

GRANULAR RESOURCE INVENTORY
- MACKENZIE -
ONTARATUE RIVER NTS 106 J
(1:125,000)

Produced for Indian and Northern Affairs
by Dept. of Energy, Mines and
Resources



D001315



GRANULAR RESOURCES INVENTORY - MACKENZIE

ONTARATUE RIVER NTS 106J

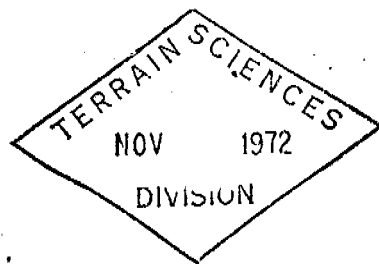
SCALE 1:125,000

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For: Department of Indian and
Northern Affairs



SUMMARY

Sand and gravel is distributed unevenly throughout the Ontaratue River map area. Concentrations of granular deposits occur west of the Ramparts River and around Marion Lake. Unconsolidated granular material is contained in glaciofluvial and some fluvial deposits.

In this map area bedrock consists primarily of shales of Cretaceous and Devonian ages. They are fissile and relatively ice-free and can be ripped for use as subgrade construction material.

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Figure Ontaratue River: physiographic regions

- Maps
- 1) Unconsolidated granular materials and granular resource areas
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INTRODUCTION

This report attempts to assess the quality and quantity of granular material available for construction from both unconsolidated deposits and bedrock sources. Sand and gravel of glaciofluvial and fluvial origin are good sources of granular construction material. Shales are considered to be a source of subgrade material.

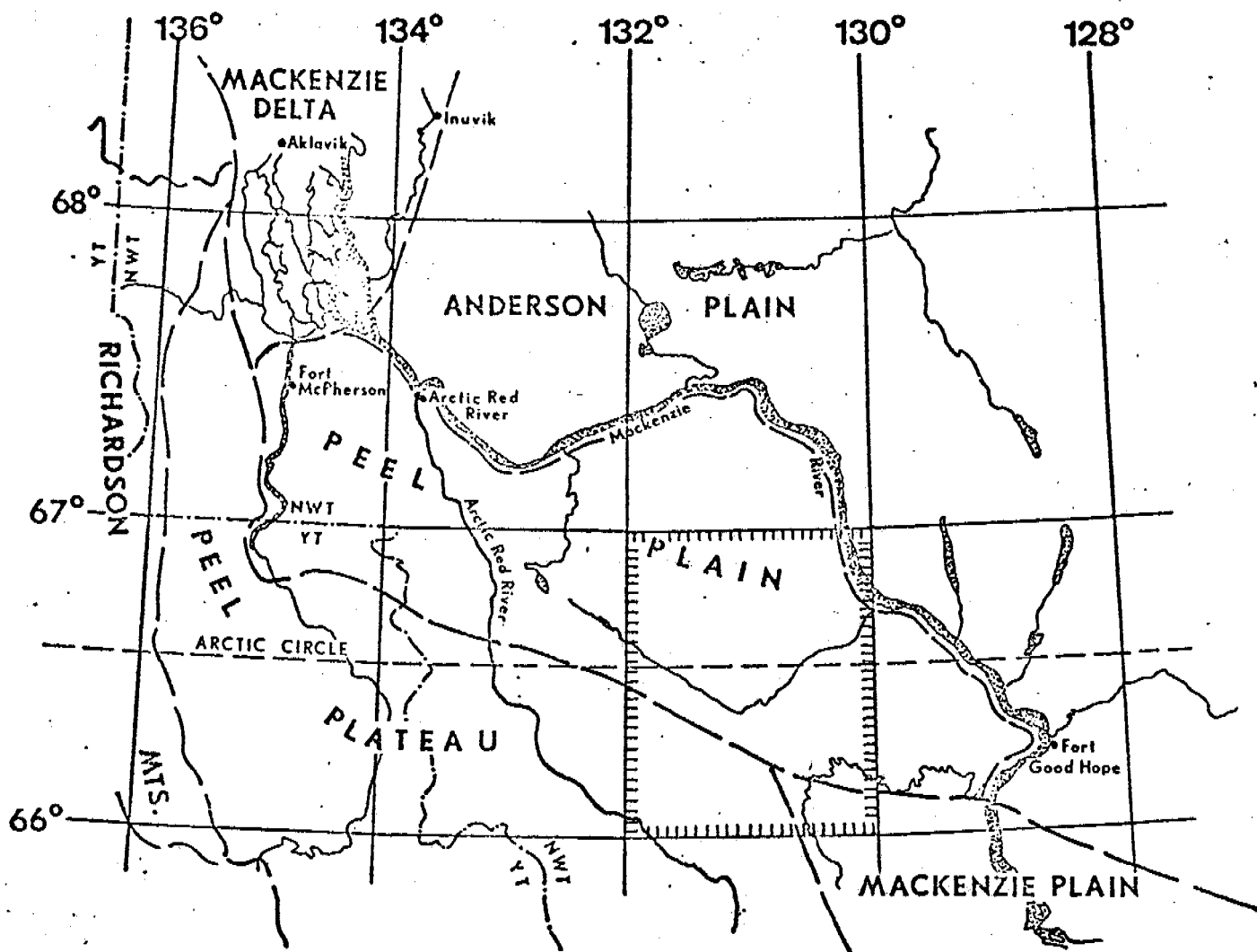
The information in this report and on the accompanying map has been compiled largely from published and unpublished manuscripts of the Geological Survey and from personal communication with officers of the Geological Survey of Canada. Supplementary data on depths, thicknesses, texture and ice content have been obtained from confidential reports of other government departments and from industry. Field checking was carried out during the summer of 1972.

The basic document used in this compilation and from which all areal data were derived, is a surficial geology map of Ontario and Quebec River map area, at a scale of 1:125,000 (Hughes, 1972). It is indexed as G.S.C. Open File Number 97 and may be viewed at Geological Survey of Canada offices in Ottawa, Calgary and Vancouver. Ozalid copies may be commercially obtained at nominal cost. The derived map of unconsolidated granular material has been produced at the same scale.

Areal extent of granular deposits was measured by planimeter. An average thickness for each deposit was estimated from the data mentioned above and reduced according to such variables as drainage, height above the water table and amount of ground ice. A volume of granular material for each deposit was calculated from these considerations of area and thickness. These estimated volumes of available sand and gravel appear in a tabular summary at the end of the report.

A bedrock geology map has been prepared as an overlay sheet from the Geological Survey of Canada published bedrock map 30-1963 (Douglas, R.J.W. and Maclean, B., 1963). The rock units are grouped according to gross lithology and age as shown on the overlay sheet which indicates the availability of bedrock as an alternative to unconsolidated material for construction purposes.

For convenience in description, areas of granular material are numbered in Roman numerals on the Granular Resource Map. Each area is sequentially listed in the tabular summary of materials in the report.



ONTARATUE RIVER

PHYSIOGRAPHIC REGIONS

0 M.I. 80

after BOSTOCK 1967

GENERAL GEOLOGY AND PHYSIOGRAPHY

Four physiographic regions are represented in the Ontaratie River map area: the Mackenzie Plain in the southeast, the Peel Plateau in the southwest, the Peel Plain in the northern two-thirds, and the Anderson Plain east of the Mackenzie River in the extreme northeast. Deposits of sand and gravel vary in individual size. Bedrock is composed primarily of shales with minor amounts of limestone, siltstone, sandstone and conglomerate. Most of the bedrock is easily eroded and therefore it does not outcrop or form ridges; it is commonly covered by a veneer of unconsolidated material.

Unconsolidated Deposits

Glaciofluvial Deposits, G, sand and gravel.

Sand and gravel of glaciofluvial origin occur as outwash plains, terrace and hummocky deposits, and eskers. These deposits are distributed unevenly throughout the map area.

Sand comprises the major portion of the glaciofluvial plain deposits within the Anderson Plain. These deposits may be covered by a veneer of silt.

Sand is also the predominant material of the glaciofluvial terrace deposits in the southeast portion of the map area. Many of the deposits have been eroded by tributaries of the Ramparts River and appear as small dissected deposits. Both the plain and terrace deposits vary in thickness from 5 to 40 feet.

Sand and gravel of the hummocky glaciofluvial deposits are concentrated northwest of Marion Lake. The local relief of these deposits averages 40 feet.

Eskers, sinuous ridges composed of sand and gravel, are ubiquitous in the Ontaratue River map area. They vary in length from hundreds of feet up to 40 miles. The eskers may be up to 100 feet in height.

The sand and gravel deposits are well drained and have very little ground ice. The deposits composed predominantly of sand are less well drained and contain more ground ice. It is estimated that 80% of the unconsolidated granular material contained in the sand and gravel deposits and 50% of the sand deposits are available as granular construction material.

Alluvial (Fluvial) Deposits, A, sand and gravel

Sand and gravel occurs along the upper reaches of the Arctic Red and Ramparts Rivers and the lower reaches of the Ontaratue River. These deposits within the stream beds are usually not greater than 15 feet in thickness. The alluvial plain deposit of Arctic Red River consists wholly of sand and gravel while in the plains of the Ramparts and Ontaratue Rivers the coarse granular material is mixed with alluvial silts. The groundwater table in these deposits is high but the ground ice content is low or non-existent. Available granular material from alluvial deposits is estimated to be 50 percent of the total deposit.

Bedrock

Few exposures of bedrock occur in the Ontaratue River map area. Incoherent, easily weathered shales are the predominant rock type with minor occurrences of sandstone, siltstone and limestone.

The Devonian shale, siltstone, and limestone unit (Dsh δ s, ls) is composed of the Devonian Canol and Hare Indian Formations. Shale, which is highly fissile, is the major constituent; siltstone and thin bedded, rubbly limestone occur in variable but minor quantities.

The Devonian shale unit (Dsh) is the Imperial Formation. Fissile shale is the predominant rock type with sandstone subordinate. The weakness of this rock type is exemplified by the occurrence of mudslides (Hume, 1954).

Interbedded shale and sandstone are the main components of the Cretaceous unit (Ksh, ss, cong); coal seams and conglomerate are present as minor components. The shale is incoherent, fissile and plastic, while the sandstone is thinly bedded and weakly cemented.

MATERIALS

Unconsolidated granular material of the Ontaratie River map area occurs in the glaciofluvial and some of the fluvial deposits. These deposits are distributed unevenly throughout the map area. Glaciofluvial deposits consisting primarily of sand may yield 50% available granular material while glaciofluvial deposits of sand and gravel may yield up to 80% available granular material. The smaller quantity of groundwater and ground ice content in the sand and gravel deposits account for the different potential yields. The fluvial sand and gravel units may have 50% available granular construction material.

The bedrock consists principally of shale with minor siltstone, limestone, sandstone, conglomerate and coal. Generally the bedrock is covered by a veneer of unconsolidated material. Where necessary, the bedrock could be ripped for use as subgrade material. As the shale and minor rock types contain relatively less ground ice than the sand and gravel, the ripped bedrock may be a preferred construction material.

TABULAR SUMMARY

| Description and Material | Area (sq. mi.) | Estimated Average Thickness (ft.) | Estimated Volume of Granular Material (yds ³ x 10 ⁶) | |
|--|-------------------|--|---|-----------|
| | | | total | available |
| Area I MACKENZIE RIVER EAST SHORE | | | | |
| a) <u>sGhkp-fo,sGp</u> glaciofluvial hummocky, kettled thermokarst, plain; sand and gravel; some organic material. | 10.15 | 20 | 211.26 | 105.63 |
| b) <u>Gmcd-fo</u> glaciofluvial; rolling, channelled, drumlinoid; sand and gravel; some organic material. | .70 | 20 | 14.65 | 7.32 |
| c) <u>Gcp</u> glaciofluvial channelled plain; sand and gravel. | .31 | 20 | 6.53 | 5.22 |
| d) Esker; sand and gravel. | 2.00 mi | 10 | .06 | .04 |
| Area II LOWER ONTARATUE RIVER | | | | |
| a) <u>Apt</u> alluvial plain; terraced; sand and gravel. | 18.12 | 8 | 150.58 | 75.29 |
| b) <u>Gh</u> glaciofluvial; hummocky; sand and gravel. | .12 | 20 | 2.46 | 1.96 |
| Area III SOUTHEAST OF LOWER ONTARATUE RIVER | | | | |
| a) <u>Gh</u> glaciofluvial; hummocky; sand and gravel. | 1.35 | 20 | 13.00 | 10.41 |

| Description and Material | Area (sq. mi.) | Estimated Average Thickness (ft.) | Estimated Volume of Granular Material (yds ³ x 10 ⁶) | |
|--|-------------------|--|---|-----------|
| | | | total | available |
| b) <u>Gr, Gc</u> glaciofluvial; ridged and channelled; sand and gravel. | .16 | 20 | 3.26 | 2.60 |
| Area IV SOUTH OF LOWER ONTARATUE | | | | |
| a) <u>Gh</u> glaciofluvial; hummocky; sand and gravel. | 1.79 | 20 | 36.70 | 29.36 |
| b) <u>Gt</u> glaciofluvial; terraced; sand and gravel. | .32 | 20 | 6.52 | 5.22 |
| c) <u>Gc</u> glaciofluvial; channelled; sand and gravel. | .59 | 20 | 9.95 | 7.96 |
| d) Eskers; eight small eskers; sand and gravel. (appendix II, stations 44 and 45) | 6.40 mi | 10 | .23 | .15 |
| e) Mounds; 4; gravel. | | | | |
| Area V BETWEEN LOWER ONTARATUE AND RAMPARTS RIVER | | | | |
| a) <u>Gh</u> glaciofluvial; hummocky; sand and gravel. | .12 | 20 | 2.46 | 6.97 |
| b) <u>Gr</u> glaciofluvial; ridged; sand and gravel. | .20 | 20 | 4.06 | 3.24 |
| Area IV EAST OF RAMPARTS RIVER | | | | |
| a) <u>Gp</u> glaciofluvial plain; sand and gravel. | .90 | 20 | 18.72 | 14.98 |

| Description and Material | Area (sq. mi.) | Estimated Average Thickness (ft.) | Estimated Volume of Granular Material (yds ³ x 10 ⁶) | |
|--|-------------------|--|---|-----------|
| | | | total | available |
| b) <u>sGt</u> glaciofluvial; terraced; sand. | .78 | 20 | 16.25 | 8.12 |
| c) <u>sGr</u> glaciofluvial; ridged; sand. | .35 | 20 | 7.33 | 3.66 |
| d) <u>Gr</u> glaciofluvial; ridged; sand and gravel. | .20 | 20 | 4.06 | 3.25 |
| e) <u>G</u> glaciofluvial; sand and gravel. | .27 | 20 | 5.66 | 2.83 |
| Area VII RAMPARTS RIVER | | | | |
| a) <u>Apt</u> alluvial plain; terraced; sand and gravel. | 7.22 | 8 | 60.04 | 30.02 |
| Area VIII NORTHWEST OF RAMPARTS RIVER | | | | |
| a) <u>sGt</u> glaciofluvial; terraced; sand. | 4.77 | 20 | 213.69 | 132.85 |
| b) <u>Gt</u> glaciofluvial; terraced; sand and gravel. | .78 | 20 | 16.25 | 13.00 |
| Area IX NORTHEAST OF ARCTIC RED RIVER | | | | |
| a) <u>Gr</u> glaciofluvial; ridged; sand and gravel. | 1.46 | 20 | 29.02 | 23.22 |

| Description and Material | Area (sq. mi.) | Estimated Average Thickness (ft.) | Estimated Volume of Granular Material (yds ³ x 10 ⁶) | |
|--|-------------------|--|---|-----------|
| | | | total | available |
| b) <u>Gc</u> glaciofluvial; channelled; sand and gravel. | .39 | 20 | 8.13 | 6.50 |
| c) <u>Gt</u> glaciofluvial; terraced; sand and gravel. | .16 | 20 | 3.26 | 2.61 |
| d) <u>Gh</u> glaciofluvial; hummocky; sand and gravel. | .40 | 20 | 8.12 | 6.49 |
| e) Eskers; eight small eskers; sand and gravel. | 3.00 mi | 10 | .08 | .07 |
| Area X ARCTIC RED RIVER | | | | |
| a) <u>s,gAp</u> alluvial plain; sand and gravel. | 9.56 | 8 | 79.51 | 39.75 |
| Area XI SOUTH OF ARCTIC RED RIVER | | | | |
| a) <u>Gr</u> glaciofluvial; ridged; sand and gravel. | .20 | 20 | 4.06 | 3.21 |
| b) Esker; sand and gravel. | .60 mi | 10 | .02 | .01 |
| Area XII NORTH OF WELDON CREEK | | | | |
| a) Esker; sand and gravel. | .30 mi | 10 | .01 | .01 |
| b) Eskers; sand and gravel. | 1.20 mi | 10 | .04 | .03 |
| Area XIII NORTHEAST OF WELDON CREEK | | | | |
| a) <u>Gr</u> glaciofluvial; ridged; sand and gravel. | .41 | 20 | 10.52 | 8.42 |
| b) Eskers; two small eskers; sand and gravel. | 1.00 mi | 10 | .03 | .02 |

| Description and Material | Area (sq. mi.) | Estimated Average Thickness (ft.) | Estimated Volume of Granular Material (yds ³ x 10 ⁶) | |
|--|-------------------|--|---|-----------|
| | | | total | available |
| Area XIV SOUTH AND SOUTHEAST OF UPPER ONTARATUE RIVER | | | 7.32 | 5.86 |
| a) <u>Gt</u> glaciofluvial; terraced; sand and gravel. | .36 | 20 | | |
| b) Eskers; sand and gravel. | 3.60 mi | 20 | .63 | .51 |
| Area XV SOUTH OF UPPER ONTARATUE | | | 170.11 | 136.09 |
| a) <u>Gr</u> glaciofluvial; ridged; sand and gravel. | 8.66 | 20 | | |
| b) <u>Gh</u> glaciofluvial; hummocky; sand and gravel. | .31 | 20 | 6.53 | 5.22 |
| c) Esker; discontinuous; sand and gravel. | 14.00 mi | 20 | 2.46 | 1.97 |
| d) Esker; discontinuous; sand and gravel. | 24.00 mi | 20 | 4.22 | 3.38 |
| Area XVI NORTH OF UPPER ONTARATUE RIVER | | | 20.32 | 16.25 |
| a) <u>Gr</u> glaciofluvial; ridged; sand and gravel. | 1.06 | 20 | | |
| b) <u>Gp</u> glaciofluvial plain; sand and gravel. | .32 | 20 | 6.52 | 4.9 |
| c) <u>Gh</u> glaciofluvial; hummocky; sand and gravel. | .20 | 20 | 4.06 | 3. |
| d) <u>G</u> glaciofluvial sand and gravel. | .04 | 20 | .80 | |

| Description and Material | Area (sq. mi.) | Estimated Average Thickness (ft.) | Estimated Volume of Granular Material (yds ³ x 10 ⁶) | |
|--|-------------------|--|---|-----------|
| | | | total | available |
| e) Esker; sand and gravel. | 8.00 mi | 20 | 1.41 | 1.13 |
| f) Eskers; five small eskers; sand and gravel. | 11.00 mi | 20 | 1.94 | 1.55 |
| g) Eskers; three small eskers; sand and gravel. | .20 mi | 20 | .0019 | .0016 |
| Area XVII UPPER ONTARATUE RIVER | | | | |
| a) <u>Gr</u> glaciofluvial; ridged; sand and gravel. | .16 | 20 | 3.26 | 2.61 |
| b) Eskers; six small eskers; sand and gravel | 10.00 mi | 10 | .33 | .23 |
| Area XVIII SOUTHWEST OF MARION LAKE AND NORTH OF UPPER ONTARATUE RIVER | | | | |
| a) <u>Gr</u> glaciofluvial; ridged; sand and gravel. | .79 | 20 | 16.18 | 12.94 |
| b) Eskers; five small eskers; sand and gravel. | 6.80 mi | 10 | .20 | .16 |
| c) Eskers; three small eskers; sand and gravel. | 2.40 mi | 10 | .07 | .05 |
| Area XIX WEST OF MARION LAKE | | | | |
| a) <u>Gp</u> glaciofluvial plain; sand and gravel. | .31 | 20 | 6.53 | 5.22 |
| b) <u>Gh</u> glaciofluvial; hummocky; sand and gravel. | .08 | 20 | 1.60 | 1.28 |

| Description and Material | Area (sq. mi.) | Estimated Average Thickness (ft.) | Estimated Volume of Granular Material (yds ³ x 10 ⁶) | |
|--|-------------------|--|---|-----------|
| | | | total | available |
| c) <u>G</u> glaciofluvial sand and gravel. | .16 | 20 | 3.26 | 2.61 |
| d) Esker; sand and gravel. | .60 mi | 10 | .02 | .01 |
| Area XX NORTHWEST CORNER OF THE MAP AREA | | | | |
| a) <u>Gr</u> glaciofluvial; ridged; sand and gravel. | .48 | 20 | 9.82 | 7.86 |
| b) <u>s,gGh</u> glaciofluvial; hummocky; sand and gravel | .36 | 20 | 7.26 | 5.81 |
| c) <u>Gp</u> glaciofluvial plain; sand and gravel. | .08 | 20 | 1.60 | 1.28 |
| d) <u>Gt</u> glaciofluvial; terraced sand and gravel. | .12 | 20 | 2.46 | 1.97 |
| e) Esker; discontinuous; sand and gravel. | 13.80 mi | 10 | .41 | .33 |
| f) Esker; discontinuous; sand and gravel. | 15.00 mi | 10 | .44 | .36 |
| g) Esker; discontinuous; sand and gravel. | 11.00 mi | 10 | .32 | .26 |
| Area XXI NORTHCENTRAL PORTION OF THE MAP AREA | | | | |
| a) <u>Gh</u> glaciofluvial; hummocky; sand and gravel. | 3.48 | 20 | 73.26 | 58.61 |
| b) <u>Gt</u> glaciofluvial; terraced; sand and gravel. | 1.49 | 20 | 30.90 | 24.72 |

| Description and Material | Area (sq. mi.) | Estimated Average Thickness (ft.) | Estimated Volume of Granular Material (yds ³ x 10 ⁶) | |
|---|-------------------|--|---|-----------|
| | | | total | available |
| c) <u>Gpc</u> glaciofluvial plain; channelled; sand and gravel. | .43 | 20 | 8.99 | 7.99 |
| d) <u>Gtr</u> glaciofluvial; terraced, ridged; sand and gravel. | 1.81 | 20 | 37.42 | 29.94 |
| e) <u>G</u> glaciofluvial; sand and gravel. | .16 | 20 | 3.26 | 1.63 |
| f) Eskers; two small eskers; sand and gravel. | .60 mi | 10 | .02 | .01 |
| g) Mound; gravel. | | | | |
| Area XXII MARION LAKE - SOUTH SHORE | | | | |
| a) <u>Ch</u> glaciofluvial; hummocky; sand and gravel. | 6.49 | 20 | 131.37 | 105.10 |
| b) <u>Gr</u> glaciofluvial; ridged; sand and gravel. | .39 | 20 | 8.06 | 6.88 |
| c) <u>G</u> glaciofluvial sand and gravel; | .16 | 20 | 3.20 | 2.56 |
| d) Esker; discontinuous; sand and gravel. (appendix II, Stations 46a, 46b and 47) | 10.40 mi | 10 | .31 | .24 |
| e) Eskers; thirteen small eskers; sand and gravel; | 13.00 mi | 10 | .39 | .31 |
| f) Mounds; 3; gravel. | | | | |

| Description and Material | Area (sq. mi.) | Estimated Average Thickness (ft.) | Estimated Volume of Granular Material (yds ³ x 10 ⁶) | |
|---|-------------------|--|---|-----------|
| | | | total | available |
| Area XXIII GOSSACE RIVER - WEST SHORE | | | | |
| a) <u>Gh</u> glaciofluvial; hummocky; sand and gravel. (appendix II, Station 48) | 6.90 | 20 | 145.38 | 116.31 |
| b) <u>Gp</u> glaciofluvial plain; sand and gravel. | 1.44 | 20 | 30.04 | 24.03 |
| c) <u>G</u> glaciofluvial; sand and gravel. | .36 | 20 | 7.32 | 5.86 |
| d) <u>Gr</u> glaciofluvial; ridged; sand and gravel. | .28 | 20 | 5.66 | 4.53 |
| Area XXIV NORTH OF LOWER ONTARATUE RIVER | | | | |
| a) <u>Gh</u> glaciofluvial; hummocky; sand and gravel. | 3.36 | 20 | 69.87 | 55.90 |
| b) <u>Gp</u> glaciofluvial plain; sand and gravel. | 10.93 | 20 | 227.51 | 187.01 |
| c) Eskers; two small eskers; sand and gravel. | 2.10 | 20 | .37 | .30 |

SOURCES OF INFORMATION

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APPENDIX I, Part I

Unconsolidated Granular Materials

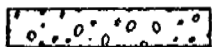
Each map sheet has a surficial geology legend (see appendix). This legend, differentiated by means of patterns, only indicates granular material classified by genetic characteristics. In some cases only part of a map unit has been patterned, indicating that only that portion is considered a suitable source for granular material.

Legend

GLACIOFLUVIAL



coarse grained granular material: cobbles, pebbles, gravel; may be mixed with some coarse sand

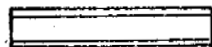


mixed or interbedded sand and gravel

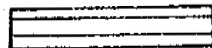


predominantly sand or sand with some fine material

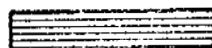
GLACIOLACUSTRINE



coarse grained granular material: cobbles, pebbles, gravel; may be mixed with some coarse sand.

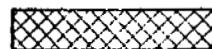


mixed or interbedded sand and gravel



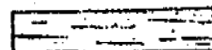
predominantly sand or sand with some fine material

FLUVIAL



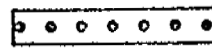
only sand and gravel deposits are patterned

MORAINAL

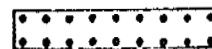


predominantly till; unsorted matrix of silt, clay, and sand imbedded with pebbles, cobbles and boulders

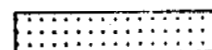
MARINE



coarse grained granular material: cobbles, pebbles, gravel; may be mixed with coarse sand

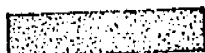


mixed or interbedded sand and gravel



predominantly sand or sand with some fine material

EOLIAN



fine and medium sandy material

COLLUVIUM

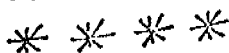


only the patterned area is coarse grained

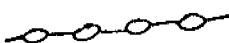
Symbols



eskers



gravel mounds



morainal ridge found within moraine

APPENDIX I Part (ii)

Bedrock Geology

(black line overlay)

The rock units which appear on the accompanying overlay are a geological grouping according to gross lithology and age.

These units were derived from a more detailed geological map, whose units were subdivided largely on the basis of airphoto and stratigraphic interpretation. The units are identified by a two component code. The first component is upper case and designates age which is followed by a mnemonic designating gross lithology, e.g. Dls - Devonian limestone. When no lithology follows the age component, the unit is composed of many of the rock types listed below.

Legend

Age

T - Tertiary
K - Cretaceous
JR - Jurassic
TR - Triassic
Pr - Permian
C - Carboniferous
D - Devonian
S - Silurian
O - Ordovician
E - Cambrian
P - Precambrian

Lithology

car - carbonate
limestone and/or dolomite
ls - limestone
dol - dolomite
ss - sandstone
fs - siltstone
sh - shale
cong - conglomerate

no mnemonic component indicates unit is composed of many of the above rock types

Symbols

Boundary of bedrock unit (approximate)

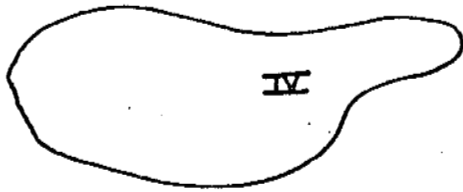
Boundary of bedrock unit inferred in areas of surficial cover

Limit of mapping

APPENDIX I, Part (iii)

GRANULAR RESOURCE UNITS.

Granular resource area



(see text for corresponding description)

APPENDIX I, Part III

SURFICIAL GEOLOGY AND LANDFORMS

| TEXTURE | GENESIS | MORPHOLOGY | SLOPE (superscript) |
|-----------|--------------------|-------------------|---------------------|
| f fen | O organic | v veneer | 1 moderate |
| p peat | M morainic | p plain | (<5°) |
| c clay | G glaciofluvial | d drumlin | 2 steep |
| si silt | L lacustrine | s fluted striated | (5° - 15°) |
| s sand | A alluvial | t terrace | >15° normally |
| g gravel | fluvial | h hummocky | in Cx unit |
| b boulder | C colluvial | r ridged | |
| t till | E eolian | e eroded | |
| | U upland, rolling | f fan | |
| | bedrock controlled | m rolling | |
| | R rock outcrop | c channelled | |
| | | k kettled | |
| | | thermokarst | |
| | | x complex | |

Complex Units:

e.g. in: Mp-f0, f0 constitutes 25% to 49% of area
 : Mp/f0, f0 = 5% - 24% of area

Using all four elements of the legend, a smooth ground moraine surface with moderate slope would be tMp¹; hummocky and ridged glaciofluvial gravel would be gGhr. Note that there are inconsistencies in the use of Mp and Mv mainly because of the difficulty in estimating till thickness.

APPENDIX II

TEXTURAL DATA

Samples, from which the textural data are derived, were gathered during the summer of 1972 when spot checking of surficial and bedrock sources of granular materials was carried out.

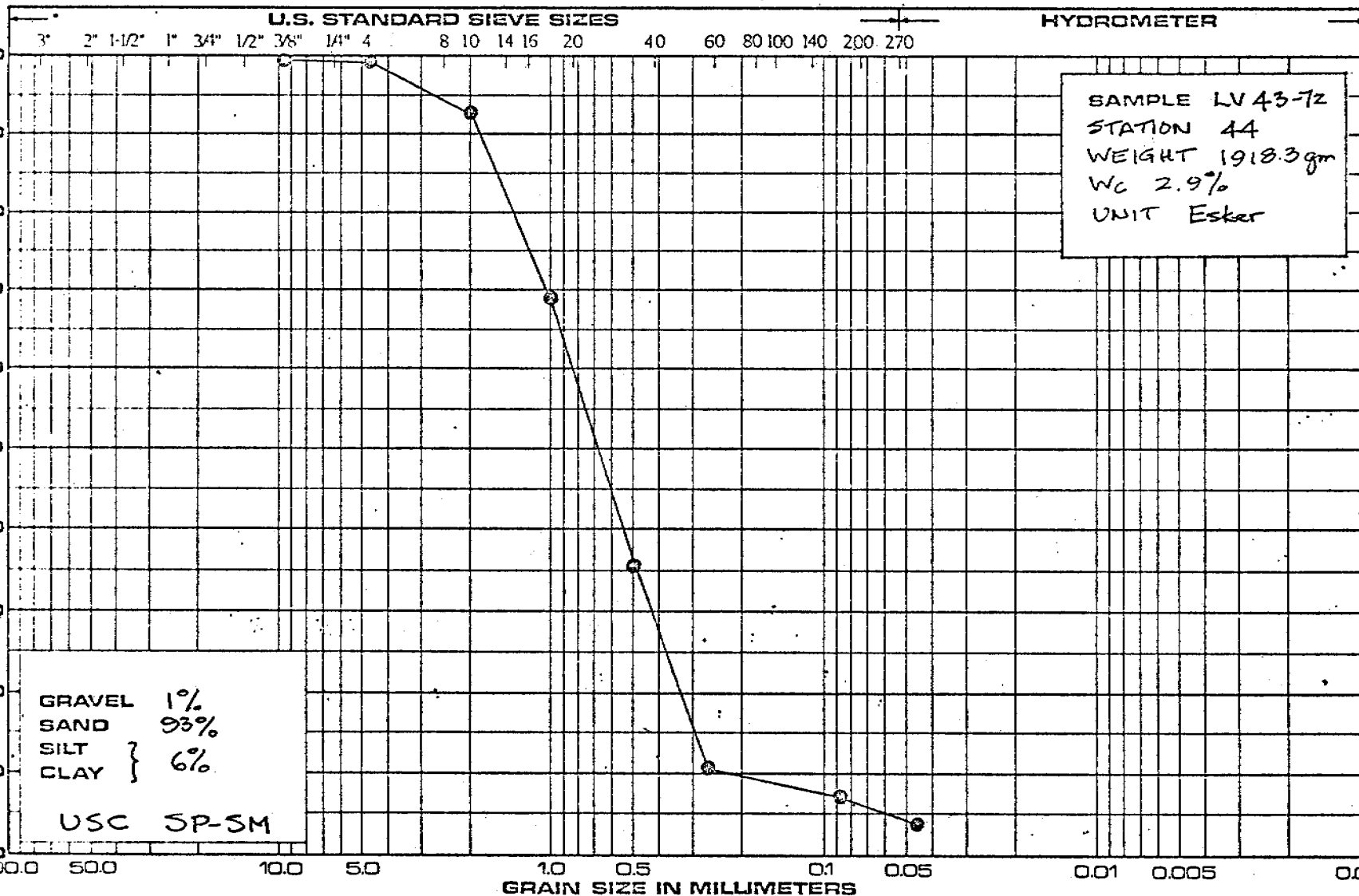
References to samples are given by station and sample number. Cross-reference with the "Tabular Summary" and U.T.M. grid is included so that location of textural data can be established on the 1:125,000 scale Granular Resources Map and on a 1:250,000 scale topographical map.

SAMPLE LOCATIONS

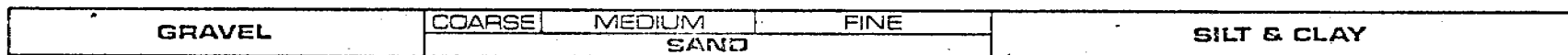
| STA. | SAMPLE | TABULAR SUMMARY | | GRID REFER. UTM |
|------|-----------|-----------------|-------|--------------------|
| | | AREA | UNIT | |
| 44 | LV 43-72 | IV | Esker | VD 463777 |
| 45 | LV 44-72 | IV | Esker | VD 398844 |
| 46 | LV 45a-72 | XXII | Esker | VD 125984 |
| 46 | LV 46-72 | XXII | Gh | VD 125984 |
| 47 | LV 46-72 | XXII | Gh | VD 102033 |
| 48 | LV 47-72 | XXXIIIIa | Gh | VD 304213 |

CUMULATIVE PERCENT PASSING

CUMULATIVE PERCENT RETAINED



UNIFIED

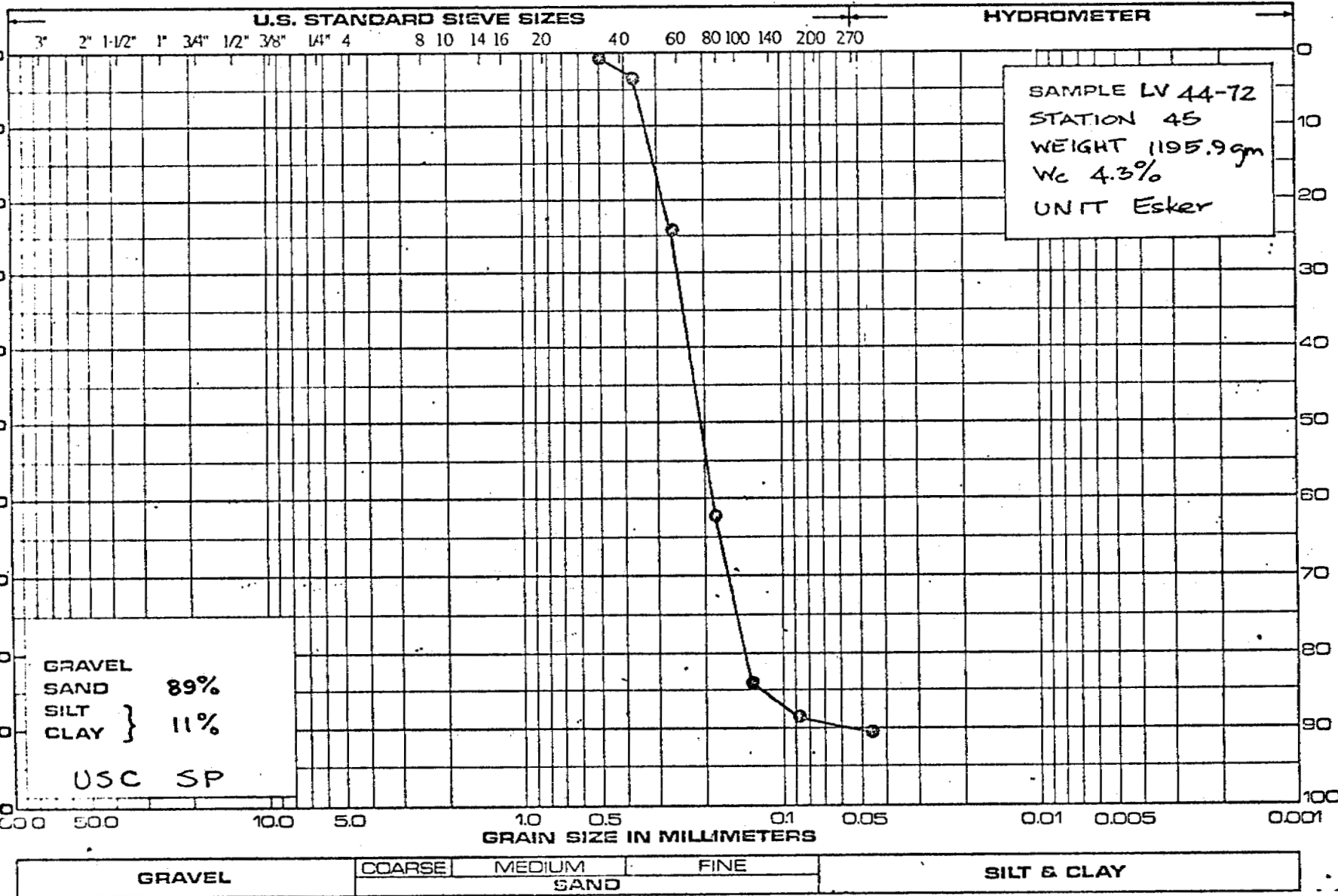


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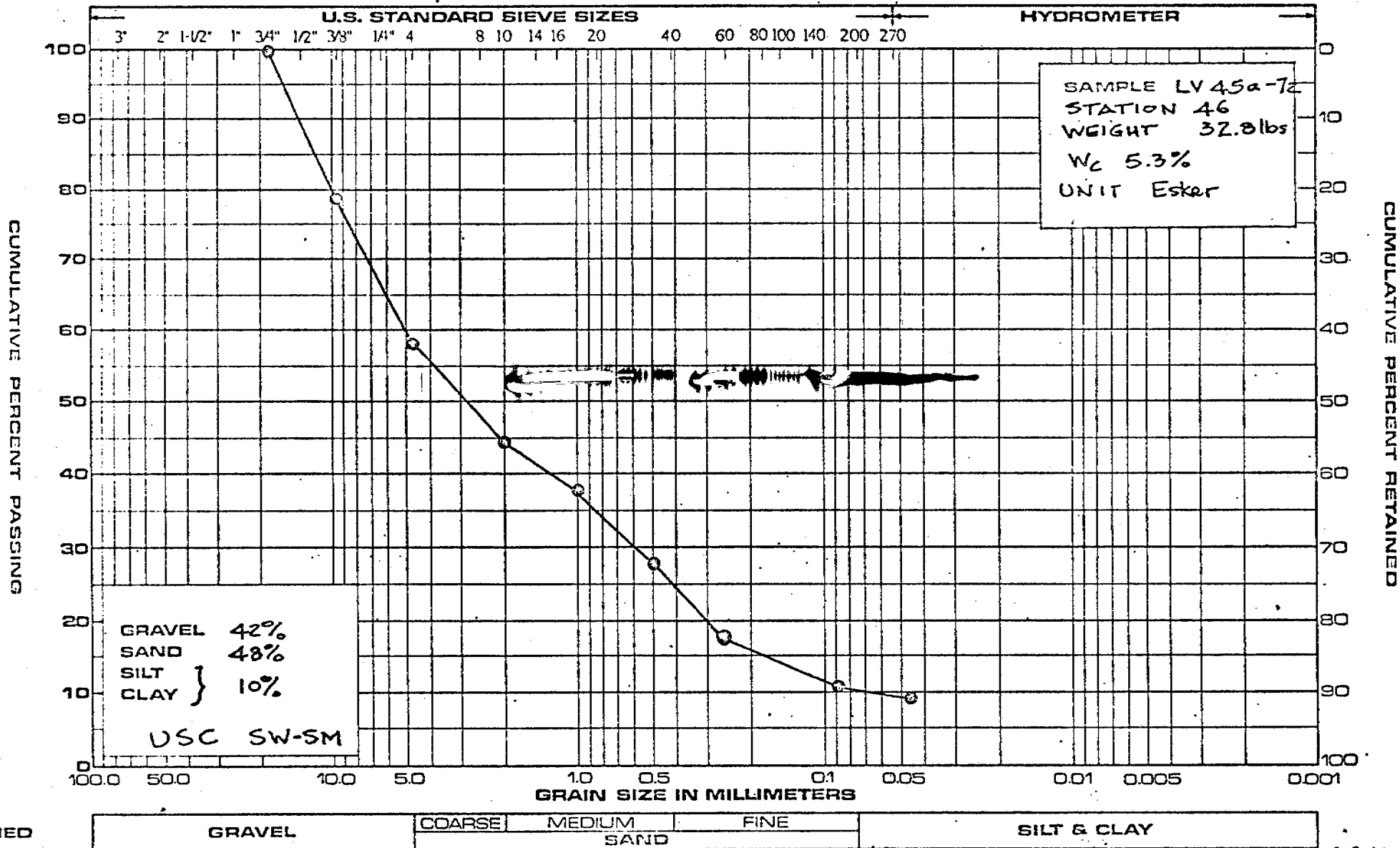
CUMULATIVE PERCENT PASSING

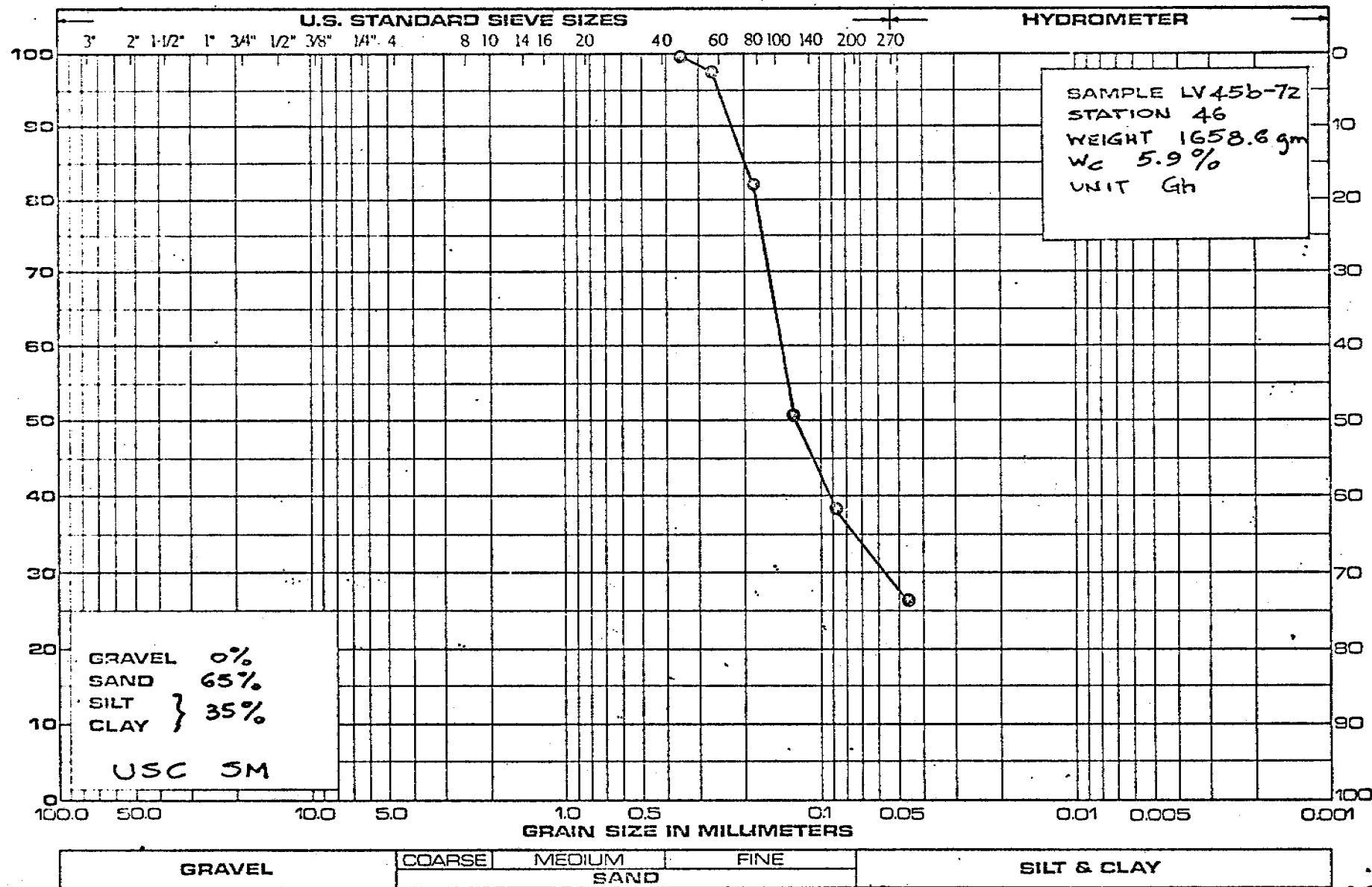
CUMULATIVE PERCENT RETAINED

PARTICLE SIZE DISTRIBUTION



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HYDROMETER

U.S. STANDARD SIEVE SIZES

SAMPLE LV46-72
STATION 47
WEIGHT 49.3lbs
Wc 1.7%
UNIT Esker

CUMULATIVE PERCENT PASSING

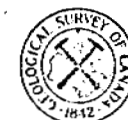
GRAVEL 37%
SAND 58%
SILT } 5%
CLAY }

USC SW

GRAIN SIZE IN MILLIMETERS

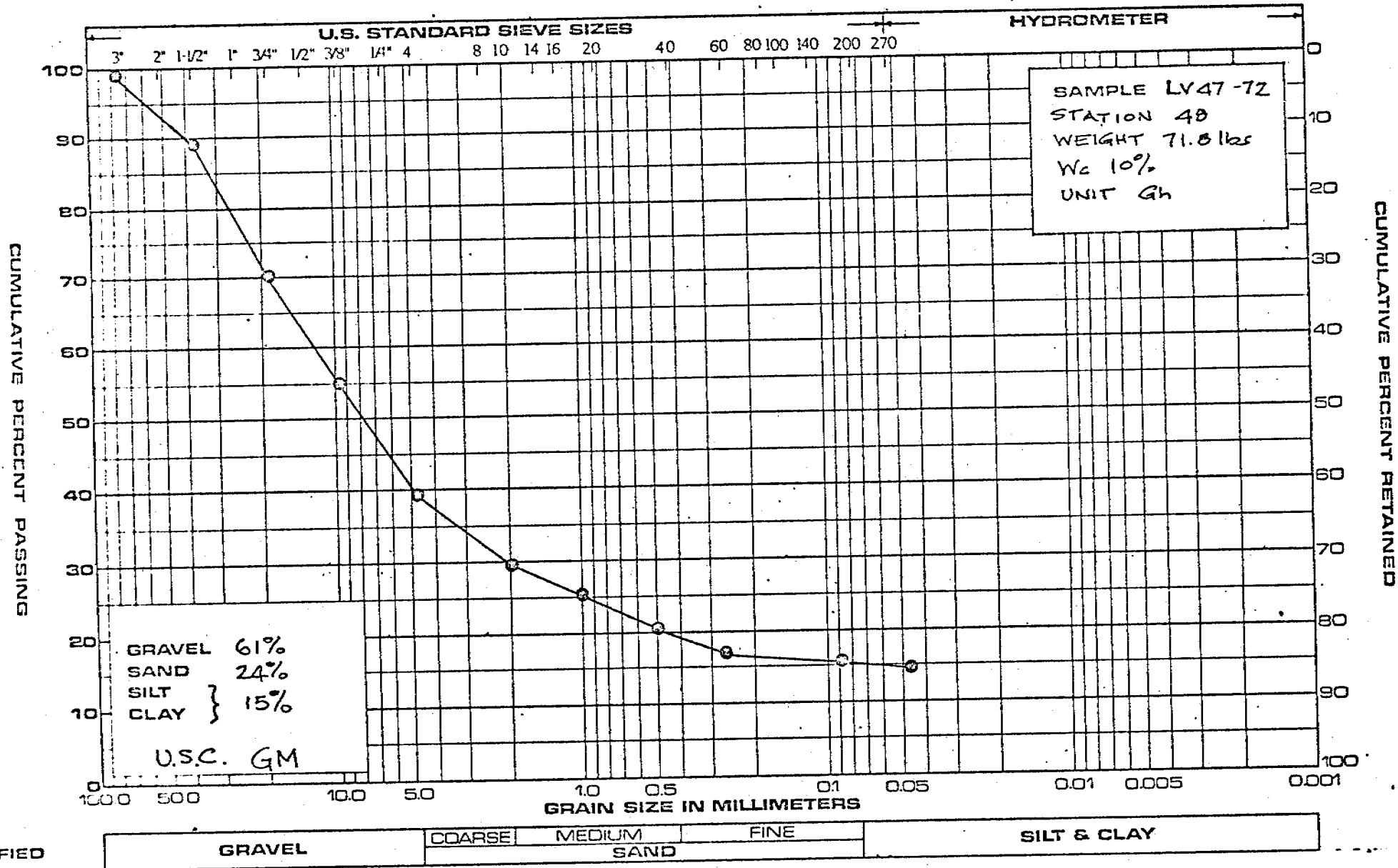
| | | | | |
|--------|--------|--------|------|-------------|
| GRAVEL | COARSE | MEDIUM | FINE | SILT & CLAY |
| | SAND | | | |

UNIFIED



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