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PROPERTY FILE

MAKORTOFF TRAVERTINE PROPOSAL

E. W Crowe. Oct 1975

PROPERTY FILE

REPORT ON THE MAKORTOFF TRAVERTINE PROPOSAL

Object

Mr. Makortoff submitted a request for assistance to the B.C. Government with regard to his travertine deposit in June, 1975. The reply from Mr. McMynn indicated that he was not willing to recommend the expenditure of any funds on the project. Mr. Markortoff replied in October, 1975, requesting the cost analysis on which the above decision was made.

The report attempts to provide a realistic cost base from which Mr. Makortoff can proceed, as well as a specific direction of operation.

The Market

A report on travertine marble by the Import Analysis Division, Department of Industrial Policy (Ottawa) indicated that imports into Canada of slab and tiles totalled about 65,000 $ft.^2$ for the first quarter of 1973 (est. 260,000 $ft.^2$/1973) with a value of $48,000 (est. $192,000/1973). Sightly more than 30% of this material entered western Canada. At the same time all classes of marble

TABLE 1 - BUILDING STONE AND NATURAL ROCK PRODUCTS

IMPORTS (OVER $75,000) THROUGH B.C. CUSTOM PORTS - 1974

	Country	Unit	Quantity	Value
Pumiceand Lava - crude or ground	U.S.A.	cwt.	51,908	199,288
Silica sand	U.S.A.	ton	127,423	1,157,995
Sand and gravel NES	U.S.A.	ton	1,192,809	1,156,477
Crushed limestone and limestone refuse	U.S.A.	ton	40,291	433,189
Crushed stone and stone refuse	Mexico	ton	22	506
	U.S.A.	ton	27,366	434,282
			27,388	434,788
Talc or soapstone	U.S.A.	ton	4,709	294,459
Roofing granules	U.S.A.	cwt.	166,592	244,360
Marble, shaped or dressed	Italy	N/A *	N/A	102,461
	Portugal	N/A	N/A	27,103
	Taiwan	N/A	N/A	5,111
	U.S.A.	N/A	N/A	31,461
				166,136
Natural stone, basic products, NES	Italy			76,537
	Netherlands			1,832
	U.S.A.			50,082
				128,451
			TOTAL	$4,215,143

* - not available from Economic Development but could be ft.^{2}

N.B. - 1975 unit prices not known

- 1975 FOB cost/ft.^{2} for polished travertine not available

entering Canada in 1973 were estimated to value $1,865,000 (see Table 1).

The External Trade Report, Department of Economic Development (B.C.) shows that shaped or dressed marble, valued at $166,136; natural stone (NES) valued at $128,451; crushed 'limestone' valued at $434,189$^{(74/ton)}$; and crushed 'stone' valued at $434,788$^{(59/ton)}$ entered B.C. during 1974. In addition roofing granules valued at $244,360 and natural stone valued at $128,451 were also imported. The value of these materials totals $1,420,769. There does not appear to have been any simple trend (general increase) in this situation over the last five years with the possible exception of dressed marble imports which have increased steadily at about 15 to 20% per annum.

The B.C. production of building stone has shown a dramatic overall decrease in recent years. Only three quarries are now operating (Sirdar, Greenwood and Revelstoke). The Greenwood and Revelstoke quarries produce quartzite for facing ($60.00/ton), flagstones ($45/ton) and rip rap ($25.00/ton) etc., and the Sirdar produces dolomite. Only the Revelstoke quarry, operated by an individual, has shown any major increase in its productivity. Most of this rock is shipped to Calgary, but it is also becoming popular for many users in the Revelstoke area.

The market demand for all classes of building stone (and end products) has shown an overall increase in use in B.C. during the last five years. But, conversely the production of native building stone has decreased noticeably with the result that only three quarries are now in operation (part-time), and only one shows positive growth.

Current explanation of public buying motivation stresses that the product being purchased must be uniform and that it will be delivered to the user on schedule. Also, the buyer should be attracted if the product is superior in reducing cost. The limit of the market area is also determined by the transportation plus production cost (break-even point). These as well as a host of other variables enter into the question of marketability.

If the economic precept "that the market is more important than the deposit" is accepted and that the indication is the market for building stone is expanding (example 15 - 20% per annum for dressed limestone), then serious consideration should be given to new proposals. The social benefit of new industry and employment in the Slocan must also be considered.

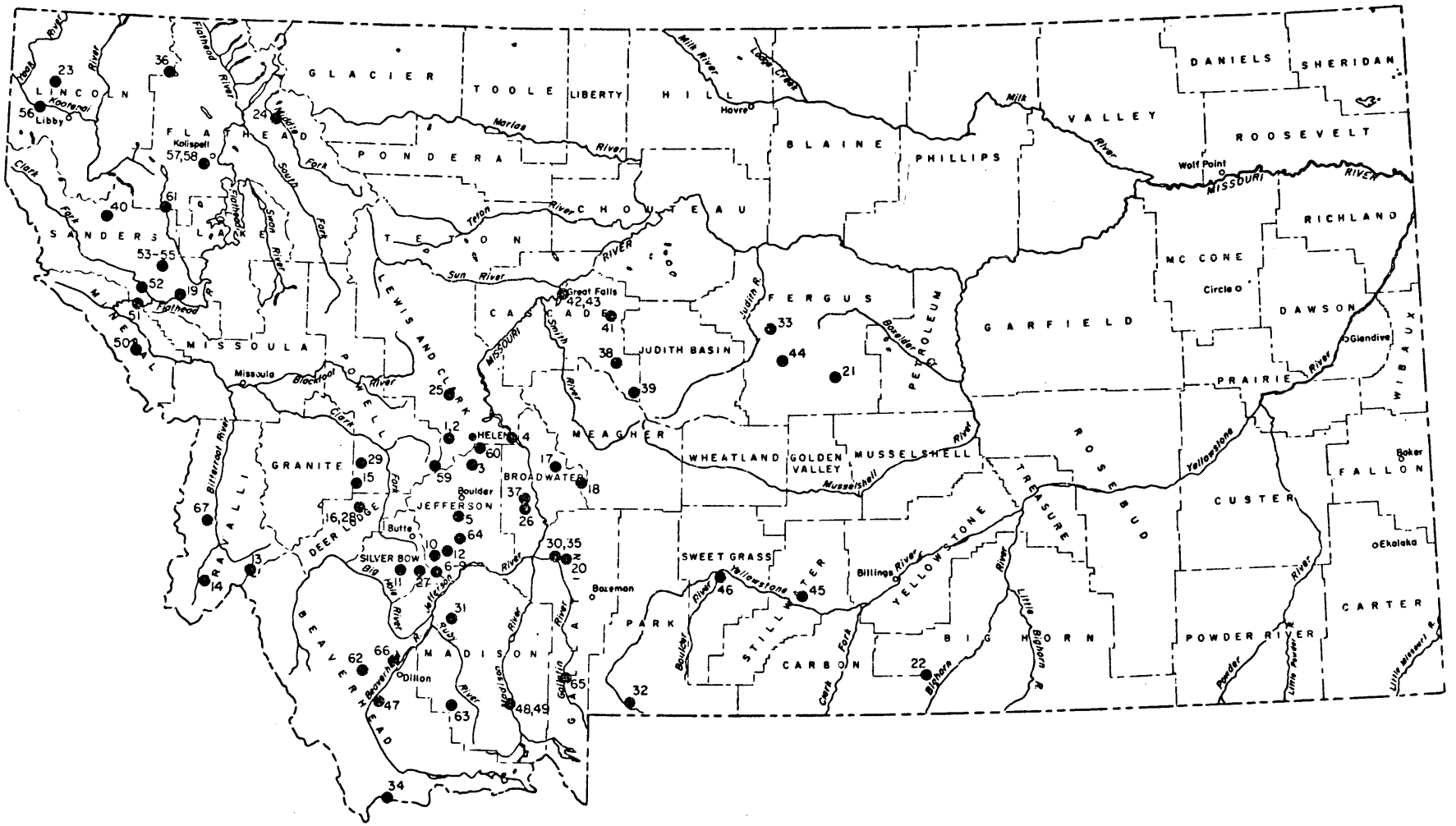

Figure 1.–Deposits of building stone. ~~**See Table 2 for additional information**~~

Travertine - 32
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34

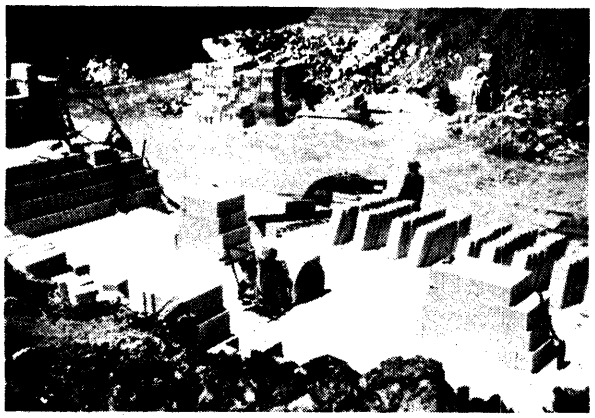
MONTANA

The Deposit

As I indicated in my geological report of September 3/75, the travertine on Arthur Creek is only one of several large deposits in the New Denver area. This deposit can be made easily accessible by upgrading the existing road. The tonnage in sight was estimated at about 200,000 tons, and has an inferred potential of about 400,000 tons. The colour of the clean travertine is consistent and the texture reasonably attractive. A variety of textural and compositional types are present although the proportion of each is not known. Only mining, cutting, breaking and sorting will determine the proportions of each textural type.

Mining

Quarrying experience in Montana where travertine deposits have been mined continuously since 1932 has shown that only about 25 per cent of a deposit is actually sent to a mill for sawing. During manufacture another 50 per cent of this stone may be lost to waste. The stone from these quarries is variable in colour and texture and has been sold for a variety of decorative uses. Quarried blocks are hauled to mills where polished panels, and split face ashlar blocks are produced. A study of the literature



—General view of a limestone quarry—Mount Gambier

—Pulling block of limestone over with cable—Mount Gambier

—Vertical mobile ashlar-cutting saw—Mount Gambier

Experiments were made with a petrol-driven crosscut saw, column mounted, to do the same job. Later experiments were successfully conducted on a method of cutting ashlars *in situ* with petrol-driven circular saws mounted on small rubber-tyred wheels and pushed or pulled by a man. Conventional-toothed saws were first used with the mobile units, but improvements have been made with tungsten carbide-tipped teeth, and the machines are now self propelled. Almost all of the Mount Gambier stone is now cut direct from the face by this method. A small quantity of block stone is produced for the Adelaide market by hand-sawing methods—the power-driven crosscut saw is no longer used.

Overland Corner and Cadell Limestone

These types of stone are similar to the Mount Gambier stone but are slightly darker in colour and somewhat harder. They are worked intermittently.

Waikerie Limestone

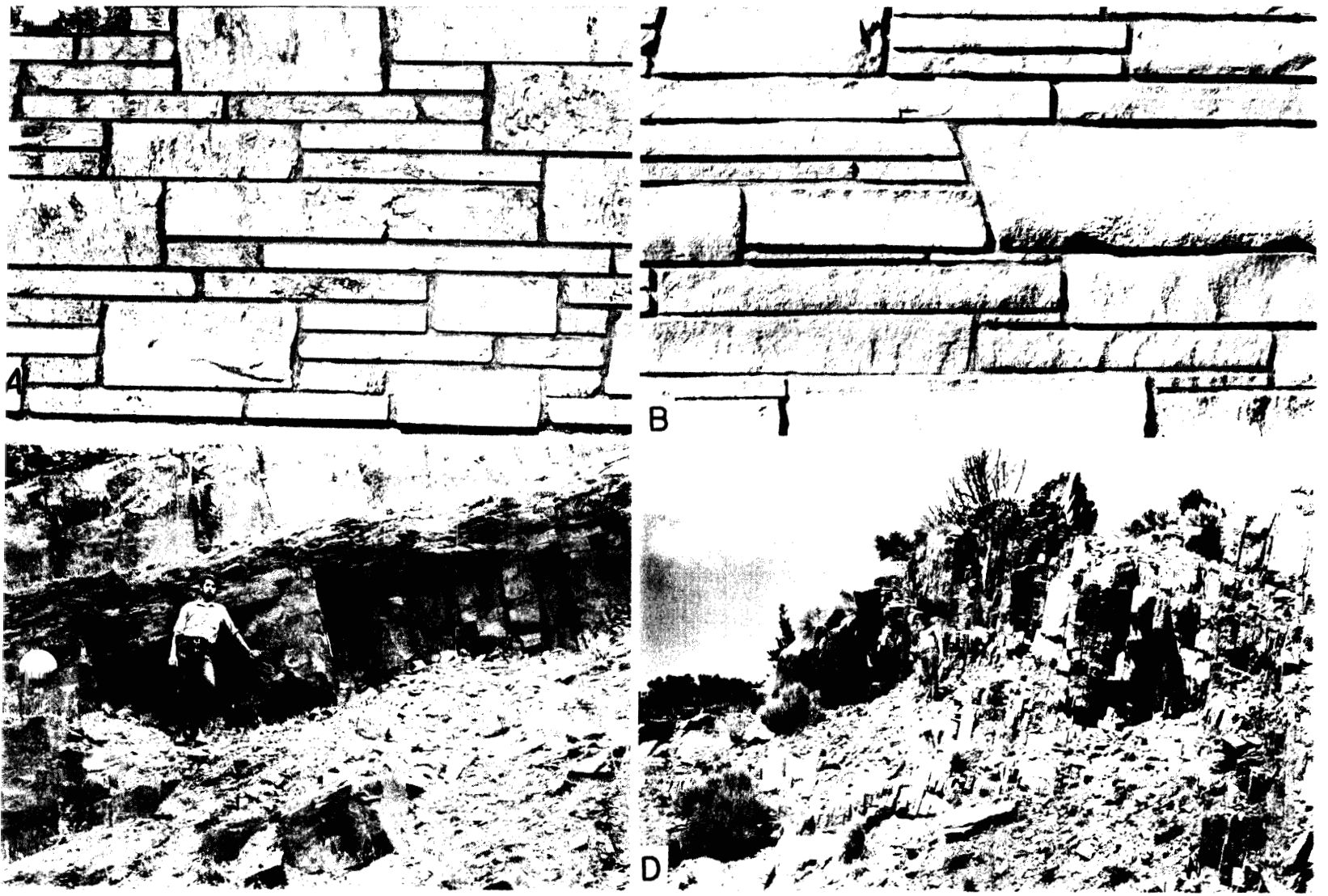
The Waikerie deposits are much harder. This building limestone is won by boring jackhammer holes close together

shows that there are four major areas of travertine in Montana (up to 8.2 million tons) where material of quite variable colour, texture and absorption has been explored and two are now being mined.

Very little literature on quarrying methods and costs are available for examination. What there is, shows a tendancy for adaptability to the local rock and market situation. As indicated previously Montana travertine is broken into large blocks at the quarry and then transported to a finishing plant. In other situations, as in Australia for example, ashlar has been cut directly in the quarry utilizing small mobile power saws. These two examples appear to represent the major trends.

A) Quarrying of large blocks by conventional drilling and breaking methods and then transportation to dressing sheds (and mill) appears to present the best method for optimal utilization of the rock.

B) Cutting slabs and ashlar in the quarry would limit the type of product initially but would require the least amount of men, equipment and buildings, and decrease transport problems. In addition, the mobile cutting saws are run by one man and have



ure 6—Travertine and sandstone. A. Travertine ashlar. B. Ashlar of Flathead Quartzite. C. Blocky sandstone of Lahood Formation (locality 35). Note well-developed joints. D. Exposure of Flathead Quartzite, bedding steeply inclined to left (locality 37).

a low unit price compared to the large gang saws employed in mills.

The type of mobile equipment suitable for a small quarrying operation is apparently available through a manufacturer in Portland, Oregon. These equipment prices are being sent but are not available at the moment. Small commercial mobile vertical saws plus blade start at about $900.00, portable saws at about $500.00, portable masonary saws (table or cut-off type) at $700.00, and hydraulic rock splitters at $500.00. Other mobile equipment such as a front-end loader, fork lift, small trucks, and eventually polishing equipment would also be required. The typical stiff-legged crane used in larger quarrying operations could be replaced by a low-cost truck-mounted mobile crane.

Two or three men could operate a small quarry using mobile equipment governed by both weather and market demand. Stockpiled material could be finished during pit down-time.

The products of A would be dressed slabs for interior and exterior veneer, dressed table tops (and other decorative items), rough slabs, ashlar, flagging, rubble, crushed stones, and refuse which could find use as a soil conditioner. Mr. Makortoff has outlined

the products in his presentation. This approach would involve large scale quarrying equipment, saws etc., big transport equipment, dressing sheds, a gang saw, cutting and breaking equipment, and polishing. This direction is therefore capital intensive, would require experienced quarry, dressing, and polishing personnel, and extensive factory and storage areas. Rohwedder's estimate of $200,00 working capital for the basic equipment for a 15-20 man operation is probably low, with the $1 million to $1.5 million probably close.

The products from B, would be small slabs, ashlar, flagstones, rubble blocks, crushed stone etc. as above, but would require a working capital of at least $50,000.

Conclusion

(1) The advantages of quarrying method B over A are fairly obvious. In addition the mobile equipment can be moved at will from one deposit to another. Also, once a deposit had been opened up and markets tested, method A could be implemented.

(2) The market in B.C. and western Canada for dressed building stone has obviously enlarged and is still growing as exhibited by the import statistics.

(3) The state of the building stone industry in B.C. has probably never been worse. However, as Mr. McKenzie of Revelstoke has shown, completely on his own, without marketing studies etc., there is a strong market in Alberta. Freight costs mitigate against shipping to Vancouver.

(4) The market for ashlar, flagstone, rubble, and end products in western Canada is strong but also dominated by imports.

(5) The travertine deposits near New Denver are probably of sufficient size, quality and reasonable access to allow for intermittent production of a variety of building stone materials.

(6) The energy and skill of the operator will largely determine the profitability of the venture.

Recommendation

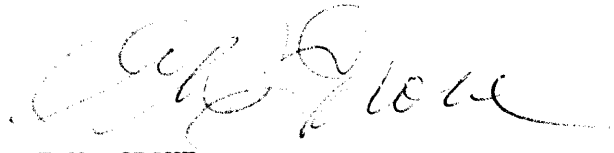
The B.C. Department of Mines and Petroleum Resources should help Mr. Makortoff in this venture by:-

(a) Providing funds to upgrade the road to the Arthur Creek deposit (2 miles ±)

(b) Extend technical assistance through Inspection Division, and

(c) Help Mr. Makortoff to get technical training through the Department of Economic Development.

(d) Incentive should be given to utilizing B.C. building stone products in public buildings. The B.C. Legislative and Museum Complex are two of the rare examples where this has been done in the past.



E.W. GROVE,
Senior Geologist, Geological Division,
Mineral Resources Branch.

October 27, 1975.