

Titleholder	Mineral Holdings Australia Pty Ltd
Operator	Mineral Holdings Australia Pty Ltd
Tenement	RL1/2005
Report name	RL1/2005 Hogarth Creek. Annual report for period 15 June 2018 to 14 June 2019
Personal authors	R. Fulton
Corporate author	Mineral Holdings Australia Pty Ltd
Target commodity	Silica
Date of report	31 August 2019
Datum/Zone	GDA94, Zone 55
100,000 map sheet	Circular Head 7916
25,000 map sheets	Mawbanna 3646
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ABSTRACT

Mineral Holdings Australia Pty Ltd has identified approximately 5.3 million tonnes of high-grade silica resources at Hogarth Creek in north-west Tasmania. The inventory includes 1.9 million tonnes of quartzite/strongly indurated sandstone, 0.65Mt of soft, weathered sandstone and 2.72Mt of very soft sand. Over a period of several years, the company has undertaken metallurgical test work to determine the suitability of the silica for a variety of industrial uses, including the manufacture of silicon metal, ferro-silicon and as frac sand. The company has vigorously pursued potential marketing opportunities for high value uses of the silica resource and intends to continue. In particular, the frac sand market is seen as significant opportunity if current restrictions on fracking in eastern Australia are eased in light of predicted gas shortages.

In the short term, the company is considering producing a crushed quartzite material for the local construction and roadmaking use. Commercial negotiations are currently being undertaken with a local State-wide construction company.

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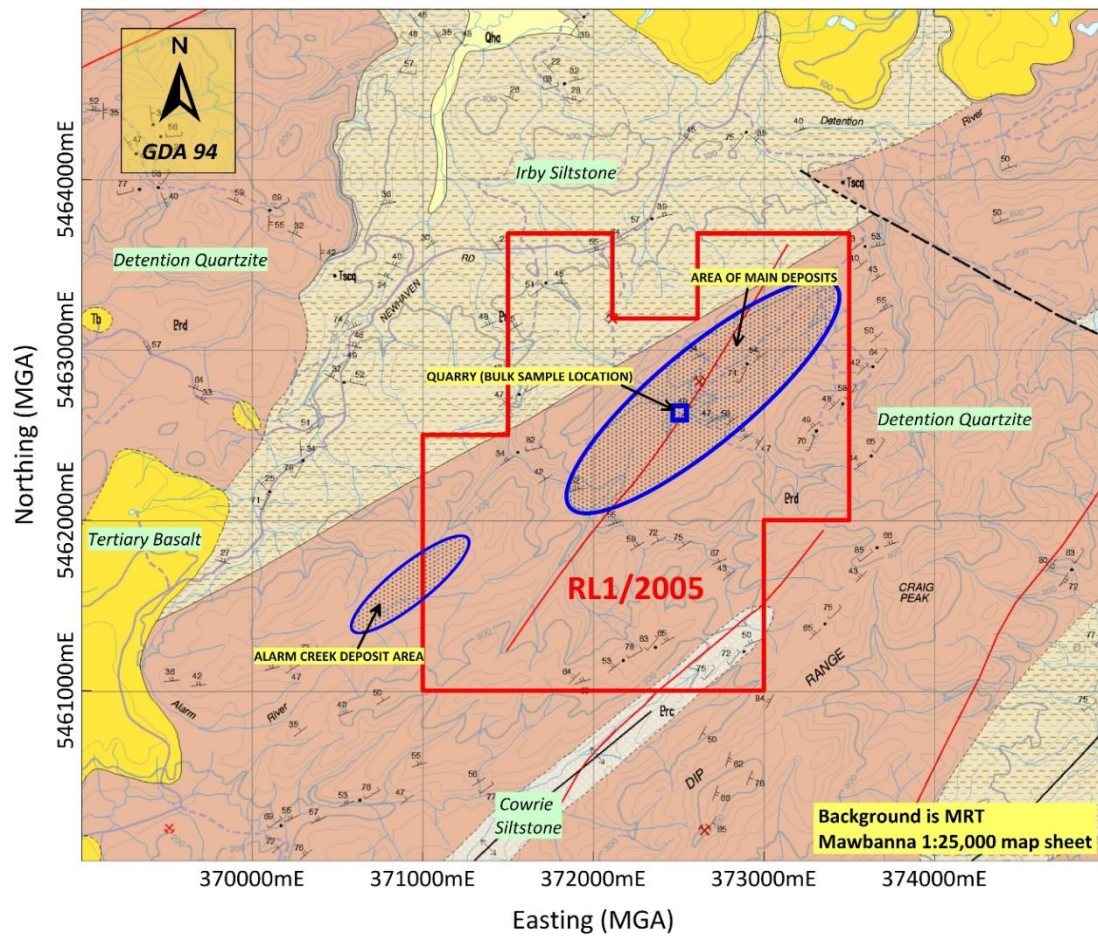
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1. SUMMARY ACTIVITY MAP

No field-based activities took place during the reporting year.



2. INTRODUCTION

2.1 Exploration rationale

The licence area is prospective for silica and silica sand with a variety of potential industrial uses within the chemical, metallurgical glass and coal seam methane industries.

The exploration area is located in the northern Dip Range, approximately 25 kilometres south-west of Wynyard and 20 kilometres south-east of a deep-water harbour at Port Latta. Access is via the township of Montumana on the Bass Highway, south along Montumana and Newhaven roads.

The licence holder has had discussions with a number of industrial companies during the life of the tenement to find a market for a high-grade silica product. A significant effort has been put into finding a market with frac sand users in particular, however restrictions and bans on fracking by state governments in eastern Australia has greatly reduced interest in frac sands at present.



Figure 1: Regional location plan.

2.1.1 Geology

Occurrences of high-grade quartzite within the Proterozoic of north-west Tasmania have been reported in various government publications. The better quality quartzite occurs 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 thick), the Irby Siltstone (760m thick) and the Detention Quartzite (1400m thick). Gee suggested that the Detention Sub-group contained about 10% siltstone in beds from a few metres thick to more than 80 metres thick. The Rocky Cape Group overlies the Cowrie Siltstone, which is at least 2400 metres thick.

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 beds dipping north-west at 45 degrees or more.

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) preferred to call the mature, quartzose, sandy sediments quartz arenites and attributes their variable physical character primarily to degree of silicification or metamorphism.

The silica resources outlined by Duncan in 2005 are 0.35Mt of very hard, silicified sandstone and quartzite, 1.55Mt of hard sandstone, 0.65Mt of poorly consolidated or soft weathered sandstone and 2.45Mt of unconsolidated sand. The frac sand component of that resource is estimated at 2.72Mt although approximately 0.55Mt occur in an area (Area 2) that contains a *Banksia serrata* population and so may not be available for extraction. *Banksia serrata* is listed as rare species under the Threatened Species Protection Act 1995 (Tasmania) and *Banksia serrata* woodland is listed as a rare and endangered forest community under the Tasmania Commonwealth Regional Forest Agreement.

2.2 Tenure and ownership

RL 1/2005 was applied for by Mineral Holdings Australia Pty Ltd (“MHA”) on 21 February 2005 and was granted on 15 June 2005. RL1/2005 covers the site of the Thomas Mountain Silica Resource that was originally covered by CML 8M/1989 and 1W/1088. A later mining lease, 23M/2009 was taken out over the main resource but was revoked in 2016 leaving RL1/2005 as the only extant tenure over the resource.

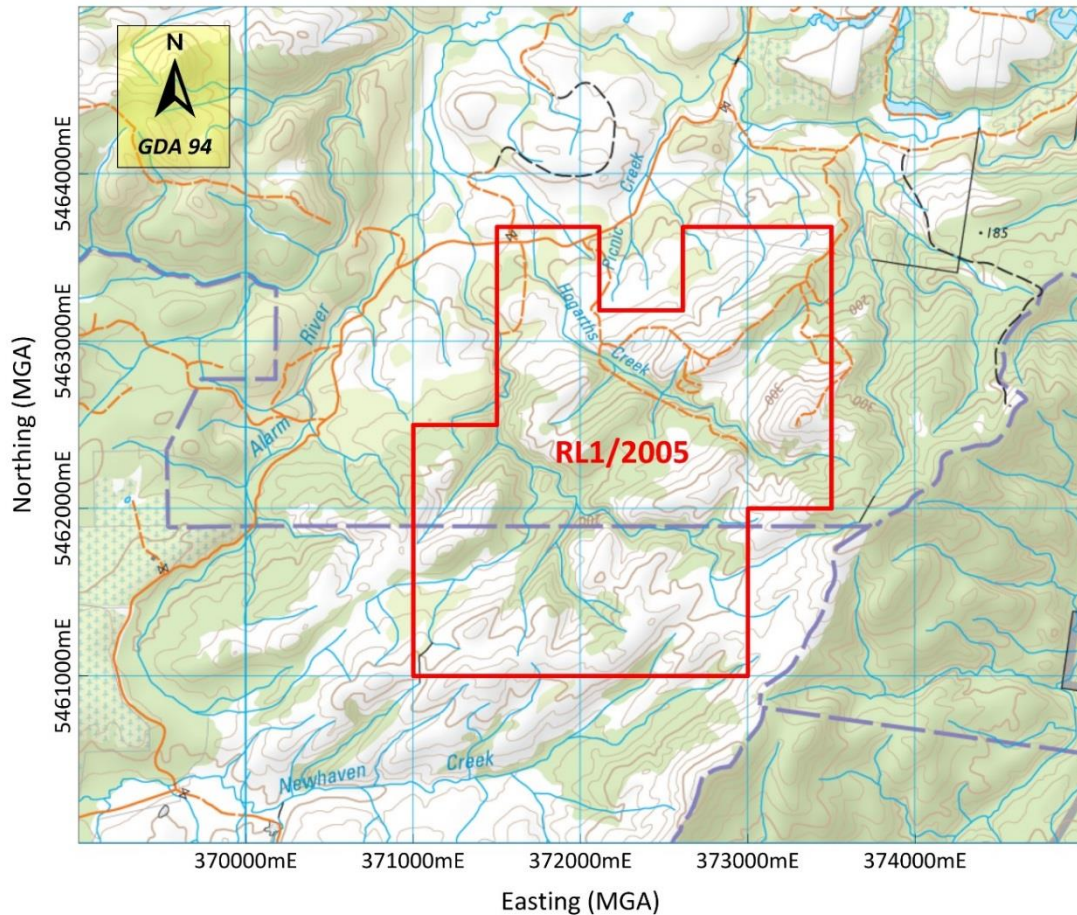


Figure 2: RL1/2005 location plan on Tasmap 1:50,000 topography.

3. REVIEW OF PREVIOUS WORK

3.1 During the life of the licence

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, under former licences. Details of that work have been provided in previous reports.

In 1993/94, MHA completed 42 percussion drill holes for a total of 666 metres along 8 sections in the area south-west of Hogarth Creek. This drilling formed the basis for a resource estimate to be made over an area of approximately 25 hectares to a depth of 10 metres, extending south-west from the Quarry site. Duncan (2005) estimated an inferred resource of 5 million tonnes of siliceous material in the area south of Hogarth Creek broken down as follows:

- 0.35 Mt of very hard silicified sandstone
- 1.55Mt of hard sandstone
- 0.65Mt of poorly consolidated, soft sandstone
- 2.45Mt of very soft sand (since increased to 2.72Mt)

Duncan suggested that some infill drilling would be necessary to lift the resource to a JORC Indicated Resource. He also suggested that a significant increase in resource

was likely at depth and along strike to the north-east and the south-west, with a potential Inferred resource of 20Mt of high-grade sand and sandstone available within the licence area.

In 2010, MHA was asked by Temco to supply a bulk sample of quartzite from Hogarth Creek to determine its suitability for use in the manufacture of ferro-silicon at its Bell Bay plant. Approximately 8,000 tonnes of quartzite was mined and crushed on site to +25 to -60mm size and 5,000 tonnes of sized material was transported to Bell Bay. A full report is not available but verbal information indicated that Hogarth Creek material provided superior furnace returns but the cost of transport to Bell Bay more than offset the cost of inferior local quartzite. Temco subsequently ceased production of ferro-silicon.

Frac sand

Subsequently, MHA focussed on testing the unconsolidated sand for suitability as a propping agent in oil and gas drilling. Dip Range sand was tested by Slim Laboratories, Halliburton Services and Dowell Schlumberger (all based in the USA) and by Santos and Amdel in Australia. Tests were carried out on the 20/45 US screen size range (-850 to +420 micron fraction). Dip Range sand is a fine-medium grained sand with a median value of approximately 250 microns with about 50% in the 20/45 size fraction.

As summarised by Stim Laboratories, 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 test, it was found that the sand grains have a dramatic decrease in crush resistance at about 4,000 psi which would, according to Halliburton, restrict the use of sand to shallow wells where less than 1,200 psi is required in the recovery of methane gas from coal seams.

Four areas of frac sand have been identified and background environmental data (e.g. water quality data) has been collected to assist in preparation for future mining permitting. The focus has been on the potential to provide frac sand to the Queensland coal seam gas industry and discussions with potential mining and beneficiation contractors are ongoing.

Resource Area 1 lies immediately north of Hogarth Creek. The resource is based on 14 drill holes and 25 shallow auger holes. The estimated resource to a depth of 10 metres is approximately 830,000 tonnes after allowing for a 15% loss during mining. Additional drilling would be required to bring the resource to a JORC Indicated Resource status.

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 button grass regrowth is typically less than 0.5 metres in thickness. One *Banksia serrata* tree, a listed rare species under the Tasmanian Threatened Species Act 1995, occurs within the resource area.

The grain size of the sand typically ranges from 1.0mm (medium silt) to less than 53 microns. The pay fractions -20 to +40 mesh (-850 to +425 microns) and -40 to +70 mesh (-425 to +212 microns) make up 26.2% and 47.3% respectively. The oversize fraction (+20 or +850 microns) makes up only 0.4% of the sand while the fines, -70 mesh or -212 microns, makes up an additional 25.1% of the sand. Once markets are established, even the 21.8% of the sand resource lying in the -70 to +140 mesh range (-212 to +105 microns) may be saleable to some frac sand users. Only 1.3% of the sand is fine enough to be sold as silica flour and so is unlikely to be economic.



Figure 3: Resource Area 1 on Google Earth background.

Resource Area 2 lies immediately to the north of Area 1. It contains an estimated 500,000 tonnes of frac sand based on 6 drill holes and 8 shallow auger holes. Resource area 2 contains a significant occurrence of *Banksia serrata* woodland. *Banksia serrata* is listed as rare species under the Threatened Species Protection Act 1995 (Tasmania) and *Banksia serrata* woodland is listed as a rare and endangered forest community under the Tasmania Commonwealth Regional Forest Agreement. It is uncertain as to whether permission for mining to occur in this area would be granted.

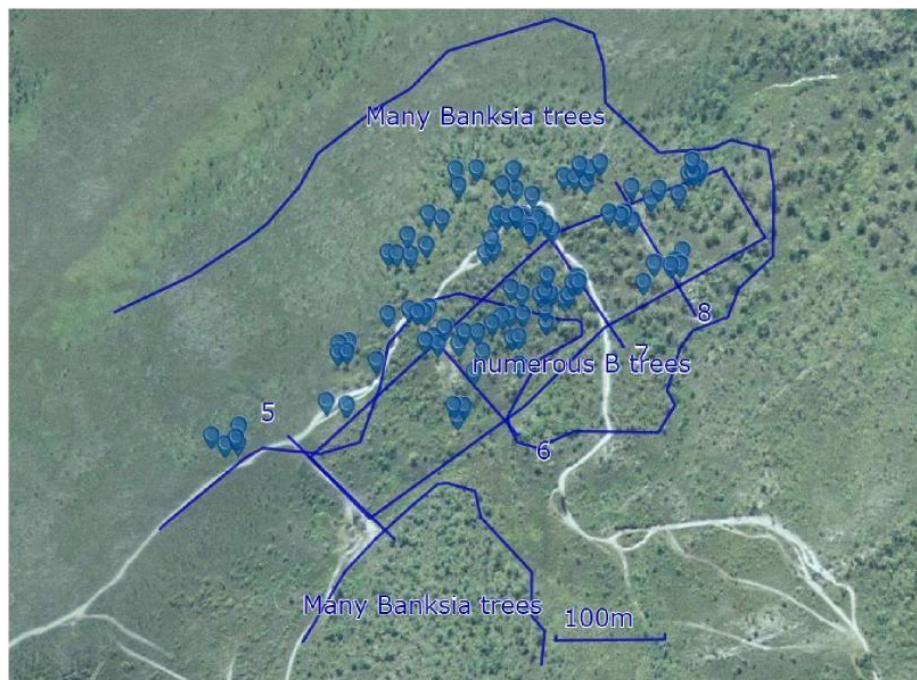


Figure 4: Resource Area 2 on Google Earth background.

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

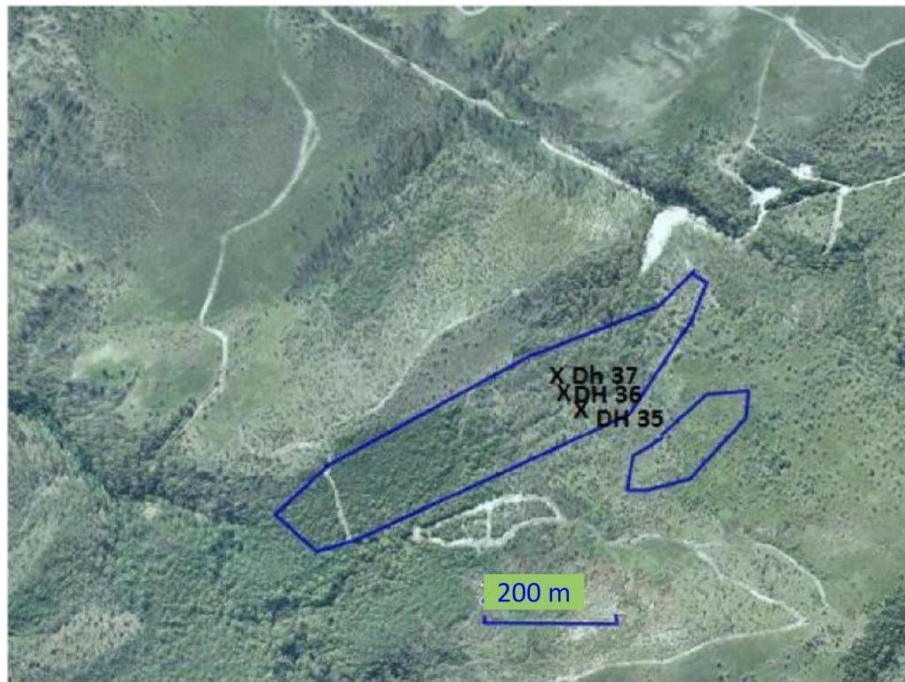


Figure 5: Resource Area 3 on Google Earth background.
(Drill holes for Stim Laboratories composite sample shown).

Resource Area 4 or the Alarm Creek Area was identified in the 2017-2017 season through 5 backhoe traverses. The potential resource straddles the western boundary of EL1/2005 and lies along strike from the three main deposits. This area is estimated to have the potential to contain approximately 36,600 tonnes of frac sand to a depth of 4 metres.

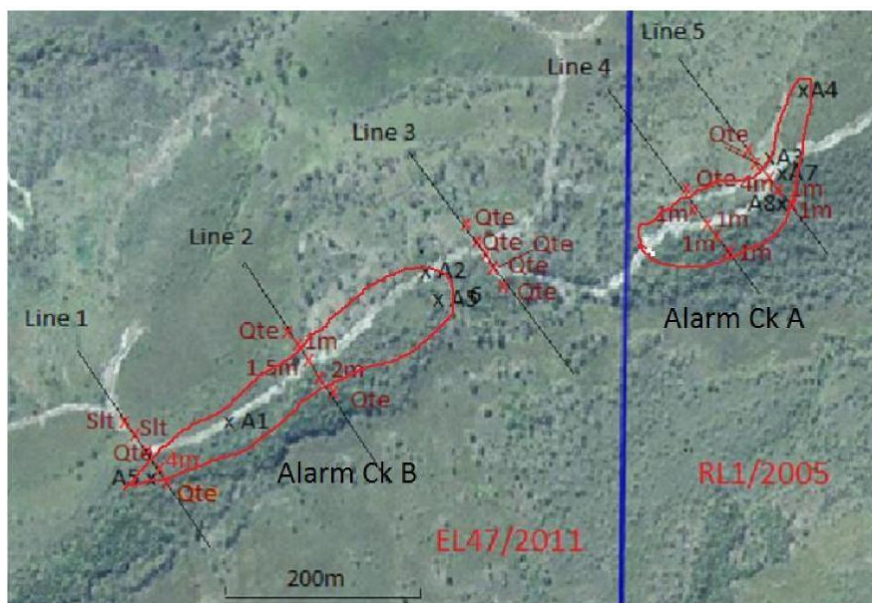


Figure 6: Resource Area 4 on Google Earth background.
(EL47/2011 no longer exists).

Simcoa is the only producer of silicon metal in Australia. Simcoa visited Hogarth Creek in December 2015 and collected a representative sample of high-grade quartzite to use to determine whether silica from the RL would be suitable to use as a blending agent with the material they currently mine in WA to reduce the impurities aluminium, iron titanium and phosphorous.

A hand-drawn map of a study area, likely a geological or environmental site. The map features a pink shaded area labeled 'A' and a yellow shaded area labeled 'B'. Various points are marked with dots and labeled with codes: D16, D17, D20, D21, D25, D27, D28, D29, D30, D31, D32, D33, D34, D35, D36, D37, D38, D39, D40, D41, D42, D43, D44, D45, D46, D47, D48, D49, D50, D51, D52, D53, D54, D55, D56, D57, D58, D59, D60, D61, D62, D63, D64, D65, D66, D67, D68, D69, D70, D71, D72, D73, D74, D75, D76, D77, D78, D79, D80, D81, D82, D83, D84, D85, D86, D87, D88, D89, D90, D91, D92, D93, D94, D95, D96, D97, D98, D99, D100. A scale bar at the bottom indicates 100 m. A green 'X' marks 'Schist 13'. A pink box contains the text '17-21' and another pink box contains '5-14m'. A yellow box contains 'G-15' and a blue box contains 'G-12'.

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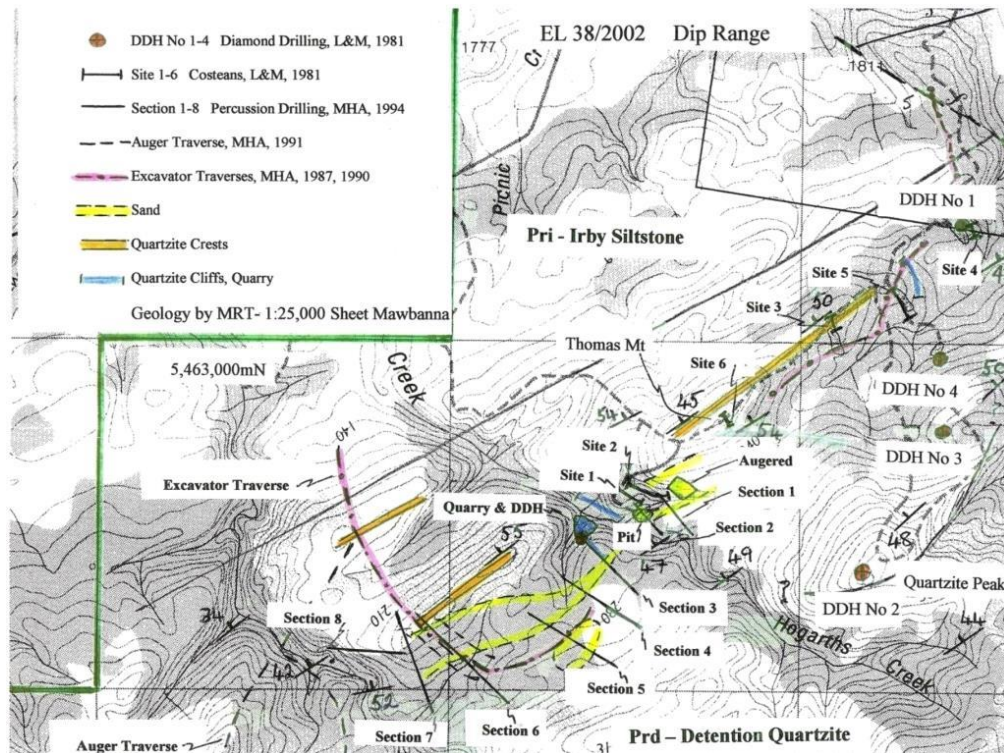


Figure 8: Summary sketch plan showing geology and exploration at Hogarth Creek.

4. EXPLORATION COMPLETED DURING THE REPORTING PERIOD

4.1 Regional exploration activities

No regional exploration activities were carried out during the reporting period.

4.2 Prospect-based exploration activities

Prospect-based exploration activities as described in the previous section were carried

4.3 Feasibility activities

During the reporting year, the company has held discussion with a Tasmanian-based construction company, Hazell Brothers, to supply crushed quartzite material from the licence area for general construction and road-making purposes. MHA are in the process of negotiating a commercial agreement.

5. DISCUSSION OF RESULTS

No new exploration results are available for discussion.

6. CONCLUSIONS

The focus during the last year has shifted from the longer term aim of finding a market for high value frac sand in eastern Australia to finding a source of income by selling crushed quartzite as construction material locally. MHA remains confident that restrictions on fracking in eastern Australia will eventually be eased as gas shortages develop and a market will eventually be found for the frac sand resource.

A customer for construction material has been identified and commercial negotiations are in process. The company expects to decide in the near term in regard to commencing operations to supply locally.

At an administrative level, the company has undergone board changes and is in the process of reviewing past and present operations.

7. FUTURE EXPLORATION

The company propose to continue to seek customers for higher value silica products as well as to progress negotiations with Hazell Brothers to the stage where mining can commence. To that end, a modest budget is proposed to enable a small pre-extraction drilling program to better define the resource for initial quarry operation.

8. ENVIRONMENTAL MANAGEMENT

No surface disturbing activities were carried out during the year. Some rehabilitation of disturbance relating to the bulk sample taken from the existing quarry in 2010 is likely to be required.

One species listed as Rare (Threatened Species Protection Act 1995) is present in the area – *Banksia serrata*. *Banksia serrata* woodland is also listed as a rare and endangered forest community under the Tasmania Commonwealth Regional Forest Agreement. The species is easily identifiable.

9. EXPENDITURE

Expenditure for the year was:

Feasibility	\$5,000
Other	\$10,000
Administration	\$1,500
TOTAL	\$16,500

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