Gladstone Nickel Project
Environmental Impact Statement Supplement

Volume 1 • Main Report

Prepared for

Gladstone Pacific Nickel LTD

February 2008

Prepared by

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GLADSTONE NICKEL PROJECT ENVIRONMENTAL IMPACT STATEMENT SUPPLEMENT

Supplement Introduction 1

URS

Gladstone Pacific Nickel LTD

Section 1 Introduction

1.1 Introduction

An environmental impact statement (EIS) has been prepared for Gladstone Pacific Nickel Ltd (GPNL), for its Gladstone Nickel Project (GNP).

The EIS was made available for public comment and review from 16 April to 28 May 2007. In response to this, 21 written submissions were received. Copies of all these submissions are attached in Appendix A.

Submissions were received from the following:

1) Environmental Protection Agency (EPA)
2) Department of Primary Industries and Fisheries (DPIF)
3) Queensland Police Service (QPS)
4) Department of Local Government, Planning, Sport and Recreation (DLGPSR)
5) Department of Mines and Energy (DME)
6) Department of State Development (DSD)
7) Department of Housing (DH)
8) Queensland Rail (QR)
9) Queensland Transport (QT)
10) Department of Communities (DC)
11) Department of Main Roads (DMR)
12) Department of Emergency Services (DES)
13) Department of Natural Resources and Water (DNRW)
14) Queensland Health (QH)
15) Central Queensland Ports Authority (CQPA)
16) Calliope Shire Council and Gladstone City Council (CSCGCC)
17) Damian and Barbara Ahern
18) Fitzroy Shire Council (FSC)
19) East End Mine Action Group
20) Larry John Coward
21) Celestine Taylor

Over 205 different topics were raised by the submitters and these have been listed in Table 1. The table shows which of these topics were commented on by each of the respondents. Some of the submissions received mentioned the same or similar issues.

This EIS Supplement contains responses to all of the submissions received. It has been divided into sections corresponding to the relevant sections of the EIS. This will facilitate reference back to the EIS to enable responses to be read in context.

The numbers in parenthesis after each section heading of this Supplement indicate which submitters made submissions on that topic. The numbers relate to the submitter numbers given in the submission summary (Table 1).

Section 1 Introduction

Table 1. Response Matrix

Respondent	Executive Summary	1.4 Proposed Project	1.9 Project Approvals & Legislation	1.9.2 Environment Protection Act	1.9.7 Fisheries Management Act	2.1 Site Location	2.2. Project Components	2.2.1 Refinery (Rail Access)	2.2.1.4 Wiggins Island	2.2.3 Pipelines	2.3.4.1 Construction Staging	2.3.4.31 Sewage	2.3.4.6 Transportation	2.3.5 RSF Construction	2.3.5.4 Transportation	2.3.6 Pipeline Construction	2.3.6.1 Construction Procedures	2.3.6.3 Construction Depots	2.3.6.5 Construction Workforce Accom.	2.3.6.8 Water Supply & Management	2.3.6.9 Transportation	Table 2.3.9 Existing Infrastructure	2.5.2.5 Cobalt / Nickel Metal Handling	2.5.6 Pipelines	2.5.6.2 Cathodic protection Facilities	2.6 Project inputs	2.6.4 Limestone	2.7.1 Nickel and Cobalt Briquettes	2.7.2.2 Ammonium Sulphate Storage	2.9.4 Pipelines	3.1.2 Water Supply – Potable Water	3.1.3 Seawater	3.4 Sewerage
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Section 1 Introduction

Table 1. Response Matrix

Respondent	4.0 Waste Management	4.5.3 Waste Generation	4.6 Operational Liquid Wastes	4.8 Operational Air Emissions	4.10 Waste Disposal	5.4.1 Marlborough Ore	5.4.2 Imported Ore	5.5.2 Route Refinement	5.5.3 Multi-User Pipeline corridor	5.14 Modularisation	6.0 Transportation	6.2 Road Transport	6.2.2 Existing Traffic	6.2.3.1 Refinery Construction Traffic	6.2.3.3 Pipeline Construction Traffic	6.2.5 Traffic Predictions	6.2.5.3 Traffic Volumes	6.2.5.4 Traffic Volumes – Council	6.2.6.2 Hanson / Reid	6.2.6.3 Dawson Hwy/Blain / Herbert	6.2.6.5 Hanson / Red Rover	6.2.6.7 Transportation Gladstone	6.2.6.11 Bruce Hwy/RSF Access Rd	6.2.6.12 Summary of Intersection	6.2.7 Pavement Impact Assessment	6.2.7.2 Pipeline Impacts	6.2.8 Public Transport	6.3.1 Wiggins Island	6.3.2 Shipping Fisherman's Landing	6.4 Rail Transport	7.0 Environmental Effects of Pipelines	7.2.4 Acid Sulphate Soils	7.3.2 Effects – Surface Water	7.3.3 Groundwater	7.3.4 Watercourse Crossing	7.3.4.2 Watercourse Crossing Methods	7.4 Flora	7.4.11.3 Spread of Weeds	7.4.12.4 Spread of Weeds	7.5 Fauna	7.8 Hazard and Risk	7.8.2.1 Hazard Identification
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Table 1. Response Matrix

Respondent	8.2.1.7 Flooding of Refinery Stockpile	8.2.1.8 Water Quality in Calliope River	8.2.3.1 Stormwater Management System	8.3 Marine Environment	8.3.2.1 Methodology	Table 8.3.3 World Heritage Criteria	Table 8.3.6 Percentiles for Water Quality Data	Table 8.3.7 Sediment Contaminant Values	Table 8.3.8 Adopted Water Quality	Table 8.3.9 Characteristics of Stage 1	Table 8.3.10 Water Quality Objective	8.3.8 Commercial and Recreational Fishing	8.3.10 Ambient Water Quality Criteria	8.3.10.2 Manganese Criteria Trigger Value	8.3.12.1 Location of Refinery Discharge	8.3.12 Refinery Discharge	8.3.12.1 Discharge Location	8.3.12.2 Discharge Arrangement	8.3.12.3 Discharge Characteristics	8.3.12.3 Process Upsets	8.3.13 Water Quality Impacts of Refinery	8.3.13.2 Far-field Effects	8.3.14 Discharge Pipeline Crossing Calliope	8.3.15 Potential Marine Impacts - Materials	8.3.15.1 Sulphur	8.3.15.2 Nickel Ore	8.3.15.3 Ammonium Sulphate	8.3.16.4 Ships Garbage	8.5 Terrestrial Flora	Figure 8.5.1a Vegetation Communities	8.6 Terrestrial Fauna	8.7 Air Quality	8.7.3.2 Legislative Framework National	8.7.7 Emission Rates	8.7.7.2 Materials Handling Emissions	8.7.8.3 Air Quality Impacts from Material	8.8 Noise	8.8.2.2 Long-term Monitoring Results	8.8.3.1 Noise Criteria	8.8.4.3 Predicted Noise Levels from Stg 2 Ops	8.8.5.5 EPA Background Plus	8.8.5.6 Haulage Truck Noise
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Table 1. Response Matrix – Volume 1 Main Report Section 9

Respondent	9 Environmental Effects of the RSF	9.1.1.2 Site Geology	9.1.2 Topsoil Resources	9.2 Residue Characterisation	9.2.2 Residue Characteristics	9.3 RSF Design	9.3.1 RSF Design Criteria	Figure 9.3.3 RSF Main Embankment	9.3.2 RSF Spillway Location	9.3.3 Embankment Design	9.3.4 Seepage Collection System	9.3.5 Spillway	9.4 RSF Operations	9.4.1 Residue Disposal	9.4.3 Water Balance	9.4.4 RSF Monitoring	9.4.5 Risk Management	9.5.1 Overview	9.5.2 Cover Design	9.5.4 Stormwater Management	9.6 Surface Water	9.6.5 Surface Water Quality	9.6.9.1 Changes to Flow Regime	9.6.8.5 Mitigation Strategies	9.7 Groundwater	9.7.3 Groundwater Levels and Flow	9.7.8 Potential Groundwater Impacts - Ops	9.7.8.1 Seepage from the RSF	9.8.3 RSF Rehabilitation	9.9 Terrestrial Flora	9.11 Freshwater Ecology
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Table 1. Response Matrix

Respondent	10 Socio-Economic Effects	10.4.8 Rental Property	10.4.11 Caravan Parks	10.4.12 Worker's Villages	10.5 Project Workforce	10.7 Effects on Housing and Accomm.	10.7.1.4 Summary of GNP Housing Demand	10.7.2 Housing Strategy	10.7.2.2 New Dwellings	10.7.2.5 Workers Village	10.7.3.1 Displacement of Low income	10.7.3.3 Modularisation	10.8 Community Services, Facilities	10.10 Land Tenure	10.11.2 Residue Storage Facility	10.12.2 Calliope Shire Council	10.13 Visual Amenity	10.13.10 Mitigation Measures	11 Cultural Heritage	11.3 Potential Impacts and Mitigation	12.3. Community Consultation	12.3.3 Consultation Methods	13 Risk and Safety – Slurry & Seawater	13.2.3 Dangerous Goods (MHF)	13.3 Risk Approach Results	Table 13.5.1 Risk Assessment Results	13.9 Workplace Hazards	13.9.6 Fires
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Respondent	14.3 Legislation	14.8.3.7 Hydrotesting Management Plan	14.8.4.1 Flora and Fauna Management	14.8.4.4 Soil Management Plan	14.8.4.8 Air Quality Management Plan	14.8.4.10 Traffic Management Plan	14.9 Pipeline Operations EM Plan	14.10.2 Air Quality Management Plan	14.10.3 Noise Management Plan	14.10.7 Surface Water Management Plan	14.10.10 Mosquito Management Plan	14.10.13 Traffic Management Plan	14.11.2 Air Quality Management Plan	14.11.7 Water Discharge Management Plan	14.11.13 Traffic Management Plan	Appendix A – Terms of Reference	Appendix B – Traffic Impact Assessment	Appendix H – Marine Environments	Appendix I – Marine Modelling	Appendix M – Air Quality	Appendix N - Noise Impact Table 4.3	Appendix O – Residue Characterisation	Appendix Q – Housing Impacts Study
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GLADSTONE NICKEL PROJECT ENVIRONMENTAL IMPACT STATEMENT SUPPLEMENT

Changes to Project Description 2

URS

Gladstone Pacific Nickel LTD

Section 2 Changes to Project Description

2.1 Summary of Project Changes

This section provides a description of the major changes that have been made to the proposed project since the release of the EIS. These changes have been made as further design studies have been undertaken and options have been optimised. Any environmental impacts resulting from these project changes have been assessed in this EIS Supplement.

The following table summarises the project changes.

Project Changes Since EIS Release

Project Component	EIS Description (Stage 2)	Current Description (Stage 2)	Reason for Change	Impact of Change
Ore from Marlborough	Piped to refinery in a seawater slurry	Railed to refinery for Stage 1 Railed or piped to refinery in a freshwater slurry for Stage 2	Use of rail is more economical and provides greater flexibility. Use of freshwater avoids the need to build a duplicate pipeline.	Pipeline construction Impacts avoided Minimal impacts from additional rail traffic
Rail Access	No rail access to refinery site	Rail siding from Mt Millar rail siding to refinery site	Delivery of ore from Marlborough	Noise and dust impacts not significant
Refinery Layout	Stage 1 and Stage 2 refinery footprint to the south of existing power easement and stockpiles in reclamation area (Area C)	Stage 2 footprint to the north of the existing power easement and stockpiles away from reclamation area	Reduced earthworks and avoidance of consolidation delays for fill in reclamation area	Reduced potential for erosion during construction Reduced initial vegetation clearing Increased length of power easement to be relocated
Refinery Production	Stage 1 Nickel – 60,000 t/y Cobalt – 4,800 t/y Stage 2 Nickel – 126,000 t/y Cobalt – 10,400 t/y	Stage 1 Nickel – 63,000 t/y Cobalt – 6,000 t/y Stage 2 Nickel – 126,000 t/y Cobalt – 12,000 t/y	Improved processing efficiency	Small increase in the number of product shipments from the refinery
Acid Production	Acid demand is 3.3 Mt/y	Acid demand is 4.5 Mt/y	Addition of a parallel atmospheric leach process for saprolite material will increase acid consumption	Increased generation of SO_2 mitigated by increase in acid plant efficiency
Acid export	None	Excess acid to be exported through existing facilities at Fisherman's Landing. New pipeline and storage facility required	Acid plant is most efficient at a production rate greater than that required periodically by the refinery. Hence excess acid is produced.	Risks from acid transport and storage
Limestone	Limestone demand is 1.43 Mt/y	Limestone demand is 2.6 Mt/y	Increased demand due to increased acid production	Increased greenhouse gas emissions and solid wastes to RSF
Sulphur	Sulphur demand is 1.1 Mt/y	Sulphur demand is 1.6 Mt/y	Increased demand due to increased acid production	Increased material handling
Sea Water	Sea water demand is 240 GL/y	Sea water demand is 8 GL/y	Fresh water to replace sea water for ore slurry pipeline and for refinery cooling	Increased demand for fresh water

Section 2 Changes to Project Description

Project Component	EIS Description (Stage 2)	Current Description (Stage 2)	Reason for Change	Impact of Change
Seawater Intake	Intake via 1.7 m diameter pipeline from WIW	Intake via 0.4 m diameter pipeline from Calliope River	Reduced demand for sea water as fresh water to be used for cooling	Less disturbance from pipeline construction and less pumping energy required
Fresh Water	Fresh water demand is 10.5 GL/y	Stage 1 demand is approximately 15 GL/y. Detailed optimisation of this water use has yet to be performed and GPNL is confident that Stage 2 will be designed using less freshwater per tonne of nickel produced. Until these studies and designs are carried out the estimated Stage 2 demand is 30GL/y	Once-through seawater cooling replaced by closed circuit freshwater cooling towers. Reasoning based on high energy required to pump large seawater volumes, usage of seawater as a heat sink, and high relative costs	Increased demand for fresh water from 5.45 GL/y to 15 GL/y (Stage 1)
Residue	Generation rate is 10.8 Mdt/y	Generation rate is 14.1 Mdt/y	Additional residue generated by the additional limestone used	Increased area and/or depth of residue storage required
Residue Pipeline Route	From GSDA multi-user corridor to the north of the RSF and along the Bruce Highway	Preferred alternative is from multi-user corridor, along Calliope River Road and Boyles Road	Shorter distance and less pumping energy	Less energy consumption and alienation of land
RSF Design	Single cell	Multiple cells	Reduced footprint, less disturbance, increased flexibility, potential for progressive rehabilitation	Reduced footprint, less disturbance, potential for progressive rehabilitation
Port Curtis Discharge Rate	Discharge rate is 38,000 m^3/h	Discharge rate is 3,420 m^3/h	Freshwater cooling is recirculated and not discharged	Slight increase in size of mixing zone
Barren liquor quality discharged to Port Curtis	Manganese – 130,000 µg/L Cobalt – 1,000 µg/L	Manganese – 100,000 µg/L Cobalt – 700 µg/L	Development of improved water treatment efficiencies resulting from additional laboratory testing	Reduced water quality impact
Port Curtis Discharge Pipeline	1.7 m diameter pipeline crossing the Calliope River in an excavated trench	0.6 m diameter pipeline crossing the Calliope River by horizontal directional drilling	Smaller diameter pipe enables horizontal directional drilling	No disturbance of river banks and bed
Amsul Transportation	Trucked to Fisherman's Landing for export	Trucked to Barney Point wharf for export	Fisherman's Landing is not available for amsul shipments	Additional truck traffic along haul route
Construction Method	Stick build	Stick build plus the option of using PAMs	Reduced construction time and on-site construction workforce	Reduced housing demand and socio-economic effects
H_2S scrubber for the neutralisation vent	Not specified in EIS	Emission rate of 0.01 g/s per stack	Addition of H_2S scrubber to reduce odorous emission levels	A reduction in emissions of odour and H_2S

Section 2 Changes to Project Description

2.2 Ore Transportation by Rail

GPNL is considering the use of rail instead of a slurry pipeline for the transport of ore from Marlborough to the refinery for Stage 1. The ore will be transported by truck along a haul road to a rail loading facility adjacent to the existing North Coast Rail Line (NCL) to the north of the mine site. The haul road and rail loading facility are outside of the existing mining lease at Marlborough and approvals for these will be addressed through the amendment of the existing Marlborough environmental approvals.

GPNL requires the haulage of 2.7 million tonnes per year (Mt/y) of nickel ore for Stage 1. Queensland Rail (QR) has advised that this is likely to require running 18 train services per week each way between the Marlborough mine and the Yarwun refinery site along the NCL. Each train will consist of 50 gondola type rotary dump wagons of 80 t capacity hauled by two diesel electric locomotives. Storage, fuelling and maintenance will be conducted by QR at Rockhampton.

At Yarwun, loaded trains will exit the NCL onto a siding to be built to the south-east of the refinery through a 1:12 turnout and proceed to the refinery unloader. The location of the proposed rail siding is given in Figure 2.1. The train will slow to the speed allowed through the unloader and pass through until the trailing wagon is clear of the unloader.

Wagons will be unloaded one at a time at a rate of one wagon per three minutes. Unloading will be by rotary dumpers which will rotate the loaded wagon so that the ore falls into a below-ground hopper from where it will be conveyed to the ore stockpile. The unloading will take place in an enclosed unloading shed. The unloaded wagons will then pass onto a loading apron where reject material could be loaded by front end loader for backloading to the Marlborough mine. Wagons will then pass over an overload detector to check wagon loads and overloads corrected as necessary.

The scheduling and operation of train movements is the responsibility of QR as are safety and amenity issues.

Assessments of the noise and dust implications of the rail unloading facility at the refinery are discussed in Section 8.8.5.5 and Appendix G respectively. These assessments demonstrate that the rail unloading operation at the refinery will comply with the relevant noise and dust guidelines and no significant impacts are expected.

2.3 Ore Transportation by Slurry Pipeline

The EIS described a two pipe system between Marlborough and Yarwun; the seawater pipe delivering slurry water to the mine (northbound), and the slurry pipe delivering the slurried ore to the refinery (southbound). GPNL has now determined that if the slurry system is to be used for Stage 2, it will use freshwater rather than seawater. Consequently the seawater pipe is no longer required and there will be only one pipe (the slurry pipe) running between Marlborough and Yarwun.

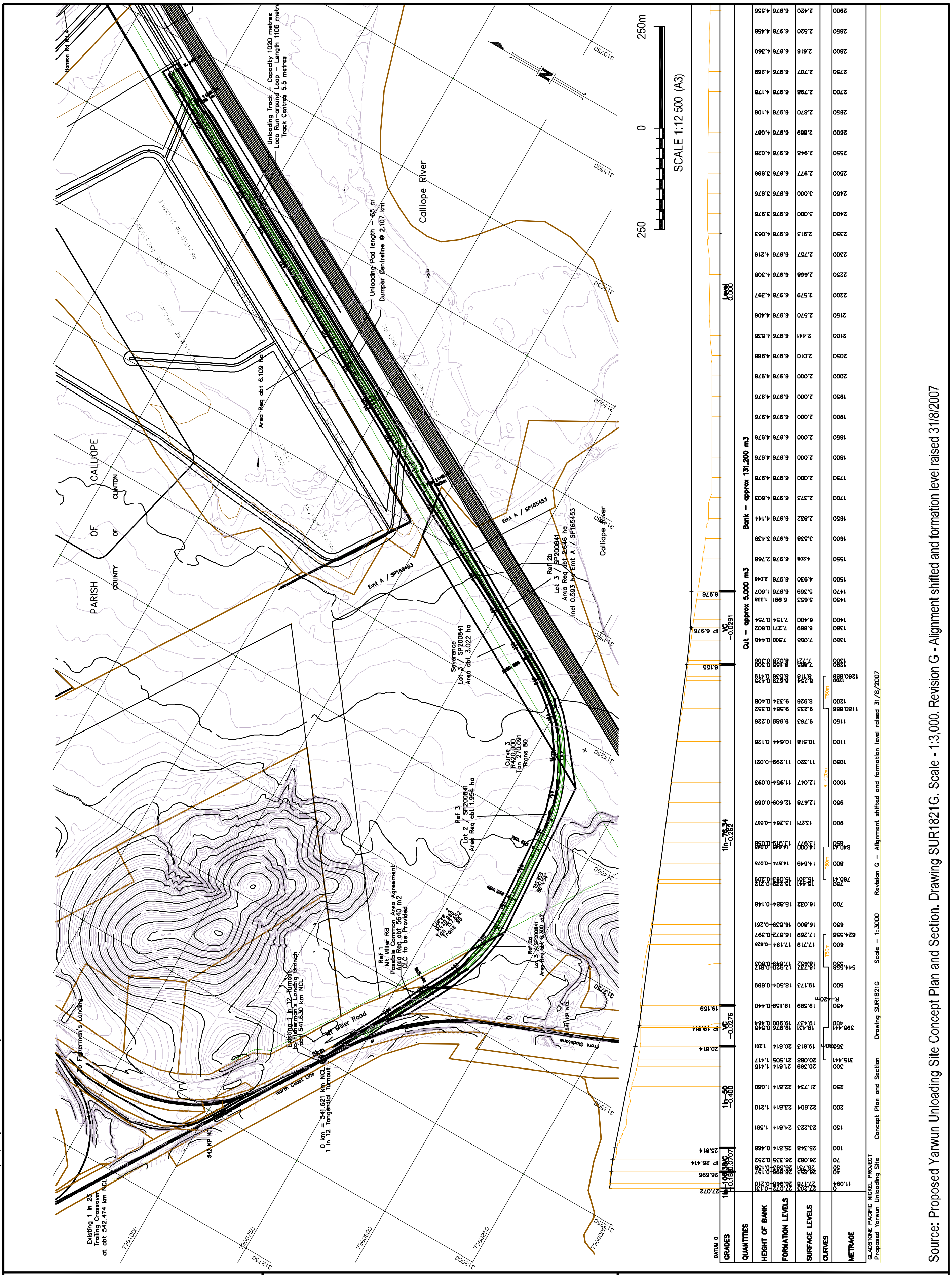
The source of the freshwater to be used for the slurry will be from the Fitzroy River as contemplated in the environmental approval already received for the Marlborough Nickel Project which included a water intake and pipeline from the Fitzroy River.

The implications of this change are that:

- Only one pipeline required.
- A narrower pipeline easement will be required.
- The pipeline construction workforce will be reduced.
- The construction traffic (including pipeline delivery traffic) will be reduced.
- Should a leak occur, it will be freshwater with the ore rather than saltwater that will be discharged.

2.4 Refinery Layout

The layout of the refinery has changed from that described in the EIS.



Source: Proposed Yarwun Unloading Site Concept Plan and Section. Drawing SUR1821G. Scale - 1:3,000. Revision G - Alignment shifted and formation level raised 31/8/2007

Client	Project	Title
Gladstone Pacific Nickel Ltd	GLADSTONE NICKEL PROJECT ENVIRONMENTAL IMPACT STATEMENT SUPPLEMENT	RAIL SIDING LOCATION
URS	Drawn: VH / Approved: CMP / Date: 29/01/2008	Figure: 2.1 / Rev. A
	Job No.: 4262 5791 / File No.: 42625791-g-233.dwg	A4

Section 2 Changes to Project Description

The EIS layout had Stage 1 and Stage 2 of the refinery located at the southern end of the site to the south of the existing powerline easement that crosses the site from east to west. Refinement of the design has identified opportunities for reducing the extent of earthworks required to construct the refinery by moving the footprint to more level land away from the elevated terrain in the south-west corner. The revised layout also includes relocating the Stage 1 ore and sulphur stockpiles away from the north-eastern reclamation area to firm ground to the south of the powerline easement. This avoids delays that would otherwise occur in waiting for consolidation of the reclamation area before construction can commence.

The revised refinery layout is shown on Figure 2.2.

2.5 Acid Production

The volume of acid produced during Stage 2 will increase from the 3.3 Mt/y reported in the EIS to 4.5 Mt/y. This is due to the addition of the atmospheric leach processing of saprolite material. Originally saprolite material was to be leached by excess acid from the pressure acid leach. However, testwork has indicated that this was inadequate for acceptable nickel extraction from this material. Therefore separate atmospheric leaching of the saprolite material has been added and this requires extra sulphuric acid.

The increased acid production will generate more energy than reported in the EIS. The on-site power generated during Stage 2 will increase from 75 MW to 169 MW. This will reduce the requirement for external power from the grid from 47 MW to 7 MW.

The increased acid production will result in increased SO_2 generation which will be mitigated by increasing the conversion rate of sulphur to sulphuric acid from 99.8% to 99.85%. This is achieved by adding more catalyst at an additional operating cost. The air quality impacts from this are discussed in Appendix G.

2.6 Acid Pipeline

Not all of this acid will be consumed in the process and excess acid will be exported from the site. An export pipeline with a capacity of approximately 4,000 t/d is proposed. The pipeline will transfer the sulphuric acid to/from a storage area located at the southern end of the Fisherman's Landing Wharf Area, approximately five kilometres from the refinery site. The storage area consists of two,10,000 tonne storage tanks. The storage area will allow for the export for sale of excess acid and also provide a storage reservoir in the event that one of the acid plants is offline, and additional acid is required for processing. The acid pipeline alignment will generally follow Orica's ammonia pipeline alignment.

An environmental assessment of the acid pipeline is given in Appendix M.

2.7 Sulphur

Due to the increased acid production, the quantity of sulphur required during Stage 2 will increase from the 1.1 million tonnes per year (Mt/y) reported in the EIS to 1.6 Mt/y. There will be no changes required to the sulphur handling facilities described in the EIS to accommodate this increased demand.

2.8 Limestone

Due to the increased rate of acid production and testwork indicating that saprolite material would not be a suitable neutralising agent, the volume of limestone required for neutralisation during Stage 2 will increase from the 1.43 Mt/y reported in the EIS to 2.6 Mt/y. The increased consumption of limestone will increase the refinery's greenhouse gas emissions. The implications of this are discussed in Appendix G.

Client: Gladstone Pacific Nickel Ltd

Project: GLADSTONE NICKEL PROJECT
ENVIRONMENTAL IMPACT STATEMENT
SUPPLEMENT

Title: **STAGE 1 REFINERY LAYOUT**

URS

Drawn: VH	Approved: CMP	Date: 19-01-2008	Figure: **2.2**	Rev:A
Job No: **4262 5791**	File No: 42625791-g-234.wor			**A4**

Section 2 Changes to Project Description

2.9 Fresh Water

2.9.1 Cooling Water

In the EIS, refinery cooling was to be provided by a once-through (open) seawater cooling system. 240 GL/y of sea water was to be drawn from Port Curtis, passed through the refinery's cooling system, and then discharged back to Port Curtis with other refinery wastewater. An analysis of the energy consumption and construction costs of piping such large amounts of seawater to and from Port Curtis along with the impact of return water temperature to the seawater in Port Curtis lead to a re-assessment of seawater cooling. The capital and operating costs (including energy costs for pumping) were such that this form of cooling could not be justified when compared to the alternative of freshwater cooling towers.

Stage 1 demand for freshwater is now approximately 15 GL/y (not including ore slurry water). Detailed optimisation of this water use has yet to be performed and GPNL is confident that Stage 2 will be designed using less freshwater per tonne of nickel produced. Until these studies and designs are completed, the estimated Stage 2 demand is 30 GL/y. These estimates represent 0.23 ML/t of nickel produced. This compares favourably with the main HPAL plant in Australia (Minaro Resources) which uses water at 0.3 ML/t Ni. Another proposed HPAL plant in New Caledonia (Goro Nickel) also uses water at 0.3 ML/t Ni.

The cooling water will be reused in a closed cooling water circuit which will use cooling towers. Water losses from the system will be primarily from evaporation. Blowdown from the cooling water circuit will be reused in the refinery as much as possible.

This additional fresh water demand will be sought from the Gladstone Area Water Board.

2.9.2 Slurry Water

As discussed in Section 2.3, freshwater will now be used to transport the slurried ore from Marlborough to Yarwun rather than seawater.

The source of the freshwater to be used for the slurry will be the Fitzroy River as contemplated in the environmental approval already received for the Marlborough Nickel Project which included a water intake and pipeline from the Fitzroy River. The volume of water proposed by the 1998 EIS Supplement for the Marlborough Nickel Project to be extracted from the Fitzroy River was 10 GL/y. The volume to be extracted to slurry the ore from Marlborough to Yarwun is approximately 4-5 GL/y.

2.10 Seawater

As discussed above, the large demand for sea water described in the EIS is no longer proposed. However there has always been a demand for seawater to be used in the refining process. This demand (8 GL/y) will continue.

As the seawater demand has reduced significantly (from 250 GL/y to 8 GL/y), it is possible to source the seawater from the Calliope River which is much closer to the refinery rather than from Port Curtis. This will result in a significantly shorter delivery pipeline, less disturbance from pipeline construction, and reduced energy consumption for pumping.

Seawater will be extracted from the Calliope River near its junction with the Anabranch approximately 500 m to the east of the refinery see Figure 2.2. A land-based pump station will be installed with an intake line extending into the river. A 400 mm diameter pipeline will transport the water to the refinery and will follow the existing powerline easement.

An assessment of the marine impacts of the seawater extraction from the Calliope River is given in Appendix H.

Section 2 Changes to Project Description

GPNL is investigating the potential to use warm seawater from the NRG Power Station discharge which would reduce the temperature effect on NRG's discharge on the Calliope River and save the energy required to heat raw seawater.

2.11 RSF Operations

A number of alternative residue pipeline routes from the refinery to the RSF have been considered following the EIS, and these are discussed in Appendix L. A preferred route has been identified from the options considered and is presented in Figure 2-3. This route crosses Reid Road to the northwest of the refinery, before heading west to Yarwun, crossing the North Coast Railway. From Yarwun it heads south on the Calliope River Road Reserve, before heading through private land and then along Boyles Road, and south and southwest before arriving at the RSF location.

Review of the proposed single-cell design of the RSF facility has been undertaken since the release of the EIS. A multi-cell, compartmentalised design is now proposed to replace the initial larger single-cell design. The concept design includes three cells (RSF-A, RSF-B1 and RSF-B2) which will occupy only a portion of the area to be covered by the previous single-cell design. The locations of RSF-A, B1 and B2 are shown on Figure 2.4.

The revised design has included improvements to construction design, spillway location, seepage monitoring and transportation. The new design provides benefits of practicality and long term sustainability as it will:

- Reduce construction earthworks by approximately 33%, which will reduce traffic associated with construction.
- Reduce the spatial extent of catchment area taken up by the RSF and the extent of vegetation clearing at any one time.
- Provide protection from overflows in almost all scenarios with a probability of overflow of one event in every 500 to 1000 years.
- Reduce impacts to Farmer Creek flows, fish habitat and ecology due to earlier progressive rehabilitation opportunities.
- Provide early opportunities for monitoring performance and improving design and management procedures for future stages.
- Minimise the extent of dam wall.
- Enable progressive rehabilitation.

The large single-cell RSF described in the EIS was designed to accommodate 25 years of residue production. The original residue generation rate was 5.4 million dry tonnes per year (Mdt/y) for Stage 1 production, increasing to 10.8 Mdt/y for Stage 2 production. However, due mainly to the refinery's increased acid generation and limestone consumption, the residue production rate will increase by 30% to 7.05 Mdt/year and 14.1 Mdt/y for Stages 1 and 2, respectively. The capacity of the currently proposed smaller multi-cell design is roughly 129 Mdt, or 132 Mm^3 based on a residue dry density of 0.98 t/m^3. At this rate the capacity of RSF-A, B1 and B2 will be reached within approximately 12 years. The total 25-year production is expected to be roughly 314 Mdt.

The RSF study focuses on staged upstream raising, which significantly reduces the containment dam cross section and therefore cost. The cumulative residue production rate for the 25-year design life at a residue generation rate increasing from 3.5 Mdt/y during the first year of production to 14.1 Mdt/y by 2015 is shown in the following figure. This figure illustrates that the capacity of RSF-A, B1 and B2 combined is reached by Year 12 of production.

In preparing this map, RLMS have endeavoured to ensure that the data and information are as accurate and reliable as possible. However RLMS cannot accept liability for any decisions or actions of whatever kind or nature based on this study. RLMS expressly disclaims any loss or damage that may arise therefrom.

Map Projection: GDA94 Lat/Long

0 500 1,000m

1:30,000 at A3

LEGEND

- Residue Storage Facility
- GSDA Boundary
- Alternate Residue Pipeline - Rev E
- Gas Pipeline
- 275kV Power Line

Tenure

- Freehold
- Leasehold
- Crown Reserve
- State Land
- National Park
- State Forest

WKSP Z:\clients\GladstonePacificNickel\Slurry_Pipeline\workspaces\A3_Alternate_Residue_NativeTitle.wor (Map_AlternatePipeline_2of2_Layout)
Created on 30/05/2007 by JAM

PROJECT: GLADSTONE NICKEL PROJECT
ENVIRONMENTAL IMPACT STATEMENT
SUPPLEMENT

TITLE: **ALTERNATIVE RESIDUE PIPELINE ROUTE**

Figure: **2.3**

JULY 2007

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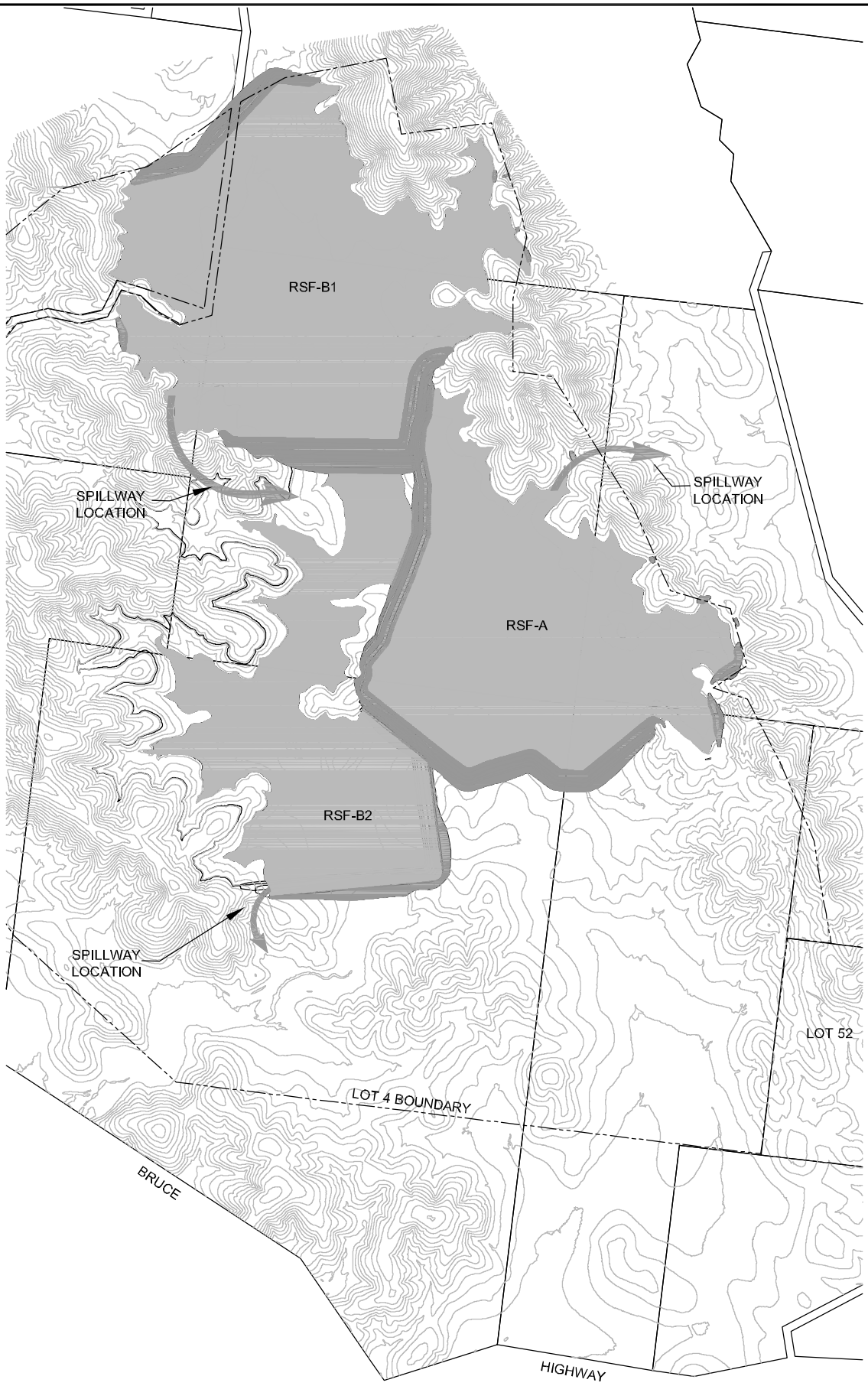
Gladstone Pacific Nickel Ltd

URS File: 42625791-g-236.cdr (Date:29-01-2008)



Client: Gladstone Pacific Nickel Ltd

Project: GLADSTONE NICKEL PROJECT
ENVIRONMENTAL IMPACT STATEMENT
SUPPLEMENT

Title: **RESIDUE STORAGE FACILITY LAYOUT**

URS

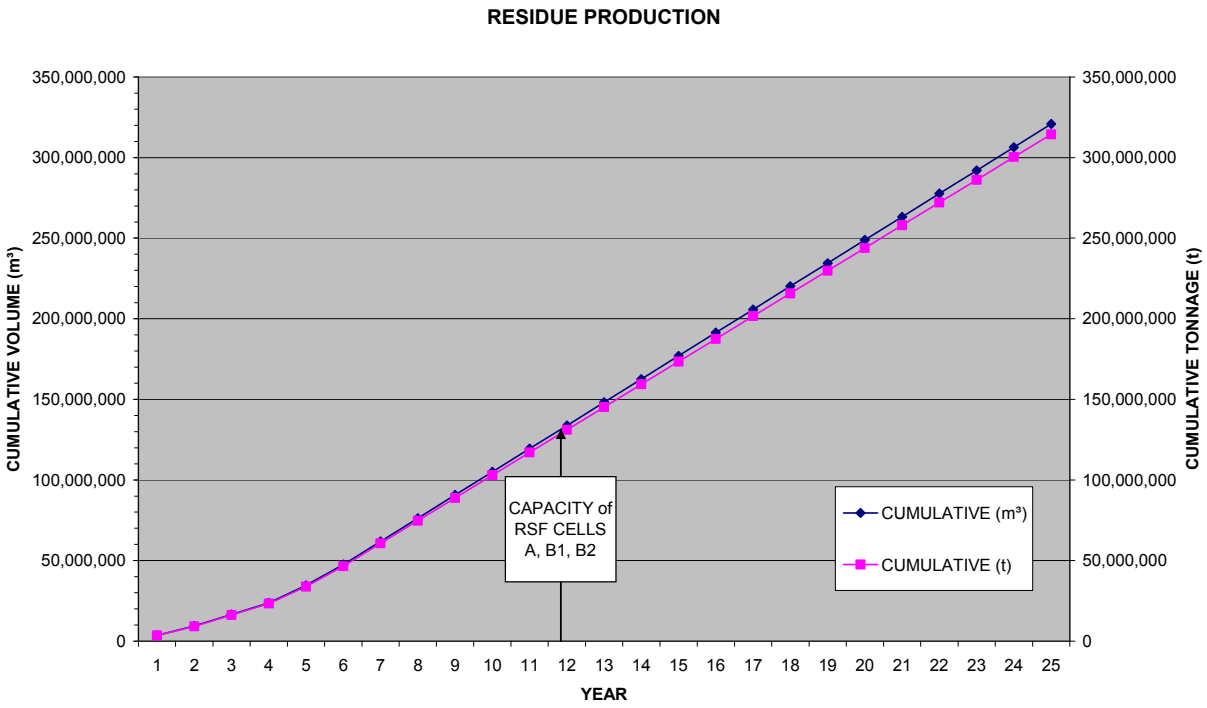
Drawn: VH	Approved: CDP	Date: 29/01/2008
Job No.: 4262 5791	File No.: 42625791-g-237b.dwg	

Figure: 2.4

Rev. B

A4

Section 2 Changes to Project Description



An appropriate filling strategy for the increased production rate has been proposed. This strategy includes filling multiple cells at once to allow sufficient time for residue settlement and consolidation to enable upstream rises to be established. The strategy for residue storage beyond 12 years is to establish further RSF cells in the existing land area shown in Figure 2.4 as “Lot 4 Boundary”.

Further details of the new RSF design and operation are included in the report URS (2007a). This report is too large to be included in this EIS Supplement but a copy will be made available on request.

2.12 Waste Water Discharge

The waste water discharge to Port Curtis that was assessed in the EIS was a combination of RSF return liquor, boiler blowdown, cooling water blowdown and reject water from the water treatment plant. Given the proposed replacement of the “once through” seawater cooling water system to a closed freshwater circuit, the cooling water component of the discharge to Port Curtis has been eliminated. Consequently the volume of waste water to be discharged to Port Curtis during Stage 2 has reduced from 38,086 m^3/h to 3,420 m^3/h. In addition, based on further testwork, further improvements are able to be achieved to the quality of the discharge so that the manganese concentrations will be reduced from the 130 mg/L quoted in the EIS to 100 mg/L and the cobalt concentrations reduced from 1 mg/L to 0.7 mg/L.

Due to the reduced volume of water to be discharged, the nature of the diffuser described in the EIS has changed. It is no longer necessary to use the vertical eductors along the diffuser pipeline to achieve adequate dispersion of the discharge. It is now proposed to use a conventional diffuser consisting of a pipeline laid along the seabed with 45 mm diameter discharge holes at 2 m spacing along the top of the pipe. The diffuser section of the pipes will be approximately 200 m long with one diffuser for Stage 1 and three for Stage 2.

Due to constraints caused by the proposal of the Central Queensland Ports Authority (CQPA) to develop a tug harbour at the RG Tanna Terminal, the locations of the diffusers have been changed from that described in the EIS. They will now be located further upstream (north-west) further away from the proposed tug harbour and the marina.

Section 2 Changes to Project Description

The diameter of the discharge pipeline from the refinery to RG Tanna Wharf will be reduced from 1.7 m to 0.6 m due to the reduced discharge rate. This reduction in diameter will enable the Calliope River crossing to be made using horizontal directional drilling techniques rather than an excavated trench across the riverbed as was proposed in the EIS. This approach will avoid disturbance of the fringing mangroves and the generation of any turbidity associated with the trench excavation. The route of the discharge pipeline will remain unaltered from that given in the EIS.

2.13 Water Balance

Due to the project changes discussed above, the overall project water balance has changed. Figure 2.5 shows the modified water balance for Stage 1. The Stage 2 flows will be approximately double the Stage 1 flows. Note that a slightly different discharge rate to Port Curtis has been used in the marine modelling due to a different method of flow estimation. The marine modelling has used a larger (more conservative) flow rate.

2.14 Ammonium Sulphate Transportation

The EIS stated that the ammonium sulphate (amsul) produced at the refinery would be trucked to Fisherman's Landing for export through a common user bulk loading/unloading berth that was proposed to be constructed by the CQPA. Currently there are insufficient materials to justify construction of the new berth. Consequently Fisherman's Landing is no longer an option and it is now proposed to truck the amsul to the existing Barney Point wharf for export.

After manufacture, the amsul will be stored at the refinery in a covered shed. The Stage 1 shed capacity will be 2000 t or two days of production. This capacity will double for Stage 2. From there the amsul will be loaded directly into B-Double trucks by front end loader for trucking to Barney Point.

The trucks are expected to be purpose-built bottom-dump trailing equipment with an automated rollover tarping system. Automated tarping systems provide both quick loading times and suitable dust suppression during transport. The truck route will be along Hanson Road, Glenlyon Drive and Port Access Road to Barney Point (see Figure 2.6).

At Barney Point, trucks will discharge into a covered dump pit to control dust during unloading. The amsul will be conveyed to a 25,000 t storage shed to be constructed to store the amsul prior to it being loaded onto a ship. The conveyors will be covered and the area under the conveyors sealed. Run off will be collected.

The amsul in the shed will be reclaimed by front end loader into mobile hoppers mounted over a load out conveyor running the length of the shed. The conveyor will connect to the CQPA ship loading conveyor system. The ship loader is able to load at an average rate of 30,000 t/d. There are no draught restrictions for Handymax vessels at Barney Point. As this is a shared berth with coal loading berth, availability will be in order of arrival sequence at the harbour mooring area.

The traffic implications of the amsul trucking to Barney Point are discussed in Appendix F.

2.15 Pre-assembled Modules

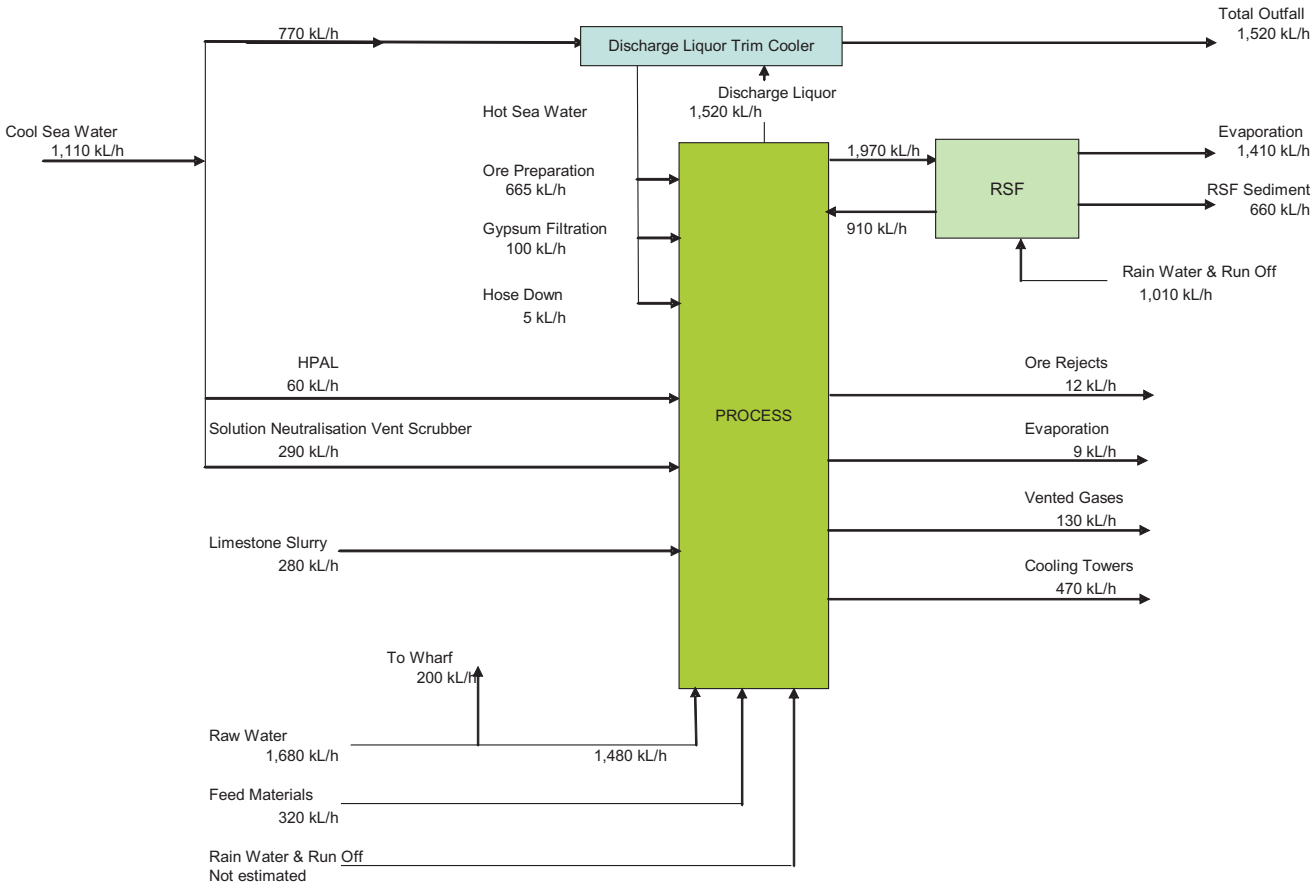
The strategy for construction of the GNP is to maximise modularisation by the offsite fabrication of pre-assembled modules (PAMs). This includes modularisation of key vendor packages such as the power plant and sulphuric acid plants.

These process modules and tanks will be fabricated complete with structural steel platforms, walkways, handrails, piping, electrical, instrumentation, equipment and in some cases foundations. Once complete, they will be loaded onto a vessel using hydraulic trailers for shipment from the fabrication site to Gladstone directly by sea transport. The PAMs will then be offloaded with hydraulic trailers and installed directly onto prepared foundations. Pre-commissioning activities will also be maximised prior to delivery.

GPNL Water Balance

Overall Balance

Metsim Model Design Case 7.30



Process Inputs

Hot Sea Water	770 kL/h
Cool Sea Water	350 kL/h
Raw Water	1,680 kL/h
Rain Water & Run Off	1,010 kL/h
Feed Materials	320 kL/h
Limestone Slurry	280 kL/h
Total Input	4,410 kL/h

Process Outputs

Discharge Liquor	1,520 kL/h
Ore Rejects	12 kL/h
Evaporation	9 kL/h
RSF Sediment	660 kL/h
RSF Evaporation	1,410 kL/h
Vented Gases	130 kL/h
Cooling Towers	470 kL/h

Client: Gladstone Pacific Nickel Ltd	Project: GLADSTONE NICKEL PROJECT ENVIRONMENTAL IMPACT STATEMENT SUPPLEMENT	Title: **GPNL WATER BALANCE STAGE 1**	
URS	Drawn: VH / Approved: CMP / Date: 29-01-2008	Figure: **2.5**	Rev. B
	Job No.: **4262 5791** / File No. 42625791-g-238b.cdr		A4

Client: Gladstone Pacific Nickel Ltd

URS

Project: GLADSTONE NICKEL PROJECT
ENVIRONMENTAL IMPACT STATEMENT
SUPPLEMENT

Title: **AMSUL HAUL ROUTE**

Drawn: RG	Approved: CMP	Date: 29-01-2008
Job No: **42625791**	File No: 42625791-g-256.wor	

Figure: **2.6**

Rev: A

A4

Section 2 Changes to Project Description

The PAM strategy is based on utilising S.E. Asian fabrication facilities. These facilities include large well-equipped and established contractors with low cost labour capable of achieving high output at a competitive price and fit for purpose quality. GPNL will visit a number of contractors based overseas to choose facilities that best meet the project's needs.

Sea transportation of the PAMs, tanks, stand alone vessels, pre-fabricated structural members and pipe spools will be by a combination of tugs with barges and roll-on - roll-off vessels. These vessels will be contracted under a continuous hire basis for the duration of the scheduled delivery period, and the tugs and barges will be contracted on an as required basis.

2.15.1 PAM Facility

A port facility to accept the PAMs will be established in the north-east corner of the existing Fisherman's Landing Port Precinct, between the existing Wharf 5 – Bulk Liquids Facility and future Wharf 6 to be developed by the CQPA as part of the proposed Northern Development at Fisherman's Landing Port Facility, as detailed in CQPA Initial Advice Statement dated September 2005.

The port facility will be established to be a common-user facility.

The port facility will be able to service a wide range of sea transport vessels, inclusive of roll-on - roll-off, lift-on – lift-off, and ocean-going barges. The quay line for the wharf and barge ramp will be located at the existing reclamation line, requiring a dredged channel to be established between Wharf 5 and 6, and a dredged berth pocket adjacent to the existing reclamation line. The port facility is to allow for the retention, if possible, of the existing barge ramp facility located in this area, both in the short term until Wharf 6 is established, and post Wharf 6 construction.

In order to release each barge as quickly as possible, it will be necessary to remove each PAM from the ship and place in a module staging area near the wharf. The size of this laydown area has been estimated as 20,000 m^2 to allow for the holding of one complete ship load while a second is being unloaded with sufficient clearance for access to the PAMs for removal of transport steelwork that may interfere during the journey to the work site. Sufficient provision will be made for cyclone tie-down.

The location of the marine facility is shown on Figure 2.7.

2.15.2 Land Transport Route

The land transport route proposed from the above marine facility to the GNP refinery site comprises:

- Northern bund of the existing reclamation, upgraded as required.
- Widening the existing access road from above, south to the Aldoga Materials Transport & Services Corridor (AMTSC).
- Widening the existing access road from above, south along the AMTSC to north of Boat Creek located on the western side of the AMTSC between Rio Tinto Aluminium Yarwun (RTAY) Services Licensed Area and Queensland Rail (QR) Fisherman's Landing Rail.
- Exiting west from the AMTSC generally on the alignment of the Fisherman's Road reserve for approximately 400 m, with an at-grade crossing of the Fisherman's Landing Rail.
- Turning south from the above to cross Boat Creek, then ramping up and turning east to cross the AMTSC and the RTAY Licensed Area via a grade separated overpass.
- Continuing east and ramping down to cross both the Fisherman's Landing Rail at grade and the southern half of the AMTSC.
- Turning south east towards Hanson Road, generally following and to the seaward side of the alignment of the AMTSC for a distance of approximately 2 km.
- Turning south across Hanson Road, approximately 500 m east of the Reid Road intersection, to enter the GNP site.

Client: Gladstone Pacific Nickel Ltd

URS

Project: GLADSTONE NICKEL PROJECT
ENVIRONMENTAL IMPACT STATEMENT
SUPPLEMENT

Title: **PAM MARINE FACILITY AND HAUL ROUTE**

Drawn: VH	Approved: CMP	Date: 29-01-2008	Figure: **2.7**	Rev:A
Job No: **4262 5791**	File No: 42625791-g-239.wor			**A4**

Section 2 Changes to Project Description

The layout of the PAM route from Fisherman's Landing to the refinery site is shown on Figure 2.7. An environmental assessment of the PAM haul route is given in Appendix M.

2.15.3 Access Roads, Lay-Down and Positioning of Pams on Site

In order to install the PAMs utilising hydraulic trailers, the excavation, foundations, piles, footings and structural plinths of other PAMs will be established at the refinery site prior to the PAM's arrival.

Process PAMs are generally complete structures or sections of a facility with columns and base plates already sitting on a foundation that can be placed on surveyed packers sitting on pile caps. Tanks are mostly flat bottom sitting on a concrete pad with holding down bolts.

The process PAMs will be delivered to their final positions and lowered by the hydraulics of the trailer onto the concrete plinth. The hydraulic trailers will then drive out under the PAM, temporary bracing will be removed and the hook up of the PAM can start with connection of structural steel and spooled piping.

GLADSTONE NICKEL PROJECT ENVIRONMENTAL IMPACT STATEMENT SUPPLEMENT

Executive Summary 3

URS

Gladstone Pacific Nickel LTD

Section 3 Executive Summary

Executive Summary (13, 15)

(13) *The Department of Natural Resources and Water (DNRW) has concerns about the project if seawater is not the final secure water supply for the project. If the proponent did require water from the Fitzroy it would be dependant on the procurement of an authority to take water (eg a water licence or water allocation).*

GPNL is investigating alternatives associated with the transport of ore from Marlborough to Yarwun instead of the proposed seawater slurry pipeline. These options include the utilisation of rail from Marlborough. This would avoid the use of water other than small quantities associated with dust control on haul roads and mining operations. Any water that would be required in this case would be sourced from a bore within the mining area and/or from the Fitzroy River in accordance with an existing environment approval obtained for the Marlborough Nickel project. If GPNL does decide to slurry ore from Marlborough to Yarwun, an authority to take water would be sought through a licence or water allocation.

(15) *The Central Queensland Ports Authority (CQPA) has advised that in the Proposed Project (ES-3), Reference is made in the third paragraph of '.... Imported through the Wiggins Island Wharfs (WIW) to be developed at Wiggins Island by the CQPA as part of its proposed Wiggins Island Coal Terminal (WICT). If the WIW does not proceed or is delayed, nickel ore can be imported through the existing port facilities at Fisherman's Landing' CQPA has sought approval under its EIS process for the construction of Berths 5 and 6 at Wiggins Island for the purposes of handling bulk products in cape sized vessels. Subject to the granting of approval under the WICT EIS, the two berths being used for the import of nickel ore and sulphur can be constructed irrespective of whether the coal terminal proceeds or not. It should be further noted that the 'existing' port facilities at Fisherman's Landing, are in fact 'proposed only. The potential to import nickel ore and sulphur through Fisherman's Landing No. 3 is limited and subject to further investigation.*

It is proposed to import nickel ore and sulphur through the Wiggins Island Warf. As indicated by CQPA above, this facility can be built irrespective of the construction of the Wiggins Island Coal Terminal.

The GPNL EIS indicated that it was proposed to export ammonium sulphate from the proposed Fisherman's Landing No 3. This is no longer the case. Due to the uncertainty surrounding Fisherman's Landing No 3, it is now proposed to export ammonium sulphate from the existing Barney Point wharf.

Introduction 4

URS

Gladstone Pacific Nickel LTD

Section 4 Introduction

1.9 Project Approvals & Legislation (1, 4)

(1) *The Environmental Protection Agency (EPA) has advised that the EIS should provide complete information on ore transport alternatives and their associated environmental impacts and management to allow assessment and generation of the relevant approval conditions.*

The EIS addressed two of the alternative ore transport modes viz. a slurry pipeline from Marlborough and shipping of imported ore over the Wiggins Island Wharf. One further alternative is the use of rail to transport ore from Marlborough. Details of this alternative are given in Section 2.2.

(4) *The Department of Local Government, Planning, Sport and Recreation (DLGSR) stated that this section would benefit from minor updating in line with more recent developments in the Calliope Shire planning scheme. The new IPA compliant planning scheme commenced on 27 April 2007. Comparisons made in the EIS with an earlier draft of the planning scheme should be revised, particularly in relation to land zoning and development made assessable by the scheme for the project area. This will have implications for determining the assessment manager for some project approvals.*

The proposed GPNL refinery and RSF are situated on land covering two planning jurisdictions, with the responsible agencies being both the Coordinator General (CG) and the Calliope Shire Council (CSC).

The following statutory planning documents were applicable at the time of preparing the EIS and were the basis of the land use analysis and planning studies:

- Development Scheme for the Gladstone State Development Area Scheme (2001);
- Calliope Shire Council Transitional Planning Scheme (1991).

Since the preparation of the GPNL EIS, these documents have been superseded and replaced by the following documents:

- Development Scheme for the Gladstone State Development Area (November 2006); and
- Calliope Planning Scheme (27 April 2007).

Compliance with the Development Scheme for the Gladstone State Development Area (November 2006).

On 5 April 2007 the Gladstone State Development Area (GSDA) was expanded pursuant to Part 6, Division1 of the SDPWO Act.

> *"the Gladstone State Development Area was amended by the inclusion of 3 areas to facilitate more effective management, planning and control over industrial and infrastructure development (both existing and proposed) within the State Development area"*

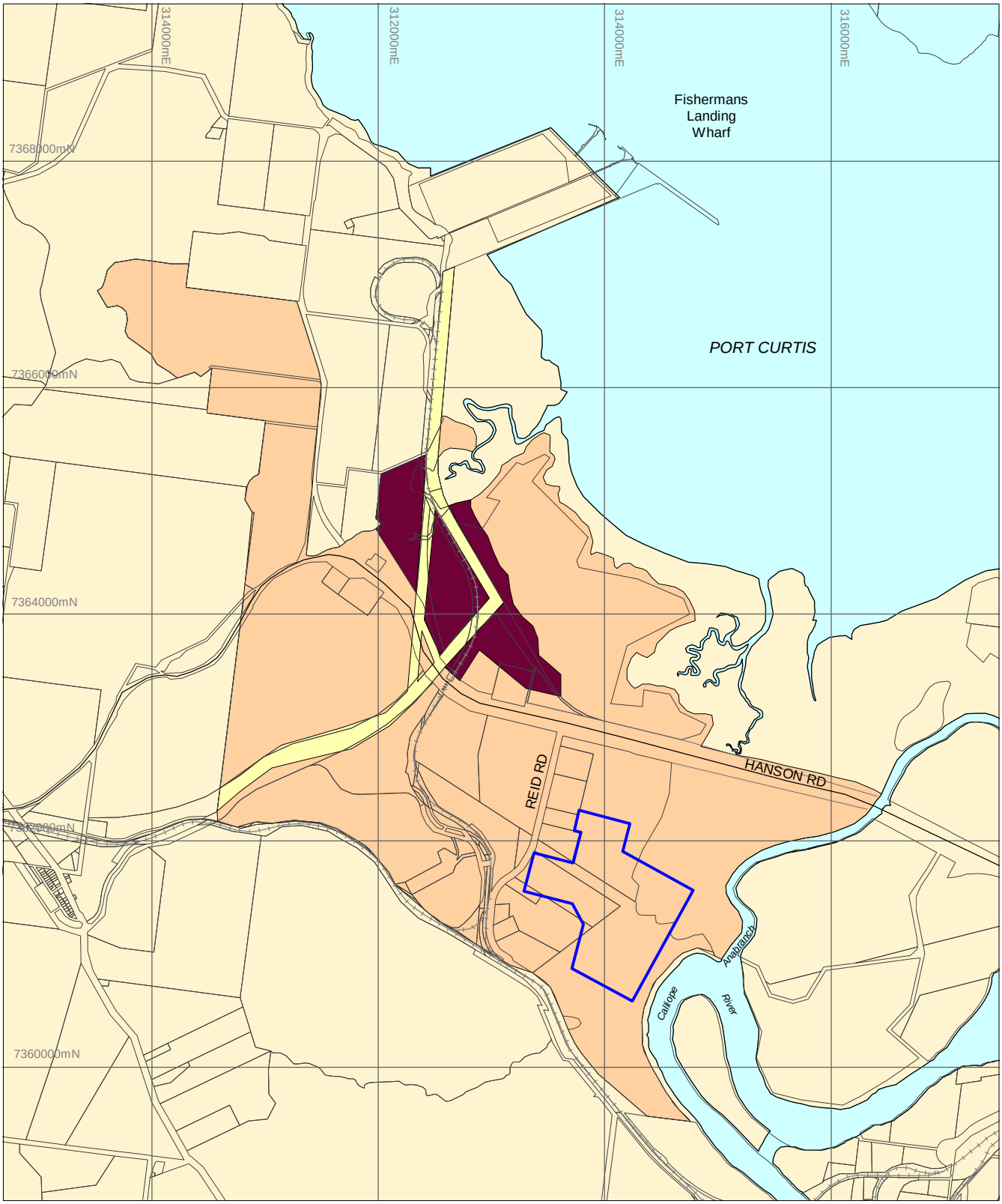
(http://www.coordinatorgeneral.qld.gov.au/infrastructure/sda_gladstone_scheme.shtm)

The GSDA has been expanded to encompass the following lots in their entirety:

- Lot 2 on SP147891l
- Lots 1, 3 on SP157699; and
- Esplanade on 157699

Figure 4.1 shows the updated extent of the Yarwun Precinct of the GSDA area.

The expanded GSDA also incorporates a parcel of unallocated state land (USL) located between Lot 2 on SP147891l and Anabranch Creek. Part of this land will be used for the refinery stockpiles. A plan has recently been lodged to DNRW to register this USL. It is noted that an "Application for Permanent Road Closure" of Esplanade Road is also being processed. The road reserve will be annulled and the land is likely to be incorporated into Lot 2 on SP147891.



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MGA Z56, GDA94

- Yarwun Precinct
- Materials Transportation & Services Corridor
- Stuart Oil Shale Reserve Preservation Area
- Proposed Development Footprint

Client: Gladstone Pacific Nickel Ltd

URS

Project: GLADSTONE NICKEL PROJECT
ENVIRONMENTAL IMPACT STATEMENT
SUPPLEMENT

Title: **GLADSTONE STATE DEVELOPMENT AREA YARWUN PRECINCT**

Drawn: RG	Approved: CMP	Date: 29-01-2008
Job No: **4262 5791**	File No: 42625791-g-240.wor	

Figure: **4.1**

Rev:A
A4

Section 4 Introduction

Compliance with the Calliope Shire Planning Scheme 2007

The transitional planning scheme has been replaced by the Calliope Shire Planning Scheme 2007 (Calliope Plan).

"The new Planning Scheme for Calliope Shire was adopted on Friday, 13th April 2007 and took effect on Friday 27th April 2007. This follows final approval of the draft Planning Scheme from the Minister for Local Government, Planning and Sport on 21 March 2007"

(http://tpscheme.dz1.calliope.qld.gov.au/Documents/pdfs/pressrelease/Planning%20Scheme%20Adopted.pdf)

The proposed GPNL development would be defined as "Major Industry" under the Calliope Plan:

"Major Industry" (Industry (High Impact)) means the use of premises for the purpose of any industrial activity such as fabricating, handling, manufacturing, processing, treating and the ancillary storage, of heavy materials, products or machinery and including the packaging, repair, storage or maintenance of any item, machine or product, which activity involves one or more of the following:

(i) the emission of intense noise, light, heat, waste material or by-products of any kind;

(ii) the generation of high traffic flows in the context of the locality or the road network;

(iii) an elevated demand for services such as treated water, sewerage and solid waste disposal, electricity, supply, roads, stormwater drainage and the like.

(iv) a total floor area of 2,000 m^2 GFA or more;

(v) the activity requires the provision of additional infrastructure or the augmentation of existing infrastructure; or

(vi) the activity has the potential to impose impacts on the environment, such that a license issued pursuant to the Environment Protection Act 1994 is required for it to operate.

The term does not include a "local industry", "service trades" or "waterfront industry" as described in this Planning Scheme."

The Calliope Plan divides the Shire into five geographic 'Localities'. Each Locality has a particular character or characteristics that require particular development outcomes. The GPNL project area is located within the 'GSDA Locality'.

Assessable development under the planning scheme for this Locality is limited to building work, some aspects of operational work, reconfiguring a lot and erecting an advertising device. Other development is exempt from assessment. Table 8-1 sets out the assessment category and relevant assessment criteria for assessable development.

Section 8.7 of the Planning Scheme sets out overall outcomes of the Gladstone State Development Area Locality Code. The proposed GPNL development meets the overall outcomes set out in Section 8.7.

1.9.2 Environmental Protection Act (1)

The EPA advised that the list of Environmentally Relevant Activities (ERAs) given in the EIS could be expanded to include 20(c) Extracting rock or other material, (during construction), and possibly 75(b) Disposing of regulated waste.

It is agreed that ERAs 20(c) Extracting rock or other material, (during construction), and 75(b) Disposing of regulated waste should be added to the list of relevant ERAs included in the EIS. These will be included in the application for an Integrated Authority that GPNL will lodge with the EPA.

Section 4 Introduction

1.9.7 Fisheries Management Act (2)

The Department of Primary Industries and Fisheries (DPIF) has advised that a development approval for the disturbance of the marine plants within the proposed areas of reclamation will be required. Through this approval process DPIF will require minimisation of the effect of reclamation on tidal fish habitats and will require offsets for any impacts that are approved. DPIF recommended that the Co-ordinator General ensure that adjacent projects within Wiggins Island are well integrated to minimise any unnecessary impacts of fish habitats.

Three areas within the Yarwun site proposed development footprint are relevant to marine plants. Figure 8.5.1a of the draft EIS summarises these in addition to associated tables. The relevant vegetation communities are described as:

- 1a Marine sand flat (Regional Ecosystem [RE] 12.1.2);
- 1b *Sporobolus virginicus* grassland on marine clay plains (RE 12.1.2); and
- 1c Mangrove shrubland to low closed forest on marine clay plains and estuaries (RE 12.1.3).

Whilst these vegetation communities have the conservation status Not of Concern, they contain marine plants protected under the Queensland *Fisheries Act 1994*. An application to clear for the purpose of infilling of 1.8 ha of 1a, 1.8 ha of 1b and 0.1 ha of 1c will be submitted to the DPIF in accordance with the requirements of s.123 of the *Fisheries Act 1994*. The application will include details pertaining to the minimisation of the effect of reclamation on tidal fish habitats and offsets.

DPIF advised that a development approval for the disturbance of marine plants will be required for the construction of the discharge pipeline across the Calliope River and that it will require supporting information which describes alternative construction methods and justification for the preferred open trenching construction method.

Contrary to the pipeline trenching method described in the EIS for the Calliope River crossing of the discharge pipeline, it is now proposed to construct the crossing by horizontal directional drilling. This has been made possible because the pipeline diameter has reduced from 1.7 m to 0.6 m. This method will ensure that there will be no disturbance to the mangrove fringe at the mouth of the river or to the river bed. The drill mud and sediment generated by the drilling process will be disposed of with the dredge sediment from the WIW dredging program.

In the unlikely event that disturbance of marine plants is required, an application will be submitted to the DPIF in accordance with the requirements of Section 123 of the *Fisheries Act 1994* for the clearing of marine plants.

GLADSTONE NICKEL PROJECT ENVIRONMENTAL IMPACT STATEMENT SUPPLEMENT

Proposed Project 5

URS

Gladstone Pacific Nickel LTD

Section 5 Proposed Project

2.1 Site Location (8)

Queensland Rail (QR) has advised that the EIS indicates the provision of a rail connection along the eastern boundary of the refinery site is being proposed by QR for the Wiggins Island Coal Terminal (WICT) project. QR stated that this option is no longer pursued by CQPA and QR. The current option is for the trains to unload coal through a balloon loop on the southern side of the existing North Coast Line and transfer coal to the stockpile yard on Wiggins Island by three conveyors crossing underneath the North Coast Line. QR pointed out that the delivery of ore from rail transport to the refinery is not addressed in the WICT EIS and will need to be addressed separately by GPNL.

GPNL requires the haulage of 2.7 million tonnes per year (Mt/y) of nickel ore from a loading facility located adjacent to the North Coast Line (NCL) near the Marlborough mine. GPNL is also investigating the potential for backloading approximately 1.0 Mt/y of reject material from the Yarwun refinery to the Marlborough mine for disposal in mined-out pits.

QR has advised that this is likely to require the running of 18 train services per week each way between the Marlborough mine and the Yarwun refinery sites along the NCL. Each train will consist of 50 gondola type rotary dump wagons of 80 t capacity hauled by two diesel electric locomotives. Storage, fuelling and maintenance will be conducted by QR at Rockhampton.

At Yarwun, loaded trains will exit the NCL onto a siding to be built to the refinery through a 1:12 turnout and proceed to the refinery unloader. A plan of the proposed rail siding is given in Figure 2.1 in Section 2. The train will slow to the speed allowed through the unloader and pass through until the trailing wagon is clear of the unloader.

Wagons will be unloaded one at a time at a rate of one wagon per 3 minutes. Unloading will be by rotary dumpers which will rotate the loaded wagon so that the ore falls into a below-ground hopper from where it will be conveyed to the ore stockpile. The unloading will take place in an enclosed unloading shed. The unloaded wagons will then pass onto a loading apron where reject material could be loaded by front end loader for backloading to the Marlborough mine. Wagons will then pass over an overload detector to check wagon loads and overloads corrected as necessary.

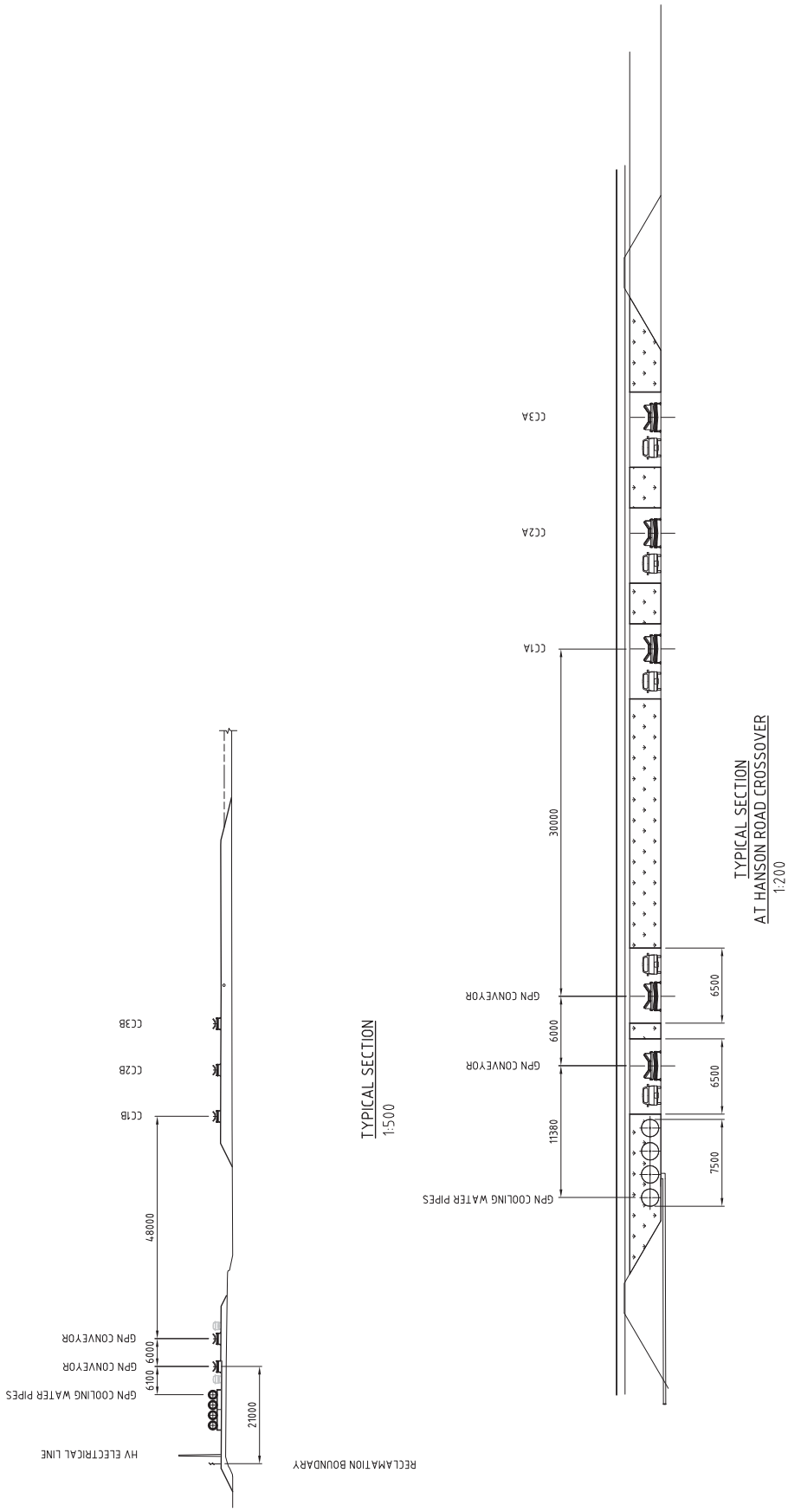
After loading, the train will undergo a train test before entering the mainline at Mt. Miller to return to the Marlborough site.

2.2. Project Components (11)

The Department of Main Roads (DMR) advised that the EIS provides insufficient information about the construction of the seawater pipes, materials handling facility and materials conveyor/s for transportation of materials, to allow DMR to judge whether road impacts of project traffic are adequately dealt with. As required by s2.2.1 ToR, the EIS must provide sufficient information about these elements of the project in terms of:- location/ physical interaction of the pipelines/conveyor with Hansen Rd e.g where they cross; - volume of construction inputs and resulting traffic generation; - assess road safety and efficiency impacts of the above traffic; - adverse impacts on DMR' plans for future duplication of Hanson Road. The EIS should also detail proposed mitigation strategies following consultation with the DMR district office.

The ore and sulphur conveyors will pass under Hanson Road in the same manner proposed for the conveyors for the WICT. The refinery discharge pipelines will also pass under Hanson Road. A typical cross-section of the Hanson Road crossing is shown on Figure 2.1(a).

The planned crossing of Hanson Road will allow for the road's duplication and will be undertaken in such a way so as to minimise detrimental affects on traffic flow. This will be achieved by undertaking construction of the widened road corridor for a predetermined length and to a higher road level. During the construction of this widened portion of the road, a series of culverts and slabs will be constructed within the embankment to provide the necessary clearance for the sub-road structures which will contain the conveyors and pipelines as well as maintenance access and other related services.



TYPICAL SECTION
1:500

TYPICAL SECTION
AT HANSON ROAD CROSSOVER
1:200

NOTE:
The two cooling pipes crossing Hanson Road are no longer required. However the two water discharge pipes will remain.

Source: Connell Hatch, Drawing No: HR73 SKM 006

Client: Gladstone Pacific Nickel Ltd	Project: GLADSTONE NICKEL PROJECT ENVIRONMENTAL IMPACT STATEMENT SUPPLEMENT		Title: **PIPELINE AND CONVEYOR CROSSINGS OF HANSON ROAD**
URS	Drawn: VH	Approved: CMP	Date: 29-01-2008
	Job No.: **4262 5791**	File No. 42625791-g-241.cdr	Figure: **2.1(a)**
			Rev. A
			A4

When complete, traffic on Hanson road will be diverted onto the newly constructed alignment. This will permit work to proceed on the original alignment. Local services will be protected, the height of the embankment of the original road will be increased to match the diverted section of road, and matching sub-road structures installed for the continuation of the conveyors and pipelines under the existing road. Finally, traffic will return to the original alignment and the widened portion will remain in place ready for eventual upgrade of the entire road.

Ground improvement works using piles and preloading will be used to minimise differential settlement between new and old areas of embankment.

2.2.1 Refinery (Rail Access) (8)

QR has stated that rail access needs to be covered by the proponent as part of their EIS.

Rail access issues have been discussed in Section 2.1.

2.2.1.4 Wiggins Island (15)

CQPA has advised that the development Wiggins Island Wharf (WIW) is not conditional on CQPA proceeding with the development of WICT. GNP will be allocated Berth No. 5 for the handling of bulk products.

GPNL understands that situation and has incorporated it into its project design.

2.2.3 Pipelines (8, 15, 16)

(8) *QR has advised that the pipeline interfaces / crosses the QR network in several locations and that details on how the proponent intends to address this impact are minimal. One of the key areas is within the GSDA from Aldoga to the plant. The pipeline route is parallel to the QR corridor where there are expansion plans under consideration. GPNL's construction methods may impact QR operations (e.g. crossings, blasting, etc). These need to be discussed with QR and mitigation measures agreed prior to completion of detailed design.*

GPNL has already begun consultation with QR to determine the location of proposed QR infrastructure in accordance with available information. GPNL has committed to locating pipelines away from proposed and existing QR infrastructure. Further detailed design and ongoing negotiations and discussions will occur with QR. It is proposed in the detailed design phase to provide full details associated with the construction methods around and across railway lines. GPNL is committed to ongoing discussions with QR to ensure an acceptable outcome for both parties.

(15) *CQPA has noted that four pipes will be required in the corridor from the GPNL site to the RSF. These pipes will carry slurry into the site, seawater to Marlborough, residue to the RSF and return of barren liquor for discharge into Port Curtis. Given the area and the cross section of the Materials Transportation Corridor, the EIS should provide details of how these four pipes for Stage 1 can be accommodated in the MTC and how six pipes for Stage 2 can be accommodated.*

Detailed studies have been undertaken to confirm the capability of materials transport corridor (MTC) between the Yarwun and Aldoga precincts of the Gladstone State Development Area (GSDA) to accommodate the pipelines necessary for both Stages 1 and 2 of the Gladstone Nickel Project (GNP). It should be noted that the seawater pipeline to Marlborough is no longer proposed.

Subsequent discussion with government has indicated potential changes to the MTC. A revised MTC is being developed by the Queensland Government. When this is finalised, GPNL will be able to finalise project requirements.

Another pipeline corridor for the slurry residue is being investigated as alternatives to the government materials transport corridor. This will avoid a number of congestion issues associated with the bottle necks within the Yarwun/Aldoga MTC.

Section 5 Proposed Project

(16) *The Calliope Shire and Gladstone City Councils (CSC/GCC) advised that the location of the proposed pipeline with respect to the future multiple services corridor established by the Coordinator General (CG) is not clear. This should be presented in a modified Figure 2.2.4. While Councils acknowledge that GPNL had progressed the identification of their own pipeline corridor prior to the declaration of the proposed multipurpose corridor from the Stanwell industrial estate to Gladstone by the CG, Council would encourage the placement of all or part of the pipeline within this corridor if the corridor is officially declared within a suitable timeframe. The impact of this inclusion on other existing or proposed uses within the corridor also needs to be assessed.*

At the time of the EIS, the government corridor was still under development. This is still the case and until the pipeline is declared and ratified and land is controlled by the government, it is not possible for GPNL to relocate the pipeline into this corridor. Also required as part of the process is an acceptable approval process to allow pipelines to be located in the government corridor. GPNL will relocate its ore slurry pipeline into the proposed future multiple services corridor once the corridor route and access details have been finalised.

It should be noted that the slurry pipeline will not be part of the Stage 1 development.

(16) *CSC/GCC advised that if the proposal for a slurry pipeline does not proceed then the EIS should consider the impact of increased rail transport through Calliope and Gladstone on the safety and amenity of local residents. The EIS should include a statement that, should the slurry pipeline not be the preferred option for the haulage of nickel ore, a fresh consultation process will be initiated with Local Government and the future rail system subject to a separate environmental impact statement.*

Should ore be transported by rail from Marlborough to Yarwun, it would travel on the existing North Coast Rail Line (NCL). This line is owned and operated by QR.

GPNL requires the haulage of 2.7 million tonnes per year (Mt/y) of nickel ore for Stage 1. Queensland Rail (QR) has advised that this is likely to require the running of 18 train services per week each way between the Marlborough mine and the Yarwun refinery site along the NCL. Each train will consist of 50 gondola type rotary dump wagons of 80 t capacity hauled by two diesel electric locomotives. Storage, fuelling and maintenance will be conducted by QR at Rockhampton.

Data were obtained from QR for the number of train movements at Mt Miller, between Gladstone and Yarwun. On the weekdays, the typical number of daily train movements is 80, whereas on weekends the daily train movements are halved to approximately 40. The trains use the railway line 24 hours/day, 7 days/week. Transporting GNP ore would result in an increase in daily train movements of approximately 6 (3 inbound and 3 outbound) which is only a small increase on existing rail traffic in the area.

The scheduling and operation of train movements is the responsibility of QR as are safety and amenity issues.

It should be noted that trains carrying GPNL's ore will not pass through either Gladstone City nor Calliope township so residents in these areas will not be affected. Residents of smaller communities in proximity to the rail line are already experiencing the effects of train movements and the effects of the QR trains carrying the GNP ore will be no different.

Assessments of the noise and dust implications of the rail unloading facility at the refinery are discussed in Section 8.8.5.5 and Appendix G respectively.

GPNL is committed to undertaking further consultation with both CSC and GCC on the issue of rail transport of ore.

2.3.4.1 Construction Staging (8)

QR advised that the proponent needs to allow for the change in scope of the WICT project with no rail infrastructure on the northern side of the North Coast Line.

GPNL has incorporated the change of scope of the WICT project into its design.

2.3.4.3 Sewage (16)

CSC/GCC advised that while the Yarwun Sewage Treatment Plant has the additional capacity to accept sewage from the GPNL project, the plant is currently experiencing operational problems as a result of an imbalance in the solids to liquids ratio in the input stream. Calliope Shire Council/Gladstone City Council request that a breakdown of the waste stream is provided.

The waste water from the refinery to be discharged to the Yarwun Sewage Treatment Plant will come from site ablutions and will be normal domestic sewage standard. Process wastes will not be discharged to sewer.

2.3.4.6 Transportation (11)

DMR is concerned that this assumed ratio of workers travelling to site by bus and car understates the reasonable expectation in relation to travel modes. The EIS indicated that only 1000 workers of the 2200 Comalco Aluminium Refinery construction workforce travelled by bus. This is less than 50% of the construction workforce. Based on this experience, it is unlikely that a substantial high proportion travelling by bus could be reasonably assumed. If such an assumption is to be made, the proponents would need to indicate what measures will be taken to ensure a higher bus travel proportion. Otherwise, the proponent should amend the assessment of the construction traffic impacts based on a more realistic ratio of 50% by bus and 50% by private car.

Construction workers for the Comalco Alumina Refinery were accommodated throughout Gladstone and Calliope Shire. Because they were accommodated at multiple locations across a large area, in many instances it was not feasible to operate an effective bus service between the worker's houses and the refinery. However, the GNP proposes to accommodate the majority of its construction workers in a construction camp. This will greatly facilitate the ability to effectively transport a significant portion of the workforce to the site by bus. Consequently the Comalco experience will not be relevant to the GNP and the assumed car/bus ratio given in the EIS is considered to be appropriate.

DMR noted a conflict between Table 2.3.2 (85 buses) and section 4.3.1 of Appendix B (58 buses). The proponent should confirm the correct figures and ensure that they are the figures used for the road impact assessment report.

The correct number was 85 and this is the number that was used in the traffic assessment.

2.3.5 RSF Construction (11)

DMR has advised that the proponent should demonstrate that alternate routes for access to the Residue Storage Facility (RSF) from the north or east have been adequately investigated. The proponent should consult with DMR with respect to the acceptability of any options proposing to gain access to the State-controlled road in accordance with the Road Planning & Design manual, prior to finalisation of the supplementary EIS.

GPNL has reconsidered the issue of access to the RSF and has determined that access for both construction and operations will now be from Bruce HIghway through Koncina Road. A fully channelised intersection should be built to accomodate the longer deceleration requirements of trucks, in accordance with DMR's Road Planning and Design manual.

2.3.5.4 Transportation (16)

CSC/GCC has advised that access to the RSF should be provided through the GSDA internal road network and not direct to the Bruce Highway. The EIS should be amended to include this alternate arrangement so that traffic safety impacts on the Bruce Highway are minimised.

See the response for Section 2.3.5 above.

2.3.6 Pipeline Construction (11, 16)

(11) *DMR has advised that the proponent should provide more precise details of the location and method of crossing of state-controlled roads including the extent of boring under the road reserve, depth and the angle of crossing at each location. Traffic safety management issues should be detailed in the road use management plan.*

Section 7.3.4.2 of the EIS (page 7-27) provides a discussion of the horizontal directional drilling technique. This details the under-drilling of water ways. This technology is also relevant for under-drilling of main roads. The detailed location of under-drilling is an element of works that will be undertaken prior to construction and with the approval of DMR. Application processes will be followed which will provide information and obtain approvals in accordance with DMR's requirements.

As part of the detailed design process, GPNL will prepare a road use management plan which will address all relevant traffic safety issues at each location where the pipeline crosses a state-controlled road.

(16) *CSC/GCC has noted that Section 2.3.6 of the EIS states that ammonia is used to adjust pH within the process, however ammonium sulphate is an output of this process. Does this remove any elevated concentrations of nitrogen from the discharge stream?*

The ammonium sulphate production removes ammonia from the process consequently the amount of nitrogen in the discharge stream is negligible.

2.3.6.1 Construction Procedures (15)

CQPA has noted that four pipes will be required in the corridor from the GPNL site to the RSF. These pipes will carry slurry into the site, seawater to Marlborough, residue to the RSF and return of barren liquor for discharge into Port Curtis. Given the area and the cross section of the Materials Transportation Corridor, the EIS should provide details of how these four pipes for Stage 1 can be accommodated in the MTC and how six pipes for Stage 2 can be accommodated.

Refer to comment in Section 2.2.3.

2.3.6.3 Construction Depots (16)

CSC/GCC have advised that the impact of traffic to construction depots and temporary facilities on Local Government controlled roads is not addressed in detail, as the location for these facilities is yet to be determined. The EIS should therefore be amended such that the proponent is required to prepare a road use management plan (RUMP) that considers issues such as the standard of the road network, access conditions, hours of operation, dust control, safety etc related to these facilities. The proponent should also prepare a road impact assessment (RIA) for Local Government controlled roads to ensure that traffic generated by the proposed construction depots and temporary facilities is investigated and the traffic impacts resulting from these facilities mitigated to the satisfaction of the relevant Local Government. Both the RUMP and the RIA should conform to the current requirements of the DMR. Both plans should be approved by the relevant Local Government prior to any access or construction work on the pipeline.

During the detailed design stage, GPNL will prepare a RUMP and a RIA to address all relevant issues including the standard of the road network, access conditions, hours of operation, dust control, safety etc related to these facilities in accordance with the requirements of the DMR and the relevant local authorities.

Table 2.3.9 (8)

QR has advised that the proponent will need to meet all QR requirements with regard to all pipeline crossings over/under QR rail. QR will need engineering details of the proposed crossings before it can approve the crossing and it will be necessary to execute a crossing agreement with QR.

GPNL will continue to meet and negotiate with QR and follow all application processes and procedures to obtain agreement regarding all pipeline crossings over/under QR rail.

2.3.6.5 Construction Workforce Accommodation (12, 14)

(12) *The Department of Emergency Services (DES) recommended that pre-construction phase consultation be undertaken with local representatives from Queensland Ambulance Service, Queensland Fire and Rescue Service and Emergency Management Queensland regarding the proposed locations, demographics and lifespan of the construction workers village. DES recommended that the workers' villages are planned with consideration of the safety of location and layout.*

GPNL has already met with the Queensland Fire and Rescue Service and Emergency Management Queensland with regard to the project. Ongoing discussion will be undertaken with them and with the Queensland Ambulance Service regarding the proposed locations, demographics and lifespan of the construction workers village.

(14) *Queensland Health (QH) has recommended that the proponent ensures the onsite treatment plants and all drinking water used during the construction and operation of the project complies with the current version of the National Health and Medical Research Council's Australian Drinking Water Quality Guidelines. Other issues that need to be considered include:*

- *Safe food supply*
- *Sewage treatment / disposal*
- *Waste management*
- *Management of mosquitoes and other disease vectors*.

GPNL will specify that it and all of its contractors will ensure that any onsite treatment plants and all drinking water used during the construction and operation of the project complies with the current version of the National Health and Medical Research Council's Australian Drinking Water Quality Guidelines.

All food provided to construction and operations workers will be prepared in accordance with all relevant health regulations.

All sewage from the site will be discharged to the nearby Calliope Shire sewerage treatment plant for treatment and disposal.

Waste management strategies for both the construction and operational phases are detailed in Sections 4, 14.10.1 and 14.11.1 of the EIS.

Mosquito and pest management strategies are detailed in Sections 14.10.10 and 14.10.11.

Compliance with these requirements is considered critical and GPNL will ensure that contractors and staff are inducted in these procedures.

2.3.6.8 Water Supply & Management (14)

Refer to comment in Section 2.3.6.5.

2.3.6.9 Transportation (8, 11, 16)

(8) *QR has advised that the proponent to include the scope of works, assessment of impacts and mitigation measures in their EIS with respect to the potential for the transport of pipe by rail.*

GPNL will discuss with QR the potential for the delivery of pipe by rail. Should it be decided to use rail for pipe delivery, details of the delivery schedule, necessary rolling stock, and frequency of delivery will be determined by QR's operational procedures.

(11) *DMR has advised that some of the intersections along the route for the delivery of pipe may only be designed for 19 m semi-trailer turn movements and may not accommodate the swept path of the pipe transporters within the confines of the existing intersection infrastructure. The proponent should provide details of the actual haul route for the pipeline construction and undertake a detailed assessment of the swept path of the pipe transporters at each intersection proposed to be used in the pipe hauling task.*

It is necessary to undertake a significant amount of detailed design work prior to construction of the pipeline. The work will include road surveys and land owner negotiations, construction compensation and ongoing communication with DMR. A road use management plan for the delivery of pipe will be developed and agreed with DMR in accordance with their requirements.

(16) *CSC/GCC has advised that the statement that truck movements will take place during daylight hours 'as far as practical' is however not acceptable. The timing of truck movements must be addressed as a part of the RUMP for the project.*

Truck movements will be addressed in the road use management plan which will be agreed with DMR and CSC/GSS. This will include consideration of the timing of pipe deliveries to minimise disturbance to nearby communities.

2.5.2.5 Cobalt / Nickel Metal Handling (8)

QR has advised that the use of Mt Miller yard for transporting of nickel/cobalt briquettes needs to be agreed with QR and impacts assessed as part of this EIS.

The cobalt and nickel briquettes will be packed into steel drums and loaded onto pallets. The drums will be strapped and shrink wrapped to the pallet. The palletised drums will then be loaded into containers at the refinery ready for export.

A number of options were studied to determine the most economic method of delivering the containers to market. The study was carried out in conjunction with Toll Mining Services (Toll). Toll has an established operation in Gladstone including the transporting of Orica's sodium cyanide product in containers to Brisbane for export. Toll is a logical logistics partner for GPNL with its capability in Gladstone and ability to offer a fully integrated logistics service leveraging off other Toll Holdings Limited business units.

The optimal solution is to containerise the nickel and cobalt at the refinery, transfer the containers to the Mt Miller rail siding, load them onto rail for shipment to Brisbane for loading onto ships. As well as delivering the lowest cost it is also the most secure, with the least handling of the nickel and cobalt.

It is likely a third party will manage the logistics associated with export. Prior to receiving and loading containers, GPNL will issue shipping advices, including client and port destination, drum or pallet numbers, batch and lot numbers. The containers will be packed and secured with detail/manifest of all drum and pallet/batch numbers packed into each container and the container seal fitted. Container manifests and container packing declarations will be completed for all containers.

Toll has exclusive access to the Mt Miller rail terminal. An overhead gantry crane (owned and operated by Toll) has sufficient capacity to handle the required volume of export containers onto Brisbane bound train services. Details of the storage and loading procedures at Mt Miller will be agreed with QR.

2.5.6 Pipelines (16)

CSC/GCC has advised that the location of the proposed pipeline with respect to the future multiple services corridor established by the CG is not clear. This should be presented in a modified Figure 2.2.4. While Calliope Shire Council/Gladstone City Council acknowledge that GPNL had progressed the identification of their own pipeline corridor prior to the declaration of the proposed multipurpose corridor from the Stanwell industrial estate to Gladstone by the CG, Council would encourage the placement of all or part of the pipeline within this corridor if the corridor is officially declared within a suitable timeframe. The impact of this inclusion on other existing or proposed uses within the corridor also needs to be assessed.

See Section 2.2.3.

CSC/GCC has advised that if the proposal for a slurry pipeline does not proceed then the EIS should consider the impact of increased rail transport through Calliope and Gladstone on the safety and amenity of local residents. The EIS should include a statement that, should the slurry pipeline not be the preferred option for the haulage of nickel ore, a fresh consultation process will be initiated with Local Government and the future rail system subject to a separate environmental impact statement.

See Section 2.2.3.

2.5.6.2 Cathodic Protection Facilities (8)

QR has advised that the proponent needs to provide detailed plans of all pipelines in proximity to the electrified rail lines, the cathodic protection to be provided on the pipeline,e and to secure QR's consent on the measures prior to completion of detailed design.

Once they are available GPNL will provide to QR detailed plans of all pipelines in proximity to electrified rail lines. GPNL will follow all of QR's application processes and procedures with respect to construction of the pipelines and ongoing operating procedures will be agreed and followed.

2.6 Project Inputs (16)

CSC/GCC has advised that the inputs required for the project will have an impact on the transport network. The proponent should confirm that these inputs have been included as a part of the traffic impact assessment.

The project inputs are detailed in Section 2.6 of the EIS. The transport implications of the inputs have been incorporated into the project's traffic studies and the additional traffic generated by their transportation has been allowed for in the modelling.

2.6.4 Limestone (16, 19)

(16) *CSC/GCC has indicated that the project will source limestone from East End or Taragoola mines. It is proposed that this material be conveyed to the site by a slurry pipeline. The location of this pipeline is not clear and needs to be assessed in regard to its impact on Local Government infrastructure. The EIS should be amended so that the location of the pipeline is investigated in greater detail and the assessment of the location made available for public comment.*

The limestone pipeline from East End currently exists and has operated for a number of years. It is proposed to extend this pipeline from the cement plant at Fisherman's Landing using the materials transport corridor to the GPNL site at Yarwun. The alignment of this proposed route is shown on Figure 1.1 of Appendix M. Provision of this pipeline will be the responsibility of the limestone supplier.

Alternative supply sources of limestone currently being considered by GPNL include the Fairview deposit currently held by Metallica Minerals and the Taragoola mines currently controlled by Unimin. Should a pipeline be required from either of these sites, its approval and development would be the responsibility of the limestone supplier. While such a pipeline has not yet been designed, it is anticipated that it would meet the Aldoga Precinct near the RSF and utilise the corridor proposed by GPNL for the residue pipelines to and from the RSF.

As this part of the project is controlled by the limestone suppliers it is not possible to provide more detail for the EIS stage. Once final commercial terms have been agreed and a supplier selected, the necessary approval process will be identified and the relevant approval procedures and studies implemented.

(19) *The East End Mine Action Group has noted that limestone will be supplied from one of the existing limestone mines sites (East End or Taragoola). They have indicated that the EIS does not:*

- *state the source of the water to be used in the limestone slurry; and*
- *state what quantity of water is intended to be used in the limestone slurry.*

The respondent raised strong objection to the use of the East End Mine using mine pit discharge water due to apparent on-going issues regarding groundwater.

As discussed above, the final source of limestone for the refinery is yet to be determined. Part of the selection process GPNL will undertake to determine the source of the limestone will be consideration of the ability of the prospective suppliers to demonstrate that they have all necessary approvals in place and that they can supply the limestone in an environmentally acceptably manner. The source and quality of the water used by the East End or Taragoola quarries will be the responsibility of the operators and will be a factor considered by GPNL in the selection of the preferred supplier.

2.7.1 Nickel and Cobalt Briquettes (9)

Queensland Transport (QT) has requested Gladstone Pacific Nickel Limited (GPNL) to liaise with the Central Queensland Ports Authority (CQPA) about the capacity and suitability of CQPA facilities to lift, store and load containers of the required number, dimensions and weight at the port of Gladstone, for trans-shipment by rail to the port of Brisbane. GPNL is requested to outline why export of nickel and cobalt product through the Port of Gladstone is not efficient or practicable, and why Brisbane is the preferred port for the export of product.

Consultation has occurred with CQPA and Toll Holdings (managers of Mt Miller Rail yard) with regard to transport of containers and capacity discussions associated with Mt Miller container yard adjacent to the Yarwun refinery site. The economics of transporting rail containers to shipping lines has been modelled and the outcome has shown that the Port of Brisbane provides lower cost and more frequent delivery services. This was raised and conceded in further discussions with CQPA.

2.7.2.2 Ammonium Sulphate Storage (15)

CQPA has advised that wharf facilities at Fisherman's Landing No. 3 Wharf are not existing and are 'proposed only' at this stage.

Due to the uncertainty regarding the availability of Fisherman's Landing No. 3 Wharf, GPNL is now proposing to export ammonium sulphate from the existing Barney Point wharf.

Amsul will be loaded into B-Double trucks at the refinery and transported along Hanson Road, Glenlyon Drive and Port Access Road to Barney Point. At Barney Point, the trucks will discharge into a covered dump pit to control dust during unloading. The amsul will be conveyed to a 25,000 t storage shed to be constructed to store the amsul prior to it being loaded onto a ship. The conveyors will be covered and the area under the conveyors sealed.

The amsul in the shed will be reclaimed by front end loader into mobile hoppers mounted over a load out conveyor running the length of the shed. The conveyor will connect to the CQPA ship loading conveyor system. The shiploader is able to load at an average rate of 30,000 t/d. There are no draught restrictions for Handymax vessels at Barney Point. As this is a shared berth with coal loading berth availability will be in order of arrival sequence at the harbour mooring area.

2.9.4 Pipelines (8)

QR has advised that the procedure for decommissioning pipelines near/under/over rail lines will need to be agreed with QR initially as part of this EIS and then prior to the actual decommissioning at which time further conditions on decommissioning may apply.

GPNL will develop a procedure for decommissioning of pipelines near railway lines in conjunction with QR as part of the detailed design phase. Prior to decommissioning, GPNL will discuss and agree relevant procedures with QR.

GLADSTONE NICKEL PROJECT ENVIRONMENTAL IMPACT STATEMENT SUPPLEMENT

Project Infrastructure 6

URS

Gladstone Pacific Nickel LTD

3.1.2 Water Supply – Potable Water (14)

QH has advised that the EIS has identified that water for potable use will be supplied by the GAWB. How will GPNL ensure that it will not adversely impact on or deplete the community's water supply?

The GNP will be a minor user of potable water. As discussed in the EIS, the demand for potable water for Stage 2 will be (64 ML/y). This will be supplied from the Gladstone Area Water Board's (GAWB) water treatment plant which is adjacent to the refinery site. The GAWB has indicated that this plant can be augmented if necessary to meet growing demand.

In addition to potable water, the GNP will also require raw water. GAWB has indicated an available net 15 gigalitres per year (GL/y) sustainable yield is currently available for new users. Stage 1 of the GNP will consume approximately 12-15 GL/y while the Stage 2 demand will be 25-30 GL/y.

The regulatory processes controlling the supply and use of raw water place top priority on community requirements and the reliability on supply of water to the community is a mandatory element of GAWB's water licensing activities. Protection of water supply is considered priority particularly with regard to community use and GAWB will not be allowed to provide water to the GNP unless they can guarantee supply within a regulated probability of supply to the general community.

As discussed in the EIS, a number of alternative options for raw water supply are being considered by GAWB. Thus alternatives to the existing Awoonga Dam may be available by the time the Stage 2 demand is required which will be 2015 or later.

3.1.3 Seawater (15)

QCPA has advised that the pipeline route for seawater is not shown on Figure 3.1.2. Information is sought on the location of the seawater pumps and associated intake structures at Wiggins Island. If, as is pointed out in comments elsewhere, the wharves at Wiggins Island have not been constructed, what arrangements are to be made for saltwater pumps?

As discussed in Section 2.8, the large demand for seawater described in the EIS is no longer required due to the proposed use of fresh water rather than sea water for cooling. However there will still be a small demand for sea water to be used in the refining process. This demand is 8 GL/y.

As the seawater demand has reduced significantly (from 240 GL/y to 8 GL/y), it is proposed to source the seawater from the Calliope River which is much closer to the refinery rather than from Port Curtis. This will result in a significantly shorter delivery pipeline and less disturbance from pipeline construction.

Sea water will be extracted from the Calliope River near its junction with the Anabranch approximately 500 m to the east of the refinery. A land-based pump station will be installed with an intake line extending into the river. The pipeline to the plant will follow the current powerline easement which will be relocated around the plant.

3.4 Sewerage (16)

CSC/GCC advised that while the Yarwun Sewage Treatment Plant has the additional capacity to accept sewage from the GPNL project, the plant is currently experiencing operational problems as a result of an imbalance in the solids to liquids ratio in the input stream. Calliope Shire Council/Gladstone City Council request that a breakdown of the waste stream is provided.

The waste water from the refinery to be discharged to the Yarwun Sewage Treatment Plant will come from site ablutions and will be normal domestic sewage standard. Process wastes will not be discharged to sewer.