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# **NELSON BAY RIVER MAGNETITE DEPOSIT CONCEPTUAL MINING STUDY**

for

**GUJARAT NRE RESOURCES NL**

**24 July 2007**

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## 1. EXECUTIVE SUMMARY

The first Nelson Bay River Iron Ore Conceptual Mining Study by The Minserve Group Pty Ltd (Minserve) in March 2006 was commissioned by Zelos Resources N.L. (Zelos) to look at the opencut mining potential of the inferred resource of 4Mt of ore to a depth of 225m and the Addendum to this report incorporated later cost information regarding process options. This study concluded that the best means to exploit the magnetite deposit was by way of opencut mining and site processing to produce around 150,000tpa of coal washery heavy media magnetite product or 150,000tpa of magnetite pellet product.

Subsequent to this report ownership of the deposit has passed to Gujarat NRE Resources NL (Gujarat) and additional geological investigations have been undertaken to better understand and define the resource.

The results of the geology investigations are recorded in the report, "Report on the Resource Estimation of the Nelson Bay River Magnetite Deposit, N.W. Tasmania", by Simon Tear of Hellman and Schofield Pty Ltd, 5 January 2007 (ref. 4). This included the results from three diamond drillholes and Davis Tube Recovery (DTR) tests for magnetite on the relevant intervals. A revised geological model was created for the deposit and a new resource estimate identified for the model which has a strike length of 400m for the major portion of the resource. The revised Inferred Resource estimate is 6.9Mt of 38.2% magnetite based on a 20% magnetite cut-off grade. The resource estimate is from surface (80mRL) to a depth of some 225m (-140mRL). This equates to a magnetite content of 2.63Mt.

The 2006 study 600m long open pit orebody defined by ground magnetic interpretation, surface mapping, and three cored drillholes has now been re-interpreted as being essentially 400m long and considerably wider at the northern end.

The modelled resource has a shape some 600m long with an average down dip depth of 220m. True thickness ranges from 2.2m at the southern end to 27m in the middle and 18m at its northern end. The deposit dips at 65° to Local Grid west.

Minserve has been asked to look at the new 2007 resource model and develop an opencut design to produce a ROM product that would undergo beneficiation to a saleable product. Two process options have been nominated and an indicative order of magnitude costing of the perceived best case is to be used to provide order of magnitude project costs.

The two options are the production of magnetite for use in coal washeries and the production of magnetite pellets using a Savage River style process.

The 2006 conceptual study perceived the production of magnetite products for use in Australian (and Indonesian) coal mine washeries to be the highest value market for Nelson Bay River magnetite. Currently, central Queensland coal mines pay prices around \$250 to \$260 per tonne for delivered magnetite which is used in the coal washery heavy media separation process. Current suppliers are few in number with most magnetite supplies coming from Tasmania, New South Wales, Western Australia and Canada.

Annual magnetite supply requirements are limited and mining generally occurs on a small scale with mines producing around 50,000tpa to 100,000tpa. This would suit production from the Nelson Bay River Iron Ore resource at 150,000tpa.

Prior to commencing the detailed mining study it was deemed necessary to locate the deposit's position accurately relative to the adjacent Nelson Bay River. Past conflicting information on the location of the drillhole and magnetite survey anomaly was resolved by taking two known points located on the 1985 and 2006 aerial photos and converting all information to the MGA94 survey system to show the true position of the magnetite anomaly and drillhole information. This clearly located the deposit relative to the Nelson Bay River and this now allows the position of the river to be taken into account when assessing opencut mining options.



Limitations still exist with the interpretation of the distribution of magnetite and the associated metallurgical interpretation of the distribution of the magnetite within the deposit as described in the latest geological report and resource estimation by Simon Tear, 5 January 2007 (ref. 4). This restricts this report, therefore, to a conceptual level of study and costing and to this extent the cost base of the Minserve March 2006 reports has not been updated but has been extended to provide additional conceptual cost allowances for site infrastructure, road transport to Port Latta and an allowance for port charges. All these costs need to be reviewed by Gujarat and discussions initiated with contractors, port authorities and government agencies to source better cost estimates.

Two conceptual opencut designs and project costings have been carried out now that the position of the Nelson Bay River has been established relative to the deposit.

The first case looks at mining the resource to a depth of 220m and diverting the river in order to mine all the resource available. The river diversion is a conceptual diversion some 400m long and 30m deep requiring some 500,000m<sup>3</sup> of rock to be mined.

The second case looks at no river diversion with opencut mining to a depth of 220m restricted by leaving a safety pillar under the river. It has been assumed that this ore resource pillar outside the opencut could be mined, in part, by underground mining with geotechnically designed pillars left to maintain the stability and integrity of the river above. Such a method is likely to rely on decline access off the opencut and would need geotechnical guidelines and confirmation before it could be undertaken.

In both cases the waste mined will be placed in dumps to the west of the opencut. It has been assumed that the mine and treatment plant facilities will be sited to the south of the opencut on the same (western) side of the river. It has also been assumed that product magnetite will be transferred by conveyor to the eastern side of the river to the loadout bin and/or stockpile facilities where it will be loaded for road haulage to Port Latta some 90km to the north using existing roads. It has been assumed that product magnetite will be loaded at Port Latta and transported to its final destination.

For this study Port Latta has been taken as the point of sales and a sales price of \$200 per product tonne has been used. This allows some \$60 per tonne to cover costs after loading at Port Latta.

A summary of the Coal Washery Magnetite project for the two opencut mining cases is shown in Table 1.1.

**Table 1.1**  
**Coal Washery Magnetite Product**  
**Summary Conceptual Opening Project Costs**

<b>Coal Washery Magnetite</b>		<b>River Diversion</b>	<b>No Diversion</b>
Pit Depth	m	225	225
Mining Pit Ore Reserve	t	6,500,000	4,500,000
Product Recovery	%	38.2	38.2
<b>Contained Product Tonnes</b>	<b>t</b>	<b>2,483,000</b>	<b>1,719,000</b>
Waste to Ore Rates	bcm/t	3.0	3.0
Pit Shell Nominal Waste	Mbcm	19.5	13.5
Annual Product Tonnes	t	150,000	150,000
<b>Nominal Project Life</b>	<b>years</b>	<b>16.6</b>	<b>11.5</b>
Estimated Mine Gate – Cost per tonne	\$/t	\$109.70	\$109.70
Mine to FOB Port – Cost per tonne	\$/t	\$18.80	\$18.80
<b>Total FOB Cost per tonne</b>	<b>\$/t</b>	<b>\$128.50</b>	<b>\$128.50</b>
<b>FOB Price/tonne</b>	<b>\$/t</b>	<b>\$200.00</b>	<b>\$200.00</b>
Project Operating Surplus	\$	\$177,518,000	\$122,897,000
Capital Cost Estimate	\$	\$25,000,000	\$21,500,000
<b>Estimated Project Life Surplus</b>	<b>\$</b>	<b>\$152,518,000</b>	<b>\$101,397,000</b>

The above conceptual costs do not take into consideration government royalties, local government contributions/charges or taxation.



The Nelson Bay River Iron Ore project is at an early stage of evaluation. An inferred resource has been estimated from only six cored drillholes. Metallurgical testwork and assays show encouraging results without being specifically tailored to the mining of the two products mentioned. Each has potential to be a viable operation if the ore is proven to be suitable for the purpose proposed.

At this stage there would appear to be advantages in seeking to divert the Nelson Bay River in order to maximise the opencut ore that could be mined and hence obtain the greatest benefit for the project. A compromise may be to start with a no diversion opencut design whilst negotiating to divert the river several years after the project is underway having stated at the outset that this is the plan adopted for the project.

Key areas to advance the project to the next stage of are perceived to include:

### **Geology**

- Additional cored drillholes to upgrade the resource to indicated or measured status
- Definition of the basal 7m ore zone and the magnetite distribution within the ore zone and the ore zone/waste interfaces.

### **Mining**

- Topography coverage for mine design and out-of-pit waste dumps
- The ability to divert the river
- Confirm geotechnical and mine design parameters
- Confirm environmental guidelines for mining.

### **Mineralogy/Metallurgy**

- Testwork to determine suitability of ore for supply to coal washeries and Ausmelt processes
- Flowcharts and recoveries/yields for the selected processes
- Capital and operating costs for the selected processes.

### **Marketing**

- Confirm market specifications and suitability of processes to meet specification
- Establish market windows of opportunity with regard to quantity and price for the selected processes.

### **Project**

- Establish project infrastructure requirements and costs
- Establish environmental requirements for the project
- Establish government and regulatory requirements framework for the project.

The conceptual study results support continuing the study evaluation to delineate opencut mining to 225m depth, resource definition to define the ore zone over the 600m strike length and determine metallurgical factors and recoveries to produce magnetite products suitable for sale to coal mine washeries or as a pellet product. Process flowsheets and capital and operating costs need to be provided to match these studies along with more precise site infrastructure requirements and costs.



## 2. INTRODUCTION

### 2.1 GENERAL

This report has been commissioned by Gujarat to update the desk top conceptual mining study of the Nelson Bay River Magnetite Deposit based on the latest resource data contained in the report "Resource Estimation of the Nelson Bay River Magnetite Deposit, NW Tasmania", by Simon Tear of Hellman and Schofield Pty Ltd dated 5 January 2007.

This report should be read in conjunction with the above resource estimation report which describes in detail the geology and geological setting of the resource.

The report reviewed the survey limitations for the deposit where there was a discrepancy in the relationship between the local mine grid and the Australian Mapping Grid system reporting of drillhole information and magnetic anomaly information.

Prior to commencing the detailed study, work was done to resolve the differences in the various survey systems used in the past such that the spatial relationship between the deposit and the Nelson Bay River could be established and clearly defined in all the systems and the project information summarised in the current Mapping Grid Australia 94 survey system (MGA 94). This report has now taken information from earlier sources, reconciled the data and combined them into the current MGA94 co-ordinate system.

### 2.2 LOCATION AND ACCESS

The Nelson Bay River area is held under licence by Zelos as EL 41/2004. Exploration licence EL 41/2004 covers 50km<sup>2</sup> and is located about 7km northeast of the small township of Temma, and about 60km southwest of Smithton in North West Tasmania (Figure 2.1).

Main road access to the property is via the Temma and Heemskirk roads and parts of the licence can be accessed by the Wuthering Heights forestry roads. Off-road access is potentially very difficult for parts of the EL.

The Nelson River Iron Prospect is accessible by foot from the Wuthering Heights forestry track. The original access has been environmentally rehabilitated but only requires minor work to restore vehicle access.

### 2.3 PRODUCT SALES

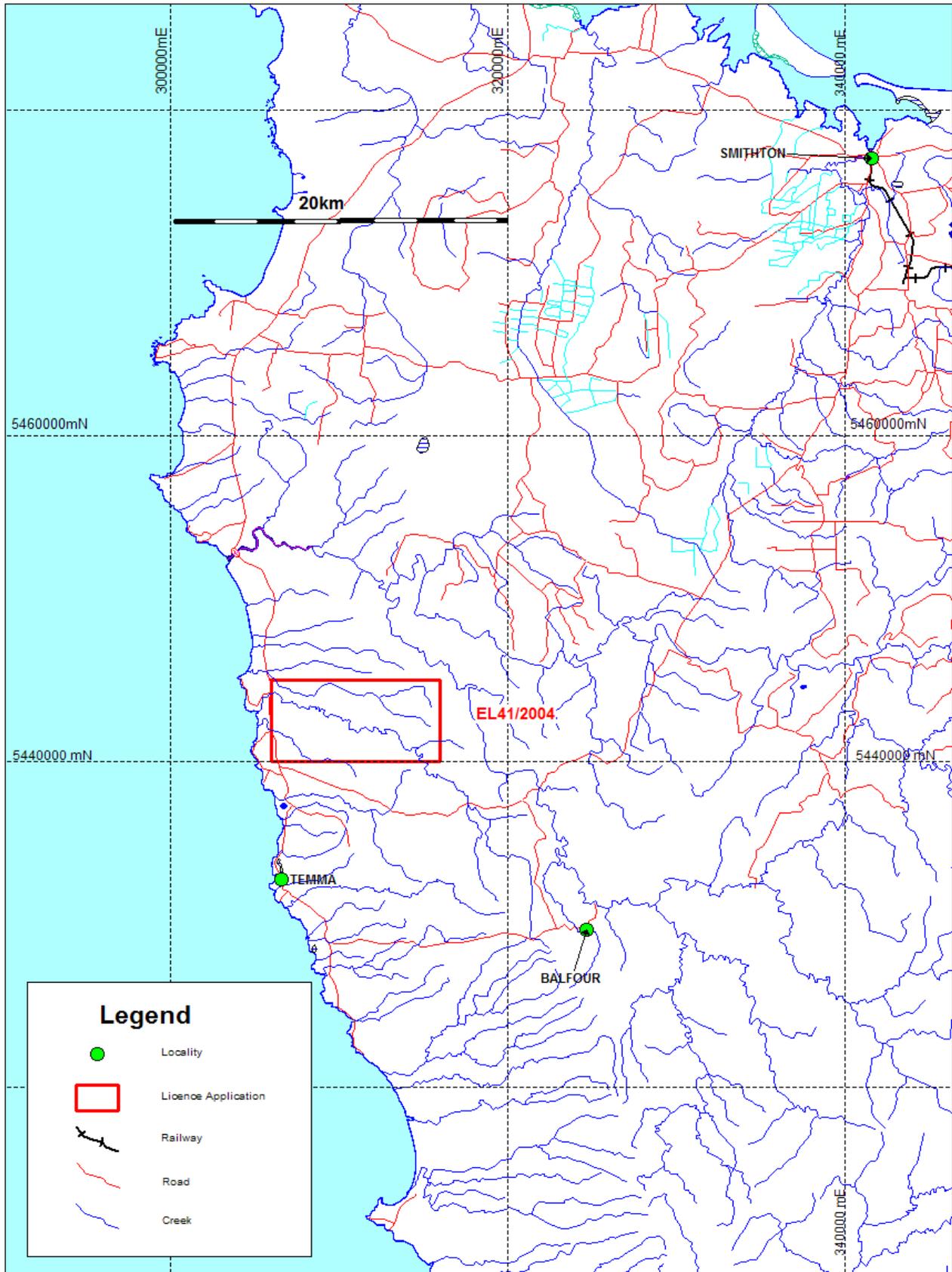
The previous March 2006 Minserve report looked at exploiting The Nelson Bay River Magnetite Deposit with two preferred sales options:

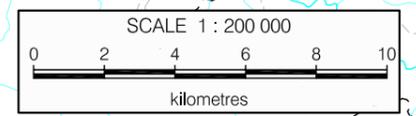
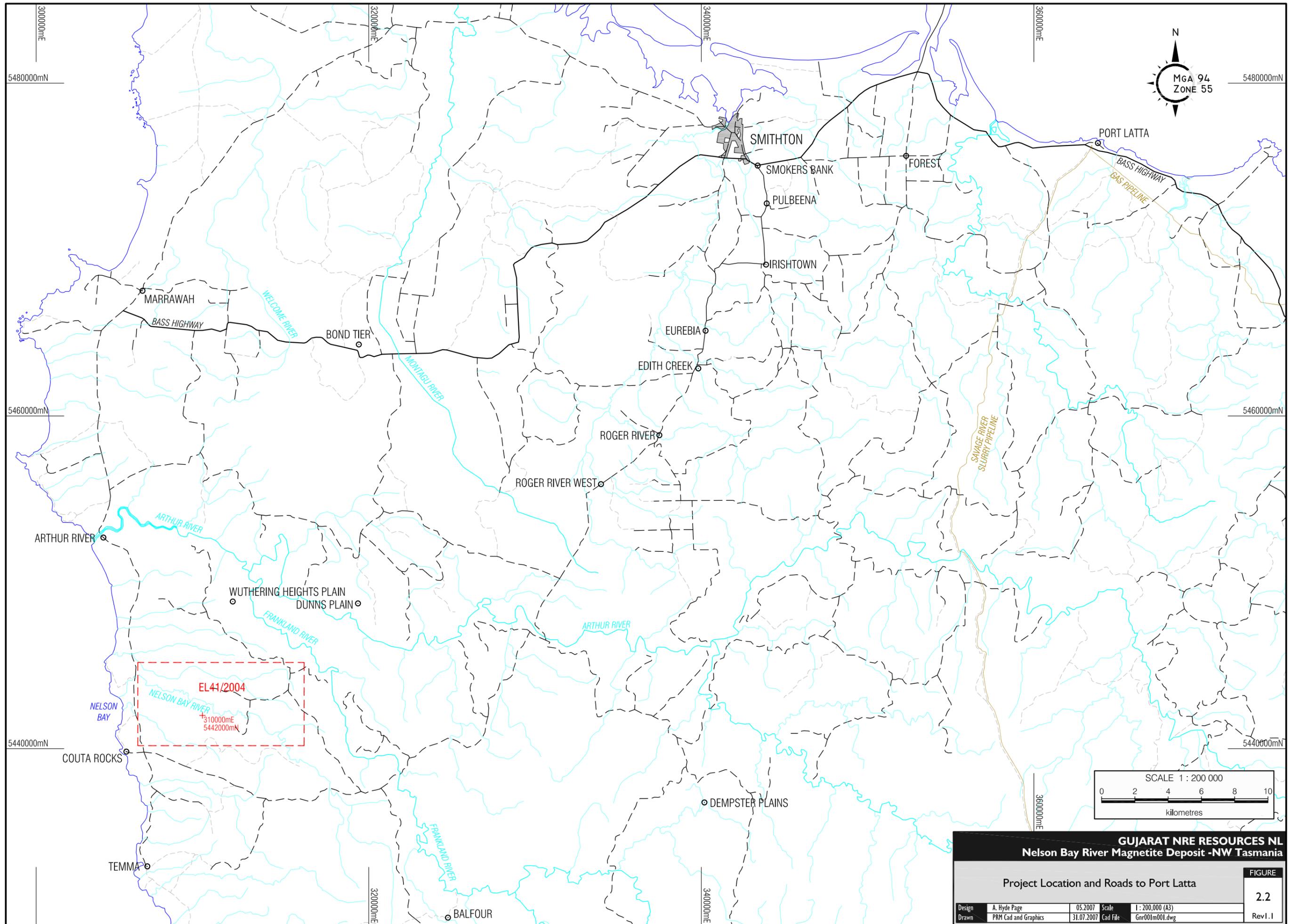
- Magnetite concentrate for coal washeries in Australia and Indonesia
- Magnetite pellets using a Savage River style process.

Both options are based on the product being shipped from Tasmania. This report assumes that the minegate product will be trucked from the mine to Port Latta on the north coast of Tasmania from which it will be shipped to its destination port and forwarded to end user. Figure 2.2 shows the existing road infrastructure linking the mine to Port Latta, a distance of some 90km.



Figure 2.1  
Project Location





**GUJARAT NRE RESOURCES NL**  
**Nelson Bay River Magnetite Deposit -NW Tasmania**

**Project Location and Roads to Port Latta**

**FIGURE**  
**2.2**  
 Rev 1.1

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## 2.4 TOPOGRAPHY AND CLIMATE

The Nelson Bay River Iron Ore resource area lies within the central portion of EL 41/2004 (Figure 2.3).

The western portion of the tenement is a peneplained hinterland adjacent to the coast with localised fossil sand dunes. Further to the east the terrain becomes more undulating with incision by creeks and major rivers draining from the east to the west. These include Sundown Creek, Sardine Creek and the Nelson Bay River.

Map coverage for the resource area is confined to state government 1:100,000 maps which show the iron ore resource area to be generally flat to undulating country some 90m to 100m above sea level. Past exploration work has been centred around the base line established by Pickands Mathers prior to 1972.

The March 2006 aerial photo coverage obtained for the resource area shows the trace of the drill line on the ridge to the southwest of the Nelson Bay River and the adjacent surface drainage system likely to be affected by opencut mining. The earlier 1985 aerial photo coverage has also been sourced to help with plan interpretation when converting information to the MGA 94 co-ordinate system.

The climate is temperate with substantial annual rainfall typical of Western Tasmania. Temperature ranges from just above freezing in winter to a likely maximum of 30°C in summer.

Vegetation cover is a mixture of low level heath in the west of the licence and plantation forestry in the east of the area. This is clearly shown on the 2006 photomosaic plan prepared of the area (Figure 2.4).

## 2.5 TENURE AND HISTORY

Land tenure in Tasmania is based on a series of classifications that have resulted from the Regional Forestry Agreement Act (RFA).

In conjunction with other stakeholders' interests, this Act establishes what land is available for exploration and mining in defined areas such as State Forest. RFA land use categories that allow mineral exploration and mining include Nature Recreation Areas, Regional Reserves and Conservation Areas. All planned activities are subject to a prior project review before they can commence.

Any exploration work program planned within any of the above three categories triggers the Mineral Exploration Working Group (MEWG) convened by MRT. MEWG reviews the planned work program and can make recommendations and/or modifications to the plan before it is approved. Mineral exploration/exploitation can also be approved for Forest Reserve areas not available for forestry use.

An MDC Informal Reserve is a forestry-related category that has very minor impact on mineral exploration. Nature Reserves, State Reserves and National Parks all exclude mineral exploration.

For the Nelson Bay River licence EL 41/2004, 55% of the tenement is classified as State Forest with 40% classified as a Conservation Area with the remaining 5% as an MDC informal reserve. A small 'forest community managed by prescription' occurs in the northeast corner of the tenement but information supplied by MRT indicates that this is not likely to be an impediment to mineral exploration.

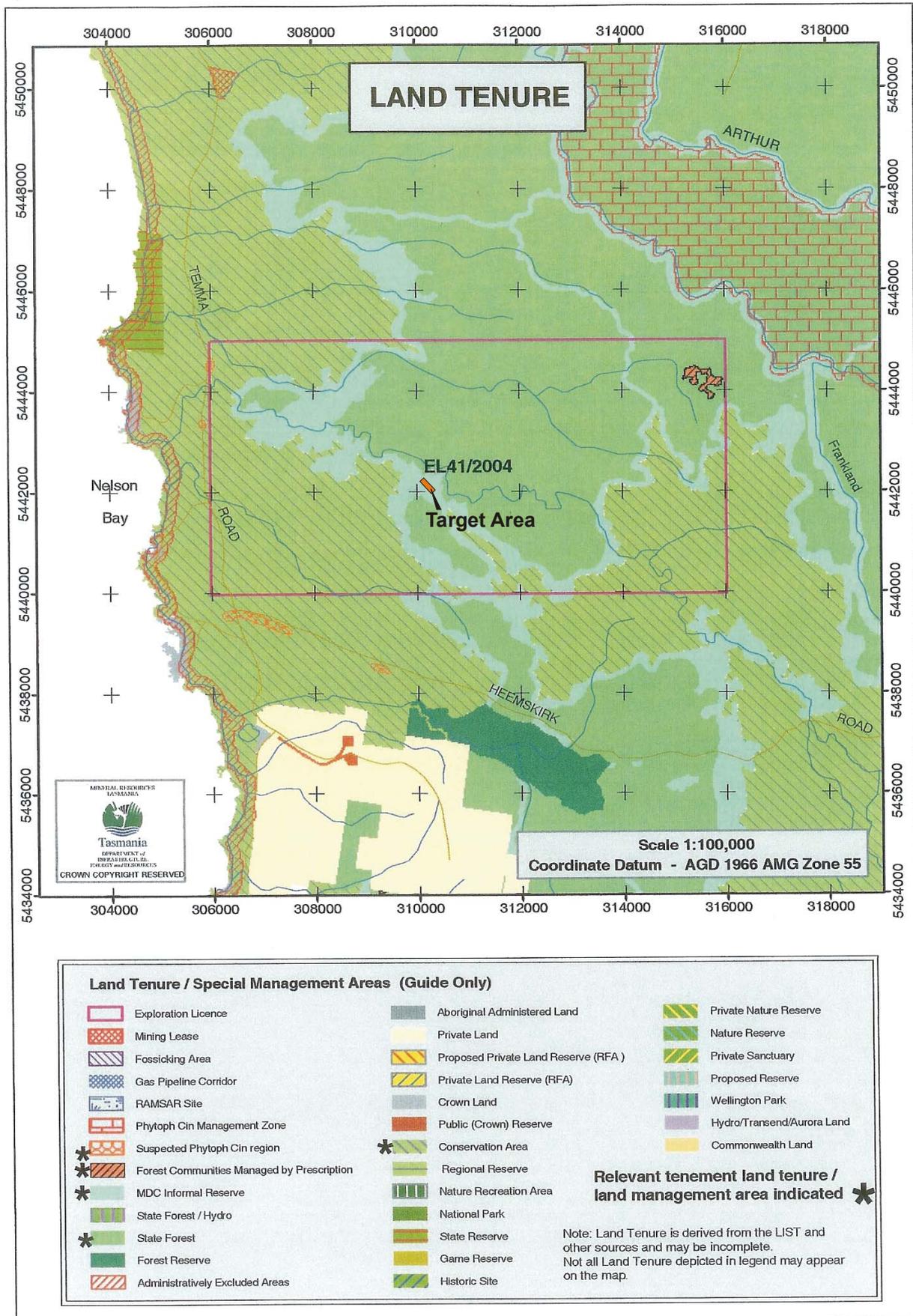
MRT has informed Zinico N.L. that there are no mining leases within the property.

A map detailing the tenure and land use situation is included as Figure 2.3.

Peripheral to the southwest corner of the licence there are recorded areas of the plant disease *Phytophthora Cinnamoni*. Care must be exercised when working near these areas to avoid spreading the infestation. This generally refers to washing all field gear ranging from gumboots to heavy plant machinery when moving to new sites/locations.



**Figure 2.3**  
**Land Tenure and Land Use**



Exploration in the area was first undertaken by Pickands Mather between 1966 and 1972. This identified the Nelson Bay River aeromagnetic anomaly which was tested with one diamond drillhole. This encountered magnetite 70m below surface.

In 1973 Australian and New Zealand Exploration Company concentrated on the nearby clean quartzites for the possible production of silica.

Between 1977 and 1984 CRA Exploration explored the area including a period (1981 to 1982) in which Geopeko were also involved. The main targets were gold and base metals. Ground magnetics and auger drilling during this period better delineated the Nelson Bay River Iron Ore feature.

Between 1986 and 1990 Bach Holdings explored the area and tested various Quaternary sand deposits for heavy minerals.

From 1997 to 2001 Pacific Nevada Mining Pty Ltd explored the area. They re-logged and sampled the 1967 drillhole and drilled two new drillholes. Work confirmed strike length of the main airborne/ground magnetic anomaly and the geological nature of the magnetic anomaly as a magnetite rich footwall zone in an ultramafic dyke dipping 60° to the west.

Zelos (formerly Zinico Resources N.L.) acquired the Nelson Bay licence in 2004 and commissioned SMG Consultants Pty Ltd (SMGC) in Brisbane to complete a literature study of the area. The data review noted that there were indications of a coherent magnetic body of significant proportions for which an inferred resource was identified of 4Mt @ 40% total iron (Fe) for 600m of strike length and 225m of dip length with an estimated true width of 7.5m.

Recent work by Zelos in 2006 included a drilling program to further increase the knowledge of the deposit. In particular, holes NBR003 and NBR004 have indicated a wider magnetite zone that remains open to the north but is also presumably limited to the extent of the ground magnetic anomaly. The implication of this wider zone now suggests that the earlier 7.5m magnetite zone in NBR001 used to calculate the original resource can be extended to include the other magnetite-rich zones in that hole, i.e. it now becomes 28m wide from a down the hole depth of 201m. However, this extension of the potential ore zone has an associated core loss and variability in magnetite content. The recent DTR testwork shows that this core loss zone contains sections of high grade magnetite and this zone can be reasonably correlated with the intercept in the overlying drillhole N401. Thus north of the NBR001/N401 section line the quality and quantity of the resource has improved from the 2005 estimate, although it must be borne in mind that any mining methods have to account for the impact of the Nelson Bay River which occurs about 50m north of NBR004.

Negative aspects of the recent work include drillhole NBR005, which was drilled 100m south of NBR001 (and 100m north of NBR002) and failed to reach its target position. This failure was compounded by the DTR results for NBR002 which, despite having a 7.5m true width of high iron assays that implied high grade magnetite, yielded only a narrow magnetite zone of 2.2m true width at a modest magnetite grade of 20%. This severely impacts on the southern end of the magnetite body, substantially reducing its width, grade and thus its potential mineability.

## 2.6 SCOPE OF WORK

Minserve was initially requested to look at updating the previous conceptual mining study for the Nelson Bay River Iron Ore resource based on the revised resource information in the 5 January 2007 Report on the Resource Estimation of the Nelson Bay River Magnetite Deposit by Simon Tear of Hellman and Schofield Pty Ltd. The scope of work was to look at the existing data, design an opencut mining operation and determine indicative costs to mine and process the ore.



The following steps are involved:

- Develop an opencut mining reserve
- Create an opencut design
- Select a contract mining method to produce a ROM mine product
- Look at processing costs
- Review previous study results and costings
- Update the previous study case for the production of a magnetite product for use in coal washeries
- Update an alternative case, if directed by GNR.

The Minserve study will be subject to any updated input on metallurgy, the beneficiation processes and marketing provided by Zelos, Gujarat or others during the study period.

Early work was focused on reviewing and combining the different data sources into the MGA 94 survey system in order to set up a common database for the interpretation of the location of the Nelson Bay River relative to the magnetite resource.

## 2.7 SURVEY

Minserve sought to resolve the differences in survey information for the project area by taking common points in the various survey systems and reconciling them to the current standard Mapping Grid Australia 94 (MGA94) system. The work was undertaken by Minserve's cartographer, Paul Stewart, who obtained air photographs showing the deposit area in 1985 and 2006.

A conversion from the Local Grid used to Australian Mapping Grid 66 (AMG66) was calculated based on two points, supplied by Simon Tear, which had known coordinates in each system. This required a scaling, rotating and moving of the Local Grid data positions to convert them to AMG66. The later conversion from AMG66 to MGA94 required a coordinate movement of +111.116mE, +183.314mN.

The two points supplied by Simon Tear used for the conversion were:

Drillhole NBR001	- Local Grid 9955mE, 22180mN
	- AMG66 310148mE, 5442077mN
Joining Baseline from Access Track	- Local Grid 10000mE, 20537mN
	- AMG66 311240mE, 5440837mN.

The two known points were located on the 1985 and 2006 aerial photos (which are not Orthophotos). This then allowed information on the photos to be located as grid positions to the accuracy that could be obtained from the air photos.

From the 1985 air photography, the positions of the Geopeko Magnetic Grid Lines were digitised. This more accurately positioned of the magnetic anomaly and allowed the problem with the Geopeko Magnetic Grid location to be resolved by rotating its grid 2° to the east such that the location of the drillholes in all the survey grid systems now coincide and the true position of the magnetic anomaly is shown consistently in each system relative to the Nelson Bay River.

The relationship of the MGA94 and Local Grid systems superimposed on the 2006 aerial photograph is shown in Figure 2.4 based on the above conversion process. The 1985 aerial photograph is included as Appendix 1. Subsequent to this conversion Simon Tear advised that he had arbitrarily ascribed the coordinates 10000E and 20000N as the origin of the Local Grid whereas Geopeko had an origin of 10000E, 10000N. It is therefore believed that the points shown are correct in the MGA94 system but need adjustments for the Local Grid.



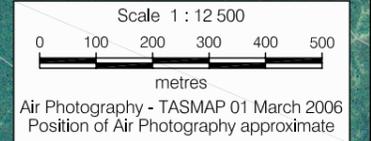
Aerial Photograph - March 2006  
Showing Local Grid and MGA94 Systems

FIGURE

2.4

Rev 1.2

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## **2.8 DISCLAIMER**

This report has been prepared at the request of Gujarat to assist them to evaluate the feasibility of opencut mining of the Nelson Bay River Iron Ore resource. The latest geological interpretation of the resource is the 5 January 2007 Simon Tear Geological Report, Resource Estimation of the Nelson Bay River Magnetite Deposit, provided by the client. This report has been used to provide quantities for this study and has not been audited by Minserve.

Metallurgical test work and investigations commissioned by Zelos have also been used un-audited. These results have been taken at face value when deriving the amount of magnetite product produced after beneficiation of the ROM ore.

Order of magnitude operating costs have been developed for the project based on broad cost assumptions. These have been used to generate operating cash surplus estimates independent of the capital cost of a site located beneficiation plant and infrastructure capital costs.

The studies and the data available are considered to be adequate for this conceptual level of study. Projections contained in the study are representations of future events based on assumptions that are subject to uncertainties and contingencies outside the control of Minserve. No representation is made that any forecast or projection will be achieved. Minserve makes no representation or warranties to the accuracy, reliability or completeness of matters in this study beyond those stated in the study.

This report has been compiled by Minserve member Alwyn Hyde-Page based on geology input by Simon Tear of Hellman and Schofield Pty Ltd.



## 3. GEOLOGY

### 3.1 GENERAL

This section on geology is a selective summary of information from the report: Nelson Bay River licence EL41/2004; Literature Study Report, November 2005 by Simon Tear of SMGC. This has been updated, where appropriate with information from the 5 January 2007 report by Simon Tear of Hellman and Schofield Pty Ltd. Reference is made to the Nelson Bay River Iron Ore resource quantified in the latter 2007 report which forms the basis of the conceptual mining study. Whilst other potential opencut magnetite occurrences are mentioned in the SMGC report, they are not quantified and therefore have not been used. Their potential still remains to be quantified.

### 3.2 REGIONAL GEOLOGY

The regional geology of the Nelson Bay River tenement consists of mixed Proterozoic siltstones, sandstones and carbonaceous mudstones of the Cowrie Siltstone, part of the Rocky Cape Stratotectonic Element.

### 3.3 LOCAL GEOLOGY

Rocks in the Nelson Bay area comprise finely laminated, psammo-pelitic, Proterozoic-aged siltstones with medium grained sandstones/quartzites. The quartzites are clean, well sorted, and massive to thinly bedded and up to 200m thick.

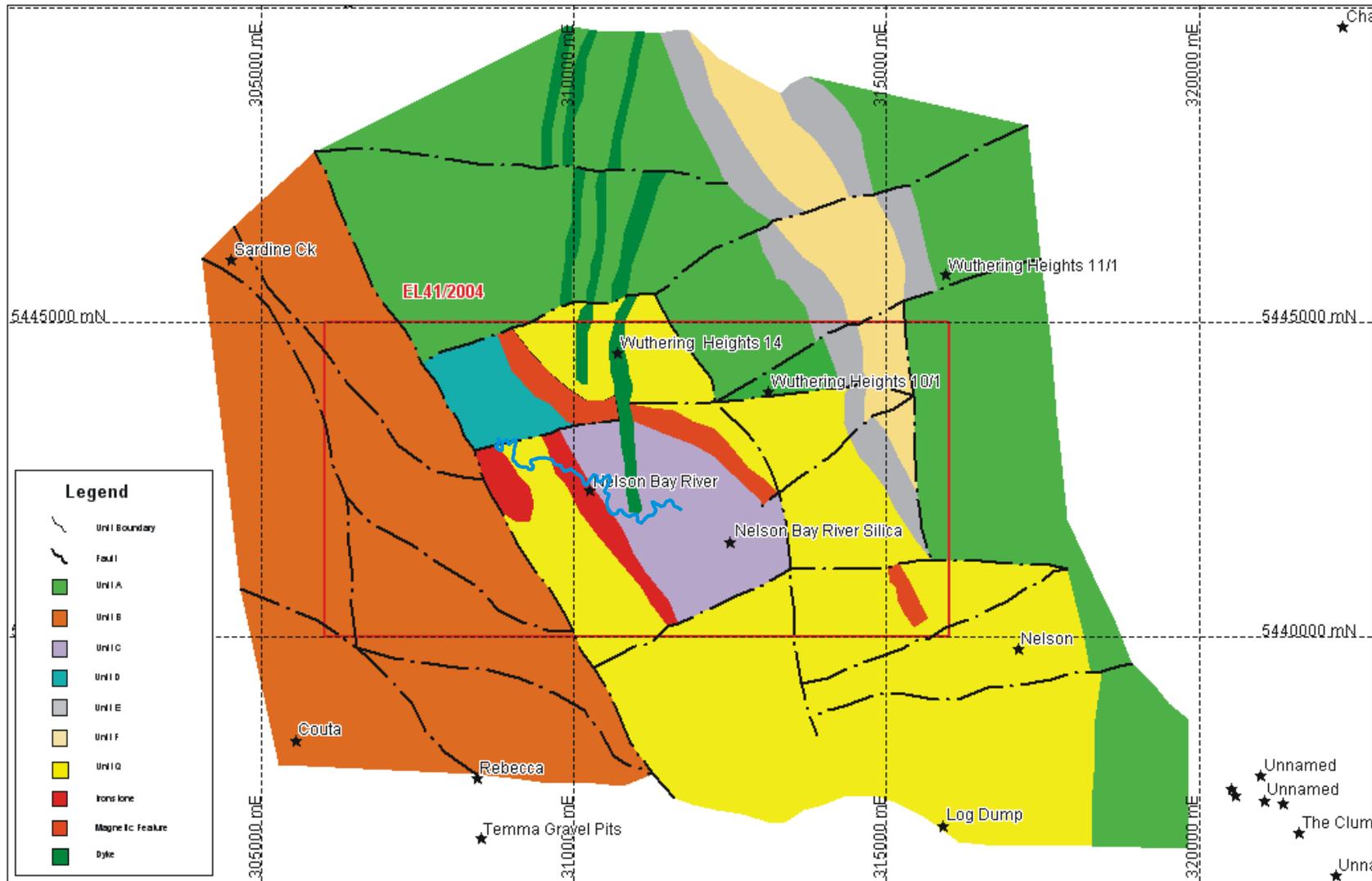
A geological map (Figure 3.1) was constructed by SMGC in November 2005 based on airborne geophysical data from the West Tasmania Mineral Reconnaissance Program (WTMRP).

The key features of the new geology map for the general licence area are:

- A new set of geological units:
  - Unit A is a distinctly dappled unit in the 1VD image. It may correspond with the Wavy Laminar Unit at Balfour (Tear & Russell 1998)
  - Unit B corresponds to Carey's Epsilon Unit, interbedded siltstones. A distinctive unit in the 1VD image and this unit may be similar to Unit Q
  - Unit C is the core of the proposed anticline and may be similar to Unit Q
  - Unit D appears to be a distinctive unit in the 1VD image, belonging to no other unit
  - Unit E part of a magnetically distinct unit in the TMI image linked to Unit F
  - Unit F equates to the Scoured Channel Unit reported by Tear & Russell 1998, at Balfour. The unit corresponds to a discretely magnetic unit in the TMI image
  - Unit Q is a large area of rocks with similar features in the 1VD image. It is believed to be a mixed quartzite and siltstone unit
  - Magnetic Feature corresponds to a discrete magnetic feature that may be a folded part of the Ironstone, maybe a fault or some other unexplained unit
- The possibility of a plunging anticline adjacent to the Nelson River Iron anomaly, with the anomaly lying in the southwest limb of the anticline, possibly as a fault structure and/or as a folded dyke(?)



**Figure 3.1**  
**Geological Map of the Project Area**



- A series of north-south striking dykes appear truncated near the Nelson Bay River prospect
- The northern limb of the proposed anticline is visible as an approximately east-west to west-northwest striking magnetic anomaly
- A major northwest to north-northwest striking fault is inferred to pass through the western third of the licence with a second parallel fault interpreted 5km to the east. The former could be Carey's Lagoon River Fault. In between the two faults lies the Nelson Bay River Iron feature with the same orientation. This orientation is also parallel to the Balfour Copper Trend. A second set of faults striking roughly east-northeast (to east-west) is also interpreted
- Part of the Balfour sequence occurs in the far northeast corner of the licence (based on magnetic correlation from Tear, 1996).

### 3.4 IRON ORE OCCURRENCE

Within the Nelson Bay River licence there are four mineral occurrences listed in the MRT database. The main one of interest to Gujarat is the Nelson River Iron occurrence, with the remaining three being recorded instances of sand and gravel.

The Nelson River Iron occurrence is a 4km long, stratabound airborne magnetic feature confirmed in the WTMRP airborne surveys. Follow up ground magnetic work by Geopeko in the 1980s has shown that the airborne feature splits into two anomalies, a northern one and a southern one. In the field, the northern anomaly comprises at surface of an 800m long lode of granular aggregates of hematite and magnetite in an iron clay and/or siliceous matrix. At depth it becomes an "ultramafic dyke-like structure", up to 40m wide, containing a quartz-carbonate-magnetite-pyrite-garnet-chlorite-amphibole assemblage that dips 60° west and cross cuts stratigraphy at about 70°. The dyke is sub-parallel to the lithological strike. Alteration associated with the dyke consists of a "white mineral and olive coloured silicate, fibrous amphibole and green silicates". In addition dense clusters of garnet are reported at the ultramafics contact with the sediments. This mineral style has been linked in the past to Proterozoic iron formations similar to that which occurs at Tennant Creek (Newnham 2000).

Prior to the latest drilling in 2006 drill logs for NBR001, NBR002 and N401 show that there is a magnetite-rich footwall zone to the dyke, which in NBR001 has yielded a 7.3m zone at 46.5% iron from 221.1m, within an overall zone of 31m @ 35.8% iron from 199.5m. The geological description for this lode is "magnetite-actinolite/chlorite skarn and...sulphide-poor...". Core recoveries for this interval are 100% with the core being described as very competent. This footwall zone appears to be repeated in N401 (140m updip on the same section) and in NBR002 (200m to the south) where it appears to be more pyritic?

Based on the 2006 drill results, the resource shape is 600m long with an average downdip extension of 220m. True thickness ranges from 2.2m in the southern end to 27m in the middle and 18m at its northern end. The deposit dips 65° to grid west (Local Grid). The shape, and hence what is excluded from the resource estimation, has also taken into account surface weathering of the resource and the base of oxidation, the latter of which has been recognised at around 30m down hole, approximately 20m in a vertical sense from the plateau level (the Nelson Bay River has incised this plateau up to 20m). The effect of topography has also been accommodated for in the shape design.



### 3.5 RESOURCE ESTIMATE

The following resource estimate has been prepared by Simon Tear in the Hellman and Schofield report, 5 January 2007 (ref 4).

From the recent drilling results a revised geological shape was interpreted in both 2D and 3D. The overall resource shape measures 600m long by an average of 225m down dip with a range of true thicknesses from 2.2m at the southern end to 27m in the middle to 18m at its northern end. The deposit dips 65° to grid west. Modelling has also taken into account surface weathering of the resource, the base of oxidation and topography.

Two methods of resource estimation were used, a sectional polygonal and inverse distance squared block model, with the former being the preferred choice. A modified density value based on the calculated grade was applied to the sectional polygonal volumes.

The sectional polygonal method involved ascribing a strike length, a down dip length and a true width to each drillhole intercept. The strike length is half the distance between each drillhole with the end holes having a 100m extension, based on the ground magnetic data. The down dip length was based on the interpolation between the intercepts in drillholes N401 and NBR001 (distance between the two is 140m) with a 50m extrapolation below the lower intercept. The upper extrapolation was taken to an approximate base of weathering i.e. 35m below surface. The true width was measured off the sections.

Results of the work are included below in Table 3.1.

**Table 3.1**  
**Inferred Sectional Polygonal Resource Figures (400m Strike)**  
(Density = 3.83t/m<sup>3</sup>)

Section	Width (m)	Estimated True Width (m)	Strike (m)	Dip Length (m)	Volume (m <sup>3</sup> )	Tonnes	Mag Grade
N401	22.0	21.1	151.2	125	398790	1527366	30.6
NBR001	28.5	27.1	151.2	100	409752	1569350	30.6
NBR003	18.0	18.0	102.2	225	413910	1585275	43.2
NBR004	18.0	17.0	150.3	225	574897.5	2201857	45.2
			<b>403.7</b>	<b>Totals</b>	<b>1797350</b>	<b>6883849</b>	<b>38.2</b>

Note : N401, which has no DTR magnetite results, is given the same grade as for NBR001

As a result, a new resource estimate was identified with a strike length of 400m, beginning at approximately 9925mN.

At a 20% magnetite cut off the January 2007 resource estimate is:

**6.9Mt at 38.2% magnetite** with the resources being in the **Inferred** category; this equates to a contained magnetite content of **2.63Mt**.

The magnetic data indicates that approximately 100m extensions of potential can be added to both ends of the current resource, although the southern end extrapolation is likely to be very narrow (<5m). The northern extrapolation crosses the Nelson Bay River.

*As stated in the earlier reports, potential still exists for unexplored anomalies with a second magnetic anomaly to the south and a small magnetic anomaly 1km to the west of the main northern feature. No explanation is offered as to what happens to the footwall zone between the northern and southern magnetic anomalies.*



*There are additional magnetic features in the WTMRP data that could indicate mineralisation e.g. 1km north of Nelson Bay River and an anomaly in the far southeast of the licence.*

*The licence area has three other mineral occurrences listed in the MRT MIRLOC database. These are Wuthering Heights 10/1, Wuthering Heights 14 and Nelson Bay River Silica and all are sand and gravel alluvial occurrences.*



## 4. MINING

### 4.1 INTRODUCTION

This conceptual mining study is based on the limited information available and the inferred resource model estimate from the Simon Tear 5 January 2007 report. No detailed study of infrastructure requirements has been undertaken for the project which is based on opencut mining of the Nelson Bay River Iron Ore deposit. No detailed topography exists for the study area, no geotechnical investigations for the project area have been carried out and future work will need to address these issues and confirm the mine design parameters and assumptions made in this study.

### 4.2 MINE SETTING

The mine setting described refers only to the inferred Nelson Bay River Iron Ore resource covered in the Simon Tear 5 January 2007 report. Key issues incorporated in the mining concepts based on the deposit characterisation are:

- The magnetite ore zone is the basal zone of an ultramafic dyke which outcrops at the surface and dips to the west at an angle around 65°. The dyke is typically 20m to 40m thick
- The ore zone evaluated has a strike length of some 600m
- The northern limit to open pit mining is affected by the Nelson Bay River
- The open pit orebody has been defined by ground magnetic interpretation, surface mapping, geophysical mapping and six cored drillholes
- The orebody extends some 100m to the north on the other side of the Nelson Bay River
- The Nelson Bay River is some 10m wide and occurs to the east of the deposit
- The Nelson Bay River is likely to impact on mining and the location of out-of-pit waste dumps
- The orebody is closed approximately 100m to the south of the defined resource
- The overburden consists of Proterozoic sediments dipping to the east at angles around 60° to 70°
- Depth to Base of Weathering is typically 10m to 25m
- The topography is gently undulating between 90m to 100m above sea level
- The floor of the ultramafic dyke is considered to be competent
- No significant groundwater inflows are anticipated.



### 4.3 MINING METHOD

A shovel and truck opencut mining method has been selected as the most appropriate way to mine the deposit. The steep 65° dip of the orebody means that it is best removed in horizontal slices. This is achieved by using a hydraulic excavator in backhoe mode loading rear dump trucks situated on the bench/flitch below it to maximise digger productivity.

The limited strike length of some 600m and the 65° dip mean that 1 in 10 gradient ramps out of the pit will be a constricting factor with the opencut mining method. Thus at a depth of say 200m some 2km of ramps will be needed to access ore in the bottom of the pit and this effectively precludes any opportunity to dump waste in-pit as part of the mining method. All waste will need to go to out-of-pit waste dumps. It has been assumed that all the waste and ore will need to be drilled and blasted as part of the mining operation. The limited resource available is deemed to be best suited to contractor mining operations.

The proximity of the Nelson Bay River to the orebody will have a direct impact on opencut mining. If the river can be diverted this will potentially allow all the opencut resource to 225m depth to be mined. If the river cannot be diverted this will restrict the depth of ore than can be mined by opencut methods.

Ore not mined by the opencut could be mined by underground methods accessed via a decline from the opencut. Sufficient pillars will need to be left for underground mining and to guarantee the stability and integrity of the Nelson Bay River above the mine. This will need detailed geotechnical assessment.

### 4.4 MINE DESIGN

Mine design parameters are based on standard mine design practice for opencut mines. At a later date geotechnical investigations will result in the formulation of geotechnical guidelines for the project which will become the basis for mine design parameters.

Parameters used for this study are:

- Orebody dip - 65° to the west
- Overburden waste sediments dip 60° to 70° to the east
- Drill and blast highwall bench face slope - 70°
- Spoil angle of repose - 35°
- Bench height - 20m
- Catch berm width - 5m
- Catch berm interval - 20m
- Swell of ore 120% of in situ volume
- Swell of waste 120% of in situ volume
- Out-of-pit spoil dump height - 50m (suggested maximum)
- Out-of-pit spoil external face slope 1 in 6
- Out-of-pit dump intermediate berm at 10m
- Intermediate berm width - 10m
- Backhoe and truck flitch height 4m to 5m
- Access ramp width - 15m
- Access ramp gradient 1 in 10



- Relative density of waste -  $2.6\text{t/m}^3$
- Relative density of ore -  $4\text{t/m}^3$ .

Details of the conceptual mine plan pit shell for a nominal 220m deep pit are shown in Figure 4.1 for a pit designed to incorporate a diversion of the Nelson Bay River in order to mine all the resource. Figure 4.2 shows the pit shell for the same nominal 220m deep pit with no river diversion. Both pit designs are based on the level interval plans produced from the geological model. These were entered into the Vulcan modelling system which was used to generate the pit shells and compute the volumes of ore and waste for each shell. Ore tonnes were then calculated based on an ore density of  $4\text{t/m}^3$  with ore tonne results corresponding closely to those expected from the inferred geological resource tonnes described in the geological report.

#### 4.5 MINING LOSS AND DILUTION

At this conceptual level of study, mining loss and dilution has not been taken into consideration because of the imprecise method of calculating magnetite content in the ore zone and the lack of knowledge of the distribution of the magnetite at the roof and floor contacts with the waste.

#### 4.6 OPENCUT MINING LIMITS

Opencut mining limits are a function of project economics. These in turn are a function (amongst others) of mining costs, mining recovery, beneficiation processes and costs, government charges and royalties, transport costs and the product price received at the point of sale.

The latest geological model has widened the ore zone at the northern end of the deposit to a depth of 225m. This has had a beneficial effect on the opencut mining of the deposit as shown in the pit shell quantities shown in Table 4.1.

**Table 4.1**  
**Opencut Mining Quantities to 220m Depth**

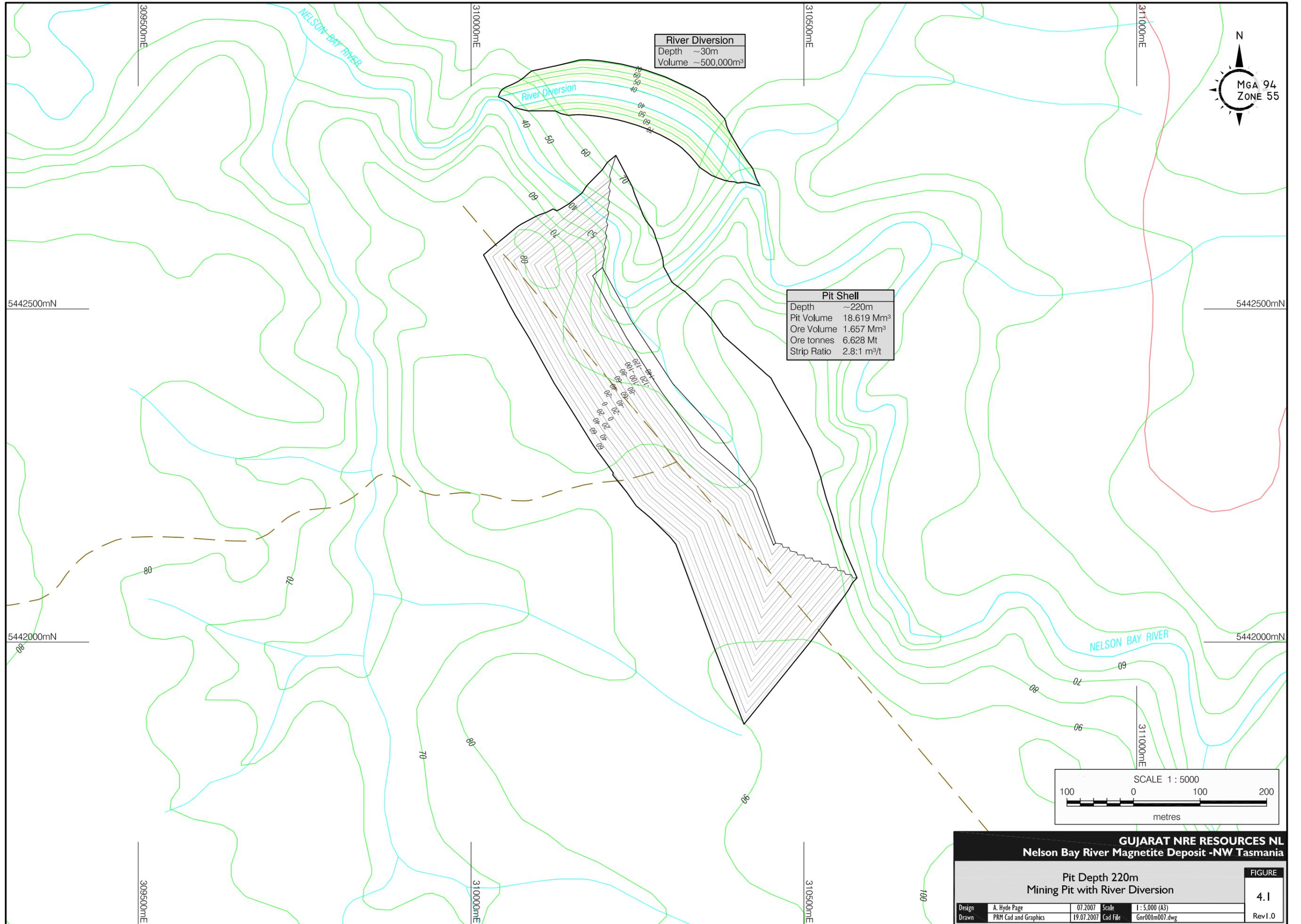
	Unit	Pit with River Diversion	Pit with no River Diversion
Depth of Mining	m	≈220	≈220
Pit Bottom	mRL	-140	-140
Pit Shell Waste Volume	$\text{Mm}^3$	18.619	11.288
Pit Shell Ore Volume	$\text{Mm}^3$	1.657	1.114
Pit Ore Tonnes	Mt	6.628	4.456
Strip Ratio	$\text{m}^3/\text{t}$	2.8 : 1	2.5 : 1

Based on the Minserve 2006 studies both pit shells would appear to be cash positive and once allowance is made for the conceptual ramp layouts shown in Figure 4.3 and Figure 4.4, the overall mining strip ratio is likely to increase to say  $3.0\text{m}^3$  of waste per tonne of ore and this has been used for cost analyses.

The size of the deposit is only likely to support an opencut operation producing between 4.5Mt to 6.5Mt of ore which at 38.2% magnetite will contain between 2.5Mt to 1.7Mt of magnetite product and therefore the highest value price received for the product is likely to be the key determinant of whether mining is likely to be economic.

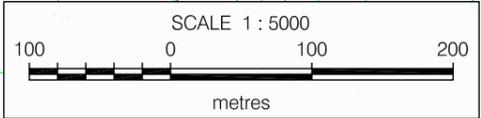
The best market (highest value) for the Nelson Bay River magnetite is deemed to be the production of magnetite concentrates for supply to coal washeries. Currently magnetite for this purpose is being provided to central Queensland coal mines at prices around \$250 to \$260 per tonne delivered to the mine. Current suppliers are few in number with most magnetite supplied from Tasmania, New South Wales, Western Australia and Canada?





**River Diversion**  
 Depth ~30m  
 Volume ~500,000m<sup>3</sup>

**Pit Shell**  
 Depth ~220m  
 Pit Volume 18.619 Mm<sup>3</sup>  
 Ore Volume 1.657 Mm<sup>3</sup>  
 Ore tonnes 6.628 Mt  
 Strip Ratio 2.8:1 m<sup>3</sup>/t



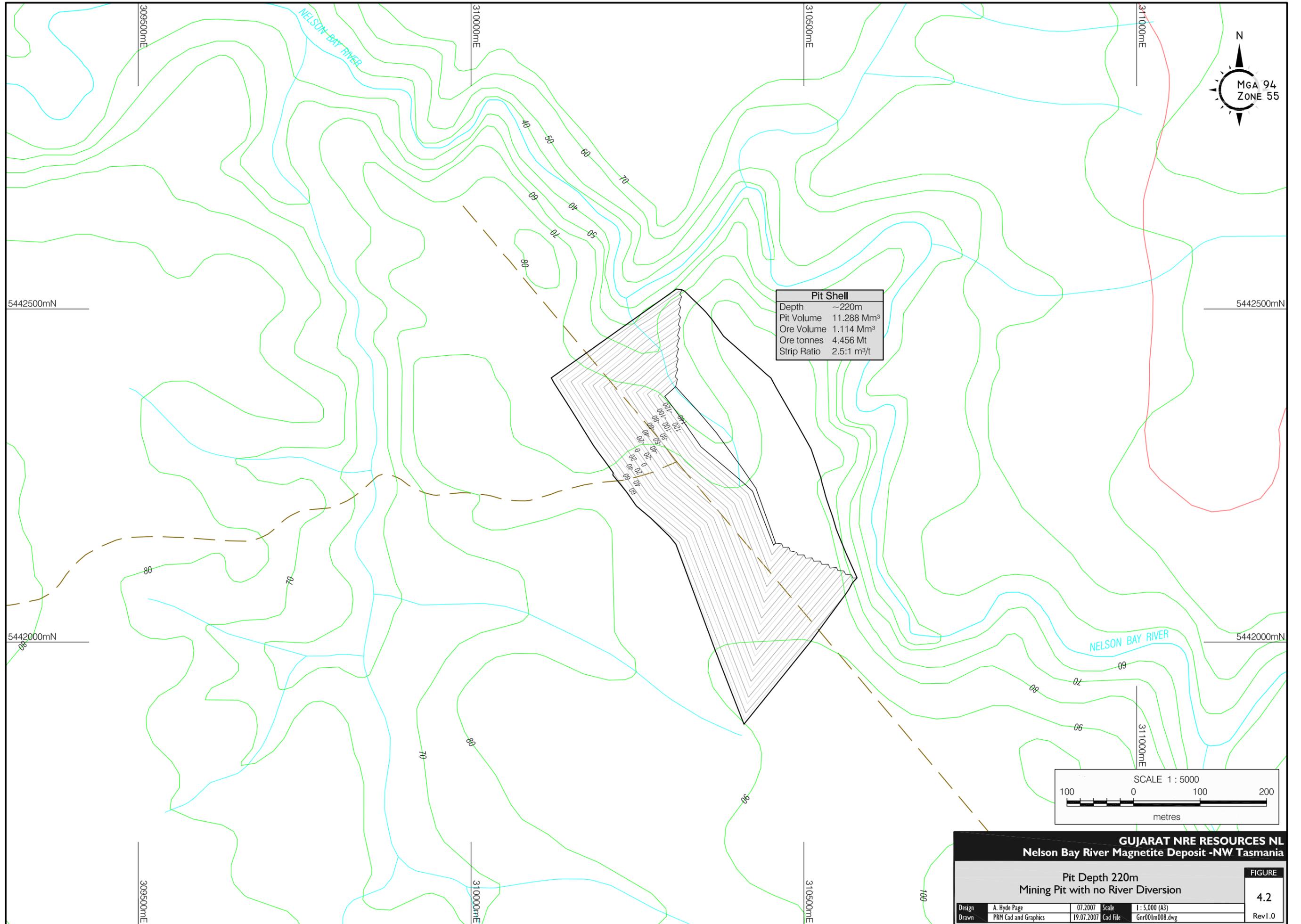
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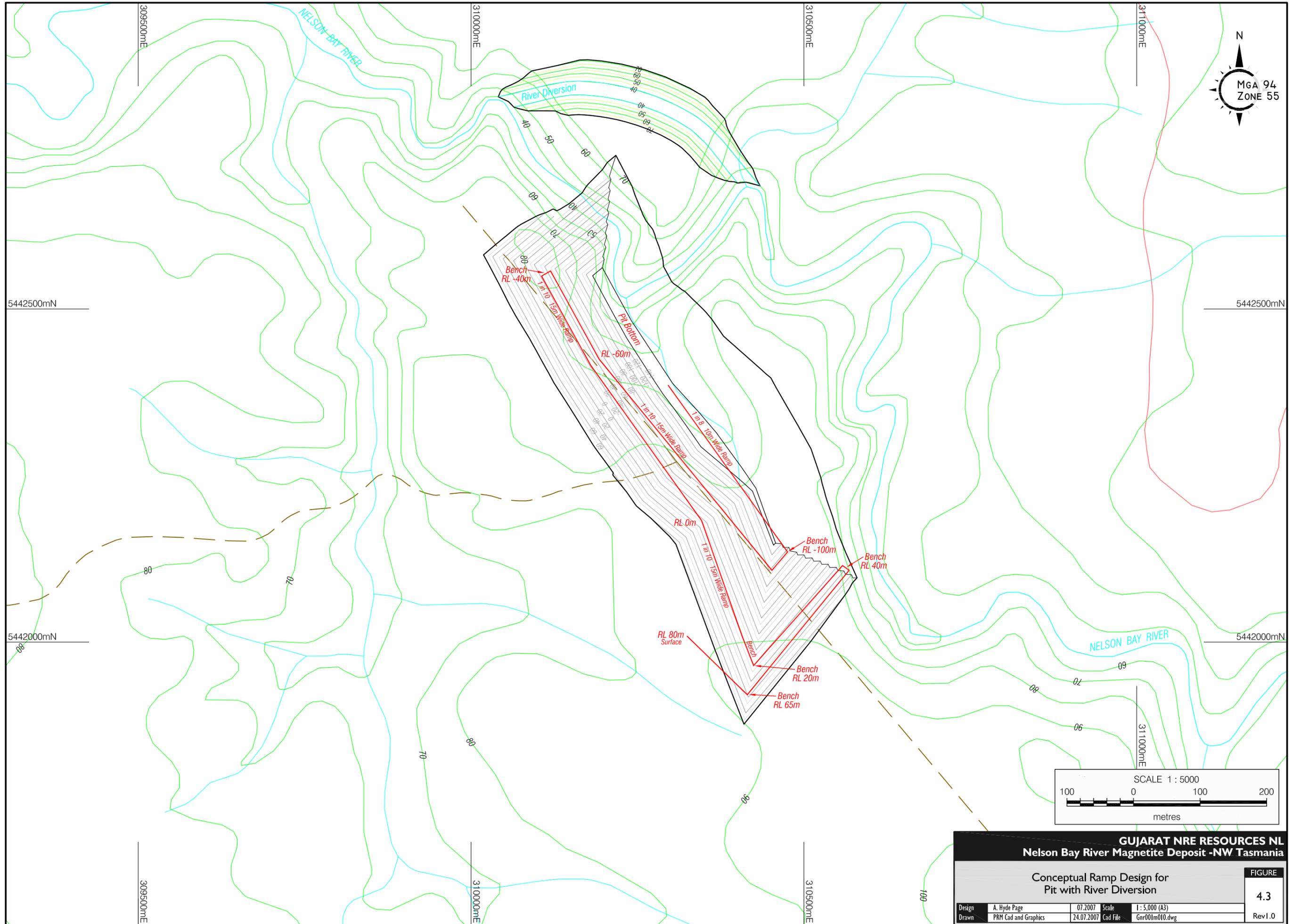
**Pit Depth 220m**  
**Mining Pit with River Diversion**

FIGURE  
**4.1**

Design	A. Hyde Page	07.2007	Scale	1 : 5,000 (A3)
Drawn	PRM Cad and Graphics	19.07.2007	Cad File	Gnr001m007.dwg

Rev 1.0



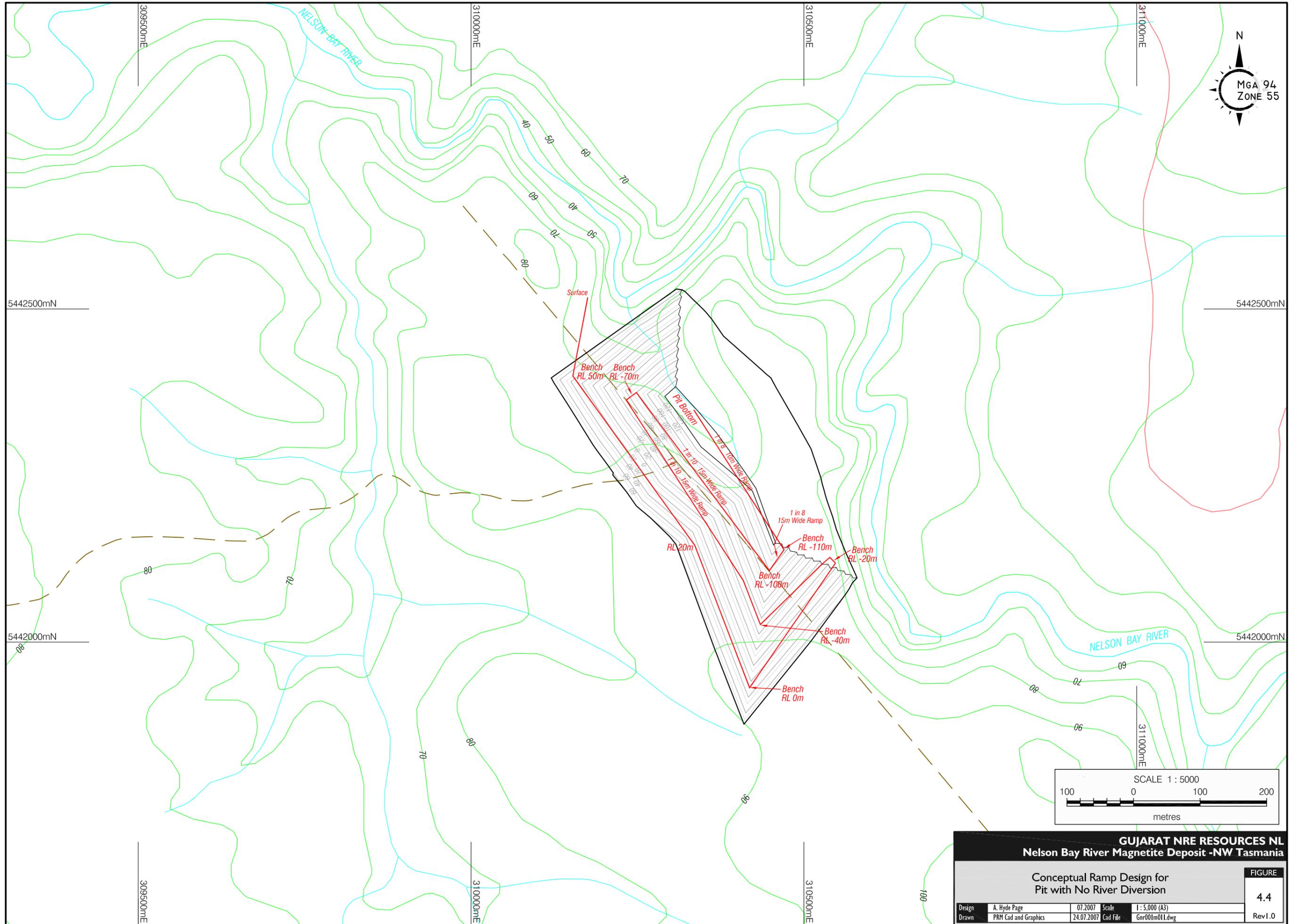


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**Conceptual Ramp Design for Pit with River Diversion**

Design	A. Hyde Page	07.2007	Scale 1 : 5,000 (A3)
Drawn	PRM Cad and Graphics	24.07.2007	Cad File Gnr001m010.dwg

**FIGURE 4.3**  
Rev1.0



**GUJARAT NRE RESOURCES NL**  
**Nelson Bay River Magnetite Deposit -NW Tasmania**

**Conceptual Ramp Design for Pit with No River Diversion**

Design	A. Hyde Page	07.2007	Scale	1 : 5,000 (A3)
Drawn	PRM Cad and Graphics	24.07.2007	Cad File	Gnr001m011.dwg

**FIGURE**  
**4.4**  
Rev 1.0

## 4.7 METALLURGICAL CONSIDERATIONS

Magnetite Fe<sub>3</sub>O<sub>4</sub> (72% Fe) deposits of igneous origin or association occur in most Australian states and are generally mined on a small scale (around 50,000tpa to 100,000tpa) mainly for coal washing and mineral separation (dense medium separation).

As part of the ongoing evaluation of the deposit in 2006, Zelos sent four samples of quarter diamond drill from hole NBR001 to Amdel for petrographic and mineralgraphic description and determination of magnetite by DTR.

Table 4.2 shows the DTR for the samples. This equates to 5.6m at 49.72% magnetite over the sample interval and 35.98% Fe in assay.

**Table 4.2**  
**Davis Table Recovery Results**

Sample Numbers		From	To	Interval	Wt% Magnetite Fraction
NBR001	PET 1	222.4m	223.1m	0.7m	53.5
NBR001	PET 2	223.1m	224.25m	1.15m	35.9
NBR001	PET 3	224.25m	225.4m	1.15m	60.2
NBR001	PET 4	225.4m	228m	2.6m	50.2

Current Australian magnetite producers for coal washery applications are Kara No1 Mine south of Burnie Tasmania which is capable of producing 60,000tpa to 100,000tpa? The mine is a joint venture, 50% Itochu Corporation and 50% Tasmanian Mines Ltd.

Tallawang Mine is north of Mudgee New South Wales with a production capacity of 100,000tpa? The process involves crushing, wet milling, grinding, sizing concentrating and drying. The owner is Unimin Australia Ltd which is owned by Unimin Corporation USA.

A Western Australian mine is currently looking to sell 30,000tpa into the Australian coal washing market where the magnetite is a by-product from a cobalt mine.

Following the 2006 study Gujarat is still looking at two treatment options:

- Magnetite concentrates for supply to coal washeries
- Magnetite pellets using a Savage River style process.

Following the March 2006 report Phase 1 of a test program for the magnetite has been completed. The main purpose of the tests was to establish whether a heavy media material could be produced from the proposed ore. The testwork included composite chemical analysis, dry magnetic separation at 600 Gauss, Davis Tube analyses at 1000 Gauss (wet magnetic separation), bond work index, and liberation sizing assessment for waste rejection. The additional testwork for the magnetite assessment was conducted to provide information for future scoping and feasibility studies.

The chemical analysis of the bulk composite is shown in Table 4.3.

**Table 4.3**  
**Assay Values of Magnetiferous Composite Sample**

Component	%
Fe	40.9%
SiO <sub>2</sub>	22.6%
Al <sub>2</sub> O <sub>3</sub>	1.15%
MgO	3.46%
S	1.75%
P	0.01%



The coarse dry magnetite separation and Davis Tube analyses (wet magnetic separation of dry mags) and recoveries are shown in Table 4.4.

**Table 4.4**  
**Composition and Recovery of Magnetic Fraction**

Sample Particle Size (dry magnetic separation)	Sample Particle Size (DTR)	Magnetic Fraction Recovery (%)	Fe (%)	SiO <sub>2</sub> (%)	Al <sub>2</sub> O <sub>3</sub> (%)	S (%)	P (%)
-3.35mm	95% - 75um	57.0	60.9	1.58	0.05	0.08	0.00
-2.0mm	95% - 75um	61.3	70.1	1.57	0.06	0.10	0.00
-0.5mm	95% - 75um	61.1	70.4	1.49	0.05	0.08	0.00

The Phase 1 testwork indicated that a recoverable magnetite concentrate by weight should be in the range 57% to 61% with Fe grade >69.0% and SiO<sub>2</sub> <1.6%, Al<sub>2</sub>O<sub>3</sub> <0.05%, S <0.1% and P <0.01%. This implies that >96% of the magnetic material is magnetite.

The above results indicate that material equivalent to the composite sample from Nelson Bay River deposit can be ideally suited for the production of a marketable magnetite concentrate for either heavy media markets or pellet production.

## 4.8 PRODUCTION RATES

Mining production rates for the deposit have been set at 150,000tpa of magnetite product based on the current assessment of what the market can take.

For magnetite sold into the coal washery dense media market a production rate of up to 150,000tpa may be achievable. Can this be supplemented with sales into other market areas which could be used to boost the annual mining production rate using these other product options? The viability of these options needs to be known for them to be evaluated.

Assuming a production rate of 150,000tpa of product then the deposit to a depth of 225m could provide between 12 to 16 years of product at a stripping ratio around 3m<sup>3</sup> of waste per tonne of ore.

Market supply forces will determine the actual production rate that can be sustained by the deposit. The window of market demand is not known and the cost to produce and supply this amount to individual minesites is also yet to be determined.

The current buoyant coal market in Australia offers a good opportunity for new suppliers of magnetite for coal washeries to enter the market in Australia and Indonesia.

## 4.9 ENVIRONMENTAL CONSIDERATIONS

The proximity of the Nelson Bay River to the opencut mining area limits the area adjacent to the pit available for out-of-pit waste dumps. The steep 65° dip of the ore and the limited strike length of 600m means that all waste mined must go to out-of-pit waste dumps.

The location and size of these dumps have not been determined but the cost of mining and placing waste in dumps has been allowed for in the costing. More detailed topography coverage of the area is needed before design can proceed. In the river diversion case some 18.2Mm<sup>3</sup> of waste is mined requiring some 22.5Mm<sup>3</sup> of dump space. In the no river diversion case some 11.3Mm<sup>3</sup> of waste is mined requiring some 13.6Mm<sup>3</sup> of dump space.

At this conceptual level of study where the orebody extends under the Nelson Bay River an opencut base case has been developed centred around diverting the river. A second case is developed based on no river diversion. The environmental impact of these cases has not been assessed.



Rainfall and water management issues such as the need to bund areas of the project to prevent inundation need to be addressed.

The presence of pyrite and sulphides with the ore is noted in the geological report. Studies have not been done to determine the potential for waste and ore to become acid forming and require encapsulation within dumps.

Land use, out-of-pit waste dumps, rehabilitation and related topics need to be defined. These are likely to cover mining and out-of-pit waste dumping issues, land use and rehabilitation criteria, final void issues, water management and capital, MRT specific issues, royalties and departmental requirements.

#### **4.10 MINE SITE INFRASTRUCTURE**

A conceptual mine site infrastructure requirement and layout has been prepared to suit either pit layout.

The Nelson Bay River is seen as the major feature affecting the site layout with the mine and associated infrastructure on the southern and western side of the river. Road access to Port Latta is located on the other side of the river. To accommodate this it is recommended that the minesite infrastructure, including mine facilities and processing plant, be located on the southern and western side of the river at the southern end of the opencut and that an elevated product conveyor (and footbridge) be built across the river to a loadout bin and product stockpile area on the northern and eastern side of the river. This will minimise disruption to the operations during periods when the flow of the river is likely to restrict vehicle access across the river.

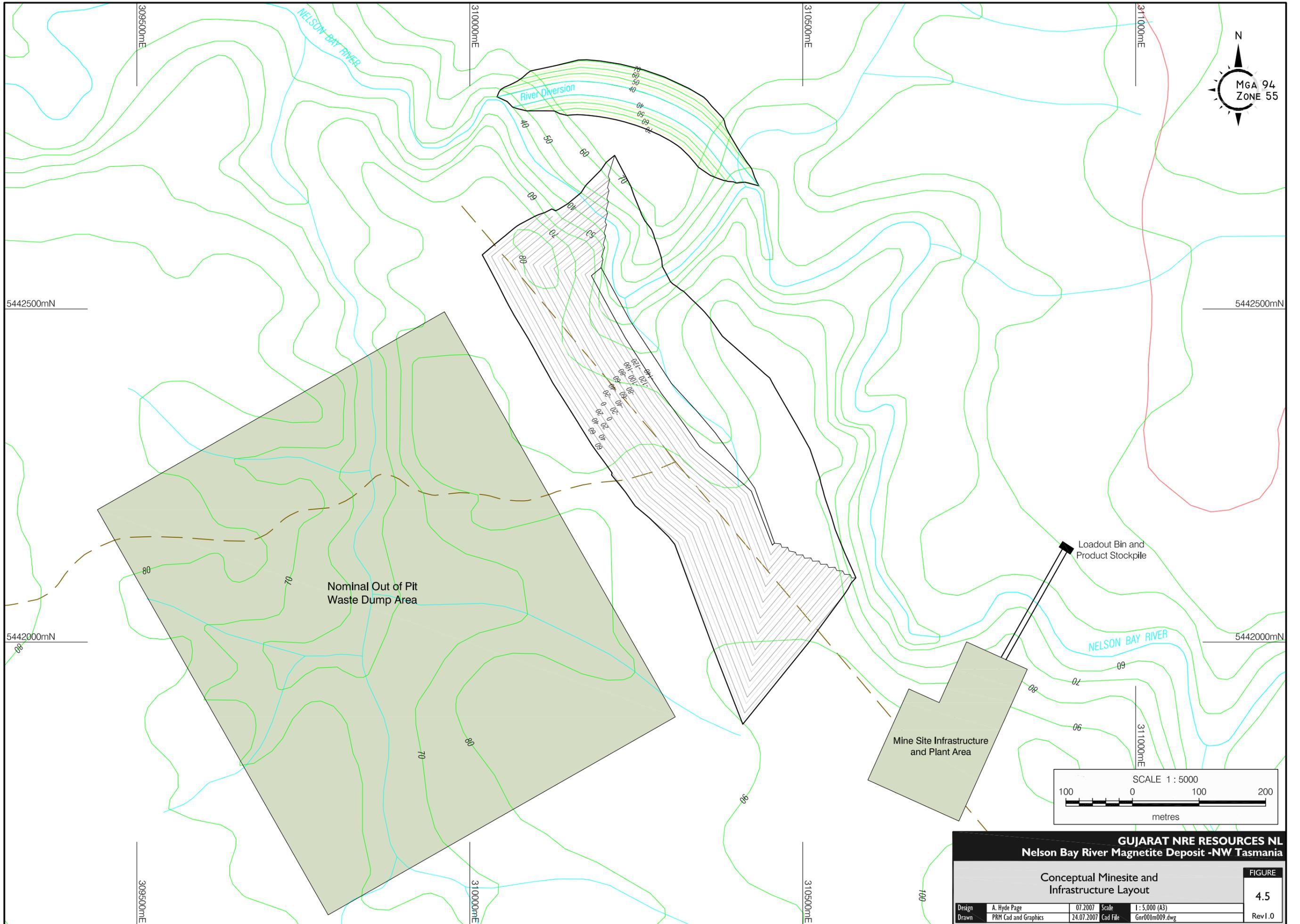
Figure 4.5 shows a conceptual layout for the mine, waste dump areas and mine site infrastructure based on the above situation.

At this stage of the project only broad concepts and assumptions can be made with regard to mine site infrastructure. The concept to have the mining and processing done by contractors makes it difficult to determine what the site requirements are likely to be. The OrePro treatment plant cost estimate of \$15M to \$20M does not give details of their requirements.

Without visiting the site or being aware of the capabilities of the local area with regard to infrastructure or services for water, roads, power, accommodation, communications and the supply chain for the minesite operations, the assessment of minesite infrastructure can only be covered by making a dollar allowance to cover the provision for these aspects.

At this stage of the project a site allowance of \$5M has been estimated as being in line with the earlier OrePro Pty Ltd treatment plant estimate of \$15M as provided in their letter dated 17 March 2006.

Similarly, the cost of trucking the magnetite product a distance of 90km to Port Latta may involve a capital contribution or infrastructure work which is yet to be established. For costing purposes, in the following section, the contract rate cost per tonne per kilometre used has sought to include some small allowance to help cover these costs.



**GUJARAT NRE RESOURCES NL**  
**Nelson Bay River Magnetite Deposit -NW Tasmania**

**Conceptual Minesite and Infrastructure Layout**

Design	A. Hyde Page	07.2007	Scale	1 : 5,000 (A3)	<b>FIGURE</b> <b>4.5</b>
Drawn	PRM Cad and Graphics	24.07.2007	Cad File	Gnr001m009.dwg	

## 5. COSTING

In March 2006 indicative order of magnitude costing was undertaken to determine the factors that will affect the viability of opencut mining and highlight the factors that will have the greatest impact on mining/project costs. This was done by constructing a spreadsheet to look at annual operating costs for a range of production rate cases.

Minserve was able to put together price information for the supply of magnetite for coal washing. This is perceived to offer the best case for the exploitation of the resource and we still perceive there is a potential opportunity for the Nelson River Bay Iron resource to supply this market. Annual supply and demand tonnages will be key factors that will affect how this might be achieved.

The order of magnitude used in the earlier study have been adjusted and extended in this study to include the following:

- Coal washery magnetite product sale price ex Port Latta FOB - \$200/t
- Cost of mining opencut ore - \$3.00/t
- Magnetite product recovered from ore – 38.2%
- Cost of waste mined and dumped out-of-pit - \$7.00/m<sup>3</sup>
- Other site related costs per product tonne - \$5.00/t
- Ore processing cost per product tonne - \$12.00/t.

The above costs have been used to determine annual operating costs for a mine gate product based on contract mining and processing the ore.

Additional costs have been estimated for trucking the product from the minesite to Port Latta 90km away by road. The order of magnitude costs used for this are:

- Road haulage including road maintenance - \$0.12/t/km
- Port charges - \$3.00/t
- Marketing and Administration - \$5.00/t
- Price received FOB Port Latta - \$200.00/t

Order of magnitude capital costs have been estimated now that the deposit has been positioned relative to the Nelson Bay River. The costs listed below are best guess capital cost allowances based on the assumptions discussed in Section 4.10.

- Feasibility Studies and Approvals - \$1.5M
- Project Treatment Plant Capital Cost - \$15M
- Site Infrastructure Allowance - \$5M
- River Diversion Cost - \$3.5M

Order of magnitude project costs have been derived for the Nelson Bay River deposit for annual magnetite sales of 150,000t based on the two opencut mining cases described in this report for a coal washery magnetite product and a magnetite pellet product based on the discussion in the March 2005 Addendum Report. Order of magnitude project costs for magnetite product sales of 150,000tpa are shown in Table 5.1.



**Table 5.1**  
**Magnetite Washery Sales 100,000t - Order of Magnitude Operating Costs**

Coal Washery Magnetite				Pellet Product			
		River Diversion	No Diversion			River Diversion	No Diversion
Annual Product Tonnes	t	150,000	150,000	Annual Product Tonnes	t	150,000	150,000
Pit depth	m	225	225	Pit depth	m	225	225
Mining Pit Ore Reserve	t	6,500,000	4,500,000	Mining Pit Ore Reserve	t	6,500,000	4,500,000
Mining Pit Product Reserve	t	2,483,000	1,719,000	Mining Pit Reserve	t	2,483,000	1,719,000
Ore to Waste Ratio	m <sup>3</sup> /t	3	3	Product to Waste Ratio	m <sup>3</sup> /t	3	3
Product Recovery	%	<b>38.2%</b>	<b>38.2%</b>	Product Recovery	%	<b>38.2%</b>	<b>38.2%</b>
Waste Mined	m <sup>3</sup>	1,178,010	1,178,010	Waste Mined	m <sup>3</sup>	1,178,010	1,178,010
Mill Feed	t	392,670	392,670	Mill Feed	t	392,670	392,670
Product Tonnes	t	150,000	150,000	Product Tonnes	t	150,000	150,000
<b>Annual Mining Costs</b>				<b>Annual Mining Costs</b>			
Waste Removal unit cost	\$/m <sup>3</sup>	\$7.00	\$7.00	Waste Removal unit cost	\$/m <sup>3</sup>	\$7.00	\$7.00
Waste Mining cost	\$	\$8,246,073	\$8,246,073	Waste Mining cost	\$	\$8,246,073	\$8,246,073
Ore mining unit cost	\$/t	\$3.00	\$3.00	Ore mining unit cost	\$/t	\$3.00	\$3.00
Ore Mining cost	\$	\$2,748,691	\$2,748,691	Ore Mining cost	\$	\$2,748,691	\$2,748,691
Ore Processing unit cost	\$/t	\$12.00	\$12.00	Ore Processing unit cost	\$/t	\$13.00	\$13.00
Ore Processing cost	\$	\$4,712,042	\$4,712,042	Ore Processing cost	\$	\$5,104,712	\$5,104,712
Other site costs unit cost	\$/t	\$5.00	\$5.00	Other site costs unit cost	\$/t	\$5.00	\$5.00
Other site costs	\$	\$750,000	\$750,000	Other site costs	\$	\$750,000	\$750,000
Annual Mine Gate Cost		\$16,456,826	\$16,456,826	Annual Mine Gate Cost		\$16,849,497	\$16,849,497
<b>Product Price FOB Port Latta</b>	\$/t	\$200.00	\$200.00	<b>Product Price FOB Port Latta</b>	\$/t	\$200.00	\$200.00
Annual Revenue \$		\$30,000,000	\$30,000,000	Annual Revenue \$		\$30,000,000	\$30,000,000
Annual Mine Gate Surplus		\$13,543,174	\$13,543,174	Annual Mine Gate Surplus		\$13,150,503	\$13,150,503
Project Mine Gate Surplus		\$224,184,668.93	\$155,204,770.80	Project Mine Gate Surplus		\$217,684,652.38	\$150,704,759.34
<b>Mine to Port Costs</b>				<b>Mine to Port Costs</b>			
Road distance to Port Latta	km	90	90	Road distance to Port Latta	km	90	90
Rate at cents per tonne per km	\$/t/km	\$0.12	\$0.12	Rate at cents per tonne per km	\$/t/km	\$0.12	\$0.12
Annual Trucking costs	\$	\$1,620,000	\$1,620,000	Annual Trucking costs	\$	\$1,620,000	\$1,620,000
Port Charges rate	\$/t	\$3.00	\$3.00	Port Charges rate	\$/t	\$3.00	\$3.00
Annual Port Charges	\$	\$450,000	\$450,000	Annual Port Charges	\$	\$450,000	\$450,000
Marketing and Administration	\$/t	\$5.00	\$5.00	Marketing and Administration	\$/t	\$5.00	\$5.00
Annual Marketing & Admin	\$	\$750,000	\$750,000	Annual Marketing & Admin	\$	\$750,000	\$750,000
Annual Off Site Costs		\$2,820,000	\$2,820,000	Annual Off Site Costs		\$2,820,000	\$2,820,000
Project Annual Surplus		\$10,723,174	\$10,723,174	Project Annual Surplus		\$10,330,503	\$10,330,503
<b>Project Operating Surplus</b>		\$177,504,269	\$122,887,571	<b>Project Operating Surplus</b>		\$171,004,252	\$118,387,559
<b>Capital Costs</b>				<b>Capital Costs</b>			
Feasibility studies & Approvals	\$	\$1,500,000	\$1,500,000	Feasibility studies & Approvals	\$	\$1,500,000	\$1,500,000
Project Treatment Plant Capital	\$	\$15,000,000	\$15,000,000	Project Treatment Plant Capital	\$	\$15,000,000	\$15,000,000
Site Infrastructure	\$	\$5,000,000	\$5,000,000	Site Infrastructure	\$	\$5,000,000	\$5,000,000
River Diversion Costs	\$	\$3,500,000	\$3,500,000	River Diversion Costs	\$	\$3,500,000	\$3,500,000
Subtotal Capital Costs		\$25,000,000	\$21,500,000	Subtotal Capital Costs		\$25,000,000	\$21,500,000
<b>Project Surplus after Capital</b>		\$152,504,269	\$101,387,571	<b>Project Surplus after Capital</b>		\$146,004,252	\$96,887,559
Project Life	Years	16.6	11.5	Project Life	Years	16.6	11.5

## 6. RESULTS AND RECOMMENDATIONS

The update resource estimate and order of magnitude costing shows that the project is likely to be viable if it can produce suitable magnetite for the lucrative coal washery market and can capture a share of this market sufficient to justify the operation. Currently central Queensland coal mines pay prices around \$250 to \$260 per tonne for delivered magnetite which is used in the coal washery heavy media separation process. Current suppliers are few in number with most magnetite supplies coming from Tasmania, New South Wales, Western Australia and Canada.

The current resource shows that opencut mining to a depth of 220m is likely to be feasible with or without diverting the Nelson Bay River. Markets and processing costs will need to be better defined to provide a more accurate appraisal of the project. The conceptual study mine design shows that opencut mining can proceed to a depth of 225m but that all waste would need to go to out-of-pit waste dumps due to the limited strike length of the pit and the need to keep a 1 in 10 access ramp open to the pit bottom. No waste dump design has been done but its location west of the opencut can be established now that the deposit's position is known relative to the river.

Current results are encouraging and the project is likely to be viable if high value products can be produced.

The economic depth for mining is unlikely to be greater than the 225m shown in this report.

The order of magnitude costing showed that, based on the broad assumptions used, producing around 150,000tpa of magnetite for coal washeries is likely to be viable once all capital and operating costs have been taken into consideration. A pit depth of around 225m is also likely to give a better return if the Nelson Bay River can be diverted around the northern end of the deposit. This issues needs to be reviewed by Gujarat.

Only broad metallurgical concepts have been addressed to date and the distribution of the ore within the dyke needs to be known more precisely. The next stage of the project needs to better define the magnetite distribution throughout the orebody and be able to provide level plans showing this distribution at regular intervals for mine planning.

Project viability has been assessed on the basis of the surplus operating cash generated from the case studies costed being sufficient to pay for the capital items and generate an acceptable profit.

The conceptual study results support continuing the study evaluation to delineate the opencut mining resource and better define the ore zone over its 600m strike length and determine the metallurgical factors and recoveries associated with this to produce magnetite products suitable for sale to coal mine washeries. Process flowsheets and capital and operating costs need to be provided to match these studies along with site infrastructure requirements and costs.

An opencut magnetite mine with processing/treatment plant providing 150,000tpa of coal washery product has potential to generate an annual surplus cashflow around \$9M over a 10 to 15 year mine life. Capital costs are estimated to range between \$22M to \$25M.

It is recommended that minesite coal washery prices for delivered magnetite be verified and that specifications for these products be determined. Results of this study need to be reviewed once prices have been confirmed or new prices have been established.

Process flowsheets need to be progressed for the various options under review and metallurgical recoveries, capital costs and operating costs determined more accurately for project evaluation studies.

Surface maps and topography for the resource area need to be produced in digital form and in sufficient detail to support ongoing studies and further resource evaluation now that previous discrepancies appear to have been resolved.



Gujarat need to look at the requirement to divert the Nelson Bay River and decide what course of action they wish to pursue. A compromise may be to start with a no diversion opencut design whilst negotiating to divert the river several years after the project is underway having stated at the outset that this is the plan adopted for the project. This would be the best use of the resource and is likely to give the best economic outcome for the project.

Environmental issues need to be defined and investigations/studies progressed to meet future study requirements. These area likely to cover mining and out-of-pit waste dumping issues, land use and rehabilitation criteria, final void issues, water management, MRT issues and requirements.

The Nelson Bay River Iron Ore project is at an early stage of evaluation. An inferred resource has been estimated from six cored drillholes. Metallurgical testwork and assays show encouraging results without being specifically tailored to the two products mentioned. Each has potential to be a viable operation if the ore is proven to be suitable for the purpose proposed and the product prices used are sustainable.

Key areas perceived for the next stage of the project are likely to include:

### **Geology**

- Additional cored drillholes to upgrade the resource to indicated or measured status
- Definition of the basal 7m ore zone and the magnetite distribution within the ore zone and the ore zone/waste interfaces
- Geotechnical investigations.

### **Mining**

- The ability to divert the river
- Topography coverage for mine design and out-of-pit waste dumps
- Confirm geotechnical and mine design parameters
- Confirm environmental guidelines for mining.

### **Mineralogy/Metallurgy**

- Testwork to determine suitability of ore for supply to coal washeries and Ausmelt processes
- Flowcharts and recoveries/yields for the selected processes
- Capital and operating costs for the selected processes.

### **Marketing**

- Confirm market specifications and suitability of processes to meet specification
- Establish market windows of opportunity with regard to quantity and price for the selected processes.

### **Project**

- Establish project infrastructure requirements and costs
- Establish environmental requirements for the project
- Establish government and regulatory requirements framework for the project.



## 7. ACKNOWLEDGEMENTS AND REFERENCES

### 7.1 ACKNOWLEDGEMENTS

This report has relied on the general project summary information and geology provided by Simon Tear of Hellman and Schofield Pty Ltd referenced below.

Information on studies related to metallurgical processes initiated by Zelos and correspondence in this area has been provided by Dr Andrew Firek.

### 7.2 REFERENCES

1. Simon Tear, SMG Consultants, Nelson Bay River Licence EL41/2004 Literature Study Report, November 2005.
2. The Minserve Group Pty Ltd, Nelson Bay River Iron Ore Conceptual Mine Study, 13 March 2006.
3. The Minserve Group Pty Ltd, Addendum to Nelson Bay River Iron Ore Study, 22 March 2006.
4. Simon Tear, Hellman and Schofield Pty Ltd, Report on the Resource Estimation of the Nelson Bay River Magnetite Deposit, NW Tasmania, 5 January 2007.



## **APPENDIX 1**

### **1985 Aerial Photo with Drillholes and Base Line**



Aerial Photograph - March 1985  
with Drillholes and Base Line

APPENDIX

I

Rev. I

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