INVENTORY OF AGGREGATE RESOURCES

by

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INTRODUCTION

The Inventory of Aggregate Resources in Newfoundland was begun in 1975 as part of the Surficial and Glacial Mapping Program. In 1977 a separate sampling program conducted analyses in areas previously mapped surficially (Vanderveer, 1977; Grant, 1973; and Brookes, 1974). This program was supplemented in 1977 by sampling conducted by the Surficial and Glacial Mapping Program (Vanderveer and Sparkes, 1978).

The 1980 project has been a continuation of project 2.2 of the Inventory of Aggregate Resources program begun in 1978 and is funded under the Canada/Newfoundland Mineral Development Subsidiary Agreement. The program is designed to provide an inventory of aggregate (sand, gravel, crushed stone, stone, ballast) resources along existing and proposed transportation routes in Newfoundland and Labrador and will show the location, size, quality, present degree of use, and potential of each deposit.

During 1980, mapping in Insular Newfoundland (Map I) was concentrated in the following areas: Cormack, Main Brook, Burgeo Road, and Fogo Island. Also included in the survey were a number of hydroelectrical developments: Upper Salmon - under construction; and Lake Michel, Cat Arm and Dry Pond - proposed developments.

Areas sampled in Labrador (Map 2) were as follows: (a) the proposed road link between North West River and the Kitts-Michelin sites (Makkovik area), (b) the completion of reconnaissance begun in 1979 of a proposed transmission line route between Gull Island and Forteau, (c) all southern Labrador roads, (d) the road system around Wabush and Labrador City, (e) infilling work along the transmission line between Twin Falls and Labrador City, and (f) complete corridor sampling along all of the QNS&L Railway Line within Labrador.

FIELD PROGRAM

A 6 km wide corridor (Maps 1 & 2) centered and parallel to existing, proposed, or partially constructed highways and secondary roads in Newfoundland and Labrador and the QNS&L Railway Line has been covered. Tertiary roads and trails capable of being upgraded to handle truck traffic were included in the corridor and sampling extended for a distance of 8 km along these from the main road.

During 1980, extensive helicopter support was needed in sampling isolated areas. Highway and all-terrain vehicles were used for most of the work along roads and rail lines in western Labrador. In areas of potential aggregate resources (*e.g.* glaciofluvial, fluvial, deltaic, marine or esker deposits), foot traverses were carried out. These traverses extended 3 km from the road or rail line with samples taken every 0.5 to 1 km in areas of aggregates.

Additional samples were obtained where deposit changes occurred or quality differences were apparent at any given location; *i.e.*, where products could be quarried separately. In areas lacking potential sand and/or gravel material, morainal and bedrock materials were sampled; *i.e.*, one sample per 1 to 2 km, except where the varying nature of the deposit required additional sampling.

Generally, sample sites were limited to existing natural (stream or coastal cuts) or man made (road cuts, pits and quarry excavations, etc.) exposures. In areas of potential aggregate resources, shallow pits were hand dug if no other exposures existed.

All field and sieve data for 1980 were placed on two separate forms. Form I gives general site information including data on location, landforms, stratigraphy, ice movement indicators, and notation for photo numbers and extra notes. Form II gives a field description of the sample, plus data on field sieve analyses, field pebble analyses and a section for laboratory sieve analyses.

Field sieve analyses were conducted on all samples containing +8 mm size material. Moisture tests were usually conducted on every second or third sample if the deposit remained consistent along the traverse route; otherwise, analyses were done at every sample location. During sieve analyses, approximately 10 to 20 kg of material was sampled, weighed and sieved through a bank of four 30 cm diameter sieves (sizes 63 mm, 31.5 mm, 16 mm and 8 mm). The total sample weight and the weights retained on each field sieve and canvas were recorded on Form II. A 200-500 gm split of the -8 mm sand-silt/clay fraction was retained for laboratory sieve analyses. If a sample had a high silt-clay content and/or a high moisture content, it was wet sieved; *i.e.*, washed through the bank of field sieves. The -8 mm size fraction for laboratory analyses was then taken from the exposure site. A split (100-200 pebbles) of the +16 mm retained pebble fraction of each sieved sample was saved for the field pebble lithological study. A bulk sample (500-1000 gm, minus any larger stones) was taken and returned to the laboratory for sieve analyses when sieve analyses were not conducted in the field. All samples were taken from fresh unweathered exposures and from below the normal soil horizon wherever possible. Where exposures permitted, channel sampling or multiple spot sampling was used to ensure a representative sample.

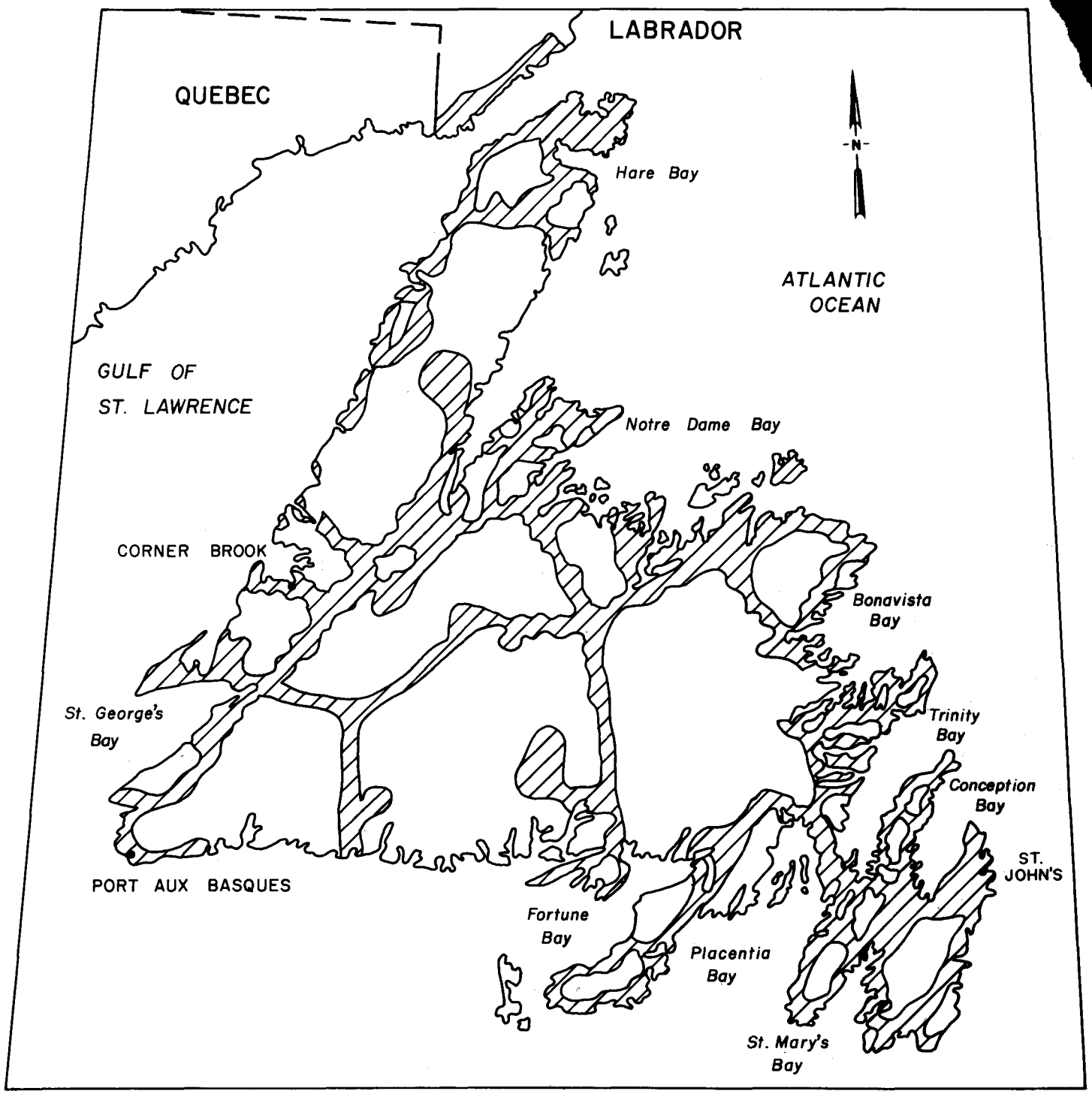
More detailed experimental sampling projects have been carried out on gravel deposits in Butt's Pond and Sandy Brook areas. These projects were designed to assess the feasibility of such projects in areas where the nature of the terrain or deposit characteristics would yield inadequate data if normal sampling procedures were used. Also, such detailed information has become essential in planning sequential land use development in high demand areas.

Samples for these projects were taken at 50-250 m intervals, to more accurately delineate horizontal and vertical depositional changes. A backhoe was used extensively in order to define the depth characteristics of the deposits. Depths reached with the backhoe were normally 2.7 to 3.2 m, although at Sandy Brook depths of 7 m were not uncommon.

LABORATORY PROGRAM

The laboratory program consists of sieve analyses of the sand-silt/clay (-8 mm) fraction of each sample returned from the field. These analyses consisted of drying and splitting the sample to a manageable size (70 to 140 gm) then sieving through a bank of seven sieves (4 mm, 2 mm, 1 mm, 0.5 mm, 0.25 mm, 0.125 mm and 0.062 mm) for each sample of gravel or sand, *i.e.* samples not containing much silt and/or clay material. The weights retained on each sieve and in the pan were recorded on Form II.

Glacial tills and other samples of a high silt and/or clay content were treated as follows: the sample was (1) dried and split to 70 to 140 gm; (2) deflocculated using a few drops of a solution of hydrogen peroxide (3% percent H_2O_2); (3) wet sieved through the 0.062 mm sieve; (4) the plus 0.062 mm sand fraction was dried and sieved,



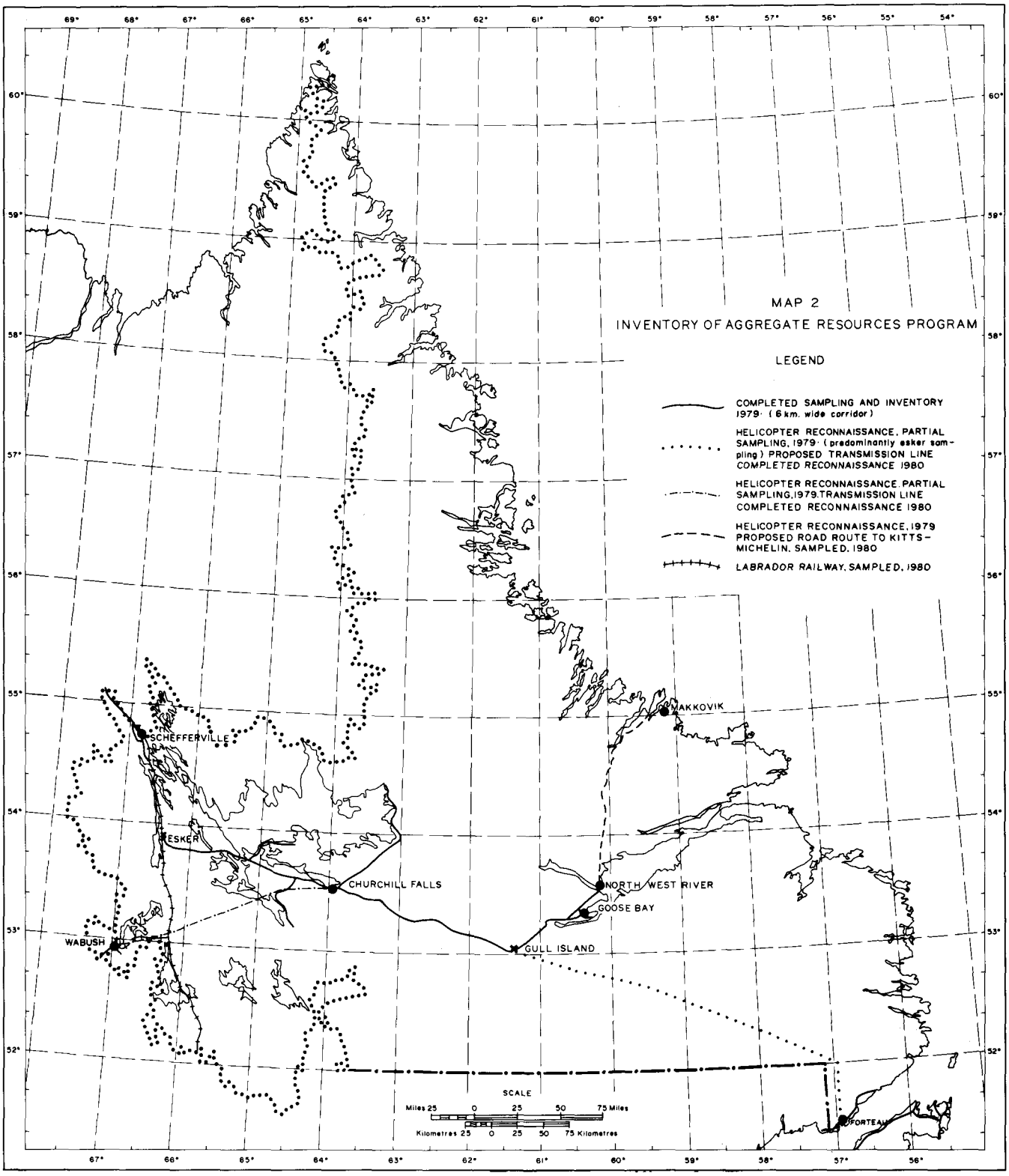
MAP 1

Inventory of Aggregate Resources Program
Island of Newfoundland
CANADA/NEWFOUNDLAND MINERAL DEVELOPMENT SUBSIDIARY AGREEMENT
SUBPROJECT 2.2

Legend

Completed 6 km wide corridor sampling parallel to existing roads and highways, and selected development areas

Unsurveyed areas include Gros Morne and Terra Nova National Parks


MAP 2
INVENTORY OF AGGREGATE RESOURCES PROGRAM
LEGEND
COMPLETED SAMPLING AND INVENTORY 1979· (6 km. wide corridor)
HELICOPTER RECONNAISSANCE, PARTIAL SAMPLING, 1979· (predominantly esker sampling) PROPOSED TRANSMISSION LINE COMPLETED RECONNAISSANCE 1980
HELICOPTER RECONNAISSANCE. PARTIAL SAMPLING,1979.TRANSMISSION LINE COMPLETED RECONNAISSANCE 1980
HELICOPTER RECONNAISSANCE, 1979 PROPOSED ROAD ROUTE TO KITTS-MICHELIN. SAMPLED. 1980
LABRADOR RAILWAY. SAMPLED. 1980
SCHEFFERVILLE
ESKER
CHURCHILL FALLS
WABUSH
GULL ISLAND
GOOSE BAY
NORTH WEST RIVER
MAKKOVIK
PORTEAU
SCALE
Miles 25 0 25 50 75 Miles
Kilometres 25 0 25 50 75 Kilometres

and the data recorded as with sand and gravel samples and; (5) the minus 0.062 mm fraction (water and silt and clay) was flocculated and settled by adding a small amount of magnesium chloride (1N $MgCl_2$), the excess water removed and the resultant silt-clay mixture dried, weighed and this data also recorded on Form II.

All field and laboratory data will be stored on computer for ease of retrieval.

LITHOLOGIC STUDY

Pebble lithology studies conducted in 1980 consisted of a review of the geological literature of each study area, the selection of a reference collection of rock specimens for each study area, and the determination of the percentage of each rock type found in each sample of pebbles.

A reference collection of bedrock samples was compiled during the field traverses for each study area as an aid to the pebble lithology investigations. The pebble lithologic studies also included information on the silt/clay coating, weathering, staining, sphericity, rounding, fracturing, mineralogy and texture for the various lithologies present in the pebble samples. A brief report will be written concerning this study for each area investigated.

RESULTS

During the 1980 field season, 978 samples were collected. The breakdown of these samples was as follows: tills - 366, gravels - 246, sands - 258, silt - 20, clay - 14, rock - 72, and organics (including peat, shells and fossils) - 2.

Field pebble lithology studies were conducted on approximately 425 pebble samples collected during 1980.

Sampling in 1980 was carried out in the following map areas: Insular Newfoundland (1M/13; 2E/9; 11P/12-14, 16; 12A/1,4,5,8; 12H/6-8,10,15; 12I/2,3, 6,11; 12P/1,8); Labrador (12P/6,7,9,11, 14,16; 13A/4; 13B/1,7,10; 13F/2,7,9,1; 13J/5,12,14; 13K/1,8,9; 13O/3; 23A/4,5, 12; 23B/9,14,16; 23G/1,2,8,9,16; 23H/4,7; 23J/1,2,7,10,15).

With the completion of the 1980 field program, all major existing and proposed transportation routes in Insular Newfoundland and Labrador have been covered (Maps 1 and 2). For a complete list of map areas covered prior to 1980, refer to Report 80-1 (Kirby *et al.*, 1980).

Analyses of all field data collected prior to 1980 should be completed by the time of this printing and will be available upon request.

Data from the 1980 program will be released as it becomes available. An outline of potential areas of aggregate materials and the locations of all samples will be plotted on 1:250,000 topographic base maps for publication during 1981. These data will also be recorded on 1:50,000 base maps for release upon request.

When the laboratory analyses program is completed on the samples collected during 1980, data will be available for 8286 samples collected since 1975, and covering a substantial part of Insular Newfoundland and Labrador.

Work is progressing on a computer package that will report on all coded field and laboratory data in an "english-like" format and enable the search and retrieval of selected data for various users and for various purposes.

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