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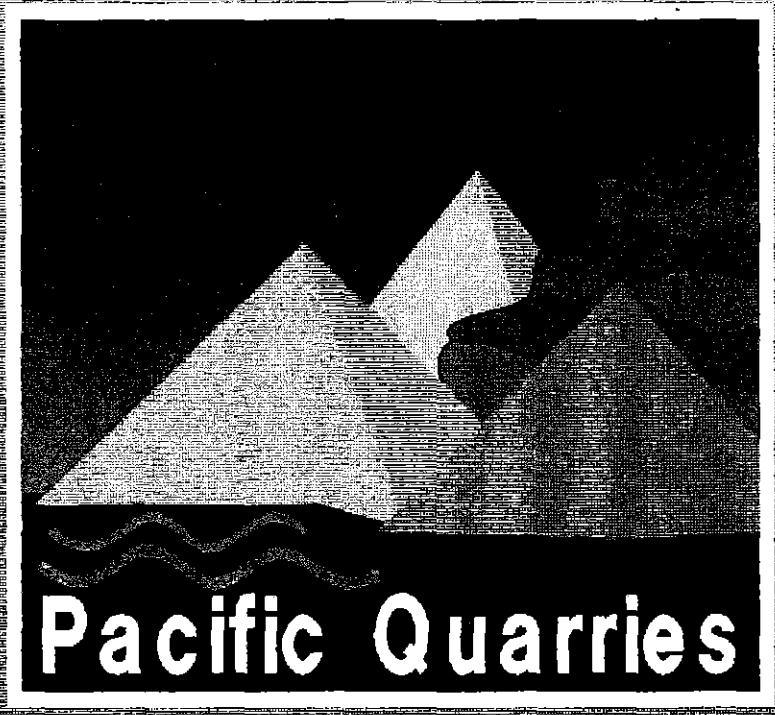

Business Plan 1992

fic Quarries Pty Ltd

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ACT ENTERPRISE WORKSHOP 1992

BUSINESS PLAN

FOR

BELL BAY EXPORT QUARRIES

OF

PACIFIC QUARRIES LTD

COMMERCIAL
IN CONFIDENCE

142003

CONTENTS

142004

LETTER OF TRANSMITTAL

Pacific Quarries
G.P.O. Box 1412
CANBERRA ACT 2601

30 July 1992

Mr. R. Soper,
Managing Director,
Resource Finance Corporation,
27-31 Macquarie Place,
SYDNEY N.S.W. 2000

Dear Ray,

BUSINESS PLAN FOR PROPOSED QUARRIES AT BELL BAY

As discussed with you earlier in the year a Business Plan has been prepared within the 1992 ACT Enterprise Workshop for the proposed export quarries at Bell Bay.

We propose to develop one or more quarries to produce 1 million tonnes of rock per annum to be shipped to Japanese, Australian and other markets.

A resource of at least 1000 million tonnes of high-quality dolerite rock at Bell Bay is held under Exploration License 10/90 by Tasmanian Hardrock Pty. Ltd., and has been explored vigorously for two years.

To enable the venture to proceed Tasmanian Hardrock will pass its holding to Pacific Quarries which will need to raise capital of $20 million by the issue of 20 million 10% cumulative preference shares, convertible to ordinary shares after 5 years. Details of the venture are set out in the Business Plan.

We look forward to your support as our financial intermediary in the matter of the capital issue subject to the arrangement of suitable terms and contract conditions.

With warm regards,

Yours sincerely,

H. J. Harrington

H.J. HARRINGTON
DIRECTOR

NOTES:

1. This letter will not be sent until approval for the use of the Business Plan has been given by the Management Committee of the ACT Entrepreneurship Centre.

2. The financial intermediary need not be Resource Finance Corporation. Other intermediaries are being assessed.

142006

DISCLAIMERS

This Business Plan and investment proposal and any accompanying appendices has been prepared as part of the 1992 ACT Enterprise Workshop.

Care has been exercised in the underlying research and presentation of the Business Plan, however the ACT Entrepreneurship Centre assumes no responsibility for the accuracy of the recommendations contained therein.

Care has been exercised in the underlying research and presentation of the Business Plan but the authors assume no responsibility for the accuracy of the information or the effectiveness of the recommendations contained therein.

142007

NON-DISCLOSURE AGREEMENT

PACIFIC QUARRIES PTY LTD

In consideration of the presentation to me by Pacific Quarries Pty. Ltd. ("**the Company**") of their business plans.

I,

of

HEREBY AGREE to the following terms and conditions:

1. To keep confidential any business plans supplied by **the company** *and not to provide copies of such business plans to third parties* without the prior written consent of **the company**;

2. That copyright in the business plans vests in **the company** and **Enterprise Workshops** and agrees to do all acts and sign all documents as maybe necessary to ensure that copyright vests in **the company** and **Enterprise Workshops**;

3. To keep confidential and not to disclose to any third party any information supplied by **the company** and not to provide copies of such information to third parties without the prior written consent of **the company**;

4. indemnify and keep indemnified **the company** and anyone assisting **the company** from any claim arising howsoever from any act or admission on my part or any servant, agent, licensee or associated company of **the company**:

This agreement does not constitute either **the company** or myself an agent or legal representative of the other and does not create or evidence a partnership between them.

DATED this day of 19 .

SIGNED: .....

WITNESSED: .....

ACKNOWLEDGEMENTS

The team wishes to express its appreciation of the ACT Entrepreneurship Centre Management Committee, and especially for guidance received from President Mr. Angus Paltridge, from Executive Director Mr. Graeme Burgess, from Mr. David Gaul and Mr. Greg Burns, and from Secretary Ms Julie Blue, and to all of the tutors and lecturers in the Workshop.

Thanks are offered to others who gave specific help to the Pacific Quarries team including:

Austrade, Hobart (Mr. David Mcfie)

Austrade, Tokyo (Mr. T. Overton-Clarke and Mr. Hiroshi Gunji)

Mr. Jack Bonner, Ex-President, Institute of Quarrying, and Secretary Mr. Ken Fletcher

Cartographic Services, Canberra

Caterpillar (Australia) Pty. Ltd.

Mr. John Dempster, Inspector of Mines, Launceston

Eglo Engineering Pty. Ltd.

George Town Council Officers (Mr. Lionel Young, Manager)

Mr. John Hogg, APPM Forest Products

Jaques Quarry Equipment Ltd. (Clyde Industries Ltd.)

Ingersoll Rand (Australia) Ltd.

Krupp (Australia) Pty. Ltd.

MLA Communications, Belconnen (Mr. Eric Leape and Ms A. Wallace)

New South Wales Department of Resources & Energy (Engineering Geology Branch)

Port of Launceston Authority (Mr. R. Hadrill, Mr. P. Smith and Harbourmaster Captain J.S.L. Brownbill)

Shipbroking Pty. Ltd. (Mr. John Hall)

Sinclair Knight & Partners, Consulting Engineers (Mr. Don Reed)

The Graphics Bureau, Queanbeyan (Mr. Bill Baggett)

The Natural Gas Company, Canberra

Wunderland Studios Ltd. (Video Productions)

142009

EXECUTIVE SUMMARY

BELL BAY EXPORT QUARRIES

Pacific Quarries Pty. Ltd. plans to export 1 million tonnes p.a. of first-grade rock from the Port of Bell Bay in Tasmania to Japanese and other markets. A capital of $20 million will return 10% or $10 million over five years. This represents an ROI of 50%.

The opportunity exists because the rock industry is being fundamentally restructured. Quarries that supply a single city by road are being superseded by super-quarries that can supply many cities by sea. This is in part because city quarries are becoming exhausted, and new quarries are needed but meet opposition and have to be established 100 km or more from city centres. In addition transport by road costs 15 to 20 cents per tonne kilometre in cities and additional charges are being imposed on heavy trucks. Sea transport has become competitive. The process is most advanced in the North Atlantic region. For example the Glen Sanda quarry in north-west Scotland was designed to produce 7.5 million tonnes p.a. It opened in 1988, supplies London and other North Sea markets, won the Channel Tunnel contract, and sends 1 million tonnes p.a. to Texas. The Explaura quarry in Newfoundland was designed to start with 1 million tonnes in 1990 rising to 4 million in 1992 for U.S. Atlantic and Gulf ports. Larger developments are predicted because markets are 2 to 7 tonnes per head of population. The total consumption in Japan alone is 1,000 million tonnes p.a. (official Japanese statistics). For Sydney it is 7 million tonnes p.a.

Selling prices for rock vary with quality and location. In Sydney they are around $35 per tonne delivered, but the price is often increased by quality, or by cartels, or by conversion of the rock to concrete or asphalt. Pacific Quarries estimates that it can deliver rock to Japan at $26.07 per tonne, plus a profit.

An Australian site for an export quarry of North Atlantic type has been located. It is at the Port of Bell Bay in Tasmania on vacant land near a number of major industrial plants. An Exploration Licence from the Tasmanian Government is held over all of the known bluestone rock at Bell Bay. The rock is technically named dolerite. Tasmanian dolerite is of legendary quality from its performance on Tasmanian roads, and in concrete construction over the past 100 years. Exploration to date has indicated deposits of at least 1000 million tonnes, sufficient for 250 years at a production of 2 million tonnes p.a. Tasmania has many skilled and 'ticketed' quarry workers and there is housing in George Town. The preferred initial quarry site is beside water, electricity and railway lines, one kilometre from the highway to Launceston, and close to ship loading berths used for exports to Japan.

The estimated costs per tonne for production and transport to Japan at a rate of 1 million tonnes p.a. in an "Expected Case" situation are:

Quarry and other operating costs	$5.00
Loading, Bell Bay	$2.35
Ship charter, piston run	$16.31
Ship's fuel	$1.91
Insurance	$0.50
COST TO DESTINATION PORT	$26.07
PROFIT AT 35%	$9.13
TOTAL	$35.20

The profit on the venture has been calculated for three situations:

i) In the "Best Case" situation the profit over 5 years will be $61 million
ii) In the "Expected Case" situation the profit over 5 years will be $43 million
iii) In the "Worst Case" situation the profit over 5 years will be $7 million.

THE DEAL:

Pacific Quarries needs to raise capital of $20 million by the issue of 20 million 10% cumulative preference shares convertible to ordinary shares after 5 years.

The return to the preference shareholders will be $10 million over 5 years, equivalent to an ROI of 50%.

Resource Finance Corporation is being approached to act as the financial intermediary in the capital issue, for a fee of $325,000 and other renumeration to be negotiated, and subject to timing and other contract conditions to be arranged.

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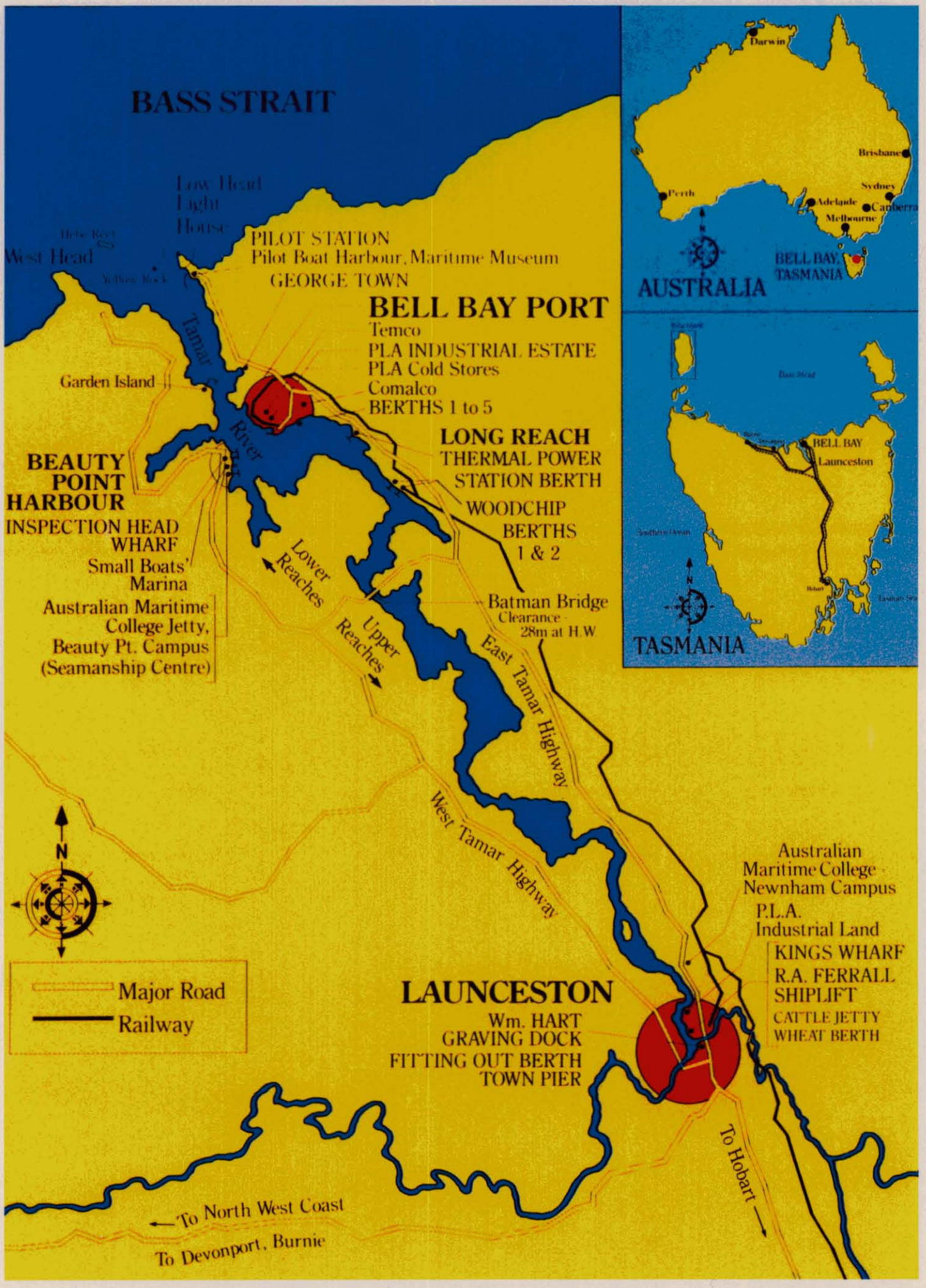
BASS STRAIT
Low Head Light House
West Head
PILOT STATION
Pilot Boat Harbour, Maritime Museum
GEORGE TOWN
BELL BAY PORT
Temco
PLA INDUSTRIAL ESTATE
PLA Cold Stores
Comalco
BERTHS 1 to 5
Garden Island
Tamar River
LONG REACH
THERMAL POWER STATION BERTH
WOODCHIP BERTHS 1 & 2
BEAUTY POINT HARBOUR
INSPECTION HEAD WHARF
Small Boats' Marina
Australian Maritime College Jetty, Beauty Pt. Campus (Seamanship Centre)
Lower Reaches
Upper Reaches
Batman Bridge
Clearance - 28m at H.W.
East Tamar Highway
West Tamar Highway
Australian Maritime College - Newnham Campus
P.L.A. Industrial Land
KINGS WHARF
R.A. FERRALL SHIPLIFT
CATTLE JETTY
WHEAT BERTH
LAUNCESTON
Wm. HART GRAVING DOCK
FITTING OUT BERTH
TOWN PIER
To Hobart
To North West Coast
To Devonport, Burnie
N
Major Road
Railway
Darwin
Brisbane
Perth
Sydney
Adelaide
Canberra
Melbourne
BELL BAY, TASMANIA
AUSTRALIA
BELL BAY
Launceston
Hobart
TASMANIA

142012

Section 1

INTRODUCTION: THE ROCK SUPPLY INDUSTRY AND THE RATIONALE FOR THE BELL BAY QUARRIES

PREAMBLE

Because the rock industry keeps a low profile many people do not realise that it is one of our largest industries, and that it generates profits not only at quarries but also in transport, and in the use of its products in manufacturing.

In Australia in 1986-87 the production of rock was 111 million tonnes valued at $707 million, or $6.40 per tonne ex bin or ex pit (Australian Bureau of Statistics). The average consumption per person was over 6.5 tonnes. With inflation and increased production the value is now possibly of the order of $1,000 million ex pit for a population of 17 million people.

Transport by road beyond the pit increases the value of the rock up to 6 times or more though usually less. There are no statistics for the average increase, but if it is 2.5 times, the raw crushed rock has an average delivered value of $16 per tonne and a total value of around $2,500,000,000. That figure is "soft" but it gives an idea of the size of the industry; and it allows another point to be made: the rock industry has one foot in quarries, a foot and one arm in heavy transport tied to the quarries, and an arm in manufacturing.

On the production side the industry has two segments, five-sixths of it being based on hard-rock quarries and one sixth on river gravels.

On the consumption side there are three main segments, roads, concrete and manufacturing plants, and each of those has subdivisions. For example a road consists of three layers, the sub-base, base and top-course. First-grade rock is needed for the top-course which is in the form of asphalt of several specifications, or top-chips sprayed with tar. Similarly there are many specifications for the base-course and it is often delivered to the site from mixing plants.

Manufacturing plants are of many kinds. Some are small and make simple products such as concrete building blocks and pavers. Others are larger and make more complex products such as beams, power-line poles, railway ties, pipes and culverts. Again the markets are large: for example concrete pipes have a sale value of $800 Mpa. Half of that niche market is held by Amatek and Rocla (BTR Nylex). The making of each product can support several major businesses in any large city. The products are improved constantly. As an example the "search is on" for a light-weight aggregate (rock) to be used in the making of the simple and common concrete block. This is because a reduction in the weight of blocks can lead to a reduction of many costs, including the $1 per block that is the charge for laying them. It will also lead to a reduction in the weight of upper walls with savings in the cost of lower walls, and will give other savings in transport charges.

The division of the total market into regional markets, and segments and subdivisions, is very important to the proposed Bell Bay quarries because it provides many niche markets. For viability the quarries require only two niche

markets of 500,000 tonnes. Those markets are small by industry standards but are numerous, and some are facing the exhaustion of the quarries that supply them, as will now be explained.

Historically the industry started with tens of thousands of quarries of homestead or village size. Modern large cities now commonly have only two or three major quarries in or near them, and several small quarries. Characteristically the quarries were established in an early phase of each city's growth, and without protective buffer zones. The cities expanded around them, and over other potential quarry resources which are now unworkable. Many of the original quarries are approaching exhaustion, and the quarry operators face intense opposition when they try to move anywhere in or near built-up areas. They are forced to move a long way from the city they are serving, and even then face opposition and very strong environmental regulations as well as high road transport costs.

Sydney is one example of this situation. For many decades most of its rock came from quarries in dolerite at Prospect, 28 km west of the CBD. Suburbia spread around and far past Prospect. There are now only two quarries there. In one the first-grade rock is effectively worked out, and the other has a limited life. There is still a large quantity of low-grade material which can be sold for some uses. The exhaustion of reserves was foreseen and quarries were started elsewhere. River gravels and sands along the Nepean River below Penrith are now important. Hard-rock quarries were started south of Wollongong but they have limited lives and are 95 km or more from Sydney. The Land and Environment Court gave permission recently for two new quarries near Berrima and Mittagong, 105 km and 130 km from Sydney, or one-third of the distance to Canberra. They face high establishment costs, estimated at $32 million dollars just for road access in one case, and high road transport costs which could be raised steeply and progressively by agreements between the States and Commonwealth (National Road Transport Council, and Ministerial Council).

The Sydney situation triggered lateral thinking, and the recognition that sea transport from a source far from Sydney had become competitive with road transport. Rail transport was investigated and rejected, because it is restricting and has high charges, the lowest State charge being 5.85 cents per tonne/kilometre for wheat. In addition the States use rail as a taxing device in the case of coal, and they could do that just as easily with rock.

A geological search for a suitable rock deposit was conducted over the whole of Australia, being concentrated near ports or potential ports. Very quickly it was found that virtually all of the coastal cities in Australia have problems similar to those of Sydney, though different in details, and none had quarries, or could have quarries capable of supplying Sydney on a long-term basis. It was then realised that a suitable coastal quarry, when located, and if large enough, could supply rock to several major Australian cities, and gain economies of scale. It was only another step to the realisation that many overseas cities in coastal locations, and most are coastal, would be facing difficulties just like those of Australian cities. There was an incentive to look for a high-quality very large deposit that could be used to export rock to a number of domestic and overseas port cities.

During the search for a deposit, it was learned from the Institute of Quarrying that European cities faced similar problems to those in Australia, with the result that the industry was undergoing major reconstruction. It has been necessary in Europe to

obtain rock by sea from distant locations, and three super-quarries had been opened about 1988, one in a sea-loch in northwest Scotland, one in a Norwegian fjord and one in Nova Scotia (Canada). They are called super-quarries because the economies of scale allow them to have productions up to 15 million tonnes p.a.

The Glen Sanda quarry of Foster Yeoman Ltd. in Scotland supplies the British region and the North Sea region, but also sends 1 million tonnes per annum to Texas. The Explaura quarry in Nova Scotia supplies Atlantic cities and Gulf cities in the USA, and any other markets as opportunities are made. Another quarry of similar type is to open at Bantry Bay in Ireland late in 1992.

At the same time a big change was occurring in the increase in the numbers of self-unloading ships. They have been observed by the writer on the Great Lakes system where they help to make Chicago – Detroit one of the world's biggest port systems even though those cities are nearly in the geographical centre of North America. Self-unloaders are now used by Foster Yeoman Ltd., providing great flexibility in the selection of discharge points, with competitive advantages. They have two new self-unloaders being built in Korea because their business is expanding rapidly.

The knowledge that the idea of super-quarries had been successfully developed in the North Atlantic using shipping transport greatly increased our confidence level for adopting the same system in the Pacific.

Three areas for a quarry made the final short-list. One had volcanic rock in sufficient quantity, but the rock contained volcanic glass which reacted with cement, and the site had to be rejected. A second area contained zeolites and was rejected for the same reason.

The third area, at Bell Bay, met all the criteria for acceptance. It is really extraordinary in having a superb rock resource adjacent to an established port, and in having all the other necessary infrastructure such as a supporting town, highway access, railway, power, water, suitable labour, education facilities to University level, and recreational facilities such as boating and golf. Its essential virtue is that it is beside a port that already serves heavy industrial plants operated by BHP and Comalco. It also has ample sites for a manufacturing plant for concrete products for export if Pacific Quarries expands in that way.

The area and its quarry sites are described in Section 4.

Fig. 1.2 Part of the eastern side of Bell Bay Harbour.

Road and railway in the foreground lead from George Town to wharves of the Port of Launceston Authority.
A small part of BHP's TEMCO plant shows one third of the way up the left margin, with part of the Comalco plant to the right. In the distance on the shore is the Bell Bay Power Station. The wood chip wharves (Fig. 4.1) are out of sight beyond the power station. The hills to the left and right of the power station are included in Exploration Licence Area 10/90.

142016

Section 2

MARKETS AND SALES

MARKETS

MARKETING STRATEGY

STRATEGIC AUDIT

MARKETS

INTRODUCTION

The project was aimed initially at the Sydney market which is about 4 Mtpa (4 million tonnes per annum) of first-grade rock and 3 Mtpa of lower grades. It was realised later that many other markets would be accessible by using sea transport, and data were collected on the ground in Sydney, Melbourne, Adelaide, Brisbane, Gladstone, Auckland, San Francisco, Los Angeles, San Diego and Chile. Some Asian markets proved to be more difficult to study because most of the information is in languages other than English. The quarry industry is not "highly-regarded" and is not considered very interesting and consequently there are almost no books and monographs dealing with it. However, Austrade produced a large Overview Study of the Japanese market for us.

Data for selected potential markets are given below. In a most interesting way the recognition of new export markets occurred, and is occurring, faster than we can assemble data and prepare summaries of them. More detailed notes are given about the Sydney market than others because it was the first to be studied in detail and we learned so much from that study, and then realised that export markets are better and far bigger. The Japanese market alone is equal to 142 Sydneys in size.

SYDNEY

Statistical data for New South Wales and the Greater Sydney region are collected by the Geological Survey Branch of the N.S.W. Department of Resources and Energy, but publication can lag for several years, so that data for 1986-87 are the most complete at the present time. Data have been published also in many planning enquiries, because it has been recognised that major problems were arising on the reservation of rock resources. The resultant reports include "Draft Sydney Regional Environmental Plan - Extractive Industry - Technical Working Papers".

For a century rock was quarried from a deposit of dolerite near Prospect Reservoir, west of Parramatta, and 28 km from the Sydney central district. The first-grade rock in it is approaching the end of its life. Quarries have been opened elsewhere, the main hard-rock ones being south of Wollongong at Bombo and Dunmore and other locations towards Kiama. The market is dominated by three companies, Boral, CSR Readymix and Pioneer International. All three opened gravel pits along the Nepean-Hawkesbury River below Penrith. An uncontrolled mess was such a possibility that the State Government actually got the companies to combine in the Penrith Lakes Scheme. (The effect, if any, was to reduce competition and increase prices). The Scheme does mean that quarry pits will be rehabilitated as a rowing course and other recreational facilities. The workings generally produce a deficiency of gravel (rock) and an excess of sand. They cannot extend easily downstream because of interference

with the historic Windsor-Richmond district, and in any case the Hawkesbury system has become a publicised environmental problem.

So in 1989 CSR Readymix began to develop a large new quarry well away from Greater Sydney in the Southern Highlands near Mittagong. It is 105 km from Sydney, one-third of the way to Canberra. A newcomer, Amatek Ltd., then appeared, wishing to open a quarry even further into the highlands at Mt Misery near Berrima, 130 km from Sydney. The Mt Misery site has been re-named Compton Park. Under the name Monier, Amatek has been part of CSR, but it was divested by management buy-out, is now part of BTR Nylex, and is competing with CSR.

The residents of the Berrima district were opposed to quarrying of any kind and tried to force CSR Readymix and Amatek to open only one quarry under joint management.

CSR refused and the matter went to a lengthy Land and Environment Court hearing in 1991 at which major written submissions were made, and passed into the public record. The most relevant were from the Department of Minerals and Energy, from Professor Donald Barnett of Macquarie University and from managerial and technical staffs of the two companies.

Many tens of pages of information could be extracted from these reports and included in this Business Plan, but it seems better to sum up some of the salient points that emerged during the hearing:

- The consumption of hard aggregate in the Sydney region fluctuates with the economic cycle but is normally about 7 Mtpa (7 million tonnes per annum), and the official base has been taken as 8 Mtpa. It is expected to increase because road maintenance and construction have suffered neglect, and public demand will force increases in construction.

- About 4.6 million tonnes of production is first-grade rock.

- The Penrith Lakes Scheme has supplied 2 Mtpa to 2.8 Mtpa of high quality gravel and can continue to do so to the year 2000 or the indefinite future (unless there is earlier strong environmental opposition). Extraction downstream from the Wallacia Bridge has already been prohibited.

- Imports to Sydney by road, rail and sea from south of Wollongong have been about 1 Mtpa and are likely to decrease because the Wollongong demand is growing and the deposits have limited lives. Another 0.5 Mtpa is imported to Sydney from quarries north of Sydney in the Newcastle Mining District, and the quantity is likely to fall because local demand is growing and supplies are limited.

- Without the new quarries near Mittagong and Berrima a shortfall in supply of 3.2 Mt is expected in 1995-1999, 4.5 Mt in 2000 to 2004 and 5.2 Mt in 2005 to 2009.

The quarries at Mittagong and Berrima are being developed to planned production rates of 500,000 tonnes rising to 1,000,000 tonnes. They will capture some of the shortfall market especially in the far western suburbs of Sydney, but road transport costs will be higher as they get towards the inner suburbs, the CBD, Botany Bay and the North Shore. In those areas rock brought in by sea would be a serious competitor because of lower costs.

Gravel from the Penrith Lakes Scheme will retain a large market share in competition with the new quarries for about a decade. The prices of crushed and screened gravel at the three Penrith Lakes workings are known because they are "posted" for spot buyers, and are all similar. For Boral at Emu Plains in 1991 they were:

Size	Pick-up Price (ex Bin)	Delivered Price (to CBD)
40mm	$24.62/t	$34.50/t
30mm	$24.62/t	$34.50/t
14mm	$24.62/t	$34.50/t
10mm	$26.62/t	$35.15/t
5mm	$24.62/t	$34.50/t

More can be charged for 10 mm stone because it is the most popular size in all quarries. The writer considers that it is likely that the pick-up price includes a high profit. The transport charge is $9.88 for say 52 km, which is 19 cents per tonne kilometre, and it also includes a profit. The prices might or might not be dropped to meet competition when the new Mittagong and Berrima quarries are opened. Spheres of influence could be decided, or might be decided by costs.

Quarry costs are often in the range $5.50 to $6.50 per tonne and normally are not critical. The prices charged ex-bin are commonly around $11 to $12 in Australia.

Road transport costs are the critical costs, and are carefully guarded. No published figures have been found but at present they are known to be commonly in the range 15 cents to 20 cents per tonne kilometre, with or without a $1 flag fall, and varying with the road, traffic density, bridge loadings, truck size and type, the presence or absence of a trailer, fuel oil charges, taxes and tolls.

It is thought that road transport from the Berrima and Mittagong quarries will be at least $20 per tonne to the CBD, and more to the northern suburbs, at present costs and taxes.

Taxes and charges on heavy vehicles are to be raised by decisions and actions of a National Road Transport Commission, a Senate Inquiry, a Ministerial Council, and a Heavy Vehicle Charges Inquiry. The first instalments of new (unannounced) charges are supposed to be introduced in January 1993 and to be fully in place by July 1995. There could also be special charges or taxes in the inner-city as there are in Singapore and other cities. It is possible that road costs from the Berrima and Mittagong quarries to the CBD would perhaps increase to $30 per tonne, imposing a considerable burden on consumers. On the other hand truck operators and some States will not agree to the increases, and nothing might happen.

At either the higher or lower prices marine sources of rock could be competitive within 10 or 20 km of harbours. Consequently several attempts have been made to copy offshore dredging methods used in the English Channel region. Applications for offshore leases in the vicinity of the mouth of the Hawkesbury River caused an outcry, and were defeated by complex legislation. Lease applications further south have been granted over sand and gravel at depths of 30 to 50 metres. The marine aggregates could probably be raised by a "Severn and Scheldt" class trailing suction dredger and delivered to shore at the rate of 2,300 tonnes per day or approximately 675,000 tonnes p.a.

The quantity could possibly be increased to 1 Mtpa. Most of the product would be sand. It could help to solve Sydney's sand problem (which is like its rock problem), but the product would contain undesirable broken shell, silt and clay. Originally the dredging possibility was being investigated by Hooker Corporation but when that company failed the leases passed to the three majors. Offshore dredging could be useful in providing fill for the Third Runway at Sydney, if it is not blocked by the opposition of environmentalists or by technical and cost problems.

Tasmanian rock from Bell Bay will be competitive with other sources of supply, especially when waterfront and shipping reform is finally completed. Shipping costs should be about $10 per tonne, and certainly no more than those to Japan. It is expected that they will fall to that level within 3 or 4 years, and the Tasmanian rock will then be clearly competitive. In the meantime it is necessary to play a waiting game, except possibly with the special "one-off" market such as the Third Runway discussed below.

Special large projects occur in Sydney and other cities. Examples are the Darling Harbour Redevelopment and the Third Runway at Kingsford Smith Airport. They use large quantities of rock. The Third Runway will require very large amounts of fill (more or less anything), and smaller amounts of first-grade rock (600,000 tonnes). If the fill is supplied by road it will require two 30 tonne trucks every minute of every hour of every day for 18 months and that might not be tolerated by the public along and near highways, especially at night. A small part of the fill could be

recycled materials from knocked-down buildings, but most would have to come from quarries which are between 52 km and 130 km from the airport. For that reason it is rumoured that engineers hope to suction dredge most of the fill from the floor of Botany Bay. That will almost certainly be opposed by organised groups because it really will have flow-on effects on beaches and on the total Botany Bay system.

Until tenders are announced and called we can do no more than register as potential suppliers, which has been done. A letter of response from the Federal Airports Corporation is included in the appendix.

MELBOURNE

Over half of the rock quarried in Melbourne is from basalt which is abundant in parts of the region and is sometimes a superior rock. Statistics are excellent, along with regional planning overviews, the most significant being dated 1986 (Stage 2 Study Report of The Extractive Industries Strategy Plan, Interdepartmental Committee, Ministry of Planning and Environment).

In the planning region termed the MSA (Melbourne Supply Area) **there is adequate rock for a long time ahead** but blending of materials from different quarries is often necessary to meet specifications because some rock is bluntly of poor quality.

Road transport costs are as usual the most important costs and are very similar to those in Sydney at $1 flag fall, 15 to 20 cents per tonne kilometre, and competition is high because most of the 900 heavy trucks have owner-drivers. **The price of rock delivered to the consumer are usually 40% lower than in Sydney because quarries are closer to the city**.

Hard-rock production in the MSA is higher than in Sydney, ranging from 9.5 Mtpa to 12.5 Mtpa, about 80% of it being by the usual three majors (Pioneer, Boral and CSR Readymix). The main subdivisions of the market are the same as elsewhere, namely aggregate for concrete, aggregate for asphalt, aggregate for sprayed seal surfacing, prepared or unprepared road base and sub-base, railroad ballast, filter and bed material for pipe laying, armour stone and rip rap for protection works.

The present supply situation is generally satisfactory, being weakest in the Mornington Peninsula along the eastern side of Port Phillip Bay, because it is furthest from the supply areas. There are predicted shortfalls in that rapidly growing sub-region of Melbourne, but they are of uncertain size. That sub-market is nicely accessible from Port Phillip Bay, either through the Port of Melbourne or through the use of self-unloading ships and it is regarded as a significant potential niche market, of a size to be determined by a more detailed study.

ADELAIDE

Quarrying in Adelaide is dotted along the Hills Face Zone behind the city, and consequently has severe "visual problems" because people object to the disfiguring scars on the background to the city. The problems and solutions are discussed in a major "Report on the Enquiry into Quarrying in the Hills Face Zone" (For the Environment Protection Council by the Department of the Environment).

The whole report can be summed up by the statement "the people want the quarries removed and re-vegetated" despite the fact that they get cheap rock because of short transport distances.

The best alternative resource of first-grade material is in the Kulpara area 130 km from Adelaide, and the report includes a 1977 financial study of it. To transport the rock to Adelaide required a fleet of 1500 trucks, and a four-line summary of the capital costs in 1977 dollars was:

Quarry and crushing plants	$77,000,000
1500 trucks	$58,000,000
Working capital	$5,000,000
	$140,000,000
	(1977 dollars)

The selling price of the rock at point of use was estimated as $20.20 per tonne in 1977 dollars, for a production of 6Mtpa rising to 12 Mtpa. The price in 1992 dollars would be close to $40.

This market is open to attack through Port Adelaide, but again a detailed sales study will be required.

PERTH

In many ways the supply problems for Perth are similar to that in Adelaide. The city is on a coastal plain with virtually no hard-rock resources. The four main quarries are in the inland Darling Scarp, and there are distance problems (transport costs) especially in the Fremantle-Kwinana par of the built-up region.

Again it seems that the market is open to attack through the Port of Fremantle but no detailed study has been made so far for want of money and time.

BRISBANE

This city is different because its supply is dominated by gravel taken from the Brisbane River by clam-shell dredges and drag-lines and then screened and washed. There is a maximum yield at any place so there are numerous riverside plants. After several decades of working, the amount of gravel is decreasing or seriously depleted and hard-rock quarries have been opened in the D'Arguilar

Range north of the city. (One is the only operating quarry owned by Amatek which is now opening a quarry west of Mittagong and Bowral). The rapidly-expanding coastal belt 20 km and more from the city has transport cost problems and is accessible from the Brisbane River port.

To the south the Gold Coast region uses gravel from the Coomera River and has no shortage of hard-rock resources. The same remarks apply to the Sunshine Coast to the north of Brisbane.

GLADSTONE

This excellent and rapidly-growing port was examined in case it had a rock supply that could compete with Bell Bay. None was found. The port has abundant low to medium-grade rock but has a problem with first-grade rock. It is a market for later detailed research partly because it offers potential back-loading of ships to Bell Bay. The two rapidly-developing ports need not be in competition; they could be complementary, with advantages for Pacific Quarries.

AUCKLAND

In practical terms Auckland can be included with the Australian city markets. Three weeks were spent examining it, with assistance from the geologists of DSIR-GEO because it looked like a much easier market than Sydney.

The city has a population of about 1 million people, and is comparable with Brisbane and is expanding rapidly to north and south in the same way as Brisbane is expanding to the Gold Coast and the Sunshine Coast. It grew originally as three separate cities which merged and are now administered by the ARA (Auckland Regional Authority). The ARA commissioned a review of the aggregate resources of its region in 1989, and for that purpose a leading firm of consultant engineers prepared a report which stated:

> **"A number of the large quarries providing the bulk of the industrial material for the Auckland Region are now tending towards the end of their economic life".**

A table showing the production from quarries in the ARA is on the next page. The total production was 5.8 Mt in 1987,

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TABLE ON AUCKLAND QUARRY PRODUCTION

Quarry	Rockfill	Building Aggregate	Road & Ballast	Total	% of Total
WINSTONE'S					
Henry's, Puni	5,980	76,517	1,627	84,124	1.4
Hunua Quarry	102,258	72,921	217,504	392,683	6.7
Lunn Avenue		603,734	861,690	1,465,424	25.1
Mt.Eden, Three Kings	84,879	25,754	170,341	280,974	4.8
STEVENSON'S					
Drury		71,570	247,879	319,449	5.5
East Tamaki	20,020		120,971	140,991	2.4
Kaiaua		23,525		23,525	0.4
Greenmount			223,881	223,881	3.8
Neilson Road			27,848	27,848	0.5
MANUKAU CITY COUNCIL					
Whitford	25,000		92,237	117,237	2.1
Couldrey's			4,038	4,038	0.1
Halliwell's			235,893	235,893	4.0
Adie & Co., Bombay			29,979	29,279	0.5
Airport Quarry			57	57	-
Anderson's, Pokeno			200	200	-
ARA, Hunua			7,552	7,552	0.1
Beachlands			13,498	13,498	0.2
Coatesville	7,504		10,862	18,366	0.3
Ellet's	39,215		207,517	246,732	4.2
Flat Top	8,486		140,192	148,678	2.5
Henderson & Pollard			5,755	5,755	0.1
Kaipara Excavators			164,000	164,000	2.8
King's Wainui	6,638	13,334	66,183	86,155	1.5
Kosovich		11,500	18,000	29,500	0.5
McCallum's Island		112,662		112,662	1.9
McPherson's			8,000	8,000	0.1
Mt.Rex Shipping		40,000		40,000	0.7
N.Z.Railways			194,299	194,299	3.3
Puhinui Scoria	23,697	100,000	20,042	143,739	2.5
Puketutu		273,780	176,881	450,661	7.7
Roscommon		163,755	233,554	397,309	6.8
Ryall's			100	100	-
Self's	46,989		11,747	58,736	1.0
Shaw's			38,440	38,440	0.7
Redvale, Dairy Flat	10,000			10,000	0.2
Smale's	246		672	918	-
Steel's, Woodhill		70,576	18,000	88,576	1.5
Stoney Hill, Waiheke	1,260	383	11,127	12,770	0.2
Tuakau Dredge		68,467		68,467	1.2
Waitakere No.1			155,900	155,900	2.7
			TOTAL	5,846,416	100.0

and it was unusual in that it was not dominated by 3 or 4 majors. Instead there is only one major producer (Winstones, now owned by an Australian company) and its output was 1.47 Mtpa or 25% of the total from its Lunn Avenue quarry. This is popularly known as the Mt Wellington Quarry, and it produces first-class rock. It is in an inner-suburban location and is a real money-maker, but DSIR-GEO people estimated its life at about only 8 years. Some of the other quarries are in greywacke and argillite in the Hunua Hills 30 to 50 km south of Auckland City, and they have problems, but can supply the southern third of the ARA far into the future.

Like Sydney, the city is bisected by a harbour. The area north of the harbour and the harbour bridge once had a lot of rock but it was not reserved and is now covered by housing. It is the equivalent of the Sunshine Coast and is actually called the Hibiscus Coast officially. Basically this large region on the north side of the harbour has no hard-rock quarries. It is estimated that it uses about 2 Mtpa of which perhaps half is from the Mt Wellington Quarry. The other half has to come from further south and is open to capture by rock exported from Bell Bay to Auckland Harbour. Its capture, up to the amount of 1 Mtpa, would be almost certain if a dedicated unloading jetty were built on the sheltered east coast north of the harbour. There is another suitable harbour where sites will remain available for a few more years. An additional 1 Mtpa will be open for capture when the Mt Wellington Quarry is exhausted, making a total of about 2 Mtpa.

Auckland is therefore regarded as a prime target for exports from Bell Bay. The ships that are used should be able to get full back-loadings of paper (mainly newspaper) or timber from the Port of Tauranga a short distance to the south, which adds very greatly to the attractiveness of the Auckland market. The back-loading makes the Auckland market particularly attractive.

LOS ANGELES

The writer has had past geological experience in California and considered that the potential markets for first-grade rock could be very large along the coast, and especially in The Bay Region (meaning the San Francisco - Berkeley - San Jose built-up region) and in Greater Los Angeles.

A flying market research visit was made in October 1991, the situation was observed, and data were collected with the help of several geologist friends, particularly Mr Tom Wright (formerly Chief Geologist, Chevron Oil, California) and Professor K.L. Burns (University of California).

Below the State level the main administrative units in California are counties. Each of the major cities has spread over several counties, but they are tied together administratively by the State Government.

Most of the coastal counties have grown and are growing dramatically, and as expected, the visit confirmed that they have rock supply problems, with more problems emerging.

One review of problems states a little about trucking problems:

> "Sand and gravel is nearly always delivered by truck and trailer combinations that can carry a maximum load of about 25 tons. The large loads are necessary because sand and gravel is a bulky, low cost-per-volume item, and transportation costs per.ton must be minimised by each company in order to remain competitive. Many producers in Orange County have their own truck fleets and transport their own sand and gravel.
>
> ..... Trucks are not only expensive to operate, but may contribute to environmental and traffic problems. Large truck fleets on freeways can become a traffic problem, and the industry has made many detailed studies in order to route trucks at appropriate times to avoid commuter traffic rushes. However, as longer hauls of sand and gravel are required, freeway traffic problems will be aggravated accordingly."

The problems with commuter traffic rushes, freeway traffic and attempts at partial solutions using computers to pick the best routes are common to Australia, and might be worse in Japan. One slight solution is to have different trucking charges at different hours of the day and for different localities and routes. The use of sea transport helps by reducing the distances travelled on crowded roads.

The total production of sand and gravel in California is at least 500 Mtpa. It is impossible here to consider the market in all coastal counties, but Orange County is an example. In 1960 it was an agricultural area on the southern fringes of Los Angeles. It now has nearly the population of Sydney. It has 31 ready-mix concrete plants and 14 asphalt batch plants. Its aggregates were entirely derived from gravels in rivers flowing into the Los Angeles basin from the surrounding mountains but they are now insufficient and rock is being imported by road from more easterly counties which in turn are being over-run by suburbia.

There are two solutions to the growing problems: rail transport and ship transport.

Rail transport in the USA is efficient, but rail lines crossing California from the east are few and far apart (two), and have suffered from freeway competition. If and when rock is brought from the east it still has to be distributed widely by trucks. At present it does not seem that rail can provide more than 50% of the solution.

It seems more likely that ship transport to the densely populated coastal regions could be more than viable through Bay Area ports, Long Beach and other entry points.

The market research in relation to Pacific Quarries is still too little to be taken very seriously. It does indicate that there might be very good niche markets and contracts for Bell Bay products. The market could be dismissed too easily,

however, for it must be remembered that Foster Yeoman Ltd., exports 1 Mtpa of rock from northwest Scotland to Texas.

SOUTH AMERICA

The writer had an earlier geological acquaintance with the western side of Central America, and of western South America down to the southern border of Peru. The countries in those regions do not provide any sound potential markets.

In 1991, Chile was being promoted as a large and promising trade partner with Australia, there were exchanges of Chilean and Australian mining and trade delegations, and publicity was being given to Australian successes, including BHP's Escondida copper mine, now the world's second largest.

It seemed advisable to make a rapid survey of the Chilean market in November 1991. Very considerable local assistance was given by Dr. F. Herve, head of the Geology Department, University of Chile, and Dr. Stanislaus Mayer of the Geological Survey of Chile.

Santiago has a population of 13 million but it does not provide a market because it has abundant rock in major rivers flowing from the Andes. Other coastal markets were examined quickly, but are smaller and are abundantly supplied with rock. The ports are so few and so bad (open roadsteads) that they are unlikely to service competitors.

JAPAN

A large Market Overview Survey has been made for us by Mr Tim Overton-Clarke (Trade Commissioner) and Mr Hiroshi Gunji of Austrade, Tokyo. There is space for only some salient points to be given here:

- Statistical data are excellent and are published up to 1991. **The market is 1000 million tonnes (equivalent to 142 markets of Sydney size)**. About half is from hard-rock quarries, and about half from river gravels and from talus and scree slopes in the mountains.

- **MITI specialists and others estimate that the supplies will last for about 10 years and a minimum of 5 years.** (It is no wonder that they are being rapidly exhausted, given the awesome production per annum).

- **The market in the Tokyo-Yokohama area is 300 Mtpa**. Because of narrow roads it has to be distributed through the urban region in 10 tonne trucks.

- The proposed Bell Bay production of 1 Mtpa is insignificant compared with that market, and is its capital requirement.

Eight of the largest producing companies have a total R&D budget of AUD 782 million. The R&D budget for one of those companies is greater than the total budget for CSIRO.

Austrade tried to establish ex-bin prices by interviews, and to collect delivered prices from consumers. There were difficulties because trucking costs seem to be based on the time taken to deliver to the user from the quarry, and not distance. That would be logical in areas of crowded traffic and traffic jams. They concluded that ex-quarry prices seem to vary between AUD 16 and AUD 20 per tonne (about twice the Australian prices and more than twice the Bell Bay FOB cost).

Nippon Hodo stated that it pays AUD 24 per tonne for road construction rock delivered, and Onoda Cement pay AUD 22 for rock for ready-mixed concrete. Austrade comments:

> "We cross-checked this figure with MITI aggregate specialists, they quoted the price at around $32/MT, higher than the price quoted by private industry sources. One possibility to explain this discrepancy is that MITI have probably quoted on 10 ton trucks loaded to the legal limit, whereas most 10 ton trucks are carrying far in excess of the legal limit under pressure from the users, thereby reducing overheads per ton. This does not account for the entire difference but could be a contributing factor." (The letters "MT" above mean metric tonne).

A reply to Austrade stated:

> "The range of prices ex pit from around AUD 16 to AUD 32 or even 40 is quite normal. Reasons are given in the next few sentences. Some quarries have thick overburden which is costly to remove, replace and rehabilitate. That process can double costs for some quarries. Again rock screened to 10 mm is the best seller at all quarries and costs more than 25 mm rock because it requires an extra stage in crushing and screening, which in turn means energy (diesel or electricity). Some rock is washed. Some quarries have rubbish, and some meet exacting tests and specifications. In some areas there are concealed marketing cartels. The variables are many. **What emerges is that we can meet the low to medium prices, and with a really superior product.** Your overview has provided essential comfort because previously we could not feel sure that we are competitive, and now we know that we are."

Indeed it seems that the variable "Japanese prices" are now so high, and rising, that the Bell Bay estimated price can meet them, at the very least in some areas and in some niche markets.

Road Transport Costs: The Austrade report stated:

> "Both MITI and the companies stressed that great importance is given to the supply source being as close to the user as possible preferably no longer than 90 minutes by road. One of the contributing factors to this requirement is that storage space is at a premium. Complicating this situation is the fact that some metropolitan located quarries are exhausting and there is some upward pressure on transport costs as quarries further afield are being utilised".
>
> "Dump truck organizations quote their cost for a 10 ton truck as $470/two return trips providing the distance one way is not greater than 25 km. One return trip up to 150 km is $720. This works out at about $11/tonne slightly higher than the figures quoted above".

In an exchange of fax messages we commented:

> **"Japanese truck rates for rock seemed to be either 78.33 cents per tonne kilometre, or half that figure (39.16 cents)**. It all depends on what is meant by two return trips. The lower figure is about twice the Australian rate but here we can use 30 tonne trucks not 10 tonne". (This matter is not yet clarified).

The high truck charges do mean that research must be concentrated on niche markets that are closest to the ship-discharge point. That strategy would mean that we would avoid most truck problems and costs, and could undercut producers who had to truck through the cities from quarries that are constructed in a region north of Tokyo and even much further from Yokohama.

Imports:

The Japanese statistics for 1991 as transmitted by Austrade provide the following data for imports:

Country	Tonnes	AUD/CIF	AUD per tonne
Taiwan	453,313	10.309,090	22.74
China	61,721	4,079,710	66.09
Philippines	31,132	5,469,040	175.67

The first reaction to the prices per tonne was the imports from China and the Philippines are possibly not ordinary construction rock but some kind of sample of monumental stone. The prices for them were disregarded, perhaps wrongly, because Austrade commented:

> "The data shows significant irregularities in volume of imported stone. For example, Taiwan can deliver at $22.7 per MT, China $66 and the Philippines $175. Variations in previous years are

similar; for the 12 months to December 31, 1990 the price per MT from Taiwan was $21 , China $70 and the Philippines $177".

There was a further paragraph:

"We have established that Taiwan is able to supply Japan at the cheapest cost as most of the crushed stone is delivered to Ishigakijima Island near Okinawa and very close to the mainland Taiwan. This material is being used for Airport development and road building projects in the area".

ONODA CEMENT import crushed stone from China. The usual cost breakdown is FOB $8/MT, Shipping $16/MT, Unloading $8/MT, and local transport $8/MT. The total cost averaging $40/MT.

A possibility that there might be competition from Korea was not confirmed:

"Despite records in Quarry Journals reporting Korean exports (ref. Harrington to Mcfie 12 June '92) there are no official statistics reflecting these imports. The Crushed Stones Association commented that as Korea is still a rapidly developing country their domestic requirements far exceed any capacity for them to export to Japan. They have no record of Korean exports to this country".

One of the most surprising facts to emerge from the study of imports is that they are negligible in comparison to the total market of 1000 million tonnes. That is very hard to understand. There could be some good reason that has not been recognised.

In theory Japan should be able to use sea transport for rock in the same way as North Atlantic countries. Perhaps importers are "killed off" by severe price-cutting by domestic producers. Perhaps there is some cultural factor in action and we do not understand it.

It seems improbable, but perhaps the countries near Japan are developing so rapidly, like Korea, or are so heavily populated, that they have little rock to export, and the Japanese have not considered a source as far away as Australia. Most other countries to our north do have real problems because their rocks decompose deeply in wet tropical environments, and the most suitable rocks form soil that support big populations. There is a lot of "lemming behaviour" in the petroleum industry and other extractive industries. Similar behaviour might or might not be operating in the quarry industry in the Pacific region.

Whatever the reason for low imports in Japan (and in Korea too for that matter) it seems that imports are going to become necessary because of the exhaustion of some supplies. In that kind of situation the Japanese act decisively and on a big scale.

SUMMARY OF THE MARKETS

The Australian coastal cities all offer market segments in which sea transport would be competitive, and the total of all segments would be large. On the other hand any real entrant would need financial reserves sufficient to counter, or scare away, price-cutting wars that would be encountered. There are also "special project" markets, usually won by secret tenders. For the present the coastal shipping industry in Australia is in such a state that it can cost more to ship from Bell Bay to Sydney than to Japan, but that problem will disappear in the next few years. At present overseas export markets look far more attractive than those in Australia.

The Auckland market looks very promising. Trans-Tasman Shipping has problems but they are being removed, and in addition the ships taking rock to Auckland could almost certainly get full back-loads at full rates, of newspaper and timber from the Port of Tauranga near Auckland.

Californian markets need more very careful studies but should not be dismissed casually, given that Scottish rock is exported successfully to Texas. The best way to enter California could be a contract with a US buyer.

The Japanese market is of awesome size, and is subject to the exhaustion of domestic quarries (which is a function of the production of 1000 million tonnes per annum; no group of quarries can last for long at that rate of production). Even niche markets would be bigger than the proposed Bell Bay production.

Markets have been discussed in this section. The market strategy is discussed next. Efforts to gain sales in the Japanese market have priority at present and are also discussed next. The Auckland market also has a high priority.

MARKETING SALES AND STRATEGY

"In marketing you have to find out what the customer **really** needs and wants, to recognise it, and to guide them through a maze to your product:. That remark by a Workshop lecturer is very relevant because Pacific Quarries will have superior rock, and some competitors have poor rock, using the best that is available in a local area. For example two quarries in Sydney sell rock that is so poor that it can be crushed to powder in the hand. For some purposes where simple fill is required that does not matter, but it can matter in other cases to the extent that it can cause the early failure or partial failure of multi-million dollar works. In other cases the rock can react with cement causing swelling and the so-called "concrete cancer" that is an emerging problem for some Sydney high-rise investing companies. In some cases only rock of the highest possible specifications should be used, as in the new Sydney Harbour tunnel.

Unfortunately design engineers sometimes take what is offered, and "design down" to its level. They are not geologists and they often do not know, and are not told by suppliers, that far superior rock could be available. In many situations a higher price would be of no consequence given the far greater costs involved in building a structure, and in repairing it if there is partial failure or early obsolescence.

One of the marketing strategies for the Bell Bay Quarries will simply involve informing the critical people – civil and structural engineers involved in design and

construction – that a superior product is available at a competitive price. The engineers in Australia, New Zealand and the USA can be targeted easily and at relatively low cost by direct-mail advertising, by advertising in professional journals for engineers, by sponsoring events at engineering conventions, and by personal contacts, with samples. The same can be done in Japan but will require the assistance of a Japanese firm of the highest quality and standing.

At present it is thought that the full force of these strategies will be needed first in the Auckland and Japanese markets, although a little early work in the Australian markets might produce some unexpected sales, and will be needed for sales to "one-off special projects" like the Third Runway (Appendix 2.1).

The most essential parts of the marketing and sales strategies are that we obtain a contract or contracts to supply 500,000 tonnes in Year 1 and another 500,000 tonnes in Year 2. With a production of 1 Mt pa the venture would be very profitable (Section 6). With still higher productions it becomes more secure and even more profitable.

As the market research proceeded it became very obvious that one of the principal first targets had to be the Japanese market, handling it in association with Austrade. The following statement is extracted from a facsimile to Austrade in Tokyo:-

> Marketing strategy in Japan is now a matter of prime interest, with three possibilities. The first is sales contracts negotiated directly with a concrete-products manufacturer which has factories on or near the coast. The second is to use a Trading House. The third is that the overall Japanese market seems destined to move to imports as the domestic quarries are worked out one by one over the next 10 years. That might mean that one or more domestic producers will seek offshore supplies, either by investments or by alliances or joint ventures. They will not have any option if they want to stay in business. They can obviously afford to look at Bell Bay and to assess it if their total R&D is AUD 782 million pa. Inspection is welcomed, and we are happy to show it to anyone... without any obligation on their part except that they pay their own travel and accommodation expenses. If a party eventuates I have no objection to representatives from more than one company. They can bring their own quarry experts and financial assessors. The financial section of the Business Plan shows that an investment of $15 million is needed for each 1 million tonnes of output. There are at least 3 quarry sites for major quarries.

It is realised that negotiations with Japanese interests have to be slow, lengthy, and very sensitive to cultural qualities and differences, but the results can be sound and secure. They can also have downstream problems, of the types that have emerged in the coal and iron ore industries, and it is essential to guard against them. Fortunately there are experienced negotiators who can assist with the Japanese problems, and there is sufficient time to absorb the delays that are part of the Japanese way (see Time Line Chart at the end of Section 4).

Because of the characteristics of Japanese negotiations every effort will be made to gain other sales, particularly with the "enemies" of the Japanese system, such as the Koreans and Taiwanese, so as to reduce the "Japanese risks" while attempting to gain from the sheer size of their markets. Every effort will be made also in the

Auckland market which seems highly suited to the early needs of the company, as does Adelaide.

STRATEGIC AUDIT (SWOT)

STRENGTHS

- Quantity of rock (very large by world standards)
- Quality of rock (first class);
- Position - Facility for expansion;
- Adjacent to excellent shipping facilities;
- Planners experienced in;
  - : Geological aspects of rock industry,
  - ; Financials,
  - : Ship transport;
- Low capital requirements by quarry/mining standards as infrastructure already exists close at hand;
  - : power,
  - : labour,
  - : transport,
  - : services (housing, education and recreation facilities);
- Latest quarry technology;
- Little overburden.

WEAKNESSES

- Small financial resources (negligible capital);
- No contract with APPM (load wharf facilities);
- Planners not experts in;
  - : quarry engineering,
  - : road/rail transport.

OPPORTUNITIES

- Export markets - N.E. & S.E. Asia;
- Domestic Markets;
  - : Sydney,
  - : Adelaide,
  - : Perth,
  - : Auckland;
- Manufacturing.

THREATS

- Competitors (not identified in the export arena);
- Costs might esculate;
- Delays (production/shipping);
- No sales contract or letter of intent. (yet)

QUITE RECENT OPPOSITION TO THE COAL AND IRON ORE EXPORT INDUSTRIES

Until the late fifties Australia had many domestic coal companies, but none went into exports. In the sixties two newcomers, Thiess and Utah, recognised the export potential, proved huge coal resources, and developed major open-pit mines (quarries) for successful exporting to global markets.

Until 1960 Australia had an iron and steel industry but no iron ore exports. Hancock and Wright showed that there were huge iron ore resources and that they could be exported even though the open-pit mines (quarries) would be 200 km from a coastline with virtually no ports and no other infrastructure.

The opportunities lay waiting, but were simply not used until insight and initiative were shown by Thiess, Utah, Hancock, Wright and others. Their drive provided profits, and also the consequential growth of innumerable Australian "high-tech" industries providing thousands of items ranging from mining machinery to electric cables, explosives, conveyor belts, and laboratory equipment, many of which in turn are now being exported.

The rock export industry is not very different from the coal and iron ore export industries, and could be of comparable size. It also has an associated domestic manufacturing industry – the Australian market for pipes, beams, railway sleepers and similar products is about $800 million p.a., and it could be increased by exports.

LNG EXPORTS: A MODEL FOR THE ROCK EXPORT INDUSTRY?

The world Liquefied Natural Gas market was born as recently as 1964 by a few innovators who have gained a huge and growing business, a large part of which is fortunately in Australia, based on the offshore Northwest Shelf. Some of the salient points about the LNG industry have been stated in a 1992 address by Bernard Wheelahan of Shell Australia Ltd. and inevitably suggest comparisons with the rock export industry:

"Many of the world's gas fields are far away from markets. Moreover, natural gas is bulky but can be liquefied by cooling.... permitting its carriage by sea in special tankers to distant markets.....

The world's first commercial international LPG project began in 1964 with shipments from Algeria to the UK, with Shell as a partner. From that... small start... LNG trade has grown steadily, and in the following 25 years average annual growth was about 20%.... Last year about 57 million tonnes of LNG was delivered around the world..... to two distinct markets: the Atlantic Basin market, and the larger Pacific market.... Japan is the world's largest LNG importer.... In addition Korea and Taiwan have entered..... and total Pacific region LNG demand could well be in the range 95-115 million tonnes a year by 2010....

LNG projects generally follow a pattern..... After exploration drilling, feasibility studies are undertaken. Marketing and financing studies lead to project definition followed by intense design and construction activity before production begins."

(The Bell Bay project is about half-way along that path, this Business Plan being in effect a Feasibility Study).

SECTION 3

COMPANY STRUCTURE, FUNDING AND CAPITAL STRUCTURE

TASMANIAN HARDROCK PTY. LTD. AND PACIFIC QUARRIES LTD.

Tasmanian Hardrock Pty. Ltd. is like other resource companies such as coal, iron ore and bauxite companies in having a resource. That resource can be valued in several ways. The simplest is by reference to the royalty charged by the Government of Tasmania which uses expert experience going back for many decades. The royalty charged by Tasmania is $1 per cubic metre, equivalent to 36.36 cents per tonne. The present value of the rock to Tasmania is $65 million, assuming a deposit of 1,000 million tonnes and a discount rate of 10% for 20 years. Tasmanian Hardrock's interest in the deposit is given the same value, $65 M.

Tasmanian Hardrock holds Exploration License 10/90, and Mining Leases can be granted and transferred to the operating company, Pacific Quarries Ltd. by the Minister for Mines.

CAPITAL FOR PACIFIC QUARRIES LTD.

Tasmanian Hardrock can capitalise the deposit to 65 million shares of $1, and will transfer them to Pacific Quarries Ltd., which will then issue 20 million of them to raise a real capital of $20 million (as required by the Financial Plan, Section 6). In effect the issue will be backed by the rock deposit.

Resource Finance Corporation, subject to conditions to be arranged, including an underwriting commitment, is invited to handle the issue of 20 million 10% cumulative preference shares convertible to ordinary shares after 5 years.

The return to preference shareholders over the 5 years will be $10 million which is an ROI of 50%.

The Financial Plan (Section 6) lists three situations termed "Best", "Expected" and "Worst". For the "Best" situation the profits will be $61 million leaving $41 million after the payment of the dividends to preference shareholders. For the "Expected" situation the excess is $23 million. In the "Worst" situation the dividend for the preference shareholders would take all the profit ($7 million) and leave $3 million to be paid from the profits of Year 6.

The profits in excess of those required for the preference dividends will be available for dividends on the ordinary shares, or can go to company reserves for use in manufacturing or ship purchase.

For the first five years the proposed division of equity will be:

Tasmanian Hardrock Pty. Ltd.	66%
Investors in preference shares	24
Board and staff (reserved for issue as incentive shares and options)	10

STRUCTURE OF PACIFIC QUARRIES LTD.

The Board for the first 5 years is expected to have four Directors nominated and elected by the ordinary shareholders and three by the preference shareholders. One will be Managing Director.

A managerial and operational staff chart is attached. Some managers will be appointed as soon as funds are available (e.g. for marketing and sales) whereas others will not be needed until different later times (see Time-Line Chart at the end of Section 4). Consultants will be used to assist in the selection and appointment of staff, marketing and sales, negotiations with potential buyers including specialists in negotiations with Japanese companies, quarry design and layout, the selection and purchase of equipment, ship charters and varied legal and financial matters.

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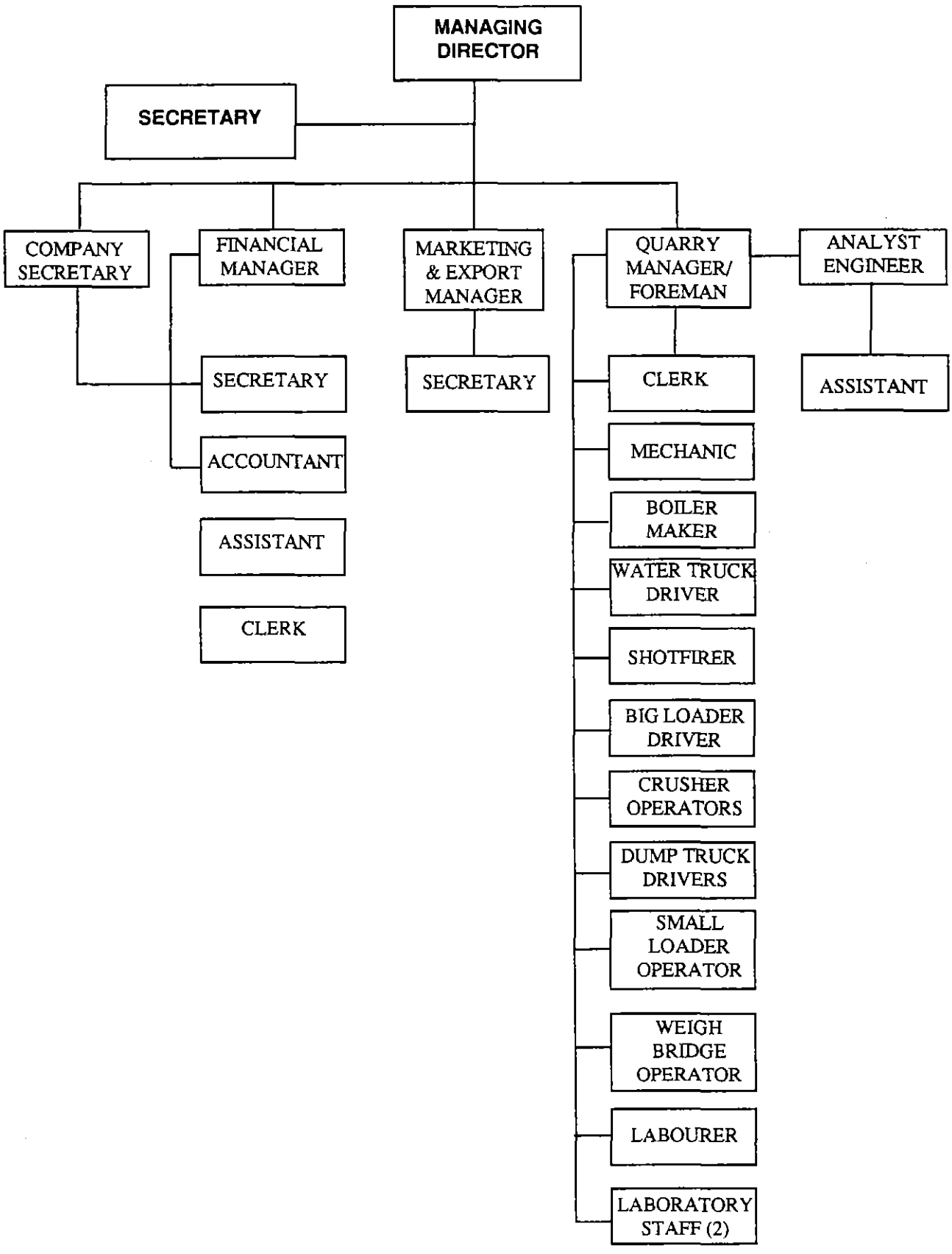
PACIFIC QUARRIES LIMITED

MANAGERIAL AND OPERATIONAL STAFF CHART

(Total 26, rising in later years, plus staff at ship-loader (4), explosives contractors and consultants)



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Section 4

THE BELL BAY ROCK DEPOSIT, QUARRY SITES AND QUARRY OPERATIONS

INTRODUCTION

In its geology Tasmania is quite different from the rest of Australia because it is a piece of Antarctica that is now attached to Australia (as a result of continental drift).

Consequently its rocks include dolerite intrusions that occur in Antarctica and Tasmania but nowhere on the Australian mainland and indeed nowhere else in the whole Pacific region. The uniqueness of Tasmania's dolerite has great commercial importance.

Dolerite is a rock that has risen in a molten state into the upper layers of the earth, solidifying with a moderately coarse crystalline structure. At Bell Bay it forms a sheet about 300 m thick rising eastwards of the harbour to form the Tippogoree Hills and Mount George.

The possible commercial significance of the dolerite was recognised by Tasmanian Hardrock Pty. Ltd., and after due process, an Exploration License over it was granted by the Minister for Mines and covers an area of 79 square kilometres (Fig. 4.1 and Appendix 4.1).

Subsequent exploration work programs, as approved by the Department of Mines, have shown that the area contains a dolerite resource of at least 1000 million tonnes. It is accessible and can be quarried and transported to wharves or other ship-loading facilities.

There is also a much smaller basalt deposit within the License Area at East Arm Road.

SIZE OF THE RESOURCE

The resource of at least 1000 million tonnes within the License Area is so large that there has been no need at this stage to spend funds and effort in calculating the full quantity available. It could possibly be over 3000 million tonnes. It is clearly sufficient to last for over 250 years at an extraction rate of 4 million tonnes per annum, or 100 years at an extraction rate of 10 Mt pa.

The resource has been defined by surface geological mapping. In the normal course of geological exploration a defined resource is converted, at the appropriate stage, into proved and indicated reserves by using detailed drilling, geophysics and other techniques. Normally some of this work is done before a quarry or mine is opened, and the remainder is done progressively during the life of the mine or quarry.

The surface mapping stage has been particularly effective at Bell Bay because the rock is exposed at the surface over large areas, and its existence can be verified easily not only by geologists and engineers but by non-specialists.

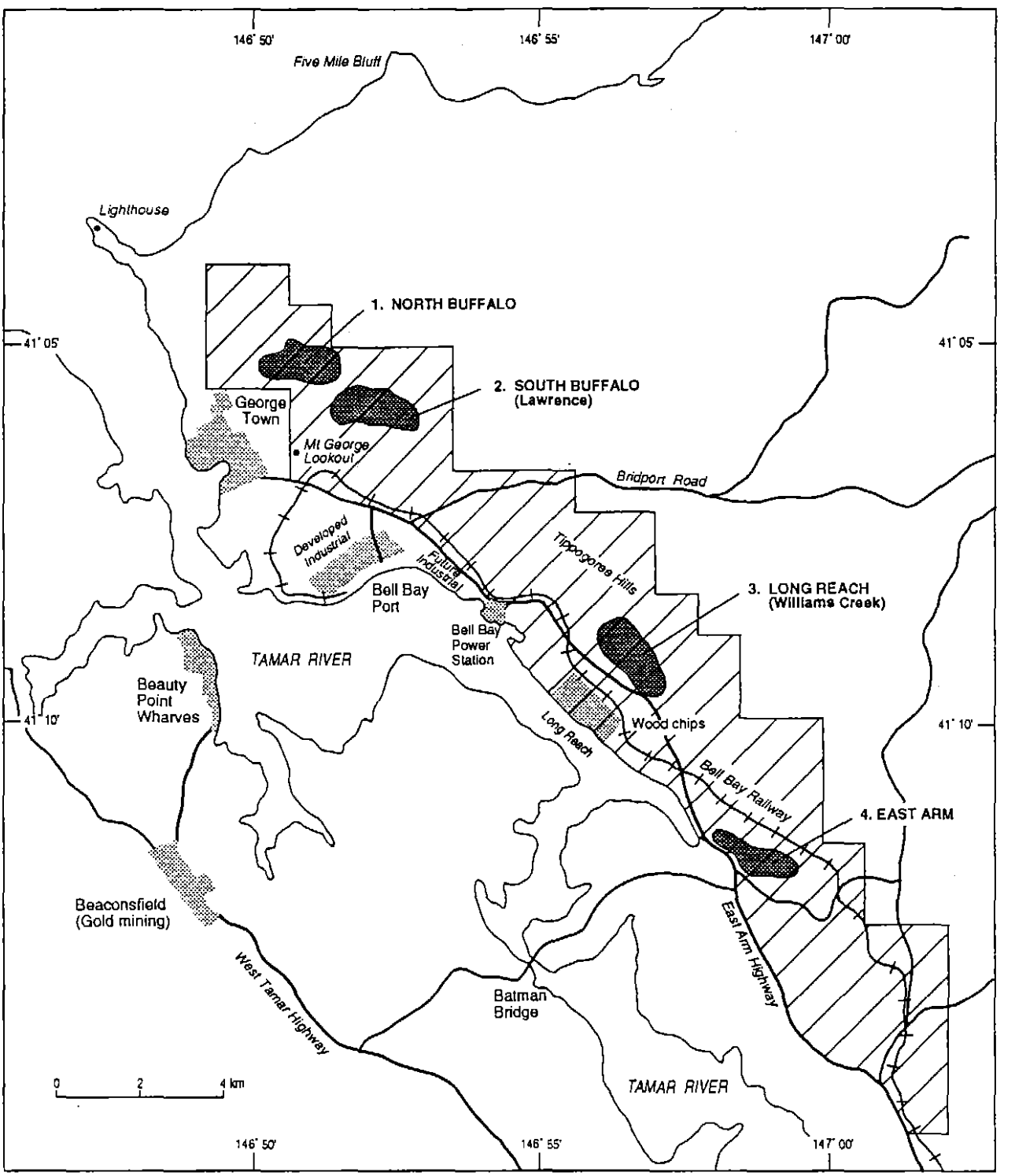

Fig 4.1 Location Map to show EL10/90 (broad cross-hatching), preferred quarry sites (dark dot screen, numbered and named), towns and industrial areas (fine dot screen), and principal roads, in relation to the Tamar River and the Port of Bell Bay

5 cm

Easy inspection is a great advantage for investors and buyers in a resource project. It puts them into a "high-comfort zone" in relation to the resource. It is also very advantageous in the lower cost of detailed drilling, reserve estimation and quality appraisal.

It must be pointed out that although Tasmanian dolerite is unique it is abundant at the surface over large areas of Tasmania. Competition with the proposed quarries at Bell Bay is therefore possible, but the Bell Bay sites should have considerable advantages and perhaps decisive advantages. This is because no other deposit with its advantages has been recognised by careful work. Most other dolerite is far inland and transport costs to a port would make it uneconomic. All the coastal occurrences of dolerite were examined but the only sites that it was considered could be worked were found at Bell Bay. Other sites are protected as reserves or parks, or would be protected, or are deeply weathered, or are too small. Hobart has a dolerite quarry that could be used for limited exports, but Hobart itself has a rock supply problem, and an even more difficult sand supply problem. New quarries for Launceston are being opened on the Lilydale Road but that product would have to be trucked over 30 km to the Port of Bell Bay and the reserves at those quarries are probably too small for long-term exports. Nevertheless competition is possible and has to be considered strategically. Possibly the markets are so large that competition would simply be a fact, just as it is in the coal and iron ore industries.

ROCK QUALITY

Fresh dolerite is nearly always of the highest quality (Appendix 4.2).

Tasmanian dolerite is of especially high quality. To avoid unintended bias the Tasmanian Department of Mines was commissioned to prepare a report (Appendix 4.3).

The qualities desired in a rock depend partly on the market, the principal markets being those for roads, railways, **in situ** concrete construction and manufactured concrete products. The specifications and tests are concentrated on particle size and shape (after crushing), wet and dry strengths, the Los Angeles Value (which is a measure of durability under traffic), soundness by the sodium sulphate test (in part a measure of resistance to frost damage), the percentage of unsound particles, polishing tests (which affect skid resistance on roads), resistance to stripping from binders (unbound particles can be thrown out, starting damage that spreads), secondary mineral content (because most secondary minerals are soft and can be deleterious, reacting with cement leading to concrete failure), and fractured faces on particles (because the round faces of stream gravels adhere less strongly to concrete or asphalt). These properties are given different weightings in each of the major markets mentioned above and the subdivisions of them. There are national Australian Standards (AS1141, 2758.1 and .2) for Bituminous Surfacing and for Concrete Aggregates, and for other uses. These are being superseded in some markets and many countries by ISO Standards (International Standards Association), but in Australia there are modifications to them. In addition there are State modifications to standards for the reason that only poor-quality aggregates are available in some regions.

Appendix 4.3 is therefore not industry-specific and is not specific to the proposed

Bell Bay sites. At a later stage it will be necessary to drill the initial quarry sites and to blast out about 6,000 tonnes of rock at each site to get test samples and to gain other kinds of information to allow matching of the rock with the best drilling and crushing equipment. That site work requires permits and will follow the preparation of this Business Plan.

The Department of Mines report (Appendix 4.3) provides a large range of test results showing that fresh dolerite is of high quality. (Weathered dolerite like any other weathered rock is of poor quality). In addition dolerite has the great advantage that it has been proved in use in Tasmania over many decades, and has a first-class record. Roads and structures of dolerite can be inspected and discussed, which is invaluable for potential buyers.

QUARRY SITES

Exploration has proceeded to the stage at which four potential quarry sites have been identified (figure 4.1). Detailed maps of each site at a scale of 1 to 10,000 have been prepared and are in an end-pocket (Plates 1 to 3).

Rock and site qualities and environmental factors were dominant in the selection process (after the initial selection of the Exploration License Area).

Representatives of the Department of Environment and Planning and of the George Town Council made it plain that the scenic values of the district had to be preserved, in part because of the importance of the tourism industry. Consequently permits to operate would not be granted for quarries visible from the Tamar River, the port, George Town or the East Tamar Highway. The selected sites comply with that ruling.

Some potential sites were eliminated because the rock was weathered or otherwise unsuitable. All except the East Arm site have desirable close jointing and fractures in the rock facilitating the cheaper production of aggregates in the size ranges below 40 mm. The East Arm site has widely spaced joints facilitating the production of large blocks of armour stone.

Site qualities that were considered included adequate room for plant and stockpiles, and suitable topography for drainage and for the easy development of benches and working faces.

North and South Buffalo Sites

These provide high-quality well-jointed and fractured rock that would be relatively cheap to extract and crush for aggregate. They would yield only a small quantity of large blocks suitable for armour stone. Both sites are at present surrounded almost completely by buffer zones separating them from the built-up areas of George Town but are close to existing roads, water and electricity. Additional short access roads can be built easily from George Town and from the Bridport Road.

The existing roads and new roads would provide easy access, skirting George Town, to the PLA wharves (Port of Launceston Authority). The existing sealed roads already carry logging trucks (30 tonnes) and high-capacity trucks serving the Temco and Comalco plants.

The sites are invisible from George Town and the Tamar River. They have no known environmental problems, being used mainly for cattle grazing and some firewood cutting. Several private owners are involved and there would have to be appropriate negotiations with them, but the owners have been friendly and co-operative, and it seems that they would welcome a royalty income. The Department of Mines has powers to settle any disputes that can not be resolved directly by a landowner and a company, such as a dispute about royalty payments. Most of the land that would be quarried is almost useless for grazing because it is so rocky and it might be possible and desirable to purchase it outright.

The two sites do have the cost disadvantage that they are further from the PLA wharves than the Long Reach (Williams Creek) site is from the APPM loading facility. The greater transport cost would be decisive for the viability of the whole project.. In addition the APPM loading facility has a ship-loading conveyor belt and trained labour for it, whereas the PLA wharves do not. It would be necessary to spend several millions of dollars in storage and loading facilities at the PLA wharves.

For those reasons the Williams Creek site is superior to the North and South Buffalo sites when all factors are considered. However, the North and South Buffalo sites would move to first place if APPM imposed unreasonable charges or unworkable conditions for the use of its loading facility.

In addition it must be noted that two of the new quarries in the North Atlantic were designed for outputs of 1 Mt pa, but had to be expanded to 7.5 Mt pa, and one is now being expanded to 15 Mt pa, all in the four years since they were opened in 1988. If the Bell Bay venture should be equally successful it will be necessary to use the Williams Creek site and the North and South Buffalo sites.

Williams Creek (Long Reach) Site

This is shown on plate 3 (end pocket).

A fence parallel to Williams Creek separates land to the west owned by Comalco from land to the east administered by the Forestry Commission. There is also some private land to the east of the fence and south of the Forestry land. Parts of a large quarry would be on both Comalco and Forestry land, with the crushing plant, stockpiles and transport system being almost entirely on Comalco land. Some quarry faces could be on Comalco land but there would be long-term limits to their development because that part of the Comalco land falling towards the west is in a Skyline Protection Zone (– a zone intended to preserve views from the Tamar River and the East Tamar Highway).

The Forestry land contains by far the best sites for long-term quarrying, but there is a possible conflicting land-use problem. In 1990 and 1991 there was a decision to preserve representative samples of each of the forest types in Tasmania in RAP's (Representative Areas for Protection). The Forestry land on the east side of Williams Creek was recommended for preservation as a sample of dry sclerophyll forest. This is possibly not an insuperable problem because Tasmania has abundant areas of such forest, and because other use of an RAP is not "automatically incompatible with this aim". If quarrying is permitted and is successful the Forestry Commission will receive considerable royalties, a portion of

Fig. 4.1 The Bell Bay wood chip wharves and the southern part of the Exploration Licence Area.

The Williams Creek Quarry site is in a major hidden valley (Williams Creek) beyond the high tension power line in the left-hand part of the photograph. The ships loading woodchips for Japan are 50,000 tonners, the size preferred for rock chips. Half of the right-hand wood chip storage area can be made available to Pacific Quarries (at a charge). A conveyor belt could be built straight from the Williams Creek Quarry to the wood chip berth.

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which could be used to purchase or reserve an area of dry sclerophyll forest elsewhere.

The principal attraction of the Williams Creek site is that it is only 2 km from the Long Reach ship-loading facilities for wood chips. There are two companies with adjoining facilities. The woodchip companies have declining supplies and are required to cease operations by the year 2000.

The more southerly loading facility is operated by APPM and discussions with that company showed that it and Tasmanian Hardrock Pty. Ltd. could hold mutually agreeable discussions. Tasmanian Hardrock commissioned Mr. Don Reed of Sinclair Knight & Partners, Consulting Engineers to visit the quarry site and the loading facility. His report indicated that use of the APPM loading facility was entirely feasible, APPM offered to fund the necessary storage facilities and auxiliary conveyor belt for ship loading for a charge based on its capital expenditure and a return on funds employed. It would be premature to have a formal signed agreement, but the situation is that pending a formal agreement, and resolution of the RAP problem, Williams Creek is the first choice for an export quarry with a production of 1 Mt pa.

The Financial Plan is based on use of the Williams Creek site.

If sales of more than 1 Mt pa are achieved it would be desirable to open a second quarry at the North and South Buffalo sites.

East Arm Road Site

This site shown in detail on Plate 3 (in end pocket) already contains a quarry from which approximately 6,000 tonnes of rock have been taken for the construction of the woodchip berths in Long Reach.

The existing quarry is in an alkali basalt, a rock type that can react chemically with Portland cement in such a way that large concrete structures can expand in volume and fail. The rock is not considered suitable for use as a concrete aggregate in major structures.

It is ideal however for the production of large massive blocks of rock for armour stone and rip rap protection works in harbours, at river mouths, and along foreshores subject to wave attack. The basalt has widely spaced joints (fractures) and so can provide large blocks whereas the Buffalo and Williams Creek sites have close-spaced joints and will not provide many large blocks.

Most of the East Arm Road site is therefore reserved for armour stone production, for which there is a large market which most quarries have difficulty in supplying for several reasons. The main reason is that in aggregate quarries it is necessary to have broken rock small enough to go through the jaws of a primary crusher. Drillhole spacing and explosive charges are designed to produce small rock with as little oversize as possible (because secondary breakage is costly and troublesome, whether it is done by explosives or hydraulic hammers). In an armour stone quarry the drillhole spacing is designed to produce large blocks.

Since the market is intermittent the quarry could be operated by the temporary transfer of drilling equipment and staff from an aggregate quarry. It would be

necessary to have a crane capable of lifting blocks of 20 to 30 tonnes for transport by low-loader to the PLA wharves where there is a 40 tonnes crane for ship-loading.

Not all of this site is underlain by basalt, but a preliminary appraisal indicates about 10 million tonnes of basalt. The remainder of the site, towards the deep gorge of Fourteen Mile Creek, is underlain by close-jointed dolerite, but it would be some years before the basalt was worked-out.

The site is owned by a local identity and major landholder, Mr. Gerald Archer, who verbally expressed keen interest in having a quarry again, having had experience of royalty payments.

QUARRY OPERATIONS

INTRODUCTION

Quarry operations are highly competitive, and tend to be standardised in a general way, with significant variations imposed by a site. A special feature at Bell Bay is that all production facilities are to be designed for export by sea. Another feature is that all sites are hills of ideal shapes for quarry layout in tiers of faces and broad working benches.

OVERBURDEN AND STRIPPING

All three quarry sites in the lease area are remarkable in having almost no overburden and very little weathered rock. That means a saving of almost all of the $1 to $2 per tonne in costs that are incurred at most quarries in the stripping of overburden, and in transporting the stripped material to a storage site near the quarry.

All three sites have a covering of dry sclerophyll forest consisting of scattered trees and shrubs rooted in fractures in the rock. Under environmental regulations the vegetation must be removed carefully, and there is a limit to the area that can be cleared at any one time. The quarry work must be followed by rehabilitation, as discussed later, under the regulatory control of the Department of Environment and Planning.

DRILLING METHODS

It is proposed that production drilling will be done with hydraulically operated percussion drills, probably making holes of a nominal 100mm diameter. The exact spacing and the drill patterns will be dependent upon terrain conditions and blasting results after full scale testing has been conducted on the site. Drill patterns are expected to be approximately 3.5m spacing x 2.4 metres burden, drilled to a depth of 16m to yield benches of nominal 15 metres height. Each hole will be drilled to a depth of about 1m below grade to provide fragmentation of rock on subsequent benches, or to provide a broken base for revegetation after the bench is no longer used for quarrying. Hole inclinations of 10 degrees and 15 degrees are most common. The yield is expected to be about 28 tonnes per metre drilled (450 tonnes per hole) and this will require two hydraulic drills to meet the proposed rate of production.

Figure 4.3

A typical quarry plant for a production of 500,000 to 1,000,000 tonnes pa, showing successive crushing and screening buildings with connecting conveyors. This quarry is in an unusually low hill.

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BLASTING METHOD

The proposed main explosive medium is standard ANFO detonated by milli second delay detonators and primers. The proposed 100mm diameter holes loaded for a length of 15m normally contain 67.8kg of explosives.

EXTRACTION METHOD

Blasted quarry rock will be loaded on to quarry dump trucks with a wheel loader of a capacity to match a crushing plant handling up to 500 tph. It is therefore proposed to use a loading machine with nominal 280kw power min (Cat CTP 988 - B, 10 t bucket, or equivalent).

Haulage from the quarry face to the crusher dump hopper could be by two 50 tonnes capacity haul trucks (773B) eventually, but initially might be by front-end loader because the quarry face will be close to the hopper.

PROCESSING PLANT

Rock will be processed to aggregates through a plant with a design capacity of 400 to 500 tph, and with the usual primary, secondary and tertiary crushing stages and scalping, feed splitting and product screens. Tables 4.1 and 4.2 provide lists of some of the major equipment items. Photographs of typical plants of half million to one million tonnes size are provided as Figures 4.3 and 4.5. A suggested plant layout is shown in Figure 4.4.

The illustrations and tables are merely indicative because plant design and equipment selection will be preceded by test drilling and rock tests.

BUILDINGS

At all sites the quarries and quarry plant will be invisible from nearly all viewpoints, but nevertheless the buildings to house plant, workshop, amenities and offices will have "colorbond" type cladding in colours selected to blend with the natural environment.

ROADS

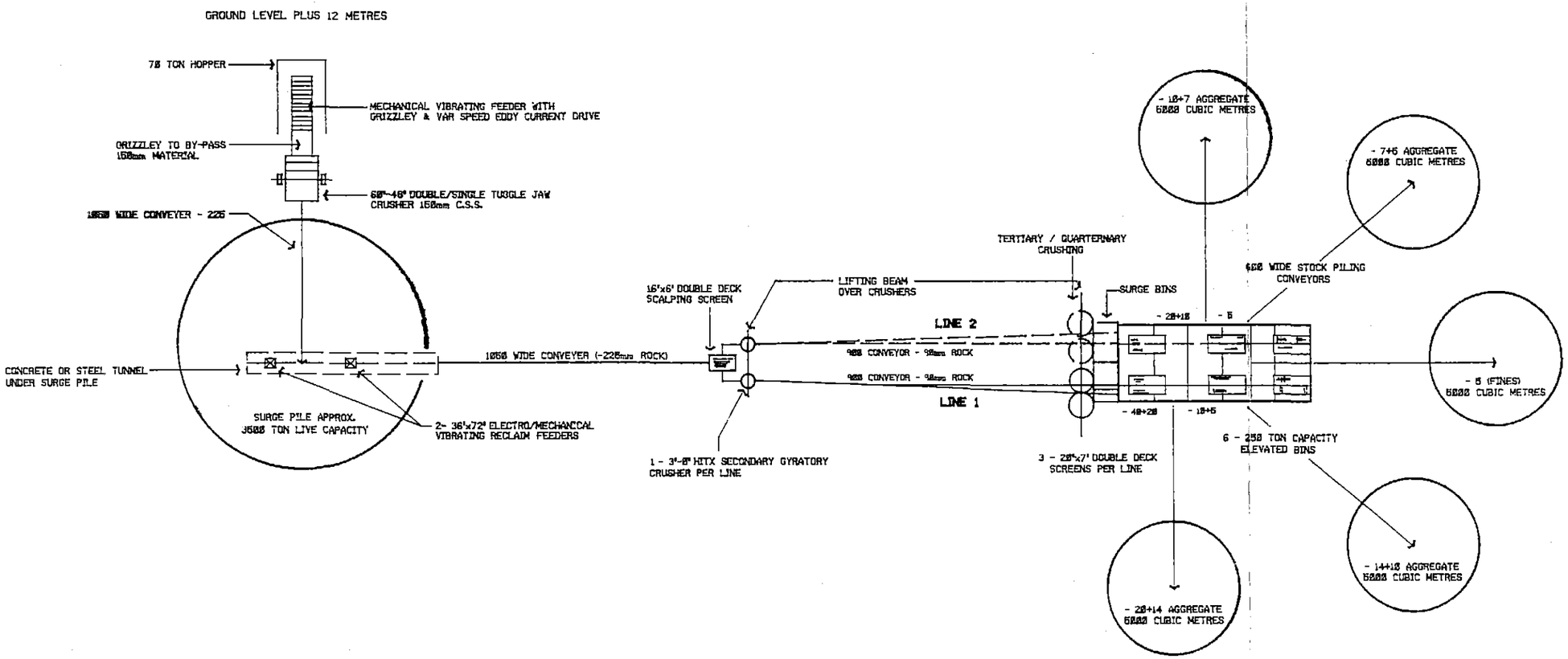
All roads will be constructed to a standard compatible with the traffic to be carried and for minimum maintenance. The main access road from the junction with East Tamar Highway through Pivot Saddle (Plate 2) to the proposed weighbridge will be of a nominal seven metres width and will be bitumen sealed. Other internal haul roads and service tracks will remain unsealed, but will be watered as required for dust control.

EMPLOYEE NUMBERS AT THE QUARRY

It is envisaged that a total of 15 people will be permanently employed at the quarry in Year 1 rising to 21 in Year 6 (Table 4.3). In addition contractors will be engaged for many kinds of specialist work. Additional staff will be needed if sales grow enough to warrant shift work. Four people will be needed at the ship loading berth, intermittently. The company will also need 10 managerial and administrative staff who are listed in Table 3.1 in Section 3).

Figure 4.4

SUGGESTED 250 TO 500 T.P.H. CRUSHING & SCREENING PLANTS
TYPICAL LAYOUT & GRADINGS



A) INITIAL PLANT DESIGN IS TO USE LINE 1 ONLY TO PROCESS APPROX. 250 TPH TO -20mm AGGREGATES.

PLANT COMPRISING		OR ALTERNATIVELY
60 x 48 JAW SURGE PILE	**PRIMARY CRUSHER**	60 x 48 JAW PRIMARY SURGE PILE
3' HITX GYRATORY	**SECONDARY CRUSHER**	3' HITX GYRATORY SECONDARY
No. 50 GYRACONE	**TERTIARY CRUSHER**	)
No. 35 GYRACONE	**QUARTERNARY CRUSHER**	)-CANICA 100
3 OFF 20 x 7 DOUBLE DECK SCREENS		3 OFF 20x7 DOUBLE DECK SCREENS

B) FOR EXPANSION TO 500 TPH IT IS PROPOSED TO DUPLICATE SEC. TERT/QUART CRUSHERS AND SCREENS AS LINE 2.

PRIMARY CRUSHER, CONVEYOR, SURGE AND RECLAIM SYSTEM, AND SCALPING SCREEN WILL BE DESIGNED TO HANDLE THE HIGHER CAPACITY.

APPROX. ANNUAL CAPACITY

9.5hrs/DAY x 5 DAYS x 50 WEEKS x 0.85 UTILISATION
= 2000hrs x 250T/hr = 500,000 TONNE/ANNUM
OR
= 2000hrs x 500T/hr = 1,000,000 TONNE/ANNUM

TABLE 4.1

Typical loading and Transport equipment suggested by Caterpillar Australia Ltd

QTY	SIZES	DESCRIPTION
1	CAT 988 B	Wheel Loader Diesel Engine 280KW - 375 HP
1	CAT 980 F	Wheel Loader Diesel Engine 220KW - 275 HP
2	CAT 773 B	Off Highway Truck (Haul truck 505) 509KW - 682 HP
2	LME-500 C	Hydraulic Crawler Drill (69 - 102mm) diameter
1	TB-425 X	Hydraulic Breakers Teledyne or Krupp
1	E-100	Weighbridge (Electronically controlled) max 100 T
1	WT-500	Water Truck (with sprayer)
*		Laboratory rock quality testing equipment
*		(Workshop) Maintenance tools and equipment

* subject to final planning.

TABLE 4.2

Typical Plant Layout and equipment suggested by JAQUES refer Plan 1 for output of 500 tph (crashing and screening).

QTY	SIZES	DESCRIPTION
1	60 x 48	Jaw Primary crusher double toggle
1	3'HITX	Gyratory secondary crusher
2	No 50	Gyracone tertiary crusher
2	Canica 100	Quaternary crusher
7	20 x 7	Double deck screens
15	Different sizes lout design	Conveyors and surge and reclaim system and sculping screen will be designed to handle 500 TPH
1	FD7	Heavy duty apron feeder
1	1,500 x 6,500	Vibrating grizzly feeder
1	JU 800	Exciter, direct driven via cardan shaft
1	RH 410	Hydrastroke feeder 700 TPH max
8	lead design	Product and loading bins
1	500 TPH	Conveyor belt from plant to wharf APPM 1.5 km long include bridge section elevated section.

TABLE 4.3

QUARRY STAFF LIST, YEARS 1 TO 6

Year 1-2	Year 3-4	Year 5-6	OPERATIONS ACTIVITIES	QUALIFICATION'S & LICENSES
1	2	2	*Drilling Operator*	Licensed Driller with experience
1	1	2	Shotfirer	Licensed Shotfirer with experience
1	1	1	Big Loader Driver	Licensed Driver with experience
1	1	1	Primary Crusher Operator	Must have min 2 years of experience
1	2	2	Secondary Crusher Operator	Must have min 2 years of experience
2	2	2	*Dump Truck drivers*	Licensed Driver with experience
1	1	1	Water Truck Drivers	Licensed Driver with experience
1	1	2	Labourer	No qualification necessary
1	1	2	Mechanic or Boilermaker	Experience in Quarry plant repairs & equipment
1	1	1	Small Loader Operator	Licensed driver with experience
1	1	1	*Weighbridge Operator*	*Clerical experience*
1	1	1	Quarry Manager	With experience in Quarry operations
1	1	1	Quality Control Manager	With laboratory experience licensed
1	1	1	Quality Control Officer	With laboratory quality control certificate
15	17	21		

INFRASTRUCTURE REQUIREMENTS

The infrastructure requirements are close at hand for all three quarry sites, being only 200m from the East Arm quarry, 500 to 600 m from the Williams Creek quarry and 2km from the Buffalo sites. The sub headings below cover the requirements at the Williams Creek site.

Electric Power

Estimated electric power requirements are:

Crushing plant complete with screening plant	850 KW/h
Conveyor belt to the wharf, 1.5km long	150 KW/h
TOTAL	1,000 KW/h

Supply will be available from the high tension line located beside the East Tamar Highway.

Telephone Services

The usual voice and facsimile services will be available at the ship loader from an existing telephone cable located at the APPM plant. Connections at the quarry can be made with the line near the East Tamar Highway.

Access from East Tamar Highway

An appropriately designed T-junction, providing safe egress from and ingress into the quarry must be constructed to Department of Roads and Transport specifications and requirements, at the company's expense. Slip lanes or passing lanes will be required at the turn into the quarry site from the East Tamar Highway.

Waste Disposal

The main type of waste generated on the site will be used lubrication oils from routine plant maintenance. The waste oil will be collected in drums for disposal by appropriate contractors. For other waste the company intends to organise collection through commercial channels for disposal on the local Council garbage tip. Sewerage disposal from toilet, shower and scrub room amenities is proposed to be dealt with through a septic tank and soak drainage system.

Water Supply

There is water available from the mains supply to George Town. The pipe line is beside the East Tamar Highway. A small storage dam for recycled water used in the washing of screened rock will be located near the quarry.

The annual demand for "new water" is estimated to be 15m,000 KL or less. The storage capacity of the proposed dam would be about 2,000 KL.

TRANSPORT FROM QUARRY TO SHIP

a) From Williams Creek Quarry Site to Ship Loader

The Williams Creek site is 1.5km in a direct line from the APPM ship loading facility on the East Arm of Tamar River, and 2km by road.

To cover this and other matters a report was obtained from Mr. Don Reed, a partner in Sinclair Knight & Partners, a major firm of consulting engineers. Before becoming a consultant he spent 15 years with Boral, TNT and Pioneer Concrete (General Management), and managed Pioneer's operations in overseas countries including Israel and Spain. In his present firm he is supported by senior staff who specialise in the extractive industries and by additional junior staff. The firm has designed many quarry plants in Australia and overseas.

He concluded that rock could be moved easily and cheaply by truck from the quarry to the ship loader until satisfactory sales contracts have been obtained, but that cost savings of 75% of more (rule of thumb) are available by adopting a conveyor belt option, direct to the shipping stockpiles.

At all tonnages the costs of trucking from the quarry to the APPM storage are estimated as $1 flag fall and 25c per tonne kilometre for a round trip of 4km, a total of $2. There is a local tradition of contract owner-drivers for logging trucks, and it is assumed therefore that we could use owner-drivers who would obtain trucks by loans, hire-purchase or lease, thus saving Pacific Quarries from the considerable capital expenditure involved in buying trucks. Some quarry companies on the mainland have stated that they have had bad experiences with the LOD (Lorry Owner Driver) system because the drivers tend to favour industrial stoppages, and those companies prefer to own trucks. Other quarries prefer the LOD system.

Mr. Reed estimated that the cost of the conveyor belt would be up to $2 M which at an interest rate of 12% equates to a cost of 96 cents per tonne at a production of 250,000 tonnes pa, reducing to 24 cents per tonne at 1 Mt pa. The operational cost is put at 30 cents per tonne at all production rates up to 1 Mt pa. The cost per tonne by conveyor is less than by trucks, and for 1 Mt pa is 54 cents, a saving of 73%. Costs in the Financial Plan (Section 6) are therefore based on the conveyor option. Trucking would probably be preferable if we obtain contracts for only 500,000 tonnes, and if the Company decided that it could go ahead at that level despite the increased transport costs.

b) Loading Ships from wharf-side bins and stock-piles

The APPM Company is in the wood chip business, exporting its product directly to Nagoya and other Japanese ports. It owns a log storage and handling area, a wood-chipping plant, and a ship-loading conveyor with jet-slinger (Figure 4.1 is a photograph of them). The conveyor was re-built in 1991. Because we had had negotiations with the company in time, the new conveyor was designed to be strong enough to take rock, at a small extra cost. The supply of wood chips to the APPM site is decreasing and the export of wood chips must end by the year 2000. The company is therefore

interested in the loading of our rock. APPM has built the shop mooring facility but ownership of it has passed to the PLA (Port of Launceston Authority).

The APPM Manager, Mr. John Hogg, worked with Mr. Don Reed of Sinclair Knight & Partners to assess the possibility of storing and loading rock, and the costs, but only to feasibility level.

Mr. Reed stated in his report that: "from the materials handing and engineering points of view the concept appears entirely feasible". Stockpile locations adjacent to the ship loading conveyor and jet-slinger were tentatively decided, and in effect would occupy the land on the north side of the conveyor. That area would be used for:

1. Aggregate stockpiles up to 50,000 tonnes in bins located over or beside a conveyor belt in a tunnel below the bins; and
2. An Armco tunnel or similar structure to contain the conveyor belt which would have a capacity of 1,000 - 1,500 tph compatible with the main ship loading conveyor; and
3. Two or three variable speed feeders from the stockpiles to the conveyor.

Preliminary costings were made for civil engineering work and design, earthworks and drainage and the costs of an Armco tunnel, the feeders and the conveyor with its structure, drivers and belting, a transfer bin, electrical and minor works. A total estimate of $1.5 M (or less) was obtained. Mr. Hogg indicated that APPM would look at supplying the capital on a "user pays" basis. The fee charged would equate to an ROF of 25% pa to be calculated after operational costs only and excluding depreciation, interest and tax. The cost per tonne is included in the Financial Plan (Section 6).

All loading is done by the APPM labour force normally at the wood chip site. There are no waterfront union people, the site has been free of stoppages and other troubles, and the ships (overseas owned) have also moved without troubles. There are normally 3 men on the actual ship loading duties, and we would need one more to supervise the conveyor system and to "push in" stockpiles. Total FOB costs are given, with harbour charges, in Section 6 (Financial Plan).

c) From the Buffalo Quarry Sites to a PLA Wharf

The Buffalo sites are at the northern end of the license area and have two access routes both of which are 9km from the Port of Launceston wharves. A conveyor belt for that distance might be economic if sufficient tonnages were to be carried. There is an easy feasible route for it, although it would have to go under two roads in tunnels. The estimated cost is not known authoritatively as yet but would be about $9 M. Truck transport would cost about $1 flag fall and 20 cents per tonne kilometre for a round trip of 18km, or a total of $4.60 per tonne. Road costs per tonne for the Buffalo sites would therefore be about $4.06 higher than at Williams Creek. Conveyor costs might be $1.50 higher. Those higher costs could be critical.

The PLA has offered much assistance including the provision of a large area

beside the most suitable wharf for storage and ship loading. The wharf is not equipped with a ship loading conveyor like that at the APPM berth. It would be necessary to build one. An engineering report on this facility has not yet been commissioned because of its cost, and because the cost is not yet justified. Therefore the cost of the loading conveyor and supporting works can only be guessed at present, and might be about $3 M.

If the Buffalo sites are brought into production it might even be feasible to truck the rock for 14.8km to the APPM shipping berth. Careful studies would be needed to determine whether that would be a cheaper or better option, following negotiations with APPM and the PLA. They would be premature at present.

d) Armour Stone from East Arm Quarry to PLA Wharf

The existing East Arm quarry is 16.6km from the PLA wharves, and they would be used for exports because several wharves are equipped with the cranes needed to load the blocks onto ships. The largest is a 40 tonnes capacity mobile crane on No. 2 Berth. It can operate with heavier loads than 40 tonnes if the boom is kept steep.

The markets for armour stone for harbour, shore and river protection works are numerous and very profitable, but are dispersed in time and place. They are not being pursued until the company has more funding, and staff. The markets can include schemes like Darling Harbour and the Third Runway in Sydney, and similar developments elsewhere. Cyclones and other major storms cause special demands for armour stone for remedial works on an emergency basis.

A resource that has proved to be ideal for armour stone is a real asset, especially as it can be dedicated to armour stone. The costs of road transport for 16.6km to the PLA wharf are not very relevant given the higher prices that can be charged for the blocks.

ENVIRONMENTAL MANAGEMENT

Regulatory Authorities and Permits

Three documents (a lease, a license and a permit) are required from the following regulatory authorities before mining or quarrying can start, and the steps to be followed in each case are set out in the three columns of Table 4.4:-

i) Division of Mines, Department of Resources and Energy;

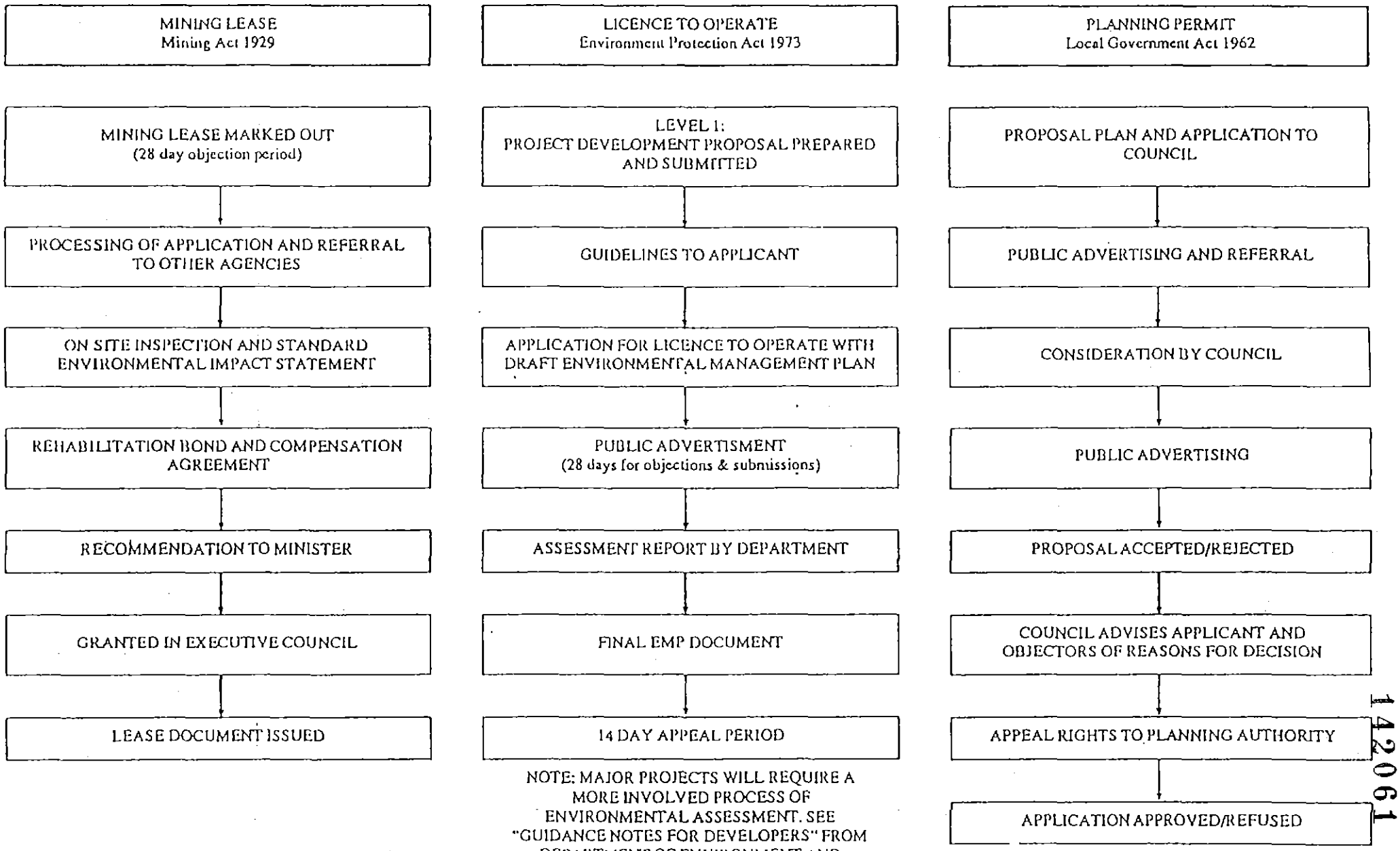
ii) Division of Environmental Management, Department of Environment and Planning; and

iii) Council of the Municipality of George Town.

The first organisation is concerned among other things with the safety of people, an important matter handled through Inspectors of Mines. The first two organisations and especially the second, are concerned among other things with what may be termed "Ecosystem" environmental matters. The third, in association with the Office of Town and Country Planning, is involved in all environmental matters, but especially with land use zoning. The Municipality of George Town extends far

TABLE 4.4

APPROVAL PROCEDURES FOR MINING TENEMENT APPLICATIONS



beyond the urban area and includes all of the EL 10/90 area except its southern edge.

In quarrying matters the Division of Mines acts as co-ordinator for the three sets of procedures in Table 4.4.

Pacific Quarries must also have Agreements with land owners, and the Division of Mines has over-riding powers to settle any disputes about royalties or other matters.

Reports for Environmental Impact Assessments (EIA)

Under the Environment Protection Act 1973 quarries producing more than 1,000 tonnes per year are classified as Scheduled Premises. These in turn are classified, as they increase in size as Level 1 Developments (smallest), Level 2 or Level 3 (largest, with expenditure over $100 M). The Bell Bay quarries could be regarded strictly as Level 2, but in practice probably as a mix of Levels 2 and 3.

A Level 2 development requires a Development Proposal (DP) followed by an Environmental Management Plan (EMP) prepared usually by consultants who follow guidelines.

A Level 3 development requires a more wide-ranging Environmental Impact Statement (EIS) prepared by qualified consultants. It may include a supplement termed a Social, Economic and Community Impact Study. An EIS is a large document, as large as a Business Plan, and its preparation, followed by its assessment in defined stages, including public comment and appeals, and resultant revisions can take 12 months, and can cost many tens of thousands of dollars. Provision for the expenses has been made in the Financial Plan.

The EIS is prepared initially for the Director of Environmental Control but in practice is used also by the Municipality concerned, and by the Division of Mines.

After the project starts there is regulatory control and Pacific Quarries will wish to keep its Environmental Management Plan up to date, and will be required to do so (see next Section).

REHABILITATION OF QUARRY SITES

Management and rehabilitation requirements are set out in a Guidelines document by the Division of Environmental Management, its Contents page is reproduced here as Table 4.5 to give a brief idea of the matters that are covered in detail.

Other 'Guides' are also available by firms specialising in the revegetation of disturbed sites using native plant species.

Table 4.5

CONTENTS PAGE OF "GUIDELINES FOR THE REHABILITATION OF QUARRIES AND EXTRACTIVE PITS" ISSUED BY THE DEPARTMENT OF ENVIRONMENT AND PLANNING.

Figure 4.5 Stockpiles at a quarry in Western Australia that produces 500,000 to 1,000,000 tonnes pa.

TIME/WORK FLOW CHART

PACIFIC QUARRIES LTD

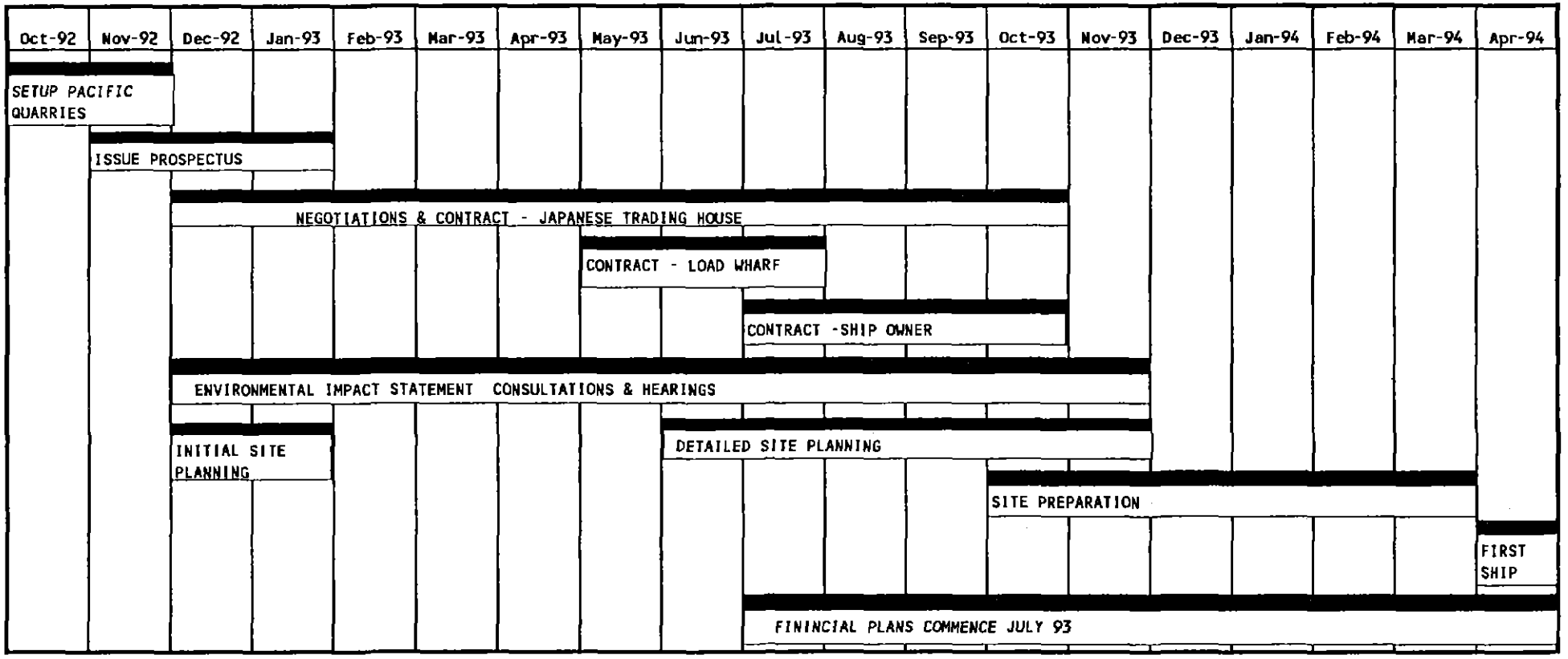


Figure 4.5

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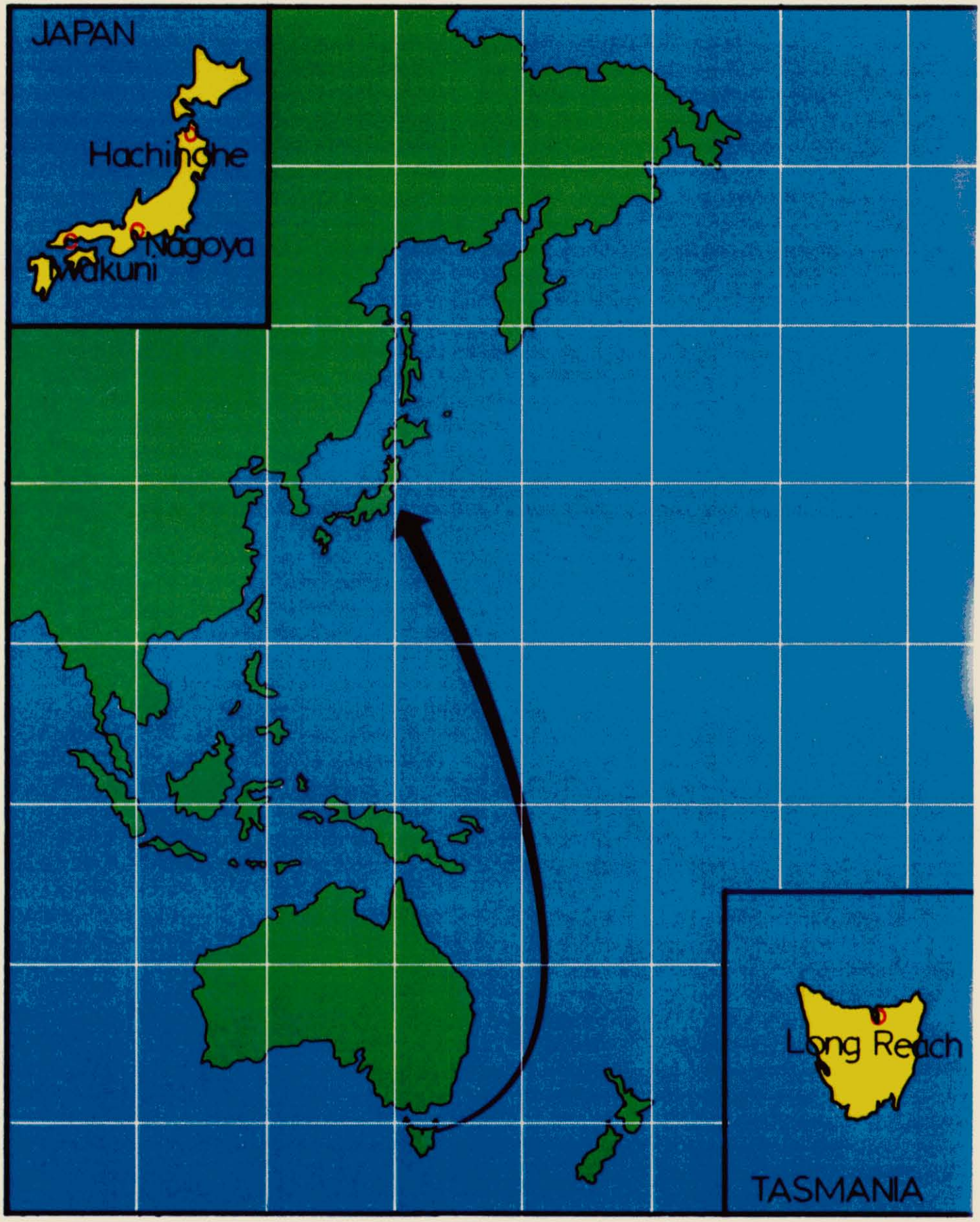

Section 5

SEA TRANSPORT

INTRODUCTION

It is likely that the Japanese will want to handle the sea transport themselves. In that case we will be selling to them on a F.O.B. basis in Bell Bay. Such an arrangement would appear to make the analysis of sea transport costs superfluous. However, Pacific Quarries requires a firm idea of freight rate levels to Japan when negotiating contracts. Secondly, Pacific Quarries must be prepared for other markets which will invariably be overseas or at least across Bass Strait to customers who may probably not wish to be involved in shipping.

The costs of sea transport are based on a large range of factors, many of which are highly variable and beyond the direct control of Pacific Quarries. As shipments are unlikely to commence before June 1994 some two years away and discharge port details have not been confirmed, prices could vary significantly in this time. As such three cost estimates are presented, a most likely, expected scenario, and two likely best and worst scenarios. Figures 5.1 to 5.3 give the breakdown of each scenario. Appendix 5 gives details of freight rates to Sydney (Botany Bay or Balmain), Adelaide and Auckland.

For comparative purposes, the scenarios are based around a time charter agreement where the voyage costs are separate from the capital and operating costs. In this way the charter rate/day can be directly compared with the prevailing international rate and it is independent on the voyage route of the vessel and hence voyage costs. The freight rate in AUD/tonne located in the bottom right hand corner is the freight rate used in the financial plan in Section 6 minus the fuel costs which have been included separately.

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MOST LIKELY SCENARIO
FIGURE 5.1

COMPANY	PACIFIC QUARRIES PTY LTD		
VOYAGE ROUTE	BELL BAY TO YOKOHAMA TO BELL BAY (PISTON RUN)		
VESSEL TYPE	PANAMAX	GEARED TYPE	CRANE
SPEED KNOTS	13.5	IFO- SEA TONNE/DAY	29.5
MDO PORT AND SEA TONNE/DAY	0.2	IFO-PORT TONNE/DAY	2
COST MDO US$/TONNE (SYD/MELB)	$170	COST IFO US$/TONNE (SYD/MELB)	$75
TYPE OF CHARTER	TIME	RATE PER DAY US$	- $11,500
CARGO	ROCK AGGREGATE	DEADWEIGHT TONNES (DWCT)	50,000
EXCHANGE RATE AUS$/US$	0.75	BROKERAGE COMMISSION&TAXES US$	$2,500

LOAD PORT DATA

NAME	BELL BAY	PILOTAGE HOURS	5
LOAD RATE TONNE/HOUR	3,000	LOAD RATE TONNE/DAY	54,000
DELAYS HOURS	6	PORT CHARGES FIX US$	$16,900
TOTAL PORT TIME DAYS	1.38	PORT CHARGES VAR US$	$52,604
EFFECTIVE HOURS WORKED/DAY	18	MARINE NAVIGATION LEVIES US$	$5,846
		AGENT'S FEES US$	$2,076

VOYAGE DATA

VOYAGE DISTANCE NAUTICAL MILES	9,750	VOYAGE TIME DAYS + 15%	34.61

DISCHARGE PORT DATA

NAME	YOKOHAMA	PILOTAGE HOURS	6
DISCH RATE TONNE/HOUR	1,000	DISCHARGE RATE TONNE/DAY	15,000
DELAYS HOURS	6	PORT CHARGES FIX US$	$14,500
TOTAL PORT TIME DAYS	3.83	PORT CHARGES VAR . US$	$45,000
EFFECTIVE HOURS WORKED/DAY	15	MISCELLANEOUS CHARGES US$	$5,063
		AGENT'S FEES US$	$7,188

SUMMARY

		RATE US$ PER DAY	FREIGHT RATE US$/TONNE	FREIGHT RATE AUS$/TONNE
TOTAL ROUND VOYAGE TIME DAYS	39.82			
LOAD PORT CHARGES US$	$77,426	$10,500	$12.87	$17.16
DISCH. PORT CHARGES US$	$66,715	$11,000	$13.27	$17.69
IFO(FUEL) VOYAGE COST US$	$77,349	- $11,500	$13.67	- $18.22
MDO (FUEL) VOYAGE COST US$	$1,354	$12,000	$14.06	$18.75
BROKERAGE COMMISSION&TAXES US$	$2,500	$12,500	$14.46	$19.28

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BEST LIKELY SCENARIO
FIGURE 5.2

COMPANY	PACIFIC QUARRIES PTY LTD		
VOYAGE ROUTE	PORT KEMBLA TO BELL BAY TO YOKOHAMA		
VESSEL TYPE	SELF DISCHARGE B.C.	GEARED TYPE	SELF DISCH CONVEYOR
SPEED KNOTS	13.5	IFO- SEA TONNE/DAY	24
MDO PORT AND SEA TONNE/DAY	0	IFO-PORT TONNE/DAY	2.5
COST MDO US$/TONNE (SYD/MELB)	$190	COST IFO US$/TONNE (SYD/MELB)	$85
TYPE OF CHARTER	TIME	RATE PER DAY US$	$12,500
CARGO	ROCK AGGREGATE	DEADWEIGHT TONNES (DWCT)	55,000
EXCHANGE RATE AUS$/US$	0.75	BROKERAGE COMMISSION&TAXES US$	$2,750

LOAD PORT DATA

NAME	BELL BAY	PILOTAGE HOURS	5
LOAD RATE TONNE/HOUR	3,000	LOAD RATE TONNE/DAY	63,000
DELAYS HOURS	6	PORT CHARGES FIX US$	$15,210
TOTAL PORT TIME DAYS	1.33	PORT CHARGES VAR US$	$52,078
EFFECTIVE HOURS WORKED/DAY	21	MARINE NAVIGATION LEVIES US$	$3,296
		AGENT'S FEES US$	$1,997

VOYAGE DATA

VOYAGE DISTANCE NAUTICAL MILES	5,334	VOYAGE TIME DAYS + 15%	18.93

DISCHARGE PORT DATA

NAME	YOKOHAMA	PILOTAGE HOURS	6
DISCH RATE TONNE/HOUR	3,000	DISCHARGE RATE TONNE/DAY	63,000
DELAYS HOURS	6	PORT CHARGES FIX US$	$14,500
TOTAL PORT TIME DAYS	1.37	PORT CHARGES VAR . US$	$49,500
EFFECTIVE HOURS WORKED/DAY	21	MISCELLANEOUS CHARGES US$	$5,569
		AGENT'S FEES US$	$2,574

SUMMARY

TOTAL ROUND VOYAGE TIME DAYS	21.64	RATE US$ PER DAY	FREIGHT RATE US$/TONNE	FREIGHT RATE AUS$/TONNE
LOAD PORT CHARGES US$	$72,581	$11,500	$7.82	$10.42
DISCH. PORT CHARGES US$	$66,601	$12,000	$8.01	$10.69
IFO(FUEL) VOYAGE COST US$	$39,197	$12,500	$8.21	$10.95
MDO (FUEL) VOYAGE COST US$	$0	$13,000	$8.41	$11.21
BROKERAGE COMMISSION&TAXES US$	$2,750	$13,500	$8.60	$11.47

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WORST LIKELY SCENARIO
FIGURE 5.3

COMPANY	PACIFIC QUARRIES PTY LTD		
VOYAGE ROUTE	BELL BAY TO *YOKOHAMA TO BELL* BAY (PISTON RUN)		
VESSEL TYPE	HANDYMAX BULK CARRIER	GEARED TYPE	CRANE
SPEED KNOTS	13.5	IFO- SEA TONNE/DAY	24
MDO PORT AND SEA TONNE/DAY	0.2	IFO-PORT TONNE/DAY	2
COST MDO US$/TONNE (SYD/MELB)	$220	COST IFO US$/TONNE (SYD/MELB)	$110
TYPE OF CHARTER	TIME	RATE PER DAY US$	$16,500
CARGO	ROCK AGGREGATE	DEADWEIGHT TONNES (DWCT)	40,000
EXCHANGE RATE *AUS$/US$*	*0.75*	*BROKERAGE COMMISSION&TAXES US$*	$2,000
LOAD PORT DATA			
NAME	BELL BAY	PILOTAGE HOURS	5
LOAD RATE TONNE/HOUR	2,000	LOAD RATE TONNE/DAY	36,000
DELAYS HOURS	6	PORT CHARGES FIX US$	$18,083
TOTAL PORT TIME DAYS	1.57	PORT CHARGES VAR US$	$45,029
EFFECTIVE HOURS WORKED /DAY	18	MARINE NAVIGATION LEVIES US$	$5,429
		AGENT'S FEES US$	$2,354
VOYAGE DATA			
VOYAGE DISTANCE NAUTICAL MILES	9,750	VOYAGE TIME DAYS + 15%	34.61
DISCHARGE PORT DATA			
NAME	YOKOHAMA	PILOTAGE HOURS	6
DISCH RATE TONNE/HOUR	1,000	DISCHARGE RATE TONNE/DAY	12,000
DELAYS HOURS	6	PORT CHARGES FIX US$	$14,500
TOTAL PORT TIME DAYS	3.83	PORT CHARGES VAR . US$	$36,000
EFFECTIVE HOURS WORKED /DAY	12	MISCELLANEOUS CHARGES US$	$4,050
		AGENT'S FEES US$	$7,188

SUMMARY

TOTAL ROUND VOYAGE TIME DAYS	40.01	RATE US$ PER DAY	FREIGHT RATE US$/TONNE	FREIGHT RATE AUS$/TONNE
LOAD PORT CHARGES US$	$70,895	$15,500	$21.13	$28.17
DISCH. PORT CHARGES US$	$57,715	$16,000	$21.63	$28.84
IFO(FUEL) VOYAGE COST US$	$92,550	$16,500	$22.13	$29.50
MDO (FUEL) VOYAGE COST US$	$1,760	$17,000	$22.63	$30.17
BROKERAGE COMMISSION&TAXES US$	$2,000	$17,500	$23.13	$30.84

THE CHARTER CONTRACT

For the initial couple of shipments a voyage contract is to be negotiated. This will give both parties the opportunity to "get to know each other" and will avoid either side being over committed if problems arise during the initial, critical, formative stage. In addition, it is unlikely that a "reputable" shipowner (which is what we would be looking to form an agreement with in the longer term) would be willing to negotiate a longer term charter contract at this stage. We would be looking for a shipowner who would have at least six similar vessels (with cranes if necessary) suitable for loading at Bell Bay.

On the completion of these voyage contracts, both parties should be in a better position to negotiate a longer term charter arrangement. The company will seek to enter a hybrid voyage/time charter agreement over a period of at least a year, which would give Pacific Quarries the benefits of both types of charter, principally;

- Pacific Quarries is assured of vessel availability over the longer term at a fixed rate; and
- would not involve Pacific Quarries in the management of the vessel (e.g. finding a back haul cargo).
- would not be involved in the operation of the vessel or the cargo in the discharge port.

The contract would essentially be;
- "Free On Board, Bell Bay to Free In Hold, Yokohama",
- payment on a USD/tonne basis,
- demurrage in the load port Pacific Quarries' responsibility,
- demurrage in the discharge port the customer's responsibility,
- the shipowner is responsible for the voyage costs, and
- the customer being responsible for the discharge costs in Yokohama.

Such a contract would reduce our risk on demurrage and payment would be on delivery of the "cargo in hold" in Yokohama.

CHARTER RATES

As stated earlier, charter rates are given on a USD/day basis for ease of comparison with current international rates. The charter rate for the most likely scenario, is based on current rates and includes a generous allowance for the charter of a geared panamax bulk carrier from a reputable shipowner. The charter rate for the best case scenario is based on the premise that rates do not move over the next 2 years. The charter rate for the worst case scenario is for the rate used in the most likely scenario to increase by 35%.

FACTORS AFFECTING THE COST OF SEA TRANSPORT

VOYAGE ROUTE

A back haul route from Japan to Australia would be most preferable. There are few bulk commodities shipped from Japan to Australia. However, BHP imports from Japan between 800,000 and 1,000,000 tonnes of limestone p.a. for its steel operations in Port Kembla. The vessels on this run usually return to Japan with coal, but there is the opportunity to negotiate an agreement with BHP to use this run as a "back haul" especially as the amounts to shift are very similar. As such, a voyage route of Port Kembla (in ballast) to Bell Bay (full cargo) to Yokohama is considered as a possible best scenario. The other two scenarios are purely piston runs as this is the most likely scenario. There are other possibilities such as a single voyage charter or hybrid charter from Singapore in ballast to Bell Bay to Yokohama.

TYPE

Dolerite in the form of aggregate is a high density bulk cargo and is most economically shipped in large bulk carriers. Bulk carriers vary slightly in type. The type most suited to our case would be the ore strengthened, modern self discharge bulk carrier with discharge rates up to 5000 tonne/hour. These vessel's high discharge rate and their independence of the discharge port facilities make them the most economical. However, these vessels are rare and it would be extremely doubtful if such a vessel could be chartered other than for an occasional single voyage. In addition there would also be a considerable premium, based on the vessel's increased capital cost and its popularity.

The next preferred type the "geared" bulk carrier. This type are fitted with cranes servicing each hatch with a discharge rate of up to 1000 tonne/hour. The last is a gearless bulk carrier used where the discharge port has its own discharge facilities and would be a cheaper vessel to charter.

SIZE

There is a draft limit of 11.6m in the river at Bell Bay which equates to a vessel of around 55,000 tonnes maximum cargo lifting capacity (DWCT). There may also be draft restrictions in Yokohama as some berths there are shallow allowing only vessels of 40,000 DWCT to berth. See discharge port details for further information. This draft restriction limits Pacific Quarries to "Handymax" (45,000 DWT) bulk carriers and "Panamax" (65,000 dwt) size bulk carriers partially loaded. This may be a viable alternative as charter rates for "Panamax" bulk carriers sometimes drift as low as the "Handymax" rates.

AVAILABILITY

At present, there is an over supply of "Panamax" bulk carriers on the international open charter market. However, only 17 of these are fitted with cranes and 14 of those are owned by one company, fortunately a reputable one. "Handymax" bulk carriers are more in demand and a much larger proportion of these are fitted with cranes. Hence one of the reasons why "Panamax" and "Handymax" charter rates are very similar at the moment. This situation is unlikely to change appreciably over the next 2 years. There are few suitable self discharge bulk carriers at the present time and it would be unlikely that one would be available for charter on the open market when we would require it as those existing have been built for specialised trades.

SPEED AND FUEL CONSUMPTION

The speed of 13.5kts used in the scenarios to determine the freight rates is a standard used by ship brokers when comparing different alternatives. Bunkers used on bulk carriers are either Marine Diesel Oil (MDO), Heavy Fuel Oil (HFO) or a mixture of both called Intermediate Fuel Oil (IFO). Fuel consumption rates used in the scenarios were based on representative figures for modern bulk carriers.

AGE, OWNERSHIP AND PORT OF REGISTRY

The company will endeavour to charter bulk carriers under 10 years of age and especially vessels under 15 years of age from reputable shipowners. Flag Of Convenience (FOC) vessels over 15 years of age will not be considered for long term chartering.

BUNKER COSTS

International bunker prices are tied very closely to the price of a barrel of crude oil. A 10% change in the price of MDO/HFO/IFO closely relates to a 10% change in the crude oil price. The price used here are based on Singapore (June 92) and relate to a crude oil price of around USD 22/barrel. Bunker prices are not expected to rise appreciably in the next 2-3 years. With the virtual Break up of the OPEC cartel in 1985, crude oil prices (with the exception during the Gulf War) have generally varied between 10 and 24 USD per barrel. The reasons why bunker prices are not expected to increase appreciably above present levels are;

- A World re-cessionary outlook over the next few years;
- While Russian production levels have been at negligible levels, prices have not risen,
- current prices are obviously at a level to warrant continued oil exploration suggesting that there are profits to be made at this price level,
- the OPEC cartel has become less important,

- the market has learnt to cope with fluctuating prices;
- the present price is near peak levels.

As such, only a 10% increase in bunker charges has been estimated for the worst scenario and a 10% decrease for the best scenario.

SUMMARY

To reflect this cross section of bulk carriers available to ship the rock aggregate the following three vessels were chosen,

Most likely scenario	Panamax partially loaded with cranes
Likely worst scenario	Handymax vessel with cranes
Likely best scenario	60,000 dwt Self Discharge vessel

LOAD PORT - BELL BAY

The port is controlled by the Port of Launceston Authority (PLA) who allows a maximum ship draft of 11.6m to enter and leave the port.

Loading Berth: No 2 A.P.P.M. woodchip berth is the preferred berth and is now owned by the PLA. The designed loading rate has been upgraded to 3000t/hr in anticipation of this project being undertaken. Depths alongside the wharf is 11.2m. There is no actual wharf but a series of dolphins and a central "FIXED" conveyor belt for loading. The draft restriction in the river is the controlling factor, with the vessels loading staged for completion at or near high water for passage to sea. Currently one woodchip carrier per month uses each berth and spends an average of 4 days at the berth. This frequency has been gradually declining from 2 carriers per month 10 years ago and it is expected to decrease further as forest suppliers dry up. This leaves approximately 25 days per month on which the berths are free. It will be preferable if negotiations with A.P.P.M. gave berth priority to this new project.

Tides: Delays could be experienced of up to 10 hours while waiting for the next high tide for departure.

Port charges: Under the anticipated charter agreement, all port charges would be paid by the shipowner's agent, on a "free on Board" at the loading port to :Free in Hold" at the discharge port (known as a "free in and out" (FIO) contract). The wharfage rate of $1.35/tonne the most significant component of the port charges. This rate is however negotiable (0.75c/tonne) where a long term project such as this is undertaken.

Cargo Loading charges: This is to be undertaken by existing A.P.P.M. staff at the woodchip terminal on cost/tonne basis.

Load Port Time: Preferably three 8 hour shifts will be worked over each 24 period to reduce port time for the ship. Unavoidable delays will include shift change over, shifting ship, 3 ship movements per shift, inclement weather,

awaiting tide and unforeseen delays. This effectively works out at 18hr/day effective cargo loading and at 3000t/hr equals 54,000 tonne/day.

DISCHARGE PORTS

Discharge port details are broad in nature and are only estimates. Under the charter contract, the customer will be responsible for the discharge of the cargo, its costs and the method and costs of land transport to the specific market. The discharge wharf facility (or an area nearby) will require a large area for stockpiling the rock aggregate after each shipment. Such could involve large capital investment by the customer if an efficient transport and distribution system is required.

There are two tracks down which discharge facilities can operate. The first is to use existing wharf facilities in each port. This has the advantage of a low initial investment but major disadvantages in terms of unsuitable discharge facilities which increases port time considerably. The second track is to invest in specialised discharge equipment which will require a high initial investment and a long term contracts but will reduce port time considerably and hence running costs. This would not be necessary if a self discharge bulk carrier is used.

Three possible discharge ports have been identified where a market opportunity exists. These are Yokohama, Botany Bay and Auckland.

YOKOHAMA

The general purpose wharves in Yokohama are owned and operated by the Japanese Trade Houses. A number of these wharves are shallow depth wharves and hence would limit the size of vessel using them. Some wharves have cranage available to discharge vessels with rates of up to 1000 tonne/hr per crane. It will be imperative then to determine exact discharge details when negotiating a contract with a Japanese Trading House before entering a ship charter agreement.

BOTANY BAY

The purpose of including Botany Bay is to supply rock aggregate for the Third Runway project. At present, there is no dry bulk discharge berth in Botany Bay and no cranage available. However, there are two container terminal berths. These berths are privately operated and an agreement would be required in addition to a clearance from the Maritime Services Board (MSB) of NSW to discharge bulk cargo at these berths. The company also has an engineering proposal under consideration to use a self discharge bulk carrier to discharge directly onto the third runway itself.

Otherwise, a "geared" bulk carrier would be required and would need to use one of the two container terminal berths or possibly a vacant area of land adjacent to these berths. The vessel could be fitted with cranes (500 to 1000 tonne/hr) or one of the new self discharge ships operating on the coast with

discharge rates up to 3000 tonne/hr. There is no problem with the depth of water at these berths.

AUCKLAND

Auckland's general bulk discharge berths have no discharge facilities. As such a "geared" bulk carrier would be required for this trade unless as stated above a long term contract warrants the construction of a specialised berth. There are no draft restrictions in the port for handymax vessels.

RISKS

INDUSTRIAL DISPUTES

The company acknowledges that the Australian waterfront has been a strike prone area for many years. However, since the mid 80's strikes in the Australian Maritime Industry have reduced considerably.
A.P.P.M. have negotiated with the Australian Transport Workers Union (ATWU)to load their ships at their Bell Bay wharf to the total exclusion of the Waterside Workers Federation (WWF). This arrangement has worked well. However, under the federal government's rationalisation of the Union movement in Australia, it is inevitable that these workers will become part of the WWF.

The other Australian Maritime Unions who will be indirectly involved in the operations of the Company are;

- The Merchant Services Guild of Australia representing the tugboat skippers and the Pilots,
- Seaman's Union of Australia representing the tugboat and pilot launch crew, and
- The Institute of Marine Engineers represented on the tugs.

The Linesman are represented by the WWF.

It will be the Company's policy to keep these unions involved in the setting up and running of the Company in so far as there is a "Need to Know" basis. At this stage we do not foresee any problems with the Unions. However we acknowledge that industrial disputes are inevitable, and we plan to have in place set procedures to handle these disputes if we are directly involved.
As a last point, and one which we think is most important in regard to industrial disputes, the area around Bell Bay is an area of high unemployment. When you consider that we will be setting up an operation that if successful will be providing jobs and wealth to the local community for at least a generation, the likelihood of industrial disputes appears to be minimal.

LOADING WHARF CONGESTION

Under the contract to ship 1 million tonnes of rock per annum, their will be on average 2 ships per month at the berth with each spending at the maximum 2 days at the wharf. At the moment one woodchip carrier uses the berth per month for a maximum port stay of 4 days. As such, no congestion is foreseen at this stage.

There is no wharf congestion at the discharge ports the company is marketing to.

FUTURE DEVELOPMENTS

SHIP PURCHASE

As stated earlier, Pacific Quarries will investigate the purchase of at least one specially designed gravity fed self discharge bulk carrier in year four of operation. Such a vessel would reduce freight rates considerably and management of the vessel could be handled by a ship management company such as ASP.

LOADING PORT IMPROVEMENTS

Before the commencement of the wood chip trade out of Bell Bay, in the early 70's, the river was deepened and widened to accommodate the long term nature of this trade. If Pacific Quarries is able to win a long term contract, say ten years, then the PLA would be willing to investigate the possibility of deepening and widening the river further to accommodate vessel's with maximum drafts of 13m. Such an investigation (called channel improvement scheme stage II) was undertaken in the early 70's at the then cost of AUD 2 million or roughly AUD 15 million at today's values. If this improvement scheme was undertaken it would allow Pacific Quarries to use specially designed vessels of around 100,000 dwct (or roughly twice the current limit) to ship the rock aggregate.

SHIP LOADER

The current ship loader at the A.P.P.M. wharf is a fixed design which means that the ship must be walked along the wharf (shift ship) each time a different hold is loaded. Each shift takes about 20 minutes and there is around 2 shifts per hold or around 3 hours per ship visit. A mobile design would remove these delays and is being investigated by Pacific Quarries.

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PORTS OF
AUCKLAND
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SECTION 6

FINANCIAL PLAN

CAPITAL INVESTMENT REQUIRED

FINANCIAL SCENARIO

KEY ASSUMPTIONS TO THE FINANCIAL PROPOSAL

SCHEDULE OF CAPITAL EXPENDITURE

FIRST YEAR OF OPERATION

SECOND YEAR OF OPERATION

GOVERNMENT GRANT

RISK FACTOR AND FALL BACK FINANCIAL STRATEGY

FINANCIAL PLAN

CAPITAL INVESTMENT REQUIRED

Pacific Quarries Limited require an initial capital of 20 Million in order to be able to set up and complete stage one and two of the quarry operations which total $11,375,000 plus a working capital of $3,825,000 which is required to cover costs during the unproductive time of the quarry, plus an initial capital reserve of 5 million dollars to cover of any contingencies.

A detailed breakdown of such requirements is given on page 6.13 as well as cash flow projections.

The $20 Million of capital invested will provide a return of 10% per year or a total of $10,000,000 over the five years. This represents a 50% return on investment.

At the end of the five years, Pacific Quarries Limited would have sufficient accumulated funds to fulfil the investor's options which are detailed in section 3 of this business plan.

FINANCIAL SCENARIO

Budget Profit & Loss, Production & Transportation estimates as well as the Cash Flow projection statements for the five years are given in Appendix 6.1 as well as in section 6.4

Such projections are based on sound financial and marketing analysis and are conservatively assessed.

They are based on Pacific Quarries Limited being able to secure two major contracts to Japan of 500,000 tonnes per annum. One contract of 500,000 tonnes in the first year of operation and one other in the second year and totalling 1 Million tonnes from the second year on.

Since shipping is the major costing factor to the operation, we have based the 3 scenarios around this.

- **BEST CASE SCENARIO**

In the Best Case scenario Pacific Quarry Limited will make use of a self discharge bulk carrier, Panamax Size, Back Haul Cargo Yokohama/Port Kembla & Bell Bay/Yokohama, with maximum capacity of 55,000 tonnes of rock. Cost of charter $10.95 P.T. Loading based on 3,000 tonnes per hour. Loading time 18 hours. Discharge same way.

Such an operation will see Pacific Quarries Limited being profitable in the first year with a Net Profit of $843,000. Cumulative profits before tax for the 5 years are $61 Millions or Net Profit after tax of $37 Millions.

- **EXPECTED CASE SCENARIO**

In this case the Company will be using a self discharge bulk carrier, Panamax type, piston run voyage. DWCT 50,000 tonnes. Cost **$16.31** per tonne. Same loading time as for Best Scenario.

Once again the Company should be able to show a profit result from second year on. The cumulative profits before tax for the five years are $42.7 Millions and Net Profit after tax of $26.0 Millions.

- **WORST CASE SCENARIO**

In this case a Handy Max Bulk Carrier will be used. DWCT 40,000 tonnes. Allowances have been made for increases in charter fees by 35% per day as well as fuel increases by 10%. Cost $27.59 and based on piston run.

Such a scenario would see our operation profitable from year two onwards. However, due to carry forward of previous year loss we would not be able to show a profit until year four of the operation.

However it must be pointed out that notwithstanding the above, the selling price on all three cases remains unaltered. Should the selling price be increased by $1/t, then the company will be making a profit of 1.2 Million in year two and a net profit after tax of $380,000. The remaining three years will be profitable at a rate of 3 Million p.a.

CASH FLOW PROJECTION FOR YEAR ENDING JUNE 19X1

PRODUCTION 500,000 TONNES P.A.

EXPECTED CASE

CASH FLOW SUMMARY [000'S]

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	Total
CASH INFLOW:													
Sales Collect.	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$1,760	$1,760	$3,520
Loan other	$200	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$200
Capital	$20,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$20,000
Interest Rcvd	$0	$65	$64	$63	$63	$59	$50	$42	$33	$27	$22	$23	$511
TOTAL INFLOW	$20,200	$65	$64	$63	$63	$59	$50	$42	$33	$27	$1,782	$1,783	$24,231
CASH OUTFLOW:													
Overhead Exp.	$72	$75	$72	$75	$72	$75	$72	$114	$112	$115	$114	$117	$1,085
Product. Exp.	$10	$10	$10	$10	$10	$10	$10	$10	$279	$1,353	$1,353	$1,353	$4,418
Capital Items	$525	$200	$250	$100	$1,120	$2,550	$2,550	$2,550	$1,530	$0	$0	$0	$11,375
TOTAL OUTFLOW	$607	$285	$332	$185	$1,202	$2,635	$2,632	$2,674	$1,921	$1,468	$1,467	$1,470	$16,878
CASH MOVEMENTS	$19,593	($220)	($268)	($122)	($1,139)	($2,576)	($2,582)	($2,632)	($1,888)	($1,441)	$315	$313	$7,353
OPENING BALANCE	$0	$19,593	$19,373	$19,105	$18,983	$17,844	$15,268	$12,686	$10,054	$8,166	$6,725	$7,040	
OVERDRAFT INT.	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
FUNDS AVAILABLE	$19,593	$19,373	$19,105	$18,983	$17,844	$15,268	$12,686	$10,054	$8,166	$6,725	$7,040	$7,353	

CASH FLOW PROJECTION FOR YEAR ENDING JUNE 19X1

PRODUCTION 500,000 TONNES P.A.

EXPECTED CASE

PROFITABILITY FORECAST [000'S]

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total
Sales(Invoiced)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$1,760	$1,760	$1,760	$5,280
Other Income	$0	$65	$64	$63	$63	$59	$50	$42	$33	$27	$22	$23	$511
Total Income	$0	$65	$64	$63	$63	$59	$50	$42	$33	$1,787	$1,782	$1,783	$5,791
Cost of goods sold	$10	$10	$10	$10	$10	$10	$10	$10	$279	$1,353	$1,353	$1,353	$4,418
Gross Profit before oh & tax	($10)	$55	$54	$53	$53	$49	$40	$32	($246)	$434	$429	$430	$1,373
Company Overhead	$72	$75	$72	$75	$72	$75	$72	$114	$112	$115	$114	$117	$1,085
Taxation	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Depreciation	$0	$0	$0	$0	$0	$0	$0	$0	$0	$84	$84	$84	$252
Profitability	($82)	($20)	($18)	($22)	($19)	($26)	($32)	($82)	($358)	$235	$231	$229	$36

CASH FLOW PROJECTION FOR YEAR ENDING 19X2

PRODUCTION 1,000,000 TONNES P.A.

EXPECTED CASE

CASH FLOW SUMMARY [000'S]

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	Total
CASH INFLOW:													
Sales Collect.	$1,760	$1,760	$1,760	$1,760	$1,760	$1,760	$1,760	$1,760	$3,520	$3,520	$3,520	$3,520	$28,160
Interest Rcvd	$24	$25	$26	$27	$28	$29	$30	$31	$29	$33	$38	$42	$362
TOTAL INFLOW	$1,784	$1,785	$1,786	$1,787	$1,788	$1,789	$1,790	$1,791	$3,549	$3,553	$3,558	$3,562	$28,522
CASH OUTFLOW:													
Overhead Exp.	$117	$118	$117	$118	$119	$120	$120	$122	$120	$122	$120	$122	$1,435
Product. Exp.	$1,353	$1,353	$1,353	$1,353	$1,353	$1,353	$1,480	$2,173	$2,173	$2,173	$2,173	$2,173	$20,463
Taxation	$3	$0	$4	$0	$0	$3	$0	$0	$4	$0	$0	$0	$14
TOTAL OUTFLOW	$1,473	$1,471	$1,474	$1,471	$1,472	$1,476	$1,600	$2,295	$2,297	$2,295	$2,293	$2,295	$21,912
CASH MOVEMENTS	$311	$314	$312	$316	$316	$313	$190	($504)	$1,252	$1,258	$1,265	$1,267	$6,610
OPENING BALANCE	$7,353	$7,664	$7,978	$8,290	$8,606	$8,922	$9,235	$9,425	$8,921	$10,173	$11,431	$12,696	
FUNDS AVAILABLE	$7,664	$7,978	$8,290	$8,606	$8,922	$9,235	$9,425	$8,921	$10,173	$11,431	$12,696	$13,963	

CASH FLOW PROJECTION FOR YEAR ENDING JUNE 19X2

PRODUCTION 1,000,000 TONNES P.A.

EXPECTED CASE

PROFITABILITY FORECAST [000'S]

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total
Sales(Invoiced)	$1,760	$1,760	$1,760	$1,760	$1,760	$1,760	$1,760	$3,520	$3,520	$3,520	$3,520	$3,520	$29,920
Other Income	$24	$25	$26	$27	$28	$29	$30	$31	$29	$33	$38	$42	$362
Total Income	$1,784	$1,785	$1,786	$1,787	$1,788	$1,789	$1,790	$3,551	$3,549	$3,553	$3,558	$3,562	$30,282
Cost of goods sold	$1,353	$1,353	$1,353	$1,353	$1,353	$1,353	$1,480	$2,173	$2,173	$2,173	$2,173	$2,173	$20,463
Gross Profit before oh & tax	$431	$432	$433	$434	$435	$436	$310	$1,378	$1,376	$1,380	$1,385	$1,389	$9,819
Company Overhead	$117	$118	$117	$118	$119	$120	$120	$122	$120	$122	$120	$122	$1,435
Taxation	$1	$1	$2	$1	$1	$1	$1	$1	$1	$2	$1	$1	$14
Depreciation	$83	$83	$83	$83	$83	$83	$83	$83	$83	$83	$83	$87	$1,000
Profitability	$230	$230	$231	$232	$232	$232	$106	$1,172	$1,172	$1,173	$1,181	$1,179	$7,370

CASH FLOW SUMMARY FOR THE FIVE YEARS

EXPECTED CASE

[000'S]	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
A. OPENING BALANCE	$0	$7,353	$13,963	$24,692	$34,627
B. RECEIPTS					
Sales Collections	$3,520	$28,160	$42,940	$44,620	$46,360
Loans other	$200	$0	$0	$0	$0
Capital Inv.	$20,000	$0	$0	$0	$0
Interest Received	$511	$362	$675	$1,077	$1,501
TOTAL RECEIPTS	$24,231	$28,522	$43,615	$45,697	$47,861
C. PAYMENTS					
Overhead Expenses	$1,085	$1,435	$1,499	$1,558	$1,609
Product. Expenses	$4,418	$20,463	$26,512	$27,576	$28,687
Capital Items	$11,375	$0	$0	$0	$0
Taxation paid	$0	$14	$2,875	$4,628	$4,320
Dividends paid	$0	$0	$2,000	$2,000	$2,000
TOTAL PAYMENTS	$16,878	$21,912	$32,886	$35,762	$36,616
D. CASH MOVEMENTS	$7,353	$6,610	$10,729	$9,935	$11,245
F. FUNDS AVAILABLE	$7,353	$13,963	$24,692	$34,627	$45,872

EXPECTED CASE

BUDGETED PROFIT & LOSS FOR THE FIVE YEARS

[000's]	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
INCOME:					
Trading Receipts	$5,280	$29,920	$43,080	$44,760	$46,512
Less					
Wages/Salaries	$336	$823	$921	$964	$1,005
Operat./Transp. Costs	$4,082	$19,640	$25,591	$26,612	$27,682
COST OF GOODS SOLD	$4,418	$20,463	$26,512	$27,576	$28,687
GROSS PROFIT	$862	$9,457	$16,568	$17,184	$17,825
OTHER INCOME:					
Interest	$511	$362	$675	$1,077	$1,501
TOTAL INCOME	$1,373	$9,819	$17,243	$18,261	$19,326
EXPENDITURE:					
Wages & Salaries	$441	$731	$761	$792	$810
Directors Fees	$125	$138	$144	$150	$156
Professional Services	$190	$190	$197	$205	$214
Financial	$1	$2	$3	$4	$5
H.P. & Leasing	$60	$62	$64	$67	$70
Insurance	$12	$13	$14	$14	$15
Occupancy	$24	$26	$27	$28	$29
Office Supplies	$6	$7	$8	$9	$9
Telephone & Postage	$18	$20	$21	$22	$24
Advert. & Promotion	$12	$13	$14	$14	$15
Travel	$64	$96	$100	$104	$108
Entertainment	$30	$31	$36	$34	$35
Other	$102	$106	$110	$115	$119
Depreciation	$252	$1,000	$1,000	$1,000	$1,000
Taxation	$0	$14	$2,875	$4,628	$4,320
TOTAL EXPENDITURE	$1,337	$2,449	$5,374	$7,186	$6,929
NET PROFIT	$36	$7,370	$11,869	$11,075	$12,397
LOSS PREVIOUS YEAR	$0	$0	$0	$0	$0
INCOME TAX PAYABLE	$14	$2,875	$4,628	$4,320	$4,834
NET PROFIT AFTER TAX	$22	$4,495	$7,241	$6,755	$7,563
DIVIDENDS PAID	$0	$2,000	$2,000	$2,000	$4,000
RETAINED EARNINGS	$22	$2,495	$5,241	$4,755	$3,563
GROSS PROFIT/SALES	16%	32%	38%	38%	38%
NET PROFIT BEFORE TAX/SALES	0.70%	25%	28%	25%	27%
NET PROFIT AFTER TAX/SALES	0.42%	15%	17%	15%	16%

OVERHEAD EXPENSES FOR THE FIVE YEARS

EXPECTED CASE

[000'S]	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
WAGES/SALARIES	$441	$731	$761	$792	$810
DIRECTORS FEES	$125	$138	$144	$150	$156
PROFESSIONAL FEES	$190	$190	$197	$205	$214
FINANCIAL	$1	$2	$3	$4	$5
H.P. & LEASING	$60	$62	$64	$67	$70
INSURANCE	$12	$13	$14	$14	$15
OCCUPANCY	$24	$26	$27	$28	$29
OFFICE SUPPLIES	$6	$7	$8	$9	$9
TELEPHONE & POSTAGE	$18	$20	$21	$22	$24
ADVERT. & PROMOTION	$12	$13	$14	$14	$15
TRAVEL	$64	$96	$100	$104	$108
ENTERTAINMENT	$30	$31	$36	$34	$35
OTHERS	$102	$106	$110	$115	$119
TOTAL OVERHEAD EXP.	$1,085	$1,435	$1,499	$1,558	$1,609

BALANCE SHEET FOR THE FIVE YEARS

EXPECTED CASE

[000'S]	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
CURRENT ASSETS					
Cash	$7,353	$12,774	$20,534	$25,743	$32,567
Trade Debtors	$1,760	$3,520	$3,660	$3,800	$3,952
W.I.P.	$1,175	$2,350	$2,444	$2,542	$2,643
Total Current Assets	$10,288	$18,644	$26,638	$32,085	$39,162
FIXED ASSETS					
Land & Buildings	$335	$335	$335	$335	$335
Plant & Machinery	$9,865	$9,865	$9,865	$9,865	$9,865
Less Depreciation	$252	$1,252	$2,252	$3,252	$4,252
Total Fixed Assets	$9,948	$8,948	$7,948	$6,948	$5,948
TOTAL ASSETS	$20,236	$27,592	$34,586	$39,033	$45,110
CURRENT LIABILITIES					
Provision for Tax	$14	$2,875	$4,628	$4,320	$4,834
Provision for Loans	$0	$0	$0	$0	$200
Provision for dividends	$0	$2,000	$2,000	$2,000	$4,000
Total Curr.Liabilities	$14	$2,875	$4,628	$4,320	$5,034
NON CURRENT LIABILITIES					
Directors Loans (5 years	$200	$200	$200	$200	$0
SHAREHOLDERS FUND					
Paid-in Capital	$20,000	$20,000	$20,000	$20,000	$20,000
Retained Earnings	$0	$22	$2,517	$7,758	$12,513
Profit & Loss	$22	$2,495	$5,241	$4,755	$3,563
Total Sharehold. Fund	$20,022	$22,517	$27,758	$32,513	$36,076
TOTAL LIABILITIES	$20,236	$25,592	$32,586	$37,033	$41,110
WORKING CAPITAL RATIO	735%	382%	402%	507%	433%
CURRENT RATIO	650%	334%	365%	467%	404%
EQUITY RATIO	10%	81%	80%	83%	80%

KEY ASSUMPTIONS IN THE FINANCIAL PLAN

a) All revenue and expenditure have been indexed in line with forecast inflation rate of 4%. No increase due on first or second year as these are cost based contracts.
b) No sales made during first nine months (July/March) of operation due to stage one and two of the initial site development.
c) Cost to install a conveyor belt from quarry site to Port: $2.0 Million.
d) Cost of site development : $1.0 Million (includes drilling).
e) Purchase and erection of quarry plants to include crushing and screening: $7.2 Million.
f) Environmental impact statement, plus planning and testing: $850,000.
g) Allowance for working capital: $3,825,000.
h) Wages and salaries (first year): $777,000.
i) Shipping Charters: normal monthly run first year and twice monthly second year on.
j) Special Charters: for supplementary runs to complete contracts.
k) Cost to prepare a prospectus $100,000.
l) Local Government grants on export.
m) Royalty payments.
n) Foreign exchange rate. Transactions expressed in foreign currencies are converted into AUD at exchange rates ruling at the date of the transaction. For this Financial Plan, the exchange rate used is 0.75 to USD.
o) Payment received from debtors based on a Documentary Letter of Credit and goods payable on receipt of the Bill of Lading, via their Bank through to our Bank.

SCHEDULE OF CAPITAL EXPENDITURE

A. TIME FRAME AND INITIAL COST

Pacific Quarries Limited proposes to establish the quarry over two planning stages :

STAGE 1 Pre-Operation
Lead Time 3-9 months

a. Cost of Preparing a Prospectus		$ 100,000
b. Environmental Impact Statement		$ 100,000
c. Site and Preparation Period (approval of plans)		
- Site & Drilling Testing	$100,000	
- Engineering Planning	$250,000	
- Sales Inspections at Bell Bay	$100,000	
- Rehabilitation Expenses	$200,000	
		$ 650,000
Total Cost Stage 1		$ 850,000

STAGE 2 - Site Development Planning, Construction of Conveyor Belt, Purchase and Erection of Quarry Plants, Buildings and other Amenities.

As per following details :

B. CONVEYOR BELT

Requirement would be for approx. 1.5 to 2 kms of conveyor belt with infrastructure to include:

Loading Bins, Bridge Section, Elevated Section at the stock pile	$2,000,000

C. **SITE DEVELOPMENT PLANNING**

Site development to include:

- Ship lane to main road
- Access road to quarry site
- Drainage/Dam construction
- De-forestation
- Earth works/hard stand for
- Plant & stock pile area
- Stripping of quarry area
- Fencing
- Quarry Development Planning
- Geological study $1,000,000

D. **PURCHASE AND ERECTION OF QUARRY PLANTS**

(TO INCLUDE CRUSHING & SCREENING)

Costed as follows:

- Drilling	$ 300,000	
- Front Loader	$ 600,000	
- 2 Dump Trucks (50 tonnes)	$1,400,000	
- Primary Crusher	$ 400,000	
- Scalper	$ 50,000	
- Conveyor System	$ 250,000	
- Secondary Crusher	$ 600,000	
- Screens	$ 250,000	
- Sales Loader	$ 400,000	
- Weighbridge	$ 130,000	
- Other electrical & plant installations	$2,000,000	
		$6,380,000

Plus

- Office	$ 40,000	
- Laboratory/Equipment	$ 200,000	
- Workshops/Tools etc. (60'x40')	$ 60,000	
- Amenities Block	$ 35,000	
- Reserves	$ 485,000	
		$ 820,000

Total Cost Stage 2 $11,050,000

E. **WORKING CAPITAL**
(first twelve months) $3,825,000

F. **RESERVES** $ 325,000

TOTAL CAPITAL EXPENDITURE ***$15,200,000***

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G. **CAPITAL RESERVES** $ 5,000,000

GRAND TOTAL **$20,200,000**

FIRST YEAR OF OPERATION
Production 500,000 Tonnes p.a.

A. **PRODUCTION EXPENSES**

Wages /Salaries
(full year) $ 771,000

Transportation Costs
(full year)

- Loading charges at Bell Bay - $2.75 p.t.	$ 1,375,000	
- Ship Charters (piston run) $16.31 p.t.	$ 8,155,000	
Fuel Costs - $1.91 p.t.	$ 955,000	
Insurance - $0.50 p.t.	$ 250,000	
		$10,735,000

Operating Costs (full year)

- Electricity - $0.45 p.t.	$ 225,000	
- Explosive - $0.35 p.t.	$ 175,000	
- Fuel - $0.40 p.t.	$ 200,000	
- Maintenance to all plants & equipment - $1.90 p.t. (not required in year one)	$ 950,000	
- Other (tax, Gvt. fees & Royalties) - $1.00 p.t. *(from production day on)*	$ 600,000	
		$2,150,000
TOTAL PRODUCTION COST		$13,656,000

PRODUCTION COST PER TONNE ON PRODUCTION OF 500,000 TONNES **P.A. = $27.31.**

B. **OVERHEAD EXPENSES** (full year)

Wages/Salaries	$ 703,000
Directors Fees	$ 125,000
Professional Services (Acct./Legal)	$ 190,000
Financial	$ 1,000
H.P. & Leasing (motor vehicles only)	$ 60,000
Insurance	$ 12,000
Occupancy	$ 24,000
Office Supplies	$ 6,000
Phone & Postage	$ 18,000
Advertising & Promotion	$ 12,000
Travel & Transfer	$ 64,000
Entertainment	$ 30,000
Other (to include 3 negotiating teams)	$ 102,000
TOTAL OVERHEAD EXPENSES	$1,347,000

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2ND YEAR OF OPERATION

Production 1 Million Tonnes p.a.

A. **PRODUCTION EXPENSES**

Wages/Salaries

(15 Workers)	$ 903,000

Transportation Costs

- Port Charges			
Loading Bell Bay	$ 2.35 p.t.	$ 2,350,000	
- Ship Charters			
(piston run)	$16.31 p.t.	$16,310,000	
- Fuel Cost	$ 1.91 p.t.	$ 1,910,000	
- Insurance	$ 0.50 p.t.	$ 500,000	
			$21,070,000

Operating Costs

- Electricity	$ 0.45 p.t.	$ 450,000	
- Explosives	$ 0.35 p.t.	$ 350,000	
- Fuel	$ 0.40 p.t.	$ 400,000	
- Maint. to all Plants & Equip.	$ 1.90 p.t.	$ 1,900,000	
- Other (Tax, Gvt. Fees & Royalties)	$ 1.0 p.t.	$ 1,000,000	
			$4,100,000
TOTAL PRODUCTION EXPENSES			$26,073,000

PRODUCTION COST PER TONNE ON PRODUCTION OF 1 MILLION TONNES **P.A. = 26.07 P.T.**

B. **OVERHEAD EXPENSES**

Wages & Salaries (4%)	$ 731,000
Directors Fees (4%)	$ 138,000
Professional Services (Acct. & Legal)	$ 190,000
Financial	$ 2,000
H.P. & Leasing (motor vehicles only)	$ 62,000
Insurances	$ 13,000
Occupancy	$ 26,000
Office Supplies	$ 7,000
Phone & Postage	$ 20,000
Advertising & Promotion	$ 13,000
Travel & Transfer	$ 96,000
Entertainment	$ 31,000
Other	$ 106,000
TOTAL OVERHEAD EXPENSES	$1,435,000

GOVERNMENT GRANTS

It is envisaged that Pacific Quarries Limited will apply for and receive Government Export Market Development Grant Funding of $200,000 per year for the prescribed years.

Additionally, the Tasmanian Government Payroll Tax Relief scheme will be sought for relief in payroll tax for companies with wages bills of $1.25 Million or more.

There are other benefits available such as the Concessional Tax Relief via the 150% reduction on the eligible R & D and Travel Expenditure.

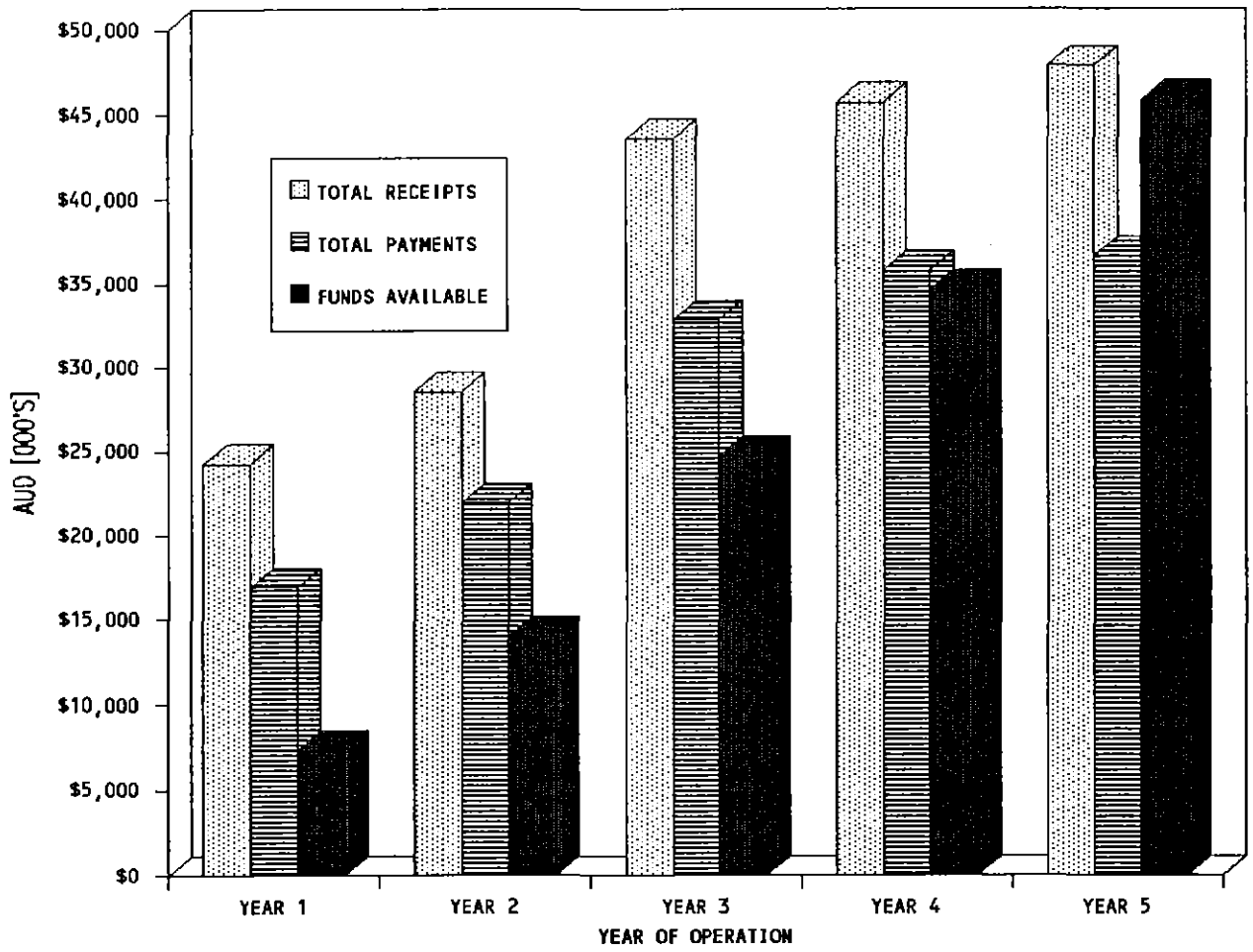
These benefits although applicable to this Company, have not been included in this financial plan as they are usually paid in later years.

RISK FACTOR AND FALL BACK FINANCIAL STRATEGY

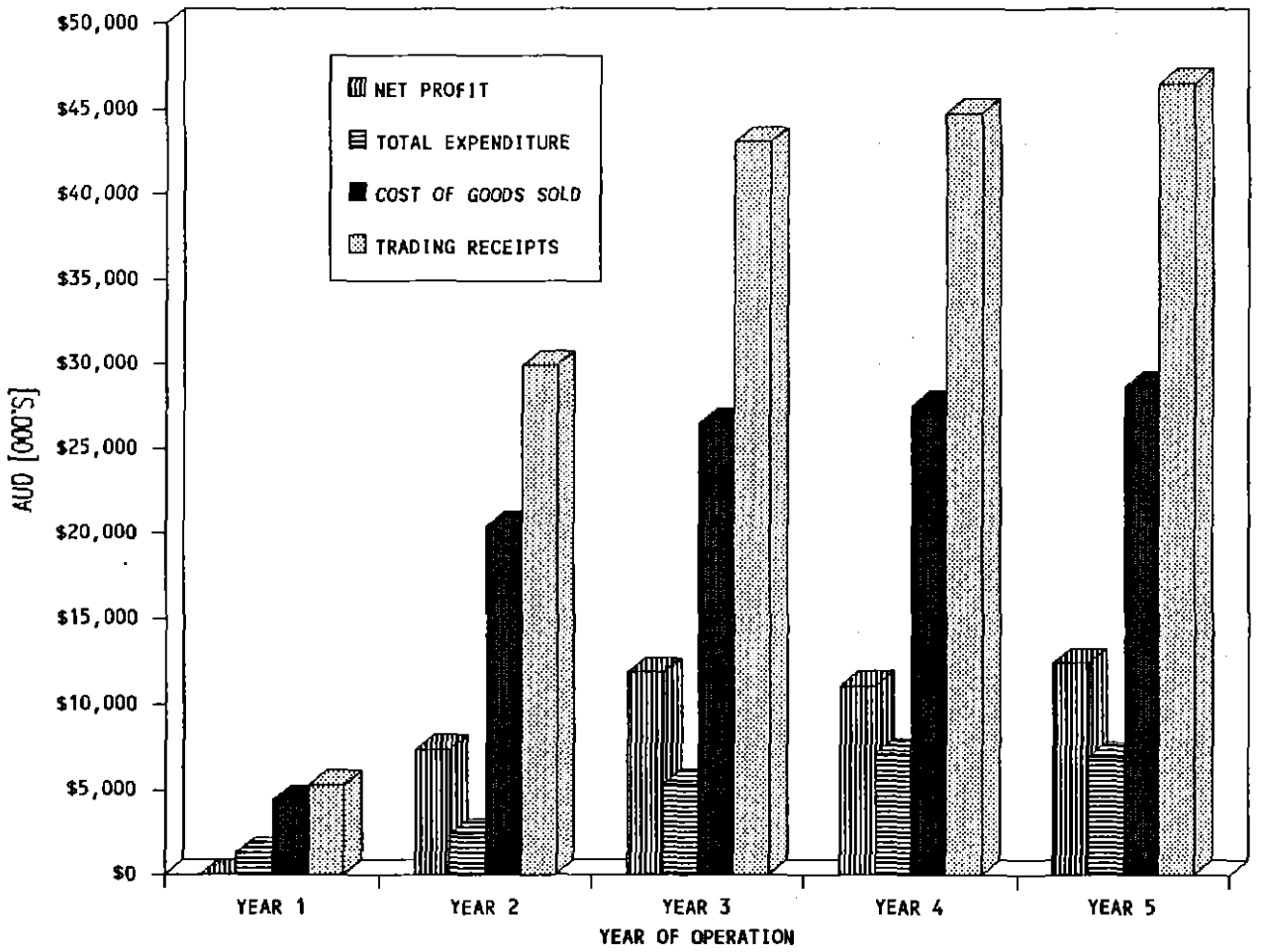
Provision for $5 Million reserve has been alocated to cover for any contingencies which could result from our shipment to Japan as well as to cover for any delayed payments.

However, it must be pointed out that on our contracts with Japan, we intend to stipulate the deal on a documentary letter of credit and relevant payment against receipt of Bill of Lading by the buyer's bank.

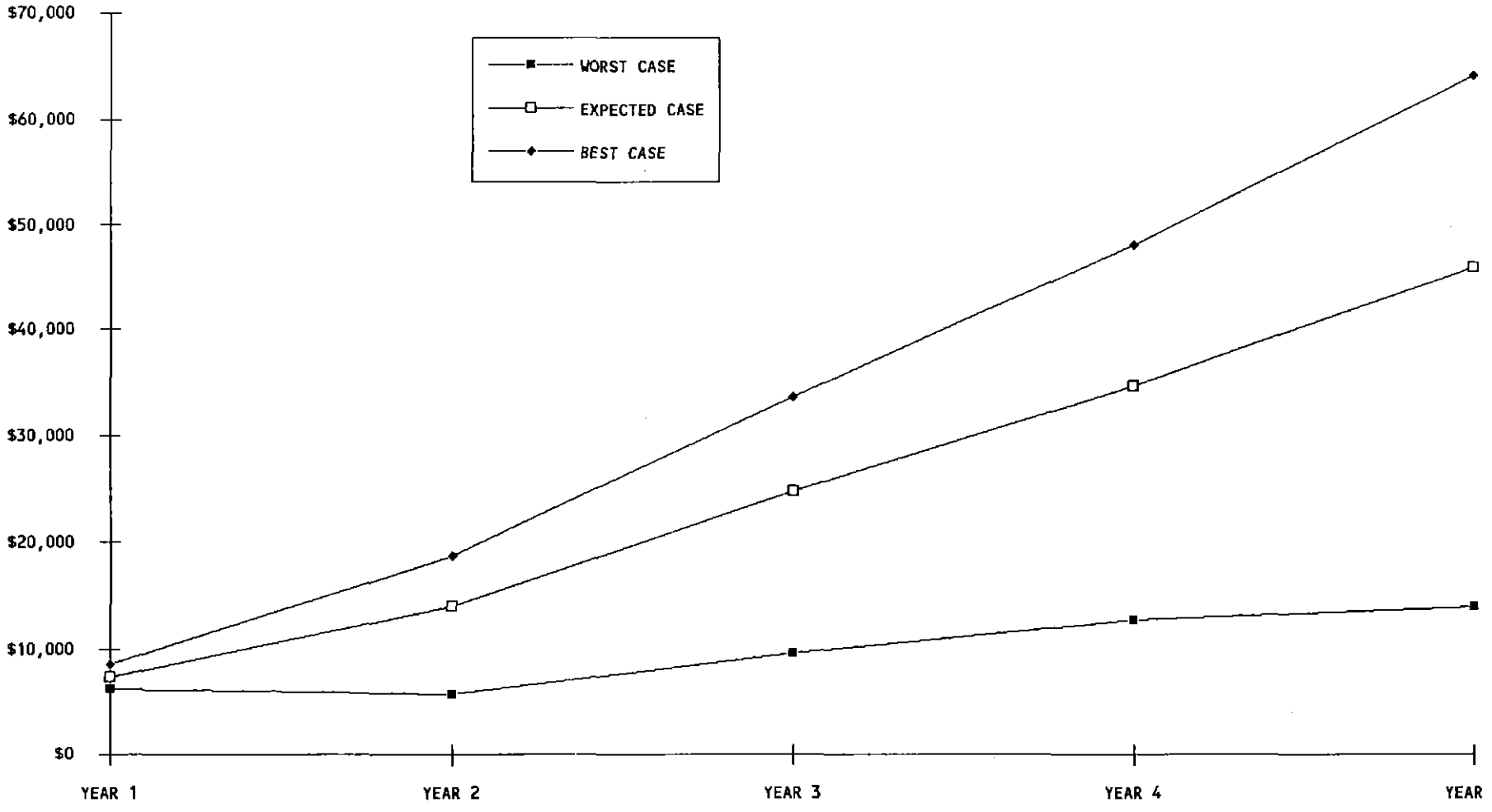
EXPECTED CASE - CASH FLOW SUMMARY



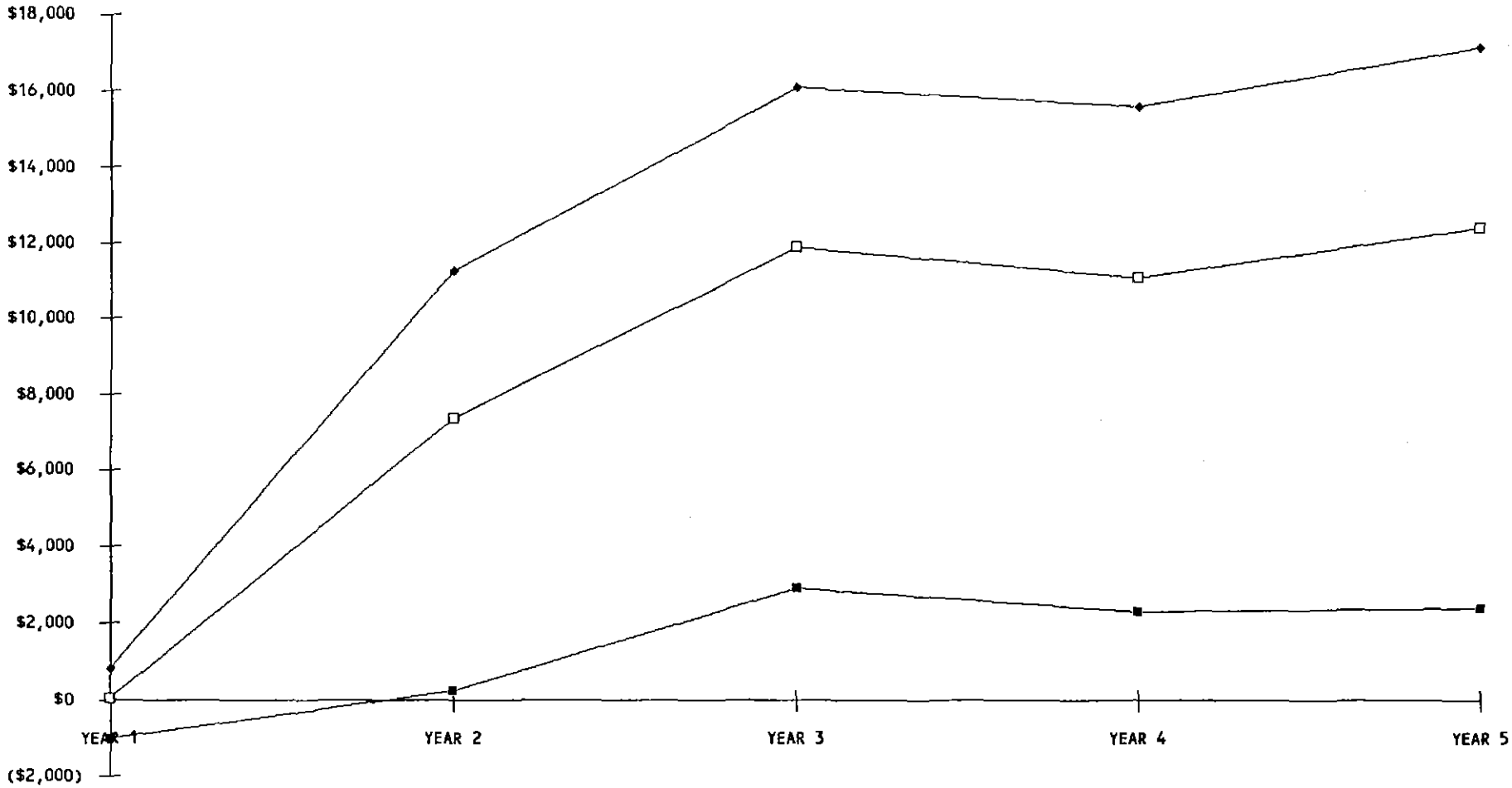
EXPECTED CASE SCENARIO - BUDGETED PROFIT & LOSS



FUNDS AVAILABLE



NET PROFIT



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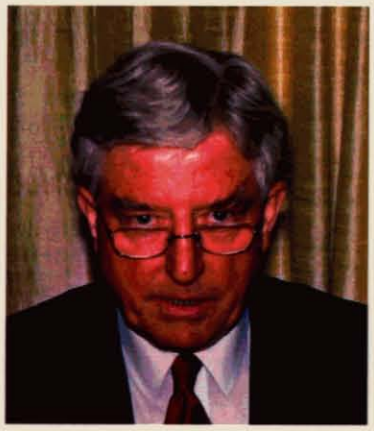
APPENDICES 1.1 TO 1.4

CURRICULA VITAE



142102

H.J. LARRY HARRINGTON

CHAIR, PACIFIC QUARRIES

Address: GPO Box 1412
Canberra, ACT, 2601

Voice and Fax Phone: (06) 248 0323
E-mail: mjr 653 @ CSC gpo.anu.edu.au

Qualifications:

M.Sc., D.Phil. (Oxon)
Fellow, Australian Institute of Geoscientists
Fellow, Australian Institute of Energy
Fellow, Geological Society of America

Career:

Leader, Oxford University Expedition (Spitsbergen) 1953; Leader, Oxford University Expedition to the Himalayas in West Nepal, 1954.

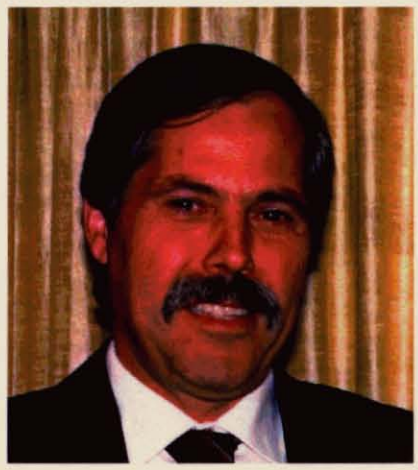
Two years, National Service (Artillery); four secondments as Guest Scientific Officer with U.S. Navy, U.S. Air Force and U.S. National Science Foundation.

Chief Scientist of one Antarctic Expedition and Leader of three other Antarctic Expeditions.

Twenty-five years at the University of New England as Associate Professor of Geology. During that time founded the Faculty of Natural Resources; spent a year as Visiting Professor, Graduate School, The University of Illinois (near Chicago); one year full-time as Visiting Principal Research Scientist, CSIRO Division of Mineral Physics, followed by eight years part-time; one year as Visiting Research Professor, University of Wisconsin, Madison; was a consultant for Pioneer Concrete, and on consultant panels for BHP, MIM (Carpentaria Exploration) and Mineral Deposits Ltd; jointly opened MIM's Kalgoorlie Office (Carpentaria Exploration); did extensive geological work in the Bowen Basin, Hunter Valley and Gunnedah Basin coalfields in their development stages. From 1975 to 1979 was joint leader of a project for the gravity mapping of Indonesia at the initiative of AIDAB (Australian International Development Assistance Bureau, now DFAT). In 1980 took up position as Principal Research Scientist, Bureau of Mineral Resources, and Project Leader of a joint study of Australian coals and coalfields by Coal Companies, CSIRO, BMR and State Agencies. Have worked for shorter periods at Los Alamos National Laboratory (USA), and on mining projects in southern Africa, India and several countries in South America.

Currently Visiting Fellow, Australian National University. Director of Tasmanian Hardrock Pty. Ltd., and working on the Pacific Quarries project, essentially full-time.

142103



VINCENZO CIANO

DIRECTOR and FINANCE MANAGER
PACIFIC QUARRIES PTY LTD

Address: 6 Rountree Crescent Isaacs ACT 2607.
Age: 47 years.
Date Birth: 29th November 1944.
Nationality: Australian.

Qualifications:

Italian Diploma of Agriculture.

Matriculation Certificate from Sydney University.

Career:

Employed by Bank of New South Wales on 25th March 1969 in Travel Department.

Positions Held

March 69 - November 76	Travel Department - Sydney.
November 76 - July 79	Assistant Travel Manager - Newcastle.
July 79 - May 80	Travel Promotion Officer - Sydney.
May 80 - October 80	Customer Service Representative -NSW/ACT Travel Region - Sydney.
October 80 - September 86	Travel Manager - Blacktown.
September 86 - April 87	Accounts Supervisor - Travel Manager - NSW Office - Sydney.
April 87 - November 88	Travel Manager - Macquarie Centre - North Ryde.
November 88 - June 90	Manager Travel Papua New Guinea - Westpac Bank (PNG) Ltd.
June 90 - February 91	Manager Travel - A.C.T.
February 91 to present	Bank Manager - Erindale Branch - A.C.T.
Interests:	Fishing, Soccer, Gardening.

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Laurence John Mayer

DIRECTOR and SHIPPING MANAGER
PACIFIC QUARRIES LTD

Address:	9 Tanumbirini St., Hawker ACT 2614
Age:	36 years.
Date Birth:	17th January 1956.
Nationality:	Australian.

Qualifications:

Bachelor of Engineering Honours (Naval Architecture) 1985.

Certificate of Competency - Master Class 1 (Limited to sail as a Chief Mate) 1979.

Higher School Certificate 1973

Career:

Sept 88 to Recently;	Senior Naval Architect, Australian Maritime Safety Authority (AMSA) in Canberra.
1982-1988;	Naval Architect, Department of Defence, in Canberra and Garden Is., Sydney.
1980-1981;	Ampol Petroleum Ltd. 2nd/3rd Officer, tankers.
1977-1980;	Bank Line (London) Ltd. 3rd Officer, General Cargo Vessels.
1974-1977	The Australian National Line. Container, Bulk and Ro/Ro Vessels. Cadet Deck Officer.

Educational Background:

The University of New South Wales 1981 to 1984.

Sydney Tech. College June 79 to Dec.79

Cadetship with the Australian National Line 1974-1977

Canberra High School 1968 to 1973 (HSC)

Interests: Sailing and Windsurfing.
Surfing, Skin Diving, and Canyoning.
Model Boat Making and Personal Computing.

142105

Samuel Kerekes

DIRECTOR and QUARRY MANAGER
PACIFIC QUARRIES LTD

Address:	2/11 Wirilda St. Rivett Canberra ACT 2609
Age:	36 years
Date of Birth:	8th October 1956
Nationality:	Hungarian
Citizenship:	Australian

Qualifications:

Certificate of registration and Licence No. 27922
Class: DR G M R S W D from 2214188 Registration
Board of Victoria, Melbourne - Plumbers, Gas-fitters & Drainers.

Master Trade Certificate: Gas-fitting & Plumbing -
Munich, West Germany (1982 - 1983).

Apprentice Trade Certificate Plumbing, Gas-fitting,
Sanitation & Heating Trades (1972 - 1976) Munich,
West Germany.

Education:

Primary 1963 to 1969 Pacevo, Yugoslavia

Secondary, 1969 to 1972 Munich, West Germany

Career:

Mar. 1991 to Present;

The Natural Gas Company, Fyshwick ACT - Service Technician (Gas-fitter) Grade 5 - Operations , Customer Service.

Sept. 1989 to Mar. 1991;

Gas & Fuel Corporation of Victoria, Contract for small itinerant works - self employed.

Jan. 1989 to Sept. 1989;

Tait Mechanical & Air-conditioning Service
Adelaide Street, Dandenong, Victoria.

May. 1988 to Jan. 1989:

Tamp-Air Heating & Air-conditioning
Melbourne Phone: 579 3633

1985 to 1988:

Samuel Kerekes Plumbing Services
Munich, West Germany - Self employed

1983 to 1984:

John - Valiant GMBH & Co
Munich, West Germany

1978 to 1982:

Weber & Sauter GMBH Sanitation Systems
Munich, West Germany

1976 to 1977:

Franz Weber KG Plumber & Gas-fitter
Munich, West Germany

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APPENDIX 2

PACIFIC QUARRIES LTD

MARKETS AND SALES

Head Office

Federal Airports Corporation

2 Lord Street
Locked Bag No 28 Botany NSW 2019 Australia
Telephone: (02) 316 2777 Facsimile: (02) 316 5606

18th August, 1992.

Mr. H.J. Harrington,
Managing Director,
Tasmanian Hardrock Pty Ltd.,
G.P.O. Box 1412,
CANBERRA ACT 2601

Dear Sir,

Re: Parallel Runway Project

With reference to your letter dated 23rd July offering your services to supply armour stone and crushed aggregates, we have forwarded your details to the Parallel Runway Project to hand over to the successful tender.

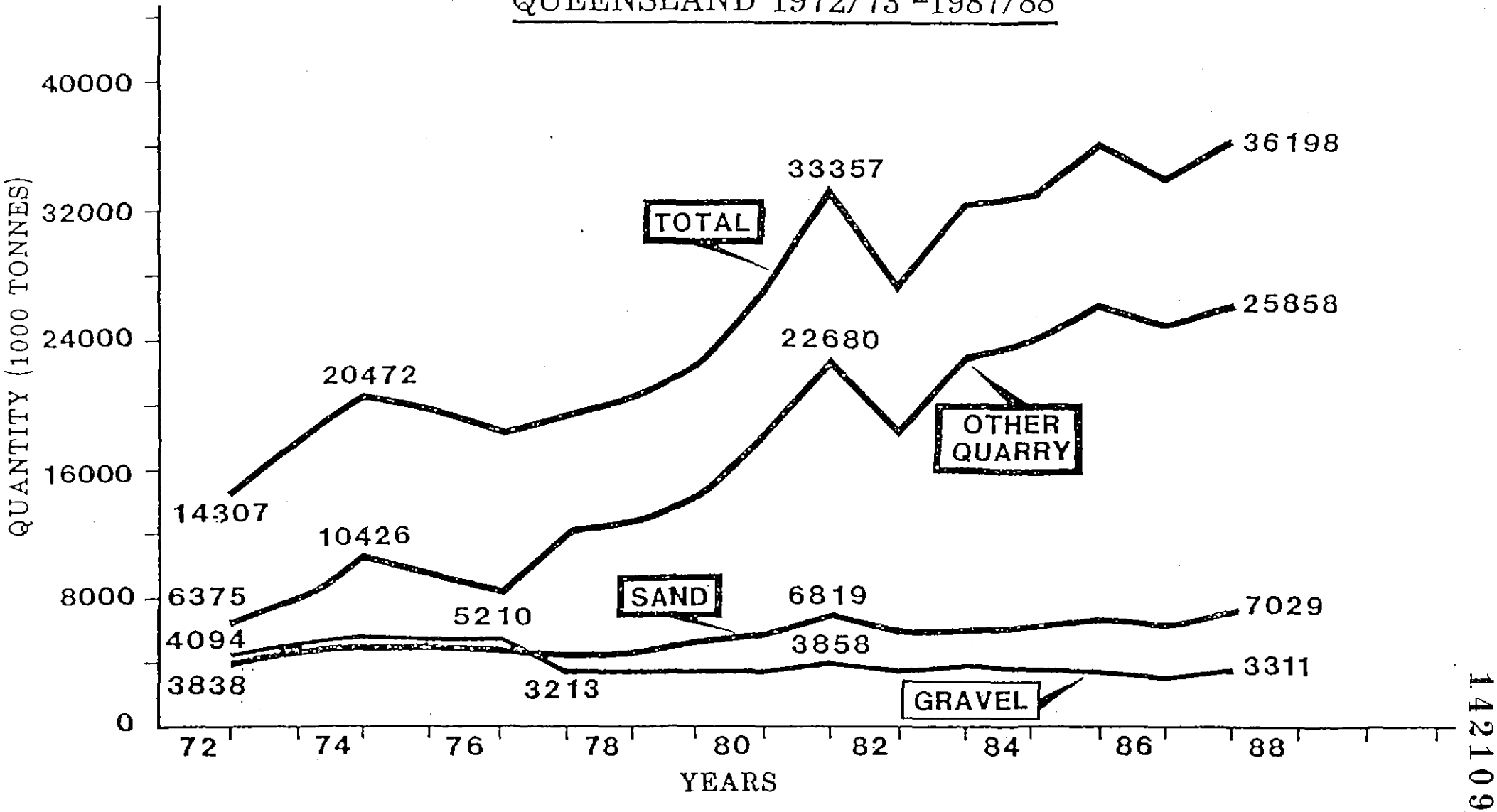
A copy of your details will be kept at our Head Office for future projects.

Yours sincerely,

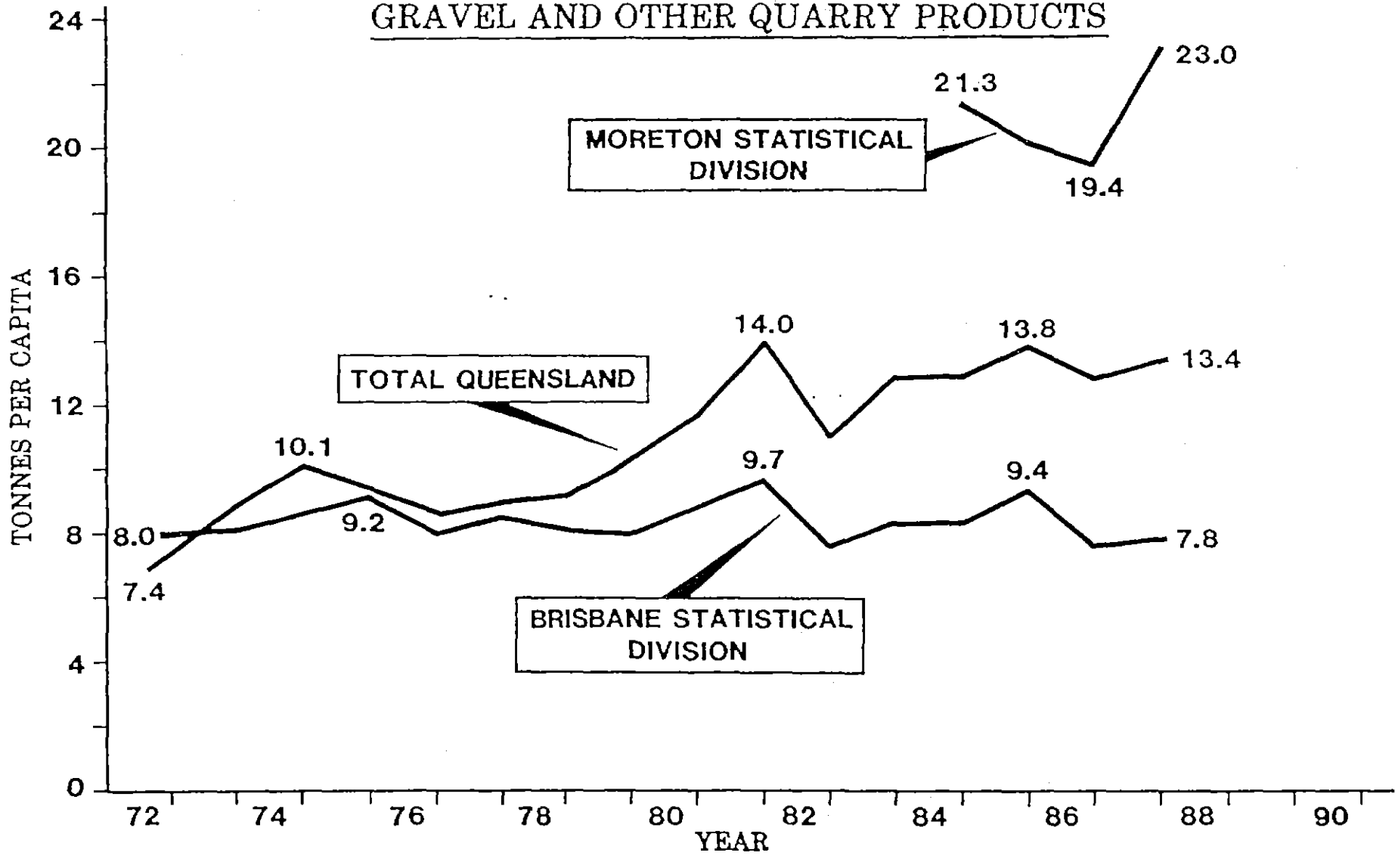
DON M. HAYMAN,
MANAGER,
PROJECTS & CONSULTING SERVICES.

SAND, GRAVEL AND OTHER QUARRY PRODUCTION

QUEENSLAND 1972/73 -1987/88



ANNUAL PER CAPITA PRODUCTION OF SAND GRAVEL AND OTHER QUARRY PRODUCTS



APPENDIX 3

PACIFIC QUARRIES LTD

COMPANY STRUCTURE

(No papers presented)

APPENDIX 4

PACIFIC QUARRIES LTD

BELL BAY ROCK DEPOSIT QUARRY OPERATIONS, AND ENVIRONMENT

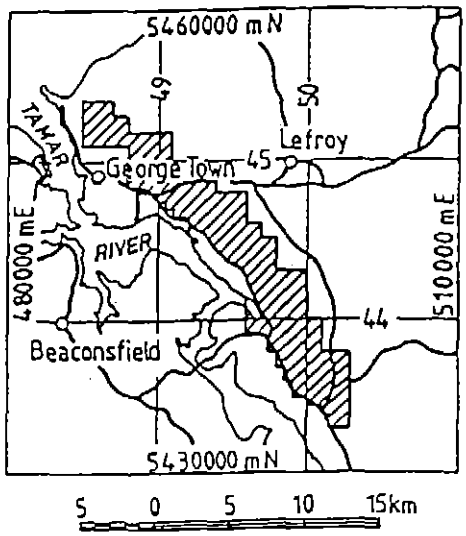
APPENDIX 4.1

142113

EXPLORATION LEASE 10/90

DESCRIPTION

5 cm



Locality and situation of land:

Commencing at the southeast corner at grid coordinates 503 000 metres E. 5 433 000 metres N. thence grid west to 501 500 metres E. grid north to 5 434 000 metres N. again grid west to 501 000 metres E. again grid north to 5 434 500 metres N. again grid west to 500 000 metres E. again grid north to 5 435 000 metres N. again grid west to 499 000 metres E. again grid north to 5 436 000 metres N. again grid west to 498 500 metres E. again grid north 5 437 000 metres N. again grid west to 498 000 metres E. again grid north to 5 438 000 metres N. again grid west 497 500 metres E. again grid north to 5 439 000 metres N. again grid west to 496 000 metres E. again grid north to the low water mark on the eastern bank of the Tamar River at approximate grid coordinates 496 000 metres E. 5 401 200 metres N. by that low water mark in a general northwesterly direction to its intersection with 492 000 metres E. again grid north to 5 446 500 metres N. again grid west to 491 000 metres E. again grid north to 5 447 000 metres N. again grid west to 490 500 metres E. again grid north to 5 447 500 metres N. again grid west to 490 000 metres E. again grid north to 5 448 000 metres N. again grid west to 489 000 metres E. again grid north to 5 448 500 metres N. again grid west to 488 000 metres E. again grid north to 5 451 000 metres N. again grid west to 485 000 metres E. again grid north to 5 454 000 metres N. grid east to 487 000 metres E. grid south to 5 453 000 metres N. again grid east to 488 000 metres E. aforesaid again grid south to 5 452 000 metres N. again grid east to 491 000 metres E. aforesaid again grid south to 5 449 000 metres N. again grid east to 494 000 metres E. again grid south to 5 448 000 metres N. aforesaid again grid east to 496 000 metres E. aforesaid again grid south to 5 446 000 metres N. again grid east to 497 000 metres E. again grid south to 5 445 000 metres N. again grid east to 498 000 metres E. aforesaid again grid south to 5 443 000 metres N. again grid east to 500 000 metres E. aforesaid again grid south to 5 440 000 metres N. again grid east to 501 000 metres E. aforesaid again grid south to 5 438 000 metres N. aforesaid again grid east to 503 000 metres E. aforesaid thence again grid south to the point of commencement.

APPENDIX 4.2

LIST OF AGGREGATE TYPES IN ORDER OF QUALITY

(The Order is that of Average Test Results)

Rock Types	Per Cent Compliance with Specifications
Dolerite	83%
Quartzite, basalt	76
Microdiorite	75
Slag, limestone, microgranite	70
Granite, slate	67
Crushed river gravel	64
Volcanic breccia	52
Hornfels	48
Quartz	40

Source: Minty, E.J., Petrology in relation to road materials.
Journal and Proceedings, Royal Society of New South Wales, 97, p. 47.

There is no perfect material in terms of meeting all specifications exactly. Dolerite is the best of those available but inferior rocks are often used because better rock is not available. A superior material gives big savings beyond its cost, e.g. if a road topcourse lasts 10 years instead of 5 before it has to be uplifted and replaced.

Tasmania Department Of Resources and Energy

Division of Mines and Mineral Resources — Report 1991/22

Some physical properties of dolerite

by D. J. Sloane

Abstract

Dolerite, an igneous rock, is exposed over half of Tasmania. The good physical and chemical properties of the rock make it suitable for a wide variety of uses. Crushed rock is used as aggregate in concrete, as road sub-base and *in flush seals, as facing stone in building construction*, and as armour stone and rip-rap.

INTRODUCTION

Following a request for information concerning the physical properties of dolerite, a brief attempt was made to collate such information. Fresh dolerite rock is considered to be very strong and is not greatly affected by weathering. The uses for this rock are widely accepted and its physical properties are suitable for most purposes. This appears to account for the difficulty in obtaining test information, a reason confirmed by some of the information sources contacted.

Information concerning the strength properties was sought from: Rivers and Water Supply Division; University of Tasmania; Hydro-Electric Commission; major quarry companies; consultant engineers; Division of Mines and Mineral Resources; Concrete Association; and the Department of Roads and Transport.

GEOLOGY

Dolerite is an igneous rock, that is, rock initially molten and injected as a fluid into older sedimentary rocks. The *magma, of quartz tholeiite composition, was emplaced as* a liquid which rose upwards through the basement rocks into older sedimentary rocks of the Parmeener Supergroup. Emplacement probably occurred over an interval of 20 million years, and the average age of the rock is middle Jurassic, approximately 175 Ma (Hergt *et al.*, 1989).

Approximately half the area of Tasmania is underlain by Jurassic dolerite. The estimated volume of dolerite is of the order of 15 000 km^3 (Hergt *et al.*, 1989).

Dolerite is composed of two essential and several accessory minerals. The essential minerals are plagioclase *feldspar and pyroxene, which together constitute between* about 60% and 80% of the total rock composition. The accessory minerals are quartz, orthoclase, chlorite and magnetite. Quartz, orthoclase and chlorite may comprise 20% to 40% of the rock while the magnetite composition *may* be 2% to 3% (Leaman, 1973).

Numerous quarries occur throughout the State, with preferable sites close to contacts where jointing is platy. Decomposed, usually coarse-grained granophyric dolerite is used for surfacing unsealed roads.

PHYSICAL PROPERTIES

The physical and chemical properties of dolerite make it highly suitable for a variety of purposes. It is used mainly as crushed aggregate in concrete production, as road sub-base and in flush seals, facing stone in building construction, and as armour stone and rip-rap.

The physical properties of dolerite are given below for *various localities. There is, however, no rock description* for some sites. It can only be assumed that the tests were conducted on the best representative samples for each site. The physical properties of dolerite will vary depending on the grainsize, composition, degree of weathering and physical defects.

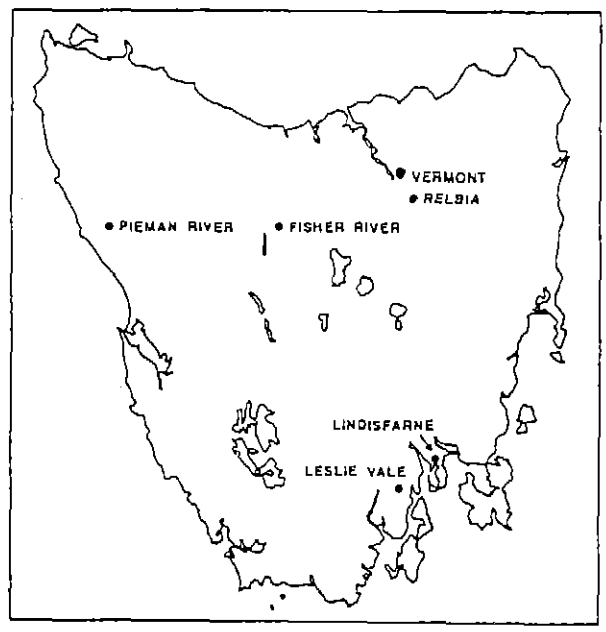


Figure 1. Location of sites of tested materials

Leaman (1972) provided a general summary of the physical properties of dolerite for the Hobart area. The source of this information is not known but the information may be useful as a general guide.

Density:	2.80–3.10 t/m^3 (average 2.9–2.95 t/m^3)
Poissons ratio:	0.02–0.1 (weathered) 0.3–0.4 (unweathered)
Youngs modulus:	10–40 GPa (weathered) 90–110 GPa (unweathered)
Bulk modulus:	5–30 GPa (weathered) 90–100 GPa (unweathered)
Rigidity modulus:	10–50 GPa (unweathered)
Uniaxial compressive strength:	40 MPa (unweathered)
Porosity:	Approximately 1%

The physical property results from tests obtained at various specific sites (fig. 1) are presented below.

Density

Apparent Density

Lindisfarne:	2.91 t/m^3 (date ?) 2.905 t/m^3 (June 1989) 2.88 t/m^3 (20 mm screenings) 2.73 t/m^3 (37 mm crusher run)

Bulk Density — Saturated surface dry

Relbia:	2.89 t/m^3
Lindisfarne:	2.865 t/m^3 2.85 t/m^3 (20 mm screenings) 2.68 t/m^3 (37 mm crusher run)
Fisher:	3.01 t/m^3 (figure quoted as 'density', samples air dried and saturated prior to testing)

Bulk Density — Oven Dry

Relbia:	2.87 t/m^3
Lindisfarne:	2.84 t/m^3 2.83 t/m^3 (20 mm screenings) 2.65 t/m^3 (37 mm crusher run)
*Pieman (1978):	2.96 t/m^3 (mean of 18 samples) 2.95–3.004 t/m^3 (range for good quality rock)
*Pieman (1983):	2.971 t/m^3 ('Hard' rock — mean of 9 samples) 2.935 t/m^3 ('Soft' rock — mean of 10 samples)

*N.B. Results quoted as 'Dry Density'. The Pieman (1983) results subdivided samples into 'hard' and 'soft' categories, depending on the ease of percussion drilling.

Water Absorption

Relbia:	0.6%	
Lindisfarne:	0.9%	
Lindisfarne:	1.09% 0.56%	(37 mm crusher run) (20 mm screenings)
Pieman (1978):	0.7% 0.3–0.6%	(mean of 20 samples) (range of values — good quality rock)
Pieman (1983):	0.28% 0.35%	('Hard' rock — mean of 9 samples) ('Soft' rock — mean of 10 samples)

Unconfined Compressive Strength

Relbia: Core 1 — 90 MPa
Core 2 — 125 MPa
Mean — 108 MPa
(50 mm diameter core approximately 200 mm in length)

Pieman (1978): 171 MPa (mean of 18 samples)
91–282 MPa (general range for good quality rock, although one sample gave 369 MPa)

Pieman (1983):	253 MPa	('Hard' rock — mean of 9 samples)
	173 MPa	('Soft' rock — mean of 10 samples)

Fisher: Mean 91 MPa (range of results was 30–155 MPa)

Schmidt Hardness

Pieman (1983): 43–44 for good quality fresh rock

Wet/Dry Strength

Lindisfarne: Dry strength = 282 kN
Wet strength = 197 kN
Wet/Dry variation = 30%

Los Angeles Test Values

Lindisfarne: Los Angeles Test 'A' grading
1985 — 16.5%
(37 mm crusher run)

Lindisfarne: March 1989 — 15.0%
August 1990 — 15.0%
April 1991 — 14.5%

Pieman (1978): Los Angeles Test 'B' grading

Sample	*% loss*	*Quality*	*RQD (%)*	*Weathering*
1	13.7	Good	95	Fresh
2	9.7	Good	95–100	Fresh
3	14.5	Poor	0–75	Partly weathered
4	16.5	Poor	0–50	Partly weathered
5	6.3	Good	100	Fresh

Vermont:	Los Angeles Test 'B' grading 14% (16 mm aggregate)

Polished Aggregate Friction Values

Lindisfarne:	52 (RCA Victoria Method 374.01)
Leslie Vale:	51 (AS1141-41/42)
Vermont:	46 (AS1141-41/42) (14 mm aggregate) 45 (10 mm aggregate)

California Bearing Ratio

Vermont:	220 (37 mm crusher run)

Point Load Strength

Pieman (1978): Is (50) MPa for 20 specimens. Refers to above samples.

Sample	*Median*	*Mean*	*Standard Deviation*	*Weathering*
1	15.4	14.5	3.1	Fresh
2	13.4	11.6	5.6	Fresh
3	6.5	7.2	4.5	Partly weathered
4	4.2	4.6	3.1	Partly weathered
5	17.0	16.6	1.4	Fresh

Pieman (1983): Is (50) MPa for 20 specimens:

For 'Hard' rock	Mean — 18.1 (range 3.4 to 21.6)
For 'Soft' rock	Mean — 10.7 (range 2.6 to 20.7)

Young's Modulus

Pieman (1978)

Dynamic	93 GPa (mean of 18 samples) 87–102 GPa (range for good quality rock)
Static	96 GPa (mean of 5 samples) 101–110 GPa (range for good quality rock)

Pieman (1983)

Dynamic	102 GPa	('Hard' rock – mean of 9 samples)
	97 GPa	('Soft' rock – mean of 10 samples)

Poisson's Ratio

Pieman	0.22 (mean of 5 samples) 0.217–0.240 (range for good quality rock)

Petrographic Descriptions

Lindisfarne

Rock species –	diabase
Plagioclase –	63%
Augite –	37%
Texture –	no orientation, even-grained, dominant grain size 0.5 mm. No weathering.
Vickers hardness –	740
Drillability Index –	PNI = 32 Drilling rate index = 31 Friability index (S_{20}') = 31 PROTO 20 = 23, s = 1.1 Sievers J value (SJ') = 10, s = 3.8

Relbia — Sample 1

Dolerite. Fine grained, ophitic texture.

Primary minerals — plagioclase, pyroxene, hornblende and quartz. Acicular and lath-like plagioclase, equant grains of pyroxene — some alteration to chlorite along cleavage and fissures. Secondary minerals (10%) include chlorite. Quartz content 10%.

Relbia — Sample 2

Dolerite. Fine grained, ophitic texture.

Primary minerals — plagioclase, pyroxene, amphibole. Plagioclase crystals acicular, pyroxene grains subhedral with chloritised outlines. Secondary minerals (13.5%) include chlorite and quartz (8.8%).

Pavement Skid Resistance

Information source: *Relative Performance of Basalt and Dolerite Flush Seals* (DRT Report 85/93)

Summary

Test programme included a range of seal ages, traffic densities and curve radii. Skid resistance properties measured using the British Pendulum Tester. Testing generally done during winter months.

Test result trends are shown in Figure 2, where BPN skid resistance values vs. total vehicles (from AADI counts and years in service) are shown for curve radii greater than 500 m, between 500 m and 100 m, and less than or equal to 100 m. The results showed no positive indication of BPN values being a function of aggregate size (10–16 mm).

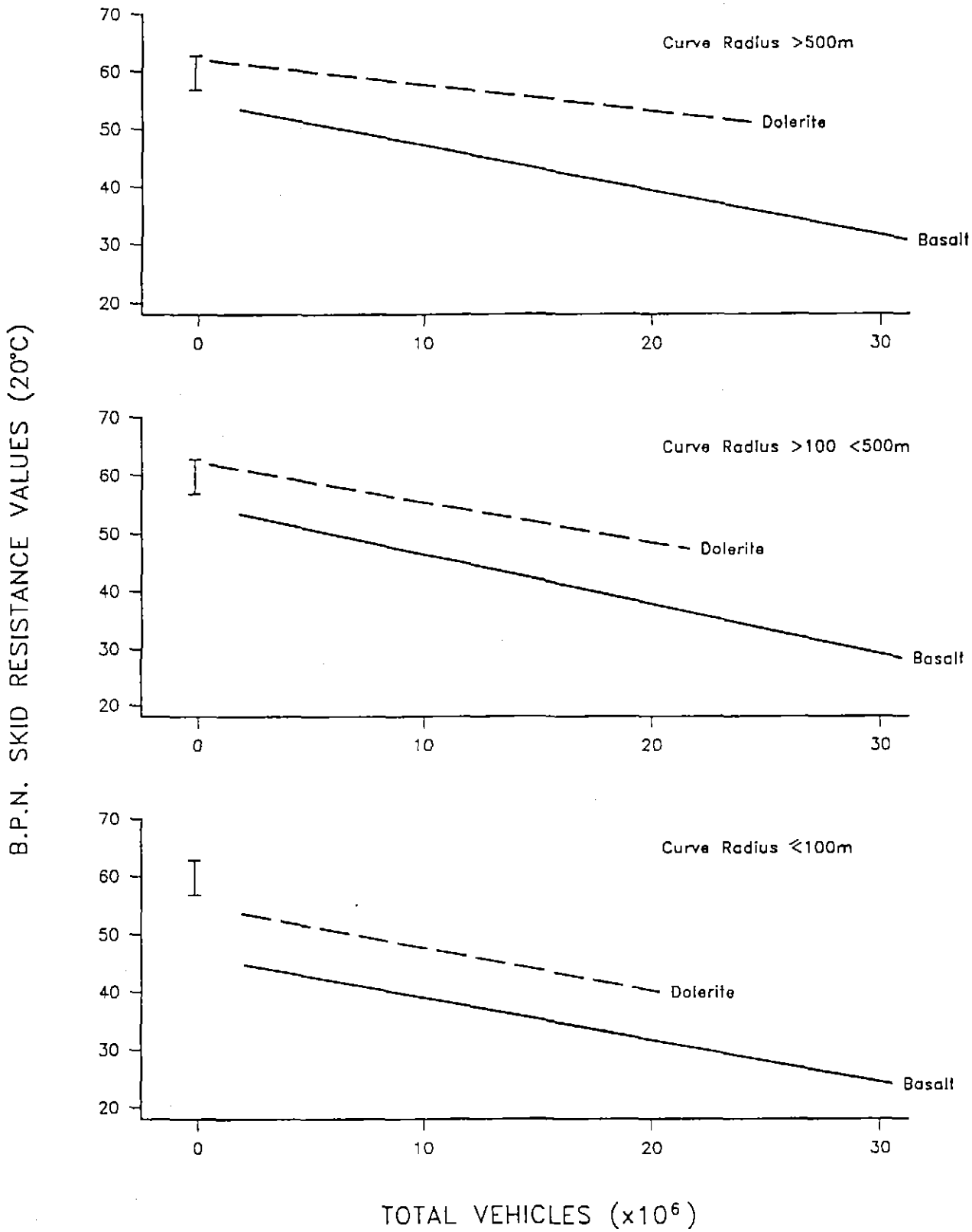
Results summary

Curve radii >100 m — Steady decline in BPN value from initial 60–65.

Curve radii <100 m — More rapid decline than above for the first 2.5×10^6 vehicles, but less than for basalt, followed by steady decline in BPN with continued traffic.

Lowest BPN value — 45 at 17.5×10^6 vehicles for curve radius less than 100 metres.

The results show that dolerites maintained higher levels of skid resistance, considered significant in the high traffic stress situations.



(I – Typical range of B.P.N. values on new, untrafficked surface.)

(From DRT Report 85/93)

Figure 2

Physical properties of dolerite — BPN skid resistance versus total vehicles

CONCLUSIONS

The results reported in the body of this report indicate a range of physical properties for dolerite rock. The results were obtained from five locations. Variations in the properties of dolerite appear to be largely related to the degree of weathering and rock defects. Other factors, such as composition and grainsize, probably play a less important role in determining rock properties.

The Pieman (1983) results indicate differences in properties of good quality 'fresh' rock within the quarry. The results are interesting but no petrographic information was reported. The only reported differences were that the 'soft' rocks had slightly discoloured joints, evident in the broken uniaxial and point load specimens. Defects, and possibly slight weathering, appear to produce the difference in properties.

Comparative testing of basalt and dolerite indicates that dolerite has better properties for road seals. Dolerite has better polished stone values and skid resistance properties.

The results are considered to be representative of the general quality of dolerite currently quarried. However, not all results provided a description of the rock tested or the method of testing. Therefore they are only considered to be indicative of each site and cannot be assumed to apply elsewhere. The results provide an overview of physical properties but do not replace specific site testing.

REFERENCES

LEAMAN, D. E. 1972. *Hobart engineering geology map series*. Department of Mines, Tasmania.

LEAMAN, D. E. 1973. The engineering properties of Tasmanian dolerite, with particular reference to the route of the Bell Bay Railway. *Tech. Rep. Dep. Mines Tasm.* 16:148–163.

HERGT, J. M.; MCDOUGALL, I.; BANKS, M. R.; GREEN, D. H. 1989. Igneous Rocks. Jurassic dolerite, *in:* BURRETT, C. F.; MARTIN, E. L. (ed.). Geology and Mineral Resources of Tasmania. *Spec. Publ. geol. Soc. Aust.* 15:375–381.

DEPARTMENT OF ROADS AND TRANSPORT, 1985. Relative performance of basalt and dolerite flush seals. *Rep. Dep. Roads Transport Tasm.* 85/93.

[31 October 1991]

APPENDIX 4.4

PACIFIC QUARRIES PTY. LTD.

QUARRY: WILLIAMS CREEK PRODUCTION/LOAD OUT — SUMMARY - TEST RESULTS, DAILY FOR ONE WEEK

MATERIAL: 20mm FIRST GRADE — COARSE AGGREGATES

DATE SAMPLED								Average	TARGET	SPECIFICATIONS		
SAMPLE NUMBER											DMR 351	AS 2758.1
SAMPLE LOCATION												
% PASSING SIEVE 63.0 mm												
53.0 mm												
27.5 mm												
26.5 mm									100		100	100
19.0 mm									92 ± 5		-	85-100
13.2 mm									35 ± 7		0-10	-
9.50 mm									7 ± 5		0-5	0-20
6.70 mm											-	-
4.75 mm									2 ± 1		-	0-5
2.36 mm											-	-
1.18 mm											0-2	-
0.075 mm												0-2
PARTICLE SHAPE 2:1 %												
PARTICLE SHAPE 3:1 %												max 10
MATERIAL FINER THAN 75 mm %												max 2
AVERAGE LEAST DIMENSION mm											min 10.0	
PARTICLE DENSITY - dry t/cu.m												min 2100
PARTICLE DENSITY - SSD t/cu.m												min 2100
WATER ABSORPTION %												
BULK DENSITY - LOOSE t/cu.m												min 1200
BULK DENSITY - COMPACT t/cu.m												min 1200
SULPHATE SOUNDNESS LOSS %												max 9
10% FINES WET STRENGTH KN											min 50	min 80
WET/DRY STRENGTH VAR. %											max 35	max 35
MOISTURE CONTENT %												

APPENDIX ____. Draft of form for reporting tests on rock to meet the requirement of the Australian Standards Association or the Department of Main Roads (NSW).

142121

APPENDIX 4.5

Photocopy of Japanese Industry Standards Sheet for Reporting The Results of Tests on Crushed Stone.

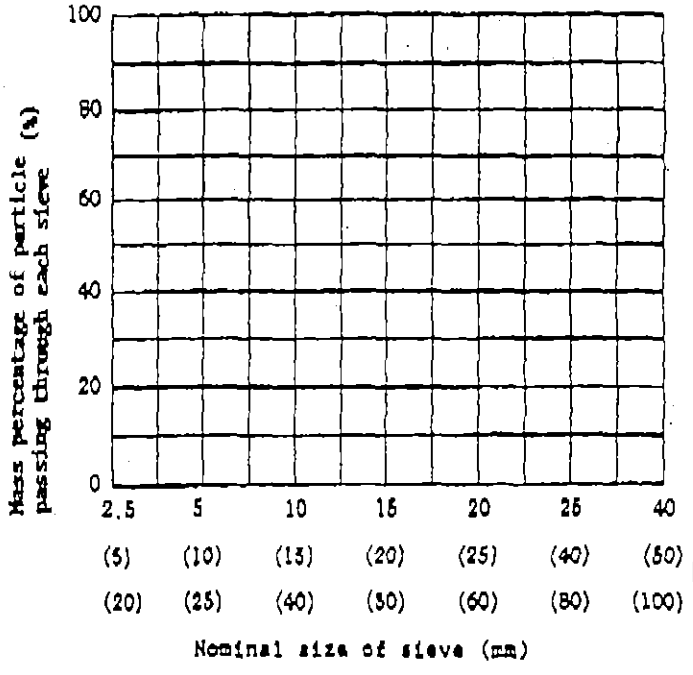
(The Japanese and Australian tests and standards are very similar).

Test Report of Crushed Stone for Concrete

Class		Kind of raw stone	
Name of manufacturer		Name and number of digging site	
Name of factory		Date of test	Physical test:
			Alkali-silica reaction test:

Test items (Physical test)	Standardized value	Test value	Remark
Absolute dry specific gravity (JIS A 1110)	2.5 min.		Specific gravity in saturated surface dry condition ( )
Water absorption test (JIS A 1110)	3 % max.		
Soundness test (JIS A 1122)	12 % max.		
Abraded quantity (JIS A 1121)	40 % max.		
Amount lost in washing test (JIS A 1103)	10 % max.		
Absolute volume percentage for assessment of grain shape (JIS A 5005)	55 % min.		For only crushed stone 2005

	Nominal size of sieve	Mass percentage of particles passing through each thieve (%)
Sieve analysis test	100	
	80	
	60	
	50	
	40	
	25	
	20	
	15	
	10	
	5	
	2.5	
f.m.		



Alkali-silica reaction test (JIS A 5308)	Test result*	
	Test method	

* A: Judged as harmless B: Not judged as harmless or not tested yet.

Name of testing organization	Physical test:
	Alkali-silica reaction test:
Transferar from original text	Name of manufacturer:
	Name of person in charge:

142122

APPENDIX 5

PACIFIC QUARRIES LTD

SHIPPING OPERATIONS

VOYAGE ESTIMATE - BELL BAY TO AUCKLAND - PISTON RUN

COMPANY	PACIFIC QUARRIES LTD			
VOYAGE ROUTE	BELL BAY TO AUCKLAND TO BELL BAY (PISTON RUN)			
VESSEL TYPE	BULK CARRIER	AUSTRALIAN	GEARED TYPE	CRANE
SPEED KNOTS	13.5	FLAG	IFO- SEA TONNE/DAY	34
MDO PORT AND SEA TONNE/DAY	2		IFO-PORT TONNE/DAY	1
COST MDO US$/TONNE (SYD/MELB)	$220		COST IFO US$/TONNE (SYD/MELB)	$110
TYPE OF CHARTER	TIME		RATE PER DAY US$	$18,500
CARGO	ROCK AGGREGATE		DEADWEIGHT TONNES (DWCT)	40,000
EXCHANGE RATE AUS$/US$	0.75		BROKERAGE COMMISSION&TAXES US$	$2,000
LOAD PORT DATA				
NAME	BELL BAY		PILOTAGE HOURS	5
LOAD RATE TONNE/HOUR	3,000		LOAD RATE TONNE/DAY	54,000
DELAYS HOURS	6		PORT CHARGES FIX US$	$16,900
TOTAL PORT TIME DAYS	1.20		PORT CHARGES VAR US$	$42,083
EFFECTIVE HOURS WORKED/DAY	18		MARINE NAVIGATION LEVIES US$	$2,320
			AGENT'S FEES US$	$1,799
VOYAGE DATA				
VOYAGE DISTANCE NAUTICAL MILES	3,200		VOYAGE TIME DAYS + 15%	11.36
DISCHARGE PORT DATA				
NAME	AUCKLAND		PILOTAGE HOURS	7
DISCH RATE TONNE/HOUR	1,000		DISCHARGE RATE TONNE/DAY	10,000
DELAYS HOURS	6		PORT CHARGES FIX US$	$14,500
TOTAL PORT TIME DAYS	4.54		PORT CHARGES VAR . US$	$46,000
EFFECTIVE HOURS WORKED/DAY	10		MISCELLANEOUS CHARGES US$	$4,050
			AGENT'S FEES US$	$8,516

SUMMARY

TOTAL ROUND VOYAGE TIME DAYS	17.10	RATE US$ PER DAY	FREIGHT RATE US$/TONNE	FREIGHT RATE AUS$/TONNE
LOAD PORT CHARGES US$	$63,102	$17,500	$12.10	$16.13
DISCH. PORT CHARGES US$	$69,043	$18,000	$12.31	$16.42
IFO(FUEL) VOYAGE COST US$	$43,110	$18,500	$12.53	$16.70
MDO (FUEL) VOYAGE COST US$	$7,523	$19,000	$12.74	$16.99
BROKERAGE COMMISSION&TAXES US$	$2,000	$19,500	$12.96	$17.27

VOYAGE ESTIMATE - BELL BAY TO AUCKLAND - PISTON RUN

COMPANY	PACIFIC QUARRIES LTD			
VOYAGE ROUTE	BELL BAY TO AUCKLAND TO BELL BAY (PISTON RUN)			
VESSEL TYPE	SELF DISCHARGE	AUSTRALIAN	GEARED TYPE	
SPEED KNOTS	13.5	FLAG	IFO- SEA TONNE/DAY	29
MDO PORT AND SEA TONNE/DAY	0		IFO-PORT TONNE/DAY	2
COST MDO US$/TONNE (SYD/MELB)	$220		COST IFO US$/TONNE (SYD/MELB)	$110
TYPE OF CHARTER	TIME		RATE PER DAY US$	$24,500
CARGO	ROCK AGGREGATE		DEADWEIGHT TONNES (DWCT)	55,000
EXCHANGE RATE AUS$/US$	0.75		BROKERAGE COMMISSION&TAXES US$	$2,750
LOAD PORT DATA				
NAME	BELL BAY		PILOTAGE HOURS	5
LOAD RATE TONNE/HOUR	3,000		LOAD RATE TONNE/DAY	54,000
DELAYS HOURS	6		PORT CHARGES FIX US$	$16,900
TOTAL PORT TIME DAYS	1.48		PORT CHARGES VAR US$	$57,865
EFFECTIVE HOURS WORKED/DAY	18		MARINE NAVIGATION LEVIES US$	$2,193
			AGENT'S FEES US$	$2,215
VOYAGE DATA				
VOYAGE DISTANCE NAUTICAL MILES	3,200		VOYAGE TIME DAYS + 15%	11.36
DISCHARGE PORT DATA				
NAME	AUCKLAND		PILOTAGE HOURS	7
DISCH RATE TONNE/HOUR	3,000		DISCHARGE RATE TONNE/DAY	54,000
DELAYS HOURS	6		PORT CHARGES FIX US$	$14,500
TOTAL PORT TIME DAYS	1.56		PORT CHARGES VAR . US$	$63,250
EFFECTIVE HOURS WORKED/DAY	15		MISCELLANEOUS CHARGES US$	$5,569
			AGENT'S FEES US$	$2,925

SUMMARY

TOTAL ROUND VOYAGE TIME DAYS	14.40	RATE US$ PER DAY	FREIGHT RATE US$/TONNE	FREIGHT RATE AUS$/TONNE
LOAD PORT CHARGES US$	$79,173	$23,500	$9.78	$13.04
DISCH. PORT CHARGES US$	$80,702	$24,000	$9.91	$13.21
IFO(FUEL) VOYAGE COST US$	$36,900	$24,500	$10.04	$13.39
MDO (FUEL) VOYAGE COST US$	$0	$25,000	$10.17	$13.56
BROKERAGE COMMISSION&TAXES US$	$2,750	$25,500	$10.30	$13.74

VOYAGE ESTIMATE - BELL BAY TO AUCKLAND - PISTON RUN

COMPANY	PACIFIC QUARRIES LTD			
VOYAGE ROUTE	BELL BAY TO AUCKLAND TO BELL BAY (PISTON RUN)			
VESSEL TYPE	PANAMAX	TASMAN	GEARED TYPE	CRANE
SPEED KNOTS	13.5	WAIVER	IFO- SEA TONNE/DAY	32
MDO PORT AND SEA TONNE/DAY	0.6	REQUIRED	IFO-PORT TONNE/DAY	1.2
COST MDO US$/TONNE (SYD/MELB)	$220	FOREIGN FLAG	COST IFO US$/TONNE (SYD/MELB)	$110
TYPE OF CHARTER	TIME		RATE PER DAY US$	$13,500
CARGO	ROCK AGGREGATE		DEADWEIGHT TONNES (DWCT)	55,000
EXCHANGE RATE AUS$/US$	0.75		BROKERAGE COMMISSION&TAXES US$	$2,750
LOAD PORT DATA				
NAME	BELL BAY		PILOTAGE HOURS	5
LOAD RATE TONNE/HOUR	3,000		LOAD RATE TONNE/DAY	54,000
DELAYS HOURS	6		PORT CHARGES FIX US$	$16,900
TOTAL PORT TIME DAYS	1.48		PORT CHARGES VAR US$	$57,865
EFFECTIVE HOURS WORKED/DAY	18		MARINE NAVIGATION LEVIES US$	$2,876
			AGENT'S FEES US$	$2,215
VOYAGE DATA				
VOYAGE DISTANCE NAUTICAL MILES	3,200		VOYAGE TIME DAYS + 15%	11.36
DISCHARGE PORT DATA				
NAME	AUCKLAND		PILOTAGE HOURS	7
DISCH RATE TONNE/HOUR	1,000		DISCHARGE RATE TONNE/DAY	10,000
DELAYS HOURS	6		PORT CHARGES FIX US$	$14,500
TOTAL PORT TIME DAYS	6.04		PORT CHARGES VAR . US$	$63,250
EFFECTIVE HOURS WORKED/DAY	15		MISCELLANEOUS CHARGES US$	$5,569
			AGENT'S FEES US$	$11,328

SUMMARY

TOTAL ROUND VOYAGE TIME DAYS	18.88	RATE US$ PER DAY	FREIGHT RATE US$/TONNE	FREIGHT RATE AUS$/TONNE
LOAD PORT CHARGES US$	$79,855	$12,500	$8.20	$10.94
DISCH. PORT CHARGES US$	$89,105	$13,000	$8.37	$11.17
IFO(FUEL) VOYAGE COST US$	$40,973	$13,500	$8.55	$11.39
MDO (FUEL) VOYAGE COST US$	$2,492	$14,000	$8.72	$11.62
BROKERAGE COMMISSION&TAXES US$	$2,750	$14,500	$8.89	$11.85

VOYAGE ESTIMATE - BELL BAY TO BOTANY BAY - PISTON RUN

COMPANY	PACIFIC QUARRIES LTD			
VOYAGE ROUTE	BELL BAY TO AUCKLAND TO BELL BAY (PISTON RUN)			
VESSEL TYPE	BULK CARRIER	AUSTRALIAN	GEARED TYPE	CRANE
SPEED KNOTS	13.5	FLAG	IFO- SEA TONNE/DAY	34
MDO PORT AND SEA TONNE/DAY	2		IFO-PORT TONNE/DAY	1
COST MDO US$/TONNE (SYD/MELB)	$220		COST IFO US$/TONNE (SYD/MELB)	$110
TYPE OF CHARTER	TIME		RATE PER DAY US$	$18,500
CARGO	ROCK AGGREGATE		DEADWEIGHT TONNES (DWCT)	40,000
EXCHANGE RATE AUS$/US$	0.75		BROKERAGE COMMISSION&TAXES US$	$2,000
LOAD PORT DATA				
NAME	BELL BAY		PILOTAGE HOURS	5
LOAD RATE TONNE/HOUR	3,000		LOAD RATE TONNE/DAY	54,000
DELAYS HOURS	6		PORT CHARGES FIX US$	$16,900
TOTAL PORT TIME DAYS	1.20		PORT CHARGES VAR US$	$42,083
EFFECTIVE HOURS WORKED/DAY	18		MARINE NAVIGATION LEVIES US$	$1,235
			AGENT'S FEES US$	$1,799
VOYAGE DATA				
VOYAGE DISTANCE NAUTICAL MILES	970		VOYAGE TIME DAYS + 15%	3.44
DISCHARGE PORT DATA				
NAME	BOTANY BAY		PILOTAGE HOURS	5
DISCH RATE TONNE/HOUR	1,000		DISCHARGE RATE TONNE/DAY	10,000
DELAYS HOURS	6		PORT CHARGES FIX US$	$14,500
TOTAL PORT TIME DAYS	4.46		PORT CHARGES VAR . US$	$50,000
EFFECTIVE HOURS WORKED/DAY	10		MISCELLANEOUS CHARGES US$	$4,050
			AGENT'S FEES US$	$8,359

SUMMARY

TOTAL ROUND VOYAGE TIME DAYS	9.10	RATE US$ PER DAY	FREIGHT RATE US$/TONNE	FREIGHT RATE AUS$/TONNE
LOAD PORT CHARGES US$	$62,017	$17,500	$7.84	$10.46
DISCH. PORT CHARGES US$	$72,886	$18,000	$7.96	$10.61
IFO(FUEL) VOYAGE COST US$	$13,499	$18,500	$8.07	$10.76
MDO (FUEL) VOYAGE COST US$	$4,004	$19,000	$8.18	$10.91
BROKERAGE COMMISSION&TAXES US$	$2,000	$19,500	$8.30	$11.06

VOYAGE ESTIMATE - BELL BAY TO BOTANY BAY - PISTON RUN

COMPANY	PACIFIC QUARRIES LTD			
VOYAGE ROUTE	BELL BAY TO AUCKLAND TO BELL BAY (PISTON RUN)			
VESSEL TYPE	SELF DISCHARGE	AUSTRALIAN	GEARED TYPE	
SPEED KNOTS	13.5	FLAG	IFO- SEA TONNE/DAY	29
MDO PORT AND SEA TONNE/DAY	0		IFO-PORT TONNE/DAY	2
COST MDO US$/TONNE (SYD/MELB)	$220		COST IFO US$/TONNE (SYD/MELB)	$110
TYPE OF CHARTER	TIME		RATE PER DAY US$	$24,500
CARGO	ROCK AGGREGATE		DEADWEIGHT TONNES (DWCT)	55,000
EXCHANGE RATE AUS$/US$	0.75		BROKERAGE COMMISSION&TAXES US$	$2,750
LOAD PORT DATA				
NAME	BELL BAY		PILOTAGE HOURS	5
LOAD RATE TONNE/HOUR	3,000		LOAD RATE TONNE/DAY	54,000
DELAYS HOURS	6		PORT CHARGES FIX US$	$16,900
TOTAL PORT TIME DAYS	1.48		PORT CHARGES VAR US$	$57,865
EFFECTIVE HOURS WORKED/DAY	18		MARINE NAVIGATION LEVIES US$	$974
			AGENT'S FEES US$	$2,215
VOYAGE DATA				
VOYAGE DISTANCE NAUTICAL MILES	970		VOYAGE TIME DAYS + 15%	3.44
DISCHARGE PORT DATA				
NAME	BOTANY BAY		PILOTAGE HOURS	5
DISCH RATE TONNE/HOUR	3,000		DISCHARGE RATE TONNE/DAY	54,000
DELAYS HOURS	6		PORT CHARGES FIX US$	$14,500
TOTAL PORT TIME DAYS	1.48		PORT CHARGES VAR . US$	$68,750
EFFECTIVE HOURS WORKED/DAY	15		MISCELLANEOUS CHARGES US$	$5,569
			AGENT'S FEES US$	$2,769

SUMMARY

TOTAL ROUND VOYAGE TIME DAYS	6.40	RATE US$ PER DAY	FREIGHT RATE US$/TONNE	FREIGHT RATE AUS$/TONNE
LOAD PORT CHARGES US$	$77,954	$23,500	$5.98	$7.97
DISCH. PORT CHARGES US$	$86,046	$24,000	$6.03	$8.05
IFO(FUEL) VOYAGE COST US$	$11,633	$24,500	$6.09	$8.12
MDO (FUEL) VOYAGE COST US$	$0	$25,000	$6.15	$8.20
BROKERAGE COMMISSION&TAXES US$	$2,750	$25,500	$6.21	$8.28

VOYAGE ESTIMATE - BELL BAY TO PORT ADELAIDE - PISTON RUN

COMPANY	PACIFIC QUARRIES LTD			
VOYAGE ROUTE	BELL BAY TO AUCKLAND TO BELL BAY (PISTON RUN)			
VESSEL TYPE	SELF DISCHARGE	AUSTRALIAN	GEARED TYPE	
SPEED KNOTS	13.5	FLAG	IFO- SEA TONNE/DAY	29
MDO PORT AND SEA TONNE/DAY	0		IFO-PORT TONNE/DAY	2
COST MDO US$/TONNE (SYD/MELB)	$220		COST IFO US$/TONNE (SYD/MELB)	$110
TYPE OF CHARTER	TIME		RATE PER DAY US$	$24,500
CARGO	ROCK AGGREGATE		DEADWEIGHT TONNES (DWCT)	55,000
EXCHANGE RATE AUS$/US$	0.75		BROKERAGE COMMISSION&TAXES US$	$2,750
LOAD PORT DATA				
NAME	BELL BAY		PILOTAGE HOURS	5
LOAD RATE TONNE/HOUR	3,000		LOAD RATE TONNE/DAY	54,000
DELAYS HOURS	6		PORT CHARGES FIX US$	$16,900
TOTAL PORT TIME DAYS	1.48		PORT CHARGES VAR US$	$57,865
EFFECTIVE HOURS WORKED/DAY	18		MARINE NAVIGATION LEVIES US$	$1,072
			AGENT'S FEES US$	$2,215
VOYAGE DATA				
VOYAGE DISTANCE NAUTICAL MILES	1,150		VOYAGE TIME DAYS + 15%	4.08
DISCHARGE PORT DATA				
NAME	PORT ADELAIDE		PILOTAGE HOURS	5
DISCH RATE TONNE/HOUR	3,000		DISCHARGE RATE TONNE/DAY	54,000
DELAYS HOURS	6		PORT CHARGES FIX US$	$14,500
TOTAL PORT TIME DAYS	1.48		PORT CHARGES VAR . US$	$57,750
EFFECTIVE HOURS WORKED/DAY	15		MISCELLANEOUS CHARGES US$	$5,569
			AGENT'S FEES US$	$2,769

SUMMARY

TOTAL ROUND VOYAGE TIME DAYS	7.04	RATE US$ PER DAY	FREIGHT RATE US$/TONNE	FREIGHT RATE AUS$/TONNE
LOAD PORT CHARGES US$	$78,052	$23,500	$6.09	$8.12
DISCH. PORT CHARGES US$	$75,046	$24,000	$6.15	$8.20
IFO(FUEL) VOYAGE COST US$	$13,671	$24,500	$6.22	$8.29
MDO (FUEL) VOYAGE COST US$	$0	$25,000	$6.28	$8.37
BROKERAGE COMMISSION&TAXES US$	$2,750	$25,500	$6.34	$8.46

VOYAGE ESTIMATE - BELL BAY TO PORT ADELAIDE - PISTON RUN

COMPANY	PACIFIC QUARRIES LTD			
VOYAGE ROUTE	BELL BAY TO AUCKLAND TO BELL BAY (PISTON RUN)			
VESSEL TYPE	BULK CARRIER	AUSTRALIAN FLAG	GEARED TYPE	CRANE
SPEED KNOTS	13.5		IFO- SEA TONNE/DAY	34
MDO PORT AND SEA TONNE/DAY	2		IFO-PORT TONNE/DAY	1
COST MDO US$/TONNE (SYD/MELB)	$220		COST IFO US$/TONNE (SYD/MELB)	$110
TYPE OF CHARTER	TIME		RATE PER DAY US$	$18,500
CARGO	ROCK AGGREGATE		DEADWEIGHT TONNES (DWCT)	40,000
EXCHANGE RATE AUS$/US$	0.75		BROKERAGE COMMISSION&TAXES US$	$2,000
LOAD PORT DATA				
NAME	BELL BAY		PILOTAGE HOURS	5
LOAD RATE TONNE/HOUR	3,000		LOAD RATE TONNE/DAY	54,000
DELAYS HOURS	6		PORT CHARGES FIX US$	$16,900
TOTAL PORT TIME DAYS	1.20		PORT CHARGES VAR US$	$42,083
EFFECTIVE HOURS WORKED/DAY	18		MARINE NAVIGATION LEVIES US$	$1,321
			AGENT'S FEES US$	$1,799
VOYAGE DATA				
VOYAGE DISTANCE NAUTICAL MILES	1,150		VOYAGE TIME DAYS + 15%	4.08
DISCHARGE PORT DATA				
NAME	PORT ADELAIDE		PILOTAGE HOURS	5
DISCH RATE TONNE/HOUR	1,000		DISCHARGE RATE TONNE/DAY	10,000
DELAYS HOURS	6		PORT CHARGES FIX US$	$14,500
TOTAL PORT TIME DAYS	4.46		PORT CHARGES VAR . US$	$54,000
EFFECTIVE HOURS WORKED/DAY	10		MISCELLANEOUS CHARGES US$	$4,050
			AGENT'S FEES US$	$8,359

SUMMARY

		RATE US$ PER DAY	FREIGHT RATE US$/TONNE	FREIGHT RATE AUS$/TONNE
TOTAL ROUND VOYAGE TIME DAYS	9.74			
LOAD PORT CHARGES US$	$62,103	$17,500	$8.29	$11.05
DISCH. PORT CHARGES US$	$76,886	$18,000	$8.41	$11.22
IFO(FUEL) VOYAGE COST US$	$15,888	$18,500	$8.53	$11.38
MDO (FUEL) VOYAGE COST US$	$4,285	$19,000	$8.66	$11.54
BROKERAGE COMMISSION&TAXES US$	$2,000	$19,500	$8.78	$11.70

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APPENDIX 6

PACIFIC QUARRIES LTD

FINANCIAL PLAN

CASH FLOW PROJECTION FOR YEAR ENDING JUNE 19X1

PRODUCTION 500,000 TONNES P.A.

BEST CASE

CASH FLOW SUMMARY [000'S]

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	Total
CASH INFLOW:													
Sales Collect.	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$1,760	$1,760	$3,520
Loans other	$200	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$200
Capital	$20,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$20,000
Interest Rcvd	$0	$65	$64	$63	$63	$59	$50	$42	$33	$27	$23	$25	$514
TOTAL INFLOW	$20,200	$65	$64	$63	$63	$59	$50	$42	$33	$27	$1,783	$1,785	$24,234
CASH OUTFLOW:													
Produc. Expenses	$10	$10	$10	$10	$10	$10	$10	$10	$279	$1,085	$1,085	$1,085	$3,614
Overh. Expenses	$72	$75	$72	$75	$72	$75	$73	$114	$112	$115	$114	$116	$1,085
Capital Items	$525	$200	$250	$100	$1,120	$2,550	$2,550	$2,550	$1,530	$0	$0	$0	$11,375
TOTAL OUTFLOW	$607	$285	$332	$185	$1,202	$2,635	$2,633	$2,674	$1,921	$1,200	$1,199	$1,201	$16,074
CASH MOVEMENTS	$19,593	($220)	($268)	($122)	($1,139)	($2,576)	($2,583)	($2,632)	($1,888)	($1,173)	$584	$584	$8,160
OPENING BALANCE	$0	$19,593	$19,373	$19,105	$18,983	$17,844	$15,268	$12,685	$10,053	$8,165	$6,992	$7,576	
FUNDS AVAILABLE	$19,593	$19,373	$19,105	$18,983	$17,844	$15,268	$12,685	$10,053	$8,165	$6,992	$7,576	$8,160	

CASH FLOW PROJECTION FOR YEAR ENDING JUNE 19X1

PRODUCTION 500,000 TONNES P.A.

BEST CASE

MONTH	SALES	CASH INFLOW												
		Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total
JUL	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
AUG	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
SEP	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
OCT	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
NOV	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
DEC	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
JAN	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
FEB	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
MAR	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
APR	$1,760	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$1,760	$0	$1,760
MAY	$1,760	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$1,760	$1,760
JUN	$1,760	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
TOTAL	$5280	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$1,760	$1,760	$3,520
TOT. CASH INFLOW [SALES+DEBTORS]		$0	$0	$0	$0	$0	$0	$0	$1,760	$1,760	$1,760	$1,760	$1,760	$8,800

TOTAL SALES FOR YEAR:	$5,280
TOTAL CASH INFLOW FROM SALES:	$3,520
OUTSTANDING DEBTORS AT YEAR END:	$1,760

CASH FLOW PROJECTION FOR YEAR ENDING JUNE 19X1

PRODUCTION 500,000 TONNES P.A.

BEST CASE

ESTIMATED EXPENSE PAYMENTS [000'S]

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total
PRODUCT.EXPENSES													
Wages & Salaries	$10	$10	$10	$10	$10	$10	$10	$10	$64	$64	$64	$64	$336
Transport	$0	$0	$0	$0	$0	$0	$0	$0	$0	$806	$806	$806	$2,418
Operating Cost	$0	$0	$0	$0	$0	$0	$0	$0	$215	$215	$215	$215	$860
Produc. Expenses	$10	$10	$10	$10	$10	$10	$10	$10	$279	$1,085	$1,085	$1,085	$3,614
OVERHEAD EXPENSES													
Wages & Salaries	$21	$21	$21	$21	$21	$21	$21	$59	$58	$59	$59	$59	$441
Directors Fees	$10	$10	$10	$10	$10	$10	$11	$11	$11	$11	$11	$10	$125
Prof. Services	$15	$16	$15	$16	$15	$16	$15	$16	$16	$16	$17	$17	$190
Financial	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$1	$1
H.P. & Leasing	$5	$5	$5	$5	$5	$5	$5	$5	$5	$5	$5	$5	$60
Insurances	$1	$1	$1	$1	$1	$1	$1	$1	$1	$1	$1	$1	$12
Occupancy	$2	$2	$2	$2	$2	$2	$2	$2	$2	$2	$2	$2	$24
Office Supplies	$1	$0	$1	$0	$1	$0	$1	$0	$1	$0	$1	$0	$6
Phone & Post	$1	$2	$1	$2	$1	$2	$1	$2	$1	$2	$1	$2	$18
Advert & Prom	$1	$1	$1	$1	$1	$1	$1	$1	$1	$1	$1	$1	$12
Travel & Trans.	$5	$5	$5	$5	$5	$5	$5	$5	$6	$6	$6	$6	$64
Entertainment	$2	$3	$2	$3	$2	$3	$2	$3	$2	$3	$2	$3	$30
Other	$8	$9	$8	$9	$8	$9	$8	$9	$8	$9	$8	$9	$102
Overhead Exp.	$72	$75	$72	$75	$72	$75	$73	$114	$112	$115	$114	$116	$1,085
TOTAL EXPENSES	$82	$85	$82	$85	$82	$85	$83	$124	$391	$1,200	$1,199	$1,201	$4,699

CASH FLOW PROJECTION FOR YEAR ENDING JUNE 19X1

PRODUCTION 500,000 TONNES P.A.

BEST CASE

PROFITABILITY FORECAST [000's]

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total
Sales(Invoiced)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$1,760	$1,760	$1,760	$5,280
Other Income	$0	$65	$64	$63	$63	$59	$50	$42	$33	$27	$23	$25	$514
Total Income	$0	$65	$64	$63	$63	$59	$50	$42	$33	$1,787	$1,783	$1,785	$5,794
Cost of goods sold	$10	$10	$10	$10	$10	$10	$10	$10	$279	$1,085	$1,085	$1,085	$3,614
Gross Profit before oh & tax	($10)	$55	$54	$53	$53	$49	$40	$32	($246)	$702	$698	$700	$2,180
Company Overhead	$72	$75	$72	$75	$72	$75	$73	$114	$112	$115	$114	$116	$1,085
Taxation	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Depreciation	$0	$0	$0	$0	$0	$0	$0	$0	$0	$84	$84	$84	$252
Profitability	($82)	($20)	($18)	($22)	($19)	($26)	($33)	($82)	($358)	$503	$500	$500	$843

CASH FLOW PROJECTION FOR YEAR ENDING 19X2

PRODUCTIO 1,000,000 TONNES P.A.

BEST CASE

CASH FLOW SUMMARY [000'S]

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	Total
CASH INFLOW:													
Sales Collect.	$1,760	$1,760	$1,760	$1,760	$1,760	$1,760	$1,760	$1,760	$3,520	$3,520	$3,520	$3,520	$28,160
Interest Rcvd	$27	$28	$30	$32	$34	$36	$37	$39	$39	$44	$50	$56	$452
TOTAL INFLOW	$1,787	$1,788	$1,790	$1,792	$1,794	$1,796	$1,797	$1,799	$3,559	$3,564	$3,570	$3,576	$28,612
CASH OUTFLOW:													
Produc. Expenses	$1,085	$1,085	$1,085	$1,085	$1,085	$1,085	$1,212	$1,726	$1,726	$1,726	$1,726	$1,726	$16,352
Overh. Expenses	$115	$117	$118	$118	$119	$120	$121	$120	$121	$120	$121	$125	$1,435
Taxation	$82	$0	$82	$0	$0	$82	$0	$0	$83	$0	$0	$0	$329
Dividends Paid	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
TOTAL OUTFLOW	$1,282	$1,202	$1,285	$1,203	$1,204	$1,287	$1,333	$1,846	$1,930	$1,846	$1,847	$1,851	$18,116
CASH MOVEMENTS	$505	$586	$505	$589	$590	$509	$464	($47)	$1,629	$1,718	$1,723	$1,725	$10,496
OPENING BALANCE	$8,160	$8,665	$9,251	$9,756	$10,345	$10,935	$11,444	$11,908	$11,861	$13,490	$15,208	$16,931	
FUNDS AVAILABLE	$8,665	$9,251	$9,756	$10,345	$10,935	$11,444	$11,908	$11,861	$13,490	$15,208	$16,931	$18,656	

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CASH FLOW PROJECTION FOR YEAR ENDING 19X2

PRODUCTIO 1,000,000 TONNES P.A.

BEST CASE

ESTIMATED MONTHLY SALES [000'S]

MONTH	SALES	CASH INFLOW												
		Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total
JUL	$1,760	$0	$1,760	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$1,760
AUG	$1,760	$0	$0	$1,760	$0	$0	$0	$0	$0	$0	$0	$0	$0	$1,760
SEP	$1,760	$0	$0	$0	$1,760	$0	$0	$0	$0	$0	$0	$0	$0	$1,760
OCT	$1,760	$0	$0	$0	$0	$1,760	$0	$0	$0	$0	$0	$0	$0	$1,760
NOV	$1,760	$0	$0	$0	$0	$0	$1,760	$0	$0	$0	$0	$0	$0	$1,760
DEC	$1,760	$0	$0	$0	$0	$0	$0	$1,760	$0	$0	$0	$0	$0	$1,760
JAN	$1,760	$0	$0	$0	$0	$0	$0	$0	$1,760	$0	$0	$0	$0	$1,760
FEB	$3,520	$0	$0	$0	$0	$0	$0	$0	$0	$3,520	$0	$0	$0	$3,520
MAR	$3,520	$0	$0	$0	$0	$0	$0	$0	$0	$0	$3,520	$0	$0	$3,520
APR	$3,520	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$3,520	$0	$3,520
MAY	$3,520	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$3,520	$3,520
JUN	$3,520	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
TOTAL	$29,920	$0	$1,760	$1,760	$1,760	$1,760	$1,760	$1,760	$1,760	$3,520	$3,520	$3,520	$3,520	$26,400
TOT. CASH INFLOW [SALES+DEBTORS]		$1,760	$1,760	$1,760	$1,760	$1,760	$1,760	$1,760	$1,760	$3,520	$3,520	$3,520	$3,520	$28,160

TOTAL SALES FOR YEAR: $29,920

TOTAL CASH INFLOW FROM SALES: $28,160

OUTSTANDING DEBTORS AT YEAR END: $3,520

CASH FLOW PROJECTION FOR YEAR ENDING 19X2

PRODUCTIO N 1,000,000 TONNES P.A.

BEST CASE

ESTIMATED EXPENSE PAYMENTS [000'S]

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total
PRODUCT.EXPENSES													
Wages & Salaries	$64	$64	$64	$64	$64	$64	$64	$75	$75	$75	$75	$75	$823
Transport	$806	$806	$806	$806	$806	$806	$806	$1,309	$1,309	$1,309	$1,309	$1,309	$12,187
Operating Cost	$215	$215	$215	$215	$215	$215	$342	$342	$342	$342	$342	$342	$3,342
Produc. Expenses	$1,085	$1,085	$1,085	$1,085	$1,085	$1,085	$1,212	$1,726	$1,726	$1,726	$1,726	$1,726	$16,352
OVERHEAD EXPENSES													
Wages & Salaries	$61	$61	$61	$61	$61	$61	$61	$61	$61	$61	$61	$60	$731
Directors Fees	$11	$11	$11	$11	$11	$11	$12	$12	$12	$12	$12	$12	$138
Prof. Services	$14	$16	$16	$16	$16	$16	$16	$16	$16	$16	$16	$16	$190
Financial	$0	$0	$0	$0	$0	$0	$0	$0	$1	$0	$0	$1	$2
H.P. & Leasing	$5	$5	$5	$5	$5	$6	$6	$5	$5	$5	$5	$5	$62
Insurances	$1	$1	$1	$1	$1	$1	$1	$1	$1	$1	$1	$2	$13
Occupancy	$2	$2	$2	$2	$2	$2	$2	$2	$2	$2	$3	$3	$26
Office Supplies	$1	$0	$1	$0	$1	$0	$1	$0	$1	$0	$1	$1	$7
Phone & Post	$1	$1	$1	$1	$2	$2	$2	$2	$2	$2	$2	$2	$20
Advert & Prom	$1	$1	$1	$1	$1	$1	$1	$1	$1	$1	$1	$2	$13
Travel & Trans.	$8	$8	$8	$8	$8	$8	$8	$8	$8	$8	$8	$8	$96
Entertainment	$2	$3	$2	$3	$2	$3	$2	$3	$2	$3	$2	$4	$31
Other	$8	$8	$9	$9	$9	$9	$9	$9	$9	$9	$9	$9	$106
Overhead Exp.	$115	$117	$118	$118	$119	$120	$121	$120	$121	$120	$121	$125	$1,435
TOTAL EXPENSES	$1,200	$1,202	$1,203	$1,203	$1,204	$1,205	$1,333	$1,846	$1,847	$1,846	$1,847	$1,851	$17,787

CASH FLOW PROJECTION FOR YEAR ENDING 199X2

PRODUCTION 1,000,000 TONNES P.A.

PROFITABILITY FORECAST [000'S]

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total
Sales(Invoiced)	$1,760	$1,760	$1,760	$1,760	$1,760	$1,760	$1,760	$3,520	$3,520	$3,520	$3,520	$3,520	$29,920
Other Income	$27	$28	$30	$32	$34	$36	$37	$39	$39	$44	$50	$56	$452
Total Income	$1,787	$1,788	$1,790	$1,792	$1,794	$1,796	$1,797	$3,559	$3,559	$3,564	$3,570	$3,576	$30,372
Cost of goods sold	$1,085	$1,085	$1,085	$1,085	$1,085	$1,085	$1,212	$1,726	$1,726	$1,726	$1,726	$1,726	$16,352
Gross Profit before oh & tax	$702	$703	$705	$707	$709	$711	$585	$1,833	$1,833	$1,838	$1,844	$1,850	$14,020
Company Overhead	$115	$117	$118	$118	$119	$120	$121	$120	$121	$120	$121	$125	$1,435
Taxation	$28	$27	$28	$27	$28	$27	$27	$28	$27	$28	$27	$27	$329
Depreciation	$83	$84	$83	$84	$83	$84	$83	$84	$83	$84	$83	$82	$1,000
Profitability	$476	$475	$476	$478	$479	$480	$354	$1,601	$1,602	$1,606	$1,613	$1,616	$11,256

BEST CASE

CASH FLOW SUMMARY FOR THE FIVE YEARS

[000'S]

	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
A. OPENING BALANCE	$0	$8,160	$18,656	$33,535	$48,047
B. CASH INFLOW					
Sales Collections	$3,520	$28,160	$42,940	$44,620	$46,360
Loans other	$200	$0	$0	$0	$0
Capital Inv.	$20,000	$0	$0	$0	$0
Interest Received	$514	$452	$946	$1,566	$2,110
TOTAL RECEIPTS	$24,234	$28,612	$43,886	$46,186	$48,470
C. CASH OUTFLOW					
Overhead Expenses	$1,085	$1,435	$1,499	$1,558	$1,609
Product. Expenses	$3,614	$16,352	$21,058	$21,906	$22,796
Capital Items	$11,375	$0	$0	$0	$0
Taxation Paid	$0	$329	$4,390	$6,270	$6,080
Dividends paid	$0	$0	$2,000	$2,000	$2,000
TOTAL PAYMENTS	$16,074	$18,116	$28,947	$31,734	$32,485
D. CASH MOVEMENTS	$8,160	$10,496	$14,939	$14,452	$15,985
E. FUNDS AVAILABLE	$8,160	$18,656	$33,595	$48,047	$64,032

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BEST CASE	BUDGETED PROFIT & LOSS FOR THE FIVE YEARS				
[000's]	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
INCOME:					
Trading Receipts	$5,280	$29,920	$43,080	$44,760	$46,512
Less					
Wages/Salaries	$336	$823	$921	$964	$1,005
Operat./Transp. Costs	$3,278	$15,529	$20,137	$20,942	$21,791
COST OF GOODS SOLD	$3,614	$16,352	$21,058	$21,906	$22,796
GROSS PROFIT	$1,666	$13,568	$22,022	$22,854	$23,716
OTHER INCOME:					
Interest	$514	$452	$946	$1,566	$2,110
TOTAL INCOME	$2,180	$14,020	$22,968	$24,420	$25,826
EXPENDITURE					
Wages & Salaries	$441	$731	$761	$792	$810
Directors Fees	$125	$138	$144	$150	$156
Professional Services	$190	$190	$197	$205	$214
Financial	$1	$2	$3	$4	$5
H.P. & Leasing	$60	$62	$64	$67	$70
Insurance	$12	$13	$14	$14	$15
Occupancy	$24	$26	$27	$28	$29
Office Supplies	$6	$7	$8	$9	$9
Telephone & Postage	$18	$20	$21	$22	$24
Advert. & Promotion	$12	$13	$14	$14	$15
Travel	$64	$96	$100	$104	$108
Entertainment	$30	$31	$36	$34	$35
Other	$102	$106	$110	$115	$119
Depreciation	$252	$1,000	$1,000	$1,000	$1,000
Taxation	$0	$329	$4,390	$6,270	$6,080
TOTAL EXPENDITURE	$1,337	$2,764	$6,889	$8,828	$8,689
NET PROFIT	$843	$11,256	$16,079	$15,592	$17,137
LOSS PREVIOUS YEAR	$0	$0	$0	$0	$0
INCOME TAX PAYABLE	$329	$4,390	$6,270	$6,080	$6,683
NET PROFIT AFTER TAX	$514	$6,866	$9,809	$9,512	$10,454
DIVIDENDS PAID	$0	$2,000	$2,000	$2,000	$4,000
RETAINED EARNINGS	$514	$4,866	$7,809	$7,512	$6,454
GROSS PROFIT/SALES	32%	45%	51%	51%	51%
NET PROFIT BEFORE TAX/SALES	16%	38%	37%	35%	37%
NET PROFIT AFTER TAX/SALES	10%	23%	23%	21%	22%

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BEST CASE

OVERHEAD EXPENSES FOR THE FIVE YEARS

[000'S]

	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
WAGES/SALARIES	$441	$731	$761	$792	$810
DIRECTORS FEES	$125	$138	$144	$150	$156
PROFESSIONAL FEES	$190	$190	$197	$205	$214
FINANCIAL	$1	$2	$3	$4	$5
H.P. & LEASING	$60	$62	$64	$67	$70
INSURANCE	$12	$13	$14	$14	$15
OCCUPANCY	$24	$26	$27	$28	$29
OFFICE SUPPLIES	$6	$7	$8	$9	$9
TELEPHONE & POSTAGE	$18	$20	$21	$22	$24
ADVERT. & PROMOTION	$12	$13	$14	$14	$15
TRAVEL	$64	$96	$100	$104	$108
ENTERTAINMENT	$30	$31	$36	$34	$35
OTHERS	$102	$106	$110	$115	$119
TOTAL OVERHEAD EXP.	$1,085	$1,435	$1,499	$1,558	$1,609

BEST CASE

BALANCE SHEET FOR THE FIVE YEARS

[000'S]

	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
CURRENT ASSETS					
Cash	$8,160	$17,152	$27,607	$35,691	$45,495
Trade Debtors	$1,760	$3,520	$3,660	$3,800	$3,952
W.I.P.	$1,175	$2,350	$2,444	$2,542	$2,643
Total Current Assets	$11,095	$23,022	$33,711	$42,033	$52,090
FIXED ASSETS					
Land & Buildings	$335	$335	$335	$335	$335
Plant & Machinery	$9,865	$9,865	$9,865	$9,865	$9,865
Less Depreciation	$252	$1,252	$2,252	$3,252	$4,252
Total Fixed Assets	$9,948	$8,948	$7,948	$6,948	$5,948
TOTAL ASSETS	$21,043	$31,970	$41,659	$48,981	$58,038
CURRENT LIABILITIES					
Provision for Tax	$329	$4,390	$6,270	$6,080	$6,683
Provision for Dividends	$0	$2,000	$2,000	$2,000	$4,000
Provision for Loans	$0	$0	$0	$0	$200
Total Curr.Liabilities	$329	$6,390	$8,270	$8,080	$10,883
NON CURRENT LIABILITIES					
Director's Loans (5 years)	$200	$200	$200	$200	$0
SHAREHOLDERS FUND					
Paid-in Capital	$20,000	$20,000	$20,000	$20,000	$20,000
Retained Earnings	$0	$514	$5,380	$13,189	$20,701
Profit & Loss	$514	$4,866	$7,809	$7,512	$6,454
Total Sharehold. Fund	$20,514	$25,380	$33,189	$40,701	$47,155
TOTAL LIABILITIES	$21,043	$31,970	$41,659	$48,981	$58,038
WORKING CAPITAL RATIO	3372%	360%	407%	520%	478%
CURRENT RATIO	3015%	323%	378%	488%	454%
EQUITY RATIO	97%	79%	79%	83%	81%

CASH FLOW PROJECTION FOR YEAR ENDING JUNE 19X1

PRODUCTION 500,000 TONNES P.A.

EXPECTED CASE

CASH FLOW SUMMARY [000'S]

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	Total
CASH INFLOW:													
Sales Collect.	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$1,760	$1,760	$3,520
Loan other	$200	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$200
Capital	$20,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$20,000
Interest Rcvd	$0	$65	$64	$63	$63	$59	$50	$42	$33	$27	$22	$23	$511
TOTAL INFLOW	$20,200	$65	$64	$63	$63	$59	$50	$42	$33	$27	$1,782	$1,783	$24,231
CASH OUTFLOW:													
Overhead Exp.	$72	$75	$72	$75	$72	$75	$72	$114	$112	$115	$114	$117	$1,085
Product. Exp.	$10	$10	$10	$10	$10	$10	$10	$10	$279	$1,353	$1,353	$1,353	$4,418
Capital Items	$525	$200	$250	$100	$1,120	$2,550	$2,550	$2,550	$1,530	$0	$0	$0	$11,375
TOTAL OUTFLOW	$607	$285	$332	$185	$1,202	$2,635	$2,632	$2,674	$1,921	$1,468	$1,467	$1,470	$16,878
CASH MOVEMENTS	$19,593	($220)	($268)	($122)	($1,139)	($2,576)	($2,582)	($2,632)	($1,888)	($1,441)	$315	$313	$7,353
OPENING BALANCE	$0	$19,593	$19,373	$19,105	$18,983	$17,844	$15,268	$12,686	$10,054	$8,166	$6,725	$7,040	
OVERDRAFT INT.	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
FUNDS AVAILABLE	$19,593	$19,373	$19,105	$18,983	$17,844	$15,268	$12,686	$10,054	$8,166	$6,725	$7,040	$7,353	

CASH FLOW PROJECTION FOR YEAR ENDING JUNE 19X1

PRODUCTION 500,000 TONNES P.A.

EXPECTED CASE

ESTIMATED MONTHLY SALES [000'S]

MONTH	SALES	CASH INFLOW												
		Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total
JUL	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
AUG	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
SEP	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
OCT	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
NOV	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
DEC	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
JAN	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
FEB	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
MAR	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
APR	$1,760	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$1,760	$0	$1,760
MAY	$1,760	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$1,760	$1,760
JUN	$1,760	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
TOTAL	$5,280	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$1,760	$1,760	$3,520
TOT.CASH INFLOW [SALES+DEBTORS]		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$1,760	$1,760	$3,520

TOTAL SALES FOR YEAR:	$5,280
TOTAL CASH INFLOW FROM SALES:	$3,520
OUTSTANDING DEBTORS AT YEAR END:	$1,760

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CASH FLOW PROJECTION FOR YEAR ENDING JUNE 19X1

PRODUCTION 500,000 TONNES P.A.

EXPECTED CASE

ESTIMATED EXPENSE PAYMENTS [000'S]

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total
PRODUCT.EXPENSES													
Wages & Salaries	$10	$10	$10	$10	$10	$10	$10	$10	$64	$64	$64	$64	$336
Transport	$0	$0	$0	$0	$0	$0	$0	$0	$0	$1,074	$1,074	$1,074	$3,222
Operating Cost	$0	$0	$0	$0	$0	$0	$0	$0	$215	$215	$215	$215	$860
Produc. Expenses	$10	$10	$10	$10	$10	$10	$10	$10	$279	$1,353	$1,353	$1,353	$4,418
OVERHEAD EXPENSES													
Wages & Salaries	$21	$21	$21	$21	$21	$21	$21	$59	$58	$59	$59	$59	$441
Directors Fees	$10	$10	$10	$10	$10	$10	$10	$11	$11	$11	$11	$11	$125
Prof. Services	$15	$16	$15	$16	$15	$16	$15	$16	$16	$16	$17	$17	$190
Financial	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$1	$1
H.P. & Leasing	$5	$5	$5	$5	$5	$5	$5	$5	$5	$5	$5	$5	$60
Insurances	$1	$1	$1	$1	$1	$1	$1	$1	$1	$1	$1	$1	$12
Occupancy	$2	$2	$2	$2	$2	$2	$2	$2	$2	$2	$2	$2	$24
Office Supplies	$1	$0	$1	$0	$1	$0	$1	$0	$1	$0	$1	$0	$6
Phone & Post	$1	$2	$1	$2	$1	$2	$1	$2	$1	$2	$1	$2	$18
Advert. & Promot.	$1	$1	$1	$1	$1	$1	$1	$1	$1	$1	$1	$1	$12
Travel & Trans.	$5	$5	$5	$5	$5	$5	$5	$5	$6	$6	$6	$6	$64
Entertainment	$2	$3	$2	$3	$2	$3	$2	$3	$2	$3	$2	$3	$30
Other	$8	$9	$8	$9	$8	$9	$8	$9	$8	$9	$8	$9	$102
Overhead Exp.	$72	$75	$72	$75	$72	$75	$72	$114	$112	$115	$114	$117	$1,085
TOTAL EXPENSES	$82	$85	$82	$85	$82	$85	$82	$124	$391	$1,468	$1,467	$1,470	$5,503

CASH FLOW PROJECTION FOR YEAR ENDING JUNE 19X1

PRODUCTION 500,000 TONNES P.A.

EXPECTED CASE

PROFITABILITY FORECAST [000'S]

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total
Sales(Invoiced)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$1,760	$1,760	$1,760	$5,280
Other Income	$0	$65	$64	$63	$63	$59	$50	$42	$33	$27	$22	$23	$511
Total Income	$0	$65	$64	$63	$63	$59	$50	$42	$33	$1,787	$1,782	$1,783	$5,791
Cost of goods sold	$10	$10	$10	$10	$10	$10	$10	$10	$279	$1,353	$1,353	$1,353	$4,418
Gross Profit before oh & tax	($10)	$55	$54	$53	$53	$49	$40	$32	($246)	$434	$429	$430	$1,373
Company Overhead	$72	$75	$72	$75	$72	$75	$72	$114	$112	$115	$114	$117	$1,085
Taxation	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Depreciation	$0	$0	$0	$0	$0	$0	$0	$0	$0	$84	$84	$84	$252
Profitability	($82)	($20)	($18)	($22)	($19)	($26)	($32)	($82)	($358)	$235	$231	$229	$36

CASH FLOW PROJECTION FOR YEAR ENDING 19X2

PRODUCTION 1,000,000 TONNES P.A.

EXPECTED CASE

CASH FLOW SUMMARY [000'S]

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	Total
CASH INFLOW:													
Sales Collect.	$1,760	$1,760	$1,760	$1,760	$1,760	$1,760	$1,760	$1,760	$3,520	$3,520	$3,520	$3,520	$28,160
Interest Rcvd	$24	$25	$26	$27	$28	$29	$30	$31	$29	$33	$38	$42	$362
TOTAL INFLOW	$1,784	$1,785	$1,786	$1,787	$1,788	$1,789	$1,790	$1,791	$3,549	$3,553	$3,558	$3,562	$28,522
CASH OUTFLOW:													
Overhead Exp.	$117	$118	$117	$118	$119	$120	$120	$122	$120	$122	$120	$122	$1,435
Product. Exp.	$1,353	$1,353	$1,353	$1,353	$1,353	$1,353	$1,480	$2,173	$2,173	$2,173	$2,173	$2,173	$20,463
Taxation	$3	$0	$4	$0	$0	$3	$0	$0	$4	$0	$0	$0	$14
TOTAL OUTFLOW	$1,473	$1,471	$1,474	$1,471	$1,472	$1,476	$1,600	$2,295	$2,297	$2,295	$2,293	$2,295	$21,912
CASH MOVEMENTS	$311	$314	$312	$316	$316	$313	$190	($504)	$1,252	$1,258	$1,265	$1,267	$6,610
OPENING BALANCE	$7,353	$7,664	$7,978	$8,290	$8,606	$8,922	$9,235	$9,425	$8,921	$10,173	$11,431	$12,696	
FUNDS AVAILABLE	$7,664	$7,978	$8,290	$8,606	$8,922	$9,235	$9,425	$8,921	$10,173	$11,431	$12,696	$13,963	

CASH FLOW PROJECTION FOR YEAR ENDING 19X2

PRODUCTION 1,000,000 TONNES P.A.

EXPECTED CASE

ESTIMATED MONTHLY SALES [000'S]

MONTH	SALES	CASH INFLOW												
		Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total
JUL	$1,760	$0	$1,760	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$1,760
AUG	$1,760	$0	$0	$1,760	$0	$0	$0	$0	$0	$0	$0	$0	$0	$1,760
SEP	$1,760	$0	$0	$0	$1,760	$0	$0	$0	$0	$0	$0	$0	$0	$1,760
OCT	$1,760	$0	$0	$0	$0	$1,760	$0	$0	$0	$0	$0	$0	$0	$1,760
NOV	$1,760	$0	$0	$0	$0	$0	$1,760	$0	$0	$0	$0	$0	$0	$1,760
DEC	$1,760	$0	$0	$0	$0	$0	$0	$1,760	$0	$0	$0	$0	$0	$1,760
JAN	$1,760	$0	$0	$0	$0	$0	$0	$0	$1,760	$0	$0	$0	$0	$1,760
FEB	$3,520	$0	$0	$0	$0	$0	$0	$0	$0	$3,520	$0	$0	$0	$3,520
MAR	$3,520	$0	$0	$0	$0	$0	$0	$0	$0	$0	$3,520	$0	$0	$3,520
APR	$3,520	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$3,520	$0	$3,520
MAY	$3,520	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$3,520	$3,520
JUN	$3,520	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
TOTAL	$29,920	$0	$1,760	$1,760	$1,760	$1,760	$1,760	$1,760	$1,760	$3,520	$3,520	$3,520	$3,520	$26,400
TOT. CASH INFLOW [SALES+DEBTORS]		$1,760	$1,760	$1,760	$1,760	$1,760	$1,760	$1,760	$1,760	$3,520	$3,520	$3,520	$3,520	$28,160

TOTAL SALES FOR YEAR:	$29,920
TOTAL CASH INFLOW FROM SALES:	$28,160
OUTSTANDING DEBTORS AT YEAR END:	$3,520

CASH FLOW PROJECTION FOR YEAR ENDING JUNE 19X2

PRODUCTION 1,000,000 TONNES P.A.

EXPECTED CASE

ESTIMATED EXPENSE PAYMENTS ('000'S)

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total
PRODUCT.EXPENSES													
Wages & Salaries	$64	$64	$64	$64	$64	$64	$64	$75	$75	$75	$75	$75	$823
Transport	$1,074	$1,074	$1,074	$1,074	$1,074	$1,074	$1,074	$1,756	$1,756	$1,756	$1,756	$1,756	$16,298
Operating Cost	$215	$215	$215	$215	$215	$215	$342	$342	$342	$342	$342	$342	$3,342
Produc. Expenses	$1,353	$1,353	$1,353	$1,353	$1,353	$1,353	$1,480	$2,173	$2,173	$2,173	$2,173	$2,173	$20,463
OVERHEAD EXPENSES													
Wages & Salaries	$61	$61	$61	$61	$61	$61	$61	$61	$61	$61	$61	$60	$731
Directors Fees	$11	$11	$11	$11	$11	$11	$12	$12	$12	$12	$12	$12	$138
Prof. Services	$16	$16	$16	$16	$16	$16	$16	$16	$16	$16	$16	$14	$190
Financial	$0	$0	$0	$0	$0	$0	$1	$0	$0	$0	$0	$1	$2
H.P. & Leasing	$5	$5	$5	$5	$5	$5	$5	$5	$5	$6	$5	$6	$62
Insurances	$1	$1	$1	$1	$1	$1	$1	$1	$1	$1	$1	$2	$13
Occupancy	$1	$2	$1	$2	$2	$2	$2	$3	$2	$3	$3	$3	$26
Office Supplies	$1	$0	$1	$0	$1	$1	$0	$1	$1	$0	$1	$0	$7
Phone & Post	$1	$1	$1	$1	$2	$2	$2	$2	$2	$2	$2	$2	$20
Adv. & Promot.	$1	$1	$1	$1	$1	$1	$1	$1	$1	$1	$1	$2	$13
Travel & Trans.	$8	$8	$8	$8	$8	$8	$8	$8	$8	$8	$8	$8	$96
Entertainment	$2	$3	$2	$3	$2	$3	$2	$3	$2	$3	$2	$4	$31
Other	$9	$9	$9	$9	$9	$9	$9	$9	$9	$9	$8	$8	$106
Overhead Exp.	$117	$118	$117	$118	$119	$120	$120	$122	$120	$122	$120	$122	$1,435
TOTAL EXPENSES	$1,470	$1,471	$1,470	$1,471	$1,472	$1,473	$1,600	$2,295	$2,293	$2,295	$2,293	$2,295	$21,898

CASH FLOW PROJECTION FOR YEAR ENDING JUNE 19X2

PRODUCTION 1,000,000 TONNES P.A.

EXPECTED CASE

PROFITABILITY FORECAST [000'S]

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total
Sales(Invoiced)	$1,760	$1,760	$1,760	$1,760	$1,760	$1,760	$1,760	$3,520	$3,520	$3,520	$3,520	$3,520	$29,920
Other Income	$24	$25	$26	$27	$28	$29	$30	$31	$29	$33	$38	$42	$362
Total Income	$1,784	$1,785	$1,786	$1,787	$1,788	$1,789	$1,790	$3,551	$3,549	$3,553	$3,558	$3,562	$30,282
Cost of goods sold	$1,353	$1,353	$1,353	$1,353	$1,353	$1,353	$1,480	$2,173	$2,173	$2,173	$2,173	$2,173	$20,463
Gross Profit before oh & tax	$431	$432	$433	$434	$435	$436	$310	$1,378	$1,376	$1,380	$1,385	$1,389	$9,819
Company Overhead	$117	$118	$117	$118	$119	$120	$120	$122	$120	$122	$120	$122	$1,435
Taxation	$1	$1	$2	$1	$1	$1	$1	$1	$1	$2	$1	$1	$14
Depreciation	$83	$83	$83	$83	$83	$83	$83	$83	$83	$83	$83	$87	$1,000
Profitability	$230	$230	$231	$232	$232	$232	$106	$1,172	$1,172	$1,173	$1,181	$1,179	$7,370

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CASH FLOW SUMMARY FOR THE FIVE YEARS

EXPECTED CASE

[000'S]	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
A. OPENING BALANCE	$0	$7,353	$13,963	$24,692	$34,627
B. RECEIPTS					
Sales Collections	$3,520	$28,160	$42,940	$44,620	$46,360
Loans other	$200	$0	$0	$0	$0
Capital Inv.	$20,000	$0	$0	$0	$0
Interest Received	$511	$362	$675	$1,077	$1,501
TOTAL RECEIPTS	$24,231	$28,522	$43,615	$45,697	$47,861
C. PAYMENTS					
Overhead Expenses	$1,085	$1,435	$1,499	$1,558	$1,609
Product. Expenses	$4,418	$20,463	$26,512	$27,576	$28,687
Capital Items	$11,375	$0	$0	$0	$0
Taxation paid	$0	$14	$2,875	$4,628	$4,320
Dividends paid	$0	$0	$2,000	$2,000	$2,000
TOTAL PAYMENTS	$16,878	$21,912	$32,886	$35,762	$36,616
D. CASH MOVEMENTS	$7,353	$6,610	$10,729	$9,935	$11,245
F. FUNDS AVAILABLE	$7,353	$13,963	$24,692	$34,627	$45,872

EXPECTED CASE

BUDGETED PROFIT & LOSS FOR THE FIVE YEARS

[000's]	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
INCOME:					
Trading Receipts	$5,280	$29,920	$43,080	$44,760	$46,512
Less					
Wages/Salaries	$336	$823	$921	$964	$1,005
Operat./Transp. Costs	$4,082	$19,640	$25,591	$26,612	$27,682
COST OF GOODS SOLD	$4,418	$20,463	$26,512	$27,576	$28,687
GROSS PROFIT	$862	$9,457	$16,568	$17,184	$17,825
OTHER INCOME:					
Interest	$511	$362	$675	$1,077	$1,501
TOTAL INCOME	$1,373	$9,819	$17,243	$18,261	$19,326
EXPENDITURE:					
Wages & Salaries	$441	$731	$761	$792	$810
Directors Fees	$125	$138	$144	$150	$156
Professional Services	$190	$190	$197	$205	$214
Financial	$1	$2	$3	$4	$5
H.P. & Leasing	$60	$62	$64	$67	$70
Insurance	$12	$13	$14	$14	$15
Occupancy	$24	$26	$27	$28	$29
Office Supplies	$6	$7	$8	$9	$9
Telephone & Postage	$18	$20	$21	$22	$24
Advert. & Promotion	$12	$13	$14	$14	$15
Travel	$64	$96	$100	$104	$108
Entertainment	$30	$31	$36	$34	$35
Other	$102	$106	$110	$115	$119
Depreciation	$252	$1,000	$1,000	$1,000	$1,000
Taxation	$0	$14	$2,875	$4,628	$4,320
TOTAL EXPENDITURE	$1,337	$2,449	$5,374	$7,186	$6,929
NET PROFIT	$36	$7,370	$11,869	$11,075	$12,397
LOSS PREVIOUS YEAR	$0	$0	$0	$0	$0
INCOME TAX PAYABLE	$14	$2,875	$4,628	$4,320	$4,834
NET PROFIT AFTER TAX	$22	$4,495	$7,241	$6,755	$7,563
DIVIDENDS PAID	$0	$2,000	$2,000	$2,000	$4,000
RETAINED EARNINGS	$22	$2,495	$5,241	$4,755	$3,563
GROSS PROFIT/SALES	16%	32%	38%	38%	38%
NET PROFIT BEFORE TAX/SALES	0.70%	25%	28%	25%	27%
NET PROFIT AFTER TAX/SALES	0.42%	15%	17%	15%	16%

OVERHEAD EXPENSES FOR THE FIVE YEARS

EXPECTED CASE

[000'S]	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
WAGES/SALARIES	$441	$731	$761	$792	$810
DIRECTORS FEES	$125	$138	$144	$150	$156
PROFESSIONAL FEES	$190	$190	$197	$205	$214
FINANCIAL	$1	$2	$3	$4	$5
H.P. & LEASING	$60	$62	$64	$67	$70
INSURANCE	$12	$13	$14	$14	$15
OCCUPANCY	$24	$26	$27	$28	$29
OFFICE SUPPLIES	$6	$7	$8	$9	$9
TELEPHONE & POSTAGE	$18	$20	$21	$22	$24
ADVERT. & PROMOTION	$12	$13	$14	$14	$15
TRAVEL	$64	$96	$100	$104	$108
ENTERTAINMENT	$30	$31	$36	$34	$35
OTHERS	$102	$106	$110	$115	$119
TOTAL OVERHEAD EXP.	$1,085	$1,435	$1,499	$1,558	$1,609

142154

BALANCE SHEET FOR THE FIVE YEARS

EXPECTED CASE

[000'S]	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
CURRENT ASSETS					
Cash	$7,353	$12,774	$20,534	$25,743	$32,567
Trade Debtors	$1,760	$3,520	$3,660	$3,800	$3,952
W.I.P.	$1,175	$2,350	$2,444	$2,542	$2,643
Total Current Assets	$10,288	$18,644	$26,638	$32,085	$39,162
FIXED ASSETS					
Land & Buildings	$335	$335	$335	$335	$335
Plant & Machinery	$9,865	$9,865	$9,865	$9,865	$9,865
Less Depreciation	$252	$1,252	$2,252	$3,252	$4,252
Total Fixed Assets	$9,948	$8,948	$7,948	$6,948	$5,948
TOTAL ASSETS	$20,236	$27,592	$34,586	$39,033	$45,110
CURRENT LIABILITIES					
Provision for Tax	$14	$2,875	$4,628	$4,320	$4,834
Provision for Loans	$0	$0	$0	$0	$200
Provision for dividends	$0	$2,000	$2,000	$2,000	$4,000
Total Curr.Liabilities	$14	$2,875	$4,628	$4,320	$5,034
NON CURRENT LIABILITIES					
Directors Loans (5 years	$200	$200	$200	$200	$0
SHAREHOLDERS FUND					
Paid-in Capital	$20,000	$20,000	$20,000	$20,000	$20,000
Retained Earnings	$0	$22	$2,517	$7,758	$12,513
Profit & Loss	$22	$2,495	$5,241	$4,755	$3,563
Total Sharehold. Fund	$20,022	$22,517	$27,758	$32,513	$36,076
TOTAL LIABILITIES	$20,236	$25,592	$32,586	$37,033	$41,110
WORKING CAPITAL RATIO	735%	382%	402%	507%	433%
CURRENT RATIO	650%	334%	365%	467%	404%
EQUITY RATIO	10%	81%	80%	83%	80%

CASH FLOW PROJECTION FOR YEAR ENDING JUNE 19X1

PRODUCTION 500,000 TONNES P.A.

WORST CASE

CASH FLOW SUMMARY [000'S]

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	Total
CASH INFLOW:													
Sales Collect.	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$1,760	$1,760	$3,520
Loans other	$200	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$200
Capital	$20,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$20,000
Interest Rcvd	$0	$65	$64	$63	$63	$59	$50	$42	$33	$27	$21	$21	$508
TOTAL INFLOW	$20,200	$65	$64	$63	$63	$59	$50	$42	$33	$27	$1,781	$1,781	$24,228
CASH OUTFLOW:													
Overhead Exp.	$72	$75	$72	$75	$72	$75	$72	$114	$112	$115	$114	$117	$1,085
Product. Exp.	$10	$10	$10	$10	$10	$10	$10	$10	$279	$1,701	$1,701	$1,701	$5,462
Capital Items	$525	$200	$250	$100	$1,120	$2,550	$2,550	$2,550	$1,530	$0	$0	$0	$11,375
TOTAL OUTFLOW	$607	$285	$332	$185	$1,202	$2,635	$2,632	$2,674	$1,921	$1,816	$1,815	$1,818	$17,922
CASH MOVEMENTS	$19,593	($220)	($268)	($122)	($1,139)	($2,576)	($2,582)	($2,632)	($1,888)	($1,789)	($34)	($37)	$6,306
OPENING BALANCE	$0	$19,593	$19,373	$19,105	$18,983	$17,844	$15,268	$12,686	$10,054	$8,166	$6,377	$6,343	
FUNDS AVAILABLE	$19,593	$19,373	$19,105	$18,983	$17,844	$15,268	$12,686	$10,054	$8,166	$6,377	$6,343	$6,306	

CASH FLOW PROJECTION FOR YEAR ENDING JUNE 19X1

PRODUCTION 500,000 TONNES P.A.

WORST CASE

ESTIMATED MONTHLY SALES [000'S]

MONTH	SALES	CASH INFLOW												
		Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total
JUL	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
AUG	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
SEP	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
OCT	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
NOV	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
DEC	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
JAN	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
FEB	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
MAR	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
APR	$1,760	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$1,760	$0	$1,760
MAY	$1,760	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$1,760	$1,760
JUN	$1,760	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
TOTAL	$5,280	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$1,760	$1,760	$3,520
TOT.CASH INFLOW [SALES+DEBTORS]		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$1,760	$1,760	$3,520

TOTAL SALES FOR YEAR:	$5,280
TOTAL CASH INFLOW FROM SALES:	$3,520
OUTSTANDING DEBTORS AT YEAR END:	$1,760

CASH FLOW PROJECTION FOR YEAR ENDING JUNE 19X1

PRODUCTION 500,000 TONNES P.A.

WORST CASE

ESTIMATED EXPENSE PAYMENTS [000'S]

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total
PRODUCT.EXPENSES													
Wages & Salaries	$10	$10	$10	$10	$10	$10	$10	$10	$64	$64	$64	$64	$336
Transport	$0	$0	$0	$0	$0	$0	$0	$0	$0	$1,422	$1,422	$1,422	$4,266
Operating Cost	$0	$0	$0	$0	$0	$0	$0	$0	$215	$215	$215	$215	$860
Produc. Expenses	$10	$10	$10	$10	$10	$10	$10	$10	$279	$1,701	$1,701	$1,701	$5,462
OVERHEAD EXPENSES													
Wages & Salaries	$21	$21	$21	$21	$21	$21	$21	$59	$58	$59	$59	$59	$441
Directors Fees	$10	$10	$10	$10	$10	$10	$10	$11	$11	$11	$11	$11	$125
Prof. Services	$15	$16	$15	$16	$15	$16	$15	$16	$16	$16	$17	$17	$190
Financial	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$1	$1
H.P. & Leasing	$5	$5	$5	$5	$5	$5	$5	$5	$5	$5	$5	$5	$60
Insurances	$1	$1	$1	$1	$1	$1	$1	$1	$1	$1	$1	$1	$12
Occupancy	$2	$2	$2	$2	$2	$2	$2	$2	$2	$2	$2	$2	$24
Office Supplies	$1	$0	$1	$0	$1	$0	$1	$0	$1	$0	$1	$0	$6
Phone & Post	$1	$2	$1	$2	$1	$2	$1	$2	$1	$2	$1	$2	$18
Advert. & Promot.	$1	$1	$1	$1	$1	$1	$1	$1	$1	$1	$1	$1	$12
Travel & Trans.	$5	$5	$5	$5	$5	$5	$5	$5	$6	$6	$6	$6	$64
Entertainment	$2	$3	$2	$3	$2	$3	$2	$3	$2	$3	$2	$3	$30
Other	$8	$9	$8	$9	$8	$9	$8	$9	$8	$9	$8	$9	$102
Overhead Exp.	$72	$75	$72	$75	$72	$75	$72	$114	$112	$115	$114	$117	$1,085
TOTAL EXPENSES	$82	$85	$82	$85	$82	$85	$82	$124	$391	$1,816	$1,815	$1,818	$6,547

142157

CASH FLOW PROJECTION FOR YEAR ENDING JUNE 19X1

PRODUCTION 500,000 TONNES P.A.

WORST CASE

PROFITABILITY FORECAST [000'S]

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total
Sales(Invoiced)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$1,760	$1,760	$1,760	$5,280
Other Income	$0	$65	$64	$63	$63	$59	$50	$42	$33	$27	$21	$21	$508
Total Income	$0	$65	$64	$63	$63	$59	$50	$42	$33	$1,787	$1,781	$1,781	$5,788
Cost of goods sold	$10	$10	$10	$10	$10	$10	$10	$10	$279	$1,701	$1,701	$1,701	$5,462
Gross Profit before oh & tax	($10)	$55	$54	$53	$53	$49	$40	$32	($246)	$86	$80	$80	$326
Company Overhead	$72	$75	$72	$75	$72	$75	$72	$114	$112	$115	$114	$117	$1,085
Taxation	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Depreciation	$0	$0	$0	$0	$0	$0	$0	$0	$0	$84	$84	$84	$252
Profitability	($82)	($20)	($18)	($22)	($19)	($26)	($32)	($82)	($358)	($113)	($118)	($121)	($1,011)

CASH FLOW PROJECTION FOR YEAR ENDING 19X2

PRODUCTION 1,000,000 TONNES P.A.

WORST CASE

CASH FLOW SUMMARY [000'S]

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	Total
CASH INFLOW:													
Sales Collect.	$1,760	$1,760	$1,760	$1,760	$1,760	$1,760	$1,760	$1,760	$3,520	$3,520	$3,520	$3,520	$28,160
Interest Rcvd	$21	$20	$20	$20	$20	$20	$20	$20	$15	$16	$17	$18	$227
TOTAL INFLOW	$1,781	$1,780	$1,780	$1,780	$1,780	$1,780	$1,780	$1,780	$3,535	$3,536	$3,537	$3,538	$28,387
CASH OUTFLOW:													
Overhead Exp.	$117	$118	$117	$118	$119	$120	$120	$122	$120	$122	$120	$122	$1,435
Product. Exp.	$1,701	$1,701	$1,701	$1,701	$1,701	$1,701	$1,701	$3,113	$3,113	$3,113	$3,113	$3,113	$27,472
TOTAL OUTFLOW	$1,818	$1,819	$1,818	$1,819	$1,820	$1,821	$1,821	$3,235	$3,233	$3,235	$3,233	$3,235	$28,907
CASH MOVEMENTS	($37)	($39)	($38)	($39)	($40)	($41)	($41)	($1,455)	$302	$301	$304	$303	($520)
OPENING BALANCE	$6,306	$6,269	$6,230	$6,192	$6,153	$6,113	$6,072	$6,031	$4,576	$4,878	$5,179	$5,483	
FUNDS AVAILABLE	$6,269	$6,230	$6,192	$6,153	$6,113	$6,072	$6,031	$4,576	$4,878	$5,179	$5,483	$5,786	

CASH FLOW PROJECTION FOR YEAR ENDING 19X2

PRODUCTION 1,000,000 TONNES P.A.

WORST CASE

ESTIMATED MONTHLY SALES [000'S]

MONTH	SALES	CASH INFLOW												
		Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total
JUL	$1,760	$0	$1,760	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$1,760
AUG	$1,760	$0	$0	$1,760	$0	$0	$0	$0	$0	$0	$0	$0	$0	$1,760
SEP	$1,760	$0	$0	$0	$1,760	$0	$0	$0	$0	$0	$0	$0	$0	$1,760
OCT	$1,760	$0	$0	$0	$0	$1,760	$0	$0	$0	$0	$0	$0	$0	$1,760
NOV	$1,760	$0	$0	$0	$0	$0	$1,760	$0	$0	$0	$0	$0	$0	$1,760
DEC	$1,760	$0	$0	$0	$0	$0	$0	$1,760	$0	$0	$0	$0	$0	$1,760
JAN	$1,760	$0	$0	$0	$0	$0	$0	$0	$1,760	$0	$0	$0	$0	$1,760
FEB	$3,520	$0	$0	$0	$0	$0	$0	$0	$0	$3,520	$0	$0	$0	$3,520
MAR	$3,520	$0	$0	$0	$0	$0	$0	$0	$0	$0	$3,520	$0	$0	$3,520
APR	$3,520	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$3,520	$0	$3,520
MAY	$3,520	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$3,520	$3,520
JUN	$3,520	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
TOTAL	$29,920	$0	$1,760	$1,760	$1,760	$1,760	$1,760	$1,760	$1,760	$3,520	$3,520	$3,520	$3,520	$26,400
TOT. CASH INFLOW [SALES+DEBTORS]		$1,760	$1,760	$1,760	$1,760	$1,760	$1,760	$1,760	$1,760	$3,520	$3,520	$3,520	$3,520	$28,160

TOTAL SALES FOR YEAR:	$29,920
TOTAL CASH INFLOW FROM SALES:	$28,160
OUTSTANDING DEBTORS AT YEAR END:	$3,520

142160

CASH FLOW PROJECTION FOR YEAR ENDING JUNE 19X2

PRODUCTION 1,000,000 TONNES P.A.

WORST CASE

ESTIMATED EXPENSE PAYMENTS [000'S]

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total
PRODUCT.EXPENSES													
Wages & Salaries	$64	$64	$64	$64	$64	$64	$64	$75	$75	$75	$75	$75	$823
Transport	$1,422	$1,422	$1,422	$1,422	$1,422	$1,422	$1,422	$2,696	$2,696	$2,696	$2,696	$2,696	$23,434
Operating Cost	$215	$215	$215	$215	$215	$215	$215	$342	$342	$342	$342	$342	$3,215
Produc. Expenses	$1,701	$1,701	$1,701	$1,701	$1,701	$1,701	$1,701	$3,113	$3,113	$3,113	$3,113	$3,113	$27,472
OVERHEAD EXPENSES													
Wages & Salaries	$61	$61	$61	$61	$61	$61	$61	$61	$61	$61	$61	$60	$731
Directors Fees	$11	$11	$11	$11	$11	$11	$12	$12	$12	$12	$12	$12	$138
Prof. Services	$16	$16	$16	$16	$16	$16	$16	$16	$16	$16	$16	$14	$190
Financial	$0	$0	$0	$0	$0	$0	$1	$0	$0	$0	$0	$1	$2
H.P. & Leasing	$5	$5	$5	$5	$5	$5	$5	$5	$5	$6	$5	$6	$62
Insurances	$1	$1	$1	$1	$1	$1	$1	$1	$1	$1	$1	$2	$13
Occupancy	$1	$2	$1	$2	$2	$2	$2	$3	$2	$3	$3	$3	$26
Office Supplies	$1	$0	$1	$0	$1	$1	$0	$1	$1	$0	$1	$0	$7
Phone & Post	$1	$1	$1	$1	$2	$2	$2	$2	$2	$2	$2	$2	$20
Adv. & Promot.	$1	$1	$1	$1	$1	$1	$1	$1	$1	$1	$1	$2	$13
Travel & Trans.	$8	$8	$8	$8	$8	$8	$8	$8	$8	$8	$8	$8	$96
Entertainment	$2	$3	$2	$3	$2	$3	$2	$3	$2	$3	$2	$4	$31
Other	$9	$9	$9	$9	$9	$9	$9	$9	$9	$9	$8	$8	$106
Overhead Exp.	$117	$118	$117	$118	$119	$120	$120	$122	$120	$122	$120	$122	$1,435
TOTAL EXPENSES	$1,818	$1,819	$1,818	$1,819	$1,820	$1,821	$1,821	$3,235	$3,233	$3,235	$3,233	$3,235	$28,907

CASH FLOW PROJECTION FOR YEAR ENDING JUNE 19X2

PRODUCTION 1,000,000 TONNES P.A.

WORST CASE

PROFITABILITY FORECAST [000'S]

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total
Sales(Invoiced)	$1,760	$1,760	$1,760	$1,760	$1,760	$1,760	$1,760	$3,520	$3,520	$3,520	$3,520	$3,520	$29,920
Other Income	$21	$20	$20	$20	$20	$20	$20	$20	$15	$16	$17	$18	$227
Total Income	$1,781	$1,780	$1,780	$1,780	$1,780	$1,780	$1,780	$3,540	$3,535	$3,536	$3,537	$3,538	$30,147
Cost of goods sold	$1,701	$1,701	$1,701	$1,701	$1,701	$1,701	$1,701	$3,113	$3,113	$3,113	$3,113	$3,113	$27,472
Gross Profit before oh & tax	$80	$79	$79	$79	$79	$79	$79	$427	$422	$423	$424	$425	$2,675
Company Overhead	$117	$118	$117	$118	$119	$120	$120	$122	$120	$122	$120	$122	$1,435
Taxation	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Depreciation	$83	$83	$83	$83	$83	$83	$83	$83	$83	$83	$83	$87	$1,000
Profitability	($120)	($122)	($121)	($122)	($123)	($124)	($124)	$222	$219	$218	$221	$216	$240

142163

CASH FLOW SUMMARY FOR THE FIVE YEARS

WORST CASE

[000'S]	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
A. OPENING BALANCE	$0	$6,306	$5,786	$9,539	$12,692
B. CASH INFLOW					
Sales Collections	$3,520	$28,160	$42,940	$44,620	$46,360
Loans other	$200	$0	$0	$0	$0
Capital Inv.	$20,000	$0	$0	$0	$0
Interest Received	$508	$227	$294	$424	$475
TOTAL RECEIPTS	$24,228	$28,387	$43,234	$45,044	$46,835
C. CASH OUTFLOW					
Overhead Expenses	$1,085	$1,435	$1,499	$1,558	$1,621
Product. Expenses	$5,462	$27,472	$37,982	$39,507	$41,096
Taxation paid	$0	$0	$0	$826	$894
Dividends paid	$0	$0	$0	$0	$2,000
Capital Items	$11,375	$0	$0	$0	$0
TOTAL PAYMENTS	$17,922	$28,907	$39,481	$41,891	$45,611
D. CASH MOVEMENTS	$6,306	($520)	$3,753	$3,153	$1,224
E. FUNDS AVAILABLE	$6,306	$5,786	$9,539	$12,692	$13,916

142164

WORST CASE	BUDGETED PROFIT & LOSS FOR THE FIVE YEARS				
[000's]	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
INCOME:					
Trading Receipts	$5,280	$29,920	$43,080	$44,760	$46,512
Less					
Wages/Salaries	$336	$823	$921	$964	$1,005
Operat./Transp. Cost	$5,126	$26,649	$37,061	$38,543	$40,091
COST OF GOODS SOLD	$5,462	$27,472	$37,982	$39,507	$41,096
GROSS PROFIT	($182)	$2,448	$5,098	$5,253	$5,416
OTHER INCOME:					
Interest	$508	$227	$294	$424	$475
TOTAL INCOME	$326	$2,675	$5,392	$5,677	$5,891
EXPENDITURE					
Wages & Salaries	$441	$731	$761	$792	$822
Directors Fees	$125	$138	$144	$150	$156
Professional Service	$190	$190	$197	$205	$214
Financial	$1	$2	$3	$4	$5
H.P. & Leasing	$60	$62	$64	$67	$70
Insurance	$12	$13	$14	$14	$15
Occupancy	$24	$26	$27	$28	$29
Office Supplies	$6	$7	$8	$9	$9
Telephone & Postage	$18	$20	$21	$22	$24
Advert. & Promotion	$12	$13	$14	$14	$15
Travel	$64	$96	$100	$104	$108
Entertainment	$30	$31	$36	$34	$35
Other	$102	$106	$110	$115	$119
Depreciation	$252	$1,000	$1,000	$1,000	$1,000
Taxation	$0	$0	$0	$826	$894
TOTAL EXPENDITURE	$1,337	$2,435	$2,499	$3,384	$3,515
NET PROFIT	($1,011)	$240	$2,893	$2,293	$2,376
LOSS PREVIOUS YEAR	$0	($1,011)	($771)	$1,296	($601)
INCOME TAX PAYABLE	$0	$0	$826	$894	$926
NET PROFIT AFTER TAX	($1,011)	($771)	$1,296	$1,399	$1,450
DIVIDENDS PAID	$0	$0	$0	$2,000	$0
RETAINED EARNINGS	($1,011)	($771)	$1,296	($601)	$1,450
GROSS PROFIT/SALES	-3%	8%	12%	12%	12%
NET PROFIT BEFORE TAX/SALES	-19%	1%	7%	5%	5%
NET PROFIT AFTER TAX/SALES	-19%	-3%	3%	3%	3%

WORST CASE

OVERHEAD EXPENSES FOR THE FIVE YEARS

[000'S]

	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
WAGES/SALARIES	$441	$731	$761	$792	$822
DIRECTORS FEES	$125	$138	$144	$150	$156
PROFESSIONAL FEES	$190	$190	$197	$205	$214
FINANCIAL	$1	$2	$3	$4	$5
H.P. & LEASING	$60	$62	$64	$67	$70
INSURANCE	$12	$13	$14	$14	$15
OCCUPANCY	$24	$26	$27	$28	$29
OFFICE SUPPLIES	$6	$7	$8	$9	$9
TELEPHONE & POSTAGE	$18	$20	$21	$22	$24
ADVERT. & PROMOTION	$12	$13	$14	$14	$15
TRAVEL	$64	$96	$100	$104	$108
ENTERTAINMENT	$30	$31	$36	$34	$35
OTHERS	$102	$106	$110	$115	$119
TOTAL OVERHEAD EXP.	$1,085	$1,435	$1,499	$1,558	$1,621

WORST CASE

BALANCE SHEET FOR THE FIVE YEARS

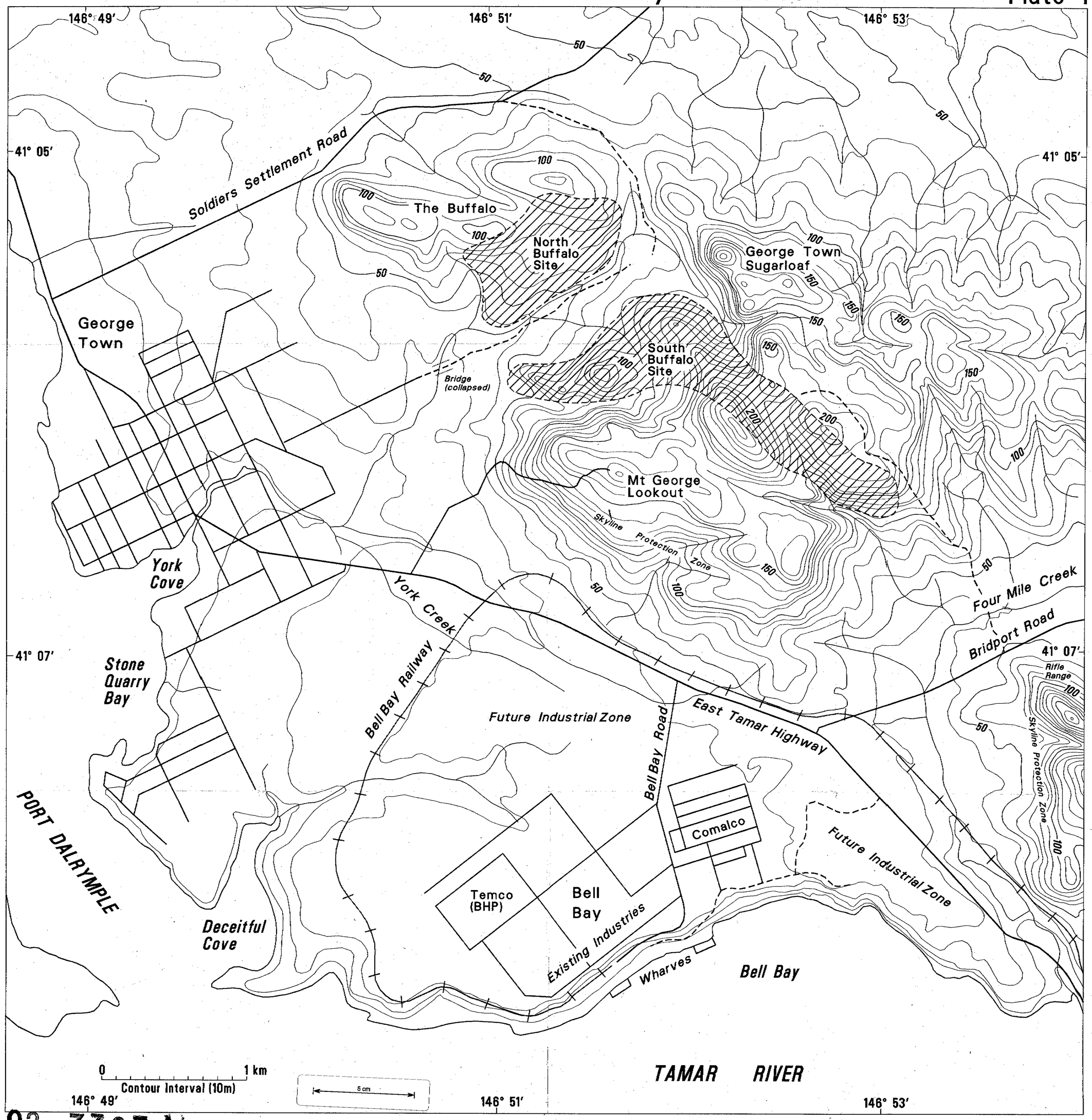
[000'S]

	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
CURRENT ASSETS					
Cash	$6,306	$4,611	$7,499	$9,728	$9,957
Trade Debtors	$1,760	$3,520	$3,660	$3,800	$3,952
W.I.P.	$1,175	$2,350	$2,444	$2,542	$2,643
Total Current Asse	$9,241	$10,481	$13,603	$16,070	$16,552
FIXED ASSETS					
Land & Buildings	$335	$335	$335	$335	$335
Plant & Machinery	$9,865	$9,865	$9,865	$9,865	$9,865
Less Depreciation	$252	$1,252	$2,252	$3,252	$4,252
Total Fixed Assets	$9,948	$8,948	$7,948	$6,948	$5,948
TOTAL ASSETS	$19,189	$19,429	$21,551	$23,018	$22,500
CURRENT LIABILITIES					
Provision for Tax	$0	$0	$826	$894	$926
Provision for divide	$0	$0	$0	$2,000	$0
Provision for Loans	$0	$0	$0	$0	$200
Total Curr.Liabili	$0	$0	$826	$2,894	$1,126
NON CURRENT LIABILITIES					
Directors Loans (5 y	$200	$200	$200	$200	$0
SHAREHOLDERS FUND					
Paid-in Capital	$20,000	$20,000	$20,000	$20,000	$20,000
Retained Earnings	$0	($1,011)	($771)	$525	($76)
Profit & Loss	($1,011)	$240	$1,296	($601)	$1,450
Total Sharehold. F	$18,989	$19,229	$20,525	$19,924	$21,374
TOTAL LIABILITIES	$19,189	$19,429	$21,551	$23,018	$22,500
WORKING CAPITAL RATI	N/A	N/A	1646%	555%	1469%
CURRENT RATIO	N/A	N/A	1350%	467%	1235%
EQUITY RATIO	98%	99%	95%	86%	94%

142167

Map of the North Buffalo & South Buffalo Quarry Sites and access to the Bell Bay Wharves

Plate 1



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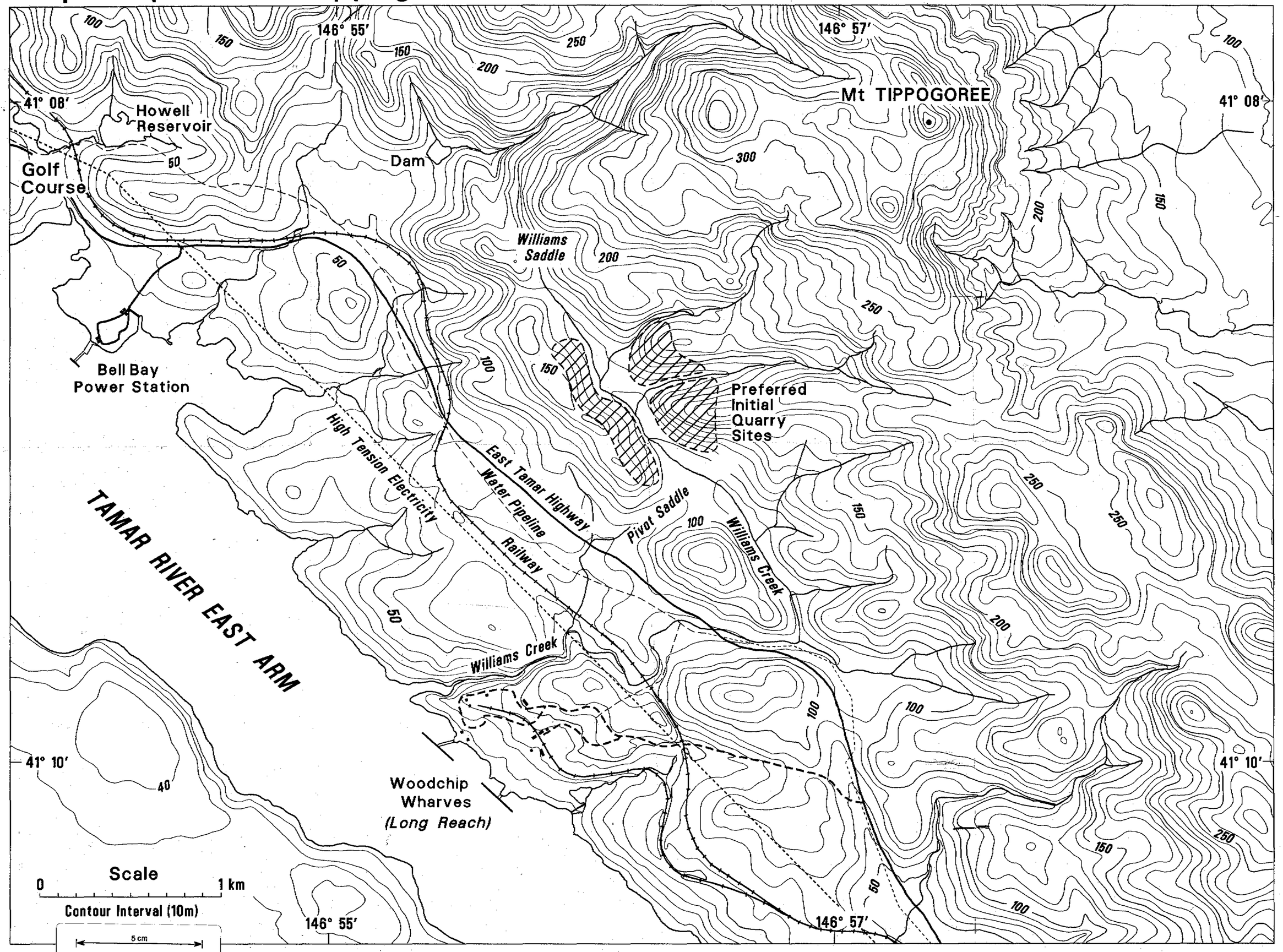
142168 Plate 2

Map of parts of Tippogoree Hills, Tamar River East Arm & Williams Creek



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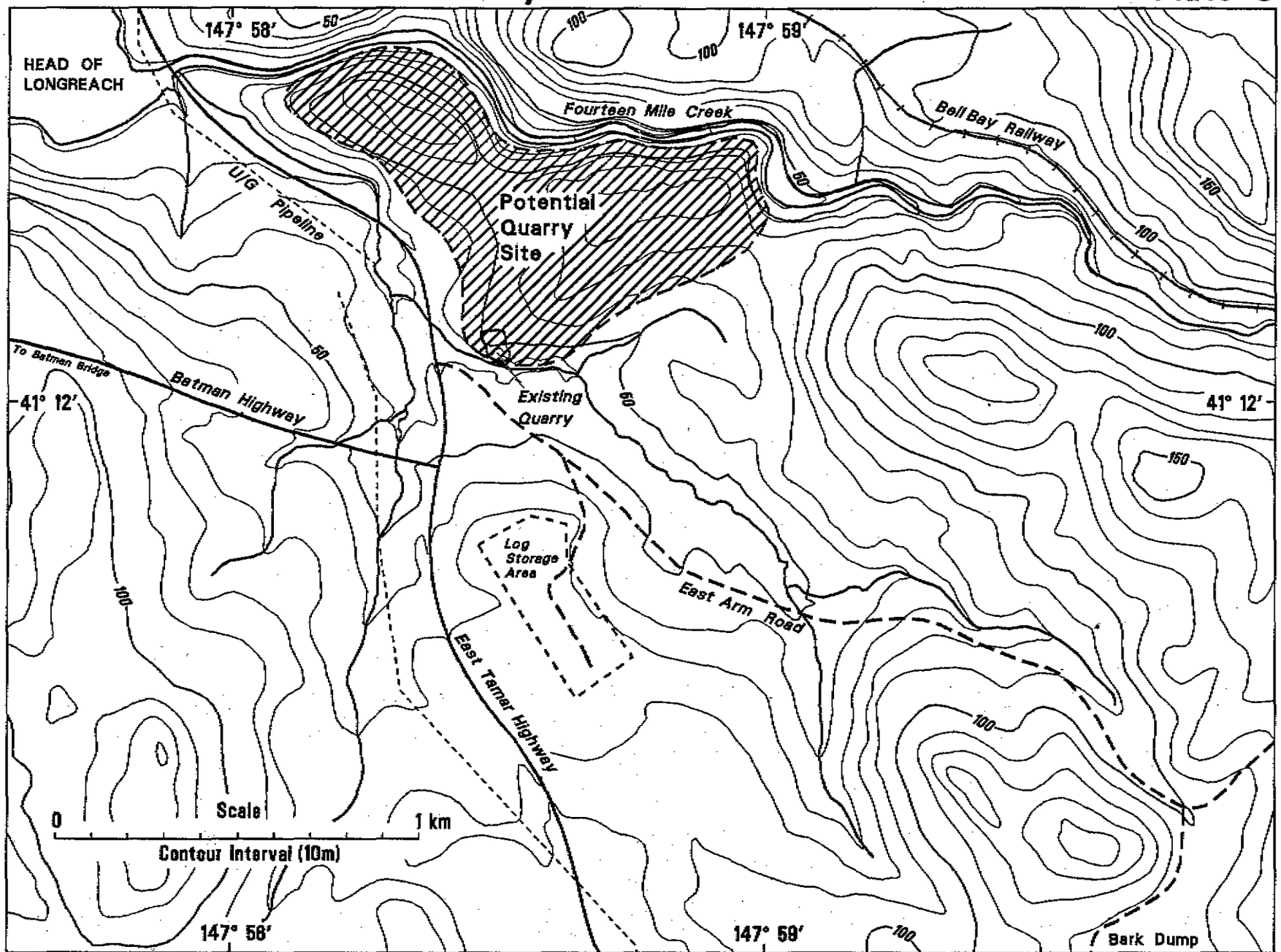
East Arm Quarry Site for Armour Stone

Plate 3



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