and Environment Policy that includes commitments to minimise environmental impacts and continually monitor and improve the way the company works.

Traditional Lands

Rio Tinto Alcan Weipa mining leases are on Aboriginal land and neighbour the communities of Aurukun, Mapoon, Napranum and Weipa. Rio Tinto Alcan Weipa supports Native Title rights and undertakes its mining operations in consultation with the Traditional Owners of the region, ensuring that obligations established in land use agreements can be met.

Rio Tinto Alcan Weipa operates under two Indigeous agreements – the Western Cape Communities Co-existence Agreement (WCCCA) and the Ely Bauxite Mining Project Agreement (EBMPA). These agreements provide economic, education and employment benefits as well as cultural heritage support and formal consultation processes between the company and the Indigenous people of the region.

The Project is situated on the western side of the Cape York Peninsula on the Gulf of Carpentaria and is located on Mining Lease ML 7024 (the portion that is south of the Embley River), and on ML 6024.

The main elements of the Project are:

- bauxite mining;
- bauxite processing (beneficiation) at two beneficiation plants (Boyd beneficiation plant, followed by a second plant at Norman Creek industrial area) and disposal of fine waste material in tailings storage facilities;
- bauxite stockpiles;
- construction and operation of port and ship loading facilities between Boyd Point and Pera Head;
- supporting infrastructure including diesel-fuelled power station, workshops, warehouse, administration facilities, package sewage treatment plants and diesel storage;
- a water supply dam on a tributary of Norman Creek, a pump on the Ward River, pipelines, and up to 12 artesian bores;
- a temporary on site construction camp of up to 630 beds;
- construction and operation of a new ferry terminal at Hornibrook Point, a roll on/roll off (RORO) barge facility at Humbug Point, and a new barge/ferry terminal on the western bank of the Hey River, to transport workforce, materials and equipment between Weipa and the Project; and
- dredging for construction and maintenance of the port and ferry and barge terminals, and disposal of dredged sediment at an off-shore spoil ground.

Key Project Facts

Construction period	Approximately three years
Employment *Operations*	The current workforce would transition as existing mining areas are depleted. Employee numbers would range from 500 to 1200 people (including contractors) depending on production rates.
Mine life	Approximately 40 years (depending on production rates).
Local Government Authorities	ML 7024 lies within the Cook Shire local government area. No additional land tenures are required for the Project.

Construction would take place in stages, according to market demand for bauxite:

Initial Stage

- Construction of the mine, Boyd beneficiation plant, port and associated infrastructure to replace depleted production from the existing East Weipa Mine.

Subsequent Stages

- Construction of Norman Creek beneficiation plant, expansion of associated infrastructure and increase in mine production to replace Andoom production.

Government Approval Processes

The Project was declared *"a significant project for which an EIS is required"* under section 26 of the *State Development and Public Works Organisation Act 1971* by the Queensland Government in late 2008. In addition, the Commonwealth Minister for Sustainability, Environment, Water, Population and Communities, declared the Project a "controlled action" in October 2010. One EIS document has been produced for assessment by both the Commonwealth and the State.

LAND

Rio Tinto Alcan Weipa mining leases are on Aboriginal land and neighbour the communities of Aurukun, Mapoon, Napranum and Weipa. Rio Tinto Alcan Weipa supports Native Title rights and undertakes its mining operations in consultation with the Traditional Owners of the region, ensuring that obligations established in the land use agreements can be met.

Lands within the Project area are not used for agriculture and are relatively undisturbed by development. There is no "Good Quality Agricultural Land" within the Project area. The terrestrial environment is generally in good condition, however some areas have been affected by camping, recreational vehicle use, rubbish dumping, fires, and damage caused by feral pigs.

Likely Impacts

- Mining involves clearing vegetation, removing up to one metre of soil and overburden above the bauxite and then excavating the bauxite (which has an average thickness of 3.4 m).
- Areas proposed to be disturbed by the 40 year mine plan include 27,290 hectares (ha) for mining areas; 700 ha for a water supply dam; and 1,400 ha for Project infrastructure.
- The Project would not have a direct impact on agricultural land uses or management practices of surrounding land.

Mitigation and controls

- A range of erosion and sediment control measures would include restricting clearing to areas essential for mining, revegetating mined pits as soon as possible and undertaking mine clearing and development work during the dry season where possible.
- Vegetation buffers would provide "setback" distances between mining areas and sensitive riparian, wetland and estuarine vegetation types.
- Mine rehabilitation would be undertaken progressively during the life of the mine. Overburden would be returned to mined out pits and topsoil respread prior to seeding and fertilising.
- Rio Tinto Alcan's objective for the rehabilitation would be to establish a self sustaining vegetation community using appropriate local native tree, shrub and grass species.
- Final land use options would be developed and discussed in consultation with Traditional Owners and relevant government stakeholders.
- Rio Tinto Alcan would facilitate access to areas of cultural significance for Traditional Owners.
- Monitoring would be carried out to assess rehabilitation against success criteria. Rehabilitated land completion criteria will be developed in consultation with Traditional Owners.

CLIMATE

The Project area lies within the Australian Monsoon Zone and has a tropical climate with a distinct wet and dry season. The most significant impact of the climate on the Project relates to cyclones and flooding (wet season inundation of flood plains).

Likely Impacts

- Cyclones, along with the associated high winds and storm surges, present a risk to the safety of employees, the community and may potentially damage infrastructure and revegetation.
- The main impact of flooding on Project construction and operation relates to restricted vehicle access.

Mitigation and controls

- Risks to the safety of employees and the community would be managed by a detailed Business Resilience and Recovery Plan and specific cyclone emergency procedures.
- The height of the port and barge/ferry terminals has been designed to accommodate wave heights and storm surges resulting from cyclones.
- All infrastructure would be designed and constructed to the relevant Australian Standards to reduce the risk of structural damage caused by high speed winds from cyclones.
- The potential for flood damage to land based infrastructure (including dams) would be reduced by designing this infrastructure to appropriate flood design criteria.

WATER RESOURCES

The main catchments within the Project footprint are the Norman Creek, Ina Creek and the Ward River catchments. The groundwater resources in the area are both shallow aquifer and artesian aquifer resources. The shallow aquifers in the Project area tend to be poorly developed and discontinuous. The artesian resources are part of the Great Artesian Basin aquifers and capable of supporting a large rate of extraction.

Likely Impacts

- Analysis of ore from the Project, as well as tailings solids and liquid from existing Andoom and East Weipa operations, indicates that any runoff or leachate from ore and tailings is not anticipated to have an adverse effect on surface or groundwaters.
- Water is required for use in the beneficiation process, vehicle wash down, dust suppression and potable (drinkable) supplies. The Project's water requirements range from 16Gigalitres (GL)/year at 15 Mdptpa to 64GL/year at 50 Mdptpa.
- Water would be recycled from the tailings storage facilities and the mine infrastructure area and used preferentially as process water. Water would be drawn, in order of preference, from tailings storage facilities, mine infrastructure areas, water supply dam, and artesian bores. Supplementary water would be drawn from the Ward River.
- The water supply dam would reduce the average annual flow in the tributary immediately downstream of the dam by 12 - 50%, depending on production rate. However, when the Norman Creek catchment is considered as a whole, the overall decline (maximum of 15%) is well within the normal range of flow.
- Rio Tinto Alcan Weipa extracts up to 9GL per year of artesian groundwater under an existing Water Licence. Rio Tinto Alcan would apply to increase the allocation to a five year moving average of 12GL per annum with a peak extraction of 15GL in any one year.
- The potential impacts of artesian groundwater extraction were modelled and indicate the relative drawdown would be within the limits described in the existing Water Licence and the aquifer could sustainably support the proposed extraction rate.

Mitigation and controls

- The water quality of natural surface drainage systems would be maintained by preserving riparian vegetation corridors, by maintaining a buffer between mining areas and riparian areas; implementing erosion control measures and the proper handling and storage of dangerous goods and hazardous substances to prevent spills.
- Water would be recycled from tailings storage facilities, mine industrial area drainage slots, vehicle wash bays, stockpile and wharf stormwater runoff, and treated sewage effluent from treatment plants and used as process water.
- The water supply dam on a tributary of Norman Creek would be fitted with an outlet pipe to allow the controlled release of environmental flows and the spillway will be designed to facilitate fish passage when the spillway is overflowing.
- The annual volume of water pumped from the Ward River would be capped at 1% of average annual flow and the rate of pumping would be less than 20% of river flow rate at any time.
- A water monitoring programme is proposed to provide an early indicator of any potential water quality impacts.

MARINE

The most significant impacts on the marine environment from the Project would be due to the dredging required for construction and maintenance of the port and, to a lesser extent, for ferry and barge terminals.

Likely Impacts

- Up to 6,500,000m^3 of marine sediment would be dredged for construction of the port. This spoil would be transported to a new off shore spoil disposal ground approximately 17km west of Boyd Point. A further 2,400,000m^3 would be dredged when the wharf is extended when the Project expands above 30 Mdptpa. Annual maintenance dredging of up to 890,000m^3 is expected.
- Smaller volumes would be dredged at Hornibrook terminal (18,680m^3), Humbug terminal (10,670m^3) and Hey River terminal (17,300m^3) and disposed of at the existing Albatross Bay spoil ground. Assessment of the material to be dredged from the port and the barge/ferry terminals indicates all dredge spoil is suitable for sea disposal.
- Near shore fringing reef communities occur at Boyd Point, Pera Head and between Pera Head and Thud Point, but no reefs would be removed for dredging or wharf construction purposes.
- Seagrass in Albatross Bay provides habitat for fish, Dugongs and Green Turtles. Seagrass and mangroves are not present in the immediate vicinity of the port. Isolated patches of seagrass are located within the proposed dredge footprint at the Humbug barge terminal and a small area of mangroves (400m^2) would be cleared at the Hey River terminal. However, in both cases, this disturbance is a small proportion of the available habitat and would result in a minor impact.
- Dredging would generate temporary increases in the turbidity of water and deposition of sediment which can affect corals.
- Modelling has identified that dredging would reduce the area of favourable light conditions over hard coral habitat by 14% during some periods of dredging (up to 8 weeks). However, turbidity is expected to remain below maximum concentrations which occur naturally during cyclones.
- Small patches of sponge reef nearest the proposed port would experience deposition and some loss of habitat may occur which is likely to locally affect feeding preferences of marine turtles, however regional impacts are not predicted.

Example of feral pig disturbance on the beach north of Boyd Point.

Species Name	Status	Presence in Project area
Dugong	Vulnerable (Queensland *Nature Conservation Act 1992* (NC Act)) Migratory (Commonwealth *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act))	Occur in low densities in Albatross Bay and graze on seagrass beds in the Embley estuary.
Dolphins *Indo-pacific Humpback* *Australian Snubfin*	 Near threatened (NC Act), Migratory (EPBC Act) Near threatened (NC Act), Migratory (EPBC Act)	Known to frequent the proposed port area.
Marine turtles *Flatback* *Olive Ridley* *Hawksbill*	 Vulnerable (NC Act and EPBC Act), Migratory (EPBC Act) Endangered (NC Act and EPBC Act), Migratory (EPBC Act) Vulnerable (NC Act and EPBC Act), Migratory (EPBC Act)	Known to nest on beaches in vicinity of Project area and forage in surrounding waters.
Marine turtles *Loggerhead* *Leatherback* *Green*	 Endangered (NC Act and EPBC Act), Migratory (EPBC Act) Endangered (NC Act and EPBC Act), Migratory (EPBC Act) Vulnerable (NC Act and EPBC Act), Migratory (EPBC Act)	Forage in surrounding waters.
Fish, sharks and rays Including *Green Sawfish* *Dwarf Sawfish*	 Vulnerable (EPBC Act) Vulnerable (EPBC Act)	The Green and Dwarf sawfish were not encountered during surveys but are likely to occur in Project area.

- Piling to construct the port and barge/ferry terminals would result in underwater noise which can affect marine mammals and turtles. This is likely to result in temporary avoidance of the area by these species during piling.
- There could be localised impacts on recreational fishers, guided fishing tour operators and commercial fishers but there is still a large area in which these industries can continue to operate unimpeded.
- Without mitigation, lighting at the port could affect sea turtle hatchlings' attempts to find water.
- The marine species of conservation significance in the table above were identified in surveys or are likely to be found within the Project area.

Mitigation and controls

- Rio Tinto Alcan would implement a lighting plan at the port to reduce the risk of disorientation of turtle hatchlings.
- Rio Tinto Alcan would implement measures in consultation with Traditional Owners to reduce feral pigs (which feed on turtle nests) in the vicinity of the port. A sea turtle monitoring programme will confirm successful nesting.
- Ferries would travel in identified 'transit lanes' in deeper waters, avoiding seagrass meadows where possible, and would slow as they approach terminals, to reduce the risk of interaction with marine animals.
- The conveyor and ship loader would be designed and operated to minimise dust generation and spillage to the surrounding environment.
- Ballast water would be managed to reduce the risk of the introduction of pest species.
- An exclusion zone would be identified and normal pile driving would not be conducted while threatened marine fauna are present in the zone. A 'soft start' approach to piling would be adopted to encourage marine animals to move away.
- Hard corals would be monitored during dredging for construction of the Port, and if unacceptable impact to corals is detected, dredging operations would be reviewed to allow corals a period of respite.

TERRESTRIAL FLORA AND FAUNA

The Project area is relatively homogenous in vegetation and landform and is characterised by large areas of Darwin Stringybark *(Eucalyptus tetrodonta)* woodlands, dissected by smaller areas of riparian vegetation, vine thicket patches and paperbark swamps. Twenty seven Regional Ecosystems (REs) were identified in the Project area. Of these, three are listed as under the Queensland *Vegetation Management Act 1999* (VM Act) as 'of concern' and none are listed as 'endangered'. The *Eucalyptus tetrodonta* woodland Regional Ecosystem comprises approximately 86% of the Project area and is listed as 'least concern' under the VM Act. No ecological communities listed as 'endangered' under the EPBC Act are present in the Project area. There are no World Heritage Areas listed for northern Cape York Peninsula, although the Queensland Government is considering nominating Cape York Peninsula as a World Heritage Area. There are three protected areas on Cape York however none are located downstream or within the Project area.

Bauxite cliffs between Pera Head and Boyd Point

Likely Impacts

- Approximately 99% of the vegetation that would be disturbed as a result of the Project is Darwin Stringybark woodland (RE 3.5.2) which is classified as 'least concern' under the VM Act. The 28,970 ha of RE 3.5.2 proposed to be progressively disturbed over the 40 year mine life represents 33% of the area of this vegetation mapped in the Project area and 4.3% of the area of this vegetation mapped in the Weipa Plateau region.
- Only one Regional Ecosystem classified as 'of concern' (RE 3.2.6a) would be disturbed as a result of the Project. Total disturbance of RE 3.2.6a would be approximately 0.3ha, which is 0.2% of the area of this RE mapped in the Project area, and 0.1% of the area mapped in the Weipa Plateau region. The remaining disturbance would be to Regional Ecosystems that are classified as 'least concern'.
- Fauna diversity is concentrated in the non Darwin Stringybark habitat which together comprises approximately 1% of the area that would be disturbed by the Project. The table below details flora and fauna species of conservation significance identified in surveys or are likely to be found in the Project area.

Mitigation and controls

- An environmental buffer system would establish set back distances between sensitive vegetation (riparian, wetland, estuarine, vine forest and coastal vegetation) and mining activity. Sensitive vegetation would be buffered by Darwin Stringybark woodland and would exceed the minimum requirements of the Queensland Government's Regional Vegetation Management Code.
- Mining would be avoided in areas of non-Darwin Stringyback vegetation and clearing activity restricted to the minimum required for the safe operation of mining equipment and infrastructure.
- Fire, weed and feral animal management programmes would be developed in consultation with Traditional Owners and implemented to enhance habitat values in some undisturbed areas.

Species Name	Status	Presence in Project area	Likely Impact of Project
Cooktown Orchid	Vulnerable (EPBC Act and NC Act)	Confirmed	Disturbance associated with the water supply dam and other infrastructure represents a minor proportion of habitat in the Project area. The remaining habitat would be protected from mining by a buffer of Darwin Stringyback forest.
Chocolate Tea Tree Orchid	Vulnerable (EPBC Act and NC Act)	Confirmed	
Beach Nightshade	Vulnerable (EPBC Act and NC Act)	Likely	It is highly unlikely populations of this plant would occur in areas subject to mining operations or infrastructure development within the Project area.
Palm Cockatoo	Near threatened (NC Act)	Confirmed	Potential short term impact on breeding of some pairs during construction of the water supply dam but other areas suitable for foraging and nesting, that would not be disturbed, occur throughout the Project area.
Rufous Owl	Near threatened (NC Act)	Confirmed	Some loss of habitat for construction of the water supply dam but other areas of suitable habitat, that would not be disturbed, occur throughout the Project area.
Estuarine Crocodile	Near threatened (NC Act), Migratory (EPBC Act)	Confirmed	Foraging and nesting habitat for the Estuarine Crocodile occurs within the footprint of the water supply dam but the Project is not expected to interfere with breeding in the region.
Black Necked Stork	Near threatened (NC Act)	Confirmed	Project related disturbances would not detrimentally affect preferred habitats.
Beach Stone Curlew	Vulnerable (NC Act)	Confirmed	The Hey River ferry terminal area supports the species but habitat would not be substantially affected.
Square-tailed Kite	Near threatened (NC Act)	Likely	The species was not located during targeted surveys. Sufficient habitat would remain to sustain the species in the area.
Eastern Curlew	Near threatened (NC Act), Migratory (EPBC Act)	Confirmed	The preferred intertidal habitat of this species would not be affected by mining or infrastructure development, apart from minimal disturbance associated with the proposed port and Hey River ferry / barge terminal.
Little Tern	Endangered, Migratory (EPBC Act)	Confirmed	There are no important breeding areas, and limited potential breeding habitats in the Project area. The species is likely to forage in coastal and estuary areas.
Migratory Birds (20 other species)	Migratory species (EPBC Act)	Confirmed or likely	The migratory species confirmed as present or likely to occur within the Project area predominantly utilise habitats that would be located within environmental buffers and not directly affected by mining.
Radjah Shelduck	Near threatened (NC Act)	Confirmed	The preferred habitat of this species would not be affected by mining.
Papuan Sheath-tail Bat	Near threatened (NC Act)	Likely	This species was not confirmed during surveys, however it is considered likely to occur. Areas of habitat would be disturbed, however sufficient habitat would remain to sustain the species in the area.
Antairoserpens warro (a burrowing snake)	Near threatened (NC Act)	Likely	Areas of habitat would be disturbed, although targeted surveys did not locate the species.

AQUATIC ECOLOGY

Aquatic ecosystems within the Project area include creeks, swamps, lagoons, channels, lakes and estuaries. The systems are a mix of perennial and seasonal systems, some of which are interconnected with the groundwater system and have environmental values of national, state and regional significance. The lower Ward River is part of a nationally significant wetland area listed in the Directory of Important Wetlands.

Surveys of the Project area found:

- A total of 45 fish species.
- Six species of crustacean. Of these, one species of freshwater crab was assessed by the Queensland Museum as possibly a new species. One specimen of Mysid (shrimp) crustacean was identified by the Queensland Museum and has not previously been recorded in Australia. These species are unlikely to be significantly impacted by the Project.
- No 'endangered', 'vulnerable' or 'near threatened' aquatic species listed under the NC Act or the EPBC Act were confirmed as present within the Project area.
- Four species (the Freshwater, Dwarf and Green Sawfish and the Speartooth Shark) listed as threatened species under the EPBC Act, were identified as likely to be present in the estaurine or lowermost freshwater reaches within the Project area.

Likely Impacts

- Other than the proposed water supply dam on a tributary of Norman Creek, the direct disturbance footprint of proposed mining and infrastructure development occurs primarily within terrestrial ecosystems.
- The primary impact on aquatic ecology arises from the water supply dam. The dam would act as a barrier to fish travelling up and downstream.
- Downstream of the dam there is potential for change to stream landforms, greater seasonal variability in lagoons and pools, fewer aquatic plants, and changes to flow timing. There is also the potential of water quality impacts if dam seepage occurs and changes in salinity at the interface with the estuary. Any of these potential changes would be confined downstream of the water supply dam.

Mitigation and controls

- The spillway of the water supply dam would be designed to facilitate fish passage during spillway flow events.
- Environmental flows would be released in the driest months (August to October) from the dam if there is natural inflow. Flow rates will be monitored upstream and downstream.
- An environmental buffer system would ensure riparian, wetland and estuarine habitats are buffered from direct impacts associated with vegetation clearing other than where they occur within narrow infrastructure and access corridors that cross drainage lines or in the footprint of the dam.
- Drainage would be managed during mining operations to minimise creation of sediment.
- A monitoring regime would include aquatic faunal communities and water quality.

AIR QUALITY

Potential sources of particulate emissions from the envi
proposed mine primarily comprise unsealed roads, smo
Rio Tinto Alcan mining activity north of the Embley Riv
The nearest sensitive receptors to the Project site are the
(4km from closest mining areas) and Aurukun (15km fro

Likely Impacts

The predicted concentrations of particulate matter (dust), nitrogen dioxide and sulphur dioxide at sensitive receptors were modelled and all concentrations at these locations comply with air quality objectives described in the *Queensland Environmental Protection (Air) Policy 2008* (EPP (Air)).

	Predicted levels (including Project)	Recommended Criterion
*PM_{10}	27µg/m^3	50µg/m^3 (averaged over 24 hours)
*$PM_{2.5}$	10µg/m^3	25µg/m^3 (averaged over 24 hours)
#Total Suspended Particulates	23µg/m^3	90µg/m^3 (averaged over one year)
^Dust deposition levels	52mg/m^2 /day	120mg/m^2/day (averaged over 1 month)
Nitrogen dioxide (NO_2)	52 parts per billion (ppb) (averaged over 1 hour)	120ppb (averaged over 1 hour)
Sulphur dioxide (SO_2)	3ppb (averaged over 1 day)	80ppb (averaged over 1 day)

* The diameter of dust is measured in microns. One micron is one millionth of a metre. PM_{10} are particles smaller than 10 microns (0.01 millimetre) in diameter (smaller than one seventh of a hair width) and $PM_{2.5}$ particles are smaller than 2.5 microns (0.0025 millimetres) in diameter.

#Total Suspended Particulates refers to the total of all particles suspended in the air. The largest of these particles is barely half the width of a human hair.

^Dust deposition is any dust that falls out of suspension in the atmosphere.

onment surrounding the
ke from bushfires, existing
er, and cattle station activities.
e townships of Weipa, Napranum
m closest mining areas).

An inventory of project greenhouse gas emissions identified the primary sources of greenhouse gas emissions as the on site diesel fired power station, heavy vehicle transport, and vegetation clearing prior to mining.

	15 Mdptpa	30 Mdptpa	50 Mdptpa
Total greenhouse gas emissions (kilo tonnes of carbon dioxide equivalents (CO_2-e) per annum)	182	319	508
Greenhouse gas intensity (tonnes CO_2-e per tonne of bauxite)	0.0121	0.0106	0. 0102

By comparison, greenhouse gas intensity at Rio Tinto Alcan's current Weipa mining operations averaged 0.026 t CO_2-e/t bauxite from 2007 – 2009.

Mitigation and controls

- Apart from conventional haul road watering and dust suppression sprays (for example at truck dump chutes), no special dust mitigation measures are required.
- Rio Tinto Alcan aims to progressively reduce the greenhouse gas emission intensity of its operations and increase energy efficiency through design considerations, awareness training, efficient operation and maintenance of equipment and regular auditing.

NOISE AND VIBRATION

The residential areas along the Embley River (Napranum and the accommodation areas in Evans Landing) would be the nearest communities to the Project area. During the construction phase, the most significant noise sources would be the construction of the proposed port, infrastructure area and the ferry and barge terminals. During mining, noise sources would include mine haul trucks, front end loaders, beneficiation plant, power station, conveyors and port operations.

Likely Impacts

- There is unlikely to be significant impact to sensitive human receptors from construction activities due to the distance of these activities from residential areas. For example, Napranum, Nanum and Weipa are approximately 40km from the Boyd infrastructure area and proposed port, and Aurukun is approximately 35km from the Norman Creek infrastructure area.
- Noise modelling was conducted for the 50 Mdptpa production scenario (which is likely to produce the highest noise levels during operations) for typically adverse weather conditions. The modelling demonstrated that operational noise levels during operations from mining and barge/ferry operations, including low frequency noise levels, are expected to comply with all proposed noise level objectives in Weipa, Napranum and Aurukun during the day, evening, night, and night with wind.
- It is anticipated that underwater noise generated by piling would temporarily deter most turtles and marine mammals from the immediate area and therefore avoid physical damage.
- Blasting is not proposed, and therefore there would be no impact from blasting noise, ground vibration, or flyrock.

Noise levels from Project predicted at Napranum

	Predicted noise levels $L_{Aeq,adj1hr}$ (dB(A)) (barge/ferry and mining)	Recommended criterion $L_{Aeq,adj1hr}$ (dB(A))
Day	32	46
Evening	33	43
Night	35	43
Night with wind	33	43

Mitigation and controls

- A noise monitoring campaign would be conducted when operations begin to validate the noise model. Where noise levels exceed noise limits, action will be taken to reduce noise levels.
- A "soft start" approach to piling would be adopted to encourage marine animals to move away.
- An exclusion zone would be identified and normal pile driving would not be conducted while threatened marine fauna are present in the zone.

CULTURAL HERITAGE

The Western Cape Communities Co-Existence Agreement (WCCCA) is a registered Indigenous Land Use Agreement (ILUA) between Traditional Owners, Councils, Cape York Land Council, Rio Tinto Alcan and the Queensland Government. The WCCCA provides for a system of cultural heritage management over the Project area.

Six archaeological surveys have been completed and documented 538 scarred trees, 23 surface stone artefact scatters (with a total of 43 artefacts), and 111 shell middens. Previous anthropological fieldwork identified 15 places of cultural significance to Traditional Owners (ethnographic sites).

There are no registered non Indigenous heritage sites located within the Project area however archaeological surveys identified seven non Indigenous heritage sites, largely associated with early exploration drilling for bauxite in the 1950s and 1960s. The sites include a disused air strip, sawn log crossings of creeks and remnants of drilling camps, and all have low local significance.

Likely Impacts

- Results of archaeological surveys indicate 82.5% of scarred trees, 88.4% of stone artefacts and 100% of shell middens and ethnographic sites are located outside of the proposed infrastructure footprint and would not be affected by the Project.
- The majority of known places of cultural heritage significance are outside of future mining areas, although at times access to some of these places may be affected by mine development for safety reasons.

Mitigation and controls

- Measures to mitigate impacts on Indigenous cultural heritage sites would be developed in consultation with Traditional Owners.
- Rio Tinto Alcan would facilitate access to areas of cultural significance for Traditional Owners as required.
- A scope and agreed timeframe for the development of a Communities, Heritage and Environmental Management Plan would be developed, in consultation with Traditional Owners, for the long term management of land access, fire, flora and fauna, signage, weeds, environmental monitoring and ongoing management of places of cultural heritage significance.
- The discovery of previously unidentified heritage sites during mining activity would be managed in consultation with the relevant Traditional Owners.

VISUAL AMENITY

The Project is situated in a remote location and is not easily accessible from surrounding communities. There are no gazetted public roads or permanent residences in the Project area and the nearest communities are located away from the main Project components.

Likely Impacts

- Although the port infrastructure would be directly visible from vessels using Gulf of Carpentaria waters the visual impacts would be low, owing to the height of the natural cliffs and vegetation and the transitory nature of visits to the area.
- Visual impacts of the stockpile, plant and mining areas are considered to be low due their distance from the coastline, vegetation buffers and the lack of visual receptors.
- The infrastructure at the barge/ferry terminals would all be below the height of the natural vegetation.
- Lights on the port would be visually prominent. They would not be visible from Weipa or Aurukun, but lighting could disorient turtle hatchlings.

Mitigation and controls

- The jetty, wharf and ship loaders would be painted in a colour that minimises visual impacts while adhering to marine safety standards.
- Rio Tinto Alcan would implement a lighting plan at the port to reduce the risk of turtle hatchlings getting disoriented.

Norman Kerindun and Henry Kelinda participated in cultural heritage surveys of the Project site.

WASTE

The Project's waste management strategies aim to minimise environmental harm at all stages of Project development, operation and decommissioning. In general, all waste streams will be assessed for potential reuse, and if a reuse option is not available, waste will be transported to a licensed disposal facility by a licensed waste transporter.

Likely Impacts

The major sources of waste generated from the Project and the proposed management of each waste type are described below:

Waste type	Source	Management
Tailings	Beneficiation plants	Tailings would be stored in tailings storage facilities constructed on mined areas near the Boyd and Norman Creek beneficiation plants. Geochemical analysis indicates the tailings are not hazardous.
Green waste	Clearing of vegetation ahead of mining	Consideration would be given to the selective extraction of structural grade timber prior to mining, where practicable and where the timber can be beneficially used. The cleared vegetation would be pushed into windrows and burnt.
Dredged material	Construction and maintenance of port and ferry/barge facilities	Disposal of dredged material from the port would be at a new off-shore spoil ground. Material dredged to construct barge and ferry facilities would be disposed of at the existing Albatross Bay spoil ground.
General waste Food scraps, paper, plastic, rags, cans and glass.	Construction offices and construction camp	General waste would be collected regularly and transported off the Project area to the licensed Weipa Waste Management Facility at Evans Landing. Recyclables would be recycled where feasible.
Regulated waste Hydrocarbon waste, detergents, solvents, batteries and tyres.	Maintenance workshops, vehicle washdown, conveyor, site infrastructure, chemical storage area and laboratory	Regulated waste would be removed from site for treatment and/or disposal by a licensed regulated waste contractor. Heavy vehicle tyres would be retreaded where feasible to maximize use prior to ultimate disposal.
Scrap metal	Ferry/barge facilities, mine infrastructure and construction camp. Mine plant, including administration, workshops	Recycled off site by third parties where feasible.
Sewage effluent and sludge	Infrastructure areas and construction camp	Sewage treatment plants would be operated to treat water to meet Class A Recycled Water quality. The construction camp treated effluent would be recycled for dust suppression, landscape watering or other appropriate uses. Treated effluent from infrastructure areas would be re-used in the beneficiation plant.
Shipping waste	Australian and overseas shipping vessels	Most ships visiting the proposed port would have onboard incinerators and sewage treatment plants. If required, Rio Tinto Alcan would remove waste for appropriate treatment and disposal in accordance with any relevant Australian Quarantine and Inspection Services requirements.
Ballast water	Bulk carrier vessels	All vessels owned and contracted by Rio Tinto would manage ballast water through a Ballast Water Management Plan which would comply with the Australian mandatory requirements and the *International Convention for the Control and Management of Ships' Ballast Water and Sediments.*

Mitigation and controls

- Waste generated by the Project during the construction, operation and decommissioning phases would be minimised through waste characterisation and separation; assessment of waste reduction opportunities; and management of waste in accordance with the waste minimisation hierarchy.
- General and regulated waste would be removed from the Project area and managed in accordance with regulatory requirements.

TRANSPORT

The transport network in the vicinity of the Project is largely undeveloped, with vehicle access restricted to minor tracks. Current road access to the site is from the Peninsula Developmental Road (PDR) via Aurukun Road, Beagle Camp Access Road, Pera Head Access Road, and the Amban Access Road.

Likely Impacts

- The predicted impact on the PDR and Kennedy Highway before construction of the new Mine Access Road is negligible.
- A 25% increase in traffic for the Aurukun Road is predicted during the construction phase, however traffic on this road is expected to remain at very low levels.
- The following roads would experience an increase in pavement impacts of more than 5% during some stages of the Project:
  - the PDR between the Archer River Quarry and the Aurukun Road turnoff during the delivery of aggregate;
  - the PDR between Weipa and the Aurukun Road turnoff prior to construction of the barge/ferry terminals and Mine Access Road;
  - Kerr Point Road and John Evans Drive prior to construction of the barge/ferry terminals and Mine Access Road, and during operations at 50 Mdptpa; and
  - Aurukun Road between the PDR and the Access Road turnoff during the construction phase.
- Bauxite shipments would commence from the new port once the Boyd beneficiation plant is commissioned.
- The majority of equipment and materials would continue to be transported by sea from Cairns to Weipa. The volume of cargo and fuel deliveries to the Port of Weipa is expected to increase 20% during the construction phase and more than double at 50 Mdptpa, compared to the current volume of deliveries for the existing Weipa operations. These volumes are expected to be within the capacity of the existing Port of Weipa.
- The proposed mooring area for ships is in an area of the Northern Prawn Fishery utilised by commercial trawlers and recreational fishers. Fishing vessels are permitted to operate within mooring areas. However, a small proportion of fishing ground would be temporarily unavailable while vessels are anchored.
- The potential increase in flight numbers as a result of the Project is within the capacity of the existing Weipa airport infrastructure.
- There would be no impact to rail infrastructure.

Mitigation and controls

- Rio Tinto Alcan proposes that intersections for entry to the Hornibrook ferry terminal and Humbug barge terminal be upgraded before operations begin.
- Materials would be transported via the Aurukun Road and PDR only when it is declared open by the Queensland Police Service and the Queensland Department of Transport (i.e. not during wet season closures). Load restrictions would be observed.
- Rio Tinto Alcan would repair any damage caused by Project related traffic on these roads. Once construction is completed, there would be limited traffic impact on public roads.

CONSULTATION

Rio Tinto Alcan consulted widely about the Project with a range of stakeholders including Commonwealth, state and local government agencies and service providers including the Weipa Town Authority; Non government organisations; local community groups; Aboriginal groups; industry, local business and service providers; residents of Aurukun, Napranum, Weipa and Mapoon; regional pastoral lease holders and managers; and Rio Tinto Alcan and local contractor employees based on the Western Cape. The feedback and the key issues raised during consultation were considered during Project planning and design.

Key issues

Across all stakeholder groups the issues of greatest significance were:

- traffic/transport on the proposed new access road to the Project;
- land and sea management;
- community consultation and engagement;
- employment, training and educational opportunities;
- breakdown in community cohesion;
- water supply dam construction;
- opportunities for business development; and
- workforce arrangements.

Other issues of relevance to government stakeholders were:

- demographic changes;
- economic impacts on the local economy;
- housing and property values; and
- cumulative impacts.

Mitigation and controls

- The EIS consultation and engagement programme will continue throughout the EIS process using a wide range of communication tools and mechanisms. Interaction with stakeholders who have already been consulted as part of the Project planning phase will continue for the remainder of the EIS process and throughout the construction and operational phases.
- The Western Cape Communities Co-existence (WCCC) Coordinating Committee and the WCCC SoE Sub-Committee will continue to provide the consultative mechanism for ongoing consultation and engagement with Traditional Owners.

SOCIAL IMPACT

The local communities likely to be affected by the Project include Aurukun, Mapoon, Napranum and Weipa. Extensive community consultation was undertaken for the EIS and provided the basis for the Social Impact Assessment.

Likely Impacts

- The majority of the Project's construction workforce would be accommodated in an on-site camp and when not on roster, would return to their point of hire. Most workers would be from the east coast of Australia and would fly-in and fly-out of Weipa airport and be bussed to site by Rio Tinto Alcan. Negligible effect on the local housing market is expected.
- At a production rate of 30Mdptpa, the Weipa population would be only slightly higher than it was in 2006. Future demands on infrastructure and government services are expected to be no higher than in recent years. At 50Mdptpa, the population is projected to be approximately 400 above the peak of 2008. Such a population rise would require development of more residential land and expanded government services.
- The majority of stakeholder groups consulted were concerned about public access to the Mine Access Road including issues of safety, unauthorised access to traditional lands, the increased potential for illegal alcohol transportation, and the potential for environmental damage.
- Maintenance of access to areas on the mining leases with cultural heritage and recreational significance, the protection of coastal and riparian landscapes, and management of land and sea areas were raised by the majority of stakeholders as a high priority.
- Maximising employment and training opportunities for the people of the region was raised as an issue.
- The proposed new dredged material disposal area and offshore mooring area for bulk carriers are located within the Northern Prawn Fishery (NPF) area. A small proportion of available fishing ground would be temporarily unavailable while vessels are disposing dredged material or anchored in the area.
- Commercial line fishermen, recreational fishermen and guided fishing operators utilise the areas near Pera Head, Boyd Point and Thud Point. Dredging may result in increased turbidity which could result in some fish species temporarily avoiding these areas.
- There is a minor risk of adverse impact on fishing activity due to the small proportion of the reef likely to be affected and the temporary nature of dredging activity.

Mitigation and controls

- Rio Tinto Alcan would continue to work collaboratively with Traditional Owners, the Western Cape Communities Trust and other key stakeholders to establish a programme to support caring for land and sea, including assistance with the implementation of a ranger programme and permit systems to protect cultural heritage sites and environmental values, while allowing controlled access to the Project site for recreational purposes.
- Access to the port, barge, ferry and Mine Access Road would be restricted to those with authorised mine related business. Security measures would be implemented at the port and at each terminal.
- Rio Tinto Alcan would work with the WCCC Employment and Training Sub-Committee to identify opportunities for training and employment for residents of Aurukun.
- Rio Tinto Alcan would continue to manage access for Traditional Owners to specific areas, including the three outstations in the Project area at Amban (False Pera Head), Waterfall (near Ina Creek) and Six Ti-Tree (just south of Waterfall). Rio Tinto Alcan would work collaboratively with Traditional Owners and the relevant WCCC sub-committee to develop a land access strategy.
- A safe passage underneath the proposed jetty for small recreational and charter boat users would be designated to prevent the need to travel around the wharf and jetty, in accordance with Maritime Safety Queensland requirements.
- Rio Tinto Alcan supports the implementation of alcohol management plans for each community.
- The construction camp mess would be licensed for the responsible service of alcohol to occupants only. Any activities outside the camp would be controlled via a permit system developed in collaboration with Traditional Owners.
- Rio Tinto Alcan would implement fitness for work policies for employees and contractors which include pre-employment medical programmes and random drug and alcohol testing.
- Rio Tinto Alcan would work collaboratively with various Queensland and Commonwealth Government agencies, regional stakeholders and job network providers to build a locally based skilled labour pool for construction and operational phases of the Project.
- Rio Tinto Alcan would work with the Weipa Town Authority to develop additional land as required.
- A comprehensive plan for ongoing consultation and engagement would be developed prior to construction.

ECONOMICS

Mining is the principal driver of the local economy, and all other industries in Weipa and neighbouring communities rely on mining for their prosperity. The Weipa Community Baseline Study found the Weipa economy would experience significant adverse impacts from the withdrawal or decline of the local mining industry. The contribution of mining to the local economy would be enhanced by the construction and operation of the Project. The Project would also deliver significant economic benefits to the regional, Queensland and Australian economies.

Likely Impacts

- The disruption to the local economy by the construction and operation of the Project is likely to be minimal. Construction workers would be accommodated on site and would not impact the local housing market. Operations at the Project are a continuation of the current mining activity.

Construction Phase (15 Mdptpa production capacity)

- Direct employment averaging more than 300 full time equivalent positions per annum over three years.
- Indirect employment of approximately 179 in the local area, 395 in the Far North Queensland (FNQ) region, 632 state-wide and 705 nationally.
- Direct financial contribution of $264 million locally, $527.9 million in FNQ region, $989.9 million in Queensland and $1,319.8 million nationally.
- Indirect financial contribution of $201.7 million locally, $612.2 million in FNQ region, $1,829.3 million in Queensland and $2,828.2 million nationally.

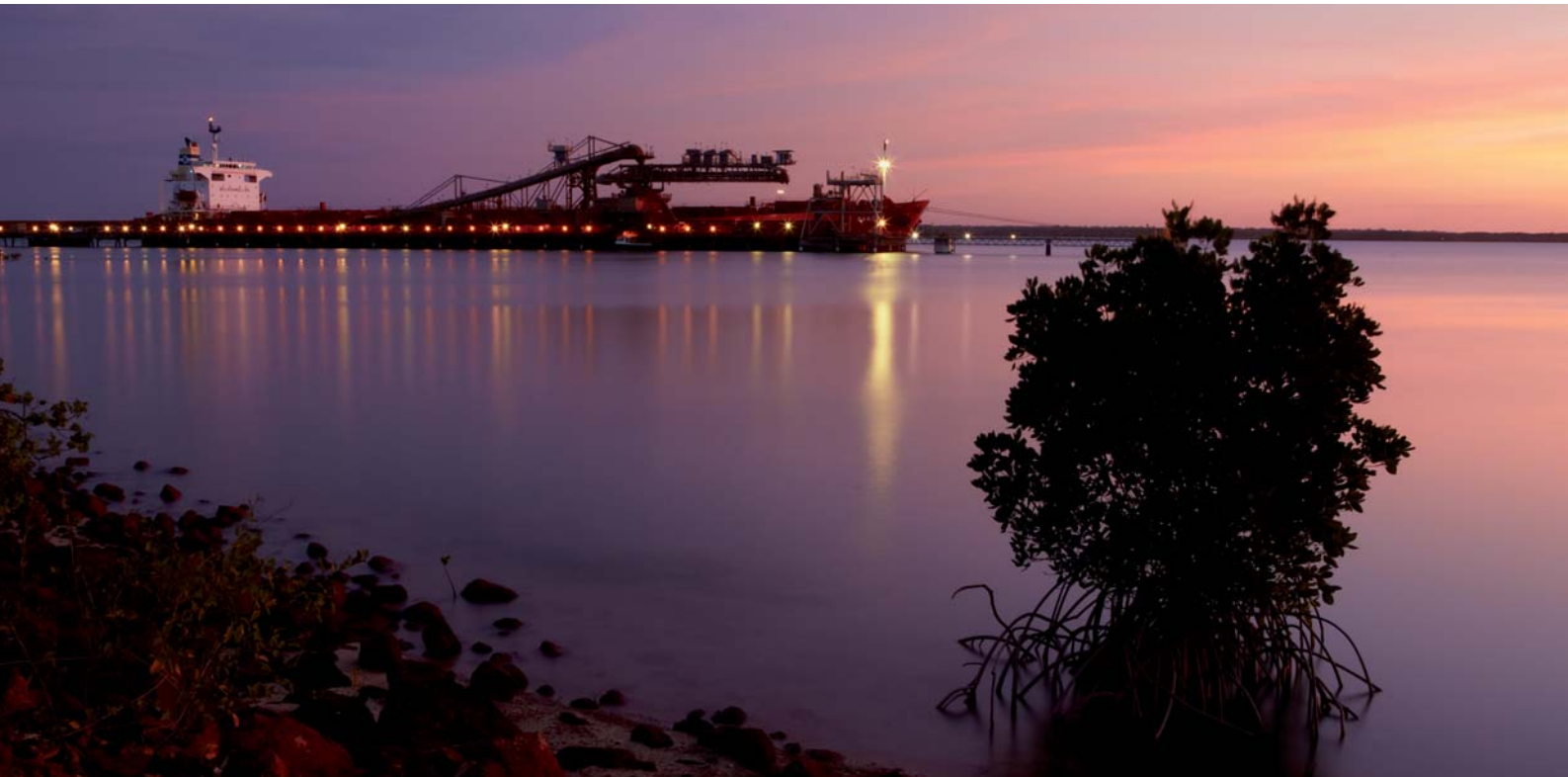
Operations Phase (at 15 Mdptpa production scenario)

- Direct employment (including contractors) of approximately 500 in the local region.
- Indirect employment of approximately 390 locally, 788 in the FNQ region, 1,170 state wide and 1,771 nationally.
- Direct annual financial contribution of $575 million across the local, regional, Queensland and national economies.
- Indirect annual financial contribution of $96 million locally, $182 million in the FNQ region, $257 million in Queensland and $423 million nationally.
- The Project area is not currently used for agricultural purposes. A reduction in economic output from the commercial fishing industry is not expected.
- No adverse impacts are expected on surrounding land uses.

The Project would also support existing local businesses and provide opportunities for new business development.

Mitigation and controls

- Rio Tinto Alcan is a party to the Regional Partnership Heads of Agreement, which includes a statement of intent by the parties to improve opportunities for business development, employment and training of Indigenous people in the Western Cape region. Rio Tinto Alcan will continue to fulfil these commitments and monitor and evaluate progress of the various projects and activities and their impact on the local social-economic environment.
- The WCCCA provides a range of benefits including employment and training, and Rio Tinto Alcan's current obligations related to the Weipa operations would also apply to the Project.
- A number of Indigenous and non Indigenous business development, training and employment opportunities and strategies for local participation have been identified.



HEALTH AND SAFETY

Rio Tinto Alcan considers the safety and health of employees, contractors and the community as paramount and a fundamental requirement for continued operation and growth. Rio Tinto Alcan Weipa's existing integrated Health Safety and Environment (HSE) Management System is certified to the international standards ISO 14001 and OHSAS 18001 and is externally audited each year. Performance is measured and reported publicly in its annual Sustainable Development Report. Health and safety risks associated with the Project were identified through a preliminary hazard analysis and risk assessment, and controls identified to manage these risks.

Likely Impacts

- The risk profile for the proposed facilities is generally 'low' or 'moderate'. Some of the main identified health and safety risks include air emissions, noise and vibration, biological hazards (bacterial or infectious diseases), exposure to hazardous substances, heat stress and radiation exposure, vehicle collisions, and fuel storage and handling.

Mitigation and controls

- Rio Tinto Alcan would adapt the existing HSE Management System for the Project and the existing MarineSafe system at the port. Both systems incorporate occupational health and safety standards currently in use at all Rio Tinto operations and provide the basis for effective management of employee and contractor health and safety.
- A Health Safety Environment and Communities Management Plan was developed specifically for the Project exploration and feasibility study activities. This plan would be reviewed and updated until the Project is incorporated into the existing HSE management system when operations begin.
- Monitoring and auditing of health and safety performance at the Project site would ensure effective implementation.

HAZARD AND RISK

The Rio Tinto Alcan Weipa risk management system was developed in accordance with the Australian Standard for Risk Management (AS/NZS 4360:2004) and would be adopted for the Project. The preliminary Project HSE risk register was compiled by Rio Tinto to identify potential hazards, accidents, spillages and abnormal events that could occur during the Project. There were 13 'high', 55 'moderate', and 11 'low' risk scenarios identified. There were no critical risks.

Likely Impacts

- The Project would utilise a number of substances (e.g. fuel and oils) that are regulated by the Australian Code for the Transport of Dangerous Goods by Road and Rail and are considered hazardous.
- There are no sensitive receptors, such as kindergartens, schools, hospitals, aged care facilities, residences, or commercial places close to the mining, processing or port areas and therefore there are no impacts on public health values in the short or long term.
- Cyclones are one of the highest risks to the Project due to the frequency of their occurrence in the Gulf area and their potential severity.

Mitigation and controls

- The storage, handling and use of hazardous substances would be in accordance with relevant Australian Standards and industry codes of practice.
- The existing Weipa operations maintain and implement a detailed Business Resilience and Recovery Plan. The Plan would be updated regularly throughout each stage of the Project.
- Rio Tinto Alcan Weipa's current Cyclone Emergency Procedure, which aims to minimise personal injury and damage to property, would be adapted to include the Project.
- Infrastructure would be designed and constructed in accordance with relevant Australian Standards to reduce the risk of damage by cyclones.
- A Failure Impact Assessment has been conducted for the water supply dam and the dam spillway would be designed to pass a 1:2,000 year average return interval flow.

CUMULATIVE IMPACTS

Cumulative impacts are those generated in combination with other existing or proposed mining projects. In addition to Rio Tinto Alcan Weipa's current mining operations, two other bauxite mining projects and a mineral sands project have been proposed for the region.

	Proponent	Operation	Status	Interaction with the Project
Aurukun Bauxite Project	Formerly Chalco. The Queensland Government terminated agreement with Chalco in June 2010.	6.5 Mdptpa bauxite	Uncertainty about future development.	Rio Tinto Alcan discussed potential for co-location or shared infrastructure with the former Proponent.
Pisolite Hills	Cape Alumina Pty Ltd	5-7 Mdptpa bauxite	Project declared economically unviable by Proponent in October 2010.	Rio Tinto Alcan did not have mining activity or infrastructure within proposed footprint.
Urquhart Point Mineral Sands	Oresome Australia Pty Ltd	50,000t heavy mineral sands	Draft EIS Terms of Reference advertised in March 2011.	Rio Tinto Alcan does not have any mining activity or infrastructure within proposed footprint.

Likely Impacts

- There is unlikely to be significant cumulative impacts related to land, groundwater, marine ecosystems, air quality, noise, visual amenity, cultural heritage and socio-economic issues arising from construction and operation of the Project.
- There is potential for cumulative impacts to arise from Project in combination with potential future projects on surface water, flora, aquatic ecosystems and transport residual impacts.

Mitigation and controls

- Impacts on surface water, flora, and aquatic ecosystems from the Project in conjunction with other mining developments would be minimised through careful management of tailings, runoff and vegetation clearing activities. Regular monitoring would allow early detection of impacts.
- Cumulative road impacts would be mitigated through repair or upgrade of the relevant part of the Aurukun Road.
- Rio Tinto Alcan would work with other project proponents to identify cumulative impacts and opportunities associated with employment, training and business development for the local communities and seek to co-ordinate programmes with other government programmes and services implemented in the region.

Rio Tinto Alcan

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