CANADA
DEPARTMENT OF MINES
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PRELIMINARY REPORT

GROUND-WATER RESOURCES OF THE RURAL MUNICIPALITY OF RUDY NO. 284 SASKATCHEWAN

By
B. R. MacKay and D. C. Maddox

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BUREAU OF ECONOMIC GEOLOGY

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INTRODUCTION

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

Publication of Results

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

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

How to Use the Report

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

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

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

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

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

GLOSSARY OF TERMS USED

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

WATER-BEARING HORIZONS OF THE MUNICIPALITY

The rural municipality of Rudy, No. 284, embraces an area of approximately 312 square miles in south-central Saskatchewan. It comprises five complete townships described as tp. 28, range 6, and tps. 29 and 30, ranges 6 and 7, and those parts of six townships lying to the east of South Saskatchewan river, namely tp. 31, range 6, tps. 28 and 31, range 7, and tps. 28, 29, and 30, range 8, all W. 3rd mer. The Outlook Section of the Canadian Pacific railway passes in a general westward direction through tp. 29, ranges 6, 7, and 8. The town of Outlook, which is about 35 miles south and a little west of Saskatoon, and the villages of Glenside and Broderick, are on this railway. According to the census of 1931 the population of the municipality was 1,940, of which 712 resided in the town of Outlook, and the others are distributed over the municipality, the majority being in its southern half.

South Saskatchewan river forms the western boundary of the municipality. Where it crosses the northern boundary of township 28 it is 1,620 feet above sea-level. South of Outlook the valley of South Saskatchewan river is about 125 feet deep and the slopes are rather abrupt, but north of Outlook the river valley becomes shallower and the slopes to the river become gentle.

In the southeast part of the municipality there is an elevated tract of rolling country in which several hills rise to over 2,050 feet above sea-level. From this elevated tract the land slopes gently westwards and northwards towards South Saskatchewan river. Dundurn Forest Reserve occupies about $2\frac{3}{4}$ square miles in the northeast corner of the municipality.

A small lake occurs in sec. 18, tp. 31, range 6, and an intermittent stream in this township drains northwards into South Saskatchewan river. Several low areas, marshy in wet

seasons, occupy about 2 square miles in the eastern part of township 30, range 7, and the western part of township 30, range 6. South Saskatchewan river, however, is the only dependable source of surface water in this municipality. River water that has been filtered through gravel supplies the town of Outlook. The river water is comparatively soft and varies seasonally, but can be used in the untreated state for all purposes except drinking.

Moraine covers an area of 61 square miles in the south-eastern part of the township, the surface of which area is characterized by many, low, rounded hills and undrained depressions. A belt of boulder clay or glacial till about a mile in average width extends about 3 miles northwards from the central part of the southern boundary of township 28, range 6, and covers about $3\frac{1}{2}$ square miles. Another belt of boulder clay from $\frac{1}{4}$ to 2 miles wide borders the moraine on the north and west. Glacial lake sands underlie most of the municipality west and north of the belt of boulder clay. Glacial lake clay covers an area of about 9 square miles in the north-central part of the municipality, four square miles of which lie in the western part of township 30, range 6, and 5 square miles in the eastern part of township 30, range 7. Glacial lake clay covers an area of about $\frac{1}{2}$ square mile in secs. 9 and 16, tp. 31, range 6. Dune sands mantle three irregularly-shaped areas in the municipality, bordering South Saskatchewan river. The largest of these is a 13-square mile area in township 31, range 6, the second is an area of approximately 8 square miles in township 30, ranges 7 and 8, and the third is an area of 8 square miles south of Outlook covering 4 square miles in the southern part of township 29, range 8, and 4 square miles in the northeastern part of township 28, range 8.

Water-bearing Horizons in the Unconsolidated Deposits

The dune sands generally contain sufficient water, most of it slightly mineralized and comparatively soft, to supply farm requirements. Most of the wells in those parts of this municipality that are mantled by dune sands are less than 30 feet deep and sand-points are generally used to obtain the water. Near the margins of the dune sand area the sand deposit is thin and most of the wells there have passed through the sands into the underlying boulder clay.

The glacial lake sands usually yield small supplies of water to wells up to 30 feet deep. On many farms more than one well in the glacial lake sands is necessary to supply farm requirements, and at other farms the water for stock is obtained from deep wells that tap water-bearing pockets in the underlying boulder clay, whereas water for domestic purposes is obtained from shallow wells in the glacial lake sands.

The glacial lake clay usually yields less water than do the glacial lake sands and this water is mostly of poor quality. In the area underlain by glacial lake clay in this municipality several wells less than 20 feet deep obtain from the glacial lake clay small supplies of water that are only fit for stock use, whereas deeper wells obtain larger supplies of water from the underlying boulder clay or the bedrock.

The boulder clay and the morainic deposits of this municipality are so similar in character that they are here considered as a unit. In both deposits clay makes up the major part and ground water is found only in irregularly distributed pockets, lenses, or discontinuous beds of sand and gravel that occur enclosed in the clay. No distinction between the two deposits can be made in this municipality as regards the depth at which these pockets occur or the quality of the water derived from the wells, and in neither deposit can any well-defined zones

of depth to water be outlined. The aquifers appear to be of very limited extent. Most of the wells in the glacial drift are less than 100 feet deep. At many farms the water from the deeper wells is too highly mineralized for domestic use and shallow wells that yield small supplies of less highly mineralized water are used for the household.

Water-bearing Horizons in the Bedrock

The Bearpaw formation immediately underlies the glacial drift in the southern part of this municipality. It consists mainly of dark grey, impervious shale that was deposited in the form of mud in a shallow Cretaceous sea. The shale itself yields little if any water. Layers of sand that occur interbedded with the shale generally contain soft water and many deep wells in southern Saskatchewan obtain soft water from these sand beds.

The Belly River formation underlies the Bearpaw in the southern part of this municipality, and immediately underlies the glacial drift in the northern part of the municipality. The approximate boundary between these two formations is shown on the accompanying map. The Belly River formation consists principally of sands that were deposited in fresh or in brackish water with minor amounts of shales and other sediments, some of which were deposited in the sea. The chemical composition of the water from the sandy beds in the Belly River formation is generally similar to that of water from sands in the Bearpaw formation.

The aquifers in the bedrock generally cover larger areas than aquifers in the glacial drift, but in this municipality many of the bedrock aquifers do not appear to underlie large areas.

No logs of the deep wells in this municipality are available and the distinction between a well in the bedrock and a well in the glacial drift is made on the basis of the character of the water. Where no analyses of the water from deep wells are

available, waters reported to be soft or salty are assumed to be derived from bedrock aquifers.

An aquifer that is about 1,320 to 1,353 feet above sea-level supplies four wells, 430 to 575 feet deep, in township 29, range 6, and township 30, range 6, with soft, salty water. The water in the most northerly well of the group on sec. 22, tp. 30, range 6, is too highly mineralized even for watering stock. The water in the wells on secs. 15 and 17, tp. 30, range 6, is salty but is used for stock. The water in the most southerly well of the group in sec. 16, tp. 29, range 6, is used for all purposes. This aquifer probably underlies at least the eastern part of the municipality, but in the northeastern part of the municipality the water is too highly mineralized to justify the expense of drilling to the aquifer.

In township 30, range 7, and in the adjacent parts of township 29, range 7, and of township 31, range 7, an aquifer or aquifers, 1,450 to 1,543 feet above sea-level, supply nine wells, 220 to 330 feet deep, with soft water that contains 2,880 to 3,660 parts per million of dissolved solids. The proportion of sodium chloride in the water of the wells increases in a northeasterly direction.

In the eastern third of the municipality there are a number of wells, 100 to 425 feet deep, that obtain soft water from bedrock aquifers that are 1,414 to 1,710 feet above sea-level. The water in most of these wells is used for stock, but the water in the well, 285 feet deep, on sec. 2, tp. 31, range 6, is too salty for use even for stock. The ten analyses available of the water in the remaining wells in these aquifers show that the water contains from 2,300 to 2,660 parts per million of dissolved solids and that all the waters except one are of the same general chemical type. These aquifers are described in detail in the reports on the individual townships.

GROUND WATER CONDITIONS BY TOWNSHIPS

Township 28, Range 6

Moraine covers most of this township and is characterized by low, rounded hills and undrained depressions. Most of the eastern part of the municipality is over 2,000 feet above sea-level and some of the hills in the southeastern quarter reach elevations of over 2,050 feet above sea-level. From this elevated part the land surface falls away to the west to elevations of less than 1,900 feet above sea-level along the northern and western boundaries of the township.

Boulder clay underlies an area of $3\frac{1}{4}$ square miles, comprising sections 4 and 9, most of section 16, part of the western half of sections 8 and 17, and part of the eastern half of section 3.

The depth of the wells in the glacial drift of this township ranges from 10 to 140 feet, but only three of the wells are over 100 feet deep. An aquifer that is about 1,800 to 1,840 feet above sea-level is tapped by four wells, 87 to 140 feet deep, in sections 7, 17, 18, and 20. The water of this aquifer is slightly "alkaline", but can be used for drinking and the wells on sections 7 and 17 yield large supplies of water.

The water in a well 14 feet deep on the SW.$\frac{1}{4}$, section 2, and in a well 38 feet deep on the SE.$\frac{1}{4}$, section 30, is soft. In twenty wells the water is used only for stock. In the remaining wells the water is hard, but can be used for all purposes.

The supply of ground water in this township is not satisfactory. At twenty-two farms the water supply is inadequate for stock use. Dry holes were put down on sections 4 and 36. Three wells in the NE.$\frac{1}{4}$, section 5, the SE.$\frac{1}{4}$, section 20, and the NW.$\frac{1}{4}$, section 28, penetrate clay to depths of 60, 86, and 50 feet, respectively. Dams or dugouts are used at seven farms to

supplement the supply of well water and on the NE.¼, section 11, there is a spring that is used for stock.

No wells in this township have tapped aquifers in the bedrock. It is probable, however, that some of the bedrock aquifers that were tapped by wells in the adjacent townships underlie this township, and if so these aquifers might be expected to be encountered at elevations of about 1,400 to 1,500 feet above sea-level.

Township 28, Range 7

The land surface in this township slopes very gently westwards from elevations of about 1,950 feet above sea-level near the eastern boundary of the township, to elevations of about 1,750 feet above sea-level at the top of the banks of South Saskatchewan river. Water-level in South Saskatchewan river lies approximately 100 feet below prairie-level; the river banks are fairly steep, but in sections 7 and 8 and in sections 19 and 20 two coulées extend back from the river valley for over a mile and make more easy access in these sections to the water-level.

An area of moraine covers about 12 square miles in the eastern part of the township. A belt of boulder clay about half a mile in average width borders the moraine-covered area on the west. Glacial lake sands underlie the remainder of the township to the west of this belt of boulder clay.

In the moraine-covered area the producing wells in the glacial drift are 10 to 80 feet deep. Four dry holes, 80, 30, 60, and 100 feet deep, were put down in the SE.¼, section 10, the NE.¼, section 12, the SW.¼, section 23, and the NE.¼, section 34, respectively.

In most of the deeper wells the water is too "alkaline" to be fit for drinking and in one well, 114 feet deep, on the SW.¼, section 1, the water was too highly mineralized even for stock use.

In a well 14 feet deep, on the SW.¼, section 1, and in four wells, 10 to 18 feet deep, in sections 35 and 36, the water is soft. A well, 117 feet deep, on the SW.¼, section 12, obtains soft water from an aquifer, thought to be in bedrock, that is about 1,793 feet above sea-level. This aquifer does not appear to be widespread as it was not tapped by any other wells in this township or in adjacent townships.

In the area of boulder clay two wells each 20 feet deep obtain soft water from sand or gravel lenses in the clay. Two wells each 105 feet deep, on the NE.¼, and the NW.¼, section 22, obtain from an aquifer that is about 1,750 feet above sea-level hard, "alkaline" water that is fit only for use by stock. The fact that a well, 100 feet deep, on the NE.¼, section 34, obtained no water at about 1,750 feet above sea-level, shows that this aquifer probably does not extend far north of section 22.

In the area underlain by glacial lake sands most of the drift wells are less than 50 feet deep, but two wells, 170 and 135 feet deep, on the NE.¼, section 4, and the SW.¼, section 9, respectively, obtain hard water from an aquifer that is about 1,655 feet above sea-level.

A well, 395 feet deep, on the NE.¼, section 10, obtained a large supply of hard, salty water from an aquifer, in the bedrock, that is about 1,460 feet above sea-level; this aquifer has not been tapped by any other wells in this township, but an aquifer that is about 1,485 feet above sea-level was tapped by two wells in the southern part of township 29, range 6, and this latter aquifer may be continuous with the aquifers encountered on sec. 10, tp. 28, range 7.

An aquifer in the bedrock that is about 1,535 above sea-level supplies rather salty water, suitable for stock use, to a well 300 feet deep on the SE.¼, section 16. This aquifer may be

continuous with the aquifer, about 1,500 to 1,550 feet above sea-level, that supplies many wells in the central and northern part of this municipality, but the aquifer that underlies sec. 16, tp. 28, range 7, does not appear to extend far eastwards from section 16, as the well on the NE.¼, section 10, did not obtain water until it reached an aquifer that is about 1,460 feet above sea-level. Two wells, 208 and 210 feet deep, on the NW.¼, section 16, and the NE.¼, section 17, tap an aquifer at about 1,617 and 1,600 feet above sea-level, respectively, that contains water described as hard and salty. No other wells in this municipality obtain hard, salty water from the aquifer that is about 1,617 to 1,600 feet above sea-level.

The quality of the water in many wells in this township is not good. In two of the bedrock wells, 117 and 300 feet deep, on the SW.¼, section 12, and the NW.¼, section 16, and in ten wells, 10 to 22 feet in the glacial drift, the water is soft. In four bedrock wells, 208 to 395 feet deep in sections 10, 16, and 17, the water is salty but is used for stock. In eighteen other wells the water cannot be used for drinking.

The supply of well water in this township is not satisfactory. At twenty-two farms the supply of water is not sufficient for watering the stock. Dams or dugouts are used at five farms to supplement the supply of water from the wells. Two springs in the NW.¼, section 17, and the SW.¼, section 20, contain "alkaline" water that is used for watering stock.

Township 28, Range 8

Approximately 7½ square miles in the northeast part of this township lying to the east of South Saskatchewan river are included in the rural municipality of Rudy. The bed of South Saskatchewan river lies about 125 feet below prairie level. Back

from the slopes to South Saskatchewan river the country is nearly flat.

An irregularly shaped area of about 2 square miles, in sections 24, 25, 26, 35, and 36, is underlain by glacial lake sands. The remainder of the township is mantled by more recent sand dunes into which the lake sands have been built by wind action.

Water of good quality is generally found in the dune sands within about 25 feet of the surface. A well, 20 feet deep, on section 35, appears to have passed through the dune sands into the underlying glacial lake sands, as the water in the well is "alkaline". No records of wells sunk in that part of the township underlain by glacial lake sands were obtained. No wells have been put down into the bedrock in this township.

Township 29, Range 6

The southeast corner of section 1 lies slightly over 2,000 feet above sea-level, and from here the land surface slopes northwesterly to its lowest elevation of a little over 1,750 feet above sea-level, in section 31. Approximately 15 square miles in the southern and eastern parts of the township are mantled with moraine. A belt of boulder clay that is from 1 to 1½ miles wide borders the moraine-covered area on the north and west. An area of a little over 11 square miles, which includes almost all the northwestern quarter of the township and a part of the northeastern quarter, is underlain by glacial lake sands.

In the part of the township that is underlain with glacial lake sands, most of the wells are from 24 to 33 feet deep. One well in the glacial drift is 100 feet deep, and obtains water from the boulder clay that underlies the glacial lake sands. In the part of the township that is covered by moraine and boulder clay the depth of wells in the glacial drift ranges from 9 to 158 feet, but most of the wells are less than 55 feet deep. In the

majority of wells over 40 feet deep the water is too highly mineralized to be fit for drinking.

Ten wells in this township obtain soft water from bedrock aquifers. An aquifer that is about 1,320 feet above sea-level supplies a well 575 feet deep in section 16 with soft, salty water that is reported as being used for all purposes. This aquifer probably underlies the whole township. A well on section 17 obtains soft water from an aquifer that is about 1,414 feet above sea-level. Three wells, 353, 317, and 357 feet deep, in sections 26, 34, and 35, tap an aquifer at elevations of approximately 1,484, 1,499, and 1,478 feet above sea-level, respectively, and obtain supplies of soft water. An aquifer that is about 1,517 to 1,544 feet above sea-level supplies four wells, 200 to 310 feet deep, in sections 21, 22, 32, and 33. An aquifer that is about 1,595 feet above sea-level supplies a well, 235 feet deep, on section 28. Analyses have been made of waters from all these aquifers except the one that is about 1,320 feet above sea-level. The waters are very uniform in composition and contain 2,300 to 2,660 parts per million of sodium sulphate, sodium chloride, and sodium carbonate, their relative abundance being in the order given.

The water in all the bedrock wells and in two shallow wells, 20 and 18 feet deep, on sections 1 and 11, respectively, is soft. In the bedrock well on section 16 the water is salty. In most of the wells in the glacial drift that are over 50 feet deep, the water is too "alkaline" to be fit for drinking.

The supply of ground water in this township is not very satisfactory. Dams or dugouts are in use at fourteen farms, and at four farms water is hauled. Most of the bedrock wells, however, yield large supplies of water.

Township 29, Range 7

This township is a plain that slopes very gently northeastward from the southeast corner of the township where the surface is a little over 1,900 feet above sea-level, to the western part of the northern boundary where the surface is less than 1,750 feet above sea-level. An area of approximately 3½ square miles in the southeast part of the township is underlain by moraine. A belt of boulder clay with an average width of half a mile borders the moraine-covered areas on the north and west and covers about 2 square miles; the remaining 31½ square miles of the township are underlain by glacial lake sands.

In the part of the township underlain by moraine the producing wells are 18 to 120 feet deep. In one well, 18 feet deep, on section 1, the water is soft. In the four remaining producing wells 60 to 120 feet deep the water is too "alkaline" to be fit for drinking. A dry hole, 100 feet deep, was put down on the SW.¼, section 12.

In the belt of boulder clay a well, 20 feet deep, yields soft water. In the remaining two wells, 47 and 50 feet deep, the water is used only for stock.

In the part of the township underlain by glacial lake sands most of the wells in glacial drift are less than 50 feet deep, but four wells, 80 to 127 feet deep, on sections 21, 23, 25, and 27, obtain water from aquifers that lie at approximately 1,648 to 1,695 feet above sea-level. The composition of the water in the four wells varies considerably and the aquifers that supply the wells may not be continuous. A well, 200 feet deep on section 32, obtains hard water from an aquifer that is apparently in the glacial drift. The records of the five last-mentioned wells show that the glacial drift in the north half of the township is over 100 feet thick.

Aquifers in the Belly River formation in this township supply soft water to six wells, 212 to 376 feet deep. In the southern half of the township, two wells 376 and 350 feet deep, on sections 10 and 15, respectively, tap an aquifer that is about 1,485 feet above sea-level. The water in the well on section 10 contains 3,320 parts per million of dissolved solids. Two wells, 212 and 263 feet deep, on sections 7 and 9, respectively, encounter another aquifer that is about 1,578 to 1,557 feet above sea-level. Two wells, 22 and 230 feet deep, on sections 34 and 35, tap an aquifer that is about 1,543 to 1,513 feet above sea-level. The water in the well on section 34 contains 3,300 parts per million of dissolved solids.

It seems probable that ground water can be obtained anywhere in this township at elevations between 1,475 and 1,575 feet above sea-level. The supply, however, is not very satisfactory; the bedrock wells yield ample supplies of soft water that can be used for all purposes except irrigation, but the water is rather highly mineralized. Most of the deeper wells in the glacial drift yield water that is suitable only for stock. Water is hauled at seven farms, and dams or dugouts are used at three farms.

Township 29, Range 8

The whole of the eastern half and about 3 square miles of the western half of this township are included in the rural municipality of Rudy. South Saskatchewan river forms the western boundary of the municipality and occupies a valley about 100 to 150 feet below the general level of the country, which is comparatively flat.

Dune sands cover a little over 4 square miles in the southwestern part of the township and glacial lake sands underlie the remaining part.

The deposit of dune sands in this township appears to be thin as two wells, 22 and 30 feet deep, on section 10, have passed through it into the underlying boulder clay from which they obtain small supplies of hard, "alkaline" water.

In the part of the township underlain by glacial lake sands the wells are 10 to 52 feet deep and at most farms two wells are in use. In sections 34 to 36 an ample supply of good water is obtained by the use of sand-points. South Saskatchewan river supplies water to the town of Outlook and the river water is used for watering stock.

Township 30, Range 6

This township is a very gently undulating plain that slopes towards the northwest from the southeast corner, which is nearly 1,850 feet above sea-level.

Glacial lake sands mantle over 31 square miles of the township. An area of about 4 square miles along the western boundary of the township is underlain by glacial lake clay. An area of about half a square mile in the southeast corner of the township is underlain by boulder clay.

The glacial lake clay in this township does not appear to be a good source of water as three wells, 14 to 18 feet deep, at a farm on section 18, failed to supply enough water for local use.

Most of the wells in the glacial lake sands are less than 30 feet deep, but the supply of water in them is small and at several farms more than one well is needed to supply local requirements. On section 6, an aquifer about 1,655 feet above sea-level supplies very laxative water to two wells 85 feet deep. This aquifer is in the boulder clay underlying the lake sands. No records of wells were obtained from the area in the southeast corner of the township where the till is exposed at the surface.

Aquifers in the bedrock supply water to eight wells, 160 feet to 500 feet deep, in this township. An aquifer that is about 1,329 to 1,353 feet above sea-level is tapped by three wells, 500, 400, and 430 feet, on the NE.$\frac{1}{4}$, section 15, the SE.$\frac{1}{4}$, section 17, and the SE.$\frac{1}{4}$, section 22. The water in the well in section 17 contains 5,600 parts per million of dissolved solids, but is used for stock, as is the water in the well on section 22, but the water in the well on section 15 was too highly mineralized for use. The expense of drilling to this aquifer in this township does not appear to be justified.

Four wells, 160 to 240 feet deep, in the southern half of the township, tap an aquifer that is about 1,558 to 1,585 feet above sea-level. The water in the well, 202 feet deep, on section 4, contains 2,380 parts per million of dissolved solids and the water in the well 160 feet deep, on the SW.$\frac{1}{4}$, section 17, contains 2,540 parts per million of total solids. The water in this aquifer is slightly salty but is suitable for stock, and in the wells 240 and 202 feet deep, on sections 2 and 4, respectively, the water is reported as being also used for drinking.

An aquifer about 1,707 feet above sea-level, thought to be in the bedrock, supplies a well 100 feet deep, in section 11, with soft water that is typical of the water from the bedrock aquifers. This aquifer appears to be of very limited extent, as several wells in the southeastern part of the township did not obtain water from it.

The water in the well, 160 feet deep, on the SW.$\frac{1}{4}$, section 17, rises above the surface, but the yield is small and the area of artesian flow does not appear to extend far from the well.

The supply of water in this township is not very satisfactory. At fifteen farms the water supply is not sufficient for the stock. At four farms water is hauled. Most of the bedrock

wells yield large supplies of water, but some of the bedrock waters are salty. Dams or dugouts are used at three farms.

Township 30, Range 7

This township is a plain in which the maximum difference of elevation is less than 50 feet. Most of the township is within a few feet of 1,750 feet above sea-level. An area of about 5 square miles in the eastern third of the township is underlain with glacial lake clay. About 2 square miles in the southwest quarter of the township is mantled with dune sands. Glacial lake sands mantle the remainder of the township.

The glacial lake clay does not appear to yield much water, as a well 18 feet deep on the SE.$\frac{1}{4}$, section 26, obtained only a small supply of water from the clay; and the other wells in the area mantled by glacial lake clay obtain water from pockets of sand and gravel in the boulder clay that underlies the glacial lake clay.

Most of the wells in the glacial lake sands are less than 30 feet deep, but the supply of water from many of these wells is small and at many farms several wells are required to supply local requirements.

In the dune sand area, three wells, 9 to 14 feet deep, yield small supplies of water. The dune sands in this township are probably not very thick and the area covered by them is small.

Bedrock aquifers supply six wells, 220 to 320 feet deep. An aquifer that is about 1,450 to 1,484 feet above sea-level supplies two wells, 320 and 276 feet deep, on the SW.$\frac{1}{4}$, and the SE.$\frac{1}{4}$, section 32, respectively, with soft water. The water in the western well contains 3,120 parts per million of dissolved solids. Aquifers that are about 1,510 to 1,527 feet above sea-level supply four wells 220, 245, 250, and 233 feet deep on the SE.$\frac{1}{4}$, section 3, the SW.$\frac{1}{4}$, section 24, the NW.$\frac{1}{4}$, section 25, and the SE.$\frac{1}{4}$, section 29,

respectively. The amount of dissolved solids in the waters of these four wells ranges from 3,260 to 3,660 parts per million. The water in the well on section 25 is more salty and more highly mineralized than the waters in the other bedrock wells in this township. All the aquifers in the bedrock of this township are in the Belly River formation and a bed of coal 5 feet thick was reported in the well on the SW.$\frac{1}{4}$, section 32, at depths of 220 to 225 feet.

The supply of ground water in this township is not satisfactory. At about half the number of farms the well water is insufficient for stock requirements. The bedrock wells yield large supplies of water that is fit for stock use, but is too salty to be fit for drinking.

Township 30, Range 8

About 14 square miles in the eastern half of this township are included in the rural municipality of Rudy. South Saskatchewan river forms the western boundary of the township. The slopes to the river are very gentle in the central part of the township, but are rather steeper in the northwest and the southwest.

A belt of dune sands with an average width of a little over 1$\frac{1}{2}$ miles passes eastwards through the township and underlies about 5 square miles, of which the greater part is in the southern half of the township. North and south of the dune sands, glacial lake sands mantle the township. Three shallow wells in the area underlain by dune sands provide small supplies of water that can be used for all purposes. At three farms in section 2 sand-points are used to obtain water. In the area of glacial lake sands north of the belt of dune sands the deeper wells were dry holes and rain water and river water are used to supplement the supply of well water. The producing wells in this part of the township are 10 to 16 feet deep.

In that part of the township south of the dune sand area the wells, which are 14 to 34 feet deep, supply enough water for local needs.

Township 31, Range 6

South Saskatchewan river passes through the northwestern part of the township and only that part of the township east of South Saskatchewan river is included in the rural municipality of Rudy. The slopes to the river are rather steep, but the banks are generally only from 50 to 100 feet high. An intermittent stream rises in section 12 and passes in a generally northwest direction to section 31, where it discharges into South Saskatchewan river. There is a small lake in the northern half of section 18. The land surface back from the river is very flat and all parts of the township are less than 1,750 feet above sea-level.

Dune sands underlie a very irregularly shaped area of about 12 square miles that extends in a generally northeastern direction across the township. Glacial lake sands underlie the remainder of the township. The wells in the glacial drift in this township are less than 30 feet deep. Sand-points are used in place of dug wells at many farms. The water in several wells in the dune sands is soft.

Two wells, 285 and 300 feet deep, on the SW.$\frac{1}{4}$, section 2, and the SW.$\frac{1}{4}$, section 4, respectively, obtain water from aquifers in the bedrock that are 1,464 and 1,430 feet above sea-level. The water in the well on the SW.$\frac{1}{4}$, section 2, is very salty, contains 5,394 parts per million of dissolved solids, and is only used occasionally for stock. The quality of the water in the well in the SW.$\frac{1}{4}$, section 4, is not known, but the water, which is probably salty, was not being used in the summer of 1935. The water in the well in the SW.$\frac{1}{4}$, section 4, rises above the surface of the ground, which at the well site is about 1,730 feet above sea-level. The

water in the well on the SW.$\frac{1}{4}$, section 2, rises only to about 1,709 feet above sea-level. The flowing well is about 2 miles west of the non-flowing well.

The supply of ground water in this township is not satisfactory; at about half the farms the supply is not sufficient for all purposes.

Township 31, Range 7

This township is a plain that slopes gently northwards. Elevations range from a little over 1,750 feet above sea-level in the south to a little less than 1,700 feet above sea-level in the north. South Saskatchewan river forms the western boundary of the township. In this township water-level in the river is about 50 to 100 feet below prairie-level. Glacial lake sands underlie that part of the township included in the rural municipality of Rudy.

All the wells except one in the glacial drift of this township are less than 35 feet deep. In section 5 the supply of ground water is not sufficient for local requirements, as a well, 50 feet deep, yields only a small supply of water and four dry holes were put down to depths up to 45 feet. Elsewhere in the township the supply of ground water is generally sufficient for local requirements, and some of the shallow wells yield large supplies of water. A well 250 feet deep on section 4 obtains soft, rather salty water that contains 2,880 parts per million of dissolved solids and is used for stock. The water comes from an aquifer in the bedrock that is about 1,510 feet above sea-level. No other wells in this township tap this aquifer and it is not known how far it extends northward.

STATISTICAL SUMMARY OF WELL INFORMATION IN RURAL MUNICIPALITY OF RUDY, NO. 284, SASKATCHEWAN

Township	28	28	28	29	29	29	30	30	30	31	31	Total No. in Municipality
West of 3rd meridian Range	6	7	8	6	7	8	6	7	8	6	7	
Total No. of Wells in Township	64	62	1	48	62	28	40	70	24	29	36	464
No. of wells in bedrock	0	5	0	10	6	0	8	6	0	2	1	37
No. of wells in glacial drift	64	57	1	38	56	28	32	61	23	21	34	416
No. of wells in alluvium	0	0	0	0	0	0	0	3	1	6	1	11
Permanency of Water Supply												
No. with permanent supply	56	57	1	44	50	26	38	66	18	28	31	415
No. with intermittent supply	2	1	0	2	10	0	2	2	0	1	1	21
No. dry holes	6	4	0	2	2	2	0	2	6	0	4	28
Types of Wells												
No. of flowing artesian wells	0	0	0	0	0	0	2	0	0	1	0	3
No. of non-flowing artesian wells	13	21	0	19	19	1	9	8	0	3	2	95
No. of non-artesian wells	45	37	1	27	41	25	29	60	18	25	30	338
Quality of Water												
No. with hard water	52	46	1	35	52	23	33	63	16	25	29	376
No. with soft water	6	12	0	11	8	3	7	5	2	4	3	60
No. with salty water	0	4	0	1	0	0	5	4	0	1	0	15
No. with "alkaline" water	16	23	0	15	18	4	6	3	1	1	0	87
Depths of Wells												
No. from 0 to 50 feet deep	54	43	1	31	41	27	30	63	22	27	34	373
No. from 51 to 100 feet deep	7	9	0	6	10	1	3	1	2	0	1	40
No. from 101 to 150 feet deep	3	5	0	0	4	0	0	0	0	0	0	12
No. from 151 to 200 feet deep	0	1	0	2	1	0	1	0	0	0	0	5
No. from 201 to 500 feet deep	0	4	0	8	6	0	6	0	0	2	1	33
No. from 501 to 1,000 feet deep	0	0	0	1	0	0	0	0	0	0	0	1
No. over 1,000 feet deep	0	0	0	0	0	0	0	0	0	0	0	0
How the Water is Used												
No. usable for domestic purposes	38	40	1	32	37	19	25	53	14	25	28	312
No. not usable for domestic purposes	20	18	0	14	23	7	15	15	4	4	4	124
No. usable for stock	56	57	1	44	57	24	37	68	17	28	31	420
No. not usable for stock	2	1	0	2	3	2	3	0	1	1	1	16
Sufficiency of Water Supply												
No. sufficient for domestic needs	54	55	1	43	50	25	30	65	18	27	30	404
No. insufficient for domestic needs	4	3	0	3	10	1	4	3	0	2	2	32
No. sufficient for stock needs	36	30	0	37	30	19	25	35	14	15	21	274
No. insufficient for stock needs	22	22	1	9	24	7	15	33	4	14	11	162

ANALYSES AND QUALITY OF WATER

General Statement

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

Total Dissolved Mineral Solids

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

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

Mineral Substances Present

Calcium and Magnesium

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

Sodium

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

Sulphates

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

Chlorides

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

Iron

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

Hardness

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

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

Analyses of Water Samples from the Municipality of Rudy, No. 284, Saskatchewan

LOCATION						Depth of Well, Ft.	Total dis'vd solids	HARDNESS			CONSTITUENTS AS ANALYSED						CONSTITUENTS AS CALCULATED IN ASSUMED COMBINATIONS								Source of Water
No.	Qtr.	Sec.	Tp.	Rge.	Mer.			Total	Perm.	Temp.	Cl.	Alkalinity	CaO	MgO	SO_4	Na_2O	Solids	$CaCO_3$	$CaSO_4$	$MgCO_3$	$MgSO_4$	Na_2CO_3	Na_2SO_4	NaCl	$CaCl_2$	
1	SW.	0	28	0	3	40	4,860											(4)	(1)		(2)		(3)		(5)	×1
2	SE.	10	28	7	3	300	3,100	55	10	45	1,320	345	40	7	257	1,543	3,000	72		15		271	528	2,180		×2
3	SE.	17	29	0	3	425	2,023												(4)		(5)	(3)	(1)	(2)		×2
4	NW.	21	29	0	3	275	2,500	75	10	05	430	395	30	7	1,009	1,230	2,023	54		15		342	1,493	719		×2
5	SE.	28	29	0	3	235	2,020	100	20	140	490	410	50	7	1,099	1,325	2,859	90		15		320	1,626	808		×2
6	SE.	32	29	0	3	200	2,660	100	50	110	440	400	20	4	1,177	1,358	2,887	36		8		375	1,742	726		×2
7	SE.	34	29	6	3	318	2,440	160	20	140	470	420	20	14	968	1,253	2,644	36		29		370	1,433	776		×2
8	SW.	35	29	6	3	357	2,300	120	20	100	530	445	10	7	754	1,205	2,457	18		15		434	1,116	874		×2
9	SE.	10	29	7	3	370	3,320	05	15	50	157	435	60	25	1,816	1,422	3,388	107		52		282	2,688	259		×2
10	SW.	34	29	7	3	222	3,300	65	10	55	78	500	60	18	1,931	1,538	3,501	107		38		369	2,858	129		×2
11	SE.	21	29	8	3	Saskatchewan River												113	71	84			27	10		Surface Water
12	SW.	4	30	6	3	202	2,380	240	160	80	450	420	20	29	927	1,185	2,541	36		61		330	1,372	742		×2
13	NW.	11	30	0	3	100	2,340	80	10	70	318	425	20	14	1,082	1,178	2,500	36		29		375	1,601	525		×2
14	SE.	17	30	0	3	400	5,600	280	160	120	3,210	215	110	29	8	2,806	5,509	197		15		10	45	5,242		×2
15	SW.	17	30	0	3	160	2,540	500	225	275	311	390	00	58	1,205	1,034	2,671	107		121		147	1,783	513		×2
16	SE.	3	30	7	3	220	3,420	90	10	80	190	435	40	14	2,083	1,715	3,846	72		29		348	3,083	314		×2
17	SW.	24	30	7	3	245	3,360	130	10	120	1,300	295	50	14	730	1,754	3,525	90		29		181	1,080	2,145		×2
18	NW.	25	30	7	3	250	3,000	80	20	00	2,000	205	50	11	66	1,885	3,068	90		23		157	98	3,300		×2
19	SE.	29	30	7	3	233	3,260	90	10	80	250	250	40	11	1,771	1,452	3,288	72		23		160	2,620	412		×2
20	SW.	32	30	7	3	320	3,120	90	10	80	350	295	40	11	1,628	1,477	3,289	72		23		208	2,409	577		×2
21	NE.	10	30	8	3		400	325	225	100	9	275	120	40	80	39	399	215		50	48		71	15		×1
22	SW.	2	31	0	3	285	5,394															Trace		(1)	Trace	×2
23	SW.	4	31	7	3	250	2,880	55	20	35	030	280	30	4	101	1,330	2,830	54		8		229	1,499	1,040		×2
24	SW.	17	31	7	3	30	2,040	1,000	1,000		57	110	350	263	1,222	113	1,833	110	700		784		145	94		×1

Water samples indicated thus, ×1, are from glacial drift or other unconsolidated deposits.
Water samples indicated thus, ×2, are from bedrock, Belly River formation.
Analyses are reported in parts per million; where numbers (1), (2), (3), (4), (5) are used instead of parts per million, they represent the relative amounts in which the five main constituents are present in the water.
Hardness is the soap hardness expressed as calcium carbonate ($CaCO_3$).
Analyses Nos. 1, 3, and 22, by Provincial Analyst, Regina; Analysis No. 11, by Canadian Pacific Railway Company.
For interpretation of this table read the section on Analyses and Quality of Water.

Water from the Unconsolidated Deposits

The composition of water from the glacial drift varies widely even within short distances and to predict it at any point is generally impossible. The Recent dune sands in this municipality usually contain water of good quality and comparatively soft. The rapidity of circulation and the solubility of the sediments of the aquifers are the chief determining factors in the composition of ground water. In sands that are near the surface, in springs and spring-fed wells, and in wells that are located on slopes where circulation of water is rapid, the water is mostly of good quality. The deeper wells, in glacial drift that contains a considerable proportion of soluble material, generally yield water that is rather highly mineralized.

Ground water from the glacial drift is usually very hard, and the hardness is not removed by boiling. Most of the waters in the glacial drift are sulphate waters, the carbonates are subordinate to the sulphates, and the chlorides form a very small proportion of the salts in solution. The principal sulphates present are calcium sulphate ($CaSO_4$), magnesium sulphate ($MgSO_4$), and sodium sulphate (Na_2SO_4), the relative order of abundance being usually in the order given, but occasionally sodium sulphate is predominant. Of the carbonates, calcium carbonate ($CaCO_3$) and magnesium carbonate ($MgCO_3$) are much more abundant than sodium carbonate (Na_2CO_3). Of the chlorides, sodium chloride (NaCl) is usually present in small proportions and occasionally calcium chloride ($CaCl_2$) is also present in small proportions.

Sample No. 11, which is from South Saskatchewan river, is moderately hard and contains only small amounts of salts in solution. The composition of the river water varies seasonally, but the water can be used in the untreated state for all purposes, and after it is boiled or otherwise sterilized it is fit for drinking.

Sample No. 21 in the list of analyses is from a shallow well in the dune sands. The water contains only 400 parts per million of dissolved solids, of which 313 parts per million are salts of calcium and magnesium and 86 parts per million are salts of sodium. It can be used for all purposes.

Waters Nos. 1 and 24 are from wells in the glacial drift. Water No. 1, which is from a well 40 feet deep in moraine, contains 4,860 parts per million of dissolved solids, and is excessively hard, as it contains so much calcium and magnesium sulphate and calcium carbonate. It is probably laxative as it contains a large proportion of magnesium sulphate and sodium sulphate. The water is used for stock, but the supply is small. The water is probably too highly mineralized to be used for irrigation. Water No. 24, which is from a well 30 feet deep in the glacial lake sands at the edge of the slopes to South Saskatchewan river, contains 2,040 parts per million of dissolved solids, and is excessively hard. The chief constituents are the sulphates of calcium, magnesium, and sodium. The water contains 929 parts per million of the combined sulphates of magnesium and is slightly laxative, but is used for drinking and for stock. This water must be used with caution for irrigation, as it contains so much magnesium sulphate and sodium sulphate.

Water from the Bedrock

Water from the bedrock is generally much more uniform in composition than water from the glacial drift. The sodium salts predominate in the bedrock waters, the salts of calcium and magnesium are subordinate, and the waters are soft or only moderately hard. The proportion of sodium carbonate and sodium chloride is much greater in the bedrock waters than in the glacial drift waters. The large proportion of sodium sulphate

and sodium chloride, and of sodium carbonate makes the bedrock waters unfit for irrigation.

Several types of water are found in the bedrock wells in this municipality. Water No. 10 represents a type (1) that is very common in the wells of the Darmody-Riverhurst artesian basin to the south and in many other wells in the Marine Shale series elsewhere. The water contains sodium sulphate, sodium carbonate, and sodium chloride, the relative abundance being in the order given and the proportion of sodium chloride being much less than the proportion of sodium carbonate. No wells north of township 29 in this municipality contain water of this type. The relative abundance of the salts in waters 9 and 16 are of the same order as in the preceding type, but the amount of sodium chloride is approximately equal to that of the sodium carbonate. Waters of this type (2) are not found north of sec. 3, tp. 30, range 7, in this municipality.

Waters 3 to 8, 12, 13, 15, 19, 20, and 23, represent a type (3) that is very common in this municipality. The water contains sodium sulphate, sodium chloride, and sodium carbonate, the relative abundance being in the order given. These waters are more salty than the waters of the previous type. The waters of this type, in townships 29 and 30, range 6, contain 2,300 to 2,620 parts per million of dissolved solids, but in the northern part of township 30, range 7, and the southern part of township 31, range 7, they contain from 2,880 to 3,260 parts per million of dissolved solids. Most of these waters are quite soft, but a few are moderately hard. Waters Nos. 2 and 17 represent a type (4) in which sodium chloride, sodium sulphate, and sodium carbonate are present, the relative abundance being in the order given, and the dissolved solids ranging from 3,160 to 3,360 parts per million. These waters are salty and are not fit for drinking.

Waters 14, 18, and 22 represent a type (5) in which sodium chloride is the chief constituent and in which sodium carbonate and sodium sulphate are either present in small proportions or are absent. This type contains 3,660 to 5,600 parts per million of dissolved solids. Water No. 14 is from the deepest aquifer that the wells in this municipality have tapped. Water No. 22 is from the most northeastern bedrock well in the municipality. Water No. 18 is from the most northern of a group of wells that extend in a northeasterly direction from sec. 34, tp. 29, range 7, to sec. 25, tp. 30, range 7. In this group the proportion of sodium chloride in the bedrock waters increases progressively northwards. The waters of this type are not fit for drinking and waters Nos. 14 and 22 are too salty to be used continuously for stock. Sodium sulphate is the chief laxative salt in the bedrock waters. Waters of the first three types mentioned are more laxative than the waters from the last two types.

WELL RECORDS—Rural Municipality of RUDY, NO. 284, SASKATCHEWAN.

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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				
1	NE.	1	28	6	3	Dug	15	2,025	- 10	2,015	15	2,010	Glacial sand	Hard, slightly "alkaline"	43	D	Sufficient for house use; 16-foot well waters 20 head stock.
2	NW.	2	"	"	"	Bored	42	2,022	- 37	1,985	42	1,980	Glacial gravel	Hard	40	D, S	Sufficient supply.
3	SW.	2	"	"	"	Dug	14	2,012	- 0	2,012	14	1,998	Glacial sand	Soft	45	D, S	Intermittent supply; dugout for stock; also 30-foot well with good supply.
4	SW.	4	"	"	"	Bored	40	1,955	- 22	1,933	40	1,915	Glacial drift	Hard, iron	42	S	Intermittent supply; 50-foot well of very "alkaline" water; several dry holes.
5	NW.	4	"	"	"	Bored	54	1,950	- 34	1,916	54	1,896	Glacial drift	Hard, iron	42	S	Sufficient; waters 30 head stock; 20-foot well for house use.
6	NE.	5	"	"	"	Bored	65	1,955	- 4	1,951	65	1,890	Glacial drift	Hard, iron, "alkaline"	42	S	Insufficient; waters 10 head stock; 29-foot well yields fair supply.
7	SW.	6	"	"	"	Bored	40	1,950	- 35	1,915	40	1,910	Glacial drift	Hard, "alkaline"	42	S	Insufficient; waters 3 head stock; well in slough used for drinking; #.
8	SE.	7	"	"	"	Dug	16	1,950	- 3	1,947	16	1,934	Glacial drift	Hard	42	D, S	Insufficient; four similar wells do not supply needs.
9	NE.	7	"	"	"	Bored	100	1,940			100	1,840	Glacial sand	Hard, iron	42	D, S	Ample supply.
10	NE.	9	"	"	"	Bored	30	1,958	- 21	1,937	30	1,928	Glacial drift	Hard, slightly "alkaline"	43	D, S	Sufficient; waters 12 head stock.
11	SW.	10	"	"	"	Dug	18	1,960	- 15	1,945	18	1,942	Glacial sand	Hard, slightly "alkaline"	41	D, S	Sufficient; waters 15 head stock.
12	NW.	12	"	"	"	Dug	15	1,985	- 10	1,975	15	1,970	Glacial sand	Hard, iron	41	D, S	Sufficient; waters 15 head stock; spring on NE.¼, section 11, used for stock.
13	NE.	12	"	"	"	Dug & Bored	13	2,016	- 12	2,004	13	2,003	Glacial gravel	Hard, iron	40	D, S	Sufficient for 13 head stock.
14	NE.	13	"	"	"	Bored	37	2,015	- 32	1,983	37	1,978	Glacial sand	Hard, "alkaline"		S	Insufficient; waters 6 head stock; drinking water hauled.
15	SW.	13	"	"	"	Dug	14	1,995	- 10	1,985	14	1,981	Glacial sand	Moderately hard	43	D, S	Sufficient; supplies neighbours; 48-foot well unused.
16	SE.	15	"	"	"	Dug	14	1,997	- 6	1,989	14	1,983	Glacial gravel	Hard, "alkaline"	42	D	Sufficient only for house use; 20-foot well waters 45 head stock.
17	NW.	15	"	"	"	Dug	50	1,990	- 45	1,945	50	1,940	Glacial quicksand	Hard, iron, "alkaline"	42	S	Sufficient; waters 15 head stock; dugout which goes dry in summer.
18	NE.	16	"	"	"	Dug	10	1,940	- 2	1,938	10	1,930	Glacial sand	Hard	45	D, S	Sufficient; waters 10 head stock.
19	SE.	17	"	"	"	Bored	115	1,938	- 85	1,853	115	1,823	Glacial sand and gravel	Hard, slightly "alkaline", iron	42	D, S	Abundant supply.
20	SE.	18	"	"	"	Bored	140	1,940	-100	1,840	140	1,800	Glacial sand	Hard, slightly "alkaline"	42	S	Sufficient supply.
21	NW.	18	"	"	"	Bored	85	1,950			85	1,865	Glacial sand	Hard, slightly "alkaline"	42	D, S	Sufficient; waters 20 head stock.
22	SE.	20	"	"	"	Bored	87	1,915	- 73	1,842	87	1,828	Glacial sand	Hard, iron	40	D, S	Sufficient; several dugouts for stock.
23	NW.	23	"	"	"	Bored	40	1,960	- 34	1,926	40	1,920	Glacial drift	Hard, iron	43	D, S	Sufficient waters 18 head stock; 16-foot well unused at present.
24	NE.	23	"	"	"	Dug	24	1,980	- 20	1,960	24	1,956	Glacial drift	Hard, slightly "alkaline"	43	D, S	Insufficient; 20-foot well used for stock.
25	SE.	24	"	"	"	Bored	40	2,030	- 34	1,996	40	1,990	Glacial drift	Hard, iron		S	Sufficient; waters 8 head stock.
26	SW.	25	"	"	"	Bored	37	1,995	- 23	1,972	37	1,958	Glacial drift	Hard, iron	43	D, S	Insufficient; waters 8 head stock; 22-and 24-foot wells for stock.
27	NE.	26	"	"	"	Bored	110	2,005	- 90	1,915	110	1,895	Glacial drift	Hard, "alkaline"		D, S	Sufficient for 10 head stock; 12-foot well, small supply; unused.

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 RUDY, NO. 284, SASKATCHEWAN.

B 4-4
1860—10,000

WELL No.	LOCATION ¼	Sec.	Tp.	Rge.	Mer.	TYPE OF WELL	DEPTH OF WELL	ALTITUDE WELL (above sea level)	HEIGHT TO WHICH WATER WILL RISE Above (+) Below (−) Surface	Elev.	PRINCIPAL WATER-BEARING BED Depth	Elev.	Geological Horizon	CHARACTER OF WATER	TEMP. OF WATER (in°F.)	USE TO WHICH WATER IS PUT	YIELD AND REMARKS
28	SW.	27	28	6	3	Bored	49	1,950			49	1,901	Glacial sand	Hard, iron	41	D, S	Sufficient; waters 20 head stock.
29	NW.	28	"	"	"	Bored	64	1,950	- 30	1,920	64	1,886	Glacial gravel	Hard	41	D, S	Insufficient; waters 12 head stock; 16-foot well yields 3 barrels a day; at times water is hauled.
30	SE.	28	"	"	"	Dug	11	1,923	- 6	1,919	11	1,914	Glacial sand	Hard		S	Sufficient supply.
31	SE.	30	"	"	"	Dug	36	1,910	- 36	1,874	36	1,872	Glacial sand	Soft	40	D, S	Sufficient supply.
32	NW.	30	"	"	"	Bored	65	1,925	- 30	1,895	65	1,860	Glacial drift	Hard, iron	42	D, S	Sufficient; waters 12 head stock; 10-foot well yields fair supply.
33	NE.	31	"	"	"	Dug	40	1,890	- 10	1,880	40	1,850	Glacial sand	Hard, iron, "alkaline"	42	D, S	Ample supply.
34	NW.	33	"	"	"	Bored	21	1,890	- 10	1,880	21	1,869	Glacial drift	Hard, slightly "alkaline"	44	D, S	
35	NE.	34	"	"	"	Dug	38	1,955	- 11	1,944	38	1,957	Glacial drift	Hard, iron, "alkaline", cloudy	42	S	Ample for 60 head stock.
36	NW.	36	"	"	"	Bored	45	2,010	- 35	1,975	45	1,965	Glacial sand	Hard, iron, "alkaline"	43	S	Insufficient supply; 25-foot well for stock; drinking water hauled.
37	NE.	36	"	"	"	Drilled	66	2,000	- 76	1,924	66	1,914	Glacial drift	Hard "alkaline"		S	Intermittent supply; dry at present; 20-foot well yields small supply; several dry holes 8 to 20 feet deep; water hauled.
1	NW.	1	28	7	3	Bored	80	1,910			80	1,830	Glacial sand	Hard, "alkaline"		S	Sufficient for stock need; drinking water hauled.
2	SW.	1	"	"	"	Dug	14	1,890	- 10	1,880	14	1,870	Glacial sand	Soft		D, S	Intermittent supply; 114-foot well unfit for use.
3	SW.	2	"	"	"	Bored	48	1,870	- 23	1,847	48	1,822	Glacial sand	Very hard, "alkaline"	42	S	Sufficient; yields 25 barrels a day; 16-foot well for house use.
4	NE.	4	"	"	"	Bored	170	1,825			170	1,655	Glacial sand	Hard, "alkaline"	44	S	Sufficient supply; also well for house use.
5	SE.	4	"	"	"	Bored	60	1,840			60	1,780	Glacial sand	Hard, "alkaline"		S	Sufficient for 15 head stock; drinking water hauled.
6	SW.	4	"	"	"	Bored	80	1,820			80	1,740	Glacial sand	Hard, iron, "alkaline"		S	Waters 6 head stock; 25-foot well used for house.
7	SE.	8	"	"	"	Dug	24	1,790	- 20	1,770	24	1,766	Glacial gravel and sand	Hard, iron, "alkaline"	42	D, S	Insufficient; waters 17 head stock.
8	SW.	9	"	"	"	Drilled	135	1,790	- 25	1,765	135	1,655	Glacial sand	Hard, iron		D, S	Sufficient; waters 16 head stock.
9	NW.	10	"	"	"	Bored	60	1,850	- 50	1,800	60	1,790	Glacial blue sand	Hard, "alkaline"	42	S	Insufficient; waters 10 head stock.
10	NE.	10	"	"	"	Drilled	395	1,855	-130	1,725	395	1,460	Belly River	Hard, salty		S	Ample supply.
11	SE.	10	"	"	"	Bored	80	1,845									Dry hole; base in glacial drift.
12	SW.	12	"	"	"	Bored	117	1,910			117	1,793	Marine Shale series	Soft	41	D, S	Insufficient; waters 3 head stock; dugout that goes dry in summer.
13	NW.	12	"	"	"	Bored	75	1,915	- 65	1,850	75	1,840	Glacial drift	Hard, iron, "alkaline"	41	S	Sufficient; waters 15 head stock; 14-foot seepage well for house.
14	NE.	12	"	"	"	Bored	80	1,930	- 77	1,853	80	1,850	Glacial sand	Hard, iron, "alkaline"	41	D, S	Sufficient; waters 20 head stock; 30-foot dry hole base in glacial drift.
15	NE.	14	"	"	"	Dug	45	1,910	- 41	1,869	45	1,865	Glacial sand	Hard	42	D, S	Sufficient supply.
16	SE.	16	"	"	"	Drilled	300	1,835			300	1,535	Belly River	Soft, salty	42	S,	Ample supply;30-foot well 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 RUDY, NO. 284, SASKATCHEWAN.

B 4-4
1860—10,000

WELL No.	LOCATION ¼	Sec.	Tp.	Rge.	Mer.	TYPE OF WELL	DEPTH OF WELL	ALTITUDE WELL (above sea level)	HEIGHT TO WHICH WATER WILL RISE Above (+) Below (−) Surface	Elev.	PRINCIPAL WATER-BEARING BED Depth	Elev.	Geological Horizon	CHARACTER OF WATER	TEMP. OF WATER (in°F.)	USE TO WHICH WATER IS PUT	YIELD AND REMARKS
17	NW.	16	28	7	3	Drilled	208	1,825			208	1,617	Belly River	Hard, soda, salty, iron, "alkaline"	42	S	Ample supply.
18	NE.	17	"	"	"	Drilled	210	1,810	- 60	1,750	210	1,600	Belly River	Hard, salty, soda, iron, "alkaline"	42	S	Ample supply.
19	NW.	17	"	"	"	Dug	35	1,750	- 22	1,728	35	1,715	Glacial drift	Hard	42	D, S	Ample supply; spring provides "alkaline" water for stock use.
20	SE.	17	"	"	"	Dug	22	1,780	- 18	1,762	22	1,756	Glacial drift	Hard		D, S	Insufficient supply.
21	SW.	18	"	"	"	Dug	30	1,750			30	1,720	Glacial drift	Hard, "alkaline"	42	D, S	Insufficient; waters 5 horses; 2 other wells also insufficient;
22	SW.	20	"	"	"	Dug	35	1,860	- 23	1,837	35	1,825	Glacial gravel	Hard, slightly "alkaline"	42	D, S	Ample supply; spring yields hard "alkaline" water.
23	NW.	20	"	"	"	Dug	35	1,835	- 29	1,806	35	1,800	Glacial gravel	Hard, iron, slightly "alkaline"	41	D, S	Sufficient for 50 head stock.
24	NW.	21	"	"	"	Dug	20	1,820	- 16	1,804	20	1,800	Glacial sand	Soft	44	D, S	Sufficient for 2 head stock.
25	NE.	21	"		"	Dug	22	1,855	- 2	1,853	22	1,833	Glacial sand	Soft	44	D, S	Insufficient; intermittent supply.
26	NW.	22	"	"	"	Bored	105	1,855	- 35	1,820	105	1,750	Glacial drift	Hard, iron, "alkaline"	42	S	Sufficient supply.
27	SW.	22	"	"	"	Bored	37	1,850			37	1,813	Glacial drift	Hard, iron, "alkaline"	42	D, S	Sufficient; waters 20 head stock.
28	SE.	22	"	"	"	Dug	20	1,855	- 14	1,841	20	1,835	Glacial sand	Soft	43	D, S	Sufficient supply.
29	NE.	22	"	"	"	Bored	105	1,860			105	1,755	Glacial sand	Hard, iron, "alkaline"	42	S	Abundant supply.
30	SW.	23	"	"	"	Dug	20	1,855	- 6	1,849	20	1,835	Glacial sand	Hard, iron, "alkaline"	42	S	Insufficient; waters 6 head only; 60-foot dry hole; base in glacial drift.
31	SW.	24	"	"	"	Dug	18	1,900	- 14	1,886	18	1,882	Glacial sand	Soft	41	D, S	Ample supply for 30 head stock.
32	NE.	25	"	"	"	Dug	35	1,930	- 31	1,899	35	1,895	Glacial sand	Hard	41	D, S	Sufficient for 20 head stock.
33	SE.	26	"	"	"	Dug	30	1,910	- 26	1,884	30	1,880	Glacial sand	Hard	41	D, S	Sufficient; waters 20 head stock.
34	NW.	27	"	"	"	Dug	20	1,870			20	1,850	Glacial sand	Soft	43	D, S	Insufficient supply.
35	SW.	28	"	"	"	Dug	27	1,840			27	1,813	Glacial sand	Hard, iron	43	D, S	Just sufficient for 15 head stock.
36	NE.	29	"	"	"	Dug	27	1,810	- 20	1,790	27	1,783	Glacial sand	Hard, iron, "alkaline"	43	S	Sufficient; waters 20 head stock; 27-foot well for house use.
37	SE.	30	"	"	"	Dug	33	1,790			33	1,757	Glacial sand	Hard, "alkaline"	43	S	Sufficient; waters 60 head stock; 27-foot well for house use.
38	SW.	31	"	"	"	Bored	37	1,775	- 27	1,748	37	1,738	Glacial gravel	Hard, iron, slightly "alkaline"	41	D, S	Sufficient; waters 20 head stock.
39	NW.	31	"	"	"	Dug	40	1,790	- 26	1,764	40	1,750	Glacial gravel	Hard	43	D, S	Sufficient; waters 14 head stock; 35-foot well used for poultry.
40	SW.	32	"	"	"	Dug	29	1,800	- 24	1,776	29	1,771	Glacial sand	Hard		D, S	Intermittent supply.
41	SW.	34	"	"	"	Bored	62	1,870	- 42	1,828	62	1,808	Glacial sand	Hard, slightly "alkaline"	42	D, S	Ample 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 RUDY, NO. 284, SASKATCHEWAN.

B 4-4
1860—10,000

WELL No.	LOCATION ¼	Sec.	Tp.	Rge.	Mer.	TYPE OF WELL	DEPTH OF WELL	ALTITUDE WELL (above sea level)	HEIGHT TO WHICH WATER WILL RISE Above (+) Below (−) Surface	Elev.	PRINCIPAL WATER-BEARING BED Depth	Elev.	Geological Horizon	CHARACTER OF WATER	TEMP. OF WATER (in°F.)	USE TO WHICH WATER IS PUT	YIELD AND REMARKS
42	NE.	34	28	7	3	Bored	100	1,850									Dry hole; base in Glacial drift; 45-foot well supplies 2 barrels a day.
43	NW.	35	"	"	"	Dug	10	1,880	- 7	1,873	10	1,870	Glacial quicksand	Soft	44	D, S	Sufficient; yields 2 tanks a day.
44	SW.	35	"	"	"	Bored	35	1,890	- 20	1,870	35	1,855	Glacial drift	Hard, iron, "alkaline"	42	S	Sufficient; waters 10 head stock.
45	SE.	35	"	"	"	Dug	20	1,925	- 16	1,909	20	1,905	Glacial sand	Soft	42	S	Sufficient; yields 14 barrels a day; 18-foot well for house use.
46	SW.	36	"	"	"	Dug	17	1,925	- 12	1,913	17	1,908	Glacial sand	Soft	41	D, S	Sufficient supply.
47	SE.	36	"	"	"	Dug	18	1,950	- 14	1,936	18	1,932	Glacial sand	Soft	41	D, S	Ample supply.
1	NW.	35	28	8	3	Dug	20	1,750			20	1,730	Glacial sand	Hard	42	D, S	Insufficient; waters 4 head stock.
1	SE.	1	29	6	3	Dug	20	2,000	- 15	1,985	20	1,980	Glacial drift	Soft	44	D, S	Sufficient along with 2 similar wells.
2	SW.	2	"	"	"	Dug	14	1,975	- 10	1,965	14	1,961	Glacial sand	Hard, "alkaline"	42	D	Sufficient only for house use.
3	SW.	2	"	"	"	Bored	90	1,965	- 30	1,935	90	1,875	Glacial sand	Hard, "alkaline"	40	S	Sufficient supply; several dry holes.
4	SE.	4	"	"	"	Dug	30	1,900			30	1,870	Glacial sand	Hard, iron, "alkaline"	42	S	Sufficient; waters 15 head stock; several shallow wells with large supply for stock; drinking water hauled.
5	NW.	4	"	"	"	Bored	90	1,910	- 30	1,880	90	1,820	Glacial drift	Hard, iron, "alkaline"	41	S	Sufficient; used only in winter.
6	NW.	5	"	"	"	Dug	30	1,880			30	1,850	Glacial sand	Hard, iron, slightly "alkaline"	41	D, S	Sufficient; waters 6 head stock at present; well for stock in pasture.
7	SE.	7	"	"	"	Bored	156	1,875	- 54	1,821	156	1,717	Glacial drift	Hard, iron, "alkaline"	41	S	Sufficient supply.
8	SW.	10	"	"	"	Dug	12	1,940	- 4	1,936	12	1,928	Glacial gravel	Hard	42	D, S	Sufficient in wet years; intermittent supply.
9	NW.	10	"	"	"	Bored	50	1,900			50	1,850	Glacial drift	Hard	44	D, S	Sufficient; waters 35 head stock; 50-foot well used when required.
10	SW.	11	"	"	"	Dug	18	1,900			18	1,882	Glacial drift	Soft			Good supply.
11	NW.	11	"	"	"	Dug	12	1,900	- 6	1,894	12	1,888	Glacial drift	Hard	42	D	Insufficient; yields 3 pails a day; dugout for stock; intermittent supply.
12	SW.	12	"	"	"	Bored	50	1,960	- 40	1,920	50	1,910	Glacial gravel	Hard, iron	43	D, S	Sufficient; waters 25 head stock; 9-foot well and dugout for stock.
13	SE.	13	"	"	"	Dug	20	1,980	- 18	1,962	20	1,960	Glacial drift	Hard	43	N	Water hauled.
14	SW.	13	"	"	"	Dug	35	1,950	- 27	1,923	35	1,915	Glacial drift	Hard	42	S	Insufficient; waters 4 head stock; 26-foot well for house use.
15	SE.	15	"	"	"	Bored	31	1,850	- 13	1,837	31	1,819	Glacial sand	Hard, iron, slightly "alkaline"	42	D, S	Sufficient supply.
16	SE.	16	"	"	"	Drilled	575	1,895	- 75	1,820	575	1,320	Belly River	Soft, salty	43	D, S	Ample supply.
17	SE.	17	"	"	"	Drilled	425	1,839	- 50	1,780	425	1,414	Belly River	Soft	42	D, S	Abundant supply; dam goes dry in summer; #.
18	SE.	18	"	"	"	Bored	90	1,810	- 80	1,730	90	1,720	Glacial drift	Hard, iron, "alkaline"	41	S	Ample until it caved in; 24-foot intermittent well, fairly hard water.

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

WELL RECORDS—Rural Municipality of RUDY, NO. 284, SASKATCHEWAN.

B 4-4
1860—10,000

WELL No.	LOCATION ¼	Sec.	Tp.	Rge.	Mer.	TYPE OF WELL	DEPTH OF WELL	ALTITUDE WELL (above sea level)	HEIGHT TO WHICH WATER WILL RISE Above (+) Below (−) Surface	Elev.	PRINCIPAL WATER-BEARING BED Depth	Elev.	Geological Horizon	CHARACTER OF WATER	TEMP. OF WATER (in°F.)	USE TO WHICH WATER IS PUT	YIELD AND REMARKS
19	SW.	18	29	6	3	Bored	54	1,845	- 29	1,816	54	1,791	Glacial gravel	Hard, slightly "alkaline"	42	D, S	Insufficient; waters 10 head stock only.
20	NW.	19	"	"	"	Bored	33	1,775	- 16	1,759	33	1,742	Glacial sand	Hard, iron, "alkaline"	40	S	Sufficient supply.
21	NW.	21	"	"	"	Drilled	275	1,794	- 12	1,782	275	1,519	Belly River	Soft, soda	42	D, S	Ample supply; dam that holds water all year; #.
22	SE.	22	"	"	"	Drilled	310	1,827	- 90	1,737	310	1,517	Belly River	Soft, soda	42	D, S	Ample supply.
23	NW.	23	"	"	"	Dug	20	1,885	- 6	1,879	20	1,865	Glacial gravel	Hard	42	D, S	Sufficient; waters 12 head stock easily; dam that never goes dry.
24	NE.	23	"	"	"	Bored	30	1,880	- 24	1,856	30	1,850	Glacial sand	Hard	42	D, S	Sufficient; waters 15 head stock; 45-foot well, caved in.
25	SE.	24	"	"	"	Bored	58	1,950			58	1,892	Glacial drift	Hard, iron, "alkaline"	43	S	Insufficient; waters 12 head stock; drinking water hauled.
26	NW.	26	"	"	"	Drilled	352	1,836	-200	1,636	352	1,484	Belly River	Soft, soda	42	D, S	Ample supply.
27	SE.	28	"	"	"	Drilled	235	1,830	- 40	1,790	235	1,595	Belly River	Soft, iron	42	D, S	Sufficient for 250 head stock; 50-foot dry hole; #.
28	SW.	29	"	"	"	Drilled	100	1,765			100	1,605	Glacial drift	Hard, iron, slightly "alkaline"	42	D, S	Ample supply.
29	SE.	32	"	"	"	Drilled	200	1,728	- 6	1,722	200	1,528	Belly River	Soft, soda	42	D, S	Ample supply; #.
30	NE.	32	"	"	"	Dug	24	1,782	- 9	1,773	24	1,758	Glacial drift	Hard, "alkaline"	42	D, S	Sufficient; used only for house; 25-foot well waters 16 head stock.
31	SW.	33	"	"	"	Drilled	230	1,774	- 9	1,765	230	1,544	Belly River	Fairly soft			Farm vacant.
32	SE.	34	"	"	"	Drilled	317	1,816	+ 3	1,613	317	1,499	Belly River	Soft, soda	42	D, S	Ample supply; #.
33	SW.	35	"	"	"	Drilled	357	1,835	- 20	1,815	357	1,478	Belly River	Soft, soda, reddish sediment	42	D, S	Sufficient supply; #. Dugout with intermittent supply.
34	SW.	36	"	"	"	Bored	50	1,890	- 30	1,860	50	1,840	Glacial drift	Hard, iron, "alkaline"	42	S	Sufficient; waters 20 head stock; 20-foot well for house; dugout aids stock needs.
1	SE.	2	29	7	3	Bored	65	1,900	- 35	1,865	65	1,835	Glacial sand	Hard, "alkaline"	42	S	Sufficient; waters 20 head stock; 20-foot well for domestic use.
2	NE.	2	"	"	"	Bored	120	1,875			120	1,755	Glacial sand	Hard, "alkaline"	42	S	Ample; waters 10 head stock; 60-foot well for drinking.
3	SW.	2	"	"	"	Dug	18	1,880			18	1,862	Glacial drift	Soft			
4	NW.	2	"	"	"	Bored	82	1,870	- 70	1,800	82	1,788	Glacial drift	Hard, "alkaline"	42	S	Usually waters 7 head stock; intermittent supply; 40-foot well supplies house, water hauled in late summer.
5	SE.	3	"	"	"	Bored	87	1,875	- 52	1,823	87	1,788	Glacial fine sand	Hard, slightly "alkaline"	41	S	Insufficient; yields 3 to 4 barrels a day; 24-foot well yields soft water.
6	NW.	3	"	"	"	Dug	20	1,855	- 6	1,849	20	1,835	Glacial drift	Hard	42	D, S	Intermittent supply; usually waters 10 head stock; water hauled in dry seasons.
7	NE.	4	"	"	"	Dug	16	1,830	- 14	1,816	16	1,814	Glacial gravel	Fairly hard	42	D, S	Intermittent supply; at present waters 14 head stock; water hauled in dry seasons.
8	SE.	4	"	"	"	Dug	13	1,825	- 8	1,817	13	1,812	Glacial gravel	Hard		D, S	Sufficient for 50 head stock; 65-foot well unused.
9	NW.	5	"	"	"	Dug	33	1,770	- 29	1,741	33	1,737	Glacial sand	Hard	42	S	Insufficient supply; 21-foot well for house use.
10	SE.	6	"	"	"	Bored	35	1,778	- 15	1,763	35	1,743	Glacial drift	Hard, iron, "alkaline"	41	S	Sufficient; waters 40 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 RUDY, NO. 284, SASKATCHEWAN.

B 4-4
1860—10,000

WELL No.	LOCATION ¼	Sec.	Tp.	Rge.	Mer.	TYPE OF WELL	DEPTH OF WELL	ALTITUDE WELL (above sea level)	HEIGHT TO WHICH WATER WILL RISE Above (+) Below (−) Surface	Elev.	PRINCIPAL WATER-BEARING BED Depth	Elev.	Geological Horizon	CHARACTER OF WATER	TEMP. OF WATER (in°F.)	USE TO WHICH WATER IS PUT	YIELD AND REMARKS
11	NE.	7	29	7	3	Drilled	212	1,790	- 40	1,750	212	1,578	Belly River	Soft	42	D, S	Abundant supply.
12	NW.	9	"	"	"	Drilled	263	1,820	- 60	1,760	263	1,557	Belly River	Soft		N	Vacant property.
13	SE.	9	"	"	"	Dug	24	1,840	- 14	1,826	24	1,816	Glacial gravel	Hard	42	D, S	Ample supply.
14	SE.	10	"	"	"	Drilled	376	1,861	- 65	1,796	376	1,485	Belly River	Soft, soda	42	D, S	Abundant supply; #.
15	SW.	12	"	"	"	Bored	60	1,885			60	1,825	Glacial drift	Hard, "alkaline"	42	S	Intermittent supply; 18-foot well also intermittent; dry holes to 100 feet in depth.
16	NW.	12	"	"	"	Bored	47	1,850			47	1,803	Glacial sand and gravel	Hard, "alkaline"	42	S	Sufficient for 20 head stock.
17	SE.	13	"	"	"	Bored	50	1,840	- 8	1,832	50	1,790	Glacial drift	Hard, slightly "alkaline"	42	S	Sufficient supply.
18	NE.	13	"	"	"	Dug	20	1,835	- 17	1,818	20	1,815	Glacial gravel	Soft, iron	42	D	Sufficient for domestic use; 20-foot well waters 40 head stock.
19	NW.	14	"	"	"	Dug	30	1,820	- 28	1,792	30	1,790	Glacial drift	Hard	42	D, S	Sufficient with aid of two dugouts
20	SW.	15	"	"	"	Drilled	350	1,835	-100	1,735	350	1,485	Belly River	Hard, iron, "alkaline"	42	S	Ample; has supplied 30 barrels a day; drinking water hauled.
21	NW.	16	"	"	"	Dug	18	1,825	- 12	1,813	18	1,807	Glacial gravel	Hard	42	D, S	Intermittent supply; two similar wells; water hauled in dry summers.
22	NW.	18	"	"	"	Dug	20	1,780	- 19	1,761	20	1,760	Glacial sand	Hard	43	D	Sufficient only for house use; 30-foot and 20-foot wells for stock use.
23	SW.	19	"	"	"	Dug	16	1,767	- 11	1,756	16	1,751	Glacial sand	Hard	46	D, S	Sufficient; waters 35 head stock; also similar well.
24	SW.	21	"	"	"	Dug	25	1,810			25	1,785	Glacial sand	Hard	42	D, S	Sufficient for 25 head stock.
25	NW.	21	"	"	"	Bored	120	1,790			120	1,670	Glacial drift	Hard, iron, "alkaline"	42	S	Ample supply.
26	NW.	22	"	"	"	Bored	70	1,800	- 40	1,760	70	1,730	Glacial drift	Hard, iron, "alkaline"	42	S	Just sufficient for 9 head stock; 12-foot well supplies drinking water.
27	SW.	22	"	"	"	Dug	18	1,820	- 14	1,806	18	1,802	Glacial sand	Hard, iron, "alkaline"	42	D, S	Intermittent supply; several dry holes around 20 feet; water hauled.
28	SW.	23	"	"	"	Bored	60	1,810			60	1,750	Glacial sand	Very hard, "alkaline"	42	S	Sufficient for 25 head stock; 20-foot well too "alkaline" for use.
29	NW.	23	"	"	"	Drilled	119	1,800	- 14	1,786	119	1,681	Glacial sand and gravel	Hard, iron, "alkaline"		D, S	Sufficient supply; an unused 10-foot well.
30	SE.	25	"	"	"	Bored	60	1,775	- 12	1,763	60	1,695	Glacial drift	Hard, iron, "alkaline"	42	D, S	Ample supply.
31	NW.	25	"	"	"	Bored	40	1,760			40	1,720	Glacial drift	Hard, "alkaline"	42	D, S	Sufficient supply.
32	NE.	25	"	"	"	Bored	34	1,773	- 6	1,767	34	1,739	Glacial quicksand	Hard, iron, "alkaline"	42	D, S	Ample supply; flowed until quicksand filled in; 20-foot well for house.
33	NW.	27	"	"	"	Drilled	127	1,775			127	1,648	Glacial sand	Hard, iron	42	S	Ample supply; 40-foot well for drinking.
34	NW.	30	"	"	"	Dug	10	1,757	- 7	1,750	10	1,747	Glacial sand	Hard, "alkaline"	43	S	Sufficient; waters 10 head stock; second well used for domestic purposes.
35	NE.	32	"	"	"	Drilled	200	1,800			200	1,600	Glacial sand	Hard, iron, "alkaline"	44	S	Ample supply; drinking water hauled.
36	SW.	32	"	"	"	Dug	14	1,765	- 7	1,758	14	1,751	Glacial drift			D, S	Sufficient supply.
37	SW.	33	"	"	"	Dug	20	1,810	- 13	1,797	20	1,790	Glacial drift	Hard, "alkaline"	42	D, S	Intermittent supply; similar well.

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

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

WELL RECORDS—Rural Municipality of RUDY, NO. 284, SASKATCHEWAN.

B 4-4
1860—10,000

WELL No.	LOCATION ¼	Sec.	Tp.	Rge.	Mer.	TYPE OF WELL	DEPTH OF WELL	ALTITUDE WELL (above sea level)	HEIGHT TO WHICH WATER WILL RISE Above (+) Below (−) Surface	Elev.	PRINCIPAL WATER-BEARING BED Depth	Elev.	Geological Horizon	CHARACTER OF WATER	TEMP. OF WATER (in°F.)	USE TO WHICH WATER IS PUT	YIELD AND REMARKS
38	SW.	34	29	7	3	Drilled	222	1,765	- 50	1,715	222	1,543	Belly River	Soft, soda		D, S	Ample supply; #.
39	NW.	35	"	"	"	Drilled	230	1,743			230	1,513	Belly River	Soft, soda		D, S	Abundant supply; waters 20 head stock.
40	SE.	35	"	"	"	Dug	24	1,760	- 20	1,740	24	1,736	Glacial sand	Soft		D, S	Insufficient; waters only 4 head stock; dugout used.
1	NE.	9	29	8	3	Bored	30	1,790	- 25	1,765	30	1,760	Glacial drift	Hard, slightly "alkaline"	42	D	Sufficient for house use; stock watered at river.
2	NE.	10	"	"	"	Bored	30	1,795	- 27	1,768	30	1,765	Glacial drift	Hard, slightly "alkaline"	43	D	Insufficient; waters house only; several dry holes.
3	SE.	10	"	"	"	Dug	22	1,790	- 9	1,781	22	1,768	Glacial sand	Hard, "alkaline"	43	D, S	Insufficient; waters 2 head stock.
4	NE.	12	"	"	"	Dug	24	1,773	- 20	1,753	24	1,749	Glacial gravel	Hard		D, S	Sufficient for 10 head stock; 13-foot dry hole; 17-foot well supplies 30 head stock.
5	SE.	12	"	"	"	Bored	28	1,770	- 20	1,750	28	1,742	Glacial sand	Hard		D, S	Sufficient for 30 head stock.
6	NE.	13	"	"	"	Dug	25	1,760	- 20	1,740	25	1,735	Glacial sand	Soft	43	S	Usually sufficient for 15 head stock; 40-foot well supplies house.
7	NW.	14	"	"	"	Bored	28	1,780	- 14	1,766	28	1,752	Glacial drift	Hard	42	D, S	Insufficient supply; waters 6 head stock; 10-foot well in valley waters 15 head stock.
8	NW.	23	"	"	"	Dug	15	1,740	- 30	1,710	15	1,725	Glacial gravel	Hard	42	D, S	Sufficient; waters 10 head stock; 15-foot similar well.
9	NE.	23	"	"	"	Dug	10	1,730	- 8	1,722	10	1,720	Glacial gravel	Hard, slightly "alkaline"	43	D, S	Sufficient; waters 20 head stock; 15-foot well unused.
10	NW.	25	"	"	"	Dug	18	1,738	- 9	1,729	18	1,720	Glacial sand	Hard	44	D, S	Sufficient supply.
11	NE.	26	"	"	"	Dug	14	1,738	- 10	1,728	14	1,724	Glacial sand	Soft	42	S	Sufficient; waters 15 head stock; 24-foot well for house use.
12	SE.	27	"	"	"	Bored	52	1,750	- 27	1,723	52	1,698	Glacial fine sand	Hard	43	D, S	Sufficient; waters 30 head stock; 18-foot well caved in, small supply.
13	NE.	34	"	"	"	Sand-point	25	1,760	- 15	1,745	25	1,735	Glacial sand	Hard	42	D, S	Sufficient supply; 25-foot well for stock used.
14	NW.	35	"	"	"	Sand-point	25	1,755	- 15	1,740	25	1,730	Glacial sand	Hard	42	D, S	Ample supply.
15	SW.	35	"	"	"	Bored	45	1,755			45	1,710	Glacial gravel	Hard	43	D, S	Insufficient; waters 8 head stock; 18-foot well with ample supply.
16	SW.	36	"	"	"	Sand-point	17	1,735			17	1,718	Glacial sand	Soft	43	D, S	Sufficient for 15 head stock; sand-point well for house purposes.
1	SW.	2	30	6	3	Drilled	240	1,816	-100	1,716	240	1,576	Belly River	Slightly salty		D, S	Vacant farm; water laxative.
2	SW.	4	"	"	"	Drilled	202	1,760	+ 2	1,762	202	1,558	Belly River	Soft, soda		D, S	Oversufficient supply; #.
3	NE.	6	"	"	"	Bored	85	1,740	- 30	1,710	85	1,655	Glacial drift	Hard, "alkaline"		S	Very laxative; hauls water; a dugout which is also insufficient.
4	NW.	6	"	"	"	Bored	85	1,740	- 15	1,725	85	1,655	Glacial drift	Very "alkaline", salty		N	Unfit for any use; will kill stock; farm vacant.
5	SE.	9	30	6	3	Bored	21	1,790	- 14	1,776	21	1,769	Glacial gravel	Hard		D, S	Abundant supply; used by neighbours.
6	NW.	10	"	"	"	Bored	30	1,795	- 26	1,769	30	1,765	Glacial gravel	Hard, iron, slightly "alkaline"		D, S	Abundant supply; 9-foot well in house for domestic use.
7	SW.	10	"	"	"	Bored	26	1,790	- 24	1,766	26	1,764	Glacial quicksand	Hard		D, S	Abundant supply.
8	NW.	11	"	"	"	Drilled	100	1,807	- 30	1,777	100	1,707	Belly River	Soft, soda		D, S	Abundant 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 RUDY, NO. 284, SASKATCHEWAN.

B 4-4
1860—10,000

WELL No.	LOCATION ¼	Sec.	Tp.	Rge.	Mer.	TYPE OF WELL	DEPTH OF WELL	ALTITUDE WELL (above sea level)	HEIGHT TO WHICH WATER WILL RISE Above (+) Below (−) Surface	Elev.	PRINCIPAL WATER-BEARING BED Depth	Elev.	Geological Horizon	CHARACTER OF WATER	TEMP. OF WATER (in°F.)	USE TO WHICH WATER IS PUT	YIELD AND REMARKS
9	NW.	12	30	6	3	Drilled	230	1,801	- 30	1,771	230	1,571	Belly River	Soft			
10	NE.	15	"	"	"	Drilled	500	1,829	-150	1,679	500	1,329	Belly River	Soft, salty, gaseous		N	Too salty for human or stock use.
11	SE.	15	"	"	"	Dug	37	1,809	- 28	1,781	37	1,772	Glacial gravel	Hard		D, S, I	Sufficient for house and 25 head stock.
12	NW.	16	"	"	"	Dug	41	1,760	- 27	1,733	41	1,719	Glacial sand	Hard, slightly "alkaline"		D, S	Sufficient for 16 head stock.
13	SE.	17	"	"	"	Drilled	400	1,753			400	1,353	Belly River	Soft, soda, salty		S	Hauls drinking water; #.
14	SW.	17	"	"	"	Drilled	160	1,745			160	1,585	Belly River	Soft, soda		S	Sufficient for 100 head stock; small flow; #.
15	NW.	18	"	"	"	Dug	14	1,740	- 10	1,730	14	1,726	Glacial drift	Hard, slightly "alkaline"		D, S	Insufficient supply; hauls water; also 17- and 18-foot wells.
16	NE.	20	"	"	"	Dug	16	1,750	- 13	1,737	16	1,734	Glacial drift	Hard, iron		D, S	Supply insufficient; hauls for house and stock; also two 15-foot wells.
17	NW.	20	"	"	"	Dug	15	1,750	- 13	1,737	15	1,735	Glacial sand	Hard, "alkaline"		D, S	Insufficient; hauls water; also two similar wells, abandoned.
18	NW.	21	"	"	"	Bored	47	1,750	- 37	1,713	47	1,703	Glacial drift			S	Insufficient; hauls water; also 19-foot intermittent well for house.
19	SE.	22	"	"	"	Drilled	430	1,773	-150	1,623	430	1,343	Belly River	Soft, salty		S	
20	NW.	27	"	"	"	Dug	13	1,750	- 10	1,740	13	1,737	Glacial drift	Hard		S	Sufficient for 40 head sheep and 8 horses.
21	SW.	28	"	"	"	Dug	14	1,750	- 11	1,739	14	1,736	Glacial drift	Hard		D, S, I	Sufficient; has only 4 head stock; 40-foot well too salty for use--filled in; 43-foot well, small supply--filled in.
22	NW.	28	"	"	"	Dug	9	1,750	- 8	1,742	9	1,741	Glacial drift	Hard		D, S	Intermittent supply; hauls water.
23	NE.	30	"	"	"	Dug	19	1,735	- 18	1,717	19	1,716	Glacial drift	Hard		D, S	Sufficient supply.
24	SW.	30	"	"	"	Dug	20	1,743	- 13	1,730	20	1,723	Glacial sand	Hard		D, S	Insufficient; hauls water for 15 head stock and 50 sheep.
25	NW.	31	"	"	"	Bored	20	1,740	- 13	1,727	20	1,720	Glacial sand	Hard		D, S	Insufficient supply.
26	NE.	32	"	"	"	Dug	22	1,770	- 21	1,749	22	1,748	Glacial sand	Hard	42	D, S	Sufficient for 30 head stock.
27	SE.	32	"	"	"	Dug	21	1,745	- 19	1,726	21	1,724	Glacial sand	Hard		D, S	Sufficient for 8 head stock.
28	NW.	33	"	"	"	Dug	20	1,740	- 18	1,722	20	1,720	Glacial sand	Hard		D, S	Sufficient for 13 head stock.
29	NW.	34	"	"	"	Dug	22	1,770	- 21	1,749	22	1,748	Glacial drift	Hard	42	D, S	Insufficient; supplies house and two horses; a second well of salty water and pond used for stock.
1	NW.	1	30	7	3	Dug	16	1,750	- 14	1,736	16	1,734	Glacial sand	Hard		D	Water hauled for stock.
2	NW.	3	"	"	"	Dug	19	1,755	- 17	1,738	19	1,736	Glacial drift	Hard		D	Insufficient for house and 4 head stock; 3 other wells for stock--insufficient.
3	SE.	3	"	"	"	Drilled	220	1,745	- 60	1,685	220	1,525	Belly River	Soft		D, S	Sufficient supply; #.
4	NE.	4	"	"	"	Dug	17	1,750	- 13	1,737	17	1,733	Glacial drift	Hard			Sufficient; farm abandoned.
5	SE.	6	"	"	"	Dug	15	1,780	- 14	1,766	15	1,765	Glacial quicksand	Hard		D	Enough only for house use; dugout used for stock; at times water is hauled.
6	NW.	7	"	"	"	Dug	14	1,760	- 13	1,747	14	1,746	Recent sand	Fairly hard		D	Dugout for stock always adequate for 6 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 RUDY, NO. 284, 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				
7	SW.	7	30	7	3	Dug	11	1,760	- 9	1,751	11	1,749	Recent sand	Fairly soft		D, S	Sufficient; waters 12 head stock.
8	SE.	7	"	"	"	Dug	12	1,780	- 11	1,769	12	1,768	Recent sand	Fairly hard		D, S	Barely enough for house and 25 head stock; similar well 9 feet in depth.
9	NE.	9	"	"	"	Dug	23	1,750	- 19	1,731	23	1,727	Glacial quick-sand	Hard		D, S	Sufficient; waters 50 head stock; 20-foot all purpose well and dugout completes the supply.
10	SW.	9	"	"	"	Dug	20	1,750	- 18	1,732	20	1,730	Glacial sand	Hard		D	Insufficient for house; 18-foot well used for all purposes; water hauled; 60-foot dry hole.
11	NW.	10	"	"	"	Dug	14	1,750	- 10	1,740	14	1,736	Glacial drift	Hard		D, S	Sufficient supply; also 25-foot domestic well.
12	SW.	10	"	"	"	Bored	26	1,750	- 15	1,735	26	1,724	Glacial drift	Hard			Large supply; farm vacant.
13	SE.	12	"	"	"	Bored	19	1,760	- 12	1,748	19	1,741	Glacial drift	Hard			Farm vacant.
14	SW.	13	"	"	"	Bored	40	1,760	- 15	1,745	40	1,720	Glacial drift	Hard			Farm vacant.
15	SW.	15	"	"	"	Dug	19	1,750	- 16	1,734	19	1,731	Glacial drift	Hard		D, S	Sufficient; waters 8 head stock.
16	SE.	16	"	"	"	Dug	18	1,750	- 13	1,737	18	1,732	Glacial sand	Hard		D, S	Sufficient; waters 30 head stock.
17	NE.	19	"	"	"	Dug	18	1,760			18	1,742	Glacial drift	Hard		D, S	Insufficient; 3 similar wells provide just enough for house; hauls water.
18	SW.	19	"	"	"		31	1,770	- 15	1,755	31	1,739	Glacial drift	Hard			Farm vacant.
19	SW.	19	"	"	"	Bored	35	1,760			35	1,725	Glacial drift	Hard		S	Farm vacant.
20	NW.	20	"	"	"	Dug	28	1,760	- 21	1,739	28	1,732	Glacial drift	Hard		D, S	Insufficient supply; also two 24-foot seepage wells near slough; water hauled, when slough is dry.
21	NW.	20	"	"	"	Dug	20	1,760	- 19	1,741	20	1,740	Glacial sand	Hard		D, S	Just sufficient for house and 18 head stock; 25-foot well used for stock; 30-foot well was used for house, needs repairs.
22	NW.	21	"	"	"	Dug	21	1,750	- 20	1,730	21	1,729	Glacial drift	Hard			Place vacant.
23	NE.	22	"	"	"	Dug	20	1,760	- 18	1,742	20	1,740	Glacial quick-sand	Hard		S	Insufficient supply; cistern for house use.
24	NW.	23	"	"	"	Dug	18	1,760	- 12	1,748	18	1,742	Glacial sand	Hard		D, S	Sufficient; waters 10 head stock.
25	SW.	24	"	"	"	Drilled	245	1,760	-120	1,640	245	1,515	Belly River	Salty		D, S	Sufficient for house and 35 head stock; #. 19-foot well on SE.¼, section 24, used for house.
26	NW.	25	"	"	"	Drilled	250	1,760			250	1,510	Belly River	Soft, salty		S	Waters 20 head stock; #. 18-foot well for domestic use.
27	SW.	26	"	"	"	Dug	18	1,740	- 15	1,725	18	1,722	Glacial quick-sand	Hard		D, S	Insufficient; supplies house; water hauled in dry seasons.
28	NE.	28	"	"	"	Dug	15	1,750	- 11	1,739	15	1,735	Glacial gravel	Hard, iron, "alkaline"		S	Waters 25 head stock; rain water filtered for drinking; also use spring in slough.
29	SE.	28	"	"	"	Dug	17	1,750	- 16	1,734	17	1,733	Glacial sand	Moderately hard		D, S	Sufficient only for house; 20-foot well used for stock; occasionally water hauled.
30	SE.	29	"	"	"	Drilled	233	1,760	- 53	1,707	233	1,527	Belly River	Salty, soda		S	Sufficient for stock; rain water used for house; water hauled for house in dry seasons;#.
31	NW.	30	"	"	"	Dug	25	1,760			25	1,735	Glacial drift	Hard		D	Sufficient only for house use; water hauled for stock.

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

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

B 4-4
R. 7526

WELL RECORDS—Rural Municipality of RUDY, NO. 284, SASKATCHEWAN.

WELL No.	LOCATION ¼	Sec.	Tp.	Rge.	Mer.	TYPE OF WELL	DEPTH OF WELL	ALTITUDE WELL (above sea level)	HEIGHT TO WHICH WATER WILL RISE Above (+) Below (−) Surface	Elev.	PRINCIPAL WATER-BEARING BED Depth	Elev.	Geological Horizon	CHARACTER OF WATER	TEMP. OF WATER (in °F.)	USE TO WHICH WATER IS PUT	YIELD AND REMARKS
32	SE.	30	30	7	3	Dug	20	1,770			20	1,750	Glacial drift	Hard		D, S	Insufficient; hauled water; place now vacant.
33	NE.	30	"	"	"	Dug	18	1,770	- 14	1,756	18	1,752	Glacial drift	Hard		D, S	Sufficient only for house; haul water for stock; dry hole present.
34	SW.	30	"	"	"	Dug	20	1,770	- 17	1,753	20	1,750	Glacial sand	Hard		S	Waters only 8 head stock; similar well supplies house.
35	SW.	31	"	"	"	Dug	18	1,780	- 11	1,769	18	1,762	Glacial drift	Hard, slightly "alkaline"		D	Insufficient supply; two similar wells; water hauled.
36	NE.	32	"	"	"	Dug	40	1,770	- 22	1,748	40	1,730	Glacial sand	Hard		D, S	Sufficient for house and 20 head stock.
37	SE.	32	"	"	"	Drilled	276	1,760	- 80	1,680	276	1,484	Belly River	Soft		S	
38	SW.	32	"	"	"	Drilled	320	1,770	-120	1,650	320	1,450	Belly River	Soft, salty		S	Supplies 26 head stock; 18-foot well for domestic use; #.
39	SE.	33	"	"	"	Dug	18	1,760	- 15	1,745	18	1,742	Glacial fine sand	Hard	43	D, S	Sufficient; waters 12 head stock.
40	NE.	33	"	"	"	Dug	20	1,760	- 18	1,742	20	1,740	Glacial drift		40		
41	SE.	34	"	"	"	Dug	24	1,750	- 24	1,726	24	1,726	Glacial fine sand	Hard, slightly "alkaline"	41	D	Insufficient along with 18-foot well for house and 16 head stock.
42	SE.	35	"	"	"	Dug	20	1,770	- 19	1,751	20	1,750	Glacial drift				
43	NE.	35	"	"	"	Dug	21	1,770	- 19	1,751	21	1,749	Glacial drift	Hard		D, S	Insufficient supply.
44	NE.	36	"	"	"	Bored	41	1,770	- 25	1,745	41	1,729	Glacial sand	Very hard, iron	42	S	Sufficient along with two other wells one of which supplies house.
1	SE.	1	30	8	3	Dug	14	1,750	- 12	1,738	14	1,736	Glacial sand	Hard		D, S	Sufficient for house and 13 head stock.
2	SE.	2	"	"	"	Dug	16	1,750	- 14	1,736	16	1,734	Glacial quicksand	Hard		D, S	Sufficient for house and 14 head stock; 22-foot sand-point well, large supply soft water for all purposes.
3	SE.	2	"	"	"	Dug	18	1,750	- 17	1,733	18	1,732	Glacial drift			N	Well contaminated.
4	NE.	2	"	"	"	Bored & Sandpoint	26	1,760			26	1,734	Recent sand	Hard		D, S	Sufficient for house and 25 head stock.
5	NW.	2	"	"	"	Bored	21	1,760	- 19	1,741	21	1,739	Glacial sand	Fairly soft		S	Sufficient for 40 head stock; sand-point well supplies all house needs.
6	NE.	3	"	"	"	Dug	34	1,750	- 31	1,719	34	1,716	Glacial quicksand	Hard		D, S	Sufficient for house and 23 head stock.
7	NE.	10	"	"	"	Dug		1,720					Recent sand	Soft		D, S	Sufficient for house and 13 head stock; #.
8	NE.	13	"	"	"	Dug	15	1,750	- 13	1,737	15	1,735	Glacial sand	Hard		D	Sufficient only for house; dugout all year round; used for stock.
9	NE.	14	"	"	"	Dug		1,720	- 6	1,714			Glacial drift				Farm vacant.
10	NW.	14	"	"	"	Dug	14	1,710	- 12	1,698	14	1,696	Glacial blue sand	Hard, iron		D, S	Sufficient; waters 20 head stock; #. Water in creek for stock.
11	NE.	23	"	"	"	Dug	20	1,690	- 18	1,672	20	1,670	Glacial fine sand	Hard, slightly "alkaline"		D, S	Sufficient for house and 12 head stock; river in some cases used to water stock; 3 dry holes to 60 feet in depth.
12	NW.	24	"	"	"		10	1,755	- 6	1,749	10	1,745	Glacial quicksand	Hard			Sufficient supply; used by neighbours.
13	NE.	24	"	"	"	Dug	16	1,755	- 14	1,741	16	1,379	Glacial sand	Hard		S	Supplies 32 head stock; similar well supplies house needs; 16-foot well in basement for washing; well in pasture occasionally waters 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 RUDY, NO. 284, SASKATCHEWAN.

B 4-4
R. 7526

WELL No.	LOCATION ¼	Sec.	Tp.	Rge.	Mer.	TYPE OF WELL	DEPTH OF WELL	ALTITUDE WELL (above sea level)	HEIGHT TO WHICH WATER WILL RISE: Above (+) Below (−) Surface	Elev.	PRINCIPAL WATER-BEARING BED: Depth	Elev.	Geological Horizon	CHARACTER OF WATER	TEMP. OF WATER (in °F.)	USE TO WHICH WATER IS PUT	YIELD AND REMARKS
14	SE.	36	30	8	3		48	1,750									3 dry holes to 48 feet in depth; rain water and river meet needs.
1	SE.	1	31	6	3	Bored	18	1,760	- 16	1,744	18	1,742	Glacial drift	Hard			Farm vacant.
2	NW.	2	"	"	"	Dug	16	1,780	- 10	1,770	16	1,764	Glacial quick-sand	Hard		D, S, I	This and 3 similar wells supplies house and 50 head stock.
3	SW.	2	"	"	"	Drilled	285	1,749	- 40	1,709	285	1,464	Belly River	Salty			#.
4	NE.	4	"	"	"	Dug	20	1,740	- 15	1,725	20	1,720	Glacial quick-sand	Hard		D, S, I	Ample; waters 16 head stock.
5	SW.	4	"	"	"	Drilled	300	1,730			300	1,430	Belly River				Flowing well; not used at present.
6	SW.	4	"	"	"	Dug	14	1,770			14	1,756	Glacial drift				Intermittent supply.
7	NE.	9	"	"	"		9	1,730	- 8	1,722	9	1,721	Glacial drift	Hard			Sufficient supply.
8	NW.	10	"	"	"	Dug	18	1,730	- 15	1,715	18	1,712	Glacial quick-sand	Hard		D, S	Sufficient for house and stock.
9	SE.	10	"	"	"	Dug	22	1,730	- 18	1,712	22	1,708	Recent sand	Hard			Farm deserted.
10	SE.	12	"	"	"	Dug	12	1,740	- 11	1,729	12	1,728	Glacial drift	Fairly hard		D	Insufficient supply; slough for cattle.
11	NE.	13	"	"	"	Dug	12	1,730	- 11	1,719	12	1,718	Glacial drift				Farm vacant.
12	SE.	14	"	"	"	Dug	14	1,730	- 12	1,718	14	1,716	Glacial sand	Hard		D, S	Just enough for house and occasionally waters horses; creek waters 12 head cattle.
13	NE.	14	"	"	"	Dug	11	1,720	- 9	1,711	11	1,709	Glacial quick-sand	Soft		D	Just enough for house; stock watered at creek.
14	SW.	17	"	"	"	Dug	27	1,720	- 26	1,694	27	1,693	Glacial quick-sand	Hard, slightly "alkaline"		D, S	Sufficient for house and 50 head stock.
15	NW.	19	"	"	"	Dug	18	1,710	- 15	1,695	18	1,692	Glacial quick-sand	Hard		D, S	Sufficient for house and stock; dugout used in summer.
16	NW.	20	"	"	"	Dug	20	1,690	- 18	1,672	20	1,670	Glacial drift	Hard		S	Insufficient for cattle; creek supplements supply; 20-foot sand-point well for house use.
17	SW.	22	"	"	"	Sand-point	18	1,720			18	1,702	Recent sand	Fairly soft		D, S, I	Sufficient for house and 125 head stock; supplies also 2 neighbours.
18	NE.	22	"	"	"	Sand-point	20	1,700					Recent sand	Fairly soft		D	Sufficient for house use.
19	NE.	22	"	"	"	Sand-point & Dug	14	1,700	- 13	1,687	14	1,686	Recent quick-sand	Hard		D,S	Barely sufficient for household and stock; creek waters stock in summer.
20	SE.	25	"	"	"	Dug	9	1,730	- 7	1,723	9	1,721	Recent quick-sand	Fairly soft		S	Supplies 20 head stock; sand-point well for house use.
21	SW.	28	"	"	"	Dug	24	1,700	- 23	1,677	24	1,676	Glacial drift	Hard, iron		D, S	Sufficient; waters 12 head stock; sand-point well also used.
22	SE.	28	"	"	"	Sand-point	12	1,705			12	1,693	Recent sand	Moderately hard		D, S	Sufficient for house and 23 head stock; 12-foot well unused.
1	SW.	1	31	7	3	Dug	21	1,740	- 19	1,721	21	1,719	Glacial drift	Hard, iron	41	D	Sufficient for domestic use; 7-foot intermittent well and dugout for stock.
2	SE.	2	"	"	"	Dug	21	1,740	- 20	1,720	21	1,719	Glacial drift	Hard			Farm vacant.
3	SW.	2	"	"	"	Dug	24	1,750	- 23	1,727	24	1,726	Glacial quick-sand	Hard		D	Used for house; similar well supplies 16 head stock; lake for cattle in summer.

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

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

WELL RECORDS—Rural[12] Municipality of RUDY, NO. 284, SASKATCHEWAN.

WELL No.	LOCATION ¼	Sec.	Tp.	Rge.	Mer.	TYPE OF WELL	DEPTH OF WELL	ALTITUDE WELL (above sea level)	HEIGHT TO WHICH WATER WILL RISE: Above (+) Below (−) Surface	Elev.	PRINCIPAL WATER-BEARING BED: Depth	Elev.	Geological Horizon	CHARACTER OF WATER	TEMP. OF WATER (in °F.)	USE TO WHICH WATER IS PUT	YIELD AND REMARKS
4	NW.	2	31	7	3	Dug	20	1,730	- 19	1,711	20	1,710	Glacial quick-sand	Hard		D, S	This and similar well barely sufficient.
5	NW.	3	"	"	"	Bored	20	1,740	- 19	1,721	20	1,720	Glacial drift	Hard		D	Sufficient for house; an 18-foot well waters 16 head stock.
6	NE.	4	"	"	"	Dug	25	1,740	- 23	1,717	25	1,715	Glacial quick-sand	Fairly hard		D, S	This and similar well supply house and 25 head stock.
7	NW.	4	"	"	"	Dug	22	1,750	- 21	1,729	22	1,728	Glacial sand and gravel	Hard		S	Sufficient for 18 head stock; 28-foot well for house.
8	SW.	4	"	"	"	Drilled	250	1,760	-140	1,620	250	1,510	Belly River	Soft, soda		S	Sufficient supply; #.
9	NW.	5	"	"	"	Bored	50	1,770			50	1,720	Glacial drift	Hard, ...		D, S	Insufficient supply; 80-foot sub-artesian well was used for stock; now closed; slough now supplies stock and water sometimes hauled; 4 dry holes to 45 feet in depth.
10	NE.	9	"	"	"	Dug	27	1,740	- 22	1,718	27	1,713	Glacial sand	Hard		D, S	Ample for house and 35 head stock.
11	NW.	10	"	"	"	Dug	23	1,740	- 22	1,718	23	1,717	Glacial quick-sand	Hard		D, S	Sufficient for house and 8 head stock.
12	SE.	10	"	"	"	Dug	18	1,740	- 17	1,723	18	1,722	Glacial drift	Hard, odor-ous		D, S	Sufficient only for house use.
13	NE.	12	"	"	"	Dug	20	1,720	- 19	1,701	20	1,700	Glacial quick-sand	Hard		D, S	Sufficient for house and 20 head stock; dug-out for cattle.
14	SE.	13	"	"	"	Sand-point	15	1,720			15	1,705	Recent sand	Hard		S	Sufficient for stock needs; similar well for house use.
15	SW.	13	"	"	"	Dug	17	1,715	- 10	1,705	17	1,698	Glacial sand	Hard		D, S	Sufficient along with 2 similar wells for house and 40 head stock.
16	SE.	14	"	"	"	Dug	10	1,730	- 9	1,721	10	1,720	Glacial coarse sand	Hard		D	This and similar well sufficient for house, 250 sheep, 30 cattle and 6 horses.
17	SW.	14	"	"	"	Dug	16	1,750	- 15	1,735	16	1,734	Glacial drift	Hard		D, S	Sufficient for house and 15 head stock.
18	NE.	15	"	"	"	Dug	29	1,730	- 25	1,705	29	1,701	Glacial drift	Fairly hard		D, S	This and similar well supply house and 11 head stock.
19	SW.	17	"	"	"	Dug	30	1,740	- 24	1,716	30	1,710	Glacial drift	Hard		D, S	#.
20	NW.	23	"	"	"	Dug	24	1,700	- 22	1,678	24	1,676	Glacial sand	Fairly soft		D, S	Sufficient for house and 250 head stock.
21	NE.	24	"	"	"	Dug	23	1,710	- 22	1,688	23	1,687	Glacial quick-sand	Hard		D, S	Barely sufficient for house and 9 head stock.
22	SE.	24	"	"	"	Dug	10	1,700	- 9	1,691	10	1,690	Glacial quick-sand	Fairly soft		D, S	Sufficient for house and 4 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.