

# **MAYDENA SANDS PTY LTD**

ACN 111 938 428

ABN 65 111 938 428

**RETENTION LICENCE NO. 2/2003**

**MAYDENA, TASMANIA**

**ANNUAL REPORT**

**TO**

**09 January 2010**

**GERHARD K. KRUMMEI**

**DECEMBER 2009**

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## **ABSTRACT**

After the depths of the GFC, the market place is showing signs of improvements in the demand for TFT-LCD glass, particularly in East Asia, which is good news for producers of high purity silica flour if this trend is maintained through 2010.

Similar trends in the region are evident for PV solar glass and polysilicon for PV cells which could provide additional markets for the Company's potential products.

A new development is the possibility of a local market, initially small, for construction materials which would utilise lower quality sand and rock.

The upsurge in the demand for polysilicon justifies a first pass drill test of the silica bedrock quality in the Eastern Quarry area, planned for early 2010.

An option agreement has been concluded with a Tasmanian exploration company over the Western Quarry area and is now in force. That company has commenced due diligence work.

### **Keywords:**

Maydena; Silica flour;  
Silica rock; PV glass;  
Polysilicon; Marketing;

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## 1. INTRODUCTION

At the end of April, 2005, Maydena Sands Pty. Ltd. replaced J.J. McDonald & Sons Mining Pty. Ltd. as owner/operator of this tenement without interruption to programme continuity.

This report outlines activities by Maydena Sands Pty. Ltd. in regard to the sixth year's activities relating to its Retention Licence 2/2003, granted for a four year period to 09.01.2008 and then renewed annually to 09.01.2010.

This tenement has its origins in EL 17/1998 previously held and operated by J.J. McDonald & Sons Mining Pty. Ltd. It is located just south of the sealed Gordon River road approximately 4 km west south west of Maydena and about 90 km by road from Hobart (Fig.1). There is good access to and within the prospect area. Power, water, housing and basic facilities are readily available from within a short radius of the prospect. The last few years saw the progressive upgrade of the narrow gauge New Norfolk- Maydena rail line to passenger standard only as far as the entrance to the Mt Field National Park. Plans for a further upgrade to freight standard of the entire stretch have recently been deferred indefinitely. A 700m long gravel airstrip is located 3 km north west of the silica sand deposit.

The primary target for investigation and assessment remains the deposit of silica sand and its silica flour matrix located largely to the west of the Eastern Quarry, about 1 km south east of Pine Hill (Fig.2).

The overall aim of the investigations is to determine if a commercially viable operation can be established, based on products derived from the silica sand and silica rock resource in the tenement.

In view of the upsurge of interest in the use of solar power locally and overseas, renewed attention was also directed at the high quality silica rock potential of the tenement. The latter raw material is used in the production of high purity silicon metal which is an essential component of photovoltaic solar cells. Also of potential interest is the coarser, higher purity sand fraction for use in the manufacture of solar cell cover glass with high light transmissivity characteristics.

## 2. PREVIOUS WORK

Exploration by Pioneer Silicon Industries Pty. Ltd. in 1988/89 identified a lag deposit of hard silica rock at the Western Quarry containing a small resource of material deemed suitable for the manufacture of silicon. (Fig.2). From this, approximately 19,000 tonnes of crushed, screened silica rock was produced in 1991 and 1992 for shipment, of which 10,000 tonnes were consigned to Pioneer's silicon smelter at Electrona and about 9,500 tonnes went to Temco's Bell Bay ferrosilicon plant. Extraction, by Duggans Pty. Ltd. under M.L.1396 P/M, virtually ceased upon closure of the Electrona smelter in 1992, although a small parcel of 850 tonnes of silica rock is reported to have been mined in 1995. At the end of the earlier exploration work, an occurrence of white silica sand was located between Pine Hill and the Styx Road in an area now known as the Eastern Quarry Area. Pioneer investigated this deposit in the vicinity of the Eastern Quarry by 23 shallow RC drill holes. Preliminary estimates suggested a resource in the order of some 0.75 – 1.5 million cu. m. of mostly low iron silica sand containing about 10% of high grade lump silica. Pioneer ceased operations at Electrona before any of this material could be used for silicon production.

Assay results from a number of subsequent, excavator generated pit samples by the North West Bay Co. Pty. Ltd. supported the high quality of the resource and, together with sizing determinations on a bulk sample, indicated that the sand might be suitable for the manufacture of table ware glass.

During its tenure of EL 17/1998, which contained these deposits, J.J. McDonald & Sons Pty. Ltd., using the air core drill sampling method, completed 43 drill holes totalling 553 m which outlined a raw material resource of about 6 million tonnes of loose silica ranging in size from very coarse to very fine.

The drilling also demonstrated that the deposit is more variable, complex and higher in iron oxides and other impurities than previous data suggested.

Laboratory sizing determinations indicated that the deposit is a possible source of silica flour as well as glass sand, while geological mapping and interpretation pointed to a small resource potential for hard rock silica as well.

Bench scale beneficiation tests and bulk sample processing tests, including acid wash tests on samples of the glass size fraction sand, showed that the -250 micron fraction could be upgraded to a high quality product containing only about 50ppm Fe<sub>2</sub>O<sub>3</sub> without major environmental impact, with levels of iron as low as 10ppm a possibility.

Sources of good quality limestone and dolomite were identified in relative proximity to the silica sand deposit for eventual acid neutralization uses.

The company's activities in the marketplace identified the natural silica flour as potentially the deposit's most important component economically. This material provided the major focus for ongoing geological, processing and marketing activities, though the coarser size fractions and hard-rock silica potential remain of interest for future attention under the appropriate market conditions.

Details of past activities and outcomes are provided in reports listed in the Bibliography. (See Sections 7 and 8 below).

In early 2004, EL tenure over the area was converted to a Retention Licence

In late 2004, J.J. McDonald & Sons Mining Pty. Ltd. formed a new holding and operating company, Maydena Sands Pty. Ltd., to which the Retention Licence and all of the former company's interests in the Maydena area were transferred in April 2005.

Since then, all activities are being conducted under the new Company name.

### 3. ACTIVITIES FOR PERIOD

These included:

#### 3.1 Work Done

- Site Visit with:
  - DIER personnel
  - Downer EDI personnel
  - UTas Geophysicist
  - Macquarie Harbour Mining personnel
- PAFV Test (DIER)
- Sizing Test (Downer EDI)
- Conclusion of Option Agreement over the Western Quarry area with Macquarie Harbour Mining Limited (MHM)
- Start of due diligence by MHM (desk top data review and limited rock float check sampling)
- Investigation of product mixer units
- Contact with Forestry Tasmania re land use and planning issues
- Marketing-related activities, including:
  - Market Research
  - Attendance at China Glass 2009 – Shanghai
  - Joining a global glass industry marketing platform
  - Initiate web site home page – in progress
  - Contacts or meetings with:
    - Stratum Resources – Sydney – Silica flour, Silica rock
    - Citadel Resources – Melbourne – Silica flour, Silica rock
    - OHC – Berlin - Silica flour
    - Iwatani - Silica flour

- Itochu - Silica flour
- Temco – Silica rock
- Downer EDI – Sand and Rock
- Representatives of –
  - Indian interests – Silica flour, Silica rock
  - Chinese interests – Silica flour, Silica rock
  - Korean interests – Silica flour, Silica rock
  - Boral – Blending sand
  
- Community relations: Regular contacts with Maydena Development Association maintained.

### 3.2 Statistical Summary

PAFV Test (DIER)	:	1 X 10Kg Sample
Sizing Test (Downer EDI)	:	1 Sample
Rock Samples (MHM)	:	9
No. of Analyses (by TAM for MHM)	:	81

### 3.3 Expenditure

To Dec 2008 (RL Tenure only)	:	\$348,132.00
Period Jan – Sep 2009	:	\$ 51,088.00
Estimate Oct – Dec 2009	:	\$ 30,843.00 (approx.)
Estimated Cumulative Total for period of RL Tenure	:	\$430,063.00 (approx.)

## **4. RESULTS**

### **4.1 Geophysics**

Following a site visit with the UTas Geophysicist in early 2009, a small group of geophysics students undertook orientation traverses over the silica sand deposit using shallow seismic, resistivity and magnetics. This was to familiarise the students with these methods and determine the applicability of the latter to determine depth to bedrock, compositional texture/structure of the sand, bedrock geology and geological structure.

No report on the outcomes of these surveys has been received to date.

### **4.2 Mineralogy**

There was no interest by UTas geology students in a mineralogy research project focused on identifying the location and type mineral species of the main impurities in the silica flour and silica rock in the tenement.

### **4.3 Construction Materials and Other Users**

#### **4.3.1 PAFV Test**

During a familiarisation visit to the Western Quarry, DIER personnel and their consultant inspected the silica rock lithologies there and collected a 10kg (approx) composite sample of larger lumps for a Polished Aggregate Friction Value Test. The intent was to use the material for non-slip road surfacing, subject to successful test outcomes. Somewhat surprisingly, the results were unexceptional, with no further action taken. (Appendix 1).

#### **4.3.2 Downer EDI**

The company expressed interest in sourcing sand and rock from the area for construction and road building purposes. This would provide an opportunity for the sale of lower purity material. Initial off take would be in the lower ranges of 2,000 – 4,000 t.p.a.

A sizing test by Downer of sand from the Eastern Quarry yielded 51% +75 micron material and drew no adverse comment. (Appendix 2).

Further discussion with Downer EDI are planned to develop this sales opportunity.

#### **4.3.3 Boral**

An approach on behalf of Boral for supplies of sand for blending purposes was dealt with. Amounts required were again relatively small. The combined costs of extraction and delivery to the Hobart area made the proposition commercially unattractive at this time. The matter is “on hold” for this low value product.

#### **4.3.4 TEMCO**

Tests on lump material from the Eastern Quarry submitted to TEMCO (see Krummei 2008) have been deferred due to continuing adverse conditions in the silico-manganese markets caused by the global economic downturn due to the GFC.

### **4.4 Beneficiation**

Discussions were held with Mixer Systems Inc., Pewaukee, WI, USA, regarding its high performance Turbine Mixer XL and the Glassmaster Planetary Mixer for product blending purposes. The Mixers operate on a batch process basis. Capacities range from 680 litres – 3625 litres for the Glassmaster Turbine Mixer models and 540 – 4560 litres for the Glassmaster Planetary Mixer Units.

The focus was on the Turbine Mixer which offers high quality mixing using a three dimensional mixing action which rapidly produces a homogeneous product with excellent dispersion and reportedly without crushing. The successful mixing action depends on paddle placement, shape and configuration in the mixing bowl. Linatex or urethane coating of inside bowl surfaces is possible to avoid product contamination due to abrasion. The equipment is claimed to be low maintenance. Capex for the 2320ltr Turbine Mixer starts at around USD102,000 (AUD111,000 approx.) plus shipping costs. Further discussions are subject to improvements in the global economic conditions.

#### 4.5 Project Planning

The mothballed INDEX processing plant at Heybridge, now up for sale, was inspected. However, since the vendor of the plant had surrendered its operating licence, test parcels of Maydena material to judge the plant's performance could not be processed. Further action suspended.

Proposed harvesting of Norske Skog's pine plantation south of the Western Quarry suggests the possibility of an alternative site for a processing plant. The matter remains to be discussed with Norske Skog.

#### 4.6 Marketing

The high purity silica market did not escape the impacts of the GFC, with demand for silica flour for TFT-LCD applications significantly and negatively affected for most of the year. Some company and market reports suggest that demand for TFT-LCD glass may have fallen by as much as 60%. On the local Tasmanian scene, TAM halved production late in 2008 due to the sudden drop in overseas demand for silica flour. Shortly thereafter, INDEX placed its production facility near Burnie on care and maintenance due to lack of orders and only recently announced cessation of operations, plant closure and its sale.

However, signs of improvements, albeit from a low base, have started to emerge in East Asia in the third and fourth quarters of this year. Corning, a major producer of TFT-LCD substrates now sees an upturn in demand for TFT-LCD display glass for the remainder of 2009 and beyond, fuelled mainly by demand for flat screen TV units in China for both local demand and export.

Information gleaned at China Glass 2009, highlighted emerging opportunities in the East Asian region (Taiwan, Japan and especially China) for solar cell (or PV) glass applications such as highly transparent, low iron PV cover glass and glass substrates. Current PV solar glass share of world total glass production stood at about 1% and is forecast to rise to about 5% by about 2012. (Nieminen, 2009). This is fuelled by an annual PV market growth of around 40% in recent years which is expected to continue at 20-30% per annum for the next four years.

Despite a glut of high purity polysilicon for PV solar and semiconductor application and falling prices, new production facilities are coming on stream or are in the planning stages. This resulted in a drop in spot prices from peak +US\$400/kg in 2008 to around US\$75/kg in June 2009(Hofmann, 2009), with further falls to around US\$50/kg predicted and expected to hold at this level for the next two-three years. Existing and new production facilities for solar panels, however, will ensure increasing demand for highly transparent, low iron solar glass and will also strengthen interest in supply of high purity silica rock feedstock for silicon smelters.

Countering these positive developments in the silica supply industry is the increasing strength of the Australian dollar with the predicted tendency for it to remain high over the next few years at least. This trend would have a negative effect on any profit margins from a US\$ traded commodity, including silica flour and possibly even render our materials uneconomic on the global markets. In addition, cost pressures and price competition in this product niche are emerging from Taiwan and China. This encourages a search for some local markets and off-take for at least part of our material for lower value applications such as construction and road building purposes.

In order to achieve greater exposure in the current commercial environment, this company recently joined OGIS, a global glass industry marketing platform to which it will also be linked via a website home page currently under development.

Ongoing contact on marketing matters were maintained with Stratum Resources (Sydney), OHC (Germany), Itochu and Iwatani (Japan). Discussions re silica flour and silica rock were initiated, mostly in Q4, 2009, with representatives of Korean, Indian, Chinese and Australian interests, without noteworthy outcomes as yet.

Of significance, however, was the grant, at its request, of a 6-month option commencing July 2009, over the silica resources in the Western Quarry area, to Tasmania-based Macquarie Harbour Mining Limited, with a right to extend for a further six months. As part of its due diligence process, that company advised of completion of data review and of a limited surface rock check sampling

programme around and to the south west of the Western Quarry. Results are reported as somewhat mixed, with better assays in the quarry area. Details of the sampling are provided in Appendix 3.

#### **4.7 Environmental**

This year's field activities had no environmental impact. No line cutting was required for the geophysical traverses and all lines and base-station marker tapes have been removed.

#### **4.8 Rehabilitation**

Rehabilitation of several short drill access tracks and drill pads planned for 2009 was deferred until after completion of the proposed RC drill programme in early 2010.

### **5. CONCLUSIONS AND RECOMMENDATIONS**

- According to industry reports, demand for TFT-LCD display glass is showing signs of improvement from the lows reached in 2008 and early 2009. In addition to existing producers, several new TFT-LCD glass manufacturers have emerged in East Asia. This is good news for the high purity silica flour supply industry.
- Similarly, demand for low-iron solar cell glass and PV quality polysilicon is also expanding in line with the growth of the PV solar industry. Again, good news for the suppliers of high purity silica sand and rock.
- In these improving circumstances, there is justification for a first pass, indicative RC drill test of the quality of the silica rock underlying the silica sand deposit in the Eastern Quarry. Initially a max of 4 X 50m holes are recommended.
- The recent interest in construction sand and rock from the Eastern Quarry area provides an opportunity for local sales of lower quality material. Interest

in this aspect needs to be maintained and developed. Suitable extraction sites should be defined.

- A possible alternative processing plant site has been identified and should be pursued further at the appropriate time.
- Project capex/opex estimates should be reviewed and updated regularly.
- Promotional and marketing activities in Europe and particularly the East/South East Asia region were this year again successful in generating several enquiries about this company and its products. These activities should continue world wide and include the promotion of the potential of the coarser silica sand and silica rock resource in addition to that of the high purity silica flour.

## **6. PROPOSED FUTURE ACTIVITIES**

- In view of emerging interest in the supply of high purity silica rock for PV polysilicon production, undertake a short, first pass RC drill programme to test the quality of the silica bedrock below the sand deposit in the tenement.
- Continue with product marketing and follow up on opportunities opening up for silica sand in PV glass manufacture, silica sand/flour and rock for silicon production and supply of lower quality, lower value raw material for construction and road building uses.
- Continue ongoing beneficiation investigations and tests at laboratory and possibly pilot plant scale as appropriate to provide high quality material for testing by potential customers.
- Continue with efforts to identify alternative flat land sites for the location of process plant, quarry infrastructure, quarry waste, dams, etc.
- Identify extraction sites for lower quality raw material for construction use.

- Continue to review process plant design, sand and silica rock extraction concepts with capex and opex reviews and updates as appropriate.
- Continue with product development and promotion and identify further sales opportunities as well as developing new market contacts and relationships.
- Ongoing contact with state and local regulatory authorities, as well as local civic associations, on project related matters and activities.
- Rehabilitation of several short drill access tracks and drill pads not likely to be used in the near future.

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## APPENDIX 1

### POLISHED AGGREGATE FRICTION VALUE



**Test Report**  
**POLISHED AGGREGATE FRICTION VALUE**

CLIENT: Pitt & Sherry Holdings Pty. Ltd.  
PROJECT: Quality Control: Professional Engineering Advice – Asset Management 2006/2007, No. T06029  
SAMPLE DESCRIPTION: 14mm Aggregate  
SIZE OF AGGREGATE TESTED: -13.2+9.5mm

FILE NO: 531/09  
DATE SAMPLED: Unknown 21.01.09  
DATE RECD: 7.4.09  
LOCATION: Maydena  
LAB. SAMPLE NO: 91128

DATE TESTED: 24.4.09

Samples were prepared as per AS1141.41 and tested in a wet condition as per AS1141.42 prior to and after polishing. The samples were polished using the procedure of AS1141.41.

A reference aggregate sample, "Panmure Basalt" is included with each testing run. This sample acts as a control on test performance and is used to standardise the sample results. After polishing, the samples were again tested in the wet condition according to AS1141.42.

Test Method	Test	Results for the Test Sample	Results for Panmure Reference Specimen PAN No. W15
AS1141.41/42	Sample mean friction value corrected for temperature before polishing.	75	75
	Sample mean friction value corrected for temperature after polishing.	48	51
	Polished aggregate friction value (PAFV) for the test sample after polishing.	48	-

The air temperature during the friction test was 23°C.  
Sample submitted by client.  
B. Absolom, File, Ref: 4950.Rep

W. Komsta

**NATA**

Approved Signatory   
Date: 20.4.09 Serial No. 77104

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TECHNICAL  
COMPETENCE

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NATA Accredited Laboratory  
Number: 547

## **APPENDIX 2**

### **SIZING DATA – QUARRY SAND**

ATTENTION : PETER GREEN.  
6249355.



## Particle Size Distribution Coarse and Fine Aggregate

Equipment Used			
Balance	02.662.1	Oven	04.662.1
Sieve Set	033.662.PNR	Sieve Shaker	019.662.1
Washing Sieve 75um		Protector Sieve 1.18	

Material Size: SAND. (MANDENA)

Sample No :	Sampled By : <u>S. JORDAN</u>
Source : <u>MANDENA</u>	Tested By : <u>S. JORDAN</u>
Sampling Location : <u>MANDENA DT.</u>	Date : <u>19/11/09</u>

TEST METHODS USED AS 1141.3.1 ; AS 1141.11.1 ; AS 1141.12 ; AS 1289.2.1.1  
Sampling Procedure Clause 6.9.1

AS 1141.11.1 - Sample Washed / Not Washed	g
M1 Tray	g
M2 Tray & sample WET	g
M3 Tray & Sample DRY	g
M4 Vapour Loss (M2-M3)	g
M5 Dry Sample (M3-M1)	g
Moisture % Moisture = (M4/M5) X 100	304.1
Washed Mass of Sample	g

AS Sieves	Sieve Overload Mass (g) (300mm Sieve Set)	Individual Mass Retained (g)	Cumulative Mass Retained (g)	Percent Passing (%)	Target (%)	Specification Limits %
53.00 mm	2750					
37.50 mm	2200					
26.50 mm	1800					
19.00 mm	1200					
13.20 mm	900					
9.50 mm	600					
6.70 mm	500					
4.75 mm	400	11.9	11.9	96.		
2.36 mm	300	11.4	23.3	92.		
1.18 mm	200	12.7	36.0	88.		
600 um	150	17.9	53.6	82.		
300 um	100	21.9	75.5	75.		
150 um	80	41.8	117.3	61		
75 um	50	39.1	156.4	49.		
Pan	N/A	147.4	303.8			
Total						

Checked By: [Signature]  
Date: 19/11/09



**APPENDIX 3**

**ASSAY RESULTS - ROCK SAMPLES**

**WESTERN QUARRY**

## Gerhard Krummei

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**From:** "John Richardson" <jrichardson@mhml.com.au>  
**To:** <gkrummei@ozemail.com.au>  
**Cc:** "Frank Rogers" <farogers@mhml.com.au>  
**Sent:** Friday, 4 December 2009 4:28 PM  
**Attach:** Maydena assays.dat; MAYDENA HARD ROCK SILICA RESOURCE.docx  
**Subject:** Maydena Option

### Sample Descriptions

During a one day visit to the Western Quarry area in the western part of Retention Licence 2/2003 over which MHM Ltd holds an option, a number of 2-3 kg samples were collected which were considered representative of outcrop in the quarry itself and immediately adjacent. These were submitted to Tasmanian Advanced Minerals Pty Ltd for analysis.

- May 1/A Recrystallised light grey quartzite. Black impurity in hairline fractures.
- May 1/B Recrystallised white to light grey quartzite, vuggy in places. Small amount of patchy dark impurities.
- May 1/C Grey quartzite with Fe staining.
- May 1/D Grey quartzite with dark patchy impurities.
- May 2A-D White sandy quartzite.
- May 2/E Small sample silica flour.

Of interest is that the sandy friable samples 2A-E which were collected from the south western flank of the quarry contained high titanium while the remainder, taken from the main body of the quarry, were much lower.

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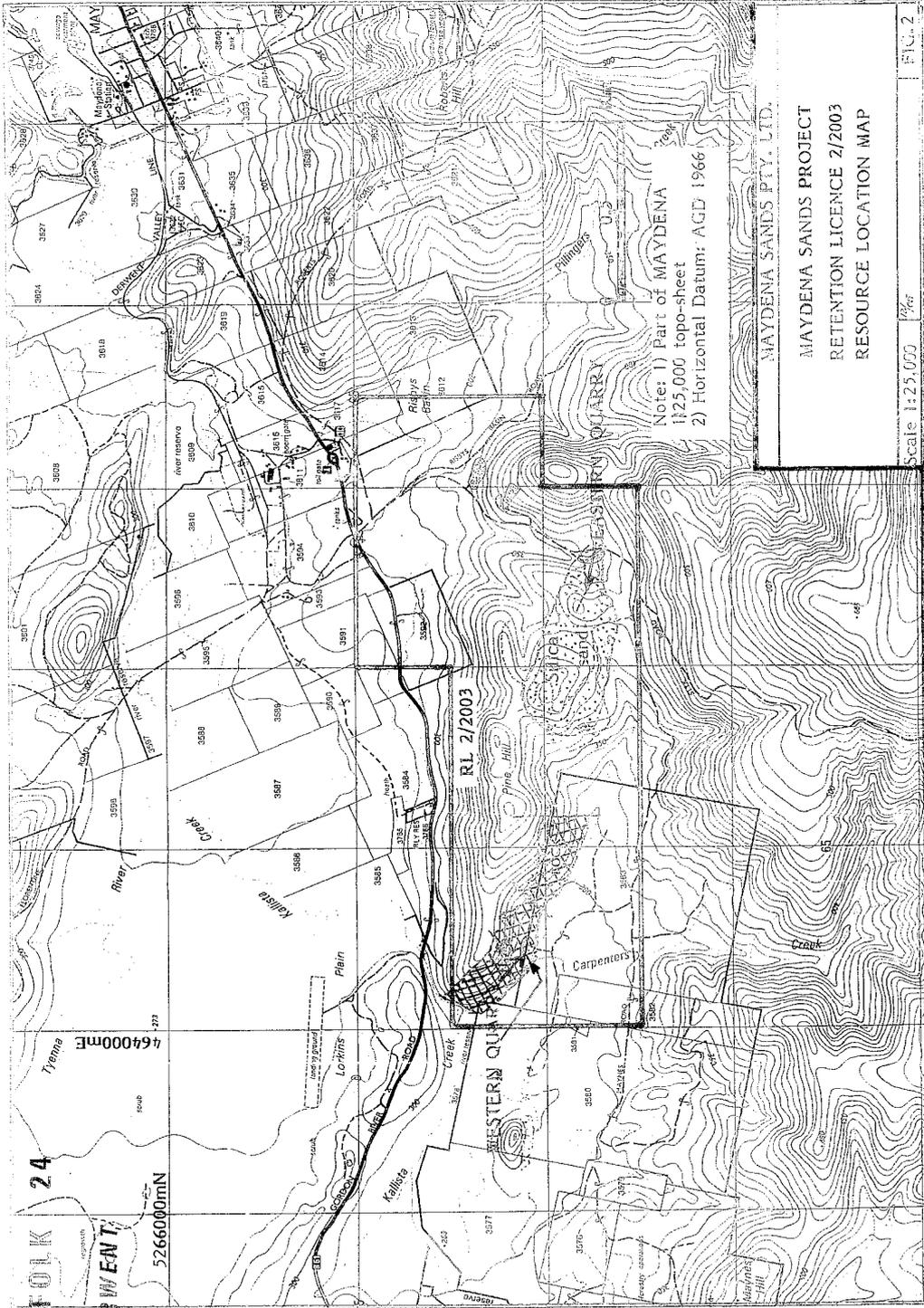
**Re Macquarie Harbour Quartzite  
Sample Analysis**

<b>Sample Ref.</b>	<b>Received date</b>	<b>Assayed date</b>	<b>Al<sub>2</sub>O<sub>3</sub></b>	<b>Fe<sub>2</sub>O<sub>3</sub></b>	<b>TiO<sub>2</sub></b>	<b>CaO</b>	<b>MgO</b>	<b>Cu</b>	<b>Cr</b>	<b>Mn</b>	<b>Ni</b>
May 2A	30-Jul-09	03-Aug-09	1094	518	over	41	153	2.5	859	5.6	1.1
May 2B	30-Jul-09	03-Aug-09	967	251	over	38	70	1.6	316	2.0	0.6
May 2C	30-Jul-09	03-Aug-09	1031	260	over	44	80	1.8	285	2.1	0.6
May 2D	30-Jul-09	11-Aug-09	822	181	over	36	63	1.5	242	1.8	0.4
May 2E (wet cut)	30-Jul-09	05-Aug-09	1038	730	1246	97	293	3.80	1541	10.59	1.55
May 1D	30-Jul-09	08-Sep-09	357	1345	50	494	95	2.93	5.50	6.78	2.69
May 1B	30-Jul-09	14-Sep-09	424	269	50	522	114	1.25	2.56	2.88	0.64
May 1A	30-Jul-09	22-Sep-09	373	130	42	388	124	0.78	3.20	1.22	0.75
May 1C	30-Jul-09	22-Sep-09	324	664	80	313	82	1.57	1.36	1.35	0.36

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## ILLUSTRATIONS





MAYDNA SANDS PTY. LTD.  
 MAYDNA SANDS PROJECT  
 RETENTION LICENCE 2/2003  
 RESOURCE LOCATION MAP

Scale: 1:25,000 <sup>1:25,000</sup>  
 FIG. 2

FOLK 24  
 WENT  
 5266000mN  
 464000mE