Darwin – MRM - Route Option Evaluation

For Xstrata Zinc

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1 INTRODUCTION

This document provides a risk assessment of transport options for the haulage of equipment and consumables during the McArthur River Mine Phase 3 Development Project's (the Project) construction and operational phases to and from Darwin to the MRM. This assessment has been undertaken in response to comments made by the Department of Lands and Planning (Transport Division) on MRM's Draft EIS (Comment 47).

The Department of Construction and Infrastructure (DCI) is recommending the use of seaborne transport from Darwin (or the port of manufacture) to MRM's Bing Bong concentrate storage and ship loading facility and the route network (Bing Bong Road – Carpentaria Highway - MRM) from this facility as the preferred route for the transport of the Project's construction and operational inputs. Likewise, it has been recommended that MRM not use the Darwin via Stuart Highway and Carpentaria Highway route to the mine site as their mine input delivery haul route for the mine's expansions works.

A comparison of the risks and hazards associated with the current transport route (Route A - Darwin - Stewart Highway – Carpentaria Highway – MRM) and the route proposed by the DCI (Route B – Darwin – seaborne – Bing Bong concentrate storage and ship loading facility – Bing Bong Road – Carpentaria Highway - MRM) is presented Table 1 below.

Generally, truck haulage poses threats to the environment from two major quantifiable sources, air pollution and noise pollution. In relation to the Project, as road infrastructure is already in place, further impacts to the environment from claiming new road corridors and road construction will not occur.

Shipping poses threats to the environment both on inland waterways and to the ocean. These threats arise from the following major sources: routine discharges of oily bilge and ballast water; dumping of non-biodegradable solid waste; accidental spills of oil/fuel, toxins or other cargo; air emissions and the potential introduction of exotic species. Further, modification to port specifications to handle non-specified cargo could result in ecological harm and disturbance and loss of marine habitats as new areas are claimed for berthing construction works are undertaken.

In relation to the Project's Bing Bong concentrate storage and ship loading facility, the facility is only configured to receive and store bulk concentrate and loading concentrate onto its self-propelled discharging barge, the MV Aburri, which transfers concentrate offshore to ocean-going vessels for shipment to the export market. If it were to accommodate the Project's construction and operational inputs, additional land within or adjacent to the port area may need to be acquired, new berthing facilities might need to be constructed as well as container unloading facilities and container storage space. The land adjacent to Bing Bong concentrate storage and ship loading facility is marsh or other wetlands making expansion of the facility difficult. Additionally, works may need to be undertaken to improve road access for trucks accessing the port facility.

It has been determined through consultation and assessment that transport Route A presents the least amount of potential environmental, social and operational impacts.

Table 1 - Evaluation

Assessment Component	Route A - Trucking (Darwin - Stewart Highway – Carpentaria Highway – McArthur River Mine)	Level of Impact	Route B - Trucking/Shipping (Darwin – seaborne – Bing Bong Facility – Bing Bong Road – Carpentaria Highway - McArthur River Mine)	Level of Impact
Environmental				
Land Use & Habitat Fragmentation	• Impacts from noise and air pollution. • Will not result in any additional footprint	L	• Disruption of wildlife and marine habitats • Creation of barriers • Impacts from noise and air pollution, accidental spills of oil/fuel etc. • Transportation facilities have an impact on the urban and rural landscape • Port upgrades will result in additional footprint (e.g. clearing to facilitate new development, dredging, etc.)	M

Transportation-Generated Pollution	• Transportation contributes to global climate change through emissions of carbon dioxide and other hydrocarbons • Air pollution considered to be the most significant environmental impact by transportation causing impacts to humans, ecosystems, global climate and property	M	• Transportation contributes to global climate change through emissions of carbon dioxide, methane and other hydrocarbons • Air pollution considered to be the most significant environmental impact by transportation causing impacts to humans, ecosystems, global climate and property • Routine discharge of oily bilge & ballast water from marine shipping • Dumping of non-biodegradable solid waste into the ocean • Accidental spills of oil, toxins or other cargo at fuel at ports and while underway • Air emissions from the vessels power supply • Port & inland channel construction and management	H
Transportation-Generated Noise & Vibration	• Trucks are a significant source of road noise compared to other modes of freight transport • Transport noise affects human health. Increasing noise levels have a negative impact on the urban environment reflected in falling land values and loss of productive land uses	L	• Trucks are a significant source of road noise compared to other modes of freight transport • Transport noise affects human health. Increasing noise levels have a negative impact on the urban environment reflected in falling land values and loss of productive land uses	L

Air Quality & Dust	• Trucking, based on miles travelled, is considered a major source air pollutant emissions	M	• Trucking, based on miles travelled, is considered a major source air pollutant emissions • Freighters are not considered a major source of air pollution	M
Water Pollution (Direct & Indirect)	• Road accidents and vehicle exhaust are both potential sources of oil and hazardous chemicals to surface and ground water	L	• Shipping is a source of oil and chemical spills at port, in coastal waters and at sea • The routine maintenance dredging of ports and inland waterways creates sediment • Road accidents and vehicle exhaust are both potential sources of oil and hazardous chemicals to surface and ground water	H
Flora & Fauna	• Direct collisions between animals and moving vehicles • Habitat fragmentation	L	• Direct collisions between animals and moving vehicles • The most serious harm from shipping affects marine life rather than humans, damage to unaffected ocean ecosystems • A number of national parks surround the proposed transport route including: o Barranyi (North Island) National Park o Limmin National Park o Garig Gunak Barlu National Park o Casuarina Coastal Reserves o Charles Darwin National Park	M

Flooding on roadways	• Flood events have impacts on communities and individuals and have social, economic and environmental consequences • Loss of revenue • Potential for accident/injury	L	• Flood events have impacts on communities and individuals and have social, economic and environmental consequences • Loss of revenue • Potential for accident/injury	L
Extreme Weather Events	• Extreme weather events have impacts on communities and individuals and have social, economic and environmental consequences	L	• Extreme weather events have impacts on communities and individuals and have social, economic and environmental consequences • Extreme weather events at sea such as cyclones and tropical storms are common in the area	M
Movement of Hazardous Goods/ Accidents	• Truck accidents may release of toxins or flammable chemicals	L	• Truck accidents may release toxins or flammable chemicals • Accidental spills have impacts on ecosystems & wildlife	M
Social				
Accidents	• Passenger transport accidents • Spills/release of hazardous materials	L	• Passenger transport accidents • Spills/release of hazardous materials	M

Impact on rural & residential areas including amenity	• Analysis undertaken for the EIS process has identified that the road links may incur an increase of approximately 5% of baseline Annual Average Daily Traffic volumes (from a very low base) as a result of the traffic generated from the Project	L	• Analysis undertaken for the EIS process has identified that the road links may incur an increase of approximately 5% of baseline Annual Average Daily Traffic volumes (from a very low base) as a result of the traffic generated from the Project	L
Operational				
Capital Cost	• Minimal road works will be required	L	• Upgrades to the Carpentaria Highway from MRM to Borroloola and Bing Bong road may be required to facilitate increased road usage • Upgrades required to port facility and new equipment	M
Legislative Requirements & Approvals	• Currently assessed and approved • Expenses that do not contribute to the output but are incurred by compliance to regulations • Environmental issues (such as emissions standards) are common and have associated compliance costs	L	• Further assessment and approvals will be required • Expenses incurred by compliance to regulations • Environmental issues (such as emissions standards) are common and have compliance associated costs • Will require consideration to further legislative requirements and approvals	M
Time Frame			• Increases with added methods of transport used due to load transfer time	M

Road Conditions	• Poor road conditions can increase travel time and effect vehicle operating costs (e.g. tyre and maintenance costs) • Stuart & Carpentaria Highway (west of MRM) are in better condition than the roadways in Option B	L	• Poor road conditions can increase travel time and effect vehicle operating costs (e.g. tyre and maintenance costs) • A number of deficiencies with the existing Carpentaria Highway and Old Bing Bong road have been observed including water damage, pot holes, uneven surfaces, reverse cambers and narrow sections of road	M
Logistics	• Loading/unloading requirements will be twice for this route option, on to and off of equipment carrying vehicles	L	• Potential loading/unloading requirements of four (4) and up to six (6) times, on to and off of equipment carrying vehicles, on to and off seaborne vessels • Increased co-ordination required • Increased likelihood of delays • Increased cranage requirements	M
Damage Risk	• Potential for damage of cargo in transfer	L	• Potential for damage of cargo in transfer • Damage to engine components or hull causes the ship to be unable to operate resulting in reduced revenue	L