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DEPARTMENT OF MINES

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BUREAU OF ECONOMIC GEOLOGY
GEOLOGICAL SURVEY

PRELIMINARY REPORT
GROUND-WATER RESOURCES
OF THE
RURAL MUNICIPALITY OF McLEOD
No. 185
SASKATCHEWAN

BY

B. R. MacKay, H. N. Hainstock & G. L. Scott

Water Supply Paper No. 151



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CONTENTS

	<u>Page</u>
Introduction.....	1
Glossary of terms used	5
Names and descriptions of geological formations referred to ..	8
Water-bearing horizons of the municipality	10
Water-bearing horizons in the unconsolidated deposits	11
Water-bearing horizons in the bedrock	14
Ground water conditions by townships:	
Township 18, Range 8, west of 2nd meridian	15
Township 18, Range 9, " " " "	15
Township 19A, Range 8, " " " "	17
Township 19A, Range 9, " " " "	17
Township 19, Range 7, " " " "	19
Township 19, Range 8, " " " "	21
Township 19, Range 9, " " " "	22
Township 20, Range 7, " " " "	24
Township 20, Range 8, " " " "	25
Township 20, Range 9, " " " "	27
Township 21, Range 7, " " " "	28
Township 21, Range 8, " " " "	30
Township 21, Range 9, " " " "	31
Statistical summary of well information	34
Analyses and quality of water	35
General statement	35
Table of analyses of water samples	39
Water from the unconsolidated deposits	40
Water from the bedrock	40
Well records	41

Illustrations

Map of the municipality.

Figure 1. Map showing surface and bedrock geology that affect the ground water supply.

Figure 2. Map showing relief and the location and types of wells.

GROUND WATER RESOURCES OF THE RURAL MUNICIPALITY

OF McLEOD NO. 185,

SASKATCHEWAN

INTRODUCTION

Lack of rainfall during the years 1930 to 1934 over a large part of the Prairie Provinces brought about an acute shortage both in the larger supplies of surface water used for irrigation and the smaller supplies of ground water required for domestic purposes and for stock. In an effort to relieve the serious situation the Geological Survey began an extensive study of the problem from the standpoint of domestic uses and stock raising. During the field season of 1935 an area of 80,000 square miles, comprising all that part of Saskatchewan south of the north boundary of township 32, was systematically examined, records of approximately 60,000 wells were obtained, and 720 samples of water were collected for analyses. The facts obtained have been classified and the information pertaining to any well is readily accessible. The examination of so large an area and the interpretation of the data collected were possible because the bedrock geology and the Pleistocene deposits had been studied previously by McLearn, Warren, Rose, Stansfield, Wickenden, Russell, and others of the Geological Survey. The Department of Natural Resources of Saskatchewan and local well drillers assisted considerably in supplying several hundred well records. The base maps used were supplied by the Topographical Surveys Branch of the Department of the Interior.

Publication of Results

The essential information pertaining to the ground water conditions is being published in reports, one being issued for each municipality. Copies of these reports are being sent to the secretary treasurers of the municipalities and to certain Provincial and Federal Departments, where they can be consulted by residents of the municipalities or by other persons, or they may be obtained by writing direct to the Director, Bureau of Economic Geology, Department of Mines, Ottawa. Should anyone require more detailed information than that contained in the reports such additional information as the Geological Survey possesses can be obtained on application to the director. In making such request the applicant should indicate the exact location of the area by giving the quarter section, township, range, and meridian concerning which further information is desired.

The reports are written principally for farm residents, municipal bodies, and well drillers who are either planning to sink new wells or to deepen existing wells. Technical terms used in the reports are defined in the glossary.

How to Use the Report

Anyone desiring information about ground water in any particular locality should read first the part dealing with the municipality as a whole in order to understand more fully the part of the report that deals with the place in which he is interested. At the same time he should study the two figures accompanying the report. Figure 1 shows the surface and bedrock geology as related to the ground water supply, and Figure 2 shows the relief and the location and type of water wells. Relief is shown by lines of equal elevation called "contours". The elevation above sea-level

is given on some or all of the contour lines on the figure.

If one intends to sink a well and wishes to find the approximate depth to a water-bearing horizon, he must learn: (1) the elevation of the site, and (2) the probable elevation of the water-bearing bed. The elevation of the well site is obtained by marking its position on the map, Figure 2, and estimating its elevation with respect to the two contour lines between which it lies and whose elevations are give on the figure. Where contour lines are not shown on the figure, the elevations of adjacent wells as indicated in the Table of Well Records accompanying each report can be used. The approximate elevation of the water-bearing horizon at the well-site can be obtained from the Table of Well Records by noting the elevation of the water-bearing horizon in surrounding wells and by estimating from these known elevations its elevation at the well-site.¹ If the water-bearing horizon is in bedrock the depth to water can be estimated fairly accurately in this way. If the water-bearing horizon is in unconsolidated deposits such as gravel, sand, clay, or glacial debris, however, the estimated elevation is less reliable, because the water-bearing horizon may be inclined, or may be in lenses or in sand beds which may lie at various horizons and may be of small lateral extent. In calculating the depth to water, care should be taken that the water-bearing horizons selected from the Table of Well Records be all in the same geological horizon either in the glacial drift or in the bedrock. From the data in the Table

¹ If the well-site is near the edge of the municipality, the map and report dealing with the adjoining municipality should be consulted in order to obtain the needed information about nearby wells.

of Well Records it is also possible to form some idea of the quality and quantity of the water likely to be found in the proposed well.

GLOSSARY OF TERMS USED

Alkaline. The term "alkaline" has been applied rather loosely to some ground waters. In the Prairie Provinces a water is usually described as "alkaline" when it contains a large amount of salts, chiefly sodium sulphate and magnesium sulphate in solution. Water that tastes strongly of common salt is described as "salty". Many "alkaline" waters may be used for stock. Most of the so-called "alkaline" waters are more correctly termed "sulphate waters".

Alluvium. Deposits of earth, clay, silt, sand, gravel, and other material on the flood-plains of modern streams and in lake beds.

Aquifer or Water-bearing Horizon. A water-bearing bed, lens, or pocket in unconsolidated deposits or in bedrock.

Buried pre-Glacial Stream Channels. A channel carved into the bedrock by a stream before the advance of the continental ice-sheet, and subsequently either partly or wholly filled in by sands, gravels, and boulder clay deposited by the ice-sheet or later agencies.

Bedrock. Bedrock, as here used, refers to partly or wholly consolidated deposits of gravel, sand, silt, clay, and marl that are older than the glacial drift.

Coal Seam. The same as a coal bed. A deposit of carbonaceous material formed from the remains of plants by partial decomposition and burial.

Contour. A line on a map joining points that have the same elevation above sea-level.

Continental Ice-sheet. The great ice-sheet that covered most of the surface of Canada many thousands of years ago.

Escarpment. A cliff or a relatively steep slope separating level or gently sloping areas.

Flood-plain. A flat part in a river valley ordinarily above water but covered by water when the river is in flood.

Glacial Drift. The loose, unconsolidated surface deposits of sand, gravel, and clay, or a mixture of these, that were deposited by the continental ice-sheet. Clay containing boulders forms part of the drift and is referred to as glacial till or boulder clay. The glacial drift occurs in several forms:

(1) Ground Moraine. A boulder clay or till plain (includes areas where the glacial drift is very thin and the surface uneven).

(2) Terminal Moraine or Moraine. A hilly tract of country formed by glacial drift that was laid down at the margin of the continental ice-sheet during its retreat. The surface is characterized by irregular hills and undrained basins.

(3) Glacial Outwash. Sand and gravel plains or deltas formed by streams that issued from the continental ice-sheet.

(4) Glacial Lake Deposits. Sand and clay plains formed in glacial lakes during the retreat of the ice-sheet.

Ground Water. Sub-surface water, or water that occurs below the surface of the land.

Hydrostatic Pressure. The pressure that causes water in a well to rise above the point at which it is struck.

Impervious or Impermeable. Beds, such as fine clays or shale, are considered to be impervious or impermeable when they do not permit of the perceptible passage or movement of the ground water.

Pervious or Permeable. Beds are pervious when they permit of the perceptible passage or movement of ground water, as for example porous sands, gravel, and sandstone.

Pre-Glacial Land Surface. The surface of the land before it was covered by the continental ice-sheet.

Recent Deposits. Deposits that have been laid down by the agencies of water and wind since the disappearance of the continental ice-sheet.

Unconsolidated Deposits. The mantle or covering of alluvium and glacial drift consisting of loose sand, gravel, clay, and boulders that overlie the bedrock.

Water Table. The upper limit of the part of the ground wholly saturated with water. This may be very near the surface or many feet below it.

Wells. Holes sunk into the earth so as to reach a supply of water. When no water is obtained they are referred to as dry holes. Wells in which water is encountered are of three classes.

(1) Wells in which the water is under sufficient pressure to flow above the surface of the ground. These are called Flowing Artesian Wells.

(2) Wells in which the water is under pressure but does not rise to the surface. These wells are called Non-Flowing Artesian Wells.

(3) Wells in which the water does not rise above the water table. These wells are called Non-Artesian Wells.

NAMES AND DESCRIPTIONS OF GEOLOGICAL FORMATIONS, REFERRED
TO IN THESE REPORTS

Wood Mountain Formation. The name given to a series of gravel and sand beds which have a maximum thickness of 50 feet, and which occur as isolated patches on the higher parts of Wood mountain. This is the youngest bedrock formation and, where present, overlies the Ravenscrag formation.

Cypress Hills Formation. The name given to a series of conglomerates and sand beds ~~which~~ occur in the southwest corner of Saskatchewan, and rest upon the Ravenscrag or older formations. The formation is 30 to 125 feet thick.

Ravenscrag Formation. The name given to a thick series of light-coloured sandstones and shales containing one or more thick lignite coal seams. This formation is 500 to 1,000 feet thick, and covers a large part of southern Saskatchewan. The principal coal deposits of the province occur in this formation.

Whitemud Formation. The name given to a series of white, grey, and buff coloured clays and sands. The formation is 10 to 75 feet thick. At its base this formation grades in places into coarse, limy sand beds having a maximum thickness of 40 feet.

Eastend Formation. The name given to a series of fine-grained sands and silts. It has been recognized at various localities over the southern part of the province, from the Alberta boundary east to the escarpment of Missouri coteau. The thickness of the formation seldom exceeds 40 feet.

Bearpaw Formation. The Bearpaw consists mostly of incoherent dark grey to dark brownish grey, partly bentonitic shales, weathering light grey, or, in places where much iron

is present, buff. Beds of sand occur in places in the lower part of the formation. It forms the uppermost bedrock formation over much of western and southwestern Saskatchewan and has a maximum thickness of 700 feet or somewhat more.

Belly River Formation. The Belly River consists mostly of non-marine sand, shale, and coal, and underlies the Bearpaw in the western part of the area. It passes eastward and northeastward into marine shale. The principal area of transition is in the western half of the area where the Belly River is mostly thinner than it is to the west and includes marine zones. In the southwestern corner of the area it has a thickness of several hundred feet.

Marine Shale Series. This series of beds consists of dark grey to dark brownish grey, plastic shales, and underlies the central and northeastern parts of Saskatchewan. It includes beds equivalent to the Bearpaw, Belly River, and older formations that underlie the western part of the area.

WATER-BEARING HORIZONS OF THE MUNICIPALITY

The rural municipality of McLeod is an area of approximately 345 square miles in southeastern Saskatchewan. It consists of seven full townships described as tp. 19, range 9, tps. 20 and 21, ranges 7, 8, and 9, parts of tps. 19, ranges 7 and 8, and tps. 18, ranges 8 and 9; fractional tp. 19A, range 9, and part of fractional tp. 19A, range 8, all W. 2nd mer. A branch line of the Canadian Pacific railway crosses the centre of the municipality and on it are located the villages of Neudorf and Lemberg. A branch line of the Canadian National railways, which runs between Regina and Yorkton, crosses the northwestern corner of the municipality and on it is located the hamlet of Finnie. The village of Neudorf lies near the centre of the municipality and is 44 miles southwest of the city of Yorkton.

The municipality is drained by Qu'Appelle river, which forms the southern boundary of the municipality, and by two tributary streams, Pearl and Pheasant creeks. The valley of Qu'Appelle river is from 1 to 2 miles wide and approximately 400 feet deep. Pearl creek flows southwards through the eastern part of the municipality. Its valley becomes increasingly deeper towards the south. Pheasant creek flows through a wide, shallow ravine, less than 50 feet deep, that cuts across the northwestern part of the municipality in a northeast-southwest direction.

The floors of the ravines and Qu'Appelle valley are mantled with a deposit of Recent sands, gravels, and clay laid down by the streams in freshet seasons. The alluvial deposit in Qu'Appelle valley is from 40 to 60 feet thick. The northwestern corner of the municipality is a flat, treeless plain and marks the site of an old, shallow, glacial lake. This area is largely covered by glacial lake clays and the top soil is a heavy, black loam. A small area within the lake basin, in the vicinity of Finnie, is covered by glacial lake

sands. The general elevation of this area is about 1,915 feet above sea-level. A large moraine, known as Pheasant hills, covers the central part of the municipality. A strip along the eastern boundary is also covered by moraine. The ground surface of these moraine-covered areas is very undulating and is characterized by numerous, undrained depressions, which in years of average rainfall retain quantities of water. These areas are thickly wooded and much clearing must be done before the land can be cultivated. The remainder of the municipality is mantled by glacial till. The glacial till-covered areas are at a lower elevation than the adjacent moraine-covered areas and the ground surface is not so rough and undulating nor so thickly wooded.

Water-bearing Horizons in the Unconsolidated Deposits

Sloughs, creeks, and Qu'Appelle river provide much surface water and when it is possible and convenient they are used for watering stock. Springs are very numerous along the north bank of Qu'Appelle valley and along Pearl creek and its tributaries in township 19, range 7. The springs are not all confined to coulées, but in places flow from the sides of small hills. Many of these springs flow continuously and deliver an abundant supply of water that varies widely in quality. A few springs yield soft water, and others yield hard, "alkaline" water that contains iron and is unsuitable for drinking. Many farmers living to the south and west of Neudorf tanked water from these springs during the drought of 1930 to 1934. Occasional springs are found along the upper course of both Pheasant and Pearl creeks, but they are not so numerous, nor do they deliver such a good flow of water as do the springs in township 19, range 7.

Moderate supplies of hard, slightly "alkaline", but drinkable water are readily found in thick beds of sand or gravel that occur at depths less than 20 feet in the deposits of Recent alluvium. Wells that have tapped these deposits are located along

Pheasant creek and in Qu'Appelle valley.

Throughout the municipality, with the exception of the area that is outlined by the "B" boundary line on the accompanying map, almost every producing well that is being used has been dug or bored to depths less than 50 feet, and most of these wells are less than 30 feet deep. The uppermost 50 feet of the glacial drift is composed of a top covering of yellow clay, underlain by blue clay. Lenses of sand and gravel are not of common occurrence and farmers experience difficulty in striking them. The thickness and extent of these pockets have a direct influence on the amount of water obtained. The water, when obtained, is hard, slightly "alkaline", and is used for drinking. It is seldom under hydrostatic pressure unless the aquifer underlies a layer of hard, blue clay. Farmers residing in the area outlined by the "A" boundary line experience the greatest difficulty in securing a permanent supply of water at any depth in the glacial drift. Occasionally, a pocket of sand and gravel that yields sufficient water for 20 to 40 head of stock is struck at depths less than 30 feet below the surface, but at least 90 percent of the farmers have no reliable source of water. In years of average rainfall sloughs provide an abundance of water for stock, but in winters and during the drought of 1930 to 1934 the farmers in this territory were very short of water. Snow is melted in winter or water is often hauled a considerable distance.

A moderate to large supply of ground water is obtained within the area outlined by the "B" boundary line. Pockets of sand and gravel that yield moderate supplies of hard, slightly mineralized water are quite numerous in the upper 40 feet of the glacial drift. A number of wells in this area also strike pockets of sand and gravel at depths ranging from 40 to 100 feet below the surface and the water is usually under pressure. The water from these deeper wells is hard and generally too highly mineralized to be used

for drinking, but the abundant supply which is little affected by drought conditions makes these wells a good source of water for stock.

In the areas outside of the districts bounded by the "A" and "B" lines on the accompanying map, Figure 1, with the exception of township 19, range 7, the supply of ground water obtained is variable. Lenses of sand and gravel become more common in the upper 50 feet of the glacial drift and farmers do not experience undue difficulty in striking them.

The only locality in the municipality wherein deep boring or drilling has been a success is in the glacial lake clay-covered area in township 21, range 9. Numerous dry holes have been bored and drilled to a depth of 200 feet in other parts of the municipality. Several dry holes have been drilled to a maximum depth of 700 feet below the surface. In the entire municipality, excluding the glacial lake clay-covered region, only four wells that are over 100 feet deep have struck permanent supplies of usable water. Of these four wells, one located in the SE. $\frac{1}{4}$, sec. 12, tp. 19A, range 9, 402 feet deep, became plugged by fine sand, and another, a 200-foot well located in Lemberg in township 20, range 9, was never used. One of the remaining two wells, located in the SE. $\frac{1}{4}$, sec. 22, tp. 20, range 7, 120 feet deep, and the other located in the NW. $\frac{1}{4}$, sec. 34, tp. 20, range 8, 262 feet deep, yield abundant supplies of water from pockets of sand and gravel, but the water is highly mineralized.

Two water-bearing horizons, which are present only in the northwestern part of the municipality, occur at depths of 140 to 175 feet, and 200 to 225 feet below the surface. Six wells have tapped these water-bearing horizons. The upper water-bearing horizon is formed by coarse sand. The water from both aquifers rises under pressure to points approximately 50 feet below the surface and the supply is abundant. The water from the second water-bearing horizon

is more highly mineralized and unsuitable for drinking than the water from the first water-bearing horizon. A 228-foot well that tapped the lower horizon is becoming plugged with the very fine sand that forms the aquifer.

The numerous slough basins in the moraine- and till-covered areas offer suitable locations for the excavation of deep dugouts. Digging or boring to depths in excess of 50 feet is not recommended in any part of the municipality lying outside of the area outlined by the "B" boundary line.

Water-bearing Horizons in the Bedrock

The Marine Shale series was struck at an elevation of 1,470 feet above sea-level in a 470-foot well in the municipality of Abernethy, which adjoins the municipality of McLeod on the west, but it is not definitely known if any well has encountered the bedrock in the municipality of McLeod. A drilled well in the NW. $\frac{1}{4}$, sec. 16, tp. 19, range 9, was sunk 700 feet or to an elevation of 1,310 feet above sea-level, but no further information regarding the log of this well could be obtained. The lower part of the well probably is in the bedrock. No water was obtained. The Marine Shale series seldom contains water-bearing horizons that yield usable water and deep drilling into the shale in search of water is not advisable.

GROUND WATER CONDITIONS BY TOWNSHIPS

Township 18, Range 8

Only about 3 square miles of this township, which lies north of Qu'Appelle river, is discussed in this report. The greater part of this area is dissected by Qu'Appelle valley and short, deep, tributary ravines. The flat valley floor consists of a thick deposit of Recent alluvium, whereas the remainder of the township is mantled by glacial till. The river is at an approximate elevation of 1,540 feet, and the banks slope up very steeply to the plain which lies at an elevation of 1,860 feet. The banks of the valley and ravines, and the plains area, are wooded with poplar trees.

Two wells in this small area were visited by the field party. They are located in the SE. $\frac{1}{4}$, section 30, and the NW. $\frac{1}{4}$, section 32. The well on section 30 is 30 feet deep and is dug in the deposits of Recent alluvium in Qu'Appelle valley. This well passed through 28 feet of sandy, yellow clay, and then struck a 2-foot bed of water-bearing gravel that overlies a layer of boulders. The water is hard, suitable for drinking, and the supply is sufficient for at least 50 head of stock. A spring is also located on this quarter-section.

The second well is 11 feet deep, and a small supply of water is obtained from a gravel aquifer. This well is not being used since the farm is abandoned. Similar deposits will be encountered should other wells be dug.

Township 18, Range 9

Qu'Appelle river flows east across the centre of the township, and only the sections north of the river are located in this municipality. The flood-plain of Qu'Appelle river consists of Recent alluvium and the remainder of the area is covered by boulder clay or till. Many, short, deep ravines, less than 2 miles long, and containing small, intermittent streams, break the slightly undulating plain surface in the vicinity of the valley.

The only wells that yield a permanent supply of water have been dug or bored in the bottoms of the coulées or in Qu'Appelle valley. Water-bearing sand or gravel is struck at depths less than 20 feet below the surface, and the supply of water obtained is usually abundant and only slightly affected by prolonged drought. A spring in a deep coulée in the SW. $\frac{1}{4}$, section 27, delivers a very large supply of water and twenty farmers hauled water from it during the drought of 1930 to 1934. A flowing artesian well, 11 feet deep, is also located on this same quarter-section. The water barely rises above the top of the well. Very few springs occur on the north bank of Qu'Appelle valley in this township.

Every farm in this township, with the exception of five where the wells have been dug in ravines or Qu'Appelle valley, was very short of water during the drought. Numerous wells have been dug and bored to a maximum depth of 100 feet on the plains area of the township, and not one well possesses a permanent supply of water. Sand and gravel beds are very scarce in the upper 100 feet of the glacial drift, and in wells where an aquifer has been struck the water is either too highly mineralized to be used or the supply is very small and easily affected by drought. The farmers rely on shallow seepage wells dug beside sloughs, dams, and dugouts, and when these sources fail they are forced to haul water from wells yielding a permanent supply, or from springs.

The glacial drift is believed to be at least 400 feet thick, and although nothing definite is known regarding water conditions at depth, as no wells are deeper than 100 feet, it is probable that discontinuous, water-bearing horizons of sand or gravel exist in the lower part of the drift. Farmers are advised, however, to excavate deep dugouts or to construct dams, rather than to risk the uncertainty of obtaining water at depth.

Township 19A, Range 8

Only the western part of this fractional township, which lies north of Qu'Appelle valley, is discussed in this report. The floor of the valley is formed by Recent alluvium. The northwestern corner of the township is covered by part of the moraine that forms Pheasant hills, whereas the remainder of the area is mantled by glacial till. The Qu'Appelle Valley slope and the undulating ground surface of the plain are thickly wooded with poplar.

Three wells and a number of springs were recorded by the field party in this small area. Five springs located on the north bank of Qu'Appelle valley on the NE. $\frac{1}{4}$, section 4, deliver abundant supplies of hard, "alkaline" water that is suitable for drinking. One of the wells located on the SW. $\frac{1}{4}$, section 10, obtains water from the alluvial deposits in Qu'Appelle valley. A water-bearing bed of sand was struck in it at a depth of 4 feet below the surface and it extended to a depth of 12 feet. The water is hard and the supply is over-sufficient for 35 head of stock. The other two wells were dug on the till plain in the SW. $\frac{1}{4}$, section 6, and in moraine on the SE. $\frac{1}{4}$, section 8. They are 18 and 12 feet deep, respectively, and each delivers a very small, intermittent supply of water. The supply is insufficient for local requirements in drought years and winters and both farmers are forced to haul water. Boring for water in the moraine- and till-covered districts is not advised, and efforts should be confined to the excavation of deep dugouts in slough basins. The glacial drift is very thick, probably in excess of 400 feet, and deep wells* may locate a permanent supply of usable water in discontinuous water-bearing horizons in the lower part of the glacial drift.

Township 19A, Range 9

This fractional township is covered with a deposit of glacial till. The elevation of the ground surface is approximately 1,900 feet, and the drainage is towards the south. The ground surface is slightly

rolling, contains many slough basins, and is only thinly wooded.

All the wells in this fractional township, with the exception of one, have been dug or bored to depths less than 75 feet. The average section penetrated in such wells in descending order is 1 foot soil, 12 to 20 feet of yellow or red clay, and 50 feet or more of blue clay. Very little or no sand is encountered. The only well in the township that yields a permanent supply of water is in a slough located in the SW. $\frac{1}{4}$, section 10. This well was bored through 4 feet of black clay, 12 feet of red clay, and 17 feet of blue clay, where it struck a pocket of fine sand at a depth of 33 feet below the surface. The water rises under pressure and the supply is more than sufficient for 30 head stock. The water is hard and is not suitable for drinking. Most of the other wells have been dug or bored in or near slough basins where the maximum amount of seepage water is obtained. In years of average rainfall these wells produce a sufficient supply of water, but in winters and prolonged drought years the supply is insufficient for local needs. The farmers depend almost entirely on run-off water that is collected in seepage wells, sloughs, dugouts, and dams. Many of the farmers melt snow or haul water for stock use. The drought of 1930 to 1934 caused a very acute shortage of water in this township.

Only one well in the township is over 75 feet in depth. It is located in the SE. $\frac{1}{4}$, section 12, and is 402 feet deep. The base of the well is in a thick bed of fine sand which is thought to lie near the base of the glacial drift. The water rose under pressure to a point 225 feet below the surface, but the fine sand particles soon plugged the casing and shut off the supply. The supply was abundant and the water was hard. This well indicates that the glacial drift is at least 400 feet thick. The base of the well is at an elevation of 1,540 feet. The Marine Shale bedrock which immediately underlies the drift, was struck at an elevation of 1,470 feet in the municipality immediately to the west.

Farmers are advised to excavate large, deep dugouts in slough basins rather than to risk the uncertainty of obtaining an abundant and permanent supply of water by drilling to depth in the glacial drift. It is inadvisable to drill into the underlying Marine Shale series.

Township 19, Range 7

Qu'Appelle river forms the southern boundary of the area under discussion. Pearl creek flows southwards through sections 34, 27, 26, and 25, and joins Qu'Appelle river in the SE. $\frac{1}{4}$, section 24. Both streams flow through deep valleys. Qu'Appelle river is floored by a thick deposit of Recent alluvium composed of sand, gravel, and clay. The part of the township east of Pearl creek is covered by moraine, whereas the remainder of the area is mantled by boulder clay or glacial till. The ground surface is very undulating and is dissected by many small ravines tributary to Pearl creek. Large, undrained depressions are numerous, and the western half of the township is wooded with poplar.

Qu'Appelle river and Pearl creek are sometimes used as sources of water for stock. The Canadian Pacific Railway Company has erected a pumping station in the SE. $\frac{1}{4}$, section 21, and water from Qu'Appelle river, at an elevation of 1,500 feet, is pumped to the village of Neudorf which lies at an elevation of 2,000 feet. The length of the pipe-line is approximately $6\frac{1}{2}$ miles, and the water is used for steam locomotives.

Two wells in section 16 were dug in the Recent alluvium in Qu'Appelle valley. Water was struck at a depth of 10 feet and the supply is always constant and sufficient for local needs. The water is hard and "alkaline", but it is being used for drinking. Springs are very numerous in the ravines and along the banks of Qu'Appelle river and Pearl creek. Many of the farmers in the northern and western part of the township haul water from these springs in

winters and drought periods. A spring in the SW. $\frac{1}{4}$, section 24, waters 100 head of stock, and another in the SE. $\frac{1}{4}$, section 28, yields 120 pails of water an hour. Some of the springs yield soft water, but most of them yield hard water that contains iron. The water is used for drinking. Several farmers depend entirely on springs on their land for water both for house use and for stock.

Shallow wells have been successful in this township. Large, thick, discontinuous beds of sand and gravel occur in the glacial till at depths of less than 20 feet, or outcrop at the surface. These thick beds of sand and gravel form huge reservoirs for the storage of rainfall seepage water, and wells that have tapped them yield constant and fairly abundant supplies of water. The discontinuity of the water-bearing deposits is shown in the NW. $\frac{1}{4}$, section 19, where a 20-foot well yields a supply of water that is adequate for 35 head of stock, and an 8-foot dry hole dug nearby struck the impervious, blue clay. Farmers in the SW. $\frac{1}{4}$, section 30, and the SW. $\frac{1}{4}$, section 31, have been unable to strike a deposit of water-bearing sand or gravel and are forced to haul water. Dry holes have been dug and bored to a maximum depth of 100 feet on these two quarter-sections. Three farmers in the moraine-covered area in section 36 have made numerous, unsuccessful attempts to obtain water by digging or boring to a maximum depth of 80 feet. These farmers melt snow in winter and haul water during drought periods.

Except for the five farms mentioned, every farm in the township is supplied with an abundance of water from springs or shallow dug wells. No attempts have been made to obtain water by drilling to depth, but it is possible that water-bearing horizons exist near the base of the glacial drift. The glacial deposits are believed to be at least 400 feet thick in this township.

Township 19, Range 8

Qu'Appelle River channel cuts across section 1, and the wide, deep valley through which it meanders occupies part of sections 2 and 12. The valley floor consists of Recent deposits of gravel and clay, whereas the banks of the valley and the eastern part of the township are mantled by glacial till or boulder clay. The remainder of the township is covered by part of the Pheasant Hills moraine. The ground surface is rough and rolling and is characterized by many undrained depressions. It is wooded with clumps of poplar.

Many springs occur along the base of the north bank of Qu'Appelle valley. Four springs that yield an abundant supply of hard, iron-bearing water are located in the NW. $\frac{1}{4}$, section 1, and are used for all farm purposes. A spring in the SE. $\frac{1}{4}$, section 12, yields a continuous but small flow of hard, "alkaline", iron-bearing water, and the supply is sufficient to water 50 head of stock.

With the above-mentioned exceptions permanent supplies of water are very difficult to obtain in the upper 125 feet of the glacial drift. The drift consists of 2 feet soil, 10 to 40 feet of yellow boulder clay, and an underlying, hard, impervious, blue clay. Scattered pockets of sand or gravel are found in some places in the upper 35 feet of the glacial drift, and they are more numerous in the northern half of the township than in the southern half. Only one well in the southern 3 miles of the township yields a permanent supply of water. This well is located near a slough in the SW. $\frac{1}{4}$, section 16, and taps a sand aquifer at a depth of 8 feet. The water is hard and suitable for drinking, and the supply is sufficient for at least 20 head of stock. In the northern 3 miles of the township there are eleven wells, 35 feet or less in depth, that have tapped pockets of sand or gravel and yield sufficient water for 25 to 60 head of stock. The water is generally hard, slightly "alkaline", and suitable for drinking, but the supply was slightly reduced by the drought of 1930 to 1934. No producing well in the township is

over 35 feet deep. Numerous dry holes have been dug and bored to depths ranging from 10 to 125 feet below the surface, and one hole was drilled in the SW. $\frac{1}{4}$, section 18, to a depth of 200 feet without encountering a water-bearing horizon. It is reasonable to assume, therefore, that unless water is obtained within the upper 35 feet of the drift it will not be found until a depth of at least 125 feet has been reached, and it is probable that it will not be found to a depth of 200 feet. Prospecting for a shallow water-bearing sand or gravel can be most economically done by means of a small test-auger. These tests need not exceed a depth of 35 feet. The boring method of making a well is not advised, and farmers intending to drill should be prepared to drill to a depth of 400 feet. Drilling much in excess of 400 feet is not recommended as the underlying Marine Shale series lies at an approximate elevation of 1,450 to 1,500 feet, and it contains no suitable water-bearing horizons.

Most of the farmers in the township depend entirely on seepage wells, dugouts, and dams as a means of collecting surface water. Sloughs are very numerous and these natural depressions usually offer the best locations for a dugout. To be satisfactory, the dugout must be made at least 12 feet deep. The excavation of dugouts is less expensive and is preferable to deep drilling.

Township 19, Range 9

The elevation in this township decreases from 2,050 feet above sea-level at the northwestern corner to 1,950 feet at the southeastern corner. The southern 1 to 3 miles of the township is mantled by glacial till and the remainder of the area is covered by part of the Pheasant Hills moraine. The ground surface over the entire township is undulating and thickly wooded, but the moraine-covered area is much more hilly and rough than the glacial till-covered area.

The supply of ground water obtained in this township is poor and there are only four wells that yield a permanent supply of usable water. These four wells are located in the NE. $\frac{1}{4}$, section 2, SE. $\frac{1}{4}$, section 10, NE. $\frac{1}{4}$, section 12, and the NW. $\frac{1}{4}$, section 27. They are 30, 24, 40, and 18 feet deep, respectively, and have tapped small pockets of sand or gravel. The water in the 40-foot well rises under pressure to a point 15 feet below the surface and the supply is barely sufficient for 60 head of stock. The supply in these wells was decreased by the drought of 1930 to 1934.

The other wells in the township either yield small, intermittent supplies of water, or do not encounter water. Numerous dry holes have been bored to a maximum depth of 120 feet throughout the township. A 60-foot well in the NW. $\frac{1}{4}$, section 4, struck a water-bearing horizon that delivered very bitter, unusable water. Most of the farmers haul water during drought seasons and winters, and some melt snow in winter.

A few farmers use dugouts, but these reservoirs are too large and shallow to be satisfactory. In the NW. $\frac{1}{4}$, section 16, nine holes were drilled to depths ranging from 150 to 700 feet without encountering water-bearing horizons. According to information obtained, the material penetrated was entirely blue clay after the upper 20 to 30 feet of weathered clay had been passed through. The base of the 700-foot dry hole is at an elevation 1,310 feet above sea-level. The bedrock is believed to lie at an elevation of 1,450 to 1,500 feet, so that it is probable that the last 100 feet of this well was drilled in the shale or "soapstone", as it is commonly termed. Sloughs are numerous and they are excellent locations for the excavation of small, deep dugouts. They should be at least 12 feet deep and situated so that a maximum amount of surface water will be drained into them. A shallow well dug a short distance from the dugout will serve as a source of water for household purposes.

The water should be filtered and not allowed to become stagnant by long standing in the well. Boring methods are not recommended, and the shallow water-bearing deposits should be located by a small hand auger before a well is dug.

Discontinuous water-bearing horizons of sand or gravel may exist in the lower part of the glacial drift, but it is recommended that dugouts be excavated in preference to deep drilling.

Township 20, Range 7

Pearl creek flows in a southerly direction through the eastern part of the township. Its valley is wide and out of proportion to the size of its present intermittent stream. In section 3, the bed of the creek is approximately 170 feet lower than that of the plain. The floor of the valley is covered by Recent alluvium. The Pheasant Hills moraine covers the northern part of the township, and the area lying east of Pearl Creek valley is also covered by moraine. The remainder of the township is mantled by glacial till. The ground surface is rolling, and west of Pearl creek it is thickly wooded. Large, undrained depressions and shallow coulées are of common occurrence.

A variable supply of ground water is obtained in this township. Of the forty-two farmers interviewed, seventeen were not obtaining a sufficient supply of water from wells on their own land. Most of the wells are less than 25 feet deep. The gravel and sand have been deposited in the form of pockets beneath the yellow or oxidized clay, and the thickness and extent of the pocket have a direct influence on the amount of water obtained in a well that has tapped it. The water in these wells is not under pressure, and is hard and often "alkaline", but it is being used for drinking. The drought of 1930 to 1934 decreased the supply materially. It is not uncommon to find one farmer deriving a fairly abundant supply of water, whereas his neighbour, perhaps only a quarter of a mile distant, cannot strike any water and must haul water for both stock and drinking purposes.

Many wells have been bored to depths ranging from 25 to 130 feet below the surface, and most of them were dry holes. However, permanent supplies of water are obtained from three bored wells in the SE. $\frac{1}{4}$, section 22, NW. $\frac{1}{4}$, section 24, and the SW. $\frac{1}{4}$, section 34. The wells are 120, 45, and 80 feet deep, respectively, and the water rises under pressure to points 70, 30, and 60 feet below the surface. These aquifers are apparently formed by pockets of sand or gravel, and are not continuous layers. The supply from these wells was not so noticeably decreased by the drought as that in the shallower wells, but the water is more highly mineralized and unsuitable for drinking. A 60-foot well in the NE. $\frac{1}{4}$, section 36, yielded water that was too highly mineralized to be used even for stock purposes.

The glacial drift is believed to be 400 to 500 feet thick in this township, and to be largely composed of blue clay. Water-bearing horizons of sand or gravel probably exist in the lower 250 feet of the thick deposit of drift, but since the deepest well in the township is 130 feet, no definite information as to the possibilities of striking water at depth can be given.

Farmers are advised to prospect for a deposit of water-bearing sand with the aid of a small test-auger, prior to digging a shallow well. Excavating deep dugouts in slough basins is also recommended. Boring for water by means of a large auger is not advised.

Township 20, Range 8

Sections 1, 12, 13, and the southeastern half of section 24, are covered by glacial till, and the remainder of the township is overlain by the moraine that forms Pheasant hills. The ground surface is very uneven and thickly wooded. Sloughs are very numerous. The largest undrained depression occurs one-half mile northwest of Neudorf. It covers approximately 140 acres and in years of average precipitation holds 7 feet of water. A height of land at an approximate elevation of

2,060 feet runs northeast across the northwestern corner of the township causing the drainage of the greater portion of the township to be towards the southwest.

Water is more difficult to obtain in this township than it is in township 20, range 7, and of the forty-six farmers interviewed, only sixteen are able to secure sufficient water from wells on their own land to meet their requirements. Most of the wells that yield a permanent supply of water have been dug to depths less than 25 feet below the surface. These wells tap pockets of sand and gravel that underlie the yellow clay and overlie the impervious blue clay, which constitutes the bulk of the glacial drift. The supply of water obtained varies with the size of the pocket tapped. For instance, a well 11 feet deep in the SW. $\frac{1}{4}$, section 11, will water 15 to 20 head of stock, whereas a 14-foot well in the SE. $\frac{1}{4}$, section 12, will water at least 100 head. The water is hard and generally not too highly mineralized to prohibit its use for drinking. Those farmers who have been unable to strike a permanent supply of water depend on sloughs, seepage wells, and dugouts in summer, and either melt snow or haul water in winter. The drought years of 1930 to 1934 consequently caused a shortage of water for stock purposes. The village of Neudorf owns eleven shallow wells, 16 to 22 feet deep, that together did not yield sufficient water to meet the population requirements during the drought of 1930 to 1934. The water from the Canadian Pacific Railway pipe-line is used by some residents for household purposes.

Numerous dry holes have been dug and bored to a maximum depth of 150 feet and one dry hole was drilled in the NW. $\frac{1}{4}$, section 21, to a depth of 275 feet. The material penetrated was hard, blue clay. The base of this well is at an elevation of 1,760 feet. A drilled well in the NW. $\frac{1}{4}$, section 34, is the only well in the township that struck a permanent supply of water at a depth greater than 45 feet below the surface. This well is 262 feet deep and its

base is at an elevation of 1,795 feet. The aquifer is gravel and the water rises under pressure to a point 127 feet below the surface. An abundant supply of hard, drinkable water is derived from this well.

It appears that unless water is struck at depths less than 40 feet below the surface it will not be obtained until a depth of 200 feet has been reached. In view of this fact, bored wells are not recommended. Numerous locations occur for the excavation of deep dugouts, and this method of collecting surface water for stock use is highly recommended.

Township 20, Range 9

The southeastern two-thirds of this township are covered by the moraine that forms Pheasant hills, and the northwestern part is mantled by glacial till. Pheasant creek flows across section 31, in a northwest to southeast direction. The ground surface is undulating, characterized by many undrained depressions, and is thickly wooded in all but the northwestern sections.

A fair supply of ground water is obtained in this township. Approximately fourteen farmers are unable to locate permanent supplies of water and are forced to haul water in winters and drought seasons. Most of the wells have been dug or bored to depths less than 100 feet. A 100-foot well will probably penetrate 2 feet soil, 25 feet yellow clay, and 73 feet blue clay. Discontinuous water-bearing horizons of sand and gravel exist here and there in the upper 85 feet of the glacial drift. The supply of water obtained from wells is extremely variable. The water in seventeen wells, less than 85 feet deep, rises under hydrostatic pressure, and in a 10-foot well in the NW. $\frac{1}{4}$, section 17, overflows the top of the casing. This flowing artesian well delivers a small, continuous flow of soft water from a gravel aquifer. The pocket arrangement of the water-bearing beds is shown in sections 11 and 12. A 67-foot bored well in the NW. $\frac{1}{4}$, section 11, delivers water under pressure, and the supply is sufficient for 500 head of stock, whereas the farmer in the SW. $\frac{1}{4}$, section 12, in an

effort to supplement the supply from a 12-foot well made sixteen wells, 100 to 180 feet deep, without obtaining a supply of water from any one of them. Several wells in the township, however, will water 50 or more head of stock regardless of the seasonal precipitation. The water is generally hard and not too highly mineralized to prohibit its use for drinking.

The village of Lemberg owns thirty wells, 15 to 30 feet deep, and all of them were nearly dry in 1933 and 1934. The village school well, 22 feet deep, obtains a fairly abundant supply of water from a gravel aquifer. A 200-foot drilled well is also located in Lemberg. This well yields a good supply of water, but it is not used, probably because the water is more highly mineralized than that from the shallow wells. There are no other producing drilled wells in the township.

The thickness of the glacial drift is thought to be in excess of 500 feet in this township, and it is quite probable that water-bearing horizons of sand and gravel exist in its lower part. The boring method of locating water has been more successful in this area than in any of the townships already discussed. Farmers are not at all certain of obtaining water at depths ranging from 40 to 100 feet below the surface, since the deposits of sand and gravel are in the form of pockets. However, when water is struck, the supply is usually abundant. Farmers who contemplate drilling for water should be prepared to drill to depths of 200 to 400 feet. Many favourable locations for the excavation of dugouts occur throughout the township.

Township 21, Range 7

Pearl creek, an intermittent stream, flows southward through the eastern sections of the township. The ravine through which it flows is less than 50 feet deep, and the ground surface near the ravine is very rough and broken by small coulées. Several, large, undrained depressions occur in the township, the largest being

Surprise lake which covers an area of approximately 150 acres in the NE. $\frac{1}{4}$, section 14. A belt approximately $1\frac{1}{2}$ miles wide in the vicinity of the creek is mantled by boulder clay or glacial till and the remainder of the township is covered by moraine. The southwestern half of the township is quite thickly wooded with poplar.

All the wells, with the exception of three, have been dug or bored to depths less than 40 feet below the surface. Generally it is not difficult to locate water-bearing beds of sand or gravel within this depth and only five farms in the township have an insufficient supply of water. The supply of water in the wells is usually sufficient for 20 to 50 head of stock, although the drought of 1930 to 1934 decreased the available supply. A shallow flowing artesian well in the SE. $\frac{1}{4}$, section 10, yields a small supply of hard, drinkable water. A 40-foot well in the SW. $\frac{1}{4}$, section 35, passed through 5 feet of yellow clay, and 35 feet of blue clay before the sand aquifer was struck. The water in this well rises under pressure to a point 10 feet above the aquifer, and the supply is more than sufficient for 15 head stock. The water is hard and "alkaline", but it is being used for drinking. This well and the flowing artesian well are the only two wells in the township that yield water under hydrostatic pressure.

Two dry holes, 105 and 124 feet deep, were bored in the SW. $\frac{1}{4}$, section 8. These holes were bored through 10 feet of yellow clay, 50 feet of blue clay, and into dark clay. A 90-foot bored well, on the SE. $\frac{1}{4}$, section 18, struck a small pocket of water-bearing sand and yields a supply of hard, highly mineralized water that is unfit for drinking, but is adequate for 30 head of stock. No other attempts have been made in the township to secure water at depths greater than 40 feet.

Since the sand and gravel in the upper 40 feet of the glacial drift occur as pockets, farmers are advised to use 2-inch

testing augers to locate one of these deposits before starting the digging of a well. A few farmers have constructed small dams in coulees as a means of conserving surface water. In periods of average rainfall sloughs hold much water and they are used as a source of water for stock. The supply of ground water in the township is nearly adequate and the water shortage during the drought of 1930 to 1934 was not acute.

Township 21, Range 8

The northwestern corner of the township is covered by deposits of glacial lake clay and glacial till, and the remainder of the township is covered by the moraine that forms Pheasant hills. A height of land passes in a north-south direction through the centre of the township. The drainage on the eastern side of the divide is towards Pearl creek, whereas the drainage on the western side is towards Pheasant creek. A small, intermittent tributary of Pheasant creek passes through sections 29, 30, and 31. The ground surface of the township is undulating and is characterized by many large sloughs. The moraine-covered area is thickly wooded.

The upper 85 feet of the glacial drift consists in descending order of 20 feet of yellow or oxidized clay and 65 feet of blue clay, which contain pockets of sand or gravel at various elevations. These pockets of sand and gravel form the aquifers for the shallow wells in this township. When the aquifer is capped by a thick layer of blue clay, the water is usually under some hydrostatic pressure. The water, although slightly "alkaline", is being used for drinking. The supply of water is more constant and abundant in the deeper wells than it is in the shallow wells, and the water is more highly mineralized. Little difficulty is experienced, except in the southeastern corner of the township, in striking a pocket of sand or gravel by either digging or boring methods. Only ten farmers are obtaining an insufficient quantity of water to meet all their requirements, and seven are located in the southeastern sections.

Two attempts were made in section 4 to obtain water by drilling. A 292-foot well in the NE. $\frac{1}{4}$, section 4, struck a very fine sand aquifer at an elevation of 1,775 feet, but the fine sand particles plugged the base of the well and shut off the water supply. A well was being drilled in the SE. $\frac{1}{4}$, section 4, at the time the field party visited the farm. The depth of the hole was 395 feet. The bulk of the material penetrated was blue clay with layers of hardpan and sand occurring at depths between 265 and 395 feet. The sand layers contained only very small supplies of water and were passed through in the hope of obtaining a more abundant supply at lower depths. This well was drilled on the height of land at an elevation 2,060 feet, and the base of the well is, therefore, at an elevation 1,665 feet above sea-level.

The supply of water from wells in this township was not greatly decreased during the drought of 1930 to 1934, and the district as a whole has not been nearly so short of water as the township to the south. Many locations for the excavation of deep dugouts occur throughout the moraine-covered area.

Township 21, Range 9

Pheasant creek flows across the township in a southwesterly direction. The ravine through which it flows is less than 50 feet deep, and its floor is very wide in comparison with the size of the present stream. Many shallow coulées, which contain small, intermittent streams, are tributary to the main stream. Pheasant creek lies one-half mile west of the shore-line of an old, shallow, glacial lake that covered all of the northwestern part of the township. The greater part of this area is overlain by a covering of glacial lake clay not more than 5 feet thick. An area in the north-central sections in the vicinity of Finnie, is covered by glacial lake sands. A strip of country about 2 miles wide and paralleling the shore-line of this glacial lake on the east is mantled by boulder clay or glacial till. The southeastern half of section 1 is covered by moraine. The slightly

undulating ground surface of the moraine and till-covered areas gradually merges into a flat, treeless plain in the glacial lake basin.

Pheasant creek and its tributary streams are used by farmers for watering stock. Small dams have been constructed on some of the tributary streams, and retain sufficient water to meet stock requirements during the summer months. Two springs that yield sufficient water for 40 head of stock are located in a coulée in the NW. $\frac{1}{4}$, section 14. The water is hard and suitable for drinking. Wells dug in the ravine and coulées have tapped beds of sand or gravel at depths less than 15 feet below the surface and yield fairly abundant supplies of slightly mineralized water.

The upper 85 feet of the glacial drift is composed of yellow and blue clays. Pockets of sand and gravel occur at depths ranging from 20 to 85 feet, and wells tapping them yield fairly abundant supplies of water. If the pocket of sand or gravel is overlain by blue clay, the water is usually under some hydrostatic pressure. The deposits of water-bearing sands and gravels are of common occurrence and only three farmers located in the SE. $\frac{1}{4}$, section 17, the NW. $\frac{1}{4}$, section 20, and the NE. $\frac{1}{4}$, section 22, have been unable to secure a sufficient supply of water. The water from the deeper bored wells is usually more highly mineralized than the water from wells that do not penetrate blue clay, but much of it is used for drinking.

The glacial lake clay-covered district of this township is, curiously, the only area in the municipality wherein drilling operations have been successful. Six drilled wells have tapped two water-bearing horizons of sand at elevations of 1,735 to 1,770 feet, and 1,690 to 1,715 feet above sea-level. The first water-bearing horizon was tapped by three wells in the NE. $\frac{1}{4}$ and NW. $\frac{1}{4}$, section 7, and the NE. $\frac{1}{4}$, section 21, at depths of 145, 175, and 140 feet, respectively. The water rises under pressure to points 70, 75, and

50 feet below the surface, and the supply is abundant. The water is hard and mineralized, and contains iron, but it is being used for drinking.

The second water-bearing horizon is composed of a finer sand. It was tapped by wells in the NW. $\frac{1}{4}$, section 18, NW. $\frac{1}{4}$, section 30, and the NW. $\frac{1}{4}$, section 33, at depths of 220, 200, and 228 feet below the surface. The hydrostatic pressure raises the water to points 45, 50, and 28 feet below the surface, and the supply is abundant. The supply in the 282-foot well has decreased, however, as the casings are becoming plugged with sand. The water is more highly mineralized than that from the first water-bearing horizon, and is not being used for drinking.

STATISTICAL SUMMARY OF WELL INFORMATION IN RURAL MUNICIPALITY OF McLEOD, NO. 185, SASKATCHEWAN.

	Township	18	18	19A	19A	19	19	19	20	20	20	21	21	21	Total No. in municipality
		8	9	8	9	7	8	9	7	8	9	7	8	9	
West of 2nd meridian	Range														
<u>Total No. of Wells in Township</u>		3	38	10	22	77	109	85	90	131	135	34	54	56	844
No. of wells in bedrock		0	0	0	0	0	0	1	0	0	0	0	0	0	1
No. of wells in glacial drift		2	35	9	22	74	109	84	89	131	135	32	54	56	832
No. of wells in alluvium		1	3	1	0	3	0	0	1	0	0	2	0	0	11
<u>Permanency of Water Supply</u>															
No. with permanent supply		3	13	6	9	48	31	14	37	48	66	23	38	51	387
No. with intermittent supply		0	18	4	10	3	46	35	27	37	43	4	10	0	237
No. dry holes		0	7	0	3	26	32	36	26	46	26	7	6	5	220
<u>Types of Wells</u>															
No. of flowing artesian wells		0	1	0	0	0	0	0	0	0	1	1	0	0	3
No. of non-flowing artesian wells		0	0	0	3	0	0	1	3	3	37	1	13	14	75
No. of non-artesian wells		3	30	10	16	51	77	48	61	82	71	25	35	37	546
<u>Quality of Water</u>															
No. with hard water		3	31	10	19	47	75	49	55	84	105	24	46	49	597
No. with soft water		0	0	0	0	4	2	0	9	1	4	3	2	2	27
No. with salty water		0	0	0	0	0	0	1	0	0	0	0	0	0	1
No. with "alkaline" water		0	2	6	15	15	34	13	23	33	16	11	14	16	188
<u>Depths of Wells</u>															
No. from 0 to 50 feet deep		3	35	10	17	70	94	61	80	104	102	31	44	45	696
No. from 51 to 100 feet deep		0	3	0	4	7	11	16	7	19	17	1	8	5	98
No. from 101 to 150 feet deep		0	0	0	0	0	3	5	3	6	9	2	0	2	30
No. from 151 to 200 feet deep		0	0	0	0	0	0	1	0	0	7	0	0	2	10
No. from 201 to 500 feet deep		0	0	0	1	0	1	1	0	2	0	0	2	2	9
No. from 501 to 1,000 feet deep		0	0	0	0	0	0	1	0	0	0	0	0	0	1
No. over 1,000 feet deep		0	0	0	0	0	0	0	0	0	0	0	0	0	0
<u>How the Water is Used</u>															
No. usable for domestic purposes		3	30	9	16	46	54	40	55	76	104	27	40	42	542
No. not usable for domestic purposes		0	1	1	3	5	23	9	9	9	5	0	8	9	82
No. usable for stock		3	30	10	18	48	67	41	63	79	107	27	48	46	587
No. not usable for stock		0	1	0	1	3	10	8	1	6	2	0	0	5	37
<u>Sufficiency of Water Supply</u>															
No. sufficient for domestic needs		3	12	6	8	48	31	12	37	47	65	23	38	51	381
No. insufficient for domestic needs		0	19	4	11	3	46	37	27	38	44	4	10	0	243
No. sufficient for stock needs		3	11	6	4	43	19	7	36	23	60	21	36	45	314
No. insufficient for stock needs		0	20	4	15	8	58	42	28	62	49	6	12	6	310

ANALYSES AND QUALITY OF WATER

General Statement

Samples of water from representative wells in surface deposits and bedrock were taken for analyses. Except as otherwise stated in the table of analyses the samples were analysed in the laboratory of the Borings Division of the Geological Survey by the usual standard methods. The quantities of the following constituents were determined; total dissolved mineral solids, calcium oxide, magnesium oxide, sodium oxide by difference, sulphate, chloride, and alkalinity. The alkalinity referred to here is the calcium carbonate equivalent of all acid used in neutralizing the carbonates of sodium, calcium, and magnesium. The results of the analyses are given in parts per million--that is, parts by weight of the constituents in 1,000,000 parts of water; for example, 1 ounce of material dissolved in 10 gallons of water is equal to 625 parts per million. The samples were not examined for bacteria, and thus a water that may be termed suitable for use on the basis of its mineral salt content might be condemned on account of its bacteria content. Waters that are high in bacteria content have usually been polluted by surface waters.

Total Dissolved Mineral Solids

The term "total dissolved mineral solids" as here used refers to the residue remaining when a sample of water is evaporated to dryness. It is generally considered that waters that have less than 1,000 parts per million of dissolved solids are suitable for ordinary uses, but in the Prairie Provinces this figure is often exceeded. Nearly all waters that contain more than 1,000 parts per million of total solids have a taste due to the dissolved mineral matter. Residents

accustomed to the waters may use those that have much more than 1,000 parts per million of dissolved solids without any marked inconvenience, although most persons not used to highly mineralized water would find such waters highly objectionable.

Mineral Substances Present

Calcium and Magnesium

The calcium (Ca) and magnesium (Mg) content of water is dissolved from rocks and soils, but mostly from limestone, dolomite, and gypsum. The calcium and magnesium salts impart hardness to water. The magnesium salts are laxative, especially magnesium sulphate (Epsom salts, $MgSO_4$), and they are more detrimental to health than the lime or calcium salts. The calcium salts have no laxative or other deleterious effects. The scale found on the inside of steam boilers and tea-kettles is formed from these mineral salts.

Sodium

The salts of sodium are next in importance to those of calcium and magnesium. Of these, sodium sulphate (Glauber's salt, Na_2SO_4) is usually in excess of sodium chloride (common salt, $NaCl$). These sodium salts are dissolved from rocks and soils. When there is a large amount of sodium sulphate present the water is laxative and unfit for domestic use. Sodium carbonate (Na_2CO_3) "black alkali", sodium sulphate "white alkali", and sodium chloride are injurious to vegetation.

Sulphates

Sulphates (SO_4) are one of the common constituents of natural water. The sulphate salts most commonly found are sodium sulphate, magnesium sulphate, and calcium sulphate ($CaSO_4$). When the water contains large quantities of the sulphate of sodium it is injurious to vegetation.

Chlorides

Chlorides are common constituents of all natural water and are dissolved in small quantities from rocks. They usually occur as sodium chloride and if the quantity of salt is much over 400 parts per million the water has a brackish taste.

Iron

Iron (Fe) is dissolved from many rocks and the surface deposits derived from them, and also from well casings, water pipes, and other fixtures. More than 0.1 part per million of iron in solution will settle as a red precipitate upon exposure to the air. A water that contains a considerable amount of iron will stain porcelain, enamelled ware, and clothing that is washed in it, and when used for drinking purposes has a tendency to cause constipation, but the iron can be almost completely removed by aeration and filtration of the water.

Hardness

Calcium and magnesium salts impart hardness to water. Hardness of water is commonly recognized by its soap-destroying powers as shown by the difficulty of obtaining lather with soap. The total hardness of a water is the hardness of the water in its original state. Total hardness is divided into "permanent hardness" and "temporary hardness". Permanent hardness is the hardness of the water remaining after the sample has been boiled and it represents the amount of mineral salts that cannot be removed by boiling. Temporary hardness is the difference between the total hardness and the permanent hardness and represents the amount of mineral salts that can be removed by boiling. Temporary hardness is due mainly to the bicarbonates of calcium and magnesium and iron, and permanent hardness to the sulphates and chlorides of calcium and magnesium. The permanent hardness

can be partly eliminated by adding simple chemical softeners such as ammonia or sodium carbonate, or many prepared softeners. Water that contains a large amount of sodium carbonate and small amounts of calcium and magnesium salts is soft, but if the calcium and magnesium salts are present in large amounts the water is hard. Water that has a total hardness of 300 parts per million or more is usually classed as excessively hard. Many of the Saskatchewan water samples have a total hardness greatly in excess of 300 parts per million; when the total hardness exceeded 3,000 parts per million no exact hardness determination was made. Also no determination for temporary hardness was made on waters having a total hardness less than 50 parts per million. As the determinations of the soap hardness in some cases were made after the samples had been stored for some time, the temporary hardness of some of the waters as they come from the wells probably is higher than that given in the table of analyses.

Analyses of Water Samples from the Municipality of McLeod, No. 185, Saskatchewan.

No.	LOCATION					Depth of well, Ft.	Total dis'vd solids	HARDNESS			CONSTITUENTS AS ANALYSED					CONSTITUENTS AS CALCULATED IN ASSUMED COMBINATIONS							Source of water		
	Qtr.	Sec.	Tp.	Rge.	Mer.			Total	Perm.	Temp.	Cl.	Alka- linity	CaO	MgO	SO ₄	Na ₂ O	Solids	CaCO ₃	CaSO ₄	MgCO ₃	MgSO ₄	Na ₂ CO ₃		Na ₂ SO ₄	NaCl
1.	NW.	34	20	8	2	262	2,740	2,400	2,200	200	16	95	520	281	1,759	196	2,513	95	1,135		838		419	26	≠1
2.	SE.	7	21	9	2	48	4,957									4,957		(3)		(1)		(2)	(4)	≠1	
3.	NW.	33	21	9	2	30	5,554	contains colon bacilli									5,554		(2)		(3)	(5)	(1)	(4)	≠1

Water samples indicated thus, ≠ 1, are from glacial drift.

Analyses are reported in parts per million; where numbers (1), (2), (3), (4), and (5), are used instead of parts per million, they represent the relative amounts in which the five main constituents are present in the water.

Hardness is the soap hardness expressed as calcium carbonate (CaCO₃).

Analysis No. 3 by Provincial Analyst, Regina; Analysis No. 2, by University of Saskatchewan.

For interpretation of this table read the section on Analyses and Quality of Water.

Water from the Unconsolidated Deposits

Three samples of water from aquifers in the glacial drift have been analysed and their results are listed on the accompanying table. The first sample was taken from a 262-foot well and the total dissolved solid content of 2,740 parts per million is largely composed of the sulphates of calcium, magnesium, and sodium, the latter two salts being the most undesirable in drinking water because of their laxative properties when present in large amounts. This water should not be used for drinking, but it is suitable for stock. The high proportion of calcium and magnesium in the water causes it to be very hard.

The second and third samples were taken from shallow wells, and the total dissolved content of 4,957 and 5,554 parts per million prohibits the use of the water either for humans or for stock. Neither well is being used. These two samples of water are not representative of the water that is generally encountered in this municipality. It is probable that most of the water from the glacial drift in this municipality is sulphate water, that is, the chief constituents of the total dissolved solid content are the sulphates of calcium, magnesium, and sodium. The third sample was condemned by the Provincial Analyst, not only on account of its high mineral salt content, but also on account of the high amount of bacteria present, including colon bacilli. An unusual feature of the third sample is that it contains a small amount of sodium carbonate (black alkali). This salt is rarely found in waters from the glacial drift, and it is particularly harmful to vegetation.

Water from the Bedrock

No well in the municipality is deriving its water supply from an aquifer in the Marine Shale series. Only in a very few places has water been found in the shale in this part of Saskatchewan and it is usually so highly mineralized that it cannot be used for any farm purpose.

1
WELL RECORDS—Rural Municipality of McLEOD NO. 185, SASKATCHEWAN

WELL No.	LOCATION					TYPE OF WELL	DEPTH OF WELL	ALTITUDE WELL (above sea level)	HEIGHT TO WHICH WATER WILL RISE		PRINCIPAL WATER-BEARING BED			CHARACTER OF WATER	TEMP. OF WATER (in °F.)	USE TO WHICH WATER IS PUT	YIELD AND REMARKS
	¼	Sec.	Tp.	Rge.	Mer.				Above (+) Below (-) Surface	Elev.	Depth	Elev.	Geological Horizon				
1	SE.	30	18	8	2	Dug	30	1,550	- 28	1,522	28	1,522	Recent river gravel	Hard	D, S	Good supply for 50 head stock; also owns a good spring; uses the river for stock. Deserted farm.	
2	NW.	32	"	"	"	Dug	11	1,855	- 5	1,850			Glacial gravel	Hard, iron	D, S		
1	NE.	19	18	9	2	Dug	12	1,850	- 9	1,841			Glacial gravel	Hard	D, S	Intermittent supply in drought years; hauled water from river for 3 years. Sufficient for 35 head stock; owns 3 similar wells.	
2	SW.	24	"	"	"	Bored	20	1,535	- 11	1,524			Recent stream sand	Hard	D, S		
3	SE.	25	"	"	"	Dug	17	1,880	- 13	1,867			Glacial sandy clay	Hard	D, S	Insufficient supply; well can water about 12 head stock. Sufficient for 20 head stock.	
4	SE.	26	"	"	"	Dug	21	1,800	- 9	1,791			Glacial fine sand	Hard	D, S		
5	SW.	27	"	"	"	Dug	11	1,780	0	1,780			Glacial gravel	Hard	D, S	Abundant supply; a spring in coulee has supplied about 20 farmers. Abundant supply; but seldom used.	
6	NW.	27	"	"	"	Dug	3	1,800	0	1,800	0	1,800	Glacial gravel	Hard	D, S		
7	NE.	28	"	"	"	Dug	12	1,860	- 7	1,853	7	1,853	Glacial sand and gravel	Hard, "alkaline"	D, S	Sufficient for about 20 head stock; also owns a dam. Poor supply; uses sloughs, dams and springs.	
8	SW.	28	"	"	"	Dug	30	1,850					Glacial drift	Hard	D, S		
9	SE.	30	"	"	"	Bored	100	1,860					Glacial drift	Hard, dark colour	N	Very poor supply of unusable water; many dry holes; hauls drinking water. Intermittent supply; uses a dam and hauls water in winter; 2 dry holes 100 feet deep. Intermittent supply; hauls nearly all water 3 miles. Poor and insufficient supply; uses a dugout and 3 seepage wells. Intermittent supply; hauled water from 1929 to 1934. Intermittent supply; 2 similar wells; uses a dugout. Intermittent supply; uses a dam.	
10	NE.	30	"	"	"	Dug	30	1,860	- 5	1,855			Glacial white clay	Hard	D, S		
11	SE.	32	"	"	"	Dug	14	1,870	- 2	1,868			Glacial gravelly clay	Hard, "alkaline"	D		
12	NW.	32	"	"	"	Dug	24	1,880					Glacial clay	Hard	D, S		
13	SW.	33	"	"	"	Dug	20	1,860	0	1,860			Glacial clay	Hard	D, S		
14	SE.	34	"	"	"	Dug	14	1,860	- 12	1,848			Glacial gravel	Hard	D, S		
15	SW.	34	"	"	"	Dug	12	1,855					Glacial drift	Hard	D, S		
16	SW.	35	"	"	"	Dug	18	1,875	0	1,875			Glacial drift	Hard	D, S		
17	NE.	36	"	"	"	Dug	18	1,910	- 13	1,897			Glacial clay	Hard	D, S		
1	NE.	4	19A	8	2	Dug	2	1,600	0	1,600	0	1,600	Glacial gravel	Hard, "alkaline"	D, S	Abundant supply; four similar springs on the farm. Intermittent supply; but usually sufficient for 20 head stock; uses 3 wells and hauls water. Intermittent supply; hauls water in winter.	
2	SW.	6	"	"	"	Dug	18	1,920	- 4	1,916			Glacial clay	Hard	D, S		
3	SE.	8	"	"	"	Dug	12	1,900	- 5	1,895			Glacial sand	Hard, "alkaline"	D, S		
4	SW.	10	"	"	"	Dug	12	1,560	- 4	1,556			Recent river sand	Hard	S		
5	SW.	11	"	"	"	Spring		1,600					Glacial gravel	Hard, "alkaline"	D, S		
1	SE.	1	19A	9	2	Dug	12	1,900	0	1,900			Glacial clay	Hard, "alkaline"	D, S	Insufficient water in winter. Insufficient supply; 2 seepage wells used also.	
2	NW.	1	"	"	"	Bored	65	1,920	- 55	1,865			Glacial drift	Hard, "alkaline"	D, S		

NOTE—All depths, altitudes, heights and elevations given above are in feet.

(D) Domestic; (S) Stock; (I) Irrigation; (M) Municipality; (N) Not used.
(#) Sample taken for analysis.

WELL RECORDS—Rural Municipality of McLEOD NO. 105, SASKATCHEWAN

WELL No.	LOCATION					TYPE OF WELL	DEPTH OF WELL	ALTITUDE WELL (above sea level)	HEIGHT TO WHICH WATER WILL RISE		PRINCIPAL WATER-BEARING BED			CHARACTER OF WATER	TEMP. OF WATER (in °F.)	USE TO WHICH WATER IS PUT	YIELD AND REMARKS
	¼	Sec.	Tp.	Rge.	Mer.				Above (+) Below (-) Surface	Elev.	Depth	Elev.	Geological Horizon				
3	SW.	2	19A	9	2	Dug	16	1,905	- 4	1,901			Glacial clay	Hard		D, S	Sufficient for 15 head stock in wet years; uses sloughs and hauls water.
4	NE.	2	"	"	"	Dug	16	1,905	- 8	1,897			Glacial clay	Hard		D, S	Sufficient for 15 head stock; uses 2 similar wells; hauls water in dry years.
5	SW.	4	"	"	"	Dug	30	1,890	- 12	1,878			Glacial clay	Hard, "alkaline"		D	Poor supply; uses a dugout in summer and hauls water in winter.
6	NE.	4	"	"	"	Dug	26	1,910	- 4	1,906			Glacial clay	Hard		D, S	Poor supply; uses a dugout and hauls water 4 miles.
7	SE.	6	"	"	"	Dug	14	1,880	0	1,880			Glacial clay	Hard, "alkaline"		D	Intermittent supply; one dry hole 60 feet deep; uses a dam and hauls water in winter.
8	SW.	6	"	"	"	Bored	70	1,865					Glacial drift				Dry hole; uses a dam and stores ice; seepage well used for drinking.
9	SW.	8	"	"	"	Dug	12	1,900	- 8	1,892			Glacial clay	Hard, iron		D	Sufficient for the house only; water stock at a dam.
10	SW.	10	"	"	"	Bored	33	1,905	0	1,905	33	1,872	Glacial fine sand	Hard		S	Good supply for 30 head stock; also uses a dam.
11	SE.	11	"	"	"	Dug	18	1,900	0	1,900			Glacial clay	Hard		D, S	Intermittent supply; 2 similar wells; dry hole 54 feet deep; hauls water in winter.
12	SE.	12	"	"	"	Dug	35	1,940	0	1,940			Glacial clay	Hard, "alkaline"		S	Intermittent supply; dugout used in summer and hauls in winter.
13	SE.	12	"	"	"	Drilled	402	1,940	-225	1,715			Glacial fine sand	Hard			Well was never used on account of sand plugging; there was an abundant supply of water.
1	NE.	16	19	7	2	Dug	16	1,500	- 10	1,490			Recent river clay	Hard, "alkaline"		D, S	Sufficient for 15 head stock.
2	NW.	16	"	"	"	Dug	14	1,520	- 11	1,509	11	1,509	Recent river sand	Hard, "alkaline"		D	Uses the river for stock.
3	NW.	18	"	"	"	Dug	9	1,910	- 5	1,905	5	1,905	Glacial sand	Hard		D, S	Sufficient for 30 head stock.
4	NW.	19	"	"	"	Dug	20	1,910	- 14	1,896			Glacial drift	Hard, "alkaline"		S	Sufficient for 35 head stock; hauls drinking water; one 8-foot dry hole made.
5	SW.	20	"	"	"	Dug	20	1,910	- 16	1,894	15	1,895	Glacial sand	Hard, "alkaline"		S	Good supply for 20 head stock; uses similar well for the house.
6	NW.	20	"	"	"	Dug	9	1,910	- 6	1,904	6	1,904	Glacial gravel	Hard		D, S	Sufficient for 25 head stock.
7	SE.	21	"	"	"	Dug	10	1,550	0	1,550			Glacial gravel	Hard, iron		D, S	Abundant supply; five springs on this farm.
8	NW.	21	"	"	"	Dug	10	1,905	- 7	1,898	7	1,898	Glacial gravel	Soft		D, S	Good supply for 35 head stock; 6 springs in the valley.
9	SW.	24	"	"	"	Spring		1,600	0	1,600			Glacial gravel	Hard, iron		D, S	Plenty of water for 100 head stock; uses springs and the river.
10	SE.	25	"	"	"	Spring		1,600	0	1,600			Glacial sand	Hard		D, S	One of several continuous flowing springs; farmers tank from springs.
11	SE.	28	"	"	"	Dug	2	1,900	0	1,900	0	1,900	Glacial sand	Soft		D, S	Delivers 100 pails of water an hour; 5 springs located near house.
12	NE.	28	"	"	"	Spring		1,875	0	1,875			Glacial sand and gravel	Hard, iron, "alkaline"		D, S	Abundant supply; several springs on the farm.
13	SW.	29	"	"	"	Dug	8	1,910	- 6	1,904	6	1,904	Glacial sand	Hard		D, S	Good supply for 20 head stock.
14	NE.	29	"	"	"	Dug	8	1,900	- 4	1,896	4	1,896	Glacial sand	Hard		D, S	Good supply for 20 head stock; also uses a dugout.
15	SE.	30	"	"	"	Dug	10	1,915	- 7	1,908	7	1,908	Glacial sand	Soft		D, S	Good supply for 25 head stock; several dry holes.
16	SW.	30	"	"	"	Dug	14	1,925	- 11	1,914			Glacial clay	Hard, "alkaline"		N	Several dry holes; hauls drinking water and drives stock ¼ mile to water.

NOTE—All depths, altitudes, heights and elevations given above are in feet.

(D) Domestic; (S) Stock; (I) Irrigation; (M) Municipality; (N) Not used.
(#) Sample taken for analysis.

WELL RECORDS—Rural Municipality of McLEOD NO. 185 SASKATCHEWAN

WELL No.	LOCATION					TYPE OF WELL	DEPTH OF WELL	ALTITUDE WELL (above sea level)	HEIGHT TO WHICH WATER WILL RISE		PRINCIPAL WATER-BEARING BED			CHARACTER OF WATER	TEMP. OF WATER (in °F.)	USE TO WHICH WATER IS PUT	YIELD AND REMARKS
	¼	Sec.	Tp.	Rge.	Mer.				Above (+) Below (-) Surface	Elev.	Depth	Elev.	Geological Horizon				
17	SW.	31	19	7	2	Bored	100	1,930					Glacial drift				Dry hole.
18	SE.	32	"	"	"	Dug	11	1,905	- 7	1,898	7	1,898	Glacial gravel	Soft		D, S	Good supply for 36 head stock; three farmers hauled water from well in 1933.
19	NW.	34	"	"	"	Dug	8	1,905	- 4	1,901	4	1,901	Glacial fine sand	Hard		D, S	Good supply for 15 head stock; flowing spring in a coulee.
20	NW.	35	"	"	"	Dug	12	1,800	- 7	1,793	7	1,793	Glacial sand	Hard, "alkaline"		D, S	Sufficient for 50 head stock.
21	SE.	36	"	"	"	Bored	80	1,860					Glacial drift				One of 15 dry holes; uses slough, melts snow and hauls water.
22	SW.	36	"	"	"	Dug	15	1,850	0	1,850			Glacial sand	Hard		D, S	Intermittent supply; 30-foot well delivers highly mineralized water; insufficient in dry years and winter.
23	NW.	36	"	"	"	Dug	40	1,875					Glacial drift				Dry hole; hauls water, uses sloughs and melts snow.
1	NW.	1	19	8	2	Spring		1,600	0	1,600			Glacial gravel	Hard, iron		D, S	One of three springs; abundant supply; uses river for stock.
2	SW.	3	"	"	"	Dug	12	1,900	- 5	1,895	11	1,889	Glacial sand	Hard		D, S	Insufficient supply in drought years.
3	SE.	5	"	"	"	Dug	13	1,925	0	1,925			Glacial sand	Hard		D, S	Barely sufficient for 10 head stock.
4	NW.	5	"	"	"	Dug	7	1,945	0	1,945			Glacial sand	Hard, "alkaline"		D, S	Sufficient in wet years only; has hauled water and melted snow.
5	SE.	6	"	"	"	Dug	9	1,945	- 4	1,941			Glacial sand	Hard, "alkaline"		D	Intermittent supply; 2 similar wells, hauls water in winter.
6	SW.	6	"	"	"	Dug	16	1,950	0	1,950			Glacial clay	Hard		D, S	Intermittent supply; dry hole 90 feet deep; hauls water in winter.
7	NE.	6	"	"	"	Dug	24	1,950					Glacial drift	Hard, very "alkaline"		N	Hauls water, uses sloughs and melts snow.
8	NW.	8	"	"	"	Dug	15	1,950					Glacial sand	Hard, "alkaline"		N	Waters stock at sloughs and hauls water.
9	NE.	8	"	"	"	Bored	94	1,940					Glacial drift	Hard, "alkaline"		N	Very poor supply; hauls water and uses sloughs for stock.
10	SE.	10	"	"	"	Dug	25	1,910	0	1,910			Glacial sandy clay	Hard, "alkaline"		D, S	Insufficient for 17 head stock; owns five similar wells; hauls water and melts snow.
11	NW.	10	"	"	"	Dug	8	1,920	- 3	1,917			Glacial clay	Hard		D, S	Poor supply; waters stock at a slough.
12	NE.	10	"	"	"	Dug	16	1,920	0	1,920			Glacial clay	Hard		S	Intermittent supply; numerous seepage wells; 60-foot bored well gave small supply of unusable water.
13	SE.	12	"	"	"	Spring		1,600	0	1,600			Glacial sand	Hard, iron, "alkaline"		S	Continuous small flow; sufficient for 50 head stock.
14	SE.	14	"	"	"	Bored	100	1,920					Glacial drift				Dry hole; hauls water, uses a dugout and melts snow, seepage wells.
15	SW.	14	"	"	"	Dug	20	1,920	- 10	1,910			Glacial sand	Hard, "alkaline"		S	Poor supply; hauls water and uses sloughs for stock.
16	NW.	14	"	"	"	Dug	64	1,925					Glacial drift				The deepest of four dry holes; uses sloughs; hauls water and melts snow.
17	SW.	15	"	"	"	Dug	12	1,930	- 7	1,923			Glacial clay	Hard		D	Poor supply; dry holes to a depth of 90 feet; uses a dugout and hauls water in winter.
18	NE.	15	"	"	"	Dug	14	1,925	0	1,925	7	1,918	Glacial gravel	Hard, "alkaline"		S	Intermittent supply; uses a dugout and hauls drinking water.
19	SW.	16	"	"	"	Dug	8	1,940	0	1,940			Glacial sand	Hard		D, S	Good supply for 20 head stock.

NOTE—All depths, altitudes, heights and elevations given above are in feet.

(D) Domestic; (S) Stock; (I) Irrigation; (M) Municipality; (N) Not used.
(#) Sample taken for analysis.

WELL RECORDS—Rural Municipality of

WELL No.	LOCATION					TYPE OF WELL	DEPTH OF WELL	ALTITUDE WELL (above sea level)	HEIGHT TO WHICH WATER WILL RISE		PRINCIPAL WATER-BEARING BED			CHARACTER OF WATER	TEMP. OF WATER (in °F.)	USE TO WHICH WATER IS PUT	YIELD AND REMARKS
	¼	Sec.	Tp.	Rge.	Mer.				Above (+) Below (-) Surface	Elev.	Depth	Elev.	Geological Horizon				
20	SW.	17	19	8	2	Dug	14	1,945	- 8	1,937			Glacial sandy clay	Hard, "alkaline"	D	Intermittent supply; sloughs are used for stock.	
21	SE.	18	"	"	"	Dug	24	1,950					Glacial clay	Hard, "alkaline"	D, S	Very small supply; several dry holes 12 to 14 feet deep; uses well on the SW. ¼, section 17.	
22	SW.	18	"	"	"	Dug	26	1,970	0	1,970			Glacial clay	Hard	D, S	Sufficient for 13 head stock in summer; dry hole over 200 feet deep; hauls water in winter	
23	NW.	19	"	"	"	Test	30	1,980	- 7	1,973	7	1,973	Glacial sand	Hard, "alkaline"	N	Hauls water for stock and house and melts snow in winter.	
24	SE.	20	"	"	"	Dug	12	1,950	- 0	1,950			Glacial clay	Hard	N	Several dry test holes; hauls water; uses sloughs and melts snow.	
25	SW.	20	"	"	"	Dug	22	1,950	- 6	1,944			Glacial fine sand	Hard	D, S	Insufficient because of sand plugging; several dry holes to 100 feet; hauls water and melts snow.	
26	NW.	20	"	"	"	Dug	14	1,955	- 2	1,953	8	1,947	Glacial fine sand	Hard	D, S	Sufficient for 30 head stock; neighbours tank drinking water from this well.	
27	NE.	20	"	"	"	Dug	20	1,950	- 4	1,946			Glacial sand	Hard	D, S	Intermittent supply; 85-foot dry hole; hauls and melts snow for 55 head stock.	
28	SE.	22	"	"	"	Dug	12	1,940	- 8	1,932			Glacial sand	Hard, "alkaline"	D	Uses sloughs and hauls water for stock.	
29	NW.	22	"	"	"	Dug	12	1,950	- 6	1,944	6	1,944	Glacial sand	Soft	D, S	Sufficient for 25 head stock; neighbours tank water from this well.	
30	NW.	23	"	"	"	Dug	25	1,950	0	1,950			Glacial clay	Hard, "alkaline"	S	Intermittent supply.	
31	SE.	24	"	"	"	Dug	8	1,920	- 5	1,915	5	1,915	Glacial sand and gravel	Soft	D, S	Abundant supply; neighbours haul and water can be used in a steam engine; uses dugout for stock.	
32	NW.	26	"	"	"	Dug	15	1,945	- 7	1,938			Glacial clay	Hard, "alkaline"	D, S	Well is dry in winters and is forced to haul water.	
33	SE.	28	"	"	"	Dug	12	1,955	- 6	1,949	6	1,949	Glacial sand	Hard	D, S	Good supply for 25 head stock.	
34	SW.	28	"	"	"	Dug	13	1,950	- 10	1,940	10	1,940	Glacial sand	Hard, "alkaline"	D, S	This well has never been dry; several neighbours tank from this well.	
35	NW.	28	"	"	"	Dug	20	1,965	0	1,965			Glacial sand and gravel	Hard	D, S	Insufficient for 22 head stock in drought years; hauled water in 1932 and 1934.	
36	NE.	28	"	"	"	Dug	14	1,960	- 6	1,954	5	1,955	Glacial sand and gravel	Hard	D, S	Good supply for 15 head stock.	
37	NE.	29	"	"	"	Dug	17	1,970	- 15	1,955	13	1,957	Glacial grey sand	Hard, "alkaline"	D, S	Good supply for 25 head stock; another 10-foot well used in summer; one 20-foot dry hole.	
38	SE.	30	"	"	"	Dug	28	1,975	0	1,975	8	1,967	Glacial sand	Hard, "alkaline"	D, S	Sufficient in wet years; dry hole 124 foot deep.	
39	SW.	30	"	"	"	Bored	60	1,980					Glacial drift			Dry hole; hauls water in summer and melts snow in winter.	
40	NW.	30	"	"	"	Bored	29	1,990	- 10	1,980	11	1,979	Glacial sand and gravel	Hard	D, S	Good supply for 25 head stock.	
41	NE.	30	"	"	"	Dug	24	1,980	0	1,980	10	1,970	Glacial sand	Hard, iron	D, S	Sufficient for 50 head stock.	
42	NW.	31	"	"	"	Dug	35	2,000	- 16	1,984			Glacial sand and gravel	Hard	D, S	Sufficient for 60 head stock.	
43	SW.	32	"	"	"	Dug	18	1,990	- 8	1,982			Glacial sand and gravel	Hard, "alkaline"	D, S	Another well 12 feet deep; good supply for 20 head stock.	
44	NW.	32	"	"	"	Dug	12	1,990					Glacial clay	Hard, "alkaline"	D, S	Insufficient for 12 head stock in drought years.	
45	NE.	32	"	"	"	Dug	24	1,995	- 20	1,975	20	1,975	Glacial fine sand	Hard	D, S	Good supply for 50 head stock; dry hole 120 feet deep.	

NOTE—All depths, altitudes, heights and elevations given above are in feet.

(D) Domestic; (S) Stock; (I) Irrigation; (M) Municipality; (N) Not used. (#) Sample taken for analysis.

WELL RECORDS—Rural Municipality of

McLEOD

NO. 185, SASKATCHEWAN

B 4-4

WELL No.	LOCATION					TYPE OF WELL	DEPTH OF WELL	ALTITUDE WELL (above sea level)	HEIGHT TO WHICH WATER WILL RISE		PRINCIPAL WATER-BEARING BED			CHARACTER OF WATER	TEMP. OF WATER (in °F.)	USE TO WHICH WATER IS PUT	YIELD AND REMARKS
	¼	Sec.	Tp.	Rge.	Mer.				Above (+) Below (-) Surface	Elev.	Depth	Elev.	Geological Horizon				
46	NW.	33	19	8	2	Dug	24	1,980	- 18	1,962	18	1,962	Glacial gravel	Hard		D, S	Insufficient supply.
47	SE.	34	"	"	"	Dug	10	1,950	- 7	1,943	7	1,943	Glacial sand	Hard		D, S	Sufficient for the house and a few head stock.
48	NE.	34	"	"	"	Dug	20	1,955					Glacial drift				The deepest of three dry holes.
49	SE.	36	"	"	"	Dug	18	1,930	0	1,930			Glacial clay	Hard, "alkaline"		D, S	Insufficient supply; one dry hole 10 feet deep.
50	NE.	36	"	"	"	Dug	20	1,940	- 16	1,924			Glacial clay	Hard		D	Intermittent supply; uses a cistern and hauls water for stock.
1	SE.	2	19	9	2	Dug	16	1,910					Glacial clay			N	Very small supply; uses sloughs and hauls water; many dry shallow holes have been dug.
2	NE.	2	"	"	"	Dug	30	1,925	- 10	1,915	27	1,898	Glacial sand	Hard, "alkaline"		D, S	Sufficient for 35 head stock; also uses sloughs in summer.
3	SE.	4	"	"	"	Dug	15	1,920	- 5	1,915			Glacial clay	Hard		D, S	Seepage water from a dugout.
4	NW.	4	"	"	"	Bored	60	1,935	- 30	1,905			Glacial drift	Hard, salty, "alkaline"		S	Sufficient for only 15 head stock; hauled water in dry years; several dry holes on the farm.
5	SW.	5	"	"	"	Bored	85	1,910					Glacial drift				Dry hole; uses sloughs and a dugout in summer and melts ice in winter.
6	NW.	6	"	"	"	Bored		1,915					Glacial drift	Hard, "alkaline"		N	Uses dugout and seepage wells; hauls water for house and stock.
7	NW.	8	"	"	"	Dug	20	1,970					Glacial drift				Dry hole; uses a dam and hauls water.
8	SE.	10	"	"	"	Dug	24	1,935	- 14	1,921			Glacial sand	Hard		D, S	Sufficient for 20 head stock; also uses sloughs for stock.
9	SW.	11	"	"	"	Dug	20	1,930	0	1,930			Glacial clay	Hard		D, S	Intermittent supply; uses a dugout; dry holes 60 and 70 feet deep.
10	NE.	12	"	"	"	Dug	40	1,960	- 15	1,945	40	1,920	Glacial gravel	Hard		D, S	Sufficient for 60 head stock; also uses a dugout and two seepage wells.
11	SE.	13	"	"	"	Dug	12	1,975					Glacial clay	Hard, "alkaline"		D, S	Intermittent supply; depends entirely on surface water.
12	NE.	14	"	"	"	Dug	35	1,995	- 5	1,990			Glacial clay	Hard		D, S	Intermittent supply; uses sloughs and hauls water in winter.
13	NE.	15	"	"	"	Bored	60	1,980					Glacial drift				Dry hole; uses sloughs and hauls water; seepage wells deliver water unfit for use.
14	SE.	16	"	"	"	Bored	106	1,990					Glacial drift				Dry hole; uses seepage well and hauls water.
15	NW.	16	"	"	"	Drilled	700	2,010					Bedrock Marine Shale				One of nine dry drilled holes; uses a dam and hauls water.
16	NE.	16	"	"	"	Dug	18	2,000					Glacial clay	Hard		D, S	Two other similar intermittent wells; has hauled all water since 1933.
17	SE.	18	"	"	"	Bored	120	2,000					Glacial drift				Dry hole; uses a seepage well, sloughs and hauls water.
18	SW.	18	"	"	"	Dug	30	1,985	- 18	1,967			Glacial clay	Hard		N	Intermittent supply; uses rain water for drinking and sloughs for stock.
19	NW.	19	"	"	"	Bored	70	2,020					Glacial drift				Dry hole; uses seepage wells, sloughs and hauls water.
20	SE.	19	"	"	"	Bored	22	2,000	- 18	1,982	22	1,978	Glacial fine sand	Hard, "alkaline"		N	Uses sloughs for stock and rain water for drinking.
21	SW.	19	"	"	"	Dug	25	2,010	- 15	1,995	15	1,995	Glacial sand	Hard		D	Uses a large slough for stock.
22	SE.	20	"	"	"	Dug	15	2,005	0	2,005	14	1,991	Glacial sand	Hard, "alkaline"		D, S	Poor supply; dry hole 43 feet deep; uses large slough for stock.

NOTE—All depths, altitudes, heights and elevations given above are in feet.

(D) Domestic; (S) Stock; (I) Irrigation; (M) Municipality; (N) Not used.
(#) Sample taken for analysis.

WELL RECORDS—Rural Municipality of.....

WELL No.	LOCATION					TYPE OF WELL	DEPTH OF WELL	ALTITUDE WELL (above sea level)	HEIGHT TO WHICH WATER WILL RISE		PRINCIPAL WATER-BEARING BED			CHARACTER OF WATER	TEMP. OF WATER (in °F.)	USE TO WHICH WATER IS PUT	YIELD AND REMARKS
	¼	Sec.	Tp.	Rge.	Mer.				Above (+) Below (-) Surface	Elev.	Depth	Elev.	Geological Horizon				
23	SE.	21	19	9	2	Dug	45	2,000	- 42	1,958	42	1,958	Glacial sand	Hard	D	Poor supply; uses a cistern and hauls in winter for 30 head stock.	
24	NW.	21	"	"	"	Dug	20	2,015	- 3	2,012			Glacial clay	Hard	D	Intermittent supply; uses a cistern and waters stock at sloughs.	
25	SE.	22	"	"	"	Dug	15	1,995	- 11	1,984			Glacial clay	Hard, "alkaline"	D	Intermittent supply; water stock at small lake ¼ mile north, and hauls water in winter.	
26	SW.	26	"	"	"	Dug	10	2,000	0	2,000			Glacial clay	Hard	D, S	Intermittent supply; waters stock at sloughs in summer.	
27	SW.	27	"	"	"	Bored	90	1,990					Glacial drift			Dry hole; seepage well yields an intermittent supply.	
28	NW.	27	"	"	"	Dug	18	2,000	- 10	1,990	10	1,990	Glacial sand	Hard	D, S	Good supply for 20 head stock; a school and four neighbours use this well.	
29	SE.	29	"	"	"	Dug	16	2,010	- 4	2,006			Glacial clay	Hard	D	Intermittent supply; water stock at sloughs and hauled water in 1930 to 1934.	
30	NE.	29	"	"	"	Bored	95	2,020					Glacial drift			One of several dry holes; use sloughs and seepage wells in summer; hauls water in winter.	
31	SE.	30	"	"	"	Dug	34	2,025	0	2,025			Glacial clay	Hard, "alkaline"	D, S	Intermittent supply in winter; uses sloughs for stock.	
32	SW.	32	"	"	"	Dug	20	2,040	- 18	2,022			Glacial clay	Hard	D	Sufficient for house use in summer; waters stock in sloughs and hauls in winter.	
33	NW.	32	"	"	"	Dug	40	2,050	- 37	2,013			Glacial clay	Hard	D	Waters stock at sloughs.	
34	NE.	32	"	"	"	Dug	45	2,045	- 39	2,006	40	2,005	Glacial sand	Hard, "alkaline"	D	Good supply for the house; hauls water for stock.	
35	SW.	33	"	"	"	Bored	100	2,020					Glacial drift			The deepest of two dry holes; uses dugouts and sloughs for stock.	
36	SW.	34	"	"	"	Bored	110	2,000					Glacial drift			Dry hole; uses 10-foot seepage well and waters stock at a large slough.	
37	NW.	34	"	"	"	Dug	10	2,000	- 7	1,993	6	1,994	Glacial sand and gravel	Hard	D, S	Good supply for the house; sloughs used for watering stock.	
38	SW.	36	"	"	"	Dug	30	1,995	0	1,995			Glacial clay	Hard	D, S	Intermittent supply; hauls water and melts snow in winter.	
1	SE.	2	20	7	2	Dug	20	1,800	- 6	1,794	6	1,794	Glacial sand and gravel	Hard, "alkaline"	D, S	Sufficient for 50 head stock.	
2	SW.	2	"	"	"	Dug	16	1,800	- 8	1,792	10	1,790	Glacial sand	Hard, "alkaline"	D, S	Sufficient for 20 head stock.	
3	NW.	3	"	"	"	Dug	6	1,850	- 2	1,848	2	1,848	Glacial sand	Hard	D, S	Sufficient for 25 head stock.	
4	NW.	4	"	"	"	Dug	10	1,905	- 7	1,898			Glacial sand and gravel	Hard	D	Intermittent supply; a 20-foot well used for stock; hauls water in winter for house use.	
5	NE.	4	"	"	"	Dug	20	1,880	0	1,880			Glacial clay	Hard, "alkaline"	S	Two similar wells also used; sufficient supply of water.	
6	SE.	6	"	"	"	Dug	8	1,930	- 6	1,924	6	1,924	Glacial sand	Hard	D, S	Sufficient for 15 head stock.	
7	NW.	6	"	"	"	Dug	20	1,945	- 16	1,929	16	1,929	Glacial fine sand	Hard	D, S	Sufficient for 20 head stock.	
8	NE.	6	"	"	"	Dug	15	1,935	- 10	1,925	10	1,925	Glacial sand	Hard	D, S	Insufficient in dry years and in winter.	
9	NE.	7	"	"	"	Dug	14	1,925	0	1,925	1	1,924	Glacial gravel	Hard, "alkaline"	D, S	Good supply in wet years; one dry hole 135 feet deep.	
10	SW.	9	"	"	"	Dug	18	1,895	- 13	1,882	13	1,882	Glacial gravel	Hard	D, S	Good supply for 20 head stock.	
11	SW.	10	"	"	"	Dug	30	1,860					Glacial clay	Hard, "alkaline"	S	Intermittent supply; hauls water for house and stock.	

NOTE—All depths, altitudes, heights and elevations given above are in feet.

(D) Domestic; (S) Stock; (I) Irrigation; (M) Municipality; (N) Not used.
(#) Sample taken for analysis.

7

WELL RECORDS—Rural Municipality of McLEOD NO.185, SASKATCHEWAN

WELL No.	LOCATION					TYPE OF WELL	DEPTH OF WELL	ALTITUDE WELL (above sea level)	HEIGHT TO WHICH WATER WILL RISE		PRINCIPAL WATER-BEARING BED			CHARACTER OF WATER	TEMP. OF WATER (in °F.)	USE TO WHICH WATER IS PUT	YIELD AND REMARKS
	¼	Sec.	Tp.	Rge.	Mer.				Above (+) Below (-) Surface	Elev.	Depth	Elev.	Geological Horizon				
12	NW.	10	20	7	2	Dug	14	1,850	0	1,850			Glacial gravel	Hard, "alkaline"	D, S	Sufficient for 35 head stock; one dry hole 25 feet deep.	
13	SE.	11	"	"	"	Dug	10	1,800	- 5	1,795			Glacial gravel	Hard		Insufficient supply in winter.	
14	SW.	12	"	"	"	Dug	18	1,850	- 12	1,838	12	1,838	Glacial sand	Hard	D, S	Sufficient for 35 head stock; soft water spring with continuous flow in a ravine.	
15	NW.	12	"	"	"	Dug	20	1,815	- 18	1,797	17	1,798	Glacial sand	Hard	D, S	Sufficient for 35 head stock.	
16	SW.	14	"	"	"	Dug	13	1,850	- 9	1,841	7	1,843	Glacial fine sand	Soft	D, S	Good supply for 30 head stock.	
17	NW.	14	"	"	"	Dug	10	1,850	- 7	1,843			Glacial clay	Hard, "alkaline"	S	Intermittent supply; uses sloughs and hauls water.	
18	NE.	14	"	"	"	Dug	13	1,730	- 9	1,721	9	1,721	Recent stream gravel	Hard	D, S	Sufficient for 20 head stock; one dry hole 25 feet deep.	
19	SW.	16	"	"	"	Dug	10	1,870	- 4	1,866	4	1,866	Glacial sand	Hard	D, S	Intermittent supply.	
20	NW.	16	"	"	"	Dug	20	1,875	- 12	1,863			Glacial sand	Soft	D, S	Good supply for 20 head stock; a 15-foot well also used.	
21	NW.	18	"	"	"	Dug	12	1,955	0	1,955			Glacial clay	Hard, "alkaline"	S	Intermittent supply; several dry holes 30 feet deep; hauls water in winter for 16 head stock.	
22	NE.	18	"	"	"	Dug	12	1,945	- 6	1,939	9	1,936	Glacial sand	Hard, "alkaline"	D, S	Plenty of water for 25 head stock.	
23	NE.	19	"	"	"	Dug	15	1,950	- 8	1,942	8	1,942	Glacial gravel	Hard	D	Intermittent supply; a dry hole 92 feet deep; uses two large dugouts for stock.	
24	SW.	20	"	"	"	Dug	14	1,915	- 6	1,909	6	1,909	Glacial gravel	Soft	D, S	Good supply for 50 head stock; several neighbours haul from well.	
25	NE.	20	"	"	"	Dug	25	1,905					Glacial drift			One of several dry holes; hauls water from SW. ¼, section 21.	
26	SE.	22	"	"	"	Bored	120	1,850	- 70	1,780	120	1,730	Glacial gravel	Hard, "alkaline"	D, S	Abundant supply for 20 head stock; 18-foot well usually used for house.	
27	NE.	22	"	"	"	Dug	20	1,850	- 14	1,836			Glacial sand	Hard	D, S	Sufficient supply; dugout used for stock.	
28	NW.	23	"	"	"	Dug	14	1,800	- 4	1,796	4	1,796	Glacial sand and gravel	Soft	D, S	Sufficient for 40 head stock; another well in the valley.	
29	NW.	24	"	"	"	Bored	45	1,825	- 30	1,795	44	1,781	Glacial gravel	Hard, sulphur	D, S	Plenty of water for 25 head stock; dry holes to a depth of 100 feet.	
30	NW.	29	"	"	"	Dug	7	1,940	- 3	1,937	3	1,937	Glacial gravel	Hard	D, S	Sufficient supply.	
31	SE.	30	"	"	"	Dug	10	1,950	- 6	1,944			Glacial sand	Hard, "alkaline"	D, S	Insufficient supply in winter and is forced to haul.	
32	SW.	30	"	"	"	Dug	12	1,990	- 8	1,982	8	1,982	Glacial gravel	Hard	D, S	Sufficient for 25 head stock.	
33	NE.	30	"	"	"	Dug	14	1,950	- 7	1,943	7	1,943	Glacial sand and gravel	Hard	D, S	Plenty of water in wet years; dry holes 90 to 100 feet deep.	
34	NE.	31	"	"	"	Dug	14	1,960	- 11	1,949	11	1,949	Glacial sand	Hard	D, S	Sufficient for 25 head stock.	
35	SE.	32	"	"	"	Dug	17	1,920	- 8	1,912			Glacial clay	Hard, "alkaline"	D, S	Intermittent supply; dry hole 125 feet deep; has deepened a slough and expects good supply	
36	NW.	32	"	"	"	Bored	45	1,950	- 30	1,920	30	1,920	Glacial sand	Hard, "alkaline"	D, S	Intermittent supply.	
37	NE.	32	"	"	"	Dug	16	1,905	- 10	1,895	10	1,895	Glacial sand and gravel	Hard	D, S	Sufficient supply in average years; uses sloughs for stock.	

NOTE—All depths, altitudes, heights and elevations given above are in feet.

(D) Domestic; (S) Stock; (I) Irrigation; (M) Municipality; (N) Not used.
(#) Sample taken for analysis.

WELL RECORDS—Rural Municipality of

WELL No.	LOCATION					TYPE OF WELL	DEPTH OF WELL	ALTITUDE WELL (above sea level)	HEIGHT TO WHICH WATER WILL RISE		PRINCIPAL WATER-BEARING BED			CHARACTER OF WATER	TEMP. OF WATER (in °F.)	USE TO WHICH WATER IS PUT	YIELD AND REMARKS
	¼	Sec.	Tp.	Rge.	Mer.				Above (+) Below (-) Surface	Elev.	Depth	Elev.	Geological Horizon				
38	SE.	33	20	7	2	Dug	14	1,850	- 7	1,843	7	1,843	Glacial sand	Hard	D, S	Sufficient for 20 head stock.	
39	SW.	34	"	"	"	Bored	80	1,950	- 60	1,790	80	1,770	Glacial sand	Hard, "alkaline"	D, S	Good supply for 40 head stock; two shallow wells used in summer.	
40	NE.	34	"	"	"	Dug	10	1,830	- 2	1,828			Glacial sand	Hard	D, S	Sufficient supply.	
41	NW.	34	"	"	"	Dug	21	1,840					Glacial drift			One of several dry holes; hauls water.	
42	SE.	35	"	"	"	Dug	12	1,810	- 8	1,802	8	1,802	Glacial sand	Soft	D, S	Two similar intermittent wells; insufficient supply.	
43	NE.	36	"	"	"	Dug	16	1,800	- 8	1,792	8	1,792	Glacial gravel	Hard	D, S	Sufficient for 20 head stock; 60-foot well yields water unfit to use.	
1	SW.	1	20	8	2	Dug	10	1,945	- 5	1,940	5	1,940	Glacial sand	Hard	S	Good supply for 50 head stock.	
2	SW.	2	"	"	"	Dug	15	1,955	- 9	1,946	14	1,941	Glacial sand	Hard	D, S	Barely sufficient for 25 head stock; sloughs used for stock.	
3	NW.	2	"	"	"	Dug	12	1,960	- 8	1,952			Glacial sandy clay	Hard, "alkaline"	D	20-foot well waters 20 head stock; 15-foot well ½ mile from house is sometimes used.	
4	SW.	3	"	"	"	Dug	34	1,970	- 28	1,942			Glacial clay	Hard	D	Sufficient for house use only; 3 dry holes 60 to 69 feet deep; waters stock at slough.	
5	NW.	3	"	"	"	Dug	16	1,980	- 12	1,968	8	1,972	Glacial fine sand	Hard, "alkaline"	D	Good supply for the house; waters stock at a lake and sloughs; one dry hole 21 feet deep	
6	SE.	4	"	"	"	Dug	12	1,980	- 4	1,976			Glacial sand	Hard, "alkaline"	D, S	Intermittent supply.	
7	NW.	4	"	"	"	Dug	19	2,000	- 11	1,989	11	1,989	Glacial gravel	Hard	D, S	Sufficient for 20 head stock.	
8	NE.	4	"	"	"	Bored	20	1,980					Glacial drift			One of three dry holes; uses a large slough for stock.	
9	SE.	5	"	"	"	Dug	12	2,000	- 4	1,996	4	1,996	Glacial sand	Hard	D, S	Sufficient for 16 head stock in winter; uses sloughs in summer.	
10	NW.	7	"	"	"	Dug	15	2,010	- 10	2,000	13	1,997	Glacial sand	Hard	D, S	Plenty of water for 22 head stock.	
11	SE.	8	"	"	"	Dug	12	2,005	- 5	2,000	5	2,000	Glacial sand and gravel	Hard, "alkaline"	D, S	Intermittent supply; dry holes to a depth of 20 feet.	
12	NE.	8	"	"	"	Bored	86	2,010					Glacial drift			One of numerous dry holes; hauls water winter and summer for 30 head stock; one shallow well used.	
13	NE.	9	"	"	"	Dug	14	2,000	- 9	1,991	9	1,991	Glacial gravel	Soft	D, S	Good supply of water. Two neighbours tank from it.	
14	NW.	10	"	"	"	Dug	28	1,995	0	1,995			Glacial gravel	Hard, "alkaline"	S	Sufficient supply; uses sloughs for stock and another well for house.	
15	SW.	11	"	"	"	Dug	11	1,970	- 8	1,962	8	1,962	Glacial sand	Hard	D, S	Sufficient for 15 head stock.	
16	SE.	12	"	"	"	Dug	14	1,950	- 8	1,942	14	1,936	Glacial gravel	Hard	D, S	Good supply for 100 head stock.	
17	NE.	12	"	"	"	Dug	9	1,950	- 4	1,946	4	1,946	Glacial gravel	Hard	D, S	Sufficient in summer but well is dry in winter.	
18	SE.	13	"	"	"	Dug	40	1,955					Glacial clay			Small supply; farm deserted and well seldom used.	
19	SE.	14	"	"	"	Dug	22	2,000	- 12	1,988			Glacial clay	Hard, "alkaline"	D, S	Eleven similar wells in village of Neudorf; insufficient supply; water is supplied by C. P. R. also.	
20	SW.	14	"	"	"	Dug	16	1,990	0	1,990			Glacial clay	Hard, "alkaline"	D	Intermittent supply; uses sloughs and hauls water.	

NOTE—All depths, altitudes, heights and elevations given above are in feet.

(D) Domestic; (S) Stock; (I) Irrigation; (M) Municipality; (N) Not used.
(#) Sample taken for analysis.

WELL RECORDS—Rural Municipality of McLEOD NO.185, SASKATCHEWAN

WELL No.	LOCATION					TYPE OF WELL	DEPTH OF WELL	ALTITUDE WELL (above sea level)	HEIGHT TO WHICH WATER WILL RISE		PRINCIPAL WATER-BEARING BED			CHARACTER OF WATER	TEMP. OF WATER (in °F.)	USE TO WHICH WATER IS PUT	YIELD AND REMARKS
	¼	Sec.	Tp.	Rge.	Mer.				Above (+) Below (-) Surface	Elev.	Depth	Elev.	Geological Horizon				
21	NE.	14	20	8	2	Dug	20	2,000	- 10	1,990			Glacial sand	Hard, "alkaline"	D, S	Insufficient supply in winter; uses sloughs and lake for stock.	
22	SE.	16	"	"	"	Dug	20	2,010	- 8	2,002	10	2,000	Glacial sand and gravel	Hard	D, S	Insufficient supply in winter; uses a dugout and melts snow.	
23	SW.	16	"	"	"	Dug	11	2,015	- 5	2,010	6	2,009	Glacial sand	Hard	D, S	Hauled water in winter and dry years; uses dugout and sloughs; 3 dry holes 60,70 and 102 feet deep.	
24	NW.	16	"	"	"	Dug	20	2,020	0	2,020			Glacial clay	Hard	D, S	Wells are dry in winter.	
25	NW.	18	"	"	"	Dug	16	2,030	- 6	2,024	10	2,020	Glacial sand	Hard	D, S	Intermittent supply; owns two similar wells and hauls water.	
26	NE.	19	"	"	"	Dug	18	2,035	- 9	2,026	99	2,026	Glacial sand and gravel	Hard	D, S	Plenty for 50 head stock; uses a dugout; dry holes 85 and 100 feet deep.	
27	SE.	20	"	"	"	Dug	18	2,040	- 14	2,026	14	2,026	Glacial sand	Hard	D	Poor supply; uses sloughs and melts snow; many dry holes.	
28	SW.	20	"	"	"	Dug	25	2,020					Glacial clay	Hard	D,	Intermittent supply; waters stock at sloughs and melts snow.	
29	SE.	21	"	"	"	Dug	18	2,010	- 8	2,002	8	2,006	Glacial sand	Hard, "alkaline"	D, S	Good supply for 35 head stock; also uses sloughs for stock.	
30	SW.	21	"	"	"	Dug	24	2,025					Glacial drift		N	Good supply but unfit for use; uses sloughs, melts snow and hauls water; many dry holes.	
31	NW.	21	"	"	"	Drilled	275	2,035					Glacial drift			Dry hole; 75-foot well yields a poor supply; hauls water winter and summer.	
32	SW.	22	"	"	"	Dug	12	2,000	- 7	1,993			Glacial clay	Hard, "alkaline"	D, S	Poor supply; uses sloughs and melts snow.	
33	NW.	23	"	"	"	Dug	9	2,005	- 2	2,003	7	1,998	Glacial sand	Hard, "alkaline"	D, S	Sufficient for 40 head stock; waters stock at sloughs in summer.	
34	NE.	23	"	"	"	Dug	25	2,005	- 5	2,000			Glacial clay	Hard	D, S	Intermittent supply; short of water in winter; uses a lake.	
35	NE.	24	"	"	"	Dug	24	1,980	- 18	1,962			Glacial clay	Hard, "alkaline"	N	Numerous dry holes to 150 feet; uses sloughs, melts snow and hauls water.	
36	SW.	25	"	"	"	Dug	12	2,005	0	2,005			Glacial clay	Hard	D, S	Intermittent supply; hauls water winter and summer; dry holes 75,87 and 90 feet deep.	
37	SE.	26	"	"	"	Bored	15	2,020	- 5	2,015			Glacial gravel	Hard, "alkaline"	D, S	Only sufficient in wet seasons; uses sloughs and drives cattle in winter.	
38	SE.	28	"	"	"	Dug	13	2,050	0	2,050	10	2,040	Glacial sand	Hard, "alkaline"	D, S	Poor supply; hauls water summer and winter.	
39	SE.	29	"	"	"	Dug	14	2,040	- 4	2,036	8	2,032	Glacial fine sand	Hard, "alkaline"	D, S	Plenty for 40 head stock; also uses a slough for stock; one dry hole 20 feet deep.	
40	NW.	29	"	"	"	Bored	18	2,045	0	2,045			Glacial clay	Hard, "alkaline"	S	Insufficient supply; waters 23 head stock in summer; hauls drinking water.	
41	NE.	30	"	"	"	Dug	20	2,030	- 8	2,022			Glacial gravel	Hard	D, S	Intermittent supply; many wells deliver water unfit for use; hauls water in winter.	
42	SW.	30	"	"	"	Bored	45	2,030	- 25	2,005			Glacial clay	Hard, "alkaline"	D, S	Obtains sufficient water from four similar wells; hauled water previous to 1934; also dry hole 66 feet deep.	
43	SW.	31	"	"	"	Bored	60	2,040	- 40	2,000	40	2,000	Glacial sand and gravel	Hard	D, S	Sufficient supply.	
44	NE.	31	"	"	"	Bored	45	2,050					Glacial drift	Hard	D, S	Sufficient for 25 head stock; numerous intermittent wells.	
45	NW.	34	"	"	"	Drilled	262	2,055	-127	1,928	260	1,795	Glacial gravel	Hard	D, S	Abundant supply for 50 head stock; 5 dry holes to 90 feet. #	
46	NW.	35	"	"	"	Dug	16	2,025	0	2,025	16	2,009	Glacial sand	Hard, "alkaline"	D, S	Good supply for 20 head stock.	

NOTE—All depths, altitudes, heights and elevations given above are in feet.

(D) Domestic; (S) Stock; (I) Irrigation; (M) Municipality; (N) Not used.
(#) Sample taken for analysis.

WELL RECORDS—Rural Municipality of McLEOD NO. 185, SASKATCHEWAN

WELL No.	LOCATION					TYPE OF WELL	DEPTH OF WELL	ALTITUDE WELL (above sea level)	HEIGHT TO WHICH WATER WILL RISE		PRINCIPAL WATER-BEARING BED		CHARACTER OF WATER	TEMP. OF WATER (in °F.)	USE TO WHICH WATER IS PUT	YIELD AND REMARKS
	¼	Sec.	Tp.	Rge.	Mer.				Above (+) Below (-) Surface	Elev.	Depth	Elev.				
47	NW.	36	20	8	2	Dug	15	2,000	- 12	1,988			Glacial drift	Hard, sweet	D, S	Sufficient supply.
1	SE.	2	20	9	2	Dug	18	2,005					Glacial gravel	Hard, "alkaline"	N	Uses slough seepage wells in summer and melts snow in winter.
2	SE.	4	"	"	"	Bored	100	2,025					Glacial drift			Dry hole; uses seepage wells and hauls water in dry years.
3	NW.	4	"	"	"	Bored	36	2,040	- 21	2,019	36	2,004	Glacial gravel	Hard, iron	D, S	Good supply for 20 head stock.
4	NE.	4	"	"	"	Dug	30	2,040	- 28	2,012			Glacial clay	Hard	D	Uses sloughs and hauls water for stock.
5	SE.	5	"	"	"	Dug	33	2,045	- 31	2,014	30	2,015	Glacial sand	Hard, "alkaline"	D, S	Good supply for 20 head stock.
6	SW.	5	"	"	"	Dug	20	2,050	- 8	2,042	18	2,032	Glacial sand	Hard	D, S	Insufficient supply in dry years; hauls water, dry holes 50 feet deep.
7	SE.	6	"	"	"	Dug	38	2,045					Glacial sand and gravel	Hard	D, S	Good supply for 11 head stock.
8	SE.	7	"	"	"	Dug	27	2,045	- 12	2,033			Glacial sand	Hard, yellow colour	D, S	Sufficient for 20 head stock.
9	SE.	8	"	"	"	Dug	30	2,050	- 24	2,026			Glacial drift	Hard, iron, "alkaline"	S	Sufficient for stock; hauls drinking water.
10	NE.	8	"	"	"	Dug	25	2,050	- 13	2,037	13	2,037	Glacial sand	Hard	D, S	Sufficient for 20 head stock.
11	SW.	10	"	"	"	Dug	20	2,030	- 15	2,015	17	2,013	Glacial gravel	Hard	D, S	Also uses a 17-foot well; both of which deliver an insufficient supply for 50 head stock.
12	NW.	11	"	"	"	Bored	67	2,020	- 37	1,983	67	1,953	Glacial sand	Hard	D, S	Sufficient for 500 head stock.
13	SW.	12	"	"	"	Dug	12	2,000	- 9	1,991	9	1,991	Glacial gravel	Hard, iron	S	Sufficient for 35 head stock; 16 dry holes to a depth of 180 feet.
14	NW.	12	"	"	"	Dug	20	2,005	- 15	1,990	15	1,990	Glacial gravel	Hard	D, S	Sufficient for 20 head stock; also uses a 14-foot well; dry holes 35 feet deep.
15	NE.	12	"	"	"	Dug	12	2,010	- 2	2,008	10	2,000	Glacial sand	Hard	D, S	Sufficient for 25 head stock.
16	NE.	13	"	"	"	Bored	60	2,015	- 35	1,980			Glacial drift	Hard, "alkaline"	D, S	Sufficient supply except in 1932.
17	SW.	14	"	"	"	Dug	8	2,020	- 5	2,015	5	2,015	Glacial gravel	Soft	S	Good supply, but well is ½ mile from buildings.
18	SW.	15	"	"	"	Bored	70	2,030	- 30	2,000	50	1,980	Glacial sand	Hard	D, S	Sufficient for 10 head stock.
19	NW.	15	"	"	"	Dug	30	2,030	- 18	2,012	30	2,000	Glacial gravel	Hard	D	Plenty of water.
20	SE.	16	"	"	"	Dug	35	2,030	- 31	1,999			Glacial clay	Hard, "alkaline"	D	Poor supply; hauls water and melts snow in winter.
21	NE.	16	"	"	"	Bored	67	2,025	- 20	2,005	67	1,958	Glacial sand	Hard, iron	D, S	Abundant supply for 10 head stock; dry holes 60 to 70 feet deep.
22	NW.	17	"	"	"	Dug	10	2,015	0	2,015			Glacial gravel	Soft	D, S	A continuous small flow of water.
23	NE.	17	"	"	"	Dug	30	2,015	- 10	2,005	25	1,990	Glacial gravel	Hard, iron	D, S	Good supply for 30 head stock.
24	SE.	18	"	"	"	Dug	28	2,030	- 18	2,012			Glacial gravel	Hard, "alkaline"	D, S	Good supply for 20 head stock.
25	SW.	18	"	"	"	Dug	22	2,030	- 13	2,017	20	2,010	Glacial gravel	Hard	D, S	Sufficient for 15 head stock.
26	NW.	18	"	"	"	Dug	38	2,010					Glacial gravel	Hard	D, S	Slough seepage well; hauled water from 1930 to 1934; melts snow in winter.

NOTE—All depths, altitudes, heights and elevations given above are in feet.

(D) Domestic; (S) Stock; (I) Irrigation; (M) Municipality; (N) Not used.
 (#) Sample taken for analysis.

WELL RECORDS—Rural Municipality of McLEOD NO. 185, SASKATCHEWAN

WELL No.	LOCATION					TYPE OF WELL	DEPTH OF WELL	ALTITUDE WELL (above sea level)	HEIGHT TO WHICH WATER WILL RISE		PRINCIPAL WATER-BEARING BED			CHARACTER OF WATER	TEMP. OF WATER (in °F.)	USE TO WHICH WATER IS PUT	YIELD AND REMARKS
	¼	Sec.	Tp.	Rge.	Mer.				Above (+) Below (-) Surface	Elev.	Depth	Elev.	Geological Horizon				
27	NE.	18	20	9	2	Dug	50	2,010	- 25	1,985			Glacial drift	Hard, "alkaline"	D, S	Intermittent supply; hauled water in drought years.	
28	SE.	19	"	"	"	Dug	40	2,005	- 20	1,985			Glacial gravel	Hard	D, S	Sufficient for 25 head stock; one other similar well; dry holes 25 to 50 feet deep.	
29	SE.	20	"	"	"	Dug	16	2,010	- 12	1,998	12	1,998	Glacial gravel	Soft	D, S, I	Sufficient for 20 head stock; irrigation results are good.	
30	S½.	21	"	"	"	Dug	22	2,027	- 19	2,008			Glacial sand	Hard	D, S, I	A typical well in village of Lemberg; all wells nearly dry in 1933 and 1934; school well yields fairly good supply, 200-foot well never used.	
31	SW.	22	"	"	"	Dug	25	2,020	- 18	2,002	18	2,002	Glacial sand	Hard	D, S	Sufficient for house and few head stock.	
32	NE.	22	"	"	"	Dug	21	2,020	- 13	2,007	13	2,007	Glacial gravel	Hard	D, S	Sufficient for 50 head stock.	
33	SW.	24	"	"	"	Dug	42	2,025	- 22	2,003	42	1,983	Glacial sand and gravel	Hard	D, S	Sufficient for 40 head stock; another similar well with less supply.	
34	SW.	25	"	"	"	Bored	60	2,020	- 40	1,980	60	1,960	Glacial gravel	Hard, "alkaline"	D, S	Good supply for 50 head stock.	
35	SW.	26	"	"	"	Dug	50	2,015	- 30	1,985			Glacial drift	Hard	D, S	Three similar wells and a dam; sufficient water for 25 head stock.	
36	SE.	27	"	"	"	Bored	90	2,010					Glacial drift	Hard	D	Very small supply; owns three wells that do not yield sufficient water.	
37	NW.	27	"	"	"	Dug	30	2,010	- 14	1,996	30	1,980	Glacial sand	Hard	D, S	Good supply for 30 head stock.	
38	SE.	28	"	"	"	Bored	40	2,005	- 15	1,990	40	1,965	Glacial sand	Hard, iron	D, S	Good supply for 20 head stock; also uses a dugout.	
39	NE.	29	"	"	"	Bored	58	1,975	- 20	1,955	58	1,917	Glacial sand	Hard	D, S	Sufficient for 25 head stock.	
40	SW.	30	"	"	"	Dug	22	1,900	- 15	1,885	21	1,879	Glacial fine sand	Hard, "alkaline"	D, S	Good supply for 30 head stock; owns an 85-foot well and a dam.	
41	NE.	32	"	"	"	Dug	8	1,940	- 5	1,935	5	1,935	Glacial sand	Hard	D, S	Good supply for 40 head stock; 7 springs located in the ravine.	
42	SW.	33	"	"	"	Dug	32	1,985	- 15	1,970			Glacial drift	Hard	D, S	Good supply for 15 head stock.	
43	NW.	33	"	"	"	Bored	60	1,970	- 30	1,940			Glacial drift	Hard	D, S	Good supply for 20 head stock.	
44	SW.	34	"	"	"	Bored	61	1,990	- 46	1,944			Glacial drift	Hard, iron	D, S	Plenty for 25 head stock; a 52-foot well used since 1890.	
45	SE.	35	"	"	"	Dug	32	2,005					Glacial drift	Hard	D, S	Insufficient for 40 head stock; uses dam and hauls from section 36.	
46	NW.	35	"	"	"	Bored	38	2,000	- 22	1,978	38	1,962	Glacial sand	Hard, "alkaline"	D, S	Good supply for 35 head stock; one other 28-foot well used.	
47	SE.	36	"	"	"	Dug	20	2,020	- 5	2,015	5	2,015	Glacial gravel	Hard	D, S	Abundant supply.	
48	SW.	36	"	"	"	Bored	40	2,010	- 30	1,980			Glacial sand	Hard, "alkaline"	D, S	Sufficient for 20 head stock; an old well 60 feet deep yielded a good supply.	
1	SE.	1	21	7	2	Bored	30	1,815	- 15	1,800	26	1,789	Glacial sand	Hard, "alkaline"	D, S	Sufficient for 30 head stock.	
2	NE.	5	"	"	"	Dug	14	1,900	- 10	1,890			Glacial sand	Hard	D, S	Sufficient for 40 head stock; also owns a 20-foot well.	
3	NW.	6	"	"	"	Dug	16	2,000	- 13	1,987			Glacial sandy clay	Hard, "alkaline"	D	Intermittent supply; waters stock at a small lake.	
4	SW.	8	"	"	"	Bored	124	1,950					Glacial drift			Dry hole; dugout used for horses and hauls water; another dry hole 105 feet deep.	

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(D) Domestic; (S) Stock; (I) Irrigation; (M) Municipality; (N) Not used.
(#) Sample taken for analysis.

WELL RECORDS—Rural Municipality of McLEOD NO. 185, SASKATCHEWAN

WELL No.	LOCATION					TYPE OF WELL	DEPTH OF WELL	ALTITUDE WELL (above sea level)	HEIGHT TO WHICH WATER WILL RISE		PRINCIPAL WATER-BEARING BED			CHARACTER OF WATER	TEMP. OF WATER (in °F.)	USE TO WHICH WATER IS PUT	YIELD AND REMARKS
	¼	Sec.	Tp.	Rge.	Mer.				Above (+) Below (-) Surface	Elev.	Depth	Elev.	Geological Horizon				
5	SE.	9	21	7	2	Dug	9	1,860	- 3	1,857	6	1,854	Glacial sand	Soft	D, S	Sufficient for 20 head stock.	
6	SE.	10	"	"	"	Dug	10	1,850	- 6	1,844	6	1,844	Glacial sand	Hard	D, S	Sufficient for 35 head stock; an artesian well used for the house.	
7	NW.	11	"	"	"	Dug	22	1,825	- 16	1,809			Glacial sand	Hard	D, S	Plenty of water for 15 head stock; a 12-foot well yields a good supply.	
8	NE.	12	"	"	"	Dug	12	1,750	- 9	1,741	9	1,741	Recent stream sand Glacial sand	Hard, "alkaline" Soft	D, S	Sufficient supply.	
9	NW.	13	"	"	"	Dug	12	1,800	- 10	1,790			Glacial sand	Soft	D, S	Sufficient for 30 head stock.	
10	NE.	14	"	"	"	Dug	6	1,800	- 2	1,798	2	1,798	Glacial sand	Hard, "alkaline"	D, S	Sufficient for 25 head stock; lake is also used for stock.	
11	SE.	15	"	"	"	Dug	20	1,820	- 18	1,802			Glacial sand	Hard	D, S	Intermittent and insufficient for 20 head stock.	
12	NE.	17	"	"	"	Dug	25	1,890	- 19	1,871			Glacial sand	Hard, "alkaline"	D, S	Intermittent supply in 1933 and 1934; waters 25 head stock in average years.	
13	SE.	18	"	"	"	Bored	90	1,950	- 74	1,876			Glacial drift	Hard, "alkaline"	D, S	Insufficient for 35 head stock.	
14	SW.	20	"	"	"	Bored	36	1,940	- 32	1,908	32	1,908	Glacial gravel	Hard, iron	D, S	Sufficient for 15 head stock.	
15	NW.	20	"	"	"	Dug	16	1,950	- 7	1,943	14	1,936	Glacial gravel	Hard	D, S	Over supply for 10 head stock.	
16	SE.	20	"	"	"	Dug	9	1,900	- 6	1,894			Glacial sand and gravel Glacial drift	Hard	D, S	Good supply for 35 head stock; also uses a dam and a 20-foot well.	
17	SW.	28	"	"	"	Dug	18	1,880					Glacial drift			One of several dry holes; hauls all water.	
18	NE.	32	"	"	"	Bored	30	1,880	- 23	1,857	23	1,857	Glacial sand and gravel	Hard, "alkaline"	D, S	Sufficient for 30 head stock.	
19	SW.	33	"	"	"	Dug	34	1,870	- 32	1,838	32	1,838	Glacial sand	Hard, "alkaline"	D	A dam is used for stock purposes.	
20	NE.	33	"	"	"	Dug	30	1,840	- 22	1,818	22	1,818	Glacial gravel	Hard, "alkaline"	D, S	Sufficient for 25 head stock.	
21	NW.	34	"	"	"	Dug	8	1,840	- 5	1,835	5	1,835	Glacial sand	Soft	D	Intermittent supply; creek is used for watering stock.	
22	SW.	35	"	"	"	Dug	40	1,820	- 30	1,790	40	1,780	Glacial sand	Hard, "alkaline"	D, S	Good supply for 15 head stock.	
23	SE.	35	"	"	"	Dug	8	1,810	- 4	1,806	4	1,806	Glacial sand	Hard	D, S	Sufficient for 10 head stock.	
24	SE.	36	"	"	"	Dug	24	1,820	- 15	1,805			Glacial gravel	Hard, "alkaline"	D, S	Sufficient for 25 head stock.	
1	SW.	2	21	8	2	Dug	15	2,050					Glacial drift			Dry hole.	
2	SE.	4	"	"	"	Drilled	395	2,060					Glacial drift			Dry hole; well is in process of being drilled; water is hauled ½ mile.	
3	NE.	4	"	"	"	Drilled	292	2,065					Glacial drift			Dry hole.	
4	NE.	5	"	"	"	Bored	80	2,055	- 50	2,005	80	1,975	Glacial gravel	Hard	D, S	Good supply for 20 head stock.	
5	SW.	6	"	"	"	Bored	30	2,030	- 26	2,002	28	2,002	Glacial sand	Hard	D, S	Sufficient for 25 head stock; 14-foot well yields soft water.	
6	NW.	6	"	"	"	Dug	20	2,020	- 12	2,008	16	2,004	Glacial sand	Soft	D, S	Sufficient for 55 head stock; also uses two sloughs for stock.	
7	NW.	7	"	"	"	Bored	50	2,010	- 20	1,990			Glacial drift	Hard	D, S	Sufficient supply.	

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(#) Sample taken for analysis.

WELL RECORDS—Rural Municipality of McLEOD NO.185, SASKATCHEWAN

WELL No.	LOCATION					TYPE OF WELL	DEPTH OF WELL	ALTITUDE WELL (above sea level)	HEIGHT TO WHICH WATER WILL RISE		PRINCIPAL WATER-BEARING BED			CHARACTER OF WATER	TEMP. OF WATER (in °F.)	USE TO WHICH WATER IS PUT	YIELD AND REMARKS
	¼	Sec.	Tp.	Rge.	Mer.				Above (+) Below (-) Surface	Elev.	Depth	Elev.	Geological Horizon				
8	SW.	9	21	8	2	Dug	20	2,060	- 16	2,044			Glacial sand	Hard	D, S	Insufficient for 16 head stock; uses a dug-out.	
9	NE.	9	"	"	"	Bored	76	2,050	- 46	2,004	75	1,975	Glacial sand	Hard	D, S	Sufficient and constant supply.	
10	NE.	10	"	"	"	Bored	50	2,050	- 47	2,003			Glacial drift	Hard, "alkaline"	D, S	Insufficient for 32 head stock.	
11	NE.	11	"	"	"	Dug	30	2,025					Glacial drift			Dry hole.	
12	SW.	12	"	"	"	Dug	22	2,025	- 18	2,007	21	2,004	Glacial gravel	Hard, "alkaline"	D, S	Intermittent and insufficient for 20 head stock.	
13	NE.	12	"	"	"	Dug	42	2,000	- 30	1,970			Glacial gravel	Hard, "alkaline"	D, S	Sufficient water obtained with a dugout for 40 head stock.	
14	SE.	15	"	"	"	Dug	16	2,040					Glacial drift			Dry hole.	
15	SW.	16	"	"	"	Bored	50	2,055	- 44	2,011	48	2,007	Glacial sand	Hard, iron	S	Sufficient for 25 head stock; hauls drinking water ½ mile.	
16	SW.	17	"	"	"	Bored	45	2,040	- 15	2,025	39	2,001	Glacial gravel	Hard	D, S	Sufficient for 30 head stock.	
17	NW.	17	"	"	"	Dug	26	2,030	0	2,030			Glacial clay	Hard, "alkaline"	D, S	Intermittent supply.	
18	SW.	18	"	"	"	Dug	27	2,000	- 12	1,988	27	1,973	Glacial sand	Hard, "alkaline"	D, S	Sufficient for 30 head stock.	
19	SE.	19	"	"	"	Bored	50	2,015	- 25	1,990			Glacial gravel		D	Sufficient supply; uses dugouts for stock.	
20	NE.	21	"	"	"	Bored	45	2,040	- 30	2,010			Glacial drift	Hard, "alkaline"	D, S	Sufficient for 30 head stock.	
21	SE.	22	"	"	"	Dug	25	2,030	- 22	2,008	21	2,009	Glacial gravel	Hard, "alkaline"	D, S	Sufficient for 30 head stock.	
22	SE.	23	"	"	"	Dug	35	2,020	- 14	2,006	14	2,006	Glacial gravel	Hard, "alkaline"	D, S	Sufficient for 25 head stock; uses sloughs for stock also.	
23	NW.	24	"	"	"	Bored	83	2,010	- 53	1,957			Glacial drift	Hard	D, S	Poor supply; three wells yield sufficient water for 40 head stock.	
24	SE.	24	"	"	"	Bored	18	2,000	- 8	1,992	15	1,985	Glacial gravel	Hard, "alkaline"	D, S	Three wells yield sufficient water for 45 head stock.	
25	SE.	26	"	"	"	Bored	62	2,010					Glacial clay	Hard, "alkaline"	D, S	Intermittent supply.	
26	NW.	26	"	"	"	Bored	40	2,015	- 20	1,995			Glacial drift	Hard	D, S	Sufficient for 20 head stock at least.	
27	SE.	27	"	"	"	Bored	82	2,025	- 42	1,983			Glacial drift	Hard, "alkaline"	D, S	Sufficient water for 20 head stock with the aid of 70-foot well and a dugout. One 50-foot dry hole.	
28	NE.	27	"	"	"	Bored	50	2,020	- 25	1,995			Glacial drift	Hard, iron, sulphur	D, S	Well pumps dry but always returns to the same level.	
29	NE.	28	"	"	"	Dug	21	2,020	- 13	2,007			Glacial sand	Hard	D, S	Sufficient for 30 head stock.	
30	SW.	29	"	"	"	Dug	30	2,005	- 22	1,983			Glacial drift	Hard, "alkaline"	S	One of four intermittent wells; uses 2 dams to water 40 head stock.	
31	SE.	30	"	"	"	Dug	20	2,000	- 14	1,986			Glacial sand	Hard	D, S	Sufficient for 40 head stock.	
32	SE.	31	"	"	"	Dug	22	1,980	- 8	1,972			Glacial drift	Hard	D, S	Sufficient for 50 head stock.	
33	SE.	32	"	"	"	Dug	25	2,010	0	2,010	23	1,987	Glacial sand	Hard	D, S	Three wells deliver sufficient water for 50 head stock.	

NOTE—All depths, altitudes, heights and elevations given above are in feet.

(D) Domestic; (S) Stock; (I) Irrigation; (M) Municipality; (N) Not used.
(#) Sample taken for analysis.

WELL RECORDS—Rural Municipality of McLEOD NO.185, SASKATCHEWAN

WELL No.	LOCATION					TYPE OF WELL	DEPTH OF WELL	ALTITUDE WELL (above sea level)	HEIGHT TO WHICH WATER WILL RISE		PRINCIPAL WATER-BEARING BED			CHARACTER OF WATER	TEMP. OF WATER (in °F.)	USE TO WHICH WATER IS PUT	YIELD AND REMARKS
	¼	Sec.	Tp.	Rge.	Mer.				Above (+) Below (-) Surface	Elev.	Depth	Elev.	Geological Horizon				
34	SW.	34	21	8	2	Bored	43	2,015	- 21	1,994			Glacial drift	Hard	D, S	Sufficient and constant supply for 20 head stock.	
35	NE.	35	"	"	"	Dug	42	1,995	- 22	1,973			Glacial sand	Soft	D, S	Sufficient for 20 head stock.	
36	SW.	36	"	"	"	Bored	60	2,000	- 12	1,988	48	1,952	Glacial fine sand	Hard, "alkaline"	D, S	Sufficient for 65 head stock.	
37	NW.	36	"	"	"	Bored	65	2,000	- 25	1,975	65	1,935	Glacial gravel	Hard, "alkaline"	D, S	Good supply for 40 head stock.	
38	SE.	36	"	"	"	Bored	50	2,000	- 20	1,980	45	1,955	Glacial sand	Hard, iron	D, S	Good supply for 40 head stock.	
1	SE.	1	21	9	2	Bored	22	2,015	- 10	2,005	10	2,005	Glacial gravel	Soft	D, S	Sufficient for 15 head stock.	
2	SE.	2	"	"	"	Bored	50	2,000	- 30	1,970	45	1,955	Glacial sand	Hard, "alkaline"	D, S	Sufficient for 20 head stock.	
3	NW.	2	"	"	"	Bored	28	1,950	- 10	1,940	28	1,922	Glacial gravel	Hard, "alkaline"	D, S	Sufficient for 30 head stock; also uses a dam for stock.	
4	NE.	3	"	"	"	Bored	50	1,950	- 30	1,920	40	1,910	Glacial gravel	Hard, iron	D, S	Uses a 11-foot well and a dam.	
5	SW.	3	"	"	"	Dug	20	1,970	- 16	1,954	16	1,954	Glacial gravel	Hard	D, S	Sufficient for 25 head stock.	
6	SE.	4	"	"	"	Dug	22	1,955	- 19	1,936	20	1,935	Glacial gravel	Hard	D, S	Sufficient for 30 head stock.	
7	NE.	4	"	"	"	Dug	6	1,950	- 4	1,946	4	1,946	Glacial gravel	Hard	D, S	Sufficient for 25 head stock.	
8	SE.	5	"	"	"	Bored	30	1,890	- 20	1,870	25	1,865	Glacial gravel	Hard, "alkaline"	D, S	Good supply for 30 head stock.	
9	SE.	6	"	"	"	Dug	30	1,900	- 20	1,880			Glacial drift	Hard, "alkaline"	D, S	Sufficient for 10 head stock; owns a dugout.	
10	SE.	7	"	"	"	Dug	15	1,905	- 1	1,904	11	1,894	Glacial fine sand	Hard	D, S	Sufficient supply; troubled with sand washing in and shutting off supply.	
11	SE.	7	"	"	"	Bored	48	1,905	- 20	1,885			Glacial drift	Hard, "alkaline" "black"	N	Water is seldom used. #	
12	NW.	7	"	"	"	Drilled	175	1,910	- 75	1,835	175	1,735	Glacial sand	Hard, iron	D, S	Abundant supply.	
13	NE.	7	"	"	"	Drilled	145	1,910	- 70	1,840	145	1,765	Glacial sand	Hard, "alkaline"	D, S	Good supply for 20 head stock.	
14	NW.	10	"	"	"	Dug	20	1,900	- 18	1,882	18	1,882	Glacial gravel	Hard	D, S	Sufficient for 30 head stock; a spring and creek on property.	
15	SE.	10	"	"	"	Bored	52	1,950	- 27	1,923			Glacial drift	Hard, iron, "alkaline"	D	A dam used for watering stock.	
16	NW.	12	"	"	"	Dug	22	1,960	- 15	1,945	20	1,940	Glacial gravel	Hard	D, S	Sufficient for 30 head stock.	
17	SE.	12	"	"	"	Dug	37	2,000	- 31	1,969			Glacial drift	Hard, "alkaline"	D, S	Sufficient for 25 head stock.	
18	SW.	13	"	"	"	Bored	40	1,975	- 30	1,945	35	1,940	Glacial gravel	Hard, "alkaline"	D, S	Sufficient for 15 head stock.	
19	NW.	13	"	"	"	Bored	50	1,960	- 47	1,913			Glacial drift	Hard, "alkaline"	D, S	Sufficient for 20 head stock.	
20	SW.	14	"	"	"	Dug	12	1,900	- 6	1,894			Glacial gravel	Hard, iron	D, S	Insufficient for 25 head stock; a dam conserves runoff water.	
21	NW.	14	"	"	"	Spring		1,890					Glacial drift	Hard	D, S	Sufficient for 40 head stock; another spring and creek on farm.	
22	SE.	17	"	"	"	Bored	40	1,910	- 38	1,872			Glacial drift	Hard, "alkaline"	D, S	Insufficient for 60 head stock; owns a small dam.	

NOTE—All depths, altitudes, heights and elevations given above are in feet.

(D) Domestic; (S) Stock; (I) Irrigation; (M) Municipality; (N) Not used.
 (#) Sample taken for analysis.

WELL RECORDS—Rural Municipality of MOLEOD NO. 185, SASKATCHEWAN

WELL No.	LOCATION					TYPE OF WELL	DEPTH OF WELL	ALTITUDE WELL (above sea level)	HEIGHT TO WHICH WATER WILL RISE		PRINCIPAL WATER-BEARING BED			CHARACTER OF WATER	TEMP. OF WATER (in °F.)	USE TO WHICH WATER IS PUT	YIELD AND REMARKS
	¼	Sec.	Tp.	Rge.	Mer.				Above (+) Below (-) Surface	Elev.	Depth	Elev.	Geological Horizon				
23	NW.	18	21	9	2	Drilled	220	1,910	- 45	1,865	220	1,690	Glacial fine sand	Hard, "alkaline"	S	Abundant supply; a 12-foot well used for the house; owns a dugout.	
24	NW.	20	"	"	"	Bored	32	1,910					Glacial drift			Dry hole.	
25	NE.	21	"	"	"	Drilled	140	1,905	- 50	1,855	135	1,770	Glacial sand	Hard, iron	D, S	Plenty of water for 50 head stock.	
26	SW.	22	"	"	"	Dug	12	1,900	- 7	1,893	7	1,893	Glacial gravel	Hard	D, S	Sufficient for 20 head stock.	
27	NE.	22	"	"	"	Dug	35	1,905					Glacial drift			Dry hole.	
28	SW.	23	"	"	"	Dug	10	1,895	- 5	1,890	5	1,890	Glacial gravel	Hard	D, S	Sufficient for 15 head stock.	
29	SW.	25	"	"	"	Dug	25	1,890	- 20	1,870	20	1,870	Glacial gravel	Hard	D, S	Sufficient for 25 head stock.	
30	NW.	29	"	"	"	Drilled	82	1,910	- 30	1,880	80	1,830	Glacial gravel	Hard	D, S	Sufficient supply.	
31	NE.	29	"	"	"	Bored	48	1,910	- 12	1,898	44	1,866	Glacial sand	Hard, "alkaline"	S	Good supply for 20 head stock; uses shallow well for the house and a dugout.	
32	SE.	30	"	"	"	Dug	30	1,915	- 15	1,900			Glacial drift	Hard, iron	D, S	Sufficient for 30 head stock.	
33	NW.	30	"	"	"	Drilled	200	1,915	- 50	1,860	200	1,715	Glacial sand	Hard, iron	S	Abundant supply; seepage well used for drinking; owns a dugout.	
34	SW.	32	"	"	"	Bored	70	1,915					Glacial drift	Hard, odour	S	Good supply; but water has a peculiar odour.	
35	NW.	33	"	"	"	Drilled	228	1,915	- 28	1,887	220	1,695	Glacial fine sand	Hard, "alkaline"	S	Supply gradually decreased probably due to sand plugging.	
36	NW.	33	"	"	"	Bored	30	1,915					Glacial drift	Hard, "alkaline"	N	Water condemned; owns a large slough; many dry holes made. #	
37	SE.	34	"	"	"	Dug	25	1,910	- 19	1,891	19	1,891	Glacial sand	Hard	D, S	Sufficient supply.	
38	SW.	35	"	"	"	Dug	32	1,905	- 18	1,887	28	1,877	Glacial sand	Hard	D, S	Sufficient for 50 head stock.	
39	SW.	36	"	"	"	Dug	24	1,900	- 18	1,882	20	1,880	Glacial gravel	Hard	D, S	Sufficient for 35 head stock.	
40	NW.	36	"	"	"	Bored	60	1,905	- 57	1,848	57	1,848	Glacial sand	Hard	D	A 6-foot well will water 35 head stock.	

NOTE—All depths, altitudes, heights and elevations given above are in feet.

(D) Domestic; (S) Stock; (I) Irrigation; (M) Municipality; (N) Not used.
(#) Sample taken for analysis.