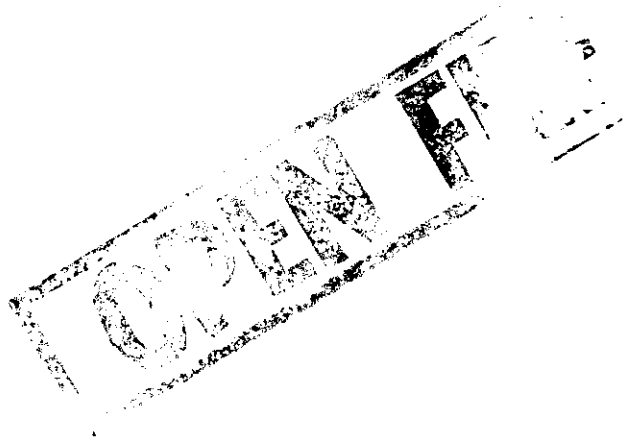
EL 15/85

ANNUAL REPORT 1986



87-2631

000

954001

EXPLORATION LICENCE 15/85

ANNUAL REPORT 1986

Four areas were programmed to be investigated during 1986.

(a) Drilling

It was intended to percussion drill the previously located sand deposits and penetrate the quartzite layers to determine whether there was sand under the quartzite. Previous investigation of the sand in the Sisters Hills west of Boat Harbour had shown that shale occurred under a thin quartzite layer.

(b) Drill sample preparation

Analysis of the previous auger drilling samples showed that high grade silica sands become severely contaminated during drilling. A method of removing the impurity from the drilling process had to be devised and laboratory simulation of the upgrading that would take place in a sand washing had to be determined.

(c) Marketing

To enable the silica sand to be successfully mined, processed and sold appropriate markets have to be located. Domestic and export markets were investigated.

(d) Silica Flour and Magnesite

Uses for the silica flour rock at the Cann Creek quarry and the magnesite nearby were investigated.

Drilling:

(i) Sisters Hills - Brambles sand pit west of Boat Harbour Beach:

After proving the existence of high grade sand and quartzite, the quartzite outcrops were percussion drilled by Queensland Mines for Pioneer Silicon to determine the depth of the quartzite. It proved to be a thin veneer over shale only a few metres thick and hence of no further commercial interest.

(ii) Lapoinya Pine Plantation: 3784E 4574N

Because of the loose nature of the sand any drill rig used would have to be towed up the face of the deposit by bulldozer. This limited severely the range of drill rigs that could be used to pneumatic airtracks. Availability of suitable drill rigs proved to be very small and a suitable rig could not be obtained in the reporting period. (The drilling has been subsequently completed after two drillers who were contracted to do the work failed to turn up.)

(iii) Dip Range:

The same problems encountered in drilling the Lapoinya Pine Plantation also applied to the Dip Range. (This also has been subsequently completed.)

From the drilling carried out after the reporting period it can be concluded that there is a large deposit of friable high grade sand adjacent to the Lapoinya Pine Plantation.

Drill Sample Preparation:

Analysis of the drill samples by commercial laboratories with various suggestions for cleaning the samples produced highly variable results which bore little or no relationship to the results from surface hand samples. It thus became important to establish a method of sample preparation which would return the sample back to its inground state and also to determine to what extent the sample could be beneficiated by the wash plant to be designed later.

Various processes were tried by S.G.S. in Sydney but the results were inconsistant so Kyoritsu of Japan was asked for a solution. Their laboratory preparation method and pilot plant results gave good correlation. However, commercial laboratories in Australia do not have the appropriate facilities and modifications to the method had to be made.

The resultant method is :

(a) Attrition for one minute in water
(b) Wash in water and decant the slimes four times
(c) Pass through a high intensity magnetic separator
(d) Wash in (6N) Hydrochloric acid with agitation for 18 hours
(e) Wash in water then dry
(f) Float off using T.B.E. or similar heavy liquid
(g) Wash with ethyl alcohol
(h) Analyse for impurities

Whilst the method is very expensive there is no alternative method to determine accurately in a laboratory the purity that can be achieved without constructing a pilot plant.

Results obtained using this method are usually interesting geologically as the propensity for a given sand deposit to beneficiation has little correlation with its inherent purity in the "as mined" state.

Marketing

A marketing study was carried out in Australia, S.E. Asia, Japan, Taiwain, Korea and Europe to detemine the grades of silica sand that could be sold and for what prices. The only grades that are required are for glass making purposes, for fracturing and for high grade fillers after milling.

.../...

(a) Fracturing

Sand for this purpose needs to be single sized, absolutely spherical with high compressive strength and acid insolubility. Spherity is the hardest parameter to obtain and the sands from Lapoinya and the Dip Range are rounded but not spherical. They would probably satisfy many applications but at this stage there is little demand for fracturing sand due to the downturn in oil drilling. It is expected that when oil drilling returns to its normal, historical level, fracturing sands will be in demand again and the possibility of using these sands determined.

(b) High Grade Fillers

Silica fillers are used in nylon, plastics, rubber, food, detergents etc. The usual source is by milling high grade sand then beneficiating to remove impurity introduced in the milling process. The Australian market (mainly Melbourne and Sydney) is satisfied by sand from Lang Lang in Victoria. However, South East Asia currently imports significant quantities and there is a potential export market to satisfy that demand.

Fused quartz (cristobalite) in in demand throughout the world and is produced by fusing high grade quartz then crushing, milling and beneficiating. The Japanese, South East Asian and Australian markets would be available to a Tasmanian plant. This option is currently being investigated.

Amorphous silica or silica gel is used in food e.g. tooth paste. It can be sourced from flyash but the more usual route is to put high grade silica into solution e.g. silicon tetrachloride then precipitate the silica at the required particle size. There is a current shortage of amorphous silica and this option is also being investigated.

(c) Glass Sand

The sand would be suitable for producing silica for plate glass, T.V. tubes, light globes, automotive glass and tableware. Australian markets are generally well satisfied with local sources but there are opportunities for export to south East Asia, Taiwan, Korea and Japan. These markets are currently supplied by Mitsubishi from Cape Flattery in North Queensland, but most customers prefer to have two sources and some customers will not buy from Mitsubishi because of direct competition from Mitsubishi's manufacturing divisions.

If the Shelburne Bay project proceeds then the dual sourcing requirement or other then Mitsubishi sourcing will generally be satisfied. If it does not go ahead there will be a requirement for 200,000 per year of export silica sand. We are maintaining contact with the major Japanese trading houses should any opportunity arise.

Tonnes?

Silica Flour and Magnesite:

The silica flour at Cann Creek was previously proven to be too small to be commercially viable however, there is a considerable amount of silica flour rock. The possibility of using this rock as a feedstock for fused silica is being investigated.

Magnesite in the same location is marmoreal and has a relatively unique appearance. Samples were taken for cutting and polishing and the results would satisfy most architects. Unfortunately it is extremely difficult to justify any marble mine in Australia because of the vast range of marble types and resultant small production from each source. The best solution appears to be to leave samples with each of the Australian and major overseas dimension stone suppliers and quarry the required blocks on an opportunity basis whenever orders are received.

Conclusion:

Little exploration work was done during the year because of the problems in obtaining a suitable drill rig. Now that this has been resolved it is expected that a complete investigation of the sand potential will proceed smoothly.

BRH 30.3.87
10/38