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BUREAU OF ECONOMIC GEOLOGY
GEOLOGICAL SURVEY

PRELIMINARY REPORT

GROUND-WATER RESOURCES OF THE RURAL MUNICIPALITY OF MONTMARTRE No. 126 SASKATCHEWAN

BY

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

Water Supply Paper No. 76

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CONTENTS

	Page
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.........	12
Water-bearing horizons in the bedrock........................	15
Ground water conditions by townships:	
Township 13, Range 10, west of 2nd meridian.................	16
Township 13, Range 11, west of 2nd meridian.................	18
Township 13, Range 12, west of 2nd meridian.................	21
Township 14, Range 10, west of 2nd meridian.................	23
Township 14, Range 11, west of 2nd meridian.................	25
Township 14, Range 12, west of 2nd meridian.................	28
Township 15, Range 10, west of 2nd meridian.................	30
Township 15, Range 11, west of 2nd meridian.................	32
Township 15, Range 12, west of 2nd meridian.................	34
Township 16, Range 12, west of 2nd meridian.................	36
Statistical summary of well information.........................	39
Analyses and quality of water...................................	40
General statement...	40
Table of analyses of water samples..........................	44
Water from the unconsolidated deposits......................	45
Water from the bedrock......................................	46
Well records..	47

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 MONTMARTRE, NO. 126

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

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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 Montmartre is an area of 333 square miles in the southeastern part of Saskatchewan. It consists of townships 13 and 14, ranges 10, 11, and 12; township 15, range 10; sections 1 to 30 inclusive, township 15, range 11; sections 1 to 33 inclusive, township 15, range 12; and the western half of township 16, range 12, all west of the Second meridian.

The municipality contains the villages of Kendal and Candiac and the town of Montmartre all of which are on the Canadian National railways. The town of Montmartre lies near the centre of the municipality, 53 miles east-southeast of the city of Regina. The Assiniboine Indian Reserve, No. 76, covering an area of 63 square miles, lies immediately north of the municipality.

There are three watercourses in the municipality, all of which have an intermittent flow of water. Waskana creek flows in a southeasterly direction through sec. 6, tp. 13, range 12. Redfox creek flows north towards Qu'Appelle river through township 16, range 12, and Moose Mountain creek flows southeast towards Souris river through the east-central part of the municipality. Waskana Creek valley is comparatively small, but Redfox and Moose Mountain creeks flow in wide, deep valleys that are out of proportion to the size of the present streams and are remnants of what were at one time the main drainage channels in this district, carved out by the water from the melting ice-sheet during the glacial period.

There are three small permanent bodies of surface water. The two Chapleau lakes are located in Moose Mountain Creek valley and are the headwaters of the Moose Mountain Creek drainage system.

They are supplied by springs, and generally hold 3 to 6 feet of water. Marguerite lake, in sec. 31, tp. 16, range 12, is also a spring-fed body of water from 5 to 7 feet deep covering approximately 150 acres. Small, undrained depressions, or sloughs, are numerous in the municipality, but they only hold surface water in the spring or wet seasons. During the drought of 1930 to 1934 these sloughs were dry. Small clumps of poplar trees occur over most of the municipality, and the growth is particularly dense in township 15, range 10, and in the northern part of township 16, range 12.

The municipality is largely mantled with glacial till and glacial moraine. The essential difference between these two types of glacial debris is in their method of deposition rather than in the composition of the deposit. As a rule the topography of a morainic area is hilly and rolling, in comparison to a flat or slightly undulating ground surface of glacial till areas. The top soil in the areas that are mantled by glacial till is usually lighter, sandier, and less stony than the top soil in the areas that are covered by morainic deposits. Along the valley of Moose Mountain creek, the ground surface is very uneven and has been broken up into many ravines and gullies by stream erosion. Small, flat, sandy areas of glacial outwash sands and gravels are scattered throughout the municipality, and a fairly large area of glacial outwash sands and gravels, and glacial lake sands, occurs in township 16, range 12.

Water-bearing Horizons in the Unconsolidated Deposits

An average cross-section of the glacial drift in the eastern three townships would probably reveal 1 to 2 feet of top soil, 10 to 30 feet of yellow clay, a thin bed of sand, and approximately 300 feet of blue clay. Water-bearing horizons of sand or gravel apparently do not exist in the upper 150 feet of the heavy blue clay layer, but they probably do occur at various depths in the lower 150 feet. Only nine wells in these three townships are deeper than 50 feet. Financial reasons have probably caused the farmers to refrain from drilling to the water-bearing horizons that probably occur at depth.

The thin layer of sand that occurs at some places beneath the yellow clay, serves as the aquifer in nearly all the shallow wells. This sand layer depends entirely on rainfall seepage for its supply of water, consequently a prolonged drought, such as was experienced during 1930 to 1934, caused a severe shortage of well water. Farmers have dug numerous dry holes and wells that produced only a paltry supply of water, in an effort to strike a pocket of sand that might yield a good supply of water. Some farmers have difficulty in striking sand at all above the blue clay, whereas others, after many attempts, have finally tapped a pocket of sand that yields sufficient water for about 25 head of stock. Most of the wells cannot be depended upon to yield enough water for 10 to 15 head of stock in dry seasons. The water is hard, but usually is not too highly mineralized for drinking. The valley of Moose Mountain creek is the only locality in the three townships where farmers are reasonably assured of a good water supply at shallow depths. Springs are located along the valley, and, although the creek is intermittent in its flow, these springs furnish pools of water that are used for stock. Chapleau lake is also used as a source of water for stock. Some of the farmers in township 15, range 10, tank from Duncan's spring, located in township 15, range 9. Permanent supplies of water are extremely difficult to locate within 150 feet of the ground surface in these three townships. Six of the deeper wells are over 240 feet deep. Four dry holes were recorded that have been drilled to depths of 200 to 250 feet below the surface.

The water in the deeper wells is hard and mineralized, but the supply is abundant and not easily affected by prolonged drought. They make good stock wells and some of the farmers use the water for drinking and domestic purposes as well. It is believed that water will be obtained within a depth of 240 feet in the glacial drift. Farmers are advised to refrain from drilling into the Marine Shale bedrock.

The water situation in the remainder of the municipality is better. It is difficult, however, to obtain water at shallow depths in township 15, range 11, and in this area farmers usually possess more than one well, each of which supplies a small quantity of water, and by using them all, sufficient water is obtained to meet farm requirements. Many of the shallow wells in township 13, range 11, deliver highly mineralized water that cannot be used for drinking. Many of the deep wells, which range in depth from 100 to 280 feet, produce an abundant and permanent supply of mineralized water. Water-bearing horizons of sand or gravel are of more frequent occurrence in the upper 150 feet of the thick deposit of blue clay in these townships than they are in the three eastern townships. It is quite probable that drilling operations will meet with success in any one of these townships. Farms who desire to obtain water at shallow depths are advised to test with 2-inch augers in various places, and in this manner a lens or pocket of sand or gravel may be tapped with a minimum amount of effort and expense.

An area in townships 13 and 14, range 12, is outlined on the map wherein abundant supplies of highly mineralized water can be obtained within 40 to 100 feet of the surface. The water is under pressure and the yield was affected only slightly by the drought of 1930 to 1934. The water has a laxative effect on humans, but it is not harmful for stock. Farmers experience little difficulty in striking this water by digging or boring. Over the greater part of township 14, range 11, and the northeastern half of township 14, range 12, there appears to be a fairly continuous layer of sand, 2 to 10 feet in thickness. It generally is encountered from 20 to 35 feet below the surface and underlies the yellow clay. The water is not under pressure and rainfall conditions have an influence on the supply. An individual well will usually water 25 to 30 head of stock in dry seasons. The water is fairly highly mineralized, but farmers use it for drinking and household purposes as well as for stock.

Thick deposits of sand and gravel in township 16, range 12, contain abundant supplies of slightly mineralized water that is tapped by wells 15 feet deep. The water in these sand beds originates from rainfall seepage, but the thickness and extent of the sand and gravel is so great that enormous quantities of water can be stored in it, and drought years have only a slight effect on the water level.

In those parts of the municipality where water is difficult to obtain small, deep dugouts provide a good means of obtaining a permanent supply of water for stock use. These dugouts will prove satisfactory if the location is carefully chosen so that a maximum amount of spring run-off can be collected from a large catchment area. The dugout should be at least 12 feet deep.

The undulating ground surface of the municipality offers many locations for the collection of surface water by this method. The ravines can also be dammed and a supply of water retained.

Water-bearing Horizons in the Bedrock

Bedrock of the Marine Shale series was encountered in township 13, range 10, of the municipality. Three wells drilled in the NW.$\frac{1}{4}$, section 16, penetrated a formation described by the well drillers as "soapstone". The description given of this material corresponds to that of the Marine Shale bedrock and there is little doubt that this bedrock was encountered. The deepest drilled hole was 280 feet deep, but the exact point of contact between the drift and the bedrock was not reported. Water was not obtained in any of the three holes drilled. Water is rarely found in this formation in this part of Saskatchewan, and farmers and well drillers are advised to refrain from drilling into it in this municipality. If water is found, it is very probable that it will be so highly mineralized as to be of no use to the farmer.

GROUND WATER CONDITIONS BY TOWNSHIPS

Township 13, Range 10

The central part of the township is mantled by glacial till, and is 15 to 25 feet lower in elevation than the surrounding areas that are covered by moraine. The ground surface of the glacial till-covered district is fairly flat in contrast to the undulating ground surface of the moraine. It is also rather sandy, and a large proportion of it is uncultivated. The moraine-covered country is more stony, contains many large undrained depressions, and is wooded with poplar.

The approximate thickness of the glacial drift has been determined by a dry hole that was drilled in the NW.$\frac{1}{4}$, section 16. "Soapstone" or "joint clay", the local terms applied to the bedrock Marine Shale, is believed to have been entered shortly before the drilling was terminated at a depth of 280 feet from the surface. If this is correct the elevation of the bedrock formation at this point would be approximately 1,880 feet.

An average section of the glacial drift of the area will probably reveal the following deposits, in descending order: 1 to 2 feet of soil, 15 to 35 feet of yellow boulder clay, 1 to 2 feet of sand, and approximately 250 to 300 feet of blue clay, which may or may not contain sand or gravel water-bearing beds at any level. Since there are only five deep drilled wells reported in the township, the extent of any water-bearing horizon in the blue clay has not been determined.

With the possible exception of not more than three wells, all the producing wells in this township are deriving their water supply from the first water-bearing horizon of sand or gravel that overlies the blue clay. This water-bearing horizon depends entirely on the amount of precipitation for its supply of water. Consequently, the prolonged drought of 1930 to 1934 had a pronounced effect on water conditions in this township. The beds of sand or gravel are usually not more than 3 feet thick and their areal extent is very limited, with the result that only small quantities of water can be stored in them. Farmers experience difficulty in striking these sand lenses and frequently the well must be located at an inconvenient distance from the house or barn. Not more than ten shallow wells in the township can be relied upon to each water more than 25 head of stock in dry seasons, and these wells have tapped larger pockets of sand than the other shallow wells in the township. The water is hard, but generally not excessively mineralized. Farmers use it for household and drinking purposes as well as for stock. During the drought at least twenty farmers in the township were forced to haul water winter and summer to meet their requirements. Even in years of average rainfall some farmers are forced to secure water from a source that is not on their own land. Water in dependable and abundant quantities does not seem to exist at depths of less than 40 feet in this township.

Five attempts have been made to secure water by drilling methods, only one being successful. A drilled well, 150 feet deep, located in the SW.$\frac{1}{4}$, section 16, yields an abundant supply of highly mineralized water that is under hydrostatic pressure. The water is suitable for stock, but it has a laxative effect on humans. The supply was not affected to any great degree by the drought. A dry hole, 300 feet deep, was drilled in the NE.$\frac{1}{4}$, section 12, and three dry holes 280 feet deep, in the NW.$\frac{1}{4}$, section 16. It is probable, however, that some drilling operations will meet with success. The drilling should be confined to the glacial drift and farmers are strongly advised to refrain from the expense of drilling into the Marine Shale bedrock. The water that has been obtained from this formation at a few places was too highly mineralized to be of any use to the farmer. Larger quantities of water probably exist in the lower 150 feet of the glacial drift than in the upper 150 feet.

There are very few dugouts in the township and none of them is deep enough to hold a permanent supply of water. Where drilling operations cannot be financed, the excavation of small dugouts, at least 12 feet deep, in suitable locations, is recommended. Many farmers tank water from Moose Mountain creek.

Township 13, Range 11

In the eastern, central, and extreme southern and western parts of the township, the glacial drift is in the form of boulder clay or till plain, whereas in the remainder of the township it is in the form of a moraine. The ground surface of the moraine-covered country is very undulating, almost hilly in some localities, in contrast to the flat or slightly undulating sandy ground surface of the areas that are mantled with till. A long, shallow ravine passes from west to east at the northern borders of sections 7, 8, 9, and 10, and another small ravine traverses sections 23, 14, and 13 in a northwest to southeast direction. The moraine-covered district contains numerous sloughs, and clumps of poplar trees occur throughout the township.

The glacial drift is composed largely of blue clay, which may be struck anywhere in the township at a depth of 30 feet or less below the surface. The blue clay extends to the Marine Shale bedrock, but sand or gravel beds may occur in it at any depth.

The uppermost 30 feet of glacial covering is usually composed of yellow clay and sand or gravel beds. The contact between the glacial blue clay and the bedrock has not been definitely determined in this township, but it is probable that the surface of the Marine shale formation is approximately 1,800 to 1,850 feet above sea-level.

The majority of the wells in the township have been dug or bored to depths of less than 70 feet. The quantity and quality of the water obtained from these shallow wells are extremely variable. The uppermost water-bearing horizon that is tapped by these wells is formed by pockets of sand and gravel, rather than by a continuous, uninterrupted bed. The thickness and extent of a pocket tapped by a well has a direct influence on the supply of water obtained. The source of the water in these pockets is from rainfall seepage, so that seasonal, as well as prolonged drought periods, affects the supply of water in the wells to a considerable extent. If the sand or gravel water-bearing horizon overlies the blue clay, the water from it is not so highly mineralized as it is if the sand or gravel is struck after a layer of blue clay has been penetrated. Blue clay is the chief source of the sulphate salts, and seepage water that comes in contact with it is usually rendered unfit for drinking on account of its laxative effect. Farmers who do not possess drilled wells generally have three or four dug or bored wells, no one of which will supply sufficient water, but by using all the wells sufficient water is obtained for local requirements. Shallow, 10-or 20-foot wells, which derive their water from sand overlying the blue clay, serve as household wells. A few farmers were forced to tank water during the drought of 1930 to 1934. Sand and gravel beds are more readily found at shallow depths in this township than they are in township 13, range 10, but the water obtained is generally highly mineralized. There are at least twelve wells less than 50 feet deep in this township that will yield sufficient water for 30 head of stock even in dry periods.

A second water-bearing horizon has been tapped by three wells in sections 20 and 21, at depths of 100 to 125 feet below the surface. The water is hard and highly mineralized; it is not suitable for drinking, but is being used for watering stock. Two of the wells yield water that is under sufficient pressure to raise it to a point 18 to 30 feet below the surface, whereas the third well, in the SE.$\frac{1}{4}$, section 20, yields water under a slight pressure, and the supply of water in this well was affected by the drought of 1930 to 1934.

A third water-bearing horizon has been located at depths of 160 and 175 feet below the surface by two wells, in the NW.$\frac{1}{4}$, section 20, and the NE.$\frac{1}{4}$, section 32. The supply is abundant and not easily affected by rainfall conditions. The hydrostatic pressure raises the water to a point 40 feet below the surface. The water has a fairly high iron content but is not too highly mineralized to be used for drinking, as well as for stock.

The deepest producing well in the township is 270 feet deep, and it is located in the SW.$\frac{1}{4}$, section 15. The aquifer in this well is believed to lie very near the contact of the glacial drift and the Marine Shale bedrock. The hydrostatic pressure raises the water to a point 35 feet below the surface, and the supply is abundant. The water contains a high content of magnesium sulphate and sodium sulphate, which renders it unfit for drinking, and the farmer reports that his stock are injuriously affected by the high salt content. Springs that yield a small supply of water are occasionally found in the ravines.

Dry holes have been bored and drilled to a maximum depth of 300 feet in the township, so that no continuous water-bearing horizon occurs throughout the entire township. If drilling operations are contemplated it is advised that the well be made at least 150 feet deep, and not more than 250 to 300 feet deep. Drilling into the Marine shale bedrock or "soapstone", is not advised. Numerous sloughs and ravines offer locations for the excavation of deep dugouts and the construction of small dams.

Township 13, Range 12

The entire township, with the exception of the northeastern and southwestern parts, is mantled with glacial till. Section 36 and parts of sections 25 and 35, are covered by moraine, and the southwestern corner of the township is covered mainly by glacial moraine, and glacial outwash sands and gravels. Waskana creek, an intermittent stream at this point, flows in a southeasterly direction diagonally across section 6. Surface elevations become lower gradually in a southwesterly direction, from an elevation of 2,190 feet at the northeastern corner to an elevation of 2,100 feet in sections 5 and 7. The surface then declines rather abruptly to 2,040 feet at Waskana creek. The gradual decrease in elevation has a direct influence on well water conditions in the township. The ground surface is undulating and small clumps of poplar trees occur throughout the township.

During times of retreat and advance of the continental ice-sheet immense quantities of water from the glacier flowed in a southwesterly direction towards the Regina Lake basin that lies to the southwest of this township. As a result, beds of sand and gravel were laid down in a tongue-like arrangement within the upper 90 feet of the glacial drift in the central and western parts of this township.

These deposits extend southeasterly and northwesterly into those parts of the two adjacent rural municipalities underlain by the belt of glacial till that borders the moraine on the southwest. The approximate location of these sand and gravel beds is shown, bounded by the "A" line, on the accompanying map.

Due to the existence of the sand and gravel beds described above, the majority of farmers in the township have had little difficulty in obtaining a permanent supply of water, and very few dry holes have been dug in the area. The source of the water is from the highland area to the northeast of the township and the southwesterly gradient of the aquifer results in the water being under a slight hydrostatic pressure. In most of the wells, the water rises halfway up the well, whereas in others it rises to a point 15 feet below the surface. The quality of the water is similar in all these wells, which is further evidence that the sand beds are fairly continuous and that the water comes from a common source. The farmers describe it as being hard, "alkaline", and containing iron. The water imparts a harsh laxative effect to strangers, but it is being used by the farmers themselves for drinking as well as for stock. The drought of 1930 to 1934 had a slight effect on the water supply, but generally an individual well will water at least 50 head of stock at all times.

To the northeast of this area, water is readily obtained, but is not under pressure. A well in the NW.$\frac{1}{4}$, section 36, 80 feet deep, which contains water under pressure, has probably tapped a gravel pocket.

There are no wells deeper than 100 feet in this township, hence the thickness of the glacial drift is not known. It is believed, however, that the surface of the bedrock Marine Shale series lies at about the same elevation as in the adjoining townships, i.e., approximately 1,850 feet above sea-level.

A permanent supply of highly mineralized water, suitable for stock purposes, can be obtained readily within 90 feet of the surface over the greater part of this township, but good drinking water is scarce.

Township 14, Range 10

Part of the eastern Chapleau lake lies in sections 19 and 20. It is a permanent body of water, 3 feet to 4 feet deep, that is fed by springs. The water level of this lake decreased only slightly during the drought of 1930 to 1934. The Chapleau lakes are the headwaters of Moose Mountain creek, which flows intermittently in a southeasterly direction through this township. The valley that contains the lake and the creek is wide and the banks slope up gradually to the plain level. The land surface, from the northern boundary of the township to within approximately 1 mile of the valley, is approximately 2,250 feet in elevation. It then drops rather abruptly to an elevation of 2,200 feet, and is quite flat until the valley is reached. South of the valley, the elevation increases gradually from 2,150 to 2,170 feet, and the ground surface is slightly undulating. The valley marks the site of a former stream channel in which enormous quantities of water from the melting ice front were drained off to Souris river. The valley is not wooded or cultivated, but the remainder of the township contains many scattered clumps of poplar. The top soil in sections 7 and 18 is sandy. Four large, deep ravines are located on the north side of Moose Mountain creek; they contain water only in the freshet season.

A strip of glacial till, 1 to 2 miles wide, follows the course of Moose Mountain Creek valley and separates two areas of glacial moraine. A small area of glacial outwash sands and gravels occurs in sections 15 and 16. The glacial drift is usually composed of 15 to 40 feet of yellow clay, underlain by approximately 300 to 350 feet of blue clay. The elevation of the Marine Shale bedrock, which immediately underlies the glacial drift, is not definitely known, but it is believed that it lies at an approximate elevation of 1,850 feet. The producing wells in the township all draw their supplies from water-bearing horizons in the glacial drift.

The uppermost water-bearing horizon is usually composed of sand generally located between the yellow clay and the blue clay. Wells that tap this aquifer deliver an exceedingly variable supply of water. Farmers have usually dug numerous wells, 20 to 40 feet deep, before a satisfactory water supply is obtained and a few farmers have been unable, as yet, to secure a permanent supply by shallow dug wells. The sand, therefore, occurs in pockets rather than in a continuous, uninterrupted bed, and the thickness and extent of the pocket encountered determines the quantity of water available. The water supply in this upper layer of sand also depends to a great extent on rainfall seepage. A number of shallow wells located in the till covered lowlands in the valley of Moose Mountain creek yield abundant supplies of water. A well, 45 feet deep, in the SE.$\frac{1}{4}$, section 15, yields an abundance of water which is under a slight pressure, and the drought has had no apparent effect on the supply. Those farmers who do not own deep producing wells, and whose shallow wells yielded an insufficient supply during the drought of 1930 to 1934, were forced to tank water, generally from Moose Mountain creek or Chapleau lake.

Three drilled wells have tapped a second water-bearing horizon, at depths of 200 to 260 feet from the surface. The water is under a high hydrostatic pressure and rises to a point

40 feet below the surface. The water is hard, highly mineralized, and contains iron. It is unfit for humans because of its laxative effect, but it is suitable for stock. The supply is abundant and is not readily diminished by deficiency of rainfall. A farmer in the SW.$\frac{1}{4}$, section 23, drilled two holes, 200 and 350 feet deep, without striking water. Many dry holes have been dug and bored to depths ranging from 60 to 150 feet.

As a whole, the drought of 1930 to 1934 did not cause such a serious shortage of water in this township as it did in the township lying immediately to the south. Moose Mountain valley with its lake and springs has been of great value to many farmers as a source of water for stock. Even though there are a number of good producing shallow wells in this township, as a rule, much time, labour, and money were spent before they were found. In spite of the fact that the farmer in section 23 did not strike water in 200-foot and 350-foot holes, it is believed that drilling elsewhere to depths of at least 200 feet will probably meet with success. Drilling operations should be confined to the glacial drift, however, and if the Marine Shale bedrock or "soapstone", is reached and water is not encountered, drilling in that particular hole should be discontinued. The village of Candiac, with a population of approximately 100, has no reliable source of water. It is reported that twenty dry holes have been made, from 20 to 80 feet in depth, and there are, at present, about ten wells in the village that yield an intermittent supply of "alkaline" water, so that water is generally obtained from wells on neighbouring farms.

Township 14, Range 11

The western part of the eastern Chapleau lake is in sections 25 and 26, and a small intermittent creek passes through sections 26, 27, 28, 29, and 30, and carries the surplus water from western Chapleau lake into eastern Chapleau lake. This valley is approximately 50 feet lower than the surrounding plain. The ground surface of the plain is undulating and has an approximate elevation of 2,200 feet. Small clumps of poplar trees occur throughout the township, and large sloughs also occur. A flat, marshy area is located in section 13 and part of sections 14 and 23.

The northern part of the township is mantled by glacial till with small patches of glacial outwash sands and gravels occurring adjacent to the creek. The remainder of the township is mantled by a portion of a moraine. The upper 5 to 40 feet of glacial covering is composed of yellow clay. Beneath the yellow clay, beds of sand or gravel are almost certain to be found. The thickness of these porous beds is from 2 to 20 feet, and farmers have very little difficulty in striking them when they dig a well. Blue clay is located beneath the sand and extends to a depth of at least 260 feet. The blue clay also contains layers of sand and gravel 150 feet or more below the surface. The total thickness of the glacial deposit has not been established by any well in this township. It probably does not exceed a thickness of 350 feet, judging from bedrock contacts established by wells in the adjacent townships.

Most of the wells in the township have been dug or bored to the water-bearing horizon that is formed by the deposits of sand underlying the yellow clay. This sand bed is apparently extensive and more or less continuous over the southeastern and central parts of the township. The supply of water derived from this horizon, although limited, is good. The water is not under pressure, and the drought of 1930 to 1934 affected the supply to a slight extent. In general, an individual well will water 30 head of stock. In places where a single well does not yield a sufficient supply, the farmer has dug two or three wells and by using them all he obtains enough water for his requirements. The water is hard and generally "alkaline", but the farmers use it for drinking, as well as for stock. Due to the fact that good supplies of water are readily obtained by shallow digging, the water situation in this township has been comparatively good and very little water has been hauled.

The northern part of the township contains five drilled wells, all of which produce an abundant supply of water. Three of the five wells tap an aquifer at depths of 150 to 180 feet below the surface, and the other two have been drilled to a depth of 245 and 260 feet from the surface. The 245-foot well, in the town of Montmartre, struck a water-bearing horizon at 174 feet from the surface, so that it is probable that these two water-bearing horizons are at least continuous through the northern part of this township. The water is under pressure and the supply has not been altered to any material extent by the prolonged drought. With one exception, the water is hard and mineralized. The details pertaining to the log of Montmartre well are as follows:

Elevation of the well - 2,205 feet

Thickness, feet	Character of Material Penetrated
4	Surface soil
6	Yellow clay
154	Blue clay
10	Yellow clay
6	Fine sand - water - $1\frac{1}{2}$ gallons an hour
39	Yellow clay
2	Hardpan
4	Fine sand - small supply of water
12	Blue clay
5	Coarse sand - water - 8 gallons a minute
3	Blue clay

Total depth of well - 245 feet.

The water rises to a point 197 feet below the surface and continual pumping by a gas engine for 96 hours could not lower the water level. The Canadian National Railways has built a dam across the valley in section 27, which holds back a body of water approximately 30 feet deep. This water is pumped into the town of Montmartre where it is used for locomotives.

Springs are of frequent occurrence at the lake and along the valley. Water conservation projects are not necessary in this township

Township 14, Range 12

The southwestern part of western Chapleau lake occurs in sections 35 and 36. The valley in which this lake lies is approximately one-quarter mile wide and 50 feet lower than the plain level. The lake marks the extreme northwestern limit of the Moose Mountain Creek drainage system. It is spring fed and holds 3 to 5 feet of water. The lake did not become dry during the drought of 1930 to 1934 although the water level was lowered.

A large portion of the southwestern part of the township is mantled by glacial till and the land surface is not so rough and rolling as it is in the remainder of the township, which is covered by moraine except for a small area, in the vicinity of Chapleau lake that is covered with glacial till and glacial outwash sands and gravels. Large, deep, undrained depressions are numerous in the moraine-covered district, and small clumps of scrub poplar occur over the whole township. The elevation of the land surface decreases in a southwesterly direction from 2,200 feet near Chapleau lake, to 2,150 feet at the southwestern corner of the township.

A continuation of the area shown in township 13, range 12, in which ground water acting under pressure can be obtained at comparatively shallow depths, occurs in the southwestern part of this township. The sand beds that form this aquifer are struck at depths of 50 to 100 feet below the surface, and the hydrostatic pressure is variable. In one well the water may rise only a few feet above the top of the aquifer, whereas in another it will rise to a point 20 feet below the surface. The water is described as being hard, "alkaline", and containing iron. The laxative effect imparted by thi water makes it unsuitable for drinking, but the salt content is not so high as to render the water unsuitable for stock.

In the moraine-covered country, in the central and northwestern parts of the township, the wells are not so deep, varying from 14 to 35 feet in depth. The horizon tapped in these areas is composed of either sand or gravel, and usually underlies the yellow clay and separates it from the thick layer of blue clay that probably extends to the bedrock. Farmers do not experience undue difficulty in striking sand at shallow depths, and the amount of water obtained is proportional to the thickness and extent of the sand layer tapped. Usually the supply is sufficient for 25 head of stock, but the drought of 1930 to 1934 has lowered the water level in these shallow wells. The water is hard and mineralized, but farmers use it for drinking as well as for stock.

A second water-bearing horizon was tapped by a drilled well in the NE.$\frac{1}{4}$, section 11, at a depth of 112 feet below the surface. The aquifer is coarse sand and the water rises under pressure to a point 40 feet below the surface. The supply has not been noticeably affected by the drought and the water is hard and contains a high iron content, but it was not described as being "alkaline". It is being used for drinking as well as for stock. A bored well, 150 feet deep, in the NW.$\frac{1}{4}$, section 6, taps a water-bearing horizon composed of sand that delivers the same type of water. The drought has lowered the water level from 75 feet to 100 feet in this well. Bedrock was not reached in this, the deepest well in the township, and, consequently, the thickness of the glacial drift is not definitely known. It is believed the drift is about 350 feet thick. Water-bearing horizons are almost certain to occur in the blue clay between 150 feet from the surface and the base of the glacial deposit.

Very few dry holes were reported in this township and apparently substantial supplies of water are not difficult to locate either by digging and boring or by drilling methods. The ground surface is favourable for dugout excavation. The existence of springs in the vicinity of thelake produces a permanent body of surface water that is suitable for stock.

Township 15, Range 10

The entire township is mantled by a portion of a moraine, the surface of which is undulating in character with a gradual rise in elevation from the eastern to the western boundary of approximately 75 feet. The northern 4 miles of the township is heavily bushed with poplar. A very small part of the northwestern quarter of the township is cleared and cultivated. Shallow sloughs are fairly numerous, but they have not held much water during the drought. The glacial drift is estimated to be at least 350 feet thick and to be largely composed of blue clay. A layer of yellow clay, containing pockets of sand or gravel, composes the upper 30 feet, or less, of glacial drift, and blue clay is struck anywhere in the township immediately beneath, at an average depth of 30 feet below the surface. This blue clay at places is 300 feet in thickness and extends to the top of the Marine Shale bedrock. The presence of sand or gravel beds in it are of very rare occurrence.

The majority of the wells in the township have been dug to encounter pockets of sand or gravel that lie within 30 feet of the ground surface. The supply of water in these wells depends entirely on rainfall seepage, and the drought of 1930 to 1934 caused a severe shortage of well water for most farmers in this township. Fifteen of the thirty farmers interviewed, who have shallow wells, were forced to tank water during the drought, but the remainder usually had a sufficient, but not an abundant, supply of water to meet their farm requirements. There are not more than six wells, less than 30 feet in depth that can be depended upon to yield sufficient water for 25 head of stock. Some farmers experience difficulty in striking any sand at all above the blue clay, whereas others may strike thick beds of sand that contain only a paltry supply of water. One farmer, in the NE.$\frac{1}{4}$, section 20, has dug and tested for a water supply for the past fifty-two years, to a maximum depth of 115 feet, without success. Within the southern 4 miles of this township, unless water is found within 35 feet of the surface it will not be found until a minimum depth of 200 to 250 feet is reached. There are numerous dry holes within this range to corroborate this statement. In this district three wells, 243, 309, and 346 feet deep, were drilled through solid blue clay from within 30 feet of the surface until the sand aquifer was reached. The water in these deep wells is hard and highly mineralized, and the water from the 243-foot well can only be used for stock. The hydrostatic pressure raises the water to a point 150 to 160 feet below the surface, and the supply is abundant and not easily affected by prolonged drought.

In sections 34 and 36, a water-bearing horizon was located by two wells at depths of 80 and 90 feet, respectively, from the surface. The water is under pressure and the quality is such that it can be used for drinking as well as for stock. It was not described as being "alkaline". The supply is abundant and is not easily affected by variations in yearly rainfall. This water-bearing horizon is confined to the northern sections of the township.

Farmers in search of water at shallow depths are advised to use testing augers as a means of locating a sand or gravel pocket within the upper 30 to 40 feet of glacial drift. Where testing to shallow depths does not meet with success and deep drilling operations cannot be financed, the only means of securing a substantial supply of water is to excavate a small dugout, at least 12 feet deep, in a suitable locality, and in this manner snow and rain water can be collected and stored for stock use. The dugout will be much more satisfactory if it is deep and small rather than if it is shallow and large.

Township 15, Range 11

The northern six sections of this township are part of the Assiniboine Indian Reserve, No. 76, and their water conditions are not discussed in this report. The northeastern half of the township is mantled by part of a moraine, the ground surface of which is more undulating and hilly than the southwestern half of the township, which is covered with glacial till. A small flat, sandy area of glacial outwash sands and gravels occurs in sections 19 and 20. Sections 24, 25, 26, and 27 are heavily wooded with poplar.

The deepest well is 280 feet and does not penetrate the Marine Shale bedrock. The bedrock probably lies at an approximate elevation of 1,850 feet, and if so, the thickness of the glacial drift is approximately 400 feet.

The initial 10 to 40 feet of glacial covering consists of yellow clay, sand, and gravel. Red clay was reported in the NW.$\frac{1}{4}$, section 20, instead of the usual yellow clay. Glacial blue clay is struck at a maximum depth of 40 feet from the surface anywhere in the township, and it probably extends to the bedrock. Layers of sand or gravel may lie within it at any level.

The present well water condition of this township is described as being spotty or patchy. Within the upper 100 feet of glacial drift the deposits of sand or gravel lie in lenses or pockets rather than in continuous layers of considerable extent. This pocket arrangement of the water-bearing deposits gives rise to the condition where a farmer in one section will bore to a depth of 80 feet and strike an abundant supply of water, whereas, the farmer in the adjacent section may bore a number of holes 100 to 150 feet deep and not encounter any supply of water. No definite statement can be made as to the possibilities of striking water within the initial 100 feet of glacial drift. For instance, the farmer on section 30 declares he can obtain abundant supplies of water at shallow depths anywhere on his land, whereas in section 16, water in any quantity is difficult to locate within 100 feet of the surface. A 12-foot well in the NW.$\frac{1}{4}$, section 22, yields an abundant supply of water and many farmers tank water for both stock and domestic use from this well, whereas a 90-foot well in the section to the south yields a very poor supply. The quality of the water in the wells is just as variable as the quantity. Water has been located at comparatively shallow depths that is too "alkaline" and salty for stock use, wheras some wells yield good drinking water for either man or stock. Before digging a shallow well, it is advised that tests be made with a 2-inch auger, and in that manner a large pocket of sand may be tapped at a small expense.

It is almost certain that a permanent supply of water can be encountered at depths of at least 150 feet. It was pointed out in the discussion of township 14, range 11, that there were two known water-bearing horizons, located at approximately 150 feet and 250 feet from the surface, in the vicinity of Montmartre. The four drilled wells in this township apparently show that these water-bearing horizons extend northwards into this township. Two of these wells are 261 and 280 feet deep and the other two wells are 140 and 180 feet deep. The hydrostatic pressure causes the water to rise a considerable distance in all four wells. With the exception of the water from the 180-foot well, which is too bitter for human use, the water in the other three wells, although mineralized, is being used for drinking. The abundant supply of water from these drilled wells was not appreciably decreased by the drought of 1930 to 1934. Drilling operations are to be favoured over the boring method in this township. Farmers are advised to confine their efforts to the glacial drift. The Marine Shale bedrock, or "soapstone" as it is frequently termed, lies at an approximate depth of 350 to 400 feet from the surface, and when water is found in this formation it is usually too highly mineralized to be of any use to the farmer.

Township 15, Range 12

Sections 34, 35, and 36 are located in the Assiniboine Indian Reserve, No. 76, and they do not enter into the discussion of this township. The greater part of western Chapleau lake lies in sections 2, 10, 11, and 15, and the headwaters of Redfox creek, an intermittent stream, are located in section 33. The valley that contains Chapleau lakes and Moose Mountain creek continues northwestward and links up with the valley of Redfox creek. Redfox creek flows north and the divide between the two drainage systems occurs in section 28. The land surface in the vicinity of the valley is exceedingly rough, and is broken by many ravines and gullies. The surface in the remainder of the township is very undulating. Sloughs are numerous and small clumps of poplar bush are scattered over the township, becoming more dense towards the northeast.

The extreme western and southwestern parts of the township are covered by part of a moraine. Sections 32 and 33 contain deposits of glacial lake sands and glacial outwash gravels and sands. The remainder of the township is covered with glacial till. The elevation of the Marine Shale bedrock is approximately 1,850 feet, so that the thickness of the glacial drift varies from 300 to 400 feet. The deepest drilled well is only 130 feet, but it is probable that except for a top covering of 10 to 40 feet of yellow clay, sand, and gravel, the remainder of the glacial drift is composed largely of blue clay containing beds of sand and gravel. Except for the one well drilled in section 30, all the producing wells in this township have been dug or bored from 7 to 90 feet deep, and the supply in most of them has been decreased considerably by the drought of 1930 to 1934. Farmers do not experience difficulty in striking sand or gravel in their drilling operations, but the supply of water delivered by the aquifer is extremely variable. The sand and gravel have apparently been deposited in the form of lenses or pockets rather than in a continuous bed, or layer, and the size, and thickness of the deposit, and the point at which the well taps the pocket, are factors that determine the supply of water obtained. Shallow wells 28 to 40 feet deep, located in the NE.$\frac{1}{4}$, section 6, SE.$\frac{1}{4}$, section 8, and NW.$\frac{1}{4}$, section 18, yield water that is under a slight hydrostatic pressure, whereas a few 60-to 80-foot wells deliver small supplies of water that is not under pressure. The average well in this township will not water more than 20 head of stock in dry seasons.

The 130-foot drilled well is deriving its supply of water from an 8-foot gravel bed, and the hydrostatic pressure is sufficient to raise the water to a point 10 feet below the surface. The water is hard and not too highly mineralized to prohibit its use for drinking. The drought has caused no noticeable decrease in the supply. Deep drilling operations are advised as a means of obtaining a permanent water supply, rather than boring methods. Abundant supplies of water should be easily obtained by shallow digging in the glacial lake sands and glacial outwash sands in sections 32 and 33. Ideal locations for dugout excavation exist in the glacial till and glacial moraine covered districts of the township. Tests for a good supply of water at shallow depths should be made with 2-inch augers, and in this manner a large pocket of sand or gravel may be located with a minimum amount of work and expense.

The village of Kendal derives its supply of water from a number of 30- to 65-foot wells, each well delivering a small amount of water.

Township 16, Range 12

The discussion of this township covers only the western eighteen sections, the remainder falling within the area occupied by Assiniboine Indian Reserve, No. 76. Redfox creek flows in a northeasterly direction through sections 4, 9, 16, 21, 29, 32, and 33. This creek flows in the freshet season and open patches of water along its course mark the locations of springs during the summer and autumn when the continual flow of the creek ceases. Redfox creek is a tributary of Qu'Appelle river. In the southern part of the township the valley of this creek is narrow and shallow but it increases in size towards the north attaining a width of approximately $\frac{1}{4}$ to $\frac{1}{2}$ mile and a depth of about 100 feet. Marguerite lake covers an area approximately 150 acres in section 30. It is a permanent body of water, about 7 feet deep, fed by springs.

The southern sections have an undulating topography, but in the north the ground surface is very hilly and rough. Large undrained depressions are of numerous occurrence and tree growth is particularly dense in the north of the township.

A strip of glacial lake sands that were deposited by an old glacial lake, which once extended westward to the Strawberry lakes region, occurs in this township. An area of glacial outwash sands and gravels occurs adjacent to the lake sands. The remainder of the township is mantled by glacial till and moraine.

In the glacial till and moraine covered districts yellow clay 10 to 35 feet thick occurs beneath the top soil and is underlain by blue clay. Beds of sand or gravel are usually found separating the yellow clay from the blue clay, but in a well in the SE.$\frac{1}{4}$, section 32, 57 feet of blue clay was penetrated before the aquifer was located. The water in these wells is hard and highly mineralized, and the deeper wells usually contain water that is under a slight hydrostatic pressure.

In the areas that are covered by glacial outwash and glacial lake sands, sand and gravel occur directly beneath the top soil without any occurrence of yellow clay. These large deposits of sand and gravel act as reservoirs for the storage of rainfall seepage. As a result, water can be located anywhere in this district by the simple expedient of driving a sand-point or digging to a depth of 10 to 12 feet in the sand. The water, since it does not come into contact with either yellow or blue clay, does not contain a high dissolved content of mineral salts, and it is described as being medium hard to soft, and "non-alkaline". The supply of water is abundant and the drought of 1930 to 1934 has not lowered the water level in the wells to any appreciable extent.

The water condition of this township is good and all the farmers have a sufficient supply of water, or they are able to get it within short distances of their farms. Numerous locations are available in the glacial till and moraine covered areas for the excavation of deep dugouts, and it is very probable that supplies of water can be obtained by drilling to depths of at least 130 feet. Springs are numerous in the valley of Redfox creek, and Marguerite lake is a permanent body of surface water.

STATISTICAL SUMMARY OF WELL INFORMATION IN RURAL
MUNICIPALITY OF MONTMARTRE, NO. 126, SASKATCHEWAN

Township	13	13	15	14	14	14	15	15	15	16	Total No. in Muni-
West of 2nd meridian Range	10	11	12	10	11	12	10	11	12	12	cipality
Total No. of Wells in Township	195	113	80	381	75	54	233	148	59	14	1352
No. of wells in bedrock	3	0	0	0	0	0	0	0	0	0	3
No. of wells in glacial drift	192	113	80	381	75	54	233	148	59	14	1349
No. of wells in alluvium	0	0	0	0	0	0	0	0	0	0	0
Permanency of Water Supply											
No. with permanent supply	41	59	61	61	55	46	46	48	32	13	462
No. with intermittent supply	5	7	2	15	7	3	12	5	5	0	61
No. dry holes	149	47	17	305	13	5	175	95	22	1	829
Types of Wells											
No. of flowing artesian wells	0	0	0	0	0	0	0	0	0	0	0
No. of non-flowing artesian wells	2	9	24	5	11	18	5	6	7	2	89
No. of non-artesian wells	44	57	39	71	51	31	53	47	30	11	434
Quality of Water											
No. with hard water	44	60	62	71	58	44	52	46	30	6	473
No. with soft water	2	6	1	5	4	5	6	7	7	7	50
No. with salty water	0	2	5	0	0	0	0	1	0	0	8
No. with "alkaline" water	9	16	33	17	10	19	8	12	10	2	136
Depths of Wells											
No. from 0 to 50 feet deep	190	85	37	337	65	31	185	103	48	13	1094
No. from 51 to 100 feet deep	0	15	40	36	5	20	38	41	10	1	206
No. from 101 to 150 feet deep	1	6	3	2	1	3	7	1	1	0	25
No. from 151 to 200 feet deep	0	2	0	1	2	0	0	1	0	0	6
No. from 201 to 500 feet deep	4	5	0	5	2	0	3	2	0	0	21
No. from 501 to 1,000 feet deep	0	0	0	0	0	0	0	0	0	0	0
No. over 1,000 feet deep	0	0	0	0	0	0	0	0	0	0	0
How the Water is Used											
No. usable for domestic purposes	40	48	39	64	45	40	40	36	34	11	397
No. not usable for domestic purposes	6	18	24	12	17	9	18	17	3	2	126
No. usable for stock	43	63	48	75	59	47	56	47	37	12	487
No. not usable for stock	3	3	15	1	3	2	2	6	0	1	36
Sufficiency of Water Supply											
No. sufficient for domestic needs	40	59	58	61	54	45	46	46	32	13	454
No. insufficient for domestic needs	6	7	5	15	8	4	12	7	5	0	69
No. sufficient for stock needs	23	42	51	40	31	33	35	27	27	13	322
No. insufficient for stock needs	23	24	12	36	31	16	23	26	10	0	201

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 harness 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 Montmartre, No. 126, Saskatchewan

LOCATION						Depth of well, Ft.	Total dis'vd solids	HARDNESS			CONSTITUENTS AS ANALYSED						CONSTITUENTS AS CALCULATED IN ASSUMED COMBINATIONS										Source of Water
No.	Qtr.	Sec.	Tp.	Rge.	Mer.			Total	Perm.	Temp.	Cl.	alka-linity	CaO	MgO	SO_4	Na_2O	Solids	$CaCO_3$	$CaSO_4$	$MgCO_3$	$MgSO_4$	Na_2CO_3	Na_2SO_4	NaCl	$CaCl_2$	
1	SW.	15	13	11	2	270	1,960	1,050	1,050		36	415	210	205	1,091	444	1,980	376		33	563		949	59		* 1
2	SE.	20	14	11	2	48	260	280	230	50	5	170	30	54	66	36	254	54		98	21		73	8		* 1
3	NE.	33	14	11	2	245	1,163											(3)	(1)		(2)		(4)		(5)	* 1
4	SW.	14	15	11	2	40	1,449												(2)		(4)	(3)	(1)	(5)		* 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 ($CaCO_3$).

Analyses Nos. 3 and 4, by Provincial Analyst, Regina;

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

Water from the Unconsolidated Deposits

The four samples of water that have been analysed have all been taken from wells that are deriving water from the glacial drift. The first and third samples come from comparatively deep wells and the second and fourth samples were taken from shallow wells. In general, the deeper the well, the higher will be the total dissolved mineral salt content.

The main constituents forming the total dissolved solid content of these four samples are the sulphates of magnesium, sodium, and calcium, and this content causes them to be termed sulphate waters. Sulphate water is of very common occurrence in the glacial drift of southern Saskatchewan. Generally, the amount of the combined solids of magnesium sulphate and sodium sulphate determines whether the water is drinkable or non-drinkable, on account of the high laxative properties of these two salts. None of these four samples has an excessively high sulphate content, although sample 1, with a combined Epsom salts and Glauber's salt content of 1,532 parts per million, would cause a harsh laxative affect and is unfit for drinking and for stock. The farmer who owns this well declares that the water has killed two of his horses and it also makes his stock sick. It is very doubtful if the water alone would cause this misfortune, even though it is very hard and the sulphate content is fairly high. Water that has fatal effects on stock and horses usually contains an excess of 4,000 to 5,000 parts per million of total mineral solids. The water from the deep well at Montmartre has a total dissolved solid content of 1,163 parts per million. The water from the second, third, and fourth wells in the analysis sheet is being used by humans for drinking purposes without any noticeably ill effects.

It would be very difficult to find better water, especially in the southern part of Saskatchewan, than that which is found in well No. 2.

A sample of the water from one of the 40-to 90-foot, non-flowing artesian wells found in townships 13 and 14, range 12, was analysed and the results are given in a report for the municipality of Fillmore. The total dissolved solid content is approximately 2,000 parts per million and the main salt is sodium sulphate.

Perhaps the best water for drinking in this municipality is obtained from the thick deposits of sand and gravel located in township 16, range 12. This water does not come into contact with the clays of the glacial drift, and, consequently, the total dissolved solid content is low. Since the sand occurs directly beneath the top soil, care must be taken by farmers that wells do not become contaminated by refuse of animal origin. The water from the shallow 20-to-40-foot wells is 1 degree to 3 degrees colder than water from the 200-to-300-foot wells.

Water from the Bedrock

There are no wells in this municipality that are producing water from the Marine Shale bedrock. Three dry holes were drilled in the NW.$\frac{1}{4}$, sec. 16, tp. 13, range 10, that penetrated the Marine Shale series, but there are no other dry holes or producing wells that have encountered the "soapstone" in this municipality. Elsewhere this formation seldom yields a good supply of water and what has been obtained in a few places has so high a total dissolved mineral salt content that it is of no use for the farmer. The main mineral constituents in solution in the water from the Marine Shale have been found to be magnesium sulphate, sodium sulphate, and sodium chloride, the three most undesirable salts in drinking water for either humans or stock.

WELL RECORDS—Rural Municipality of MONTMARTRE NO. 126, SASKATCHEWAN.

WELL No.	LOCATION ¼	Sec.	Tp.	Rge.	Mer.	TYPE OF WELL	DEPTH OF WELL	ALTITUDE WELL (above sea level)	HEIGHT TO WHICH WATER WILL RISE Above (+) Below (−) Surface	Elev.	PRINCIPAL WATER-BEARING BED Depth	Elev.	Geological Horizon	CHARACTER OF WATER	TEMP. OF WATER (in °F.)	USE TO WHICH WATER IS PUT	YIELD AND REMARKS
1	NE.	2	13	10	2	Dug	20	2,150	- 19	2,131	18	2,132	Glacial sand	Hard, "alkaline"		D	Barely sufficient for house use; 2 other shallow wells with poor supply.
2	NE.	5	"	"	"	Bored	45	2,135	- 35	2,100	44	2,091	Glacial gravel	Hard, "alkaline"		D, S	Insufficient for 20 head stock; 6 dry holes 25 to 30 feet deep.
3	NW.	6	"	"	"	Dug	24	2,165	- 14	2,151	22	2,143	Glacial gravel	Hard, "alkaline"		D, S	Intermittent supply in dry years; 1 other 45 foot well with poor supply.
4	NE.	7	"	"	"	Bored	35	2,150	- 18	2,132			Glacial sand	Hard		D, S	Sufficient for 35 head stock.
5	NW.	10	"	"	"	Bored	18	2,140	- 8	2,132	15	2,125	Glacial fine sand	Hard		D, S, I	Abundant supply for 10 head stock; another 8 foot well with good supply.
6	NW.	12	"	"	"	Dug	18	2,160	- 10	2,150	0	2,160	Glacial sand	Hard		D, S	Sufficient for 15 head stock; but well is ½ mile from the buildings; dry hole.
7	NE.	12	"	"	"	Dug	11	2,140	- 6	2,134	0	2,140	Glacial gravel	Hard		D, S	Sufficient for 20 head stock. 300 foot drilled dry hole.
8	NE.	14	"	"	"	Dug	16	2,155	- 12	2,143	5	2,150	Glacial sand	Hard		D, S	Insufficient for 25 head stock. 6 dry holes to a depth of 40 feet.
9	SW.	16	"	"	"	Drilled	150	2,140					Glacial drift	Hard, iron, "alkaline"		D, S	Abundant supply but water produces laxative effect on man. 6 dry holes.
10	NW.	16	"	"	"	Bored	25	2,140	- 17	2,123	18	2,122	Glacial sand	Hard		D, S.	Insufficient supply. Numerous unsuccessful attempts for water.
11	NW.	16	"	"	"	Drilled	280	2,140					Bedrock marine shale				Dry hole. 2 other dry holes to the same depth.
12	SW.	17	"	"	"	Bored	45	2,135	- 15	2,120			Glacial gravel	Hard		D, S.	Insufficient for 10 head stock. Waters 40 head stock in wet seasons.
13	NE.	19	"	"	"	Bored	30	2,150	- 27	2,123			Glacial fine sand	Hard		D	Sufficient for house use only. Water from two wells condemned.
14	SE.	22	"	"	"	Dug	16	2,135	- 11	2,124	13	2,122	Glacial gravel	Hard, iron, "alkaline"		D, S, I	Sufficient for 50 head stock; 14 foot well in pasture with good supply.
15	SE.	23	"	"	"	Dug	7	2,160	- 1	2,159	7	2,153	Glacial sand	Hard		D, S.	Sufficient for 15 head stock. Dry holes. Well is situated 1 mile from buildings.
16	NE.	23	"	"	"	Dug	30	2,200	- 25	2,175	25	2,175	Glaicl gravel	Hard, "alkaline"		D, S	Intermittent supply. 5 dry holes to a depth of 35 feet deep.
17	SE.	24	"	"	"	Dug	30	2,165					Glacial drift	Hard, very "alkaline"		N	Numerous wells from 30 to 55 feet but water is unfit for use.
18	SW.	25	"	"	"	Bored	35	2,185	- 25	2,160			Glacial drift	Hard, iron, "alkaline"		D	Sufficient for house use only. Also an 18 foot stock well with good supply.
19	NE.	26	"	"	"	Dug	18	2,200	- 12	2,188	12	2,188	Glacial sand	Hard		D,	Poor supply; numerous dry holes to a depth of 40 feet.
20	SE.	27	"	"	"	Dug	25	2,160	- 10	2,150	9	2,151	Glacial sand	Soft		D, S, I	Sufficient for 40 head stock. No shortage of water on this farm.
21	SW.	30	"	"	"	Bored	40	2,155	- 30	2,125			Glacial sand and gravel	Hard		S	Abundant supply; well cannot be bailed dry.
22	SE.	32	"	"	"	Dug	25	2,160	- 23	2,137	23	2,137	Glacial sand	Soft		D, S	Constant supply, but only sufficient for 25 head stock.
23	SW.	33	"	"	"	Dug	30	2,140					Glacial drift				Dry hole. Farmer has hauled water a distance of 4 miles since 1917.
24	NW.	33	"	"	"	Dug	16	2,150	- 10	2,140	0	2,150	Glacial gravel	Hard		D, S	Insufficient for 15 head stock. Dry holes; another 20 foot well with poor supply.
25	NW.	34	"	"	"	Bored	23	2,150	- 16	2,134	12	2,138	Glacial sand	Hard, "alkaline"		S	Intermittent supply; horses do not like to drink this water. 5 dry holes to 48 feet.
26	NE.	34	"	"	"	Dug	9	2,170	- 1	2,2169			Glacial drift	Hard		D, S	Poor supply. Has an intermittent 70 foot well; hauls water. Dry hole.
27	NE.	35	"	"	"	Dug	30	2,200					Glacial drift				Dry hole. Hauls water continuously.

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 MONTMARTRE NO.126, SASKATCHEWAN

WELL No.	LOCATION ¼	Sec.	Tp.	Rge.	Mer.	TYPE OF WELL	DEPTH OF WELL	ALTITUDE WELL (above sea level)	HEIGHT TO WHICH WATER WILL RISE Above (+) Below (−) Surface	Elev.	PRINCIPAL WATER-BEARING BED Depth	Elev.	Geological Horizon	CHARACTER OF WATER	TEMP. OF WATER (in °F.)	USE TO WHICH WATER IS PUT	YIELD AND REMARKS
28	SW.	36	13	10	2	Dug	14	2,190	0	2,190	7	2,183	Glacial sand	Hard, iron		D, S	Intermittent supply. Hauls water; 5 dry holes.
1	SW.	2	13	11	2	Bored	20	2,150	- 2	2,148	5	2,145	Glacial sand and gravel	Hard, "alkaline"		D, S	Poor supply. 6 foot well in pasture; waters 10 head stock.
2	SW.	3	"	"	"	Bored	20	2,150	- 10	2,140			Glacial gravel	Hard, "alkaline"		S	Sufficient for 40 head stock; water unfit for human use.
3	NE.	4	"	"	"	Dug	12	2,160	- 7	2,153			Glacial sand	Hard		D	Seepage water from dugout. Many dry holes. One well was condemned.
4	SE.	6	"	"	"	Bored	48	2,160	- 28	2,132			Glacial sand	Hard, "alkaline", bad odour		S	Poor supply. Tanks water summer and winter in drought years.
5	SW.	6	"	"	"	Bored	40	2,172	- 30	2,142			Glacial drift	Hard, iron, "alkaline"		D, S	Sufficient for 20 head stock only. Waters 20 head stock at neighbours well.
6	SE.	10	"	"	"	Dug	12	2,157	- 6	2,151	6	2,151	Glacial gravel	Soft		D	Sufficient for the house. 7 foot well fed by a spring is used for 35 head stock.
7	NW.	10	"	"	"	Bored	20	2,150	- 15	2,135			Glacial sand	Hard		D, S	Good supply for 20 head stock.
8	SW.	12	"	"	"	Bored	45	2,138	- 8	2,130			Glacial sand	Hard		D	Slow seepage; cannot be used extensively.
9	NE.	12	"	"	"	Bored	40	2,175	- 31	2,144			Glacial sand	Hard		D, S	Sufficient for 35 head stock.
10	SE.	13	"	"	"	Bored	23	2,150	- 14	2,136	21	2,129	Glacial sand	Hard		D	Poor supply. Was forced to dispose of some stock on account of water shortage.
11	SW.	14	"	"	"	Bored	20	2,155	- 14	2,141	10	2,145	Glacial sand and gravel	Hard		D, S	Sufficient for 10 head stock. Water readily found but it is very "alkaline".
12	NE.	14	"	"	"	Bored	28	2,156	- 13	2,143			Glacial drift	Hard		D, S	Sufficient for 10 head stock.
13	SW.	15	"	"	"	Drilled	270	2,173	- 35	2,138			Glacial drift	Hard, iron, very "alkaline", salty, cloudy		S	Abundant supply, but water makes stock sick. #
14	SE.	16	"	"	"	Dug	20	2,178					Glacial drift	Hard		D	Intermittent supply. 2 other wells yield enough water for stock needs.
15	SE.	17	"	"	"	Bored	35	2,169	- 31	2,138			Glacial gravel	Hard		D, S	Sufficient for 15 head stock.
16	SE.	18	"	"	"	Bored	55	2,155					Glacial drift	Hard, "alkaline" bad taste		D, S	Sufficient for 15 head stock. Tanks water in the fall and winter.
17	NW.	19	"	"	"	Bored	65	2,186	- 40	2,146			Glacial drift	Hard, "alkaline"		D, S	Sufficient for 30 head stock.
18	SE.	20	"	"	"	Bored	100	2,185	- 50	2,135			Glacial drift	Hard, "alkaline"		D, S	Sufficient for 40 head stock; water has a laxative effect on man.
19	NW.	20	"	"	"	Drilled	175	2,185					Glacial drift	Hard, iron		S	Sufficient for 50 head stock.
20	NE.	20	"	"	"	Drilled	350	2,180	- 30	2,150			Glacial drift	Hard, iron, "alkaline" green colour		S	Sufficient for 125 head stock at least.
21	SW.	21	"	"	"	Bored	108	2,180	- 18	2,162			Glacial gravel	Hard, "alkaline"		D, S	Sufficient for 35 head stock.
22	SE.	22	"	"	"	Bored	32	2,154	- 27	2,127	28	2,126	Glacial drift	Hard		D, S	Intermittent supply. Tanks water in winter and dry in summers.
23	SW.	23	"	"	"	Bored	32	2,150	- 12	2,138	32	2,118	Glacial sand	Hard, "alkaline"		S	Sufficient for 40 head stock. 23 dry holes to a maximum depth of 62 feet.

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 MONTMARTRE NO. 126, SASKATCHEWAN

WELL No.	LOCATION ¼	Sec.	Tp.	Rge.	Mer.	TYPE OF WELL	DEPTH OF WELL	ALTITUDE WELL (above sea level)	HEIGHT TO WHICH WATER WILL RISE Above (+) Below (−) Surface	Elev.	PRINCIPAL WATER-BEARING BED Depth	Elev.	Geological Horizon	CHARACTER OF WATER	TEMP. OF WATER (in °F.)	USE TO WHICH WATER IS PUT	YIELD AND REMARKS
24	SE.	24	13	11	2	Bored	32	2,194	- 16	2,178	30	2,164	Glacial sand	Hard, iron, "alkaline"		S	Sufficient for 15 head stock. Uses dugout in summer, and tanks in winter.
25	NW.	24	"	"	"	Bored	35	2,160	- 23	2,137	26	2,134	Gladial sand and gravel	Hard		S	This well and another 40 foot well yield sufficient water for 30 head stock.
26	SE.	25	"	"	"	Bored	38	2,177	- 5	2,172			Glacial drift	Hard		D	Abundant supply. Will water 100 head stock.
27	NW.	26	"	"	"	Bored	27	2,163	- 15	2,148	27	2,136	Glacial fine sand	Hard		D, S	Sufficient for 45 head stock.
28	NE.	26	"	"	"	Bored	30	2,165	- 10	2,155			Glacial drift	Hard		D	Poor supply. Tanks water summer and winter for 15 head stock.
29	SW.	27	"	"	"	Drilled	240	2,184					Glacial coarse sand	Hard		D, S	Abundant supply.
30	NE.	28	"	"	"	Bored	36	2,170					Glacial drift	Hard, "alkaline" odour		D, S	Very poor supply. Uses 12 foot well in pasture for stock.
31	SE.	29	"	"	"	Dug	21	2,171	- 12	2,159			Glacial gravel	Hard		S	Intermittent supply; 12 foot well in ravine supplies 40 head stock.
32	SE.	30	"	"	"	Dug	16	2,190	- 5	2,185	5	2,185	Glacial sand and gravel	Soft		D, S	Sufficient for 15 head stock.
33	NW.	30	"	"	"	Bored	70	2,181	- 40	2,141			Glacial drift	Hard, "alkaline"		D, S	Waters about 20 head stock; laxative effect on man.
34	SE.	32	"	"	"	Bored	60	2,175					Glacial sand	Hard		S	Insufficient for 15 head stock. One 300 foot drilled dry hole.
35	NE.	32	"	"	"	Drilled	163	2,174	- 35	2,139			Glacial gravel	Hard, iron		D, S	Abundant supply; neighbours haul from this well
36	SW.	34	"	"	"	Bored	47	2,184	- 35	2,149			Glacial drift	Hard, iron		D, S	Sufficient for 35 head stock.
1	SE.	2	13	12	2	Bored	41	2,150	- 37	2,113			Glacial drift	Hard, "alkaline"		D, S	Intermittent supply; hauls water summer and winter for 7 head stock.
2	NE.	2	"	"	"	Bored	50	2,145	- 30	2,115			Glacial drift	Hard, "alkaline"		S	Abundant supply.
3	NE.	3	"	"	"	Bored	68	2,146	- 25	2,121	68	2,078	Glacial gravel	Hard, iron, "alkaline"		S	Sufficient for 40 head stock.
4	SE.	4	"	"	"	Dug	36	2,128					Glacial sand	Hard, iron		D, S	Well has never been pumped dry.
5	NE.	5	"	"	"	Bored	48	2,113	- 35	2,078			Glacial sand	Hard, iron		D, S	Sufficient for 40 head stock.
6	NE.	6	"	"	"	Dug	12	2,085	- 1	2,084			Glacial drift	Soft		D	Seepage water from a dam.
7	NE.	7	"	"	"	Bored	85	2,110	- 40	2,070			Glacial sand	Hard, iron, "alkaline"		D, S	Sufficient for at least 20 head stock.
8	SW.	8	"	"	"	Bored	30	2,103	- 10	2,093			Glacial sand	Hard		D, S	Sufficient for at least 30 head stock.
9	NE.	13	"	"	"	Bored	65	2,163	- 35	2,128	35	2,128	Glacial sand	Hard, "alkaline" yellow colour		S	Poor supply. Water from a dam and in summer. Drives stock 1 mile in winter.
10	NW.	14	"	"	"	Bored	35	2,163	- 25	2,138			Glacial fine sand	Hard, iron, "alkaline"		D, S	Barely enough for 30 head stock.
11	NE.	14	"	"	"	Bored	40	2,159	- 35	2,124			Glacial drift	Hard, iron, "alkaline"		D, S	Waters 12 head stock only. Hauls 1 tank every other day.
12	NE.	15	"	"	"	Bored	34	2,150	- 19	2,131			Glacial sand	Hard, "alkaline"		D, S	Sufficient for 16 head stock only.
13	SW.	16	"	"	"	Bored	52	2,107	- 32	2,075			Glacial drift	Hard, iron, "alkaline"		D, S	Waters at least 25 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 MONTMARTRE NO.126, SASKATCHEWAN

WELL No.	LOCATION ¼	Sec.	Tp.	Rge.	Mer.	TYPE OF WELL	DEPTH OF WELL	ALTITUDE WELL (above sea level)	HEIGHT TO WHICH WATER WILL RISE Above (+) Below (−) Surface	Elev.	PRINCIPAL WATER-BEARING BED Depth	Elev.	Geological Horizon	CHARACTER OF WATER	TEMP. OF WATER (in °F.)	USE TO WHICH WATER IS PUT	YIELD AND REMARKS
14	NE.	16	13	12	2	Bored	60	2,131	- 10	2,121	59	2,072	Glacial sand	Hard, iron		D, S	Waters at least 25 head stock.
15	NW.	17	"	"	"	Bored	75	2,120	- 20	2,100			Glacial drift	Hard,"alkaline"		D, S	Waters at least 25 head stock.
16	NW.	18	"	"	"	Bored	70	2,114	- 37	2,077	37	2,077	Glacial gravel	Hard,"alkaline"		D, S	Poor supply, very slow seepage. Hauls water for 20 head stock.
17	NE.	18	"	"	"	Bored	90	2,118	- 25	2,093	88	2,030	Glacial sand	Hard, iron		D, S	Abundant supply.
18	NE.	19	"	"	"	Bored	40	2,119	- 30	2,089	38	2,081	Glacial sand and gravel	Hard		D, S, I	Sufficient for 200 head stock.
19	SE.	20	"	"	"	Bored	80	2,128	- 20	2,108			Glacial sand	Hard, iron, "alkaline"		D, S	Sufficient for 20 head stock; trouble with sand plugging.
20	SE.	21	"	"	"	Bored	65	2,148					Glacial drift	Hard, iron, "alkaline"		D, S	Sufficient for at least 25 head stock. Uses a dam in ravine in summer.
21	SW.	22	"	"	"	Bored	73	2,146	- 20	2,126			Glacial sand and gravel	Hard, iron		D, S	Sufficient for 30 head stock. 12 dry holes bored 32 to 101 feet deep.
22	NW.	23	"	"	"	Bored	60	2,178	- 20	2,158			Glacial drift	Hard, iron, "alkaline"		D, S	Sufficient for 40 head stock.
23	NW.	24	"	"	"	Bored	23	2,173					Glacial drift	Hard		D, S	Permanent supply.
24	NE.	24	"	"	"	Bored	68	2,180	- 46	2,134			Glacial drift	Hard, iron, "alkaline"		S	Sufficient for 25 head stock. Hauls drinking water.
25	SW.	24	"	"	"	Bored	35	2,175	- 15	2,160			Glacial drift	Hard		D, S	Sufficient supply; laxative effect on man.
26	SE.	26	"	"	"	Bored	30	2,155	- 20	2,135			Glacial drift	Hard		S	Sufficient for 20 head stock.
27	SW.	26	"	"	"	Bored	74	2,179	- 50	2,129			Glacial sand	Hard, iron, "alkaline"		D, S	Sufficient for 30 head stock.
28	NE.	26	"	"	"	Bored	30	2,174	- 22	2,152			Glacial drift	Hard,"alkaline"		S	Sufficient for 30 head stock.
29	NE.	29	"	"	"	Bored	100	2,157	- 30	2,127			Glacial drift	Hard,"alkaline"		D, S	Very slow seepage. Uses a 30 foot well on section 28 for stock.
30	SE.	30	"	"	"	Bored	90	2,132	- 70	2,062			Glacial sand	Hard,"alkaline"		D, S	Abundant supply.
31	NE.	30	"	"	"	Bored	90	2,145	- 35	2,110			Glacial drift	Hard, iron		D, S	Sufficient for at least 25 head stock.
32	NE.	32	"	"	"	Bored	65	2,159	- 15	2,144			Glacial drift	Hard, iron, "alkaline"		D, S	Abundant supply for 50 head stock.
33	SE.	33	"	"	"	Bored	45	2,172					Glacial sand	Hard,"alkaline"		D, S	Waters about 25 head stock.
34	NW.	33	"	"	"	Bored	60	2,164	- 20	2,144			Glacial drift	Hard, iron		D, S	Abundant supply for 20 head stock.
35	NW.	34	"	"	"	Bored	29	2,171					Glacial drift	Hard		D, S	Sufficient for 12 head stock in summer; uses 60 foot well in winter.
36	NE.	34	"	"	"	Bored	52	2,179					Glacial drift	Hard, iron, "alkaline"		D, S	Intermittent supply. Hauls water in dry years.
37	NW.	36	"	"	"	Bored	80	2,190	- 40	2,150	79	2,111	Glacial gravel	Hard,"alkaline"		D, S	Sufficient for 60 head stock.
1	NE.	2	14	10	2	Dug	16	2,160	- 6	2,154			Glacial drift	Hard,"alkaline"		S	Intermittent supply. 3 dry holes to a depth of 30 feet. Tanks water.
2	NW.	2	"	"	"	Drilled	200	2,175					Glacial drift	Hard, iron		S	Abundant supply for 70 head stock.
3	SW.	3	"	"	"	Dug	17	2,175	0	2,175	4	2,171	Glacial gravel	Soft		D, S, I	Intermittent supply. Water is tanked in the fall and winter; 5 dry holes.

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 MONTMARTRE NO. 126, SASKATCHEWAN

WELL No.	LOCATION ¼	Sec.	Tp.	Rge.	Mer.	TYPE OF WELL	DEPTH OF WELL	ALTITUDE WELL (above sea level)	HEIGHT TO WHICH WATER WILL RISE Above (+) Below (−) Surface	Elev.	PRINCIPAL WATER-BEARING BED Depth	Elev.	Geological Horizon	CHARACTER OF WATER	TEMP. OF WATER (in °F.)	USE TO WHICH WATER IS PUT	YIELD AND REMARKS
4	SW.	4	14	10	2	Dug	20	2,145	- 14	2,131	16	2,129	Glacial sand	Hard		D	Intermittent supply. 16 dry holes from 20 to 30 feet deep.
5	NE.	6	"	"	"	Dug	14	2,150	- 12	2,138	12	2,138	Glacial sand	Hard		D, S	Good supply for 20 head stock.
6	SW.	7	"	"	"	Drilled	262	2,160	- 15	2,145	256	1,904	Glacial gravel	Hard, iron, "alkaline"		S	Abundant supply for 30 head stock. Many dry holes 28 to 82 feet deep.
7	SE.	9	"	"	"	Dug	20	2,165	- 16	2,149			Glacial gravel	Hard, "alkaline"		D, S	Good supply for 20 head stock; 3 dry holes.
8	SE.	10	"	"	"	Dug	14	2,155	- 5	2,150	13	2,142	Glacial fine sand	Hard		D	Intermittent supply. 7 dry holes 20 to 60 feet deep; hauls water.
9	NE.	11	"	"	"	Bored	30	2,140	- 10	2,130			Glacial sand	Hard, iron, "alkaline"		S	Insufficient for 35 head stock; uses creek and tanks water in winter.
10	SW.	12	"	"	"	Dug	15	2,135	- 10	2,125	14	2.121	Glacial gravel	Hard, "alkaline"		D, S, I	Abundant supply; seepage from a creek.
11	SE.	12	"	"	"	Dug	15	2,175	- 3	2,172			Glacial sand	Hard		D, S	This well and another 16 foot well supply sufficient water for the farm; 6 dry holes.
12	SE.	13	"	"	"	Dug	14	2,180	- 5	2,175	11	2,169	Glacial sandy gravel	Hard		D, S	Insufficient for 20 head stock. Tanks water in winter 5 dry holes.
13	SW.	13	"	"	"	Dug	13	2,175	- 10	2,165	1	2,174	Glacial gravel	Soft		D, S	Good supply; can be pumped dry but refills quickly; dependable.
14	SE.	15	"	"	"	Bored	45	2,135	- 32	2,103	44	2,091	Glacial coarse sand	Hard		D, S, I	Good well; neighbours [illegible] from it.
15	SW.	15	"	"	"	Dug	25	2,140	- 20	2,120			Glacial gravel	Soft		D	Sufficient for house use; waters stock at creek or neighbour's well.
16	SE.	16	"	"	"	Dug	20	2,135	- 18	2,117	0	2,135	Glacial gravel	Soft		D, S	Good supply for 30 head stock.
17	SW.	16	"	"	"	Bored	22	2,150	- 20	2,130	20	2,130	Glacial sand	Hard, iron		D, S, I	Sufficient for 30 head stock.
18	SE.	18	"	"	"	Dug	30	2,155	- 15	2,140			Glacial sand	Hard		D, S	Good supply for 30 head stock.
19	SW.	18	"	"	"	Dug	18	2,160	- 8	2,152	0	2,160	Glacial gravel	Hard		D, S	Sufficient for about 25 head stock; 5 other shallow wells used; dry holes.
20	SW.	22	"	"	"	Dug	20	2,250	- 15	2,235	4	2,246	Glacial gravel	Hard, "alkaline"		D, S	Intermittent supply. Tanks water; 5 shallow dry holes.
21	NW.	22	"	"	"	Dug	30	2,250	- 12	2,238	18	2,232	Glacial sand	Hard, iron		S	Barely sufficient for 30 head stock; 2 other wells occasionally used.
22	SW.	23	"	"	"	Dug	24	2,245	- 8	2,237	14	2,231	Glacial sand	Hard, iron		S	Sufficient for 35 head stock. 3 dry holes 200 to 350 feet deep.
23	NE.	23	"	"	"	Dug	18	2,250	- 13	2,237	12	2,238	Glacial sand	Hard		D, S, I	Poor supply; well goes dry in winters; tanks water. 10 dry holes to 30 feet deep.
24	NW.	24	"	"	"	Dug	30	2,250	- 26	2,224	18	2,232	Glacial sand	Hard		D, S	Good supply; can be pumped dry but refills quickly; sufficient for 40 head stock.
25	NE.	24	"	"	"	Dug	15	2,155	- 12	2,143			Glacial sand	Soft		D, S	Sufficient for 25 head stock.
26	SE.	25	"	"	"	Dug	26	2,240	- 20	2,220	25	2,215	Glacial sand	Hard, "alkaline"		D	Poor supply; 6 dry holes to 32 feet. Uses dam and tanks in winter.
27	NE.	26	"	"	"	Dug	23	2,250	- 15	2,235	7	2,243	Glacial gravel	Hard		D, S	Small supplies of water are readily located on this farm.
28	SW.	28	"	"	"	Dug	12	2,165	- 8	2,157	8	2,157	Glacial gravel	Hard, "alkaline"		D, S	Poor supply; 6 dry holes 20 to 80 feet deep. tanks water from lake.
29	NW.	28	"	"	"	Dug	12	2,210	- 4	2,206	7	2,203	Glacial sand	Hard, iron, "alkaline"		D, S	Poor supply; 15 dry holes to 24 feet. Tanks water 2½ miles.
30	NW.	29	"	"	"	Dug	16	2,200	- 6	2,194	15	2,185	Glacial sand	Hard, "alkaline"		D, S	Poor supply; cannot locate a permanent supply. Tanks water from a lake.

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 MONTMARTRE NO.126, SASKATCHEWAN

WELL No.	LOCATION ¼	Sec.	Tp.	Rge.	Mer.	TYPE OF WELL	DEPTH OF WELL	ALTITUDE WELL (above sea level)	HEIGHT TO WHICH WATER WILL RISE Above (+) Below (—) Surface	Elev.	PRINCIPAL WATER-BEARING BED Depth	Elev.	Geological Horizon	CHARACTER OF WATER	TEMP. OF WATER (in °F.)	USE TO WHICH WATER IS PUT	YIELD AND REMARKS
31	NE.	30	14	10	2	Dug	12	2,240	- 6	2,234	8	2,232	Glacial gravel	Hard, iron		D, S	Sufficient for 10 head stock; numerous dry holes 20 to 70 feet deep.
32	NW.	30	"	"	"	Drilled	250	2,230	- 50	2,180			Glacial sand	Hard, "alkaline"		D, S	Abundant supply; 7 dry holes 50 to 130 feet deep.
33	SW.	32	"	"	"	Dug	25	2,240	- 19	2,221			Glacial drift	Hard		D	Poor supply. Tanks water in winter and dry years.
34	NE.	32	"	"	"	Dug	8	2,255	- 2	2,253			Glacial drift	Hard		D	Poor supply. 20 dry holes to 50 feet. Tanks water 4½ miles.
35	NE.	33	"	"	"	Dug	13	2,235	- 11	2,224	3	2,232	Glacial gravel	Hard, iron		D, S	Sufficient for 25 head stock. One other 17 foot well with good supply.
36	SE.	34	"	"	"	Dug	30	2,250	- 15	2,235	26	2,224	Glacial sand	Hard, "alkaline"		D, S	3 other wells and a dugout give enough water for 80 head stock.
37	NE.	34	"	"	"	Dug	35	2,250	- 7	2,243	5	2,245	Glacial sand	Hard		D, S	Intermittent supply. 10 dry holes to 40 feet. Tanks water in winter.
38	SE.	35	"	"	"	Bored	64	2,245	- 57	2,188			Glacial drift	Hard, "alkaline"		D, S	Village well of Candiac; 10 other wells give "alkaline" water. Water is tanked from farmers.
39	SE.	36	"	"	"	Dug	22	2,260	- 12	2,248	19	2,241	Glacial sand	Hard		D, S	Barely sufficient for 20 head stock.
40	NE.	36	"	"	"	Bored	30	2,270	- 15	2,255	29	2,241	Glacial sand	Hard, "alkaline"		D	Poor supply. 30 dry holes to 80 feet; tanks water from 2 to 6 miles.
1	NW.	1	14	11	2	Dug	14	2,163	- 8	2,155			Glacial sand	Soft		D	Sufficient for house use. A 14 foot well supplies 37 head stock.
2	NE.	2	"	"	"	Dug	18	2,158	- 8	2,150			Glacial sand	Hard, iron		S	Sufficient for 70 head stock. 6 dry holes to 50 feet.
3	NW.	3	"	"	"	Bored	31	2,182					Glacial drift	Hard, iron		D, S	Sufficient for 20 head stock.
4	SE.	4	"	"	"	Bored	30	2,182					Glacial drift	Hard		D	Very slow seepage; boiled dry easily; sufficient for house use only.
5	NW.	7	"	"	"	Bored	60	2,191					Glacial drift	Hard, "alkaline"		D, S	Sufficient for 20 head stock. 30 foot well supplies remaining 30 head stock.
6	SW.	8	"	"	"	Bored	64	2,181	- 58	2,123			Glacial fine sand	Hard		D, S	Another 30 foot well used in summer; hauls water in winters.
7	SE.	9	"	"	"	Bored	30	2,178	- 12	2,166			Glacial drift	Hard, "alkaline"		D, S	Good supply for 20 head stock.
8	SE.	10	"	"	"	Bored	42	2,169	- 39	2,130			Glacial gravel	Hard		D, S	Sufficient for 25 head stock.
9	NE.	10	"	"	"	Bored	30	2,183	- 23	2,160			Glacial drift	Hard, iron		D, S	Sufficient for 30 head stock.
10	NW.	11	"	"	"	Bored	22	2,163	- 18	2,145			Glacial sand	Hard		D	A 22 foot well supplies 25 head stock.
11	NW.	12	"	"	"	Bored	35	2,168	- 20	2,148	20	2,148	Glacial sand	Hard		S	3 other similar wells supply 42 head stock.
12	SE.	14	"	"	"	Bored	33	2,155	- 18	2,137			Glacial sand	Hard, "alkaline"		D, S	Sufficient for 25 head stock at least.
13	SE.	16	"	"	"	Bored	30	2,187	- 20	2,167			Glacial sand	Hard		S	Sufficient for 25 head stock. Hauls water for domestic use.
14	SE.	17	"	"	"	Bored	45	2,192	- 20	2,172			Glacial drift	Hard, "alkaline"		D, S	Sufficient for 20 head stock at least.
15	SW.	18	"	"	"	Bored	44	2,187					Glacial drift	Hard, "alkaline"		D, S	Poor supply. Tanks water for 15 head stock in the fall.
16	SE.	19	"	"	"	Bored	25	2,195	- 20	2,175			Glacial drift	Hard, iron		D, S	Sufficient for 30 head stock; fast seepage.
17	SE.	20	"	"	"	Bored	48	2,215	- 44	2,171	42	2,173	Glacial sand	Hard, iron		D, S	Barely sufficient for 35 head stock. #

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

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(#) Sample taken for analysis.

WELL RECORDS—Rural Municipality of MONTMARTRE NO.126, SASKATCHEWAN

WELL No.	LOCATION ¼	Sec.	Tp.	Rge.	Mer.	TYPE OF WELL	DEPTH OF WELL	ALTITUDE WELL (above sea level)	HEIGHT TO WHICH WATER WILL RISE Above (+) Below (−) Surface	Elev.	PRINCIPAL WATER-BEARING BED Depth	Elev.	Geological Horizon	CHARACTER OF WATER	TEMP. OF WATER (in °F.)	USE TO WHICH WATER IS PUT	YIELD AND REMARKS
18	NE.	20	14	11	2	Bored	40	2,198	- 37	2,161			Glacial gravel	Hard		D, S	Rapid seepage; always sufficient for 25 head stock.
19	SE.	21	"	"	"	Bored	22	2,184	- 19	2,165			Glacial sand	Hard		D, S	Sufficient for 25 head stock.
20	NW.	22	"	"	"	Bored	33	2,181	- 30	2,151			Glacial sand	Hard		D, S	Barely sufficient for 20 head stock. One other wellin pasture also used.
21	SE.	23	"	"	"	Bored	27	2,160	- 17	2,143			Glacial sand	Hard,"alkaline"		S	Waters about 10 head stock. Another 12 foot well waters 40 head stock.
22	NW.	23	"	"	"	Dug	30	2,182					Glacial drift	Hard		D, S	One other well is also needed to water 22 head stock. 2 dry holes to 90 feet.
23	SW.	25	"	"	"	Dug	6	2,192	- 2	2,190	2	2,190	Glacial sand	Hard, iron		D, S	Sufficient for 40 head stock.
24	SW.	26	"	"	"	Bored	18	2,196	- 15	2,181			Glacial fine sand	Hard		D, S	Barely sufficient supply.
25	NE.	26	"	"	"	Drilled	183	2,195	- 80	2,115			Glacial gravel	Hard, iron, "alkaline"		D, S	Supplies 3 gallons a minute.
26	NW.	31	"	"	"	Bored	55	2,203	- 50	2,153			Glacial gravel	Hard		D, S	Sufficient for 45 head stock.
27	NW.	32	"	"	"	Bored	40	2,198	- 15	2,183			Glacial sand	Hard,"alkaline"		S	Sufficient for 15 head stock; slow seepage 2 other 40 foot wells, also used.
28	NE.	32	"	"	"	Bored	40	2,194	- 20	2,174			Glacial drift	Hard		D, S	Intermittent supply; tanks water for 21 head stock.
29	SE.	33	"	"	"	Bored	30	2,197	- 18	2,179			Glacial drift	Hard,"alkaline"		D, S	Poor supply. Hauls water for stock from C. N. R. dam.
30	SW.	33	"	"	"	Drilled	145	2,175	- 20	2,155			Glacial sand	Soft		D, S	Abundant supply for 50 head stock.
31	NE.	33	"	"	"	Drilled	245	2,205	-197	2,008	237	1,968	Glacial coarse sand and gravel	Hard, iron		D, S, I	Town well of Montmartre delivers 8 gallons a minute. Water level cannot be lowered by continuous pumping. #
32	SE.	34	"	"	"	Drilled	159	2,185	- 45	2,140			Glacial gravel	Hard,"alkaline"		S	Good supply for 50 head stock.
33	NW.	34	"	"	"	Bored	100						Glacial drift			N	Dry hole. Uses dugout in summer and tanks water from town in winter.
34	NW.	35	"	"	"	Dug	10	2,235	0	2,235			Glacial sand	Hard		S	Intermittent supply. Tanks water from Montmartre for stock.
35	SW.	36	"	"	"	Dug	20	2,242	- 12	2,230	14	2,228	Glacial sand	Hard		D, S	Intermittent supply. Several other wells with limited supply. Tanks water.
36	NW.	36	"	"	"	Drilled	260	2,278	-100	2,178			Glacial sand	Hard		D, S	Abundant supply for 80 head stock.
1	SW.	2	14	12	2	Bored	100	2,178	- 50	2,128			Glacial drift	Hard,"alkaline"		S	Abundant supply for 15 head stock. Hauls drinking water.
2	NE.	2	"	"	"	Bored	53	2,200	- 33	2,167	52	2,148	Glacial sand	Hard,"alkaline"		S	Poor supply. Abundant supply of water can be obtained but it is unfit for use.
3	NW.	3	"	"	"	Bored	50	2,193	- 47	2,146	48	2,145	Glacial gravel	Hard		D, S	Sufficient for only 8 head stock. Drives 16 head stock to neighbours well.
4	SW.	4	"	"	"	Bored	103	2,172	- 20	2,152			Glacial sand	Hard, iron, "alkaline"		D, S	Abundant supply for 10 head stock.
5	NE.	4	"	"	"	Bored	72	2,195					Glacial drift	Hard, iron, "alkaline"		D, S	Intermittent supply. 17 head stock driven to neighbours well in summer.
6	NW.	6	"	"	"	Bored	150	2,156	- 75	2,081			Glacial sand	Hard, iron		D, S	Waters at least 20 head stock.
7	NE.	7	"	"	"	Bored	60	2,175	- 30	2,145	60	2,115	Glacial fine sand	Hard, iron		D, S	Waters at least 70 head stock.
8	NW.	8	"	"	"	Bored	100	2,177	- 50	2,127			Glacial drift	Hard,iron, "alkaline"		D, S	Will water at least 20 head stock; water has laxative effect on man.

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(#) Sample taken for analysis.

WELL RECORDS—Rural Municipality of MONTMARTRE NO.126 SASKATCHEWAN

WELL No.	LOCATION ¼	Sec.	Tp.	Rge.	Mer.	TYPE OF WELL	DEPTH OF WELL	ALTITUDE WELL (above sea level)	HEIGHT TO WHICH WATER WILL RISE Above (+) Below (−) Surface	Elev.	PRINCIPAL WATER-BEARING BED Depth	Elev.	Geological Horizon	CHARACTER OF WATER	TEMP. OF WATER (in °F.)	USE TO WHICH WATER IS PUT	YIELD AND REMARKS
9	SE.	9	14	12	2	Bored	70	2,190	- 40	2,150			Glacial drift	Hard, iron, "alkaline"		D, S	Waters at least 30 head stock; water has laxative effect on man.
10	NW.	9	"	"	"	Dug	60	2,190	- 20	2,170			Glacial drift	Hard		D, S	Waters at least 30 head stock.
11	NE.	11	"	"	"	Drilled	112	2,206	- 40	2,166	104	2,102	Glacial gravel	Hard, iron		D, S	Abundant supply. Dry holes to 90 feet.
12	SE.	14	"	"	"	Bored	40	2,200					Glacial drift	Hard, iron, "alkaline"		D, S	Waters only 5 head stock. Tanks water for 23 head stock.
13	SW.	14	"	"	"	Bored	40	2,200	- 36	2,164	36	2,164	Glacial coarse gravel	Hard, iron		D, S	Waters 25 head stock.
14	NW.	14	"	"	"	Bored	50	2,188	- 20	2,168			Glacial sand	Hard, iron, "alkaline"		D, S	Waters only 8 head stock. Drives stock ½ mile in winter for water.
15	NW.	15	"	"	"	Bored	60	2,188	- 30	2,158			Glacial drift	Hard		S	Intermittent supply. A 60 foot well is also used.
16	SE.	17	"	"	"	Dug	20	2,182	- 16	2,166	10	2,172	Glacial fine sand	Hard, iron		D, S	Waters about 10 head stock at one time; trouble with fine sand plugging.
17	SW.	18	"	"	"	Bored	59	2,172					Glacial sand	Hard, iron, "alkaline"		D, S	Sufficient for 25 head stock at least; laxative effect on strangers.
18	NW.	19	"	"	"	Bored	90	2,152					Glacial drift	Hard, iron, "alkaline"		D, S	Waters at least 50 head stock.
19	NE.	19	"	"	"	Bored	69	2,171	- 15	2,156			Glacial gravel	Hard, iron		D, S	Sufficient for at least 50 head stock.
20	NW.	20	"	"	"	Dug	40	2,180					Glacial sand	Hard		D, S	Sufficient for only 5 head stock. Tanks water in winter for 9 head stock.
21	NE.	20	"	"	"	Bored	50	2,180	- 25	2,155	25	2,155	Glacial sand	Hard, "alkaline"		D, S	Sufficient for 20 head stock. Another 28 foot well also used. Melts snow in winter.
22	SE.	21	"	"	"	Bored	56	2,185	- 26	2,159			Glacial drift	Hard, iron, "alkaline"		D, S	Sufficient for 60 head stock.
23	SE.	22	"	"	"	Bored	26	2,197	- 11	2,186			Glacial gravel	Hard		D, S	Sufficient for 50 head stock.
24	SE.	24	"	"	"	Bored	23	2,186	- 17	2,169	23	2,163	Glacial sand	Hard, iron		D, S	Sufficient for 80 head stock.
25	NE.	24	"	"	"	Bored	32	2,182	- 20	2,162			Glacial sand	Hard, iron		D, S	Sufficient for 40 head stock.
26	NE.	26	"	"	"	Dug	12	2,176	- 6	2,170	11	2,165	Glacial gravel	Soft		D, S	Sufficient for 80 head stock.
27	SW.	27	"	"	"	Bored	40	2,198	- 20	2,178	30	2,168	Glacial sand	Hard, iron, "alkaline"		D, S	Waters about 15 head stock. Hauls water in summer and melt snow in winter.
28	SE.	30	"	"	"	Bored	40	2,171	- 20	2,151			Glacial drift	Hard, iron, "alkaline" odour		D, S	Sufficient for 30 head stock.
29	SW.	30	"	"	"	Dug	15	2,161					Glacial sand	Hard		D, S	Poor supply. Hauls water summer and winter for 6 head stock.
30	SE.	32	"	"	"	Bored	60	2,168	- 40	2,128			Glacial drift	Hard, "alkaline"		D, S	Sufficient for at least 30 head stock.
31	SW.	32	"	"	"	Dug	14	2,155					Glacial sand	Hard		D, S	Sufficient for at least 20 head stock.
32	NW.	32	"	"	"	Bored	46	2,181	- 18	2,163	40	2,141	Glacial sand	Hard		D, S	Well has been bored recently.
33	NW.	33	"	"	"	Bored	35	2,185	- 30	2,155	30	2,155	Glacial fine sand	Hard, iron, "alkaline"		D, S	Barely sufficient for 25 head stock.
34	SW.	34	"	"	"	Dug	14	2,195	- 11	2,184	10	2,185	Glacial sand	Soft		D, S	Good supply for 40 head stock.
35	SE.	35	"	"	"	Bored	38	2,186	- 30	2,156			Glacial fine sand	Soft		D, S	Sufficient for 15 head stock.

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

WELL RECORDS—Rural Municipality of MONTMARTRE NO.126, SASKATCHEWAN

WELL No.	LOCATION ¼	Sec.	Tp.	Rge.	Mer.	TYPE OF WELL	DEPTH OF WELL	ALTITUDE WELL (above sea level)	HEIGHT TO WHICH WATER WILL RISE Above (+) Below (−) Surface	Elev.	PRINCIPAL WATER-BEARING BED Depth	Elev.	Geological Horizon	CHARACTER OF WATER	TEMP. OF WATER (in °F.)	USE TO WHICH WATER IS PUT	YIELD AND REMARKS
36	NW.	35	14	12	2	Dug	10	2,150	- 7	2,143	0	2,150	Glacial sand and gravel	Soft		D, S	Abundant supply; probably seepage from a lake.
1	NW.	2	15	10	2	Drilled	309	2,260	-150	2,110	300	1,960	Glacial sand	Hard, iron		D, S	Abundant supply for 80 head stock.
2	NE.	3	"	"	"	Bored	40	2,260	- 20	2,240			Glacial drift	Hard, iron		D, S	Poor supply. Water is tanked 3 miles. No dry holes.
3	SE.	4	"	"	"	Dug	9	2,260	- 7	2,253	0	2,260	Glacial gravel	Hard		D	Poor supply. Dugout is used for stock in summer, tank water in winter.
4	NE.	4	"	"	"	Dug	14	2,235	- 5	2,230	0	2,235	Gladial gravel	Soft		D, S	Abundant supply; neighbours tank from it.
5	SE.	5	"	"	"	Dug	19	2,260	0	2,260	9	2,251	Glacial sand	Soft		S	Seepage from slough; intermittent supply. Tanks water.
6	SW.	5	"	"	"	Dug	10	2,255	0	2,255			Glacial drift	Hard		S	Poor supply. Water is tanked 3½ miles in winter.
7	SE.	6	"	"	"	Dug	16	2,265	- 11	2,254	11	2,254	Glacial sand	Hard		D, S, I	Sufficient for 35 head stock.
8	SW.	6	"	"	"	Drilled	243	2,255	-160	2,095	220	2,035	Glacial sand	Hard, "alkaline"		S	Abundant supply for 50 head stock; water unfit for humans.
9	SW.	7	"	"	"	Bored	48	2,260	- 32	2,228	45	2,215	Glacial gravel	Hard, iron, "alkaline"		S	Poor supply. Water is tanked from a well on the NW.¼ section 6.
10	NW.	7	"	"	"	Dug	20	2,260	- 15	2,245	8	2,252	Glacial sand	Hard		D, S, I	A 70 foot well is also used; both wells are used to water 30 head stock.
11	NE.	7	"	"	"	Dug	20	2,255	- 16	2,239	18	2,237	Glacial sand	Soft		D, S	Sufficient for 20 head stock. Owns 5 other wells with "alkaline" water.
12	NE.	8	"	"	"	Drilled	346	2,270	-146	2,124	335	1,935	Glacial black sand	Hard, iron		D, S	Sufficient supply for 40 head stock; water unfit for humans.
13	NE.	9	"	"	"	Bored	32	2,260	- 10	2,250	8	2,252	Glacial sand	Hard		D, S, I	Poor supply. 10 dry holes to 30 feet. Tanks water for stock.
14	SW.	10	"	"	"	Dug	20	2,255	- 18	2,237	12	2,243	Glacial sand	Hard		D, S	Good supply for 85 head stock.
15	NE.	14	"	"	"	Dug	25	2,240	- 24	2,216			Glacial sand	Hard		D	Poor supply. Numerous unsuccessful tests. Tanks water for stock.
16	SW.	15	"	"	"	Bored	32	2,240	- 26	2,214	31	2,209	Glacial gravel	Hard, iron		D, S	Poor supply. Tanks water in drought years.
17	NE.	17	"	"	"	Dug	24	2,270	- 19	2,251	17	2,253	Glacial sand	Hard		D, S, I	Sufficient for 15 head stock.
18	SW.	17	"	"	"	Dug	15	2,275	- 12	2,263	12	2,263	Glacial gravel	Hard		S	Sufficient for 25 head stock.
19	SE.	18	"	"	"	Dug	12	2,285	0	2,285			Glacial sand	Hard		D, S	Sufficient for 15 head stock.
20	NE.	18	"	"	"	Dug	23	2,285	- 17	2,268	19	2,266	Glacial sand	Hard		D, S	Poor supply. One other 12 foot well; water is tanked for stock in winter.
21	NW.	19	"	"	"	Dug	20	2,290	- 12	2,278	6	2,284	Glacial gravel	Hard		D, S	Sufficient for at least 20 head stock.
22	NE.	20	"	"	"	Bored	140	2,270					Glacial drift			N	Dry hole. Farmer has tanked water continuously for 52 years.
23	SE.	21	"	"	"	Dug	15	2,255	- 12	2,243	12	2,243	Glacial gravel	Hard, iron		D, S	Sufficient for 10 head stock.
24	SW.	22	"	"	"	Dug	20	2,240	- 4	2,236	14	2,226	Glacial fine sand	Soft		D, S	Intermittent supply. 20 dry holes to 60 feet. Tanks water for stock.
25	NW.	23	"	"	"	Dug	16	2,240	- 14	2,226			Glacial drift	Hard, "alkaline"		S	Poor supply. One other well. Tanks water for household use.
26	NE.	23	"	"	"	Dug	20	2,230	- 16	2,214	18	2,212	Glacial fine sand	Hard		D, S	Sufficient for 25 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 MONTMARTRE NO.126, SASKATCHEWAN

WELL No.	LOCATION ¼	Sec.	Tp.	Rge.	Mer.	TYPE OF WELL	DEPTH OF WELL	ALTITUDE WELL (above sea level)	HEIGHT TO WHICH WATER WILL RISE Above (+) Below (−) Surface	Elev.	PRINCIPAL WATER-BEARING BED Depth	Elev.	Geological Horizon	CHARACTER OF WATER	TEMP. OF WATER (in °F.)	USE TO WHICH WATER IS PUT	YIELD AND REMARKS
27	NW.	24	15	10	2	Bored	18	2,225	- 14	2,211	10	2,215	Glacial sand	Hard		D, S	Sufficient for 30 head stock. 7 dry holes 50 to 60 feet deep.
28	NE.	24	"	"	"	Dug	14	2,225					Glacial drift				Dry hole. Tanks water winter and summer.
29	NW.	25	"	"	"	Dug	12	2,220	- 7	2,213	0	2,220	Glacial sand	Soft		D, S	Sufficient for 15 head stock.
30	NW.	27	"	"	"	Dug	20	2,260	- 16	2,244	6	2,254	Glacial sand	Soft		D, S	Sufficient for 20 head stock at least.
31	NW.	34	"	"	"	Bored	80	2,240	- 35	2,205	70	2,170	Glacial sand	Hard		D, S	Abundant supply for 80 head stock.
32	NE.	34	"	"	"	Dug	10	2,220	- 5	2,215	8	2,212	Glacial fine sand	Hard		D, S, I	Sufficient for 35 head stock.
33	SE.	35	"	"	"	Dug	20	2,220	- 16	2,204	16	2,204	Glacial sand	Hard, "alkaline"		S	Intermittent supply. Tanks water.
34	SW.	36	"	"	"	Bored	90	2,210	- 70	2,140	87	2,123	Glacial gravel	Hard		D, S	Good supply. 3 dry holes to 60 feet.
35	NE.	36	"	"	"	Dug	16	2,145	- 14	2,131	8	2,137	Glacial sand	Hard, "alkaline"		D, S	Intermittent supply. 10 dry holes to 50 feet. Tanks water ¼ of a mile.
1	NE.	2	15	11	2	Drilled	280	2,255	-130	2,125			Glacial drift	Hard, "alkaline"		D, S	Water at least 50 head stock.
2	SW.	4	"	"	"	Drilled	140	2,200	- 75	2,125			Glacial gravel	Hard, iron		D, S	Waters at least 75 head stock.
3	SE.	5	"	"	"	Dug	40	2,210					Glacial drift	Hard		D,	Sufficient for house use only.
4	SW.	5	"	"	"	Drilled	180	2,198	- 90	2,108			Glacial sand	Soft, "alkaline"		S	Abundant supply; bitter water. A 40 foot well supplies domestic water.
5	SW.	7	"	"	"	Bored	30	2,198	- 20	2,178			Glacial sand	Hard, "alkaline"		D	Sufficient for house use. A 25 foot well supplies 22 head stock.
6	NE.	8	"	"	"	Bored	61	2,247	- 10	2,237			Glacial drift	Hard		D, S	Good supply for 15 head stock.
7	NE.	10	"	"	"	Dug	9	2,268	- 4	2,264	0	2,268	Glacial gravel and sand	Hard		D, S	Will water 20 head stock.
8	SW.	11	"	"	"	Test	17	2,250					Glacial drift			N	Dry hole. Hauls water for 3 head stock.
9	NW.	11	"	"	"	Dug	40	2,260					Glacial drift				Dry hole. Hauls water.
10	NW.	12	"	"	"	Bored	40	2,278	- 12	2,266			Glacial drift	Hard, "alkaline"		D, S	Intermittent supply. Dry test holes to 35 feet. Hauls water summer and winter.
11	NE.	12	"	"	"	Dug	40	2,265	- 37	2,228	30	2,235	Glacial sand and gravel	Hard		D, S	Sufficient for 25 head stock. Dry holes to 70 feet.
12	SW.	13	"	"	"	Dug	35	2,276	- 33	2,243	15	2,261	Glacial sand	Hard, iron, "alkaline"		D, S	Waters 7 head stock only.
13	SE.	14	"	"	"	Dug	12	2,275	- 4	2,271			Glacial gravel	Soft		D, S	Dry holes to 104 feet deep.Waters 25 head stock only.
14	SW.	14	"	"	"	Bored	40	2,282	- 13	2,269			Glacial drift	Hard, "alkaline"		D, S	Sufficient for 20 head stock. #
15	SW.	15	"	"	"	Bored	90	2,292	- 80	2,212			Glacial sand	Hard, iron, "alkaline"		D	Sufficient for house use. Dry holes to 20 feet. Hauls water for 16 head stock.
16	SE.	16	"	"	"	Dug	30	2,291	- 28	2,263	25	2,266	Glacial sand	Hard		S	Poor supply. Another well also used to meet stock needs.
17	SW.	16	"	"	"	Dug	13	2,250	- 5	2,245			Glacial sand and gravel	Hard		S	Barely sufficient for 20 head stock. Dry holes 20 to 40 feet deep.
18	NE.	16	"	"	"	Dug	15	2,284	- 11	2,273			Glacial gravel	Soft		D, S	Well is dry in winter. Hauls water; dry holes bored to 100 feet.

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(#) Sample taken for analysis.

WELL RECORDS—Rural Municipality of MONTMARTRE NO.126, SASKATCHEWAN

WELL No.	LOCATION ¼	Sec.	Tp.	Rge.	Mer.	TYPE OF WELL	DEPTH OF WELL	ALTITUDE WELL (above sea level)	HEIGHT TO WHICH WATER WILL RISE Above (+) Below (−) Surface	Elev.	PRINCIPAL WATER-BEARING BED Depth	Elev.	Geological Horizon	CHARACTER OF WATER	TEMP. OF WATER (in °F.)	USE TO WHICH WATER IS PUT	YIELD AND REMARKS
19	SE.	17	15	11	2	Dug	40	2,240	- 20	2,220	25	2,215	Glacial sand	Hard		D	Sufficient for house use. Waters stock at a spring
20	SE.	18	"	"	"	Dug and Bored	26	2,239	- 11	2,228			Glacial fine sand	Hard		D, S	Poor supply; hauls water in drought periods. Dry holes.
21	SW.	19	"	"	"	Bored	55	2,225	- 30	2,195	30	2,195	Glacial gravel	Hard, iron, "alkaline"		D, S	Intermittent supply. Uses dugout and tanks in winter.
22	SE.	20	"	"	"	Bored	40	2,296	- 38	2,258			Glacial fine sandd	Soft		D	Sufficient for house use only. 10 foot well in pasture water 22 head stock.
23	NW.	20	"	"	"	Dug	16	2,245	- 13	2,232	10	2,235	Glacial sand	Hard		D, S	Sufficient for 50 head stock.
24	SW.	21	"	"	"	Bored	80	2,295					Glacial sand	Hard		D, S	Sufficient for 35 head stock.
25	SW.	22	"	"	"	Bored	65	2,275					Glacial drift	Heavily "alkaline"		N	Waters makes stock sick. Dry holes. Haul water from NW. ¼ section 22.
26	NW.	22	"	"	"	Dug	12	2,293	- 10	2,283	12	2,281	Glacial gravel	Hard		D, S	Well has never been pumped dry; neighbours tank from it.
27	NE.	22	"	"	"	Dug	18	2,298	- 11	2,287			Glacial sand and gravel	Hard		D	Intermittent supply. Hauls water from NW.¼ section 22.
28	SE.	24	"	"	"	Drilled	261	2,309	-141	2,168			Glacial fine sand	Hard, iron		D, S	Abundant supply. Dry holes to 35 feet.
29	SW.	24	"	"	"	Test	20	2,300					Glacial drift			N	Dry hole. Waters stock at a neighbours well.
30	NW.	24	"	"	"	Dug	22	2,305	0	2,305	18	2,287	Glacial snad	Hard		S	Poor supply. Dry holes to 25 feet; hauls water summer and winter.
31	SW.	25	"	"	"	Dug	25	2,300	- 21	2,279			Glacial fine sand	Hard		S	Will water 15 head stock; 2 other wells also used. Tanks water in winter.
32	SW.	26	"	"	"	Dug	14	2,284	- 11	2,273			Glacial sand	Soft		D, S	Sufficient for 25 head stock.
33	SW.	28	"	"	"	Dug	13	2,290	- 4	2,286			Glacial sand	Hard, "alkaline"		D, S	Will water 13 head stock. Hauls water from section 22 for 14 head stock.
34	NW.	28	"	"	"	Dug	15	2,348	- 7	2,341	8	2,340	Glacial sand	Hard		D, S	Will water 5 head stock. Dry holes 40 to 70 feet deep.
35	NW.	29	"	"	"	Dug	24	2,277	- 12	2,265			Glacial sand	Hard, iron		D, S	Intermittent supply. Dry holes 60 feet deep. One other 21 foot well.
36	SW.	30	"	"	"	Bored	40	2,248	- 20	2,228	32	2,216	Glacial sand and gravel	Hard		D, S	Rapid seepage; abundant supply.
1	NE.	3	15	12	2	Dug	7	2,178	+ 1	2,179	6	2,172	Glacial sand	Soft		D, S	Abundant supply.
2	SW.	4	"	"	"	Dug and Bored	24	2,170	- 10	2,160	20	2,150	Glacial fine sand	Hard, iron		D, S	Barely sufficient for 40 head stock.
3	SE.	6	"	"	"	Bored	53	2,154	- 45	2,109			Glacial drift	Hard, iron		D, S	Sufficient for 15 head stock. Stock driven to neighbours well in winter.
4	NW.	6	"	"	"	Bored	28	2,141	- 19	2,122			Glacial fine sand	Hard		D, S	Sufficient for 30 head stock.
5	NE.	6	"	"	"	Bored	40	2,160	- 20	2,140	40	2,120	Glacial sand and gravel	Hard		D, S	Sufficient for 35 head stock at least. 8 dry holes 35 feet deep.
6	NW.	7	"	"	"	Bored	30	2,140	- 15	2,125			Glacial fine sand	Hard, iron, "alkaline"		D, S	Sufficient for 25 head stock; laxative effect on humans who are not used to it.
7	SE.	8	"	"	"	Bored	28	2,162	- 13	2,149	28	2,134	Glacial sand and gravel	Hard, "alkaline"		D, S	Sufficient for 30 head stock.
8	NW.	9	"	"	"	Bored	66	2,174	- 16	2,158			Glacial drift	Hard, "alkaline"		D, S	Intermittent supply; dry holes to 60 feet. Hauls water summer and winter.
9	NE.	11	"	"	"	Bored	45	2,183	- 30	2,153			Glacial gravel	Hard, "alkaline"		D, S	Insufficient in drought years; also owns a dam.

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(#) Sample taken for analysis.

WELL RECORDS—Rural Municipality of MONTMARTRE NO.126, SASKATCHEWAN

WELL No.	LOCATION ¼	Sec.	Tp.	Rge.	Mer.	TYPE OF WELL	DEPTH OF WELL	ALTITUDE WELL (above sea level)	HEIGHT TO WHICH WATER WILL RISE Above (+) Below (−) Surface	Elev.	PRINCIPAL WATER-BEARING BED Depth	Elev.	Geological Horizon	CHARACTER OF WATER	TEMP. OF WATER (in °F.)	USE TO WHICH WATER IS PUT	YIELD AND REMARKS
10	SE.	13	15	12	2	Bored	85	2,228	- 65	2,163			Glacial fine sand	Hard		D, S	Sufficient for 20 head stock.
11	SW.	14	"	"	"	Bored	60	2,191	- 48	2,143			Glacial drift	Hard, iron		D, S	Waters only 16 head stock. Remaining 54 head stock watered at the creek.
12	NE.	14	"	"	"	Dug	25	2,208	- 20	2,188	24	2,184	Glacial gravel	Hard		D, S	Sufficient for 8 head stock. Tanks water. Dry holes to 45 feet.
13	SW.	15	"	"	"	Dug	14	2,160	- 6	2,154			Glacial fine sand	Soft		D, S	Sufficient for 15 head stock.
14	SE.	16	"	"	"	Dug	10	2,174	- 4	2,170	6	2,168	Glacial sand	Hard		D, S	Sufficient for about 50 head stock.
15	SE.	17	"	"	"	Bored	65	2,173	- 14	2,159	14	2,159	Glacial sand	Hard, iron, "alkaline"		S	Village of Kendal well. 4 other shallow wells are also used.
16	NE.	17	"	"	"	Bored	55	2,174					Glacial fine sand	Hard, "alkaline"		D, S	Sufficient for 30 head stock.
17	SE.	18	"	"	"	Bored	33	2,154	- 20	2,134			Glacial sand	Hard, "alkaline"		D, S	Sufficient for 30 head stock.
18	NW.	18	"	"	"	Dug	32	2,154	- 24	2,130			Glacial drift	Soft, "alkaline"		D, S	Sufficient for 70 head stock.
19	SE.	20	"	"	"	Dug	30	2,169	- 25	2,144			Glacial sand	Hard, "alkaline"		D, S	Waters about 20 head stock in winter.
20	NE.	20	"	"	"	Dug	8	2,150	- 4	2,146	0	2,150	Glacial sand	Soft		D, S	Sufficient for 80 head stock; one 95 foot dry hole.
21	SW.	21	"	"	"	Dug	20	2,185	- 12	2,173			Glacial sand and gravel	Soft		D, S	Sufficient for 25 head stock.
22	SE.	22	"	"	"	Dug	20	2,136			0	2,136	Glacial fine sand	Soft		D, S	Sufficient for 30 head stock.
23	SE.	24	"	"	"	Bored	55	2,235	- 25	2,210			Glacial gravel	Hard		D, S	Sufficient for at least 30 head stock.
24	SW.	28	"	"	"	Bored	55	2,146	- 35	2,111			Glacial gravel	Hard, iron, "alkaline"		D, S	Poor supply. Cattle are driven 1½ mile in winter. Dry test holes 15 feet deep.
25	NW.	28	"	"	"	Bored	40	2,160					Glacial drift	Hard		S	Sufficient supply.
26	SW.	30	"	"	"	Drilled	130	2,193	- 10	2,183	124	2,069	Glacial gravel	Hard, iron		D, S	Waters at least 50 head stock.
27	NE.	33	"	"	"	Dug	14	2,150	- 13	2,137	8	2,142	Glacial sand	Soft		D, S	Waters at least 60 head stock.
1	NW.	6	16	12	2	Dug	24	2,190	- 21	2,169			Glacial gravel	Hard, poor taste		D, S	Sufficient for 15 head stock.
2	NW.	8	"	"	"	Dug	12	2,170	- 9	2,161			Glacial gravel	Soft		D, S	Sufficient for 15 head stock.
3	SW.	16	"	"	"	Bored	45	2,194	- 25	2,169	36	2,158	Glacial sand	Hard, "alkaline"		D, S	Sufficient for 15 head stock at least.
4	NW.	16	"	"	"	Dug	10	2,184	- 7	2,177			Glacial sand and gravel	Soft		D, S	Abundant supply; well has never been pumped dry.
5	SE.	18	"	"	"	Dug	12	2,193	- 9	2,184			Glacial gravel	Soft		D, S	Abundant supply.
6	SE.	19	"	"	"	Dug	12	2,191	- 2	2,189	1	2,190	Glacial gravel	Soft		D, S	Abundant supply.
7	NW.	21	"	"	"	Dug	6	2,100	- 2	2,098	0	2,100	Glacial sand	Soft		D, S	Abundant supply.
8	NW.	28	"	"	"	Dug	10	2,175	- 3	2,172	0	2,175	Glacial sand	Soft		D, S	Abundant supply.
9	NE.	31	"	"	"	Dug	8	2,044	- 3	2,041	0	2,044	Glacial sand	Hard		D, S	Rapid seepage; abundant supply.
10	SE.	32	"	"	"	Bored	68	2,050	- 45	2,005	60	1,990	Glacial sand	Hard, "alkaline"		S	Sufficient for at least 80 head stock; 1 dry hole 40 feet deep.

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