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GEOLOGICAL SURVEY OF CANADA
WATER SUPPLY PAPER No. 212

PRELIMINARY REPORT
GROUND-WATER RESOURCES
OF THE
RURAL MUNICIPALITY OF ELFROS
NO. 307
SASKATCHEWAN

By
B. R. MacKay, H. N. Hainstock and G. L. Scott



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DEPARTMENT OF MINES
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GROUND WATER RESOURCES OF PART OF THE RURAL MUNICIPALITY
OF ELFROS, NO. 307
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

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

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

GLOSSARY OF TERMS USED

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Cypress Hills Formation. The name given to a series of conglomerates and sand beds which occur in the southwest corner of Saskatchewan, and 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

Only that part of the rural municipality of Elfros that lies south of the north boundary of township 32 is discussed in this report. This part of the municipality, located in eastern Saskatchewan, covers an area of approximately 175 square miles, and consists of three fractional townships, townships 31, ranges 13, 14, and 15, and three full townships, townships 32, ranges 13, 14, and 15, west of the Second meridian. The fractional townships each consist of eighteen full sections, sections 19 to 36 inclusive, and six fractional sections, sections 13 to 18 inclusive. The centre of the area under discussion is 72 miles northwest of the city of Yorkton. The Canadian Pacific railway line that runs between Winnipeg and Edmonton traverses the municipality. On it are located the villages of Leslie and Elfros at elevations of 1,845 feet and 1,809 feet above sea-level, respectively, and the hamlet of Mozart at an elevation of 1,803 feet.

The southwestern part of the municipality is covered by moraine, and this area is densely wooded with poplar, particularly in township 31, range 15. The ground surface is rolling and is characterized by numerous low hills and undrained depressions. The remainder of the area is mantled by boulder clay or glacial till, and the surface is slightly undulating. Scattered clumps of poplar and small sloughs are common. In an area in the northern part of townships 32, ranges 13 and 15, the glacial till is overlain by not more than 4 feet of glacial lake clays. The district is not wooded and is quite flat. A small area in the eastern part of sec. 12, tp. 32, range 13, is covered by at least 15 feet of glacial outwash sands and gravels.

The maximum elevation of 2,085 feet above sea-level is reached in the southwestern corner of the municipality, and the elevation decreases gradually to the north and east to a

minimum of 1,720 feet in the northern part of the glacial lake clay-covered district. The municipality is drained by four main streams, Birch creek, Duck-hunting creek, Jolly creek, and Rushville brook. All these streams are small, have an intermittent flow of water, and drain into the Quill lakes. The largest undrained depression covers an area of approximately 325 acres in the northeastern part of township 32, range 13.

Water-bearing Horizons in the Unconsolidated Deposits

The water supply in this municipality is derived mainly from sloughs and springs, and from wells dug, bored, or drilled to aquifers within the glacial drift. Most of the sloughs in the municipality do not retain water throughout the year and are unreliable sources of water for stock. Two sloughs in township 31, range 13, however, are fed by springs, and they have never been known to be dry. Small springs are of frequent occurrence along the ravines, and farmers generally use the water for stock. One spring in the NE. $\frac{1}{4}$, sec. 18, tp. 32, range 13, yields an abundant supply of soft water. The water from this spring is used by many farmers for domestic purposes and it is also used in steam boilers. Another spring that yields an abundant supply of water is located in the NW. $\frac{1}{4}$, sec. 29, tp. 32, range 14. The water from this spring is too highly mineralized for drinking, but the supply is sufficient for 350 to 500 head of stock.

The producing wells of the municipality are from 4 to 450 feet deep, and all but two are thought to be deriving their water from lenses of sand and gravel in the glacial drift. Adequate supplies of water are not particularly difficult to locate in the glacial drift, and it is estimated that only 20 per cent of the farmers have an unsatisfactory supply. Slightly more than one-half the farmers in the municipality

rely on shallow, hand-dug wells that tap pockets of sand and gravel overlying blue boulder clay. These pockets of water-bearing sand and gravel usually underlie yellow boulder clay, but occasionally they outcrop at the surface. Moderate supplies of water can be obtained in the deposits of glacial outwash sands and gravel at depths of less than 15 feet. No water is obtained from the thin covering of glacial lake clay, but water is not difficult to locate in pockets of sand and gravel at depths of less than 40 feet in the underlying boulder clay. The average shallow well in the municipality will water from 20 to 30 head of stock, but the supply decreases in winters and drought years. Occasionally a shallow well strikes a large lens of sand and gravel and the supply of water obtained is abundant and quite constant even in drought years because of the immense quantity of water stored within the pocket. Two such wells, 10 and 22 feet deep, in township 32, range 14, will water 200 and 150 head of stock, respectively, and many farmers haul water from them. Water that is located in sand and gravel above the blue clay is generally not highly mineralized and is suitable for drinking. The village of Leslie obtains adequate supplies of water for domestic purposes from wells 8 to 12 feet deep, and the village of Elfros and the hamlet of Mozart haul water from shallow wells in the SW. $\frac{1}{4}$, sec. 19, tp. 32, range 13, and the NW. $\frac{1}{4}$, sec. 31, tp. 32, range 14.

The most abundant and constant supplies of water in the municipality are derived from wells 25 to 280 feet deep that tap lenses of sand and gravel in the blue clay of the glacial drift. These wells are usually non-flowing artesian in type, but seven wells are flowing artesian. The hydrostatic pressure is often sufficient to raise the water to points less than 30 feet below the surface. Prolonged drought years have little or no apparent effect on the supply of water from these

wells, but in a few wells the supply has been partly shut off by sand plugging the casings. The quality of the water is generally not as good as that from shallow wells, and it is often described as being hard, "alkaline", and containing iron. The water is often used for drinking, however, if water from shallow wells is not available. Two wells located in the NW. $\frac{1}{4}$, sec. 7, tp. 32, range 14, and in the hamlet of Mozart yield soft water. The wells are 160 and 175 feet deep, respectively, and the water rises to points 14 and 4 feet below the surface. The 160-foot well cannot be pumped dry, but the supply in the well in Mozart has decreased due to sand plugging the casings. Of the nine flowing artesian wells in the municipality seven are from 65 to 204 feet deep. The other two wells, located in township 31, range 13, are springs that have been dug out. Three of the seven flowing artesian wells are located in the village of Leslie, and are approximately 110 feet deep. The water from these seven wells is highly mineralized and not suitable for drinking, but it has no ill effects on stock. It is highly improbable that these seven wells tap a common aquifer. The water is noticeably more highly mineralized in wells that are between 125 and 280 feet deep than it is in wells 25 to 125 feet deep. There are exceptions, however, to the above statement. A few wells in the municipality yield water that is too highly mineralized for stock. The 280-foot well in the NE. $\frac{1}{4}$, sec. 25, tp. 32, range 13, is believed to be deriving water from a sand aquifer at or near the base of the glacial drift. The elevation of this sand aquifer is 1,480 feet above sea-level.

If finances permit the risk of failure, boring or drilling to a maximum depth of 300 feet is advisable in this municipality. If water is obtained from a lens of sand and gravel in the blue clay it will probably be highly mineralized

but suitable for stock, and the supply is almost certain to be abundant and constant. Test augers should be used for prospecting the upper 30 feet of the glacial drift prior to digging a shallow well. The excavation of dugouts, at least 12 feet deep, in slough basins is recommended for the collection of surface water for stock use.

Water-bearing Horizons in the Bedrock

The Marine Shale series underlies the glacial drift throughout the municipality. The contact between the glacial drift and the Marine Shale is estimated as occurring at an approximate elevation of 1,475 feet above sea-level. Two wells in the municipality, both located in township 32, range 14, are believed to have penetrated the bedrock. One of these wells was drilled 300 feet deep in the SE. $\frac{1}{4}$, section 23, to an elevation of 1,485 feet. The water obtained is so highly mineralized that it cannot be used. The second well was drilled by the Canadian Pacific railway in the NW. $\frac{1}{4}$, section 3. The depth of this well is not definitely known, but it is believed to be 450 feet. The base of this well will, therefore, be at an elevation of 1,420 feet above sea-level. The quality of the water from this well is similar to that from the 300-foot well. No information was obtained as to the amount of water obtained or the height to which it rises in the wells. In this part of Saskatchewan the Marine Shale series seldom yields water, and on the rare occasions when it has been found the water is usually so highly mineralized that it cannot be used. Well drillers are advised to confine their prospecting efforts to the glacial drift. The Marine Shale is often locally termed "soapstone".

GROUND WATER CONDITIONS BY TOWNSHIPS

Township 31, Range 13

The elevation in this township decreases 100 feet from the southwestern corner to the northeastern corner. This entire fractional township is mantled by glacial till. The land is slightly undulating, and parts of some sections are wooded with poplar. Duck-hunting creek flows intermittently in a north-easterly direction from its source in the SW. $\frac{1}{4}$, section 34.

The supply of water in this township is derived mainly from springs and wells. The wells are from 4 to 107 feet deep and tap pockets of water-bearing sand and gravel in the glacial drift. A few small springs occur near the source of Duck-hunting creek, and a spring in a coulée in the SW. $\frac{1}{4}$, section 36, is used for watering stock. Two sloughs, one in the SE. $\frac{1}{4}$, section 20, and the SW. $\frac{1}{4}$, section 21, and the other in the NE. $\frac{1}{4}$, section 23, are fed by springs. In winter, when a hole is chopped through the ice covering the sloughs the water bubbles up through the opening, due to pressure. The slough in the NE. $\frac{1}{4}$, section 23, has never been known to be dry. Flowing springs have formed a small marsh in section 26. Two flowing artesian wells in the SE. $\frac{1}{4}$, section 23, and the NE. $\frac{1}{4}$, section 26, are actually springs that have been dug out and cribbed. The wells are 6 and 11 feet deep and are dug in sand on the slope of a small ravine. The flow of water from the 6-foot well is intermittent, whereas that from the 11-foot well is continuous throughout the year. The water is hard and suitable for drinking, although that from the 11-foot well contains some iron in solution.

Most of the producing wells in the township are dug or bored to small pockets of sand and gravel that usually underlie yellow boulder clay. Unless the well is dug through the aquifer into the underlying blue clay to form a catchment pit these wells are seldom more than 30 feet deep. The supply of water is variable and it generally decreases during the winter months. Most of these

shallow wells are not reliable sources of water in drought periods. The water is of good quality, seldom "alkaline", and occasionally soft. The village of Leslie obtains drinking water from several wells 8 to 12 feet deep, each of which yields a small supply of water.

Ten wells, 44 to 65 feet deep, apparently tap a water-bearing horizon of sand and gravel that underlies a layer of blue clay. The water in all these wells is under pressure. It rises to a point 12 feet below the surface in a 64-foot well in the SW. $\frac{1}{4}$, section 21, and, unlike the water from the other nine wells, is soft and suitable for washing. The water rises approximately half-way up the other wells, and the supply is abundant and constant. The supply in a 60-foot well in the SW. $\frac{1}{4}$, section 35, has probably been partly shut off by sand as it is insufficient for 60 head of stock. The water from this group of wells is usable for drinking and for watering stock.

A well drilled 107 feet deep, to a sand aquifer in the village of Leslie, yields an abundant supply of hard and highly mineralized water that is unfit for drinking. The water in this well has risen to a point 7 feet above the surface, but in 1935 it barely overflowed the top of the casing. Two other wells in the village are flowing artesian in type and obtain water of the same quality at approximately the same depth. The water from these wells is usable only for stock. The water was described as hard, containing iron, and very "alkaline". The deepest dry hole in the township was bored 143 feet deep in the SE. $\frac{1}{4}$, section 24.

Water is not particularly difficult to locate in the upper 110 feet of the glacial drift in this township, but abundant supplies are very difficult to obtain in aquifers that lie above the blue clay. The water-bearing horizon tapped by the ten wells 44 to 65 feet deep yields usable water in abundant quantities, and boring to this water-bearing horizon is recommended.

Township 31, Range 14

The eastern 2 to $2\frac{3}{4}$ miles of this fractional township is a glacial till plain, whereas the remainder is covered by moraine. The elevation decreases gradually about 125 feet from the southwestern to the northeastern corner of the township. The land surface is more undulating and densely wooded in the moraine-covered area than in the till plain. The top soil in some quarter sections is very stony. Birch creek and two tributary streams that join Birch creek in the NW. $\frac{1}{4}$, section 35, flow intermittently in a northerly direction through the eastern half of the township. Small springs occur along the banks of the ravines, and in the summer months open patches of water along the courses of the creeks indicate the location of these springs. Two small dams have been built across Birch creek in the SW. $\frac{1}{4}$ and NW. $\frac{1}{4}$, section 24, and the impounded water is used for stock during the summer months.

Adequate supplies of water are difficult to obtain from sand and gravel pockets that lie above the blue boulder clay. Occasionally shallow wells, such as those in the SE. $\frac{1}{4}$, section 14, and the NE. $\frac{1}{4}$, section 28, tap thick deposits of sand and gravel that outcrop at the surface, and yield moderate and constant supplies of water. Those farmers who rely on shallow, hand-dug wells usually have more than one well and use them all in order to obtain an adequate supply of water. Several farmers have shallow wells that yield a sufficient supply of water in summer, but which yield an insufficient supply during the winter, and water must be hauled or snow melted to meet stock requirements.

The best supply of water is obtained from wells that tap pockets of water-bearing sand and gravel in the blue clay of the glacial drift. These wells range in depth from 40 to 154 feet and the water obtained is under pressure. It is often found in boring these wells that a layer of hard, black boulder

clay or "hardpan" immediately overlies the aquifer, and when this hardpan is penetrated the water rushes into the wells and rises to a level usually 20 to 50 feet below the surface. The supply is abundant and not readily reduced by prolonged drought. The water is hard, contains iron, and is sometimes too "alkaline" for drinking.

Several dry holes and seepage wells, 40 to 90 feet deep, were dug and bored in six quarter sections in the till-covered area of the township, and five dry holes 47 to 84 feet deep were dug in the SW. $\frac{1}{4}$, section 24. The farmers on these six quarter sections, and those in the NW. $\frac{1}{4}$, section 28, NE. $\frac{1}{4}$ and SW. $\frac{1}{4}$, section 30, and the NW. $\frac{1}{4}$, section 31, are the only farmers in the township who have been unable to obtain a satisfactory supply of water. They are advised to excavate deep dugouts to collect and retain surface water. These dugouts will retain permanent supplies of water if the location is carefully chosen and the dugout is at least 12 feet deep.

Township 31, Range 15

With the exception of the northern parts of sections 31 and 32, which are mantled by glacial till, this fractional township is covered by moraine. The elevation of the ground surface decreases gradually from 2,100 feet above sea-level at the southwestern corner of the township to approximately 1,950 feet at the northeastern corner. The land is rolling and characterized by numerous, small, rounded hills and undrained depressions. The largest undrained depression covers an area of approximately 100 acres in the west half of section 33. The township is densely wooded with poplar.

The wells in this township are from 8 to 100 feet deep, and those that yield water are dug or bored to pockets of sand and gravel in the glacial drift. It is not very difficult to locate

sufficient quantities of water in the upper 100 feet of the glacial drift in this township. Most of the producing wells are less than 30 feet deep and the beds of sand and gravel often outcrop at the surface. Generally the shallow wells strike the sand and gravel beneath yellow boulder clay. A 35-foot bored well in the NE. $\frac{1}{4}$, section 17, penetrated the following materials, in descending order; 8 feet of yellow clay, 7 feet of dry sand, 5 feet of yellow clay, and 15 feet of water-bearing sand. In those wells dug entirely in sand and gravel, the water-table lies between 4 and 10 feet below the surface. Some of the shallow wells in the township yield over-sufficient supplies of water for 50 head of stock, whereas others yield small supplies that must be augmented from other shallow wells in order to meet stock requirements. One farmer in the SW. $\frac{1}{4}$, section 36, uses six wells, 10 to 20 feet deep, in order to obtain sufficient water, whereas in the NW. $\frac{1}{4}$, section 36, abundant supplies of water can be obtained from gravel located 10 to 16 feet below the surface. The water from the wells in this quarter section is usually soft, and water is hauled from them for use in steam engines. The water from shallow wells in this township is seldom highly mineralized, although it is usually hard.

At least twelve wells, 50 to 100 feet deep, have tapped pockets of water-bearing sand and gravel within the blue clay. The water is under slight pressure, generally rising less than 35 feet above the aquifer. All these wells, with the exception of a 60-foot well in the SE. $\frac{1}{4}$, section 36, which has partly caved in, yield abundant supplies of water. Drought years have little or no apparent effect on the supply. The water is hard, often "alkaline", contains iron, and is not usually used for drinking if shallow well water is available.

Only nine farmers in the township have experienced undue difficulty in securing water. One farmer in the SW. $\frac{1}{4}$,

section 30, has dug sixteen dry holes. The deepest dry hole in the township, 80 feet deep, was bored in the SW. $\frac{1}{4}$, section 15. Test augers could be used to advantage in this township in locating beds of water-bearing sand and gravel in the upper 35 feet of the glacial drift. Boring or drilling to depths of 150 feet are advised if finances permit. The excavation of small, deep dugouts for catching and conserving surface water is also recommended.

Township 32, Range 13

This township is mantled by boulder clay or glacial till. In the northwestern part the boulder clay is overlain by a thin covering of glacial lake clay. The depth of the lake clay probably does not exceed 4 feet. The eastern part of section 12 is mantled by glacial outwash sands and gravels that reach a thickness of at least 15 feet. The ground surface is slightly undulating to flat, and part of a few sections only are wooded with poplar. Birch creek flows through the northwestern corner of the township. Duck-hunting creek flows intermittently diagonally across the township in a northwesterly direction, and joins Birch creek in the SW. $\frac{1}{4}$, section 32. Duck-hunting creek has two small tributary streams that flow into it from the south. Several flat, marshy areas occur in the northeastern corner of the township. One of these depressions covers approximately 325 acres in sections 26 and 35.

Springs occur along Duck-hunting creek in the NE. $\frac{1}{4}$, section 12, and the SW. $\frac{1}{4}$, section 22. Springs were also reported in small draws in the SE. $\frac{1}{4}$ and NE. $\frac{1}{4}$, section 18, and the NE. $\frac{1}{4}$, section 19. One flowing spring in a gravel pit in the NE. $\frac{1}{4}$, section 18, yields an abundant supply of soft water and farmers haul water from the spring for washing and for use in steam boilers.

Moderate supplies of water are easily obtained in the glacial outwash sands and gravels in the NE. $\frac{1}{4}$ and SE. $\frac{1}{4}$, section 12. The water-table lies 9 to 10 feet below the surface, and although the wells can be pumped dry they soon refill. The water is not highly mineralized and that from a 14-foot well in the NE. $\frac{1}{4}$, section 12, was reported soft.

No water is obtained from the glacial lake clays, but pockets of water-bearing sand and gravel occur in the underlying boulder clay at depths of 8 to 20 feet. One 12-foot well in the NE. $\frac{1}{4}$, section 21, yields an abundant supply of soft water. Several neighbouring farmers haul water from this well.

In some parts of the glacial till plain water is easily found in pockets of sand and gravel occurring above the blue boulder clay, whereas in other parts these pockets are very difficult to strike. Occasionally the pockets outcrop at the surface, and the sand and gravel is sometimes used for commercial purposes. One well, 6 feet deep, dug in a gravel pit in the SW. $\frac{1}{4}$, section 19, yields an abundant supply of soft water. This well is the source from which water is tanked into the village of Elfros for drinking and domestic purposes. Although the supplies of water obtained from lenses of sand and gravel above the blue clay are extremely variable, the water is of good quality and is seldom "alkaline".

At least fourteen wells, 27 to 85 feet deep, obtain water under pressure from pockets of sand and gravel within the blue boulder clay. These wells yield abundant supplies of water unless the casings have become plugged with quicksand, as in a 57-foot well in the NE. $\frac{1}{4}$, section 36. They are not readily affected by drought conditions. The water is hard, contains iron, and is sometimes too "alkaline" for drinking. In some of these wells the blue clay is very hard, whereas in others a layer of hard, firmly cemented, dark clay immediately overlies the

aquifer. In one well in the SW. $\frac{1}{4}$, section 36, this hard, black clay was struck 45 feet below the surface, and the auger of the boring machine was broken in an attempt to pierce the material.

Two wells 204 and 144 feet deep, in the SW. $\frac{1}{4}$, section 28, and the NW. $\frac{1}{4}$, section 32, are flowing artesian wells. It is possible that these two wells have tapped a common water-bearing horizon of sand, since the bases of the wells are at elevations of 1,536 feet and 1,586 feet above sea-level, respectively. The water in the 204-foot well was struck beneath a layer of hardpan and it rose to a point 6 feet above the surface. The well was drilled in 1919 and the flow at that time was 12 gallons a minute, but it has decreased and now flows at the rate of 2 gallons a minute. The 144-foot well was bored to a depth of 80 feet where hard, dark clay was struck, and it had to be drilled to the 144-foot level. The water rose to a point 10 feet above the surface, but the supply has decreased from 80 to 60 gallons an hour, due to sand plugging the casing. The water from both wells is too highly mineralized for drinking, but it imparts no ill effects to stock. The water contains iron.

The deepest well in the township was drilled in the NE. $\frac{1}{4}$, section 25. Water was struck at a depth of 280 feet, or at an elevation of 1,480 feet above sea-level. The aquifer is sand and it is probable that it occurs very near the contact of the glacial drift and the Marine Shale series. The water rises to a point 12 feet below the surface, and the supply is very abundant. The quality of the water is similar to that from the two flowing artesian wells, and although used for drinking it has a laxative effect on people unaccustomed to its use. Dry holes 180 and 210 feet deep were drilled in the SE. $\frac{1}{4}$, section 24, and the SE. $\frac{1}{4}$, section 36.

The Marine Shale series underlies the glacial drift and the contact is believed to be near an elevation of 1,475 feet

above sea-level. Any attempt to obtain water should be confined to the glacial drift, since the Marine Shale seldom yields water in this part of Saskatchewan. Drilling should be confined to depths of less than 300 feet.

Township 32, Range 14

The elevation decreases gradually from 1,940 feet at the southwestern corner of the township to 1,720 feet at the northeastern corner. The moraine-covered area in the southwestern part of the township is separated from the glacial lake clay-covered area in the northeastern part by a glacial till plain. The ground surface becomes less undulating towards the north, and in the glacial lake clay-covered region it is quite flat. Birch creek, which flows north through the eastern part of the area, and two small tributary streams drain the township. Small springs are of numerous occurrence along the ravines that contain Birch creek, but only one of these springs, in the SE. $\frac{1}{4}$, section 24, is used extensively for stock. One flowing spring located near a slough in the NW. $\frac{1}{4}$, section 29, yields sufficient water for 350 to 500 head of stock. The water is hard, "alkaline", and contains iron. It is suitable for stock, but is not used for drinking.

Most of the wells in the township are dug to depths of less than 40 feet. Generally these shallow wells do not yield very abundant supplies of water and often a farmer must use more than one of them to secure sufficient water for his local needs. These wells are dug to deposits of water-bearing sand and gravel that occur as pockets either wholly concealed by yellow clay or outcropping at the surface. The supply of water in many of these wells decreases in winters and drought years, and a few wells become intermittent every winter. One of the best wells in the township, 10 feet deep, is located in the NE. $\frac{1}{4}$, section 28. This well yields a supply of soft water that is over-sufficient

for 200 head of stock. A well 22 feet deep in the NW. $\frac{1}{4}$, section 31, was dug through 20 feet of yellow clay and 2 feet of gravel. The water-level remains constant at a point 20 feet below the surface, and the supply is sufficient for 150 head of stock. The water is hard and suitable for drinking. Water is hauled from this well to the hamlet of Mozart for domestic purposes. Water is not obtained from the thin veneer of glacial lake clays, but water-bearing sands and gravels are not difficult to locate in the underlying boulder clay at depths of 40 feet or less.

At least nine wells in the township, 35 to 220 feet deep, obtain abundant supplies of water under pressure from pockets of sand and gravel within the blue clay. Two wells, 150 and 160 feet deep, in the SE. $\frac{1}{4}$ and NW. $\frac{1}{4}$, section 7, have apparently tapped the same water-bearing horizon of sand at an elevation of 1,735 feet. The water rises to points 19 and 14 feet below the surface, respectively, but the water from the 160-foot well is soft, whereas that from the 150-foot well is hard, "alkaline", contains iron, and acts as a laxative on humans. This wide divergence in the quality of water from the same horizon is common in the glacial drift. Both wells yield abundant supplies of water, and the 160-foot well cannot be pumped dry. Another 110-foot well in the NW. $\frac{1}{4}$, section 6, yields water that is too highly mineralized for stock use. The 220-foot well drilled in the NE. $\frac{1}{4}$, section 9, also yields very highly mineralized water that is unfit for stock. The village of Elfros owns a bored well, 55 feet deep, that yields water under pressure that is too highly mineralized for drinking. Drinking water for the village is hauled from a well in the SW. $\frac{1}{2}$, sec. 19, tp. 32, range 13.

The two deepest wells in the municipality were drilled in the NW. $\frac{1}{4}$, section 3, and the SE. $\frac{1}{4}$, section 23. The well in the SE. $\frac{1}{4}$, section 23, is 300 feet deep and the base is at an

elevation of 1,485 feet above sea-level. The depth of the well drilled by the Canadian Pacific Railway Company in the NW. $\frac{1}{4}$, section 3, is not definitely known, but it is believed to be 450 feet and, if so, the base is at an elevation of 1,420 feet. Both wells yield very highly mineralized water that cannot be used even for stock. The quality of the water and the depth of the wells lead to the assumption that they have tapped aquifers within the Marine Shale series. No information is available as to the quantity of water obtained from either well. It is known that the Marine Shale in this part of Saskatchewan generally yields unusable water, and farmers are strongly advised to refrain from drilling into it.

Several dry holes have been dug, particularly in the NE. $\frac{1}{4}$, section 15, NE. $\frac{1}{4}$, section 23, SE. $\frac{1}{4}$, section 24, and NE. $\frac{1}{4}$, section 30. The deepest dry hole is 140 feet deep, and is bored in the NE. $\frac{1}{4}$, section 30. The farmer in the NE. $\frac{1}{4}$, section 15, has excavated a dugout in a ravine and collects and retains surface water. This means of obtaining a permanent supply of water is recommended. Dugouts will prove satisfactory if the sites are carefully chosen and the dugout is made at least 12 feet deep.

Township 32, Range 15

The southeastern part of the township is covered by moraine, but the remainder of the area is mantled by glacial till. The southern part of the township is quite densely wooded with poplar, and the land is undulating. The ground surface becomes less undulating towards the north of the township, and tree growth is scattered. Two undrained depressions that cover an area of about 75 to 100 acres occur in sections 4 and 8. Jolly creek flows north through the centre of the township from its source in the SE. $\frac{1}{4}$, section 4, and Rushville brook parallels the course of Jolly

creek on the west, flowing north from its source in the SW. $\frac{1}{4}$, section 5. Both creeks are very small, intermittent streams and flow through shallow ravines. The elevation decreases gradually from approximately 1,975 feet above sea-level at the southern boundary to approximately 1,775 feet at the northern boundary.

Several small springs occur near Jolly creek in the NW. $\frac{1}{4}$, section 10, and springs were reported along the course of Rushville brook in the SW. $\frac{1}{4}$, section 17, and the NE. $\frac{1}{4}$, section 31. The water from the springs in these quarter sections is used for watering stock.

Most of the producing wells have been dug to pockets of water-bearing sand and gravel in the yellow boulder clay. These wells are usually from 4 to 30 feet deep, and the supply is small and readily affected by seasonal variations in rainfall. Occasionally a shallow well taps an aquifer of large areal extent and the supply of water obtained is fairly abundant. Two such wells are located in the SW. $\frac{1}{4}$, section 14, and the NE. $\frac{1}{4}$, section 19. The well in the SW. $\frac{1}{4}$, section 14, was dug through 5 feet of clay and 5 feet of gravel and quicksand. The supply is more than sufficient for 80 head of stock, although the water-level stands at a point only 3 feet above the base of the well. The 18-foot well in the NE. $\frac{1}{4}$, section 19, has never been pumped dry, and farmers haul water from this well in winter and drought years. The average shallow well will water from 20 to 30 head of stock. The water is generally not highly mineralized and that from several wells is soft. Little difficulty is experienced in striking water-bearing sand and gravel in the upper 30 feet of the glacial drift, except in the southwestern part of the township.

At least nine wells in the township have struck lenses of water-bearing sand and gravel within the blue clay of the glacial drift. These wells are from 25 to 175 feet deep and the

water rises from the aquifers under pressure. In two wells, 110 and 65 feet deep, in the NE. $\frac{1}{4}$, section 1, and the NE. $\frac{1}{4}$, section 26, the water formerly flowed above the ground surface. During the past few years the pressure in these two wells has decreased and in 1935 the water-level in the 65-foot well was 5 feet below the surface. The water from the deep wells in the township is usually hard, contains iron, and is "alkaline", but the 175-foot well drilled in the hamlet of Mozart yields soft water. This well was drilled through 17 feet of yellow clay, 143 feet of blue clay, and 15 feet of sand. The water rises to a point 4 feet below the surface, but the supply has decreased due to sand plugging the casing. The shallow wells in the hamlet yield highly mineralized water, so that most of the water for the settlement is hauled from a well in the NW. $\frac{1}{4}$, sec. 31, tp. 32, range 14.

Several dry holes have been dug and bored in the township to a maximum depth of 100 feet, but only eleven farmers, most of them located in the southwestern part of the township, have an inadequate supply of water. Those farmers are advised to excavate dugouts, at least 12 feet deep, for conserving surface water to supplement the supply from shallow wells.

STATISTICAL SUMMARY OF WELL INFORMATION IN PART OF
THE RURAL MUNICIPALITY OF ELFROS, NO.307, SASKATCHEWAN

Township	31	31	31	32	32	32	Total No. in muni- cipality
	13	14	15	13	14	15	
West of 2nd meridian	Range						
<u>Total No. of Wells in Township</u>	73	57	91	118	100	96	535
No. of wells in bedrock	0	0	0	0	2	0	2
No. of wells in glacial drift	73	57	91	118	98	96	533
No. of wells in alluvium	0	0	0	0	0	0	0
<u>Permanency of Water Supply</u>							
No. with permanent supply	54	40	57	65	72	79	367
No. with intermittent supply	6	5	4	7	4	3	29
No. dry holes	13	12	30	46	24	14	139
<u>Types of Wells</u>							
No. of flowing artesian wells	5	0	0	2	0	2	9
No. of non-flowing artesian wells	10	19	12	14	9	7	71
No. of non-artesian wells	45	26	49	56	67	73	316
<u>Quality of Water</u>							
No. with hard water	55	41	51	57	66	71	341
No. with soft water	5	4	10	15	10	11	55
No. with salty water	0	0	0	0	0	0	0
No. with "alkaline" water	3	17	10	14	19	14	77
<u>Depths of Wells</u>							
No. from 0 to 50 feet deep	58	32	81	94	73	79	417
No. from 51 to 100 feet deep	1	18	10	17	20	15	91
No. from 101 to 150 feet deep	4	6	0	2	3	1	16
No. from 151 to 200 feet deep	0	1	0	1	1	1	4
No. from 201 to 500 feet deep	0	0	0	4	3	0	7
No. from 501 to 1,000 feet deep	0	0	0	0	0	0	0
No. over 1,000 feet deep	0	0	0	0	0	0	0
<u>How the Water is Used</u>							
No. usable for domestic purposes	51	35	52	59	55	69	321
No. not usable for domestic purposes	9	10	9	13	21	13	75
No. usable for stock	57	42	61	71	69	75	375
No. not usable for stock	3	3	0	1	7	7	21
<u>Sufficiency of Water Supply</u>							
No. sufficient for domestic needs	54	39	57	64	72	79	365
No. insufficient for domestic needs	6	6	4	8	4	3	31
No. sufficient for stock needs	44	33	43	53	63	68	304
No. insufficient for stock needs	16	12	18	19	13	14	92

ANALYSES AND QUALITY OF WATER

General Statement

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

Total Dissolved Mineral Solids

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

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

Mineral Substances Present

Calcium and Magnesium

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

Sodium

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

Sulphates

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

Chlorides

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

Iron

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

Hardness

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

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

Analyses of Water Samples from the Municipality of Elfros, No. 307, Saskatchewan

No.	LOCATION			Depth of Well, Ft.	Total solids dis'vd	HARDNESS			CONSTITUENTS AS ANALYSED										CONSTITUENTS AS CALCULATED IN ASSUMED COMBINATIONS					Source of Water
	Qtr.	Sec.	Tr. Rge.			Mer.	Total	Perm.	Temp.	Cl	Alka- linity	CaO	MgO	SO ₄	Na ₂ O	Solids	CaCO ₃	CaSO ₄	MgCO ₃	MgSO ₄	Na ₂ CO ₃	Na ₂ SO ₄	NaCl	
1	SE.	30	31	13	2nd	1,491		B. Coli Present								(2)			(4)	(5)	(1)	(3)		≠1
2	SW.	29	31	14	2nd	1,209										(2)		(3)	(4)	(1)	(5)		≠1	
3	SE.	22	31	15	2nd	1,769		B. Coli Present							(4)	(1)		(2)		(3)		(5)	≠1	
4	SW.	19	32	13	2nd	240		B. Coli Present							(3)	(1)		(2)		(4)		(5)	≠1	
5	NW.	10	32	14	2nd	1,369									(4)	(1)		(2)		(3)		(5)	≠1	
6	SW.	13	32	14	2nd	3,497		Nitrites Present								(2)		(3)		(4)	(1)	(5)	≠1	
7	NW.	14	32	14	2nd	340		B. Coli Present							(1)	(2)	(3)					(4)	≠1	
8	NE.	25	32	15	2nd	2,883		Nitrites and B. Coli Present								(2)		(3)		(4)	(1)	(5)	≠1	
9	NE.	25	32	15	2nd	1,849		B. Coli Present								(2)		(3)		(4)	(1)	(5)	≠1	

Water samples indicated thus, ≠1, are from glacial drift or other unconsolidated deposits. Numbers (1), (2), (3), (4), and (5) are used to represent the relative amounts in which the five main constituents are present in the water.

Hardness is the soap hardness expressed as calcium carbonate (CaCO₃). Analyses 1 to 9 inclusive by Provincial Analyst, Regina.

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

Water from the Unconsolidated Deposits

The results of analyses of nine samples of water taken from wells tapping aquifers in the glacial drift in the municipality are listed in the accompanying table. Seven of the nine samples are from wells 6 to 22 feet deep. The total dissolved solid content in the water from these seven shallow wells varies from 240 parts per million in sample 4, to 1,849 parts per million in sample 9. This wide divergence in the quality of water from the glacial drift is very common. Samples 4 and 7, with 240 and 340 parts per million of total dissolved solids, are moderately soft. Sample 4 was taken from the well used by the village of Elfros. Sample 1 was taken from a well in the village of Leslie, and sample 9 from a well in the hamlet of Mozart. The water from any one of these seven shallow wells is not highly mineralized for water in southern Saskatchewan. The main salts in solution are the sulphates of calcium, magnesium, and sodium, and these waters can be termed "sulphate" waters. The water analysed from the shallow wells is usable for drinking. With the exception of samples 2 and 5, however, the waters analysed have a bacillus coli content and are probably being contaminated by polluted surface waters. Such waters may cause typhoid fever or dysentery.

Sample 6 was taken from a 55-foot bored well in Elfros, and sample 8 from a 175-foot drilled well in Mozart. The total dissolved mineral solids of 3,497 parts per million and 2,883 parts per million render the water unsuitable for drinking, but it can be used for stock. Both samples contain sodium carbonate (black alkali). This salt is particularly injurious to vegetation and the water is not suitable for irrigation.

The difference in quality between water from shallow wells and deep wells in the municipality is clearly illustrated by the analyses data. Water from shallow wells, unless contaminated by surface waters, is suitable for stock and is usually usable for drinking. The water from the deep wells is often too highly mineralized to be used for domestic purposes, and that from a few wells is even unsuitable for stock.

Water from the Bedrock

Two wells are assumed to be deriving their water from the Marine Shale series. The water is very highly mineralized and cannot be used for drinking or for stock. No analyses are available, but it is probable that the salts of sodium make up the greater part of the total dissolved solid content. It is doubtful if usable water will be obtained from the Marine Shale series in this municipality.

WELL RECORDS—Rural Municipality of ELFRAS NO. 244, SASKATCHEWAN

WELL No.	LOCATION					TYPE OF WELL	DEPTH OF WELL	ALTITUDE WELL (above sea level)	HEIGHT TO WHICH WATER WILL RISE		PRINCIPAL WATER-BEARING BED			CHARACTER OF WATER	TEMP. OF WATER (in °F.)	USE TO WHICH WATER IS PUT	YIELD AND REMARKS
	¼	Sec.	Tp.	Rge.	Mer.				Above (+) Below (-) Surface	Elev.	Depth	Elev.	Geological Horizon				
1	SE.	13	31	13	2	Dug	13	1,910								Dry hole in glacial drift; hauls water.	
2	NW.	13	"	"	"	Dug	16	1,910	- 12	1,898	12	1,898	Glacial sand	Hard	D, S	Sufficient supply.	
3	NE.	13	"	"	"	Dug	8	1,900	- 4	1,896	4	1,896	Glacial coarse sand	Hard, iron	D, S	Sufficient supply; usually hauls drinking water from Leslie.	
4	SW.	14	"	"	"	Dug	22	1,925	- 3	1,922	7	1,918	Glacial sand	Hard	D, S	Intermittent supply; hauls water when well is dry.	
5	SW.	19	"	"	"	Bored	50	1,930	- 30	1,900	50	1,880	Glacial sand	Hard	D, S	Plenty of water for 24 head stock; several dug dry holes.	
6	SE.	19	"	"	"	Dug	30	1,925	- 20	1,905			Glacial drift	Hard		Intermittent supply.	
7	SW.	20	"	"	"	Dug	22	1,925	- 14	1,911			Glacial sand	Hard	D, S	Constant supply of water.	
8	SE.	20	"	"	"	Dug	20	1,920	- 16	1,904	16	1,904	Glacial sand	Soft	S	Sufficient supply; a 13-foot well provides drinking water; also uses a spring-fed slough.	
9	NE.	20	"	"	"	Dug	40	1,915	- 20	1,895	26	1,889	Glacial fine sand	Hard, iron	D, S	Sufficient for 30 head stock; several dry holes in glacial drift.	
10	SW.	21	"	"	"	Bored	64	1,915	- 12	1,903	64	1,851	Glacial sand	Soft	S	Abundant supply.	
11	SE.	21	"	"	"	Dug	12	1,915	- 9	1,906	9	1,906	Glacial sand	Soft	D, S	Sufficient supply; the water is suitable for washing.	
12	NE.	21	"	"	"	Bored	60	1,910	- 40	1,870	60	1,850	Glacial sand	Hard, iron	D, S	Sufficient supply.	
13	NW.	22	"	"	"	Bored	65	1,900	- 35	1,865	65	1,835	Glacial sand	Hard, iron	D, S	Abundant supply.	
14	SW.	23	"	"	"	Dug	30	1,905	- 23	1,882			Glacial sand	Hard	D, S	Good supply for 15 head stock; but well requires cleaning frequently.	
15	SE.	23	"	"	"	Dug	6	1,900	+ 2	1,902			Glacial sand	Hard	D, S	An intermittent artesian flow of water; abundant supply.	
16	NE.	23	"	"	"	Dug	16	1,895	- 5	1,890			Glacial sand	Hard	D, S	Also uses a large slough that has never been dry; it is apparently fed by springs.	
17	SE.	24	"	"	"	Bored	143	1,890								The deepest of several dry holes in glacial drift.	
18	SW.	24	"	"	"	Dug	14	1,900	- 4	1,896			Glacial sand	Soft	D, S	One of several shallow wells; sufficient for 20 head stock.	
19	NW.	24	"	"	"	Dug	8	1,890	- 4	1,886	4	1,886	Glacial sand	Hard, iron, "alkaline"	D, S	Insufficient for 8 head stock in winter.	
20	NE.	25	"	"	"	Dug	12	1,875	- 8	1,867			Glacial gravel	Hard	D, S	Sufficient supply.	
21	NE.	26	"	"	"	Dug	11	1,850	+ 1	1,851			Glacial sand	Hard, iron	D, S	Abundant supply; a large bog on this section is fed by springs.	
22	SE.	26	"	"	"	Dug	14	1,875	- 8	1,867	8	1,867	Glacial sand	Hard	D, S	Sufficient supply.	
23	SE.	27	"	"	"	Bored	44	1,880	- 18	1,862	44	1,836	Glacial sand	Hard	D, S	Abundant supply.	
24	SW.	28	"	"	"	Bored	53	1,900	- 29	1,871	53	1,847	Glacial fine sand	Hard, iron	D, S	Plenty of water for 50 head stock; a 14-foot well is not in use.	
25	NW.	28	"	"	"	Dug	16	1,900	- 10	1,890			Glacial drift	Hard	S	Intermittent supply.	
26	SW.	30	"	"	"	Bored	70	1,920	- 20	1,900			Glacial drift	Hard, iron, cloudy	D, S	Sufficient supply.	

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 ELFROS NO. 307, SASKATCHEWAN

WELL No.	LOCATION					TYPE OF WELL	DEPTH OF WELL	ALTITUDE WELL (above sea level)	HEIGHT TO WHICH WATER WILL RISE		PRINCIPAL WATER-BEARING BED			CHARACTER OF WATER	TEMP. OF WATER (in °F.)	USE TO WHICH WATER IS PUT	YIELD AND REMARKS
	¼	Sec.	Tp.	Rge.	Mer.				Above (+) Below (-) Surface	Elev.	Depth	Elev.	Geological Horizon				
27	SW.	31	31	13	2	Bored	65	1,900	- 12	1,888			Glacial drift	Hard, iron, "alkaline"	N	Two other wells furnish sufficient water.	
28	NE.	31	"	"	"	Bored	57	1,875	- 40	1,835	57	1,818	Glacial sand	Hard, iron	D, S	Sufficient for 40 head stock; one dry hole 25 feet deep.	
29	SW.	32	"	"	"	Bored	60	1,885	- 40	1,845	60	1,825	Glacial gravel	Hard, iron, "alkaline"	D, S	Sufficient for 30 head stock.	
30	NE.	32	"	"	"	Bored	56	1,860	- 8	1,852	56	1,804	Glacial fine sand	Hard, iron	D, S	Abundant supply.	
31	SE.	32	"	"	"	Dug	14	1,880	- 11	1,869	11	1,869	Glacial gravel	Hard	D, S	Sufficient supply except in dry seasons.	
32	SW.	33	"	"	"	Dug	12	1,880	- 9	1,871			Glacial fine sand	Hard	D, S	Intermittent supply.	
33	NW.	33	"	"	"	Dug	20	1,850	- 10	1,840	10	1,840	Glacial sand	Hard	D, S	Insufficient supply in drought years.	
34	SW.	34	"	"	"	Dug	4	1,840	0	1,840	0	1,840	Glacial fine sand	Hard	D, S	Also uses a 7-foot well; plenty of water along the ravine.	
35	NE.	34	"	"	"	Bored	36	1,835	- 27	1,808	27	1,808	Glacial sand	Hard, iron	D, S	Sufficient supply; although well pumps dry.	
36	NW.	34	"	"	"	Dug	20	1,840	- 10	1,830	10	1,830	Glacial sand	Hard	S	Abundant supply.	
37	SE.	34	"	"	"	Dug	30	1,860	- 23	1,837	23	1,837	Glacial gravel	Hard	D, S	Sufficient for 10 head stock only.	
38	NE.	35	"	"	"	Dug	8	1,820	0	1,820	5	1,815	Glacial gravel	Hard	D, S	Well is dry in winters.	
39	SW.	35	"	"	"	Bored	60	1,855	- 30	1,825	60	1,795	Glacial sand	Hard, iron	D, S	Insufficient for 60 head stock; also uses two other wells.	
40	NE.	36	"	"	"	Dug	20	1,825	- 15	1,810	15	1,810	Glacial gravel	Hard, "	D, S	Sufficient for 25 head stock.	
41	SE.	36	"	"	"	Drilled	107	1,845	+ 7	1,852	107	1,738	Glacial sand	Hard, iron, very "alkaline"	S	One of three artesian wells in village of Leslie; several 8 to 12-foot wells yield small supplies of water.	
42	SW.	36	"	"	"	Dug	10	1,848	- 7	1,841	7	1,841	Glacial sand	Hard	D	A spring in a ravine is used for stock.	
1	SE.	14	31	14	2	Dug	7	1,945	- 5	1,940	5	1,940	Glacial sand	Hard	D, S	Abundant supply.	
2	NE.	14	"	"	"	Bored	80	1,940								Dry hole in glacial drift; hauls water.	
3	SW.	15	"	"	"	Bored	58	1,950	- 20	1,930	58	1,892	Glacial sand	Hard	D, S	Sufficient supply.	
4	NE.	16	"	"	"	Bored	140	1,945	- 20	1,925	140	1,805	Glacial sand	Hard, iron, "alkaline"	D, S	Abundant supply; also owns a similar well a few feet more in depth.	
5	SW.	16	"	"	"	Bored	115	1,960	- 50	1,910	115	1,845	Glacial sand	Hard, iron, "alkaline"	D, S	Abundant supply, but water is a laxative on humans.	
6	SE.	17	"	"	"	Dug	125	1,960	- 20	1,940	125	1,835	Glacial sand	Hard, iron, "alkaline"	D, S	Abundant supply.	
7	NE.	18	"	"	"	Bored	84	1,975	- 16	1,959	84	1,891	Glacial sand	Hard, iron, "alkaline"	D, S	Abundant supply.	
8	NW.	19	"	"	"	Bored	90	1,970	- 20	1,950	90	1,880	Glacial fine sand	Hard, iron, "alkaline"	S	Abundant supply; a shallow well is used for drinking water.	
9	NE.	20	"	"	"	Bored	60	1,945	- 25	1,920	60	1,885	Glacial sand	Hard, iron	D, S	Sufficient supply.	
10	SE.	20	"	"	"	Bored	115	1,950	- 70	1,880	115	1,835	Glacial sand	Hard, iron	D, S	Oversufficient supply.	

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

ELFROS

NO. 307, SASKATCHEWAN

B 4-4
1860-10,000

WELL No.	LOCATION					TYPE OF WELL	DEPTH OF WELL	ALTITUDE WELL (above sea level)	HEIGHT TO WHICH WATER WILL RISE		PRINCIPAL WATER-BEARING BED			CHARACTER OF WATER	TEMP. OF WATER (in°F.)	USE TO WHICH WATER IS PUT	YIELD AND REMARKS
	¼	Sec.	Tp.	Rge.	Mer.				Above (+) Below (-) Surface	Elev.	Depth	Elev.	Geological Horizon				
11	SW.	21	31	14	2	Bored	115	1,945	- 15	1,930	115	1,830	Glacial sand	Hard, iron	D, S	Abundant supply.	
12	SE.	22	"	"	"	Bored	58	1,925	- 48	1,877			Glacial gravel		N	Poor supply; a shallow well in a ravine yields sufficient water.	
13	NW.	22	"	"	"	Dug	12	1,915	- 5	1,910	5	1,910	Glacial gravel	Soft	D, S	Also uses a 7-foot well; sufficient supply.	
14	SW.	24	"	"	"	Dug	84	1,920								The deepest of 5 dry holes in glacial drift; uses a dam in summer and hauls water in winter.	
15	NW.	24	"	"	"	Bored	90	1,910					Glacial sand	Hard, iron, "alkaline"	D, S	Poor supply; well was nearly dry in 1930; uses a dam on Birch creek.	
16	SE.	25	"	"	"	Bored	70	1,915	- 25	1,890	70	1,845	Glacial gravel	Hard	D, S	Oversufficient supply.	
17	NW.	25	"	"	"	Bored	100	1,900	- 15	1,885	100	1,800	Glacial sand	Hard, iron, "alkaline"	S	Good supply; but water is highly mineralized; hauls drinking water.	
18	NW.	26	"	"	"	Bored	40	1,900	- 10	1,890	40	1,860	Glacial sand	Hard, iron, "alkaline"	D, S	Abundant supply; a 90-foot well has caved in.	
19	NE.	27	"	"	"	Bored	60	1,890								One of several dry holes in glacial drift.	
20	SW.	27	"	"	"	Dug	9	1,905	- 5	1,900	5	1,900	Glacial gravel	Soft	D, S	Sufficient supply.	
21	NE.	28	"	"	"	Dug	6	1,910	- 2	1,908	2	1,908	Glacial gravel	Soft	D, S	Sufficient supply.	
22	NW.	28	"	"	"	Bored	35	1,915	- 25	1,890			Glacial drift	Hard, iron, "alkaline"	D, S	Poor supply; stock usually water at sloughs.	
23	SW.	29	"	"	"	Dug	12	1,940					Glacial sand	Hard, iron, "alkaline"	D, S	Sufficient for 25 head stock. #	
24	NW.	30	"	"	"	Bored	60	1,960	- 40	1,920	60	1,900	Glacial sand	Hard, iron, "alkaline"	D, S	Sufficient for 25 head stock; several shallow dry holes.	
25	NE.	30	"	"	"	Dug	9	1,950	0	1,950			Glacial gravelly clay	Hard	S	Intermittent supply; hauls drinking water and melts snow in winter for stock.	
26	SW.	30	"	"	"	Dug	21	1,965	- 13	1,952			Glacial drift	Hard, bitter	S	Intermittent supply; melts snow for stock in winter.	
27	SE.	31	"	"	"	Dug	20	1,940	- 10	1,930	10	1,930	Glacial sand	Hard, "alkaline"	D, S	Plenty of water for 20 head stock.	
28	NE.	31	"	"	"	Bored	40	1,940	- 12	1,928	40	1,900	Glacial sand	Hard, "alkaline"	D, S	Plenty of water.	
29	NW.	31	"	"	"	Dug	10	1,945	- 7	1,938			Glacial gravel	Hard	N	Poor supply; uses a well on the road allowance that yields a good supply of water.	
30	SE.	32	"	"	"	Dug	16	1,900	- 14	1,886	14	1,886	Glacial sand	Hard	D, S	Also uses an 8-foot well in a ravine; plenty of water.	
31	NE.	32	"	"	"	Bored	154	1,905	- 48	1,857	154	1,751	Glacial sand	Hard, iron, "alkaline"	S	A 30-foot well in pasture also yields plenty of water.	
32	SE.	33	"	"	"	Bored	45	1,895	- 37	1,858	37	1,858	Glacial sand	Hard	D, S	Sufficient for 35 head stock.	
33	SE.	34	"	"	"	Dug	12	1,875	- 10	1,865			Glacial drift	Hard	D	A 42-foot well yields sufficient water for stock.	
34	NE.	34	"	"	"	Bored	60	1,860	- 35	1,825			Glacial drift	Hard, iron	S	Intermittent supply; uses a shallow well in a slough during the winter.	
35	SE.	35	"	"	"	Bored	63	1,890	- 30	1,860	63	1,827	Glacial sand	Hard	D, S	Abundant supply; a 53-foot well yields highly mineralized water.	
36	NE.	36	"	"	"	Bored	85	1,890	- 75	1,815			Glacial sand	Hard, iron, "alkaline"	D, S	Intermittent supply; hauled water in 1934.	
37	NW.	36	"	"	"	Dug	12	1,885	- 8	1,877			Glacial gravel	Hard	D	Sufficient for house use.	

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

ELFRCS

NO. 307, SASKATCHEWAN

B 4-4
1880—10,000

WELL No.	LOCATION					TYPE OF WELL	DEPTH OF WELL	ALTITUDE WELL (above sea level)	HEIGHT TO WHICH WATER WILL RISE		PRINCIPAL WATER-BEARING BED			CHARACTER OF WATER	TEMP. OF WATER (in °F.)	USE TO WHICH WATER IS PUT	YIELD AND REMARKS
	¼	Sec.	Tp.	Rge.	Mer.				Above (+) Below (-) Surface	Elev.	Depth	Elev.	Geological Horizon				
38	NW.	36	31	14	2	Bored	43	1,885	- 12	1,873	43	1,842	Glacial sand	Hard, iron, "alkaline"	S	Abundant supply.	
1	NE.	13	31	15	2	Dug	20	1,995	- 14	1,931			Glacial gravel	Hard	D, S	Sufficient for 4 head stock.	
2	NW.	13	"	"	"	Bored	52	2,010	- 40	1,970	52	1,958	Glacial sand	Hard, iron, "alkaline"	D, S	Abundant supply.	
3	NE.	14	"	"	"	Bored	60	2,015	- 25	1,990	60	1,955	Glacial sand	Hard	D, S	Plenty of water.	
4	SW.	14	"	"	"	Bored	50	2,040	- 20	2,020	50	1,990	Glacial gravel	Hard	D, S	Sufficient supply.	
5	NE.	15	"	"	"	Bored	100	2,030	- 85	1,945	100	1,930	Glacial sand	Hard, iron, "alkaline"	D, S	Oversufficient supply.	
6	SW.	15	"	"	"	Bored	80	2,045								Dry hole in glacial drift; uses a slough seepage well and hauls water.	
7	NE.	16	"	"	"	Bored	55	2,040	- 30	2,010	55	1,985	Glacial sand	Hard, iron	D, S	Sufficient supply.	
8	NW.	16	"	"	"	Dug	12	2,050	- 8	2,042	8	2,042	Glacial sand	Soft	D, S	Sufficient supply.	
9	SE.	17	"	"	"	Dug	12	2,060	- 8	2,052			Glacial drift	Hard	S	Intermittent supply.	
10	NE.	17	"	"	"	Bored	35	2,055	- 25	2,030	27	2,028	Glacial sand	Hard, "alkaline"	D, S	Sufficient for 20 head stock; several dry holes.	
11	NW.	17	"	"	"	Bored	27	2,055	- 8	2,047	10	2,045	Glacial fine sand	Hard, "alkaline"	S	Abundant supply.	
12	SW.	17	"	"	"	Bored	50	2,075	- 20	2,055	50	2,025	Glacial sand	Hard, iron	D, S	Sufficient supply.	
13	NE.	18	"	"	"	Dug	22	2,060	- 18	2,042			Glacial sand	Hard	D, S	Poor supply; uses the well on the NW. ¼, section 17.	
14	SW.	18	"	"	"	Dug	18	2,035	- 6	2,079	6	2,079	Glacial sand	Hard	D, S	Plenty of water.	
15	NE.	19	"	"	"	Bored	27	2,050	- 17	2,033	20	2,030	Glacial gravel	Hard	D, S	Sufficient for 45 head stock; supply decreased slightly during the drought.	
16	SW.	20	"	"	"	Bored	27	2,050	- 8	2,042			Glacial sand	Hard, iron, "alkaline"	D, S	Oversufficient for 20 head stock.	
17	SE.	22	"	"	"	Dug	12	2,020	- 10	2,010	10	2,010	Glacial sand	Hard	D, S	Sufficient supply. #	
18	SE.	23	"	"	"	Dug	12	2,005	- 7	1,998	7	1,998	Glacial gravel	Soft	S	Sufficient supply; uses neighbours well for drinking water.	
19	NW.	23	"	"	"	Dug	10	2,010	- 6	2,004	6	2,004	Glacial sand	Soft	D, S	Sufficient for 20 head stock.	
20	SW.	23	"	"	"	Dug	10	2,025	- 4	2,021	4	2,021	Glacial sand	Hard	S	Sufficient for 15 head stock; uses a neighbours well for drinking water.	
21	NE.	23	"	"	"	Dug	40	2,000	- 37	1,963			Glacial drift	Hard, "alkaline"	D, S	Intermittent supply; a 46-foot well yields a very small supply; 5 dry holes in glacial drift.	
22	SW.	24	"	"	"	Dug	25	1,995	- 13	1,982	13	1,982	Glacial gravel	Hard	D, S	Sufficient supply.	
23	SE.	24	"	"	"	Bored	50	1,985	- 25	1,960	50	1,935	Glacial sand	Hard	D, S	Sufficient supply.	
24	NE.	25	"	"	"	Bored	50	1,960	- 40	1,920	50	1,910	Glacial sand	Hard, iron, "alkaline"	S	Sufficient for 15 head stock.	
25	SW.	26	"	"	"	Bored	95	1,995	- 80	1,915	95	1,900	Glacial sand	Hard, iron, "alkaline"	D, S	Oversufficient supply.	

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 ELFROS NO. 307, SASKATCHEWAN

WELL No.	LOCATION					TYPE OF WELL	DEPTH OF WELL	ALTITUDE WELL (above sea level)	HEIGHT TO WHICH WATER WILL RISE		PRINCIPAL WATER-BEARING BED			CHARACTER OF WATER	TEMP. OF WATER (in °F.)	USE TO WHICH WATER IS PUT	YIELD AND REMARKS
	¼	Sec.	Tp.	Rge.	Mer.				Above (+) Below (-) Surface	Elev.	Depth	Elev.	Geological Horizon				
26	N.E.	26	31	15	2	Dug	8	1,990	- 6	1,984	6	1,984	Glacial sand	Hard	D, S	Plenty of water.	
27	N.W.	27	"	"	"	Dug	18	2,010	- 16	1,994			Glacial drift	Hard	D, S	Poor supply; hauls water from a neighbours well.	
28	S.E.	27	"	"	"	Dug	12	2,010	- 9	2,001	9	2,001	Glacial sand	Soft	D, S	Sufficient supply.	
29	S.W.	28	"	"	"	Dug	10	2,025	- 7	2,018	7	2,018	Glacial gravel	Hard	D, S	Plenty of water.	
30	S.E.	28	"	"	"	Dug	13	2,020	- 8	2,012	8	2,012	Glacial gravel	Hard	D, S	Sufficient supply.	
31	N.W.	28	"	"	"	Bored	14	2,015	- 4	2,011	4	2,011	Glacial gravel	Soft	D, S	Oversufficient for 50 head stock; two dry holes 60 feet deep.	
32	S.E.	29	"	"	"	Dug	15	2,030	- 10	2,020	10	2,020	Glacial sand	Hard	D, S	Oversufficient supply.	
33	N.E.	29	"	"	"	Dug	14	2,020	- 4	2,016			Glacial gravel	Soft	S	Sufficient supply.	
34	N.W.	30	"	"	"	Bored	50	2,025	- 16	2,009	43	1,982	Glacial sand	Hard, iron, "alkaline"	D, S	Sufficient supply.	
35	S.E.	30	"	"	"	Bored	20	2,035	- 10	2,025			Glacial sand	Hard	D, S	Sufficient supply.	
36	N.E.	30	"	"	"	Dug	30	2,020	- 14	2,006	14	2,006	Glacial sand	Hard	D, S	Sufficient supply in normal years; several shallow dry holes.	
37	S.W.	30	"	"	"	Dug	20	2,040	- 18	2,022			Glacial drift	Hard	S	Intermittent supply; sixteen dug dry holes; hauls water from the N.W.¼, section 31.	
38	N.E.	31	"	"	"	Dug	20	1,985	- 10	1,975	10	1,975	Glacial sand	Hard	D, S	A 24-foot well yields a good supply of water.	
39	N.W.	31	"	"	"	Dug	20	1,990	- 10	1,980	13	1,977	Glacial sand	Hard	D, S	Good supply of water.	
40	S.W.	31	"	"	"	Bored	50	2,005	- 40	1,965			Glacial gravel	Hard, "alkaline"	D, S	Poor supply; a dugout yields too "alkaline" water; hauls water.	
41	S.E.	31	"	"	"	Dug	30	2,000	- 16	1,984	18	1,982	Glacial gravel	Hard	D, S	Oversufficient supply.	
42	N.E.	32	"	"	"	Dug	28	1,990	- 24	1,966	24	1,966	Glacial gravel	Soft	D	Another similar well is used for stock.	
43	N.W.	32	"	"	"	Bored	87	1,965	- 26	1,959	87	1,898	Glacial sand	Hard, iron	S	Oversufficient for 70 head stock; a shallow well provides plenty of drinking water.	
44	N.E.	34	"	"	"	Bored	19	1,975	- 14	1,961	14	1,961	Glacial gravel	Soft	D, S	Sufficient supply; a 17-foot well in barn yields a similar supply.	
45	N.W.	35	"	"	"	Dug	30	1,970	- 5	1,965	5	1,965	Glacial sand	Hard	D, S	Sufficient supply.	
46	S.E.	35	"	"	"	Bored	25	1,975	- 10	1,965			Glacial sand	Hard	D, S	Sufficient supply.	
47	N.W.	36	"	"	"	Dug	11	1,960	- 5	1,955	5	1,955	Glacial gravel	Hard	D, S	Abundant supply; water is tanked from well for steam engines.	
48	S.W.	36	"	"	"	Bored	20	1,960	- 10	1,950			Glacial sand	Hard	D	Uses six other shallow wells for stock.	
49	S.E.	36	"	"	"	Bored	60	1,960	- 7	1,953	60	1,900	Glacial sand	Hard	D, S	Well has partly caved in; insufficient supply a 20-foot well is used for the house.	
1	S.W.	1	32	13	2	Bored	55	1,810	- 15	1,795	55	1,755	Glacial sand	Hard, iron, "alkaline"	D, S	Sufficient supply; a 12-foot well in gravel yields soft water.	
2	S.E.	2	"	"	"	Dug	8	1,815	0	1,815	5	1,810	Glacial gravel	Soft	D, S	Sufficient supply.	
3	N.W.	3	"	"	"	Bored	47	1,805	- 17	1,788	47	1,758	Glacial gravel	Hard	D, S	Abundant supply; a 14-foot well also provides drinking 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

ELFROS

NO. 307, SASKATCHEWAN

B 4-4
1860—10,000

WELL No.	LOCATION					TYPE OF WELL	DEPTH OF WELL	ALTITUDE WELL (above sea level)	HEIGHT TO WHICH WATER WILL RISE		PRINCIPAL WATER-BEARING BED			CHARACTER OF WATER	TEMP. OF WATER (in°F.)	USE TO WHICH WATER IS PUT	YIELD AND REMARKS
	¼	Sec.	Tp.	Rge.	Mer.				Above (+) Below (-) Surface	Elev.	Depth	Elev.	Geological Horizon				
4	SE.	3	32	13	2	Dug	18	1,825	- 13	1,812			Glacial sand	Soft	D, S	Sufficient for 10 head stock.	
5	SW.	4	"	"	"	Dug	33	1,840	- 18	1,823	33	1,807	Glacial sand	Hard	D, S	Oversufficient for 75 head stock.	
6	NW.	4	"	"	"	Dug	15	1,820	- 11	1,809	13	1,807	Glacial sand	Hard	D, S	Insufficient supply.	
7	SE.	4	"	"	"	Dug	15	1,840	- 12	1,828	12	1,828	Glacial gravel	Hard	D, S	A 22-foot well yields soft water. Water conditions good.	
8	SE.	5	"	"	"	Bored	60	1,850	- 24	1,826	48	1,802	Glacial fine sand	Hard, iron	S	Oversufficient for 65 head stock.	
9	SW.	5	"	"	"	Bored	34	1,850	- 20	1,830			Glacial drift	Hard	S	Sufficient supply.	
10	SE.	6	"	"	"	Bored	85	1,360	- 23	1,837	85	1,775	Glacial fine sand	Hard, iron	D, S	Plenty of water.	
11	SW.	6	"	"	"	Bored	60	1,660	- 30	1,830	60	1,800	Glacial fine sand	Hard, iron, "alkaline"	D, S	Oversufficient supply.	
12	SE.	9	"	"	"	Bored	27	1,805	- 15	1,790	24	1,781	Glacial sand	Hard	D, S	Sufficient supply.	
13	SW.	9	"	"	"	Dug	10	1,800	- 6	1,794	6	1,794	Glacial sand	Hard	D, S	Sufficient supply.	
14	SW.	10	"	"	"	Bored	34	1,805	- 24	1,781			Glacial sand	Hard	D, S	Intermittent supply in winter; three wells yield sufficient water for 30 head stock.	
15	SW.	11	"	"	"	Dug	14	1,790	- 7	1,783	11	1,779	Glacial sand	Hard	S	Sufficient for stock.	
16	NW.	11	"	"	"	Dug	10	1,790	- 8	1,782	8	1,782	Glacial sand	Hard, "alkaline"	D, S	Insufficient supply; several dry holes as deep as 100 feet; sometimes hauls water.	
17	NE.	12	"	"	"	Dug	14	1,785	- 9	1,776	9	1,776	Glacial gravel	Soft	D, S	Oversufficient supply; several springs on this quarter-section.	
18	SE.	12	"	"	"	Dug	14	1,785	- 10	1,775	10	1,775	Glacial sand	Hard	D	A 12-foot well is used for stock.	
19	SE.	13	"	"	"	Bored	65	1,780	- 30	1,750	65	1,715	Glacial sand	Hard	D, S	Plenty of water for 25 head stock.	
20	SW.	13	"	"	"	Bored	55	1,770	- 20	1,750	55	1,715	Glacial sand	Hard	D, S	Oversufficient supply.	
21	NE.	14	"	"	"	Dug	13	1,770	- 9	1,761	9	1,761	Glacial fine sand	Hard, "alkaline"	D, S	Abundant supply.	
22	SE.	14	"	"	"	Dug	8	1,775	0	1,775			Glacial drift	Hard	S	Intermittent supply.	
23	SW.	14	"	"	"	Bored	65	1,780	- 30	1,750	65	1,715	Glacial sand	Hard, iron, "alkaline"	S	Sufficient for stock; but drinking water must be hauled.	
24	SW.	15	"	"	"	Dug	12	1,785	- 10	1,775	10	1,775	Glacial sand	Hard	D, S	Poor supply; hauls water; several dry test-holes.	
25	SE.	16	"	"	"	Dug	11	1,785	- 9	1,776	9	1,776	Glacial gravel	Hard	D, S	Oversufficient for 20 head stock.	
26	SW.	17	"	"	"	Dug	22	1,805	- 19	1,786	19	1,786	Glacial sand	Soft	D, S	Oversufficient supply.	
27	NW.	18	"	"	"	Dug	7	1,795	- 4	1,791	4	1,791	Glacial gravel	Hard	D, S	Insufficient in winter after well frozen; twenty-four dry shallow holes; 40-foot well yields bitter water.	
28	SE.	18	"	"	"	Dug	12	1,805	- 8	1,797	8	1,797	Glacial gravel	Hard	D, S	Well is dry after fifty-seven pails, but re-fills rapidly; springs in the pasture yield soft water.	
29	NE.	18	"	"	"	Spring		1,800	0	1,800	0	1,800	Glacial gravel	Soft		Water is hauled from this spring for boilers and washing purposes.	

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 ELFROS NO. 307, SASKATCHEWAN

WELL No.	LOCATION					TYPE OF WELL	DEPTH OF WELL	ALTITUDE WELL (above sea level)	HEIGHT TO WHICH WATER WILL RISE		PRINCIPAL WATER-BEARING BED			CHARACTER OF WATER	TEMP. OF WATER (in °F.)	USE TO WHICH WATER IS PUT	YIELD AND REMARKS
	¼	Sec.	Tp.	Rge.	Mer.				Above (+) Below (-) Surface	Elev.	Depth	Elev.	Geological Horizon				
30	SW	18	32	13	2	Dug	9	1,800	- 3	1,797		Glacial sand	Hard		D, S	Sufficient for 8 head stock; a 16-foot well yields highly mineralized water.	
31	NE	19	"	"	"	Dug	8	1,755	- 5	1,750	5	1,750	Glacial gravel	Hard	S	Well freezes in winter and water must be hauled; a spring is also used for stock.	
32	NW	19	"	"	"	Dug	18	1,750	- 11	1,739	11	1,739	Glacial gravel	Hard	D, S	Supply decreases in winter.	
33	SW	19	"	"	"	Dug	6	1,760	- 2	1,758	2	1,758	Glacial gravel	Soft	D, S	Abundant supply; water is hauled into the village of Elfros from this well. #	
34	NW	20	"	"	"	Dug	16	1,755	- 12	1,743	12	1,743	Glacial sand	Soft	D, S	Oversufficient supply.	
35	NE	21	"	"	"	Dug	12	1,745	- 8	1,737	8	1,737	Glacial sand	Soft	D, S	Abundant supply; several farmers haul water from this well.	
36	NW	22	"	"	"	Bored	35	1,745								One of several dry holes; haul water from the NE. ¼, section 21.	
37	NE	22	"	"	"	Dug	16	1,745	- 11	1,734	11	1,734	Glacial sand	Soft	S	Sufficient supply; the water can be used for washing.	
38	SW	22	"	"	"	Dug	60	1,750	- 55	1,695			Glacial sand	Hard	D, S	Intermittent supply; also uses a spring in the pasture.	
39	SW	23	"	"	"	Bored	56	1,760	- 26	1,734	56	1,704	Glacial sand	Hard, "alkaline"	S	A 10-foot well is used for the house; sufficient supply.	
40	NW	23	"	"	"	Bored	60	1,760	- 20	1,740	60	1,700	Glacial sand	Hard, "alkaline"	D, S	Plenty of water; several farmers hauled water from this well in 1933.	
41	SE	24	"	"	"	Dug	14	1,755	- 8	1,747	8	1,747	Glacial sand	Hard	D, S	Sufficient in summer only; hauls water in winter; one dry hole 180 feet deep.	
42	NE	25	"	"	"	Drilled	280	1,760	- 12	1,748	280	1,480	Glacial sand	Hard, iron, "alkaline"	D, S	Oversufficient supply.	
43	SE	25	"	"	"	Bored	130	1,760	-127	1,633			Glacial sand	Hard	D, S	Intermittent supply; hauls water in winter.	
44	SW	26	"	"	"	Bored	55	1,755	- 25	1,730	55	1,700	Glacial sand	Hard, iron, "alkaline"	D, S	Oversufficient supply.	
45	SW	28	"	"	"	Drilled	204	1,740	+ 6	1,746	204	1,536	Glacial sand	Hard, iron, "alkaline"	S	Well yielded 12 gallons a minute when drilled but only 2 gallons a minute at present; hauls drinking water.	
46	SE	30	"	"	"	Bored	30	1,745	- 28	1,717	28	1,717	Glacial coarse sand	Hard	D, S	Poor supply and hauls water.	
47	NW	30	"	"	"	Dug	20	1,735	- 10	1,725	10	1,725	Glacial gravel	Hard	D, S	Sufficient supply; cattle usually water at a creek.	
48	SW	31	"	"	"	Dug	8	1,740	- 5	1,735	5	1,735	Glacial sand	Hard	D, S	Oversufficient for 25 head stock.	
49	SW	32	"	"	"	Dug	20	1,730	- 17	1,713	17	1,713	Glacial gravel	Hard	D, S	Supply is limited in winter; an 8-foot well in creek bed yields plenty of water.	
50	NW	32	"	"	"	Bored & Drilled	144	1,730	+ 10	1,740	144	1,586	Glacial fine sand	Hard, iron, "alkaline"	S	Supply has decreased from 80 to 60 gallons an hour. A shallow well is used for the house.	
51	SE	33	"	"	"	Dug	24	1,750	- 21	1,729	21	1,729	Glacial gravel	Soft	D, S	Sufficient supply; several dry holes as deep as 30 feet.	
52	NW	33	"	"	"	Bored	24	1,750	- 22	1,728	22	1,728	Glacial gravel	Hard	D, S	Pumps dry, but refills quickly.	
53	NE	34	"	"	"	Dug	18	1,745	- 12	1,733	12	1,733	Glacial sand	Hard	D, S	One of two similar wells; dry holes as deep as 25 feet.	
54	SE	35	"	"	"	Dug	15	1,755	- 14	1,741	14	1,741	Glacial sand	Hard	D, S	Pumps dry, but soon refills.	
55	NE	36	"	"	"	Bored	57	1,760	- 30	1,730	57	1,703	Glacial fine sand	Hard, iron, "alkaline"	S	Insufficient supply; well is probably plugged with sand.	

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

ELFROS

NO. 307, SASKATCHEWAN

B 4-4
R. 7526

WELL No.	LOCATION					TYPE OF WELL	DEPTH OF WELL	ALTITUDE WELL (above sea level)	HEIGHT TO WHICH WATER WILL RISE		PRINCIPAL WATER-BEARING BED			CHARACTER OF WATER	TEMP. OF WATER (in °F.)	USE TO WHICH WATER IS PUT	YIELD AND REMARKS
	¼	Sec.	Tp.	Rge.	Mer.				Above (+) Below (-) Surface	Elev.	Depth	Elev.	Geological Horizon				
56	SW	36	32	13	2	Dug	110	1,755								One of two dry holes in glacial drift; slough is used for stock.	
57	SE	36	"	"	"	Dug	30	1,755	- 22	1,733			Glacial drift	Hard, "alkaline"	D, S	Intermittent supply; hauls water; several dry holes to a maximum depth of 210 feet.	
1	NE	1	32	14	2	Dug	12	1,860	0	1,860			Glacial drift	Hard	S	Intermittent supply; hauls drinking water.	
2	SW	1	"	"	"	Dug	15	1,875	- 8	1,867			Glacial sand	Hard	D, S	A 12-foot well yields a similar supply; sufficient water.	
3	SE	2	"	"	"	Dug	14	1,870	- 6	1,864	6	1,864	Glacial sand	Hard	D, S	Sufficient supply.	
4	NE	2	"	"	"	Bored	40	1,870	- 30	1,840			Glacial sand	Hard, "alkaline"	D, S	A 20-foot well is also used for stock; both wells were deepened during the drought.	
5	NW	3	"	"	"	Dug	20	1,870	- 18	1,852	18	1,852	Glacial sand	Hard, "alkaline"	S	Sufficient for stock use; hauls drinking water.	
6	NW	3	"	"	"	Drilled	450	1,870					Probably bedrock Marine shale	Hard, iron, very "alkaline"	N	A C. P. R. well; water is so highly mineralized it cannot be used.	
7	NE	4	"	"	"	Dug	12	1,870	- 10	1,860	10	1,860	Glacial sand	Hard	D, S	Sufficient for 50 head stock.	
8	SW	4	"	"	"	Dug	11	1,890	- 8	1,882	8	1,882	Glacial sand	Soft	D, S	Oversufficient for 9 head stock.	
9	SE	5	"	"	"	Dug	20	1,905	- 10	1,895			Glacial gravel	Hard	D, S	Sufficient supply.	
10	NE	5	"	"	"	Bored	50	1,895	- 20	1,875			Glacial drift	Hard, iron, black	S	Intermittent supply; hauls water.	
11	NW	5	"	"	"	Dug	18	1,900	- 4	1,896			Glacial sand	Hard, "alkaline"	S	Good supply; a well in a ravine yields soft water and farmers tank water from it.	
12	SW	5	"	"	"	Dug	17	1,910	- 12	1,898	12	1,898	Glacial sand	Hard, "alkaline"	D, S	Oversufficient supply.	
13	SE	6	"	"	"	Bored	35	1,915	- 2	1,913	35	1,880	Glacial sand	Hard, iron, "alkaline"	D, S	Good supply, but water is laxative.	
14	NW	6	"	"	"	Drilled	110	1,890	- 60	1,830	110	1,760	Glacial sand	Hard, iron	N	Well was used for stock in 1930, but not since that date.	
15	SE	7	"	"	"	Drilled	150	1,885	- 19	1,866	150	1,735	Glacial sand	Hard, iron, "alkaline"	D, S	Abundant supply.	
16	NW	7	"	"	"	Drilled	160	1,890	- 14	1,876	160	1,730	Glacial sand	Soft	D, S	Abundant supply; well cannot be pumped dry.	
17	SE	9	"	"	"	Drilled	58	1,860	- 28	1,832	58	1,802	Glacial sand	Hard, iron, "alkaline"	D, S	Sufficient supply.	
18	NE	9	"	"	"	Bored	32	1,855	- 17	1,838			Glacial drift	Hard, "alkaline"	S	Poor supply; another well in a ravine is used and water is hauled; a 220-foot well yields highly mineralized water.	
19	SE	10	"	"	"	Dug	12	1,855	- 10	1,845			Glacial sand		N	Intermittent supply; uses a well dug in a creek bed.	
20	NW	10	"	"	"	Dug	12	1,845	- 6	1,839	6	1,839	Glacial gravel	Hard	D, S	Sufficient supply. #	
21	NW	11	"	"	"	Dug	10	1,840	- 6	1,834	6	1,834	Glacial gravel	Hard, "alkaline"	S	Oversufficient for 40 head stock; hauls drinking water.	
22	SW	11	"	"	"	Dug	6	1,842	- 3	1,839	3	1,839	Glacial gravel	Hard	D, S	Oversufficient supply.	
23	SW	12	"	"	"		40	1,860	- 16	1,844	40	1,820	Glacial coarse sand	Hard, iron	D, S	Sufficient supply.	
24	NW	13	"	"	"	Dug	10	1,815	- 7	1,808	7	1,808	Glacial gravel	Soft	D, S	Sufficient supply.	

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 ELFROS NO. 307, SASKATCHEWAN

WELL No.	LOCATION					TYPE OF WELL	DEPTH OF WELL	ALTITUDE WELL (above sea level)	HEIGHT TO WHICH WATER WILL RISE		PRINCIPAL WATER-BEARING BED			CHARACTER OF WATER	TEMP. OF WATER (in °F.)	USE TO WHICH WATER IS PUT	YIELD AND REMARKS
	¼	Sec.	Tp.	Rge.	Mer.				Above (+) Below (-) Surface	Elev.	Depth	Elev.	Geological Horizon				
25	SW	13	32	14	2	Bored	55	1,810	- 45	1,765	55	1,755	Glacial sand	Hard, "alkaline"	S	Abundant supply of highly mineralized water. The village of Elfros hauls drinking water. #	
26	NW	14	"	"	"	Dug	10	1,790	- 5	1,785	5	1,785	Glacial sand	Soft	D, S	Sufficient for 35 head stock. #	
27	NE	15	"	"	"	Bored	90	1,825								Dry hole in glacial drift; a 75-foot well yields water, stock refuse to drink; has a dugout and hauls drinking water.	
28	NE	16	"	"	"	Dug	19	1,850	- 15	1,835	15	1,835	Glacial coarse gravel	Hard	D, S	Sufficient for 100 head stock.	
29	NW	18	"	"	"	Bored	70	1,860	- 60	1,800			Glacial drift	Hard	D, S	Poor supply; another 60-foot well is not in use; one dry hole 25 feet deep.	
30	SW	18	"	"	"	Dug	15	1,865	- 12	1,853	14	1,851	Glacial gravel	Hard	D, S	Oversufficient for 40 head stock.	
31	SE	21	"	"	"	Dug	12	1,825	- 8	1,817	8	1,817	Glacial sand	Hard, iron, "alkaline" cloudy	D, S	Sufficient supply.	
32	NE	21	"	"	"	Dug	13	1,800	- 9	1,791	9	1,791	Glacial gravel	Hard	D, S	Sufficient supply.	
33	NW	22	"	"	"	Dug	22	1,810	- 20	1,790	20	1,790	Glacial gravel	Hard	D, S	Sufficient for 25 head stock; but supply is decreasing.	
34	SE	23	"	"	"	Drilled	300	1,785					Probably bedrock Marine shale	Hard, iron, very "alkaline"	N	Water is too highly mineralized for stock.	
35	NE	23	"	"	"	Bored	70	1,775								One of many dry holes in glacial drift.	
36	SW	23	"	"	"	Dug	10	1,810	- 5	1,805	5	1,805	Glacial sand	Soft	D, S	A 7-foot well yields similar water; plenty of water.	
37	SE	24	"	"	"	Bored	85	1,765	- 25	1,740	25	1,740	Glacial sand	Hard	D	Poor supply; a spring near Birch creek is used for stock; fifteen dry holes as deep as 100 feet.	
38	SW	24	"	"	"	Dug	10	1,780	- 6	1,774			Glacial gravel	Soft	S	Well becomes intermittent in winter.	
39	NW	24	"	"	"	Dug	18	1,765	- 8	1,757	10	1,755	Glacial sand	Hard, "alkaline"	S	Plenty of water; another shallower well is used for the house.	
40	SE	25	"	"	"	Dug	12	1,730	- 6	1,724	6	1,724	Glacial gravel	Hard	D, S	One of several shallow wells along a ravine; sufficient supply.	
41	SW	26	"	"	"	Dug	16	1,755	- 4	1,751	4	1,751	Glacial gravel	Soft	D, S	Sufficient for 40 head stock.	
42	SE	27	"	"	"	Dug	24	1,760	- 20	1,740	20	1,740	Glacial gravel	Hard	D, S	Sufficient for 25 head stock.	
43	NE	27	"	"	"	Dug	12	1,755	- 8	1,747	8	1,747	Glacial gravel	Hard	D, S	Sufficient supply.	
44	NE	28	"	"	"	Dug	10	1,780	- 7	1,773	7	1,773	Glacial sand	Soft	D, S	Oversufficient for 200 head stock.	
45	SE	28	"	"	"	Dug	9	1,800	0	1,800			Glacial gravel	Hard	S	Sufficient supply.	
46	NW	28	"	"	"	Bored	40	1,780	- 35	1,745			Glacial gravel	Hard	D, S	Sufficient for 10 head stock; a 12-foot well yields a small supply.	
47	SW	28	"	"	"	Dug	18	1,810	- 15	1,795			Glacial sand	Hard	D, S	Pumps dry, but regains level rapidly.	
48	SE	29	"	"	"	Dug	20	1,810	- 17	1,793	17	1,793	Glacial gravel	Hard	S	Sufficient supply.	

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

ELFROS

NO. 307, SASKATCHEWAN

WELL No.	LOCATION					TYPE OF WELL	DEPTH OF WELL	ALTITUDE WELL (above sea level)	HEIGHT TO WHICH WATER WILL RISE		PRINCIPAL WATER-BEARING BED			CHARACTER OF WATER	TEMP. OF WATER (in °F.)	USE TO WHICH WATER IS PUT	YIELD AND REMARKS
	¼	Sec.	Tp.	Rge.	Mer.				Above (+) Below (-) Surface	Elev.	Depth	Elev.	Geological Horizon				
49	NW.	29	32	14	2	Spring		1,795	0	1,795			Glacial drift	Hard, iron, "alkaline"	S	This spring located in a slough will water 350 to 500 head stock.	
50	NE.	30	"	"	"	Bored	140	1,800								Dry hole in glacial drift; uses spring on the NW.¼, section 29.	
51	NW.	30	"	"	"	Dug	25	1,805	- 15	1,790			Glacial drift	Hard, iron	S	Sufficient for stock; hauls drinking water one mile.	
52	NW.	31	"	"	"	Dug	22	1,780	- 20	1,760	20	1,760	Glacial gravel	Hard	D, S	Sufficient for 150 head stock; the Hamlet of Mozart hauls water from this well.	
53	NW.	32	"	"	"	Dug	18	1,765	- 12	1,753	15	1,750	Glacial sand	Hard	D, S	Sufficient supply; but it decreased during the drought; many shallow dry holes.	
54	SW.	32	"	"	"	Dug	24	1,795	- 21	1,774	21	1,774	Glacial sand	Hard	D, S	Oversufficient for 35 head stock.	
55	SE.	33	"	"	"	Dug	17	1,755	- 15	1,740	15	1,740	Glacial sand	Hard	D, S	Three shallow wells yield sufficient water for the farm.	
56	SW.	33	"	"	"	Bored	18	1,765	- 10	1,755	10	1,755	Glacial gravel	Hard	D, S	Good supply for 20 head stock; an 8-foot well in a ravine is used also.	
57	SE.	34	"	"	"	Dug	40	1,745	- 20	1,725	40	1,705	Glacial sand	Hard, iron, "alkaline"	S	Abundant supply of highly mineralized water; hauls drinking water.	
58	NW.	34	"	"	"	Dug	20	1,745	- 8	1,737	10	1,735	Glacial sand	Hard	D, S	Sufficient supply.	
59	SW.	34	"	"	"	Dug	14	1,750	- 10	1,740	11	1,739	Glacial sand	Hard	D, S	Sufficient supply.	
60	SE.	35	"	"	"	Dug	14	1,740	- 6	1,734	6	1,734	Glacial gravel	Hard	D, S	Sufficient supply.	
61	NW.	36	"	"	"	Dug	12	1,720	- 9	1,711	9	1,711	Glacial sand	Hard	D, S	Sufficient supply.	
62	SW.	36	"	"	"	Dug	9	1,750	- 8	1,742	8	1,742	Glacial fine sand	Hard	D, S	Insufficient supply.	
1	SE.	1	32	15	2	Dug	10	1,920	- 6	1,914	6	1,914	Glacial sand	Hard	S	Oversufficient supply.	
2	NE.	1	"	"	"	Dug	8	1,915	- 4	1,911	4	1,911	Glacial gravel	Hard	D, S	Good supply for 35 head stock; a 110-foot well, not used, yielded flowing artesian water.	
3	NW.	1	"	"	"	Dug	18	1,940	- 15	1,925			Glacial gravel	Hard	D	Poor supply; a 9-foot well yields sufficient water for 10 head stock.	
4	SW.	2	"	"	"	Bored	60	1,960	- 30	1,930	60	1,900	Glacial gravel	Hard	S	Well has partly caved in; hauls drinking water; dry holes as deep as 90 feet.	
5	SE.	3	"	"	"	Bored	80	1,960	- 35	1,925	80	1,880	Glacial sand	Hard, iron, "alkaline"	D, S	Abundant supply.	
6	SW.	4	"	"	"	Bored	44	1,975	- 40	1,935	40	1,935	Glacial sand	Hard	D	A 14-foot well yields sufficient water for 70 head stock; five dry holes 40 to 85 feet deep.	
7	SE.	5	"	"	"	Dug	28	1,980	- 26	1,954	26	1,954	Glacial gravel	Hard	D, S	Sufficient supply.	
8	SE.	6	"	"	"	Dug	20	1,980	- 17	1,963	17	1,963	Glacial sand	Hard	D, S	One of two similar wells; sufficient for 15 head stock.	
9	NE.	6	"	"	"	Bored	40	1,955	- 30	1,925			Glacial sand	Hard	D, S	Sufficient for 17 head stock.	
10	SE.	7	"	"	"	Dug	11	1,950	- 8	1,942			Glacial sand	Hard	D, S	Hauls water in winter.	
11	NW.	7	"	"	"	Dug	30	1,940	- 28	1,912	28	1,912	Glacial sand	Hard	D, S	A well in a slough is used for stock also.	
12	NE.	8	"	"	"	Bored	30	1,920	- 25	1,895			Glacial drift	Hard	S	Intermittent supply.	
13	SW.	8	"	"	"	Dug	12	1,945	- 10	1,935	10	1,935	Glacial gravel	Hard	D, S	Oversufficient for 75 head stock.	

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

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

WELL RECORDS—Rural Municipality of ELFRCS NO. 307, SASKATCHEWAN

WELL No.	LOCATION					TYPE OF WELL	DEPTH OF WELL	ALTITUDE WELL (above sea level)	HEIGHT TO WHICH WATER WILL RISE		PRINCIPAL WATER-BEARING BED			CHARACTER OF WATER	TEMP. OF WATER (in °F.)	USE TO WHICH WATER IS PUT	YIELD AND REMARKS
	¼	Sec.	Tp.	Rge.	Mer.				Above (+) Below (-) Surface	Elev.	Depth	Elev.	Geological Horizon				
14	NE.	9	32	15	2	Dug	22	1,885	- 19	1,866			Glacial drift	Hard, iron, "alkaline"	D	A 7-foot well in ravine yields soft water.	
15	NE.	10	"	"	"	Bored	55	1,905								Dry hole in glacial drift.	
16	NW.	10	"	"	"	Dug	22	1,890	- 18	1,872	18	1,872	Glacial sand and gravel	Soft	D, S	Sufficient for 40 head stock; also use springs near creek.	
17	NE.	11	"	"	"	Bored	35	1,900	- 23	1,877			Glacial gravel	Soft	D, S	Oversufficient supply; two dry holes 70 and 100 feet deep.	
18	NE.	12	"	"	"	Dug	40	1,890	- 34	1,856			Glacial sand	Hard	D, S	Plenty of water; another well in a ravine yields a good supply.	
19	SE.	13	"	"	"	Dug	9	1,875	0	1,875			Glacial gravel	Hard	D, S	Sufficient supply; another well 80 or 90 feet deep is not in use.	
20	SW.	14	"	"	"	Dug	10	1,905	- 7	1,898	7	1,898	Glacial sand and gravel	Hard	D, S	Oversufficient for 80 head stock.	
21	SE.	15	"	"	"	Dug	15	1,890	- 11	1,879	11	1,879	Glacial sand	Hard	D, S	Sufficient supply.	
22	SE.	17	"	"	"	Bored	50	1,910								Dry hole in glacial drift; four shallow wells supply 15 head stock.	
23	SW.	17	"	"	"	Bored	44	1,905	- 41	1,864			Glacial sand	Hard	D, S	Stock are also watered at a spring; dry hole 34 feet deep.	
24	SE.	18	"	"	"	Dug	16	1,910	- 12	1,898	12	1,898	Glacial sand	Hard	D, S	Oversufficient for 50 head stock.	
25	NW.	18	"	"	"	Dug	32	1,900	- 29	1,871	29	1,871	Glacial sand	Soft	D, S	Insufficient supply.	
26	NE.	19	"	"	"	Dug	18	1,800	0	1,800			Glacial gravel	Hard	D, S	Well has never been pumped dry; neighbours use this well also.	
27	NW.	19	"	"	"	Dug	20	1,820	- 11	1,809			Glacial gravel	Hard	D, S	Oversufficient supply.	
28	SE.	20	"	"	"	Dug	18	1,850	- 14	1,836	14	1,836	Glacial sand	Soft	D, S	Oversufficient supply.	
29	NE.	20	"	"	"	Dug	4	1,825	0	1,825	0	1,825	Glacial sandy clay	Hard	D, S	Sufficient for 20 head stock.	
30	SW.	20	"	"	"	Dug	9	1,855	- 5	1,850	5	1,850	Glacial gravel	Hard	D, S	Sufficient supply.	
31	NE.	21	"	"	"	Dug	18	1,810	- 13	1,797	13	1,797	Glacial sand	Hard, "alkaline"	D, S	Sufficient for 20 head stock.	
32	SE.	21	"	"	"	Dug	10	1,835	- 7	1,828	7	1,828	Glacial gravel	Soft	D, S	Sufficient for 30 head stock.	
33	SW.	21	"	"	"	Dug	8	1,840	- 6	1,834	6	1,834	Glacial sand	Soft	D, S	Sufficient for 20 head stock.	
34	NW.	21	"	"	"	Dug	20	1,815	- 17	1,798			Glacial drift	Hard	D, S	Stock are watered at a deep slough.	
35	NE.	22	"	"	"	Dug	35	1,825	- 12	1,813	35	1,790	Glacial sand and gravel	Hard, "alkaline"	D, S	Sufficient supply.	
36	SW.	22	"	"	"	Dug	20	1,825	- 17	1,808			Glacial drift	Soft	D	A 10-foot well yields a good supply of water for stock.	
37	SE.	23	"	"	"	Bored	50	1,840	- 45	1,795	45	1,795	Glacial sand	Hard	D, S	Sufficient for 30 head stock.	
38	NW.	23	"	"	"	Dug	18	1,825	- 8	1,817			Glacial gravel	Hard	D, S	Good supply.	
39	NE.	23	"	"	"	Dug	20	1,830	- 18	1,812	18	1,812	Glacial fine sand	Hard	D, S	Sufficient supply when well is not plugged with sand.	

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(#) Sample taken for analysis.

WELL RECORDS—Rural Municipality of ELFRUS NO. 307, SASKATCHEWAN

WELL No.	LOCATION					TYPE OF WELL	DEPTH OF WELL	ALTITUDE WELL (above sea level)	HEIGHT TO WHICH WATER WILL RISE		PRINCIPAL WATER-BEARING BED			CHARACTER OF WATER	TEMP. OF WATER (in °F.)	USE TO WHICH WATER IS PUT	YIELD AND REMARKS
	¼	Sec.	Tp.	Rge.	Mer.				Above (+) Below (-) Surface	Elev.	Depth	Elev.	Geological Horizon				
40	NE.	24	32	15	2	Dug	20	1,825	- 18	1,807	18	1,807	Glacial gravel	Hard	D, S	Good supply for 40 head stock.	
41	NW.	24	"	"	"	Dug	17	1,825	- 10	1,815			Glacial sand	Hard	D, S	Oversufficient supply.	
42	NE.	25	"	"	"	Drilled	175	1,805	- 4	1,801	160	1,645	Glacial sand	Soft	D, S	Hamlet well of Mozart is partly caved in; wells 17 to 30 feet deep yield "alkaline" water. #	
43	NE.	26	"	"	"	Bored	65	1,800	+ 1	1,801	65	1,735	Glacial sand	Hard, iron, "alkaline"	D, S	Abundant supply; level of water decreased slightly during the drought.	
44	SW.	27	"	"	"	Dug	10	1,810	- 5	1,805	5	1,805	Glacial sand	Soft	D, S	Sufficient supply.	
45	SE.	28	"	"	"	Dug	26	1,805	- 21	1,784			Glacial sand	Hard	D, S	Sufficient supply.	
46	NW.	28	"	"	"	Dug	11	1,790	- 8	1,782			Glacial drift	Hard	D, S	Sufficient supply.	
47	SE.	29	"	"	"	Dug	12	1,810	- 8	1,802	8	1,802	Glacial sand	Hard	D, S	Sufficient for 25 head stock.	
48	NE.	29	"	"	"	Bored	95	1,795	- 50	1,745	95	1,700	Glacial sand	Hard, iron, "alkaline"	D, S	Sufficient supply, but water is laxative on humans.	
49	NW.	29	"	"	"	Dug	25	1,795	- 11	1,784	25	1,770	Glacial sand	Hard	D, S	Sufficient for 53 head stock.	
50	SW.	30	"	"	"	Dug	9	1,800	- 5	1,795	5	1,795	Glacial gravel	Hard	D, S	Good supply, but well freezes in winter.	
51	NW.	30	"	"	"	Dug	16	1,790	- 11	1,779			Glacial sand	Hard	D, S	A dam on a creek is used for stock; sufficient supply.	
52	NE.	30	"	"	"	Dug	19	1,790	- 15	1,775			Glacial drift	Hard, "alkaline"	S	Intermittent supply.	
53	NE.	31	"	"	"	Drilled		1,765					Glacial drift	Hard, iron, "alkaline"	D, S	Abundant supply; a spring is located in the pasture.	
54	NW.	31	"	"	"	Dug	12	1,755	- 8	1,747	8	1,747	Glacial sand	Soft	D, S	Sufficient for 16 head stock; one 40-foot dry hole.	
55	NW.	32	"	"	"	Dug	26	1,765	- 24	1,741	24	1,741	Glacial gravel	Hard	D, S	Sufficient for 40 head stock.	
56	NE.	33	"	"	"	Dug	10	1,775	- 6	1,769			Glacial sand	Hard	D,	A similar well is used for stock.	
57	SE.	35	"	"	"	Dug	34	1,790	- 31	1,759	31	1,759	Glacial sand	Hard, iron, "alkaline"	D, S	Poor supply; hauls water from a slough for stock.	
58	NW.	35	"	"	"	Dug	14	1,785	- 7	1,778			Glacial gravel	Hard	S	Sloughs are also used for stock.	
59	NE.	36	"	"	"	Dug	16	1,780	- 13	1,767	13	1,767	Glacial sand	Hard	D, S	Sufficient supply.	
60	NW.	36	"	"	"	Dug	30	1,780	- 27	1,753	27	1,753	Glacial gravel	Hard	D, S	Good supply for 35 head stock.	

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