



PROVINCE OF MANITOBA

DEPARTMENT OF MINES AND NATURAL RESOURCES

HON. STERLING R. LYON, Q.C.
Minister

STUART ANDERSON
Deputy Minister

MINES BRANCH
J. S. RICHARDS
Director

PUBLICATION 63-5

PRELIMINARY SURVEY OF BOGS FOR PEAT MOSS
IN SOUTHEASTERN MANITOBA

by
BARRY B. BANNATYNE

WINNIPEG, 1964



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TABLE OF CONTENTS

	Page
I. INTRODUCTION.....	1
Methods.....	1
Reporting of Results.....	1
Acknowledgements.....	2
Southeastern Manitoba.....	2
Peat Moss: Composition, Properties, Uses, Tests.....	3
Production and Markets.....	5
II. PRODUCING BOG	7
(1) Julius bog.....	7
III. BOGS CONTAINING PEAT MOSS OR FIBROUS PEAT OF HIGH ABSORPTIVE VALUE.....	10
(2) Shelley bog.....	10
(3) Bog east of Elma.....	11
(4) Bog northeast of Whitemouth.....	11
(5) Lewis bog.....	14
(6) Whiteshell bog.....	15
(7) Medika bog.....	15
(8) Bog southwest of Elma.....	16
(9) Bog north of Sprague Lake.....	17
(10) Bogs in and north of Northwest Angle Forest Reserve.....	18
(11) Caliento bog.....	20
(12) Sundown bog.....	20
IV. OTHER BOGS SAMPLED; INFERIOR OR SHALLOW PEAT.....	22
(13) Molson bog.....	22
(14) Heart Lake bog.....	22
(15) Jessica Lake bog.....	23
(16) Nourse bog.....	23
(17) Bog south of Hazel Creek.....	24
(18) Bog north of Hazel Creek.....	24
(19) Contour bog.....	25
(20) Bog east of Ste. Genevieve.....	26
(21) Bog southeast of Richer.....	26
(22) Bog northeast of Richer.....	27
(23) Bog along Trans-Canada Highway.....	27
(24) Bog southwest of Hadashville.....	28
(25) Birch River bog.....	28
(26) Glenn bog.....	28
(27) Falcon Beach bog.....	29
(28) Carrick bog.....	30
(29) Piney bog.....	30
(30) Bog east of Highway 89.....	31
(31) Sprague bog.....	32
(32) Moose Lake Road bog.....	33
V. NOTES ON BOG AREAS NOT SAMPLED IN PRESENT SURVEY.....	34
(33) East of Aneda.....	34
(34) Bog north of Highway 4.....	34
(35) Southwest of Julius.....	34
(36) Bog southwest of Whitemouth.....	34
(37) Bog south of Darwin.....	34
(38) Area south of Craigs.....	35
(39) Area west of Rennie.....	35
(40) Bogs east of Birch River.....	35

	Page
(41) Bog southeast of Ste. Genevieve.....	35
(42) Bog east of Larkhall.....	35
(43) Bog north of Hugo Lake.....	35
(44) Bog east of La Broquerie.....	35
(45) Bog south of Glenn	35
(46) Boggly River area.....	36
(47) Bog north of Marchand.....	36
(48) St. Labre bog.....	36
(49) Bog south of Birch Lake.....	36
(50) Bog northeast of Whitemouth Lake.....	36
(51) North of Whitemouth Lake.....	36
(52) Northeast of Caliento.....	36
(53) Northeast of Sundown.....	36
(54) Northwest of Menisino.....	36
(55) Sprague River area.....	37
(56) South of Menisino.....	37
(57) Pine Creek area.....	37
(58) East of Middlebro.....	37
VI. SUMMARY OF RESULTS.....	38
Appendix: Specifications for Peat.....	40
References.....	42
Index of bogs.....	43

TABLES

TABLE 1.	Peat production in Manitoba.....	6
TABLE 2.	Summary of test results.....	39

LIST OF ILLUSTRATIONS

Figure	In Separate envelope
1 Julius and Shelley bogs.....	A2
2 Bogs east of Elma and northeast of Whitemouth.....	A3
3 Lewis bog.....	A4
4 Whiteshell bog.....	A4
5 Medika bog and bog southwest of Elma.....	A5
6 Bogs in and north of Northwest Angle Forest Reserve.....	A6
7 Caliento and Sundown bogs.....	A7
8 Molson bog.....	A8
9 Heart Lake bog.....	A8
10 Jessica Lake bog.....	A9
11 Nourse bog.....	A9
12 Bogs north and south of Hazel Creek.....	A10
13 Contour bog.....	A10
14 Bog east of Ste. Genevieve.....	A11
15 Bog southeast of Richer.....	A11
16 Bog northeast of Richer.....	A12
17 Bog along Trans-Canada Highway.....	A12
18 Bog southwest of Hadashville.....	A13
19 Birch River bog.....	A13
20 Glenn bog.....	A14
21 Falcon Beach bog.....	A14
22 Carrick bog.....	A15
23 Piney bog and bog east of Highway 89.....	A15
24 Sprague and Moose Lake road bogs.....	A16
25 Preliminary map of peat bogs in southeastern Manitoba.....	

I. INTRODUCTION

The primary objective of this survey was to outline possible commercial deposits of high-quality sphagnum peat moss in the numerous peat bogs of southeastern Manitoba. The area considered is comprised of townships 1 to 13, ranges 9 to 17 EPM, in the southeast corner of Manitoba. Because of the large area of over 4,000 square miles involved, as well as the reconnaissance nature of this survey, the results presented in this report should be considered as being preliminary only. A few deposits have been found that are worthy of more detailed testing; many bogs, containing peat of intermediate to inferior quality, could be eliminated from consideration in any future survey. Included in this report is information from various sources on other bogs not sampled in this survey but within the area.

METHODS

An interpretation of the aerial photographs of the entire area was made in which 64 bog areas were outlined and sampling of 41 of these was recommended (Graham, 1962). The selection was based on the following factors:

- the open character of the bog; heavily forested bogs were eliminated
- the possibility of providing drainage
- a minimum area of 75 to 100 acres of open bog
- an estimation of the depth of the bog; bogs which from their distinctive patterns on aerial photographs were considered shallow were eliminated
- access to the bog

Most of the selected bog areas were examined in the field, and samples were collected for laboratory tests. Complete sampling of the recommended locations was hindered by the wet spring and summer seasons of 1962, by difficulties of access to some of the areas, and by water control structures that have converted two of the bogs into shallow lakes. Altogether 100 locations in 38 bog areas were sampled during 1962 and 1963; three of the areas were found to be underlain by peaty soil.

At each location the surface vegetation was recorded using the general classes of sphagnum moss, hypnum moss, reeds, sedge, grass, shrubs, and trees; no detailed botanical classification was attempted. The bogs were sampled from top to bottom using a Djos Beus and Mattson peat sampler that gave cored samples in $\frac{1}{2}$ -meter lengths. The upper green or living layer of a bog cannot be sampled by coring, but was sampled by hand in some bogs. The samples were immediately placed in polyethylene bags to preserve their original state, and were tied and labelled. The nature of the bottom material was recorded.

The peat samples were tested in the laboratory for absorptive value, pH, and moisture, ash and nitrogen content, using standard procedures (see Leverin, 1946; Graham and Tibbetts, 1961; also this report, page 5). The composition of the peat was determined by examination under a binocular microscope.

REPORTING OF RESULTS

For each bog, analyses of the samples, a log or description of the peat, and a detailed map showing location, access, and surface growth are presented. The area of open bog is recorded, along with notes on topography and drainage.

The bogs containing substantial quantities of peat moss or fibrous peat of high absorptive value are described first. The remainder of the sampled bogs are described next, followed by notes on other bogs within the area. The order of presentation of the bogs within each group is in general from west to east across each township, beginning with township 13.

The index map of southeastern Manitoba (fig. 25) shows the location of the sampled bogs, as well as other bog areas determined by studies of aerial photographs supplemented by forestry and soils maps of the area. The following limitations should be noted in regard to figure 25:—

- bog areas in range 8 EPM, townships 1 to 13, are not shown
- the boundaries of the bog areas are interpretative only
- some heavily forested bog areas may not be included
- some of the open areas shown may include land properly classed as marsh, shallow swamp, or hay meadow, and possibly some burned areas (see notes on other bog areas)
- some small or shallow bog areas are not shown.

ACKNOWLEDGEMENTS

The aerial photograph interpretation of the area was made, at the request of the Manitoba Mines Branch, by R. Bruce Graham and Associates Limited, Toronto. A total of 64 bog areas was outlined in this study, and sampling was recommended on 41 of these bogs (Graham, 1962).

The sampling of the bogs was carried out by the Manitoba Mines Branch. The writer wishes to acknowledge the capable assistance in the field in 1962 of E. Williams, and in both the field and the laboratory test work in 1963 of R. Armstrong, both students at the University of Manitoba and affiliated colleges. A Djos Beus and Mattson peat sampler was obtained from the Soils Survey Department of the University of Manitoba. The Manitoba Forest Service district office at Sprague made available the use of a J-5 bombardier-type swamp vehicle that facilitated the detailed sampling of the large Sprague bog.

The peat samples with the highest absorptive values from the 1962 survey were sent to the Fuels and Mining Practice Division, Mines Branch, Department of Mines and Technical Surveys, Ottawa for detailed tests. The writer wishes to thank T. E. Tibbetts and T. A. Lloyd of Ottawa for their co-operation in the peat analyses, and the results of the Ottawa tests are acknowledged where presented in this report. All other test results were made in the Manitoba Mines Branch Laboratory; the analyses for nitrogen content were made by A. M. MacKay.

SOUTHEASTERN MANITOBA

The bedrock geology, glacial geology, soils, forest cover, and topography of the survey area have been described in the following reports and maps, all of which were of value in this investigation.

Bedrock geology:

- Davies, J. F. (1954): Geology of the West Hawk Lake-Falcon Lake Area; Manitoba Mines Branch Publ. 53-4.
- De Lury, J. S. (1937): Boundary Area, Southeastern Manitoba, Manitoba Mines Branch Map 37-4 (out of print).
- Springer, G. D. (1952): Geology of the Rennie-West Hawk Lake Area; Manitoba Mines Branch Publ. 50-6.

Glacial and Recent deposits:

Johnston, W. A. (1921): Winnipegosis and Upper Whitemouth River Areas, Manitoba; Pleistocene and Recent Deposits; Geol. Surv., Canada, Memoir 128.

Soils Survey map

in preparation, Manitoba Soil Survey

Forest Service Maps, 1 mile to 1 inch

MFS-1 Woodridge-Piney
MFS-2 Middlebro-Sprague Lake
MFS-3 Dawson
MFS-4 East Braintree

Topographic Maps

National Topographic Series

(a) 4 miles to 1 inch

52E Kenora
52L Pointe du Bois
62H Winnipeg
62I Selkirk

(b) 1 mile to 1 inch

62H/1 Sundown
62H/8 Marchand
62H/9 Richer
62I/1 Molson

(c) 1:50,000

62H/16 Vivian Station (advance information sheet)
52E/3 Buffalo Bay (advance information sheet)
52E/4 Sprague
52E/5 Whitemouth River (advance information sheet)
52E/6 Berry Point
52E/11 Waugh (advance information sheet)
52E/12 McMunn (advance information sheet)
52E/13 Whitemouth (advance information sheet)
52E/14 Caddy Lake (advance information sheet)

Department of the Interior: Map of Upper Portion of Roseau River Valley, Manitoba; Sheets 1, 2 and 3.

Extracts from Reports on Townships East of the Principal Meridian (1915), Dept. of the Interior, Ottawa.

Aerial photographs

- (a) township mosaics, $\frac{1}{2}$ mile to 1 inch
- (b) individual photographs, $\frac{1}{4}$ mile to 1 inch

PEAT MOSS: COMPOSITION, PROPERTIES, USES, TESTS

Peat consists of the remains of a variety of plants that have accumulated in low, wet, poorly drained areas such as meadows, swamps, marshes, muskegs, or bogs. The plants include everything from small algae to large trees, but the common ones in southeast Manitoba are:

- (a) *Sphagnum Moss* — a dense growth of a slender-stemmed plant with many short branches, covered with leaves composed of hyaline cells capable of taking in and holding water; it is distinguished by its high absorptive value, its resistance to decay, and its acidity.

- (b) *Hypnum Moss* — somewhat resembles sphagnum moss, but is often reddish, more brittle when dry, and lacks hyaline cells.
- (c) *Sedges* — grass-like plants, but usually have triangular instead of round stems, and are not hollow; include cotton grass, which yields a strong reddish bundle of fibres, and the tall-stemmed carex group.
- (d) *Marsh and Aquatic plants* — Labrador tea, blueberry, pitcher plant, bulrushes, horsetails, reeds.
- (e) *Shrubs and Trees* — dwarf birch, willows, alders, spruce and tamarack; some jack pine and cedar.

The plant remains may be undecomposed (especially sphagnum moss), disintegrated into roots, leaves, and stems, or partially or completely decomposed. Humification is the process of disintegration and decomposition of plants, and in an advanced state the recognition of original plant types may not be possible.

In the bog descriptions of this report, the peat is classed, according to its major constituents, (following Rigg, 1958, in part), as

- (a) *Sphagnum Moss*
- (b) *Hypnum Moss*
- (c) *Fibrous Peat* — consists mainly of the remains of sedge and grass; may be made up of finely fibrous remains or of coarse fibres
- (d) *Woody Peat* — consists of particles of partially decayed wood
- (e) *Humified Peat* — decomposed organic material.

The peat seldom consists of the remains of one type only, but may be a mixture of two or more types, and may contain remains of aquatic and marsh plants as well as of grasses, shrubs, and trees. Carbonized remains are found in bogs whose surfaces have been burned.

Fibrous peat generally occurs in the "low-moor" type of bog that represents the infilling of a shallow topographic depression with organic material. Sphagnum moss occurs in "raised bogs" formed by the upward growth of moss from either an original flat, poorly drained surface or a gentle slope, or as a surface dome over a fibrous peat bog.

Swinnerton (1958) and Graham and Tibbetts (1961) have described the properties and uses of peat moss. The main use of peat moss is in horticulture where its addition to the soil promotes better lawns, more luxuriant flowers, and stronger plants and shrubs. Although not a fertilizer in itself, it is a good soil conditioner as it loosens a clay soil, helps to maintain the moisture in a light sandy soil, and adds valuable organic matter to depleted soils. It makes excellent packing material for the shipment of perishable fruits, vegetables, and cut flowers. It makes an excellent stable litter for horses and cattle, and it is especially valuable for poultry litter. It is useful for making compost and as a diluent and carrier in the application of artificial fertilizers. Other uses are in the metallurgical and brewing industries, as a deodorant, and as an insulator.

Peat moss should be fibrous, elastic, relatively unhumified, and resistant to decomposition. An ash content of less than 5% and a pH of 3.5 to 6 is desirable. It must have the ability to add vegetable matter to the soil; some nitrogen content in the peat moss is an advantage. Above all, it must have a high absorptive capacity, and some specifications (see Appendix) require a minimum absorptive capacity for water greater than 12 times its own oven-dry weight.

Sphagnum moss is the most desirable variety; in its pure form, it absorbs from 18 to 26 times its own dry weight. In practice, the absorptive value of commercial

sphagnum moss produced in Canada greatly exceeds the minimum specification, generally ranging from 16 to 24 or more times its own weight (dry basis) or approximately 12 to 18 times its own weight (25% moisture basis). Almost all Canadian production is of sphagnum peat moss, of which 94% is exported. The moss is air-dried to 35% moisture or less by weight, and is broken down and screened to $\frac{1}{4}$ inch or less for horticultural uses. For poultry litter it is shredded to $\frac{3}{4}$ inch (medium shredded) and the dust is removed. For stable litter the moss is coarsely shredded.

Hypnum moss absorbs from 8 to 13 times its own weight (dry basis) of water, but it is brittle and easily disintegrated when dry and hence lacks some of the commercial applications of sphagnum peat moss.

Fibrous peats are composed of grass, reeds, and sedge and, depending on composition, absorb from 3.5 to 13 times their own weight (dry basis); the residues do not have the good cellular texture of sphagnum moss. Although it is not produced to any extent in Canada, it is used in the United States as a soil conditioner as its plant nutritive value is comparatively high. Wet fibrous peat is used on large areas being landscaped, and also on smaller gardens and in preparing new lawns. It is useful around the home in growing potted plants and in flower beds. Pure fibrous peat and its mixtures with humified peat are often sold under the name of humus, and sometimes leaf mould. Its value per ton is only one quarter that of sphagnum moss.

Hypnum and fibrous peats are inferior to sphagnum moss and are not produced in Canada for the export market which is supplied only with high-quality sphagnum moss that is sold at a premium price.

Several quantitative analyses are made on peat moss samples to determine their comparative quality. The detailed procedures of the tests are described by Leverin (1946) and Graham and Tibbetts (1961).

- (1) **ABSORPTIVE VALUE:** expressed as the number of times its own dry weight the amount of water the peat will absorb; for comparative purposes, the absorptive value for dry peat is re-computed by formula to determine what the absorptive value for peat with a 25% moisture content would be; commercial sphagnum moss is shipped with a 25 to 35% moisture content.
- (2) **MOISTURE CONTENT:** the percentage of moisture in the field sample of peat, determined by drying the sample to 105°C.
- (3) **ASH CONTENT:** determined by heating the peat sample to 750°C; several sources of ash are mineral matter within the plant or in solution, sediment washed in, or small shells and animal remains. Rigg (1958) suggests that in samples with less than 10% ash, plant remains are probably the main source.
- (4) **NITROGEN CONTENT:** a relation may exist between the nitrogen content and the type of plant remains; sphagnum moss has a nitrogen content considerably lower than that of fibrous peat.
- (5) **pH:** most peat deposits are acid, and sphagnum moss is strongly acid (low pH).

PRODUCTION AND MARKETS

Canadian production of peat moss in 1963 was 258,857 tons valued at \$8,923,623 (from: The Canadian Mineral Industry in 1963, Preliminary; Mineral Information Bulletin MR71, Ottawa, 1964).

In 1960, the latest year for which detailed figures are available, Canadian production consisted of (from: Mineral Statistics of Canada, 1960; Dominion Bureau of Statistics, Ottawa, 1962):

USE	TONS	VALUE*	VALUE/TON
Horticulture.....	178,226	\$5,830,675	\$32.71
Poultry and stable litter.....	7,493	251,841	33.61
Other Uses.....	65	5,622	86.49
Total.....	185,784	\$6,088,138	\$32.77

The production of peat in the United States in 1960 included (from: Minerals Yearbook, Fuels, Volume II, 1960, Bureau of Mines, Washington, D.C.):

TYPE	TONS	VALUE*	VALUE/TON
Peat moss.....	64,634	\$ 747,863	\$11.57
Reed-sedge.....	244,483	3,376,763	13.81
Humus.....	161,772	1,013,705	6.27
Total.....	470,889	\$5,138,331	\$10.91

Imports into the United States in 1960 amounted to 263,877 tons valued at \$13,509,015 of which 157,453 tons with a market value of \$9,272,085 (\$58.89 per ton) were from Canada. Only a negligible amount of peat was exported by the United States.

Annual production figures for peat in Manitoba are listed in Table 1.

TABLE I. PEAT PRODUCTION IN MANITOBA

YEAR	TONS	VALUE*	YEAR	TONS	VALUE*
1941.....	1,457	\$ 32,342	1953.....	2,085	\$ 92,433
1942.....	2,224	55,832	1954.....	3,494	146,477
1943.....	2,042	72,687	1955.....	6,146	190,381
1944.....	1,128	41,878	1956.....	6,145	236,254
1945.....	1,181	43,243	1957.....	5,700	213,855
1946.....	1,771	65,039	1958.....	8,347	344,096
1947.....	1,845	76,291	1959.....	16,239	649,539
1948.....	1,939	79,654	1960.....	12,496	468,167
1949.....	1,367	56,712	1961.....	18,370	731,896
1950.....	595	22,569	1962.....	19,720	812,724
1951.....	1,236	44,098	1963.....	27,195	1,070,850
1952.....	3,042	158,094	Total....	145,764	\$5,705,111

*Selling value, f.o.b. peat plant, exclusive of cost of containers.

II. PRODUCING BOG

(1) JULIUS BOG (FIG. 1)

Aerial photographs: A14955-125, 126

The Julius bog is located in the southeast part of township 12, range 10 EPM. A secondary road to the peat plant on the bog connects with Highway 4 eleven miles east of Beausejour. The main line of the Canadian Pacific Railway crosses the bog, and a parallel spur line services the peat plant.

The Julius bog extends over an area of 3,900 acres in sections 2, 3, 9, 10, 11, 14, 15, 16, and 17 of township 12, range 10 EPM. The adjoining bog area to the southeast is described separately in this report as the Shelley bog. High quality sphagnum moss is produced from an area of 1,000 acres in the central and south parts of the bog.

The part of the bog to the north of the railway is drained to the northeast by a ditch and a small creek to the Whitemouth River. A drop in elevation of 14.5 feet is present from the centre of the property to the creek. The main drainage ditch was first cut 6 feet wide and 10 feet deep for a distance of 8,000 feet. Other feeder ditches were then excavated. A small lake is present in the centre of the bog.

Drainage of the part of the bog south of the railway presented difficulties because there were no culverts under the railway track. Attempts made to drain the bog eastward along the south side of the railway were not entirely successful. Recently, a culvert has been placed under the railway near the southeast corner of 14-2-12-10 EPM, and the south part of the bog is being more extensively developed.

The bog has been described by Anrep (1912), Leverin (1946), Cameron (1948), and in annual reports of the Manitoba Mines Branch.

The area of good sphagnum moss formed a high moor in the central part of the bog. The original surface had a clear area in the centre of the bog, where the depth was 15 feet of which 10 feet was moss of very good quality. Two distinct types were present: white sphagnum, consisting of decayed sphagnum moss only, confined to l.s.d. 3 of section 11; and brown sphagnum. Except on the white sphagnum the entire area was covered with young spruce and tamarack trees, and with Labrador tea, low-bush cranberry and moss berry. The surface of the southern part of the bog was heavily wooded with spruce, tamarack, poplars, alders, and other kinds of bushes. The bottom material is chiefly clay; in some places marl, sand, and rock are found.

Outside of the central area of sphagnum moss, the depth of the bog decreases, and the moss becomes darker and more humified; the sphagnum moss is intermixed with carex, humified peat, other aquatic plants, and roots of trees. The margins of the bog are heavily wooded, with the exception of an open area along the south part of sections 14 and 15, and extending across section 16. Anrep's map of the bog indicates the depth of the western half of this open area is 8 to 10 feet, but the eastern half is shallow. The quality of the moss in this open area has not been investigated.

The sphagnum moss is white or light yellow to brown, only slightly humified, elastic, and porous. Leverin (1946) reported analyses of the top moss from the centre of the bog and of processed mull and litter. In the present survey, location S-1 is immediately south of the south ditch along the railway track, at the road crossing near the west end of the peat plant; the full original depth is recorded.

Location S-2 is toward the east edge of the bog, south of the railway track; the moss is partly humified.

SAMPLE	DEPTH		ABSORPTIVE VALUE <i>(times own weight)</i>		MOIS- TURE %	ASH %	NITRO- GEN %	pH
			Dry	25%				
	Meters	Feet						
Top stratum, centre of bog	0 - 1.22	0 - 4	21.2	15.7	—	3.7	0.9	—
Processed peat moss								
mull.....	—	—	15.6	11.4	—	6.9	0.7	—
Poultry litter	—	—	21.3	15.7	—	4.9	0.5	—
*S-1-1.....	0.5 - 1.5	1.64- 4.92	22.7	16.8	89.8	4.5	0.6	4.5
*S-1-2.....	1.5 - 2.5	4.92- 8.2	24.2	17.9	90.0	3.3	0.6	4
*S-1-3.....	2.5 - 3.5	8.2 -11.48	18.9	13.9	91.7	4.2	1.2	4.5
*S-1-4.....	3.5 - 4.5	11.48-14.76	13.5	9.9	87.4	29.5	1.0	4
S-2-1 (air dried).....	0.0 - 0.5	0 - 1.64	14.4	10.5	—	—	—	4.5
S-2-2.....	0.5 - 2.0	1.64- 6.56	19.1	14.1	—	—	—	—
S-2-3.....	2.0 - 3.0	6.56- 9.84	14.3	10.6	—	—	—	—

The samples at locations S-1 and S-2 were logged as follows:

Location S-1

Surface:	sphagnum moss, low bog plants, small shrubs
0 - 0.5 m.:	green moss, no recovery
0.5 - 2.5 m.:	sphagnum moss, light brown, spongy, woody stems
2.5 - 3.5 m.:	similar, except slightly darker colour
3.5 - 4.5 m.:	light to medium brown sphagnum moss; only slightly spongy
4.5 m.:	clay

Location S-2

Surface:	cleared of surface growth; moss exposed
0 - 0.5 m.:	light brown sphagnum moss, some woody peat
0.5 - 2.0 m.:	light to medium brown sphagnum, slightly spongy
2.0 - 3.0 m.:	medium to dark brown sphagnum moss mixed with some humified peat, slightly spongy.

HISTORY OF PRODUCTION

The Winnipeg Supply and Fuel Company Limited leased some 660 acres on the central part of the Julius bog in 1940, and constructed a two-storey shredding and baling plant and several camp buildings on the north side of the railway track. Drainage ditches were excavated, the surface was cleared, and production of poultry litter and horticultural moss began in 1941. Production during the war years was limited because of a labour shortage. After the drainage ditches were completed, the peat moss in the top layer was cut into blocks, piled on the surface for drying, transported by conveyor belt to the plant where it was shredded and screened for litter and horticultural sizes, and fed into a mechanical baler. In

*Analyses by Mines Branch, Ottawa; Tibbetts and Lloyd (1963)

addition, finely screened moss for use on golf greens and bowling greens was produced.

McCabe Grain Company Limited leased over 100 acres in the Julius bog south of the railway, and erected a shredding and baling plant at Shelley (in l.s.d. 6-1-12-10 EPM) in 1942. The company produced a considerable quantity of air dried stacks, but operations were suspended from 1943 to 1946. The plant was placed into operation in 1946, and a total of 2,760 tons of moss was produced. However, the company sold their stacked moss to The Winnipeg Supply and Fuel Company Limited in 1947 and the Shelley plant was dismantled. Drainage problems hindered the development of the south part of the bog as there were no culverts under the railroad bed.

In June, 1949, Western Peat Company Limited purchased the bog and plant owned by The Winnipeg Supply and Fuel Company Limited and also the acreage leased by McCabe Grain Company Limited. Swinnerton (1950) described the method of operation: "A bulldozer is used to remove the surface growth on the bog in the spring when the bog is still frozen. The peat is excavated partly by hand and partly by machine. The machine used consists of a caterpillar tractor with five circular knives mounted at the front. The peat is first cut into strips to the required depth and is then cut into blocks by running the tractor at right angles to the original cut. The cut peat when dry is taken to storage on tractor-drawn cars. From storage it is taken by belt conveyor to the shredding and baling mill which is equipped with high capacity balers operated by compressed air. The baling is done in winter after the cutting and harvesting has been completed."

A fire destroyed the original shredding and baling plant in 1949, but a new plant was erected and production resumed in 1950.

In 1960, a new method of recovery was used in part of the bog north of the railway track. Spring-toothed cultivators plow up moss to a depth of 2 or 3 inches; after air-drying for a few days, the loosened material is raked into windrows and then picked up by suction machines equipped with a large storage bin which transport the peat to the plant where it is shredded and separated into various products. The peat is packaged in paper containers and plastic bags and marketed under a variety of trade names. The eastern and southern parts of the bog are worked by the older method of cutting into blocks. The company employs up to 200 workers in the summer months.

The total production of peat moss from the Julius bog from 1941 to 1963 has been 145,764 tons valued at \$5,705,111. Annual production is listed in Table 1.

III. BOGS CONTAINING PEAT MOSS OR FIBROUS PEAT OF HIGH
ABSORPTIVE VALUE

(2) SHELLEY BOG (FIG. 1)

Aerial photograph: A14955-127

The main open area of the Shelley bog is in the south part of sections 1 and 2, township 12, range 10 EPM and in parts of sections 34, 35 and 36 of township 11, range 10 EPM; it lies southeast of the Julius bog and to the south of the main line of the Canadian Pacific Railway. Access is by a farm road to near Shelley station, and thence by foot along a trail south of the railway to the north end of the bog. Because of wet conditions in 1962, only the northern part of the bog was sampled.

The bog has an open area of over 800 acres; a bush- and shrub-covered bog area extends to the south and southeast over several sections. The vegetation in the area tested consists of grass and sedge; the bog was covered with 1 to 2 feet of water. In the area around location S-5, a number of low, wet, soft areas are present, but cored samples were obtained to the bottom of the bog. The bog is 1.8 to 2.3 meters deep (6 to 7.5 feet), and is underlain by black greasy clay (S-5) and grey calcareous clay (S-3 and S-4), both of which contain white limy particles.

Drainage of the bog should be possible by means of the culvert under the railway at the east end of the Julius bog. The bog surface appears to be flat. The bush-covered extensions to the south and east are higher than the open areas.

The 3 test holes passed through similar materials. The log of the deepest hole, S-5, is:

Location S-5

Surface:	mainly grass and sedge; a few low shrubs, some low, wet, soft areas
0 - 0.55 m.:	green, no recovery
0.55- 1.5 m.:	medium to dark brown fibrous peat, mixed with hypnum moss and minor sphagnum; minor humified peat
1.5 - 2.0 m.:	as above, but dark brown
2.0 - 2.3 m.:	brownish black humified peat mixed with fibrous peat
2.3 - 2.5 m.:	black greasy clay, some limy particles

Analyses of the samples showed:

SAMPLE	DEPTH		ABSORPTIVE VALUE <i>(times own weight)</i>		MOIS- TURE %	ASH %	NITRO- GEN %	pH
			Dry	25%				
	Meters	Feet		Mois- ture				
S-3-1...	0.3 -1.0	0.98-3.28	17.1	12.6	87.9	7.12	—	6.1
S-3-2...	1.0 -1.5	3.28-4.92	13.0	9.5	87.9	6.52	—	6.2
S-3-3...	1.5 -1.8	4.92-5.91	9.8	7.4	77.0	13.94	—	—
*S-4-1...	0.3 -1.0	0.98-3.28	18.1	13.5	90.1	10.9	2.9	5.5
*S-4-2...	1.0 -2.0	3.28-6.56	16.2	12.0	88.7	8.2	—	6
S-5-1...	0.55-1.5	1.80-4.92	16.4	12.1	89.2	7.09	2.70	6.2
S-5-2...	1.5 -2.0	4.92-6.56	15.6	11.4	88.6	8.68	2.86	5.9
S-5-3...	2.0 -2.3	6.56-7.55	12.0	8.8	78.2	15.78	—	—

*Analysis by Mines Branch, Ottawa; Tibbetts and Lloyd (1963)

Green moss to a depth of 0.3 meters was obtained at locations S-3 and S-4; the depth to the bottom clay at S-3 is 1.8 meters, and at S-4 was 2.0 meters. The map by Anrep (1912) indicated a thickness of peat ranging from 7 to 9 feet (2.13 to 2.74 meters) in the south and west parts of the main open area.

The north part of the Shelley bog contains fibrous peat mixed with hypnum moss; a product of intermediate quality could be produced as the absorptive value of the upper layers is reasonably high; however the ash content is high and the material is probably not suitable for export. The central and southern parts of the bog have not been tested.

(3) BOG EAST OF ELMA (FIG. 2)

Aerial photograph: A15541-137

The bog is located 2.5 miles east of Elma, in section 35, township 10, range 12 EPM, on both sides of the main line of the Canadian National Railway. Access is by road to the northwest corner of 27-10-12 EPM, 0.2 miles north to the railway, and thence 1.0 mile east to the west edge of the bog.

The bog covers 400 acres in section 35-10-12 EPM, and is part of a large bog that extends into neighbouring townships (see fig. 2). The bog was tested north of the railway at location S-6. The bog has a border of tall willows and alders, and has an open, grassy area in the centre. The bog is fairly dry, has a depth of 1.5 meters (4.92 feet) at location S-6, and has a silt bottom.

Location S-6

Surface:	open grassy area, fairly dry
0 - 0.2 m.:	green, not recovered
0.2 - 1.0 m.:	dark brown stringy fibrous peat; slightly spongy
1.0 - 1.4 m.:	similar, with some humified peat
1.4 - 1.5 m.:	dark brown humified peat, and fibrous peat
- 1.5 m.:	grey clayey silt

SAMPLE	DEPTH		ABSORPTIVE VALUE (times own weight)		MOIS- TURE %	ASH %	pH
	Meters	Feet	Dry	25% Moisture			
S-6-1.....	0.2 - 1.0	0.66-3.28	14.56	10.68	89.1	8.35	6.4
S-6-2.....	1.0 - 1.4	3.28-4.60	14.02	10.28	88.8	7.56	—

Anrep (1912, p. 29) described the bog area between the Canadian Pacific and Canadian National Railways, in townships 10 and 11, ranges 12 and 13 EPM: "The peat is formed principally of carex and aquatic plants. The bog is heavily wooded with spruce, tamarack, alders and poplars. The surface has been burned over several times, which accounts for the fact that the bog is comparatively shallow. The average depth is about 4 to 5 feet." This bog, where sampled, does not contain peat with high absorptive value, but is included in this section as it forms the southern extension of the large Whitemouth bog.

(4) BOG NORTHEAST OF WHITEMOUTH (FIG. 2)

This large bog area covers a large part of townships 12 and 13, range 12 EPM, and extends westward into the eastern part of township 12, range 11 EPM, and has a total area of about 30 square miles. The bog was described by Anrep (1912, p. 29). "North of the Canadian Pacific Railway the peat is formed of carex, remains of grasses and aquatic plants, slightly mixed with eriophorum and hypnum. The average depth around the margin is about 7 to 8 feet. Average depth of the

middle part of the bog is about 11 to 12 feet. A large area of the middle part of the bog is comparatively free from trees; nearer the margin it is very heavily wooded with spruce, tamarack, and other soft wood trees."

In the present survey, the open area of the bog was sampled in 3 separate areas, near its southeastern, western, and northern edges.

(a) SOUTHEASTERN AREA

Aerial photograph: A15541-146

Access to this area is by road from the junction, 4 miles east of Whitemouth, of highways 4 and 11, to the SE $\frac{1}{4}$ -10-12-12 EPM, from where a transmission line and service road extend northeastward across the bog. Access to the bog is difficult because of water in the deep ditches alongside the power line road; only the south part was sampled at location S-7. There the surface is covered with tall grass, sedge, and reeds, and is under 2 to 3 feet of water. The bog in this area is composed of very loose moss that gave poor sample recovery; it is almost a floating type of bog. A creek enters the bog a short distance to the east. This part of the bog is 1.75 meters deep and has a clayey silt bottom.

Surface:	grass, sedge, and reeds; deep water, very soft
0 - 0.7 m.:	no recovery
0.7 - 1.5 m.:	medium brown stringy and coarse fibrous peat; slightly spongy
1.5 - 1.75 m.:	blackish brown humified peat, mixed with fibrous peat and quartz silt
1.75- 2.00 m.:	black peaty clay and olive clayey silt

SAMPLE	DEPTH		ABSORPTIVE VALUE (times own weight)		MOIS- TURE %	ASH %	pH
			Dry	25% Moisture			
S-7-1.....	0.7 - 1.5	2.30- 4.92	15.31	11.22	93.0	7.34	5.9
S-7-2.....	1.5 - 1.75	4.92- 5.74	9.89	7.14	—	—	—

This part of the bog contains about 5 feet of fibrous peat, including 2.3 feet of green material. Drainage of this part of the bog would be difficult because the creek flows into the bog in this area.

(b) WESTERN AREA

Aerial photograph: A15545-37

The west side of the bog can be reached from a farm in E $\frac{1}{2}$ -23-12-11 EPM. Location S-8 is near the southeast corner of 24-12-11 EPM, about $\frac{1}{2}$ mile east of the west edge of the bog. There the bog has treed areas with grass and sedge between. A drainage ditch has been excavated across section 24 and drains to the west; the bog is firm and not too wet.

Location S-8:

Surface:	grass and sedge
0 - 0.2 m.:	green, no recovery
0.2 - 1.0 m.:	medium to dark brown fine to coarse fibrous peat, some hypnum moss; spongy
1.0 - 1.5 m.:	similar, with some humified peat; not spongy
1.5 - 2.0 m.:	blackish brown fibrous peat; some humified peat
2.0 - 2.1 m.:	dark humified peat

SAMPLE	DEPTH		ABSORPTIVE VALUE (<i>times own weight</i>)		MOIS- TURE %	ASH %	NITRO- GEN %	pH
			Dry	25% Mois- ture				
	Meters	Feet						
S-8-1.....	0.2 – 1.0	0.66– 3.28	17.60	12.97	91.8	6.84	2.86	6.2
S-8-2.....	1.0 – 1.5	3.28– 4.92	16.71	12.08	91.4	5.68	2.82	6.1
S-8-3.....	1.5 – 2.0	4.92– 6.56	16.52	12.19	90.1	6.38	—	—

The fibrous peat in this bog is mixed with some hypnum moss, and appears to be of consistent quality to a depth of 2 meters (6.56 feet). The open area extending eastward and north and south from location S-8 was not investigated. Anrep (1912) reports this central area is 11 to 12 feet deep.

(c) NORTHERN AREA

Aerial photograph: A15541-30

The north part of Whitemouth bog is located southwest of Eleanor Lake, and is accessible from a transmission line service road that crosses section 22-13-12 EPM. Samples were taken at 3 locations in this area. The open part of the bog is covered with grass and sedge; some moss clumps are exposed at the surface. Treed bluffs with reedy fringes form a pattern indicating drainage to the northeastward. The bog is 1.8 to 2.0 meters deep (5.91 to 6.56 feet), and the deepest samples obtained were of a black peaty clay.

Location S-10

Surface:	grass and sedge; some clumps of moss exposed
0 - 0.25 m.:	green, finely fibrous peat mixed with hypnum moss; some coarse fibrous peat
0.25- 1.0 m.:	medium brown fine and coarse fibrous peat; some hypnum moss; slightly spongy
1.0 - 1.85 m.:	dark brown fine and coarse fibrous peat, humified peat
1.85 m.:	black peaty clay

SAMPLE	DEPTH		ABSORPTIVE VALUE (times own weight)		MOIS- TURE %	ASH %	pH
			Dry	25% Moisture			
	Meters	Feet					
S-9-1.....	0.3 - 1.0	0.98- 3.28	13.72	10.03	89.5	7.32	6.2
S-9-2.....	1.0 - 1.5	3.28- 4.92	13.63	9.98	88.9	8.01	6.0
S-10-a.....	0 - 0.25	0 - 0.82	19.57	14.41	—	—	—
S-10-1....	0.25- 1.0	0.82- 3.28	16.50	12.01	92.4	6.27	6.2
S-10-2....	1.0 - 1.5	3.28- 4.92	13.16	9.62	89.7	8.11	6.2
S-10-3....	1.5 - 1.85	4.92- 6.07	10.00	7.23	86.7	9.59	—
S-11-a....	0 - 0.3	0 - 0.98	19.14	14.12	—	—	—
S-11-1....	0.3 - 1.0	0.98- 3.28	14.71	10.77	91.7	7.20	6.5
S-11-2....	1.0 - 1.5	3.28- 4.92	13.81	10.11	90.5	7.98	6.6
S-11-3....	1.5 - 2.0	4.92- 6.56	12.10	8.85	87.9	9.20	—

At location S-9, the bottom material at 1.8 meters is black clay. Sample S-11-3 consists of dark brownish black humified peat, and is underlain by clay. Samples S-10-a and S-11-a are of the green surface layer.

The northern part of the Whitemouth bog consists of an upper layer of fibrous peat mixed with hypnum moss, underlain by fibrous peat. The area to the south of location S-11 was not tested; a greater depth of good moss than in the tested area would be required to make this bog an economic source of peat.

(5) LEWIS BOG (FIG. 3)

Aerial photograph: A14954-157

The open part of the Lewis bog covers part of sections 5, 7, and 8 in township 10, range 11 EPM, 4 miles south of Lewis and 47 miles due east of Winnipeg. A road from Highway 15 at Lewis extends south to the northeast corner of 8-10-11 EPM; a cut line extends south for 0.85 miles to the northeast edge of the bog.

The open area covers 750 acres; the bog is firm and not too wet. Moss is exposed at the surface, which is covered with grass and a fairly dense growth of low shrubs. Samples were taken at 4 locations. The bog drains westward and northwestward into Hazel Creek.

At the 3 locations in the south part of the bog, S-12, S-13, and S-14, the bog is 1.8 to 2.35 meters deep (5.91 to 7.71 feet), and has a bottom of grey silty clay. At location S-14, the peat sampler would not penetrate beyond 2.25 meters; at that depth the peat was slightly mucky. At location S-15, toward the east side, the bog is shallower; the surface is grassy with some rushes and very few shrubs, and only rare clumps of moss.

Location S-14

- Surface:
- clumps of moss, grass and sedge, dense growth of small shrubs
- 0 - 0.25 m.:
- hypnum moss mixed with some fibrous peat; green
- 0.25 - 1.0 m.:
- medium brown fine and coarse fibrous peat and hypnum moss; slightly spongy
- 1.0 - 1.5 m.:
- medium to dark brown fibrous peat
- 1.5 - 2.25 m.:
- dark brown fibrous peat and humified peat
- 2.25 m.:
- could not penetrate any deeper.

At location S-13, the bottom material from 2.25 to 2.35 meters consists of black peaty clay, whereas at S-12, the material from 1.80 to 1.95 meters is dark brown humified peat and yellow calcareous clay with small stones.

SAMPLE	DEPTH		ABSORPTIVE VALUE (times own weight)		MOIS- TURE %	ASH %	pH
			Dry	25% Moisture			
	Meters	Feet					
S-12-1....	0.3 – 1.0	0.98– 3.28	15.10	11.07	—	—	—
S-12-2....	1.0 – 1.5	3.28– 4.92	11.72	8.63	—	—	—
S-12-3....	1.4 – 1.8	4.60– 5.91	12.50	9.13	—	—	—
S-13-1....	0.35– 1.0	1.15– 3.28	15.88	11.62	92.6	9.67	6.1
S-13-2....	1.0 – 1.5	3.28– 4.92	14.51	10.63	89.5	7.38	6.3
S-13-3....	1.5 – 2.0	4.92– 6.56	12.72	9.27	89.9	8.24	6.3
S-13-4....	1.85– 2.25	6.07– 7.38	11.71	8.54	—	—	—
S-14-1....	0.25– 1.0	0.82– 3.28	16.81	12.33	93.0	7.05	6.2
S-14-2....	1.0 – 1.5	3.28– 4.92	15.91	11.58	90.5	6.62	
S-14-3....	1.5 – 2.0	4.92– 6.56	13.55	9.88	90.2	8.54	6.1
S-14-4....	1.75– 2.25	5.74– 7.38	13.16	9.59	86.9	11.45	
S-15-1....	0.3 – 1.0	0.98– 3.28	13.06	9.16	—	—	—

The bog consists of fibrous peat mixed with some hypnum moss in the upper layers; the peat has a high absorptive value.

(6) WHITESHELL BOG (Fig. 4)

Aerial photograph: A15806-82

The south part of the Whiteshell bog covers part of sections 15, 22 and 23 in township 8, range 15 EPM, 5 to 6 miles west of Falcon Beach. From a gravel pit in the northwest corner of 11-8-15 EPM, a cut line extends northward between sections 14 and 15, for 0.8 miles to the south edge of the open part of the bog.

The southern open part of the bog has an area of over 700 acres. The surface is covered with grass and sedge; some moss clumps are exposed at water level. The open area is dotted with bluffs treed mainly with spruce. At location S-17, the surface is bouncy and loose, and consists of hard grassy clumps protruding from a low soft area. The bog drains southward to the Boggy River.

The bog is about 2.9 meters deep (9.51 feet) and has a silty clay bottom.

Location S-17

Surface:	very loose; clumps of grass protruding from a soft wet area
0 - 0.5 m.:	green, no recovery
0.5 - 1.0 m.:	medium brown fibrous peat
1.0 - 1.5 m.:	medium to dark brown fibrous peat; minor humified peat
1.5 - 2.0 m.:	dark brown fibrous peat; humified peat
2.0 - 2.7 m.:	blackish brown fibrous peat mixed with humified peat; some leaves of hypnum moss
2.7 - 2.85 m.:	dark blackish brown humified peat
2.85- 3.0 m.:	black humified peat and silt; underlain by grey-green clayey silt

SAMPLE	DEPTH		ABSORPTIVE VALUE <i>(times own weight)</i>		MOIS- TURE %	ASH %	NITRO- GEN %	pH
			Dry	25%				
	Meters	Feet						
S-16-1....	0.45- 1.0	1.48- 3.28	15.41	11.30	91.7	8.78	—	} 5.7
S-16-2....	1.0 - 1.5	3.28- 4.92	15.65	11.45	92.4	7.83	—	
S-16-3....	1.5 - 2.5	4.92- 8.20	14.73	10.81	91.9	6.82	—	
S-16-4....	2.5 - 2.95	8.20- 9.67	15.40	11.30	89.3	8.87	—	—
S-17-1....	0.5 - 1.0	1.64- 3.28	15.91	11.71	93.9	6.87	} 3.02	5.8
S-17-2....	1.0 - 1.5	3.28- 4.92	17.21	12.64	91.4	6.14		
S-17-3....	1.5 - 2.0	4.92- 6.56	16.04	11.81	90.4	6.35		
S-17-4....	2.0 - 2.7	6.56- 8.86	16.90	12.44	90.9	8.16	} 2.31	6.3

This bog contains a good thickness (about 9 feet) of fibrous peat with a high absorptive value, and is unusual as compared to most of the other bogs tested in that the quality of the peat is uniform from top to bottom of the bog, excluding the layer of living moss.

(7) MEDIKA BOG (FIG. 5)

Aerial photograph: A15545-179

A thick deposit covering at least 1000 acres in sections 19, 20, 29, and 30, township 9, range 12 EPM, and consisting mainly of sphagnum moss, occurs within a large bog area underlain by a few feet of peat or peaty soil. Western Peat Company Limited is planning development of the sphagnum area. From a point on Highway 11 about 8.5 miles north of the Trans-Canada Highway, a road has been built 1.25

miles west and southwest to a gravel pit on the northeast edge of the sphagnum area. The bog is now dry, being drained by a ditch eastward into the Whitemouth River.

The bog was sampled at 3 locations in the southeast part of section 30-9-12 EPM. The surface consists of large masses of sphagnum moss, with some low shrubs and some scattered pine trees. The bog increases in depth towards the centre, from 1.25 meters (4.10 feet) at location S-18, to 2.8 meters (9.19 feet) at S-20. The bottom material, under a layer of mucky peat, is quartz silt.

Location S-20

Surface:	sphagnum moss clumps, low shrubs and bog plants
0 - 0.45 m.:	light yellowish brown sphagnum moss
0.45- 1.5 m.:	light brown sphagnum moss, spongy
1.5 - 2.0 m.:	light to medium brown sphagnum moss, slightly spongy
2.0 - 2.5 m.:	light to medium brown sphagnum moss, spongy
2.5 - 2.8 m.:	dark brown sphagnum moss, mixed with humified peat
2.8 - 3.0 m.:	black, sphagnum moss mixed with humified peat; some quartz silt

SAMPLE	DEPTH		ABSORPTIVE VALUE (times own weight)		MOIS- TURE %	ASH %	NITRO- GEN %	pH
			Dry	25% Mois- ture				
S-18-1....	0 - 0.5	0 - 1.64	17.92	13.20	91.0	10.17	—	4.4
S-18-2....	0.5 - 1.0	1.64- 3.28	17.71	13.03	89.1	7.12	—	5.2
S-18-3....	0.8 - 1.25	2.62- 4.10	15.64	11.24	—	—	—	—
S-19-1....	0 - 1.0	0 - 3.28	19.21	14.15	91.5	6.02	—	4.6
S-19-2....	1.0 - 1.5	3.28- 4.92	25.32	18.78	93.5	4.29	—	
S-19-3....	1.5 - 2.0	4.92- 6.56	17.36	12.75	90.1	5.75	—	5.7
S-19-4....	2.0 - 2.5	6.56- 8.20	11.53	8.40	85.8	14.18	—	
S-20-1....	0.45- 1.0	1.48- 3.28	24.31	18.01	93.2	5.94	0.87	4.4
S-20-2....	1.0 - 1.5	3.28- 4.92	33.36	24.80	93.5	6.30	0.65	
S-20-3....	1.5 - 2.0	4.92- 6.56	19.41	14.36	92.2	5.58	—	5.7
S-20-4....	2.0 - 2.5	6.56- 8.20	22.49	16.61	93.1	5.77	—	
S-20-5....	2.5 - 2.8	8.20- 9.19	15.93	11.72	87.5	6.92	—	—

The westward extent of the sphagnum area is not known, but aerial photographs indicate it might cover another 1,000 acres in sections 23, 24, and 25, in township 9, range 11 EPM.

(8) BOG SOUTHWEST OF ELMA (FIG. 5) Aerial photograph: A15545-185

The bog is 2 miles southwest of Elma, mainly in section 19, township 10, range 12 EPM. From a point 1.5 miles south of Elma on Highway 11, a road extends 1.5 miles west to a gravel pit on the north side of the bog.

The bog has an area of 350 acres and is covered by clumps of sphagnum moss and Labrador tea; parts of the bog have a light, moderate, or heavy tree cover, mainly tamarack and spruce. The main part of the bog is dry and high; a swampy area occurs as a narrow fringe around it. The bog is 1.9 meters deep at location S-21, and is underlain by quartz silt. The appearance of the bog on the aerial photograph

is similar to that of the sphagnum area within the Medika bog. It has been reported that some surface moss has been stripped near the east edge of the bog in 20-10-12 EPM.

Location S-21

Surface: clumps of sphagnum moss; small bog plants and shrubs
 0.0 - 0.1 m.: white, straw yellow and light brown pure sphagnum moss
 0.1 - 1.0 m.: light brown sphagnum moss; spongy
 1.0 - 1.5 m.: medium brown sphagnum moss, spongy
 1.5 - 1.8 m.: medium to dark brown sphagnum moss, mixed with fine and coarse fibrous peat; slightly spongy
 1.8 - 1.9 m.: brownish black humified peat
 1.9 m.: fine quartz silt

SAMPLE	DEPTH		ABSORPTIVE VALUE <i>(times own weight)</i>		MOIS- TURE %	ASH %	NITRO- GEN %	pH
			Dry	25% Mois- ture				
	Meters	Feet						
S-21-1....	0.1 – 0.5	0.32– 1.64	22.00	16.23	92.6	6.69	}0.87	4.5
S-21-2....	0.5 – 1.0	1.64– 3.28	19.32	14.24	90.0	5.25		
S-21-3....	1.0 – 1.5	3.28– 4.92	17.91	13.18	89.6	8.27	—	5.8
S-21-4....	1.4 – 1.8	4.60– 5.91	14.94	10.99	91.1	6.68	—	—

The bog contains at least 5 feet of good quality sphagnum moss in the area tested. Detailed testing would be required to determine acreage and reserves, and the tree cover would have to be removed. This bog would appear to be a possible source of good quality sphagnum moss.

(9) BOG NORTH OF SPRAGUE LAKE (FIG. 6) Aerial photo.: twp. 4-16 EPM mosaic

This bog is located along the west side of the Moose Lake-East Braintree road, 4 miles northwest of Sprague Lake. It is a large bog, extending westward from the road for several sections; it was sampled near its eastern edge, in section 22, township 4, range 16 EPM.

The main part of the bog has a light to medium cover of spruce with some jack pine; the bush cover becomes denser to the west. Sphagnum moss and Labrador tea in clumps up to 2 feet thick cover the surface solidly; the bog is fairly dry. A wet swampy strip about 100 feet wide is present between the main part of the bog and the road. The bog is drained to the west by Mosquito Creek, a tributary of Whitemouth River.

The bog is 3.0 to 3.5 meters deep (9.84 to 11.48 feet), and has a silt bottom. At location S-23, black mucky peat is present from 3.0 to 3.5 meters. Two sets of samples were taken at location S-22; analysis of the first samples indicated a layer of poorer moss within a section of good sphagnum moss, and the bog was resampled at narrower intervals to investigate the distribution of the lower quality material.

Location S-23

Surface: Sphagnum moss clumps; bog plants; moderately heavy tree cover
 0 - 0.1 m.: green to light yellow sphagnum moss
 0.1 - 0.5 m.: light brown sphagnum moss, spongy

0.5 - 0.75 m.:	light to medium brown sphagnum moss, some rootlets; slightly spongy
0.75- 1.0 m.:	medium to dark brown sphagnum moss, small amount humified peat
1.0 - 2.5 m.:	medium brown sphagnum moss, some rootlets, slightly spongy
2.5 - 3.0 m.:	dark brown sphagnum moss and humified peat
3.0 - 3.5 m.:	dark brownish black humified peat mixed with fibrous peat

Quartz silt and sand mixed with mucky humified peat is present from 3.0 to 3.2 meters at location S-22.

SAMPLE	DEPTH		ABSORPTIVE VALUE (times own weight)		MOIS- TURE %	ASH %	NITRO- GEN %	pH
			Dry	25%				
	Meters	Feet						
S-22a-1...	0.0 - 0.5	0.0- 1.64	21.61	15.75	—	—	—	—
S-22a-2...	0.5 - 1.0	1.64- 3.28	14.95	10.97	—	—	—	—
S-22a-3...	1.0 - 2.0	3.28- 6.56	21.37	15.78	—	—	—	—
S-22a-4...	2.0 - 2.5	6.56- 8.20	16.10	11.81	—	—	—	—
S-22b-1...	0.1 - 0.5	0.33- 1.64	25.03	18.55	91.9	6.35	—	4.4
S-22b-2...	0.5 - 0.75	1.64- 2.46	18.25	13.52	91.6	6.55	—	5.3
S-22b-3...	0.75- 1.0	2.46- 3.28	13.95	10.02	89.2	7.04	—	6.0
S-22b-4...	1.0 - 1.25	3.28- 4.10	13.04	9.55	88.8	8.72	—	6.2
S-22b-5...	1.25- 1.5	4.10- 4.92	15.32	11.28	92.9	8.08	—	6.4
S-23-1....	0.1 - 0.5	0.33- 1.64	19.05	14.03	93.7	5.40	} 1.42	5.5
S-23-2....	0.5 - 0.75	1.64- 2.46	15.96	11.70	92.7	7.34		
S-23-3....	0.75- 1.0	2.46- 3.28	15.80	11.58	92.1	8.16		
S-23-4....	1.0 - 1.25	3.28- 4.10	16.70	12.23	93.2	9.56	} 1.03	6.4
S-23-5....	1.25- 1.5	4.10- 4.92	17.30	12.73	92.6	9.19		
S-23-6....	1.5 - 2.0	4.92- 6.56	21.60	15.93	92.5	7.88		
S-23-7....	2.0 - 2.5	6.56- 8.20	21.38	15.56	93.5	7.22	—	} 6.5
S-23-8....	2.5 - 3.0	8.20- 8.53	13.00	9.46	89.8	9.89	—	

This bog contains some good sphagnum moss in the area tested, but it is mixed at depth with layers of poorer quality. Drainage of the bog would be difficult as it is part of a very large bog area situated in the low, wet basin surrounding White-mouth Lake. The tree cover on the bog is an added hindrance to development. However, the possibility of adapting hydraulic recovery procedures to this and other bogs in the area might be worth investigating.

This method, which has been used in British Columbia, involves loosening the peat by a force of water which carries it along a ditch to a sump pump; after screening, the peat is pumped by pipe to a plant where it is passed through the rollers of a Fourdrinier paper machine and emerges as a ¼ inch blanket. Drying and shredding processes follow. The process is described in detail by Swinnerton (1958, pp. 21-25).

(10) BOGS IN AND NORTH OF NORTHWEST ANGLE FOREST RESERVE (FIG. 6)

Aerial photograph: township 5-16 EPM mosaic

Large bog areas extend over all that part of township 5, range 16 EPM west of the Moose Lake-East Braintree road, an area of about 15 sections. In most places

a low, wet swampy margin is present between the higher main part of the bog and the road. This was crossed in two places and samples were taken at locations S-24 and S-25 close to the east edge of the bog.

At location S-24, the main part of the bog is fairly dry, and the surface is formed of sphagnum moss clumps, with numerous shrubs (mainly dwarf birch and Labrador tea), some grass and sedge, and a moderate cover of dead spruce trees. There the bog has a depth of over 1.6 meters; mucky peat and black clay were present from 1.6 to 1.8 meters (5.25 to 5.91 feet).

Location S-25 is in an open grassy area of the bog, with sphagnum moss exposed at water level. Treed areas occur on either side of the open part. The bog is 2.95 meters (9.68 feet) deep, and has a bottom of black sandy clay.

This bog extends westward over much of township 5, range 15 EPM, and is drained through Mosquito Creek westward into the Whitemouth River. However, on the east side of the bog, there appears to be some drainage to the east; this drainage is blocked by the Campbell Beach ridge of glacial Lake Agassiz, along which the Moose Lake-East Braintree road has been constructed; this has resulted in the ponding of the water and the formation of the wet swampy area along the east margin of the bog.

Location S-24

Surface:	sphagnum moss clumps, plants, grass, dead spruce trees
0 - 0.1 m.:	white, light brown, and green sphagnum moss
0.1 - 1.25 m.:	medium brown fibrous peat, some sphagnum moss, minor humified peat
1.25- 1.60 m.:	medium to dark brown fibrous peat and humified peat
1.60- 1.80 m.:	black humified peat, some fibrous material, mixed with sand

Location S-25

Surface:	open grassy area, moss clumps at water level
0 - 0.25 m.:	light brown sphagnum moss; some fibrous and woody peat
0.25- 1.0 m.:	medium brown sphagnum moss, coarse fibrous peat, spongy
1.0 - 1.5 m.:	medium brown sphagnum moss, fibrous peat, not spongy
1.5 - 2.5 m.:	medium to dark brown fibrous peat mixed with sphagnum; small amount of humified peat
2.5 - 2.85 m.:	blackish brown fibrous peat mixed with humified peat
2.85- 3.0 m.:	humified peat to black muck, some fibrous peat; some silt

SAMPLE	DEPTH		ABSORPTIVE VALUE <i>(times own weight)</i>		MOIS- TURE %	ASH %	NITRO- GEN %	pH
			Dry	25% Mois- ture				
	Meters	Feet						
S-24-1....	0.1 – 0.5	0.33– 1.64	13.84	10.15	90.4	7.69	—	5.5
S-24-2....	0.5 – 1.0	1.64– 3.28	15.72	11.51	90.2	6.69	—	5.7
S-24-3....	1.0 – 1.25	3.28– 4.10	16.91	12.44	89.9	7.10	—	5.7
S-24-4....	1.25– 1.60	4.10– 5.25	11.93	8.69	90.3	10.70	—	6.0
S-25-1....	0.25– 1.0	0.82– 3.28	19.37	14.19	92.9	6.57	} 2.90	5.9
S-25-2....	1.0 – 1.5	3.28– 4.92	20.73	15.29	93.0	8.07		
S-25-3....	1.5 – 2.0	4.92– 6.56	20.09	14.83	93.3	6.95	} 2.56	6.2
S-25-4....	2.0 – 2.5	6.56– 8.20	20.87	15.42	92.7	8.83		
S-25-5....	2.5 – 2.85	8.20– 9.35	17.60	12.91	90.4	10.13		

The treed area of the bog, as represented by location S-24, is underlain by fibrous peat, mixed with some sphagnum moss in the upper layers. The peat is of marginal quality. The open area of the bog is underlain by a thick deposit of fairly good quality sphagnum moss, of uniform quality for a depth of 2.5 meters or 8.20 feet; the ash and nitrogen contents are slightly high.

The areas sampled are part of a large bog whose main drainage is to the west by Mosquito Creek into Whitemouth Lake. Drainage of the bog to the dryness required for machine working would be difficult as this bog lies within the large basin surrounding Whitemouth Lake. The possibility of working this bog by hydraulic methods might be worth investigating.

(11) CALIENTO BOG (FIG. 7)

Aerial photograph: A14939-67

The Caliento bog, actually an open area within a much larger bog, covers 400 acres in section 31, township 1, range 9 EPM. The bog can be reached from the Sundown-Caliento road by following the farm road through the west part of section 5-2-9 EPM, travelling south 1.25 miles, and thence westward into the bog.

The open area of 400 acres is covered with grass and sedge; some soft spots and hard ridges are present. The bog drains both northward into the Rat River and westward into the Roseau River. The bog is 2.3 meters deep (7.55 feet) at location S-26.

Location S-26

Surface:	grass and sedge
0 - 0.3 m.:	mainly fibrous peat; some hypnum moss
0.3 - 2.0 m.:	dark brown fibrous peat; some hypnum
2.0 - 2.3 m.:	blackish brown humified peat and fibrous peat; some hypnum
2.3 - 2.4 m.:	fine grained quartz silt mixed with some humified peat

SAMPLE	DEPTH		ABSORPTIVE VALUE <i>(times own weight)</i>		MOIS- TURE %	ASH %	NITRO- GEN %	pH
			Dry	25% Mois- ture				
	Meters	Feet						
S-26-1....	0.3 – 1.0	0.98– 3.28	15.38	11.54	91.9	10.13	3.06	7.2
S-26-2....	1.0 – 1.5	3.28– 4.92	18.05	13.32	91.2	7.92	} 2.58	6.4
S-26-3....	1.5 – 2.0	4.92– 6.56	19.34	14.31	91.8	9.25		
S-26-4....	1.9 – 2.3	6.23– 7.55	14.34	10.25	90.4	9.43	—	—

The bog contains over 7 feet of fibrous peat mixed with hypnum moss, that has high absorptive value. This bog and the Sundown bog were the only two of the sampled bogs that had an upper layer of slightly alkaline moss; the ash and nitrogen contents are high.

(12) SUNDOWN BOG (FIG. 7)

Aerial photograph: A14941-135

This large bog covers much of the central part of township 1, range 10 EPM, and extends eastward into township 1, range 11 EPM. The sampled area in NE $\frac{1}{4}$ -20-1-10 EPM was reached from a farm in NE $\frac{1}{4}$ -19-1-10 EPM. The total area of the bog is over 10,000 acres.

The bog is shallow and firm near the farm, and is softer about $\frac{1}{2}$ mile to the east. The surface is covered with grass and sedge. Detailed topographic maps indicate two outlets: a slope to the west at the northwest end of the bog, where the drainage is to the west into the Caliento bog, and a slope to the south at the southeast end of the bog, where the drainage is to the Roseau River.

Location S-27

Surface: grass and sedge; surface somewhat loose
 0 - 0.6 m.: not cored; fibrous peat mixed with some hypnum moss
 0.6 - 2.0 m.: dark brown fibrous peat; some hypnum moss, some humified peat
 2.0 - 2.2 m.: dark brown fibrous peat mixed with humified peat
 2.2 - 2.3 m.: grey-black silty calcareous muck
 2.3 - 2.5 m.: yellow to light grey silty calcareous clay

SAMPLE	DEPTH		ABSORPTIVE VALUE <i>(times own weight)</i>		MOIS- TURE %	ASH %	NITRO- GEN %	pH
			Dry	25% Mois- ture				
	Meters	Feet						
S-27-1....	0.6 - 1.0	1.97- 3.28	16.43	12.04	92.9	11.70	}3.06 —	7.2 —
S-27-2....	1.0 - 2.0	3.28- 6.56	17.85	13.16	91.1	10.87		
S-27-3....	2.0 - 2.2	6.56- 7.22	14.03	10.23	82.8	37.47		

The fibrous peat in this bog is similar in quality to that of the Caliento bog (sample S-26) as it has high absorptive value, high ash content, high nitrogen content, and is slightly alkaline.

IV. OTHER BOGS SAMPLED; INFERIOR OR SHALLOW PEAT

(13) MOLSON BOG (FIG. 8)

Aerial photograph: A14940-78

The Molson bog is a horseshoe-shaped bog in sections 8, 17, and 18, township 12, range 9 EPM, located 1 to 2 miles southwest of Molson. Only the northern part of the bog was sampled. The open part of the bog has an area of 270 acres, and is covered with grass and sedge, numerous shrubs, some bulrushes and some treed bluffs. Drainage is northward through a creek into Brokenhead River.

At locations S-28, S-29, and S-30 in the central part, the bog is 1.8 to 2.0 meters deep (5.91 to 6.56 feet). The upper layer contains some hypnum moss mixed with medium to dark brown fibrous peat; the lower part consists of blackish brown fibrous peat, mixed with humified peat. At locations S-31 and S-32 in the northwest arm, the bog is shallower and the peat is of poorer quality without any hypnum moss. The peat is underlain by dark grey and yellow calcareous clay.

SAMPLE	DEPTH		ABSORPTIVE VALUE <i>(times own weight)</i>		MOIS- TURE %	ASH %	NITRO- GEN %	pH
			Dry	25% Mois- ture				
	Meters	Feet						
*S-28-1...	0.3 - 1.0	0.98- 3.28	13.7	9.9	86.9	8.9	2.9	6
*S-28-2...	1.0 - 1.5	3.28- 4.92	12.1	8.8	86.8	9.3	} 2.5	6
*S-28-3...	1.3 - 1.8	4.27- 5.91	3.9	2.8	66.7	58.7		5.5
S-29-1...	0.1 - 1.0	0.33- 3.28	10.8	7.9	—	—	—	—
S-29-2...	1.0 - 1.5	3.28- 4.92	10.0	7.3	—	—	—	—
S-29-3...	1.5 - 2.0	4.92- 6.56	10.3	7.5	—	—	—	—
S-30-1...	0.3 - 1.0	0.98- 3.28	10.7	7.8	—	—	—	—
S-30-2...	1.0 - 1.5	3.28- 4.92	9.4	6.9	—	—	—	—
S-31-1...	0.4 - 1.0	1.31- 3.82	12.8	9.4	86.2	8.4	2.61	—
S-32-1...	0.3 - 1.0	0.98- 3.28	11.7	8.5	—	—	—	—
S-32-2...	1.0 - 1.5	3.28- 4.92	7.5	5.4	—	—	—	—

(14) HEART LAKE BOG (FIG. 9)

Aerial photograph: A15543-22

This bog covers about 250 acres north of Heart Lake in Whiteshell Provincial Park. The Whiteshell Central Road crosses the northeast part of the bog. The bog drains to the south into Heart Lake; a ditch has been excavated across the bog.

Location S-33:

Surface:	dry; grass and sedge; clumps of tall shrubs
0 - 0.15 m.:	green, fibrous moss, sphagnum moss
0.15- 0.50 m.:	medium brown fibrous peat, minor sphagnum, woody peat; slightly spongy
0.50- 1.45 m.:	dark brown fibrous peat; humified peat
1.45- 1.55 m.:	brownish black humified peat
1.55 m.:	greenish-grey calcareous clay

*Analysis by Mines Branch, Ottawa; Tibbetts and Lloyd (1963)

SAMPLE	DEPTH		ABSORPTIVE VALUE (times own weight)		pH
			Dry	25% Mois- ture	
	Meters	Feet			
S-33-1.....	0.15- 0.5	0.49- 1.64	12.68	9.29	} 6.4
S-33-2.....	0.5 - 1.45	1.64- 4.76	10.37	7.54	

(15) JESSICA LAKE BOG (FIG. 10)

Aerial photographs: A15806-192, 110

The bog is one mile south and east of Jessica Lake in Whiteshell Provincial Park, and extends over 700 acres. Only the western end was sampled. The bog is fairly dry and the surface is formed of a continuous thick cover of sphagnum moss clumps. It is heavily treed with 20- to 30-foot spruce. Location S-34 is in a narrow part of the bog between two granite hills. Medium to dark brown fibrous peat, mixed with some sphagnum moss and woody peat, is present to a depth of 4.5 meters. The material from 4.5 to 5.0 meters is blackish brown humified peat mixed with some fibrous peat. Drainage is to the northwest into Jessica Lake.

SAMPLE	DEPTH		ABSORPTIVE VALUE (times own weight)		MOIS- TURE %	ASH %	pH
			Dry	25% Moisture			
	Meters	Feet					
S-34-1....	0.25- 1.0	0.82- 3.28	14.83	10.89	90.1	8.84	} 5.9
S-34-2....	1.0 - 1.5	3.28- 4.92	11.01	8.00	90.9	8.44	
S-34-3....	1.5 - 2.0	4.92- 6.56	13.88	10.14	89.8	8.34	
S-34-4....	2.0 - 2.5	6.56- 8.20	12.30	8.97	91.0	7.57	} 6.2
S-34-5....	2.5 - 3.0	8.20- 9.84	16.86	12.38	92.6	6.47	
S-34-6....	3.0 - 3.5	9.84-11.5	14.54	10.89	90.5	9.61	
S-34-7....	3.5 - 4.0	11.5 -13.1	12.96	9.38	88.7	10.37	—
S-34-8....	4.0 - 4.5	13.1 -14.8	14.23	10.41	88.9	12.53	—
S-34-9....	4.5 - 5.0	14.8 -16.4	12.26	8.97	87.8	10.75	—

The bog was not tested in the large area to the northeast of S-34; the tree cover is thinner in that area.

(16) NOURSE BOG (FIG. 11)

Aerial photograph: A14939-130

The Nourse bog is located south of Highway 15, 35 miles due east of Winnipeg. The Canadian National Railway crosses north of the bog. The sampled area is the north part of a large bog that covers several sections to the east of the Brokenhead River. Drainage is northward through a creek to the Brokenhead River.

Location S-35

Surface:	grass and sedge; some clumps of low shrubs
0 - 0.45 m.:	green; fibrous peat mixed with hypnum moss
0.45- 1.0 m.:	medium brown fibrous peat, some hypnum
1.0 - 1.7 m.:	dark brown fibrous peat and humified peat
1.7 - 2.0 m.:	grey slightly calcareous plastic clay.

Southeast of S-35 the bog is shallower, being 1.1 to 1.2 meters deep. Some black carbonized fragments occur throughout the peat, probably indicating the bog surface was burned at different times.

SAMPLE	DEPTH		ABSORPTIVE VALUE <i>(times own weight)</i>		MOIS- TURE %	ASH %	NITRO- GEN %	pH
			Dry	25%				
	Meters	Feet						
S-35-1....	0.45- 1.0	1.48- 3.28	17.35	13.51	91.9	6.54	2.89	6.7
S-35-2....	1.0 - 1.5	3.28- 4.92	12.76	9.32	88.9	8.81	—	—
S-36-1....	0.3 - 0.5	0.98- 1.64	20.86	15.40	92.5	14.12	—	—
S-36-2....	0.5 - 1.0	1.64- 3.28	12.90	9.43	89.7	—	—	—
S-36-3....	0.85- 1.2	2.78- 3.94	12.72	9.18	88.3	8.02	—	—
S-37-1....	0.35- 0.5	1.14- 1.64	14.41	10.24	91.2	8.02	—	—
S-37-2....	0.5 - 1.0	1.64- 2.38	11.53	8.19	—	—	—	—

(17) BOG SOUTH OF HAZEL CREEK (FIG. 12)

Aerial photograph: A14941-59

The bog south of Hazel Creek is 40 miles due east of Winnipeg on the south side of Highway 15. Hazel Creek borders the bog to the northeast. The Canadian National Railway crosses the north edge. In the wet year of 1962, part of the area along Hazel Creek was flooded most of the summer.

The open area of the bog covers 2,000 acres and, in the sampled area, is covered with tall grass and sedge, except for small shrub-covered or treed bluffs that, as seen on the aerial photograph, have a definite northwest trend. The bog contains dark brown fibrous peat and some humified peat. The two sample locations toward the north end of the bog indicated a depth of 1.4 to 1.5 meters; the peat is underlain by grey to black silty clay.

SAMPLE	DEPTH		ABSORPTIVE VALUE (times own weight)	
			Dry	25% Moisture
	Meters	Feet		
S-38-1.....	0.25- 1.0	0.82- 3.28	9.4	6.8
S-38-2.....	1.0 - 1.4	3.28- 4.60	7.0	5.0
S-39-1.....	0.25- 1.0	0.82- 3.28	12.1	8.9
S-39-2.....	1.0 - 1.5	3.28- 4.92	9.2	6.6

(18) BOG NORTH OF HAZEL CREEK (FIG. 12)

Aerial photographs: A14944-11; A14941-56, 57

The bog north of Hazel Creek, in the southeast part of township 11, range 9 EPM, contains 2 treeless areas. Access to the eastern part was by a cut line starting from Highway 15, $\frac{1}{4}$ mile east of the Hazel Creek bridge. Access to the western part of the bog would be difficult.

The bog covers 3,000 acres, of which 1,300 acres are open, except for small treed bluffs. Location S-40 is in the treed area, where clumps of sphagnum moss surround the spruce and tamarack trees. At S-41, the open area is covered with grass and sedge, with some moss exposed at water level and also in clumps. The surface at S-42 is wet and soft; a reedy area is present to the north. Numerous low shrubs grow throughout the open area. The bog drains westward into Hazel Creek.

Medium to dark brown sphagnum moss mixed with some fibrous peat is present at location S-40. The peat from the open area at S-41 and S-42 is medium to dark

brown finely fibrous peat with some coarse fibrous peat and, especially in the lower parts, humified peat. The upper layer at S-42 contains a small amount of hypnum moss mixed with fibrous peat.

SAMPLE	DEPTH		ABSORPTIVE VALUE <i>(times own weight)</i>		MOIS- TURE %	ASH %	NITRO- GEN %	pH
			Dry	25% Mois- ture				
	Meters	Feet						
*S-40-1...	0 - 1.0	0 - 3.28	16.8	12.1	92.4	14.8	1.6	5.5
*S-40-2...	1.0 - 1.5	3.28- 4.92	11.6	8.5	89.8	11.6	2.2	5.5
S-41-1...	0 - 1.0	0 - 3.28	10.2	7.4	—	—	—	—
S-41-2...	1.0 - 1.5	3.28- 4.92	11.3	8.2	—	—	—	—
S-41-3...	1.5 - 2.0	4.92- 6.56	10.7	7.8	—	—	—	—
S-41-4...	2.0 - 2.4	6.56- 7.87	7.7	5.5	—	—	—	—
S-42-1...	0.5 - 1.0	1.64- 3.28	12.4	9.0	—	—	—	—
S-42-2...	1.0 - 1.5	3.28- 4.92	11.0	8.0	—	—	—	—
S-42-3...	1.5 - 2.0	4.92- 6.56	11.4	8.3	—	—	—	—
S-42-4...	2.0 - 2.5	6.56- 8.20	9.7	7.1	—	—	—	—

(19) CONTOUR BOG (FIG. 13)

Aerial photograph: A14955-133

The Contour bog was sampled in section 1, township 11, range 10 EPM, about 1 mile northeast of Highway 15 and 45 miles due east of Winnipeg. The more open part of the bog covers 320 acres and is forested with scattered short conifers. Large clumps of sphagnum moss completely cover the surface; numerous low shrubs and some grass and sedge are present. The south part of the bog is shallow, but the north and central parts are at least 2.05 to 2.45 meters deep (6.73 to 8.04 feet). Sand and sandy clay underlie the peat.

The upper layers consist of light to medium brown finely fibrous peat, mixed with coarse fibrous peat, rootlets, some hypnum moss, and minor sphagnum moss. The lower layer is dark brown fibrous peat mixed with humified peat.

SAMPLE	DEPTH		ABSORPTIVE VALUE (times own weight)		MOIS- TURE %	ASH %	pH
			Dry	25% Moisture			
	Meters	Feet					
S-43-1....	0.4 – 1.25	1.31– 4.10	9.35	6.79	—	—	—
S-44-1....	0.25– 0.5	0.82– 1.64	12.62	9.24	—	—	—
S-44-2....	0.5 – 1.0	1.64– 3.28	12.09	8.83	—	—	—
S-44-3....	1.0 – 1.5	3.28– 4.92	12.70	9.25	—	—	—
S-44-4....	1.5 – 2.05	4.92– 6.73	11.27	8.09	—	—	—
S-45-1....	0.3 – 1.0	0.98– 3.28	11.76	8.56	88.9	7.57	} 6.1
S-45-2....	1.0 – 1.5	3.28– 4.92	12.60	9.19	89.4	7.58	
S-45-3....	1.5 – 2.0	4.92– 6.73	14.78	10.87	90.0	8.75	6.2
S-46-1....	0.2 – 1.0	0.66– 3.28	12.68	9.28	—	—	—
S-46-2....	1.0 – 1.5	3.28– 4.92	12.15	8.86	—	—	—
S-46-3....	1.5 – 2.0	4.92– 6.56	13.36	9.77	—	—	—
S-46-4....	1.95– 2.35	6.40– 7.71	12.32	9.54	—	—	—

*Analysis by Mines Branch, Ottawa; Tibbetts and Lloyd (1963)

(20) BOG EAST OF STE. GENEVIEVE (FIG. 14) Aerial photographs: A14940-96, 206

This large bog in the north central part of township 9, range 9 EPM was sampled in sections 21, 22, and 28. High water levels in 1962 and deep ditches on either side of the Greater Winnipeg Water District Railway and aqueduct prevented adequate sampling of the north part of the bog, although 2 samples were obtained south of and close to the railway. From a point 7.5 miles east of Richer on the Trans-Canada Highway, a Manitoba Forest Service road extends 7 miles north to the bog, from which the area around locations S-49 to S-52 is easily accessible.

The area tested covers at least 1000 acres and is mainly open with grass and sedge growth. Around locations S-50 and S-51, some patches of tall reeds and horsetail rushes are present; in a few places clumps of moss are exposed at water level. The bog drains northward to the Brokenhead River.

The bog contains finely fibrous peat with abundant coarse fibrous peat, and is mixed with some humified peat. The area along the railway is shallow (1.3 meters) and the bottom material consists of black sandy clay. Around locations S-49 and S-52, the bog is 1.2 to 1.85 meters deep, and the bottom material is bluish grey gritty clay.

SAMPLE	DEPTH		ABSORPTIVE VALUE (times own weight)		MOIS- TURE %	ASH %	NITRO- GEN %	pH
			Dry	25%				
	Meters	Feet						
S-47-1....	0.4 - 1.0	1.31- 3.28	13.8	10.1	89.8	9.6	—	—
S-47-2....	1.0 - 1.3	3.28- 4.27	8.33	5.99	82.2	17.33	—	—
S-48-1....	0.3 - 1.3	0.98- 4.27	13.1	9.6	86.8	8.82	—	—
S-49-1....	0.3 - 1.0	0.98- 3.28	10.6	7.7	—	—	—	—
S-50-1....	0.2 - 1.0	0.66- 3.28	13.4	9.8	89.3	8.55	—	—
S-50-2....	1.0 - 1.85	3.28- 6.07	10.8	7.9	86.3	9.30	—	—
S-51-1....	0.4 - 1.0	1.31- 3.28	12.4	9.1	—	—	—	—
S-51-2....	1.0 - 1.8	3.28- 5.91	11.3	8.2	—	—	—	—
S-52-1....	0.35- 1.0	1.14- 3.28	14.1	10.3	89.2	9.41	2.76	} 5.8
S-52-2....	0.75- 1.25	2.46- 4.10	12.6	9.2	85.2	11.10	3.04	

(21) BOG SOUTHEAST OF RICHER (FIG. 15) Aerial photograph: A14940-106

This bog covers parts of sections 8, 9, 16, and 17 in township 8, range 9 EPM, 5 to 7 miles east of Richer. It can be reached most easily from the curve in Dawson Road in the SW $\frac{1}{4}$ -16-8-9 EPM.

The open area of the bog covers 900 acres. The surface growth is grass and sedge with only a few shrubs and isolated trees. Some small clumps of moss are exposed at the surface of the bog in narrow ridges. The bog drains to the east into Brokenhead River.

Location S-55

Surface: grass and sedge
 0 - 0.4 m.: yellowish brown finely fibrous moss; some hypnum; some coarse sedge
 0.4 - 1.5 m.: dark brown fibrous peat; some hypnum and sedge
 1.5 - 2.25 m.: blackish brown humified peat mixed with fibrous peat

The bottom material at location S-53 is grey-green silty calcareous clay.

SAMPLE	DEPTH		ABSORPTIVE VALUE (times own weight)		MOIS- TURE %	ASH %	pH
			Dry	25% Moisture			
	Meters	Feet					
S-53-1....	0.3 - 0.5	0.98- 1.64	12.62	9.21	89.8	9.09	—
S-53-2....	0.5 - 1.0	1.64- 3.28	15.17	10.81	87.9	9.28	—
S-53-3....	1.0 - 1.5	3.28- 4.92	12.37	9.35	88.0	13.31	—
S-54-1....	0.5 - 1.0	1.64- 3.28	11.10	8.11	—	—	—
S-54-2....	1.0 - 1.5	3.28- 4.92	13.22	9.69	—	—	—
S-54-3....	1.5 - 2.0	4.92- 6.56	8.46	5.93	—	—	—
S-54-4....	1.7 - 2.2	5.58- 7.22	8.74	6.31	—	—	—
S-55-1....	0.4 - 1.0	1.31- 3.28	16.40	11.00	89.4	9.23	} 6.6
S-55-2....	1.0 - 1.5	3.28- 4.92	16.59	12.18	91.1	9.24	
S-55-3....	1.5 - 2.25	4.92- 7.38	11.33	8.49	—	—	

(22) BOG NORTHEAST OF RICHER (FIG. 16)

Aerial photograph: A14939-115

This bog forms the southern part of a large bog extending north of the Trans-Canada Highway and west of Brokenhead River. The south edge of the bog is about 0.67 miles north of the highway. The surface growth is grass and sedge with shrubby areas. Charred stumps indicate the surface has been burned. Some clumps of moss are present in places, but the bog is very shallow, and the peat is of poor quality. It is medium to dark brown, fibrous, and is mixed with some humified peat. It is underlain by grey calcareous clay.

SAMPLE	DEPTH		ABSORPTIVE VALUE (<i>times own weight</i>)		MOIS- TURE %	ASH %	pH
			Dry	25% Moisture			
	Meters	Feet					
S-56-1	0.2 - 0.45	0.66- 1.48	15.02	11.02	89.3	10.58	7.0
S-57-1	0.05- 0.45	0.16- 1.48	10.45	7.60	—	—	—

(23) BOG ALONG TRANS-CANADA HIGHWAY (FIG. 17)

Aerial photographs: A19444-130; A14955-152, 12

The main part of the bog is north of the Trans-Canada Highway, 11 to 15 miles east of Richer; the southeast extension is crossed by the highway. The bog is located within a large burned out area and numerous charred trees are standing in the bog; charcoal fragments were found in some of the peat samples.

The west part has a thick cover of low to medium shrubs over a rough surface, of which 30 per cent is low, wet, grassy areas; horsetail rushes are abundant. The southeast part is open with grass and sedge, and with some small clumps of shrubs around S-62.

The areas tested were shallow and the peat of poor quality — blackish brown fibrous peat mixed with humified peat. The large central part was not tested.

SAMPLE	DEPTH		ABSORPTIVE VALUE (<i>times own weight</i>)		MOIS- TURE %	ASH %	pH
			Dry	25% Moisture			
	Meters	Feet					
S-58-1....	0 - 0.8	0 - 2.62	8.79	6.35	—	—	—
S-59-1....	0 - 1.0	0 - 3.28	7.94	5.72	—	—	—
S-60-1....	0 - 1.0	0 - 3.28	9.03	6.52	85.4	12.48	—
S-60-2....	1.0 - 1.5	3.28- 4.92	7.48	5.36	78.3	26.44	—
S-61-1....	0.2 - 1.0	0.66- 3.28	10.97	7.97	—	—	—
S-61-2....	0.7 - 1.2	2.30- 3.94	10.10	7.33	—	—	—
S-62-1....	0.0- 1.3	0.0 - 4.27	10.59	7.77	86.6	11.54	6.45

(24) BOG SOUTHWEST OF HADASHVILLE (FIG. 18) Aerial photograph: A14954-174

The bog is located in the northwest part of township 7, range 11 EPM, immediately south of the Dawson Road. The bog has an open area of 80 acres, and is part of larger heavily wooded bog areas connected to it on the south and east. The open part has a wet, reedy area around the edge, and an area of sedge in the centre. The bog is shallow at location S-63, and increases in depth to 1.15 meters at S-64. The upper layer at S-64 consists of medium brown fibrous peat mixed with some humified peat, and is underlain by peat fibres in humified black peat. The bottom material is fine-grained sand.

SAMPLE	DEPTH		ABSORPTIVE VALUE <i>(times own weight)</i>		MOIS- TURE %	ASH %	pH
			Dry	25%			
	Meters	Feet					
S-63-1....	0 - 0.5	0 - 1.64	10.66	7.76	—	—	—
S-64-1....	0 - 0.6	0 - 1.97	15.79	11.59	90.7	6.76	6.5
S-64-2....	0.6 - 1.15	1.97- 3.77	12.70	9.41	88.2	8.55	6.2

(25) BIRCH RIVER BOG (FIG. 19) Aerial photograph: A15574-19

The bog covers parts of sections 14, 15, 22, and 23 in township 8, range 13 EPM; it is north of the Trans-Canada Highway and east of Birch River, into which it drains. The open part of the bog covers 500 acres. Location S-65 is in a grass- and sedge-covered clearing in an area studded with dead trees, some reeds, and a few shrubs. Moss is exposed in some places at the surface of the bog. The upper layer consists of fibrous moss and some humified peat. It is underlain by medium to dark brown fibrous peat, mixed with humified peat. The bottom layer, from 2.3 to 2.4 meters, consists of fine quartz silt mixed with grey clay and black humified peat.

SAMPLE	DEPTH		ABSORPTIVE VALUE <i>(times own weight)</i>		MOIS- TURE %	ASH %	pH
			Dry	25% Moisture			
	Meters	Feet					
S-65-1....	0.4 - 1.0	1.31- 3.28	13.92	10.17	88.4	7.71	}6.3
S-65-2....	1.0 - 2.0	3.28- 6.56	13.29	9.71	88.9	7.22	
S-65-3....	1.9 - 2.3	6.23- 7.55	12.31	8.98	89.4	11.00	

(26) GLENN BOG (FIG. 20) Aerial photograph: A15837-81

This bog is part of a large bog in the west part of township 8, range 15 EPM; it

was sampled in the south part of section 30. Access is from the Trans-Canada Highway north along an old railroad bed along the west side of sections 12 and 13, 8-14 EPM, to a gravel pit; then northeastward for 1 mile to a trail leading into and across the bog.

The north part of the bog covers 700 acres. It is moderately to heavily forested; the surface is formed of clumps of moss with grass, sedge, and reeds. Drainage is to the south to Boggy River.

Location S-67

0 - 0.2 m.:	reddish hypnum moss and finely fibrous moss
0.2 - 1.0 m.:	medium brown fibrous peat
1.0 - 2.0 m.:	blackish brown fibrous peat and humified peat
2.0 - 2.4 m.:	black humified peat, some fibrous peat
2.4 - 2.5 m.:	black humified peat and greenish grey calcareous clay.

SAMPLE	DEPTH		ABSORPTIVE VALUE (times own weight)		MOIS- TURE %	ASH %	pH
	Meters	Feet	Dry	25% Moisture			
S-66-1....	0.2 - 1.0	0.66- 3.28	12.61	9.22	90.0	7.96	} 6.4
S-66-2....	1.0 - 1.5	3.28- 4.92	10.58	7.67	89.4	7.78	
S-66-3....	1.5 - 2.0	4.92- 6.56	12.59	9.22	88.6	8.84	} 6.2
S-66-4....	2.0 - 2.5	6.56- 8.20	13.08	9.56	86.6	12.57	
S-67-1....	0.25- 1.0	0.82- 3.28	10.04	7.29	—	—	—
S-67-2....	1.0 - 2.0	3.28- 6.56	12.63	9.69	—	—	—
S-67-3....	2.0 - 2.4	6.56- 7.87	12.48	9.09	—	—	—

(27) FALCON BEACH BOG (FIG. 21) Aerial photograph: A15805-32

This bog is located in sections 28, 29, and 32 in township 8, range 16 EPM, north of the Trans-Canada Highway and 2 miles west of Falcon Beach. The south part of the bog has an area of 150 acres, and is lightly treed with spruce and some jack pine; the surface is fairly dry and consists of clumps of sphagnum moss with some sedge and shrubs.

The bog contains a good thickness of dark brown fibrous peat, mixed with a small amount of sphagnum and hypnum mosses and humified peat. The bottom material is sand and grey clay.

SAMPLE	DEPTH		ABSORPTIVE VALUE (times own weight)		MOIS- TURE %	ASH %	NITRO- GEN %	pH
	Meters	Feet	Dry	25% Mois- ture				
S-68-1...	0.35- 1.0	1.15- 3.28	9.9	7.2	87.1	10.22	—	—
S-68-2...	1.0 - 1.5	3.28- 4.92	11.1	8.1	87.4	9.65	—	—
S-68-3...	1.5 - 2.0	4.92- 6.56	18.5	13.6	89.3	7.86	—	—
S-68-4...	2.0 - 2.5	6.56- 8.20	12.5	9.1	86.2	12.65	—	—
S-68-5...	2.5- 3.35	8.20- 11.0	10.2	7.4	84.6	20.65	—	—
*S-69-1...	0.25- 1.0	0.82- 3.28	12.8	9.4	88.7	6.7	1.7	5
*S-69-2...	1.0 - 2.0	3.28- 6.56	14.0	10.3	89.8	5.8	2.3	5
*S-69-3...	2.0 - 2.5	6.56- 8.20	16.7	12.4	90.6	6.8	2.3	5
*S-69-4...	2.5 - 2.85	8.20- 9.35	10.0	7.2	82.2	40.9	2.0	5.5

*Analyses by Mines Branch, Ottawa; Tibbetts and Lloyd (1963)

(28) CARRICK BOG (FIG. 22)

Aerial photograph: A14955-186

The Carrick bog has a central open area of 90 acres straddling the central part of the section line between 24-3-10 EPM and 19-3-11 EPM, and is accessible from the south. The surface growth is grass and sedge, with numerous shrubs, a few live spruce, and some dead trunks. Drainage is to the southwest to the Rat River.

The bog contains medium to dark brown fibrous peat, with some sphagnum moss in the upper layer, some hypnum peat in the lower layer, and humified peat. The bottom material is grey fine-grained quartz silt and grey calcareous clay.

SAMPLE	DEPTH		ABSORPTIVE VALUE (times own weight)		MOIS- TURE %	ASH %	pH
	Meters	Feet	Dry	25% Moisture			
S-70-1....	0.1 - 1.0	0.33- 3.28	11.2	8.1	—	—	—
S-70-2....	1.0 - 1.5	3.28- 4.92	8.1	5.8	—	—	—
S-71-1....	0.4 - 1.0	1.31- 3.28	10.6	7.7	—	—	—
S-71-2....	1.0 - 1.5	3.28- 4.92	8.9	6.4	—	—	—
S-72-1....	0.3 - 1.0	0.98- 3.28	9.3	6.7	83.6	13.43	}6.3
S-72-2....	1.0 - 2.0	3.28- 6.56	11.7	8.5	87.3	8.97	

(29) PINEY BOG (FIG. 23)

Aerial photograph: A14946-107

The Piney bog is centred in section 23, township 1, range 11 EPM, 1 to 3 miles southwest of Piney. The bog covers about 1100 acres, of which 300 acres in section 23 are heavily forested. The northeast part of the bog is covered with grass and sedge, abundant horsetail rushes, and scattered clumps of low shrubs and moss. The central area is treed mainly by spruce, and has a thick cover of sphagnum moss. The southwest part is shrub-covered around the edge of an open area of grass, sedge, and low shrubs. A ditch crosses the east part of the bog and drains southward.

Location S-75

- 0.2 - 0.5 m.:
- medium to dark brown fibrous peat, some hypnum
- 0.5 - 2.0 m.:
- dark brown fibrous peat, some hypnum, some humified peat
- 2.0 - 3.2 m.:
- blackish brown fibrous peat mixed with humified peat
- 3.2 m.:
- grey silty calcareous clay

SAMPLE	DEPTH		ABSORPTIVE VALUE (times own weight)		MOIS- TURE %	ASH %	NITRO- GEN %	pH
	Meters	Feet	Dry	25% Mois- ture				
S-73-1...	0.15- 1.0	0.49- 3.28	10.3	7.5	—	—	—	—
S-73-2...	1.0 - 1.35	3.28- 4.43	8.7	6.3	—	—	—	—
S-74-1...	0.15- 1.0	0.49- 3.28	13.2	9.6	—	—	2.33	—
S-74-2...	1.0 - 1.5	3.28- 4.92	11.7	8.5	—	—	2.56	—
S-74-3...	1.5 - 2.0	4.92- 6.56	12.3	9.0	86.2	8.59	—	—
S-74-4...	2.0 - 2.35	6.56- 7.71	10.8	7.9	84.8	13.74	—	—
*S-75-1...	0.2 - 0.5	0.66- 1.64	14.1	10.2	88.8	11.4	2.7	6
*S-75-2...	0.5 - 1.0	1.64- 3.28	12.5	9.5	89.4	8.8	2.8	6
*S-75-3...	1.0 - 1.5	3.28- 4.92	12.2	9.8	88.9	8.5	2.5	6

*Analysis by Mines Branch, Ottawa; Tibbetts and Lloyd (1963)

SAMPLE	DEPTH		ABSORPTIVE VALUE (times own weight)		MOIS- TURE %	ASH %	NITRO- GEN %	pH
			Dry	25% Mois- ture				
	Meters	Feet						
*S-75-4...	1.5 - 2.0	4.92- 6.56	13.1	9.8	89.4	7.6	2.7	6
*S-75-5...	2.0 - 2.5	6.56- 8.20	12.0	8.8	87.5	8.4	2.2	6
*S-75-6...	2.5 - 3.0	8.20- 9.84	10.3	7.4	86.9	19.3	2.6	6
S-75-7...	2.85- 3.2	9.35-10.50	10.8	7.8	—	—	—	—
S-76-1...	0.35- 1.0	1.15- 3.28	15.0	11.0	88.3	9.6	2.81	—
S-76-2...	1.0 - 1.5	3.28- 4.92	14.5	10.7	89.1	9.3	2.58	—
S-76-3...	1.5 - 2.0	4.92- 6.56	14.4	10.5	88.9	10.9	—	—
S-76-4...	2.0 - 2.3	6.56- 7.55	13.9	10.2	—	—	—	—
S-77-1...	0.5 - 1.0	1.64- 3.28	12.8	9.4	89.1	14.6	—	—
S-77-2...	1.0 - 1.5	3.28- 4.92	14.8	10.8	90.3	9.5	—	—
S-77-3...	1.5 - 2.0	4.92- 6.56	15.0	11.0	89.2	10.7	—	—
S-77-4...	2.0 - 2.5	6.56- 8.20	13.7	10.0	88.5	11.0	—	—
*S-78-1...	0 - 0.5	0 - 1.64	15.7	11.6	89.8	9.7	} 2.4	6
*S-78-2...	0.5 - 1.5	1.64- 4.92	12.3	8.8	88.3	8.9		6
*S-78-3...	1.5 - 2.0	4.92- 6.56	10.7	7.9	88.1	11.1		2.2
*S-78-4...	2.0 - 2.45	6.56- 8.04	9.9	7.2	89.2	10.2	2.1	6

(30) BOG EAST OF HIGHWAY 89 (FIG. 23)

Aerial photograph: A14946-119

The bog is located along the section line between sections 6 and 7, township 1, range 12 EPM, 4 miles south of Piney. The open part of 200 acres is fairly high and dry. Surface growth includes sphagnum moss, Labrador tea, cotton grass, shrubs, and a few scattered trees. A drainage ditch, with flow to the west, crosses immediately north of the bog. The bog is shallow, and consists of an upper layer of light brown spongy sphagnum moss, with some fibrous and woody peat, and a lower layer of medium to dark brown sphagnum moss mixed with fibrous, woody, and some humified peat. The bottom material is black non-calcareous clay 0.3 meters thick, overlying greenish buff calcareous clay.

SAMPLE	DEPTH		ABSORPTIVE VALUE (<i>times own weight</i>)		MOIS- TURE %	ASH %	pH
			Dry	25% Moisture			
	Meters	Feet					
S-79-1....	0 - 0.1	0 - 0.33	20.23	14.99	—	—	—
S-79-2....	0.1 - 0.5	0.33- 1.64	17.15	12.61	92.5	11.42	—
S-79-3....	0.4 - 0.9	1.31- 2.95	13.51	9.89	89.8	8.75	—
S-80-1....	0.05- 0.5	0.16- 1.64	19.78	14.60	91.9	7.93	} 6.0
S-80-2....	0.5 - 1.0	1.64- 3.28	14.51	10.63	89.5	7.77	

The upper layer of this bog contains peat with a high absorptive value, but it is an impure sphagnum moss and would probably not be suitable for export. Some small-scale production might be possible; the tonnage is limited.

*Analysis by Mines Branch, Ottawa; Tibbetts and Lloyd (1963)

(31) SPRAGUE BOG (FIG. 24)

Aerial photographs: A15542-105, 119, 121

The large Sprague bog covers the north part of township 1, range 15 EPM, the south part of township 2, range 15 EPM, and extends into the northeast part of township 1, range 14 EPM. The extent of the open part, between 3,500 and 4,000 acres, is shown on figure 24. The northern lobe has a grass, sedge, shrub, and moss

SAMPLE	DEPTH		ABSORPTIVE VALUE (times own weight)		MOIS- TURE %	ASH %	NITRO- GEN %	pH
	Meters	Feet	Dry	25% Mois- ture				
S-81-1...	0.45- 1.0	1.48- 3.28	12.9	9.5	88.7	8.5	—	—
S-81-2...	1.0 - 1.5	3.28- 4.92	10.7	7.7	88.2	7.6	—	—
S-81-3...	1.5 - 1.8	4.92- 5.91	7.9	4.7	—	—	—	—
S-82-1...	0 - 1.0	0 - 3.28	12.1	8.8	—	—	—	—
S-82-2...	1.0 - 1.85	3.28- 6.07	11.9	7.0	—	—	—	—
S-83-1...	0 - 0.5	0 - 1.64	11.9	8.7	90.0	8.7	—	—
S-83-2...	0.5 - 1.0	1.64- 3.28	13.7	10.0	89.0	8.1	—	—
S-83-3...	1.0 - 1.7	3.28- 5.58	10.1	7.3	86.2	12.4	—	—
S-84-1...	0 - 1.0	0 - 3.28	12.1	8.8	—	—	—	—
S-84-2...	1.0 - 1.9	3.28- 6.23	9.7	7.0	—	—	—	—
S-85-1...	0.4 - 1.5	1.31- 4.92	15.1	11.0	89.5	10.1	—	—
S-85-2...	1.5 - 1.8	4.92- 5.91	10.3	7.5	83.3	9.6	—	—
S-86-1...	0.35- 1.0	1.15- 3.28	12.0	8.8	—	—	—	—
S-86-2...	1.0 - 1.3	3.28- 4.27	6.2	4.4	—	—	—	—
*S-87-1...	0.25- 1.0	0.82- 3.28	13.3	9.8	87.1	10.2	—	6.5
*S-87-2...	1.0 - 1.5	3.28- 4.92	13.3	9.7	87.3	7.8	2.7	6.5
*S-87-3...	1.5 - 1.8	4.92- 5.91	9.2	6.7	79.1	20.0	—	6.5
S-88-1...	0.3 - 1.0	0.98- 3.28	11.8	8.6	—	—	—	—
S-88-2...	1.0 - 1.5	3.28- 4.92	13.5	9.9	—	—	—	—
S-88-3...	1.5 - 1.75	4.92- 5.74	7.7	5.5	—	—	—	—
S-89-1...	0.4 - 1.0	1.31- 3.28	13.5	9.9	—	—	—	—
S-89-2...	1.0 - 1.5	3.28- 4.92	12.1	8.8	—	—	—	—
S-90-1...	0.25- 1.0	0.82- 3.28	12.7	9.3	85.1	9.9	2.77	—
S-90-2...	1.0 - 1.5	3.28- 4.92	15.1	11.0	83.4	8.1	2.82	—
S-90-3...	1.5 - 2.0	4.92- 6.56	13.1	9.6	82.4	8.5	3.13	—
S-91-1...	0.25- 1.0	0.82- 3.28	14.3	10.5	85.4	7.5	—	—
S-91-2...	1.0 - 2.0	3.28- 6.56	11.3	8.3	86.0	11.7	—	—
S-92-1...	0.5 - 1.0	1.64- 3.28	13.9	10.2	—	—	—	—
S-92-2...	1.0 - 1.6	3.28- 5.25	12.5	9.1	—	—	—	—
*S-93-1...	0.25- 1.0	0.82- 3.28	14.2	10.5	87.8	8.8	} 2.6	6
*S-93-2...	1.0 - 1.5	3.28- 4.92	15.0	11.1	88.3	6.4		6
*S-93-3...	1.5 - 2.0	4.92- 6.56	11.2	8.2	86.0	8.3		6
S-93-4...	1.8 - 2.2	5.91- 7.22	8.9	6.4	—	—	—	—
S-94-1...	0.4 - 1.0	1.31- 3.28	12.9	9.5	87.8	10.8	—	—
S-94-2...	1.0 - 2.0	3.28- 6.56	14.8	10.9	86.7	8.0	—	—
S-94-3...	2.0 - 2.45	6.56- 8.04	10.8	7.9	—	—	—	—
*S-95-1...	0.35- 1.0	1.15- 3.28	12.7	9.3	86.6	9.1	} 2.7	6
*S-95-2...	1.0 - 1.5	3.28- 4.92	14.1	10.3	88.0	6.3		6
*S-95-3...	1.5 - 2.5	4.92- 8.20	12.0	8.7	88.3	8.5		6

*Analysis by Mines Branch, Ottawa; Tibbetts and Lloyd (1963)

cover; the southwestern part is similar but also has some large reedy areas; the southern part is mainly sedge and grass, with patches of moss and reeds.

The southern part drains southwestward into Mud River; the northern part probably drains eastward through Reed River to Lake of the Woods.

The bog contains medium to dark brown fibrous peat, including some hypnum moss in the upper layers, and most samples contain some humified peat. The lowest layer consists of dark brown humified peat mixed with fibrous peat, and is underlain by fine quartz silt, black clay, and greenish grey calcareous clay. The average depth is 2 meters (6.56 feet); the greatest depth found in the testing was 2.6 meters (8.53 feet) at location S-95.

(32) MOOSE LAKE ROAD BOG (FIG. 24)

Aerial photograph: A15837-127

The sampled area in the north part of 20-2-15 EPM forms the southwest part of a large bog extending north from the Moose Lake Road, 13 miles by road northeast of Sprague. A creek crosses the bog and drains it to the southeast to Reed River. West of the creek the bog is open, with grass, sedge, and reeds, and contains a shallow layer of dark brown humified peat underlain by black muck.

East of the creek, the bog is high and dry; the surface is formed of thick clumps of sphagnum moss and is heavily treed. The peat is dark brown and humified, mixed with some fibrous fragments, and is underlain by greenish grey calcareous clay at a depth of 1.9 meters (6.23 feet).

SAMPLE	DEPTH		ABSORPTIVE VALUE (<i>times own weight</i>)		MOIS- TURE %	ASH %	pH
			Dry	25% Moisture			
	Meters	Feet					
S-96-1....	0 - 0.8	0 - 2.62	6.22	4.41	—	—	—
S-97-1....	0.1 - 1.0	0.32- 3.28	9.95	7.23	85.3	8.02	5.0
S-97-2....	0.9 - 1.4	2.95- 4.60	14.19	10.41	84.7	7.38	5.5
S-97-3....	1.4 - 1.9	4.60- 6.23	9.42	6.80	85.5	17.10	—

V. NOTES ON BOG AREAS NOT SAMPLED IN PRESENT SURVEY

The main areas underlain by peat in southeastern Manitoba are outlined on the regional map (fig. 25). Aside from the sampled areas described above, some information is available on other bog areas in southeastern Manitoba.

(33) EAST OF ANEDA: 19-13-10 EPM

When examined in 1963, this area was a reedy lake and could not be sampled.

(34) BOG NORTH OF HIGHWAY 4: sections 3, 4, 9; 13-10 EPM

This bog was described by Leverin (1943, 1946) as consisting of a chain of 3 bogs with a total area of 560 acres. A heavy growth of sphagnum moss covers the surface. The southern part is open and has a depth of 5 feet, containing a mixture of fibrous and humified peat. The centre bog is treed, and has an average depth of 12 feet of good quality light yellowish brown peat moss underlain by 3 feet of darker humified peat. Leverin reported the following analyses of the good peat moss:

DEPTH		ABSORPTIVE VALUE (<i>times own weight</i>)		ASH %	NITRO- GEN %
		Dry	25% Mois- ture		
Meters	Feet				
0 — 1.22	0 — 4	16.8	12.3	3.9	0.8
1.22— 2.44	4 — 8	17.2	12.6	3.9	0.7
2.44— 3.66	8 —12	15.6	11.4	6.9	0.7

Leverin reported the northwest lobe to be somewhat spotty in quality, but that good moss is available above the 7-foot level. He concluded:

"The deposit appears to be a good prospect for a fair-sized production of good quality peat moss. The growth of trees on the parts carrying the best moss is not particularly dense and they are comparatively small."

Molson Peat Company attempted development of this bog, including the partial excavation of a drainage ditch in 1951, but no production has been recorded.

(35) SOUTHWEST OF JULIUS: sections 2, 3, 11, and 12; 12-9 EPM

Surveyors notes, published in Extracts from Reports on Townships East of the Principal Meridian (1915), reported the area is composed principally of muskeg overgrown with spruce and tamarack, except for the open area. Access to this bog would be difficult.

(36) BOG SOUTHWEST OF WHITEMOUTH: sections 27 and 28, 11-11 EPM

Surveyors notes (1915) reported: "Nearly all of this township is swamp, with a growth of spruce and tamarack. In the swamp there is generally about 14 to 20 inches in depth of muck composed of moss and moist vegetable matter."

(37) BOG SOUTH OF DARWIN: sections 10, 11, 12, 15, and 22; 11-12 EPM

Surveyors (1915) described the area as partly open muskeg and partly spruce and tamarack muskeg, both underlain by moss of unknown depth and quality. A

report by Anrep (1931) reported the bog is composed of sphagnum moss intermixed with a large amount of carex vegetation, and is considerably humified. The heavily wooded part of the bog averaged 3 to 7 feet deep.

(38) AREA SOUTH OF CRAIGS: sections 15 and 16; 10-9 EPM

Access to this area is difficult. A sample taken in 1963 in the north part of 22-10-9 EPM did not intersect peat; the area has been burned and it is not a bog, at least in the sampled area.

(39) AREA WEST OF RENNIE: sections 19 and 30; 10-14 EPM; and
sections 22 to 26, and 36; 10-13 EPM

Surveyors (1915) described the area as consisting generally of spruce and tamarack swamps, and muskegs with small spruce and tamarack and willow scrub.

(40) BOGS EAST OF BIRCH RIVER: south part of 10-13 EPM; southwest part of
10-14 EPM; 9-13 EPM; 9-14 EPM

This area is inaccessible at the present time. Surveyors (1915) described the area as consisting of muskegs and swamps with spruce and tamarack, and some willow scrub. The surface of township 9-13 EPM is "generally covered with moss, but below that there is in some places a rich black loam." An open muskeg is present in the south part of 9-14 EPM.

(41) BOG SOUTHEAST OF STE. GENEVIEVE: southwest part; 9-9 EPM

Johnston (1921) mapped this area as a floating bog. Surveyors (1915) reported the area as wet and marshy, covered to a depth of several feet with moss.

(42) BOG EAST OF LARKHALL: sections 23 to 26, and 35; 9-10 EPM

Surveyors (1915) record moss along the section line between 25 and 26 and, north of the railway track, between 23 and 24. Material along other section lines is described as black loam.

(43) BOG NORTH OF HUGO LAKE: sections 1, 11 to 14, and 22 to 27; 7-9 EPM

This area is described by the surveyors (1915):
"The southeastern quarter of the township is swampy and in some places there are floating bogs or muskegs which render this portion nearly impassable. Practically the whole of sections 1, 2, 3, 10, 11, 12, 13, 14, 15 and 25 are more or less flooded all the time. The lower portions of the township are covered with a thick growth of peaty moss."

(44) BOG EAST OF LA BROQUERIE: sections 1 and 12; 7-8 EPM; and
sections 5 to 8; 7-9 EPM

Surveyors (1915) described the north, east, and south section lines of 1-7-8 EPM as having an upper layer of moss and peat. Total depth and quality are not known.

(45) BOG SOUTH OF GLENN: west part of 7-15 EPM; north part of 6-15 EPM

Surveyors (1915) described the southwest corner of 7-15 EPM as "principally muskeg and floating bog with willow scrub and tamarack," and the north and northeast part of 6-15 EPM as "a large muskeg which is impassable at any time of the year as it is a floating bog and dangerous for man or beast." This area, known as the Caribou bog, is generally covered with 6 inches to 3 feet of water; it is reported to have a great thickness of sphagnum moss.

- (46) BOGGY RIVER AREA: southeast part of 7-16 EPM; southwest part of 7-17 EPM; northeast part of 6-16 EPM; northwest part of 6-17 EPM

Surveyors (1915) described the area as mostly spruce and tamarack swamps with some open muskeg in the area around the junction of the 4 townships. This area is almost inaccessible.

- (47) BOG NORTH OF MARCHAND: central to southwest part of 6-9 EPM

Surveyors (1915) described the township as being about one-third muskeg and the remainder swampy except for stony ridges. The low areas have "a thick growth of moss overlying wet peaty mould."

- (48) ST. LABRE BOG: 6-11 EPM; 6-12 EPM; 5-12 EPM

The huge St. Labre bog covers at least 50 sections but is in an almost inaccessible area described by surveyors as consisting mainly of almost impassable floating bogs, muskegs, and swamps, much of it covered with 1 to 4 feet of water.

- (49) BOG SOUTH OF BIRCH LAKE: south half, 6-14 EPM

This area is described by surveyors (1915) as being muskeg with a top layer of "black loam," and covered with water 6 inches to 1 foot deep. Surface growth consists of some scattered tamarack, willow scrub, and reeds. Most of the area is not easily accessible.

- (50) BOG NORTHEAST OF WHITEMOUTH LAKE: sections 1, 2, and 3; 5-15 EPM;
sections 35 and 36; 4-15 EPM

Surveyors (1915) described the area as being principally spruce and tamarack swamps, generally under water. Access would be difficult, as the Moose Lake-East Braintree road is 4 miles to the east.

- (51) NORTH OF WHITEMOUTH LAKE: 4-12 EPM; 4-13 EPM; 4-14 EPM; 4-15 EPM

Several large bogs are present in this area. The large open bog in the northwest part of 4-13 EPM is described by the surveyors (1915) as a deep, wet muskeg with "quite a depth of moss, the subsoil being decayed vegetable matter or peat." Depth and quality are not known. The areas in the east part of 4-14 EPM and in 4-15 EPM are almost inaccessible. They are described as being either flat and swampy or very wet muskeg. The areas along the north and west shores of Whitemouth Lake are described as marshes.

- (52) NORTHEAST OF CALIENTO: east part, 2-8 EPM; west part, 2-9 EPM

Johnston (1912) reported that wire grass from the large marsh near Caliento was utilized in the manufacture of mattresses. The peaty material in the marsh areas is composed of partly decayed grasses, rather than peat moss. However, the surveyors (1915) recorded a top layer of moss in sections 7, 18, and 19 in 2-9 EPM.

- (53) NORTHEAST OF SUNDOWN: west part, 2-10 EPM; section 12-2-9 EPM

Any peat available in this area is probably of shallow depth.

- (54) NORTHWEST OF MENISINO: sections 15 and 22, 2-10 EPM

This area was recommended for testing (Graham, 1962), but the recent construction of a water control structure has converted the area into a lake.

(55) SPRAGUE RIVER AREA: southeast part, 2-13 EPM; sections 7 and 8, 2-14 EPM
Most of this area is described by surveyors (1915) as being a tamarack and spruce swamp. Moss and peat were recorded along the north edge of the area.

(56) SOUTH OF MENISINO: section 30, 1-11 EPM

A sampled location in the northeast part of section 30, thought to be an extension of the Sundown bog, intersected black soil; this area is not a bog.

(57) PINE CREEK AREA: sections 17 and 20, 1-12 EPM

A sampled location east of Pine Creek in a partly open swamp in the south part of 17-1-12 EPM intersected peat muck and black soil; it is not a bog.

(58) EAST OF MIDDLEBRO: east part, 1-16 EPM; west part, 1-17 EPM

This area is described by surveyors (1915) as spruce and tamarack swamps, with an open muskeg in the southeast part of 1-16 EPM. The area adjoining Lake of the Woods is classed by Johnston (1921) as hay marsh.

VI. SUMMARY OF RESULTS

The best intersection of peat for each of the sampled bogs is summarized in table 2. The green layer of living plants is not included in the calculations.

High-quality sphagnum moss in quantities suitable for large scale production is available in the Julius (1)* and Medika (7) bogs. These bogs are presently leased by Western Peat Company Limited. The bog north of Highway 4 (34), investigated previously by Leverin (1943, 1946) is a possible source of large quantities of good peat moss.

The bog southwest of Elma (8) contains good sphagnum moss. The total area is limited, and the surface is treed in part. Additional sampling is warranted to determine the area of good moss.

The large bog areas in and north of the Northwest Angle Forest Reserve (10) contain some good sphagnum moss; the samples taken from the bog north of Sprague Lake (9) indicated a layer of poorer peat within the best section. This area would present drainage difficulties.

The small bog east of Highway 89 (30) contains a thin layer of good sphagnum moss mixed with woody peat; however, the bog has an area at most of 200 acres and is of shallow depth. It may be suitable for small scale production of peat moss, not of export grade.

The Jessica Lake bog (15) contains fibrous peat with some intermixed sphagnum moss. The Falcon Beach bog (27) contains fibrous peat mixed with small amounts of sphagnum and hypnum moss. Both bogs are treed.

Fibrous peat mixed with some hypnum moss occurs in several bogs. The highest absorptive values, ranging from 11.1 to 12.6 times weight of peat (25% moisture basis), were found in the bogs at Shelley (2), northeast of Whitemouth (4b, 4c), at Lewis (5), at Nourse (16), and southeast of Richer (21). Some parts of the Piney bog (29) and Sprague bog (31) have similar material.

The central areas of the bog northeast of Whitemouth (4) and of the Jessica Lake bog (15) were not tested and better moss may be present than that obtained in the reported samples.

Fibrous peat of intermediate to good quality occurs in the Whiteshell bog (6) and in the Caliento-Sundown bog (11, 12) in which a small amount of hypnum moss is present.

Of the unsampled bog areas, the following are accessible: the bogs west of Rennie (39), east of Larkhall (42), east of La Broquerie (44), north of Marchand (47), northwest of Whitemouth Lake (51), and east of Middlebro (58). The aerial photographs indicate that parts of these areas are free of trees, and surveyors notes indicate they are "muskeg" areas. However, the depth and quality of any peat moss present are not known.

Other areas of untested, open muskeg, that may contain peat moss, but which are inaccessible or remote from present transportation facilities, include the bogs southwest of Julius (35), east of Birch River (40), along Boggy River (46), and in the Sprague River area northwest of Sprague (55),

Floating bogs have been reported from southeast of Ste. Genevieve (41), north of Hugo Lake (43), south of Glenn (45), and on either side of St. Labre Creek (48).

*Numbers correspond to those in the text descriptions.

TABLE 2. SUMMARY OF TEST RESULTS

Bog	LOCATION	DEPTH METERS	THICKNESS		ABSORPTIVE VALUE (times own weight)		MOIS- TURE	ASH	NITRO- GEN	pH
			Meters	Feet	Dry	25% Mstr.				
(1) Julius.....	S-1	0.5 -3.5	3.0	9.84	21.9	16.2	90.5	4.0	0.8	4.3
(2) Shelley.....	S-4	0.3 -2.0	1.7	5.58	17.0	12.6	89.3	9.3	2.9	5.8
(3) East of Elma...	S-6	0.2 -1.4	1.2	3.94	14.4	10.5	89.0	8.1	—	6.4
(4) Whitemouth										
(a) SE.....	S-7	0.7 -1.5	0.8	2.62	15.3	11.2	93.0	7.3	—	5.9
(b) W.....	S-8	0.2 -2.0	1.8	5.91	17.0	12.5	91.2	6.4	2.8	6.1
(c) N.....	S-10	0.25-1.5	1.25	4.10	15.2	11.1	91.3	7.0	—	6.2
(5) Lewis.....	S-14	0.25-1.5	1.25	4.10	16.4	12.0	92.0	6.9	—	6.2
(6) Whiteshell.....	S-17	0.5 -2.7	2.2	7.22	16.6	12.2	91.5	7.0	2.6	6.0
(7) Medika.....	S-20	0.45-2.5	2.05	6.72	24.9	18.4	93.0	5.9	0.7	4.9
(8) SW of Elma....	S-21	0.1 -1.5	1.4	4.60	19.6	14.4	90.5	6.7	0.9	4.9
(9) N. of Sprague L.	S-23	0.1 -2.5	2.4	7.87	19.0	13.9	92.9	7.6	1.2	5.9
(10) NW Angle F. R.	S-25	0.25-2.85	2.6	8.53	19.8	14.6	92.5	7.8	2.7	5.9
(11) Caliento.....	S-26	0.3 -2.0	1.7	5.58	17.3	12.9	91.7	9.2	2.8	6.8
(12) Sundown.....	S-27	0.6 -2.0	1.4	4.60	17.4	12.8	91.6	11.1	3.1	7.2
(13) Molson.....	S-28	0.3 -1.5	1.2	3.94	12.9	9.4	86.9	9.1	2.7	6.0
(14) Heart Lake.....	S-33	0.15-1.45	1.3	4.27	11.0	8.0	—	—	—	6.4
(15) Jessica Lake....	S-34	0.25-4.5	4.25	13.94	13.9	10.2	90.3	9.0	—	6.1
(16) Nourse.....	S-36	0.3 -1.0	0.7	2.30	15.2	11.1	91.3	7.0	2.9	6.7
(17) S. of Hazel....	S-39	0.25-1.0	0.75	2.46	12.1	8.9	—	—	—	—
(18) N. of Hazel....	S-40	0 -1.0	1.0	3.28	16.8	12.1	92.4	14.8	1.6	5.5
(19) Contour.....	S-45	0.3 -2.0	1.7	5.58	12.9	9.4	89.4	7.9	—	6.1
(20) Ste. Genevieve.	S-52	0.35-1.25	0.9	2.95	13.6	9.9	87.9	10.0	2.9	5.8
(21) SE. of Richer...	S-55	0.4 -1.5	1.1	3.61	16.5	11.5	90.2	9.2	—	6.6
(22) NE. of Richer...	S-56	0.2 -0.45	0.25	0.82	15.0	11.0	89.3	10.6	—	7.0
(23) Trans-Canada..	S-62	0 -1.3	1.3	4.27	10.6	7.8	86.6	11.5	—	6.4
(24) Hadashville....	S-64	0 -1.15	1.15	3.77	14.3	10.5	89.5	7.6	—	6.4
(25) Birch R.....	S-65	0.4 -2.3	1.9	6.23	13.3	9.7	88.9	7.9	—	6.3
(26) Glenn.....	S-66	0.2 -2.5	2.3	7.55	12.2	9.0	88.8	9.1	—	6.3
(27) Falcon Beach...	S-69	0.25-2.5	2.25	7.38	14.2	10.5	89.6	6.3	2.1	5.0
(28) Carrick.....	S-72	0.3 -2.0	1.7	5.58	10.7	7.8	85.8	10.8	—	6.3
(29) Piney.....	S-76	0.35-2.30	1.95	6.40	14.5	10.7	88.8	9.9	2.7	6.0
(30) Highway 89....	S-80	0.05-1.0	0.95	3.12	17.1	12.6	90.7	7.8	—	6.0
(31) Sprague.....	S-93	0.25-2.0	1.75	5.74	13.5	9.8	87.5	7.8	2.6	6.0
(32) Moose L. road..	S-97	0.1 -1.9	1.8	5.91	10.9	7.9	85.3	10.2	—	5.2

APPENDIX: SPECIFICATIONS FOR PEAT

Leverin (1946) quoted specifications for peat issued by the United States Treasury Department, from which the following is extracted:

Peat shall be furnished in the following types and classes, as specified in the invitation bids:

- | | |
|-----------|--------------------------|
| Type I. | Moss peat. |
| Type II | Reed muck or sedge muck. |
| Type III. | Reed peat or sedge peat |

Detail Requirements

TYPE I.

Moss peat shall be the poorly decomposed (fibrous or cellular) stems and leaves of any of several species of sphagnum mosses. Its texture may vary from porous fibrous to spongy fibrous and it shall be either crumbly or compact but fairly elastic and substantially homogeneous. It shall be free from decomposed colloidal residue, wood, sulphur and iron, and shall be brown in colour, tinted grey, yellow or red.

Acidity. The pH value shall be not less than 3.5 and not greater than 5.5.

Moisture Content. Peat shall be furnished in air-dry condition and shall contain not more than 35 per cent moisture by weight.

Water-holding Capacity. Shall be not less than 1100 per cent, by weight, on oven-dry basis.

Coarseness Classification of Shreds. Peat shall be furnished in three classes of coarseness, as specified in the invitation for bids:

1. Class A (Horticultural grade) — shall be finely shredded material suitable for horticultural purposes. Particles shall vary in size from dust up to the size of wheat bran.

2. Class B (Poultry litter) — Shall be medium shredded, suitable for use as poultry litter. It shall be coarser than Class A and lumpy. Individual pieces may be as large as walnuts.

3. Class C (Stable bedding) — Shall be coarsely shredded, suitable for use as stable bedding. It shall be coarser than Classes A and B and may contain larger lumps.

NOTE: Where the highest grade of moss peat (Type I) is not required, the purchaser may find satisfactory a grade containing up to 2 per cent, of foreign matter, such as twigs and cotton grass. In this event, it should be so specified in the invitation for bids.

TYPE II.

Reed muck or sedge muck shall be finely divided plant debris in a fairly advanced state of decomposition (peat humus). It shall be furnished in granular form of uniform composition and size, free from hard lumps.

TYPE III.

Reed peat or sedge peat shall be the moderately decomposed stems and roots of rushes, coarse grasses, sedges, reeds, canes, and similar plants. It shall be coarse or

finely fibrous, and brown in colour. It shall be low in wood, decomposed colloidal residue, sulphur, and iron content. It shall have either a definitely acid reaction (Class A) or be slightly acid to slightly alkaline (Class B) as specified in the invitation for bids.

Acidity. Class A shall have a pH value not lower than 4.5 and not greater than 5.5. Class B shall have a pH value not lower than 5.5 and not greater than 7.5.

Moisture Content. Shall be not more than 50 per cent by weight.

Water-holding Capacity. Shall be not less than 350 per cent, by weight, on an oven-dry basis.

Ash. Shall not be more than 10 per cent.

NOTES:

Type I, moss peat, is generally designated by the trade as "peat moss."

The various types of peat specified herein commonly have a water absorption capacity greatly in excess of the minimum specified.

The following limits are characteristic of the respective types:

Moss peat.....1100 to 2000 per cent

Reed muck or sedge muck..... 100 to 350 per cent

Reed peat or sedge peat..... 350 to 800 per cent

REFERENCES

- ANREP, A. (1912) Investigation of the Peat Moss and Peat Industry of Canada, 1910-11; Mines Branch, Ottawa, Rept. No. 151.
- ANREP, A. (1931) Report on the Possibilities of a Western Peat Litter and Peat Moss Insulating Board Industry; report on file, Manitoba Mines Branch.
- CAMERON, E. LEE (1948) Peat Moss in Manitoba; Manitoba Mines Branch, Bulletin No. 48-1.
- GIRARD, H. (1947) Peat in Quebec, its Origin, Distribution, and Utilization; Dept. of Mines, Quebec, Geological Rept. 31.
- GRAHAM, R. BRUCE (1962) Selection of Bogs for Field Investigation, Southeastern Manitoba; on file, Manitoba Mines Branch.
- GRAHAM, R. BRUCE, and TIBBETTS, T. E. (1961) Evaluation of Peat Moss as Applied to some Bogs in Southern Ontario; Mines Branch, Ottawa, Technical Bulletin TB22.
- JOHNSTON, W. A. (1921) Winnipegosis and Upper Whitemouth River Areas, Manitoba, Pleistocene and Recent Deposits; Geol. Surv., Canada, Memoir 128, Map No. 1802.
- LEVERIN, H. A. (1943) Peat Moss Deposits in Canada; Investigations in 1942; Mines and Geology Branch, Ottawa, Memorandum Series No. 83.
- LEVERIN, H. A. (1946) Peat Moss Deposits in Canada, Mines and Geology Branch, Ottawa, Rept. No. 817.
- MOLLARD, J. D. (1961) Guides for the Interpretation of Muskeg and Permafrost Conditions from Aerial Photographs; in: Proceedings of the Sixth Muskeg Research Conference; National Research Council, Canada, Technical Memorandum No. 67, pp. 67-87.
- RIGG, GEORGE B. (1958) Peat Resources of Washington; Division of Mines and Geology, State of Washington; Bulletin No. 44.
- SURVEYORS (1915) Extracts from Reports on Townships East of the Principal Meridian to July 1, 1914; Department of the Interior, Topographical Surveys Branch, Ottawa.
- SWINNERTON, A. A. (1958) Peat Moss in Canada; Mines Branch, Ottawa, Information Circular IC 104.
- TIBBETTS, T. E., and LLOYD, T. A. (1963) Evaluation of Samples of Peat Moss Conducted for Province of Manitoba Department of Mines and Natural Resources; Mines Branch, Ottawa, Fuels and Mining Practice Division Internal Report FMP 63/69 — Peat.

INDEX OF BOGS

	Page		Page
Aneda, east of (33)*.....	34	Menisino, northwest of (54)...	36
Birch Lake, bog south of (49)..	36	Menisino, south of (56).....	37
Birch River bog (25).....	28	Middlebro, east of (58).....	37
Birch River, bogs east of (40)..	35	Molson bog (13).....	22
Boggy River area (46).....	36	Moose Lake Road Bog (32)...	33
Caliento bog (11).....	20	Northwest Angle Forest Reserve, bogs in and north of (10).....	18
Caliento, northeast of (52)....	36	Nourse bog (16).....	23
Carrick bog (28).....	30	Pine Creek area (57).....	37
Contour bog (19).....	25	Piney bog (29).....	30
Craigs, area south of (38)....	35	Rennie, area west of (39)....	35
Darwin, bog south of (37)....	34	Richer, bog northeast of (22)..	27
Elma, bog east of (3).....	11	Richer, bog southeast of (21)..	26
Elma, bog southwest of (8)....	16	Ste. Genevieve, bog east of (20)	26
Falcon Beach bog (27).....	29	Ste. Genevieve, bog southeast of (41).....	35
Glenn bog (26).....	28	St. Labre bog (48).....	36
Glenn, bog south of (45).....	35	Shelley bog (2).....	10
Hadashville, bog southwest of (24).....	28	Sprague bog (31).....	32
Hazel Creek, bog north of (18)..	24	Sprague Lake, bog north of (9)	17
Hazel Creek, bog south of (17)..	24	Sprague River area (55).....	37
Heart Lake bog (14).....	22	Sundown bog (12).....	20
Highway 4, bog north of (34)..	34	Sundown, northeast of (53)...	36
Highway 89, bog east of (30)..	31	Trans-Canada Highway, bog along (23).....	27
Hugo Lake, bog north of (43)..	35	Whitemouth, bog northeast of (4).....	11
Jessica Lake bog (15).....	23	Whitemouth, bog southwest of (36).....	34
Julius bog (1).....	7	Whitemouth Lake, north of (51)	36
Julius, southwest of (35).....	34	Whitemouth Lake, bog northeast of (50).....	36
La Broquerie, bog east of (44)..	35	Whiteshell bog (6).....	15
Larkhall, bog east of (42)....	35		
Lewis bog (5).....	14		
Marchand, bog north of (47)..	36		
Medika bog (7).....	15		

*Corresponds to bog number in text.

