MINERAL HOLDINGS AUSTRALIA PTY LTD

RETENTION LICENCE 1/2005
HOGARTH CREEK, NW TASMANIA

ANNUAL REPORT ON EXPLORATION
TO JUNE 2018

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For

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ABSTRACT

This report gives a review of the marketing and exploration work carried out by Mineral Holdings Australia Pty. Ltd. over the past 12 months on RL 1/2005. The licence covers 5 sq km in the Dip Ranges and encloses the Thomas Mountain Silica Mine and the Thomas Mountain Frac Sand deposits.

The licence covers the Detention Quartzite of the Rocky Cape Group and the target of exploration is silica, silica sand and quartzite for the chemical, metallurgical glass and coal seam methane industries.

Previous exploration by Mineral Holdings Australia Pty. Ltd. and its joint venture partners has outlined a substantial inventory of potential silica products in the RL consisting of silicified quartzite, sandstone, and soft unconsolidated sand. Three separate resource areas of frac sand have now been outlined. Resource Area 1 lies immediately north of Hogarth's Creek. It contains an estimated 830,000 tonnes of frac sand based on 14 drill holes and 25 shallow auger holes. Resource Area 2 lies immediately to the north of Area1. It contains an estimated 550,000 tonnes of frac sand based on 6 drill holes and 8 shallow auger holes. However it may never be mined due to a thick cover of Banksia Serrata trees. Resource Area 3 lies south of Hogarth's Creek and contains an estimated 1,350,000 tonnes of frac sand based on 43 shallow drill holes. A fourth area near the western boundary of the licence was investigated during 2017 by 10 shallow backhoe holes. It is estimated to contain an additional 36,700 tonnes of frac sand to a depth of 4 metres.

Size fraction and crush resistance testing has been carried out on 8 sand samples from Resource Area 1, the best researched resource area and the area most likely to be mined first. A further sample, a composite of three auger holes drilled previously (holes 35, 36, and 37) in Resource Area 3 south of Hogarth's Creek was taken as an initial evaluation of the sand in that area.

Background environmental data has been collected in preparation for a full environmental effects statement and a contractor has been appointed to market the Thomas Mountain frac sand to the Australian coal gas industry.

Simcoa, the Western Australian Silicon Metal producer, has investigated the Thomas Mountain Quartzite as a possible source of silica feed to blend with their chert deposit in WA during 2016. The Thomas Mountain Quartzite would appear to match specifications and discussions with Simcoa are continuing. The resource of high grade quartzite was reassessed at 386,000 tonnes with a possible extra 180,000 tonnes further to the west.

1.0 INTRODUCTION

RL 1/2005 was applied for by Mineral Holdings Australia Pty Ltd on 21th February 2005 and was granted on 15th June 2005. RL 1/2005 covers the site of the Thomas Mountain Silica Resource which was originally covered by CML 8M/1989 and 1W/1088. Under its policy of revoking non performing mining leases Mineral Resources Tasmania suggested that a Retention Licence would be a more appropriate title for the marketing and industrial testing activities currently being pursued by MHA. Consequently RL1/2005 was granted and the mineral leases cancelled.

The Thomas Mountain Quartzite Mine and the Frac sand prospect occurs in the northern Dip Range about 25 km south-west of Wynyard and 20km south-east of a deep water harbour at Port Latta. Access is via the township of Montumana on the Bass Highway, 25 km west of Wynyard, thence 6 km south along Montumana and Newhaven roads to a turn-off just east of Hogarths Creek. The mine site was also held within 23M/2009 of 2Km² inside RL1/2005 but that mining Licence was revoked late in 2016. RL1/2005 is the only title now covering the Thomas Mountain resources.

Over the past several years, MHA has had discussions with a number of industrial companies, within Australia and overseas, as potential customers or developers of the deposit. However restrictions and outright bans on fracking by various state governments has greatly reduced interest in frac sands at the present time. Acute shortages of gas throughout Eastern Australia should relieve the problem in the near future. MHA has appointed a consultant to assist in bringing the resources into production.

Three separate resource areas of frac sand have now been outlined and a fourth is now under investigation. Background environmental data has been collected in preparation for a full environmental effects statement.

Resource Area 1 lies immediately north of Hogarth's Creek. It contains an estimated 830,000 tonnes of frac sand based on 14 drill holes and 25 shallow auger holes. Resource Area 2 lies immediately to the north of Area1. It contains an estimated 550,000 tonnes of frac sand based on 6 drill holes and 8 shallow auger holes. However it may never be mined due to a thick cover of Banksia Serrata trees. Resource Area 3 lies south of Hogarth's Creek and contains an estimated 1,350,000 tonnes of frac sand based on 43 shallow drill holes. Full details on the resource areas along with size fraction and crush resistance testing on 9 sand samples from Resource Area 1 and 3 have been detailed in the 2016 Annual Report.

A fourth area of frac sand, along strike and to the south west, from the three existing deposits was tested by 10 backhoe holes during the year. It is estimated to contain an additional 36,700 tonnes of frac sand to a depth of 4 metres.

A program of water sampling has been initiated from Hogarth's Creek downstream from the potential work site to provide background water quality data was also listed in the 2016 report.

Simcoa, the Western Australian Silicon Metal producer, has investigated the Thomas Mountain Quartzite as a possible source of silica feed to blend with their chert deposit in WA. The Thomas Mountain Quartzite would appear to match specifications and evaluation work is continuing. As a part of this possible use for the quartzite the resource of high grade quartzite was reviewed and assessed at 386,000 tonnes with a possible extra 180,000 tonnes further to the west.

2.0 GEOLOGY

Resources of high grade quartzite have been reported in various government publications as occurring within the Proterozoic rocks of north- west Tasmania. The better quartzite occurred within the Detention Quartzite sub-group and rocks of this sub-group underlie most of the licence area..

Gee (1971) described the Proterozoic sequence within the Rocky Cape Group from youngest to oldest as – the Jacob Quartzite (1130m in thickness), the Irby Siltstone (760m) and the Detention Sub-group (1400m). Gee suggested The Detention Sub-group contained about 10% siltstone in beds from a few metres to more than 80 metres in thickness. The Rocky Cape Group, in turn, overlies the Cowrie Siltstone which was at least 2400m in thickness.

Structurally the Detention Quartzite is folded into a tight series of anticlines and synclines with north-east trending and dipping axes with folds becoming overturned in the east resulting in north-west dipping beds at 45 degrees or above.

Gee (1971) described the quartzites as uniformly fine grained orthoquartzites with 99% quartz grains and a granular to glassy texture depending on the degree of cementation by silica. Turner (1989) on the other hand preferred to call the mature, quartzose, sandy sediments quartz arenites and attributes their variable physical character as mostly due to variable silicification and occasionally to metamorphism.

The silica resources outlined in the licence by Duncan in 2005 were 0.35Mt of very hard, silicilied sandstone or quartzite, 1.55 Mt of hard sandstone, 0.65 Mt of poorly consolidated or soft weathered sandstone and 2.45 Mt of unconsolidated sand. The frac sand component of that resource has increased to 2.72 million tonnes although 550,000 tonnes of that in Area 2 may never be mined due to the presence of numerous supposedly endangered Banksia Serrata trees. The potential uses of the resources include silicon metal, silica sand and quartzite for the chemical, metallurgical, glass petroleum and coal seam gas industries.

3.0 PREVIOUS EXPLORATION AND EVALUATION

There has been a long history of exploration by MHA and a series of joint venture partners for a wide range of silica products at Thomas Mountain. Details of that work were provided in the 2007 report.
In 1993/4 MHA developed 42 hammer drill holes along 8 sections for 666m in the area SW of Hogarths Creek. This has allowed a resource estimate to be made for an area of about 25 Ha extent to a depth of 10 metres extending south- west of the Quarry site.
(Duncan (2005) estimated an inferred resource of **5 million tonnes** of siliceous material in the area just south of Hogarths Creek which breaks down to –

0.35 Mt of very hard, silicified sandstone,
1.55 Mt of hard sandstone,
0.65 Mt of poorly consolidated, soft sandstone and
2.45 Mt of very soft sand (now 2.72 Mt)

Duncan suggested some infill drilling would be necessary to lift the resource to the Indicated level of the JORC Code. He also suggested a significant increase in resource was likely at depth and along strike to the NE and SW with an inferred 20 Mt of high grade sand and sandstone available as a conservative figure in the area of the Retention Licence.

In 2010 MHA was asked by Temco to supply a bulk sample of quartzite from Hogarth Creek to determine its suitability in the manufacture of Ferro – silicon at the Temco plant in Bell Bay. About 8,000 tonnes of quartzite was mined and crushed on site to +25 -60mm size and 5,000 tonnes of sized material was shipped to Bell Bay. A full report has not yet been supplied but verbal information suggests the Hogarth Creek material provided superior furnace returns but the cost of transport to Bell Bay more than offset the cost of inferior local quartzite. (Great material but cost of transport is too high). Temco has subsequently ceased production of ferro-silicon and the Bell Bay plant is for sale.

In recent times considerable effort was put into testing the unconsolidated sand from Thomas Mountain as a propping agent in oil drilling. Dip Range sand was tested by **Stim Laboratories, Halliburton Services and Dowell Schlumberger** of the USA and **Santos and Amdel** in Australia. Tests were carried out on the 20/45 size range (US screen) which is the -850 to +420um fraction. Dip range sand is a fine / medium grained sand with a median value of about 250um with about 50% in the 20/45 size fraction

As summarized by Stim, the Dip Range sample passed the size analysis, the acid solubility test and the turbidity test but was slightly below standard for shape factor, grain clusters and crush resistance tests for deep wells. From the Amdel tests, it is found that the sand grains have a dramatic decrease in crush resistance at about 4000 psi which would, according to Halliburton, restrict the use of the sand to shallow wells where less than 1200 psi is required in the recovery of methane gas from coal seams.

4.0 CURRENT EXPLORATION AND MARKETING

4.1 FRAC SAND

Four separate resource areas of frac sand have now been outlined and background environmental data has been collected in preparation for a full environmental effects statement. Discussions are underway with potential contract miners and treatment companies to process and market the frac sand to the Queensland coal seam gas industry.

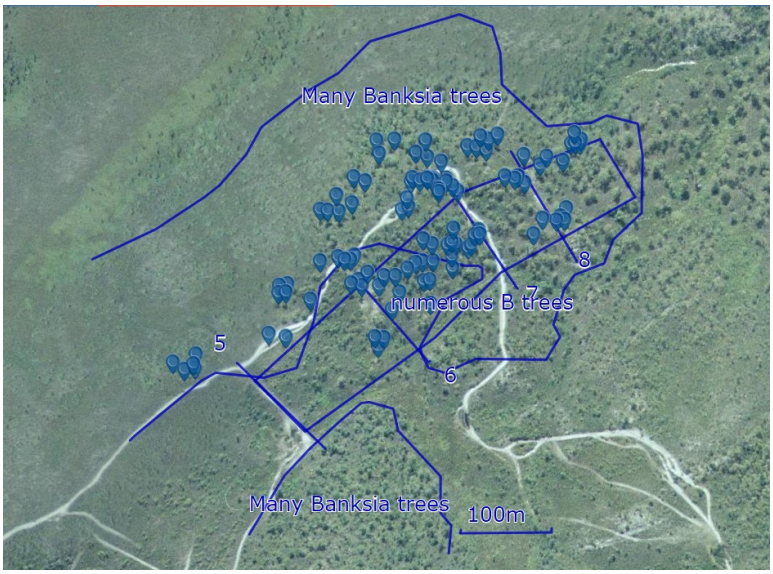
Resource Area 1 lies immediately north of Hogarth's Creek. The resource is based on 14 drill holes and 25 shallow auger holes. The estimated resource to a possible depth of 10 metres is approximately 830,000 tonnes after allowing for a 15% loss during mining and would be close to an indicated resource status under the JORC code although additional drilling would be necessary on the steep down slope sections of the area..

The sand resource exists as a thick 'layer' draped over the south-east slope of a prominent NE-SW trending ridge. A thin veneer of A-horizon soil covers the resource. The soil horizon, which supports heathland and buttongrass regrowth is typically less than 0.5 m in thickness. Banksia Serrata trees are the only threatened faunal species but only one tree occurs within the resource area.

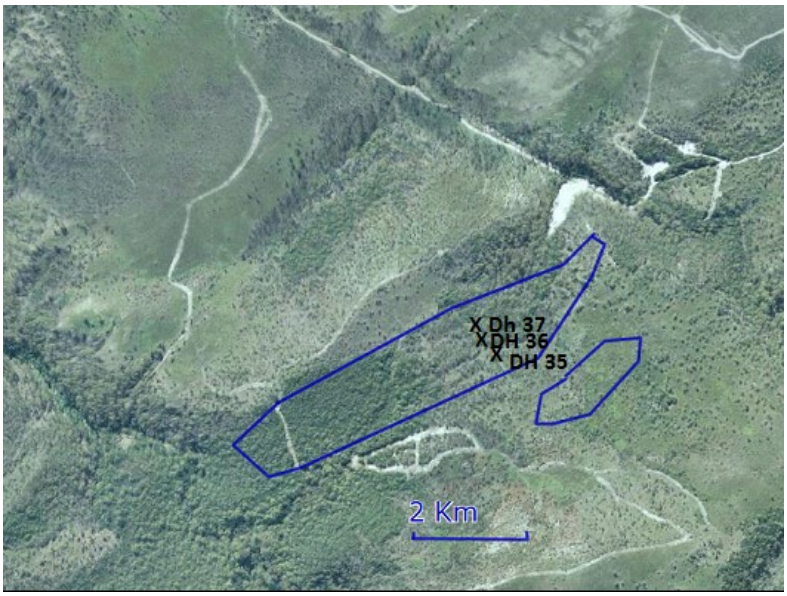
The grain size of the raw sand typically ranges from 1.0 mm (medium silt) down to less than 53 microns. The pay fractions -20 to +40 mesh (-850 microns to +425 microns) and -40 to +70 mesh (-425 to +212 Microns) make up 26.2% and 47.3 % respectively of the sand. The oversize fraction (+20 or 850 microns) makes up only 0.4% of the sand while the fines (less than or minus 70 mesh or 212 microns down to -53 microns makes up an additional 25.1% of the sand. Once markets are established even the 21.8% of the sand sitting below -70 mesh to 140 mesh may be saleable to some frac sand users. Only 1.3% of the sand is fine enough to be sold as silica flour but such small quantities would hardly be economic.

Resource area 1 Scale I----------I 100 Metres

Resource Area 2 lies immediately to the north of Area1. It contains an estimated 550,000 tonnes of frac sand based on 6 drill holes and 8 shallow auger holes. However it may never be mined due to a thick cover of Banksia Serrata trees.



Resource Area 3 lies south of Hogarth's Creek and contains an estimated 1,350,000 tonnes of frac sand based on 43 shallow drill holes.



4.2 Simcoa Quartzite Evaluation.

Simcoa is the major producer of silicon metal in Australia. They currently produce the metal from a chert deposit in Western Australia but are having problems with high levels of alumina, iron titanium and phosphorous and are currently looking for sources of lump silica materials to blend with their material in order to reduce the level of impurities. They visited the Thomas mountain site on 10 th December 2015 and collected a number of representative samples of the high grade quartzite.

Simcoa were especially interested in the Iron, Aluminum, Titanium and Phosphorus content of the samples.. Other elements are monitored but not often included in customer specifications. For the Thomas Mountain Quartzite samples they suggested

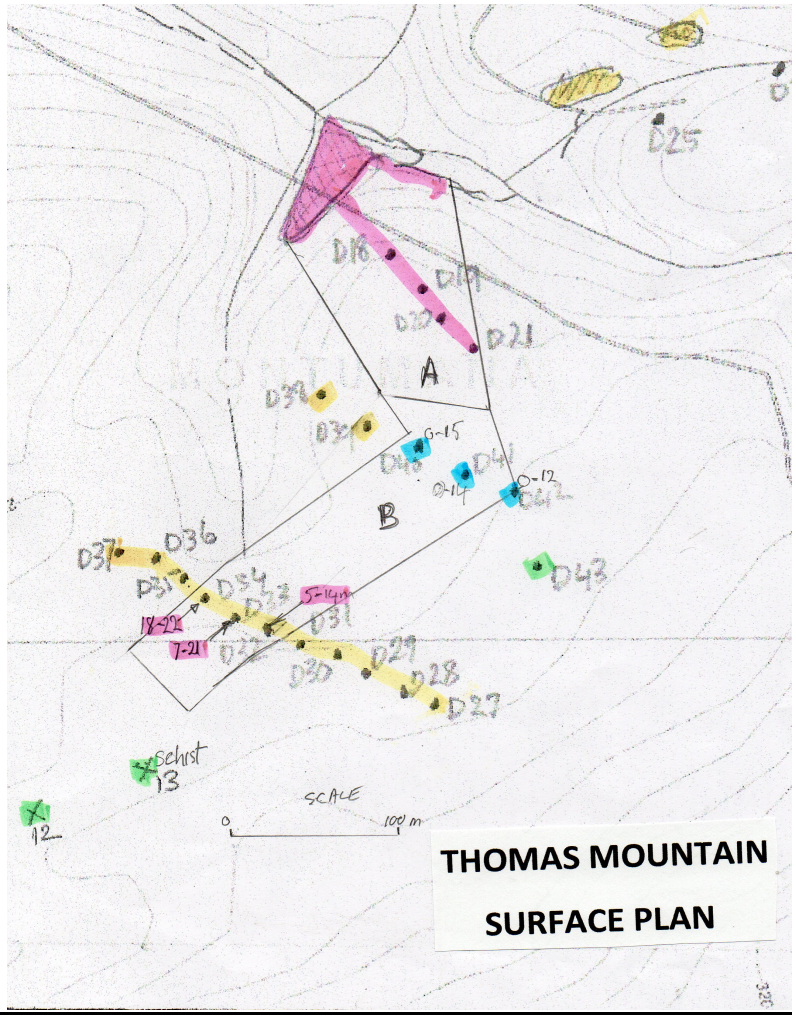
- Fe2O3 – acceptable result, but not outstanding. They work on 0.07% as the cut off for most of their own grades and typically have stockpiles ranging from 0.03-0.07%. The high result on the large lump sample is a concern, but could be sampling error (small volume taken) or contamination (old stockpile present in exposed environment).
- Al2O3 – sample results high. They work on an Al2O3 cut off at 0.20%, having found that high alumina increases the power requirement in the furnace. Again the large crushed lump result is very high.
- TiO2 – sample results tending high. Their internal cut off is ~0.015 % with some grades tolerating 0.030% TiO2.
- P2O5 – sample results very good.

MHA reviewed the quantity of high grade quartzite and a detailed plan has been prepared for the three drill traverses immediately above the quarry, 18-21 (Section 1), and traverses 27-37 (Section 3) and traverse 38-42(Section 2) as shown below. The colour scheme is yellow for sand, red for meets specification, green for schist and quartzite between 0.4 and 1% Al2O3. Blue is used for when there is no assay but the quartzite is described as white, cream or light brown. It should be noted all TiO2 assays by MHA are much higher than BHP or Simcoa most probably due to different assay method.

Two areas have been identified (Area A and Area B) that would meet the Simcoa specification. Area A is immediately adjacent to the pit. It is 12,900 m² in area and is from 10 to at least 14 metres deep. It contains 154,600 m³ of quartzite and using an SG of 2.5 the **tonnage is 386,500 tonnes.**

Area B lies immediately to the south but full assay information is lacking in holes 40, 41 and 42 (marked in blue in the plan below) but the quartzite is described as white, cream, or light brown so it may possibly meet specification. Good quality quartzite was intersected under sand in holes 34, 33, and 32 on section 3 and if the good quartzite extends that far **(AREA B)** then another **187,500 tonnes would be available.**

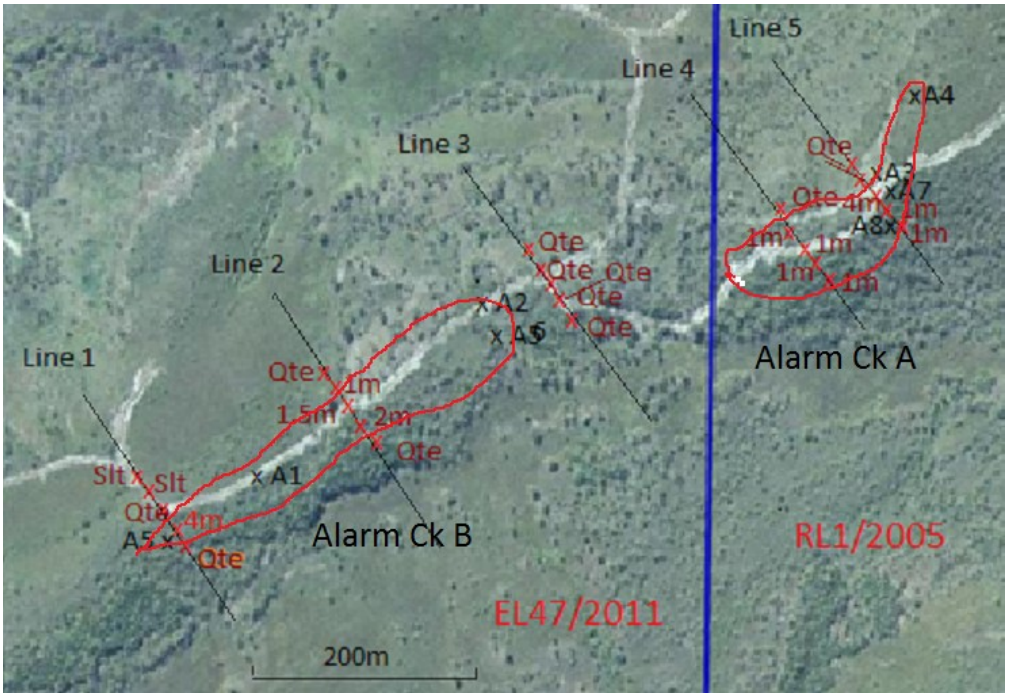
Full details of the resource calculations is given in Appendix 1



Plan 1 Resource areas of high grade quartzite,

4.3 Alarm Creek Area

Exploration work in EL 47/2011on the western boundary of RL 1/2005 located a new frac sand deposit that straddled the boundary between the two licences. The deposit is known as Alarm Creek and 5 backhoe traverses were developed during 2016/7. Two of those traverses fell within RL 1/2005 and have outlined a small isolated deposit of frac sand along strike from the three main deposits.



Alarm Creek deposits straddling boundary of RL 1/205 and EK 27/2011

This new deposit (Alarm Creek) A is estimated to contain 36,700 tonnes of frac sand to a depth of 4 metres.

5.0 FUTURE WORK PROGRAM

Further drilling of the steep down slope section of the resource area is necessary to bring the resource to JORC standard. A program of eighteen drill holes was proposed and a number of drill companies visited the site but all suggested the hill slope was too steep to get any drill rig to the drill locations. It was then proposed to construct a number of dozer tracks parallel to the hill side to allow drill access. Mineral Resources Tasmania then inspected the site prior to approval of the program and suggested the majority of the program was not feasible due to the steepness of the terrain. Any track building would be dangerous and create excessive environmental disruption.

Lachlan Brown from Mineral Resources Tasmania did suggest that six of the holes in the flatter section of the area could be developed with appropriate care. MHA has undertaken to review the program and is seeking out the possibility of using a small portable drill rig from interstate. If that is unsuccessful then the company will proceed with a much reduced program in the flatter section of the area.

Proposed drill holes (green x) and track development (red lines) Area 1 RL 1/2005

6.0 CONCLUSION

MHA is currently working to produce a fully fledged DPEMP report for submission to Environment Tasmania. All basic data has been collected and MHA is currently seeking submissions from potential mine and treatment operators to work the frac sand deposit.a Consultant has been appointed to assist in marketing of the deposits and advertisements have been posted in the financial and mining press magazines.

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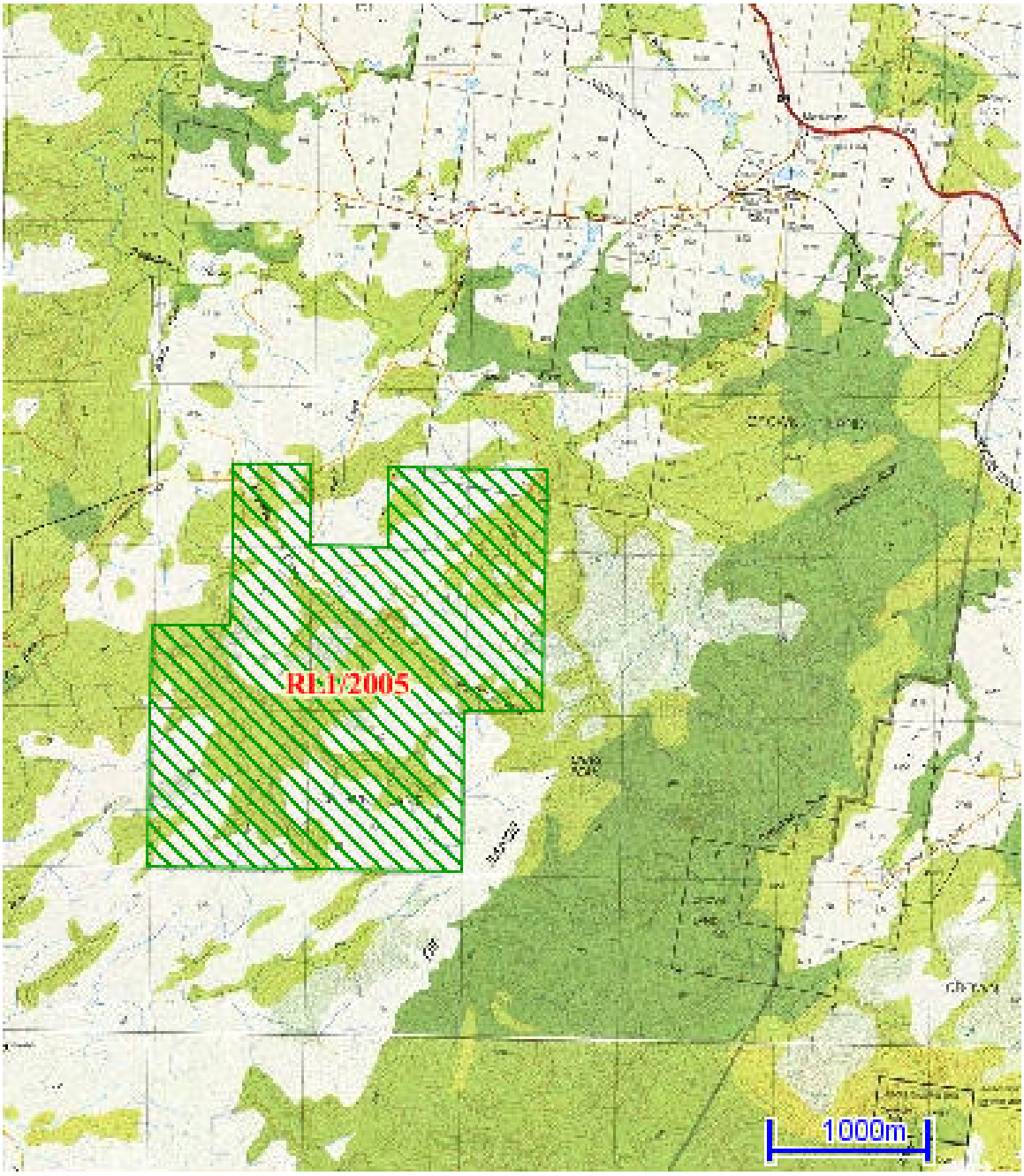
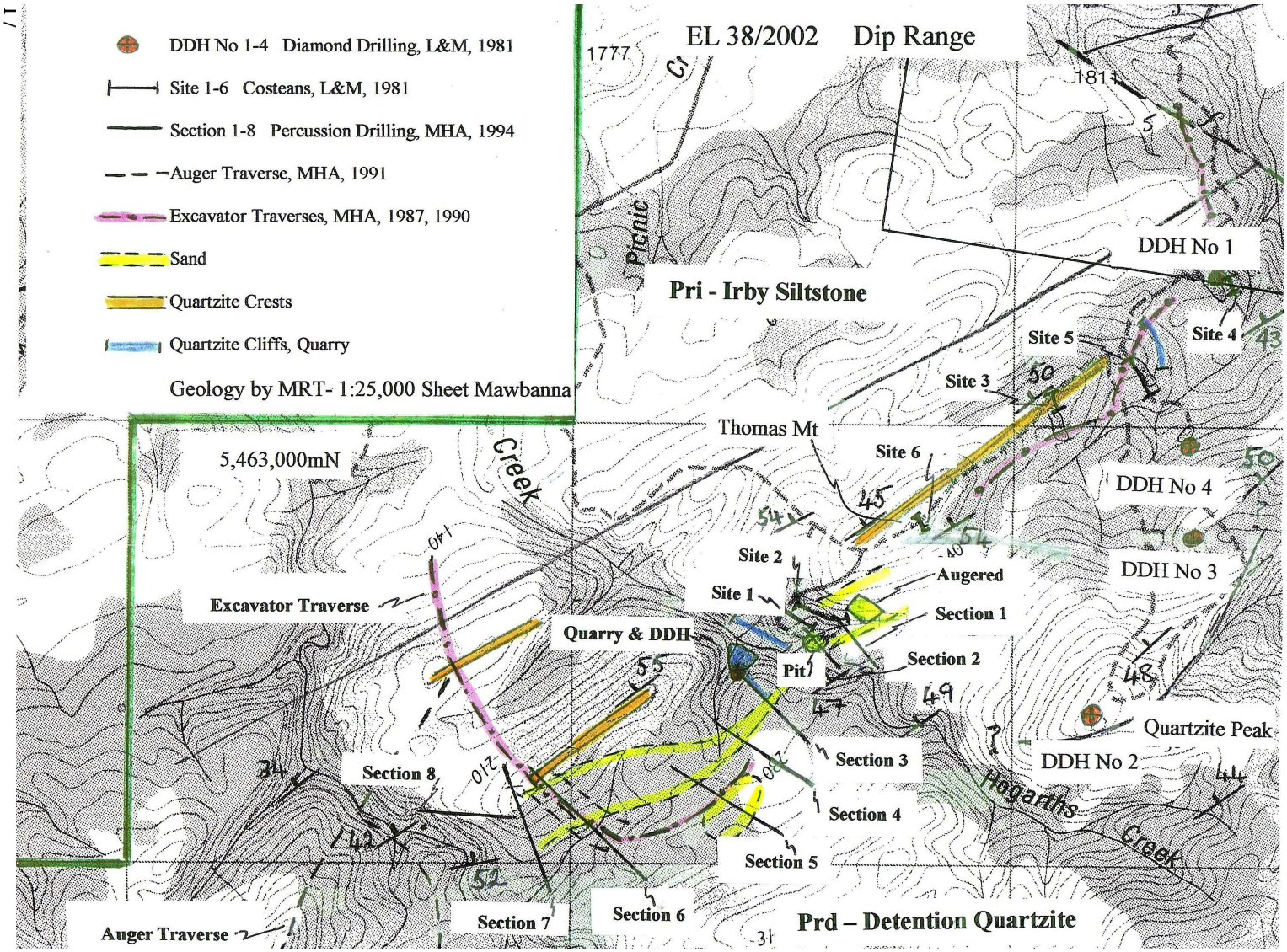
7.0 KEYWORDS

Dip Range, Thomas Mountain, Detention Subgroup, frac sand, Rocky Cape Group, Sand, Quartzite, Silica Resources.

Regional location diagram RL 1/2005



Location diagram RL 1/2005


DDH No 1-4 Diamond Drilling, L&M, 1981
Site 1-6 Costeans, L&M, 1981
Section 1-8 Percussion Drilling, MHA, 1994
Auger Traverse, MHA, 1991
Excavator Traverses, MHA, 1987, 1990
Sand
Quartzite Crests
Quartzite Cliffs, Quarry
Geology by MRT- 1:25,000 Sheet Mawbanna
EL 38/2002 Dip Range
Pri - Irby Siltstone
Prd – Detention Quartzite
Thomas Mt
5,463,000mN
Creek
Picnic
Hogarths Creek
DDH No 1
DDH No 2
DDH No 3
DDH No 4
Quartzite Peak
Site 1
Site 2
Site 3
Site 4
Site 5
Site 6
Augered
Pit
Quarry & DDH
Excavator Traverse
Auger Traverse
Section 1
Section 2
Section 3
Section 4
Section 5
Section 6
Section 7
Section 8