COASTAL LABRADOR COMMUNITY AGGREGATE RESOURCES

by

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ABSTRACT

In 1984, two days of reconnaissance aggregate surveys were conducted in the coastal communities of Postville, Hopedale, Big Bay (which is a possible relocation site for Hopedale), Davis Inlet and Nain. This is a continuation of the 1983 aggregate studies (Ricketts and Bragg, 1984) conducted to aid community development and planning. Low quantities and poor quality of materials in most of these communities make proper resource management essential if reasonable construction costs are to be realized. Work in coastal Labrador communities was conducted in a similar pattern to the Inventory of Aggregate Resource Program (Kirby et al., 1983).

INTRODUCTION

The Coastal Labrador Aggregate Resource Project was started in 1983 with the objective of mapping aggregate resources in and around isolated coastal communities. Particular aims of the project are to designate areas for extraction in specific planning proposals (e.g. municipal plans), and to ensure that aggregates are preserved to meet present and future demand in any area. It was planned to complete detailed sampling over a two-year period for coastal communities from Lodge Bay in the south to Nain in the north.

In 1983, the project was funded by the Newfoundland Department of Mines and Energy and the Canadian Department of Regional Economic Expansion (Coastal Labrador Subsidiary Agreement). During 1983, field work was completed in Lodge Bay, Mary's Harbour, Port Hope Simpson, Charlottetown, Fox Harbour, Black Tickle, Paradise River, Cartwright and Rigolet. Two sets of maps were compiled, consisting of fifteen maps each. One set includes sample localities and zones of aggregate potential; the other shows surficial geology (landform classification).

In 1984, there was no funding to continue this work and so field operations had to be greatly restricted. As a result, only two days of reconnaissance work were carried out in Postville, Hopedale, Davis Inlet and Nain, which were not sampled in 1983 (Figure 1).

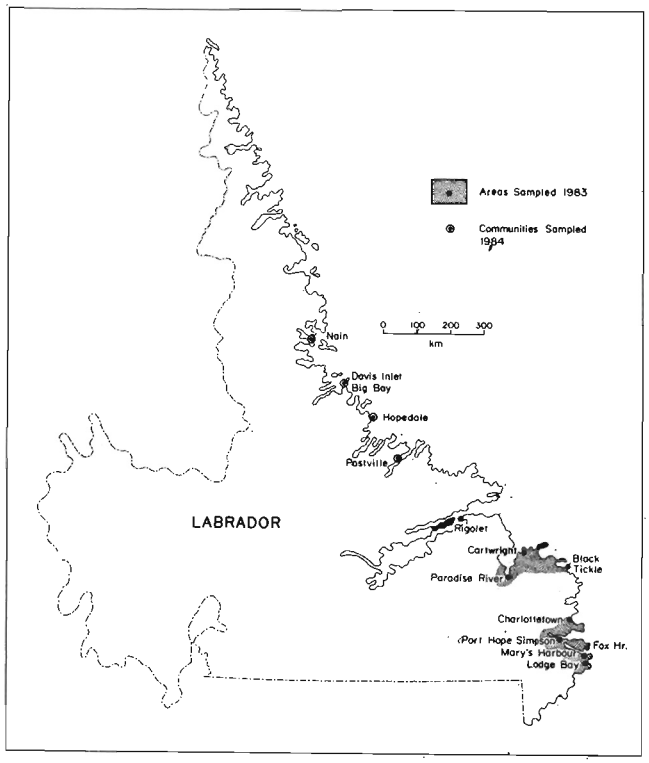

Figure 1: *Aggregate resources - coastal Labrador.*

OBJECTIVES

The main objective of this program was to map deposits of sand, gravel, stone, etc., suitable for construction purposes. There is a great need for this type of mapping in Labrador because of the lack of readily available information or mapped data and general lack of overburden and granular materials in many of these areas.

In cooperation with municipal or community councils, the intent is to delineate resource sites and have them protected by zoning within municipal plans. Proper resource management is essential in many areas. High grade aggregates should not be used for subgrade (ballast or fill) materials but should be reserved for future road topping or concrete uses in local communities. In areas lacking quality grade aggregates, alternative sources such as till with a low silt/clay content and/or suitable bedrock could be used.

Another objective of the project was to identify surficial (surface) landforms to assist land use planning for various

community needs such as housing, recreation, roads and servicing; as well as providing data on the geotechnical properties of the subsoil, overburden and bedrock materials to assist pre-engineering studies of route selection for roads and water or sewage mains.

DATA ANALYSES

The grain size distribution of granular deposits sampled in the field will be determined by laboratory sieve analyses. These analyses will include drying and splitting of samples and dry sieving of samples down to -0.062 mm (Kirby et al., 1983).

A database management system (Scientific Information Retrieval System) designed for storage and retrieval of aggregate and surficial geology data (Atkinson, 1984) will be used to record all field and laboratory data.

RECONNAISSANCE AGGREGATE SURVEYS

Reconnaissance aggregate surveys were conducted in the four most northern communities within the study area. Surficial geology maps, based on airphoto interpretation at 1:50,000 scale, were generated and field work included spot sampling and generalized note taking in areas visited.

Postville. This community is located in an area of till veneer (0-1 m) and exposed bedrock, with sparse to moderate tree growth and low bush vegetation. The general geology is composed primarily of granitic and granodioritic gneiss (Taylor, 1970). A deltaic deposit within the community will supply local demand for many years, although about 40% of this deposit was mined for use on the airstrip completed in 1984. This deposit contains various grades of material varying from silty sand and sand to sandy or cobbly gravel. This is the only known accessible deposit of good quality aggregate within a 10 km radius around the community. There are some large deposits on the eastern side of Kaipokok Bay but these are only accessible by boat or barge, which would greatly increase costs to local residents.

Hopedale. Hopedale has no large amounts of surficial material (Fulton et al., 1975) but has enough soil in cracks and hollows of the rock to allow for small shrub and bush growth in places. Exposed bedrock is the dominant landform in this coastal community. It is surrounded on three sides by rock slopes and is located in similar geological terrain to Postville. There is little available flat land for community expansion. Water and sewage projects or airstrip construction would be expensive because ditches would have to be blasted and all granular materials would have to be obtained by blasting and crushing. One limited shallow till deposit near the community is of poor quality, containing many boulders and a high concentration of iron oxide. This is currently being used for fill. Any community developments or housing will require that aggregate materials be brought in or that bedrock be blasted and crushed.

Big Bay. A reconnaissance aggregate survey was carried out in the Big Bay area to provide information on a possible relocation site for the community of Hopedale. Big Bay is located approximately 42 km (by water) north of Hopedale, at the mouth of the Hunt River. The bay is over 25 km long and has shallow areas extending 20-30 m offshore in most places. There is a high percentage of flat or gently sloping land on both sides of the bay, with dense forest growth covering most areas near the shoreline and a few large bogs (some over 2 km in length) located on the eastern side. Mountain peaks on both sides reach elevations greater than 200 m above sea level. The Hunt River, flowing northeastward into Big Bay, is a popular sports fishing area for salmon. Two fishing camps were in operation on the river during the 1984 salmon fishing season.

Aggregate reconnaissance work has shown the area to contain large deposits of glaciofluvial outwash material. A possible raised marine beach ridge was sampled between 10-12 m above sea level on the eastern side of the bay. Two samples indicate sandy and sandy/cobbly gravel textures. If Hopedale is relocated here, there appear to be adequate granular resources for construction purposes, and the nature of the unconsolidated overburden should make servicing (i.e. roads, water and sewer lines, etc.) comparatively easy.

Davis Inlet. The rocks in this area are composed primarily of anorthosite (Taylor, 1970) and the area is surrounded by a dominant spruce tree growth vegetation. There is only one large surficial deposit in the general area. This is an outwash deposit located 1 km northeast of the community, near the end of the airstrip. This outwash material is composed of fine to medium grained sand with some pebbles, but is not satisfactory for good quality concrete or road surfacing gravel.

Nain. Nain is the northernmost community studied under this survey. The geology is similar to that of Davis Inlet. Rock outcrops are dominant on the surrounding hills, with sparse to moderate tree growth in the valleys. Nain has adequate deposits of outwash material, composed of fine to medium sands with some pebbles, but lacks good quality concrete or road surfacing aggregates.

CONCLUSION

With the low quantity and quality of aggregate in most coastal communities, plans should be made now for future developments. Any major projects (e.g. airstrips, road building, water and sewer projects) in some of these areas will require aggregate production by blasting and crushing of bedrock. If equipment for such projects is brought into a community, local councils should crush and stockpile additional materials to meet their future requirements (e.g. 10-15 years). The long-term gains of reduced construction costs would more than offset the initial cost outlay since mobilization costs for the blasting and crushing equipment often represent up to 50 percent of present contracts.

In areas with adequate aggregate deposits, the designation of aggregate zones within specific locations will ensure that aggregate can be preserved to meet the future demands of the domestic and commercial aggregate consumer. After the aggregate resources are depleted, quarry areas should be rehabilitated to a condition suitable for other uses, such as housing and recreation.

A preliminary report for coastal community areas will be released in 1985; a comprehensive final report will be published in 1986.

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