CANADA
DEPARTMENT OF MINES
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WATER SUPPLY PAPER No. 163

PRELIMINARY REPORT

GROUND-WATER RESOURCES OF THE RURAL MUNICIPALITY OF CUPAR NO. 218 SASKATCHEWAN

By

B. R. MacKay, H. N. Hainstock & J. A. Chalmers

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GROUND WATER RESOURCES OF THE RURAL MUNICIPALITY OF CUPAR, NO. 218 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 given 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 age.

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 rests 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 Cupar is an area of approximately 358 square miles in southeastern Saskatchewan. It consists of nine full townships, described as townships 22, 23, and 24, ranges 16, 17, and 18; and two partial townships, townships 21, ranges 17 and 18; all west of the Second meridian. Piapot Indian Reserve, No. 75A, lying between Qu'Appelle river and partial township 21, range 18, is also included in this report. The Pheasant Hills branch of the Canadian Pacific railway traverses the centre of the municipality in a west-east direction and on it are located the villages of Southey, Markinch, and Cupar. The village of Markinch, in the SE.$\frac{1}{4}$, sec. 7, tp. 23, range 17, is 35 miles north and slightly east of the city of Regina.

The municipality is drained by Qu'Appelle river, Loon creek, and several small tributary streams of Loon creek. Qu'Appelle river forms the southern boundary of that part of the municipality in township 21, range 17, and of Piapot Indian Reserve. The river is generally a relatively small, sluggish, but permanent stream that meanders through a flood-plain about $\frac{3}{4}$ to 1 mile wide. The banks of the valley slope upwards very steeply to plain level, approximately 300 feet above the flat valley floor. Loon creek flows in a southeasterly direction across townships 24 and 23, ranges 18 and 17, and then turns and flows southwest through townships 22 and 21, range 17. The flow of the creek is intermittent and is interrupted in three places by small lakes. The valley through which it flows gradually increases in depth from 40 feet at the northwestern corner of the municipality to 300 feet at the confluence with Qu'Appelle valley in sec. 18, tp. 21, range 17. The main tributary of Loon creek flows in a southerly direction through townships 24 and 23, ranges 17 and 18.

Frequent floodings of Qu'Appelle valley by the river have caused the deposition of at least 40 feet of silt, sand, and gravel on its flood-plain. A glacial lake basin occurs in the vicinity of Cupar, and in this area a thin veneer of glacial lake clay overlies the boulder clay. The remainder of the municipality is largely covered by glacial till and moraine. The northeastern part of the municipality is covered by a moraine known as the Fox Hills moraine. Five areas ranging from 40 to 600 acres in extent, in the northern half of the municipality, are mantled by glacial outwash sands and gravels, which in some places attain a thickness of 25 feet.

The floor of Qu'Appelle valley and the glacial lake basin in the vicinity of Cupar are quite flat and treeless. The soil in the glacial lake basin is a fairly heavy black clay which when very wet is frequently termed "gumbo" clay. The glacial till-covered area is flat to undulating, lightly wooded, and the soil in many places, particularly in townships 24, ranges 17 and 18, is very sandy. The moraine-covered country is rolling and hilly, undrained depressions are very common, and the land is in most places wooded with clumps of poplar. The ground surface is particularly rough in Fox hills. The minimum elevation of 1,590 feet above sea-level is in the valley of Qu'Appelle river and the maximum elevation of 2,160 feet above sea-level is reached in Fox hills in the northern part of township 24, range 16.

Water-bearing Horizons in the Unconsolidated Deposits

Water in this municipality is derived from sloughs, streams, dams, dugouts, springs, and wells, 3 to 409 feet deep, that tap deposits of sand and gravel in the glacial drift. One 12-foot well in sec. 15, tp. 21, range 17, is deriving water from a bed of alluvial sand in the flood-plain of Qu'Appelle river.

Springs are common along the north bank of Qu'Appelle valley and along the banks of Loon creek. These springs issue from beds of sand and gravel that outcrop on the sides of the valleys. The water is under little or no pressure although the yield from many of the springs is very large. The water from these springs is variable in quality, but as a rule it is suitable for drinking. The best known spring is that owned by the Canadian Pacific Railway company in the NE.$\frac{1}{4}$, sec. 8, tp. 23, range 17. The spring is located on the bank of Loon Creek valley and the water is derived from glacial outwash sands and gravels that occur immediately northeast of the valley. The spring is dug out to a depth of 16 feet and the well enlarged to a diameter of 20 feet. From this a centrifugal pump pumps 80,000 gallons of water a day to a tank in Markinch. The water is soft and is used by the Canadian Pacific Railway Company in their locomotives. Farmers within a radius of 8 miles of Markinch haul water from the tank. Several other springs occur, which if dug out and cribbed would probably yield large supplies of water.

Adequate supplies of water are difficult to locate in the glacial drift in most parts of the municipality. Forty-seven per cent of the farmers in the municipality have been unable to secure a satisfactory supply of water from wells. Most of the wells are less than 35 feet deep and those that yield an adequate supply usually encounter sand and gravel above the blue boulder clay. Little difficulty is experienced in obtaining sufficient supplies of water at depths of less than 35 feet in the valley of Loon creek, in the northwestern part of township 23, range 16, and in the western 2 miles of township 24, range 17. Water can also be easily obtained in parts of sec. 32, tp. 21, range 18, and secs. 13, 14, 15, and 23, tp. 24, range 16. Deposits of water-bearing sands and gravels overlying the blue boulder clay, and which yield satisfactory supplies of water, however, are usually very difficult to strike.

The supply in most of the shallow wells is easily affected by seasonal rainfall, and the wells do not yield sufficient water for local needs during winters and drought periods. By using more than one well some farmers are able to obtain sufficient water in years of normal rainfall, and even in winters, but in years of drought water must be hauled. In some areas, particularly in township 24, range 16, and in the eastern 4 miles of township 24, range 17, water is exceedingly difficult to locate in the glacial drift, particularly in that part of the drift above the blue clay. Farmers in this area dig wells beside sloughs, which are very numerous, and use them in conjunction with the sloughs to obtain water for both domestic and stock use. This area suffered an acute shortage of water during 1930 to 1934. Water from seepage wells, or wells that tap an aquifer above the blue clay, is generally not highly mineralized and is suitable for drinking. The village of Markinch obtains sufficient water from a number of wells 20 to 25 feet deep, each one of which yields a small supply. Water is hauled into the villages of Cupar and Southey and sold at the rates of 5 and 2 cents a pail, respectively.

Bored or drilled wells that tap aquifers of sand and gravel in the blue boulder clay yield water under pressure, and the supply is generally more abundant and constant than it is from aquifers lying above the blue boulder clay. The deepest well in the municipality, 409 feet deep, is located in the NE.$\frac{1}{4}$, sec. 27, tp. 22, range 18. This well taps an aquifer in the glacial drift and gives some indication of the great thickness of the drift in this municipality. The deposits of sand and gravel in the blue clay are in the form of pockets and lenses and not in continuous beds. The only area wherein a fairly continuous aquifer was encountered is township 23, range 18. The aquifer is a very fine sand and occurs at an elevation of 1,552 to 1,630 feet

above sea-level, and it has been tapped by eight wells 200 to 280 feet deep, including a well in the village of Southey. The water, like most water from wells that tap aquifers in the blue boulder clay, is highly mineralized and as a rule is not used for drinking. It is described as being hard, "alkaline", cloudy, and containing iron. There are very few wells in the municipality that yield water that is not usable for stock. A few other wells in the municipality that strike aquifers of fine sand have been abandoned, as the fine sand plugged the casings or cut the valves in the pumps and it was found too expensive to keep the casings clear or the pumps in repair.

Dugouts and dams are common in most townships with the exception of townships 24, ranges 16, 17, and 18. Dams are most common in township 22, range 17, since many small, short ravines lead into Loon valley. These methods of conserving surface water in this municipality are highly recommended. Most of the existing dugouts are too shallow to retain water throughout the winter months, or in the late summer months, during dry years. A dugout must be at least 12 feet deep to be satisfactory. Drilling to depths of 150 to 400 feet in the glacial drift will probably meet with success, but such operations should not be contemplated unless finances permit the risk of failure. The water obtained at depth in the drift will undoubtedly be too highly mineralized for drinking.

Water-bearing Horizons in the Bedrock

No well in this municipality has penetrated the glacial drift and encountered the Marine Shale series. The glacial drift is at least 400 feet thick in some areas. No outcrops of the Marine Shale series occur along the banks of Qu'Appelle valley, and the floor of this valley is at an approximate elevation of 1,590 feet above sea-level. The base of the 409-foot well, which is in glacial

drift, is at an elevation of 1,560 feet. In this part of Saskatchewan the Marine Shale series seldom contains water-bearing beds, and drilling into the shale, or "soapstone" as it is often termed, is not advised.

GROUND WATER CONDITIONS BY TOWNSHIPS

Township 21, Range 17

Qu'Appelle river forms the southern boundary of this partial township. The river is relatively small and flows in an easterly direction through a valley about 1 mile wide and 300 feet deep. The floor of the valley is flat and treeless, and the banks slope upwards very steeply to plain level. Loon creek, a small, intermittent stream, flows in a southerly direction across the western part of the township and empties into Qu'Appelle river in the SW.$\frac{1}{4}$, section 18. The creek flows through a V-shaped valley which increases in depth from 200 feet in section 32 to 300 feet at its junction with Qu'Appelle valley.

The flood-plain of Qu'Appelle valley is formed by a deposit of silt, gravel, and sand at least 40 feet thick that was laid down during frequent floodings of the valley by the river. A strip of country about 1$\frac{1}{2}$ miles wide lying to the north of Qu'Appelle valley and east of Loon Creek valley is covered by moraine, whereas the remainder of the township is mantled by glacial till. The ground surface on the plain is slightly undulating and lightly wooded.

Qu'Appelle river is used by those farmers living in the valley for watering stock, and water from it is also hauled for considerable distances. Springs are common along the banks of Qu'Appelle river and Loon creek where water-bearing beds of sand and gravel occur at the surface. Three springs in the NE.$\frac{1}{4}$, section 16, SE.$\frac{1}{4}$, section 19, and NW.$\frac{1}{4}$, section 29, yield abundant supplies of water, and the latter two springs were used extensively by farmers who were forced to haul water during the drought of 1930 to 1934. The water from springs in this township is hard and highly mineralized, and that from some of them is too "alkaline", for drinking.

A 12-foot well in the NW.¼, section 15, was dug through 9 feet of alluvial clay and struck a 3-foot bed of water-bearing sand. The water is hard and "alkaline", is not under pressure, and is used for domestic purposes only, as stock are watered at the river.

Adequate supplies of water are very difficult to locate in the upper 40 feet of the glacial drift. Six wells, 40 to 109 feet deep, in the northeastern part of the township are the only wells, except in the valleys, that are either dug in Recent alluvium or at the point where springs occur that yield adequate supplies of water. These six wells are dug or bored to beds of water-bearing sand and gravel that yield water under hydrostatic pressure. A layer of hardpan usually overlies the aquifer. The 70-foot well in the NE.¼, section 26, was bored through the following materials, in descending order; 16 feet yellow clay, 40 feet blue clay, 10 feet hardpan, and 4 feet sand. The water in this well rises to a point 55 feet below the surface, and the well has never been pumped dry since it was made in 1920. The supply of water in the 109-foot well in the NE.¼ has gradually decreased, probably due to fine sand plugging the casing, but in the remaining four wells the supply is abundant and constant. The water is hard, highly mineralized, contains iron, and is generally cloudy, and that from only two of the six wells is used for drinking. Six farmers in the township are short of water, and must tank water from Qu'Appelle river or from springs.

Township 21, Range 18

This partial township lies north of Piapot Indian Reserve, No. 75A, and consists of approximately fourteen sections. The reserve occupies most of the part of Qu'Appelle valley north of the river, but part of the north bank of the valley lies within

the township. A small area in the western half of section 31 is covered by moraine, but the remainder of the township is overlain by glacial till. The ground surface is slightly undulating and is lightly wooded with poplar.

Only four wells less than 38 feet deep in this township yield adequate supplies of water, and three of them are located in the NW.$\frac{1}{4}$, section 32. The fourth well, 14 feet deep, in the SE.$\frac{1}{4}$, section 26, yields a small but sufficient supplies of soft water from sand and gravel that extends from the surface to the base of the well. The other three wells are dug in a similar deposit at least 20 feet thick, but the catchment area must be larger as the supply from them is quite abundant, although in two of the wells the supply decreased slightly during the drought of 1930 to 1934. One of these wells, in section 32, dug to a depth of 12 feet, is a municipal well and several farmers tank water from it. A 20-foot well dug entirely through gravel yields sufficient water for at least 300 head of stock. Although the gravel outcrops at the surface at this well, another well dug only 4 feet distant struck clay beneath the top soil. The water in all three wells in section 32 is soft. Most of the shallow wells in the township are dug in or near sloughs and, consequently, the supply of water from them is intermittent and only satisfactory in wet seasons when the sloughs hold water.

Ten wells 38 to 175 feet deep tap pockets of water-bearing sand and gravel in the blue boulder clay. These wells yield a sufficient supply of water for local requirements, and seven of them yield water under pressure. In those wells where the water is under hydrostatic pressure the supply is abundant and is not easily affected by drought conditions. Three of these wells, 58, 175, and 160 feet deep, made in 1918, 1916, and 1917, have never been pumped dry and the supply has been constant. The water is hard, "alkaline", contains iron, and is sometimes cloudy.

The water from some wells is used for drinking, as water from shallow wells, which is usually less mineralized, is not available. Dry holes to depths of 90 feet have been dug and bored in this township.

Sloughs and a few dugouts are used by farmers for watering stock during the summer months, the dugouts being too shallow to retain supplies of water throughout the winter months. Eight farmers are short of water and additional water is hauled from springs in Qu'Appelle valley, from Qu'Appelle river, or from the municipal well.

Township 22, Range 16

The northwestern corner of the township is covered by a thin veneer of glacial lake clay not more than 2 feet thick. The eastern 2 miles of the township is covered by moraine, whereas the remainder of the township is mantled by glacial till. The ground surface is quite flat in the glacial lake basin, becomes undulating in the till plain, and rather rough and rolling in the moraine-covered area. A low ridge extends around the margin of the glacial lake basin, and the township is lightly wooded with poplar.

The wells in the township are from 12 to 152 feet deep, and approximately one-half the farmers are unable to obtain a sufficient supply of water. Adequate supplies of water are difficult to obtain in the upper 40 feet of the glacial drift. Most of the wells less than 40 feet deep are dug near sloughs, dams, or dugouts, and depend entirely on seepage from these surface reservoirs. A few wells, such as those in the NW.$\frac{1}{4}$, section 24, and the NW.$\frac{1}{4}$ and NE.$\frac{1}{4}$, section 26, obtain small but sufficient supplies of water from pockets of water-bearing sand that underlie yellow boulder clay. The water from these wells is hard but not highly mineralized, and

is quite suitable for drinking. Several farmers haul drinking water from the 18-foot well in the NW.¼, section 24.

The most productive wells are those that tap pockets of water-bearing sand and gravel in the blue boulder clay. With the exception of the 152-foot well in the SW.¼, section 14, these wells are 42 to 82 feet deep. The water-bearing sand and gravel deposits occur in the form of pockets or lenses rather than as a continuous bed, and several wells as deep as 110 feet failed to strike water. When a pocket of sand and gravel is struck in the blue boulder clay, the water rises under slight pressure. The supply is always adequate for local requirements, although in some wells it is not very abundant, and variations in the annual precipitation affect the supply only slightly or not at all. The water is almost invariably hard, "alkaline", cloudy, and contains iron. It is used for stock, but rarely for drinking. Some farmers prefer to haul drinking water rather than to use the water from these wells.

Surface water in sloughs is used for stock whenever it is available, as it is preferable to the highly mineralized water from deep wells. Dugouts are common, but most of them do not retain water during the winter months, owing to the fact that they have been excavated large and shallow instead of small and deep. A few of the coulées leading to Loon creek have been dammed and the water is used for stock. The best dam, known as Findlay's dam, is located in the NW.¼, section 21, and several farmers haul water from it. McKinnon's dam, in the SE.¼, sec. 24, tp. 22, range 17, is also used by several farmers in this township. Good drinking water is scarce.

Drilling to depths of less than 300 or 350 feet will probably strike highly mineralized water in sand and gravel deposits in the glacial drift, but unless finances permit the risk

of failure this method of obtaining water should not be used. Dugouts at least 12 feet deep and located in favourable locations are an economical and practical means of alleviating the shortage of well water, and this method of retaining a supply of surface water is recommended. A shallow well dug beside the dugout will derive seepage water that will be suitable for drinking and domestic purposes.

Township 22, Range 17

Loon creek flows intermittently in a southerly direction through the central part of the township. The valley in which it lies is wide in comparison to the size of the creek, and its depth increases from approximately 100 feet in section 33 to about 160 feet in section 4. Short, deep ravines dissect the plain on either side of the main valley and carry surface water to Loon creek. A strip of country about one-half mile wide on the eastern side of Loon valley, in the northern half of the township, and part of section 32 are covered by moraine. The remainder of the township is covered by glacial till, and in the northeastern corner of the township it is overlain by a thin veneer of glacial lake clay. The glacial lake basin is flat, whereas the remainder of the township is undulating. Clumps of poplar trees occur throughout the area, the growth being fairly dense in the valley of Loon creek.

Springs are located along the banks of Loon Creek valley, and stock that are pastured in the valley are watered at these springs. Also, during the drought of 1930 to 1934 several farmers hauled water from them. Pockets of water-bearing sand and gravel are very difficult to locate in the upper 40 feet of the glacial drift. The most productive shallow wells are dug in or near Loon Creek valley or its tributary ravines, but even

in these locations adequate supplies of water are not readily located. Two wells 10 and 24 feet deep, in the SE.$\frac{1}{4}$, section 4, and the SE.$\frac{1}{4}$, section 5, were dug on the slopes of Loon Creek valley. These two wells yield abundant supplies of water under pressure, from aquifers of sand and gravel. The 10-foot well begins to flow in the spring, the water rising to a maximum height of 4 feet above the surface; it ceases to flow in mid-summer. The water in the 24-foot well rises to a point 2 feet below the surface and the supply is oversufficient for 75 head of stock. These two wells have tapped aquifers of considerable extent. The water, as in most shallow wells that tap aquifers above the blue clay, is not highly mineralized and is quite suitable for drinking. Most of the shallow wells in the township are dug beside sloughs, dams, or dugouts, and depend on seepage water from these reservoirs for their supply. This type of well is usually dug to provide water for domestic purposes.

Six wells, 40 to 220 feet deep, have struck pockets of sand and gravel in the glacial drift and yield water under pressure. The supply is moderate to abundant, but two wells, 175 and 120 feet deep, in the NW.$\frac{1}{4}$, section 7, and the SE.$\frac{1}{4}$, section 34, are now plugged with sand. The 52-foot well in the SE.$\frac{1}{4}$, section 2, has never been pumped dry, and the 220-foot well in the SW.$\frac{1}{4}$, section 7, yields a very abundant supply of water. The water from three wells is hard and used for drinking, but that from the 52-, 175-, and 220-foot wells is too highly mineralized for drinking.

Many dry holes have been dug and bored to depths of less than 100 feet. Inflammable gas was struck in a dry hole 220 feet deep in the SW.$\frac{1}{4}$, section 7, and further drilling in that well was discontinued.

Surface water is used extensively for stock in this township. Small dams built across ravines are common in the part of the township east of Loon creek. Most of these dams do not retain sufficient water for use during the winter months, but two dams in the NW.$\frac{1}{4}$ and SE.$\frac{1}{4}$, section 24, retain continuous supplies of water. McKinnon's dam, in the SE.$\frac{1}{4}$, section 24, is the source from which many farmers haul water. Dugouts are quite common in the western sections of the township, but they are too shallow to be satisfactory. They must be at least 12 feet deep to retain sufficient water from the spring thaw and summer rains to last throughout the following winter. It is in winters and in drought years that water is scarce in this township, and over one-half the farmers must haul water during these periods. The Canadian Pacific Railway company tank in Markinch is a source from which many farmers haul water.

The drilling method is the best means of searching for water in the glacial drift in this township. The drift is at least 400 feet thick, but costly drilling operations should not be undertaken if finances do not permit the risk of failure. Farmers are advised to continue their efforts in making or improving dams and dugouts.

Township 22, Range 18

This township is a treeless, gently undulating till plain, the elevation of which decreases slightly towards the northeastern corner. Small, rounded hills and shallow, undrained depressions are more common in the western part of the township than they are in the eastern sections.

Most of the producing wells in the township are dug or bored to depths of less than 35 feet. The supply of water from these shallow wells is exceedingly variable, and is readily

affected by drought conditions. These wells tap small pockets of sand and gravel above the blue boulder clay and the water is not under pressure. In many places more than one well is dug in order to obtain sufficient water for all farm requirements. For instance, the farmer in the SW.$\frac{1}{4}$, section 28, uses four shallow wells, each of which taps small pockets or beds of sand beneath yellow clay, the combined yields forming a sufficient supply throughout the year. Two of the most productive shallow wells in the township are 12 and 16 feet deep, and are located in the NE.$\frac{1}{4}$, section 12, and the SW.$\frac{1}{4}$, section 13. The 12-foot well yields sufficient water for 250 head of stock, and the water-level in the 16-foot well stands at a point 4 feet below the surface and has never been lowered since the well was dug in 1929. Many shallow wells derive water by direct seepage from sloughs and are not reliable in winters or during periods of drought. Pockets of water-bearing sand and gravel above the blue boulder clay are most difficult to strike in the central sections of the township. The water from these shallow wells is usually not highly mineralized, and that from seven wells is moderately soft.

Eight wells, 33 to 67 feet deep, a well 160 feet deep, and a well 409 feet deep tap deposits of sand and gravel in the blue boulder clay and yield water under pressure. The shallower wells yield moderate to abundant supplies of hard water that is in many cases "alkaline", but the supply from none of the wells decreased during the drought of 1930 to 1934. The 67-foot well in the NW.$\frac{1}{4}$, section 30, has never been pumped dry since it was bored in 1907, and the water-level has remained constant at a point 16 feet below the surface. The water from many of these wells is used for drinking, but that from the 60-foot well in the SE.$\frac{1}{4}$, section 11, is not usable for stock. The 160-foot well in the SW.$\frac{1}{4}$, section 24, yields a very small supply, as it is plugged with fine sand. The 407-foot well, the deepest well in the municipality, was

drilled in the NE.$\frac{1}{4}$, section 27. The base of this well is believed to be plugged by sand and the water is thought to enter the well at a point about 270 feet below the surface. The water rises to a point 120 feet below the surface and the supply is adequate and constant. The water, although it is hard, "alkaline", and contains iron, is used for drinking.

Numerous dry holes as deep as 160 feet have been dug and bored, particularly in the central sections of the township. Twenty of the forty-seven farmers interviewed are unable to obtain a sufficient supply of water. Surface water in sloughs, dugouts, and dams is used whenever available, and much water is hauled. The Canadian Pacific Railway Company tank in Markinch is one of the main sources from which water is tanked.

Excavating dugouts is an economical and practical method of alleviating the water shortage in this township. The glacial drift is at least 400 feet thick, and deep drilling into the drift will probably strike water. The two deepest wells in the township, however, are being gradually plugged with sand. Drilling to depths in excess of 400 feet is not considered advisable as the underlying Marine Shale series in this part of Saskatchewan rarely contains water-bearing beds.

Township 23, Range 16

The southwestern part of the township is covered by a thin veneer of glacial lake clay. This area is quite flat and devoid of tree growth, and the soil is a heavy, black, clay loam. The elevation in the glacial lake basin rises gently about 25 feet from the southwestern corner of the township to the north-eastern shore-line. A strip of country approximately one-half mile wide, which is covered by glacial till, separates the area of glacial lake clay from the moraine known as the Fox Hills. The

ground surface rises rapidly from the old shore-line of the glacial lake to an elevation of 2,060 feet above sea-level at the northeastern corner of the township. The land surface in Fox hills is rough and rolling, and sloughs and small, rounded hills are common. This part of the township is lightly wooded with poplar. A deposit of glacial outwash sands and gravels, 10 to 20 feet thick and covering an area of 40 acres, is located in the SE.$\frac{1}{4}$, section 30. The village of Cupar, at an elevation of 1,881 feet above sea-level, is located in the NW.$\frac{1}{4}$, section 8, in the glacial lake basin.

The wells in the township are from 9 to 312 feet deep and are dug, bored, or drilled into glacial drift. Deposits of water-bearing sand and gravel are extremely difficult to locate in the southern 3 miles of the township, and most of the thirty farmers in the township who are short of water are settled in this area. Most of the producing wells in the township are less than 35 feet deep and tap pockets or lenses of sand and gravel above the blue boulder clay. In several wells the sand and gravel extends from the ground surface to the base of the well. Most of the shallow wells that yield permanent and adequate supplies of water are located in the northern and western sections. In these sections adequate and often abundant supplies of water are easily obtained from sand and gravel at depths of less than 35 feet. The aquifers usually underlie yellow boulder clay, but in some places the sand and gravel beds occur at the surface. One of the best shallow wells in this township is the 9-foot deep one located in the NW.$\frac{1}{4}$, section 31. This well is dug in gravel, and as many as 15 tanks of water a day are hauled from it in winters and drought years. A well, 20 feet deep, dug in the glacial outwash sands and gravels in the SE.$\frac{1}{4}$, section 30, is used by the village of Cupar. Water is hauled into the village from the well and sold at the rate of 5 cents a pail. The water

from the shallow wells in this township is not highly mineralized, and several wells, including the well used by Cupar, yield soft water. Adequate supplies of water at depths of less than 35 feet are almost impossible to find in the southern part of the township, and most of the shallow wells in this area derive their water by seepage from sloughs or dugouts. The water from these wells is used for drinking and domestic purposes.

Five wells, 60, 70, 60, 110, and 312 feet deep, tap water-bearing pockets of sand and gravel in the blue boulder clay and yield water under pressure. The supply in all these wells, except the 312-foot well, was affected by the drought of 1930 to 1934, but the yields were adequate for stock requirements. The water is highly mineralized, and that from the 60-foot well in Cupar is too "alkaline" for drinking. The water in the 110-foot well is hard, "alkaline", cloudy, and contains iron. It is used only for stock. The farmer who drilled the 312-foot well in the SW.$\frac{1}{4}$, section 20, kept a log of the well as it was being drilled. The well was drilled through 30 feet of yellow boulder clay into grey clay. Sand was struck at the base of the well beneath 292 feet of grey clay, and water rose to a point 187 feet below the surface. The well has never been pumped dry since it was drilled in 1919. The water is hard and contains iron, but is used for drinking. Seventeen dry holes were sunk in this quarter section before the above well encountered water.

Numerous dry holes have been sunk in the southern half of the township, including two 300-foot dry holes in the SE.$\frac{1}{4}$, section 7, and the village of Cupar. Dugouts are common, but most of them are too shallow to conserve sufficient water for use during the winter months. A large dugout was excavated in the village of Cupar. Farmers in the southeastern part of the township haul water from a large slough in the SE.$\frac{1}{4}$, section 25, locally known as Roper's lake. The well in the NW.$\frac{1}{4}$, section 31, and the

Canadian Pacific Railway Company tank in Markinch are also used as sources from which water is hauled by farmers in this township. Farmers residing in the southern and northeastern parts of the township are advised to excavate deep dugouts, at least 12 feet deep, in order to alleviate the shortage of water. The glacial drift is over 400 feet thick and deep drilling into it may possibly strike water, but the underlying Marine Shale series seldom contains water-bearing sand or gravel.

Township 23, Range 17

Loon creek flows in a southeasterly direction across the southwestern corner of the township. The valley through which the creek flows increases in depth from 50 feet in section 18 to approximately 100 feet in section 4. The southeastern part of the township is overlain with a thin covering of glacial lake clay. Moraine covers the northeastern corner of the township and a strip of country $1\frac{1}{4}$ to $1\frac{1}{2}$ miles wide in the vicinity of Loon Creek valley. Small deposits of glacial outwash sands and gravels occur in sections 8 and 17, sections 20, 21, 28, and 29, and sections 32 and 33. The remainder of the township is mantled by glacial till. The land is undulating except in the glacial lake basin where it is quite flat. The southwestern corner of the township and the slopes of Loon Creek valley are lightly wooded with poplar. The maximum elevation of 1,950 feet is reached at the northeastern corner of the township, and the village of Markinch, in the SE.$\frac{1}{4}$, section 7, is at an elevation of 1,834 feet above sea-level.

Springs flow out of the banks of Loon valley in the NW.$\frac{1}{4}$, section 4, SE.$\frac{1}{4}$ and NE.$\frac{1}{4}$, section 8, and NE.$\frac{1}{4}$, section 18. The most productive spring is that in the NE.$\frac{1}{4}$, section 8, which is used by the Canadian Pacific Railway Company. A well 16 feet deep and 20 feet in diameter was sunk at the point where the

spring issued from the ground and yields 80,000 gallons of water a day. The water is lifted by a centrifugal pump to a tank in the village of Markinch and used in the company's locomotives. Many farmers within a radius of 8 miles of the town haul water from this tank for both stock and drinking purposes. The water is soft. The other reported springs yield abundant supplies of water, but it is hard, although not "alkaline", and is quite suitable for drinking.

Nearly all the producing wells in this township are less than 35 feet deep, and tap pockets of water-bearing sand and gravel overlying blue boulder clay. The supply of water from these wells is exceedingly variable, and depends upon the extent of the aquifer and the amount of annual precipitation. Most of the wells yield small but sufficient supplies of water. Five of the most productive shallow wells are located in the S.W.$\frac{1}{4}$, section 2, SW.$\frac{1}{4}$, section 13, NW.$\frac{1}{4}$, section 21, SE.$\frac{1}{4}$, section 26, and SE.$\frac{1}{4}$, section 31, and are 16, 20, 12, 12, and 8 feet deep, respectively. The 16-foot well, although it holds only 2 feet of water, has never been bailed dry. The water in the 20-foot well stands at a point 11 feet below the surface, and continuous pumping has not lowered this level. The 12-foot well in the SE.$\frac{1}{4}$, section 26, is used by many farmers as a source from which water is hauled, and as many as eleven tanks of water are hauled from this well in one day. The village of Markinch obtains an adequate supply of water from several shallow wells 20 to 25 feet deep. The water in the shallow wells is not highly mineralized and at least twelve wells in the township yield soft water.

Only four wells, 60, 248, 210, and 160 feet deep, have struck pockets of sand and gravel in the blue boulder clay that yield water under pressure, and the latter two wells are both plugged with sand, and are abandoned. The 60-foot well in the SE.$\frac{1}{4}$, section 1, yields a moderate supply of hard, cloudy,

"alkaline" water which contains iron. The 248-foot well in the NE.¼, section 21, yields from a gravel aquifer an abundant supply of water that rises to a point 148 feet below the surface. The water is similar to that in the 60-foot well, but it is used for drinking although it acts as a laxative. A 250-foot well in the NE.¼, section 10, the deepest in the township, yields a very small supply of bitter, unusable water.

Seventeen farmers in this township rely on seepage wells, dugouts, and sloughs, or haul water. Most of the dugouts are too shallow to retain a permanent supply of water, and the sloughs become dry during drought periods so that all these farmers have had to haul water. The usual sources from which water is hauled are the Canadian Pacific Railway Company tank in Markinch, and wells in the SE.¼, section 26, and in the NW.¼, sec. 31, tp. 23, range 16. The deepest dry hole in the township is 325 feet deep. It is located in the SW.¼, section 26.

Test augers should be used to locate pockets of water-bearing sand and gravel in that part of the glacial drift overlying the blue boulder clay. Dugouts should be at least 12 feet deep and should be excavated in natural depressions, where the maximum amount of surface water collects.

Township 23, Range 18

Loon creek flows in a southeasterly direction from section 34 to section 13, and an intermittent, tributary stream flows south through sections 36 and 25 and joins Loon creek in the NE.¼, section 24. Both streams flow through wide ravines that are less than 50 feet deep. A strip of country ½ mile to 2 miles wide to the south of Loon creek, and a small area in sections 30 and 31, are covered by moraine, whereas the remainder of the township is mantled by glacial till. The ground surface is undulating and is lightly wooded with poplar, the growth becoming more dense in the

central sections. The village of Southey, in the SE.$\frac{1}{4}$, section 7, is at an elevation of 1,832 feet above sea-level.

Springs occur along Loon creek in section 24. One spring in the SE.$\frac{1}{4}$, section 24, yields an abundant supply of hard water, and several farmers hauled water from it during the years of drought.

The wells in the township are from 7 to 280 feet deep, and the producing wells tap aquifers of sand and gravel in the glacial drift. Adequate supplies of water are difficult to locate in the glacial drift overlying the blue boulder clay. Occasionally wells such as those in the SW.$\frac{1}{4}$, section 6, NW.$\frac{1}{4}$, section 18, SW.$\frac{1}{4}$, section 34, and NW.$\frac{1}{4}$, section 36, all less than 13 feet deep, tap large pockets of water-bearing sand and gravel that yield fairly abundant supplies of water. Generally, however, the pockets of sand and gravel are small, and some farmers use as many as five shallow wells in order to obtain an adequate supply of water during the winter months and drought years. In some quarter sections pockets of water-bearing sand and gravel have not been located in that part of the drift above the blue boulder clay.

Abundant supplies of highly mineralized water are obtained from deposits of sand and gravel in the blue boulder clay at depths of 80 to 280 feet. The water from these deposits in many cases rises under strong hydrostatic pressure. The highest pressure was recorded in a 260-foot well in the NE.$\frac{1}{4}$, section 1, where the water rose to a point 10 feet below the surface. This well, however, is now plugged with sand. A 275-foot well in the SE.$\frac{1}{4}$, section 16, struck a sand aquifer, and the water rose to a point only 25 feet below the surface, and this level is not lowered by continuous pumping. Water rises to a point 6 feet below the surface in an 85-foot well in the NW.$\frac{1}{4}$, section 22. Eight wells, 200 to 280 feet deep, tap what appears to be a fairly continuous aquifer of fine sand at an elevation of 1,552 to 1,630

feet above sea-level. The water is hard, cloudy, "alkaline", contains iron, and is not suitable for drinking. A 230-foot well in the village of Southey obtains an abundant supply of water, but the water acts as a laxative and cannot be used for drinking. The water for the village is hauled from a well in the NW.¼, sec. 35, tp. 22, range 19, and sold at the rate of 2 cents a pail. Three wells, 260, 200, and 248 feet deep, were partly or wholly plugged with fine sand which forms their aquifers.

About one-third of the farmers in the township have been unable to derive a satisfactory supply of water from wells. Surface water in sloughs and dugouts is used for stock or water is hauled. Numerous dry holes have been sunk to a maximum depth of 125 feet. The glacial drift is at least 400 feet thick, and the possibility of striking water by drilling to depths of 125 to 400 feet are considered to be fairly good. The water, however, will undoubtedly be too highly mineralized for drinking, but will be quite suitable for stock. Drilling to depths greater than 400 feet is not considered advisable as the Marine Shale series which underlies the glacial drift is believed to contain very few water-bearing beds.

Township 24, Range 16

This township is covered by a moraine known as the Fox Hills. The elevation rises rapidly from 1,950 feet above sea-level at the southwestern corner of the township to a maximum elevation of 2,160 feet in the northern part of sections 27 and 28. The land is rough and rolling and becomes quite densely wooded in the northeastern sections of the township. Sloughs are very common, thirty-two being counted in one half section.

A spring issues from the side of a hill in the SE.¼, section 23, and yields an abundant supply of soft water. Several farmers hauled water from this spring in the drought years of 1930 to 1934, and four farmers haul from it regularly.

Every producing well in this township is less than 35 feet deep. Pockets of water-bearing sand and gravel are extremely difficult to locate in that part of the glacial drift overlying the blue boulder clay. Most of the farmers depend entirely on surface water to meet all farm requirements. Sloughs are common and when they retain water they are used almost entirely for watering stock. Wells are dug beside the sloughs in summer and yield seepage water for domestic purposes. In the winter wells are dug in the centre of slough basins, and in years of average rainfall sufficient water is obtained from a number of these wells for stock requirements. During the drought years of 1930 to 1934 the sloughs became dry and water was very scarce, and at least thirty-four farmers in the township were forced to haul water for stock.

Occasionally a pocket of water-bearing sand and gravel is struck that yields a fairly good supply of water. Ten such wells were recorded, the most productive being a 5-foot well in the SW.$\frac{1}{4}$, section 13. The water in this well stands 1 foot below the surface and continual bailing does not lower this level. Most of these wells that tap pockets of water-bearing sand and gravel were affected by the drought of 1930 to 1934, but the supply was adequate for local requirements, and in some instances several farmers hauled water from the wells. The quality of the water from the shallow wells of this township is quite variable. As a rule it is hard and in many cases slightly "alkaline", but it is used for drinking.

Farmers in this township have not extensively prospected the lower part of the glacial drift for deposits of water-bearing sand and gravels. They use surface water and seepage wells, or haul water when these sources fail in drought years. A few dry holes have been sunk to depths of 100 feet, and

one dry hole in the SE.¼, section 6, was 225 feet deep. No wells in the township yield water under pressure.

Farmers are advised to excavate deep dugouts in slough basins to conserve surface water for the winter months and drought periods when the water shortage is acute. These dugouts will prove satisfactory if they are made at least 12 feet deep and are properly maintained. The glacial drift is probably 400 to 500 feet thick, and deposits of water-bearing sand and gravel may exist in it at depths greater than 100 feet. The excavation of dugouts, however, is a more economical and satisfactory method of obtaining water than is deep drilling, and these artificial reservoirs are highly recommended.

Township 24, Range 17

A small, intermittent tributary of Loon creek flows south through the western part of the township. A narrow area along the western boundary of the township is mantled by glacial till, whereas the remainder of the township is covered by moraine. The elevation rises from a minimum of 1,800 feet in the ravine in the northwestern corner of section 6 to a maximum of 2,040 feet at the northeastern corner of the township. The land is undulating and becomes rough and very uneven in the moraine-covered area. The soil in the vicinity of the creek in the till-covered area is very sandy. Sloughs and small, rounded hills are common in that part of the township overlain by moraine.

Ground water conditions in the eastern 4 miles of the township are poor and are similar to those in township 24, range 16. In the sandy area in the western 2 miles of the township adequate supplies of water are more easily obtained, usually at depths of less than 25 feet. The producing wells in the township are dug or occasionally bored to depths of 7 to 40 feet. At least 50 per cent of the wells in the township do not yield sufficient water in

winters and drought years, and, consequently, water must be hauled. Some farmers melt snow during the winter months. Those farmers who are unable to strike water-bearing sand and gravel in that part of the drift overlying the blue boulder clay use sloughs for watering stock and obtain water for domestic purposes from shallow seepage wells dug beside the sloughs. In some quarter sections very small and insufficient supplies of water are obtained from aquifers of sand and gravel, but several such wells dug in the vicinity of the farm buildings together yield sufficient water for local needs throughout the year. One of the most productive wells in the township, and the one from which many farmers haul water, is located in the SW.$\frac{1}{4}$, section 7. This well is 8 feet deep and is dug in a bed of gravel that occurs at the surface. The water stands at a point 5 feet below the surface, and this level is not lowered by bailing. Wells in the SE.$\frac{1}{4}$, section 12, NW.$\frac{1}{4}$, section 14, SE.$\frac{1}{4}$, section 18, SW.$\frac{1}{4}$ and SE.$\frac{1}{4}$, section 30, NW.$\frac{1}{4}$, section 31, and NW.$\frac{1}{4}$, section 32, yield sufficient water for 40 to 150 head of stock. The water from the wells in this township is usually not highly mineralized, and at least twenty-three wells yield soft water.

No attempts have been made to obtain water at depths greater than 80 feet in this township. The glacial drift is believed to be at least 400 feet thick, and is largely composed of impervious, bluish grey boulder clay. Water-bearing beds of sand and gravel may possibly exist at depths greater than 80 feet in the drift, and they are possibly more common in the lower half than the upper half. Farmers are advised to excavate dugouts to collect and retain surface water rather than to drill deep wells.

Township 24, Range 18

Loon creek flows in a southeasterly direction from section 30 to section 3. Its valley is wide and less than 50 feet

deep. A smaller tributary creek flows in a southerly direction across section 1. Glacial till covers the northeastern corner of the township and most of the southern twelve sections. An area of about 600 acres, in sections 17, 19, 20, and 30, is mantled by glacial outwash sands and gravels, and the remainder of the township is covered by moraine. The township is wooded with groves of poplar.

One of the most productive springs in Loon Creek valley is located in the SW.$\frac{1}{4}$, section 3. This spring flows throughout the year and has been in use since 1910. The aquifer is gravel and the water is hard and suitable for drinking. Eight farmers hauled water from it during the drought years of 1930 to 1934.

Only one well over 60 feet deep that yields an adequate supply of water for local requirements has been sunk in this township. Satisfactory supplies of water are difficult to locate in the upper 300 feet of the glacial drift, and most of the producing wells are dug to pockets of water-bearing sand and gravel in the upper 30 feet of the drift. Most of these wells are located on the banks or the floor of Loon Creek valley, and in two of them 12 and 9 feet deep, in the NW.$\frac{1}{4}$, section 4, and the SE.$\frac{1}{4}$, section 9, the water overflows the surface. The 12-foot well was dug on the bank of Loon valley and passed through 9 feet of blue boulder clay and 3 feet of hardpan. The water rises from an aquifer of sand and gravel beneath the hardpan to a point 4 feet above the surface. The water is hard, "alkaline", and contains iron, and the supply has been very abundant and constant since the well was dug in 1907. Several dry holes were dug in this vicinity, one only 25 feet distant from this well. The 9-foot well yields an abundant supply of soft water, but the well has been in use only since 1934. Other wells in the valley also yield abundant supplies of water, but the water is not under hydrostatic pressure. An 18-foot well dug near

the creek, in the SW.$\frac{1}{4}$, section 18, holds only 3 feet of water, yet this well has never been pumped dry since it was made in 1917. As many as 150 barrels of water a day were hauled from this well by neighbouring farmers in the drought years.

With the exception of along Loon creek, only nine farmers in the township obtain an adequate supply of water from wells. Numerous dry holes have been sunk to a maximum depth of 325 feet in the glacial drift, and one farmer in the NE.$\frac{1}{4}$, section 10, has sunk twenty-seven dry holes to a maximum depth of 185 feet, and has hauled water a distance of 3 miles from the spring in the SW.$\frac{1}{4}$, section 3, for eighteen years. Gas was struck in the 185-foot dry hole. Two wells, 230 and 210 feet deep, in the NW.$\frac{1}{4}$, section 13, and the NW.$\frac{1}{4}$, section 25, struck water in fine sand, but the latter well had to be abandoned as it became plugged with sand. The 230-foot well yields an abundant supply of hard, "alkaline", cloudy water but it is unsuitable for drinking. Dugouts are not common in this township, and at least twenty-six farmers haul water in dry years. These farmers are advised to excavate artificial reservoirs to collect and conserve surface water. The dugouts should be at least 12 feet deep, and shallow wells sunk near the impounded water will derive sufficient seepage water for domestic purposes.

1 Piapot Indian Reserve, No. 75A

Piapot Indian Reserve, No. 75A, is located immediately north of Qu'Appelle river, in the southwestern corner of the municipality, and consists of the flood-plain and north bank of the river. The valley floor is about one-half mile wide and consists of a Recent deposit of silt, sand, and gravel at least 40 feet thick. The banks of the valley slope upwards very steeply to the plain which lies approximately 300 feet above the floor of the valley.

Springs are common along the banks of Qu'Appelle valley and one of them is used extensively by farmers residing north of the reserve as a source from which water is tanked.

No wells were reported in the reserve. The residents probably water their stock at the river and use springs for drinking and domestic purposes. Water should be readily derived from the Recent stream deposits on the flood-plain of the river at depths of less than 30 feet.

STATISTICAL SUMMARY OF WELL INFORMATION IN RURAL MUNICIPALITY OF CUPAR, NO. 218, SASKATCHEWAN

Township / West of 2nd mer. Range	21 17	21 18	22 19	22 17	22 18	23 16	23 17	23 18	24 16	24 17	24 18	Total No. in Municipality
Total No. of Wells in Township	21	48	53	52	80	157	78	148	101	93	112	949
No. of wells in bedrock	0	0	0	0	0	0	0	0	0	0	0	0
No. of wells in glacial drift	20	48	53	52	86	157	78	148	101	93	112	948
No. of wells in alluvium	1	0	0	0	0	0	0	0	0	0	0	1
Permanency of Water Supply												
No. with permanent supply	14	20	33	37	55	58	50	73	40	41	40	467
No. with intermittent supply	4	8	2	7	7	14	7	1	24	32	7	113
No. dry holes	3	14	18	8	24	85	21	74	37	20	05	369
Types of Wells												
No. of flowing artesian wells	0	0	0	1	0	0	0	0	0	0	2	3
No. of non-flowing artesian wells	0	7	13	7	11	5	4	13	0	0	4	70
No. of non-artesian wells	12	27	22	30	51	07	53	61	64	73	41	507
Quality of Water												
No. with hard water	18	29	35	43	53	00	30	03	50	43	35	465
No. with soft water	0	5	0	1	9	12	21	11	14	30	12	115
No. with salty water	0	0	0	0	0	0	0	0	0	0	0	0
No. with "alkaline" water	11	14	17	8	21	11	8	32	19	11	12	164
Depths of Wells												
No. from 0 to 50 feet deep	15	33	34	35	02	104	57	104	92	91	00	093
No. from 51 to 100 feet deep	5	13	10	12	14	29	12	26	6	2	25	160
No. from 101 to 150 feet deep	1	0	2	2	6	15	3	9	1	0	14	53
No. from 151 to 200 feet deep	0	2	1	1	3	7	2	2	1	0	4	23
No. from 201 to 500 feet deep	0	0	0	2	1	2	4	7	1	0	3	20
No. from 501 to 1,000 feet deep	0	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	0
How the Water is Used												
No. usable for domestic purposes	12	28	21	33	40	56	50	50	01	03	37	463
No. not usable for domestic purposes	0	0	14	11	10	10	7	18	3	10	10	117
No. usable for stock	18	33	34	39	59	67	53	73	64	73	45	558
No. not usable for stock	0	1	1	5	3	5	4	1	0	0	2	22
Sufficiency of Water Supply												
No. sufficient for domestic needs	13	25	33	34	55	59	48	73	40	40	39	459
No. insufficient for domestic needs	5	9	2	10	7	13	9	1	24	33	8	121
No. sufficient for stock needs	10	23	21	22	33	37	40	38	23	23	22	292
No. insufficient for stock needs	8	11	14	22	29	35	17	36	41	50	25	288

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 boilders and tea-kettles is formed from these mineral salts.

Sodium

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

Sulphates

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

Chlorides

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

Iron

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

Hardness

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

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

Analyses of Water Samples from the Municipality of Cupar, No. 218, 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.	Alkalinity	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.	3	22	16	2nd	45	3,149												(3)	(4)	(2)		(1)		(5)	x1
2	SE.	13	22	18	2nd	14	3,089											(4)	(1)		(2)		(3)		(5)	x1
3	SW.	17	23	16	2nd	10	ooo											(1)		(2)		(4)			(3)	x1
4	NW.	21	23	16	2nd	18	2,111											(4)	(1)		(2)		(3)		(5)	x1
5	NE.	30	23	16	2nd	20	991											(3)	(1)		(2)				(4)	x1
6	SE.	30	23	16	2nd	20	354											(3)	(1)		(2)				(4)	x1
7	SE.	20	23	17	2nd	12	366											(4)	(3)		(2)		(1)	(5)		x1
8	NE.	7	23	18	2nd	150	2,629																			x1
9	NW.	18	23	18	2nd	7	340											(3)	(1)		(2)				(4)	x1

Water samples indicated thus, x1, are from glacial drift or other unconsolidated deposits.
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 by Provincial Analyst, Regina.
For interpretation of this table read the section on Analyses and Quality of Water.

Water from the Unconsolidated Deposits

Nine samples of water from wells that are sunk in the glacial drift were analysed by the Provincial Analyst, and the data are tabulated on the accompanying table. These wells, with the exception of the well indicated by sample 3, tap aquifers of sand and gravel; the 10-foot well from which sample 3 was taken derives its water by seepage from a nearby dugout.

The water indicated by sample 3 is not highly mineralized, and the laxative producing salts, magnesium sulphate and sodium sulphate, are absent. The surface water from the dugout was originally soft, but in seeping through the yellow boulder clay small amounts of the carbonate of calcium, magnesium, and sodium, and calcium chloride were taken into solution. These salts cause the water to be hard, but they will impart no ill effects on the human system.

Samples 6, 7, and 9 are from wells that tap deposits of sand and gravel that occur at the surface, sample 6 being from a well in glacial outwash sands and gravels that is used by the village of Cupar. These samples contain only small amounts of mineral salts in solution, and the water is excellent for drinking and all farm uses. The fact that clay was not passed through in these wells probably accounts for the low amount of dissolved mineral salts. Since the beds of sand and gravel occur at the surface, care must be taken to prevent contamination by polluted surface water, particularly in the well at Cupar where so many families use this water for drinking. The water from this well should be frequently tested for bacteria content. Samples 2, 4, and 5 were also taken from shallow wells. The water represented by sample 2 is too highly mineralized for drinking, the large amounts of magnesium sulphate and sodium sulphate making it highly laxative.

Samples 1 and 18 are from wells that tap aquifers in the blue boulder clay of the glacial drift, and the water in these wells is described as being "alkaline", and containing iron. The Provincial Analyst condemned the water from both wells for drinking purposes. The water should impart little or no ill effects on stock. The principal constituent salts in sample 1, and probably in sample 8, are the laxative producing salts, Epsom salts and Glauber's salt. Water from the glacial drift commonly contains a large amount of these mineral salts and is a sulphate water, or as it is frequently called, "alkaline".

Water from the Bedrock

No water is obtained from the bedrock in this municipality. The water obtained from aquifers in the Marine Shale series in this general region is very highly mineralized, and on the rare occasions when it has been obtained it was, as a rule, too salty or too laxative even for stock use.

WELL RECORDS—Rural Municipality of CUPAR, NO. 218, 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	NW.	15	21	17	2	Dug	12	1,600	- 9	1,591	9	1,591	Recent river sand	Hard, "alkaline"		D	Stock are watered at the river.
2	NE.	16	"	"	"	Dug	5	1,750	+ 1	1,751			Glacial sand	Hard, iron, "alkaline"		D, S	Oversufficient for 250 head stock.
3	SE.	19	"	"	"	Dug	5	1,750	+ 1	1,751			Glacial drift	Hard, "alkaline"		S	Abundant supply; several farmers hauled water from this well during the drought.
4	SW.	20	"	"	"	Dug	14	1,850	- 7	1,843			Glacial drift	Hard, "alkaline"		D, S	Seepage water from a spring; oversufficient for 25 head stock.
5	SE.	21	"	"	"	Dug	30	1,900	0	1,900			Glacial drift	Hard		D, S	Intermittent supply.
6	NE.	24	"	"	"	Dug	18	1,910	0	1,910			Glacial drift	Hard		S	Well becomes dry in winter, and stock must be driven to Qu'Appelle river.
7	SW.	25	"	"	"	Bored	52	1,910	- 44	1,866	52	1,858	Glacial sand	Hard, "alkaline"		D, S	Sufficient for 20 head stock.
8	NE.	26	"	"	"	Bored	76	1,900	- 55	1,845	66	1,834	Glacial sand	Hard, iron, "alkaline", cloudy		S	Well has never pumped dry; drinking water hauled from SW.¼, section 25.
9	NE.	27	"	"	"	Bored	109	1,905	- 55	1,850	105	1,800	Glacial fine sand	Hard, iron, cloudy		D, S	Insufficient for 12 head stock; several dry holes in glacial drift; hauls water 4½ miles from a dam.
10	NW.	29	"	"	"	Spring		1,800					Glacial drift	Hard, iron		D, S	Spring flowing out of bank of Loon creek ravine; abundant supply and farmers haul from this spring.
11	NW.	30	"	"	"	Dug	25	1,895	0	1,895			Glacial drift	Hard		D, S	Intermittent supply; stock water at a spring in the ravine in winter.
12	SW.	30	"	"	"	Bored	25	1,900	- 20	1,880			Glacial drift	Hard, iron, "alkaline"		S	Poor supply; hauls water from Qu'Appelle river and melts snow in winter.
13	SE.	32	"	"	"	Dug	18	1,750	- 12	1,738			Glacial gravel	Hard		D, S	Intermittent supply; hauls water and melts snow in winter.
14	SW.	34	"	"	"	Bored	60	1,860	- 40	1,840	60	1,820	Glacial sand?	Hard, iron, "alkaline"		D, S	Oversufficient for 85 head stock.
15	SW.	35	"	"	"	Dug	40	1,890	- 24	1,866	40	1,850	Glacial sand and gravel	Hard, "alkaline"		S	Oversufficient for 65 head stock; rain water is used for domestic purposes and drinking.
16	SE.	36	"	"	"	Bored	80	1,875	- 75	1,800			Glacial drift	Hard, iron, "alkaline"		S	Very poor supply; stock are driven to a well in NW.¼, section 30, township 21, range 16.
17	SW.	36	"	"	"	Dug	51	1,880	- 30	1,850	51	1,829	Glacial sand ?	Hard, iron, "alkaline", cloudy		S	Oversufficient for 60 head stock.
1	NE.	20	21	18	2	Dug	15	1,850	- 9	1,841			Glacial gravel	Hard		D, S	Poor supply; stock are watered at a spring in the ravine during the winter.
2	NE.	22	"	"	"	Bored	65	1,910									The deepest of two dry holes; uses a dugout in summer and Qu'Appelle river in winter for stock.
3	NE.	23	"	"	"	Dug	36	1,905	- 32	1,873	32	1,873	Glacial gravel	Hard, iron, "alkaline"		D, S	Oversufficient for 14 head stock.
4	NE.	24	"	"	"	Bored	58	1,910	- 38	1,872	58	1,852	Glacial gravel	Hard, "alkaline"		D, S	Well has never pumped dry.
5	NE.	26	"	"	"	Drilled	175	1,900	-150	1,750	175	1,725	Glacial sand	Hard, iron, "alkaline"		D, S	Abundant supply for 60 head stock; six dry holes 90 feet deep in glacial drift.
6	SE.	26	"	"	"	Dug	14	1,890	0	1,890			Glacial sand	Soft		D, S	Sufficient for 4 head stock.
7	SW.	27	"	"	"	Drilled	160	1,915	-140	1,775	160	1,755	Glacial blue sand	Hard, iron		S	Well has never pumped dry; seepage well yields drinking water; several dry holes as deep as 90 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 CUPAR, NO. 218, 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
8	SE.	26	21	18	2	Dug	21	1,910	- 12	1,898			Glacial sand	Soft		D, S	Intermittent supply in winter; hauls water from the NE.¼, Section 35.
9	NW.	28	"	"	"	Dug	20	1,900	- 6	1,894			Glacial drift	Hard, "alkaline"		D, S	Intermittent supply; a 70-foot well plugged with sand; hauls water from a spring in the valley.
10	NE.	29	"	"	"	Dug	80	1,910									Dry hole in glacial drift; a seepage well provides drinking water; hauls water from a spring forstock. [illegible] two dry [illegible]
11	SE.	31	"	"	"	Dug	24	1,905	- 14	1,891			Glacial drift	Hard, "alkaline"		D, S	One of four wells that yields an intermittent supply; two dry holes 30 feet deep; waters stock at a spring in Qu'Appelle valley.
12	NW.	31	"	"	"	Dug	32	1,895	- 26	1,869			Glacial drift	Hard		D, S	Intermittent supply; hauls water.
13	NW.	32	"	"	"	Dug	12	1,890	- 7	1,883	7	1,883	Glacial gravel	Soft		M	Abundant supply and several farmers haul water from this well.
14	NW.	32	"	"	"	Dug	20	1,890	- 8	1,882	8	1,882	Glacial gravel	Soft		D, S	Oversufficient for 300 head stock; another similar well in quicksand.
15	SE.	32	"	"	"	Bored	64	1,900	- 58	1,842	58	1,842	Glacial sand ?	Hard, iron, "alkaline"		S	Sufficient for 10 head stock.
16	SE.	33	"	"	"	Bored	40	1,885	- 15	1,870	40	1,845	Glacial blue sand	Hard, iron, "alkaline", cloudy		S	Sufficient for 30 head stock; a dam is used for stock in summer and a well beside the dam provides drinking water.
17	SW.	34	"	"	"	Dug	50	1,890	- 30	1,860	50	1,840	Glacial blue sand	Hard, iron, "alkaline"		S	Sufficient for 30 head stock; slough is used for stock in summer and a seepage well near slough provides drinking water.
18	NE.	34	"	"	"	Bored	48	1,875	- 22	1,853	48	1,827	Glacial gravel	Hard, "alkaline"		D, S	Oversufficient for 100 head stock; a 20-foot well yields a small supply.
19	SE.	35	"	"	"	Dug	15	1,890	- 1	1,889			Glacial drift	Hard		D	Uses a dugout in summer, for 30 head stock and hauls water one mile in winter.
20	NE.	36	"	"	"	Bored	80	1,875	- 60	1,815	80	1,795	Glacial sand	Hard, iron, "alkaline"		S	Good supply; a dugout is used in summer and seepage well near dugout is used for drinking water.
21	SE.	36	"	"	"	Bored	60	1,900	- 30	1,870			Glacial gravel	Hard, iron, "alkaline"		D, S	Sufficient, but supply decreases in dry years; a dugout is also used in summer.
1	NE.	1	22	16	2	Bored	90	1,890									The deepest of several dry holes in glacial drift; hauls water 2½ miles in winter.
2	NE.	2	"	"	"	Dug	12	1,870	- 4	1,866			Glacial drift	Hard		D, S	Intermittent supply; hauls water in winter.
3	SW.	3	"	"	"	Dug	45	1,845	- 30	1,815	35	1,810	Glacial sand	Hard, iron, "alkaline"		S	Oversufficient for 25 head stock; a 35-foot seepage well is used for drinking water; dry hole 115 feet deep; #.
4	NE.	4	"	"	"	Dug	63	1,850	- 51	1,799	63	1,787	Glacial sand	Hard, iron, cloudy		D, S	Sufficient for 22 head stock.
5	SE.	4	"	"	"	Dug	63	1,840	- 44	1,796	60	1,780	Glacial fine sand	Hard, iron, "alkaline", cloudy		D, S	Sufficient for 17 head stock; seepage wells are generally used for drinking water.
6	SW.	6	"	"	"												Dry holes in glacial drift; hauls water for stock and house use.
7	NW.	10	"	"	"	Dug	50	1,860	- 44	1,816	50	1,810	Glacial gravel	Hard, iron, "alkaline"		S	Sufficient for 50 head stock; also uses two dugouts for stock; rain water is used for domestic purposes.
8	SW.	11	"	"	"	Bored	82	1,860	- 42	1,818	82	1,778	Glacial sand	Hard, iron, "alkaline", cloudy		S	Abundant supply; neighbours haul water from this well.
9	SE.	12	"	"	"	Dug	20	1,895									Dry hole in glacial drift; uses sloughs and hauls water.

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

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

WELL RECORDS—Rural Municipality of CUPAR, NO. 218, 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	SW.	12	22	16	2	Dug	14	1,890									Dry hole in glacial drift; hauls water 2 miles.
11	SW.	14	"	"	"	Bored	152	1,890	-127	1,763	130	1,760	Glacial fine sand	Hard, iron, "alkaline", cloudy		S	Good supply; a seepage well is used for drinking water.
12	NE.	14	"	"	"	Bored	69	1,900	- 57	1,843	69	1,831	Glacial sand?	Hard, "alkaline"		S	Well has never pumped dry; a 21-foot well is used for the house; one dry hole 40 feet deep.
13	NE.	15	"	"	"	Dug	59	1,890	- 29	1,861			Glacial sand	Hard, iron, "alkaline", cloudy		S	Sufficient for 35 head stock; uses a dugout for stock also, and s seepage well for domestic purposes.
14	SW.	16	"	"	"	Dug	67	1,845									Dry hole in glacial drift; hauls water from a dam.
15	SE.	16	"	"	"	Dug	60	1,855	- 56	1,799	56	1,799	Glacial sand	Hard, iron		D, S	Sufficient for 25 headstock; a 75-foot well yields a good supply of highly mineralized water.
16	NE.	17	"	"	"	Dug	70	1,845									Dry hole in glacial drift.
17	SE.	18	"	"	"	Dug	110	1,840									Dry hole in glacial drift; hauls water from a dam; rain water used for domestic purposes.
18	SW.	19	"	"	"	Bored	70	1,845									Dry hole in glacial drift; uses a dam; rain water cistern and hauls water.
19	NW.	20	"	"	"	Dug	20	1,870	0	1,870			Glacial drift	Hard		D	Intermittent supply; a dam is used for stock.
20	NW.	21	"	"	"	Dug	16	1,885	- 2	1,883			Glacial drift	Hard		D, S	Seepage water from a dugout; neighbour's haul from this well; a 20-foot well is also used for stock.
21	NE.	22	"	"	"	Dug	62	1,905	- 16	1,889			Glacial sand	Hard, iron, "alkaline", cloudy		S	Insufficient supply; uses a dugout and sometimes hauls water.
22	SW.	22	"	"	"	Bored	65	1,900	- 45	1,855	65	1,835	Glacial gravel	Hard, iron, "alkaline", cloudy		S	Sufficient for 40 head stock; hauls drinking water from a neighbour's well.
23	NW.	24	"	"	"	Dug	18	1,915	- 7	1,908			Glacial gravel	Hard		D, S	Oversufficient for 20 head stock; farmers haul drinking water from this well.
24	NE.	24	"	"	"	Dug	42	1,925					Glacial gravel	Hard, "alkaline"		S	Oversufficient for 50 head stock; a 15-foot well yields water for domestic purposes.
25	NW.	26	"	"	"	Dug	14	1,910	- 9	1,901			Glacial sand	Hard		D, S	Oversufficient for 35 head stock.
26	NE.	26	"	"	"	Dug	42	1,915	- 37	1,878	37	1,878	Glacial sand	Hard		D, S	Sufficient for 28 head stock.
27	SW.	27	"	"	"	Dug	48	1,905					Glacial sand	Hard, iron, "alkaline"		D, S	Sufficient for 50 head stock.
28	NE.	30	"	"	"	Dug	51	1,895	- 41	1,854			Glacial sand and gravel	Hard, "alkaline"		S	Sufficient for 50 head stock.
29	SW.	30	"	"	"	Bored	42	1,860	- 22	1,838	42	1,818	Glacial gravel	Hard, "alkaline"		D, S	Oversufficient for 25 head stock.
30	NW.	31	"	"	"	Dug	32	1,890	- 24	1,866	24	1,866	Glacial sand	Hard		D	Yields one barrel of water a day; uses a dugout for stock in summer; two dry holes the deepest being 70 feet.
31	NE.	32	"	"	"	Dug		1,905									Dry holes in glacial drift; hauls water from a dam.
32	SW.	32	"	"	"	Dug	50	1,900	- 25	1,875			Glacial drift	Hard, iron, "alkaline", cloudy		S	One of two similar wells that together yield sufficient water for 30 head stock; hauls drinking water from section 31.

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 CUPAR, NO. 218, 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
33	SE.	34	22	16	2	Dug	30	1,895									Dry hole; uses a dugout for stock and seepage well near dugout for the house; hauls water 6½ miles for 25 head stock.
34	NW.	35	"	"	"	Dug	24	1,890	- 19	1,871			Glacial drift	Hard, "alkaline"		S, D	Seepage well beside a dugout; insufficient supply.
1	NE.	1	22	17	2	Bored	70	1,840	- 66	1,774	52	1,788	Glacial sand	Hard, "alkaline"		S	Poor supply.
2	SE.	2	"	"	"	Bored	52	1,842	- 42	1,800	52	1,790	Glacial Gravel?	Hard, "alkaline"		S	Oversufficient supply.
3	NE.	3	"	"	"	Dug	20	1,815	- 14	1,801			Glacial drift	Hard		D	Well is almost dry in winter; uses a dam for watering stock.
4	SW.	3	"	"	"	Dug	12	1,820	- 5	1,815			Glacial drift	Hard		D	Seepage water from a dam; hauls water 2½ miles in winter and dry years.
5	SE.	4	"	"	"	Dug	10	1,800	+ 4	1,804			Glacial gravel	Hard, iron		D, S	Abundant supply.
6	SE.	5	"	"	"	Dug	24	1,800	- 2	1,798	24	1,776	Glacial gravel	Soft		D, S	Abundant supply for 75 head stock.
7	NE.	6	"	"	"	Dug	60	1,830					Glacial drift	Hard		D	Uses dugout for 19 head stock in summer and hauls water from the creek in winter.
8	SW.	7	"	"	"	Drilled	220	1,845	-140	1,705	220	1,025	Glacial sand	Hard, iron, "alkaline"		S	Abundant supply; seepage well used for drinking water; inflammable gas struck in a dry hole 220 feet deep.
9	NW.	7	"	"	"	Bored	60	1,840	- 30	1,810			Glacial drift	Hard		D	A 175-foot well plugged with sand; uses a dugout in summer and hauls from Markinch in winter.
10	NW.	8	"	"	"	Dug	30	1,835	- 15	1,820			Glacial drift	Hard		D, S	Intermittent supply; additional water obtained from a dam in a ravine.
11	NW.	9	"	"	"	Dug	15	1,790	- 12	1,778			Glacial drift	Hard		D, S	Intermittent supply in winter; dry hole 65 feet deep, hauls from springs near Loon creek.
12	NE.	10	"	"	"	Dug	14	1,760	- 8	1,752			Glacial gravel	Hard		D, S	Sufficient for 8 head stock.
13	NW.	11	"	"	"	Dug	12	1,780	- 6	1,774	9	1,771	Glacial gravel	Hard		D, S	Intermittent supply in winter; melts snow.
14	NE.	11	"	"	"	Dug	20	1,810	- 2	1,808			Glacial drift	Hard		D, S	Seepage from a dam.
15	NE.	12	"	"	"	Bored	140	1,830					Glacial drift	Hard, very "alkaline"		N	Water is too mineralized for use; uses a dam and hauls one mile for 10 head stock.
16	NW.	12	"	"	"	Dug	20	1,815	- 8	1,807			Glacial drift	Hard		D	Seepage water from a dam in a ravine.
17	NE.	14	"	"	"	Dug	16	1,790	- 12	1,778	12	1,778	Glacial gravel	Hard		S	Sufficient for 12 head stock; also uses a dam.
18	SE.	14	"	"	"	Dug	14	1,810	- 6	1,804			Glacial drift	Hard		D	Seepage water from a dam; hauls water in dry years.
19	NW.	16	"	"	"	Dug	12	1,725	- 6	1,719	7	1,718	Glacial gravel	Hard		D, S	Well was dry in 1934; another well dug in sand yields a fair supply; waters 100 head stock
20	SE.	17	"	"	"	Bored	60	1,820	- 12	1,808			Glacial drift	Hard		N	Well is now caved in; obtains water from section 21.
21	NE.	18	"	"	"	Dug	10	1,830	- 6	1,824	6	1,824	Glacial gravel	Hard		D, S	Poor supply; hauls water from the C.P.R. in Markinch.
22	NE.	21	"	"	"	Bored	83	1,800	- 63	1,737			Glacial sand	Hard		N	Uses two shallow wells near Loon creek for 20 head stock.
23	SE.	23	"	"	"	Dug	34	1,800	- 4	1,796			Glacial drift	Hard		D	Well has never bailed dry; a dam is used for stock.

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(#) Sample taken for analysis.

WELL RECORDS—Rural Municipality of CUPAR, NO. 218, 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	NW.	24	22	17	2	Dug	24	1,825					Glacial drift	Hard		D	Seepage water from a dam; several farmers haul drinking water from this well; dam has never been dry.
25	SE.	24	"	"	"	Dug	42	1,840	- 21	1,819	40	1,800	Glacial gravel	Hard		D, S	Good supply; owns a dam from which many farmers haul water.
26	NE.	25	"	"	"	Dug	35	1,870	- 23	1,847	15	1,855	Glacial sand	Hard, "alkaline"		S	Yields 10 barrels of water an hour; hauls drinking water.
27	SE.	26	"	"	"	Dug	47	1,845									Dry hole in glacial drift; hauls water ½ mile for 23 head stock.
28	NE.	27	"	"	"	Bored	90	1,850					Glacial drift	Hard, "alkaline"		N	Very small supply; uses a dugout and seepage well near dugout in summer; hauls water in winter.
29	SE.	28	"	"	"	Dug	18	1,750	- 12	1,738	12	1,738	Glacial gravel	Hard		D, S	Well has never pumped dry; uses a dugout for stock in summer.
30	SW.	28	"	"	"	Dug	14	1,740	- 11	1,729	11	1,729	Glacial gravel	Hard		D, S	Sufficient for 40 head stock.
31	NW.	29	"	"	"	Bored	30	1,825									Dry hole in glacial drift; uses municipal dugout in summer and hauls water from Markinch in winter.
32	NE.	30	"	"	"	Dug	8	1,825	- 6	1,819	6	1,819	Glacial sandy clay	Hard		D, S	Intermittent supply; hauls water for 3 head stock.
33	NW.	31	"	"	"	Dug	13	1,830					Glacial drift	Hard		D, S	Seepage water from a dugout.
34	NE.	32	"	"	"	Dug	25	2,810	- 22	1,788	22	1,788	Glacial sand	Hard		D	Several dry holes as deep as 80 feet; uses a dugout for stock.
35	NW.	32	"	"	"	Dug	20	1,815									Dry hole in glacial drift; hauls water from C P.R. tank in Markinch in winter.
36	NE.	33	"	"	"	Dug	14	1,745	- 9	1,736	10	1,735	Glacial gravel	Hard		D,S	Sufficient for 40 head stock; a 20-foot well became dry when the 14-foot well was dug.
37	NE.	34	"	"	"	Bored	40	1,855	- 20	1,835	40	1,815	Glacial sand	Hard		D, S	Sufficient for 20 head stock; uses a dam in summer for stock.
38	SE.	34	"	"	"	Bored	120	1,855	-108	1,747	120	1,735	Glacial fine grey sand	Hard		D, S	Insufficient supply; hauls water 2 miles from a dam for stock.
39	NE.	35	"	"	"	Bored	60	1,865	- 45	1,820			Glacial sand?	Hard, "alkaline"		S	Sufficient supply; hauls drinking water.
40	SE.	36	"	"	"	Dug	60	1,875	- 38	1,837	38	1,837	Glacial fine sand	Hard, "alkaline"		D, S	Abundant supply for 70 head stock.
1	SW.	1	22	18	2	Bored	50	1,860					Glacial drift	Hard, iron, "alkaline"		S	Sufficient for 60 head stock; another well yields less mineralized water for domestic purposes.
2	NW.	3	"	"	"	Bored	40	1,855	- 20	1,835	40	1,815	Glacial sand	Hard		D	Uses a dugout for stock; a 48-foot well yielded water that stock refused to drink.
3	NE.	4	"	"	"	Bored	33	1,850	- 17	1,833	33	1,817	Glacial sand	Hard, "alkaline"		S	Sufficient for 50 head stock.
4	SW.	4	"	"	"	Dug	12	1,860	- 6	1,854	6	1,854	Glacial gravel	Hard		D, S	Sufficient for 14 head stock.
5	SE.	5	"	"	"	Dug	16	1,865	- 8	1,857			Glacial drift	Soft		D, S	Intermittent supply; hauls water ½ mile when well is dry.
6	NW.	5	"	"	"	Dug	36	1,860	- 20	1,840	36	1,824	Glacial gravel	Hard		D, S	Sufficient for 55 head stock.
7	NW.	6	"	"	"	Dug	21	1,875	- 14	1,861	14	1,861	Glacial sand	Hard		D, S	Sufficient for 26 head stock.
8	NW.	7	"	"	"	Dug	35	1860	- 30	1,830			Glacial sand	Hard		D	Stock use dugout and in dry seasons water is hauled 3 miles.
9	SE.	9	"	"	"	Bored	65	1,845									Dry hole in glacial drift.

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WELL RECORDS—Rural Municipality of CUPAR, NO. 218, 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	NW.	9	22	18	2	Dug	23	1,845	- 22	1,823	22	1,823	Glacial sand	Hard		D, S	Sufficient for 14 head stock.
11	NW.	10	"	"	"	Bored	40	1,840	- 35	1,805	36	1,804	Glacial sand	Hard, "alkaline"		S	Insufficient for 5 head stock; hauls water from sloughs and neighbour's well.
12	SE.	11	"	"	"	Bored	60	1,845	- 45	1,800			Glacial sand and gravel	Hard, "alkaline"		N	Stock refuse to drink the water; two shallow wells used for drinking water.
13	SE.	12	"	"	"	Dug	35	1,845	- 10	1,835	35	1,810	Glacial sand	Hard		D, S	Neighbours haul water from this well; a 60-foot well yielded bitter water.
14	NE.	12	"	"	"	Dug	12	1,840	- 4	1,836	4	1,836	Glacial gravel	Soft		D, S	Abundant supply.
15	SW.	13	"	"	"	Dug	10	1,840	- 4	1,836	4	1,83[illegible]	Glacial sand	Soft		D, S	Water-level has never been lowered; abundant supply of low mineralized water.
16	SE.	13	"	"	"	Dug	14	1,840	- 6	1,834	6	1,834	Glacial sand	Soft		D, S	Small but sufficient supply; #.
17	NE.	13	"	"	"	Bored	50	1,840	- 40	1,794	46	1,794	Glacial sand	Hard, iron, "alkaline"		S	Insufficient supply; uses a dam and well in SE.¼, section 13, for additional supply for stock.
18	SE.	14	"	"	"	Bored	160	1,845									The deepest of several dry holes in glacial drift; use dam in summer and hauls water 2½ miles in winter.
19	SW.	15	"	"	"	Bored	150	1,840									Dry hole; another dry hole 110 feet deep; uses a dugout and seepage well, and hauls water.
20	SE.	15	"	"	"	Bored	65	1,840									Dry hole in glacial drift.
21	SW.	16	"	"	"	Dug	20	1,845	0	1,845	17	1,828	Glacial gravel	Soft		D, S	One of three slough seepage wells; hauled water for 17 head stock in dry years.
22	SW.	18	"	"	"	Bored	20	1,850	- 10	1,840			Glacial sand?	Hard		D, S	Sufficient for 100 head stock in years of average rainfall.
23	NW.	19	"	"	"	Dug	14	1,845	- 4	1,841	4	1,841	Glacial sand	Hard		D, S	Intermittent supply; hauls water in winter and dry years for 50 head stock.
24	SE.	20	"	"	"	Bored	110	1,840									Dry hole; another dry hole 67 feet deep; uses sloughs and hauls from NW.¼, section 20.
25	NW.	20	"	"	"	Bored	65	1,840	- 40	1,800			Glacial drift	Hard, iron, "alkaline"		S	Poor supply; several dry holes as deep as 133 feet; a 10-foot well yields sufficient water for 20 head stock.
26	SE.	21	"	"	"	Dug	11	1,835	- 7	1,828	9	1,826	Glacial sand	Hard		D, S	Sufficient for 20 head stock.
27	NE.	21	"	"	"	Bored	50	1,835	- 40	1,795			Glacial sand	Hard, "alkaline"		D, S	Insufficient for 12 head stock; one dry hole 100 feet deep; hauls water ⅛ mile.
28	SW.	22	"	"	"	Dug	20	1,835	- 6	1,829			Glacial drift	Soft		D, S	Two neighbours also use this well; a well in a slough is used for stock.
29	NE.	23	"	"	"	Dug	16	1,834	- 11	1,823			Glacial sand	Hard, "alkaline"		N	Water was too mineralized for use; one dry hole 110 feet deep.
30	SE.	24	"	"	"	Dug	12	1,835	- 8	1,827	8	1,827	Glacial gravel	Soft		D, S	Poor supply; eight dry holes in glacial drift; hauls water from Markinch.
31	SW.	24	"	"	"	Drilled	160	1,840			160	1,680	Glacial fine sand	Hard, iron		S	Well plugs with sand; uses a dugout and two shallow wells 9 and 12 feet deep dug to gravel.
32	NE.	25	"	"	"	Dug	18	1,830	- 4	1,826	14	1,816	Glacial fine sand	Hard		D, S	Sufficient for 35 head stock.
33	SE.	25	"	"	"	Dug	25	1,825	- 15	1,810			Glacial drift	Hard, "alkaline"		D, S	Intermittent supply; uses sloughs and hauls water from Markinch.
34	SE.	26	"	"	"	Dug	28	1,830	- 6	1,824			Glacial gravel	Hard, iron		D, S	Sufficient for 60 head stock.
35	NE.	27	"	"	"	Drilled	409	1,830	-120	1,710	270	1,560	Glacial sand	Hard, iron, "alkaline"		S, D	Water is partly closed off by sand plugging the pipes.

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(#) Sample taken for analysis.

WELL RECORDS—Rural Municipality of CUPAR, NO. 218, 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	SW.	28	22	18	2	Dug	14	1,835	- 8	1,827	8	1,827	Glacial sand	Hard		D, S	One of four similar wells that together provide sufficient water.
37	NW.	28	"	"	"	Bored	198	1,835									Dry hole in glacial drift; several seepage wells are used in normal years and water is hauled in winters and dry seasons for 20 head stock.
38	NE.	28	"	"	"	Bored	60	1,830	- 30	1,800	55	1,775	Glacial sand	Hard, "alkaline"		D, S	Good supply; two neighbours also use this well
39	SW.	29	"	"	"	Dug	15	1,830	- 4	1,826	4	1,826	Glacial sand	Hard, "alkaline"		D, S	One of two similar wells that together yield sufficient water for 35 head stock.
40	NW.	30	"	"	"	Bored	67	1,835	- 16	1,819	67	1,768	Glacial dark sand	Hard, "alkaline"		D, S	Abundant supply for 35 head stock.
41	SW.	30	"	"	"	Bored	48	1,835	- 42	1,793	42	1,793	Glacial dark sand	Hard, "alkaline"		S	Sufficient supply; a 9-foot well in sand is used for drinking water.
42	SW.	30	"	"	"	Bored	58	1,845	- 40	1,805	40	1,805	Glacial gravel	Hard, iron, "alkaline"		S	Poor supply; a 25-foot well yields sufficient water in normal years.
43	NW.	31	"	"	"	Dug	12	1,835	- 4	1,831			Glacial gravel	Hard, "alkaline"		D, S	Intermittent supply; an 8-foot well in quicksand yields plenty of water.
44	SW.	32	"	"	"	Dug	44	1,830	- 27	1,803	44	1,786	Glacial gravel	Hard, "alkaline"		D, S	Sufficient supply.
45	NE.	33	"	"	"	Bored	50	1,825	- 30	1,795			Glacial drift	Hard, "alkaline"		S	Poor supply; a 7-foot well dug in quicksand yields plenty of water.
46	SE.	35	"	"	"	Dug	8	1,830	- 5	1,825			Glacial sand	Hard		S	Poor supply; hauls water from Markinch in winter.
47	SW.	36	"	"	"	Dug	25	1635	- 17	1,818	23	1,812	Glacial gravel	Hard		D, S	Sufficient for 15 head stock; one dry hole 100 feet deep in glacial drift.
1	SW.	1	23	16	2	Bored	60	1,900	- 33	1,867			Glacial drift	Hard, "alkaline"		S	Good supply but horses do not like the water; uses a dugout in summer and hauls drinking water.
2	SE.	1	"	"	"	Dug	62	1,900	- 20	1,880	50	1,850	Glacial sand	Hard, "alkaline"		D, S	Yields 2 barrels a day; uses sloughs and seepage wells; dry holes as deep as 125 feet in glacial drift.
3	SW.	2	"	"	"	Dug		1,890									Dry holes; uses a dugout in summer and hauls 6½ miles from Roper's lake.
4	NE.	2	"	"	"	Bored	40	1,905									One of four dry holes; uses a dugout and hauls water.
5	SE.	3	"	"	"	Bored	70	1,890	- 55	1,835			Glacial drift	Hard		D, S	Sufficient for 15 head stock; also uses a seepage well near a dugout.
6	NW.	4	"	"	"	Dug	32	1,880	- 27	1,853	27	1,853	Glacial fine sand	Hard		D, S	Sufficient for 12 head stock; a dugout and seepage well are used in summer.
7	SE.	4	"	"	"	Bored	65	1,895									Dry hole in glacial drift; uses a dugout and hauls water.
8	SW.	5	"	"	"	Bored	180	1,885									Dry hole in glacial drift; uses a dugout for 8 head stock.
9	SE.	7	"	"	"	Dug	60	1,875					Glacial fine sand	Hard		N	Quicksand plugs the well; uses a dugout and hauls from Markinch; many dry holes as deep as 300 feet.
10	NW.	8	"	"	"	Bored	60	1,880					Glacial sand	Hard, "alkaline"		S	One of several wells in Cupar; one dry hole 300 feet deep; a large dugout is used for stock; water is hauled into the village from section 30 and sold for 5 cents a pail.
11	NW.	9	"	"	"	Bored		1,890									Dry holes; hauls water 3 miles.
12	SW.	9	"	"	"	Bored	60	1,885									Dry hole in glacial drift; dugout used for stock in summer.

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(#) Sample taken for analysis.

WELL RECORDS—Rural Municipality of CUPAR, NO. 218, 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
13	NE.	10	23	16	2	Dug	59	1,910									One of several dry holes; uses two seepage wells and hauls water from Rogers lake.
14	SW.	10	"	"	"	Bored	96	1,895									Dry hole in glacial drift; hauls water wherever it is available.
15	NW.	11	"	"	"	Bored	115	1,985									One of several dry holes; a 40-foot seepage well is used for the house; hauls water 4 miles.
16	NE.	11	"	"	"	Bored	157	1,930									The deepest of seventeen dry holes; hauls water 3 miles for 35 head stock.
17	NW.	12	"	"	"	Dug	14	1,940	- 4	1,936			Glacial drift	Hard		D, S	Well is nearly dry in winter; hauls water 2 miles for stock.
18	SE.	13	"	"	"	Dug	25	1,945	- 17	1,928	17	1,928	Glacial sand	Soft		D, S	Yields 5 barrels of water a day.
19	NE.	13	"	"	"	Dug	20	1,955	- 14	1941	18	1,937	Glacial sand	Soft		D, S	Insufficient supply in winter; hauls water 1½ miles for stock.
20	SW.	14	"	"	"	Dug	35	1,930	- 25	1,905			Glacial sand	Hard, cloudy		D, S	Poor supply; five dry holes in glacial drift; hauls water from the NE.¼, section 14.
21	NE.	14	"	"	"	Dug	28	1,955	- 25	1,930	25	1,930	Glacial sand	Hard, iron, cloudy		S	Abundant supply for 75 head stock.
22	SW.	15	"	"	"	Bored	30	1,915	- 20	1,895			Glacial gravel	Hard, "alkaline"		S	Poor supply; uses seepage wells near sloughs; dry hole 110 feet deep.
23	SW.	16	"	"	"	Dug	24	1,895	- 14	1,881			Glacial drift	Hard, "alkaline"		S	Sufficient for 10 head stock; a seepage well near a dam is used for drinking.
24	NW.	16	"	"	"	Dug	16	1,900	- 8	1,892	8	1,892	Glacial gravel	Hard		D, S	Sufficient for 25 head stock; also uses a dam for stock in winter.
25	NE.	17	"	"	"	Dug	24	1,895	- 4	1,891			Glacial sand			S	Seepage water from a slough; rainwater used for domestic purposes; one dry hole bored 75 feet deep.
26	SW.	17	"	"	"	Dug	60	1,890					Glacial drift	Hard, very "alkaline"		N	Small supply of unusable water; uses a dugout and hauls water 4 miles for 15 head stock in dry years; #.
27	SE.	18	"	"	"	Drilled	110	1,885	- 85	1,800	110	1,775	Glacial fine sand	Hard, iron, "alkaline", cloudy		S	Good supply for 100 head stock; drinking water must be hauled.
28	NE.	19	"	"	"	Dug	20	1,910	- 14	1,896			Glacial sand	Hard		D, S	Poor supply; hauls three tanks of water a week.
29	NW.	19	"	"	"	Dug	24	1,900	- 14	1,886			Glacial drift	Hard		D, S	One of two wells yielding an intermittent supply; a dam is also used for watering 13 head stock.
30	SW.	20	"	"	"	Drilled	312	1,895	-187	1,708	312	1,583	Glacial sand	Hard, iron		D, S	Abundant supply; seventeen dry holes in glacial drift.
31	SE.	20	"	"	"	Dug	18	1,920	- 12	1,908	12	1,908	Glacial sand	Hard		N	Good supply.
32	SE.	21	"	"	"	Dug	20	1,940	- 8	1,932			Glacial gravel	Hard		D, S	One of two similar wells that yield sufficient water for 14 head stock; sloughs are used by stock in summer.
33	SW.	21	"	"	"	Dug	16	1,925	- 14	1,911	14	1,911	Glacial sand	Soft		D, S	Well cannot be bailed dry.
34	NW.	21	"	"	"	Dug	18	1,955	- 13	1,942	13	1,942	Glacial sand, yellow	Hard		D, S	Very abundant supply; water used to be hauled into Cupar from this well; #.
35	SE.	22	"	"	"	Dug	14	1,955	0	1,955			Glacial drift	Hard, cloudy		S	Sufficient for 50 head stock; two shallow wells used for drinking water.
36	NW.	22	"	"	"	Dug	20	1,950	- 17	1,933	17	1,933	Glacial sand	Soft		D, S	Plenty of water for 75 head stock.

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WELL RECORDS—Rural Municipality of CUPAR, NO. 218, 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
37	SW.	23	23	16	2	Dug	30	1,950	- 15	1,935	15	1,935	Glacial sand	Hard		D, S	One of two similar wells; hauls additional water from a neighbour's well.
38	NE.	23	"	"	"	Dug	12	1,975	0	1,975			Glacial drift	Hard		D, S	Intermittent supply; hauls from the SE.¼, section 23, in winter.
39	SE.	23	"	"	"	Dug	16	1,960	- 8	1,952	8	1,952	Glacial sand	Hard, iron		D, S	Plenty of water.
40	SE.	24	"	"	"	Dug	20	1,980	- 8	1,972			Glacial sand	Hard		D, S	Intermittent supply in winter; hauls water from a slough mile north of farm.
41	SW.	24	"	"	"	Dug	17	1,970	0	1,970			Glacial drift	Hard		N	A 90-foot well yields very "alkaline" water; hauls water from a slough 1 mile north of farm.
42	NE.	25	"	"	"	Dug	14	2,020	- 8	2,012			Glacial drift	Hard, "alkaline"		D, S	Sufficient for 20 head stock.
43	SW.	26	"	"	"	Dug	20	1,980	- 16	1,964	16	1,964	Glacial sand	Hard		D, S	Sufficient for 4 headstock only; hauls water.
44	NW.	26	"	"	"	Dug	12	2,010	- 8	2,002	8	2,002	Glacial sand	Hard		D, S	Insufficient for 15 head stock in winter; hauls water 2 miles in winter.
45	NW.	27	"	"	"	Dug	20	1,990	- 18	1,972	18	1,972	Glacial sand	Soft		D, S	Good supply for 75 head stock; twelve dry holes in glacial drift.
46	SE.	27	"	"	"	Dug	18	1,985	- 6	1,979			Glacial gravel?	Soft		D, S	Cannot lower the water-level by bailing.
47	NE.	28	"	"	"	Dug	22	1,980	- 12	1,968	16	1,964	Glacial gravel	Hard		D, S	Sufficient for 13 head stock; another well 14 feet deep.
48	NW.	29	"	"	"	Dug	10	1,955	- 5	1,950	5	1,950	Glacial gravel	Hard		D	Poor supply; cattle are watered 1 mile north of farm.
49	SE.	29	"	"	"	Dug	14	1,955	- 11	1,944	11	1,944	Glacial sand	Hard		D, S	One of three similar wells that together yield sufficient water for 28 head stock.
50	NE.	30	"	"	"	Dug	20	1,960	- 12	1,948	12	1,948	Glacial sand	Hard		D, S	Sufficient supply; #.
51	SE.	30	"	"	"	Dug	20	1,930	- 16	1,914	16	1,914	Glacial gravel	Soft		D	Village well of Cupar; water hauled from this well and sold in the village at 5 cents a pail; #.
52	SW.	30	"	"	"	Dug	16	1,905	- 8	1,897	6	1,899	Glacial sand	Hard		D	Intermittent supply; a dugout is used for stock.
53	NW.	31	"	"	"	Dug	9	1,955	- 6	1,949	6	1,949	Glacial gravel	Hard		D, S	9 to 15 tanks of water are hauled from this well by farmers in winter.
54	SW.	32	"	"	"	Dug	15	1,985	- 12	1,973	12	1,973	Glacial gravel	Soft		D, S	Well cannot be bailed dry; one of two similar wells.
55	SW.	33	"	"	"	Dug	33	1,990	- 28	1,962	28	1,962	Glacial gravel	Hard, iron		D, S	Oversufficient for 60 head stock.
56	NE.	33	"	"	"	Dug	19	2,010	- 13	1,997	13	1,997	Glacial sand	Hard, iron		D, S	Sufficient for 20 head stock.
57	SW.	34	"	"	"	Dug	12	2,000	- 5	1,995			Glacial drift	Hard		D, S	Intermittent supply; several dry holes in glacial drift; hauls water 2 to 4 miles for 9 head stock.
58	NW.	34	"	"	"	Dug	20	2,015	- 12	2,003			Glacial sand	Soft		D, S	Intermittent supply; five dry holes 25 feet deep; hauls water.
59	SE.	34	"	"	"	Dug	33	2,010	- 8	2,002			Glacial drift	Hard, "alkaline"		D, S	Intermittent supply; hauls water from a well in a slough.
60	NE.	35	"	"	"	Dug	15	2,030	- 13	2,017	13	2,017	Glacial gravel	Soft		D, S	Oversufficient for 30 head stock.
61	SE.	36	"	"	"	Dug	10	2,040	- 5	2,035	5	2,035	Glacial sand and gravel	Soft		D, S	Good supply; six farmers haul water from this well.

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 CUPAR, NO. 218, 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
62	SE.	36	23	16	2	Dug	14	2,035	0	2,035			Glacial drift	Hard, cloudy		S	Intermittent supply; hauls water for 19 head stock from SE.¼, section 36.
1	NE.	1	23	17	2	Dug	12	1,845	- 6	1,839	6	1,839	Glacial sand and gravel	Hard		D, S	Sufficient for 10 head stock.
2	SE.	1	"	"	"	Bored	60	1,865	- 30	1,835	60	1,805	Glacial fine sand	Hard, iron, "alkaline", cloudy		D, S	Sufficient for 20 head stock; a dugout is used for stock in summer.
3	SW.	2	"	"	"	Dug	16	1,790	- 14	1,776	14	1,776	Glacial fine sand	Hard		D, S	Abundant supply and well cannot be bailed dry.
4	NW.	3	"	"	"	Dug	25	1,840									Dry hole in glacial drift; hauls water from a spring for 24 head stock.
5	NW.	4	"	"	"	Spring		1,775	0	1,775			Glacial sand	Hard		D, S	One of several springs on the bank of Loon creek ravine; plenty of water.
6	NW.	5	"	"	"	Bored	90	1,830									Dry hole in glacial drift; hauls water from the C.P.R.; a shallow well is used for drinking water.
7	SE.	7	"	"	"	Dug	20	1,835	- 14	1,821	14	1,821	Glacial sand	Soft		D	School well in Markinch; sufficient supply.
8	SE.	7	"	"	"	Dug	25	1,830	- 8	1,822	18	1,812	Glacial sand	Soft		S	One of several wells in Markinch; small supply of water.
9	NE.	8	"	"	"	Dug	16	1,750	- 0	1,750	0	1,750	Glacial sand and gravel	Soft		D, S	C.P.R. well near Markinch; yields 80,000 gallons of water a day; many farmers haul water from this well.
10	SE.	8	"	"	"	Spring		1,760	0	1,760	0	1,760	Glacial gravel	Hard		D, S	Plenty of water.
11	SE.	9	"	"	"	Dug	28	1,805	- 13	1,792			Glacial drift	Hard		D, S	Seepage water from a dugout; uses springs and hauls water from C.P.R. tank in Markinch.
12	SE.	10	"	"	"	Dug	36	1,855	- 24	1,831	32	1,823	Glacial sand	Hard		D, S	Sufficient for 18 head stock.
13	NE.	10	"	"	"	Dug	25	1,855	- 7	1,848			Glacial drift	Hard		D, S	Seepage water from a dugout; hauls water from Markinch; a 250-foot well yielded a small supply.
14	SE.	11	"	"	"	Dug	20	1,855	- 3	1,852			Glacial gravel	Hard		D, S	Sufficient for 20 head stock.
15	NE.	12	"	"	"	Dug	5	1,860	- 3	1,857	3	1,857	Glacial gravel	Hard		S	Well freezes in winter and then waters stock in the SE.¼, section 14.
16	SE.	12	"	"	"	Dug	30	1,865	- 11	1,854			Glacial sand	Hard		D, S	Sufficient for 25 head stock.
17	SW.	13	"	"	"	Dug	20	1,870	- 11	1,859	11	1,859	Glacial gravel	Hard		D, S	Pumping cannot lower the water-level; neighbours haul water from this well.
18	SE.	14	"	"	"	Dug	14	1,865	- 7	1,858	7	1,858	Glacial sand	Soft		D, S	One of two similar wells; sufficient for 40 head stock.
19	NE.	14	"	"	"	Bored	100	1,890	- 50	1,840			Glacial drift	Hard, iron		D, S	Poor supply; uses a dugout for stock and also hauls water 1¼ miles.
20	SE.	15	"	"	"	Dug	10	1,850	- 8	1,842	8	1,842	Glacial sand	Hard		D, S	Good supply, but water freezes in well in winter.
21	NE.	16	"	"	"	Dug	28	1,840	- 10	1,830			Glacial sand	Hard		D	Hauls water from C.P.R. in Markinch, for stock.
22	SE.	16	"	"	"	Dug	24	1,820									Dry hole in glacial drift; hauls water from C.P.R. in Markinch.
23	NE.	18	"	"	"	Spring		1,760	0	1,760	0	1,760	Glacial sand	Hard		D, S	Spring flows continuously winter and summer; plenty of water.
24	NE.	19	"	"	"	Bored	29	1,820	- 17	1,803			Glacial sand	Soft		D, S	One of two similar wells; sufficient for 35 head stock.
25	SW.	19	"	"	"	Dug	10	1,810	- 6	1,804	6	1,804	Glacial sand	Soft		D, S	Sufficient for 15 head stock.

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(#) Sample taken for analysis.

WELL RECORDS—Rural Municipality of CUPAR, NO. 218, 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
26	NE.	21	23	17	2	Drilled	248	1,845	-148	1,697	248	1,597	Glacial gravel	Hard, iron, "alkaline", cloudy		D, S	Abundant supply.
27	NW.	21	"	"	"	Dug	12	1,840	- 10	1,830	10	1,830	Glacial sand	Hard		D, S	Well has never pumped dry; a 12-foot well nearby yields a fair supply.
28	SE.	22	"	"	"	Bored	90	1,860	- 89	1,771			Glacial drift	Hard		D	Very poor supply; several dry holes in glacial drift; uses a cistern and hauls water from the SE.¼, section 26.
29	NW.	22	"	"	"	Dug	38	1,845	- 37	1,808			Glacial fine sand	Hard		D, S	Poor supply; uses a neighbour's well for stock.
30	SE.	23	"	"	"	Drilled	125	1,860					Glacial drift	Hard, iron, "alkaline"		N	Eight dry holes in glacial drift; uses dugout and cistern and hauls water 3/4 mile.
31	NE.	24	"	"	"	Dug	12	1,895	- 10	1,885	10	1,885	Glacial sand	Soft		D, S	Intermittent supply; hauls water.
32	SE.	25	"	"	"	Dug	14	1,905	- 10	1,895	10	1,895	Glacial gravel	Soft		D, S	Good supply for 25 head stock; a 42-foot well also yields plenty of water.
33	SE.	26	"	"	"	Dug	12	1,905	- 9	1,896	9	1,896	Glacial gravel	Soft		D, S	Abundant supply; farmers have hauled 11 tanks of water a day; #, from this well; a good well.
34	SW.	26	"	"	"	Dug	90	1,890	- 88	1,802	88	1,802	Glacial gravel	Hard, iron, "alkaline"		S	Sufficient for 30 head stock; dry holes as deep as 325 feet in glacial drift.
35	SE.	27	"	"	"	Drilled	210	1,875	-100	1,775	210	1,665	Glacial fine sand	Soft, iron, cloudy		N	Another 160-foot well is also plugged with sand; hauls water in winter; a 20-foot seepage well is also used.
36	NE.	28	"	"	"	Dug	18	1,850	- 6	1,844	6	1,844	Glacial gravel	Hard		D, S	Well has never bailed dry.
37	SW.	30	"	"	"	Dug	20	1,820	- 12	1,808	17	1,803	Glacial sand	Hard, "alkaline"		D, S	Sufficient for 9 head stock.
38	NE.	30	"	"	"	Dug	10	1,825	- 8	1,817	8	1,817	Glacial sand	Soft		D, S	Sufficient for 11 head stock.
39	SW.	31	"	"	"	Dug	12	1,810	- 9	1,801	10	1,800	Glacial gravel	Hard		D, S	Intermittent supply; hauls water from spring near Loon creek.
40	SE.	31	"	"	"	Dug	8	1,820	- 4	1,816	4	1,816	Glacial sand	Soft		D, S	Well has never pumped dry; several shallow dry holes.
41	NW.	32	"	"	"	Dug	8	1,825	- 4	1,821	4	1,821	Glacial gravel	Soft		D, S	Oversufficient for 40 head stock; a 24-foot well yields a small supply.
42	SE.	32	"	"	"	Dug	15	1,845	0	1,845	0	1,845	Glacial sand	Soft		D, S	Sufficient for 60 head stock.
43	NW.	34	"	"	"	Dug	12	1,900	0	1,900	8	1,892	Glacial sand	Hard		D, S	Sufficient for 25 head stock.
44	SE.	34	"	"	"	Dug	16	1,900	0	1,900	13	1,887	Glacial sand and gravel	Hard, "alkaline"		D, S	One of two wells that together yield sufficient water; one dry hole 60 feet deep.
45	SE.	35	"	"	"	Dug	15	1,930	-11	1,919	11	1,919	Glacial gravel	Hard		D, S	Sufficiant for 50 head stock.
46	SW.	36	"	"	"	Dug	16	1,930	- 13	1,917	13	1,917	Glacial gravel	Hard, "alkaline"		D, S	Insufficient water during some winters and then must haul.
1	NE.	1	23	16	2	Bored	80	1,835	- 70	1,765	70	1,765	Glacial sand	Hard, "alkaline"		D, S	Sufficient for 130 head stock; a 200-foot well plugged with sand; several dry holes 20 feet deep.
2	NW.	2	"	"	"	Dug	20	1,825	- 10	1,815	10	1,815	Glacial gravel	Hard		D, S	Three wells and a dugout yield sufficient water for the farm.
3	SW.	3	"	"	"	Dug	18	1,830	- 4	1,826			Glacial sand	Hard		D, S	One of several shallow wells; sufficient supply.
4	SE.	4	"	"	"	Bored	50	1,835	- 48	1,787			Glacial drift	Hard, "alkaline"		D, S	Sufficient supply.

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(#) Sample taken for analysis.

WELL RECORDS—Rural Municipality of CUPAR, NO. 218, 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
5	NE.	6	23	18	2	Drilled	267	1,832	- 90	1,742	240	1,592	Glacial fine sand	Hard, iron, "alkaline"		S	Abundant supply.
6	SW.	6	"	"	"	Dug	10	1,835	- 4	1,831	6	1,829	Glacial sand	Soft		D, S	Abundant supply for 22 head stock; well has never pumped dry.
7	SE.	7	"	"	"	Drilled	230	1,826	-140	1,686	230	1,596	Glacial fine sand	Hard, iron, "alkaline"		S	Village well of Southey; several shallow wells yield small supplies of "alkaline" water; water is hauled into the village from the NW.¼, section 35, township 22, range 19.
8	NE.	7	"	"	"	Bored	150	1,832	-135	1,697	150	1,682	Glacial gravel	Very hard, "alkaline", iron		S	Abundant supply; a 14-foot well is used for drinking water; 18 dry holes to a maximum depth of 125 feet; #.
9	SE.	8	"	"	"	Dug	10	1,830	- 5	1,825			Glacial fine sand	Hard, "alkaline"		D, S	Sufficient for 25 head stock.
10	SE.	9	"	"	"		90	1,825									About 12 dry holes to a maximum depth of 90 feet in glacial drift.
11	SW.	9	"	"	"	Dug	19	1,832	- 16	1,816	16	1,816	Glacial sand	Hard, "alkaline"		S	One of four similar wells that together yield sufficient water for the house and 16 head stock.
12	SE.	10	"	"	"	Bored	35	1,824	- 20	1,804			Glacial drift	Hard, iron, "alkaline"		D, S	Sufficient for 10 head stock only.
13	SW.	10	"	"	"	Bored	60	1,830	- 20	1,810			Glacial drift	Hard, iron, "alkaline", cloudy		S	Sufficient for 30 head stock in normal years; a 30-foot well is also used and sometimes water is hauled from Loon creek.
14	SE.	12	"	"	"	Bored	92	1,840									Dry hole in glacial drift; uses two seepage wells and a dugout in summer; hauls water from Markinch in winter.
15	NE.	12	"	"	"	Drilled	200	1,825	-108	1,717	200	1,625	Glacial blue sand	Hard, iron, "alkaline", cloudy		D, S	Good supply but well is partly plugged by sand
16	NW.	12	"	"	"	Bored	25	1,825	- 19	1,806			Glacial gravel	Hard		D, S	Insufficient supply; water is hauled from Loon creek.
17	SE.	13	"	"	"	Bored	34	1,830	- 32	1,798	32	1,798	Glacial sand	Hard, iron, "alkaline"		D	Hauls water for 18 head stock from a spring near Loon creek.
18	NE.	14	"	"	"	Dug	12	1,820	- 8	1,812			Glacial gravel	Hard		D, S	One of two wells that together yield sufficient water; a 35-foot well yields bitter water
19	SE.	14	"	"	"	Dug	47	1,820	- 40	1,780	28	1,792	Glacial gravel	Hard, iron, "alkaline"		D, S	Poor supply; a dugout is used for stock in summer; hauls water 3 miles from a spring; several dry holes.
20	SE.	15	"	"	"	Bored	88	1,835	- 70	1,765			Glacial drift	Hard, iron, "alkaline", cloudy		S	Sufficient supply; a shallow well is used for drinking water.
21	SW.	15	"	"	"	Bored	96	1,835	- 71	1,764			Glacial drift	Hard, iron, "alkaline", cloudy		S	Poor supply; a shallow well is used for drinking water.
22	NE.	16	"	"	"	Dug	40	1,840	- 37	1,803	37	1,803	Glacial sand	Hard, "alkaline"		S	Poor supply; several dry holes in glacial blue clay.
23	SE.	16	"	"	"	Drilled	275	1,835	- 25	1,810	275	1,560	Glacial sand	Hard, iron, "alkaline", cloudy		S	Abundant supply; a 10-foot seepage well is used for drinking water.
24	SW.	17	"	"	"	Drilled	207	1,830	- 38	1,792	200	1,630	Glacial sand	Hard		D, S	Abundant supply; a 103-foot well yields 2 barrels of water a day; many shallow dry holes and seepage wells.
25	NE.	18	"	"	"	Drilled	200	1,825	-197	1,628	197	1,628	Glacial sand	Hard, "alkaline"		D, S	Poor supply; well may be plugged with sand; hauls water.
26	NW.	18	"	"	"	Dug	7	1,835	- 3	1,832	3	1,832	Glacial sand	Soft		D, S	Bailing cannot lower the water-level; #.

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(#) Sample taken for analysis.

WELL RECORDS—Rural Municipality of CUPAR, NO. 218, 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	SW.	20	23	18	2	Dug	12	1,830	- 7	1,823	10	1,820	Glacial sand	Hard		D, S	This well together with a 20-foot well yields sufficient water for 20 head stock in dry year
28	SE.	20	"	"	"	Drilled	138	1,830					Glacial drift	Hard, iron, "alkaline"		S	Abundant supply; a seepage well is used for drinking water; several dry holes in glacial drift.
29	SE.	21	"	"	"	Bored	118	1,825									The deepest of many dry holes; a 47-foot well yields a small supply; hauls water from spring near Loon creek.
30	SW.	22	"	"	"	Dug	40	1,825					Glacial drift	Hard, "alkaline"		S	Yields 2 barrels of water a day; uses sloughs and hauls water 4 miles.
31	NW.	22	"	"	"	Bored	85	1,820	- 6	1,814	85	1,735	Glacial gravel?	Hard, "alkaline"		D, S	Oversufficient for 25 head stock.
32	SE.	24	"	"	"	Spring		1,770	0	1,770			Glacial drift	Hard		D, S	This flowing spring yields an abundant supply of water.
33	SW.	24	"	"	"	Dug	12	1,810	- 8	1,802	10	1,800	Glacial gravel	Hard		D, S	Plenty of water; another well 8 feet in diameter yields a good supply also.
34	SW.	26	"	"	"	Drilled	280	1,820	-190	1,630	280	1,540	Glacial sand	Hard, iron, "alkaline", cloudy			Abundant supply for stock but hauls drinking water; twenty dry holes about 35 feet deep.
35	SW.	30	"	"	"	Dug	12	1,825	- 7	1,818	7	1,818	Glacial sand	Soft		D, S	Sufficient supply. A 25-foot well is not in use.
36	NW.	30	"	"	"	Dug	14	1,815	- 3	1,812			Glacial sand	Soft		D, S	One of six similar wells that together yield sufficient water for 25 head stock in dry years.
37	SW.	31	"	"	"	Bored	65	1,810	- 60	1,750			Glacial fine sand	Hard		D, S	Poor supply; hauls water from springs near Loon creek; two dry holes 16 feet deep.
38	SW.	32	"	"	"	Dug	16	1,795	- 12	1,783	15	1,780	Glacial gravel	Soft		D, S	Oversufficient supply.
39	NW.	32	"	"	"	Bored	115	1,815	-111	1,704	111	1,704	Glacial sand	Hard, iron, "alkaline"		S	Poor supply; several dry holes as deep as 60 feet; hauls water from springs near Loon creek
40	SW.	33	"	"	"	Dug	10	1,805	- 7	1,798			Glacial drift	Hard, "alkaline"		D, S	Well is dry in winter; hauls water from springs near Loon creek.
41	SE.	33	"	"	"	Drilled	248	1,800	- 150	1,650	248	1,552	Glacial sand	Hard, iron, "alkaline", cloudy		S	Abundant supply when not shut off by sand plugging; hauls water from a spring near Loon creek.
42	SW.	34	"	"	"	Dug	9	1,785	0	1,785	0	1,785	Glacial sand	Hard, "alkaline"		D, S	Abundant supply.
43	NW.	35	"	"	"	Dug	10	1,820	- 6	1,814			Glacial gravel	Soft		D, S	Oversufficient supply.
44	NW.	36	"	"	"	Dug	12	1,790	- 8	1,782	8	1,782	Glacial gravel	Hard		D, S	Well cannot be bailed dry.
45	SW.	36	"	"	"	Dug	7	1,800	- 3	1,797	3	1,797	Glacial fine sand	Hard, iron		D, S	Oversufficient supply.
1	SW.	2	24	16	2	Dug	14	2,040	- 11	2,029	13	2,027	Glacial fine sand	Soft		D, S	Insufficient supply; stock use sloughs in summ and water is hauled 2 miles in winter.
2	NW.	2	"	"	"	Dug	12	2,050	- 10	2,040	10	2,040	Glacial sand and gravel	Soft		D, S	Oversufficient for 50 head stock.
3	NE.	3	"	"	"	Dug	30	2,045	0	2,045			Glacial drift	Hard, cloudy		D, S	Intermittent supply; hauls water in dry years.
4	SE.	4	"	"	"	Dug	20	2,015	- 18	1,997	18	1,997	Glacial sand	Hard		D, S	Sufficient for 4 head stock only; stock use sloughs and water is hauled in dry years.
5	SW.	4	"	"	"	Dug	10	2,015	- 7	2,008	7	2,008	Glacial sand	Hard		D, S	Sufficient for 50 head stock.
6	SE.	5	"	"	"	Dug	16	2,000	- 14	1,986	14	1,986	Glacial gravel	Hard		D, S	Intermittent supply and hauls water.

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

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

WELL RECORDS—Rural Municipality of OUPAR, NO. 218, 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
7	SW.	5	24	16	2	Dug	20	1,990	- 2	1,988			Glacial sand and gravel	Hard, "alkaline"		D, S	Plenty of water; farmers haul water from this well.
8	SE.	6	"	"	"	Dug	16	1,975	- 7	1,968	7	1,968	Glacial sand and gravel	Hard		D, S	Poor supply; several dry holes as deep as 225 feet; hauls water for 32 head stock.
9	SW.	6	"	"	"	Bored	95	1,960									The deepest of several dry holes in glacial drift; hauls water.
10	NW.	7	"	"	"	Dug	14	1,970	0	1,970			Glacial drift	Hard, cloudy		S	Sufficient for 40 head stock.
11	NW.	9	"	"	"	Dug	25	2,035	0	2,035			Glacial drift	Soft		D, S	Well situated near a large slough; sufficient for 30 head stock.
12	NE.	9	"	"	"	Dug	16	2,050	0	2,050			Glacial drift	Soft		D, S	One of two slough seepage wells; fifteen dry holes about 25 feet deep; hauls water 4 miles.
13	SE.	10	"	"	"	Bored	100	2,020									The deepest of several dry holes; uses slough seepage well and hauls water 3½ miles in winter and dry years.
14	SE.	12	"	"	"	Dug	20	2,095	- 12	2,083			Glacial drift	Hard, "alkaline"		D, S	Poor supply; 40 head stock are watered at a well 1 mile east of farm; stock also use sloughs in wet seasons.
15	NW.	12	"	"	"	Dug	22	2,080	- 4	2,076			Glacial drift	Hard, "alkaline"		S	Sufficient for 6 head stock only; hauls water.
16	SW.	12	"	"	"	Dug	30	2,100									Dry hole in glacial drift; hauls water when sloughs become dry.
17	SE.	13	"	"	"	Dug	12	2,085	- 4	2,081	4	2,081	Glacial sand	Hard		D, S	Good supply; four farmers haul water from this well.
18	SW.	13	"	"	"	Dug	5	2,090	- 1	2,089	1	2,089	Glacial sand	Soft		D, S	Good supply; water level cannot be lowered by bailing.
19	NE.	14	"	"	"	Dug	20	2,115	- 18	2,097	18	2,097	Glacial sand	Soft		D, S	Plenty of water for 50 head stock.
20	NW.	14	"	"	"	Dug	16	2,105	- 10	2,095			Glacial drift	Soft		D	Stock are watered at a well dug in a slough.
21	SE.	14	"	"	"	Dug	32	2,100	- 26	2,074			Glacial sandy clay	Hard, "alkaline"		D, S	Sufficient for 10 head stock.
22	SE.	15	"	"	"	Dug	16	2,090	- 7	2,083	7	2,083	Glacial fine sand	Soft		D, S	Well cannot be bailed dry; stock use sloughs in summer.
23	NW.	15	"	"	"	Dug	19	2,080	- 15	2,065	15	2,065	Glacial sand	Hard		D, S	Sufficient supply with additional water from slough seepage wells.
24	SE.	16	"	"	"	Dug	20	2,055	- 3	2,052			Glacial drift	Hard, "alkaline"		D, S	One of two slough seepage wells; hauls water 1½ miles in dry years for 29 head stock.
25	SW.	16	"	"	"	Dug	18	2,030	0	2,030			Glacial drift	Hard		S	Intermittent supply; dry holes as deep as 90 feet; hauls water 5 miles in dry years for 37 head stock.
26	NE.	17	"	"	"	Dug	12	2,030	- 10	2,020	10	2,020	Glacial sand and gravel	Hard		D, S	Insufficient supply.
27	SW.	18	"	"	"	Dug	25	1,980	0	1,980			Glacial drift	Hard, cloudy		D, S	Intermittent supply; hauls water in winter for stock.
28	NE.	18	"	"	"	Dug	16	1,985	- 8	1,977	8	1,977	Glacial gravel	Hard, "alkaline"		D	Two seepage wells near sloughs are used for stock; several dry holes.
29	NW.	19	"	"	"	Dug	20	2,000	0	2,000			Glacial drift	Hard, "alkaline"		D, S	One of several slough seepage wells that together yield enough water for 27 head stock.
30	NE.	20	"	"	"	Dug	8	2,050	0	2,050			Glacial drift	Hard, cloudy, "alkaline"		D, S	Intermittent supply; hauls winter and summer in dry years.
31	NW.	21	"	"	"	Dug	14	2,065	0	2,065			Glacial drift	Hard		D, S	Slough seepage well; melts snow in winter.
32	SE.	21	"	"	"	Dug	20	2,070	0	2,070			Glacial drift	Hard, "alkaline"		D, S	Intermittent supply; hauls water for 15 head stock in dry years.
33	NW.	22	"	"	"	Dug	9	2,085	- 5	2,080	7	2,078	Glacial sand	Hard, "alkaline"		D, S	Sufficient for 15 head stock; stock water at sloughs in summer.

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 CUPAR, NO. 218, 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
34	SW.	23	24	16	2	Dug	14	2,115	- 12	2,103	12	2,103	Glacial sand	Hard		D, S	Oversufficient for 25 head stock.
35	SE.	23	"	"	"	Dug	8	2,130	- 2	2,132			Glacial sand	Soft		D, S	Abundant supply; several farmers haul from this spring.
36	SE.	24	"	"	"	Bored	28	2,110	- 16	2,094			Glacial drift	Hard, "alkaline"		D	Intermittent supply; hauls water from Jumping Deer creek for stock.
37	SW.	24	"	"	"	Dug	8	2,120	- 3	2,117			Glacial drift	Hard		D, S	Water in well freezes in winter; hauls from spring in section 23.
38	SW.	26	"	"	"	Dug	9	2,130	0	2,130			Glacial drift	Hard		D, S	Intermittent supply in winter; hauls water 1½ miles.
39	SW.	27	"	"	"	Dug	18	2,110	0	2,110			Glacial drift	Hard		D, S	One of three slough seepage wells that together yield sufficient water for 10 head stock
40	NW.	27	"	"	"	Dug	14	2,140	- 3	2,137	10	2,130	Glacial sand	Hard		D, S	Another well is also used to meet stock requirements in winter.
41	SW.	28	"	"	"	Dug	15	2,065	0	2,065			Glacial drift	Hard		D, S	Sufficient for 5 head stock; stock water at sloughs in summer.
42	SE.	28	"	"	"	Dug	12	2,095	- 4	2,091	4	2,091	Glacial sand	Hard		D, S	A new well is dug in a slough every winter for stock.
43	SW.	29	"	"	"	Dug	16	2,055	0	2,055			Glacial drift	Hard		D, S	Intermittent supply in winter; hauls water from a lake 4 miles north of the farm.
44	NW.	30	"	"	"	Dug	14	2,025	0	2,025			Glacial drift	Hard		D, S	Well is nearly dry in winter and drought years
45	NE.	30	"	"	"	Dug	14	2,055	0	2,055			Glacial sandy clay	Hard, "alkaline"		D, S	Sufficient for 10 head stock.
46	SW.	31	"	"	"	Dug	16	2,035	- 4	2,031	4	2,031	Glacial sand	Hard, cloudy, "alkaline"		D, S	Good supply and water has a sweet taste.
47	SW.	32	"	"	"	Dug	20	2,070	- 11	2,059			Glacial drift	Hard, cloudy, "alkaline"		D, S	Intermittent supply; stock use sloughs in summer and water is hauled 3½ miles in winter; several dry holes.
48	SW.	33	"	"	"	Dug	14	2,085	0	2,085			Glacial drift	Hard, cloudy		D, S	Intermittent supply; melts snow or hauls water in winter for stock.
49	NE.	33	"	"	"	Dug	14	2,100	- 4	2,096			Glacial sand	Soft		D	Two other wells in sloughs supply sufficient water for 24 head stock.
50	NE.	34	"	"	"	Dug	16	2,105	- 9	2,096	9	2,096	Glacial sand	Soft		D	Another well near a large slough yields enough water for stock.
51	SE.	34	"	"	"	Dug	16	2,100	- 6	2,094			Glacial drift	Hard		D, S	Intermittent supply; hauls water in dry years.
52	SW.	36	"	"	"	Dug	14	2,080	- 4	2,076			Glacial gravelly clay	Hard		D, S	Insufficient supply.
53	SE.	36	"	"	"	Dug	20	2,100									One of several dry holes; stock use sloughs or water is hauled ¼ of a mile.
54	NW.	36	"	"	"	Dug	14	2,085	- 9	2,076	9	2,076	Glacial sand	Soft		D, S	Good supply for 30 head stock.
1	NE.	2	24	17	2	Dug	15	1,935	- 11	1,924	11	1,924	Glacial gravel	Hard		S	Good supply for 15 head stock; melts snow for drinking water.
2	SW.	2	"	"	"	Dug	14	1,950	- 0	1,950			Glacial drift	Hard, "alkaline"		S	Intermittent supply; stock use sloughs and water is hauled 3½ miles. Several dry holes as deep as 80 feet.
3	NW.	3	"	"	"	Dug	12	1,940	- 0	1,940			Glacial drift	Hard, "alkaline"		D, S	Intermittent supply; uses a dugout and hauls from the NW.¼, section 11.
4	SW.	3	"	"	"	Dug	16	1,920	0	1,920			Glacial drift	Soft		D, S	Intermittent supply; another well in a slough is also used.
5	NW.	4	"	"	"	Dug	28	1,865	- 24	1,841	24	1,841	Glacial sand and gravel	Hard		D, S	Sufficient for 15 head stock; but well often plugs with sand; seven dry holes dug in glacial drift.

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

WELL RECORDS—Rural Municipality of CUPAR, NO. 218, 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
6	NE.	4	24	17	2	Dug	18	1,910	0	1,910			Glacial gravel	Soft		D, S	Intermittent supply; several dry holes 20 to 25 feet deep; hauls water 5 miles.
7	SW.	5	"	"	"	Dug	12	1,830	- 9	1,821	9	1,821	Glacial fine sand	Soft		S	Sufficient for 25 head stock; a 35-foot well is used for the house.
8	SE.	6	"	"	"	Dug	12	1,825	- 10	1,815	10	1,815	Glacial gravel	Soft		D	Intermittent supply; hauls water.
9	SW.	7	"	"	"	Dug	8	1,810	- 5	1,805	5	1,805	Glacial gravel	Hard		D, S	Bailing cannot lower the water level; several farmers haul from this well.
10	SE.	7	"	"	"	Dug	15	1,830	0	1,830			Glacial drift	Soft		D, S	Seepage water from a dugout; hauls water from a well near Loon creek.
11	SW.	8	"	"	"	Dug	10	1,840	- 8	1,832			Glacial gravel	Soft		S	Sufficient for 25 head stock.
12	SE.	8	"	"	"	Dug	25	1,875	- 21	1,854	21	1,854	Glacial gravel	Hard		D, S	Sufficient for house use only.
13	SW.	9	"	"	"	Dug	30	1,890	- 8	1,882	8	1,882	Glacial gravel	Hard		D, S	Oversufficient for 35 head stock.
14	SW.	10	"	"	"	Dug	14	1,925	- 7	1,918			Glacial gravel	Hard		D, S	One of several slough seepage wells that together yield enough water for the farm.
15	SE.	10	"	"	"	Dug	14	1,925	0	1,925			Glacial drift	Soft, cloudy		D, S	One of several slough seepage wells.
16	NW.	11	"	"	"	Bored	40	1,940	- 35	1,905			Glacial drift	Hard		S	Insufficient supply.
17	NW.	12	"	"	"	Dug	17	1,945	0	1,945			Glacial drift	Hard		D, S	Intermittent supply; hauls water ¾ mile for 14 head stock.
18	SE.	12	"	"	"	Dug	10	1,950	- 5	1,945	5	1,945	Glacial gravel	Hard		D, S	Very good supply; three farmers haul water from this well. Intermittent supply; melts snow in winter for 18 head stock.
19	SE.	13	"	"	"	Dug	32	1,960	- 30	1,930			Glacial drift	Hard		D, S	Intermittent supply; melts snow in winter for 18 head stock.
20	NW.	14	"	"	"	Dug	9	1,955	- 4	1,951	4	1,951	Glacial sand and gravel	Soft		D, S	Oversufficient for 45 head stock.
21	NW.	15	"	"	"	Dug	35	1,955									Dry hole; uses seepage wells in summer and hauls water in winter.
22	NE.	16	"	"	"	Dug	16	1,950	0	1,950			Glacial drift	Hard		D, S	Intermittent supply; melts snow in winter for stock.
23	NW.	16	"	"	"	Dug	14	1,925	- 10	1,915	10	1,915	Glacial gravel	Soft		D, S	Sufficient for 35 head stock; several dry holes in glacial drift.
24	SW.	17	"	"	"	Dug	24	1,840	- 20	1,820	20	1,820	Glacial gravel	Hard		D, S	Sufficient for 25 head stock; a dugout is used for stock in summer.
25	NE.	17	"	"	"	Dug	10	1,900	0	1,900			Glacial gravel	Hard		D, S	Sufficient for 10 head stock.
26	NE.	18	"	"	"	Dug	24	1,845	- 22	1,823	22	1,823	Glacial gravel	Soft		D, S	Insufficient supply; uses well in the SE¼, section 18.
27	SE.	18	"	"	"	Dug	8	1,830	- 4	1,826	4	1,826	Glacial gravel	Soft		D, S	Oversufficient for 150 head stock.
28	SW.	19	"	"	"	Dug	10	1,865	0	1,865			Glacial drift	Hard, "alkaline"		S	Poor supply; stock use sloughs in summer and water is hauled in dry years and winter.
29	SE.	20	"	"	"	Dug	18	1,905	0	1,905			Glacial drift	Hard		D, S	Intermittent supply; hauls water ½ mile in winter; dry holes 35 to 40 feet deep.
30	SE.	22	"	"	"	Dug	14	1,955	0	1,955			Glacial drift	Soft		D, S	One of four similar wells that together yield sufficient water for 12 head stock.
31	SW.	22	"	"	"	Dug	16	1,950	0	1,950			Glacial sandy clay	Soft		S	Sufficient for 17 head stock; a 14-foot well is used for the house.
32	NE.	22	"	"	"	Dug	20	1,955	- 14	1,941			Glacial drift	Hard		D, S	Intermittent supply.

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(#) Sample taken for analysis.

WELL RECORDS—Rural Municipality of CUPAR, NO. 218, 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
33	SE.	23	24	17	2	Dug	10	1,960	- 5	1,955	5	1,955	Glacial sand	Hard		S	Oversufficient for 26 head stock; a seepage well is used for the house.
34	NW.	23	"	"	"	Dug	12	1,960	- 9	1,951	9	1,951	Glacial sand	Soft		D, S	Good supply.
35	SE.	24	"	"	"	Dug	20	1,990	- 10	1,980			Glacial drift	Hard, "alkaline"		S	One of three wells that together yield sufficient water for 20 head stock.
36	NW.	24	"	"	"	Dug	14	1,980	0	1,980			Glacial drift	Hard, "alkaline", cloudy		D, S	One of several wells in sloughs that supply 40 head stock in winter.
37	NE.	24	"	"	"	Dug	19	1,990	0	1,990			Glacial drift	Hard, "alkaline"		D, S	Intermittent supply; hauls water in winter and years of drought.
38	SW.	25	"	"	"	Dug	12	1,980	0	1,980			Glacial drift	Soft		D, S	Intermittent supply; another slough seepage well yields enough water for 8 head stock in winter.
39	NE.	25	"	"	"	Dug	16	2,000					Glacial drift	Soft		D, S	Intermittent supply; hauls water summer and winter.
40	NE.	26	"	"	"	Dug	16	1,975	0	1,975		5	Glacial drift	Hard, cloudy, "alkaline"		D, S	Sufficient for 10 head stock; melts snow in winter.
41	NW.	26	"	"	"	Bored	16	1,935	- 10	1,925			Glacial drift	Hard, "alkaline"		D, S	Yields only 2 pails a day in winter; hauls water.
42	SW.	26	"	"	"	Bored	12	1,935	- 7	1,928			Glacial drift	Hard		D, S	Poor supply; hauls water from a neighbour's well.
43	SE.	26	"	"	"	Dug	13	1,945	0	1,945			Glacial drift	Hard		D, S	Intermittent supply in winter; hauls water ½ mile.
44	SW.	29	"	"	"	Dug	10	1,915	- 6	1,909	8	1,907	Glacial gravel	Soft		S	Sufficient for 36 head stock.
45	SE.	29	"	"	"	Dug	14	1,925	- 6	1,919	11	1,914	Glacial sand	Soft		D, S	Sufficient for 17 head stock.
46	SE.	30	"	"	"	Dug	12	1,900	- 8	1,892	8	1,892	Glacial gravel	Soft		D, S	Oversufficient for 50 head stock.
47	SW.	30	"	"	"	Dug	12	1,875	- 8	1,867	8	1,867	Glacial sand and gravel	Soft		D, S	Abundant supply; four neighbours use this well a 10-foot well freezes in winter.
48	NW.	31	"	"	"	Dug	8	1,890	- 4	1,886	4	1,886	Glacial gravel	Soft		D, S	Sufficient for 40 head stock.
49	SW.	31	"	"	"	Dug	7	1,900	- 5	1,895	5	1,895	Glacial gravel	Hard		D, S	Sufficient for 9 head stock.
50	NW.	32	"	"	"	Dug	8	1,905	- 5	1,900	5	1,900	Glacial gravel	Soft		D, S	Abundant supply for 50 head stock.
51	SW.	32	"	"	"	Dug	14	1,915	- 7	1,908	7	1,908	Glacial sand	Soft		D, S	Plenty of water for 32 head stock.
52	NE.	34	"	"	"	Dug	13	1,975	0	1,975			Glacial drift	Hard		D, S	One of several slough seepage wells that yield enough water.
53	SW.	36	"	"	"	Dug	20	2,005	0	2,005			Glacial drift	Hard, cloudy		D, S	Intermittent supply; stock water at a large, deep slough.
54	NE.	36	"	"	"	Dug	16	2,005	- 8	1,997			Glacial drift	Hard		D	Uses a well in the NE.¼, section 35, to water 21 head stock.
1	NE.	1	24	18	2	Dug	40	1,795									Dry hole in glacial drift; hauls water.
2	SW.	2	"	"	"	Dug	15	1820	- 10	1,810	10	1,810	Glacial sand and gravel	Soft		D, S	Oversufficient supply.
3	SW.	3	"	"	"	Dug	3	1,790	0	1,790			Glacial gravel	Hard		D, S	This spring flows winter and summer; eight farmers hauled from the spring during the drought.

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(#) Sample taken for analysis.

WELL RECORDS—Rural Municipality of CUPAR, NO. 218, 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	SE.	4	24	18	2	Dug	18	1,805	- 10	1,795	15	1,790	Glacial sand	Hard		D, S	Insufficient in dry years; hauls water from spring in the SW.¼, section 3.
5	NW.	4	"	"	"	Dug	12	1,800	+ 4	1,804	12	1,788	Glacial sand and gravel	Hard, iron, "alkaline"		D, S	Abundant supply; several dry holes; one of them only 25 feet distant from the flowing artesian well.
6	SE.	7	"	"	"	Bored	40	1,815	- 20	1,795			Glacial fine sand	Hard, "alkaline"		D, S	Sufficient in normal years; hauled water in 1931 and 1932; several dry holes in glacial drift.
7	NW.	7	"	"	"	Bored	40	1,820	- 24	1,796			Glacial drift	Hard, "alkaline"		D, S	Sufficient supply.
8	SE.	9	"	"	"	Dug	9	1,790	+ 5	1,795			Glacial gravel	Soft		D, S	Oversufficient for 150 head stock.
9	NE.	9	"	"	"	Dug	7	1,845	- 3	1,842	3	1,842	Glacial gravel	Soft		D, S	Oversufficient supply.
10	SE.	10	"	"	"	Dug	13	1,830	0	1,830			Glacial drift	Hard, "alkaline"		D, S	Intermittent supply; hauls water from a spring.
11	NE.	10	"	"	"	Bored	185	1,855									four dry holes in glacial drift. The deepest of twenty-seven dry holes in glacial drift; has hauled water for 18 years from a spring 3 miles distant.
12	SE.	12	"	"	"	Dug	35	1,840									Dry hole in glacial drift; hauls water.
13	NE.	13	"	"	"	Drilled	230	1,875			230	1,645	Glacial sand?	Hard, cloudy, "alkaline"		S	Plenty of water for 20 head stock; hauls drinking water 2 miles.
14	NE.	14	"	"	"	Bored	127	1,875									Dry hole in glacial drift; hauls water from Booth 's spring.
15	NW.	14	"	"	"	Dug	44	1,875	- 22	1,853	44	1,831	Glacial gravel	Hard, iron, "alkaline"		S	Well has never pumped dry; seepage well used for the house; several shallow dry holes.
16	SE.	15	"	"	"	Dug	90	1,860									Dry hole in glacial drift; hauls water from Booth's spring.
17	SW.	16	"	"	"	Bored	50	1,855	- 33	1,822			Glacial gravel	Hard, "alkaline", cloudy		N	Poor supply; a shallow well is used for drinking water; hauls water for stock in winter.
18	SE.	17	"	"	"	Dug	8	1,790	- 4	1,786	4	1,786	Glacial gravel	Soft		D, S	Abundant supply; several farmers hauled from this well in the dry years.
19	SW.	18	"	"	"	Bored	90	1,820	- 50	1,770			Glacial sand and gravel	Hard, "alkaline"		S	Insufficient supply.
20	SE.	18	"	"	"	Bored	75	1,815	- 60	1,755			Glacial drift	Hard, iron, "alkaline"		D	Hauls water for 15 head stock from a well near Loon creek.
21	SE.	19	"	"	"	Dug	12	1,795	- 8	1,787	8	1,787	Glacial sandy gravel	Soft		D, S, I	Plenty of water; irrigation results are good.
22	NW.	20	"	"	"	Dug	28	1,845	- 20	1,825			Glacial gravel	Hard		D, S	Sufficient for 25 head stock; a few farmers haul drinking water from this well.
23	NE.	20	"	"	"	Dug	22	1,860	- 8	1,852			Glacial gravel	Hard		D, S	Intermittent supply; hauls water.
24	SW.	20	"	"	"	Dug	18	1,795	- 16	1,779	16	1,779	Glacial gravel	Hard, iron		S	Abundant supply; well has never pumped dry; 150 barrels of water a day hauled from this well in the dry years; another 18-foot well is used for house.
25	NE.	21	"	"	"	Dug	18	1,880	- 11	1,869	11	1,869	Glacial sand	Hard		D, S	Drought caused the supply to decrease greatly in this well.
26	NE.	22	"	"	"	Dug	31	1,895	- 7	1,888	31	1,864	Glacial gravel	Hard		D, S	Abundant supply; several farmers hauled from this well in the dry years; dry holes as deep as 70 feet.
27	SE.	22	"	"	"	Bored	65	1,890	- 50	1,840			Glacial sand	Hard, "alkaline"		S	Poor supply; three shallow wells yield water for the house; hauls water for stock.

NOTE—All depths, aititudes, 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 CUPAR, NO. 218, 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	NW.	22	24	18	2	Dug	30	1,890	- 10	1,880			Glacial sand	Hard		D, S	Intermittent supply in winter; melts snow for stock.
29	SW.	22	"	"	"	Bored	50	1,875	- 47	1,828	47	1,828	Glacial gravel	Soft		D, S	Sufficient for 32 head stock; several dry holes as deep as 60 feet.
30	SW.	24	"	"	"	Bored	60	1,865									One of several dry holes in glacial drift; hauls water.
31	NW.	24	"	"	"	Dug	10	1,890	0	1,890			Glacial sandy clay	Soft		D, S	Intermittent supply; hauls water in winter and dry years.
32	NW.	25	"	"	"	Drilled	210	1,885			210	1,675	Glacial fine sand			N	Well was used 10 years before it finally plugged with sand.
33	NW.	26	"	"	"	Bored	30	1,885	- 29	1,856			Glacial fine sand	Hard		D	Hauls water for stock from Loon creek; several dry holes.
34	SW.	26	"	"	"	Dug	30	1,910	- 27	1,883			Glacial sand	Hard, "alkaline"		S	Poor supply; hauls water.
35	SW.	27	"	"	"	Bored	30	1,900	- 24	1,876	27	1,873	Glacial sand	Hard		D, S	Sufficient for 15 head stock; one dry hole 60 feet deep; a slough seepage well provides soft water.
36	SE.	28	"	"	"	Bored	115	1,880									Dry hole in glacial drift; stock use sloughs in summer and water is hauled ¾ mile in winter.
37	SW.	28	"	"	"	Dug	14	1,875	0	1,875			Glacial drift	Hard		S	Intermittent supply; stock water at sloughs or water is hauled.
38	NW.	30	"	"	"	Dug	10	1,800	- 7	1,793	7	1,793	Glacial sand and gravel	Soft		D, S	Abundant supply; several farmers haul from this well.
39	SE.	30	"	"	"	Dug	35	1,850	- 32	1,818	32	1,818	Glacial sand	Soft		D, S	Oversufficient for 10 head stock.
40	NW.	32	"	"	"	Dug	27	1,890	- 12	1,878			Glacial drift	Hard		D, S	Hauls water for 6 head stock from the SW¼, section 20; one dry hole 102 feet deep.
41	NE.	32	"	"	"	Bored	95	1,885									One of several dry holes in glacial drift; hauls water 4 miles, and also uses slough seepage wells.
42	SW.	32	"	"	"	Bored	76	1,875	- 20	1,855			Glacial sand	Hard, "alkaline"		D	Poor supply; dugout used for stock and water is hauled from SW.¼, section 20.
43	NW.	33	"	"	"	Dug	15	1,885	- 10	1,875	10	1,875	Glacial sand	Soft	D	D, S	School well; oversufficient supply.
44	SW.	34	"	"	"	Drilled	325	1,875									The deepest of three dry holes in glacial drift; several seepage wells are used to water 40 head stock.
45	SE.	34	"	"	"	Dug	10	1,880	- 12	1,868			Glacial gravel	Soft		D, S	Good supply for 18 head stock.
46	NW.	36	"	"	"	Bored	55	1875	- 28	1,847			Glacial drift	Hard, cloudy		S	Sufficient for 15 head stock; hauls drinking water from near Loon creek.

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.