

REF:4300 / Garden Gully

2 December 2003

Hoskins & Associates Ltd

PO Box 11-428

Ellerslie Mail Centre

Auckland

Attn: Grant Hoskins

RE: Garden Gully - Summary of Resource Potential

Dear Sir

As requested this letter discusses the resource potential within Coal Mining Licence (CML) 37-147 and Mining Permit (MP) 41-315 at Garden Gully, Moonlight Creek, West Coast, New Zealand.

Existing Licences and Permits

Coal mining licence 37-147 was granted on 12-07-1994 and expires on 11-07-2014. The licence covers an area of 38.35 hectares and allows for the mining of coal.

Mining Permit 41-315 was granted on 13-06-1995 and Expires on 12-06-2015. The permit covers an area of 23.02 hectares and allows for the mining of alluvial gold.

It is understood that no resource consents are required to mine coal, or for the dry screening of coal. A water take and discharge consent would be required for any wet processing, but coal washing is not considered necessary due to the low ash content of the coal and the inability to remove significant sulphur by washing.

A mining licence condition stipulates that the District Council must approve dust control measures. For any mining of over a few hundred tonnes of coal a year, a water cart would be required for dust suppression. This would need consent to take water, and as wet screening is more efficient than dry screening, water for this use should be included and a discharge consent for screening water obtained.

If stream diversion is needed a consent may be required before mining in the stream area takes place. Licence conditions require a 20 metre buffer strip to be left against any streams unless otherwise approved by the Regional Council.

A water take and discharge consent may be required for wet processing of alluvial gold, but obtaining this is not likely to be difficult.

Coal Resource Potential

Coal Tonnage

In September 2003 we reviewed the geology of CML 37-147 and subsequently developed a computer model to assess the coal resources within it.

In the east the coal was modelled to be dipping at 20 degrees to the west, and in the north-west the coal was modelled as dipping at 30 degrees to the south-east. Based on calculations from available geological data these assumed dips are likely to be conservative.

The model also assumed the coal seam to have an average thickness of 6m. Personal communication with Mr Paul Cunneen has suggested however that the average coal seam thickness may be 8m. If this is the case then resource estimates based on a 6m thick seam are also conservative.

Based on our existing model, total coal tonnage within CML 37-147 (with a density of 1.2 t/m^3) is 1.4 million tonnes with a total stripping ratio of 6.8:1 (waste:coal, m^3 :t).

If the coal seam were 8m thick as suggested by Paul Cunneen, the coal tonnage within CML 37-147 would increase to 1.8 million tonnes. with a stripping ratio of 5.3:1 (waste:coal, m^3 :t).

If the coal does dip at an angle less than that currently modelled the volume of overburden to be stripped will also reduce. This will improve the projects economics by reducing the stripping cost associated with each tonne of coal mined.

Coal Quality

Coal at Garden Gully has the following quality characteristics:

Rank: The coal is sub-bituminous.

Sulfur: Garden Gully coal has a moderately high sulfur content. An average reported sulphur value for Garden Gully is approximately 4.28% by weight.

Ash: Garden Gully coal is reported to have a very low ash content down to 1.1% by weight. Ash fusion temperature is reported to be low.

Moisture: The water content of the coal is reported to be 17% by weight.

Coal Utilisation and Market Potential

Coal from Garden Gully mine has previously been sold for industrial and domestic use. The coal has been successfully used to fire saw mill boilers with no evident problems related to the low ash fusion temperature or relatively high sulphur content.

While sulphur content is high by New Zealand standards, coal with 4-5% sulphur is widely used as an industrial fuel in many countries.

The energy content of the coal (approximately 23 MJ/kg) is comparable to other thermal coals produced and used locally in New Zealand. Pre-drying (using low grade waste heat) has the potential to significantly increase the calorific value of Garden Gully coal, as does blending with a higher rank coal.

Blending with a low sulphur coal would decrease the average sulphur content and significantly increase the market potential for Garden Gully coal.

The Garden Gully mine has a favourable stripping ratio, which will minimise mining costs and a coal sale price up to \$50 per tonne could realistically be expected.

Silica (SiO₂) Potential

Silica is used in the manufacture of glass, cement, ceramics, as a foundry sand, metallurgical flux, filtration medium and in producing silicon metal, ferrosilicon and fused silica. It is also used for a range of applications in the electronics, chemical and construction industries.

Sources of silica are commonly classified as either "fine silica" which comprises silica sand and friable sandstone, or "coarse silica (also referred to as "lump silica") which includes quartz, quartzite, and quartz gravel.

Three samples of vein quartz from within CML 37-147 have been analysed by Mine Design Systems Ltd to assess their suitability as lump silica feedstock for silicon smelting. Analysed SiO₂ contents were 99.63wt %, 98.98wt %, and 99.79wt%.

In all three samples the major impurity elements were well below limits for metallurgical grade silicon and one of the samples indicates the potential for the silica to be used for chemical grade silicon smelting as it has very low aluminium concentrations.

Concentrations of the trace elements scandium, vanadium, chromium, nickel, copper, zinc, gallium, rubidium, strontium, yttrium, zirconium, niobium, barium, lanthanum, lead, cerium, and thorium are all very low.

The concentrations for all impurity elements analysed for in Garden Gully vein quartz are lower than the limits derived from impurity levels specified by Dosaj (1997) for chemical grade elemental silicon. There is therefore the potential for the vein quartz to be used as lump silica feedstock for high grade silicon smelting.

Based on communications with Paul Cunneen, the quartz vein is at least 3m wide, 15m high, and extends for a length of 1000m. A vein of these dimensions would provide approximately 120,000 tonnes of lump silica, which when smelted would produce approximately 50,000 of silica metal.

In 2000 the crushed quartz aggregate sale price in Australia was around A\$35 per tonne, whereas fused silica was around A\$1150-1500 per tonne.

Alluvial Gold Potential

Geo Resources Limited assessed the alluvial gold potential of MP 41-315. They postulated the potential gold resources within CML 41-315 as up to 5,800 ounces. Current gold sale price is around US\$400 per ounce. Any profits derived from mining alluvial gold would offset the stripping costs of the coal mining operation, increasing the overall profitability.

Other Potential Resources

Limestone

Limestone beneath the coal seam has the potential to be utilised to mitigate acid drainage from the coal measures. It also may have some value for co-firing with coal to reduce effects of sulphur in some boiler systems.

Areas Outside Existing Licences and Permits

There exists the potential for additional coal resources to the south west of CML 37-147 and there may be some merit in applying for prospecting permits in this area to supplement the existing coal resource within CML 37-147. This will capitalise on mine infrastructure developed in the course of mining at Garden Gully.

There are also in existence other alluvial gold mining permits in the Garden Gully area that could perhaps be obtained to supplement the alluvial gold resource.

Potential Resource Summary


Based on our own work and our review of existing literature, the following summarises the potential resources within the Garden Gully licence and permit areas:

Coal	1.8 million tonnes
Alluvial Gold	5,800 ounces
Lump Silica (SiO ₂)	120,000 tonnes

Please contact me directly if you require clarification on any of the issues discussed here.

Yours sincerely

Mine Design Systems Ltd

A handwritten signature in blue ink, appearing to read 'G. R. Gray', with a long horizontal flourish extending to the right.

Gary Gray
Director

CC: