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KEYWORDS: industrial minerals, dimension stone, building stone, granite

INTRODUCTION

The first part of this report was published in Exploration in British Columbia 1992. During the 1993 field season, several additional quarry sites and dimension stone prospects were visited and the following text provides descriptions of individual properties.

REGIONAL GEOLOGY

Quarry sites described in this article are situated in southeastern British Columbia. Two of them are in the Coast Plutonic Complex, and the other four represent several types of granitic intrusions in the Okanagan area. The Cayoosh Creek and the Elaho River quarries opened in two separate quartz diorite intrusions of uncertain age, both part of the Coast Plutonic Complex. The two McNulty Creek sites are in the Pennask batholith of Middle Jurassic age; the Little White Mountain prospect is in the northern part of the (Late Cretaceous) Okanagan batholith and the Allendale Lake project is in a small isolated plug of Eocene Coryell syenite (Roddick *et al.*, 1979; Tempelman-Kluit, 1989).

PROPERTY DESCRIPTIONS

McNulty Creek - East (Pacific Rose)

Location: Lat. 49° 34' Long. 120° 04' 92H/9 Osoyoos Mining Division. Approximately 31 kilometres west of Summerland.

Access: From Highway 94 on a logging road west of Summerland.

Owners: D. Sandberg and R. Bechtel

Operator: None at present, Pacific Granistone Ltd. in 1992-93

Commodities: Dimension stone - granite

LOCAL GEOLOGY

This site is located in medium to coarse-grained pink and white granite of the Middle Jurassic Pennask batholith. Granite outcrops form an elongate, east-west oriented ridge with bare rock ledges, faces and a granite boulder field on the lower part of the slope. The great size of the boulders and massive outcrops indicates low fracture density. The rock is homogeneous with only occasional dark inclusions (Photo 1).

In 1992 and 1993, Pacific Granistone Ltd. optioned this site and produced a number of blocks which were processed into facing-stone sheets (Photo 2). Under the trade name "Pacific Rose" granite, this stone was used as floor tile and outside facing in the Jack Davis Building in Victoria. This structure houses the B.C. Ministry of Energy, Mines and Petroleum Resources.

PETROGRAPHY

Pacific Rose stone is an attractive medium to coarse-grained pink two-feldspar granite. Major constituents are pink orthoclase, white plagioclase, glassy grey quartz and greenish white microcline. Minor minerals are sphene, apatite, rutile, biotite and magnetite (1-2%). Microcline imparts a faint greenish cast to the otherwise white matrix. The texture and colour are uniform with no fabric present. The rock is quite fresh with minor sericitization of plagioclase and no alteration of biotite. The rock takes a very good polish (8-9/10) with no iron staining. Grains are well interlocked but the stone developed underspread intragranular cracking. Some minor pitting occurs on biotite grains or on feldspars where cleavage intersects intragranular cracks.

McNulty Creek - West (Paradise Rose)

Location: Lat. 49° 34' Long. 120° 09' 92H/9 Osoyoos Mining Division. Approximately 36 kilometres west of Summerland.

Access: From Highway 97 on a logging road west of Summerland.

Owners: Don Sandberg, R. Bechtel and F. Arnold

Operator: None

Commodities: Dimension stone - granite



Photo 1. McNulty Creek - East - Massive rock outcrops of Pacific Rose granite

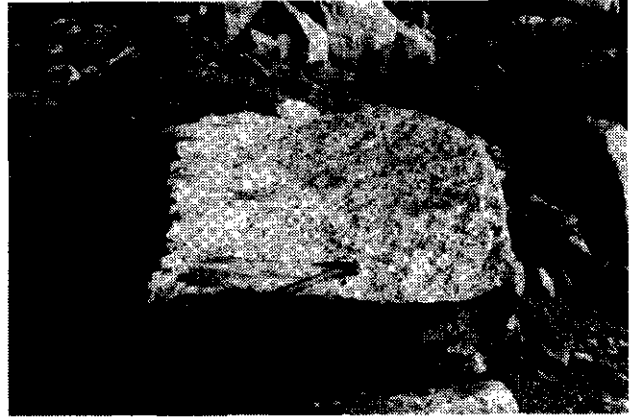


Photo 4. Little White Mountain prospect. Split boulder for testing the market.



Photo 2. McNulty Creek - East. Split boulders of Pacific Rose granite used to produce stone for the Jack Davis Building

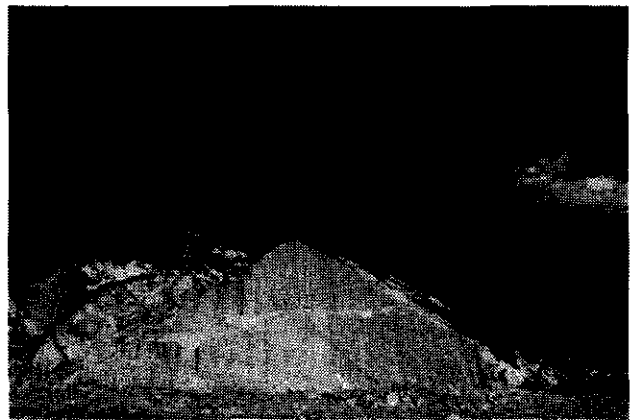


Photo 5. Elaho River quarry site of Pacific Quarry Industries Ltd.



Photo 3. Little White Mountain prospect. Large massive granite outcrops on the hillside.



Photo 6. Cayoosh Creek quarry of Northwest Granite Ltd.

LOCAL GEOLOGY

Paradise Rose is a stone similar to Pacific Rose. It is a lighter colour, medium to coarse-grained pink and white quartz syenite of the Middle Jurassic Pennask batholith. Large boulders and massive outcrops form a northeast elongate hill. No dark inclusions were observed on scattered boulders or rock outcrops. There is no production record from this locality.

PETROGRAPHY

Paradise Rose stone is a bright pink and white quartz syenite. The rock is medium to coarse grained, uniform in both colour and texture. Major mineral constituents are pink orthoclase, white plagioclase and grey quartz. Small biotite crystals pepper the surface but make up only 5% of the rock. Minor minerals are (clino?)zoisite, sphene, chlorite after biotite, hornblende, magnetite and pyrite. The rock appears to be fairly fresh but, in thin section, plagioclase is moderately sericitized. Orthoclase has some microperthitic texture and some grains are glomeroporphyritic, enclosing biotite and plagioclase. There are abundant cracks in orthoclase crystals which can be seen on the polished face. The rock takes a high polish (8/10) but some cracks are up to 0.5 millimetre deep and there are a few through-going fractures. There is some pitting of biotite grains and scattered flaking out of orthoclase fragments along cleavages intersecting with intracrystal cracks. There is no staining by pyrite or magnetite (<1% combined).

Little White Mountain

Location: Lat. 49° 42' Long. 119° 15' 82E/11 Greenwood Mining Division. Approximately 36 kilometres southeast of Kelowna.

Access: From Highway 94 and Highway 33 on a logging road southeast of Kelowna.

Owners: D. Sandberg and R. Bechtel

Operator: None at present, Pacific Granistone Ltd. in 1992-93

Commodities: Dimension stone - granite.

LOCAL GEOLOGY

The Little White Mountain site is located in a coarse-grained phase of the Late Cretaceous Okanagan batholith. This stone prospect forms a north-trending ridge with many large rock outcrops and scattered boulders below it (Photo 3). Available exposures and boulder sizes indicate low fracture density in the bedrock. The rock is homogeneous with no dark inclusions observed.

In 1992, Pacific Granistone produced some blocks to test the market (Photo 4). Processed slabs were used as a floor tile in some private residences and one Vancouver mall. This stone was given the trade name of Pacific Pearl.

PETROGRAPHY

Pacific Pearl stone is a cream-yellow-grey quartz syenite. Large, 1 to 2-centimetre, yellow orthoclase crystals are prominent. The coarse texture is quite uniform. The medium-grained groundmass is made up of grey quartz, white plagioclase and black biotite. Minor constituents, less than 1% each, are apatite, chlorite after biotite, zircon, sphene and magnetite. The rock appears fresh and shows no iron staining. In thin section, there is little alteration with only a small amount of chlorite after biotite. Microperthitic texture is well developed in the orthoclase phenocrysts and may account for some pearly yellow-white schiller seen on the polished rock face. All grains are well interlocked with no developed fabric. The rock takes a good polish (7/10) with minor surface cracks and some small pits at biotite grains. The cracks visible on the polished surface are tight and occur in orthoclase and quartz grains.

Allendale Lake

Location: 49° 24' Long. 119° 22' 82E/6 Osoyoos Mining Division. Approximately 20 kilometres east of Okanagan Falls.

Access: From Highway 94 on a logging road east of Okanagan Falls

Owners: D. Sandberg and R. Bechtel

Operator: None

Commodities: Dimension stone - granite

LOCAL GEOLOGY

This unusual type of stone prospect forms a round hill with a scattered boulder field along its edges. When cut and polished, this stone has a dark blue colour with occasional light iridescence in some feldspar grains. The rock is a very coarse grained, dark grey syenite. The colour and texture of the stone varies slightly in individual boulders and rock outcrops. The presence of many small boulders indicates a high fracture density. Therefore, in spite of its very attractive appearance in finished slabs, potential development of this site will probably be limited to monument work and interior projects only.

PETROGRAPHY

This distinctive stone is a dark grey to black alkali-feldspar syenite. The rock is very coarse with large (1 to 2 cm) phenocrysts of grey orthoclase and black augite. It has a poorly developed linear fabric defined by the augite crystals. The rock is partially altered with pseudomorphs of chlorite after augite and some chloritization of biotite. Quartz is absent, nepheline may be present as a minor constituent of the finer groundmass. Minor constituents are apatite, magnetite and pyrite. The rock takes a good polish (7-8/10) with some pitting on chlorite or biotite grains. There are tight intergranular cracks throughout

the rock and individual grains also show some cracking. Grains are well interlocked and there is no iron staining from either the pyrite or magnetite (2-3%). The polished rock exhibits bluish iridescence from some feldspar crystals.

Cayoosh Creek

Location: Lat. 49° 32' Long. 122° 11' 92J/9 Lillooet Mining Division. Approximately 55 kilometres northeast of Pemberton.

Access: On Highway 99 between Pemberton and Lillooet

Owners: Northwest Granite Ltd.

Operator: Northwest Granite Ltd.

Commodities: Dimension stone - granite

LOCAL GEOLOGY

Cayoosh Creek quarry is located in a fine to medium-grained quartz monzonite plug which intrudes Bridge River Group sedimentary rocks (Photo 6). The quarry area is characterized by horizontal ledges several metres thick, of massive monzonite, overlain by a more densely fractured zone. The existing quarry face allows removal of blocks several cubic metres in size (Photo 7). The stone is homogeneous with uniform texture. No dark inclusions can be seen on quarry faces.

The quarried blocks are split into masonry and facing shapes and marketed under the trade name Arctic White granite (Photo 8). It has been widely used around Whistler and in the Vancouver area.

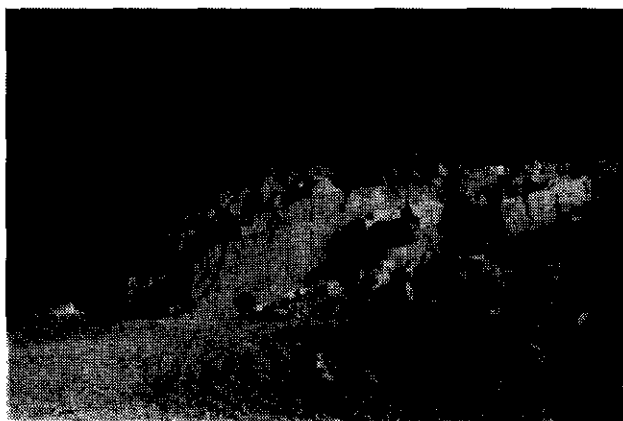


Photo 7. Cayoosh Creek quarry face

PETROGRAPHY

Arctic White is a bright white fine to medium-grained quartz monzonite. The texture is very uniform but has a strong planar fabric defined by biotite. Major minerals are white plagioclase, orthoclase, microcline, clear, colourless quartz and black biotite. Minor constituents are sphene, (clino?)zoisite and chlorite with sericitization of plagioclase. The polished surface is good



Photo 8. Cayoosh Creek quarry site - splitting the stone into masonry blocks

(7-8/10) and pitting is limited to crystal corners where cleavage planes intersect the surface. There is no staining as iron oxides or sulphides are essentially absent.

Elaho River

Location: Lat. 50° 08' Long. 123° 28' 92J/3 Vancouver Mining Division. Approximately 60 kilometres north of Squamish.

Access: From Squamish by logging road upstream along the Squamish River

Owners: Pacific Quarry Industries Ltd.

Operator: Pacific Quarry Industries Ltd.

Commodities: Dimension stone - granite

LOCAL GEOLOGY

The Elaho River quarry is opened in a quartz diorite phase of the Coastal Plutonic Complex. The stone is fine to medium grained with a parallel texture well defined by orientation of mica flakes. The rock is exposed in steep cliffs and along the banks of the Elaho River, some 7.5 kilometres upstream from its confluence with the Squamish River. The fracture spacing, several metres apart, allows removal of large blocks from the quarry face with a minimum of waste. The only observed inhomogenities in the quarry area are two light-coloured fine-grained aplitic dikes 10 to 20 centimetres thick.

The square-shaped blocks are processed into granite tile in Surrey, British Columbia and marketed under the trade name of Whistler White granite.

PETROGRAPHY

Stone from Elaho River is a distinctive white granodiorite that has a prominent parallel fabric defined by the mafic minerals. It is fine to medium grained with a uniform texture. Major constituents are white plagioclase, colourless glassy quartz and black biotite. Chloritization of biotite and virtual total replacement of minor augite gives the mafics a greenish tinge. Notable highlights are small (± 1 mm) red garnets that are

scattered through the rock. Minor minerals are sphene, (clino?)zoisite, apatite, magnetite and pyrite. The grains are well interlocked and the fabric seen at the macroscopic scale is not apparent under the microscope. The rock is reasonably fresh, considering the modest amount of chloritization, and the feldspars are unaltered. There is no iron staining from the pyrite or magnetite (\pm 1% combined). The polish is very good (8-9/10) with only slight pitting on biotite-chlorite grains and there are no fractures or significant cracks.

SUMMARY AND CONCLUSIONS

Steady progress is being made in developing British Columbia's dimension stone resources and bringing back an industry which was once vibrant, but gradually declined. More and more sites with different varieties of colours and textures are becoming producers and prospectors are bringing to industry's attention numerous potential deposits with excellent chances for development. Although data on physical properties are lacking from most of the locations, the study of thin sections and correlation with similar stones from established producers indicates possibilities for even the most demanding applications.

ACKNOWLEDGMENTS

The authors thank Joe Jelincic, Sante Jacutoni and Don Sandberg for helping to visit all the prospects and quarry sites. Editorial comments of J.M. Newell and B. Grant are most appreciated.

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NOTES