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J.J. McDONALD & SONS MINING PTY LTD

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EXPLORATION LICENCE NO. 17/98

MAYDENA, TASMANIA

ANNUAL REPORT

TO

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ABSTRACT

The first pass drill coverage of the Pine Hill silica sand deposit has been completed.

It is now apparent that silica flour, which comprises about 48% of the total mass has surpassed glass sand, at only about 40%, as the most important economic component of the deposit. Both these categories share a common size fraction which is likely to narrow production options. The oversize seems to be readily menable to reduction to flour, underlining the latter's importance as potentially the dominant product from any operation at the prospect if value is to be maximised.However, the occurrence of these materials throughout the deposit is far from uniform and the removal of contaminants remains an issue which continues to addressed.

A broad distribution pattern for the major contaminants is discernible over the deposit as a whole, though the detail in both the horizontal and vertical directions can be complex.

The eastern third of the prospect is predominantly fine grained, but relatively high in iron, titanium and alumina. The central third is generally medium to coarse grained, but with important areas of better quality, fine grained material. The remainder of the deposit to the west is more complex, ranging from fine to coarse, with highly variable depth extent and generally elevated levels of impurities.

Sufficient background information has now been generated to support a scoping study to define the broad parameters for a commercial operation based on the deposit's resources. Marketing effort needs to be prioritised towards silica flour in the first instance, but not to the exclusion of other products.

Keywords:

Maydena; Pine Hill; Silica sands;
Silica flour; Glass sand; Limestone;
Sizings; Marketing.

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1. INTRODUCTION

This report details activites by J.J. McDonald & Sons Mining Pty. Ltd. relating to Exploration Licence 17/1998 during the third year of tenure ended 04.09.2001.

Exploration licence tenure over an area of 7 sq. km was granted to J.J. McDonald & Sons Mining Pty. Ltd. for a period of five years from 04.09.1998.

E.L.17/1998 surrounds and extends to the east of Pine Hill, 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 rail-line from New Norfolk to Maydena is being progressively upgraded for passenger traffic. A 700m long gravel airstrip is located 3 km north west of the silica sand deposit.

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

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

The main objectives of this year's activites towards this aim were:

* Completion of the 1st pass assessment of the sand resource by completing some 20 shallow RC/air core drill holes and related activities
* investigation of the silica flour component of the deposit using drill hole sample material
* apply for E.L tenure over limestone-prospective ground to the east of E.L. 17/1998, subject to satisfactory drill check assays of MRT generated samples
* continue with product upgrade investigations
* continue with market enquiries, with added focus on silica flour

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. In the course of this work, a deposit of white silica sand was located between Pine Hill and the Eastern Quarry just west of the Styx Road. Pioneer explored this deposit in the vicinity of the Eastern Quarry by 23 shallow RC drill holes. Preliminary estimates suggested a resource in the order of 0.75 - 1.5 million cu. m. of mostly low iron silica sand containing about 10% of high grade lump silica.

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 material might be suitable for the manufacture of table ware glass.

In the first year of tenure of E.L. 17/1998 J.J. McDonald & Sons Mining Pty. Ltd. , using the air-core drill sampling method, extended the sampling into the western segment of the deposit along more widely-spaced drill centres. 23 drill holes totalling 294m were completed and demonstrated that the deposit is more variable, complex and higher in iron oxides than previous data suggested.

The area around the Eastern Quarry was shown generally to have a matrix of fine grained sand, but with elevated levels of iron, titanium and alumina.

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

Bench scale acid wash tests on a sample of the glass size fraction sand aimed at the removal of iron oxides showed that the material could be easily up-graded to a high quality product containing less than 50 ppm iron without major environmental impact, with levels of iron below 10 ppm a possibility.

The second year's activities by J.J. McDonald & Sons Mining Pty. Ltd. contributed to a better understanding of the geological setting of the silica sand deposit and identified a possible source of good grade limestone for use in acid neutralisation in relative proximity to the east of the silica sand deposit.

Marketing activites provided some encouragement for potential demand for the area's products, with particular interest and enquiries directed at the silica flour component and other fine fraction material.

The third year's activities and outcomes are described below.

3. ACTIVITIES FOR PERIOD

The cornerstone activity during the period under review was the completion of 20 air-core drill holes, followed by analyses, testing and investigation of material from the drill samples generated.

Satisfactory check-assay results and acid neutralisation tests on several composites of diamond and RC drill sample material from a previous MRT drill campaign in the Roberts Hill-Risbys Basin area led to an application for an exploration licence over the limestone prospective area.

3.1 Work Done:

This comprised:

* Compilation of the annual report for year 2000 activites
* Limited drill access construction
* Completion of 20 air-core drill holes over the central and western parts of the silica sand deposit
* Assaying of drill hole samples
* Sizing determinations on 16 samples composited on a drill hole basis from the year 2001 drilling programme
* Sizing of 15 drill hole composites from the 1999 drilling programme for the +10 to -75 micron fraction
* Assaying of selected samples from the above fine size ranges, including S determinations to check for possible laboratory dust contamination

* Assaying of some magnetically cleaned samples from the current to determine possible clean-up factor(s)
* Drill hole collar survey and base map update
* Minor tape and compass check surveys/measurements
* Drill site clean-up; holes plugged and covered; drainage grips dug on new drill access tracks where necessary
* Limestone check assays and acid neutralisation determinations on 1 diamond drill hole core composite and 5 RC drill chip composites
* Application for 4 sq km E.L. over prospective limestone area at Risbys Basin/Roberts Hill
* Literature review and various discussions re karst features in E.L. area under application
* Marketing - preparation for bulk sample collection by Index Mineral Processors

3.2 Statistical Summary:

Drill holes completed	:	20 by KMR Drilling Pty. Ltd., Richmond
Rig Type	:	UDR RC/Air-core unit; Track mounted; Hole diam.: 80 mm
Total drilled	:	258.5m (Average: 12.9m; Range: 2-33m)
No. of drill samples collected	:	250
No. of drill samples assayed	:	124
No. of determinations	:	1040 (Incl. duplicates & standards)
No. of samples: sizing determination	:	16
No.of samples: non-mag. samples	:	16
No.of determinations: non-mag samples	:	128
No.of fine sizings assayed	:	42 (ex holes 75, 80, 87, 90)
No.of determinations on fine sizings	:	394 (Incl. duplicates and standards)
No. of limestone samples assayed	:	6
No. of determinations	:	72
Acid neutralisation tests	:	6 samples

3.3 Expenditure:

Total expenditure for year reviewed	:	$ 54,722
Cumulative expenditure to 30.09.2001	:	$133,121

4. RESULTS

4.1 Geology:

Interpretation of drilling information shed some light on the shape of the sub-surface bedrock topography in the area west of a line joining holes 91 & 96.

This suggests a sudden rise in the basement topography of up to about 40m, culminating in a small outcrop about 2-3m high. Most of this area is covered by a thin veneer of 4 - 6 m of relatively coarse sand containing abundant, often large, boulders of silica rock. This feature, which also forms a landform high , is flanked to the immediate south by a large pocket of fine to medium silica sand averaging about 20m in thickness and extending down to more than 33m as shown by hole 102 (Fig.14). This silica sand accummulation wedges out southwards from the basement high in an apron-like fashion (Fig. 15).

To the west, the silica sand deposit and the Cambrian sequence hosting the silicified dolomite source rock appears to be truncated by a north-east trending fault as evidenced by outcrop approximately 40m west of hole 100.

A similar, steep basement slope may be present around holes 86 and 88 to the north, but a significant amount of material may have been removed by erosion, with the exact nature of the limiting northern sand contact remaining unclear.

The foregoing roughly outlines the presence of a basement block approximately 25-30m high, 50m wide and extending for some 250m in an easterly direction. This volume points to a resource of some 5-600,000 tonnes of silicified dolomitic bedrock possibly suitable for the manufacture of ferrosilicon or silicon metal.

4.2 Drilling and Assays:

This year's 20 hole drilling programme totalling 258.5m completes the first pass drill assessment of the Pine Hill silica sand deposit. Holes were sited at approximately 50m centres along north-south (state grid) lines about 100m apart. Drilling was confined largely to pre-existing tracks, requiring only limited new access construction, which may also be useful for impending timber harvesting operations in the area.

The extreme south west corner remains to be tested by a few shallow holes. This could be achieved by limited, shallow mechanical augering or back-hoe/excavator pitting as the sand cover is expected to be relatively shallow. The findings are not expected to affect materially the broader conclusions derived from the current air-core drilling.

The position of each drill hole completed to-date is shown in Fig.17, including holes 92-110 which formed this year's programme. The co-ordinates and RLs of all holes are listed in Appendix 1.

The same air-core drill rig, now owned by KMR Drilling Pty. Ltd, was used as in the first part of the programme completed in 1999. Similarly, samples were collected and logged at 1m intervals.

This year's drilling programme contributed to a better understanding of the morphology, quality (purity) and texture of the western half of the deposit and, in conjunction with the data from the 1999 drilling phase, defined and quantified the broad characteristics of the deposit as a whole. These aspects are discussed in the following sections.

Holes were stopped either on hard silica rock interpreted as "basement", in clay, on striking damp material or water or due to clogging of drill pipes. Brief drill logs are attached as Appendix 2.

Total depth of sand intersected in each hole is shown in Fig. 4. In the eastern part of the deposit there are three pockets of thick sand around holes 73, 75, and 76, but the quality is poor. In the western part of the area there are two areas on either side of a topographic and basement high where silica sand thickness exceeds 20m. The smaller area occurs around hole 88 to the north of the basement high where a thickness, not bottomed, of +30m was encountered. The larger of the two areas is defined by holes 93,94,101,and 102. Hole 102 penetrated 33m of mostly good quality silica sand and was not bottomed and is situated to the south of the basement high.

In the central part of the area, with the exception of shallow hole 85 drilled in a gully, total sand depth varies between +11 an +18m containing substantial intercepts of visually good quality material.

Within each total sand intercept there is, in most cases, an interval of better looking material referrd to as the "prospective zone", the quality of which is deemed to be amenable to significant upgrade by physical and/or chemical means. The prospective zones containing these promising intervals are broadly delineated in Fig. 5

In the eastern part of the deposit, the prospective zone, as defined by the 10m intercept contour has a distinct V shape, with the Eastern Quarry situated at its eastern extemity. The prospective intervals within this area vary from 10 to 17m while the zone itself, in plan, is about 50m wide.

The main prospective zone in the western two thirds of the area is substantially larger. Again defined by the 10m thickness contour, it commences to the west of holes 106 and 107 and extends for about 600m in a roughly eaterly direction through holes 102, 104 and then northwards to beyond hole 84 (Fig.5). The depth of the prospective intervals in this zone range from 11 - 22m with the width in plan varying between 70 - 120m.

A smaller pocket of prospective material which is centred around hole 88 lies to the north of the basement high and appears to extend to the northern contact of the deposit.

Extending the limits of the prospective zone to the 5m thickness contour significantly increases the total resource base of sand amenable to upgrade.

For assay purposes and sizing determination purposes every sample was cone and quartered. One quarter-sample from each 1m interval was composited on a per hole basis to provide a bulk sample for feed for sizing determinations. The second quarter-sample from every second 1m drill sample in each hole wass bagged for assay to determine levels for Al_2O_3, Fe_2O_3, CaO, MgO, TiO_2, MnO, Cr_2O_3 and V_2O_5. The results are presented in Appendix 3.

Alumina levels were generally in the low100s or better (down to 48ppm), with several notable exceptions. Alumina concentrations increase significantly from 16m to the bottom of hole 94 (max. 3.04%) and values are also high in adjacent hole 95 (929 -5940ppm). Hole 99 at the western edge of the deposit gave readings up to 1.29% in coarse material from 3m down. Hole 100 sited at, or just beyond the deposit boundary carried some of the highest levels of impurities, reporting up to 3.22% Al_2O_3. The colour change to chocolate brown from 9m in hole 108 is also reflected by a rise in alumina(3710 - 6510 ppm), accompanied by high iron.

Despite encouragingly low values of -10 to 32 ppm and 54 ppm Fe_2O_3 in holes 101 and 102 respectively, iron levels encountered were higher than expected and sometimes at odds with the light colour of the material.

As with alumina, hole 100 again showed very high iron in the range of 0.66 to 1.8% Fe_2O_3, but this is exceeded in the samples from the bottom of nearby Hole 99 which yield values in the range of 2.23 - 3.55% Fe_2O_3. Other spot highs in the percentage range occur at the base of holes 94 (3.83% Fe_2O_3), and hole 96 (1.14% Fe_2O_3), towards the bottom of hole 101 (1.15% Fe_2O_3) and hole 108 (1.13% Fe_2O_3) and within a bright orange-red zone from 5-9m in an otherwise white and off-white fine sand in hole 102. This relationship between very high Fe content and the bright orange-red coloration is also evident in holes 94, 96, 99, 101 and 108.

The lowest TiO_2 levels are noted in holes 101, 102, 103 and 104, falling mostly in the range of 58 - 345 ppm. Spot highs of 504, 600 and 1200 ppm TiO_2 in holes 101 and 102 are associated with sharply higher Fe_2O_3 levels. In the remaining drill holes, concentrations were more elevated, especially in holes 101 -110, where higher or peak values are again broadly associated with elevated or spike values of Fe_2O_3.

Most MnO_2 concentrations were below detection levels of 10ppm. The noteworthy exception being holes 99 (15 & 21 ppm), 100 (18-22 ppm) and the base of hole 101 (up to 77 ppm MnO_2), all of which are associated with higher values of Fe_2O_3.

Cr_2O_3 concentrations are low and spotty in the range of less than 1ppm to a high of 97 ppm (base of hole 94), and are mostly grouped in the -1 to 3 ppm band. The higher levels are again associated with high levels of Fe_2O_3.

A spike of 134 ppm V_2O_3 accompanies a peak of 97 ppm Cr_2O_3 and 5450 ppm TiO_2, 3.04% Al_2O_3 and 3.83% Fe_2O_3 in the sample from 19-20m in hole 94. Not surprisingly, holes 99 and 100 also report high V_2O_3 in the 20 - 88 ppm range. However, the majority of determinations gave readings below detection limits of 10ppm V_2O_3.

CaO and MgO are high at the base of hole 107 and in holes 100 and 108, perhaps reflecting proximity to carbonate bedrock. Elswhere, concentrations of $CaCO_3$ are in the low to mid 100s ppm and for $MgCO_3$ in the low 100 ppm or below.

The arithmetically averaged levels of Fe_2O_3, TiO_2 and Al_2O_3 over prospective drill intervals are shown in Figs. 6, 7 and 8 which highlight some common, broad distribution patterns. From these illustrations it is immediately apparent that a roughly co-incident area of relatively low contamination is located in the central part of the deposit, flanked on either side by areas with higher impurity levels.

In very broad terms, Fe_2O_3 is about 4 times higher in the eastern area and about 3 times higher in the western area than in the central part. Similarly, Al_2O_3 is 6-7 times higher in the eastern and about 5 times higher in the western area.

Bulk TiO_2 distribution appears to be somewhat different, with the western sector showing about 3 times the amount of the central apart, and the eastern area about twice the amount.

In line with experience gained from the 1999 round of drilling, it is thought that part of the iron contamination in the drill samples might have been derived through attrition of the drilling equipment by the abrasive action of the sand return.

The ability to remove the particulate iron contamination needed confirmation and 16 samples from drill holes DH 101,102 and 103 were selected to be cleaned of paramagnetic material through a Reading's Induced Roll Magnet at a setting of 15,000 gauss (WHIMS simulation).

The "cleaned" fraction was then assayed for contaminants in the usual manner with results presented in Appendix 4.

Significant reduction in iron oxide contamination in the range of 46 -88% (average: 72%) were achieved.

The improvements for TiO2 and Al2O3 were much less, amounting to an average reduction of only 27% (range 2-51%) for the former and 22% (range: 3-47%) for the latter.

However, in none of the samples was iron oxide brought down below 50 ppm.

The clean-up effect of magnetic separation, allied to further likely removal of contaminants by desliming, attrition washing, and possible acid/alkali leaching should be borne in mind when reviewing the assay results in Appendix 3 and Figs. 6, 7 and 8.

4.3 SIZING DETERMINATIONS

Two size determination projects were completed during the year.

4.3.1 Fine Grain Size Determination and Grindability Testing:

This work was initiated in response to market enquiries about the possible availability of silica flour from the Pine Hill silica sand deposit. Determinations were undertaken on feed from composite samples of 15 drill holes selected from the suite of 23 holes completed in 1999.This latest data was then integrated with sizing information from the first sizing report focused on the +75 to - 600 micron glass fraction (Krummei, 1999). The work, including grindability tests, was carried out by Esker Milling and Processing Pty. Ltd. Details of procedures, results and conclusions are given in Esker's report attached as Appendix 5.

The main points to emerge from this investigation were that:

* the drill hole samples tested had, on average, about 41% of their weight in the -106 to + 10 micron size band
* Only about 5% by weight of the material tested accrued in the ultra-fine, -10 micron fraction
* the +106μfraction of the Pine Hill silica sand deposit can be readily ground to 80% passing about 106μmesh, with the possibility, to be confirmed by further test work, of a work index less than 10.

With the amount of material in the +106 to -212 micron size band added, it can be concluded that, on average, about 50% or more of the material falls into the silica flour size range of +25 to -212 microns. This percentage represents a significant resource of silica flour at the prospect. It could be further increased at low cost by the reduction of the oversize material.

The size fractions from holes 75, 80, 87 and 90 were selected for assay as a guide to contamination levels in the various finer size fractions (Appendix 6).

The most noteworthy feature of the assay results was a noticeable rise in the levels of Al2O3, Fe2O3 and TiO2 in the -20 micron fractions. The spike in impurities in the CS1 series of fractions is attributed to the transition from screening to cyclosizing.

As there was concern about labratory contamination of the samples during the sizing process by fine metallic sulphide dust, sulphur was added to the elements investigated. The low sulphur concentrations suggest very little, if any, contamination by airborne particles from this source.

4.3.2. Sizing Determinations, DHs 92 - 110:

The objective of this investigation was to:

- determine the size distribution of material derived from drill holes DH 92 - 110
- integrate this information with prior data from holes DH 69 - 91 to obtain a prospect-wide overview of size distribution
- to characterise the deposit in terms of saleable products comprising glass sand and silica flour

Excluded from these tests were holes 97, 99, and 100 located at the north western edge of the deposit due to the clearly commercially unsuitable nature ot the material.

Esker's report attached as Appendix 7 provides detailed results and these are summarised in contour format in Figs. 9 - 12.

Several significant outcomes were achieved in addition to the acquisition of the required sizing data:

* It is apparent that the silica sand content of the Pine Hill deposit is reasonably consistent once the gravel and pebble components are removed
* A workable method of classifying the characterisitics of the Pine Hill silica sand deposit by size has been established

This scheme defines economic ore types as:

	silica sand	(-600 +20 microns)	Overall economic size band of silica

within which there are two classes of:

Glass sand	(-600 +75 microns)	
Silica flour	(-300 + 20 micron)	
containing a **Common fraction**	(-300 +75 micron)	

Outside the immediate economic range are:

Pebbles	(+2.35mm)	commercial potential
Gravel	(-2.35 +0.60mm)	commercial potential
Slimes	(-20 microns)	some commercial potential

Of the material in the DH 92 -110 series of drill holes:

. silica sand	+20 -600 microns	ca 65.5%	overall economic band
containing:			
. glass sand	+75 -600 microns	ca 41.5%	
or			
. silica flour	+20 -300 microns	ca 53.8%	
in addition:			
. slimes	-20 microns	ca 9%	
. gravel	+ 600 microns	ca 14%	reducible to flour
. pebbles	+ 2.35	ca 11%	reducible to glass sand and/or silica flour

Holes 94 and 95 were excluded as non-representative due to high slimes content.

Prospect wide overall: (DH 61 -110)

. glass sand : 40.2% (Coarse 22.3%, slimes 37.5%)

or

. silica flour : 48.0% (oversize 41.1%, slimes 10.9%)

These results focus attention on the higher value silica flour potential of the Pine Hill silica sand deposit as compared to glass sand, particularly since that potential could be enhanced by successful comminution of a significant part of the +300 fraction.

The distribution of coarse, medium and fine sand classified on the basis of D_{50} in micron is shown in Fig. 9. The latter provides a broad brush illustration of the location of the main sand types based on texture characterisitics. A zone of coarse to medium material in the centre of the deposit separates two larger areas of generally fine sand to the east and west. This strip co-incides generally with a topographic low and may represent the lower part of the deposit exposed by erosion.

The eastern area is relatively uniformly fine, with some very fine material in evidence around holes 79 and 80.

The western area is penetrated by a tongue of coarse material easterly through hole 89 and includes outcrop and abundant float of silica rock. This tongue co-incides with a topographic high representing basement rocks close to the surface. An apron of medium grained sand is formed through holes 106 - 108 and is open to the south west.

Fig. 10 shows the distribution of glass sand prospect-wide as a percentage of total sand. There is a broad zone in the centre of the deposit where the amount of glass and ranges from 40.1 - 66.5%. This zone fans out southwards to the edge of the deposit.

To the east of this is an area, comprising about one third of the deposit and including the Eastern Quarry, where the proportion of glass sand falls to a low range of 30 -39%.

The amount of glass sand in the western part of the deposit is somewhat less than in the centre, with a greater proportion of the material in the 40 -49% range and apparently wrapped around the inferred basement high centred on the area around hole89.

Silica flour distribution shows the most interesting distribution pattern of all.

East of a line approximately through holes 88 and 92 the deposit contains in excess of 50% of the material in the silica flour class. This area comprises about two thirds of the deposit and contains two sub-areas around holes 90 and 80/Eastern Quarry where the proportion of silica flour reaches 63% and 67.7% respectively. In contrast to the area around hole 80, it should be noted that the impurity levels in the segment containing holes 90, 91, 92, 102 and 104 are relatively low.

To the west of the line joining holes 88 and 92 the proportion of silica flour falls off to between 33 and 46%, with contamination somewhat higher.

An attempt to characterise the deposit in terms of wt% +600 micron material is shown in Fig.12. On this basis, about half of the area contains material with less than 20% by weight of +600 micron material. The greater proportion of the coarser material exceeding 20%by weight of +600μ material lies generally in the western third of the deposit. Again, the centre and extreme east of the deposit stand out as priority areas.

4.4 Beneficiation Tests:

Towards the end of the reporting period discussions were held with CSIRO Minerals, Melbourne, with a view to initiating new preliminary laboratory investigations aimed at product upgrade using chemical reagents as opposed to acid washing.

A work contract was raised and material collected and dressed in preparation for testing.

Work is expected to commence in the last quarter of year 2001.

4.5 Limestone:

Further to last year's literature study to identify a suitable source of limestone for possible neutralisation of acid used in the silica product upgrading process, arrangements were made to view the Cashion's Creek Limestone intercept in Risbys Basin/Roberts Hill DDH Maydena 1 at the MRT core shed. A composite sample of the best intercept was collected for assay. At the same time, four composites were made up of material from RC drill holes PDH 2, PDH3B, PDH5, and PDH6, completed by the Department in Cashions Creek Limestone at Risbys Basin in 1993. Sample PDH3A was split into a coarse and fine fraction.

A total of six samples were submitted to be assayed for CaO and MgO and scanned for deleterious impurities. Acid neutralisation determinations were undertaken on all these samples.

The results are presented in Appendix 8.

The random grab core material assayed 94.95 CaCO3 and 2.08% MgC03 with a neutralisation value of 96.9. There were no significant amounts of trace element contaminants.

The arithmetically averaged CaCO3 and MgCO3 of the five percussion hole sample composites was 94.4% and 1.4% respectively. These results were comparable with those obtained from the Departmental drilling. Acid neutralisation values ranged from 95.5 to 97.3 and averaged 96.2.

All these results are deemed satisfactory for material to be used for acid neutralisation purposes.

On the basis of these results, application was made for an exploration licence of 4 sq km adjacent to the east of the existing E.L. 17/1998 to secure the most prospective ground for further exploration purposes focused on the Ordovician limestone sequences.

In the course of this process it emerged from discussions and literature research that the area under application contained caves, karst features and springs deemed to be of conservation and heritage significance.

About eleven features in the relevant area have been identified to-date and described in reports by Eberhard (1994), Houshold (1992) and McGowan (1992). Several of these features, all of which are shown in Fig.3, are associated with, or lie along strike of, the target Cashions Creek Limestone. Surprisingly, there is no reference to any of these features in the recent technical reports on the assessment of the limestone potential of the area by MRT and its predecessors.

In the light of these findings the E.L. application was placed "on hold", pending investigations into other possible sources of limestone and alternative product upgrade methods which do not require the use of acid.

4.6 Marketing:

At the end of the period under review a request was received from Index Mineral Processors, Brisbane, for permission to collect a bulk sample of about 25 tonnes for testing at the company's plant at Heybridge, Burnie.

The purpose is to source additional silica flour for direct marketing or blending purposes.

The proposal was discussed with relevant officers of Mineral Resources Tasmania and Forestry Tasmania in Hobart and with a representative of the former on site as well.

Conditional approval was given and excavations are expected to commence shortly.

4.7 Rehabilitation:

Subsequent to the completion of drilling, all drill sites were cleaned up, flagging and samples removed, holes plugged and soil covered.

Drainage grips were dug where needed on inclined, new drill access tracks.

5. CONCLUSIONS

5.1 Completion of the first pass drilling coverage of the Pine Hill silica sand deposit now provides sufficient useful background information for an engineering scoping study to be initiated to provide a framework of options for a commercial operation based on the deposit's resources.

Additional study-specific drilling and/or beneficiation tests may be required.

5.2 Several parts of this complex resource have the potential to contribute to the cash flow from the project, but the value of the deposit appears to reside in the silica flour component which, at about 50% of the total mass, constitutes the single largest proportion of the deposit as a whole.

There is encouragement that a significant proportion of the oversize may be reduced to silica flour at low cost, thus enhancing value and reducing waste.

5.3 Assays, sizing data and thickness of silica sand combine to indicate that the central-west part of the deposit is a priority area for further attention.

5.4 The eastern third of the deposit is largely fine-grained, but the material appears sub-economic by virtue of higher impurity content. Methods and costs of upgrading this substantial resource to a marketable product need to be investigated.

5.5 The broad limits and character of the Pine Hill silica sand deposit have now been defined both laterally and in depth.

6. PROPOSED FUTURE ACTIVITIES

6.1 Exploration:

* Re-estimate more accurately the resource base of the deposit.

* Undertake a more detailed characterisation of the deposit using the research capabilities of CODES, University of Tasmania.

6.2 Beneficiation:

* Continue with investigations on product upgrade focused on both silica flour and glass sand.

6.3 Mining Engineering:

* Undertake a preliminary engineering scoping study to outline extraction, processing, capex and opex parameters and options for a commercially sized operation at the prospect.

6.4 Marketing:

* Generate product awareness and step up efforts to identify potential customers worl-wide.

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APPENDIX 1

DRILL HOLE CO-ORDINATES AND ELEVATIONS

Brooks Lark & Carrick
175 Collins Street Hobart 7000
File number 981714

865019

POINT	EASTING	NORTHING	HEIGHT	ST POINT	DESC
84	466277.500	5263799.000		0	DH46
85	466295.500	5263810.500		0	DH47
86	466284.500	5263822.500		0	DH48
87	466307.000	5263795.000		0	DH49
88	466308.000	5263841.000		0	DH50
89	466314.000	5263814.500		0	DH51
90	466332.000	5263624.500		0	DH52
91	466332.500	5263668.000		0	DH53
92	466332.500	5263720.500		0	DH54
93	466333.000	5263778.500		0	DH55
94	466340.000	5263823.000		0	DH56
95	466333.000	5263873.000		0	DH57
96	466332.000	5263895.500		0	DH58
97	466429.500	5263871.000		0	DH59
98	466449.000	5263915.500		0	DH60
99	466432.500	5263896.000		0	DH61
100	466469.500	5263781.500		0	DH62
101	466493.000	5263792.500		0	DH63
102	466482.000	5263733.500		0	DH64
103	466488.500	5263768.000		0	DH65
104	466542.000	5263787.500		0	DH66
105	466510.500	5263826.000		0	DH67
106	466619.000	5263772.000		0	DH68
107	466474.176	5263692.743	374.402	0	DH69
108	466230.935	5263644.762	388.463	0	DH70
109	466174.880	5263709.643	387.599	0	DH71
110	466190.919	5263780.323	389.092	0	DH72
111	466280.657	5263770.910	406.153	0	DH73
112	466247.226	5263722.468	395.480	0	DH74
113	466282.381	5263662.902	396.362	0	DH75
114	466389.486	5263631.547	394.048	0	DH76
115	466384.933	5263671.501	401.794	0	DH77
116	466380.142	5263723.393	402.130	0	DH78
117	466392.013	5263810.767	401.077	0	DH79
118	466447.591	5263841.623	387.826	0	DH80
119	466277.357	5263911.325	379.735	0	DH81
120	466214.505	5263904.936	386.417	0	DH82
121	466196.366	5263852.201	389.909	0	DH83
122	466203.085	5263958.451	390.444	0	DH84
123	466093.345	5263914.607	399.578	0	DH85
124	465992.340	5263936.051	409.673	0	DH86
125	466091.815	5263991.517	413.540	0	DH87
126	465984.771	5263991.889	420.376	0	DH88
127	465890.863	5263939.755	419.141	0	DH89
128	466087.143	5263766.461	393.945	0	DH90
129	465982.640	5263756.854	398.264	0	DH91
130	465926.237	5263789.924	400.416	0	DH92
131	465888.801	5263827.270	401.259	0	DH93
132	465855.062	5263869.959	405.135	0	DH94
133	465806.135	5263905.558	411.359	0	DH95
134	465756.505	5263950.888	420.309	0	DH96
135	465798.222	5264011.334	426.219	0	DH97
136	465803.027	5263961.720	425.465	0	DH98
137	465747.494	5264003.503	418.635	0	DH99

Brooks Lark & Carrick
175 Collins Street Hobart 7000
File number 981714

865020

POINT	EASTING	NORTHING	HEIGHT	ST POINT	DESC
138	465698.632	5263977.431	415.099	0	DH100
139	465893.355	5263882.066	412.418	0	DH101
140	465989.772	5263833.492	413.531	0	DH102
141	466091.762	5263861.442	412.478	0	DH103
142	466096.597	5263816.929	404.758	0	DH104
143	465868.094	5264017.953	421.033	0	DH105
144	465822.826	5263789.224	391.099	0	DH106
145	465783.678	5263845.754	394.686	0	DH107
146	465720.061	5263888.646	399.212	0	DH108
147	465716.946	5263889.671	399.279	0	DH108A
148	465885.861	5263736.391	387.629	0	DH109
149	465979.180	5263696.406	389.615	0	DH110

APPENDIX 2

DRILL HOLE LOGS
HOLES 92 - 110

865022

DRILL HOLE LOG

AREA: Eastern Quarry Area, Pine Hill, Maydena

MAP SHEET: 4626 Maydena

DRILLER: KMR Drilling Pty. Ltd.

DRILL HOLE: 92

METHOD: Air Core

AMG CO-ORDS: 5263790mN 465926mE

DATE: 03.04.2001

ANGLE: Vertical

LOGGED BY: G.K.

FINAL DEPTH: 18m

FROM	TO	DESCRIPTION	SAMPLE NUMBER
0	3	White/buff sand; clearing rods.	no sample
3	4	Pale buff/whitish sand; coarse fraction ca. 1-2%	70243
4	5	As above	
5	6	As above	70244
6	7	As above; coarse fraction ca. 5%	
7	8	Coarse dark orange-brown sand; coarse fraction ca. 5-10%	70245
8	9	Pale orange brown sand; clayey; coarse fraction ca. 2-5%	
9	10	Pale buff sand; coarse fraction ca 2%	70246
10	11	Pale buff sand, somewhat clayey; coarse fraction ca.1%	
11	12	Pale buff fine sand; somewhat clayey; coarse fraction ca 2-3%	70247
12	13	As above; coarse fraction ca. 3-5%	
13	14	As above; coarse fraction ca. 3%	70248
14	15	As above	
15	16	As above; coarse fraction ca. 1%	70249
16	17	As above; coarse fraction ca. 15%	
17	18	As above; coarse fraction ca. 2%	70250

Hole stopped due to clay/fine sand blockage.

DRILL HOLE LOG

865023

AREA: Eastern Quarry Area, Pine Hill, Maydena

MAP SHEET: 4626 Maydena

DRILLER: KMR Drilling Pty. Ltd.

DRILL HOLE: 93

METHOD: Air Core

AMG CO-ORDS: 5263827mN 465889mE

DATE: 03.04.2001

ANGLE: Vertical

LOGGED BY: G.K.

FINAL DEPTH: 24m

FROM	TO	DESCRIPTION	SAMPLE NUMBER
0	1	Fine white sand and silica flour	70251
1	2	As above: coarse material ca. 1%	
2	3	As above: coarse fraction ca. 1%	70252
3	4	As above; coarse fraction ca. 1%	
4	5	As above; coarse fraction ca. 1%	70253
5	6	As above; coarse fraction ca. 2%	
6	7	As above; coarse fraction ca. 5%	70254
7	8	As above; coarse fraction ca. 1%	
8	9	As above; no coarse material	70255
9	10	As above; coarse material ca. 10% (poor return)	
10	11	Fine, off-white sand & silica flour coarse fraction ca. 3-5%	70256
11	12	Finewhite sand and silica flour; coarse fraction ca. 3%	
12	13	Off white fine sand and silica flour; coarse fraction ca. 1-2%	70257
13	14	As above; coarse fraction ca. 3%	
14	15	White fine sand and silica flour; coarse fraction ca. 5%	70258
15	16	As above; slightly clayey; coarse fraction ca. 2-3%	
16	17	Off white fine sand and silica flour; coarse fraction ca. 3%	70259
17	18	As above; coarse fraction ca. 5%	
18	19	Light buff fine sand and silica flour; coarse fraction ca. 3%	70260
19	20	As above; coarse fraction ca. 1-2%	
20	21	Off white fine sand and silica flour coarse fraction ca. 1-2%	70261
21	22	Off white/light buff coarse sand; coarse fraction ca. 5-10%	
22	23	Brown coarse sand; coarse fraction ca.+10%	70262
13	23	Chocolate brown clay after brown coarse sand coarse fraction ca. 10%	
		Hole stopped at 24m in wet, dark brown clay and gritty, dark brown sand.	

865024

DRILL HOLE LOG

AREA: Eastern Quarry Area, Pine Hill, Maydena

MAP SHEET: 4626 Maydena

DRILLER: KMR Drilling Pty. Ltd.

DRILL HOLE: 94

METHOD: Air Core

AMG CO-ORDS: 5263870mN 465855mE

DATE: 03.04.01

ANGLE: Vertical

LOGGED BY: G.K.

FINAL DEPTH: 21m

FROM	TO	DESCRIPTION	SAMPLE NUMBER
0	3	No sample; poor recovery	no sample
3	4	Brown sand; coarse fraction ca. 2%	70263
4	5	Light brown/buff sand; coarse fraction ca. 5%	
5	6	As above; coarse fraction ca. 5-10%	70264
6	7	Off white/light brown sand slightly clayey; coarse fraction ca. 1-2%	
7	8	As above; Coarse fraction 1-2%	70265
8	9	As above; coarse fraction ca. 1-2%	
9	10	Light brown sand; coarse fraction ca. 5%	70266
10	11	Light orange-brown coarse sand; coarse fraction ca. 20%	
11	12	As above; coarse fraction ca. 10%	70267
12	13	As above; coarse fraction ca. 5-10%	
13	14	Light orange-brown sand; coarse fraction ca. 10%	70268
14	15	As above; coarse fraction ca 10-15%	
15	16	As above; coarse fraction ca. 10%	70269
16	17	As above; coarse fraction ca. 5-10%	
17	18	Brown sand; coarse fraction ca. 5%	70270
18	19	Dark orange brown sand; slightly clayey; coarse fraction ca. 2-5%	
19	20	Orange brown sand; somewhat clayey; coarse fraction ca. 3-5%	70271
20	21	Bright orange brown sand; clayey coarse fraction ca. 3-5%	

Hole stopped at 21m in orange-brown, very fine clayey sand; clogging; difficult sample return.

865025

DRILL HOLE LOG

AREA: Eastern Quarry Area, Pine Hill, Maydena

MAP SHEET: 4626 Maydena

DRILLER: KMR Drilling Pty. Ltd.

DRILL HOLE: 95

METHOD: Air Core

AMG CO-ORDS: 5263906mN 465806mE

DATE: 03.04.2001

ANGLE: Vertical

LOGGED BY: G.K.

FINAL DEPTH: 15m

FROM	TO	DESCRIPTION	SAMPLE NUMBER
0	1	Pale brown sand; coarse fraction ca3-5%	
1	2	Off white/pale cream fine sand; coarse fraction ca. 2%	70272
2	3	Pale buff fine sand; coarse fraction ca. 2%	
3	4	Pale cream fine sand; coarse fraction ca. 2%	70273
4	5	As above; coarse fraction ca. 2%	
5	6	As above; coarse fraction ca. 5%	70274
6	7	As above; coarse fraction ca. 3%	
7	8	As above; coarse fraction ca. 5%	70275
8	9	As above; coarse fraction ca. 5%	
9	10	Pale buff fine sand, coarse fraction ca. 5%	70276
10	11	As above; coarse fraction ca. 2%	
11	12	As above; coarse fraction ca. 5-10%	70277
12	13	Pale buff/off white fine sand; coarse fraction ca. 5-10%	
13	14	Pale buff fine sand; coarse fraction ca. 15%	70278
14	15	Orange-brown clayey sand; coarse fraction ca. 5%	

Hole stopped at 15m in orange-brown clay

865026

DRILL HOLE LOG

AREA: Eastern Quarry Area, Pine Hill, Maydena

MAP SHEET: 4626 Maydena

DRILLER: KMR Drilling Pty. Ltd.

DRILL HOLE: 96

METHOD: Air Core

AMG CO-ORDS: 5263951mN 465757mE

DATE: 03.04.2001

ANGLE: Vertical

LOGGED BY: G.K.

FINAL DEPTH: 11m

FROM	TO	DESCRIPTION	SAMPLE NUMBER
0	1	Dark brown sand, gravelly; coarse fraction ca. 10-15%	
1	2	Dark buff sand; somewhat finer; coarse fraction ca. 5%	70279
2	3	As above; coarse fraction ca. 5-10%	
3	4	Pale buff fine sand; coarse fraction ca. 5%	70280
4	5	Cream /pale buff fine sand; coarse fraction ca. 2%	
5	6	Cream fine sand; coarse fraction ca. 2%	70281
6	7	Pale orange/cream fine sand; coarse fraction ca. 1%	
7	8	Pale cream fine sand; coarse fraction ca. 5%	70282
8	9	Pale cream, then orange, coarser sand; coarse fraction ca. 10%	
9	10	Bright orange, coarse sand; coarse fraction ca. 10%	70823
10	11	Orange fine sand, somewhat clayey; coarse fraction ca. 3-5%	

Hole stopped in orange clay/?weathered bedrock

865027

DRILL HOLE LOG

AREA: Eastern Quarry Area, Pine Hill, Maydena

MAP SHEET: 4626 Maydena

DRILLER: KMR Drilling Pty. Ltd.

DRILL HOLE: 97

METHOD: Air Core

AMG CO-ORDS: 5264011mN 465798mE

DATE: 04.04.2001

ANGLE: Vertical

LOGGED BY: G.K.

FINAL DEPTH: 3.5m

FROM	TO	DESCRIPTION	SAMPLE NUMBER
0	1	Brown, clayey, fine sand; coarse fraction ca. 5%	
1	2	Buff/pale brown fine, somewhat clayey sand; coarse fraction ca. 10%	70284
2	3	Pale cream, fine sand; coarse fraction ca. 20%	70285
3	4	Grey-white fine sand; coarse fraction ca. 10%	70286

Hole stopped at 3.5m on silica ?bedrock.

865028

DRILL HOLE LOG

AREA: Eastern Quarry Area, Pine Hill, Maydena

MAP SHEET: 4626 Maydena

DRILLER: KMR Drilling Pty. Ltd.

DRILL HOLE: 98

METHOD: Air Core

AMG CO-ORDS: 5263962mN 465803mE

DATE: 04.04.2001

ANGLE: Vertical

LOGGED BY: G.K.

FINAL DEPTH: 5m

FROM	TO	DESCRIPTION	SAMPLE NUMBER
0	1	Dark, brown-grey sand; coarse fraction ca. 15%	
1	2	Pale grey-white fine sand; coarse fraction ca. 10%	70287
2	3	Off white fine sand; coarse fraction ca. 10-15%	70288
3	4	As above; coarse fraction ca. 5%	70289
4	5	As above; coarse fraction ca. 5-10%	70290

Hole stopped at 5m on hard ?bedrock.

865029

DRILL HOLE LOG

AREA: Eastern Quarry Area, Pine Hill, Maydena

MAP SHEET: 4626 Maydena

DRILLER: KMR Drilling Pty. Ltd.

DRILL HOLE: 99

METHOD: Air Core

AMG CO-ORDS: 5264004mN 465748mE

DATE: 04.04.2001

ANGLE: Vertical

LOGGED BY: G.K.

FINAL DEPTH: 9m

FROM	TO	DESCRIPTION	SAMPLE NUMBER
0	1	Grey brown sand, organic; coarse fraction 5-10%	
1	2	Off white coarse sand with some clay; coarse fraction ca. 10%	70291
2	3	As above; coarse fraction ca. 10%	
3	4	As above: coarse fraction ca. 10%	70292
4	5	Mixed off-white and orange, fine sand; coarse fraction ca. 10%	
5	6	Orange sand; coarse fraction ca. 10%	70293
6	7	Bright orange sand; coarse fraction ca. 15-20%	
7	8	Dark orange-red, coarse sand; coarse fraction ca. +20%	70294
8	9	Dark re-brown clayey grit	

Hole starting to clog at 9m.

865030

DRILL HOLE LOG

AREA: Eastern Quarry Area, Pine Hill, Maydena

MAP SHEET: 4626 Maydena

DRILLER: KMR Drilling Pty. Ltd.

DRILL HOLE: 100

METHOD: Air Core

AMG CO-ORDS: 5263977mN 465699mE

DATE: 04.04.2001

ANGLE: Vertical

LOGGED BY: G.K.

FINAL DEPTH: 9m

FROM	TO	DESCRIPTION	SAMPLE NUMBER
0	1	No sample; on timber pile	
1	2	Brown organic loamy sand; coarse fraction ca. 5%	70295
2	3	Orange sand; coarse fraction ca 5%	
3	4	As above	70296
4	5	As above, but coarser; coarse fraction ca. 25%	
5	6	Orange sand; coarse; coarse fraction ca. 30%	70297
6	7	Pale orange-brown sand; coarse fraction ca. 10%	
7	8	Dark brown-orange coarse sand; coarse fraction ca. 30%	70298
8	9	Dark brown, loamy coarse sand; coarse fraction ca. 25%	

Hole stopped at 9m in poor material

865031

DRILL HOLE LOG

AREA: Eastern Quarry Area, Pine Hill, Maydena

MAP SHEET: 4626 Maydena

DRILLER: KMR Drilling Pty. Ltd.

DRILL HOLE: 101

METHOD: Air Core

AMG CO-ORDS: 5263882mN 465893mE

DATE: 04.04.2001

ANGLE: Vertical

LOGGED BY: G.K.

FINAL DEPTH: 21m

FROM	TO	DESCRIPTION	SAMPLE NUMBER
0	1	Dark brown humic sand; coarse fraction ca.2%	
1	2	Grey-white fine sand; coarse fraction ca. 2%	70299
2	3	White fine sand; coarse fraction ca 5%	
3	4	Pale buff-whitefine sand;coarse fraction ca.5%	70300
4	5	As above; coarse fraction ca. 2-3%	
5	6	As above, but with some coarse lumps of silica rock; coarse fraction ca. 3-5%	70301
6	7	White fine sand; coarse fraction ca. 5%	
7	8	White fine sand; coarse fraction ca. 5-10%	70302
8	9	As above	
9	10	Pure white fine sand; coarse fraction ca. 3%	70303
10	11	As above; coarse fraction ca. 5%	
11	12	As above	70304
12	13	Pale buff/white fine sand; coarse fraction ca. 2%	
13	14	White sand; very good quality; coarse fraction ca. 5-10%	70305
14	15	Pale orange red fine sand; coarse fraction ca. 5-10%	
15	16	Orange-red sand coarse fraction ca. 15%	70306
16	17	Dark orange-brown sand; coarse; coarse fraction ca. 15%	
17	18	As above; coarse fraction ca. 5%	70307
18	19	As above	
19	20	Pale orange, very fine, ?clayey (powdery) sand;	70308
20	21	As above	

Hole stopped at 21m in very fine, clayey , pale orange sand; Poor sample return; Hole clogging.

865032

DRILL HOLE LOG

AREA: Eastern Quarry Area, Pine Hill, Maydena

MAP SHEET: 4626 Maydena

DRILLER: KMR Drilling Pty. Ltd.

DRILL HOLE: 102

METHOD: Air Core

AMG CO-ORDS: 5263834mN 465990mE

DATE: 04.04.2001

ANGLE: Vertical

LOGGED BY: G.K.

FINAL DEPTH: 33m

FROM	TO	DESCRIPTION	SAMPLE NUMBER
0	1	Dark brown, humic, fine sand; coarse fraction ca. 2%	
1	2	Mix of light brown and white sand; coarse fraction ca. 2%	70309
2	3	Off white fine sand; coarse fraction ca. 2-3%	
3	4	As above; coarse fraction ca. 3%	70310
4	5	As above; coarse fraction ca. 3-5%	
5	6	As above; coarse fraction ca. 5%	70311
6	7	White sand with admixed orange re-brown sand from base of run; coarse fraction ca. 10%	
7	8	Bright orange brown sand; coarse fraction ca. 3-5%	70312%
8	9	Bright orange brown sand; coarse fraction ca. 2%	
9	10	Pale orange fine sand; coarse fraction ca. 3%	70313
10	11	Buff fine sand; coarse fraction ca 2%	
11	12	Admixture of off-white and pale orange fine sand; coarse fraction ca. 3%	70314
12	13	Off white/pale cream fine sand; coarse fraction ca.2-3%	
13	14	Off white fine sand; coarse fraction ca. 2-3%	70315
14	15	White fine sand; coarse fraction ca. 2-3%	
15	16	Off white fine sand; coarse fraction ca. 2-3%	70316
16	17	White fine sand; coarse fraction ca. 2-3%	
17	18	As above; somewhat gritty; coarse fraction ca. 5-10%	70317
18	19	As above; coarse fraction ca. 2%	
19	20	As above; coarse fraction ca. 2%	70318
20	21	As above; coarse fraction ca. 2%	
21	22	Pale cream, fine sand; coarse fraction ca.2%	70319
22	23	White fine sand; coarse fraction ca. 2%	

DRILL HOLE LOG

DRILL HOLE: 102

FROM	TO	DESCRIPTION	SAMPLE NUMBER
23	24	White fine sand; coarse fraction ca. 2%	70320
24	25	As above; coarse fraction ca. 1-2%	
25	26	As above; coarse fraction ca. ca.2%	70231
26	27	As above, slightly geyish; coarse fraction ca. 2-3%	
27	28	Light geyish-white, fine sand; grittier; coarse fraction ca. 5%	70322
28	29	White fine sand; coarse fraction ca. 2%	
29	30	As above; grittier; coarse fraction ca. 5-10%	70323
30	31	Pale creamy white, fine sand; grittier; coarse fraction ca. 10-15%	
31	32	As above; coarse fraction ca. 15-20%	70324
32	33	Pale creamy sand; coarse; coarse fraction ca. 15%	

Hole stopped at 33m; ran out of rods.

865034

DRILL HOLE LOG

AREA: Eastern Quarry Area, Pine Hill, Maydena

MAP SHEET: 4626 Maydena

DRILLER: KMR Drilling Pty. Ltd.

DRILL HOLE: 103

METHOD: Air Core

AMG CO-ORDS: 5263861mN 466092mE

DATE: 04.05.2001

ANGLE: Vertical

LOGGED BY: G.K.

FINAL DEPTH: 13m

FROM	TO	DESCRIPTION	SAMPLE NUMBER
0	1	Grey brown sand; coarse fraction ca.5%	
1	2	Buff-whitw fine sand; coarse fraction ca. 3%	70325
2	3	Off white, fine sand	
3	4	As above, light cream; coarse fraction ca. 2%	70326
4	5	As above; coarse fraction ca. 2%	
5	6	As above; coarse fraction ca. 5-10%	70327
6	7	As above; coarse fraction ca. 10%	
7	8	White fine sand; coarse fraction ca. 3%	70328
8	9	As above; coarse fraction ca. 1%	
9	10	Off white fine sand, gritty; coarse fraction ca. 10-15%	70329
10	11	White fine sand; coarse fraction ca. 10-15%	
11	12	As above; coarse fraction ca. 5-10%	70330
12	13	As above; coarse fraction ca. 15%	

Hole stopped at 13m on hard silica ?bedrock

DRILL HOLE LOG

AREA: Eastern Quarry Area, Pine Hill, Maydena

MAP SHEET: 4626 Maydena

DRILLER: KMR Drilling Pty. Ltd.

DRILL HOLE: **104**

METHOD: Air Core

AMG CO-ORDS: 5263817mN 466097mE

DATE: 05.04.2001

ANGLE: Vertical

LOGGED BY: G.K.

FINAL DEPTH: 14.5m

FROM	TO	DESCRIPTION	SAMPLE NUMBER
0	1	Off white/pale buff fine sand; coarse fraction ca. 10%	
1	2	As above; coarse fraction ca. 5%	70331
2	3	As above; coarse fraction ca. 5%	
3	4	Off white fine sand; coarse fraction ca. 5%	70332
4	5	White fine sand; coarse fraction ca. 5%	
5	6	As above; coarse fraction ca. 2%	70333
6	7	As above; greyish tinge; coarse fraction ca. 2%	
7	8	White fine sand; coarse fraction ca. 1%	70334
8	9	As above; coarse fraction ca. 1%	
9	10	As above; greyish tinge; coarse fraction ca. 1%	70335
10	11	As above; coarse fraction ca. 2%	
11	12	As above; coarse fraction ca. 5%	70336
12	13	As above; greyish tinge: coarse fraction ca. 5%	
13	14	As above; white; coarse fraction ca. 5%	70337
14	14.5	As above	

Hole stopped at 14.5m on hard ?boulder/?bedrock

865036

DRILL HOLE LOG

AREA: Eastern Quarry Area, Pine Hill, Maydena

MAP SHEET: 4626 Maydena

DRILLER: KMR Drilling Pty. Ltd.

DRILL HOLE: 105

METHOD: Air Core

AMG CO-ORDS: 5264018mN
465868mE

DATE: 05.04.2001

ANGLE: Vertical

LOGGED BY: G.K.

FINAL DEPTH: 6m

FROM	TO	DESCRIPTION	SAMPLE NUMBER
0	1	Pale grey-brown ?clayey fine sand; coarse fraction ca. 1%	
1	2	Buff fine sand: coarse fraction ca. 1%	70338
2	3	As above, but slightly paler; coarse fraction ca. 3%	
3	4	As above; coarse fraction ca. 5-10%	70339
4	5	White fine sand; coarse fraction ca. 5%	
5	6	As above; coarse fraction ca. 5%	70340

Hole stopped at 6m on hard silica rock;
?Bottom.

865037

DRILL HOLE LOG

AREA: Eastern Quarry Area, Pine Hill, Maydena

MAP SHEET: 4626 Maydena

DRILLER: KMR Drilling Pty. Ltd.

DRILL HOLE: 106

METHOD: Air Core

AMG CO-ORDS: 5263789mN 465823mE

DATE: 05.04.2001

ANGLE: Vertical

LOGGED BY: G.K.

FINAL DEPTH: 12m

FROM	TO	DESCRIPTION	SAMPLE NUMBER
0	1	Brown, somewhat coarse sand; coarse fraction ca. 3-5%	
1	2	Buff, fine-medium sand; coarse fraction ca. 5-10%	70341
2	3	Pale cream, fine-medium sand; coarse fraction ca. 3-5%	
3	4	As above; coarse fraction ca. 3%	70342
4	5	White fine sand; coarse fraction ca. 1%	
5	6	As above; coarse fraction ca. 3%	70343
6	7	As above; greyish tinge; coarse fraction ca. 3%	
7	8	White fine sand;coarse fraction ca 5%	70344
8	9	As above; coarse fraction ca. 10%	
9	10	White coarse sand; coarse fraction ca. 15-20%	70345
10	11	Buff coarse sand, damp; coarse fraction ca. 20%	70346
11	12	Dark chocolate brown clayey sand; wet; coarse fraction ca. 5%	

Hole stopped at 11.5m in chocolate brown clay and liquid mud.

865038

DRILL HOLE LOG

AREA: Eastern Quarry Area, Pine Hill, Maydena

MAP SHEET: 4626 Maydena

DRILLER: KMR Drilling Pty. Ltd.

DRILL HOLE: 107

METHOD: Air Core

AMG CO-ORDS: 5263846mN 465784mE

DATE: 05.04.2001

ANGLE: Vertical

LOGGED BY: G.K.

FINAL DEPTH: 15m

FROM	TO	DESCRIPTION	SAMPLE NUMBER
0	1	Brown medium sand; coarse fraction ca. 5%	
1	2	Caramel medium sand; coarse fraction ca. 5-10%	70347
2	3	Light brown to buff medium sand; coarse fraction ca. 5%	
3	4	As above; coarse fraction ca. 5%	70348
4	5	Buff fine sand; coarse fraction ca. 3%	
5	6	Pale buff-cream fine sand; coarse fraction ca. 10%	70349
6	7	As above; coarse fraction ca. 10%	
7	8	As above; coarse fraction ca. 10-15%	70350
8	9	As above; coarse fraction ca. 5-15%	
9	10	As above; coarse fraction ca. 10-15%	70351
10	11	Off-white fine sand; coarse fraction ca. 10%	[illegible]
11	12	As above; coarse fraction ca. 5%	70352
12	13	As above, but slightly darker: coarse	
13	14	As above, darker, medium sand	70353
14	15	Dark brown-chocolate clay.	

Hole stopped in wet, chocolate clay.

865039

DRILL HOLE LOG

AREA: Eastern Quarry Area, Pine Hill, Maydena

MAP SHEET: 4626 Maydena

DRILLER: KMR Drilling Pty. Ltd.

DRILL HOLE: 108

METHOD: Air Core

AMG CO-ORDS: 5263889mN 465720mE

DATE: 05.04.2001

ANGLE: Vertical

LOGGED BY: G.K.

FINAL DEPTH: 15m

FROM	TO	DESCRIPTION	SAMPLE NUMBER
0	1	Pale brown sand; coarse fraction ca. 5%	
1	2	Buff fine sand; coarse fraction ca. 5%	70354
2	3	Pale buff fine sand: coarse fraction ca.5-10%	
3	4	Dark buff fine sand; coarse fraction ca. 5-10%	70355
4	5	Pale buff fine sand; coarse fraction ca. 5-10%	
5	6	Off white/pale cream fine sand; coarse fraction ca. 5%	70356
6	7	Light brown fine sand; coarse fraction ca. 5%	
7	8	Buff fine sand; coarse fraction ca. 5-10%	70357
8	9	Pale cream fine sand; coarse fraction ca. 2%	
9	10	Chocolate brown fine sand; coarse fraction ca. 5%	70358
10	11	As above; somewhat clayey; coarse fraction ca. 5%	
11	12	As above, but coarser and clayey; coarse fraction ca.15%	70359
12	13	As above, but more clayey and pebbly; coarse fraction ca. 15%	
13	14	As above, clayey, more pebbly; coarse fraction ca. 20%	70360
14	15	As above, with orange tinge	

Hole not bottomed, but stopped in poor quality material.

865040

DRILL HOLE LOG

AREA: Eastern Quarry Area, Pine Hill, Maydena

MAP SHEET: 4626 Maydena

DRILLER: KMR Drilling Pty. Ltd.

DRILL HOLE: 109

METHOD: Air Core

AMG CO-ORDS: 5263736mN
465886mE

DATE: 05.04.2001

ANGLE: Vertical

LOGGED BY: G.K.

FINAL DEPTH: 6m

FROM	TO	DESCRIPTION	SAMPLE NUMBER
0	1	Dark brown medium sand; coarse fraction ca. 1%	
1	2	As above; coarse fraction ca. 2%	70361
2	3	Brown, medium-fine sand; coarse fraction ca. 2%	
3	4	As above: coarse fraction ca. 5%	70362
4	5	Buff medium-coarse sand; coarse fraction ca. 10-15%	
5	6	Dark brown clayey, medium-coarse sand: coarse fraction ca. 20%	70363

Hole stopped at 6m in wet, clayey sand.

865041

DRILL HOLE LOG

AREA: Eastern Quarry Area, Pine Hill, Maydena

MAP SHEET: 4626 Maydena

DRILLER: KMR Drilling Pty. Ltd.

DRILL HOLE: 110

METHOD: Air Core

AMG CO-ORDS: 5263696mN 465979mE

DATE: 05.04.2001

ANGLE: Vertical

LOGGED BY: G.K.

FINAL DEPTH: 6m

FROM	TO	DESCRIPTION	SAMPLE NUMBER
0	1	Dark-brown medium-coarse sand; coarse fraction ca. 2%	
1	2	Light brown medium-fine sand: coarse fraction ca. 2%	70364
2	3	As above; coarse fraction ca. 2%	
3	4	Buff, medium-fine sand; coarse fraction ca. 2%	70365
4	5	As above; coarse fraction ca. 5%	
5	6	Pale buff fine sand; ?clayey at base: coarse fraction ca. 3%	70366

Hole stopped at 6m in water and very fine clayey sand.

APPENDIX 3

ASSAYS - DRILL HOLE SAMPLES

865043

CERTIFICATE OF ANALYSIS

ALS Chemex

Batch: ST32201
Sub Batch: 0

CONTACT:	MR G KRUMMEI	**LABORATORY:**	BRISBANE
CLIENT:	.	**DATE RECEIVED:**	27/04/2001
ADDRESS:	JJ MCDONALD & SONS MINING P/L SUITE 28 487 ST KILDA ROAD MELBOURNE VIC 3004	**DATE COMPLETED:**	04/06/2001
		SAMPLE TYPE:	SOIL
		No. of SAMPLES:	125
ORDER No.:	BR/016/99		
PROJECT:			

COMMENTS

NOTES

This is the Final Report and supersedes any preliminary reports with this batch number.
Results apply to sample(s) as submitted. All pages of this report have been checked and approved for release.

ISSUING LABORATORY: BRISBANE

Address
32 Shand Street
Stafford QLD 4053
Australia

Phone: 61-7-3243 7222
Fax: 61-7-3243 7254
Email: shaunk@als.com.au

Signature:

Batch: ST32201
Sub Batch: 0
Date of Issue: 04/06/2001
Client: .
Client Reference:

CERTIFICATE OF ANALYSIS

865044

SAMPLE	Element Unit Method LOR	Al2O ppm M289 10	Fe2O3 ppm M289 10	TiO2 ppm M289 10	CaO ppm M289 10	MgO ppm M289 10	MnO ppm M289 10	Cr2O3 ppm M289 1	V2O5 ppm M289 10
70243	Hole 92 3-4 m	917	4740	216	1260	218	59	4	<10
70244	5-6	423	1010	210	511	123	<10	1	<10
70245	7-8	360	9220	616	237	117	<10	4	24
70246	9-10	148	862	158	166	79	<10	2	<10
70247	11-12	211	1040	144	342	111	<10	2	<10
70248	13-14	218	907	116	374	123	<10	1	<10
70249	15-16	318	1860	267	445	175	16	2	<10
70250	17-18	243	1070	342	435	176	<10	2	<10
70251	Hole 93 0-1m	145	1140	101	429	90	13	2	<10
70252	2-3	150	533	128	288	79	<10	1	<10
70253	4-5	111	358	169	489	184	<10	1	<10
70254	6-7	150	433	202	543	158	<10	<1	<10
70255	8-9	92	293	147	298	85	<10	<1	<10
70256	10-11	196	1350	221	461	160	10	3	<10
70257	12-13	200	977	258	486	121	<10	2	<10
70258	14-15	212	1420	233	455	199	<10	2	<10
70259	16-17	415	3690	366	477	210	21	3	<10
70260	18-19	349	3010	318	416	146	18	4	<10
70261	20-21	144	642	150	188	94	<10	1	<10
70262	22-23	3450	732	197	582	119	<10	3	<10
70263	Hole 94 3-4	640	367	159	380	127	<10	1	<10
70264	5-6	302	421	100	342	110	<10	<1	<10
70265	7-8	168	278	72	572	125	<10	<1	<10
70266	9-10	493	1080	283	429	148	<10	2	<10
70267	11-12	356	1800	181	724	127	<10	2	<10
70268	13-14	497	1440	190	501	117	<10	2	<10
70269	15-16	1210	2230	467	373	183	<10	3	<10

Batch: ST32201
Sub Batch: 0
Date of Issue: 04/06/2001
Client: .
Client Reference:

CERTIFICATE OF ANALYSIS

865045

SAMPLE	Element	Al2O	Fe2O3	TiO2	CaO	MgO	MnO	Cr2O3	V2O5				
	Unit	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm				
	Method	M289	M289	M289	M289	M289	M289	M289	M289				
	LOR	10	10	10	10	10	10	1	10				
70270	Hole 94 17-18m	2760	2400	458	507	210	<10	5	<10				
70271	19-20	3.04%	3.83%	5450	<10	3360	<10	97	134				
70272	Hole 95 1-2	2690	780	179	303	213	<10	3	<10				
70273	3-4	2440	875	198	289	189	<10	3	<10				
70274	5-6	2020	782	170	364	204	<10	3	<10				
70275	7-8	2880	970	266	424	260	<10	3	<10				
70276	9-10	5940	1840	487	840	678	<10	7	<10				
70277	11-12	929	820	135	362	202	<10	1	<10				
70278	13-14	1010	1750	180	446	228	<10	2	<10				
70279	Hole 96 1-2	1680	1360	277	494	240	<10	2	<10				
70280	3-4	2290	1860	879	926	519	<10	4	<10				
70281	5-6	741	582	268	435	223	<10	1	<10				
70282	7-8	411	531	187	373	194	<10	<1	<10				
70283	9-10	928	1.14%	626	421	249	11	9	33				
70284	Hole 97 1-2	667	1790	931	373	181	<10	3	<10				
70285	2-3	416	540	683	502	266	<10	1	<10				
70286	3-4	720	2400	552	394	188	17	5	<10				
70287	Hole98 1-2	632	2020	245	374	152	12	2	<10				
70288	2-3	641	1160	84	335	126	<10	2	<10				
70289	3-4	1790	2200	117	387	135	13	1	<10				
70290	4-5	800	2370	94	454	154	17	3	<10				
70291	Hole 99 1-2	479	266	568	345	163	<10	2	<10				
70292	3-4	2450	1130	536	431	230	<10	<1	<10				
70293	5-6	1.29%	2.23%	1190	630	586	15	21	68				
70294	7-8	1.09%	3.55%	791	607	458	21	29	88				
70295	Hole 100 1-2	1.20%	1.80%	1300	1180	740	22	33	54				
70296	3-4	3.22%	1.51%	876	1470	863	21	43	51				

Batch: ST32201
Sub Batch: 0
Date of Issue: 04/06/2001
Client: .
Client Reference:

CERTIFICATE OF ANALYSIS

865046

SAMPLE	Element Unit Method LOR	Al2O ppm M289 10	Fe2O3 ppm M289 10	TiO2 ppm M289 10	CaO ppm M289 10	MgO ppm M289 10	MnO ppm M289 10	Cr2O3 ppm M289 1	V2O5 ppm M289 10
70297	Hole 100 5-6m	3.03%	1.96%	800	376	539	19	44	47
70298	7-8	1.18%	6570	389	770	459	18	14	20
70299	Hole 101 1-2	467	346	198	240	91	<10	<1	<10
70300	3-4	283	416	189	164	74	<10	<1	<10
70301	5-6	190	240	346	156	52	<10	<1	<10
70302	7-8	128	32	207	296	77	<10	<1	<10
70303	9-10	84	31	66	541	131	<10	<1	<10
70304	11-12	90	178	79	212	88	<10	<1	<10
70305	13-14	92	<10	58	235	88	<10	<1	<10
70306	15 16	592	2890	127	354	200	53	2	<10
70307	17-18	6300	1.15%	600	482	287	71	15	31
70308	19-20	2680	7920	504	685	321	77	9	14
70309	Hole 102 1-2	232	312	109	210	85	<10	<1	<10
70310	3-4	139	562	74	155	55	<10	<1	<10
70311	5-6	145	2.55%	205	176	46	<10	<1	<10
70312	7-8	6830	2.12%	1250	305	180	18	25	65
70313	9-10	1150	3240	391	197	94	<10	2	10
70314	11-12	152	947	202	193	84	<10	3	<10
70315	13-14	133	638	118	286	49	<10	1	<10
70316	15-16	145	991	104	306	86	<10	3	<10
70317	17-18	85	1070	192	456	63	<10	2	<10
70318	19-20	48	889	186	337	76	<10	2	<10
70319	21-22	80	940	183	344	80	<10	2	<10
70320	23-24	93	318	145	233	59	<10	<1	<10
70321	25-26	73	313	118	397	46	<10	<1	<10
70322	27-28	102	1920	112	229	66	11	4	<10
70323	29-30	106	205	164	501	245	<10	<1	<10

Batch: ST32201
Sub Batch: 0
Date of Issue: 04/06/2001
Client: .
Client Reference:

CERTIFICATE OF ANALYSIS

865047

SAMPLE	Element Unit Method LOR	Al2O ppm M289 10	Fe2O3 ppm M289 10	TiO2 ppm M289 10	CaO ppm M289 10	MgO ppm M289 10	MnO ppm M289 10	Cr2O3 ppm M289 1	V2O5 ppm M289 10
70324	Hole 102 31-32m	76	478	142	207	107	<10	2	<10
70325	Hole 103 1-2	109	428	96	228	109	<10	<1	<10
70326	3-4	235	470	111	273	146	<10	2	<10
70327	5-6	171	402	132	178	96	<10	1	<10
70328	7-8	97	54	80	240	107	<10	<1	<10
70329	9-10	94	301	79	141	75	<10	<1	<10
70330	11-12	88	572	133	240	118	<10	2	<10
70331	Hole 104 1-2	150	1440	216	171	93	11	6	<10
70332	3-4	132	810	233	210	70	<10	2	<10
70333	5-6	143	366	121	229	81	<10	<1	<10
70334	7-8	148	463	96	181	72	<10	2	<10
70335	9-10	62	629	160	211	49	<10	3	<10
70336	11-12	72	324	158	140	49	<10	<1	<10
70337	13-14	87	519	148	234	59	<10	1	<10
70338	Hole 105 1-2	243	830	1070	175	95	<10	4	<10
70339	3-4	186	1280	955	235	124	<10	4	<10
70340	5-6	181	632	164	306	151	<10	1	<10
70341	Hole 106 1-2	192	837	693	160	74	<10	2	<10
70342	3-4	119	390	379	163	70	<10	2	<10
70343	5-6	132	270	551	141	67	<10	1	<10
70344	7-8	150	401	895	174	102	<10	3	<10
70345	9-10	122	238	388	177	102	<10	1	<10
70346	10-11	208	524	532	543	293	<10	3	<10
70347	Hole 107 1-2	532	200	421	214	111	<10	2	<10
70348	3-4	510	508	449	293	160	<10	3	<10
70349	5-6	179	235	272	274	151	<10	1	<10
70350	7-8	231	391	338	520	305	<10	2	<10

Batch: ST32201
Sub Batch: 0
Date of Issue: 04/06/2001
Client: .
Client Reference:

CERTIFICATE OF ANALYSIS

865048

SAMPLE	Element Unit Method LOR	Al2O ppm M289 10	Fe2O3 ppm M289 10	TiO2 ppm M289 10	CaO ppm M289 10	MgO ppm M289 10	MnO ppm M289 10	Cr2O3 ppm M289 1	V2O5 ppm M289 10				
70351	Hole 107 9-10m	331	1410	573	644	372	12	9	<10				
70352	11-12	482	315	231	1050	648	<10	2	<10				
70353	13-14	3990	551	460	812	525	<10	4	<10				
70354	Hole 108 1-2m	770	284	377	1540	969	<10	2	<10				
70355	3-4	988	592	507	409	215	<10	2	<10				
70356	5-6	750	479	305	960	552	<10	2	<10				
70357	7-8	693	273	153	1010	603	<10	<1	<10				
70358	9-10	3710	524	765	1060	761	<10	5	<10				
70359	11-12	4920	2460	686	1870	1170	<10	10	14				
70360	13-14	6510	1.13%	1280	3440	2220	<10	15	27				
70361	Hole 109 1-2m	1060	1500	323	319	211	<10	3	<10				
70362	3-4	779	935	407	408	240	<10	2	<10				
70363	5-6	9570	4360	1640	337	291	<10	23	54				
70364	Hole 110 1-2	3200	1470	508	564	235	<10	5	11				
70365	3-4	1040	589	222	554	293	<10	2	<10				
70366	5-6	502	313	173	445	256	<10	1	<10				
SSPS NO. 2		363	151	356	29	25	<10	2	<10				

865049

CERTIFICATE OF ANALYSIS

ALS Chemex

Batch: ST32201
Sub Batch: 1

CONTACT:	MR G KRUMMEI	**LABORATORY:**	BRISBANE
CLIENT:	.	**DATE RECEIVED:**	27/04/2001
ADDRESS:	JJ MCDONALD & SONS MINING P/L SUITE 28 487 ST KILDA ROAD MELBOURNE VIC 3004	**DATE COMPLETED:**	04/06/2001
		SAMPLE TYPE:	SOIL
		No. of SAMPLES:	6
ORDER No.:	BR/016/99		
PROJECT:			

COMMENTS

NOTES

This is the Final Report and supersedes any preliminary reports with this batch number.
Results apply to sample(s) as submitted. All pages of this report have been checked and approved for release.

ISSUING LABORATORY: BRISBANE

Address
32 Shand Street
Stafford QLD 4053
Australia

Phone: 61-7-3243 7222
Fax: 61-7-3243 7254
Email: shaunk@als.com.au

Signature:

LABORATORIES

AUSTRALIA	*NORTH AMERICA*	*SOUTH AMERICA*	*AFRICA*
Brisbane, Orange, Alice Springs, Perth, Cloncurry, Townsville, Kalgoorlie	*Vancouver, Fairbanks, Thunder Bay, Chihuahua, Guadalajara, Toronto, Elko, Reno*	*Santiago, Calama, Mendoza, Antofagasta, Copiapo, Quito, Arequipa, Lima*	*Mwanza*

Batch: ST32201
Sub Batch: 1
Date of Issue: 04/06/2001
Client: .
Client Reference:

CERTIFICATE OF ANALYSIS

865050

SAMPLE	Element Unit Method LOR	Al2O3 ppm M289 10	Fe2O3 ppm M289 10	TiO2 ppm M289 10	CaO ppm M289 10	MgO ppm M289 10	MnO ppm M289 10	Cr2O3 ppm M289 1	V2O5 ppm M289 10				
BCS 313-1 A		362	107	151	67	17	<10	1	<10				
BCS 313-1 B		333	51	146	66	10	<10	<1	<10				
BCS 313-1 C		377	91	140	71	15	<10	1	<10				
BCS 267 A		7260	6770	1600	1.81%	454	1680	193	17				
BCS 267 B		7280	6500	1580	1.83%	462	1590	127	16				
BCS 267 C		7770	6680	1560	1.85%	477	1660	172	16				

APPENDIX 4

ASSAY RESULTS - SELECT NON MAGNETIC DRILL SAMPLES

865052

J.J. McDONALD & SONS MINING PTY LTD

ACN 051 399 261 ABN 29 051 399 261

FACSIMILE TRANSMISSION

TO	:	Shaun Kenny, ALS Chemex	**FAX:** 07 3243 7254
FROM	:	Gerhard K. Krummei	**FAX:** 03 9820 2595
DATE	:	20th August 2001	
PAGES	:	One	
SUBJECT	:	**SILICA SAND ASSAYS - BATCH No. ST 32201**	

Some further definitive work is required on selected samples from batch no. ST 32201.

The following samples groupings are relevant to this exercise:

70299	70325	70331
70300	70326	70332
70301	70327	70333
	70328	70334
	70329	70335
	70330	70336
		70337

Total no. of samples: 16

Please adopt the following procedure:

* riffle split each sample once; retain one half
* label the second half with the suffix M; eg. 70229M
* remove the magnetic fraction from the M series samples by WHIMS at MD Research (suggested field strength: at least 15K, preferably 20K gauss.).
* collect all the magnetic material into one composite sample and mail to me soonest at the address below
* select sufficient material from the "cleaned" sample for assay and dry/pulverise
* assay for the elements as per quotation BR/016/99
* report results in the usual manner by end September/early October.

The invoice for this work should be made out to J.J. McDonald & Sons Mining Pty. Ltd. and sent to me c/o the address below.

GERHARD K. KRUMMEI

for and on behalf of
J.J. McDonald & Sons Mining Pty. Ltd.

Suite 28, 487 St.Kilda Road, Melbourne. Vic. 3004. Australia
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865053

Batch: AM33142
Sub Batch: 0
Date of Issue: 01/10/2001
Client: .
Client Reference:

CERTIFICATE OF ANALYSIS

SAMPLE	Element Unit Method LOR	Al2O3 ppm M289 10	Fe2O3 ppm M289 10	TiO2 ppm M289 10	CaO ppm M289 10	MgO ppm M289 10	MnO ppm M289 10	Cr2O3 ppm M289 1	V2O5 ppm M289 10		COMMENTS		
70299M NON MAG		248	171	171	212	83	<10	1	<10	DH 101	1-2m		
70300M NON MAG		170	225	141	140	68	<10	2	<10		3-4m		
70301M NON MAG		125	272	326	153	55	<10	1	<10		5-6m		
70325M NON MAG		106	203	94	183	92	<10	1	<10	DH 103	1-2m		
70326M NON MAG		212	144	75	180	109	<10	2	<10		3-4m		
70327M NON MAG		132	102	80	102	57	<10	<1	<10		5-6m		
70328M NON MAG		78	91	102	217	102	<10	1	<10		7-8m		
70329M NON MAG		90	121	57	85	47	<10	<1	<10		9-10m		
70330M NON MAG		68	113	71	158	83	<10	<1	<10		11-12m		
70331M NON MAG		85	389	162	55	34	<10	2	<10	DH 104	1-2m		
70332M NON MAG		79	120	192	85	35	<10	<1	<10		3-4m		
70333M NON MAG		123	60	94	187	75	<10	1	<10		5-6m		
70334M NON MAG		128	68	68	133	56	<10	<1	<10		7-8m		
70335M NON MAG		52	103	79	119	31	<10	<1	<10		9-10m		
70336M NON MAG		64	52	113	102	41	<10	1	<10		11-12m		
70337M NON MAG		58	74	79	142	42	<10	<1	<10		13-14m		

APPENDIX 5

REPORT - FINE GRAIN SIZE DETERMINATION
AND GRINDABILITY TESTING

865055

ESKER

Fine Grain Size Determination and Grindability Testing

on

Silica Sands

from

Pine Hill, Maydena

10th October 2000

865056

ESKER Milling and Processing Pty Ltd

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Report:	Grain Size Determination of the weight percent contained in the -106μm +10μm fractions of the High Grade Silica Sands from Pine Hill, Maydena. Also determine the grindability of the +106μm fraction of these sands.
To:	Gerhard Krummei J.J. McDonald & Sons Mining Pty Ltd.
Authority:	Facsimile instruction from Gerhard Krummei dated: 4th September 2000.
Subject:	To determine the weight distribution of silica sands within the 106μm to 10μm fractions at Pine Hill and carry out a sighter grinding test to determine the work index of these sands.
Date:	9th October 2000
Officers Involved:	G.C. Tapp - Chemist/Technical Nick Moony - Esker

Summary

This series of sizing tests show that the drill hole samples tested contained ≈ 44% of the their weight in the -106μm +10μm fraction on average. It was also shown that only about 5% to 6% of the weight in these lots occurred as ultra fine -10μm material. Grinding the composite +106μm fractions indicated that Pine Hill silica sands can be readily ground to 80% passing ≈106μm.

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Introduction

A series of sizing tests were carried out at the Western Metals laboratory in Burnie by Mr G Tapp. The samples were selected by Mr G Krummei and are listed below. In these tests 14 drill cores were screened to 10μm. Each sample was wet sieved at 38μm. The oversize was dried and then dry screened for 20 minutes. The -38μm undersize was then combined with the wet fraction and the combined undersize was cyclosised to 10μm under standard conditions at 20^{0}C. All fractions were kept for analysis including two -10μm ultra fine fractions. In each procedure care was taken to minimize Fe contamination. Size fractions are now ready for assaying.

Drill core sized to 10μm are: **DH70,73,74,75,80,83,84,86,87,88,89,90 & 91.**

A sighter grind test was undertaken on the composite of all +106μm fraction from the dry screenings. Results indicate that this silica sand can be readily reduced to 80% passing ≈100μm.

(**DH85** contained too little -75μm material for sizing and no work was carried out on this sample).

The sizings undertaken in this report varied slightly from those carried out in April-May 1999 and these figures have been adjusted to suit the previous data

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TABLE ONE
PINE CREEK SIZINGS TO 10μm
&
GRINDING DATA

PINE HILL - Silica Sands. Sizings to 10μm

D.H	Z0	Z3	Z4	Z5	80	82	83	84	86	87	88	89	90	91	Comp.
METRES		4-6	8-23	0-6	0-21	0-15	1-13	1-10	0-18	0-13	1-13	16-30	1-7	0-15	Sizing
-DEPTH															
-10μm	6.7%	4.2%	4.1%	5.5%	7.1%	0.8%	6.3%	4.6%	5.2%	8.0%	11.1%	7.7%	5.1%	4.2%	5.7%
+10μm	1.2%	1.8%	2.0%	2.7%	3.2%	1.7%	0.6%	2.8%	2.7%	4.8%	3.1%	3.8%	2.3%	1.5%	2.5%
+15μm	1.8%	3.6%	3.2%	4.9%	5.7%	2.2%	1.2%	3.9%	4.5%	7.0%	4.3%	4.6%	4.0%	3.3%	6.5%
+20μm	2.5%	6.5%	5.5%	7.9%	10.4%	4.1%	2.6%	5.4%	7.6%	10.5%	6.0%	6.3%	8.0%	6.8%	4.1%
+25μm	1.9%	4.1%	3.7%	4.7%	5.9%	3.2%	1.6%	3.3%	4.3%	5.4%	3.4%	2.7%	5.3%	4.0%	8.4%
+34μm	-	0.1%	-	0.1%	0.3%	0.3%	-	-	-	0.1%	0.1%	-	0.1%	0.2%	0.1%
+38μm	4.8%	9.0%	9.1%	9.7%	14.2%	3.9%	8.1%	6.2%	8.9%	10.3%	6.4%	6.8%	12.7%	9.8%	11.0%
+53μm	8.9%	11.8%	12.0%	12.3%	17.6%	6.0%	12.5%	8.1%	10.9%	10.8%	7.3%	6.8%	17.5%	12.7%	7.2%
+75μm	5.4%	8.3%	10.3%	3.1%	8.7%	6.6%	11.0%	7.4%	8.0%	7.6%	7.4%	4.1%	8.2%	5.2%	6.5%
+106μm	4.7%	6.5%	9.2%	7.7%	5.5%	6.7%	9.1%	7.2%	6.6%	5.7%	6.6%	3.1%	5.5%	6.8%	7.0%
+150μm	5.0%	6.5%	10.0%	8.5%	5.1%	8.1%	9.3%	8.7%	7.1%	5.3%	7.5%	3.0%	5.7%	9.4%	7.0%
+212μm	5.3%	6.2%	10.0%	6.5%	4.7%	9.1%	8.7%	9.9%	7.5%	4.7%	8.2%	3.2%	6.1%	9.3%	6.0%
+300μm	8.3%	4.5%	7.2%	6.6%	3.4%	7.7%	6.4%	8.2%	6.1%	3.5%	6.8%	2.9%	5.0%	6.8%	5.0%
+425μm	3.9%	4.0%	5.1%	3.9%	2.7%	6.9%	4.9%	7.2%	5.6%	3.0%	6.2%	3.0%	4.1%	5.3%	9.0%
+600μm	39.6%	22.9%	8.6%	15.9%	5.5%	32.7%	17.7%	17.1%	15.0%	13.3%	16.1%	42.0%	10.4%	8.3%	19.0%

PINE HILL - Silica Sands. Sizings to 10μm Accumaliave Wt% passing

D.H	Z0	Z3	Z4	Z5	80	82	83	84	86	87	88	89	90	91	Comp
+10μm	6.7%	3.6%	4.3%	5.5%	7.1%	0.8%	6.3%	4.6%	5.2%	8.0%	10.6%	7.7%	5.1%	4.2%	5.7%
+15μm	7.9%	5.4%	6.3%	8.2%	10.3%	2.4%	6.6%	7.7%	7.9%	12.7%	13.7%	11.5%	7.4%	5.7%	8.2%
+20μm	9.7%	9.0%	9.3%	13.1%	16.0%	4.6%	7.8%	11.6%	12.4%	19.7%	18.0%	16.1%	11.4%	9.0%	12.2%
+25μm	12.2%	15.5%	14.8%	21.0%	26.4%	8.6%	10.4%	17.0%	20.0%	30.2%	24.0%	22.4%	19.4%	15.8%	18.7%
+34μm	14.1%	19.6%	18.5%	25.7%	32.3%	11.8%	12.0%	20.0%	24.3%	35.6%	27.4%	25.1%	24.7%	19.8%	22.8%
+53μm	18.9%	28.7%	27.6%	35.5%	46.8%	16.0%	20.4%	26.2%	33.2%	46.1%	33.9%	31.9%	37.5%	29.8%	31.3%
+75μm	27.8%	40.5%	39.6%	47.8%	64.4%	22.2%	32.9%	34.3%	44.1%	56.9%	41.2%	38.7%	55.0%	42.5%	42.3%
+106μm	33.2%	49.2%	49.9%	50.9%	73.1%	28.8%	43.9%	41.2%	52.1%	64.5%	48.6%	42.8%	63.2%	52.3%	49.4%
+150μm	37.9%	55.7%	59.1%	58.6%	78.6%	35.5%	53.0%	48.7%	58.7%	70.2%	55.2%	45.9%	68.7%	61.0%	56.0%
+212μm	42.9%	62.2%	69.1%	67.1%	83.7%	43.6%	62.3%	57.6%	65.8%	75.5%	62.7%	48.9%	74.4%	70.4%	63.0%
+300μm	48.2%	68.4%	79.1%	73.6%	88.4%	52.7%	71.0%	67.5%	73.3%	80.2%	70.9%	52.1%	80.5%	79.7%	70.0%
+425μm	56.5%	73.2%	86.3%	80.2%	91.8%	60.4%	77.4%	75.7%	79.4%	83.7%	77.7%	55.0%	85.5%	86.5%	76.0%
+600μm	60.4%	77.1%	91.4%	84.1%	94.5%	67.3%	82.3%	82.9%	85.0%	86.7%	83.9%	58.0%	89.6%	91.7%	81.0%
Fine to coarse		*13	*11	*3	*7	*1	*12	*10	*9	*6	*5	*8	*14	*4	*2	

GRINDING DATA

	feed	Grind	Grind	Grind	Grind	Grind	Grind
+820μm	19.5						
+625μm	37.0						
+425μm	46.3						
+300μm	58.1						
+212μm	72.3						
+150μm	86.4						10.0
+106μm	99.0	83.4	77.3	70.6	57.6	44.7	18.90
+75μm		16.6	22.7	29.4	42.4	55.3	71.1
+53μm		12.8	16.3	16.7	24.8	36.6	50.2
+38μm		9.7	12.7	13.5	18.8	24.8	34.8
-38μm	99.50	7.9	9.8	11.0	15.0	20.9	25.3
GRIND TIME ACTUAL	0	5min	10min	15min	20min	25min	30min

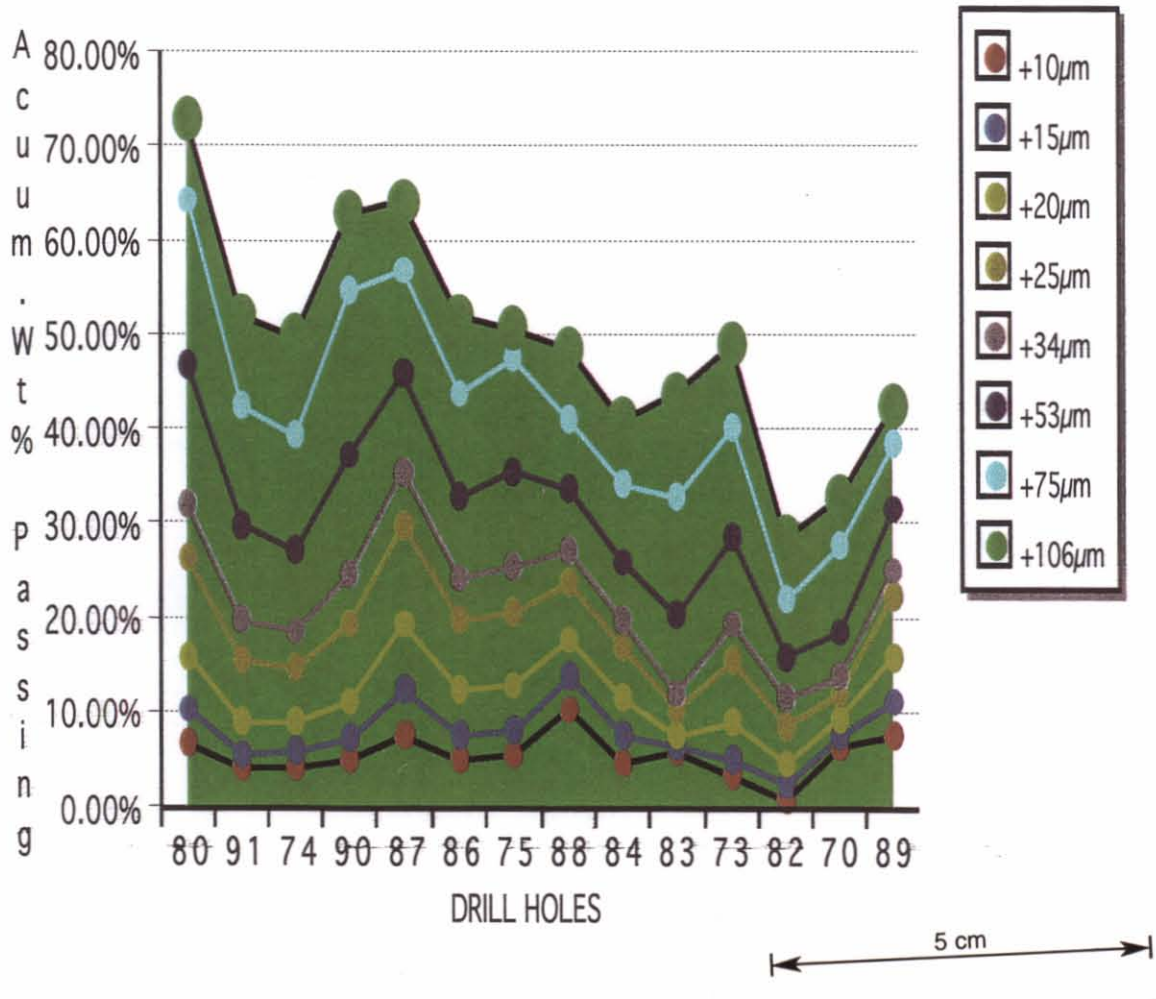
GRINDING DATA Accum. Wt% Passing

	Composite Feed	Esimated Final Product
820μm	90.0%	96.0%
625μm	81.0%	97.5%
425μm	76.0%	96.5%
300μm	70.0%	96.0%
212μm	63.0%	95.5%
150μm	56.0%	95.0%
106μm	49.4%	85.5%
75μm	42.3%	71.5%
53μm	31.3%	58.3%
38μm	22.8%	49.3%
25μm	18.7%	41.7%
20mm	12.2%	29.2%
15μm	8.2%	19.7%
10μm	5.7%	11.0%

Discussion of Results

In observing this series of Pine Hill sizings down to 10μm a weighted average of about ≈50%(refer Fig. 1 & Fig.5) of the weight reported to the prescribed fractions and in general the weight percent retained on each fraction decreases as the sizing gets finer. It was also shown that all the samples were "clean" or, more properly, well washed or free from foreign clays and most of the ultra fines is most likely to be degraded silica. On average only about 6% of the sand reported to this fraction. To simplify things the drill core have been grouped dependent on Wt % passing 600μm in descending order of weight. All the raw data is contained in Table One(opposite). In Figures Two to Ten each of the arranged groups, or lots, and grinding data are discussed in more detail. Figure One shows the Wt% retained on each -106μm fraction for all the drill core sized. This graph shows the descending weight retained as the sizing gets finer and shows the difficulty of using an average rather than a mean. For example, note that the +53μm fraction averages at 11% but deviates from 6% to 18%, but using a mean also can give unrealistic results and destroy important data.

FIGURE I

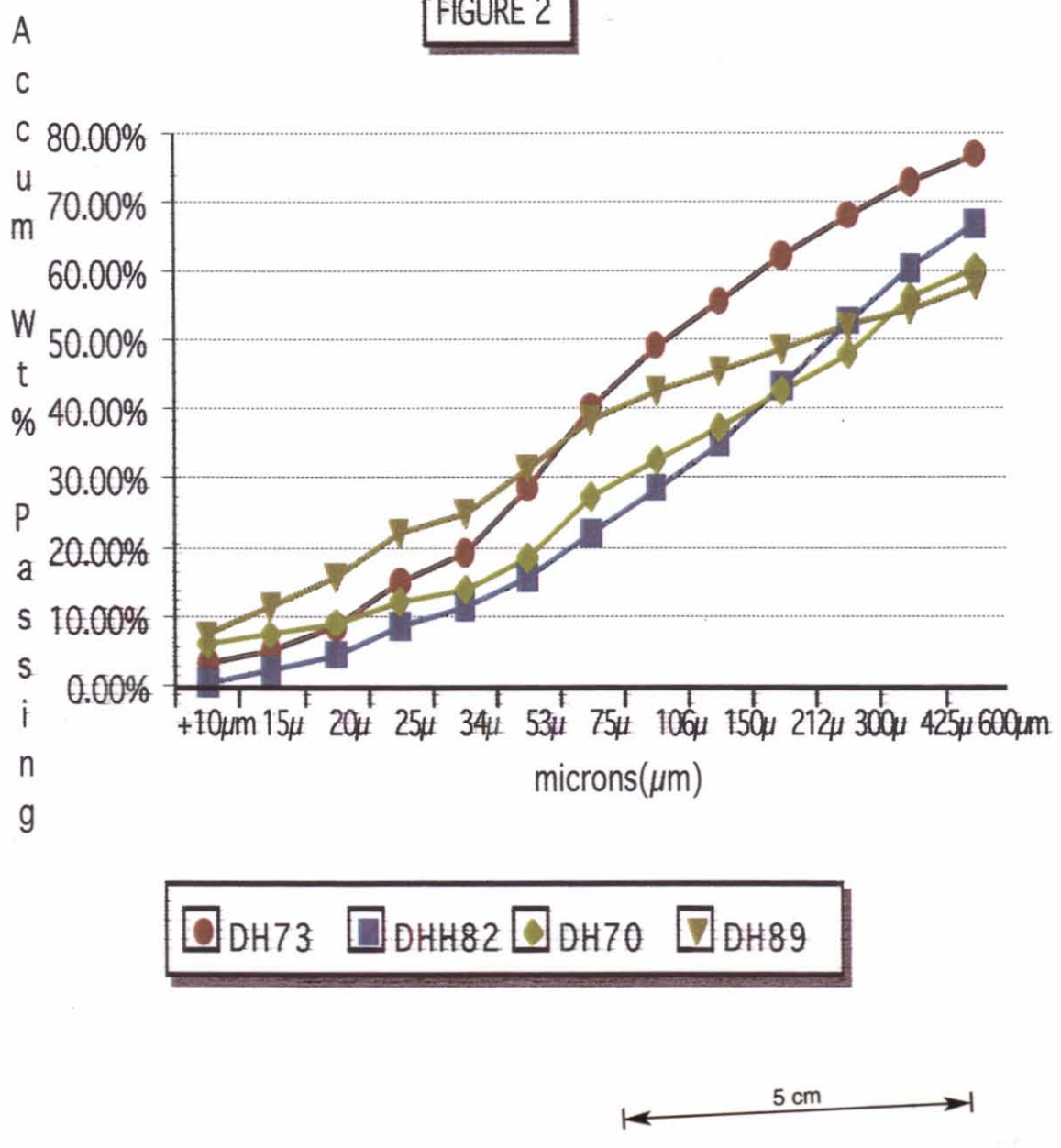


Interpretation of Sizing Data

Very Coarse Sizing Group **-DH73,82,70 & 89**

Fig.2 shows each of the very coarse samples. DH89 is the coarsest but may contain stray quartz pebbles because it also includes more fines and ultra fines. The d_{50} for this group is also wide at ≈100μm fore DH73 and ≈300μm for DH70.

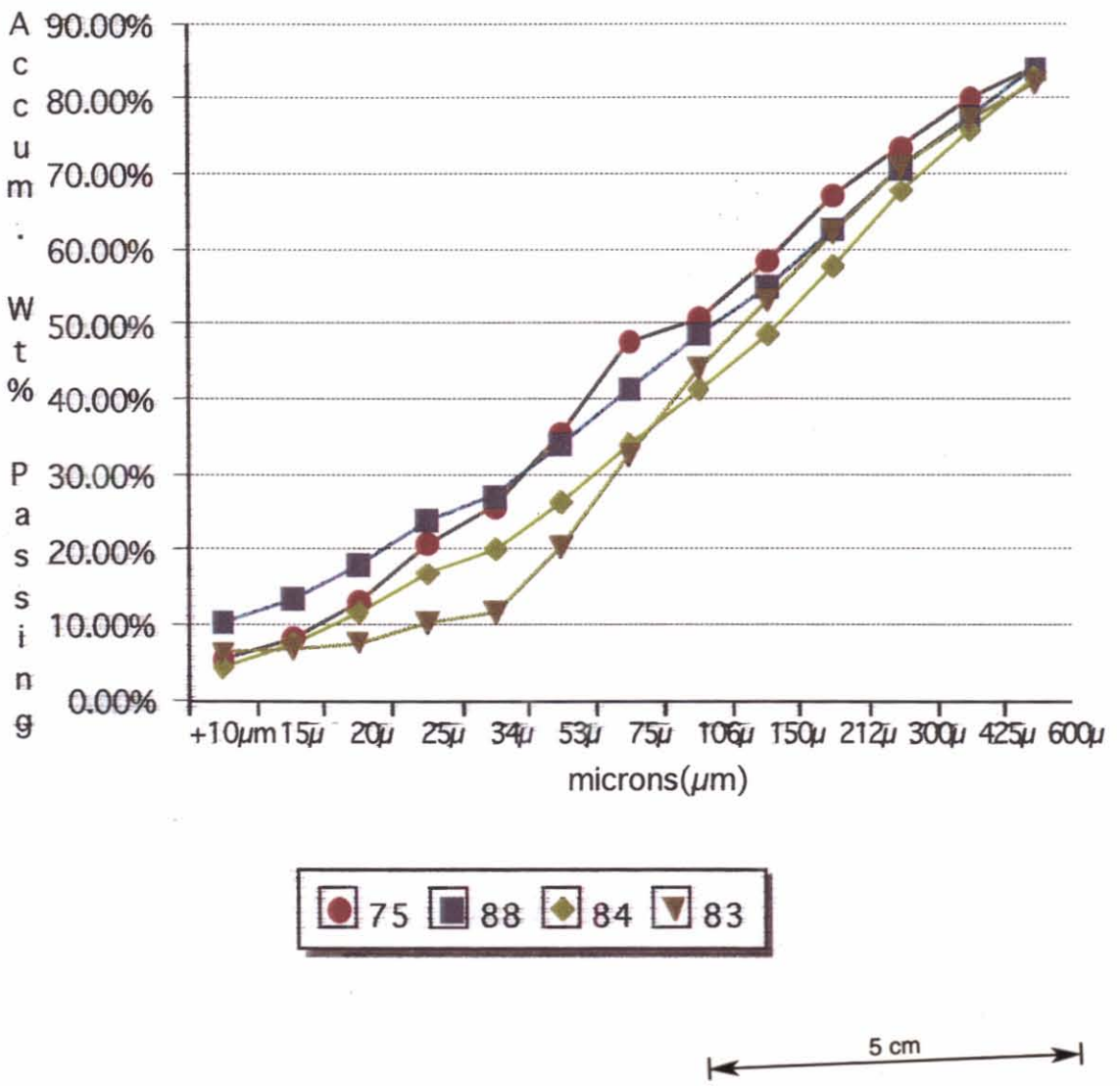
FIGURE 2



Coarse Sizing Group - **DH75,88,84 & 83**

This group displays a normal distribution. Note that DH83 is imperfectly skewed in the -38μm +10μm range. There is a large Wt% distribution of ≈30% in the 53μm to 38μm fraction of DH84. This set is just slightly finer than the average. The d_{50} for this set is close and is much as should be expected as shown in Fig. 3

FIGURE 3



Medium Sizing Group - **Dh90, 87, 86 & Composite of all drill holes**

Even though the d_{50} ranges from ≈60μm for DH87 to ≈100μm for DH86 and DH74 is skewed to the -30μm +75μm zone, as shown in Fig.4 , the amount of -10μm material does not alter from the previous sizings. The average composite is coarser than all of this group. Fig. 5 and Fig.6 , shown opposite, indicate that when averaging is based on very large Wt.% in the +600μm fractions of one or two samples the true picture can be distorted. Fig5 also shows the -106μm fractions and how close most of them are to the d_{50}. The d_{50} for this group itself ranges from ≈70μm for DH87 to ≈170μm for DH86.

FIGURE 4

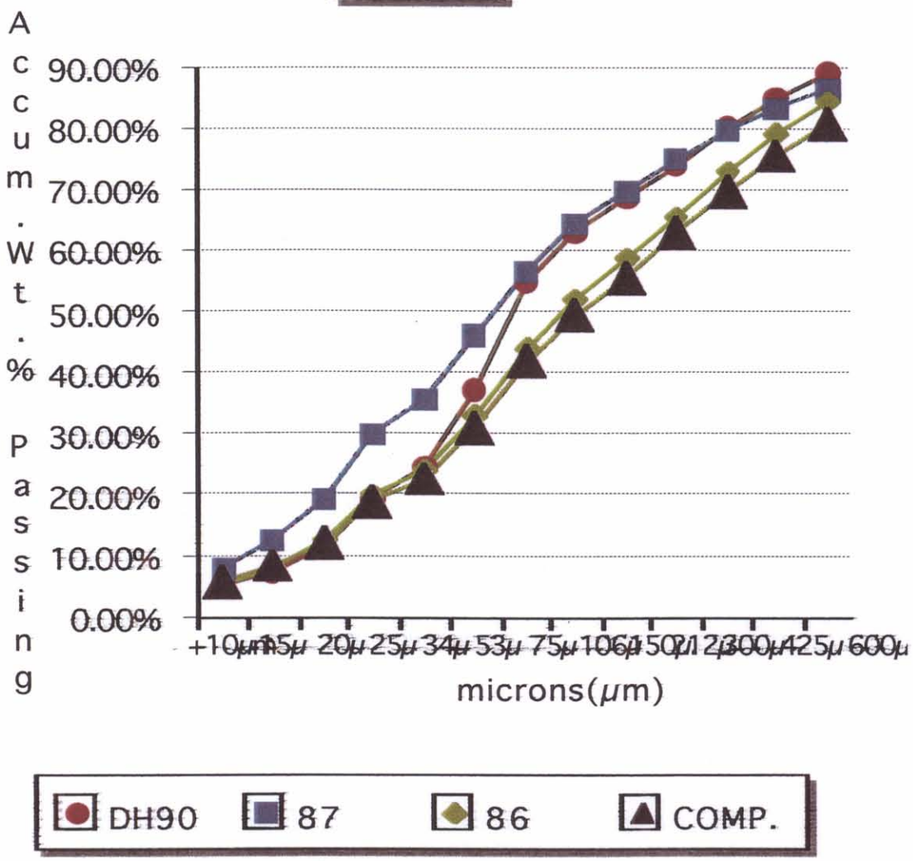


FIGURE 5

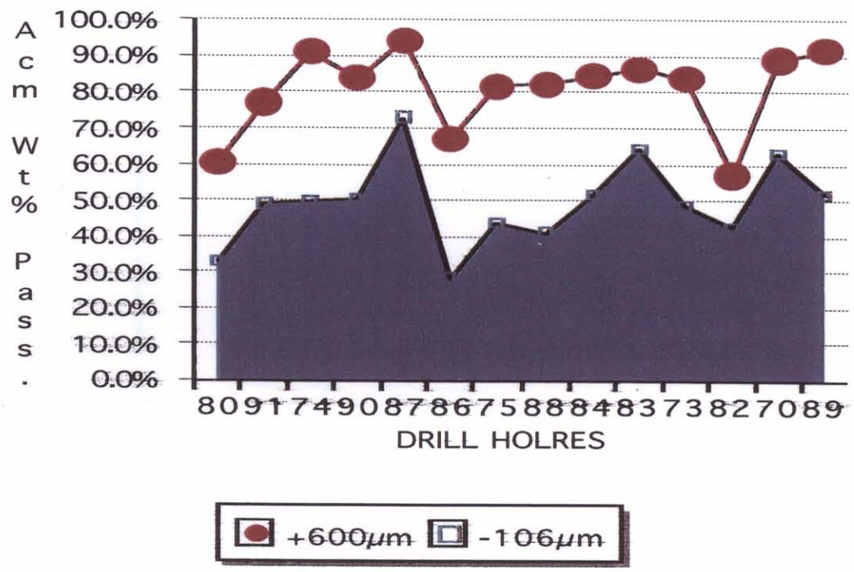
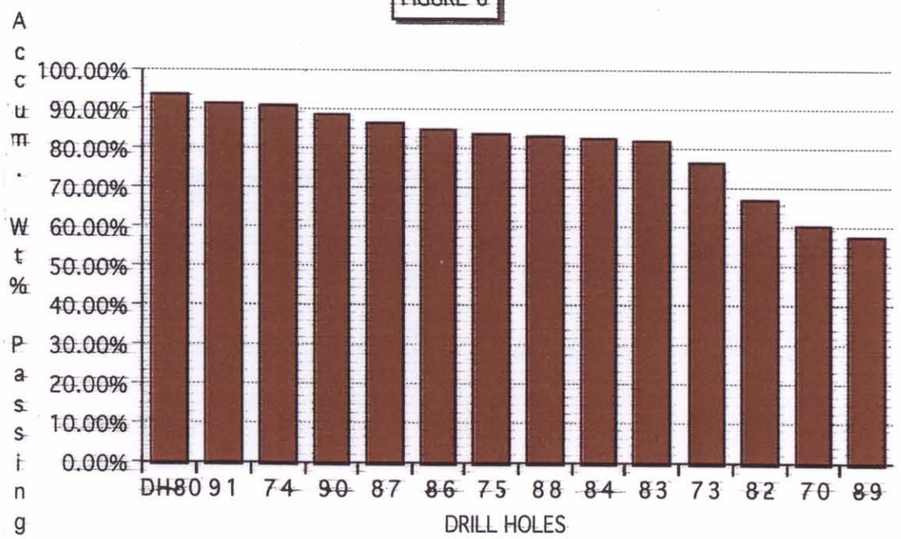


FIGURE 6



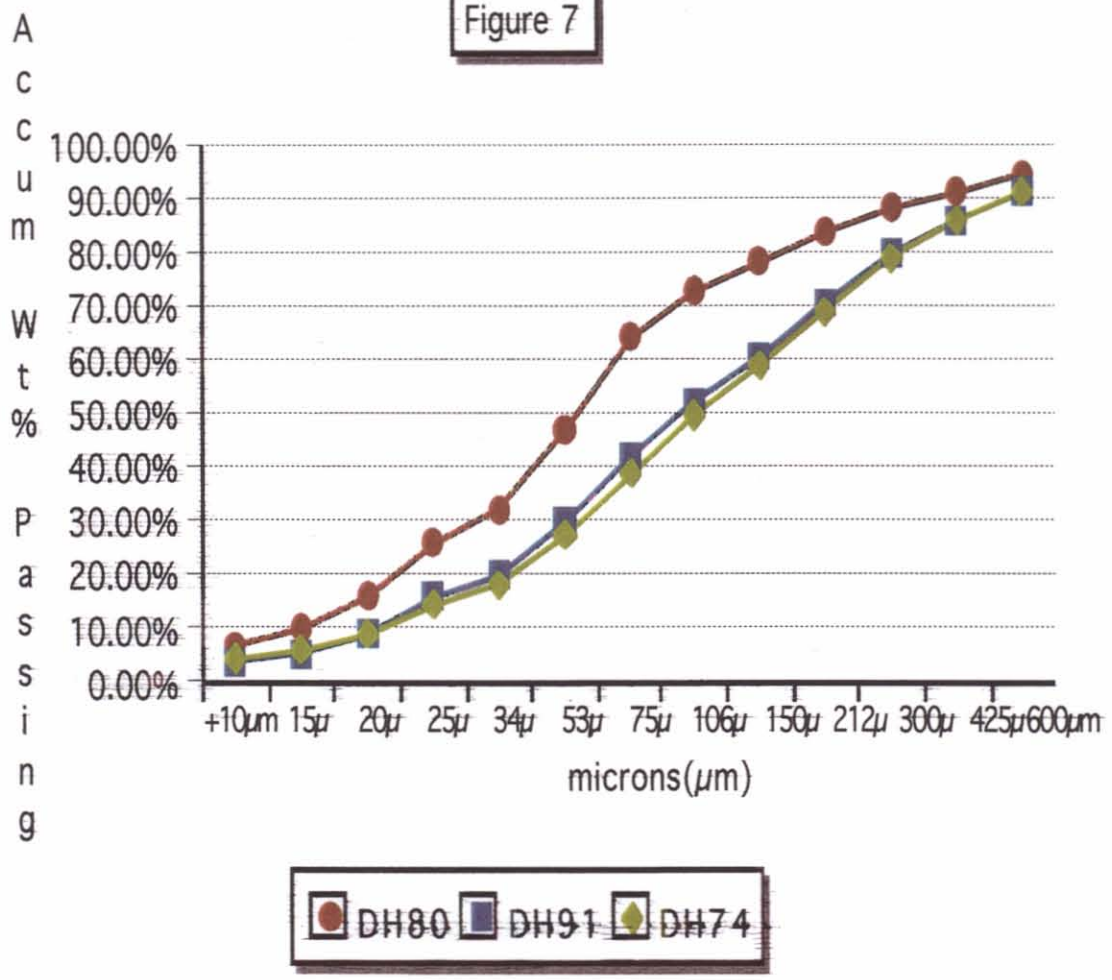
5 cm

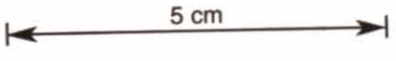
5 cm

Fine Sizing Group - **DH80, 91 &7 4**

There are only three samples in this group all with 90% passing 600μm and all show typical sizing behavior for Pine Hill. Even though they are finer, again there is no increase in the distribution of material in the -10μm fraction. The two sizings are shown in in Fig. 7.

Figure 7





Interpretation Of Grinding Data

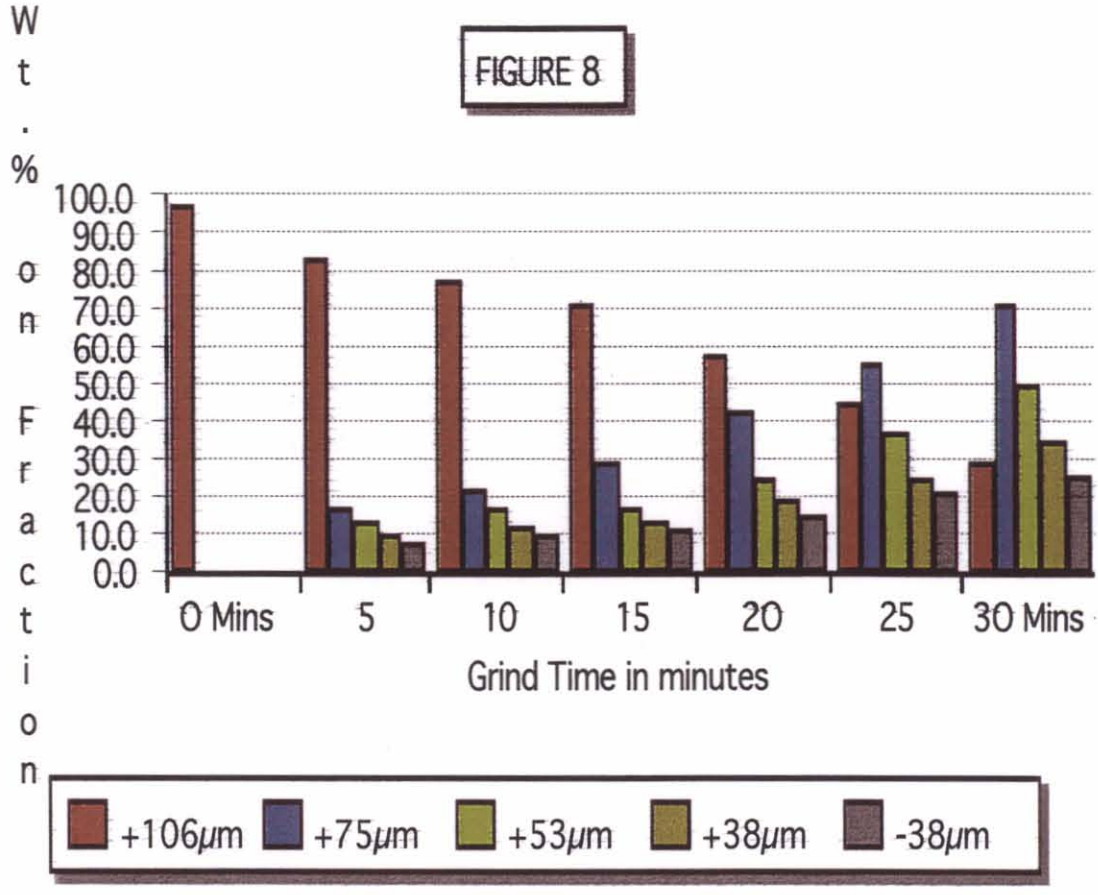
Grinding Method

All the +106μm fractions from each of the drill core sized to 10μm were composited and a one kilogram portion riffled out for grinding (shown as 0 min in Fig 8). It was noticed that there were a few rather coarse pebbles present and these were not removed. The one kilogram charge was subjected to the standard Western Metals grind and progressive samples were taken at 5 minute intervals. This work needs to be considered a sighter test.

Interpretation of Results

Pine Hill silica sands show a linear reduction ratio when the removal of material for sizing is taken into account and allowing for the coarse pebbles which will be difficult for a laboratory mill and charge to reduce. Not enough work has been done to properly calculate a work index. The grind profile shown in Fig. 8 combined with historical data suggest that Pine Hill silica can be readily reduced to 80% passing somewhere between 106μ and 75μm and may have a work index between 8 and 10 for this reduction.

FIGURE 8



5 cm

Fig.9 shows the reduction ratio on the total feed and product, the -38μm to 10μm fractions have been estimated. Observations of this sand indicate that there is a lot of fracturing in particles and this greatly assists in reduction to a given size which has not yet been determined. It is probable that Pine Hill sands can be reduced from 80% passing ≈600μm to ≈80% passing 75μm (30-40 minutes lab grind time) at very reasonable cost on the data presented in this file note. Competent silica sands normally have a work index of 13 to 14. It is possible that Pine Hill silica will have a work index of <10. Fig. 10 shows the variability in drill core at +600μm.

FIGURE 9

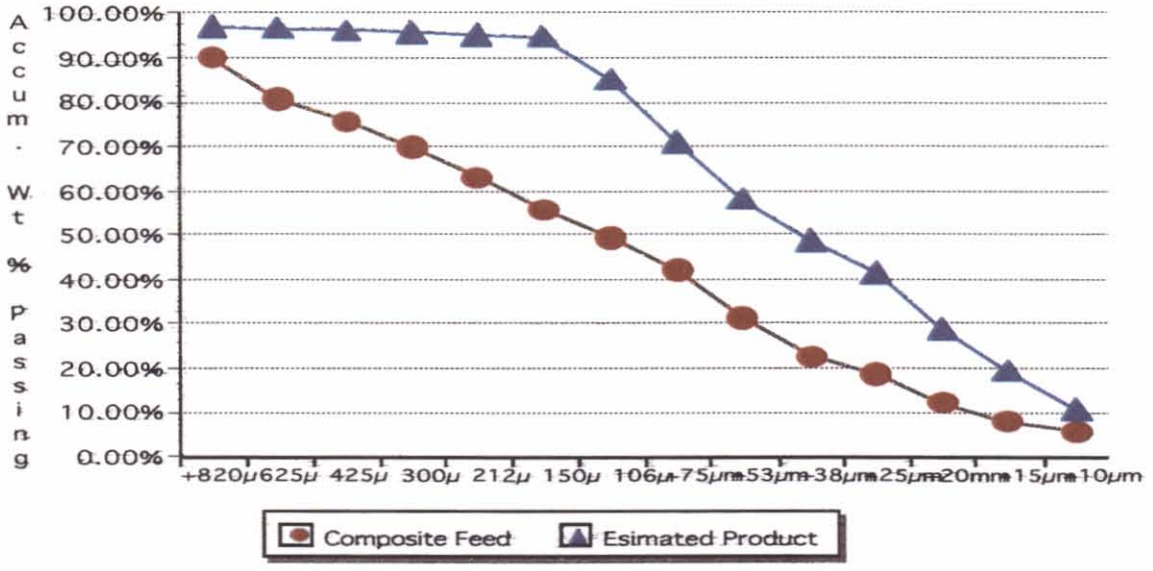
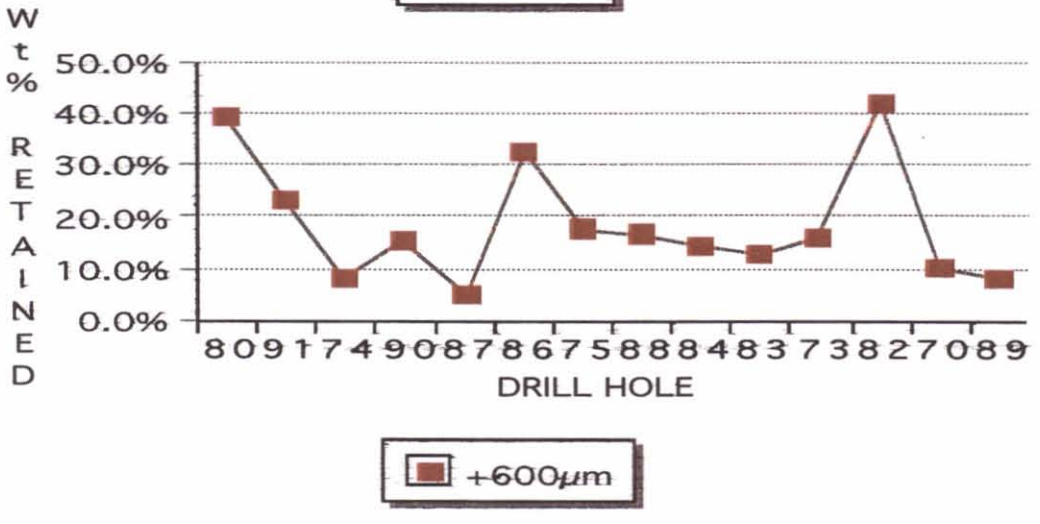


FIGURE 10



5 cm

Fig.11 contains important information on Pine Hill reduction ratio in a laboratory mill. It can be seen that the actual reduction in 30 minutes was very good. The feed was more than 18% + 820μ , and the product was 90% passing 150μm. The reduction in the +106μm fraction is illustrated in Fig 12.

FIGURE 11

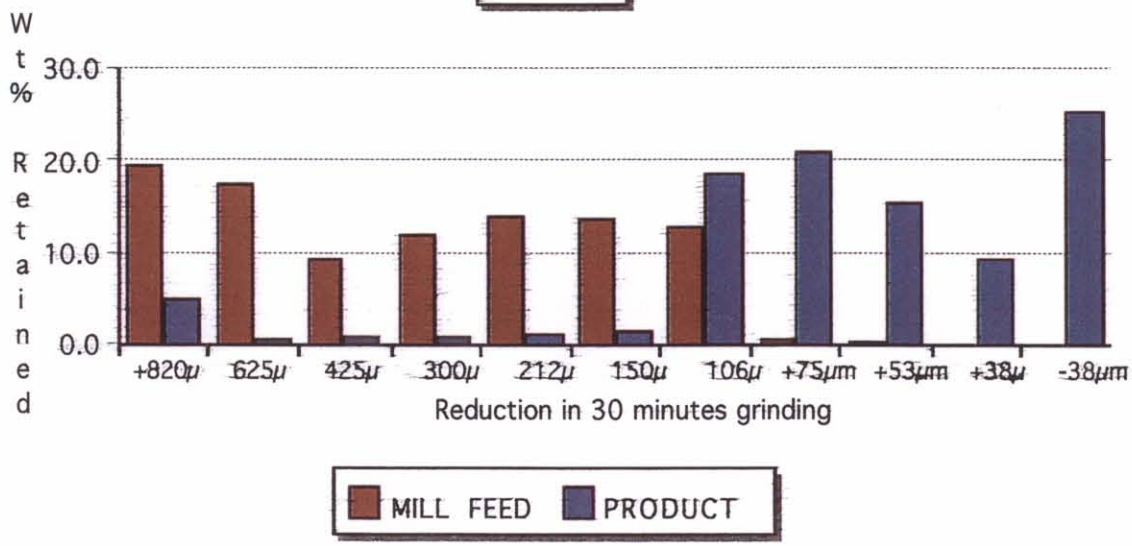
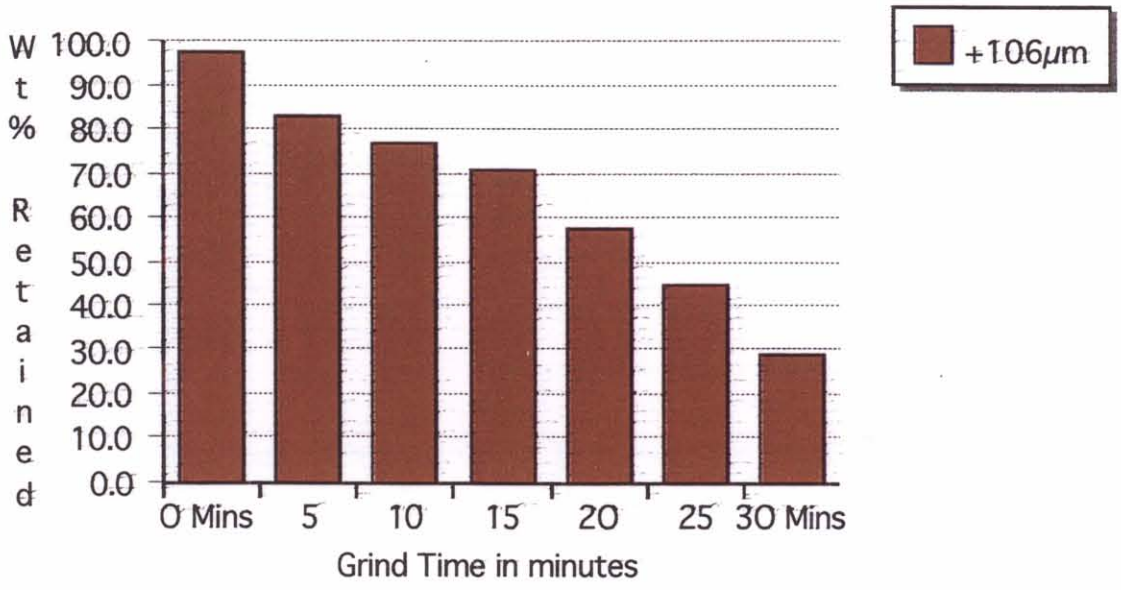


FIGURE 12



5 cm

Conclusions

* This series of sizing tests show that the drill hole samples tested contained ≈ 44% of the their weight in the -106μm +10μm fraction on average.

* It was also demonstrated that only about 5% of the weight in these lots occurred as ultra fine -10μm material.

* Grinding the composite +106μm fractions indicated that Pine Hill silica sands can be readily ground to 80% passing ≈106μm.

* It was also shown that all the samples were "clean " or, more properly, well washed and free from foreign clays and soils. It would seem most of the ultra fines are very likely to be degraded silica. On average only about 5% to 6% of the sand reported to this fraction.

* Observations of this sand indicate that there is a lot of fracturing in the grains and this greatly assists in reduction to a given size which has yet to be fully determined but will be finer than 75 μm.

* It is probable that Pine Hill sands can be reduced from 80% passing ≈600μm to ≈80% passing 75μm (30-40 minutes lab grind time) at very reasonable cost on the data presented in this report.

* Competent silica sands normally have a work index of 13 to 14. It is possible that Pine Hill silica will have a work index of ≈ <10.

Recommendations

* More detailed comminution testwork needs to be carried out on the Pine Hill silica sands in order determine the correct work index.

APPENDIX ONE

865071

J.J. McDONALD & SONS MINING PTY LTD

ACN 051 399 261

FACSIMILE TRANSMISSION

TO	:	Mr. N. Moony, Esker	Fax: 03 6223 3502
FROM	:	Gerhard K. Krummel	Fax: 03 9820 2595
DATE	:	4th September 2000	
PAGES	:	One	
SUBJECT	:	**SAMPLE SIZINGS - SILICA SANDS, MAYDENA.**	

Following our scoping discussions on 25 and 26 August 2000 regarding additional sizing determinations on sand material from our drill holes at the Maydena silica sand deposit, I delivered to your premises 15 samples of approx. 1 kg each.

These were numbered DH 70, 73, 74, 75, 80, 82, 83, 84, 85, 86, 87, 88, 89, 90, and 91.

By and large, these samples were selected from the finer grained segments of the deposit, although several come from areas of coarser material.

The primary purpose of this assignment is to gain a more detailed appreciation of the particle size distribution in the -106 micron fraction of the samples selected.

The following procedures were discussed and agreed:

* The work will be undertaken using Western Metals' laboratory facilities in Burnie
* care to be taken to avoid contamination, especially by iron and alumina
* dry screen to +106, -106, -75, -53, -38 microns; retain +106 micron fraction
* cyclosize @ 32, 25, 19, 15 and 10 microns; retain -10 micron fraction
* grind 1 or 2 samples of the +106 micron fraction to obtain a reduction ratio
* compare and, if possible, integrate the results of this investigation with the sizing data of the earlier sizing investigation by Esker
* a brief written report on the results and implications to be submitted
* the -106 micron fractions to be sent to G. Krummel for on-forwarding to ALS for assay determinations
* the +106 micron fraction to be collected by G. Krummel in Hobart for storage
* completion date of project: by about end September 2000
* cost estimate for sizing work: $2,500.00 approx.
* any major departure from procedure and/or cost estimate to be discussed with G. Krummel before actioning.

Please proceed with the assignment at your earliest convenience if the above is in accord with your understanding of the matters discussed.

GERHARD K. KRUMMEL
for and on behalf of
J.J.McDonald & Sons Mining Pty. Ltd.

cc: RW

APPENDIX TWO

865073

GC & KS TAPP
3 VAN DIEMENS CRESCENT
BURNIE TAS 7320
Tel. 03 64 333770
Mobile 04 08 366 196

Mr Nick Moony
Mensislux Pty Ltd
5 Wentworth st.,
Hobart South
Tas 7004

Re Maydena Mineral Sands

Dear Nick,

Please find accompanied herewith all results relevant to the above project as discussed on the 6th of September and as outlined in the facsimile transmission of the 4th of September from Gerhard Krummei.
My time allocated to this project is 42 hours and at the fee of $30 / hr by agreement.
Trust that this finds both yourself and Barbara well.
I hope that you will be satisfied with the quality of work received and that all results returned are satisfactory.
Thanking you for giving me the opportunity to do this work.

Kindest regards,

Gary Tapp.
19.09.00

7.20 — Q401

865074

GCT SIZE REDUCTION RATIO

Date : 19.09.00 **Customer :** **J.J.McDonald & Sons Mining Pty Ltd**
per Nick Moony,Mensislux Pty Ltd

Sample Description : **Maydena Silica Sands**

GRIND DATA : MILL 32 CM DIA OPEN ENDED MILD STEEL AND RUN AT 50 RPM
BALL CHARGE WAS 6 Kg and 1 Kg feed plus 500 mls water or 66.6 % solids as per the standard Western Metals charge.

Procedure: 1Kg as a total composite was riffled from the fifteen samples.
Milling was continuous for 30 minutes with samples drawn from the pulp with modified 20 ml syringes at 5 minute intervals.

Test work by : Gary Tapp

15 30' 17.30½ 23½ 31.5 40.0

Sieve size	5	minutes	10½	minutes	15	minutes	20	minutes	25	minutes	30	minutes
microns	Weight	%wt	Weight	%wt	Weight	%wt	Weight	%wt	Weight	%wt	Weight	%wt
+ 106	34.10	83.4	32.72	77.3	60.39	70.6	50.40	57.6	23.61	44.7	26.66	28.9
+ 75	1.55	3.8	2.69	6.4	10.84	12.7	15.42	17.6	9.91	18.7	19.30	20.9
+ 53	1.26	3.1	1.53	3.6	2.75	3.2	5.27	6.0	6.25	11.8	14.18	15.4
+ 38	0.73	1.8	1.22	2.9	2.11	2.5	3.36	3.8	2.08	3.9	8.80	9.5
- 38	3.25	7.9	4.19	9.9	9.43	11.0	13.00	14.9	11.01	20.8	23.43	25.4
	40.89	100.0	42.35	100.0	85.52	100.0	87.45	100.0	52.86	100.0	92.37	100.0

COMMENTS: Table shows a good size reduction and visually pulp became more viscous as the test period progressed revealing a good grinding performance.
However some coarse quartz particles were always evident in each sample revealing that around 5% of the material had a very high work index.

1.33

40.9 42.4 82.71 85.5 = 168.9 + 25.0

865075

GCT SIZING SHEET

Customer : J.J. McDonald & Sons Mining Pty Ltd
per Nick Moony Mensislux Pty Ltd

Date : 18.09.00

Sample Description : Maydena Silica Sands

Sample Ref No : DH 70/2

Original weight : 201.05

Test work by : G.C.Tapp

Cyclosizer Data

Run Time 20 minutes

Water Temp 21 deg C

Rotameter 185 mm

Sieve data

BS 410 W/W & S/S

Round 200mm

Wet sieving followed by dry
Ro - Tap sieving 10 minutes

Assay Ref No	Sieve size microns	Weight grammes	% Weight	% Passing
				100.0
	+ 106	154.46	76.8	23.2
	+ 75	15.03	7.5	15.7
	+ 53	10.06	5.0	10.7
	+ 38	5.35	2.7	8.0
	CS 1	0.04	0.0	8.0
	CS 2	2.28	1.1	6.9
	CS 3	2.84	1.4	5.5
	CS 4	1.95	1.0	4.5
	CS 5	1.44	0.7	3.8
	- CS 5	7.60	3.8	0.0

adjustment 1.77 factor

865076

GCT SIZING SHEET

Customer : J.J. McDonald & Sons Mining Pty Ltd
per Nick Moony Mensislux Pty Ltd

Date : 18.09.00

Sample Description : Maydena Silica Sands

Sample Ref No : DH 73/2

Original weight : 164.40

99.87

Test work by : G.C.Tapp

Cyclosizer Data

Run Time 20 minutes

Water Temp 21 deg C

Rotameter 185 mm

Sieve data

BS 410 W/W & S/S

Round 200mm

Wet sieving followed by dry
Ro - Tap sieving 10 minutes

Assay Ref No	Sieve size microns	Weight grammes	% Weight	% Passing
				100.0
	+ 106	85.01	51.7	48.3
	+ 75	15.93	9.7	38.6
	+ 53	18.22	11.1	27.5
	+ 38	14.05	8.5	19.0
	CS 1	0.09	0.1	18.9
	CS 2	6.18	3.8	15.2
	CS 3	10.04	6.1	9.1
	CS 4	5.57	3.4	5.7
	CS 5	2.83	1.7	3.9
	- CS 5	6.48	3.9	0.0

61.4

38.6

37.7

Auston 1.06

865077

GCT SIZING SHEET

Customer : J.J. McDonald & Sons Mining Pty Ltd
per Nick Moony Mensislux Pty Ltd

Date : 18.09.00

Sample Description : Maydena Silica Sands

Sample Ref No : DH 74/2

Original weight : 210.55

Test work by : G.C.Tapp

Cyclosizer Data

Run Time 20 minutes

Water Temp 21 deg C

Rotameter 185 mm

Sieve data

BS 410 W/W & S/S

Round 200mm

Wet sieving followed by dry
Ro - Tap sieving 10 minutes

Assay Ref No	Sieve size microns	Weight grammes	% Weight	% Passing
				100.0
	+ 106	108.80	51.7	48.3
	+ 75	21.84	10.4	38.0
	+ 53	24.23	11.5	26.4
	+ 38	18.26	8.7	17.8
	CS 1	0.06	0.0	17.7
	CS 2	7.29	3.5	14.3
	CS 3	11.10	5.3	9.0
	CS 4	6.74	3.2	5.8
	CS 5	3.94	1.9	3.9
	- CS 5	8.29	3.9	0.0

62.1 60.4
37.9 39.6

865078

GCT SIZING SHEET

Customer : J.J. McDonald & Sons Mining Pty Ltd
per Nick Moony Mensislux Pty Ltd

Date : 18.09.00

Sample Description : Maydena Silica Sands

Sample Ref No : DH 75/2

Original weight : 209.97

Test work by : G.C.Tapp

Cyclosizer Data

Run Time 20 minutes

Water Temp 21 deg C

Rotameter 185 mm

Sieve data

BS 410 W/W & S/S

Round 200mm

Wet sieving followed by dry
Ro - Tap sieving 10 minutes

Assay Ref No	Sieve size microns	Weight grammes	% Weight	% Passing
				100.0
	+ 106	101.89	48.5	51.5
	+ 75	19.55	9.3	42.2
	+ 53	22.62	10.8	31.4
	+ 38	18.05	8.6	22.8
	CS 1	0.15	0.1	22.7
	CS 2	8.53	4.1	18.7
	CS 3	14.60	7.0	11.7
	CS 4	9.08	4.3	7.4
	CS 5	5.13	2.4	4.9
	- CS 5	10.37	4.9	0.0

48.5
57.8 52.2
42.2 47.8

57.8

865079

GCT SIZING SHEET

Customer : J.J. McDonald & Sons Mining Pty Ltd
per Nick Moony Mensislux Pty Ltd

Date : 18.09.00

Sample Description : Maydena Silica Sands

Sample Ref No : DH 80/2

Original weight : 224.00

Test work by : G.C.Tapp

Cyclosizer Data

Run Time 20 minutes

Water Temp 21 deg C

Rotameter 185 mm

Sieve data

BS 410 W/W & S/S

Round 200mm

Wet sieving followed by dry
Ro - Tap sieving 10 minutes

Assay Ref No	Sieve size microns	Weight grammes	% Weight	% Passing
				100.0
	+ 106	63.40	28.3	71.7
	+ 75	21.03	9.4	62.3
	+ 53	38.10	17.0	45.3
	+ 38	30.85	13.8	31.5
	CS 1	0.60	0.3	31.3
	CS 2	12.84	5.7	25.5
	CS 3	22.69	10.1	15.4
	CS 4	12.36	5.5	9.9
	CS 5	6.96	3.1	6.8
	- CS 5	15.17	6.8	0.0

62.3
37.7 – 35.6
07.5 – 00.1

62.3
58.8

865080

GCT SIZING SHEET

Customer : J.J. McDonald & Sons Mining Pty Ltd
per Nick Moony Mensislux Pty Ltd

Date : 18.09.00

Sample Description : Maydena Silica Sands

Sample Ref No : DH 82/2

Original weight : 175.37

Test work by : G.C.Tapp

Cyclosizer Data

Run Time 20 minutes

Water Temp 21 deg C

Rotameter 185 mm

Sieve data

BS 410 W/W & S/S

Round 200mm

Wet sieving followed by dry
Ro - Tap sieving 10 minutes

Assay Ref No	Sieve size microns	Weight grammes	% Weight	% Passing
				100.0
	+ 106	119.24	68.0	32.0
	+ 75	12.68	7.2	24.8
	+ 53	11.12	6.3	18.4
	+ 38	7.12	4.1	14.4
	CS 1	0.52	0.3	14.1
	CS 2	7.08	4.0	10.0
	CS 3	7.67	4.4	5.7
	CS 4	4.76	2.7	3.0
	CS 5	3.50	2.0	1.0
	- CS 5	1.68	1.0	0.0

865081

GCT SIZING SHEET

Customer : J.J. McDonald & Sons Mining Pty Ltd
per Nick Moony Mensislux Pty Ltd

Date : 18.09.00

Sample Description : Maydena Silica Sands

Sample Ref No : DH 83/2

Original weight : 204.08

Test work by : G.C.Tapp

Cyclosizer Data

Run Time 20 minutes

Water Temp 21 deg C

Rotameter 185 mm

Sieve data

BS 410 W/W & S/S

Round 200mm

Wet sieving followed by dry
Ro - Tap sieving 10 minutes

Assay Ref No	Sieve size microns	Weight grammes	% Weight	% Passing
				100.0
	+ 106	117.08	57.4	42.6
	+ 75	22.20	10.9	31.8
	+ 53	24.91	12.2	19.5
	+ 38	16.22	7.9	11.6
	CS 1	0.08	0.0	11.6
	CS 2	2.94	1.4	10.1
	CS 3	4.87	2.4	7.7
	CS 4	2.29	1.1	6.6
	CS 5	1.03	0.5	6.1
	- CS 5	12.46	6.1	0.0

31.8

865082

GCT SIZING SHEET

Customer : J.J. McDonald & Sons Mining Pty Ltd
per Nick Moony Mensislux Pty Ltd

Date : 18.09.00

Sample Description : Maydena Silica Sands

Sample Ref No : DH 84/2

Original weight : 202.30

Test work by : G.C.Tapp

Cyclosizer Data

Run Time 20 minutes

Water Temp 21 deg C

Rotameter 185 mm

Sieve data

BS 410 W/W & S/S

Round 200mm

Wet sieving followed by dry
Ro - Tap sieving 10 minutes

Assay Ref No	Sieve size microns	Weight grammes	% Weight	% Passing
				100.0
	+ 106	125.22	61.9	38.1
	+ 75	15.03	7.4	30.7
	+ 53	14.68	7.3	23.4
	+ 38	11.32	5.6	17.8
	CS 1	0.10	0.0	17.8
	CS 2	5.88	2.9	14.9
	CS 3	9.85	4.9	10.0
	CS 4	7.02	3.5	6.5
	CS 5	4.98	2.5	4.1
	- CS 5	8.22	4.1	0.0

69.3 65.7
30.7 34.3

865083

GCT SIZING SHEET

Customer : J.J. McDonald & Sons Mining Pty Ltd
per Nick Moony Mensislux Pty Ltd

Date : 18.09.00

Sample Description : Maydena Silica Sands

Sample Ref No : DH 85/2

Original weight : 193.48

Test work by : G.C.Tapp

Cyclosizer Data

Run Time 20 minutes

Water Temp 21 deg C

Rotameter 185 mm

Sieve data

BS 410 W/W & S/S

Round 200mm

Wet sieving followed by dry
Ro - Tap sieving 10 minutes

Assay Ref No	Sieve size microns	Weight grammes	% Weight	% Passing
				100.0
	+ 106	167.77	86.7	13.3
	+ 75	11.40	5.9	7.4
	+ 53	6.94	3.6	3.8
	+ 38	2.46	1.3	2.5
	- 38	4.91	2.5	0.0

NOTE : No cyclosizing this sample due to low weight of -38 micron fraction.

865084

GCT SIZING SHEET

Customer : J.J. McDonald & Sons Mining Pty Ltd
per Nick Moony Mensislux Pty Ltd

Date : 18.09.00

Sample Description : Maydena Silica Sands

Sample Ref No : DH 86/2

Original weight : 218.44

Test work by : G.C.Tapp

Cyclosizer Data

Run Time 20 minutes

Water Temp 21 deg C

Rotameter 185 mm

Sieve data

BS 410 W/W & S/S

Round 200mm

Wet sieving followed by dry
Ro - Tap sieving 10 minutes

Assay Ref No	Sieve size microns	Weight grammes	% Weight	% Passing
				100.0
	+ 106	116.33	53.3	46.7
	+ 75	16.88	7.7	39.0
	+ 53	20.98	9.6	29.4
	+ 38	17.31	7.9	21.5
	CS 1	0.08	0.0	21.5
	CS 2	8.07	3.7	17.8
	CS 3	14.66	6.7	11.0
	CS 4	8.78	4.0	7.0
	CS 5	5.25	2.4	4.6
	- CS 5	10.10	4.6	0.0

61·0 — 559
39·0 — 441
51

865085

GCT SIZING SHEET

Customer : J.J. McDonald & Sons Mining Pty Ltd
per Nick Moony Mensislux Pty Ltd

Date : 18.09.00

Sample Description : Maydena Silica Sands

Sample Ref No : DH 87/2

Original weight : 209.34

Test work by : G.C.Tapp

Cyclosizer Data

Run Time 20 minutes

Water Temp 21 deg C

Rotameter 185 mm

Sieve data

BS 410 W/W & S/S

Round 200mm

Wet sieving followed by dry
Ro - Tap sieving 10 minutes

Assay Ref No	Sieve size microns	Weight grammes	% Weight	% Passing
				100.0
	+ 106	66.20	31.6	68.4 316
	+ 75	17.35	8.3	60.1 60.1
	+ 53	23.74	11.3	48.7 39.9 43.1
	+ 38	22.98	11.0	37.8 42.2
	CS 1	0.18	0.1	37.7
	CS 2	11.99	5.7	32.0
	CS 3	22.89	10.9	21.0
	CS 4	15.50	7.4	13.6
	CS 5	10.48	5.0	8.6
	- CS 5	18.03	8.6	0.0

865086

GCT SIZING SHEET

Customer : J.J. McDonald & Sons Mining Pty Ltd
per Nick Moony Mensislux Pty Ltd

Date : 18.09.00

Sample Description : Maydena Silica Sands

Sample Ref No : DH 88/2

Original weight : 212.21

Test work by : G.C.Tapp

Cyclosizer Data

Run Time 20 minutes

Water Temp 21 deg C

Rotameter 185 mm

Sieve data

BS 410 W/W & S/S

Round 200mm

Wet sieving followed by dry
Ro - Tap sieving 10 minutes

Assay Ref No	Sieve size microns	Weight grammes	% Weight	% Passing
				100.0
	+ 106	109.06	51.4	48.6
	+ 75	14.04	6.6	42.0 — 58.0 - 58.8
	+ 53	15.71	7.4	34.6
	+ 38	13.62	6.4	28.2
	CS 1	0.13	0.1	28.1
	CS 2	7.15	3.4	24.7
	CS 3	12.91	6.1	18.7
	CS 4	9.15	4.3	14.3
	CS 5	6.51	3.1	11.3
	- CS 5	23.93	11.3	0.0

865087

GCT SIZING SHEET

Customer : J.J. McDonald & Sons Mining Pty Ltd
per Nick Moony Mensislux Pty Ltd

Date : 18.09.00

Sample Description : Maydena Silica Sands

Sample Ref No : DH 89/2

Original weight : 213.68

Test work by : G.C.Tapp

Cyclosizer Data

Run Time 20 minutes

Water Temp 21 deg C

Rotameter 185 mm

Sieve data

BS 410 W/W & S/S

Round 200mm

Wet sieving followed by dry
Ro - Tap sieving 10 minutes

Assay Ref No	Sieve size microns	Weight grammes	% Weight	% Passing
				100.0
	+ 106	119.21	55.8	44.2
	+ 75	10.07	4.7	39.5
	+ 53	14.80	6.9	32.6
	+ 38	14.93	7.0	25.6
	CS 1	0.07	0.0	25.6
	CS 2	6.12	2.9	22.7
	CS 3	13.79	6.5	16.2
	CS 4	10.53	4.9	11.3
	CS 5	7.83	3.7	7.6
	- CS 5	16.33	7.6	0.0

60.3 / 39.5 — 61.3 / 38.7

865088

GCT SIZING SHEET

Customer : J.J. McDonald & Sons Mining Pty Ltd
per Nick Moony Mensislux Pty Ltd

Date : 18.09.00

Sample Description : Maydena Silica Sands

Sample Ref No : DH 90/2

Original weight : 207.57

Test work by : G.C.Tapp

Cyclosizer Data

Run Time 20 minutes

Water Temp 21 deg C

Rotameter 185 mm

Sieve data

BS 410 W/W & S/S

Round 200mm

Wet sieving followed by dry
Ro - Tap sieving 10 minutes

Assay Ref No	Sieve size microns	Weight grammes	% Weight	% Passing
				100.0
	+ 106	87.70	42.3 36.8	57.7
	+ 75	19.78	9.5 8.2	48.2
	+ 53	31.95	15.4	32.8
	+ 38	22.98	11.1	21.8
	CS 1	0.25	0.1	21.6
	CS 2	9.62	4.6	17.0
	CS 3	14.48	7.0	10.0
	CS 4	7.29	3.5	6.5
	CS 5	4.10	2.0	4.5
	- CS 5	9.42	4.5	0.0

51.8 55.00
48.2 45.00
55

51.8 4.5
48.2 55.0

865089

GCT SIZING SHEET

Customer : J.J. McDonald & Sons Mining Pty Ltd
per Nick Moony Mensislux Pty Ltd

Date : 18.09.00

Sample Description : Maydena Silica Sands

Sample Ref No : DH 91/2

Original weight : 218.44

Test work by : G.C.Tapp

Cyclosizer Data

Run Time 20 minutes

Water Temp 21 deg C

Rotameter 185 mm

Sieve data

BS 410 W/W & S/S

Round 200mm

Wet sieving followed by dry
Ro - Tap sieving 10 minutes

Assay Ref No	Sieve size microns	Weight grammes	% Weight	% Passing
				100.0
	+ 106	108.58	49.7	50.3
	+ 75	23.29	10.7	39.6
	+ 53	26.25	12.0	27.6
	+ 38	20.29	9.3	18.3
	CS 1	0.44	0.2	18.1
	CS 2	7.99	3.7	14.5
	CS 3	13.62	6.2	8.2
	CS 4	6.63	3.0	5.2
	CS 5	3.14	1.4	3.8
	- CS 5	8.21	3.8	0.0

39.6 42.5
60.4 57.5

APPENDIX 6

ASSAY RESULTS - FINE SIZE FRACTIONS
DRILL HOLES 75, 80, 87, 90

865091

CERTIFICATE OF ANALYSIS

ALS Chemex

Batch: AM31702
Sub Batch: 0

CONTACT:	MR G KRUMMEI	**LABORATORY:**	@docvar:branch_AM
CLIENT:	.	**DATE RECEIVED:**	30/04/2001
ADDRESS:	JJ MCDONALD & SONS MINING P/L SUITE 28 487 ST KILDA ROAD MELBOURNE VIC 3004	**DATE COMPLETED:**	03/05/2001
		SAMPLE TYPE:	SILICA SAND
		No. of SAMPLES:	42
ORDER No.:	LETTER 28/02/01		
PROJECT:			

COMMENTS

1. Sulphur assays may not represent total sulphur in sample.
2. No standard reference material for sulphur was included in this assay.
3. Sulphur reported to view relativity between samples in this report
4. Results for samples with low sample weights may bias high due to the large scaling involved.

NOTES

This is the Final Report and supersedes any preliminary reports with this batch number.
Results apply to sample(s) as submitted. All pages of this report have been checked and approved for release.

ISSUING LABORATORY: @docvar:branch_AM

Address
@docvar:labaddr_AM

Phone: @docvar:phone_AM
Fax: @docvar:fax_AM
Email: @docvar:labemail_AM

Signature:

LABORATORIES

AUSTRALIA		*NORTH AMERICA*			*SOUTH AMERICA*			*ASIA*
Alice Springs	*Kalgoorlie*	*Thunder Bay*	*Elko*	*Chihuahua*	*Copiapo*	*Quito*	*Arequipa*	*Vientiane*
Bendigo	*Orange*	*Toronto*	*Fairbanks*	*Guadalajara*	*Santiago*	*Mendoza*	*Lima*	
Brisbane	*Perth*	*Vancouver*	*Reno*	*Hermosillo*			*Trujillo*	
Charters Towers	*Townsville*			*Zacatecas*				
Cloncurry								

Batch: AM31702
Sub Batch: 0
Date of Issue: 03/05/2001
Client: .
Client Reference:

CERTIFICATE OF ANALYSIS

865092

SAMPLE	Element Method Unit LOR	Al2O3 ppm M289 10	Fe2O3 ppm M289 10	TiO2 ppm M289 10	CaO ppm M289 10	MgO ppm M289 10	MnO ppm M289 10	Cr2O3 ppm M289 1	V2O5 ppm M289 10	S ppm M289 10	Sample Wt. g ALS 0.001		
DH 75/2 HEAD		4020	2100	212	407	176	<10	6	<10	33	2.000		
DH 75/2 +106UM		2510	956	94	255	117	<10	5	<10	25	2.000		
DH 75/2 +75UM		1660	1190	113	297	133	<10	4	<10	10	2.000		
DH 75/2 +53UM		1650	1020	135	421	161	<10	5	<10	17	2.000		
DH 75/2 +38UM		1780	1180	168	509	198	<10	6	<10	29	2.000		
DH 75/2 CS1		396	1.22%	408	455	126	<10	26	<10	1640	0.066		
DH 75/2 CS2		1020	1140	123	582	206	<10	4	<10	38	2.000		
DH 75/2 CS3		1680	1780	187	624	269	<10	5	<10	40	2.000		
DH 75/2 CS4		2460	2460	264	662	302	<10	9	<10	71	2.000		
DH 75/2 CS5		2860	3140	257	656	304	10	9	<10	83	2.000		
DH 80/2 HEAD		3560	2880	461	450	255	<10	5	10	25	2.000		
DH 80/2 +106UM		2740	2860	315	162	186	<10	5	<10	22	2.000		
DH 80/2 +75UM		1310	1150	184	349	150	<10	3	<10	11	2.000		
DH 80/2 +53UM		1180	1080	180	691	157	<10	3	<10	10	2.000		
DH 80/2 +38UM		1300	1170	210	765	172	<10	3	<10	17	2.000		
DH 80/2 CS1		660	2570	266	662	129	<10	5	<10	654	0.208		
DH 80/2 CS2		653	804	137	742	156	<10	2	<10	321	2.000		
DH 80/2 CS3		817	1060	155	619	179	<10	2	<10	18	2.000		
DH 80/2 CS4		1430	1860	263	459	205	<10	3	<10	27	2.000		
DH 80/2 CS5		1800	2250	288	348	204	<10	3	<10	51	2.000		
DH 87/2 HEAD		440	1100	262	289	105	<10	2	<10	16	2.000		
DH 87/2 +106UM		330	547	127	117	57	<10	3	<10	27	2.000		
DH 87/2 +75UM		304	596	118	189	79	<10	2	<10	<10	2.000		
DH 87/2 +53UM		327	581	128	297	90	<10	2	<10	<10	2.000		
DH 87/2 +38UM		327	724	142	390	94	<10	2	<10	<10	2.000		
DH 87/2 CS1		51	6540	307	570	99	<10	<1	<10	1370	0.146		
DH 87/2 CS2		279	665	97	481	99	<10	<1	<10	13	2.000		

Batch: AM31702
Sub Batch: 0
Date of Issue: 03/05/2001
Client: .
Client Reference:

CERTIFICATE OF ANALYSIS

865093

SAMPLE	Element Method Unit LOR	Al2O3 ppm M289 10	Fe2O3 ppm M289 10	TiO2 ppm M289 10	CaO ppm M289 10	MgO ppm M289 10	MnO ppm M289 10	Cr2O3 ppm M289 1	V2O5 ppm M289 10	S ppm M289 10	Sample Wt. g ALS 0.001		
DH 87/2 CS3		336	828	110	478	131	<10	<1	<10	10	2.000		
DH 87/2 CS4		442	1130	160	461	171	<10	2	<10	14	2.000		
DH 87/2 CS5		500	1300	176	460	201	<10	3	<10	25	2.000		
DH 87/2 CS6		860	2760	704	410	178	<10	9	<10	71	2.000		
DH 90/2 HEAD		129	357	127	331	133	<10	<1	<10	47	2.000		
DH 90/2 +106UM		95	293	91	151	87	<10	2	<10	51	2.000		
DH 90/2 +75UM		128	401	42	375	122	<10	<1	<10	<10	2.000		
DH 90/2 +53UM		125	304	51	530	126	<10	<1	<10	11	2.000		
DH 90/2 +38UM		143	236	65	551	159	<10	2	<10	18	2.000		
DH 90/2 CS1		<10	5370	257	594	193	19	4	<10	1290	0.252		
DH 90/2 CS2		188	426	64	533	160	<10	<1	<10	62	2.000		
DH 90/2 CS3		247	1060	70	592	266	89	1	<10	258	2.000		
DH 90/2 CS4		273	762	89	599	323	25	2	<10	102	2.000		
DH 90/2 CS5		298	997	107	552	316	10	3	<10	75	2.000		
DH 90/2 CS6		620	3020	478	497	265	29	12	<10	150	1.010		

865094

CERTIFICATE OF ANALYSIS

ALS Chemex

Batch: AM31702
Sub Batch: 1

CONTACT:	MR G KRUMMEI	**LABORATORY:**	@docvar:branch_AM
CLIENT:	.	**DATE RECEIVED:**	30/04/2001
ADDRESS:	JJ MCDONALD & SONS MINING P/L SUITE 28 487 ST KILDA ROAD MELBOURNE VIC 3004	**DATE COMPLETED:**	03/05/2001
		SAMPLE TYPE:	STANDARD
		No. of SAMPLES:	2
ORDER No.:	LETTER 28/02/01		
PROJECT:			

COMMENTS

NOTES

This is the Final Report and supersedes any preliminary reports with this batch number.
Results apply to sample(s) as submitted. All pages of this report have been checked and approved for release.

ISSUING LABORATORY: @docvar:branch_AM

Address
@docvar:labaddr_AM

Phone: @docvar:phone_AM
Fax: @docvar:fax_AM
Email: @docvar:labemail_AM

Signature:

Batch: AM31702
Sub Batch: 1
Date of Issue: 03/05/2001
Client: .
Client Reference:

CERTIFICATE OF ANALYSIS

865095

SAMPLE	Element Method Unit LOR	Al2O3 ppm M289 10	Fe2O3 ppm M289 10	TiO2 ppm M289 10	CaO ppm M289 10	MgO ppm M289 10	MnO ppm M289 10	Cr2O3 ppm M289 1	V2O5 ppm M289 10				
BCS 313-1		350	120	164	57	<10	<10	<1	<10				
BCS 267		8490	6870	1700	1.75%	485	1580	182	17				

APPENDIX 7

865090

ESKER

Ore Characterisation Report

on

Pine Hill Silica Deposit

From Drill Hole 92 to Drill Hole 110

at

Maydena Tasmania

for

J. J. Mc Donald & Sons Mining Pty. Ltd.

865097

ESKER Milling and Processing Pty Ltd

5 Wentworth Street
SOUTH HOBART
Tasmania,
Australia, 7000

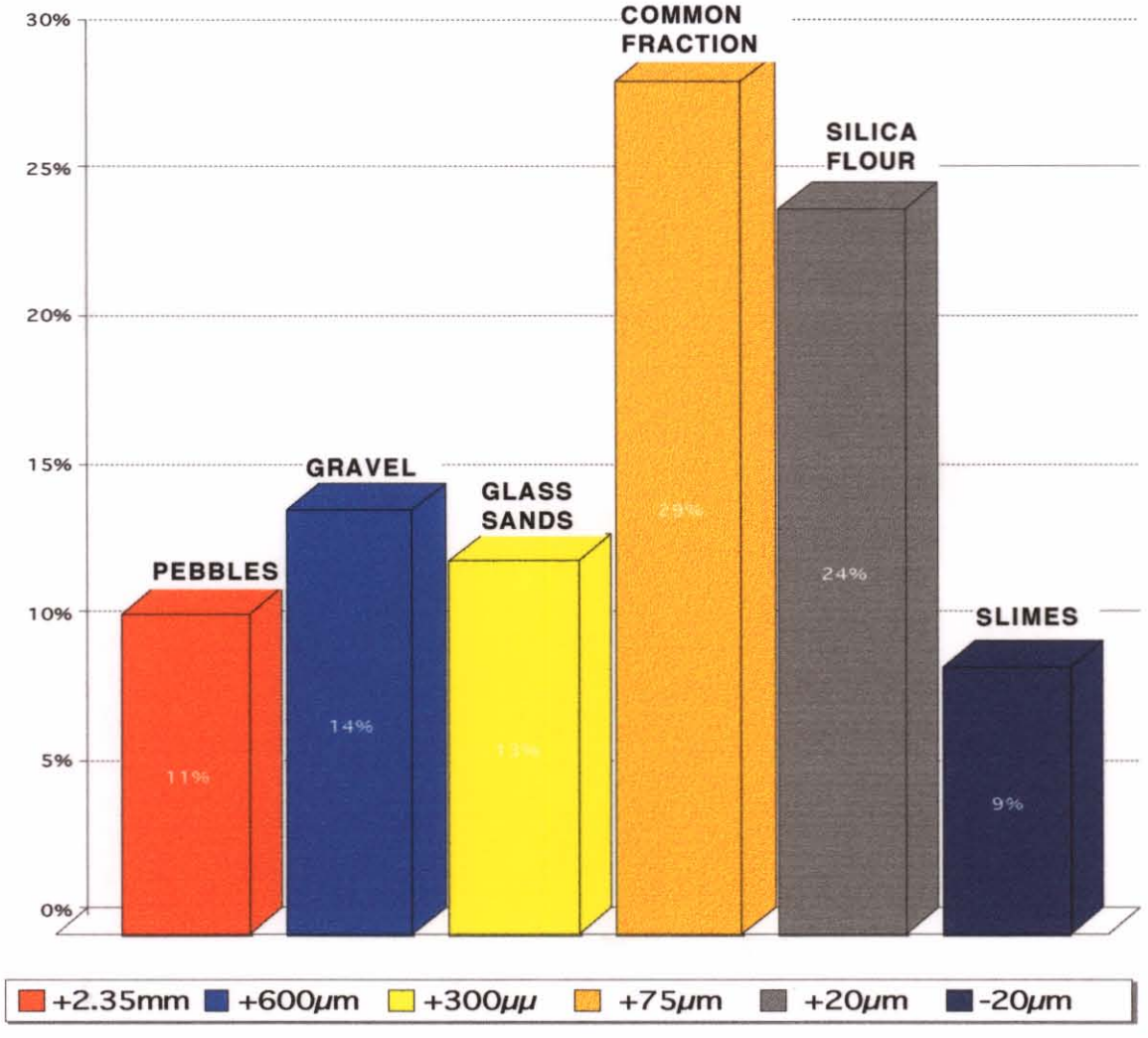
Telephone & Facsimile:03-62-233502
e-mail: moony@netspace.net.au
Direct facsimile: 03-62-244434

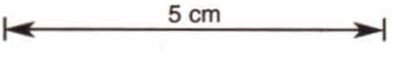
Report to:	Mr. G. K. Krummei for and behalf of J. J. McDonald & Sons Mining Pty Ltd Suite 28, 487 St. Kilda Road, Melbourne. Victoria.3004 Australia.
Date:	5th November 2001.
Subject:	Ore characterisation report and classification of ore types by size distribution.
Authorisation:	Written instructions from Mr G. K. Krummei on April 20th 2001.(refer appendix II)
Report by:	N. Moony.
Officers Involved:	Technical - G.C.Tapp.

Summary

In this test series, eighteen sizings were carried out on chip samples taken from drill holes **DH92** to **DH110** which were collected from the Pine Hill silica sand deposit at Maydena. In an arithmetically averaged composite of these chip samples, made up from 16 of the representative drill holes, it is shown that **65.5%** of the silica reported to the -600μm +20μm generally economic fraction called the **Silica Sand.** Within this overall band, some **41.5%** of the silica occurred as **Glass Sands** in the -600μm +75 domain, and **53.8%** materialised as the finer **Silica Flour** in the -300μm +20μm band. The quantity of both the **Glass Sands** & the **Silica Flour** depend on how the **Common Fraction** -300μm +75μm is distributed. Note that **28.8%** of the mass reports to this size range, while only **12.6%** of the silica reports to the **Glass Sands** alone and **24.4%** occurs solely as **Silica Flour** as shown below in the arithmetically compiled composite for **DH92** to **DH110**.

Arithmetically Compiled Composite for DH92 to DH11





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Introduction

In late May early June, 2001, eighteen drill chip samples were processed for J.J. McDonald and Son Mining Pty Ltd at the Western Metals Ltd metallurgical laboratory in Burnie, Tasmania by G.C. Tapp. The samples were selected by G. Krummei from a drilling program undertaken in April 2001. In this test series all 18 samples were sized down to 10μm. The samples were wet screened at 38μm, the oversize was then dried and screened for 20 minutes on a Ro-Tap sieve shaker. Each -38μm dry fraction was combined with the wet screen undersize and cyclosised under standard conditions. All fractions including the -10μm fraction have been retained. During the entire process great care was taken to minimize iron contamination. In this report the Pine Hill silica sands are classified as follows:

The +2.35mm fraction is assigned the name **Pebbles.** The coarse +600μm oversize is designated as **Gravel**. The silica reporting in the prescribed general fractions between 600μm and 20μm is called **Silica sand**. The fraction reporting in the coarser -600μm +75μm range is called **Glass Sand** and the finer sand distributed in the -212μm +20μm segment is called **Silica Flour.** The silica that reported to the fractions shared by both **Glass Sand** and **Silica Flour** in the -300μm to +75μm fractions has been called the **Common Fraction.** For simplicity the drill holes are grouped numerically and paired off in groups of two, all of which are detailed in **Tables Eight** to **Fifteen**. It was found that **DH94** & **DH95** were anomalous and not representive due to their high slime content. They have been excluded from general discussion but are separately discussed in **Figures Nine & Ten.**

1.0 Sample Preparation

In late April 2001, eighteen samples were received at the Western Metals Ltd metallurgical laboratory from J.J.McDonald & Son Mining Pty Ltd. Samples weighed between two and twenty kilograms as received. The sample bags were numbered as follows:

DH92, 93, (94,) (95,) 96, 97, 98, 99, 101, 102,103, 104, 105,106, 107, 108, 109 &110.

Drill holes **DH97** & **DH99** were excluded on instructions (refer attachment 1) All other samples were treated as follows:

* Each sample was weighed as received.
* Large Aluminum trays were washed, dried and lined with foil.
* Samples were placed in the trays as received, covered with foil and placed in an laboratory oven set at 120° C .
* When dry, the net dry weight of each sample was taken and water content estimated. The moisture content for each composite is given in **Table One** below.
* The + 2.35 mm material was removed from all samples which is shown below in **Table One** also.
* The samples were then placed in large heavy duty bags and each bag was rolled to break down any lumps within the bags, sizing samples were then taken from the bags by flattening the bag and scooping out several aliquots with a spatula. The bags were re-mixed and re-rolled between the taking of each aliquot.
* It is accepted that this method of sample preparation is not as accurate as riffling but it does ensure a reduction in iron contamination.
* All samples were sized down to 10μm.
* Sizings were carried out on head samples ranging from 200 grams to 300 grams. This was in an endeavor to ensure that some CS6 (-10μm) material would be collected.
* All samples were wet screened at 38μm. The oversize was dried and then screened with a Ro-tap shaker for 30 minutes in the manner shown below in **Figure One.**
* Every effort was made to recover the CS6 fraction and this was achieved in most samples.
* The cyclosizer has a water throughput of 15 litres of water per minute and the process lasts for about 20 minutes. Because of the large volume of water generated it is not possible to collect all the water processed, therefore, only the flow for the first 5 minutes was taken.

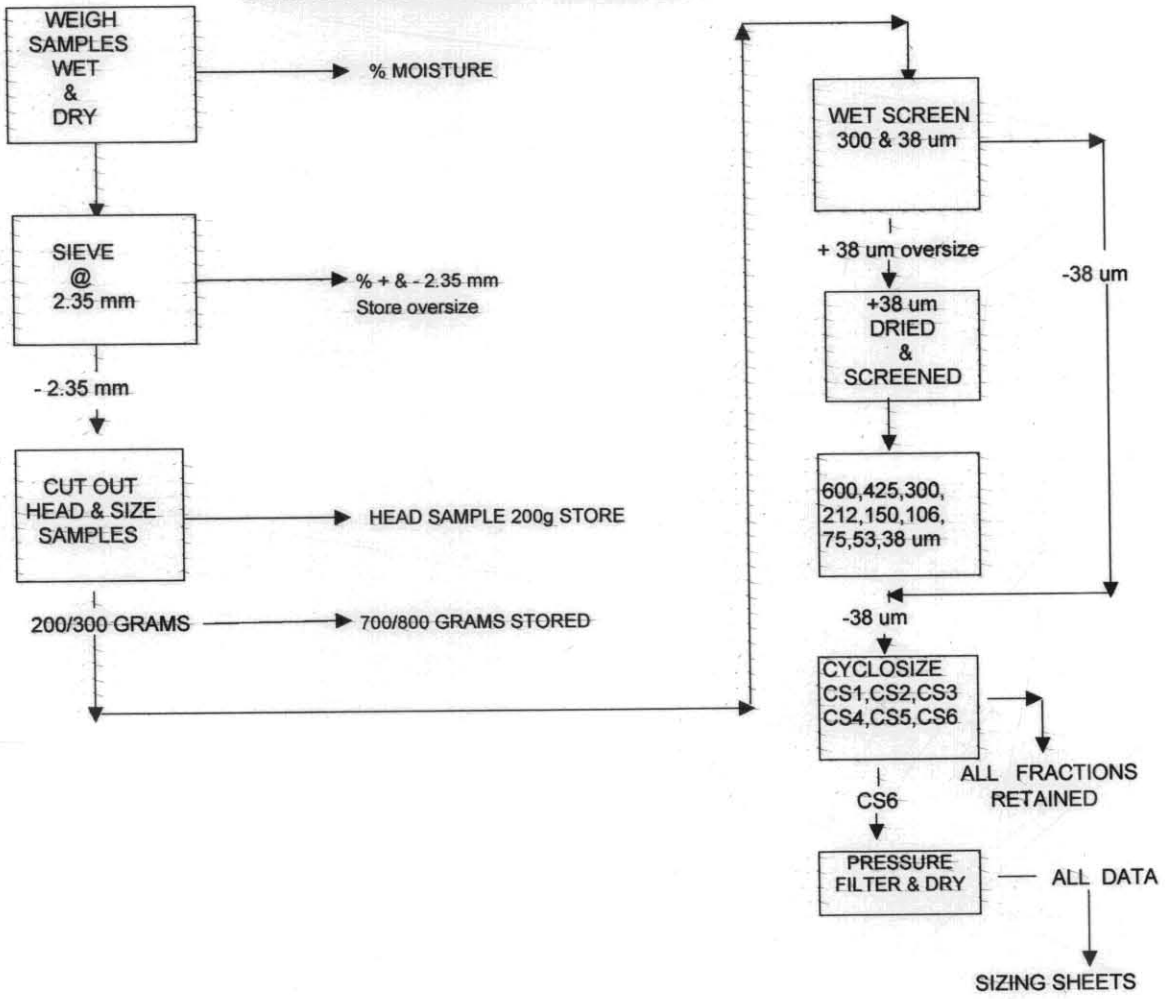
Table One

MOISTURE CONTENT & SIZING @ 2.35mm

DRILL HOLE	% MOISTURE	% +2.35mm	% +600µm
DH92	2.91	8.9	17.7
DH93	2.02	5.4	9.8
DH94	3.43	15.0	9.4
DH95	4.37	10.2	7.5
DH96	4.28	10.5	15.1
DH98	3.16	15.1	13.7
DH101	2.83	13.3	12.7
DH102	3.24	7.5	12.6
DH103	3.55	10.4	12.9
DH104	3.29	3.9	8.9
DH105	3.61	10.4	18.3
DH106	4.16	10.1	18.3
DH107	2.83	17.3	16.9
DH108	3.58	18.5	13.7
DH109	6.88	10.4	18.5
DH110	4.13	6.6	8.3
Average		10.8	13.4

FIGURE ONE

SAMPLE PROCEDURE FLOWSHEET



2.0 Discussion of Results

2.1 - General Analysis of Sizing Data for DH92 to DH110

In late May, 2001 eighteen samples were processed at the Western Metals Ltd metallurgical laboratory for J.J.McDonald & Son Mining Pty Ltd.
Samples weighed between two and twenty kilograms as received. Sample bags were numbered as follows:
DH92, 93, 94, 95, 96, 97, 98, 99, 101, 102,103, 104, 105,106, 107, 108,

In **Table Two** below the overall arithmetically composite for these drill holes is shown with **DH94 & DH95** excluded because they are anomalous. In **Table Two (a)** the as received composite is shown and in **Table Two (b)** the composite is shown with the +2.35 mm oversize removed.

Table Two

DH92 - DH110 COMPOSITE

Microns μm Fraction	Wt. %(a)	Wt.% (b)
+2,350	10.8	
+ 600	14.2	16.0
+ 425	6.2	7.0
+ 300	6.7	7.5
+ 212	7.6	8.5
+ 150	7.1	8.0
+ 106	6.7	7.5
+ 75	7.6	8.5
+ 53	8.9	10.0
+ 38	6.7	7.5
+ 32	0.1	0.1
+ 25	3.0	3.4
+ 20	5.3	6.0
- 20	9.0	10.0
DH92/110 Comp.	100.0	100.0

Most of the sizings discussed below are calculated on the basis where Table **2 (b)** is the base sizing unless otherwise explained. All the sizings using Table 2 (b) as a base (i.e 100% weight passing 2.35mm) are summarised in **Table Three** and full details are given in **Appendix One.**

Table Three

Drill Chip Sizings DH.92 to DH.110

Fraction	DH110	D.104	D93	D102	D103	D101	D98	D108
-10µm	3.2%	3.8%	8.3%	3.8%	4.1%	2.4%	7.6%	4.6%
+10µm	4.3%	4.5%	9.6%	5.8%	6.1%	8.0%	9.2%	6.4%
+20µm	5.9%	5.8%	8.6%	6.9%	6.9%	8.7%	7.7%	5.9%
+25µm	3.4%	4.6%	4.3%	4.5%	4.6%	3.6%	3.6%	3.2%
+38µm	8.6%	9.1%	8.9%	9.3%	8.1%	9.1%	7.4%	7.2%
+53µm	12.0%	14.8%	10.7%	12.6%	10.4%	12.6%	8.7%	9.5%
+75µm	10.7%	13.0%	7.7%	9.6%	8.8%	7.8%	7.3%	8.6%
+106µm	9.4%	8.9%	6.1%	7.1%	7.4%	6.4%	6.2%	7.4%
+150µm	10.0%	8.2%	6.8%	7.2%	7.8%	7.0%	6.7%	8.0%
+212µm	10.2%	7.5%	7.4%	7.5%	8.0%	7.4%	7.3%	8.6%
+300µm	7.6%	5.7%	6.0%	6.3%	7.0%	6.4%	6.3%	7.4%
+425µm	5.8%	4.8%	5.2%	6.0%	6.5%	5.9%	6.0%	6.5%
+600µm	8.9%	9.3%	10.4%	13.6%	14.4%	14.7%	16.1%	16.8%

Fraction	D96	D92	D106	D105	D107	D109	Composite
-10µm	5.9%	2.4%	4.4%	8.1%	5.0%	2.7%	4.7%
+10µm	7.7%	3.0%	4.0%	7.9%	5.1%	2.6%	6.0%
+20µm	7.3%	3.8%	3.8%	6.0%	4.3%	2.7%	6.0%
+25µm	4.0%	3.1%	2.7%	2.7%	2.3%	1.9%	3.5%
+38µm	7.9%	7.3%	5.3%	5.7%	5.4%	4.8%	7.4%
+53µm	9.1%	10.9%	8.2%	6.9%	7.5%	7.5%	10.1%
+75µm	7.5%	8.5%	7.8%	6.3%	7.3%	7.8%	8.5%
+106µm	6.4%	7.3%	7.4%	6.2%	7.0%	7.7%	7.2%
+150µm	7.0%	8.6%	8.6%	7.0%	8.4%	9.5%	7.9%
+212µm	7.6%	9.8%	10.2%	8.1%	9.9%	11.6%	8.6%
+300µm	6.6%	8.5%	9.3%	7.5%	9.0%	10.7%	7.4%
+425µm	6.2%	7.4%	8.5%	7.2%	8.3%	9.9%	6.7%
+600µm	16.9%	19.4%	19.8%	20.4%	20.5%	20.6%	15.8%

2.2 - Comparison of DH69 - DH91 and DH92 - DH110

It can be seen in **Figure Two** that the slope of accumulative distribution curves for the two composites **DH69 - 91 and DH92 - 110** are parallel & close, showing that there is little difference in the distribution for the -600μm fractions & in **Figure Three** the +600μm & +2.35 mm oversize is shown illustrating the very large variance in these fractions.

Figure Two

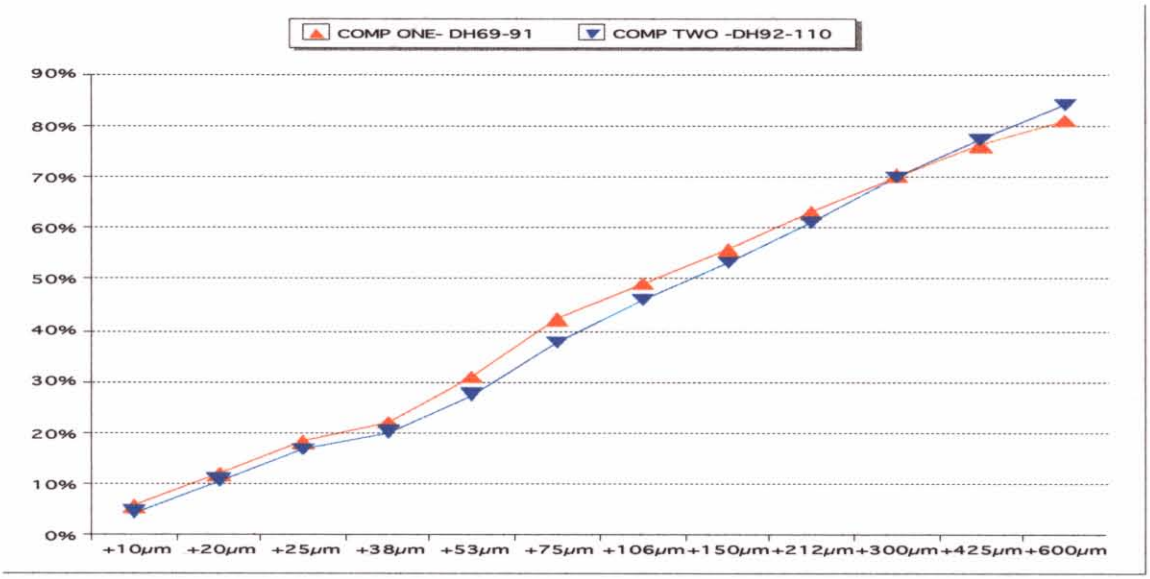
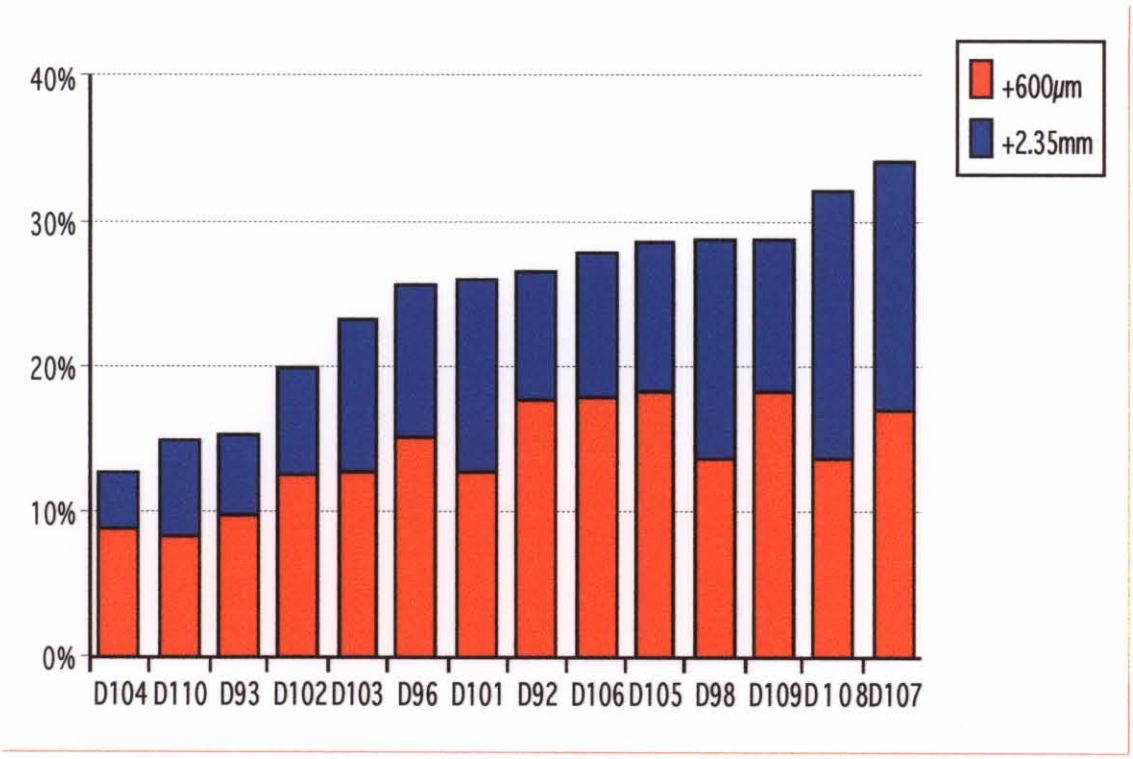


Figure Three

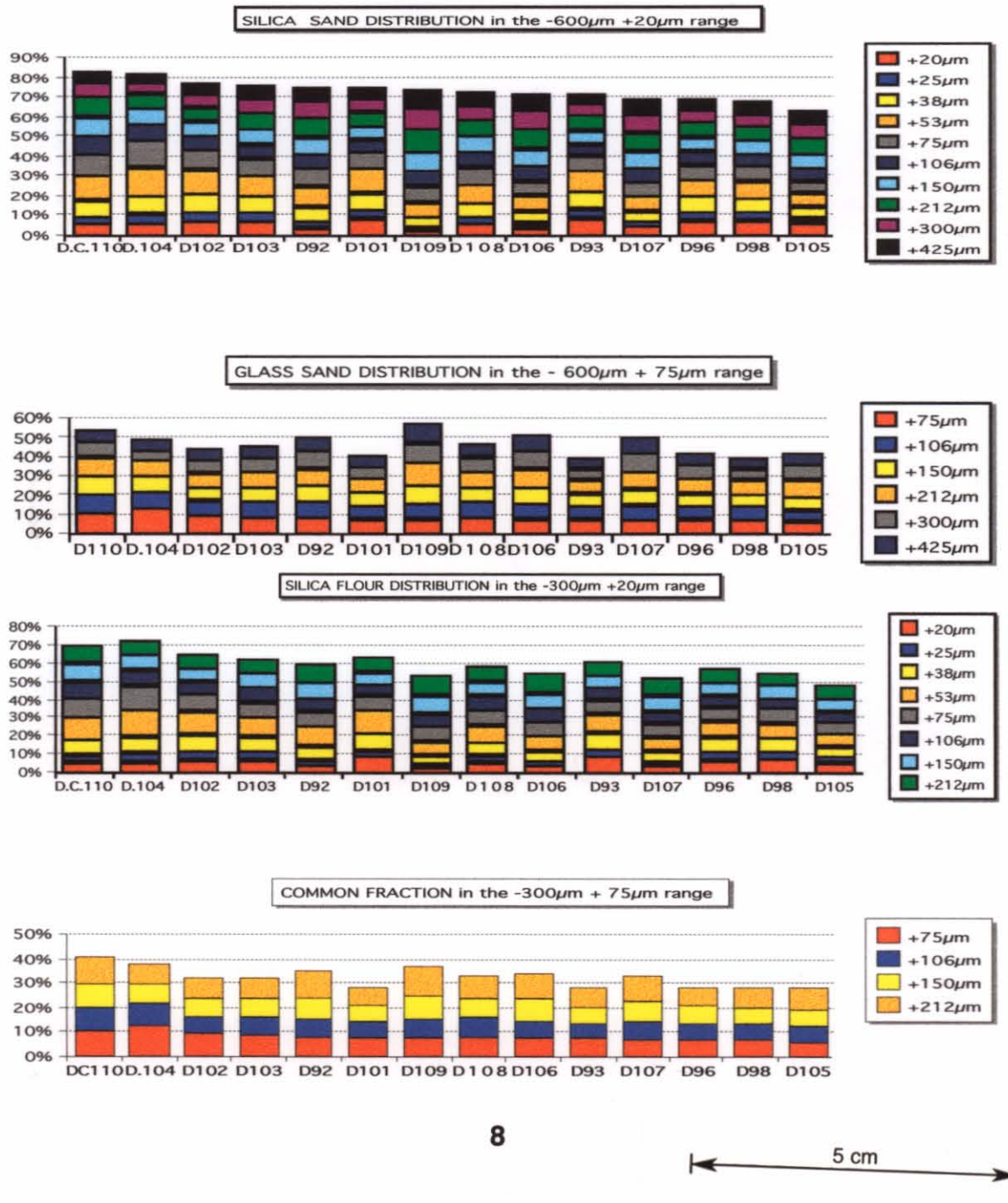


5 cm

2.3 - Comparison of the Different Economic Silica Products

In **Figure Four DH92** to **DH110** illustrates the drill holes in order of the highest percentage of Silica Sands in descending order. The Glass Sands & Silica Flour are also shown. It can be seen that the percentage of Silica Flour is higher than Glass Sands in most drill holes. **DH110,104,102,103,101 & 93** all contain more than 60% weight distribution in this class of sand. All the other holes have more than 50% of their distribution in this zone except **DH105.** It can also be seen that between 28% & 40% of the silica is distributed in the common fraction.

Figure Four



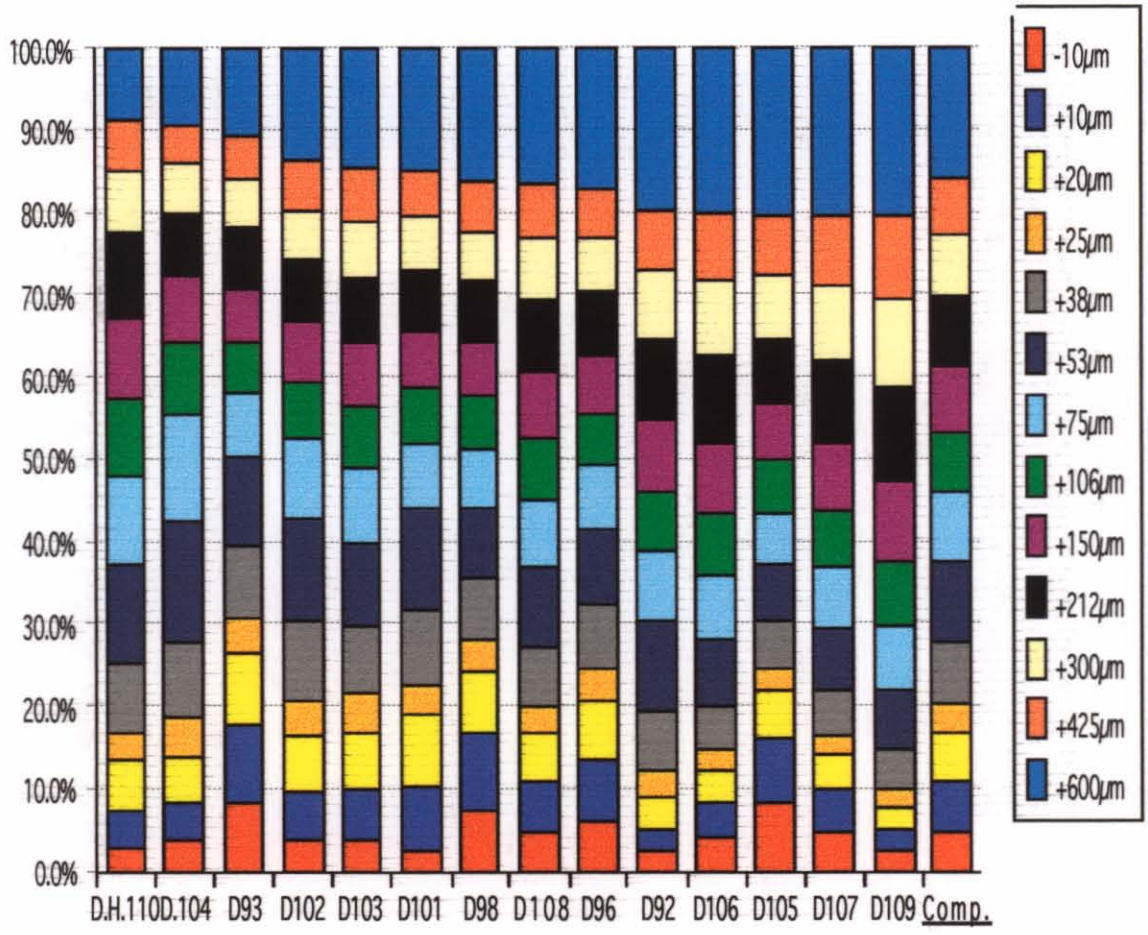
5 cm

2.4 - Comparison of DH92 to DH110 in Order of Coarseness

In **Figure Five** below, each drill hole is shown from the finest to the coarsest with histograms (using **Table Two (b)** as the base line and **Table Three**). The drill holes can be blocked into the following groups: **DH 92,105,107 & 109** can be considered coarse; DH98,101,102, 103 & 108 have an average distribution; and **DH93, 104 & 110** are considered fine. If the Pebble content is taken into account then **DH108** is misplaced & should be considered coarse. Also **DH 93, 98 & 105** have above average slime content. In the -600μm +20μm Silica Sand band, most drill holes report the highest distribution in the +53μm fraction and the lowest in the + 25μm fraction. The -20μm +10μm fraction could be in theory included as Silica Flour but in practice this material will be rejected as slimes in any classification process. In a commercial operation the +5μm -20μm fraction could be recovered at Pine Hill using mini cyclones & cleaned to sell in the cosmetics industry.

Figure Five

DRILL HOLE DH92 to DH110 of COARSENESS



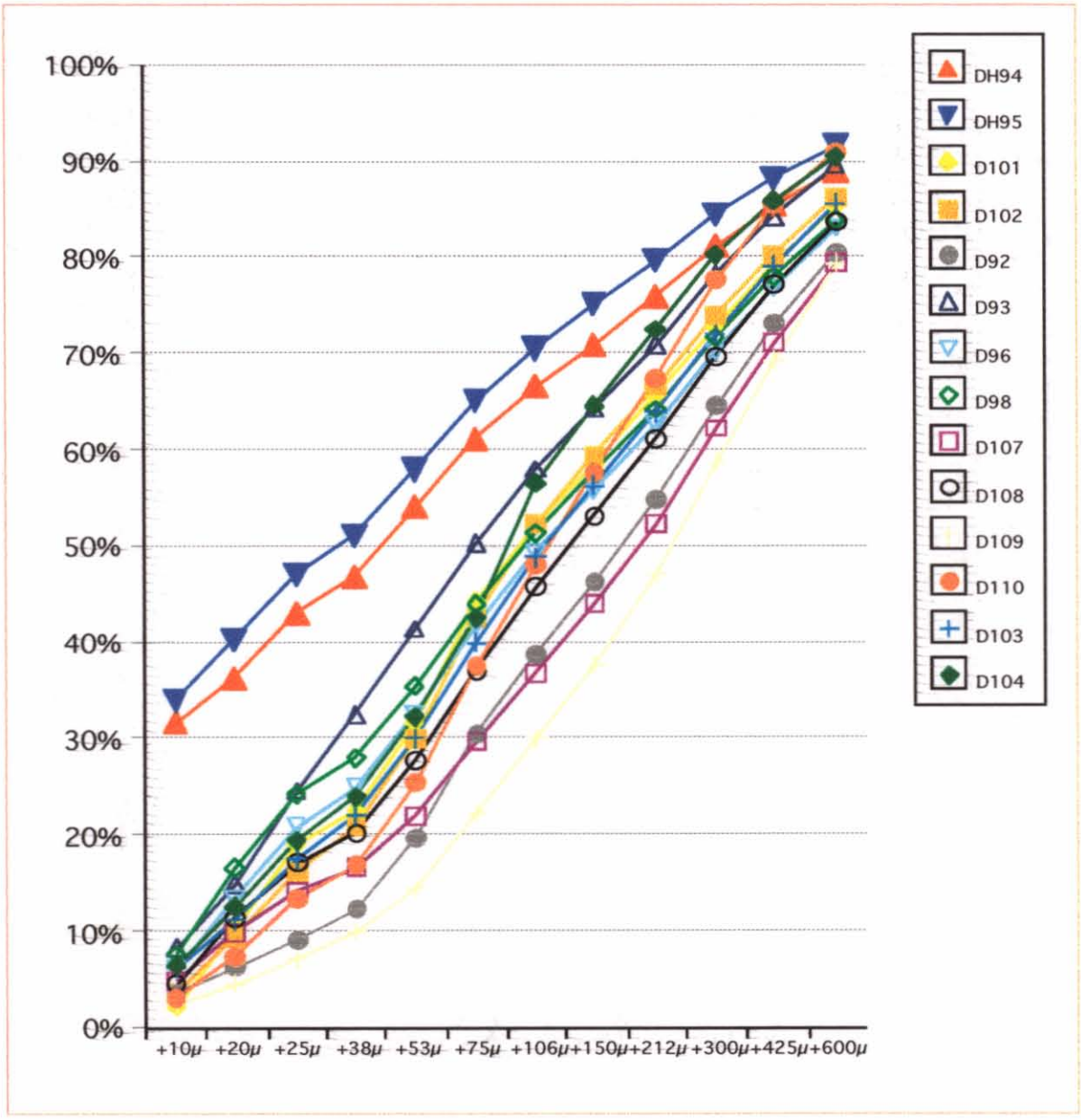
5 cm

2.5 - Discussion on DH94 and DH95

In **Figure Six** the sizings for **DH94 & DH95** are compared to all the other sizings & it can be seen that they contain considerable slimes and do not correspond to any other drill holes at Pine Hill. Further details are given in **Figure Nine.**

Figure Six

Accumulative Wt% Distribution Passing for DH92 to FDH 110



5 cm

2.6 - Classification of DH92 to DH110 into Economic Products

The composite distribution of the different products from **DH92 - DH110** are given below. Drill holes **DH92** and **DH110** are also shown as examples of coarse and fine samples. It can be seen that the difference between them is small. This is well illustrated in **Figure Four** and is discussed further in section **3.0 - Detailed Discussion of Results.**

Table Four

DH92 - DH110 General Distribution of Products

Averaged Composite Product	Wt%	Wt%	Wt%
Pebbles (+2.35mm)	10.8		
Gravel (+600μm)	14.3		
Silica Sands (-600μm +20μm)	**65.6**		
Glass Sands(-600μm +75μm)		**41.5**	
Silica Flour (-300μm +20μm)			**52.6**
Slimes (-20μm)	9.3		
Composite (D.H.92 - D.H.110)	100.0		

Table Five

General Distribution - DH92

Coarse Drill Chip Sample Product	Wt%	Wt%	Wt%
Pebbles (+2.35mm)	8.90		
Gravel (+600μm)	17.7		
Silica Sands(-600μm+20μm)	**68.4**		
Glass Sands(-600μm +75μm)		**45.5**	
Silica Flour (-300μm +20μm)			**45.0**
Slimes (-20μm)	5.0		
Drill Chips	100.0		

Table Six

General Distribution - DH110

Fine Drill Chip Sample Product	Wt%	Wt%	Wt%
Pebbles (+2.35mm)	6.6		
Gravel (+600μm)	8.4		
Silica Sands(-600μm+20μm)	**78.0**		
Glass Sands(-600μm +75μm)		**50.0**	
Silica Flour (-300μm +20μm)			**56.0**
Slimes (-20μm)	7.0		
Drill Chips	100.0		

2.7 - Comparison DH69 - 91 and DH92 - 110 by Tables and Histogram

In **Table Seven** below the arithmetically generated composite from **DH69 to DH91** drilled in March 1999 is compared to the Composite for **DH92 to DH110**. It can be seen again that there is little difference between the composites and these differences may well be within experimental error when considering the -600μm economic fractions.

Table Seven

Composite Comparison

General Distribution

Product	DH69 - DH110 Overall Composite Wt%	DH69-91 Composite Wt%	DH92-110 Composite Wt%
Pebbles (+2.35 mm)	10.0	9.0	10.8
Gravel (+600μm)	12.2	10.0	14.3
Silica Sands (-600μm +20μm)	**67.1**	**69.0**	**65.1**
Slimes (-20μm)	10.7	12.0	9.8
Total	100.0	100.0	100.0

Glass sands distribution

Product	DH69 - DH110 Overall Composite Wt%	DH69-91 Composite Wt%	DH92-110 Composite Wt%
Pebbles (+2.35 mm)	10.0	9.0	10.8
Oversize (+600μm)	12.3	10.0	14.2
Glass Sand (-600μm+212μm)	**19.1**	**18.0**	**20.1**
(-212μm+75μm)	***21.1***	***21.0***	***21.3***
Slimes (-75μm)	37.5	42.0	33.6
Total	100.0	100.0	100.0

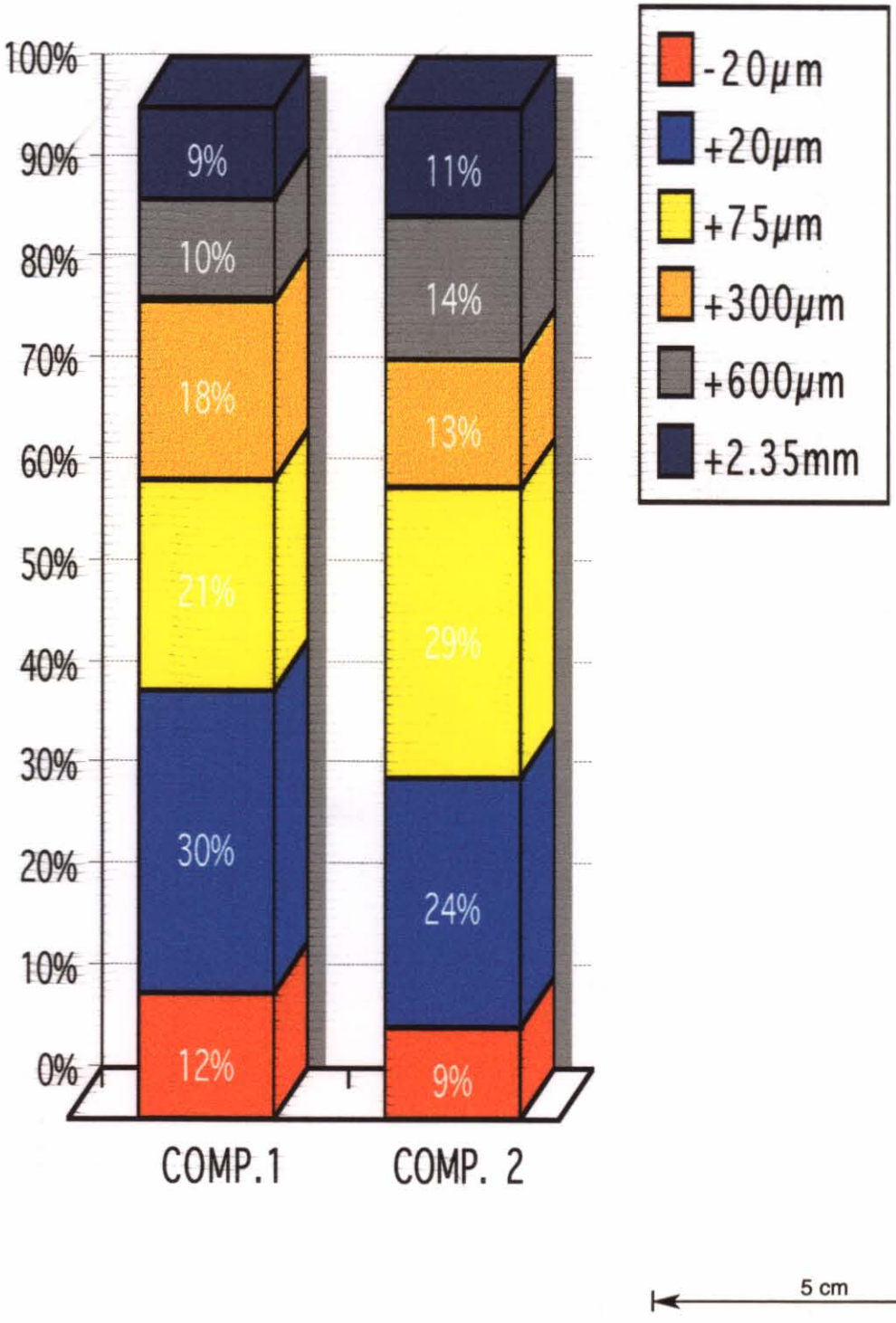
Silica Flour Distribution

Product	DH69 - DH110 Overall Composite Wt%	DH69-91 Composite Wt%	DH92-110 Composite Wt%
Oversize (+212μm)	41.1	37.0	45.2
Flour Silica (-212μm + 75μm)	***21.0***	***21.0***	***21.0***
(-75μm + 20μm)	**27.0**	**30.0**	**24.0**
Slimes (-20μm)	10.9	12.0	9.8
Total	100.0	100.0	100.0

In **Figure Seven** below the distribution histograms of the composites for both set of samples sized are shown including the **"Pebble"** content. This shows that in real terms 69% of the silica reports to the **Silica Sand** in **DH68** to **HD91** & 66% in **DH92** to **DH110.**

Figure Seven

Comparison of the Arithmetically Compiled Composites

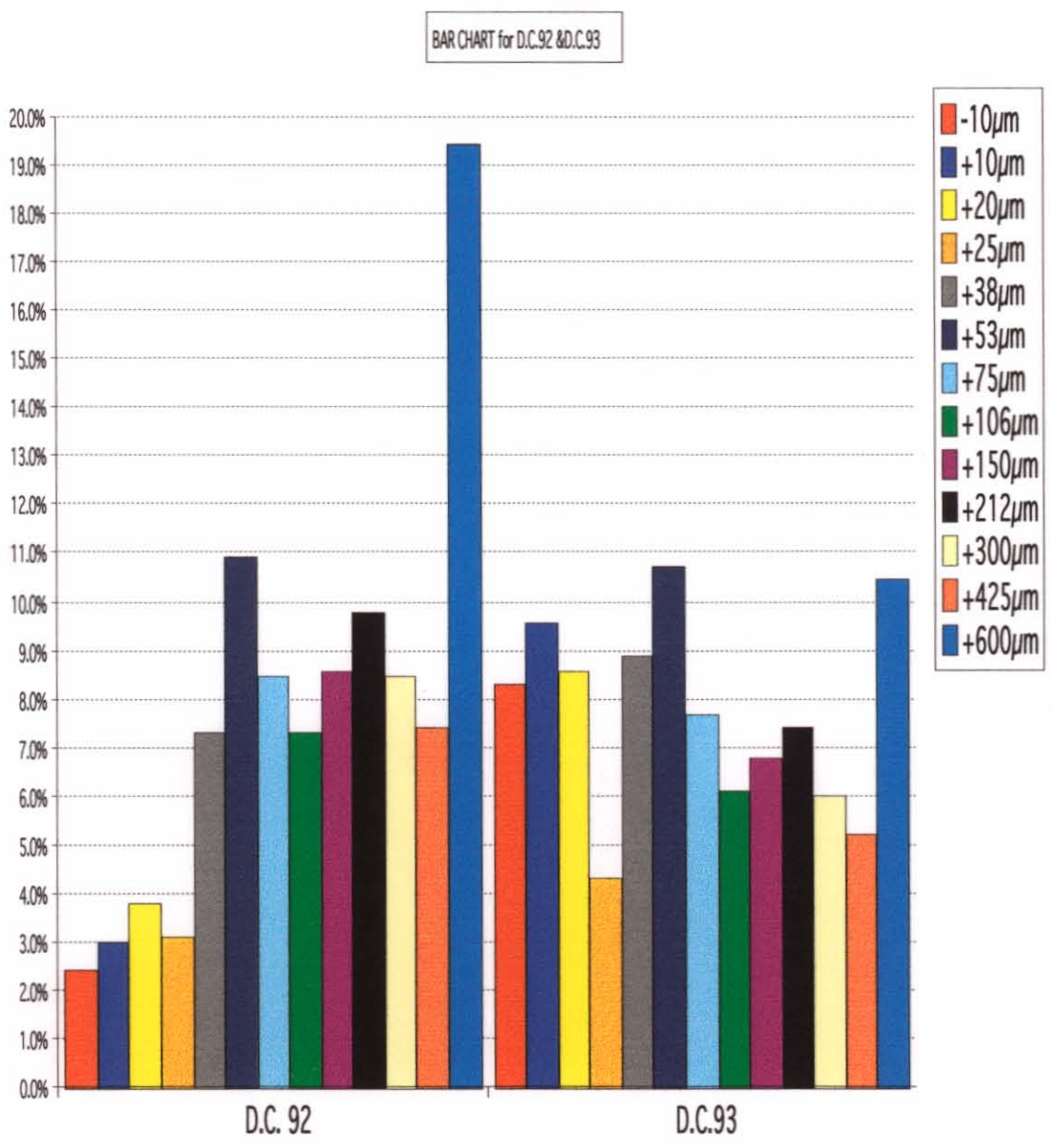


3.0 - Detailed Discussion of Results

3.1 DH92 & DH93

In **Figures Eight to Fifteen** each drill hole is discussed progressively and for convenience they have been grouped in lots of two. Grouping has been found to be very difficult on any other basis than sizings and most of the vital statistics are reported in **Figures Four, Five & Six.**

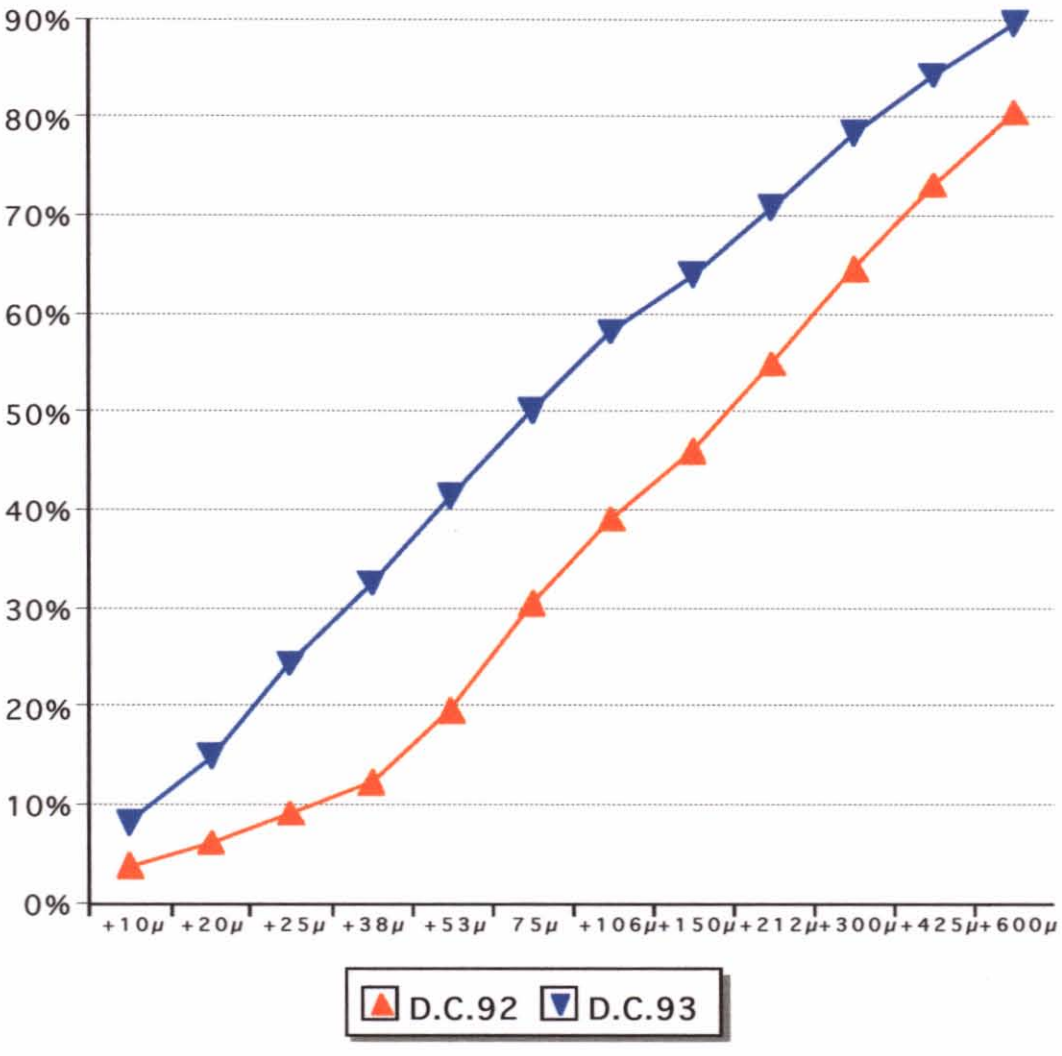
Figure Eight (A)



5 cm

Figure Eight(B)

Accumulative Wt% Passing for DH92 & DH93



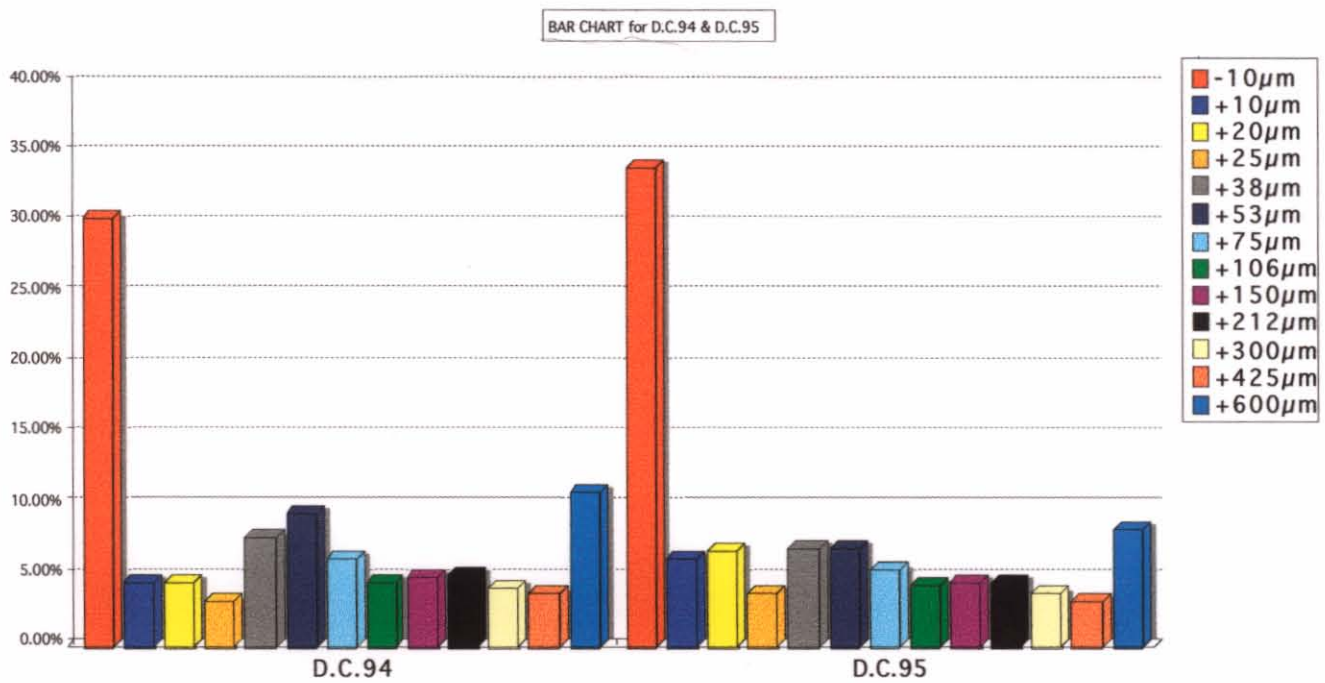
COMMENTS

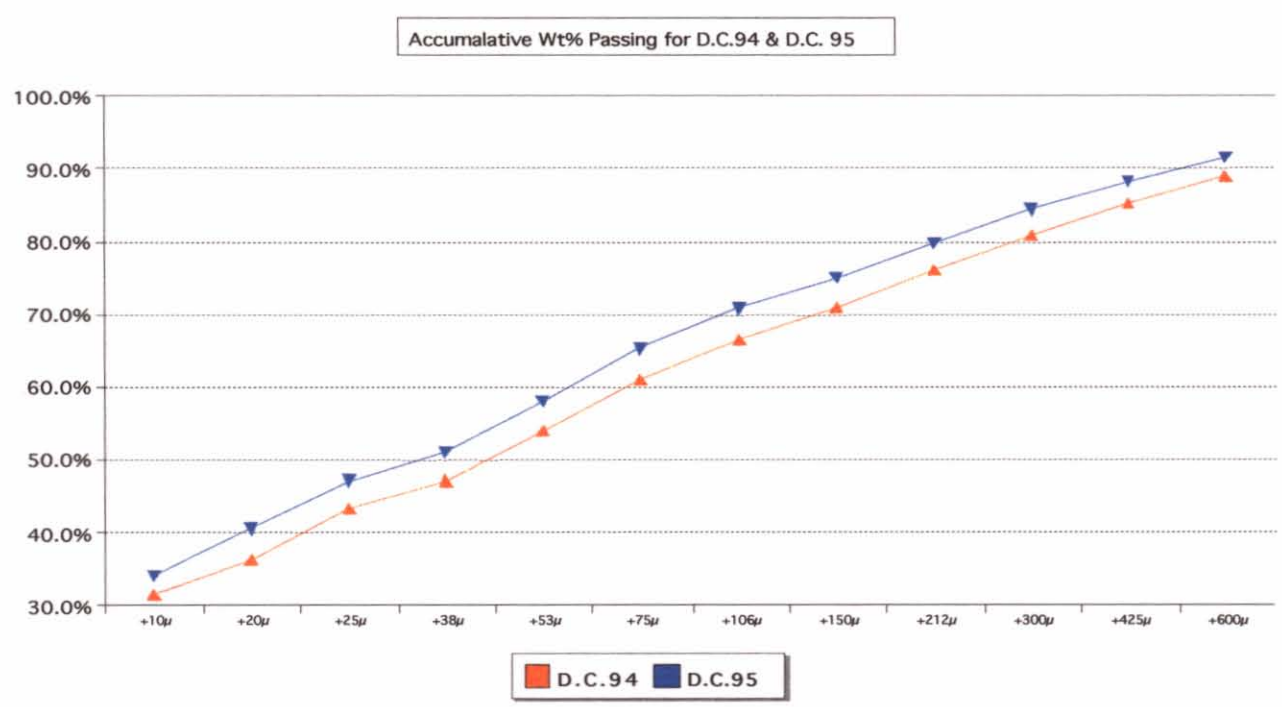
There is a large disparity between DH92 & DH93 as shown above. DH92 has a D_{50} of ≈ 200μm compared to 75μm for DH93. DH93 also has a high slime content at 18.0%. It can be seen that DH92 has a coarse distribution. The D_{50} is ≈200μm & 75.5% of the silica reports within the prescribed -600μm + 20μm Silica Sand range. 19.5% occurs as Gravel, 5.5% occurs as Slimes, 50.0% of the silica exists as Glass Sand & 49.5% reports to the Silica Flour Fraction. DH93 in contrast has a D_{50} of 75μm, only 8.5% reports as Gravel, 18.0% as slimes,39.0% as Glass Sands, 53.0% as Silica Flour & 71.5 % of the silica reports as Silica Sand.

5 cm

3.3 - DH94 & DH95

Figure Nine





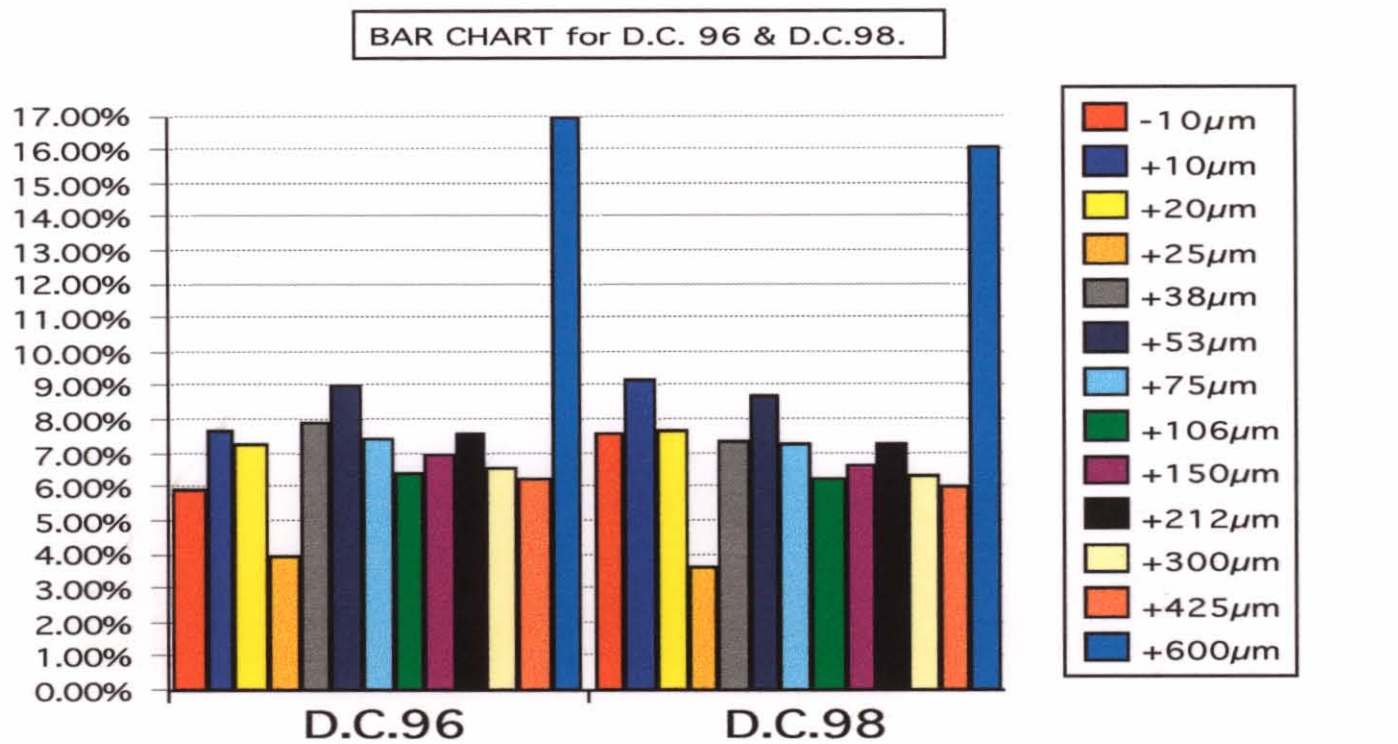
COMMENTS

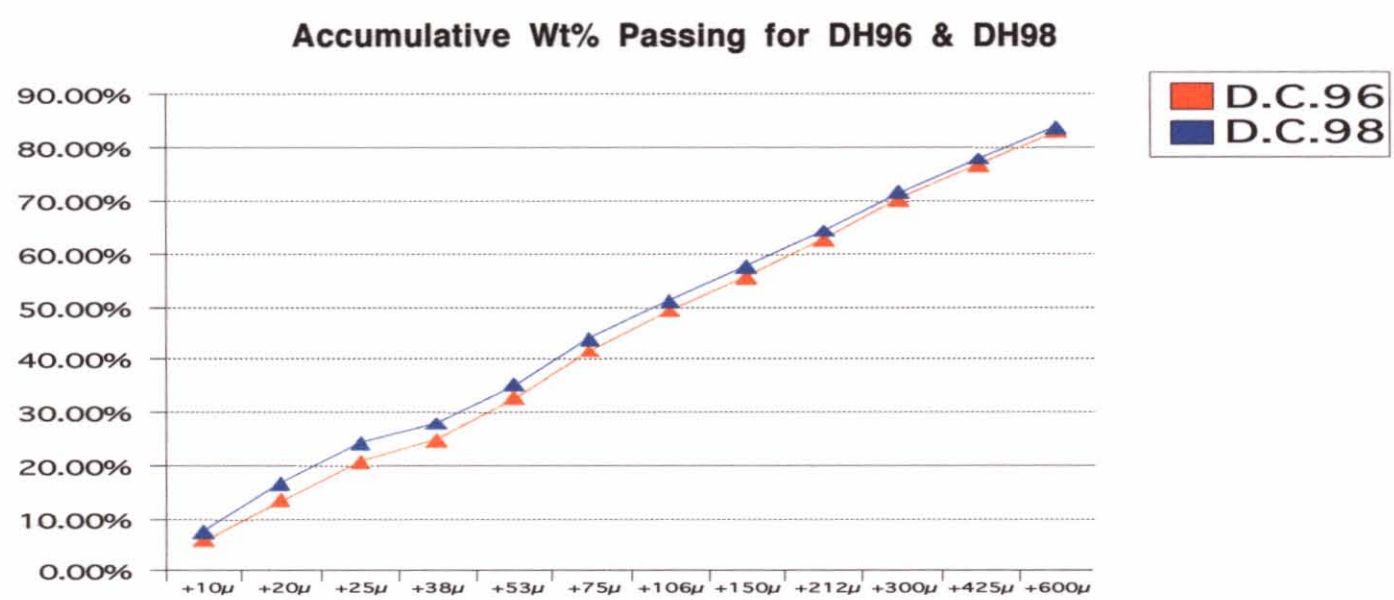
Both these drill holes indicate a silica distribution that is very different from all other samples to date. They both a contain slightly lower Gravel content, a vastly increased slime content which is greater than 30% & both have a D_{50} of less than 50μm. Because of this they have been excluded from any comparisons or composites.

In DH94 about 59.0% o f the silica reports within the prescribed Silica Sand range, 11.0% Gravel, 30.2% Slimes, 28.5% Glass Sand, 41.0% reports as Silica Flour & DH 94 has a D_{50} of $\approx$45μm.DH95 is similar to DH94, the sizing shows that only 57.5% of the feed reports to the Silica Sand, 8.5% occurs as Gravel, 34.0% appears as Slime, 26.5% is found as Glass Sand, 39.5% of the silica reports as Silica Flour & DH95 has D_{50} of $\approx$ 38μm.

5 cm

Figure Ten





COMMENTS

Both of these drill holes indicate a silica distribution that is very similar but slightly below average. They both include about the normal Gravel distribution, but they contain above the average Slime percentage. In DH96 some 69.5% of the silica reports within the proscribed Silica Sand range with 17% Gravel , 13.5% Slimes, 41.5% Glass Sand & 49% reports as Silica Flour. DH96 has a D_{50} of ≈100μm.

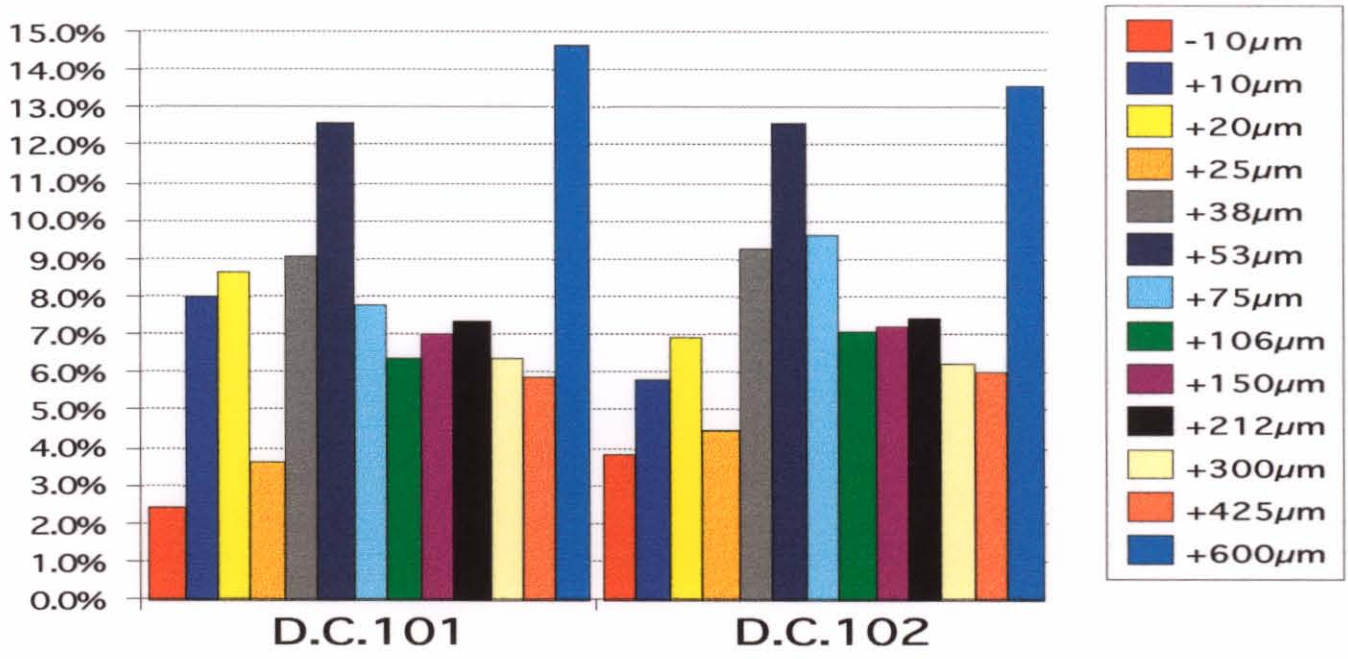
DH98 sizing shows that only 97% of the feed reports to the Silica Sand of which 16% occurs as Gravel, 17% appears as Slimes, 40% is found as Glass Sand & 47.5% of the silica reports as a Silica Flour & DH98 has a D_{50} of ≈ 106μm.

5 cm

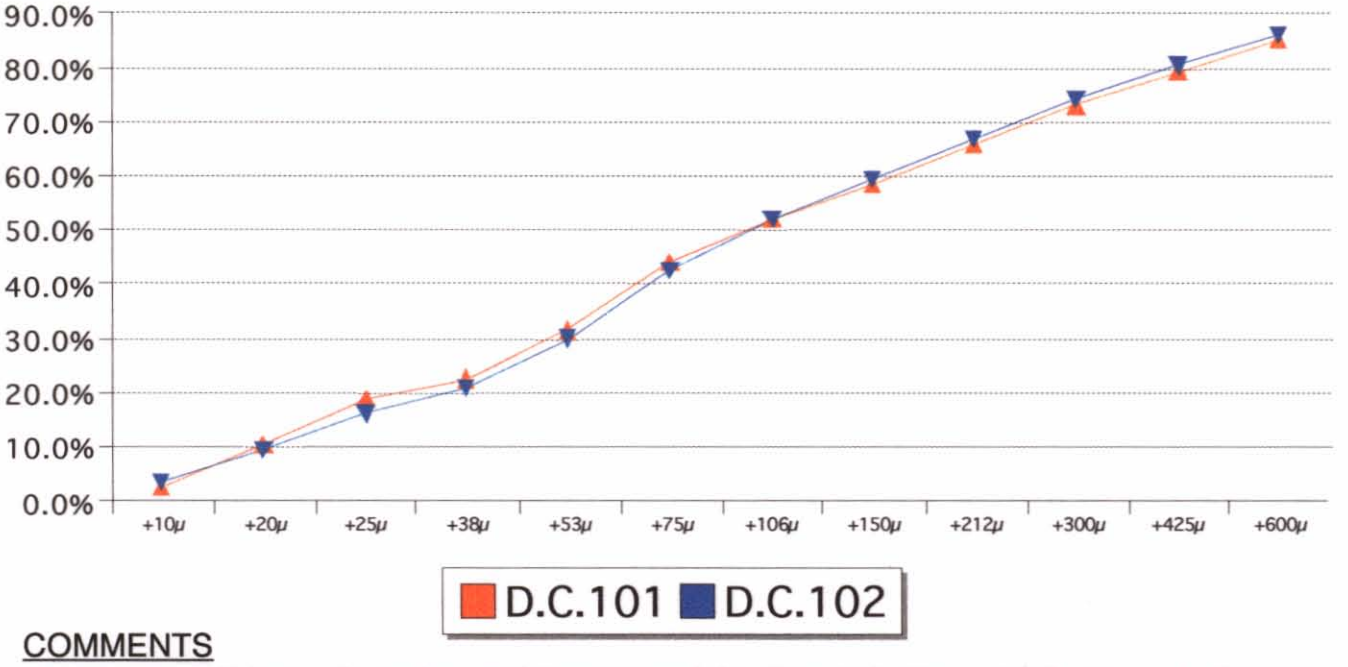
3.5 -DH101 & DH102

Figure Eleven

BAR CHART for DH101 & DH102



Accumulative Wt% Passing for DHIOI & DH102



COMMENTS

Both these drill holes lie in the middle range of the Pine Hill silica distribution. In DH101 some 15.0% of the silica reports to the Gravel, 12.5% reports as Slimes, about 41.0% exists as Glass Sands, 53.0% as Flour Silica & 7 2.5% is distributed in the prescribed -600μm + 20μm Silica Sand range. It can be seen above that the D_{50} is ≈ 100μm for both drill holes.

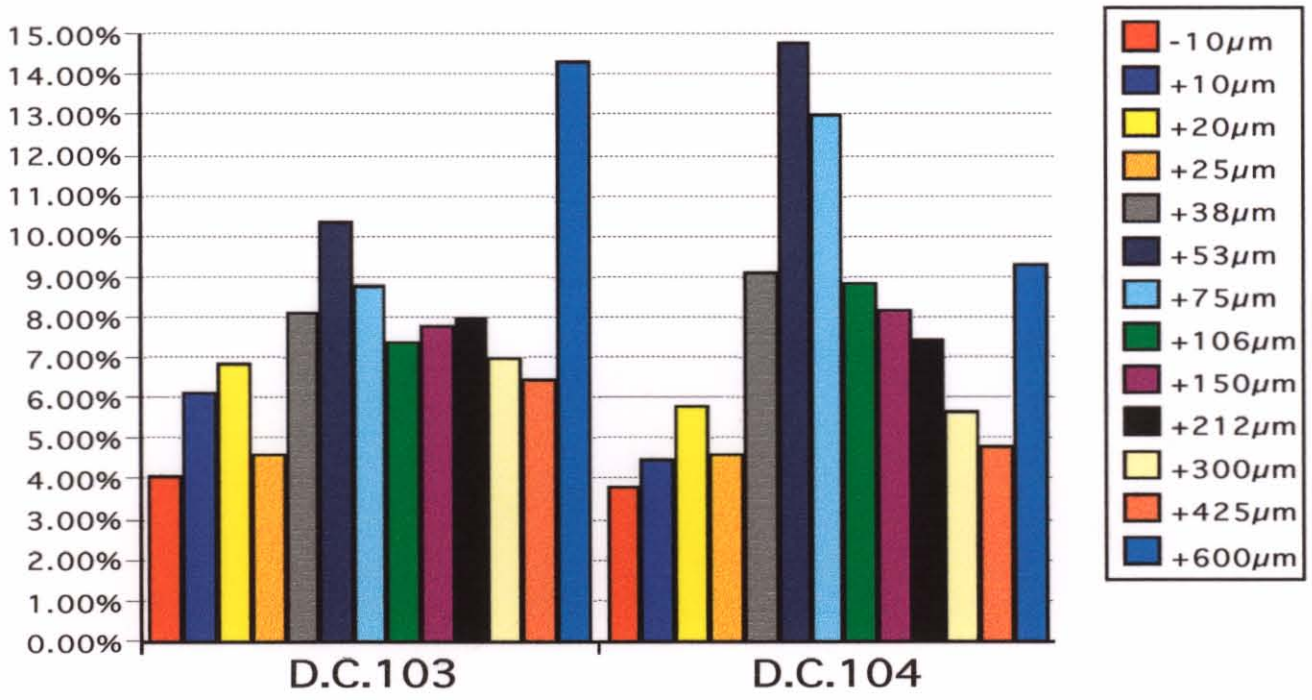
DH102 contains 13.5% Gravel, 9.5% Slimes ,43.5% Glass Sands, 57.5% Flour Silica & overall some 72.5% occurs as Silica Sands.

5 cm

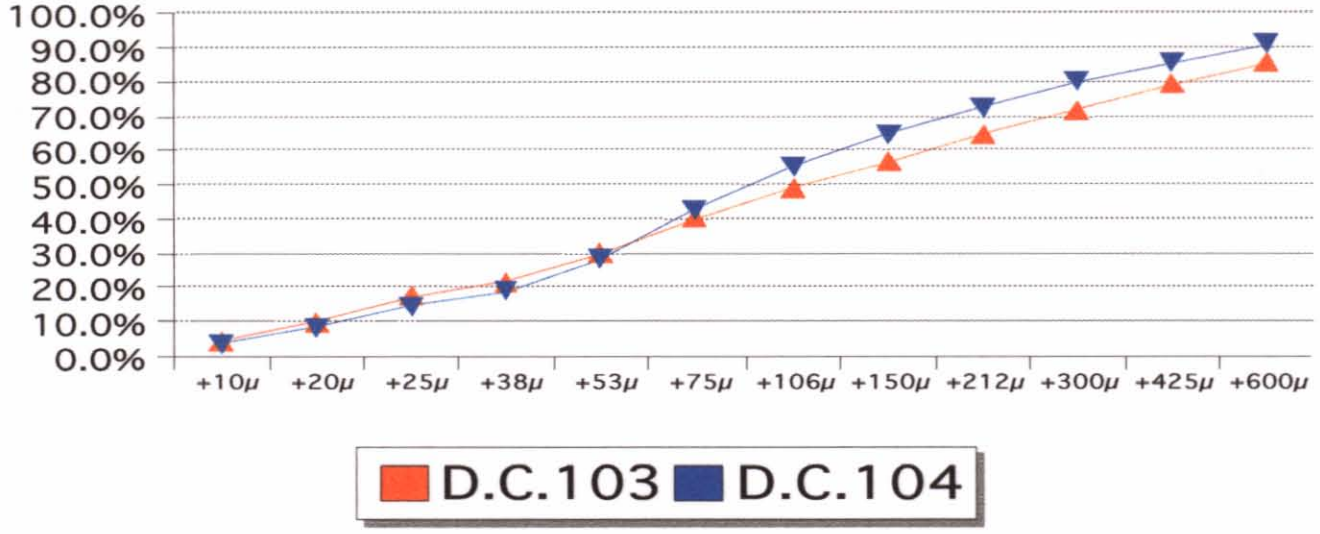
3.6 - DH103 & DH 104

Figure Twelve

BAR CHART for DH 103 DH 104



Accumulative Wt% Passing for DH103 & DH 104



COMMENTS

It can be seen that DH103 has a poorer distribution, it contains more Gravel & more Slimes. In fact only 75.5% of the silica reports within the prescribed Silica Sand range showing that, 14.5% occurs as Gravel, 10.0% as Slimes, 45.5% in the Glass Sands band & 54.0% as Silica Flour.

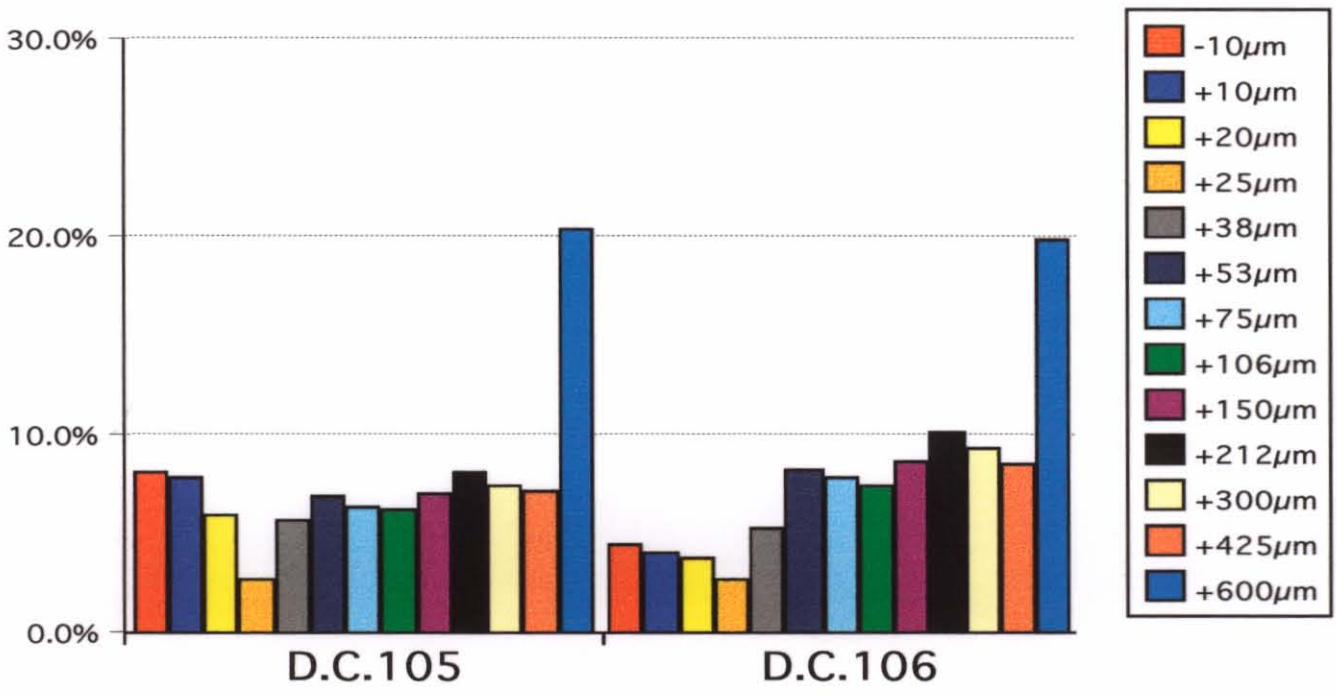
DH104 has a superior disposition with an 82.5% distribution in the Silica Sand zone & where 9.5% reports to the Gravel, 8.5% as Slimes, 48.0% to the Glass Sands & 64.5% as Silica Flour

5 cm

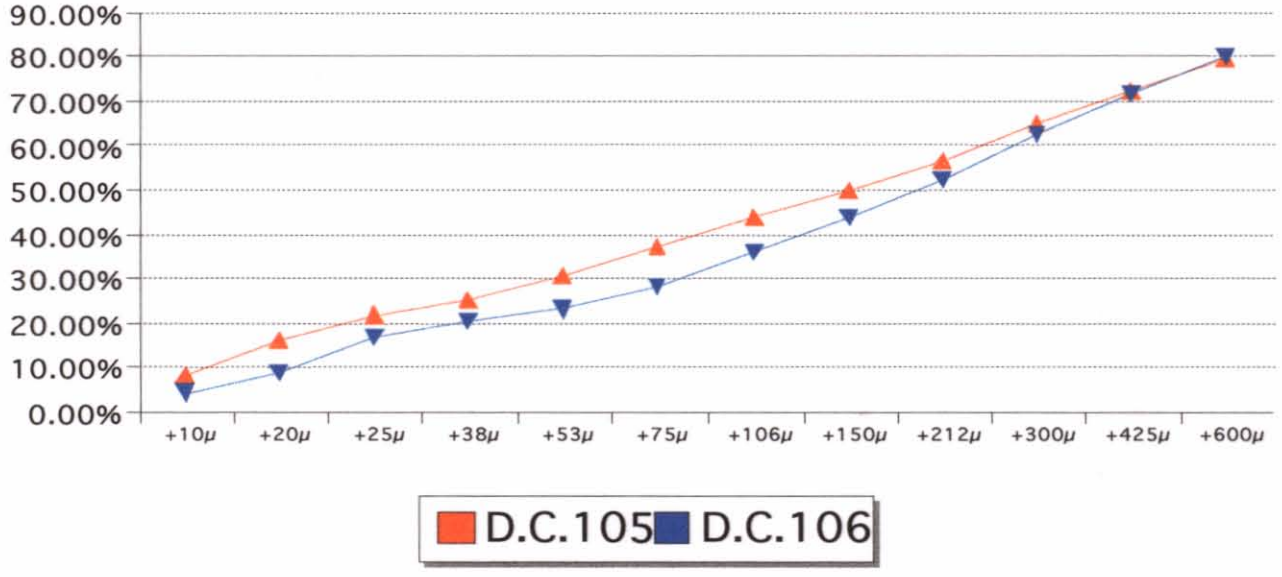
3.7 - DH105 & DH106

Figure Thirteen

BAR CHART for DH105 & DH106



Accumulative Wt% passing for DH105 & DH106



COMMENTS

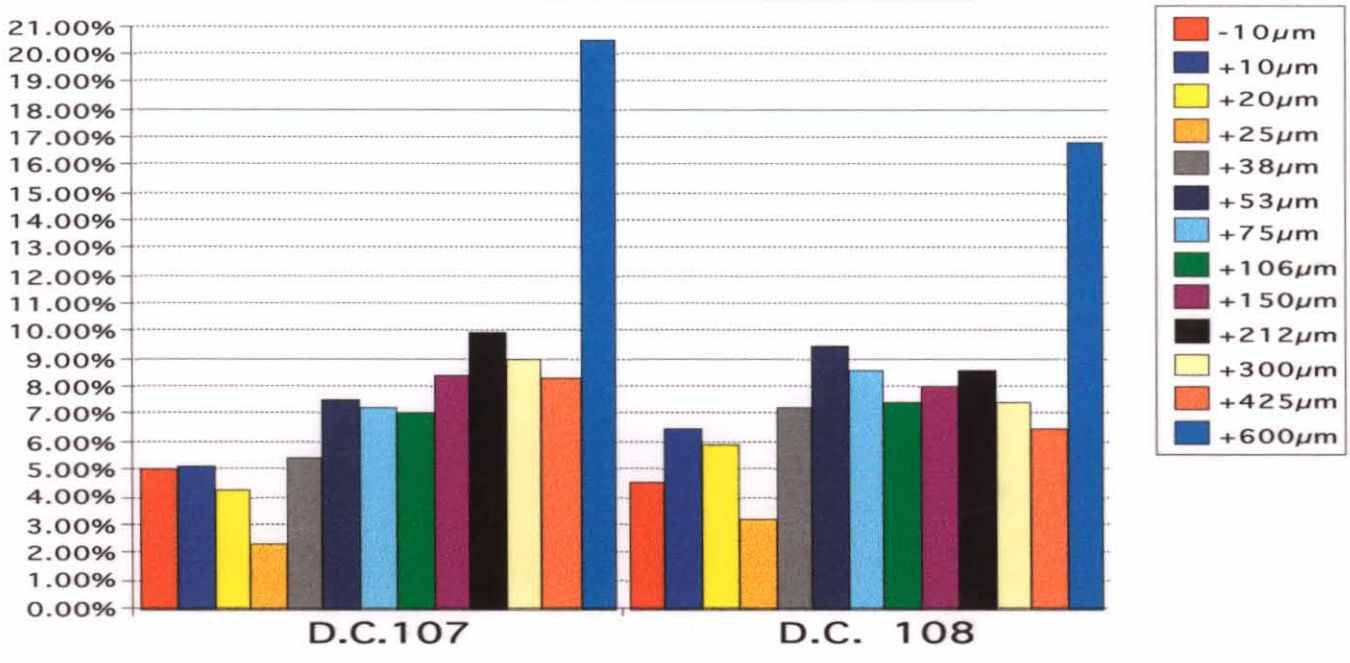
Both DH105 & DH106 have a very high Gravel content & DH105 also has a high slime content. The statistics for DH105 show that the Silica Sand content is 63.5%, 20.5% Gravel, 16.0% Slimes, 42.5% Glass Sand & only 41.0% of the silica occurs as Silica Flour & the D_{50} is ≈150μm. DH 106 is slightly better. The Silica Sand content is 71.5%, Gravel 20.0%, Slimes 8.5%, Glass Sands make up 52.0% of the weight & 44.0% of the silica in this drill hole reports as Silica Flour & the D_{50} is ≈190μm.

5 cm

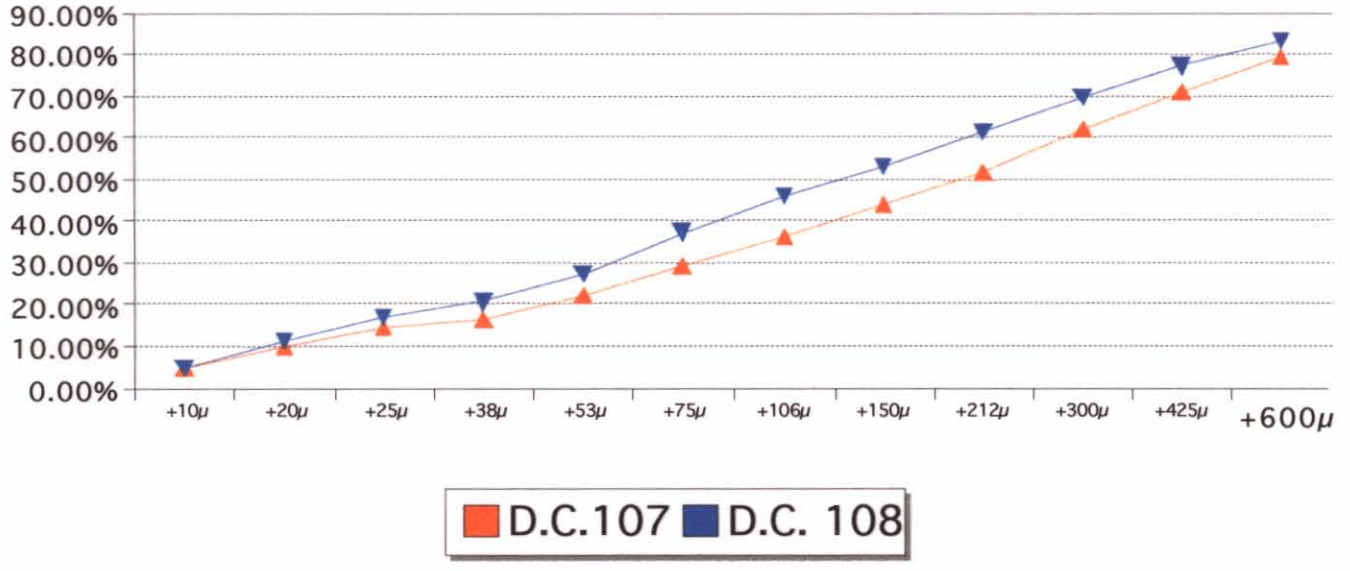
3.8 - DH107 & DH108

Figure Fourteen

BAR CHART for DH107 & DH108



Accumulative Wt% Passing for DH107 & DH108



COMMENTS

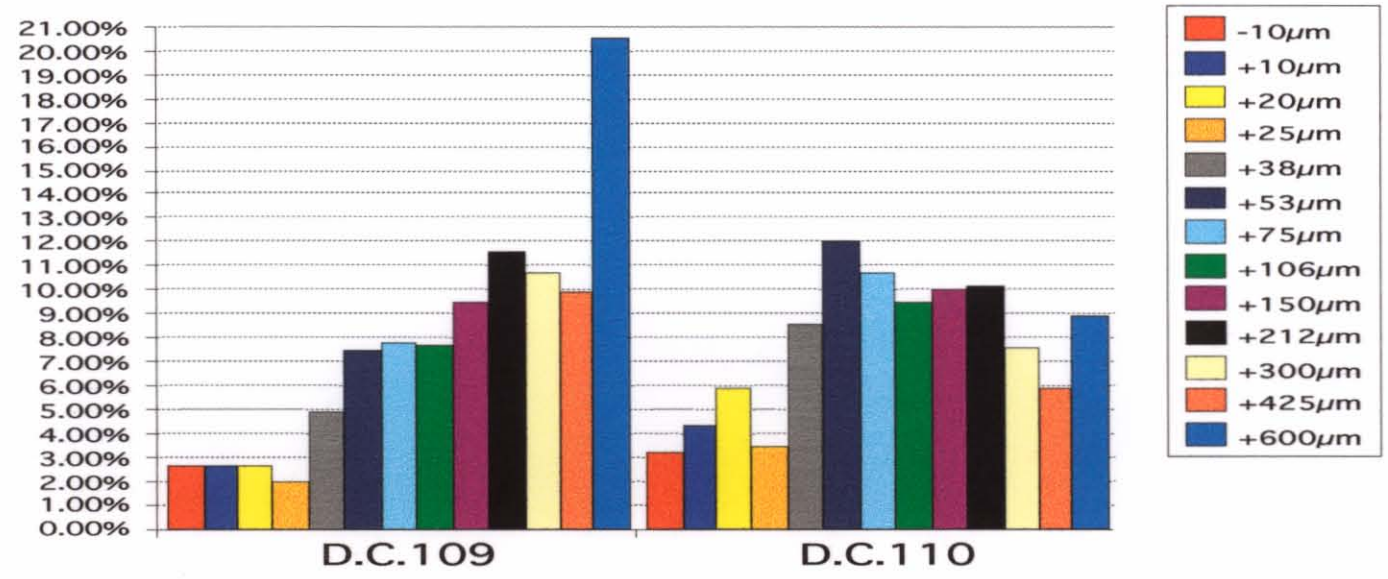
In this set both samples are progressively coarser than previous lots. DH107 is coarser having a D_{50} of ≈ 195μm with 20.5% reporting as Gravel & 10.0% occurring as slimes. The amount of Glass Sands is about 50.0% & 42.0% of the material is distributed as Silica Flour. DH108 is a little finer, its D_{50} is ≈130μm, 17.0% occurs as Gravel & there is 11.0% Slimes. In this drill hole 46.5% of material reports as Glass Sand & 42.0% Silica Flour.

5 cm

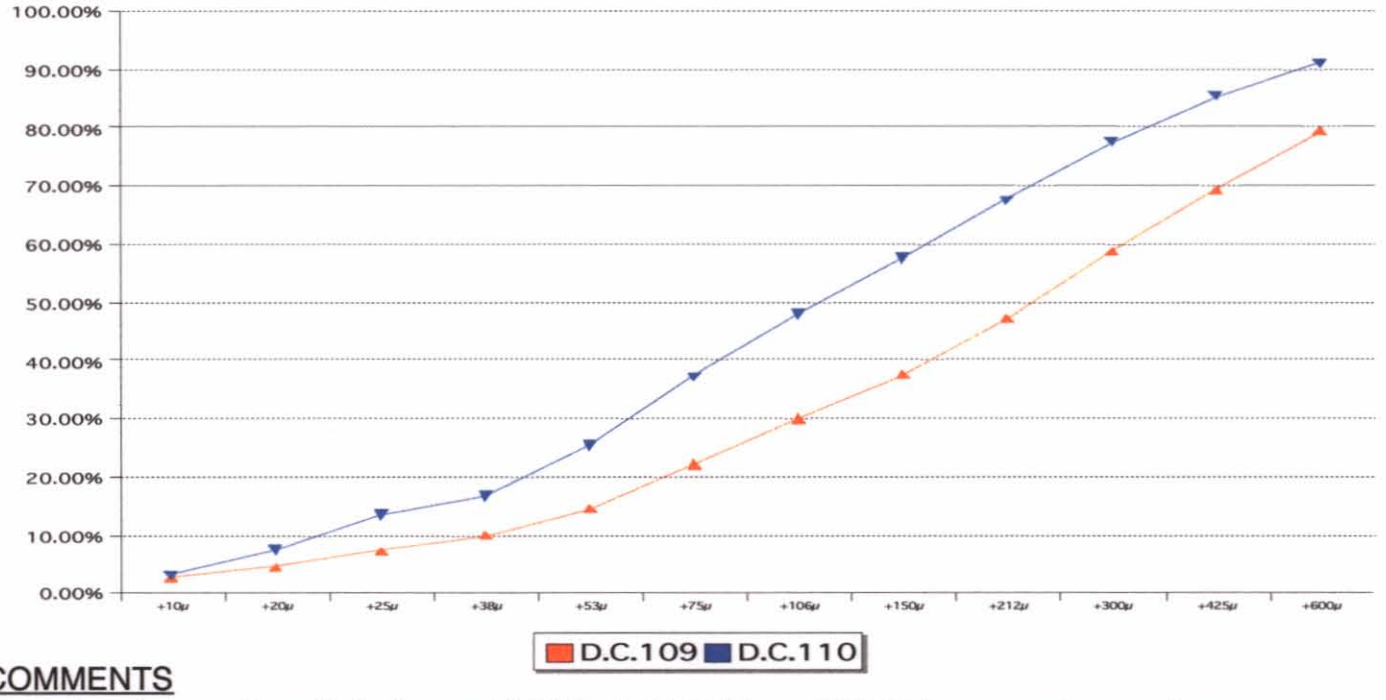
3.9 - DH109 & DH.110

Figure Fifteen

BAR CHART for DH109 & DH110



Accumulative Wt% Passing for DH109 & DH110



COMMENTS

There is a large disparity between DH109 & DH110. DH109 has an abnormally coarse distribution. The D_{50} is ≈250µm & 5.0% occurs as slimes, even when the +600µm fraction is removed some 57.3% of the silica occurs as Glass Sand which is the highest for any sample in this suite & only 42.0% reports as Silica Flour, added to which 20.5% occurs as Gravel. DH110 in contrast has a 60.0% distribution to Silica Flour, 43.5% appears as Glass Sand & only 9.0% reports as Gravel, in total 83.5% of the product reports within the overall Silica Sand range. The D_{50} is ≈75µm & 7.5% occurs as slimes. DH110 can be considered as having an excellent distribution.

5 cm

3.10 - Categorisation of Sizings

To **Categorise** all the drill holes by their D_{50} is fairly simple. Using this method to classify them into groups on this basis only can to be seen as a some what arbitrary decision and is based on data from this deposit. To help further quantify the holes economically, they each have been given a **Class** number which depends on the weight percent contained in the +600μm fraction. This is shown below in the classification table. In the future **Bench Marking** may also help, as discussed in the next section.

D_{50} Category Table

D_{50}		Category
<200μm	=	Coarse
>200μm <110μm	=	Medium
>110μm	=	Fine

Classification Table

Wt% +600μm	Class
-10%	1
+10%	2
+20%	3
+30%	4
+25% -30μm	5

In Table Nine below all the drill holes from both programs are shown numerically. The table includes economic products, D_{50}, ore and class categories. It also shows the wide disparity in +600μm oversize.

Table Eight:

Drill Hole	Wt% +600μm Gravel	Wt% in the -600μm +75μm Glass Sand	Wt% in the -212μm +20μm Silica Flour	≈ D_{50}	Ore Category	Ore Class
69	17.4	36.9		70μm	F	2
70a	29.6	54.8	33.2	280μm	C	3
70b	39.6	32.6		320μm	C	4
71	20.5	50.9		180μm	M	3
72	17.3	66.5		206μm	C	2
73a	20.7	37.8		106μm	F	3
73b	22.9	36.2	52.8	106μm	F	3
74	8.6	51.9	59.8	106μm	F	1
75	15.9	46.2	54.0	106μm	F	2
76a	18.0	38.4		106μm	F	2
76b	4.9	43.4		106μm	F	1
77	32.2	31.8		170μm	M	4
78	15.2	37.3		80μm	F	2
79	9.4	30.8		<50μm	F	1
80	5.5	30.1	67.7	<50μm	F	1
81	36.5	44.9		270μm	C	4
82	32.7	45.1	38.9	370μm	C	4
83	17.7	49.4	54.2	140μm	M	2
84	17.1	48.6	46.3	160μm	M	2
85	37.8	53.9		360μm	C	4
86	15.0	40.9	53.4	100μm	F	2
87	13.3	29.8	55.7	65μm	F	2
88a	16.6	42.8		110μm	M	2
88b	16.1	42.7	44.7	110μm	M	2
89	42.0	19.3	32.8	220μm	C	4
90	10.4	34.6	63.0	65μm	F	2
91	8.3	49.2	54.9	101μm	F	1
92	26.6	45.6	45.1	150μm	M	3
93	15.2	37.1	46.5	80μm	F	2
94	24.4	24.5	34.9	40μm	F	5
95	15.0	23.7	35.4	25μm	F	5
96	25.5	35.6	44.1	106μm	F	3
98	28.8	34.7	40.4	110μm	M	3
101	26.0	35.5	46.0	106μm	F	3
102	20.1	40.4	52.9	110μm	M	3
103	23.3	40.7	48.4	115μm	M	3
104	12.8	46.2	61.9	90μm	F	2
105	28.7	37.9	36.5	185μm	C	3
106	27.9	46.6	39.4	160μm	M	3
107	34.3	41.3	36.2	180μm	M	4
108	32.2	37.9	40.6	155μm	M	4
109	28.8	51.4	37.5	212μm	C	3
110	14.9	50.1	56.0	106μm	F	2

3.11 - The use of Benchmarks

Categorising the sizings in the future may be best done provisionally by using the "best" sizings as benchmarks in conjunction with with the D_{50} and classification tables as guides to judge the economic potential of Pine Hill. As an example of bench marking take the following: Firstly the four sizings with the maximum distribution in **Silica Flour** & **Glass Sands** are shown below in **Table Nine A .** SecondalyThe sizings , accumulative weight percent passing & product distribution are shown in **Table Nine B.** Note that **DH74, BH91** & **DH110** are all very close sized, these then could be considered as the **best feasible target(BFT)**. It may be that **DH90** is just too good to be true, which is best illustrated in the Product Distribution shown below in **Table Nine (B)**

Figure Sixteen (A)

BENCHMARK SIZINGS
for DH.74,DH.90, DH.91 & DH.110

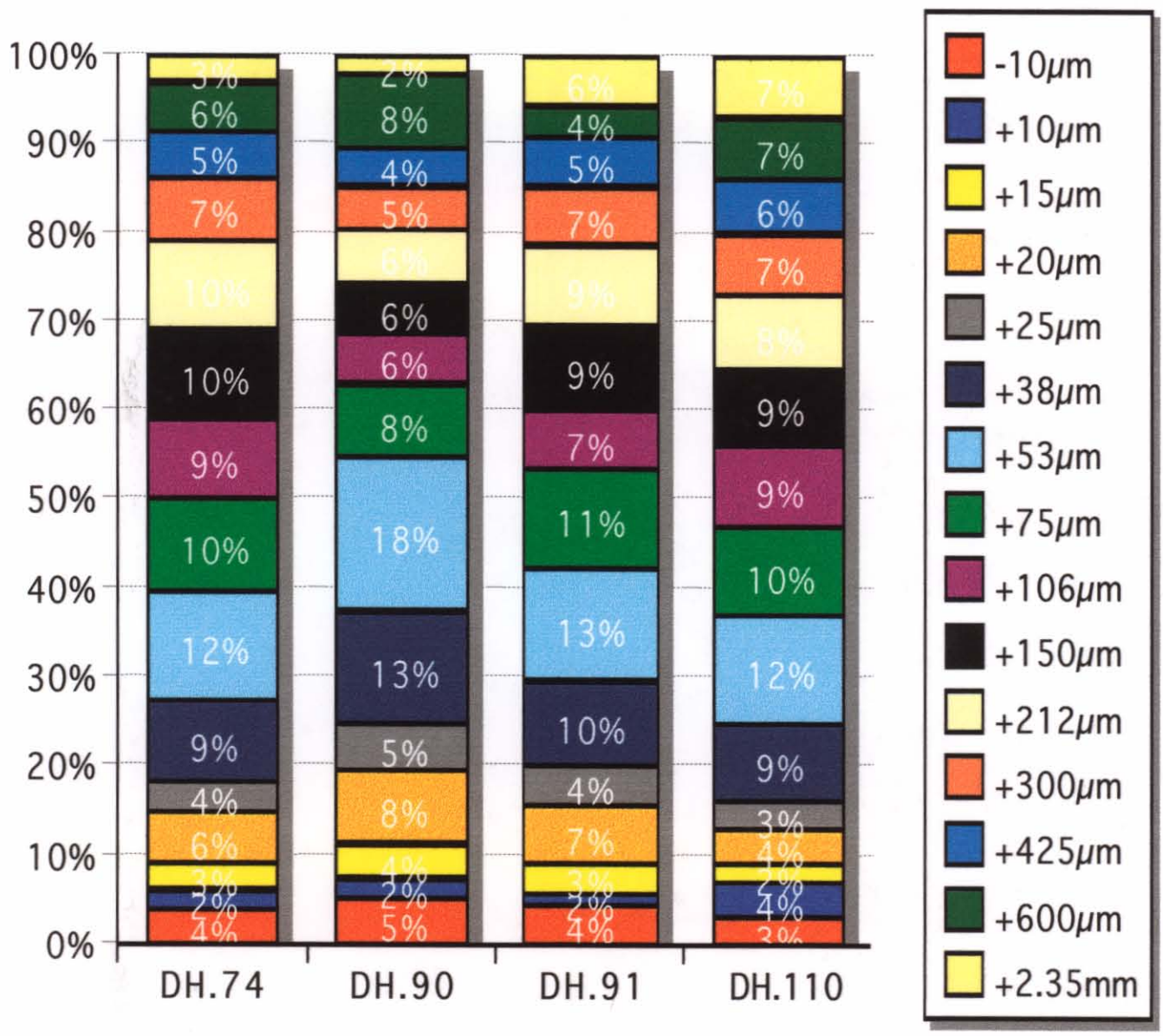
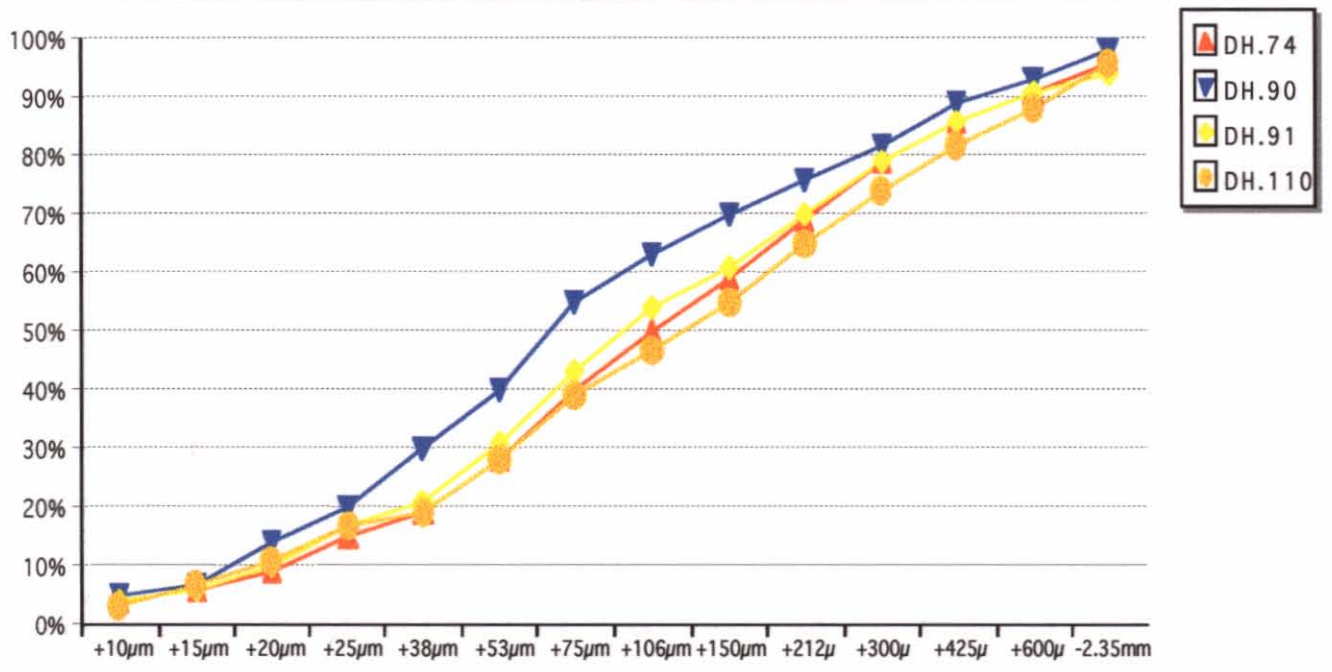
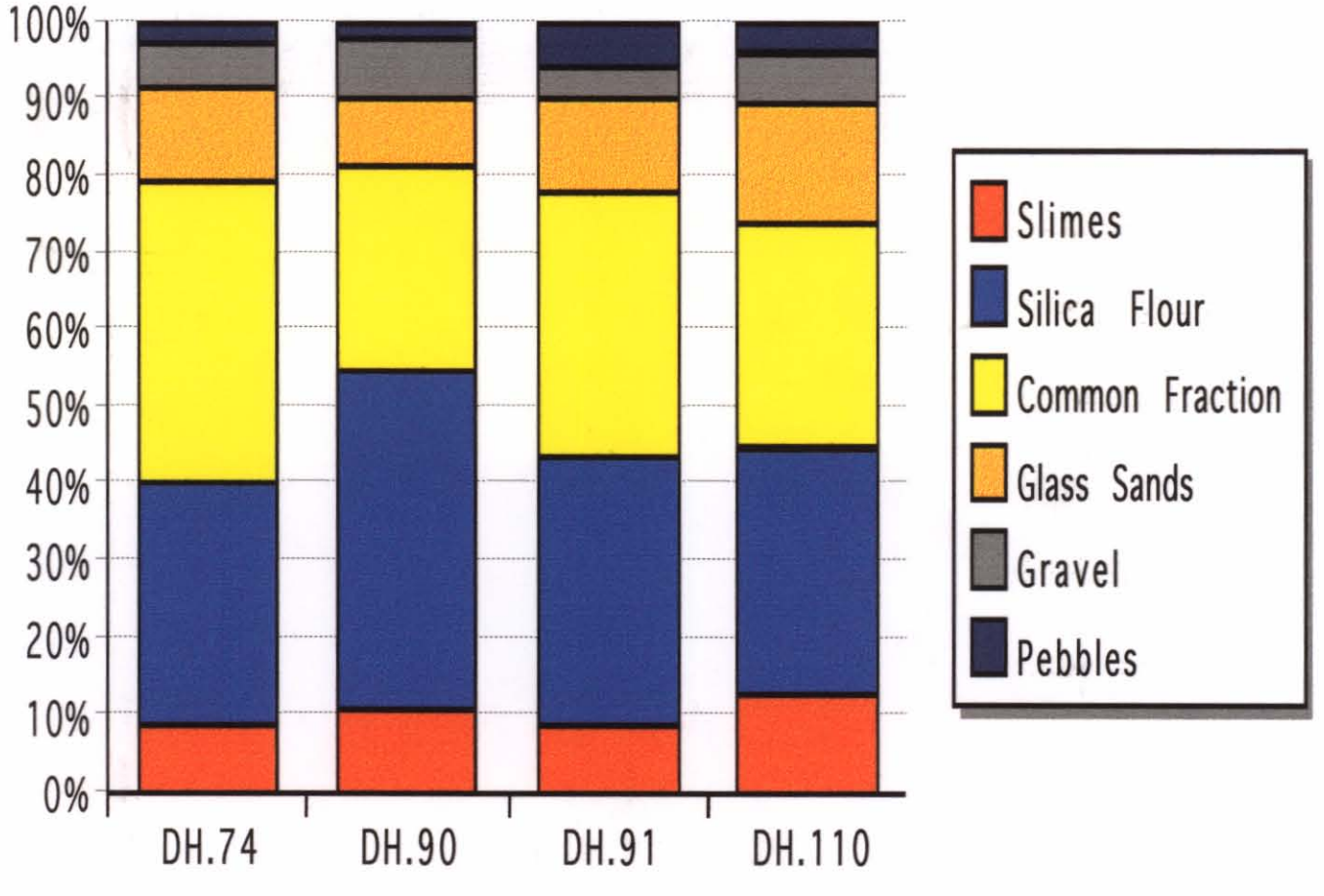


Figure Sixteen (B)

Accumulative Wt% Passing for DH74.DH90.DH92 &DH110



Benchmark Sizings - Product Distribution



5 cm

Conclusions

A workable method of classifying the characteristics of the Pine Hill Silica deposit by size has been developed in this report. The purity of any potential economic product still has to be addressed. The economic ore types defined by size distribution only are specified as follows: that material being inside the general overall economic silica zone as:

Silica Sand (-600μm +20μm)

Within this general band there two well defined classes:

Glass Sands (-600μm +75μm)
Silica Flour (-300μm+20μm)

It needs to be understood that there is also a common fraction that reports to both classes called the:

Common Fraction (-300μm+75μm)

Outside the immediate economic range the following size lots have been classified:

Pebbles (+2.35mm)
Gravel (-2.35mm +0.60mm)
Slimes (-20μm)

Previous grinding test work has shown that both the **Pebble** and **Gravel Classes** can be readily reduced to -600μm and it is possible they may have a low iron content. Moreover, it is possible that some of the silica in the **Slimes** can be used commercially by extracting the -20μm+5μm sand called **Ultra Fine Silica.**

The **Silica Sand** content of the Pine Hill deposit is reasonably consistent once the +600μm Gravel and Pebbles are removed.

There is a wide variation in the amount of Gravel and Pebble reported in all the sizings undertaken to date.

It has been observed that there is a small zone in the deposit where there is a high clay content. More work is required on this material to see if it can blended with the main ore types.

Due to the size of some samples and the method of preparation it now thought that some sample lots may not have been representive and two or three drill hole now need to be resized on four or five lots at say 2.35mm,600μm,425μm and 300μm using 500gram samples

Recommendations

Two or three drill hole now need to be selected and resized using four or five lots at say, 2.35mm, 600μm, 425μm and 300μm using about 500gram for each sample sized.

Assaying sizing fractions from **DH94** and **DH95** may be useful to see if the material in the Silica Sand zone is low in heavy metals and clay minerals.

APPENDIX I

SIZING SHEETS for DH92 to DH110

865129

TO : MR Nick Moony
FROM : Gary C Tapp
DATE : 06.06.01
SUBJECT : SAMPLE SIZINGS - SILICA SANDS, MAYDENA

Samples were received mid April and work commenced late May and concluded early June.
The following 16 samples were received:
DH 92,93,94,95,96,98,101,102,103,104,105,106,107,108,109&110.
Two other samples DH 97 & 99 were received but excluded from this investigation as instructed.
Samples as received were wet and varied appreciably in volume.
Wet & dry weights of each was recorded and each was dry sieved at 2.35 mm for removal of coarse oversize,this being retained separately for perusal if required.
The -2.35 mm products was returned to their original bags.
The material was rolled within these bags and a 1 kg sample and a 200 gram head sample was drawn from each with a spatula and placed in separate bags.
Although not as accurate as riffling this was considered the best method to avoid iron contamination.
The following table was collated from data gained during initial preparational work up to the 2.35mm screening stage:

SAMPLE #	WET grams	DRY grams	MOIST %	+2.35mm grams	+2.35mm %	-2.35mm grams	-2.35mm %
DH 92	8050	7816	2.91	696	8.9	7120	91.1
DH 93	9150	8965	2.02	485	5.4	8480	94.6
DH 94	8450	8160	3.43	1220	15.0	6940	85.0
DH 95	3750	3586	4.37	366	10.2	3220	89.8
DH 96	4600	4403	4.28	463	10.5	3940	89.5
DH 98	2250	2179	3.16	329	15.1	1850	84.9
DH 101	6150	5976	2.83	796	13.3	5180	86.7
DH 102	20050	19401	3.24	1461	7.5	17940	92.5
DH 103	6250	6028	3.55	628	10.4	5400	89.6
DH 104	8050	7785	3.29	305	3.9	7480	96.1
DH 105	3600	3470	3.61	360	10.4	3110	89.6
DH 106	7000	6709	4.16	679	10.1	6030	89.9
DH 107	7450	7239	2.83	1249	17.3	5990	82.7
DH 108	6650	6420	3.58	1190	18.5	5230	81.5
DH 109	2050	1909	6.88	199	10.4	1710	89.6
DH 110	2300	2205	4.13	145	6.6	2060	93.4

Sizing were carried out on head samples ranging from 200 to 300 grams in an endeavour to estimate the volume of CS6 during the cyclosizing stage.

Every effort was made to capture some CS6 material from each sample and generally I believe this was achieved.
The cyclosizer has a water throughput of 15 litres per minute and at 20 minutes duration it is not possible to capture 300 litres of ultra fine, low density and slow settling liquid per sample.

865130

SIZING SHEET

Customer : J.J.McDonald & Sons Mining Pty Ltd
per Nick Moony Mensislux Pty Ltd

Date : 28.05.01

Sample Description : DH 92

Original weight : 300.0

Test work by : G.C.Tapp

Cyclosizer Data

Run Time 20 minutes

Water Temp 21 deg C

Rotameter 185 mm

Sieve data

BS 410 W/W & S/S

Round 200mm

Wet sieving followed by dry
Ro - Tap sieving 10 minutes

Assay Ref No	Sieve size microns	Weight grammes	% Weight	% Passing
				100.0
	+ 600	58.32	19.4	80.6
	+ 425	22.17	7.4	73.2
	+ 300	25.56	8.5	64.7
	+ 212	29.29	9.8	54.9
	+ 150	25.91	8.6	46.3
	+ 106	22.00	7.3	38.9
	+ 75	25.48	8.5	30.4
	+ 53	32.68	10.9	19.5
	+ 38	22.01	7.3	12.2
	CS 1 (+32)	0.30	0.1	12.1
	CS 2 (+25)	9.10	3.0	9.1
	CS 3 (+19)	11.30	3.8	5.3
	CS 4 (+15)	5.80	1.9	3.4
	CS 5 (+10)	3.30	1.1	2.3
	- CS 5 (-10)	6.78	2.3	0.0

865131

SIZING SHEET

Customer : J.J.McDonald & Sons Mining Pty Ltd
per Nick Moony Mensislux Pty Ltd

Date : 28.05.01

Sample Description : DH 93

Original weight : 250.0

Test work by : G.C.Tapp

Cyclosizer Data

Run Time 20 minutes

Water Temp 21 deg C

Rotameter 185 mm

Sieve data

BS 410 W/W & S/S

Round 200mm

Wet sieving followed by dry
Ro - Tap sieving 10 minutes

Assay Ref No	Sieve size microns	Weight grammes	% Weight	% Passing
				100.0
	+ 600	26.12	10.4	89.6
	+ 425	12.98	5.2	84.4
	+ 300	14.96	6.0	78.4
	+ 212	18.50	7.4	71.0
	+ 150	17.04	6.8	64.2
	+ 106	15.26	6.1	58.1
	+ 75	19.24	7.7	50.4
	+ 53	26.81	10.7	39.6
	+ 38	22.17	8.9	30.8
	CS 1 (+32)	0.30	0.1	30.6
	CS 2 (+25)	10.40	4.2	26.5
	CS 3 (+19)	21.50	8.6	17.9
	CS 4 (+15)	14.40	5.8	12.1
	CS 5 (+10)	9.60	3.8	8.3
	- CS 5 (-10)	20.72	8.3	0.0

865132

SIZING SHEET

Customer : J.J.McDonald & Sons Mining Pty Ltd
per Nick Moony Mensislux Pty Ltd

Date : 28.05.01

Sample Description : DH 94

Original weight : 300.0

Test work by : G.C.Tapp

Cyclosizer Data

Run Time 20 minutes

Water Temp 21 deg C

Rotameter 185 mm

Sieve data

BS 410 W/W & S/S

Round 200mm

Wet sieving followed by dry
Ro - Tap sieving 10 minutes

Assay Ref No	Sieve size microns	Weight grammes	% Weight	% Passing
			12.0	100.0
	+ 600	33.15	11.1	89.0
	+ 425	11.17	3.7	85.2
	+ 300	12.61	4.2	81.0
	+ 212	15.42	5.1	75.9
	+ 150	15.11	5.0	70.8
	+ 106	14.08	4.7	66.2
	+ 75	18.74	6.2	59.9
	+ 53	28.55	9.5	50.4
	+ 38	23.12	7.7	42.7
	CS 1 (+32)	0.17	0.1	42.6
	CS 2 (+25)	9.04	3.0	39.6
	CS 3 (+19)	14.21	4.7	34.9
	CS 4 (+15)	8.54	2.8	32.0
	CS 5 (+10)	5.56	1.9	30.2
	- CS 5 (-10)	90.53	30.2	0.0

865133

SIZING SHEET

Customer : J.J.McDonald & Sons Mining Pty Ltd
per Nick Moony Mensislux Pty Ltd

Date : 29.05.01

Sample Description : DH 95

Original weight : 200.0

Test work by : G.C.Tapp

Cyclosizer Data

Run Time 20 minutes

Water Temp 21 deg C

Rotameter 185 mm

Sieve data

BS 410 W/W & S/S

Round 200mm

Wet sieving followed by dry
Ro - Tap sieving 10 minutes

Assay Ref No	Sieve size microns	Weight grammes	% Weight	% Passing
				100.0
	+ 600	16.71	8.4	91.6
	+ 425	6.63	3.3	88.3
	+ 300	7.58	3.8	84.5
	+ 212	9.48	4.7	79.8
	+ 150	9.40	4.7	75.1
	+ 106	8.77	4.4	70.7
	+ 75	10.97	5.5	65.2
	+ 53	14.10	7.1	58.2
	+ 38	14.05	7.0	51.2
	CS 1 (+32)	0.11	0.1	51.1
	CS 2 (+25)	7.51	3.8	47.3
	CS 3 (+19)	13.55	6.8	40.6
	CS 4 (+15)	8.31	4.2	36.4
	CS 5 (+10)	4.47	2.2	34.2
	- CS 5 (-10)	68.36	34.2	0.0

865134

SIZING SHEET

Customer : J.J.McDonald & Sons Mining Pty Ltd
per Nick Moony Mensislux Pty Ltd

Date : 29.05.01

Sample Description : DH 96

Original weight : 300.0

Test work by : G.C.Tapp

Cyclosizer Data

Run Time 20 minutes

Water Temp 21 deg C

Rotameter 185 mm

Sieve data

BS 410 W/W & S/S

Round 200mm

Wet sieving followed by dry
Ro - Tap sieving 10 minutes

Assay Ref No	Sieve size microns	Weight grammes	% Weight	% Passing
				100.0
	+ 600	50.62	16.9	83.1
	+ 425	18.72	6.2	76.9
	+ 300	19.86	6.6	70.3
	+ 212	22.80	7.6	62.7
	+ 150	21.08	7.0	55.6
	+ 106	19.27	6.4	49.2
	+ 75	22.45	7.5	41.7
	+ 53	27.33	9.1	32.6
	+ 38	23.72	7.9	24.7
	CS 1 (+32)	0.19	0.1	24.7
	CS 2 (+25)	11.74	3.9	20.7
	CS 3 (+19)	21.95	7.3	13.4
	CS 4 (+15)	14.09	4.7	8.7
	CS 5 (+10)	8.93	3.0	5.8
	- CS 5 (-10)	17.25	5.8	0.0

865135

SIZING SHEET

Customer : J.J.McDonald & Sons Mining Pty Ltd
per Nick Moony Mensislux Pty Ltd

Date : 29.05.01

Sample Description : DH 98

Original weight : 300.0

Test work by : G.C.Tapp

Cyclosizer Data

Run Time 20 minutes

Water Temp 21 deg C

Rotameter 185 mm

Sieve data

BS 410 W/W & S/S

Round 200mm

Wet sieving followed by dry
Ro - Tap sieving 10 minutes

Assay Ref No	Sieve size microns	Weight grammes	% Weight	% Passing
				100.0
	+ 600	48.22	16.1	83.9
	+ 425	17.95	6.0	77.9
	+ 300	19.02	6.3	71.6
	+ 212	21.75	7.3	64.4
	+ 150	20.01	6.7	57.7
	+ 106	18.53	6.2	51.5
	+ 75	21.80	7.3	44.2
	+ 53	26.18	8.7	35.5
	+ 38	22.26	7.4	28.1
	CS 1 (+32)	0.65	0.2	27.9
	CS 2 (+25)	10.12	3.4	24.5
	CS 3 (+19)	23.16	7.7	16.8
	CS 4 (+15)	16.49	5.5	11.3
	CS 5 (+10)	11.07	3.7	7.6
	- CS 5 (-10)	22.79	7.6	0.0

865136

SIZING SHEET

Customer : J.J.McDonald & Sons Mining Pty Ltd
per Nick Moony Mensislux Pty Ltd

Date : 29.05.01

Sample Description : DH 101

Original weight : 300.0

Test work by : G.C.Tapp

Cyclosizer Data

Run Time 20 minutes

Water Temp 21 deg C

Rotameter 185 mm

Sieve data

BS 410 W/W & S/S

Round 200mm

Wet sieving followed by dry
Ro - Tap sieving 10 minutes

Assay Ref No	Sieve size microns	Weight grammes	% Weight	% Passing
				100.0
	+ 600	44.15	14.7	85.3
	+ 425	17.66	5.9	79.4
	+ 300	19.17	6.4	73.0
	+ 212	22.25	7.4	65.6
	+ 150	21.08	7.0	58.6
	+ 106	19.22	6.4	52.2
	+ 75	23.44	7.8	44.3
	+ 53	31.31	10.4	33.9
	+ 38	27.19	9.1	24.8
	CS 1 (+32)	0.23	0.1	24.8
	CS 2 (+25)	10.37	3.5	21.3
	CS 3 (+19)	26.05	8.7	12.6
	CS 4 (+15)	15.67	5.2	7.4
	CS 5 (+10)	8.53	2.8	4.6
	- CS 5 (-10)	13.68	4.6	0.0

865137

SIZING SHEET

Customer : J.J.McDonald & Sons Mining Pty Ltd
per Nick Moony Mensislux Pty Ltd

Date : 30.05.01

Sample Description : DH 102

Original weight : 250.0

Test work by : G.C.Tapp

Cyclosizer Data

Run Time 20 minutes

Water Temp 21 deg C

Rotameter 185 mm

Sieve data

BS 410 W/W & S/S

Round 200mm

Wet sieving followed by dry
Ro - Tap sieving 10 minutes

Assay Ref No	Sieve size microns	Weight grammes	% Weight	% Passing
				100.0
	+ 600	34.04	13.6	86.4
	+ 425	14.94	6.0	80.4
	+ 300	15.78	6.3	74.1
	+ 212	18.66	7.5	66.6
	+ 150	18.06	7.2	59.4
	+ 106	17.66	7.1	52.3
	+ 75	24.02	9.6	42.7
	+ 53	31.58	12.6	30.1
	+ 38	23.22	9.3	20.8
	CS 1 (+32)	0.14	0.1	20.8
	CS 2 (+25)	10.86	4.3	16.4
	CS 3 (+19)	17.14	6.9	9.6
	CS 4 (+15)	9.33	3.7	5.8
	CS 5 (+10)	5.30	2.1	3.7
	- CS 5 (-10)	9.27	3.7	0.0

865138

SIZING SHEET

Customer : J.J.McDonald & Sons Mining Pty Ltd
per Nick Moony Mensislux Pty Ltd

Date : 30.05.01

Sample Description : DH 103

Original weight : 200.0

Test work by : G.C.Tapp

Cyclosizer Data

Run Time 20 minutes

Water Temp 21 deg C

Rotameter 185 mm

Sieve data

BS 410 W/W & S/S

Round 200mm

Wet sieving followed by dry
Ro - Tap sieving 10 minutes

Assay Ref No	Sieve size microns	Weight grammes	% Weight	% Passing
				100.0
	+ 600	28.86	14.4	85.6
	+ 425	13.06	6.5	79.0
	+ 300	13.90	7.0	72.1
	+ 212	16.08	8.0	64.1
	+ 150	15.61	7.8	56.2
	+ 106	14.70	7.4	48.9
	+ 75	17.67	8.8	40.1
	+ 53	20.76	10.4	29.7
	+ 38	16.26	8.1	21.6
	CS 1 (+32)	0.12	0.1	21.5
	CS 2 (+25)	8.90	4.5	17.0
	CS 3 (+19)	13.84	6.9	10.1
	CS 4 (+15)	7.71	3.9	6.3
	CS 5 (+10)	4.33	2.2	4.1
	- CS 5 (-10)	8.20	4.1	0.0

865139

SIZING SHEET

Customer : J.J.McDonald & Sons Mining Pty Ltd
per Nick Moony Mensislux Pty Ltd

Date : 30.05.01

Sample Description : **DH 104**

Original weight : 200.0

Test work by : G.C.Tapp

Cyclosizer Data

Run Time 20 minutes

Water Temp 21 deg C

Rotameter 185 mm

Sieve data

BS 410 W/W & S/S

Round 200mm

Wet sieving followed by dry
Ro - Tap sieving 10 minutes

Assay Ref No	Sieve size microns	Weight grammes	% Weight	% Passing
				100.0
	+ 600	18.51	9.3	90.7
	+ 425	9.52	4.8	86.0
	+ 300	11.41	5.7	80.3
	+ 212	15.05	7.5	72.8
	+ 150	16.48	8.2	64.5
	+ 106	17.89	8.9	55.6
	+ 75	25.95	13.0	42.6
	+ 53	29.55	14.8	27.8
	+ 38	18.18	9.1	18.7
	CS 1 (+32)	0.24	0.1	18.6
	CS 2 (+25)	8.91	4.5	14.2
	CS 3 (+19)	11.64	5.8	8.3
	CS 4 (+15)	5.89	2.9	5.4
	CS 5 (+10)	3.27	1.6	3.8
	- CS 5 (-10)	7.51	3.8	0.0

865140

SIZING SHEET

Customer : J.J.McDonald & Sons Mining Pty Ltd
per Nick Moony Mensislux Pty Ltd

Date : 31.05.01

Sample Description : DH 105

Original weight : 250.0

Test work by : G.C.Tapp

Cyclosizer Data

Run Time 20 minutes

Water Temp 21 deg C

Rotameter 185 mm

Sieve data

BS 410 W/W & S/S

Round 200mm

Wet sieving followed by dry
Ro - Tap sieving 10 minutes

Assay Ref No	Sieve size microns	Weight grammes	% Weight	% Passing
				100.0
	+ 600	51.01	20.4	79.6
	+ 425	17.96	7.2	72.4
	+ 300	18.81	7.5	64.9
	+ 212	20.28	8.1	56.8
	+ 150	17.55	7.0	49.8
	+ 106	15.46	6.2	43.6
	+ 75	15.85	6.3	37.2
	+ 53	17.23	6.9	30.3
	+ 38	14.27	5.7	24.6
	CS 1 (+32)	0.22	0.1	24.5
	CS 2 (+25)	6.59	2.6	21.9
	CS 3 (+19)	14.93	6.0	15.9
	CS 4 (+15)	11.53	4.6	11.3
	CS 5 (+10)	8.13	3.3	8.1
	- CS 5 (-10)	20.18	8.1	0.0

865141

SIZING SHEET

Customer : J.J.McDonald & Sons Mining Pty Ltd
per Nick Moony Mensislux Pty Ltd

Date : 31.05.01

Sample Description : DH 106

Original weight : 250.0

Test work by : G.C.Tapp

Cyclosizer Data

Run Time 20 minutes

Water Temp 21 deg C

Rotameter 185 mm

Sieve data

BS 410 W/W & S/S

Round 200mm

Wet sieving followed by dry
Ro - Tap sieving 10 minutes

Assay Ref No	Sieve size microns	Weight grammes	% Weight	% Passing
				100.0
	+ 600	49.56	19.8	80.2
	+ 425	21.31	8.5	71.7
	+ 300	23.29	9.3	62.3
	+ 212	25.61	10.2	52.1
	+ 150	21.53	8.6	43.5
	+ 106	18.52	7.4	36.1
	+ 75	19.60	7.8	28.2
	+ 53	20.56	8.2	20.0
	+ 38	13.31	5.3	14.7
	CS 1 (+32)	0.15	0.1	14.6
	CS 2 (+25)	6.40	2.6	12.1
	CS 3 (+19)	9.41	3.8	8.3
	CS 4 (+15)	6.06	2.4	5.9
	CS 5 (+10)	4.05	1.6	4.3
	- CS 5 (-10)	10.64	4.3	0.0

865142

SIZING SHEET

Customer : J.J.McDonald & Sons Mining Pty Ltd
per Nick Moony Mensislux Pty Ltd

Date : 31.05.01

Sample Description : DH 107

Original weight : 250.0

Test work by : G.C.Tapp

Cyclosizer Data

Run Time 20 minutes

Water Temp 21 deg C

Rotameter 185 mm

Sieve data

BS 410 W/W & S/S

Round 200mm

Wet sieving followed by dry
Ro - Tap sieving 10 minutes

Assay Ref No	Sieve size microns	Weight grammes	% Weight	% Passing
				100.0
	+ 600	51.29	20.5	79.5
	+ 425	20.82	8.3	71.2
	+ 300	22.43	9.0	62.2
	+ 212	24.69	9.9	52.3
	+ 150	21.03	8.4	43.9
	+ 106	17.61	7.0	36.9
	+ 75	18.22	7.3	29.6
	+ 53	18.80	7.5	22.0
	+ 38	13.60	5.4	16.6
	CS 1 (+32)	0.08	0.0	16.6
	CS 2 (+25)	5.85	2.3	14.2
	CS 3 (+19)	10.82	4.3	9.9
	CS 4 (+15)	7.47	3.0	6.9
	CS 5 (+10)	5.18	2.1	4.8
	- CS 5 (-10)	12.11	4.8	0.0

865143

SIZING SHEET

Customer : J.J.McDonald & Sons Mining Pty Ltd
per Nick Moony Mensislux Pty Ltd

Date : 31.05.01

Sample Description : DH 108

Original weight : 250.0

Test work by : G.C.Tapp

Cyclosizer Data

Run Time 20 minutes

Water Temp 21 deg C

Rotameter 185 mm

Sieve data

BS 410 W/W & S/S

Round 200mm

Wet sieving followed by dry
Ro - Tap sieving 10 minutes

Assay Ref No	Sieve size microns	Weight grammes	% Weight	% Passing
				100.0
	+ 600	42.01	16.8	83.2
	+ 425	16.25	6.5	76.7
	+ 300	18.52	7.4	69.3
	+ 212	21.58	8.6	60.7
	+ 150	20.09	8.0	52.6
	+ 106	18.50	7.4	45.2
	+ 75	21.48	8.6	36.6
	+ 53	23.66	9.5	27.2
	+ 38	17.94	7.2	20.0
	CS 1 (+32)	0.10	0.0	19.9
	CS 2 (+25)	7.76	3.1	16.8
	CS 3 (+19)	14.69	5.9	11.0
	CS 4 (+15)	9.70	3.9	7.1
	CS 5 (+10)	6.22	2.5	4.6
	- CS 5 (-10)	11.50	4.6	0.0

865144

SIZING SHEET

Customer : J.J.McDonald & Sons Mining Pty Ltd
per Nick Moony Mensislux Pty Ltd

Date : 01.06.01

Sample Description : DH 109

Original weight : 250.0

Test work by : G.C.Tapp

Cyclosizer Data

Run Time 20 minutes

Water Temp 21 deg C

Rotameter 185 mm

Sieve data

BS 410 W/W & S/S

Round 200mm

Wet sieving followed by dry
Ro - Tap sieving 10 minutes

Assay Ref No	Sieve size microns	Weight grammes	% Weight	% Passing
				100.0
	+ 600	51.34	20.5	79.5
	+ 425	24.81	9.9	69.5
	+ 300	26.96	10.8	58.8
	+ 212	28.88	11.6	47.2
	+ 150	23.79	9.5	37.7
	+ 106	19.37	7.7	29.9
	+ 75	19.48	7.8	22.1
	+ 53	18.86	7.5	14.6
	+ 38	11.95	4.8	9.8
	CS 1 (+32)	0.13	0.1	9.8
	CS 2 (+25)	4.58	1.8	7.9
	CS 3 (+19)	6.63	2.7	5.3
	CS 4 (+15)	3.96	1.6	3.7
	CS 5 (+10)	2.55	1.0	2.7
	- CS 5 (-10)	6.71	2.7	0.0

865145

SIZING SHEET

Customer : J.J.McDonald & Sons Mining Pty Ltd
per Nick Moony Mensislux Pty Ltd

Date : 01.06.01

Sample Description : DH 110

Original weight : 250.0

Test work by : G.C.Tapp

Cyclosizer Data

Run Time 20 minutes

Water Temp 21 deg C

Rotameter 185 mm

Sieve data

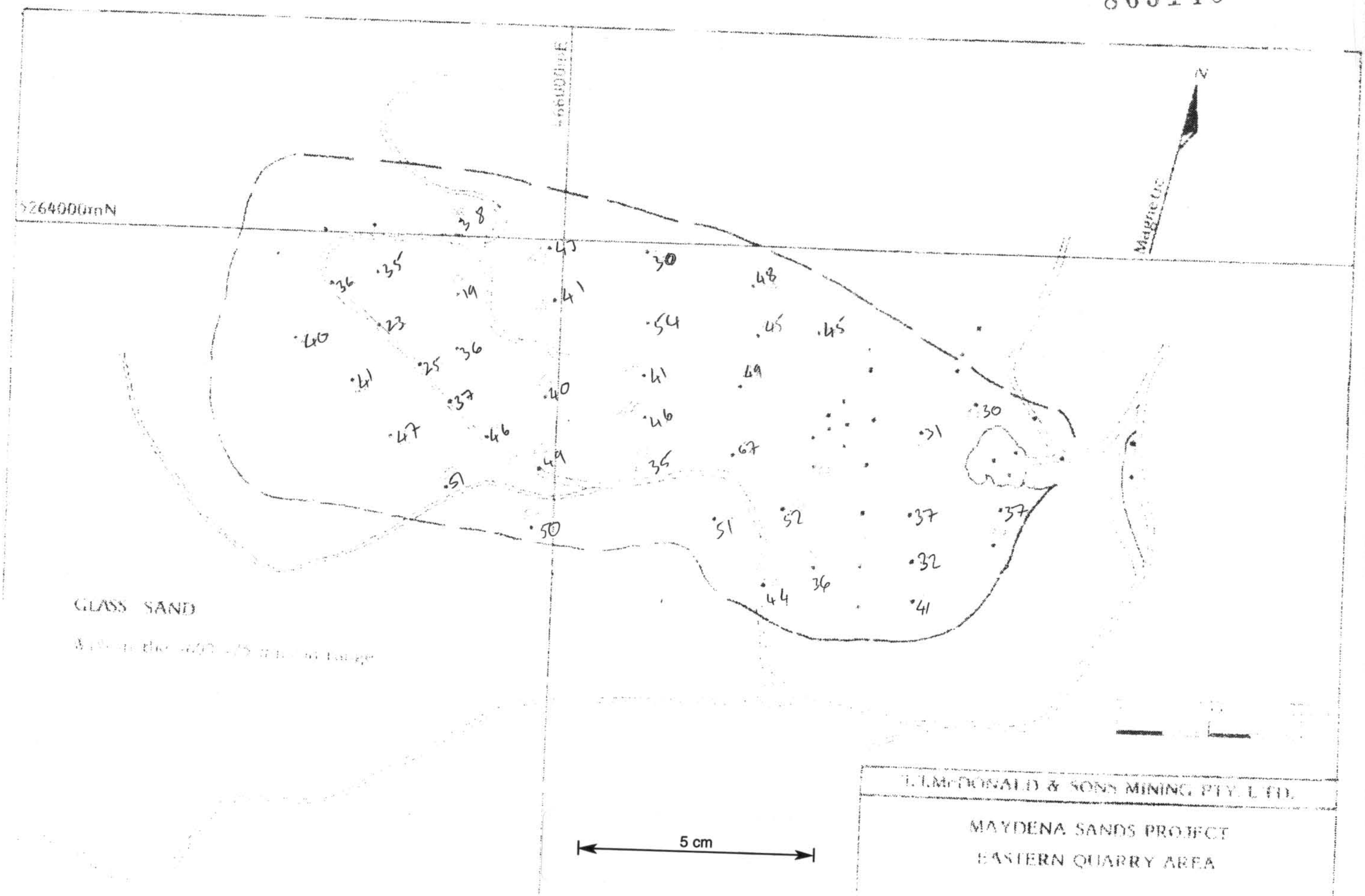
BS 410 W/W & S/S

Round 200mm

Wet sieving followed by dry
Ro - Tap sieving 10 minutes

Assay Ref No	Sieve size microns	Weight grammes	% Weight	% Passing
				100.0
	+ 600	22.18	8.9	91.1
	+ 425	14.41	5.8	85.4
	+ 300	19.09	7.6	77.7
	+ 212	25.40	10.2	67.6
	+ 150	25.09	10.0	57.5
	+ 106	23.54	9.4	48.1
	+ 75	26.68	10.7	37.4
	+ 53	29.92	12.0	25.5
	+ 38	21.42	8.6	16.9
	CS 1 (+32)	0.44	0.2	16.7
	CS 2 (+25)	8.04	3.2	13.5
	CS 3 (+19)	14.81	5.9	7.6
	CS 4 (+15)	7.20	2.9	4.7
	CS 5 (+10)	3.62	1.4	3.3
	- CS 5 (-10)	8.16	3.3	0.0

865146


264000mN
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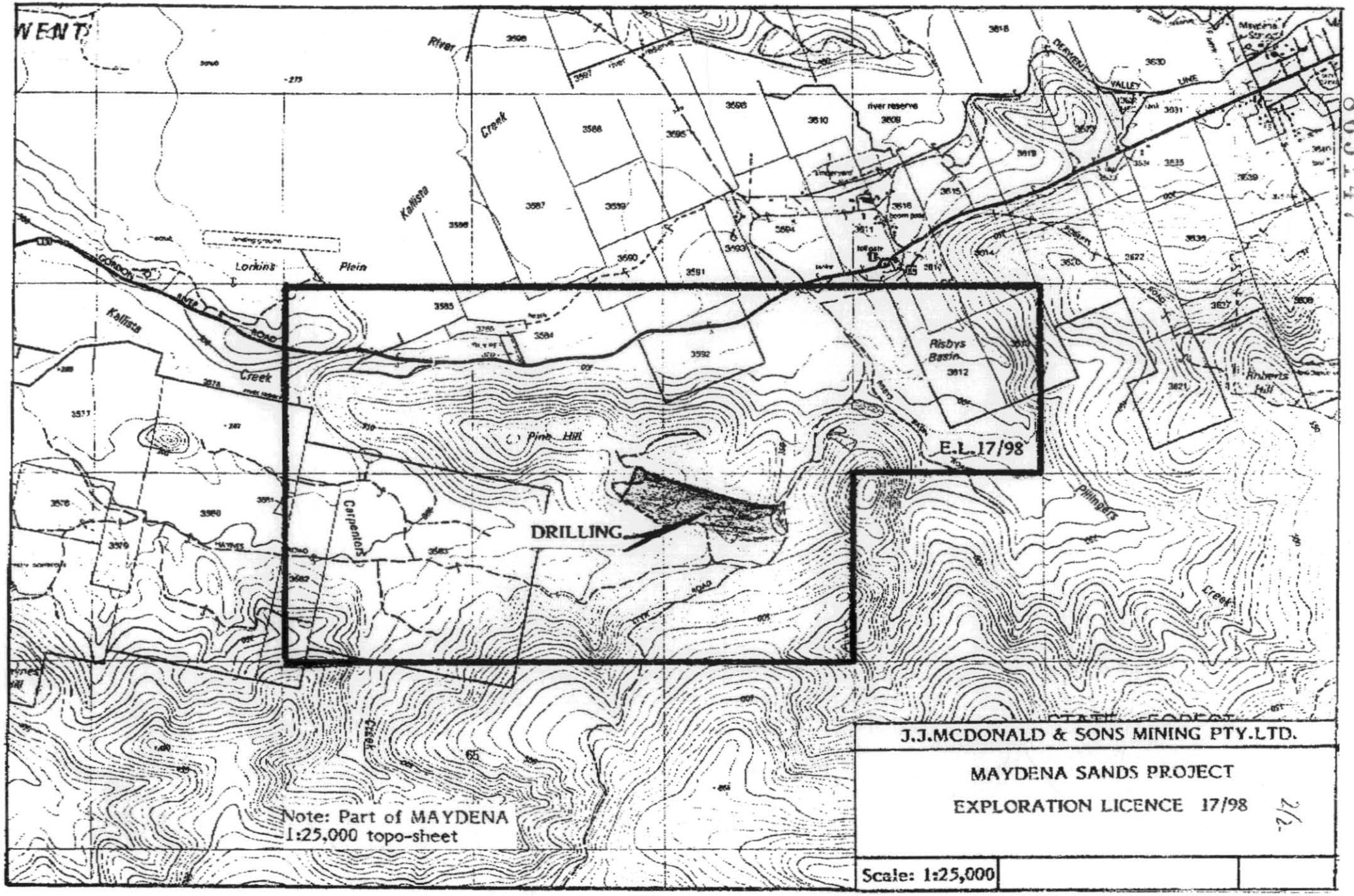
Magnetic
GLASS SAND
5 cm
J.J.McDONALD & SONS MINING PTY. LTD.
MAYDENA SANDS PROJECT
EASTERN QUARRY AREA



APPENDIX II

LETTER OF AUTHORISATION

865149

J.J. McDONALD & SONS MINING PTY LTD

ACN 051 399 261 ABN 29 051 399 261

FACSIMILE TRANSMISSION

TO	:	Mr. N. Moony, Esker	**FAX:** 03 6223 3502
FROM	:	Gerhard K. Krummei	**FAX:** 03 9820 2595
DATE	:	20th April 2001	
PAGES	:	One	
SUBJECT	:	**SAMPLE SIZINGS - SILICA SANDS, MAYDENA**	

This memo refers to the batch of some 18 air core drill hole samples delivered to you in Hobart on the 11th of April 2001 for sizing determinations at the Western Metals laboratory, Burnie.

The following samples should be **excluded** from this investigation:

DH 97
DH 99
DH100 (?not in batch)

For the sake of consistency, the required sizing determinations should proceed along the lines of the methods described in your reports of 29th May 1999 and 10th October 2000. The results should be dealt with in a single report and, again for the sake of consistency and continuity, in a manner which is correlatable and compatible with the aforesaid two reports.

To recapitulate, in summary:

* sample preparation: as per page 2 of your report of 27.05.1999
* sample sizing to 10 microns by:

  screening at:

  +600, +425, +300, +212, +150, +106, +75, +53, +38 microns

  cyclosizing at:

  + 32, +25, +19, +15, +10 microns

* retain +600 and -10 micron fractions
* care to be taken to avoid contamination, especially iron and alumina
* a brief written report on the results and implications is required:
* please supply 2 bound and 4 unbound copies of the report
* on completion of the project, all sizings, under- and over sizes and unprocessed samples to be collected by G. Krummei in Hobart in due course for storage

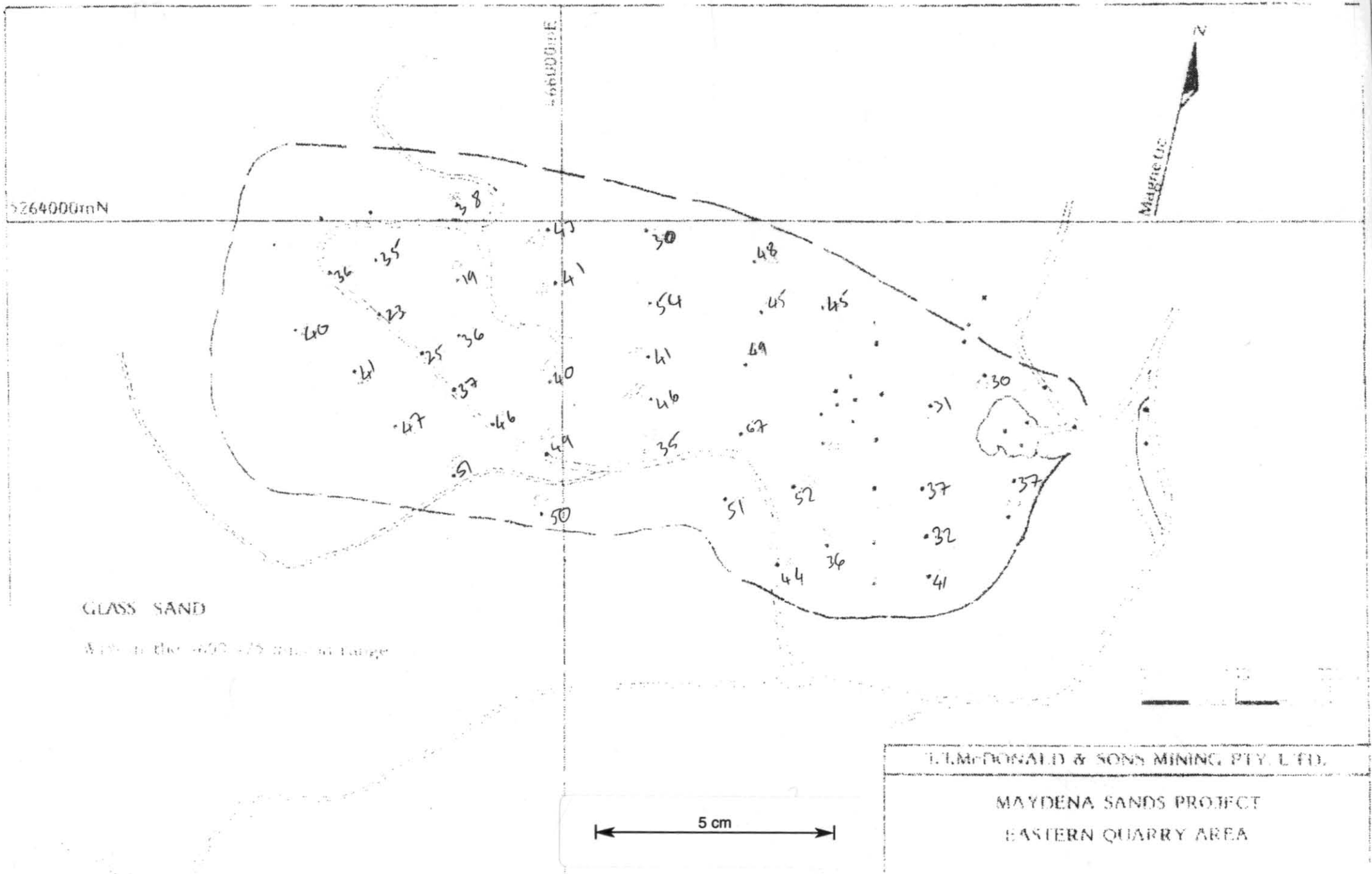
Please note that the following are not required:

* No assays
* No grinding tests

GERHARD K. KRUMMEI
for and on behalf of
J.J. McDonald & Sons Mining Pty. Ltd.

Suite 28, 487 St.Kilda Road, Melbourne. Vic. 3004. Australia
Telephone & Facsimile: 61-3-98202595

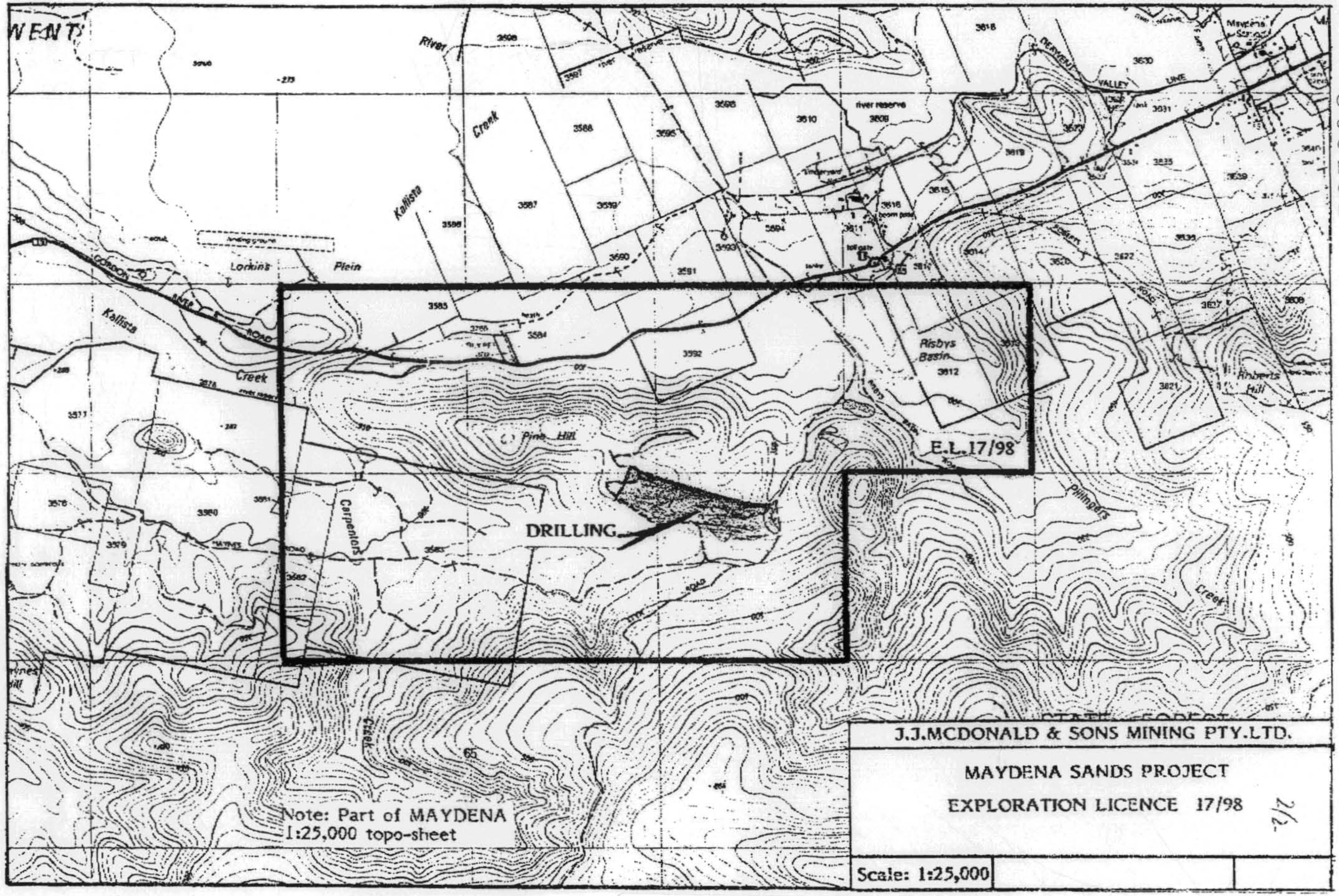
865150



T.L.McDONALD & SONS MINING PTY. LTD.

MAYDENA SANDS PROJECT

EASTERN QUARRY AREA


WENT
River
Kallista Creek
Lorkins Plein
Kallista Creek
Pine Hill
Carpenters
Risbys Basin
Roberts Hill
Pillingers
Creek
E.L.17/98
DRILLING
J.J.MCDONALD & SONS MINING PTY.LTD.
MAYDENA SANDS PROJECT
EXPLORATION LICENCE 17/98
2/2
Note: Part of MAYDENA
1:25,000 topo-sheet
Scale: 1:25,000

5 cm

APPENDIX 8

LIMESTONE ANALYSES - RC DRILL CHIP COMPOSITES

865153

CERTIFICATE OF ANALYSIS

ALS Chemex

Batch: ST31917
Sub Batch: 0

CONTACT:	MR G KRUMMEI	**LABORATORY:**	BRISBANE
CLIENT:	.	**DATE RECEIVED:**	26/03/2001
ADDRESS:	JJ MCDONALD & SONS MINING P/L SUITE 28 487 ST KILDA ROAD MELBOURNE VIC 3004	**DATE COMPLETED:**	19/04/2001
		SAMPLE TYPE:	ROCK
		No. of SAMPLES:	6
ORDER No.:	FAX 23/03/01		
PROJECT:	LIMESTONE		

COMMENTS

NOTES

This is the Final Report and supersedes any preliminary reports with this batch number.
Results apply to sample(s) as submitted. All pages of this report have been checked and approved for release.

ISSUING LABORATORY: BRISBANE

Address
32 Shand Street
Stafford QLD 4053
Australia

Phone: 61-7-3243 7222
Fax: 61-7-3243 7254
Email: shaunk@als.com.au

Signature:

865154

Batch: ST31917
Sub Batch: 0
Date of Issue: 19/04/2001
Client: .
Client Reference: LIMESTONE

CERTIFICATE OF ANALYSIS

SAMPLE	Element Method Unit LOR	MgO % M277 0.01	CaO % M277 0.01	SiO2 % M277 0.01	Al2O3 % M277 0.01	Fe2O3 % M277 0.01	N.V. % M277-1 0.1	Cd ppm MS581 0.1	As ppm MS581 1	Co ppm MS581 0.1	Cu ppm MS581 1	Mo ppm MS581 0.2	Pb ppm MS581 1
RBY 001		0.99	53.16	1.97	0.50	0.22	96.9	<0.1	2	0.8	2	0.3	3
RBY 002		0.48	53.29	2.43	0.69	0.38	95.8	<0.1	2	0.8	2	0.7	4
RBY 003C		0.76	53.58	1.62	0.37	0.21	97.3	<0.1	2	0.7	2	0.4	3
RBY 003F		0.77	53.23	2.00	0.45	0.21	96.7	<0.1	2	0.8	4	0.7	5
RBY 004		0.48	53.05	2.94	0.60	0.29	95.5	<0.1	3	0.7	2	0.3	5
RBY 005		0.86	52.52	3.18	0.52	0.23	95.7	<0.1	2	0.7	1	0.7	3

865155

Batch: ST31917
Sub Batch: 0
Date of Issue: 19/04/2001
Client: .
Client Reference: LIMESTONE

CERTIFICATE OF ANALYSIS

SAMPLE	Element Method Unit LOR	Zn ppm MS581 1	Hg ppm MS581 0.1										
RBY 001		3	<0.1										
RBY 002		10	0.2										
RBY 003C		3	<0.1										
RBY 003F		7	<0.1										
RBY 004		12	0.1										
RBY 005		7	0.1										

865156

AUSTRALIAN LABORATORY SERVICES PTY LTD ACN 000 691 029
32 Shand Street Stafford Queensland 4053 Australia
ALS Chemex
Phone: 61-7-3243 7222 Fax: 61-7-3243 7218 Website: www.als.com.au

FAX

ATTENTION: Gerhard Krummel
FAX NO.: 03 9820 2595
COMPANY: JJ McDonald & Sons
DATE: 19/04/01
CC:
NO. OF PAGES: 1 INCL COVER
FROM: Ben Cooke
SUBJECT: Results

ROCK	%	
SAMPLE	CaCO3	MgCO3
RBY001	94.9	2.08
RBY002	95.1	1.00
RBY003C	95.6	1.59
RBY003F	95.0	1.59
RBY004	94.7	1.00
RBY005	93.7	1.80

DDH Maydena BH 1
PDH 2 18-40m
PDH 3B 16-34m Coarse fraction
PDH 3B 16-34m Fine fraction
PDH 5 34-42m
PDH 6 26-40m

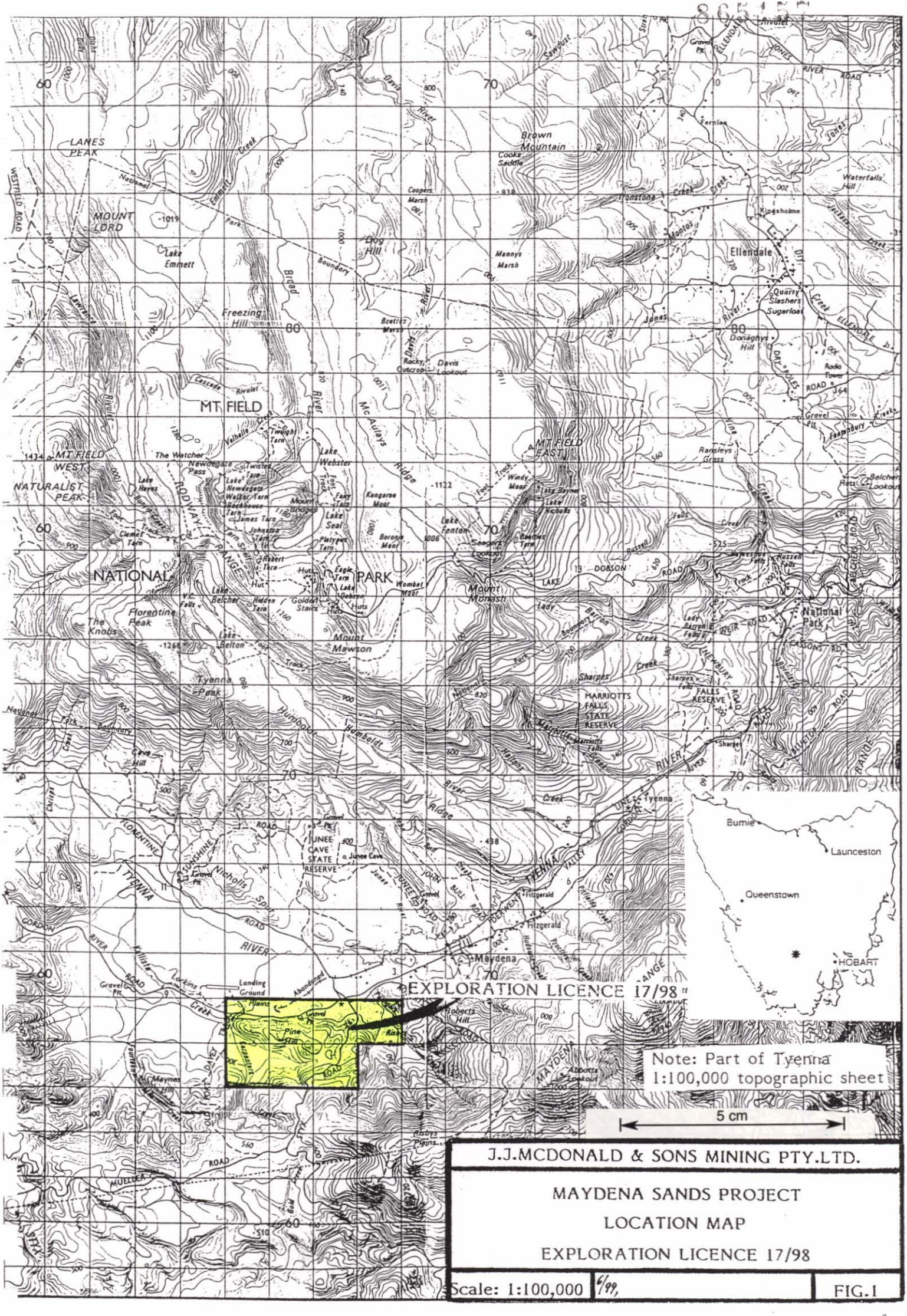
Comments: Results are total Ca and Mg expressed as CaCO3 and MgCO3 respectively.

Please note, analysis was conducted under our batch number ST31917.

A printed laboratory report will follow.

Best regards,

Ben Cooke.



J.J.MCDONALD & SONS MINING PTY.LTD.

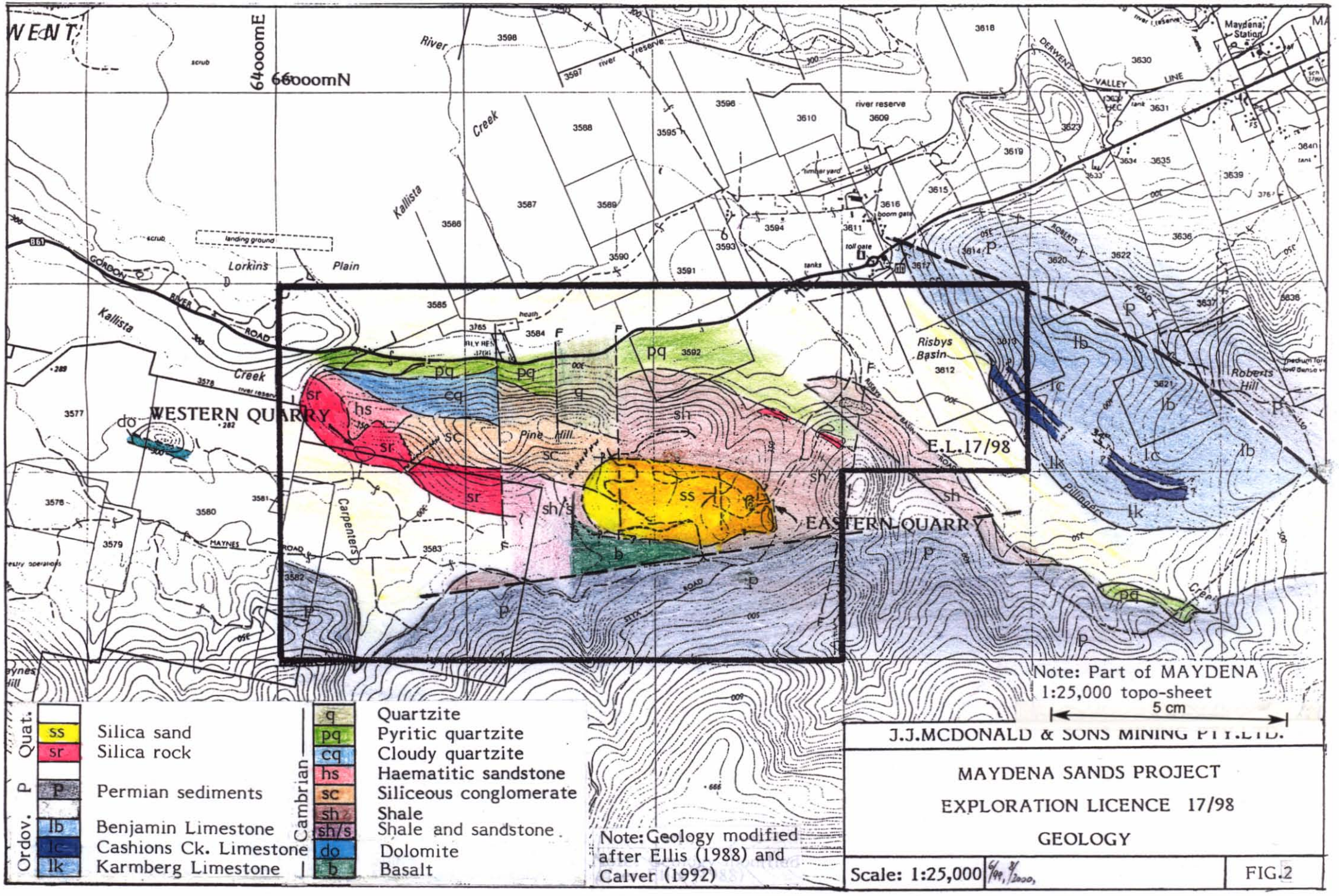
MAYDENA SANDS PROJECT

LOCATION MAP

EXPLORATION LICENCE 17/98

Scale: 1:100,000 | 6/99, | FIG.1

865158



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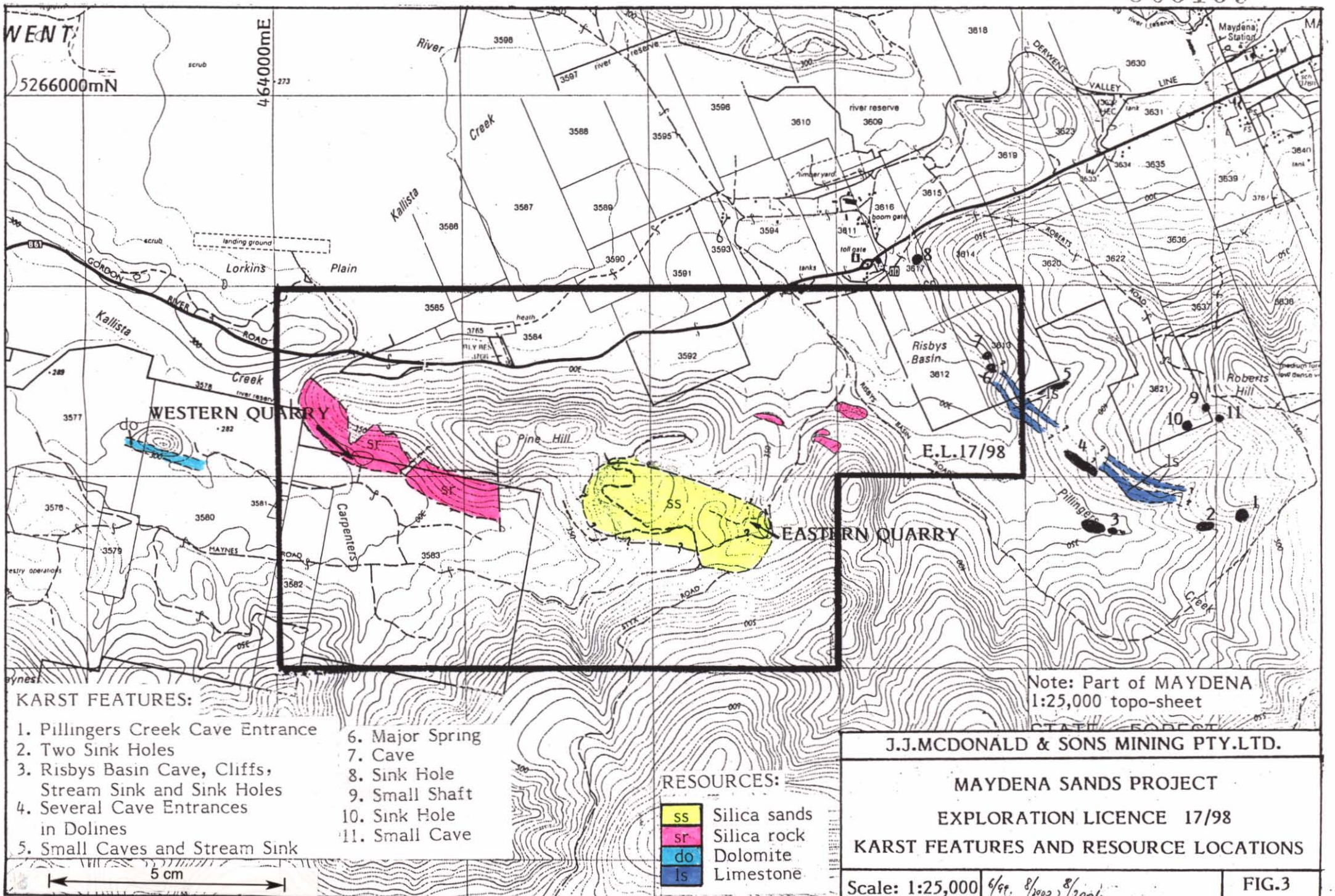
MAYDENA SANDS PROJECT

EXPLORATION LICENCE 17/98

GEOLOGY

Scale: 1:25,000 | 6/9/2000 | FIG.2

865159



KARST FEATURES:

1. Pillingers Creek Cave Entrance
2. Two Sink Holes
3. Risbys Basin Cave, Cliffs, Stream Sink and Sink Holes
4. Several Cave Entrances in Dolines
5. Small Caves and Stream Sink
6. Major Spring
7. Cave
8. Sink Hole
9. Small Shaft
10. Sink Hole
11. Small Cave

RESOURCES:

ss	Silica sands
sr	Silica rock
do	Dolomite
ls	Limestone

Note: Part of MAYDENA 1:25,000 topo-sheet

J.J.MCDONALD & SONS MINING PTY.LTD.

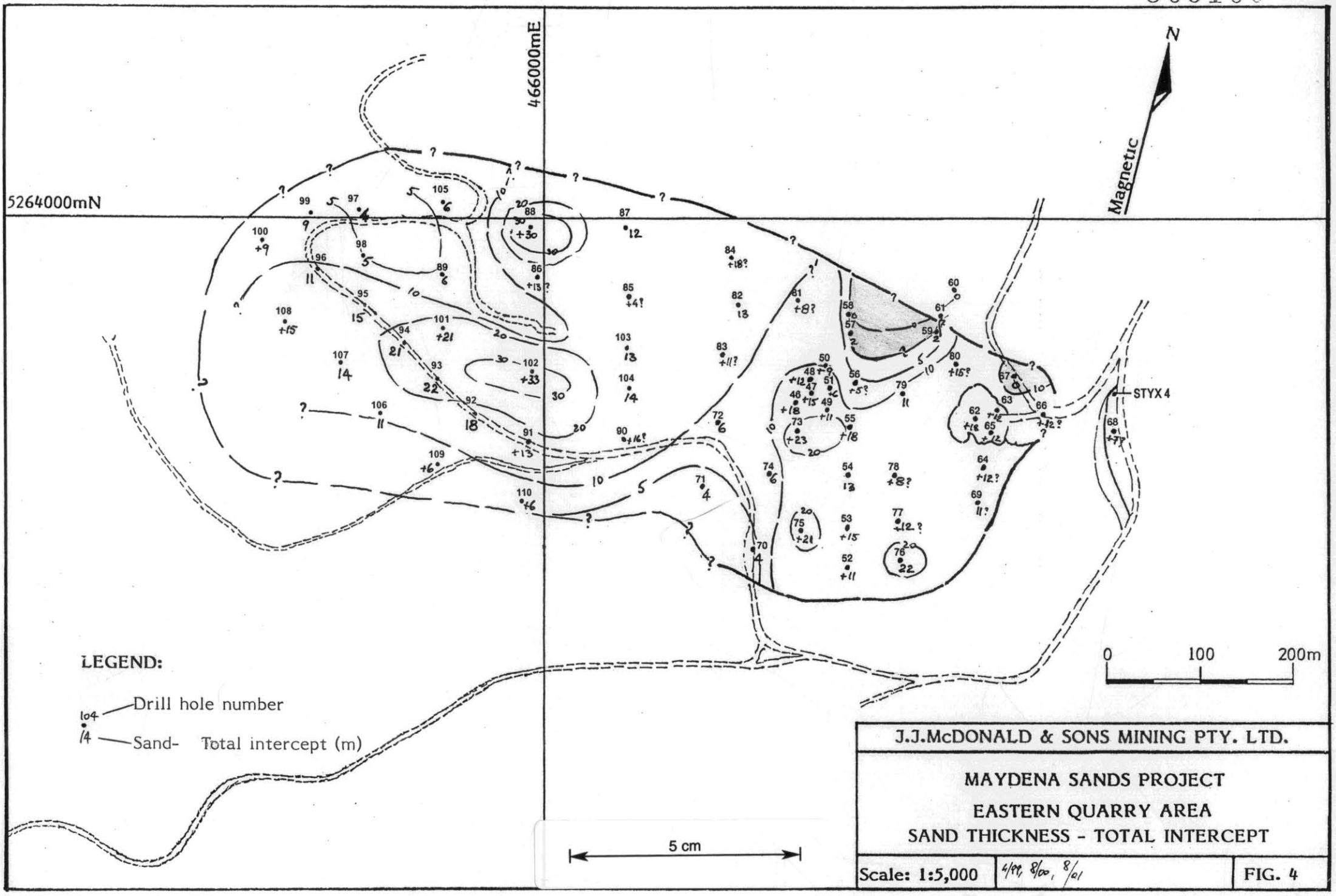
MAYDENA SANDS PROJECT

EXPLORATION LICENCE 17/98

KARST FEATURES AND RESOURCE LOCATIONS

Scale: 1:25,000 | 6/99. 8/2003, 8/2004 | FIG.3

865100



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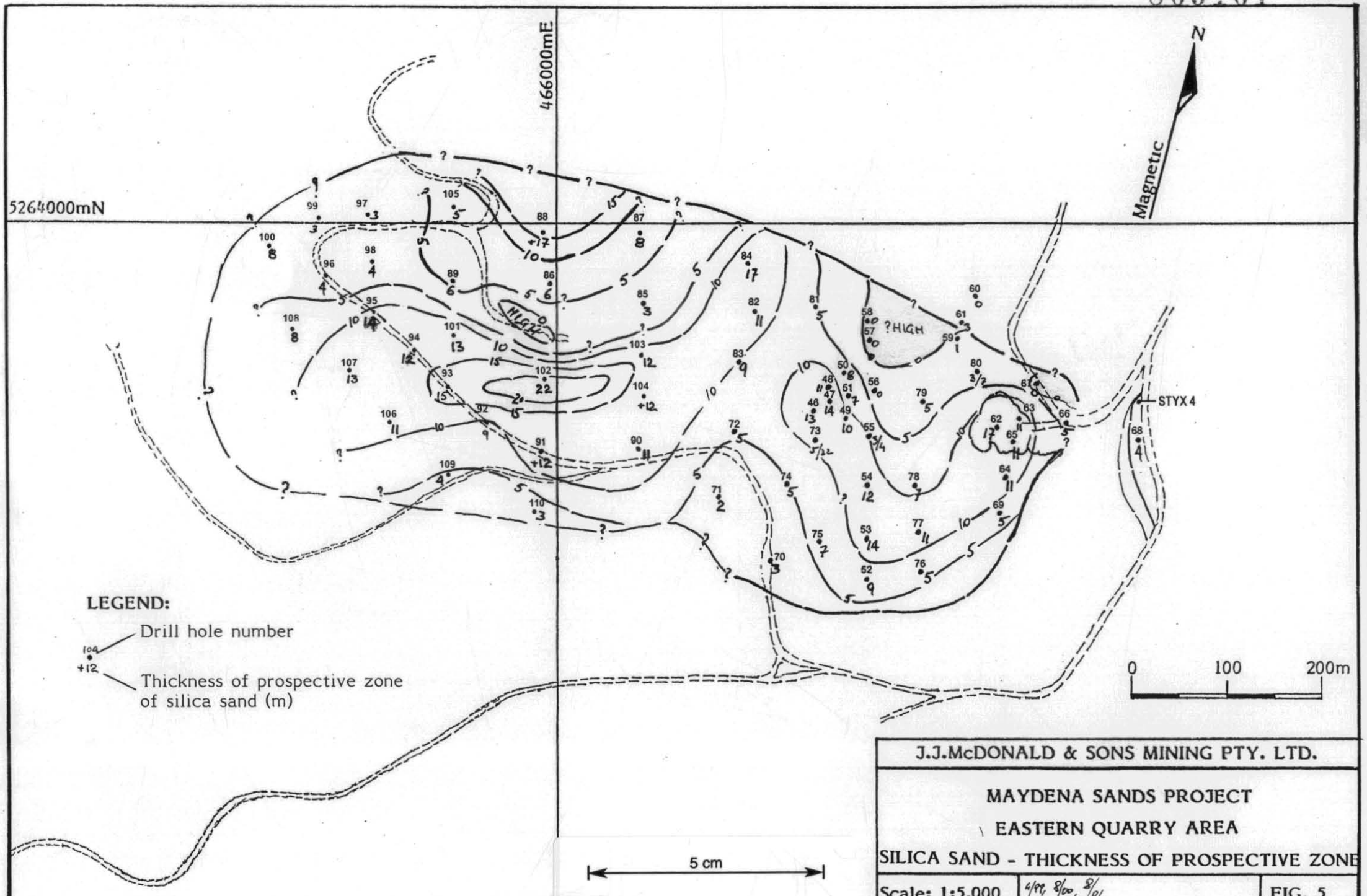
MAYDENA SANDS PROJECT

EASTERN QUARRY AREA

SAND THICKNESS - TOTAL INTERCEPT

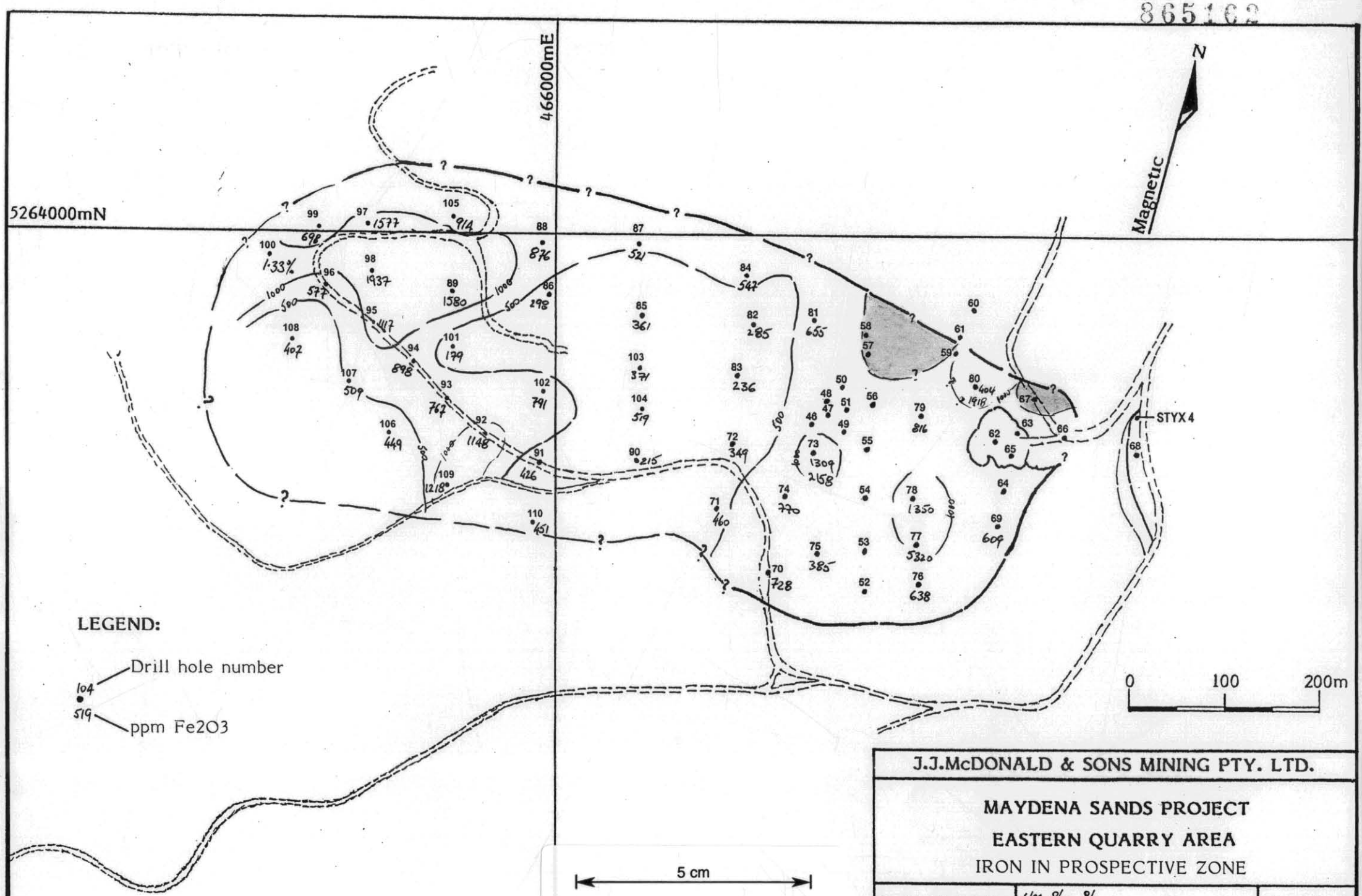
Scale: 1:5,000	4/99, 8/00, 8/01	FIG. 4

865161



J.J.McDONALD & SONS MINING PTY. LTD.		
MAYDENA SANDS PROJECT EASTERN QUARRY AREA SILICA SAND - THICKNESS OF PROSPECTIVE ZONE		
Scale: 1:5,000	4/99, 8/00, 8/01	FIG. 5

865162



J.J.McDONALD & SONS MINING PTY. LTD.

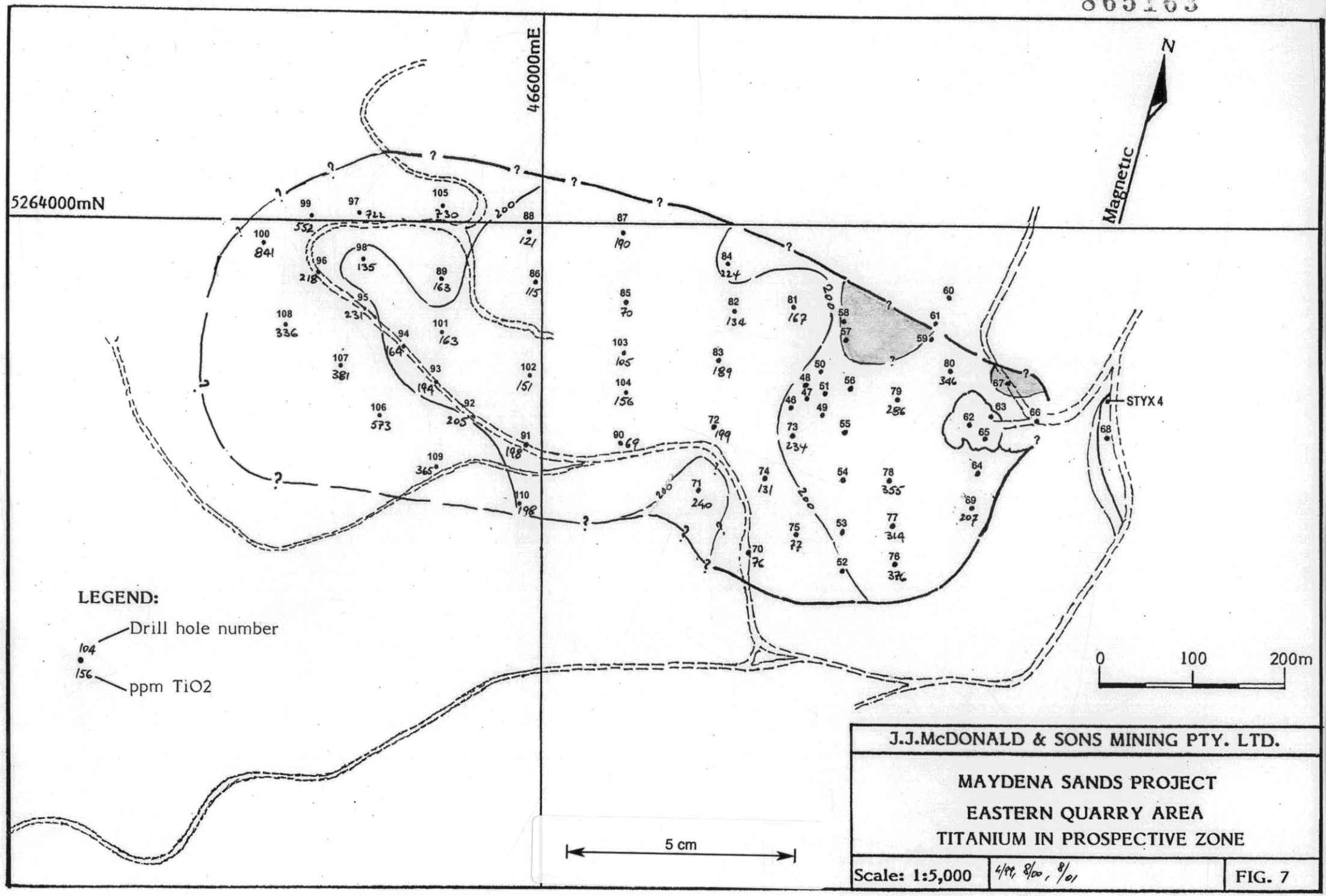
MAYDENA SANDS PROJECT

EASTERN QUARRY AREA

IRON IN PROSPECTIVE ZONE

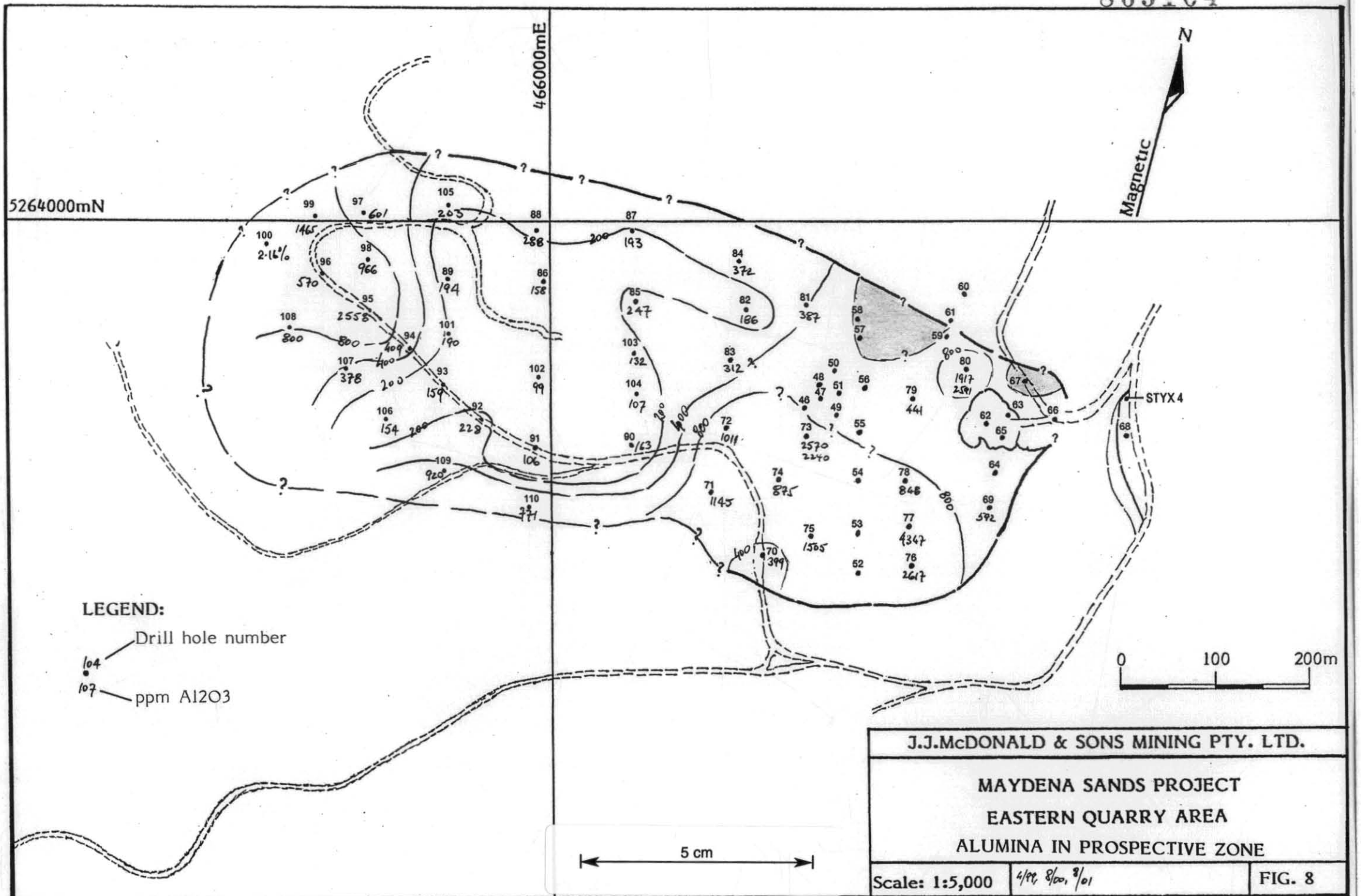
Scale: 1:5,000 | 4/99, 8/00, 8/01 | FIG. 6

865163



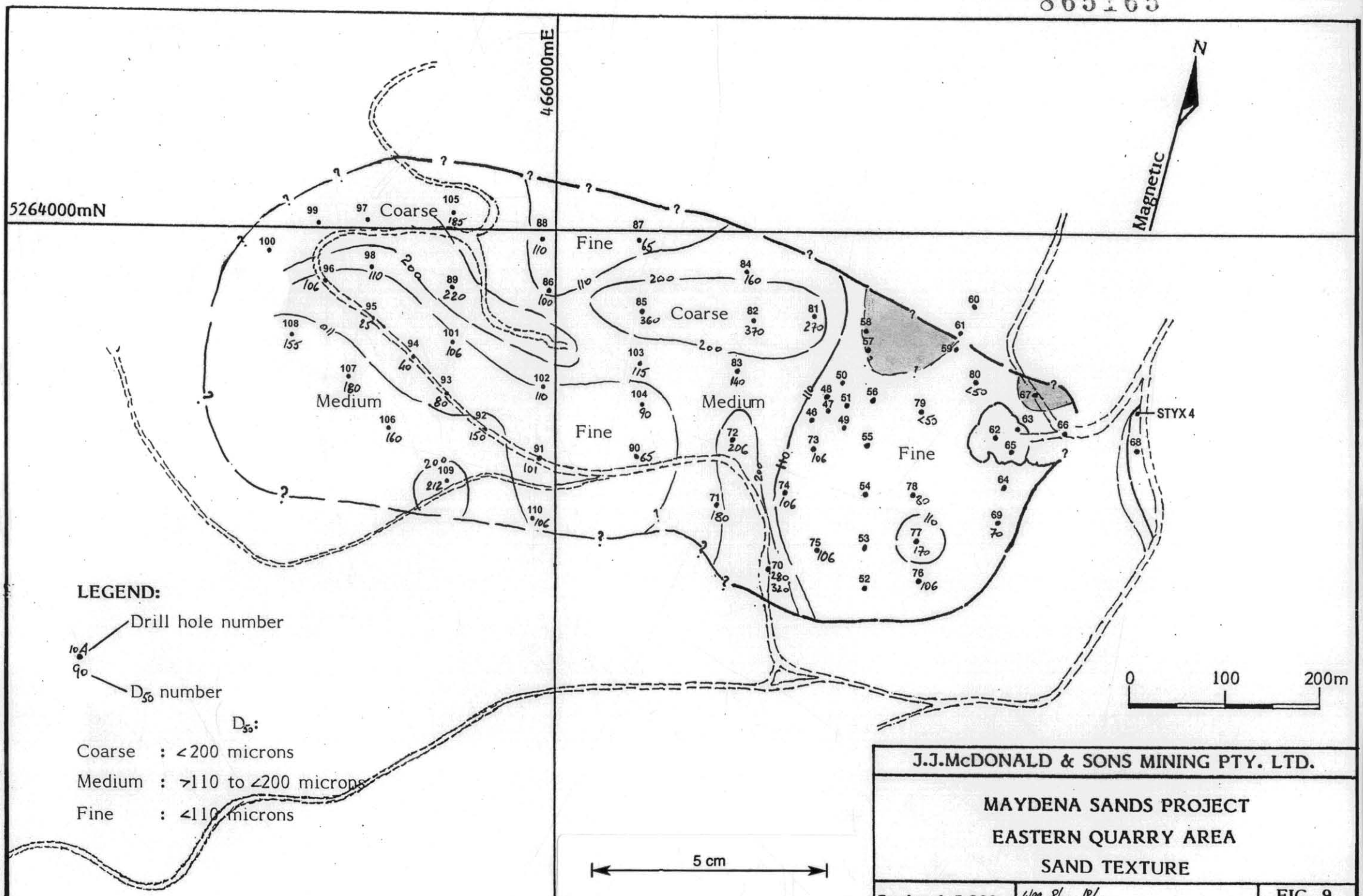
J.J.McDONALD & SONS MINING PTY. LTD.		
MAYDENA SANDS PROJECT EASTERN QUARRY AREA TITANIUM IN PROSPECTIVE ZONE		
Scale: 1:5,000	4/99, 8/00, 8/01	FIG. 7

865164



J.J.McDONALD & SONS MINING PTY. LTD.		
MAYDENA SANDS PROJECT EASTERN QUARRY AREA ALUMINA IN PROSPECTIVE ZONE		
Scale: 1:5,000	4/99, 8/00, 8/01	FIG. 8

865165



J.J.McDONALD & SONS MINING PTY. LTD.

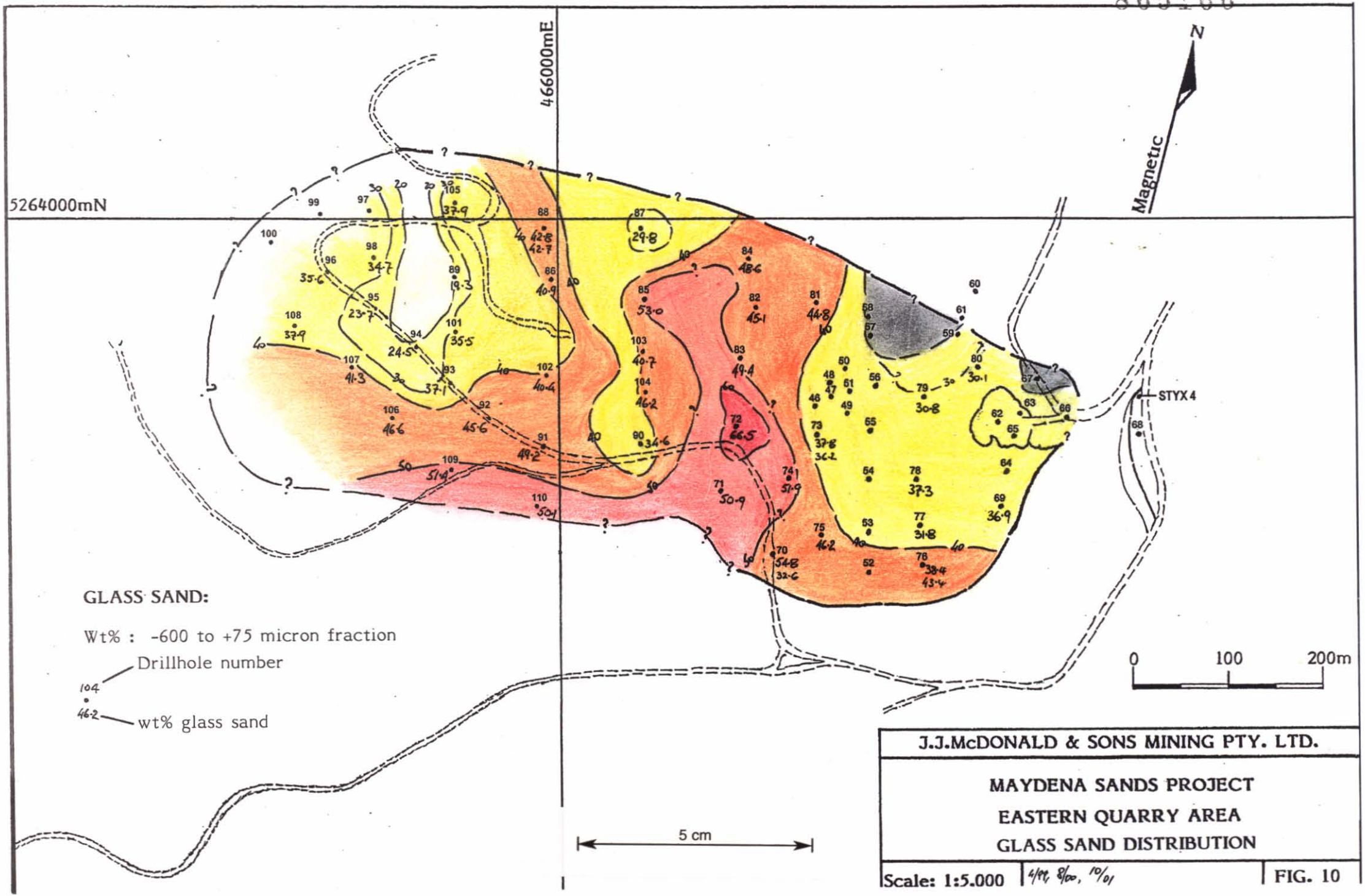
MAYDENA SANDS PROJECT

EASTERN QUARRY AREA

SAND TEXTURE

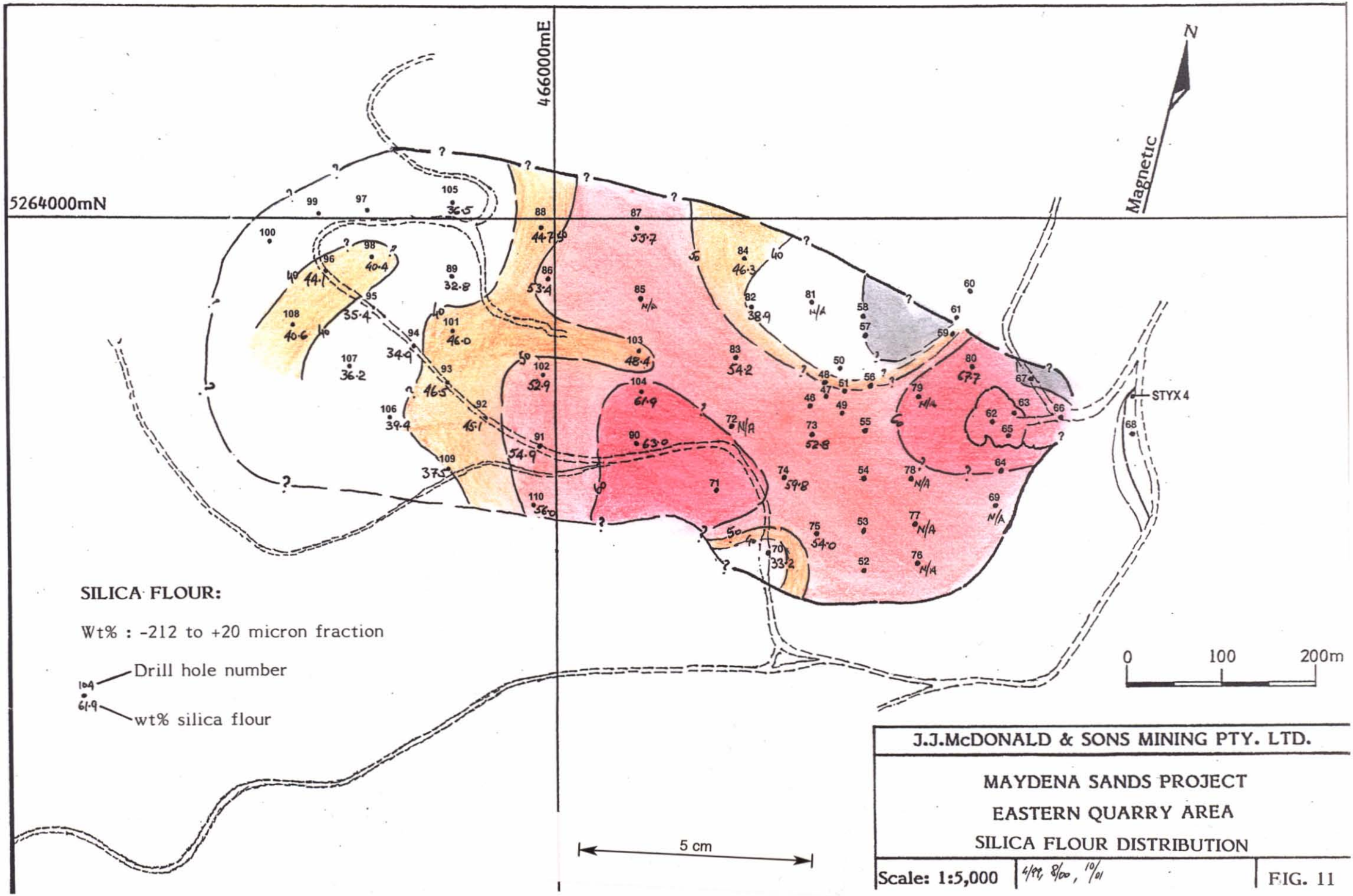
Scale: 1:5,000 | 4/99, 8/00, 10/01 | FIG. 9

865166



J.J.McDONALD & SONS MINING PTY. LTD.		
MAYDENA SANDS PROJECT EASTERN QUARRY AREA GLASS SAND DISTRIBUTION		
Scale: 1:5.000	4/99, 8/00, 10/01	FIG. 10

865167



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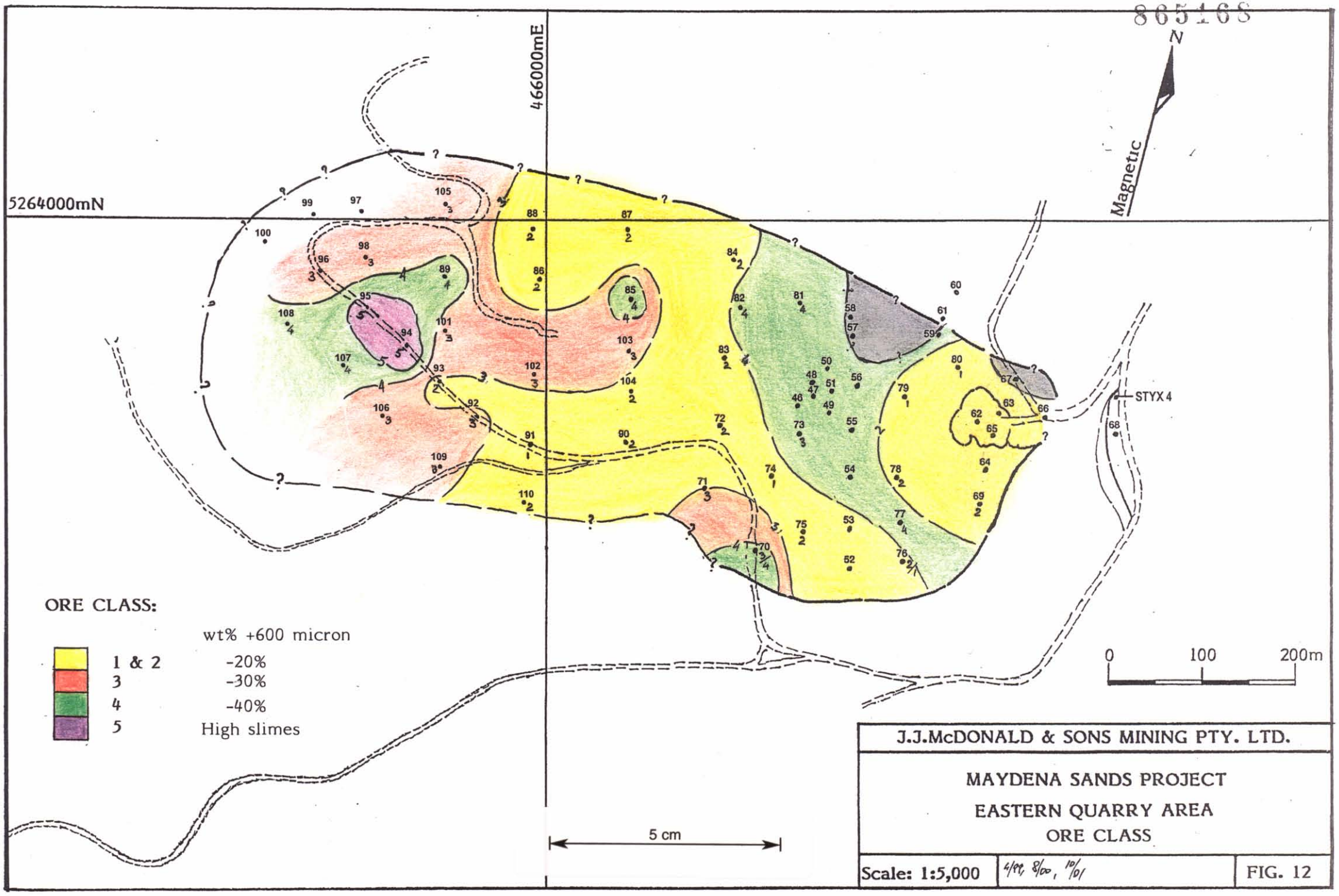
MAYDENA SANDS PROJECT

EASTERN QUARRY AREA

SILICA FLOUR DISTRIBUTION

Scale: 1:5,000 | 4/99, 8/00, 10/01 | FIG. 11

865168



J.J.McDONALD & SONS MINING PTY. LTD.

MAYDENA SANDS PROJECT

EASTERN QUARRY AREA

ORE CLASS

Scale: 1:5,000 | 4/99, 8/00, 10/01 | FIG. 12

865169

SOUTH

NORTH

5263900mN

SECTION 466332mE

RL 400m

52

53

54

55

56

57

58

Creek

Fe

11m

15m

Fe

15m

Fe

18

9m

4m

9m

Shale/ siltst.

Sand

?

Sand

? Sand

Mudstone/ Shale

RL 400m

EASTERN QUARRY

69 (Proj. 12m E)

64

65

62

63

66

(Proj. 19m E)

(Proj. 5m W)

(Proj. 54m W)

(Proj. 22m E)

80

67

(Proj. 31m E)

(Proj. 59m E)

59

61

(Proj. 56m E)

SECTION 466488mE

60

(Proj. 39mE)

Creek

shale/siltstone

sand

12m

12m

18m

12m

5m

15m

Sand

Clay

7m

11m

7m

Sand

Mudstone/shale

Sand

Dolomite (Silicified)

5 cm

J.J. McDONALD & SONS MINING PTY. LTD.

MAYDENA SANDS PROJECT

EASTERN QUARRY AREA

DRILL SECTIONS

Scale: 1:1,000

FIG. 13

865170

SOUTH

NORTH

5263900mN

SECTION 465985mE

RL 400m

110 (Proj. 5m E)

Road

Sand

91

Road

13m

102 (Proj. 4m W)

Fe

33m

Quartz outcrop

Silica Rock

86

Track

13m

Fe

88

Track

30m

Fe

Sand

Mudstone/ Shale

SECTION 466090mE

103 (Proj. 2m W)

Scattered boulders of silica

RL 400m

90

Road

Track

15m

104 (Proj. 6m W)

Track

14.5m

13m

85

4m

Track

87

Sand

Fe

12m

Sand

Mudstone/Shale

RL 400m

SECTION 466200mE

71 (Proj. 2.5mE)

Road

Sand

5m

72 (Proj. 10mE)

Track

6m

83 (proj. 3mE)

Track

11m

82 (Proj. 14mW)

14m

84 (Proj. 3mW)

Track

Fe

18m

Sand

Mudstone/Shale

5 cm

J.J.McDONALD & SONS PTY. LTD

MAYDENA SANDS PROJECT

EASTERN QUARRY AREA

DRILL SECTIONS

Scale: 1:1,000

FIG.14

865171

SOUTH

NORTH

5263900m N

RL 400m

Sand

insufficient topo data

Track

108

15m

SECTION 465720m E

Scattered boulders of silica rock

96 (Proj. 36m W)

99 (Proj.28m W)

100 (Proj.21m E)

coarse

micaceous fine sandstone

Sand

SECTION 465800m E

Scattered boulders of silica rock

98 (Proj.3mW)

97 (Proj.2m E)

Road

95 (Proj.5mW)

107

(Proj.16m E)

106

(Proj.22m W)

micacepus fine sandstone

SECTION 465890m E

Scattered boulders of silica rock

89

105 (Proj.22m E)

101

93

109

6m

21m

24m

6.5m

11.5m

5 cm

J.J.McDONALD & SONS MINING PTY. LTD.

MAYDENA SANDS PROJECT

EASTERN QUARRY AREA

DRILL SECTIONS

Scale: 1:1,000 | 5/01 | FIG. 15

865172

WEST

EAST

466000mE

RL 400m

108 (Proj. 59m S)

107 (Proj. 16m S)

Track

Road

93

102 (Proj. 5m S)

SECTION 5263830mN

(Proj.33m S)

103

Sand

15m

15m

24m

33m

13m

RL 400m

106 (Proj. 10m S)

Track

Track

Sand

12·5m

92 (Proj. 11m S)

Road

18m

91 (Proj. 22m S)

13m

SECTION 5263780mN

(Proj.6m S)

104

(Proj 12m N) 90

Sand

14·5m

15m

5 cm

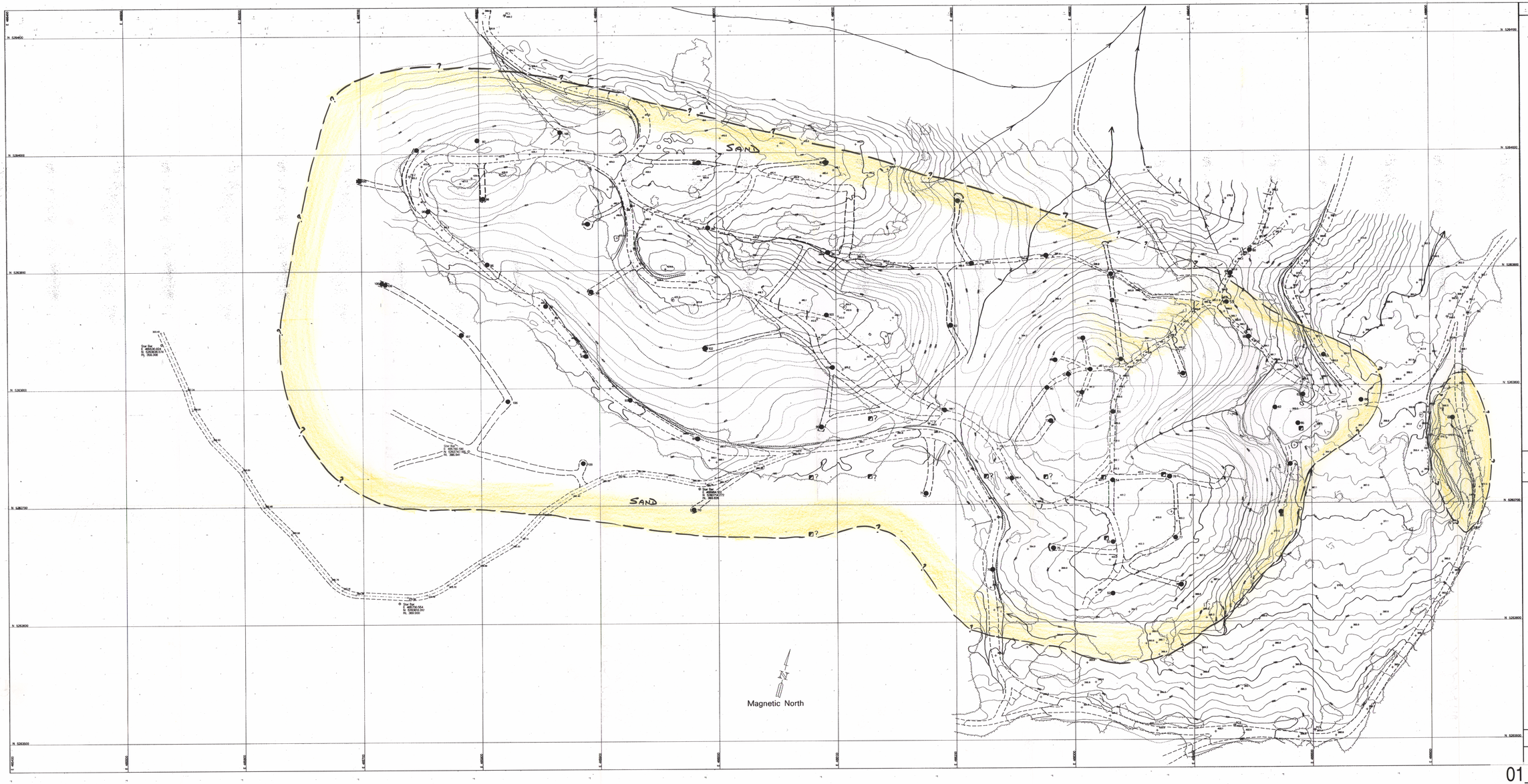
J.J.McDONALD & SONS MINING PTY. LTD.

MAYDENA SANDS PROJECT

EASTERN QUARRY AREA

DRILL SECTIONS

Scale: 1:1,000 | 5/4 | FIG. 16



Legend

Creek
Track
Pit
Drill Holes:
2500 Series, 92 – 110
5000 Series, 69 – 91
5000 Series, 46 – 68
Bank Top
Bank Toe
Quarry Area
Major Contour / Form Line
Minor Contour / Form Line
Contour Number
Spot Height & Label
Vegetation Boundary
Drain
Culvert
Photo Control Point
Star Bar

Pine Hill - Maydena

Prepared for:

Brooks Lark & Carrick

By:

HYDRO TASMANIA
SURVEY & GEOGRAPHIC INFORMATION SERVICES
"Innovative Solutions with Integrity."

1:1000

30 0 20 40 60
Metres

Contour Interval : 2.0 m

The information contained on this plan has been derived by photogrammetry from 1:7500 colour aerial photography.
Data acquisition was carried out using a "Zeiss P. Series " analytical photogrammetric system

Enhancement of final plans was undertaken in MicroStation.

5 cm

865173 Fig. 17

Photography: F401, Run 1 / 6 , 7 9-Jan-1999

Date: 26 April 2001 | REVISION 1 | G2965_9

01_4632