63A.341

GEOLOGICAL REPORT ON THE SEWELL LAKE GROUP OF CLAIMS, SEWELL TOWNSHIP, SUDBURY MINING DIVISION, PROVINCE OF ONTARIO

General Statement: The Sewell Lake Group is a large one, comprising claims S-97974 to S-97984 inclusive and S-101028 to S-101047 inclusive, 31 claims in all, and having an area of roughly two square miles. It is situated in Sewell Township, with its western boundary roughly 1,500 feet east of the Reeves - Sewell Township boundary and parallel to it. The east-west southern boundary of the claims group is some 5,500 feet north of the boundary between Sewell and Kenogaming Townships.

The base line of the group is north-south and divides the group roughly into a western two-thirds and an eastern third. The picket lines at right angles to this base line run from 0+00S at the north end to 99+00S at the southern end.

The group was surveyed in June and July, 1957 by two parties, comprising the following men;- P. V. Freeman, F. M. Vokes, R. Doig, V. Mroszczak, W. Scott, L. Allison, I. Katofsky, J. Mercure, J. Philpotts, and R. Rintamaki.

Previous Geological Work: No systematic geological work appears to have been done on the Sewell Lake Group. A geomagnetic survey had been carried out, and the resulting map was available during the work. Many old pits and trenches indicate prospecting of the group in the past.

Topography: The area on the whole shows very little relief. It is flat, with occasional low ridges of sand and bouldery moraine of glacial origin. In the west of the southern part of the group, outcrops of solid rock form features up to 50 - 60 feet above the general ground level. In the north of the group parallel east-west ridges, apparently of sand and gravel, give reliefs of up to 30 - 40 feet. Running southwest from the southern end of Sewell Lake is a marked, broad, elevated esker ridge cutting across the otherwise flat topography.

The main surface drainage is along the western edge of the claims

group where a small creek drains to the north, receiving water from the swamps and smaller creeks in the south-central part of the group. Along this creek are several flat, grassy areas which represent old beaver dams. These become open lakes in wet weather. Sewell Lake occupies a small part of the north-west of the group, with two or three small ponds southwest of it.

The main topographical features are shown on the map accompanying this report.

Accessibility: The Warren Lake highway runs approximately east-west, north of the northern boundary of the group, at a distance of between 600 and 2,000 feet. There is no road or trail into the group from this highway. For the northern and western sections of the group accessibility was made by striking south from the road to link up with a north-south tie line which ran parallel to the base line and about 3,400 feet west of it. This tie line could easily be followed south until the required picket line was reached.

For the south-east parts of the group access was via Sewell Lake. There is a trail from the highway to the northern end of the Lake. A canoe was put on the Lake in order to get to the southern end. From here a trail led in fairly easy, open ground along the esker-ridge mentioned previously. When working the southern parts of the group, travelling time often occupied up to one and one-half hours each way every day.

General Geology: Formations:

Pleistocene and Recent

Diabase (Matachewan?)
Intrusive Contact
Hornblende diorite
Hornblende grabbro
?Intrusive ? Contact
Carbonated biotite granite
Intrusive Contact
Green and light-green hornblende-chlorite? rocks; schistose and massive (volcanics?)
Chlorite phyllites and schists
Graphite schist
Quartzite

This tabulation is not in anyway intended to stratigraphic. There is no evidence as to the order of succession of the last four limits.

Quartzite: At two places only in the claims group (84+50S, 6+00W and 45+00S, 25+00E), a fine grained quartzite of apparently bedded origin was seen at 84+50S. It was exposed in one end of a shallow trench dug through the overburden at right angles to the strike of the rocks. The exposure was too small to allow any observations of the rock structurally. At 45+00S a fine grained, granular quartzite heavily charged with pyrite forms a concordant body in the phyllite rocks and was traced for 100 feet along strike - it is about 20' wide.

Graphite Schist: In contact with the above quartzite apparently overlying it and in stratigraphical conformity was a belt of poorly graphitic quartz schist or phyllite, grey or light grey in fresh specimen but stained brown on the surface due to the weathering of small amounts of sulphide.

Two outcrops revealed a strike length north-south of about 300 feet and a thickness at right angles to the strike of less than 50 feet. No evidence was seen to indicate which way up these rocks are.

Chlorite phyllites and schists: occurred in a belt, about 1,000 feet wide, striking NW-SE in the eastern part of the claims group southwest of Sewell Lake. The rocks are dark green in colour with a silver tint due to sericite. The rock is thinly bedded and highly fissile. Carbonate lenses are abundant along the bedding planes. It is difficult to separate the phyllite rocks from schistose rocks and in the field the rocks were grouped together except where they could be separated with confidence. The main minerals are green chlorite and sericite with fine quartz.

Hornblende - ? chlorite schists: These rocks are by far the most common types occurring on the claims group and form perhaps 80 percent of the outcrops on it. They show slight variations from area to area, but on the whole they comprise fine grained, green to light green schists. The development of schistosity varies considerably. In places they are very thin splitting and show a marked lineation on the planes of schistosity. In others they are quite blocky, almost massive, so that it is difficult to find a measurable schistosity direction. In the latter cases they exhibit a well marked set or sets of joints.

The rocks in general are too fine grained for their constituent minerals to be identified with certainty. The darker green varieties are doubtless very hornblende-rich; chlorite, too, is perhaps a notable constituent. The lighter coloured varieties seem to be quartz-rich. A thin section examination is essential to delineate the various types of these rocks.

They would seem to represent volcanics of different types; perhaps the more hornblende-rich schists represent original basaltic to andesitic types, while the lighter coloured ones originated in more acidic lavas.

In some places these rocks have been relatively little affected by the matamorphic processes and what appears to be the original volcanic banding is preserved. Measurements of the strike and dip of such rocks shows that this apparently primary banding is concordant with the foliation of the more schistose rocks in the same neighbourhood.

A good example of these apparently little altered volcanics was seen at 57¼00S, 7¼00E where banded, fine grained, light green or greenish-white volcanics probably andesites, outcrop. The banding was of the order of a foot or so in width. No evidence of "tops" or "bottoms" was seen.

In other places the rocks have a well marked schistosity developed in them and are often quite thin-splitting. The field evidence is that they are the same rocks as the banded, non-schistose types, but which have been more affected tectonically.

A marked feature of all these green schists is the very large amounts of carbonate which they contain. It occurs often in the body of the rock, giving it a fine granular, or 'sugary' appearance. More generally, carbonate occurs as irregular veins, stringers and less definite bodies in the schist. The carbonate is quite white on fresh fracture, weathering produces very little brown staining. The carbonate is most likely a very slightly dolomitic calcite. Its weathering produces a characteristic 'pitting' on the rock surfaces.

Pyrite and magnetite are disseminated throughout the rocks. At times they

show marked concentrations, the more notable of which will be described later under the heading of "Mineralization".

Veins of barren white quartz are common in some of the outcrops. These reach maximum widths of about two feet, but are more often less than one foot wide. Some of the larger ones have been the cause of trenching in the past, probably because of their possible gold content. Evidence of such prospecting is prominent in the northeast part of the claims group. See also below under "Mineralization".

Hornblende gabbro and hornblende diorite: Outcrops of massive, non-schistose basic to intermediate rocks of apparently igneous origin occur at various places in the area. The field distinction between gabbro and diorite is based on the colour index and it is not always possible to make a clear distinction between the two. Both types are described together here for sake of convenience. (Petrological work is necessary to establish definitely the different rock types.)

In most parts of the claims group the sparsity of outcrops was such as to make it impossible to decide on the outlines of the bodies of massive rocks, only in one case was the contact between such a body and the surrounding schists seen.

In the northwest part of the claims group, along lines 12+00S, 15+00S and 18+00S, between 18+00W and 30+00W is a body of coarse grained hornblende diorite having an elongated, semi-lenticular shape and lying conformably within the volcanics, which appear to 'flow' evenly around its outline (see map). Where the contact is seen, the diorite for some distance away from the volcanics is crushed and sheared, indicating movements after it had been emplaced. The evidence is that the igneous body was intruded as a lens-like stock into the volcanics at some stage before the finish of the orogeny.

Other outcrops of these types of rock occur widely scattered over the

claims group, but there is no sure way of linking them up into larger bodies. Outcrops of hornblende-diorite some few hundred feet south of the one mentioned above may be part of a similar, concordant lens. Some 400 - 500 feet east of the base line, between 45+00S and about 66+00S is a NNW-trending belt of diorite which also appears to be conformable with the surrounding schists. Outcrops of diorite along the base line at 24+00 to 27+00S may possibly link up with this belt. However, the petrological type of this latter locality is not quite the same - it is definitely more mafic. These outcrops may form part of a gabbro body which appears to underlie a belt along the base line. Outcrops of this supposed body of gabbro appear at 90+00S, 85+00S, 72+00S and 51+00S and as large boulders probably nearly in situ around 40+00S. Such a belt of basic rock would coincide very well with the belt of geomagnetic "highs" which occur along the base line between these limits.

A more detailed petrological description must await the results of a microscopical examination of the rocks.

Diabase (? Matachewan): In the north of the claims group, west of the base line, a series of outcrops of a fresh looking dark diabase (dolerite) occur along a NNW-trending belt. The petrological type and the positions of the outcrops strongly suggest that there is here a younger dyke of the Matachewan diabase type. The rock is dense, massive and fine to medium grained, the medium grained varieties having a good diabasic texture. In places it is porphyritic, with large (5mm-10mm) irregular phenocrysts of greenish (saussuritized?) plagioclase scattered throughout the rock.

An isolated outcrop of the same rock at the base line, 21+00S, may possibly be a part of this same dyke, though this would require the dyke to swing somewhat sharply northwest.

Pleistocene and Recent: As can be seen from the outcrop map, the claims group is heavily covered with overburden mainly of glacial or fluvioglacial character. The thick vegetational cover makes direct observation of this overburden often

possible. Its nature can, however, often be deduced from the type of vegetation which grows on it. This link between vegetational types and underlying glacial deposits has been emphasized in previous reports (e.g. West Central Sewell Group, North Weston Group, etc.). For convenience the types may be set out again here.

Sandy areas; flat sandy areas or sand ridges, eskers, etc. support an even growth of spruce and/or jackpine.

Bouldery areas; morainic ridges, bouldery eskers, etc. support a strong growth of a mixed type, with spruce, poplar and birch. Apparently the greater the proportion of boulders, the greater the proportion of the hardwood species.

Swampy areas; maybe underlain by sand or possibly clays. Here the governing factor seems to be the waterlogging. Various swamp types occur; spruce (probably on sandy swamps), spruce-alder, alder, spruce-cedar and pure cedar.

The main glacial features are shown on the map(s) accompanying this report.

Structural Geology:

Regionally the claims group lies in an area of roughly east-west or northwest - southeast striking schists - the 'volcanics' or green-schists - towards the northern edge of the area of supracrystals. The granite boundary is possibly some miles north of the northern boundary of the claims group.

Folding: Due to sparsity of exposures, absence of any leading horizon, and lack of means of determining the attitudes of the rocks, no major folds have been delineated. In plan (see map), interpretation of the strike directions of the schists between the outcrops has enabled a rough picture of the variations in strike over the area to be built up. Since such variations are themselves expressions of folds, the more important of them will be dealt with here.

As mentioned above the strike of the schists is in general E-W or NW-SE. That is, in the west of the area it is more nearly E-W, while it swings more

less evenly, to NW-SE in the eastern part. Dips are nearly all vertical, or within ten or fifteen degrees of vertical. One or two notable exceptions will be noted.

The only evidence for a large scale fold occurs in the west-central part of the group, west of the north flowing creek in that area, between lines 40+00S and 70+00S. Here the strike measurements in the volcanics seem to indicate a Z-bend in the trend directions outlining a syncline followed by an anticline, with a common axial direction of about NW, plunging at 60°. The common limits of the folds show NW dips of about 60°, but the two outer limbs are vertical. Small scale drag-folding in the rocks here plunges parallel with the apparent axes of the proposed larger folds.

This fold may represent a "regional drag-fold", but its significance in the larger scale structure of the area is not yet clear.

No other noteworthy irregularities in the strike directions have been noted.

Small scale folding: Most of the outcrops of the volcanics or green schists show small scale folding or crumpling, usually of amplitudes of only a few inches. Often these take the form of drag folds in which the schistosity and often quartz-veins in the rock are closely folded, with thickening in the crests and troughs and thinning of the limbs. The axes of these small folds most commonly parallels the lineation in the rocks, where this can be observed and measured. No cross folding was observed.

Lineation: Whenever possible, measurements were made of the lineation in the rocks, as expressed by the parallel orientation of elongated minerals, e.g. hornblende, the grooving or small scale crumpling along foliation planes, etc. In most cases the values of the plunge of the lineation were high on the highly inclined schistosity planes, i.e. lineation tended to coincide with direction of dip. In such cases measurements of lineation are not of such high value in determining structural trends, e.g. possible culminations and depressions.

Over the area of the claims group the lineation showed a fairly constant

dunge, along the foliation planes in a westerly or northwesterly direction, of the order of 60° - 80°. Exceptions were noted in the east central part of the group, southwest of Sewell Lake where values as low as 40° were recorded.

Faulting: No large scale faulting has been observed or deduced within the area of the Sewell claims group.

Of smaller faults, may be mentioned;

1) a short NE-SW striking fault cutting across the border of the diorite body in the NW part of the claims group, and displacing it a few tens of feet. This fault is a dextral one.

2) On line 6+00S at 20+00W an outcrop of the green schistose volcanics ends abruptly along a N-S, east facing scarp which may represent a fault feature. No idea of the possible movement along it, if any, could be formed.

3) At 87+00S, 5+00W, a fault striking NW-SE brings the graphite schist against the green schistose volcanics. The movement here is only small and sinistral.

Shearing: Local shearing occurs in several of the outcrops seen, nearly always parallel to the schistosity direction. Shearing is often associated with pyrititic mineralization (see below).

Mineralization:

General Statement: The survey of the claims group has not revealed any mineralization which is of economic interest. Introduced minerals, apart from the regional carbonate, comprise vein quartz, magnetite and pyrite. Chalcopyrite appears in very minor amounts.

The introduced magnetite and pyrite are ubiquitous constituents in small concentrations. Locally they reach notable amounts as described below. Likewise quartz veins or less regular bodies are often to be seen in outcrops of the schists, but locally they reach widths sufficient to have interested prospectors in the past who probably were investigating their gold content. The

fact that the investigations stopped at shallow trenching indicates this content was not noteworthy.

The various areas of increased mineralization will now be described. These are indicated by a letter on the map.

Locality A: Quartz vug in shear zone 3' wide in a medium grained, magnetic, dunitic rock. Shear strikes approximately E-W. The vug contains specks of chalcopyrite and green malachite. Staining is present sparingly.

Locality B: A vuggy quartz-calcite pod in schistose chlorite-carbonate rock, containing large pyrite and chalcopyrite blebs.

Locality C: In a massive, blocky, light green andesitic looking rock on line 48+00S, 1,100 feet east of the base line, a north trending quartz lens up to 3 feet wide contains scattered chalcopyrite and malachite staining.

Locality D: A fine grained sugary quartzite layer parallel to the foliation of phyllites and schists contains heavy pyrite disseminations. The zone is 20 feet wide and was traced for 100 feet.

Locality E: Parallel quartz veins from a few inches up to 2 feet wide from a zone in medium grained dioritic and andesitic rocks between line 57+00S and line 66+00S about 700 feet east of the base line. The zone has been extensively trenched and the veins are exposed along a strike of 800 feet and a width up to 200 feet. The veins trend from N to N10°W and dip 62°W to vertical. A second set of veins trends S75°W and dips 70°S. Within the zone the veins are closely spaced in parts. Immediately adjacent to each vein the country rock is intensely carbonated. On line 57+00 at locality E, the quartz veins are heavily charged with pyrite in parts. Elsewhere the quartz is barren and contains only scattered pyrite. A possible continuation of this zone was found on line 42+00S, 400 feet east of the base line.

Locality E: (cont'd) South of line 66+00S the southern continuation of the zone is covered by fluvio-glacial sand.

Correlation between Magnetic Anomalies and Rock Types:

The high magnetite content in parts of both green schists and diorite or gabbro appears to be responsible for the magnetic 'highs' both airborne and on the ground.

It does not appear likely that serpentinite has been responsible for some of the 'highs'. This observation makes an interpretation of subsurface geology from magnetic results open to questions as the magnetite content of the rocks alone is responsible for magnetic readings and not the rock type themselves.

Conclusions:

The survey of the claims group has shown:-

1. The outcrops have been thoroughly and intensively prospected in the past. Very little, if any, exposed mineralization has been missed.
2. There is a paucity of base metals in the sulphides found. Pyrite is a common accessory constituent in all the rock types, but is nowhere sufficiently concentrated in economic quantities.
3. There are no bodies of serpentinite exposed. The magnetic 'highs' are produced by high magnetite content of the rock types exposed.
4. A regional carbonation has affected most of the rocks in varying degree. This does not appear to have any significance as a wall rock alteration associated with mineralization. Locally intense carbonation adjacent to quartz veins is mixed with amplacement of the veins and is a form of wall rock alteration. It would, however, be difficult to distinguish local wall rock carbonation from regional carbonation.

Recommendations:

The claims group should be retained until the claims lapse. During this time a limited ground electro-magnetic survey should be conducted east of the base line from 30+S to 80+00S.

1. To see if the covered continuation of the quartz vein zone (locality E)

has any significant mineralization along its length.

2. To pick up other possible mineralized zones in this region.

Chalcopyrite in quartz in this vicinity indicates that there may be base metals. On the other hand the heavy pyrite mineralization in the quartz vein zone at locality E and in the quartzite at locality D favours a pure pyritic mineralization. A ground electro-magnetic survey would, however, be the best way to add to the picture of mineralization as exposed by the earlier trenching. If significant results are obtained the electro-magnetic survey could be extended to the other claims groups.

It would be advisable to do the survey during the winter or have the lines re-cut as they are in poor condition.

F.M. Vokes

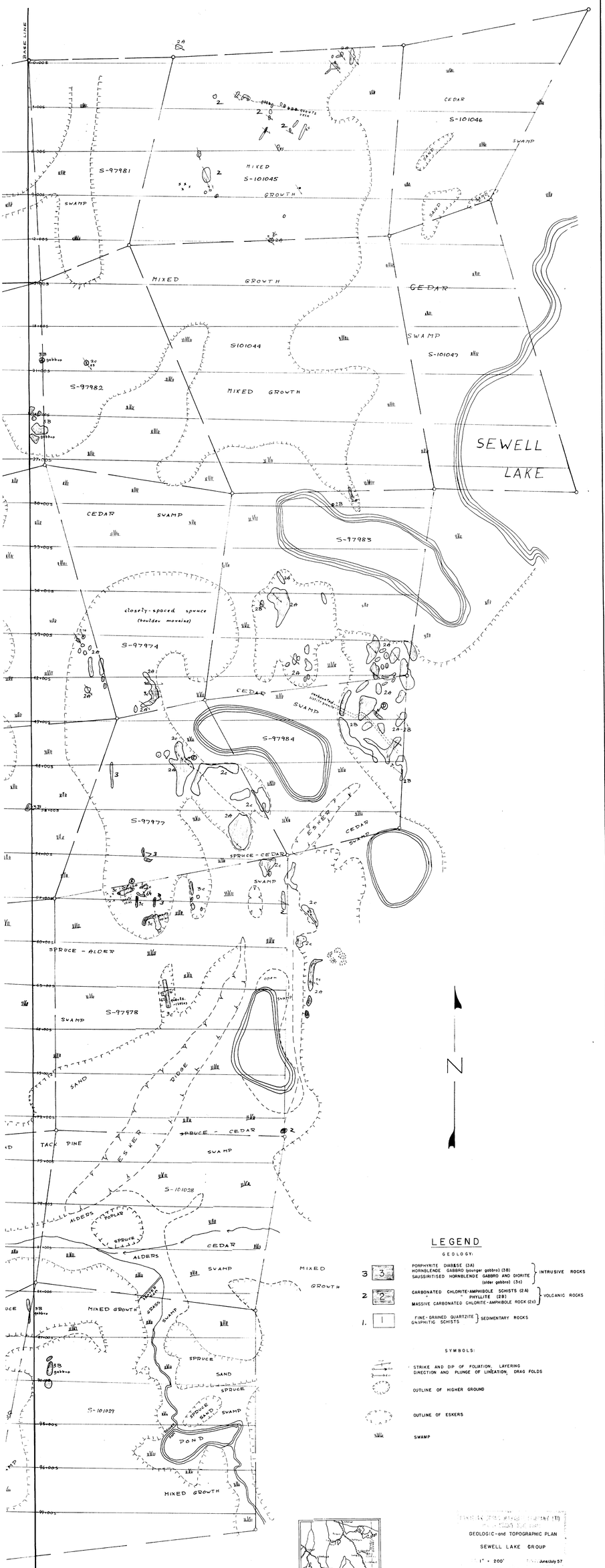
F. M. Vokes,
Geologist.

P. V. Freeman

P. V. Freeman,
Geologist.

July, 1957.

BASE LINE
MIXED GROWTH
SAND RIDGES
SPRUCE SWAMP
CEDAR SWAMP
STEEP CLIFF
porph. diabase
gabbro
diorite
S-101041
HUMMOCKY SAND RIDGES
S-101042
S-97981
S-97980
S-101045
S-101044
S-97979
S-97982
SPRUCE FOREST
S-101040
S-101043
S-101039
OPEN SPRUCE STANDS
S-101038
S-97975
closely-spaced spruce
(boulder moraine)
S-97974
S-97984
S-101033
S97976
S-97977
SPRUCE-CEDAR
S-101034
SAND
GRASSY
ALDERS
SPRUCE - ALDER
S-101032
S-97978
S-101035
outcrop ridge
SAND RIDGE
ESKER
SPRUCE AND JACK PINE
S-101028
S-101031
S-101036
POPLAR
CEDAR SWAMP
POND
open swamp
grassy swamp
S-101030
S-101029
S-101037
DRUMLIN
LOCATI



LEGEND

GEOLOGY:

3	3	PORPHYRITE DIABASE (3A) HORNBLENDE GABBRO (younger gabbro) (3B) SAUSSIRITISED HORNBLENDE GABBRO AND DIORITE (older gabbro) (3C)	INTRUSIVE ROCKS
2	2	CARBONATED CHLORITE-AMPHIBOLE SCHISTS (2A) PHYLLITE (2B) MASSIVE CARBONATED CHLORITE-AMPHIBOLE ROCK (2C)	VOLCANIC ROCKS
1.	1	FINE-GRAINED QUARTZITE GRAPHITIC SCHISTS	SEDIMENTARY ROCKS

SYMBOLS:

- STRIKE AND DIP OF FOLIATION, LAYERING
- DIRECTION AND PLUNGE OF LINEATION, DRAG FOLDS
- OUTLINE OF HIGHER GROUND
- OUTLINE OF ESKERS
- SWAMP

LOCATION SKETCH
Scale: 1" = 50 miles

GEOLOGIC and TOPOGRAPHIC PLAN

SEWELL LAKE GROUP

1" = 200' June/July 57

P.V.F. + E.M.V.

H.J.R.

F.J.E

For Noted.

63M3411