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DESCRIPTIVE NOTES

A common legend and descriptive notes are used for Star Lake and Little Grand Lake sheets (NTS 12A/11 and 12)(open file maps 2735 and 2736).

Although privately owned logging roads provide local accessibility to western portions of 12A/12 and eastern portions of 12A/11, most of this 1600 km2 area of west-central Newfoundland is accessible only by helicopter or fixed-wing float aircraft. Streams are too shallow and rocky for boat travel.

The map-area is dominated by the Long Range uplands, a gently rolling surface that in the map area reaches heights of 692 meters. Most of the area does not support forest cover, except for a more or less dense growth of stunted spruce ("tuckamore") and is characterized by boggy lowlands and rounded peaks and ridges. This upland area is bordered by heavily wooded lowlands adjacent to Grand Lake, Little Grand Lake and Red Indian Lake. All the map-area has been glaciated, as evidenced by perched boulders, even on the highest hills, with ice movement being dominately southward. A cover of bouldery till generally occurs in valleys and other bedrock depressions, whereas outcrops are, in many places, restricted to stream beds and the crests of hills and ridges.

The map-area has been previously mapped at 1:250,000 scale by Riley (1957). Portions of the area have been mapped at 1:200,000 scale by Whalen and Currie (1988) and at 1:100,000 by Currie and van Berkel (1992). An area northwest of Little Grand Lake and Star Lake (East Half)(12A/11) have been mapped at 1:50,000 scale by Knapp (1979) and Kean (1979), respectively. This map is the result of work carried out in 1982 and between 1992 and 1993.

The map-area spans the junction between the Notre Dame (to the north), Dashwoods (to the south) and Exploits (to the east) Subzones of the Dunnage Zone or Central Mobile Belt (see Insert Map and Whalen et al., 1993). The Notre Dame-Dashwoods boundary, interpreted as a northeast trending zone of thrust imbrication, juxtaposes contrasting Ordovician age or older granitoid rocks and gneisses (Units **OL, OP, OEC, Om, OES** and **EOgn**). These lithologies, though narrow (1-4 km) across strike, have considerable lateral extent parallel to strike (10-35 km). Within this boundary zone there is a suite of deformed Early Silurian granites (Unit **SS**) which are in marked contrast to contemporaneous massive granites of the Topsails intrusive suite (Unit **ST**). Apparently, the Notre Dame-Dashwoods boundary separates plutonic rocks to the north which have not undergone post-early Silurian deformation from those in the south that have. In addition, a contrast exists across the map area in the compositions of granitic magmas generated during an early Silurian thermal/tectonic event. The Red Indian Line (see Insert Map), the eastern boundary of both the Notre Dame and Dashwoods Subzones, is exposed east of Star Lake as a zone of mylonitic intrusive rocks (Unit **LS**), including equivalents of the early Silurian Topsails intrusive suite (Unit **ST**). Movement on this boundary post-dates all but the Carboniferous (**C**) and Quaternary (**Q**) units in the map-area.

Southwest of Little Grand Lake, there is an area of paragneiss (Unit **EOgn**), rocks which Currie and van Berkel (1992) correlated with the Eocambrian Fleur De Lys Supergroup. However, this correlation is speculative as these rocks lie east of the Long Range Fault (see Insert Map) that separates Humber Zone from Dunnage Zone lithologies. Two main lithologies are present, a well-layered biotite-muscovite paragneiss and a migmatitic equivalent. The migmatitic paragneiss contains numerous granitic and pegmatitic veins and intrusive sheets of biotite±muscovite granite. Complex folding in this lithology is probably due to loss of coherence accompanying partial melting and/or granite injection. This lithology occurs proximal to late granite bodies (Unit **SS**) around Island Pond and North Lake. The intrusive component in the migmatitic paragneiss is locally very abundant. Small areas of paragneiss south and east of Star Lake are also included in Unit **EOgn**. These exposures resemble Unit **OECa** in that complexly deformed paragneiss is cut by multiple generations of quartz veins.

Adjacent to and northeast of Star Lake, there is a group of mafic intrusive and volcanic rocks which are interpreted as disrupted components of an ophiolite suite, the Star Lake ophiolite complex (Unit **OES**). Layered to massive, coarse- to very coarse- grained pyroxene gabbros (Subunit **OESa**) are well exposed on shoreline and on a rugged hill northeast of Star Lake. Further northeast there are isolated good hill top exposures of sheeted gabbro, diorite and diabase (Subunits **OESb, OESc** and **OESd**). Minor dykes and pods of plagiogranite cut Subunits **OESa** to **OESd**. Northwest of Halfway Mountain there are isolated exposures of epidotized mafic pillow lavas cut by common fine-grained diabase dykes (Subunit **OESe**). Dykes within these subunits generally have a similar northeast-southwest orientation. Unfortunately relationships between these subunits are not exposed. Lithological changes in Unit **OES** are interpreted as a southwest to northeast progression form deep level to high level exposures within an ophiolite suite. Preliminary geochemical data from gabbros and sheeted dykes (O'Keefe, 1993; Whalen, unpublished data) support this interpretation.

Rocks of mafic to ultramafic composition (Unit **Om**) occur as small to large (>1 km^2) inclusions in Units **OL** and **OP**. Dunning et al.(1982) interpreted these fragments as being of ophiolitic affinity and of similar age to the Annieopsquotch ophiolite complex. This complex, which occurs approximately 10 km to the southeast of the map-area, gave U-Pb zircon ages of 477.5+1.3,-1.0 Ma and 481.4+4.0,-1.9 Ma (Dunning and Krogh, 1985). Similar mafic to ultramafic inclusions occur in the Hungry Mountain Complex to the north and younger igneous breccias (Unit **STag**). Some ophiolitic fragments are weakly foliated, however, most are massive. Unit **Om** consists of fine-grained basaltic, fine-grained to coarse-grained (2-3 cm) amphibolitic and gabbroic rocks. They commonly exhibit metamorphic rather than igneous textures and have epidote plus chlorite alteration patches and fracture fillings. In many cases, it is apparent that amphibole is a replacement of primary pyroxene in these rocks.

East and southeast of Cariboo Lakes is a group of rocks which have been called the Cariboo Lakes gneiss complex (Unit **OEC**). Based on degree and type of deformation and compositional banding, these rocks predate the adjacent Middle Ordovician age Lewaseechjeech Brook plutonic suite (Unit **OL**). The oldest component, a grey complexly folded migmatitic paragneiss (Subunit **OECa**), is cut by multiple generations of deformed and dismembered white quartz and coarse-grained muscovite-bearing pegmatite veins. This lithology grades into and is cut by a bluish grey, fine- to medium-grained, biotite-muscovite granodiorite (Subunit **OECb**) which contains abundant ovoid 2 to 5 cm lumps of white quartz. Both the paragneiss and the granodiorite contain pseudomorphs of yellow chlorite and sericite after cordierite and rare relict sillimanite. Subunit **OECb** contains a large component of material in the form of inclusions and microxenoliths derived from the migmatitic paragneiss. Bordering these subunits to the east are exposures of a white, medium-grained, biotite-hornblende granodiorite (Subunit **OECc**). Weathered surfaces reveal folded compositional banded within Subunits **OECb** and **OECc**. An U-Pb zircon age is in progress on a sample of Subunit **OECc**.

The Glover Formation (Unit **OG**) underlies a large area on the east side of Grand Lake. It consists mainly of mafic volcanic and volcaniclastic rocks (**OGa**), lesser conglomerate plus fine-grained tuffs (**OGb**) and minor rhyolite (**OGc**). Black shales of Subunit **OGb** near Square Pond contain graptolites of middle to late Arenig age (Nowlan and Thurlow, 1984). The basaltic volcanics are generally extensively altered with pervaissive chlorite plus epidote alteration of mafic silicate minerals, albitization of plagioclase, common epidote filled fractures and large massive epidote patches in outcrop. Close to contacts with younger granitic rocks the Glover Formation loses primairy features and becomes massive fine-grained hornblende-clinopyroxene- biotite-plagioclase rock, presumably due to contact metamorphism.

East of Star Lake, but west of Red Indian Lake and the Lloyds River is a narrow northeast trending belt of mafic volcanic and volcaniclastic rocks (Unit **OV**) which may be correlatives of the Victoria Lake Group further east. This unit was mainly compiled from Kean (1978). It is separated from the various plutonic units by a major ductile fault zone considered to be part of the Red Indian Line (Unit **LS**).

From southeast of Little Grand Lake to Star Lake there is a east-west trending group of gabbroic to tonalitic and granitic rocks called the Pierre's Pond plutonic suite (Unit **OP**). Exposures in this area consist mainly of common scattered small outcrops within a large expanse of string bog. The most common lithology is moderately to strongly foliated, blue quartz-eye porphyritic hornblende-biotite tonalite (Subunit **OPa**). In the Star Lake sheet, this subunit is bordered by an area of texturally diverse of more mafic gabbroic to dioritic rocks (Subunit **OPb**). There are isolated hill-size inclusions of massive to foliated gabbro (Unit **Om**) within Subunits **OPa** and **OPb**. Adjacent to Lake of the Hills in the Star Lake sheet, Subunit **OPa** is intruded by a sheet of pink feldspar porphyritic (2-4cm) biotite-hornblende granodiorite (Subunit **OPc**). On the southeast side of Star Lake, there is an area of white, medium-grained hornblende-biotite granodiorite (Subunit **OPd**). Relative age relationships between this subunit and other portions of the suite are not known but Subunit **OPd** could be significantly younger and equivalent to the Halfway Mountain granodiorite (Unit **LOH**). Foliation in Unit **OP** is mainly east-northeast but locally strikes northeast and is generally steeply dipping.

Extending from Little Grand Lake to Shanadithit Brook is a northeast trending group of foliated tonalitic to granodiorite intrusive rocks called the Lewaseechjeech Brook plutonic suite (Unit **OL**). Contact relations between Unit **OL** and Unit **OP** are very poorly exposed, but based mainly on differences in degree of deformation, Unit **OL** appears to be younger. Foliation in Unit **OL**, where developed, varies from weak to moderate, is steeply dipping and varies in strike from east-southeast in the southwest to north-south in the southeast part of its exposure area. Like Unit **OP**, intrusive lithologies within Unit **OL** are laterally extensive parallel to foliation but narrow across foliation. Contact relationships between phases of Unit **OL** and between it and Unit **OP** are not exposed but are thought to be faults. Subunit **OLa** consists of generally massive, coarse-grained, white to medium green, biotite-amphibole granodiorite to tonalite. Abundant large composite-grained blue quartz aggregates are the most distinctive feature of this unit and there are also, in places, common massive white quartz xenoliths (2-5 cm), similar to Subunit **OECb**. Tonalite Subunits **OLa** and **OPa** are lithologically different. Subunit **OLa** is only rarely unaltered; alteration consists of pervasive chlorite plus epidote alteration of mafics and feldspar. Subunit **OLb** consists of coarse-grained, equigranular, white to pale yellow, acicular amphibole-biotite granodiorite. It varies from quite fresh igneous-textured, to brittly sheared with extensive epidote plus chlorite alteration of biotite and amphibole, and sericite alteration of plagioclase. Subunit **OLc** is similar to Subunit **OLb** except that it contains scattered euhedral pink K-feldspar phenocrysts (2-4 cm). A preliminary U-Pb zircon age of 467±3 Ma has been obtained from this phase. Subunit **OLd** consists of a distinctive white, medium-grained, equigranular, biotite-hornblende granodiorite to tonalite.

Within the map-area, there are scattered small gabbroic intrusions into middle Ordovician age units (Unit **LOgb**). These mafic intrusions could be contemporaneous with similar rocks belonging to the Rainy Lake complex (Unit **LOR**) or they could be older.

On the north shore of Island Pond there are good exposures of a heterogeneous mixture of mafic intrusive rocks, including pyroxenite, gabbro, diorite and tonalite (Unit **LOag**). Lithologies present could be of various ages and be equivalent to Units **Om, OP** and **LOR**.

There are exposures on the shoreline of Grand Lake, just north of Red Indian Brook, of a granodiorite identical to that exposed on the northeast side of Glover Island (P. Cawood, 1993 pers. com.). The Glover Island granodiorite (Unit **LOG**), a foliated, white to beige, biotite-hornblende granodiorite, has yielded a Late Ordovician U-Pb age (Dunning and Cawood, unpublished data) similar to that obtained from Unit **LOR** by Whalen et al. (1987).

The Rainy Lake complex (Unit **LOR**), which outcrops well in Red Indian Brook, consists of distinctive, mildly saussuritized gabbro with clots of pyroxene, biotite and amphibole, which is cut by various mesocratic amphibole-clinopyroxene diorites, leucocratic amphibole-biotite tonalites and granodiorites. The complex clearly intrudes the Glover Group (Unit **OG**). An U-Pb age of 438±8 Ma was obtained by Whalen et al. (1987) from exposures of this complex in Harrys Brook in NTS 12A/13.

East of Shanadithit Brook is an intrusion called the Halfway Mountain granodiorite (Unit **LOH**). This slightly foliated, white to beige biotite-hornblende granodiorite to granite resembles Subunit **OPd** of the Pierres Pond Plutonic Suite.

In the area adjoining the map-area to the north (NTS 12A/13), a group of bimodal volcanic rocks correlated with the Springdale Group (Whalen and Currie, 1988) gave an U-Pb age of 429±4 Ma (Whalen et al., 1987). Correlatives in the map area consist of flow-banded and fragmental felsic volcanic rocks (Units **SSGa** and **SSGb**). The most interesting exposure is on a hill south of Caribou Lakes in the Star Lake sheet. Felsic lahar-type fragmental rocks overlain by a banded rhyolite flow overlie Ordovician age granitoid rocks (Unit **OLa**). Though no exposure of this contact was located, it is thought to be an unconformaty rather than a thrust. To the north of this hill, lithologically similar banded rhyolite dykes cut tonalite Unit **OLa**. These dykes are thought to represent feeders to the felsic volcanic rocks.

The Star Lake and Little Grand Lake sheets contain a number of ovoid, slightly to moderately foliated granite intrusions, together termed the Star Lake intrusive suite (Unit **SS**). These plutons, which intrude well-foliated Ordovician or older Units **EOgn, OL** and **OP**, include a spectrum of lithologies from subsolvus muscovite- garnet granite (**SSf**) to peralkaline arfvedsonite granite (**SSa**). A number of these bodies, such as that east of Star Lake and the body southwest of Lake of the Hills, exhibit variation or zoning from metaluminous to peraluminous compositions. Based mainly on their deformed nature, Whalen and Currie (1988) concluded that these were Ordovician intrusions which predated the Topsails intrusive suite (Unit **ST**). However, new preliminary U-Pb monozite results and more detailed mapping indicates that these plutons are contemporaneous with Unit **ST**, ie. about 429 Ma in age. Subunits **SSa**, **SSb** and **SSc** are lithologically similar to phases **STme**, **STmb** and **STmc** of the Topsails suite. Peraluminous phases (Subunits **SSd** to **SSf**) do not have equivalents within Unit **ST**.

The Topsails intrusive suite is a voluminous group of consanquinous, peralkaline to metaluminous, hypersolvus to subsolvus, hypabyssal felsic intrusions (Unit **ST**). It includes a volumetrically minor but significant, contemporaneous basaltic component (Whalen and Currie, 1984). These massive, undeformed plutons intrude folded volcanic rocks considered to be equivalent to the Springdale Group (Unit **SSG**) and well-foliated Ordovician granitoid rocks of Units **OEC** and **OL** or equivalents belonging to the Hungry Mountain Complex. Most of the suite is exposed north of the map area (Whalen and Currie, 1988). U-Pb zircon ages obtained from older and younger components of this suite, 429±3 Ma and 427±3 Ma, respectively, and from felsic volcanics equivalent to Unit **SSG**, 429±4 Ma, overlap within analytical errors (Whalen et al., 1987), indicating a major early Silurian magmatic event in the Notre Dame Subzone (Whalen, 1989).

The Topsails intrusive suite includes elongate belts of agmatite (Unit **STag**) consisting of complex mixtures of diverse mafic fragments and variously hybridized granitic rocks. The mafic fragments range from fine-grained featureless basalt, through various gabbroic rock types, to ultramafic blocks. Fragments range in size from a few millimeters to more than ten meters, and shapes range from extremely angular to almost spherical. The agmatite zones presumably sample material originally at greater depth. The mafic fragments could be, in part, derived from Unit **Om**, whereas the salic matrix is probably equivalent to Unit **STm**.

Based on intrusive relationships and degree of alteration, quartz syenite-bearing Unit **STsy** is older than Unit **STm**. This unit is orange red in colour with minor elongate acicular mafics and small scattered plagioclase phenocrysts (2-3 mm) in a matrix of granophyric feldspar and quartz.

Pink to white, biotite-dominent, semiporpyritic subsolvus granite, readily recognized in the field by the white plagioclase crystals on weathered surfaces, is a major rock type (Unit **STg**). Both intrusive and apparently gradational contacts have been observed between Units **STg** and **STm**. Easily recognizable intrusive rocks of Units **STp** and **STg** are separated by a zone of finer grained intrusive rock which is not readily assigned to either of the units.

Unit **STp** consists of coarse-grained, white to red, hypersolvus, amphibole granite with prominent quartz grains and a distinctive interstitial habit to mafic minerals. This distinctive phase is a major component of the Topsails intrusive suite both within the map area and to the north. It outcrops over a very large area extending from Lewaseechjeech Brook for more than 100 km to the northeast to the vicinity of Sheffield Lake. An U-Pb age of 429±3 Ma was obtained by Whalen et al. (1987) from this unit at Gaff Topsail in NTS 12H/2. Most, but not all, of Unit **STp** is peralkaline. It contains mafic clots consisting of alkali pyroxene, arfvedsonite, riebeckite and occasional aenigmatite

Closely associated with Unit **STp** is a spectrum of fine- to medium-grained granitic to granodioritic phases (Unit **STm**) subdivided on the basis of feldspar and mafic mineral mineralogy. These phases occur mainly at the margins of Unit **STp**, and vary from amphibole-poor to amphibole-free biotite granite to peralkaline amphibole-aegerine granite. Both hypersolvus and subsolvus types occur. Contact relationships, where observed, show these phases are younger than Unit **STp**, although in many cases the contacts appear to be gradatioal. Most marginal phases are very felsic and they range in colour from white to pink to red, and vary from fine- to medium-grained and from equigranular to porphyritic (quartz and K-feldspar).

Various intrusive units are locally cut by numerous dykes (Unit **STd**) including mafic (basalt, diabase and gabbro) (Unit **STda**), quartz-feldspar porphyritic rhyolite (Unit **STdb**) and flow- banded rhyolite (Unit **STdc**) dykes.

Just east of Star Lake, there is a north-east striking fault zone which separates plutonic rocks of Unit **SS** from volcanic rocks of Unit **OV**. Tectonites within this fault (Unit **LS**) consist of mylonitic and strongly sheared equivalent of Units **SS** and **OP**. Kinematic indicators and mapped displacements of plutonic units suggest a sinistral movement. This fault zone is interpreted as part of the Red Indian Line, which separates Notre Dame and Dashwoods Subzones to the west from the Exploits Subzone to the east (see Insert Map).

The Carboniferous rocks (Unit **C**) bordering Red Indian Lake were compiled from Kean (1979). He described these rocks as consisting mainly of medium- to very coarse-grained clastic sediments containing locally derived volcanic and plutonic rocks detritus.

There are a number of areas in the map-area where bedrock is hidden beneath glacial and glaciofluvial deposits (Unit **Q**). Though such deposits are ubiquitous elsewhere in the map-area, they are probably of a lesser thickness.

Much of the map-area has received little prospecting attention, presumably due to its relative remoteness, poorly known geology and poor exposure. The volcanogenic massive suphide deposits of the Buchans camp, historically among the most economically important mineral deposits in the Province of Newfoundland, occur within the Buchans Group, just northeast of the map area. The Glover Group (Unit **OG**) and the Buchans Group both contain considerable volumes of pillow lavas and volcaniclastic sediments and are of similar age (Dunning et al., 1987). The Glover Group may, like the Buchans Group, have potential for similar massive sulphide mineralization. The map-area strattles a number of major tectonic boundaries; the Humber-Dunnage Zone and Notre Dame-Dashwoods-Exploits Subzone boundaries (Whalen et al., 1993) (see Insert Map). These boundaries consist of major ductile and brittle shear zones or thrusts, each of which has had distinct and extended tectonic histories. Such zones have potential for gold mineralization, in particular where they cut Ordovician island arc type volcanic and intrusive rocks.

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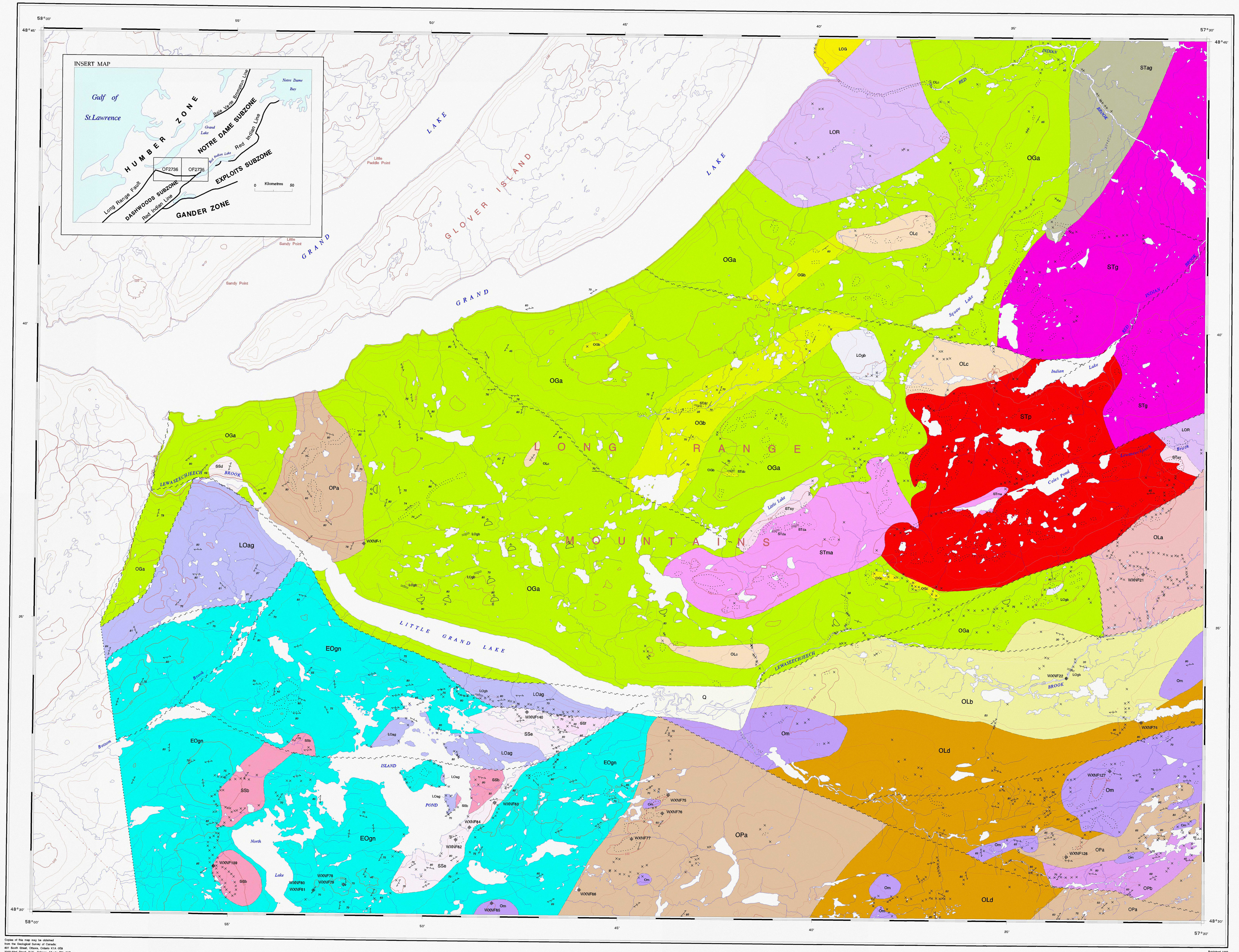

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LEGEND

This legend is common to open files 2735 and 2736
Not all units appear on this map

QUATERNARY

- **Q** — Glacial and glaciofluvial deposits; sand, gravel, boulder clay, till

CARBONIFEROUS

- **C** — Carboniferous clastic sedimentary rocks; poorly indurated red and gray sandstone and conglomerate; minor limestone and siltstone

MIDDLE SILURIAN OR YOUNGER

- **LS** — Tectonites along Red Indian Line; mainly strongly sheared to mylonitic equivalents of units **OPd**, **SSa** and **SSb**

EARLY SILURIAN

TOPSAILS INTRUSIVE SUITE
Subunits STag to STd are generally massive

- **STda** (dyke symbol) — Dyke rocks; **STda**, fine- to medium-grained diabase; **STdb**, orange to red K-feldspar porphyritic rhyolite; **STdc**, flow-banded rhyolite, probably feeders to volcanic unit **SSG**

STm: White to red, fine- to medium-grained, equigranular granite; minor quartz-feldspar porphyritic granite and aplite; marginal or higher level equivalents of units **STp** and **STg**

- **STma** — Biotite subsolvus granite
- **STmb** — Biotite-amphibole subsolvus granite
- **STmc** — Biotite-amphibole hypersolvus granite
- **STmd** — Amphibole-biotite hypersolvus granite
- **STme** — Arfvedsonite-aegirine hypersolvus granite
- **STp** — Pink to red, medium- to coarse-grained, equigranular, arfvedsonite +/- aegirine hypersolvus granite; may include minor unit **STm**, in large part peralkaline
- **STg** — White to pink, medium- to coarse-grained, biotite-amphibole subsolvus granite; contains pink, fine- to medium-grained granite with pegmatitic patches near margins
- **STsy** — Red, medium-grained, K-feldspar porphyritic amphibole-biotite subsolvus syenite to granite
- **STag** — Agmatite of mafic to ultramafic blocks in a granitic to granodioritic matrix, blocks may be as old as unit **Om**, matrix may be as young as unit **STm**

STAR LAKE INTRUSIVE SUITE
Subunits SSa to SSf are all slightly to moderately foliated and are considered to be of similar age, alkaline to metaluminous phases probably equivalent to the Topsails intrusive suite (**ST**)

- **SSa** — Pink to red, medium- to coarse-grained, equigranular, arfvedsonite +/- aegirine hypersolvus granite; may include some subunits **SSb** and **SSc**
- **SSb** — Pink to red, medium- to coarse-grained, biotite-amphibole subsolvus granite
- **SSc** — Pink, fine- to medium-grained, biotite hypersolvus granite
- **SSd** — White to pink, biotite-amphibole, subsolvus granite to granodiorite
- **SSe** — White, medium-grained, biotite-muscovite, subsolvus granite
- **SSf** — White, medium-grained, muscovite-garnet, subsolvus granite

SPRINGDALE GROUP

- **SSGa** — Beige to pink, flow-banded rhyolite
- **SSGb** — Beige to grey, felsic laharic breccia

LATE ORDOVICIAN OR EARLY SILURIAN

HALFWAY MOUNTAIN GRANODIORITE

- **LOH** — Slightly foliated, white to beige, medium- to coarse-grained biotite -amphibole subsolvus granite; maybe equivalent to unit **OPd**

RAINY LAKE COMPLEX

- **LOR** — Massive, fine- to coarse-grained, amphibole-clinopyroxene gabbro, diorite and quartz diorite and amphibole-biotite granodiorite.

GLOVER ISLAND GRANODIORITE

- **LOG** — Foliated, white to beige, medium- to coarse-grained, biotite-amphibole granodiorite
- **LOag** — Massive to foliated, fine- to coarse-grained agmatite of gabbroic to quartz dioritic rocks; ultramafic blocks may be as old as unit **Om**, portions may be equivalent to units **LOR** or **OPb**
- **LOgb** — Fine- to medium grained gabbro, intrusive into Ordovician age rocks, maybe as young as unit **LOR**

ORDOVICIAN

LEWASEECHJEECH BROOK PLUTONIC SUITE
All subunits thought to be of similar age, relative age relationships between different subunits unknown

- **OLa** — Massive to slightly foliated, beige, quartz-eye porphyritic biotite -hornblende tonalite to granodiorite
- **OLb** — Foliated, buff, equigranular hornblende-biotite granodiorite
- **OLc** — Foliated, white and pink, K-feldspar porphyritic hornblende-biotite granodiorite
- **OLd** — Foliated, white, equigranular biotite-hornblende granodiorite to tonalite

PIERRE'S POND PLUTONIC SUITE
May include intrusive phases ranging in age from Middle Ordovician to Early Silurian; subunit **OPc** intrudes **OPa**, relative age relationships between other subunits unknown

- **OPa** — Moderately to strongly foliated, beige, blue quartz-eye porphyritic hornblende tonalite
- **OPb** — Foliated to massive, grey to black, fine- to medium-grained, hornblende +/- biotite gabbro to diorite, includes a texturally diverse group of mafic to intermediate intrusive rocks
- **OPc** — Foliated, pink, feldspar porphyritc biotite-hornblende granodiorite
- **OPd** — Foliated, white, medium-grained, equigranular, hornblende-biotite granodiorite, may be equivalent to unit **LOH**

VICTORIA LAKE GROUP(?)

- **OV** — Mafic lava (locally pillowed), agglomerate, tuff, siltstone, graywacke

GLOVER GROUP

- **OGa** — Pillow basalt, agglomerate and diabase, minor red chert
- **OGb** — Tuff, tuffaceous sediments and conglomerate
- **OGc** — Banded rhyolite

ORDOVICIAN OR EARLIER

CARIBOO LAKES GNEISS COMPLEX
Subunits OECa to OECc are in order of decreasing relative age and are intruded by units **OLa**, **OLc** and **ST**

- **OECa** — Grey, fine-grained biotite-muscovite migmatitic paragneiss
- **OECb** — Bluish grey, fine- to medium-grained biotite-muscovite granodioritic to quartz monzonitic orthogneiss
- **OECc** — White, medium-grained, gneissic biotite-amphibole granodiorite
- **Om** — Mafic to ultramafic rocks; gabbro, pyroxenite, diabase; probably ophiolitic fragments equivalent to unit **OES**, present as large inclusions in units **OP** and **OL**; portions could be equivalent to unit **LOag** and **LOgb**

STAR LAKE OPHIOLITE COMPLEX
Subunits **OESa** to **OESe** are thought to be of similar age, all are massive to only slightly foliated subunit **OESe** may be equivalent in age to Skidder basalt

- **OESa** — Coarse- to very coarse-grained, layered pyroxenite
- **OESb** — Sheeted, medium- to coarse-grained, pyroxene-hornblende gabbro, diorite and diabase
- **OESc** — Sheeted, fine- to medium-grained, pyroxene-hornblende diabase, local pods of pegmatitic hornblende diorite
- **OESd** — Sheeted, fine- to medium-grained pyroxene-hornblende diabase, local pods or dykes of fine-grained hornblende plagiogranite (tonalite)
- **OESe** — Pillow basalt cut by common fine-grained diabase dykes

LATEST PROTEROZOIC (EOCAMBRIAN)(?)

- **EOgn** — Grey, fine- to medium-grained, biotite-muscovite paragneiss and migmatitic paragneiss with common biotite +/- muscovite granite in foliation parallel sheets

Limit of mapping
Rock outcrop
Area of outcrop
Geological contact (approximate)
Bedding (inclined, vertical)
Bedding, from grain gradation (inclined)
Pillowed flow, (inclined)
Schistosity (inclined, vertical, dip unknown)
Gneissosity (inclined)
Mineral lineation
Fault (approximate)
Shear, sense unknown
Dyke, dip known (inclined, vertical)
Dyke, dip unknown (inclined)
Glacial striae
Fracture (inclined)
Geochemical sample site WXNF36

Geology by J.B. Whalen 1992-93 assisted by K.L. Currie and P. Barrette in 1982, M. O'Keefe in 1992 and D. Morrison in 1993, Geological Survey of Canada

Digital map compilation by D. Morrison and J.B. Whalen, Geological Survey of Canada

Digital cartography by D. Everett, Geological Survey of Canada

Any revisions or additional information known to the user would by welcomed by the Geological Survey of Canada

Digital base map assembled and modified by the Geological Survey of Canada from digital bases compiled by the Surveys, Mapping and Remote Sensing Branch

Copies of the topographical edition of this map area may be obtained from the Canada Map Office, Natural Resources Canada, Ottawa, Ontario, K1A 0E9

Mean magnetic declination 1993, 23° 56' West, decreasing 7.8'annually. Readings vary from 23° 51' W in the SE corner to 24° 00' W in the NW corner of the map

Contribution to Canada-Newfoundland Cooperation Agreement on Mineral Development (1990-1994), a subsidiary agreement under the Canada-Newfoundland Economic and Regional Development Agreement

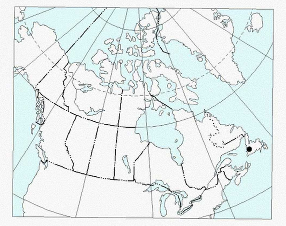
Elevation in feet above mean sea level

COOPERATION
COOPERATION AGREEMENT MINERAL DEVELOPMENT · ENTENTE DE COOPÉRATION SUR L'EXPLOITATION MINÉRALE

Contribution to Canada-Newfoundland Cooperation Agreement on Mineral Development (1990-1994), a subsidiary agreement under the Economic and Regional Development Agreement.

Contribution à l'Entente de coopération Canada-Terre-Neuve sur l'exploitation minérale (1990-1994), entente auxiliaire négociée en vertu de l'Entente Canada/Terre-Neuve de développement économique et régional.

Canada · Newfoundland Terre-Neuve



LOCATION MAP

OPEN FILE 2736

GEOLOGY

LITTLE GRAND LAKE

NEWFOUNDLAND

Scale 1:50 000 - Échelle 1/50 000

Kilometres 1 0 1 2 3 4 Kilomètres

Transverse Mercator Projection
CM 57°45', Scale Factor 1.0

Projection transverse de Mercator
M.C. 57°45', facteur d'échelle 1,0

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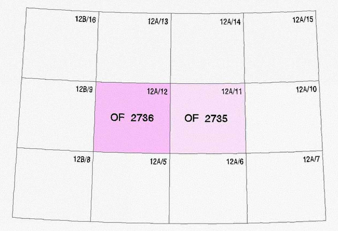

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