South Willow Creek

Montana Pioneer Oil Company #1 Miller Ranch

From	10		Description
		Ellis (cont'd)	
	2028		Shale, gray
			Lime
	2055		Shale, red
	2065		
		Amaden	Sandy line - water
	2082		ting wary hard
* 1	2084		Lime. pink layers, orange
	2112		and red colored shales
	~~~		
•	07.50		Line
	2150		Line, very hard
	2165		Shale, gray, sandy
	2174		Sand - some water
	2178		Lime
	2189		Shale, red
	2210	Total depth	DHere's

Bote: Formation tops interpreted by George Darrow

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#### INTRO . UCTION

Wytana Cartle Company's Pron horn :9 was drilled to secure a large artesian flow from the Heath sand. The Heath water was unfit for use and the well was completed in the Cut Creek sands for approximately 200 barrels of water per du; .

II

#### OPER..TICMS

Aytane Cattle Company Operator:

Leuses Pronghorn

Well No:

220' South of Northeast corner of the forty; thence dest 250' Locations

NE NE SE

Section 29, Township 11 North, Range 25 East

Pronchorn Rench Area

Musselshell County, Lontana

Elevation: Unknown Contractor: Taylor Drilling Company

Dates

higging Up: Earch 25, 1951 Sped: March 27, 1951 Under Surface: March 50, 1951 Leached Total Depth: April 25, 1951 Completed: Nay 3, 1951

Total Rigging Up Time: 3 days Total Urilling and Coring Time: 29 days Total Completion Time: 11 days Total Time From Spudding In: 40 days

Surface Formation: Quaternary gravels overlying Colorado shale Leapest Formation Fenetrated: Heath Total Depth: 2805 feet Plu; Back Depth: 2020 feet Status: Small flowin; water well

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Dellier Equipment

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SECTION SECTION

## Drilling Equipment

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Size Vake Equipment 3500 ft. Cardwell Model "S" Drawworks 86 ft. L. C. Moore Derrick 7% x 14" 185 HF Brawworks 225 Hi Pump Cardner-Denver Primit aukosha Motors (2) 3500 gals. Putane Fuel 145 Shale Shaker Link-Belt 10-3/4" Minderliter clowout Freventer Reed Drill Pipe 6-1/4" Drill Collars (5) National

### Hole Dimensions

Sise	From	To
15-3/4"	Suriace	801
a **	801	29031

Casing Record

Date Ran

10-5/4", 32- 4 77' w/ 40 ex 3-28-51

7", 20: 2802' w/ 450 ex 4-26-51

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#### Completion

man (1915年) 1915年 - 19

#### Dete

- 4-26-51 Seven inch casing sot at 2802 feet and semented with 450 sacks.
- 4-29-51 Perforated Heath semistone with 130 whote from 2714 to 2744 feet using Lame-Wells Komeshot gun. Jet perforated Third Cat Creek sandstone with 130 shote from 1850 to 1870 feet using Lame-Wells Komeshot gun.
- 4-30-51 Reperferated Third Cat Greek with Lane-Wells Open Hole jet gum from 1880 to 1869 feet with 35 shots. Ferferated Ellis sandstone with Lane-Wells Open Hole gum from 2213 to 2235 feet with 21 shots. Perforated Ellis sandstone with Komeshot gum from 2242 to 2248 feet with 24 shots. Perforated Second Cat Greek with Komeshot gum from 1719 to 1751 feet with 48 shots. Perforated First Cat Greek with Komeshot gum from 1448 to 1464 feet with 24 shots.
- 5-3-5] Set Lame-Hells Drillable Bridging Plug, Type D-2, Size BF-13 at 2230 feet. Next in hole with Baker 47-5, ET-8 Betrievable Comenter on 5g drill pipe. Set packer at 1880 feet. Acidized Third Cat Greek sandstone with 500 gallens and seid through perferation, from 1850 to 1870 feet. Used 800g pressure to creak down fermation. Pressure broke from 800g to 800g to give a 400g broakdown. Circulated with water to remove spent seid.
- 5-t-51 Set Saxor 47-C, AT-3 Retrivable Commuter at 1820 feet to reacidize Third Cat Creek sand through perforations 1830 to 1870 with 1000 galless mad acid. Used 800; pressure to break down formation. Pressure broke from 800; to 400; to give a 400; breakdown. Circulated with elear water to remove speat acid. Fumped 80 barrols of mater into fermation at 400; PSI. Circulated.

  Set Lame-Wells Drillable Bridging Flug Type D-2, Size EP-13 at
  - Set Lame-Wells Drillaule Bridging Flug Type D-2, Size BP-13 at 1795 feet.
- 5-5-51 Set baker 47-6, RT-5 letrivable Comenter at 1705 feet to soldise Second Cat Creek sandstone through perforations from 1719 to 1751 feet with 500 gallons mus sold. Formation took sold at 1800; and broke to 200; to give 1600; breakdown. Circulated spent sold out with clear water. Fumped 50 barrels of water back into formation at 4.3; PSI. Circulated.
- 5-6-51 Drilled out Lane-Wells bridging Flug at 1775 feet. Went in hole and checked top of plug at 2020 feet. Came out of hole laying down drill pipe. Well flowing approximately 200 barrels of water par day.

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## GEOLOGIC SECTION FEWERENTED

Formation	From	To	Thickness
Colorado shale  Colorado shale  Kootenai  Morrison  Ellis group  Swiit menter  Fierdon nerber  riper we ber  Ansden  Heath	0 50 1551 1953 2206 220, 2364 2407 2440 2654	50 1551 1935 2206 2440 2354 2407 2440 4 2.54 2503 7.0	60 1501 382 273 234 148 53 53 214

## Luli at 100 Tors

		A CONTRACTOR OF THE CONTRACTOR
Formation	ourple	Hadiosctivity. Log
Coloredo shele  Foury 83.  Frontier 80.  First Cat Creek  Rootenei  Second Cat Creek  Third Cat Creek  Lorrison  Ellis  Rierden  Piper  Anaden  Beath  Sandstone	750 - 830 1256 - 1270 1448 - 1540 1548 1750 - 1780 1832 - 1690 1930 2207 2350 2412 2442 2660 2705	765 - 851 1252 - 1266 1447 - 1562 1561 1717 - 1778 1931 - 1868 1953 2266 2354 2407 2440 2654 2710 2745
Total Depth	2803	<del></del>

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**电影的信息运运运动员** 

NYTANA 19 PRONGHUKH RANCH Sec. 39, T. 11 H., H. 28 E. Musselshell County, Nontana

WAST 在一种大块工具,1979年中国大学教育的企业企业,1984年中国教育工程,1984年1987年,1987年198日,1987年198日,1987年198日

#### SMPLE OFFERMINATIONS

bу

#### George Darrow

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DESCRIPTION
DEP TR
     20
            Shale, gray-black, allty, slightly micarcous.
  80
            Seme, with thinly interbedded bentonitw.
       100
  90
            As sheve; truce glasconite.
       110
100
            Shale, gray, silty, missoove, with thinly interbedded tentomits.
       120
 110
            Shale, grey-black, silty, micacoous, with successory mineral grains; trace
 120
       150
            bemtomite and esleite.
 120
       140
            Ime.
            Same; trees pyrite.
 140
            whale, grey-black, silty, with streeks of sandstone, very fine grained,
 150
            light gray.
 160
       170
            Suele, as abave.
            Siltatone, gray-black, finely arenaceus, with thin stroaks of sandstone,
 170
       180
            very fine grained, light grey.
           dame.
 180
       190
 190
       200
            Seme, increasingly sendy.
 200
       210
            As above.
            Seme.
 210
       220
 220
       230
            Same, decreasingly condy.
 230
       240
           As above.
       250
 240
            Shale, grey-black, very silty, slightly sicassous.
       260
 250
            Same, sees fixely areneceous streaks.
 280
       270
            Shale, black, fissile, micaccous,
 270
       280
            Sens.
 250
       290
            Seme, trans olive green bentonite.
 260
       200
 200
            Ye spease
            male, gray-black, firstle; trace ten ciltatone.
 210
       230
            Az aberte
 320
 530
       340
            Seme, with fish scalos.
            Sense, with bemtomate, light grey and olive grown, sand; and biotitic in part.
 840
            Shale, grey-black, silty, silicoous, brittle, bard.
       160
 DEC.
            Sene.
 560
        270
            Same, with tam milt stome.
 570
        880
            Shale, as above.
 300
        290
        400 Bestonite, white, impure.
 300
            Shale, grey-black, finally areasceous, hard, sillocous.
 400
       410
            Seme, very erenaceous with sendy streaks.
 410
        480
        430
             As shaves
 420
             thale, grey-black, silty, finalle, moderately hard, siliceous.
 450
        440
 440
        450
            Same, misaecous.
            AR BODYS.
 450
        460
            Same.
  480
        470
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Broker British (British Sanda) (British Sanda) (British Sanda) (British Sanda) (British Sanda) (British Sanda)

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DESCRIPTION
DEPTH
             Same, with trace very fine sandstone, light grey, glaucomitic.
From
       To
             Siltatone, grey-black and dark grey, finely aremaceous, trace green bentonite
       480
 470
 480
        490
             Same, a few disseminated calcite crystals.
             Siltatons, dark grey, very finely aremaceous with specks of green bentonite,
 490
        500
  500
        510
             Same, intergraded with dark grey shale:
Shale, light grey, very bentonitio, also some green bentonite specks.
Shale, dark grey, misaneous.
  510
        520
        E 30
  520
        540
  530
         560
  540
              Siltatone, dark gray, finely arenaseous, with intercalated gray-white beatenits,
         660
  680
              Silterone, gray-black, microscous, slightly aremassous, hard.
         570
  560
              Sandstone, fine to medium grained, salt and pepper, argillaceous sement
         580
   570
         590
   SBO
               Siltateme, dark gray, arenacceus with some intercalated sandatone as above.
   590
               Chale, dark grey, milty, slightly misassous, with speaks of green bentonite.
         610
   600
         620
               Same, some fine sandy streaks.
   310
               Shale, grey-black, milty, slightly micaccoust
   620
          630
               Limestone, dark brown, micro-crystalline to dense, slightly dolomitic and
          640
   630
          650
   640
               argillaceous with interculated gray male.
          660
   650
                Shale, grey-black, micaecous.
                Shale, dark grey, silty, with thinly interbedded sandstone, light grey, very
          470
    660
           680
    670
    680
                fine grained.
                Same, sandstone is fine grained in part, sait and pepper.
           100
               Swelle
    690
           710
    700
                Same, with light grey bemtemite intercalations.
           720
     710
           730
     720
                 As above.
                 Sentomite, cress-white with interbudded shale, dark brown, limy.
           740
     730
                 Sandstone, very fine to fine grained, salt and pepper, argillaccous comented,
                Seme.
           750
     740
            760
     750
                 with thinly interbedded dark grey shale.
           790
     750
                 Same, sendstone is fine grained.
                 Sandatone as above, with this partings of dark gray shale.
            780
     770
                 Same, sandatome is very argillacerus.
            700
      780
            $00
      790
                 Same
            820
      800
                  Same, impressingly shely.
                  Sandstone as above, intergraded with silt stone, dark groy, slightly bentonities
            820
      810
                  Shale, dark grey, very silty with some sandy streeks, and intercalations of
            230
      120
      830
             860 Sandstone, very fine to fine grained, salt and pepper, contonitio, dirty,
             850
      840
                  argillaccous, with intercalated dark grey shale.
                  ciltatone, dark grey, very arenaceous, very bestonitio, with some intercalated
      860
             670
       860
                   Shale, grey-black, silty, with white bemtonite.
                   shale, grey-black, silty, misasseus with specks of green bentenite.
             860
       870
             890
       590
                   Same, slightly aremassous, no bentonite specks.
             900
       890
             910
       900
                   As abeve.
              920
       910
                                           GEORGE DARROW
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BILLINGS HONTANA
                   Sme.
              930
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DEPTH
            DESCRIPTION
From
       To
       940 Some, with intercelated fine sandstone.
940
           he above; trace siltatone, dark brown, hard.
       950
950
       960
            Shalo, grey-black, micaceeus, slightly milty, fissile.
 980
       970
            Same, with gray-white bentonite.
 970
       280
            Same.
 980
       990
            Same, finely arenaceous in part.
            As above.
 290
      1000
1000
      1005
            Same.
1005
      1010
            Same.
1010
      1015
1015
      1020
            Same.
1020
      1026
            Same, with interbodied condstone, very fine grained, selt and peoper.
            argillaccous.
1025
      1030
            Same.
1080
      1035
            Same, arenaceous in part; trace white bentonite.
1035 1040
            Sandstone, very fine to fine grained, light grey, hard and tight, with inter-
            bedded shale as above.
1040
      1045
            Same
1045
      1050
            Shale, gray-black, micaocous, facile.
1050
      1055
            Some, with brown, dolemitic siltatone.
1055 1060
            Shale, grey-black, silty and arenaceous with interbedded gre, and white
            bentomite, and fine grained light gre, sandstone.
1060 1065
            Shale, grey-black, misaccous, finsile.
1065 1070
            Same, sandy in part.
1070
      1075
            As above.
      1080
1075
            Samo.
1080 1086
            Same.
1085
      1090
            Seme: Trace calcite.
1080 1085 Shale, grey-black, micaccous, fissile, slightly silty.
1095 1100
            Sume.
1100
            Same.
      1105
1105
      1110
            Sene.
1110
      1115
            Sems.
1118
      1120
            Same, very finely areasocous in part.
1120
            Shale, grey-black, micaccous, fissile, slightly silty.
      1130
1125
            Shale, dark grey, elightly micaceous, hemogeneus.
      1136
1130
            Shale, grey-black, micaecons, slightly silty.
            See.
1135
1140
      1146
            Seme, with interpodded white bentonite.
1145
      1180
            AS REDVO.
1150
      1116
            Shale as above.
1165
      1100
            Shale, gray-black, misacceus, fissile.
1160
      1166
            Same.
1165
            Eme.
      1170
1170
      1175
            Same, with trace interculated very fine sandstone,
            Same, ailty in part.
1175
     1180
11 80
            Shale, dark grey, slightly silty.
Shale, grey-black, micaecous, slightly silty.
      1185
1185
      1190
1190 1195
            Same; trace white bestomite.
1195 1200
            Same
      1206
1200
            Same.
1205
     1210
            Same.
1210 1215
            Same.
      1220
            Same, slightly arenaccous in part.
1215
      1226
            Same
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DESCRIPTION
DEPTH
Frem
            Same, slightly arenaceous with speaks of green beatonite.
1225 1220
1280 1236
             VE SPOAS
            Siltatone, gray-black, slightly arenaccous with specks of green bentonite.
1285
      1240
      1246
1240
     1250
             Same.
1245
                                 TUP UF SAND - 1250
1250 1255 Sandstone, fine to medium grained, salt and papper, grains sub-
             rounded, fair peresity, essent is calcareous and argillaceous, also some
             green bentonite speaks.
             Some, fine grained.
1255
      1360
      1265
             Same, ver, silty with interbodded grey-black shale.
             Same.
1260
             Silt stone, dark grey, contonitio, alightly arenaceous with intercedded white
12:5
       1270
 1270
       1275
             bentomite.
             Shale, grey-black, silty, slightly microsous.
             Shale, black, hemogeneus, very fissile, with some intereslated white
       3200
 1275
 1280
      1 285
             Shale, grey, hemogemous, with interbedded white bemtomite.
             bestonite.
       1290
 1.285
              Same.
       1295
 1290
             Sheld, dark grey, silty in part.
Some, with specks of green bestonite.
       1300
 1265
 1800
       1505
       1310
              Bane.
 1505
              Shale, gray-black, micacceus.
       1315
 1310
       1530
              Same
 1315
              Sees, much aragemite.
       1386
 1820
        1530
              Same.
 1325
              Silt stone, dark grey and dark bress.
 1220
        1335
              Siltstone, dark grey, slightly eremacesus.
        1340
              Shale, gray-black, fissile, with pyrite and aragonite.
 1350
 1340
        1345
              Shale, gray-black, slightly micaceous, fissile.
Siltstone, gray-black, delowitie, hard, has distinctive brown spote, possibly
        1850
 1545
        1355
  1860
  1355
        1860
              policastic, with shale as above.
        1365
              Same.
  1360
              Shale, grey-black, fissile.
  1365
  1370 1378
              Same.
        1380
  1875
        1385
              Same.
  1560
              Same, micaccous, glistems.
        1390
  1365
               As abeve.
        1385
  1380
               Same.
  1395
        1400
        1405
               Same.
  1400
        1410
               Sandstone, silt size to very fine grained, light grey, micaccous, clean,
  1405
  1410
               interbedded with male as abeve.
               Siltstone, grey-black, very finely aremaceout, with thinly interbedded sand-
        1420
  1416
               stone, light gray, very fime grained, micaecous.
               Shale, grey-black, very silty, missessous.
               Siltatone, grey-black, very finely arenaccous, micaccous.
        1425
   1420
   1425
         1480
   1480
        1486
               5me.
               Shale, grey-black, miescous.
   1435
         1440
              Same, silty in part.
        1448
   1440
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is arenascous in part; trace block shale partings.

Same, shale is olive green, grey-green in part.

siltatone is hematitis.

Bonle and siltatone, mareen, seft, bestonitie in part, allty in part, with

intercalated ampdatone as above; trace intercalated white beatenite; siltstone

thele and siltatome, merenn and pumple, soft, bentomitie, with this partiage

of splintery black male, imbedded smd grains, fine to marse, sub-round;

1600

1605 1610

DEPTH DESCRIPTION 7-Shale and siltatone as above, siltatone is hometitio, finely aremaded us in 1615 1520 part. Same, some sand streaks. 1620 10:5 Shale and milistone, marcon, bestemitie, with streaks and spots of gray-green 10 26 1630 and olive green. 16 80 1635 Siltstone, marcon, misassons, hematitis, shaly in parts Shale, grey-green, with marcon stains, soft, bentenitie. 18 55 I6 40 Shale and siltstene, marson and groy-green, bentonitic in part. 1640 1645 1945 1650 Siltstone, marean, micresous, benetitia. 1550 1665 Samistone and shale intergraded, shale is green-grey and marson, bentomitic, aronaccous, sandstone is micro-conglementic, argillaccous and shaly, grey and purple. 1655 1860 Shele, naress and green-grey, aremacouse, seft, bentonitie, with some thin sand skreaks. 1660 1065 Same, with some interbedded hematitic siltstone. 166£ 1670 As above. Shale as above, maroon and groy. 1070 1676 1076 1680 Shale, grey and green-grey, very pentonitie, soft-Seris, streeted with mercon in party trace dense brown linestone. 1880 1805 bame, silty and very finely arenaceous, shale is firmer (slightly calearsous). 1688 1690 Shale, green-grey, moderately seft, calcareous and tentomitic, with merson 1690 1695 stains. 1695 1700 Same; trace dense brown limestone (probably pebbles or modules). Shale, grey, calearcous, slightly bestonitie with imbedded modules and 1700 1705 aggregates of denue brown limestone (slastic), some poorly developed colitons 1710 Itatone, gray-black, with paper thin carbonaccous streeks, some pyrite 1705 aggregates, very finely arenecesses in part. 1710 1720 1715 Shale, light grey, very soft, very bentomitic. Same. 1720 1725 1725 1750 Same. 1735 Sandstone, medium to course grained, light grey, clean, with pink and ember 1730 grains, grains mu-round, calearsous coment, some quartistic strocks, such intercalated white and grey pentonite. 1735 1740 Limestone, light buil, miere-fragmental, some fragments are eroca-white, limestone is argillaessus in part. Sandstone, light grey, dolumitie, very fine to silt size, grains hard and tight, with interestated micro-conglemeratic sendstene as above. 1750 "endstone light grey, very delouitie, very fine to silt size, grains hard 1745 and tight, almost a delomitic siltetome. Some, with intercalated marcon shale and siltatome. 1750 1766 1765 Same, with intereslated soft, yellow-brown shale. 1760 Sendstone, fine grained to silt size, light grey and mercen, hard and tight, 1760 1755 dolomitic with some intercalated shale, mareou, seft. 1765 1770 Sandstone, light grey, very delemitie, very fine to silt size grains, grading to silty and finely arenuceous dolemite. Sandstone, fine to very fine grained, light gray, sub-angular to sub-round; trace as essery minerals, calcareous and colemitie ement, poor peresity; trace interselated marson siltstenes 1775 1780 bandstone, medium to source grained, engular and embedral to sub-round, salt and pepper, with buff matrix, black coosessry minerals, ergillacoous and bentemitie coment, good perceity, friable. Shale, maroon and interbedded dolumite, maroon, micro-crystalling and microsucrosic with sees paper thin partings of black carbonaceous shale.

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DEPTH DESCRIPTION From To 1785 1790 Shale and miltatone, maroon and purple, trace dolonite as above, with interoulated black miltstone and shale, lanses or nodules of dense, buff and grey limestone and streaks of mandstone, fine grained and micro-conglomeratio. Shale, marcon with disseminated limestone nodule a and pebbles, a few scattered 1790 1795 sond grains. 1795 1800 Sems. 1800 1805 Same to 1803, then shale, light grey and buff, elightly calcareous with imbedded disseminated aund grains and mioro-pebbles, with streeks of fine, hard sandstone. 1805 <u>1810</u> 1810 **1815** Same, purple, green and maroom in part, with limestone modules. Limestone, buff to purple, dence, with imbedded sand grains, some thin partings of green and marcon shale; trace interculated white gypsum, some thin wand stronks. Some to 1818, themsandstone pale green, very fixe grained, limy, hard and 1615 1820 tight, slightly microsous. 1820 1825 Samistone as above, with some line streaks. 1825 1830 Same, sandatome is ereco-shite. TOP OF THISE CAT CREEK - 1832 1830 1835 Same to 1832, them condetine, medium to very co ares grained, angular and embedral to sub-round, glassy, with black accessory minerals, bentonite and argillaccous ecocut, frieble, good perceity, pyritic. 1885 1840 Seme, mostly medium grained. 1840 1845 is sheve. 1850 1846 same, very friable. 1865 1850 Same, with ehert, micre-pebbles and large percentage very coarse quarts. grains. 1846 1860 SPO. Same, with micro-pubbles of delemite (?), dark grey, dense, siliceous, pitted, 1860 1865 cherty. 1865 1870 As above. 1870 1075 Sandstone as above, sandstone is better omented. 1875 As above, high percentage black accessor, minerals, sandstone is allty and 1880 argillaceous, salt and peppery. 1880 1885 Seme. 1885 1890 Sees. 1890 1805 Same. 1896 1900 Same, sandstone is harder. 1905 Samistone, fine grained, angular, glass,, clean, mone black secessory 1900 minerals, momo quartiitic streaks, slight porosity, tight. 1905 1910 Sandstone, medium to very coarse grained, salt and pepper, black assessory minerals, argillacous and bestonitie matrix, moderately well commuted, grains angular and outsdral, glass, surfaces, fair porosity, friable. Same. 1910 1915 Same, much pyrite. 1916 19 20 19 25 1920 As above, trace lignite, very friable. 1925 1930 Sems, very friable.

TUP OF MURBISON - 1930

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calcareous, light grey, limy in part.

en langual de mengelegikan kejedikan dibintukan kelandak di dibintuk ang Mengelegikan di antang selang di dibintuk

1980 1986 Sandstone, very fine grained to milt size, hard and tight, mienceous, slightly

DEL TH JESU . IPTION To Frem 19 26 1940 Same, fine grained, grains sub-angular to sub-round. Same, much pyrite, with intercalated limestone, buil, dense, slightly arenaceous 1945 1940 Same, sandstone hard and tight, partings of black pyritic shale. 1945 1950 1965 Sess, sandstone dark gre, hard and tight, with partings of black earbonaceous 19 50 shale. Thale, black and varioulored, varegated in part; black shale has paper thim 1960 1986 laminac; shale is silty as. finely arenaceous in part; trace limestone, micropebbles. 1960 1968 Sandstone, at it size to fine grained, poorl, sorted, light green to purple, very argillaceous and silty, white mineral grains give sandstone white spatted effect, sandstone is hard and tight, misaceous. 1965 1970 Same, argillaceous and shaly. Sand stone as showe, grey with interbedded grey shale. 1975 candstone fine and very fine grained, gree, grains sub-round, argillaceous matrix, misaceous; with distinctive paper thin lamines of black carbonaceous 1975 1980 material and some imbedded carbonaceous plant fragments, puritised in parts black accessory minerals, tight. 1985 1980 5**---**-Sendstone fine to medium grained, grains augular to sub-round, argillaceous 1986 1990 matrix, some calcarsous sement, inclusions of black earbonuceous material, low persentage accessor, minerals, tight. 1590 1995 same, fair peresity, friable. 1995 2000 As above, medium grained. Eame. 2000 8005 Same. 2010 2005 1015 Same, harder, maly. 2010 1020 Shale and silt, black, red, green, purple, varioulered and variegated, slightly 2015 arenaceous in part. 2030 2025 Same. Same, trace limestone, dark wrown, dense. 2025 2030 Shale and siltst me, marcon and light green, mottled, slightly arenaceous 2080 2036 with imbedded pheaphatic() modules. 20 55 2040 Siltstone, light green, finely areaseous, bentemitic, with purple and black shale and phosphatic(?) nodules. Same, mostly grey with green shale, muse fine sandy streaks. 2040 2045 2050 Siltst me, purple, finely aremaseous with intersalated green shale, some fine 2045 sandy streaks. 2050 2055 Siltstone, light green, finely erenaceous with intercalated chale, green, purple and black. 2055 Same, siltstone mottled with margon. 20.00 2060 20 65 Same. 2065 2010 Same. 2070 2075 Siltatome as above, more aremaceous. Siltstens, green-grey with intercalated gray-black shalo. 2075 2080 2080 2085 Sandstone, groy-greem, very fine grained, misassous, argillaceous matrix, calcareous. 2088 2090 Same. Same, grades to sandstone fine grained, light grey, calearcons, clean, tight. 2090 2095 2095 2100 Sanistone, fine to medium grained, angular to suc-angular, calcardous, fair peresity. 2100 2105 Some, harder. 2105 2110 Shale, dark grey, green-grey and variablored, salearsous and bentonitio, with send stone as above.

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Amount with the special production and the state of the special production of the state of the s

DEPTH DESCRIPTION From Te 2110 2115 Siltatone, dark grey and green-grey, finely arenaccous, with intercalated fine sandstone. Sandstone, fine to medium grained, light grey, calcareous, hard and tight, grains sub-round, with partings and intersolutions of shale, grey and green-2115 2120 grey. 2120 2125 Same 2125 2130 Same. 2130 2135 Siltstone, gray, finely arenassous, grading to very fine grained sandstone, Same argillaseous. Shale and siltatone, green, gray, marcon, and varioulored, calcarmus, 21 38 2140 arenaccous in part, with intercalated limestone, brown, dense. 20 2145 2148 2160 Siltstone, green-grey, calearsous, finely aremaceeus, marcon and varicelored in part, with intercedded black shale, fissile, splintery, some micro-publics of dense brown limestone. Seme, thely in part. 2160 2160 Siltstone, grown and dark prown, mottled, very limy, grades to argillaccous 23.58 limestane. 21.50 2166 Siltetone, grey-green, mottled with marcon, calcareous. Silt stone, grey-green, very liny, some imbedded miore-pebbles. 2165 2170 Shale, green, bemicuitio, with partings of black partonaccous shale. 21 70 23 78 2175 2180 Sanistone, very fine grained to silt size, grades to miltstone in part, light grey and green, calearcous, tight, misassous, argillacous matrix. 2180 2188 Linestone dark buff and clive green, erypto-crystalline, dense, argillacouse with shaly partiags. 2385 2390 Some, very argillaccous. 2195 2150 Same. Siltstone, grey-green, very finely aremaceous, limy, grades to very fine, limy andstone in part. 2195 2200 2200 220% Siltatone, grey and green-grey, limy in part, with intercalated white crystalline embydrite. TOP OF ELLIS - 2207 2205 2210 Same to 2207, them sandstone, light gray, fine to medium grained, grains subangular to sub-resend, glaucomitie, ealourseus, small percentage accessory minerals, poor poresity. 2210 2215 Same, mediam grained. 1210 2215 is abeve, fair perceity. 2220 2225 As above. 22.25 £230 Sand stone as above, fine to medium grained, with partings of black shale. 1130 2235 Same Same. 2235 2240 2245 Same, very fessiliforous, fregments of mage-fessils, limy. 2840 2245 2250 Sand stone, light groy, fine grained, calearsons, glamesnitis, with this partings of black shale, poor perceity. 2265 2250 Same. 2255 Same, very fossiliferous, fragments of mega-fossils, limy, slightly anhydrities 2.60 2260 2265 Sand Stone as above, fine to very course, and conglemerate, hard and tight. 2265 2270 Sandstone, light grey, fine to medium grained, calearcous, a few fessil fragments, fair poresity. 2270 2275 Sandstone as above, mostly fime grained. 2275 As above, with thin partings of gray-black shale. 2280 2250 2285 Some, sandstone is hard and tight, daly and argillacous.

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BILLINGS MONTANA

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DEPTH
             DESCRIPTION
      To
From
2205
       2290 As above, limy.
2290
       2285
             Sego.
             Same, fessil fragments and partings of dark grey, limy shale.
2205
       2300
             Siltstone, grey and dark grey, limy is part, finely aremaceses in part, with
       2305
2500
              trece glausomite.
2305
       2510
             Same.
            Same, dark grey and grey-black, hemogeneus.
2310
       2216
            Limestone, brewn, erypto-crystallime, sense, argillaccous and silty, slightly
2315
       2320
             glausonitie, with intergraded siltstone as above.
Sami stone, fine to very fine grained, silty, limy, glamoonitie, tight.
             Siltstone, grey, finely erenaceous, glaucenitic, liny im part, grades to very fine sandstone in part.
2225
       2330
2530
       2335
             Same.
2335
       2340
             Zans.
              Some to AMI, them shale, grey and groom-gray, very limy, glistens.
2540
       2545
2545
       2350
              Shale as abave.
2350
       2364
             Same, trace intercalated black chale.
             Seas.
       2360
2355
             Same, method with red in part, grades to argillascous linestone in part,
2569
       1166
              slightly shalky, imbedded mega-feecils.
             Lizertone, gray, fragmental, argillaceous and silty, feasiliferous, slightly
2568
       2370
              glausomitic, marly in party trace marcom coloring.
2870
       2376
              Same.
             Same to 2378, then silbstone, gray and groun-gray, mettled with red in part, very limy, finely areasessue in part, fessiliferous.
2575
       2380
              Same, grades to argillescene limestone in part.
2320
       2585
2385
       2390
              Same.
2290
       2295
              Same, shaly and bentonitie in part.
              As abeve, trace very fine conductons.
2395
       3400
             Siltatone, grey, sandy, limy, grades to finely areasones linestone in part, limy semistone in part, fessiliferous.
2400
       3404
2406
       2410 Sime, light group, thaly in parts trues erange there.
                                   TOP OF PIPER - 2412
             Some to 2412; then siltatume, red-brown and charelate-brown, delemitic, alightly missecous, mettled with grown in parts.
8410
      2415
2416
       2420
              Beres
2480
       2425
              Same.
24.25
       2430
              Same: trace intervalated white and pink, finely erystalline anhydrite.
2430
       2435
              As abeve.
2485
       2440
              Same.
                                  TOP OF AMSDEE - 2442
2440 2445 Same to 2442; them delemite, buff-whife, crypte-crystalline, dense, hard,
              siliceous; trace paper this partisgs of green shale.
              Same, subjectite, pink and light bream in part, with partiage of soft, red
              shale.
              Dolomite, buff, crypto-crystalline, dense, anhydritie, very argillaccous.
2450
      2455
24KE
       2460
              Dolomito, gray, erypto-erystallino, dence, anhydritio.
             Dolomito, grey, clastic, with delemito rhombs as grains, argillaccous, ambidritie, chalky in part.
 2460
       2465
      2470
2466
              Same, more argillaccous.
              Shale and alltetone, red, purple, groom, and grey, soft, with this bedded,
2470
      2478
              dense, buff delemite.
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GEORGE DATROW

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LEFTH DESCRIPTION From To Same, with interbedded purple delomite. 2480 Bolomite, wif, grey, pur le, dense, anhydritic, with thinly interbedded red 2495 2430 and purple shale. Dolowite, buff, crypto-crystalline and fragmental, siliceous, embydritic, 2485 2460 strined pink and purple in part. 24:0 2495 EBR#●+ D. lomite, light brown and buff, dense to fragmental, anhydritic, argillaceous; 2500 2495 truce interculated red and green shale. polomite, buff, micro-sucrosic, argillaceous, hosogenous. 2530 2505 Columite, buff, crypto-crystelline, dense, slightly anhydritic with thinly 2505 2510 interculated red and purple shale. 2510 2515 bolomite as above, pink and purple. Dolomite, grey, buff and purple, dense, and limy, with intercedded shale and 2515 2520 siltatone, red, purple, and green.
Dolumite, buff, limy, anhydritic, orypto-crystalline. 25 25 2520 Colomite, grey, buf:, purple, dense to fragmental, limy, anhydritic mith 2530 25 25 interhedded soft red sale and siltstens. 530 2535 Same, dolomite is mostly purple. bolomite, groy and buff, dense to fragmental, anhydritics 25 35 25 40 Dolorite, buff and pink, finel, sucresia, slightly anhydritic.
Out mite, light grey to red and purple, dense and fragmental, anhydritic. 2540 2545 2545 2650 Dolomite, grey, orypto-orystalline, dense, hard, suhydritic. 2550 2885 Same, purple and crypto-sucremic in part.
Dolomite, buff, crypto-crystalline, with interculated purple dolomitic milt-2555 2550 2566 2560 stone, anhydritie. 2565 2570 Limestone, buff and grey, dense, anhydritic, delomitic. 2570 2575 Delomite, purple, micro-sucrosio, argillaceous, with interbeddes soft red shals; trace fine sandstene. Limestone, grey and buff, crypto-crystalline and fragmental, subydritio, 2575 2680 ostracodal, with delouite as above and interbedded shale, soit, red-brown. Limentone as above, some intercalated purple siltatone and dolomite. 2630 2635 Same, interbedded with siltstone, grey, salt and pepper . 2585 2590 2595 Limestone, grey to purple, orgyto-crystalline, argillacetus, with inter-edded 2500 mercon shule. 2000 Limestone, grey and buff, orypto-crystalline, fossiliferous, ergillaceous in part, with interbedded male, gray, gray-black, and red. 2600 2605 Shale, grey-black and red and green settled, with limonite and hematite stains. Same, with interbedded and interestated limestone, buff and purple, dense. 2510 2010 2515 Shale and siltatone, black, green, marcon, purple, with interbedded limestone, buff, dense-2615 2620 limestone, grey and buff, with red spote and streaks, fragmental, argillaceus, with intercalated shale as above. Same, aremaceous in part, fossiliferous, possibly conglomeratie; hematitic. 2:20 2825 -ame, limestone is brown in part, wery ostracodal, shells are pink, exicareous, をぶんち 2630 filled with calcite. 2535 Limestone, built to brown and black, dense, anhymritic, vary estracedal, stained with limonite, some shaly intercalations. 2635 2640 Some, with male, dark gray, muroon. 2040 2645 Limestone, buff to grey, drypto-crystalline, anhydritic, with shale and siltstone intercolations, varioolored; trace fine sandstone. 2846 2850 Limestone, light grey and buff, mettled with purple, micro-crystalline to dense, argillaceous, some thin shaly intermalations, hematitie stains; trace

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CONSULTING GEOLOGIST

And the second s

orange chert.

From To 2686 Limestone, grey-buff, crypto-crystalline, anhydritic. Same, mottled with purple in part, with thinly intertedded soft red shale and 2655 2060 Siltstone, marcon and limonitic ten, limy in part, with interpedded sandstone, 2865 2860 white, very fine grained to silt size, clean. listone as above, with shale, red, soft. Siltatone as above, slightly fessiliferous, very finely arenaceous in part. 2665 2870 Siltatone, grey, calcareous, argillaceous and slightly bentonitie, very : sely 2675 2:70 2890 26.75 arenaceous in part, shaly in part. Siltatone as above, with imbedded micro-pebbles of quartaite, limestone; almost a mioro-conglomerate; with intercalations white orystalline anhydrite 2680 2685 and carbonaceous plant fragments, and interbedded margon siltstone. Limestone, brown, fragmental, dense, anhydritic, with intercalated chert, 2685 brown, pink, amber. 2690 2895 Same. Same, with marcon and varioelred shale. Sandstone, buff, silt size to very fine grained, limy, microcous, tight. 2695 2700 Landstone, white, medium to course grained, well rounded, high spherity, 2705 2700 some limonitic stains, with interbedded miltstone, also limonitic stained; 2710 2705 trace intercalated soft green shale; sandstone is hard and tight, calcarsous 2710 2715 Sandatone as above, red and limonitio tan, hematitic, with intercalated hematitic and limonitic siltatone, anhydritia, poor porceity; trace intercalated 2715 2720 Sandstone, white to marcon and purple, medium grained, angular to sub-angular, maroon and green shale. glassy, hematitic, with intercalated shale and silt stone, mareon and green, some white crystalline anhydritic cement, feir peresity. Same, sub-angular to sub-round, sandstone mostly light purple, good porosity. 2720 2725 2730 As above. 27 28 27 86 Same. 2780 2735 2740 Same Same, very friable. 2745 2740 Sandstone, medium grained, sub-angular to sub-round, limonitie, brown, glassy, 27 50 2745 2750 2755 comented with limomits, fair poresity, friable. Same, very friable. 2755 2760 came, very frieble. Shale and silt stone, marcon, green, and grey, with interbedded sandstone, 2760 2765 2770 2765 green, medium grained, sub-angular. Shale and silt stone, maroon and green, with interpedded sandstone, mottled red and green, fine to medium grained, sub-angular to sub-round, hard and tight. 2775 2770 Siltatone, maroon, hamatitic, soft in part, arenaceous with interbedded sand-2778 2780 stone as above. Shale and siltatone, warrow, grey, green and olive, with interbedded sandstone 2785 2780 2790 2785 as ubove. Same, Interhedded sandstone is very hematitic. 2795 2790 Same. Sandstone, fixe to medium grained, engular to sub-round, mottled red and 2795 2800 2800 2805 green, hard and tight.

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> GEORGE DARROW CONSULTING GEOLOGIST BILLINGS MONTANA

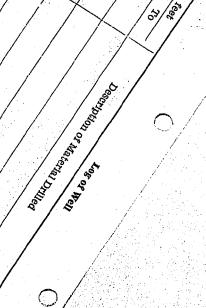
MARKET CONTROL OF THE CONTROL OF THE

(Ciro) Same, with interbedded marcon miltstone.

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MONTANA BUREAU OF MINES AND GEOLOGY Butte, Montana	
Duve, Mortalia	
WATER WELL LOG	Pearless Incorporated
Fearless Oil & Gas Company	1670 Benver Club Bldg.
Owner Wytens Rench Division Address.	Desver 2, Colorado
Driller Ferguson Address	Levistowa
Date Started	npleted
Location: Sec. 29 T 11N R 23E 1/4 sec. NE	NS 80
	Churn Drill
Type of well Deilled Equipment used (Chu	rn drill, rotary, other)
Water use: Domestic Municipal Stock	Irrigation 🔀
Water use: Domestic Municipal Stock Stock	irrigation
Industrial Drainage Other:	
Casing:ft. toft. TypeSize.	***************************************
Casing: ft. to ft. Type. Size.	
ti dika Tinana i terpesakan ali tidak	
Casing:ft. toft. TypeSize	
Perforated or Screened: Ft to ft	to ft.
Type of screen or perforations	
Static Water level, for non-flowing well:	feet.
Shut-in pressure, for flowing well:lb./sq. in. on:	(date)
Pumping water levelgal	. per min
How tested:	
Length of test	
Remarks: (Gravel packing, cementing, packers, type of shut-off, depth of shut-off	
	,
	***************************************

(over)



## Pronghorn Rench 11 No. 2 - 1948

Driller - Ferguson, Lewistown

Location - Upper Ranch headquarters barn lot, Section29, NE NE ~ Township 11 N, Range 23 E.

Size of hole - 10 inches

Size of casing - 8 inches

Depth of hole - 30 feet

Case - 20 feet slotted 5 feet

This is a gravel packed surface well with electric pump. Rated 100 gallons per minute.

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	ing Managalan	T 11N	R 23	B
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MONTANA BUREA		GEOLOGY		
	utte, Montana		1 4 4 5 1 4d	
WAT	TER-WELL LOG		Postlage	Incorporated
Peerless Oil &			1670 Denv	er Club Buil
Owner Wytana Ranch D	ivision	Address	Denver 2,	Colorado
Driller Ferguson		Address	Levi.s:ovn	
Date Started	· · · · · · · · · · · · · · · · · · ·	Date Com	pleted	
Location: Sec. 29 T	lin R 23E	1/4 sec. 182	ne sw	
Drilled			Churn Dri	11
Type of well (Dug, driven, bored, or drilled)	Equipment used	i(Chur	n drill, rotary	other)
Water use: Domestic Municipal	Stoc	k 🔼	Irrigation	
Industrial Drainage	Other:			
Pasing: ft. to ft.	Tyne			
The same of the sa		er de la companya de La companya de la co		A AND STORY
Pasing: ft. to ft.				
Casing:ft. toft.				
Perforated or Screened: Ft to ft	Ft		to ft	
Type of screen or perforations				
Static Water level, for non-flowing well:		and the second		
Static Water level, for non-flowing well:		***************************************		Ieet
Shut-in pressure, for flowing well:	lb./sq. in. (	on:	(date)	
Pumping water levelfee				
Now tested:	•••••••••••••••••••••••••••••••••••••••			
Length of test			******************	
Remarks: (Gravel packing, cementing, packers,	type of shut-off, dept	th of shut-off		
		·	:	
	***************************************	•••••		•

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## NATER WELLS ON PRODUCHORN RANCH

## Pronchorn Rench Well No. 1 - 1948

Description of Makerial Drilled

Driller - Ferguson, Lewistown

Location - Upper Ranch headquarters house, Section 19, NE NE 'S Township 11 N, Range 23 E.

Size of hole - 10 inches

Size of casing - 8 inches

Depth of hole - 30 feet

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Case - 20 feet slotted 5 feet

This is a gravel packed surface well with electric pump. Rated 100 gallons per minute.

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T11.M	R 23 S.	
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## MONTANA BUREAU OF MINES AND GEOLOGY Butte, Montana

	Butte, Montana	
	WATER WELL LOG	6/0 Pearless Incorporate
ang mengangan kanalagan dan kanalagan beranggan		1670 Diever Glub Bldg.
	ess 011 & Ges Company	Denver 2, Colorado
Owner.	a Reach Division	Address
Driller Corec		Address Roundup, Montana
Page Stantag	Becamber 16, 1958	Date Completed February 26, 1959
		Date Completed
Togetion Sec	20 Tile P 242.	¼ sec
in the state of th	The state of the s	/4 500
Pyro of wall	Equipment used	Churn drill
Type of well (Dug, driven, bored,	or drilled)	(Churn drill, rotary, other)
	era	
Water use: Domestic	Municipal Stocl	k 🗷 Irrigation 🗷
		大学 医双侧性畸形 化二氯化甲酚 "A. (15) 15 15 16 16 16 16 16 16 16 16 16 16 16 16 16
Industrial (	Drainage Other:	
lesing. It to	ft. Type	Size
The role of the second		
Casing:ft. to	ft. Type	Size
		Size
Casing:ft. to	and the state of	1987年 - 1987年
Perforated or Screened: Ft	to ft. Ft.	to ft.
	A Section of the Control of the Cont	
Type of screen or perforations		
Static Water level for non-flowing well-		feet
Static water level, for non-nowing went.		1660
Shut-in pressure, for flowing well:	<b>809</b> lb./sq. in. o	on:
		(date)
Pumping water level	feet at	gal. per min
	•	
How tested:	<u></u>	
Length of test		
GOTTE WILL OIL BOST		***************************************
Remarks: (Gravel packing, cementing,	, packers, type of shut-off, dept	h of shut-off)
enesting		
	***************************************	
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	(arraw)	

Peerless Oil & Gas Company Wytana Ranch Division Pronghorn Ranch Well No. 28 Center of Section 29, T. 11 N., R. 23 E. Musselshell County, Montana

F 2 3 454

Surface pipe: 60° of 3-5/8" cemented with 70 sacks Production pipe: 1117° of hgm cemented with 50 sacks

December 16, 1958 Date spudded: Date completed: February 26, 1959

Samples: Analysed by Serbert D. Hadley, Geologist, Billings, Hontana Contractor: Gordon Scammon, Roundup, Montana

### Tentative Sample Tops

Top Mowry		590	Feet
Base Mowry		740	
Top Muddy Zone		1140	
Zone of porosity in Muddy	Zone	1153	- 1162

Total depth: 1170

#### Urill-Stem-Tests

February 22, 1959 Fabruary 22, 1757

Facker set at 1117 feet, total depth 1170 feet.

Tool open 210 minutes. Shut in 30 minutes.

Initial flow pressure 15" - Final flow pressure 125". Shut in pressure 180# - Hydrostatic pressure 585# Recovered 1,080 feet of water. Water still rising in hole at and of test.

The analysis of the water secured in the drill-stem-test is attached to this report. Total solids calculated to be 2,23h but it is believed total solids will decrease 100 to 300 p.p.m. when the well has flowed or pumped for several days.

while the total solids are higher than hoped for, the water is potable and should not have a bad taste or odor. The water is slightly alkaline and soft. It will be excellent for all washing purposes.

Pressures taken during the drill-stem-test indicate that the water will rise to near the surface and may flow a small stream.

Fifty macks of comment, theoretically, should fill 600 feet of space between the casing and well bore and provide a safe, remmanent installation.

The water is coming from the Muddy Sandstone. No other some in the hole has any water productive capabilities.

HEREGAT D HADLEY CONSULTING SECLOGIST BILLINGS MONTANA

- 0 500 No samples available.
- 500 515 Sandstone, dark gray, very silty to shaly, hard, pyritic, micaceous, trace glauconite, non-permeable, much dark gray, silty shale. Trace tan, cryptocrystalline limestone and bentonite.

- 515 5h0 Shale, dark gray to black, sandy to silty, trace tan limestone and bentonite and glauconite. Much pyrite and very sandy 530-5h0.
- 540 590 Shale, black, blocky to sub-flaky, partly silty to finely sardy.

  Much gray-white bentonite 550-560. Much surface cavings 560-570.

  Much bentonite and ten limestone 580-590.
- 590 605 Sandstone, fine grained, gray, dark gray, silty to shalp, hard, non-permeable, trace mics and glauconite. Much black shale as above. Some bentonite. Sandstone, medium grained in part, with salt and pepper appearance. Few brown fight scales. Sandstone and shale probably thinly interbedded.
- 605 610 Bentonite; some black shale.
- 610 625 Sandstone and shale, as 590-605, interbedded, partly siliceous.
- 625 630 Shale, partly siliceous, dark gray to black, to sandy and hard. Some hard, fine grained, shaly sandstone, non-permeable.
- 630 660 Sandstone and shale, as 590-605. Very hard, siliceous, many brown, chitinous (?) spots, trace bentonite. Very sandy 635-640. Trace glauconite and increase in shale 650-660.
- 660 665 Sandstone and shale, thin interbeds, hard; sandstone fine grained to medium grained, hard, non-permeable.
- 665 700 Sandstone, white-gray, medium grained, salt and pepper, hard, trace porosity and permeability but mostly non-porous, fossiliferous, fish scales. Thin interbeds of black, hard shale. Very hard and siliceous 590-700.
- 700 7hD Sandstone, fine grained and shale in thin interbeds, as 560-665. Much bentonite 730-7hD.
- 740 790 Shale, black, blocky to flaky. Some fine grained, dark gray, shaly sandatene. Some bentonite. Gradual decrease in sandy shale.

  Bentonite 770-780. Shale blacker and softer at 780-790.
- 790 845 Shale, black, blocky to partly sub-flaky. Much light gray bentonite and metabentomite. Red silty meterial 830 probably caying but oould be "ironstene concretions".
- 8h5 855 Shale, as next above, plus some gray, poorly sorted, hard, nonpermeable, fine grained, salt and pepper, glauconitic sandstone. Shale black and partly fissile.
- 855 880 Shale, dark gray to black, blocky to sub-flaky. Trace pyrite and bestomite.

HERBERT D. HADLEY
CONSULTING SKOLOGIET
SILLINGS, MONTAMA

880 - 900 Shale, dark gray to black, blocky, fissile. Much white bentonite and metabentonite

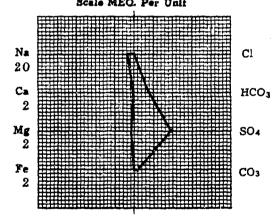
- 900 920 No samples.
- 920 990 Shale and bentonite, as 880-900.
- 990 1015 Shale, dark gray to black, blocky, partly very silty to finely sandy. Trace gray, slightly glamconitio, fine grained sandstone, non-permeable.
- Shale, dark gray to black, milty to finely sandy. Some dark gray, sandy siltatone. Much pyrite. Some black, blocky to sub-splintery, finalle shale. Increase in fine grained, milty, tight sandstone 1045-1050.
- 1050 1070 Shale, black, blocky, partly silty to finely sandy. Frace fine grained, granular, tight sandatone. Some bentonite 1065-1070.
- 1070 1100 Shale, black, blocky to platy to sub-splintery, fishile, partly silty. Sentonite. Pyrite.
- 1100 1120 Shale, black, blocky, milty to finely sandy, pyritic. At 1115 a few streaks gray, tight, fine grained, siliceous sandstone.
- 1120 1130 Shale, black, as 1070-1100.
- 1130 1140 Shale, black, blocky, silty to finely sandy. Pyrits.
- 1140 1153 Shale, black, sandy, hard. Some dark gray, shely, fine grained sandstone.
- Sandstone, gray-white, salt and pepper, medium angular grained, slightly glauconitic, slightly calcareous. Drills up partly as loose grains. Fair to good porosity and permeability. Slight indication of gas with Hel. Pyrite.
- 1162 1165 Sandstone, gray, silty to shaly, medium-fine grained. Drills up partly in grains. Possibly poor porosity and permeability.
- 1165 1170 Sandstone, gray-white, fine grained, angular, calcareous, salt and pepper, tight, no porosity and permeability.
- 1170 Total depth.

## YAPUNCICH, SANDERSON & BROWN LABORATORIES

## WATER ANALYSIS REPORT

Lab. No. 3921-1

Field PE	ONGHORN RA	NCH	County	MUSSELSHELL State	MONTANA
Well No28			Location	NW 29-11N-23E	·····
FormationMU	YDDY		Depths	1170'	
Operator WY	TANA RANCH		RONGHORN	Date Sampled	2-22-59
DST No2	_ Sample	(TOP)		Date Analyzed	2-23-59
Other Data_TO	OL OPEN 23			OVERED 1080' WATER.	SIP 480
LBS., FP	15~425 LBS	., HP 585	LBS. BENTONI	ITE TYPE DRILLING MU	D. MUDDY
WATER. C	LEAR COLOR	LESS FILTE	ATE.		
Constituents	PPM	MEQ.	MEQ. %	Total Solids in Par	rts per Million
Sodium	755	32.82	46.42	By evaporation	-ii
Calcium	16	08.0	1.13	After ignition	·
Magnesium	21	1.73	2.45	Calculated	2234
Sulfate	950	19.76	27.95	рН8.7	
Chloride	157	4.43	6.27	Specific Gravity® \$1°F_	1.002
Carbonate	84	2.80	3.96	_	
Bicarbonate	510	8.36	11.82	Recistivity @ \$8°F ohms/meter2	3.11
Chloride as NaCl	259	PPM.	Total Solids Fron	n Resistivity as NaCl 168	4 PPM



FAIRLY SOFT WATER. MINERALLY CAN BE USED FOR DOMESTIC USE.

## YAPUNCICH, SANDERSON & BROWN LABORATORIES

P. O. BOX 593

BILLINGS, MONTANA

13 M. 22NO SY

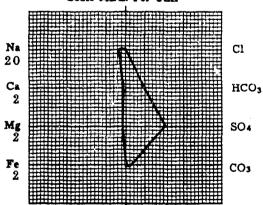
## WATER ANALYSIS REPORT

Lab. No. 3921-2 1977-W

Field	PRONGHORN B	ANCH	County MU	SSELSHELL State	MONTANA
Well No.	28		Location	NW 29-11N-23E	
	MUDDY		Depths	1170'	
Obcretor	WYTANA RANC		RONGHORN	Date Sampled	2-22-59
DO1 140.	2_Sample	(BOTTOM)		Date Analyzed	2-23-59
O 101/01 TO B 1/2 "	TOOL OPEN 2		30 MIN. REC.		IP 480
LBS., F			LBS. BENTONII	E TYPE DRILLING MU	D. MUDDY
WATER.	CLEAR COLO	RLESS FILT	ATE.		
Constituents	PPM	MEQ.	MEQ. %	Total Solids in Pe	rts per Million
Sodium	799	34.75	46.36	By evaporation	
Calcium	20	1.00	1.33	After ignition	
Magnesium	21	1.73	2.31	Calculated	2384
Sulfate	1050	21.84	29.14	pH8.2	
Chloride	161	4.54	6.05	Specific Gravity@ \$0°F.	1.002
Carbonate	50	1.67	2.22	Davissinia & COP	
Bicarbonate	575	9.43	12.59	Resistivity @ 88°F ohms/meter3	3.11
Chloride as Na	CI 265	PPM.	Total Solids From	Resistivity as NaCl177	6 PPM

NOTE: Sedium and potassium reported as sodium. MBQ.=milliequivalents per liter. PPM=parts per million (milligrams per liter). 1 PPM equivalent to 8.0001%

#### WATER ANALYSIS PATTERN Scale MEQ. Per Unit



FAIRLY SOFT WATER. MINERALLY CAN BE USED FOR DOMESTIC USE.

Control of the Contro

SPECIALIZING IN CORE WATER CAR AND CHURCOLL ANALYSES

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	,	WATER WELL LOG			
* ***	and the first of the state of t	Dil & Gas Company		Pearless Incorp. 1670 Denver Clu	beser hese
	Owner Wytana Ran		Address	Denver 2, Color	
<b></b>					
	Driller Gordon Sca	10805	Address.	Roundup, Montan	<u> </u>
	Date Started		Date Co	mpleted	
	Location: Sec32	T 11 R 23	4 sec		
en la companya de la	4114		اد اداد آنگ در ایسا در اوری	Chairm Brid 13	
Type or well	(Dug, driven, bored, or drill	£quipment us	(Cht	irn drill, rotary, other)	•••••
			िस्त		
Water use: Dome	stic Munic	ipal St	ock XX	Irrigation	
				Providence in the second of the second	
Indust	rial Drain	age Otne	<b>F</b> :		******
Jasing:	ft. to	ft. Type	Size		
	and the second of the control of the				
	ft. to			All Andrews An	
	ft. to		Size		
	med; Ftt	<u></u>			
Type of screen or p	erforations	***************************************			
			and the second second		- " " !
Static Water level,	for non-flowing well:				feet.
Shut-in pressure, f	or flowing well:	lb./sq. in	on!		
				(date)	
Pumping water leve	el 205	feet at	ga	l. per min	
How tested:			***************************************		
Length of test					
Remarks: (Gravel	packing, cementing, pack	ers, type of shut-off, de	pth of shut-of	<b>()</b>	
		***************************************	***************************************		
					***************************************
	And the second s				

(over)

THE REPORT OF THE PARTY OF THE

MIN 3 1922

GORDON SCAMMON
Drilling Contractor and Well Service
P. 0. Box 431
Roundup, Montana

Wytana Cattle Co., Water Well No. 15

O to 5 ft. Top soil

5 to 42 ft. Yellow Clay

42 to 135 ft. Light Grey Shale

135 to 156 ft. Grey Sandstone, thin layers of sandy shale (Water)

156 to 205 ft. Dark grey shale.

205 Total Depth, water level 105 feet from top of ground

Casing perferated 135 ft to 157 ft., cave catcher set at 130 ft.

205' of 6" 0.D. casing used in this well.

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# Billings CORE-LAB

## WATER ANALYSIS REPORT

Lab. No.... 11.34

	AA 22 7 777				
			Date 5-24-52		
		Da	te		
West a ma	Cattle Cornany	- 1- l'n ior	den Seammon		
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Address No	erth zu	0 1000			
Sample from NOII 119	ontana erth 20	the second contract of the second of the second of			
Intended use Nome sti	c and stock		• 67331		
Intended use		Total Solids	in Parts per Million		
	Paris per Million		3572		
Constituents	Paris per	By evaporation	3096		
	447		3030	• • •	
	447		17		

Intended use		Total Solids in Parts per Million			
Constituents	Paris per Million	<u> </u>			
Sodium	447	By evaporation 3C96 After ignition 3C33			
Calcium	234	Calculated			
Magnesium	221 1721	pH 7.7 Specific gravity: 60°F 1.008			
Sulfate					
Chloride	32	Resistivity 68°F			
Carbonate	0	ohms per meter cubed 3.0			
Bicarbonate	763				
Total Silica					
Soluble Silica					
Iron					

Total hardness as calcium carbonate 37.3 grans U.S. gallon

Remarks: Not suitable for demestic use. Suitable for stock use.

Hard water.

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AIE ENGIN	CEN	WATER	WELL LOG			
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	Owner. Figure	calca Pooling	j. Company	Address	Maratt, N	outans
	Driller 2202	agston Sata(	<b>20</b>	Address	Microsty B	ontone
	Date Started.	August 5, 19	<b>X60</b>	Date Co	mpleted August	s 9. 1960
		33 т				
						••••••
of well 57213	(Dug. driven, bore	d, or drilled)	Equipment use	d(Ch:	ırn drill, rotary, othe	r)
er use: Domestic		Municipal	Sto	ck 🙎	Irrigation	
Industrial	ft. to Six	Drainage	Taranga kanalangan k		•	
e Todaya Mariya Qaraya da ayada da ayada da a sa basa	والمناب والمتفاجع فجرانين			ما المستعملين	والمناب والمناب والمتاب والمتابية	
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ıg:						والأراث المالية الأرار
rated or Screened	: Ft.	to ft	Ft.	•••••••••••	to ft	***************************************
of screen or perfor	ations	Port Crast 1	Manufa Managar		***************************************	
c Water level, for n	on-flowing well	49764	. Para were	8 600		feet.
in pressure, for flo	wing well:	***************************************	lb./sq. in. o	n:	(date)	***************************************
oing water level		feet at				
tested:	allor		e de la companyo			
th of test		***************************************				
arks: (Gravel pacl	1	4.7			H	***
Pentar	above purf	or at long	02100 021, 400		<b>,</b>	
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Log of Well

Depu	h, feet	[ [
From	То	Description of Material Drilled
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35	60	Gravor Contract Manager A
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GROUNDWATER INDEX

Page ____of___

County MUDDIOHILL TWP. 111 Rge. 24E

Sec.	Name of Appropriator	Type of Form	County File No.	Remarks
2	Iversen andrew	CW4	169730	
3	Graves Ramch Co:	BW4	169385	· · · · · · · · · · · · · · · · · · ·
3	a facility of the second	5760		
4		GW4	169388	
4	10	576		
10	The state of the s	5760		·
10	Application of the second	5760		
11	(A) A A A A A A A A A A A A A A A A A A	5766		
14	The state of the s	57136		
14	(A)	57106		
15	10 10 10 10 10 10 10 10 10 10 10 10 10 1	BW2	184971	
20	41	57106		
22		57606		
25		576	<u> </u>	
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28	1, 11	57106		
28	1, 11	57206	·	
28	11 11 11	37606	110700	
28		0004	169392	
28	11 11 11 11	3w2	18 441	
28	1) (2)	6m4	169389	
28	tt tt	6W4	169387	
30		57106		
36	Grover, Jay & Cleon	57406		
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State of Montana Administrator of groundwater Code Office of State Engineer County / SSS SHEZ JAN 3 1964

DECLARATION OF VESTED GROUNDWATER RIGHTS
(Under Chapter 237, Montana Session Laws, 1961)

(Name of Appropriato	(Address	Hounds	yp.
County of Musaulahan have appropriated groundwater 1962, as follows:	according to the Montana laws	s in effect prior to Janu	uary 1,
2.	The beneficial use on which t	he clain is based	4. Water
	,	,	• • • • • •
3.	Date or approximate date of econtinuous the use has been .		
4.	The amount of groundwater claper minute)	aimed (in miner's inches	or gallons
	If used for irrigation, give lands to which water has been	the acreage and descript a applied and name of the	tion of the e owner
Indicate point of appropriation and place of use, if	thereof		•••••
possible. Each small square 6 represents 10 acres.	The means of withdrawing such location of each well or other such as the such	er means of withdrawal	
7. The date of commencement as works for withdrawal of grands. 8. The depth of water table.	pund water . Commen yeated . 3/22/6/	ion of the well, wells,	or other
9. So far as it may be availal specifications of any other	ole, the type, size and depth works for the withdrawal of	groundwal of groundwater	r
	a. an en gerjal		• • • • • •
10. The estimated amount of g	roundwater withdrawn each year	30.000gus	•••••
11. The log of formations enc	ountered in the drilling of each	ach well if available	•••••
			• • • • • •
12. Such other information of policy of this act, inclu	a similar nature as may be us ling reference to book and pag		
	Signatura of (	owner India M	respend
	orguature of (	12/3//6	. 2

## 169730

STATE OF MONTANA, MUSSELSHELL COUNTY. DAY OF A. D. 19.63 December

December

OCLOCK M.

H MATZKE

COUNTY RECORDER

Shanes & Slawsan

DEPLITY

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Dτ	PL:	ICA	TE								County Mucsel
										S'	TATE OF MONTANA
								P			TOR OF GROUNDWATER CODE DECEIVED
								<b>n</b> .	_11		
							İ				Vested Groundwater Rights r 237, Montana Session Laws, 1961) STATE ENGINEER
_				CID.	AVE	S R	ANC	н с	CMPANY		ROUNDUP
1.			•								of ROUNDUP (Address) (Town)
		oun			riat	ed i	SLO1	nd indi	water acc	ordi	State of MONTANA
Ŷ.		ws:					<b>J</b>				
				. 1	N					9	The beneficial use on which the claim is based
-		. !			1				]	۵.	STOCK WATERING
- [				-	-					3	Date or approximate date of earliest beneficial use; and how con-
				_						0.	tinuous the use has been 1954
					1				h-		
₹			, C (			-	<del>                                     </del>	-	E		
ं			-	-	X	<del> </del>	-	-		4.	The amount of groundwater claimed (in miner's inches or gallons
ू				-	-			-			per minute) 10 gal minute BALER TEST
-			4 3	300	102.00	-	-	-			
. (				<u> </u>	<u> </u> В	<u>                                      </u>	<u> </u>	<u>                                     </u>	<u>]</u>	5.	If used for irrigation, give the acreage and description of the lands to which water has been applied and name of the owner
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. I	E,	4.3	S	ec	3	Т	ַ בַּו	R	24E		
								iatio			The moone of withdrawing much water from the ground and the

7. The date of commencement and completion of the construction of the well, wells, or other works for with-drawal of groundwater NOT 1954

PUMP.

Each small square represents 10

acres.

other works for the withdrawal of groundwater 125 Tt., depth

12. Such other information of a similar nature as may be useful in carrying out the policy of this act, including reference to book and page of any county record.

reference to book and page of any county record....

GRAVES RANCH CONTANT
Signature of Owner Clean B. Jacobson
Date 1/23/43 Presedent

location of each well or other means of withdrawal

Three copies to be filed by the owner with the County Clerk and Recorder of the county in which the well is located

Please answer all questions. If not applicable, so state, otherwise the form will be returned.

Original to the County Clerk and Recorder; duplicate to the State Engineer; Triplicate to the Montana Bureau of Mines and Geology and Quadruplicate for the Appropriator.

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P.V. HOZZ

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Form No. 18 8-60 T. 11 R. 24 County Fusselshell MONTANA BUREAU OF MINES AND GEOLOGY DECEIVED Water Well Log STATE ENGINEER Address Roundup, Mont. Owner Graves Ranch Company Address Noundup, Mont Driller Batt Jackeck Date Started Nov. 1954 Date Completed Nov. 1954 Location: Sec. 3 T. 11 R. 24  $\frac{1}{4}$  sec. Sec. Equipment used Churn (Churn, drill, rotary, other) Type of well Drilled (Dug, driven, bored, or drilled) Municipal Water use: Domestic Stock x Irrigation ___ Industrial Drainage Other Casing: _ ft. to 128 __ft. Type 20 Ga. Galv. Size 6" Casing: ft. to ft. Type Size Type____Size__ __ft. to____ft. Casing:____ Perforated or screened: Ft. 65 to ft. 128 . Ft. to ft. Type of screen or perforations X2 20 Ga. Galv. Screen type Static water level, for non-flowing well: 55 feet. Shut-in pressure, for flowing well: _____lb./sq. in. on: ____(date) Pumping water level 110 feet at 10 gal. per min. How tested: Dailor Length of test 1hr Remarks: (Gravel packing, cementing, packers, type of shut-off, depth of shut-off)

Log of Well

Depth, From	feet To	Description of Material Drilled
0	'10	Grey Shale
40	JJOMOKEET.	Dark Shale
EE 110	128	Grey Sandstone
	10 10 10 10 10 10 10 10 10 10 10 10 10 1	
	·	
<u> </u>		
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l-Helena Independent Record T 11N R 24E File No..... County Mussel-DUPLICATE STATE OF MONTANA ADMINISTRATOR OF GROUNDWATER CODE OFFICE OF STATE ENGINEER Declaration of Vested Groundwater Rights STATE ENGINEER (Under Chapter 237, Montana Session Laws, 1961) GRAVES RANCH COMPANY ROUNDUP (Name of Appropriator) (Address) (Town) State of. have appropriated groundwater according to the Montana laws in effect prior to January 1, 1962, as fol-The beneficial use on which the claim is based ...... STOCK WATER

3. Date or approximate date of earliest beneficial use: and how continuous the use has been .... OLD WELL DRILLED ABOUT 1920 The amount of groundwater claimed (in miner's inches or gallons per minute) _____ 8 gal per min __ pump If used for irrigation, give the acreage and description of the lands to which water has been applied and name of the owner Sw........... Seq....... T...... R. 24... Indicate point of appropriation and place of use, if possible. The means of withdrawing such water from the ground and the Each small square represents 10 location of each well or other means of withdrawal 7. The date of commencement and completion of the construction of the well, wells, or other works for withdrawal of groundwater ABOUT 1920 data not available So far as it may be available, the type, size and depth of each well or the general specifications of any 11. The log of formations encountered in the drilling of each well if available ...... not available 12. Such other information of a similar nature as may be useful in carrying out the policy of this act, including reference to book and page of any county record......

GRAVES RANCH COMPANY
Signature of Owner Lead President
Date 9/23/63

Three copies to be filed by the owner with the County Clerk and Recorder of the county in which the well is located.

Please answer all questions. If not applicable, so state, otherwise the form will be returned.

Original to the County Clerk and Recorder; duplicate to the State Engineer; Triplicate to the Montana Bureau of Mines and Geology and Quadruplicate for the Appropriator.

STATE OF MONTANA. SS.

MUSSELSHELL COUNTY. SS.

PILED THIS 2 DAY OF.

A. D. 19 G. 3

AT / 24 O'GLOCK 7 M.

B. H. MATZKE

COUNTY BECORDER.

2. DEPUTY

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Form No. 18 8-60

T. 11 R. 24

MONTANA BUREAU OF MINES AND GEOLOGY Butte, Montana M vic 15 1951

STATE ENGINEER

	Water Well Log	
	Owner Graves Canch Company	Address Roundup, Montana
	Driller naknown	Address
	Date Started	and the control of th
x	Location: Sec. 1 T. 11 R	and the second of the second o
Type of well_	(Dug, driven, bored, or drilled) Equipmen:	(Churn, drill, rotary, other)
Water use: I	Domestic Municipal St	ock 🖫 Irrigation 🗌
Ind	dustrial Drainage 0t	her
Casing:	ft. toft. Type	
Casing:	ft. to ft. Type	Size
right of the state of the	ft. to ft. Type	
Commence of the second	screened: Ftto ft	
The second second	or perforations	
gradient der State (1984) bei der	evel, for non-flowing well: 35	feet.
	ure, for flowing well:1	
Pumning water	level 80 feet at 8	gal per min.
How tested:		
Length of test		
**		trans of short off double of
	evel packing, cementing, packers, shut-off)	type of snut-off, depth of
This is:	an old well that was drilled about	1920 and no log is
availahle	9	
	(over)	

10 Form No. 18 T. 11 R. 24 8-60 County____ MONTANA BUREAU OF MINES AND GEOLOGY DECEIVED Butte, Montana STATE ENGINEER Water Well Log Owner Graves Ranch Company Address Roundup, Wont. Driller <u>linknown</u> Address Date Started_____ ____Date Completed____ Location: Sec. 10 T. 11 R. 24 4 . c. Swk Type of well Drilled
(Dug, driven, bored, or drilled) _Equipment used___ (Churn, drill, rotary, other) Domestic X Municipal Stock X Irrigation Water use: Industrial Drainage Other ft. to_ Type____Size__ ___ft. Type____Size___ Casing: ft. to ft. ___ft. to____ft. Type Size Perforated or screened: Ft. to ft. to ft. to ft. Type of screen or perforations Static water level, for non-flowing well: 15 Shut-in pressure, for flowing well: ____lb./sq. in. on:_____ Pumping water level 30 feet at 15 gal. per min. How tested: משוומ Length of test 4 hours Remarks: (Gravel packing, cementing, packers, type of shut-off, depth of This is an old well that was drilled about 1920 and no log is available.

(over)

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	Control			10
Form No. 18 8-60		<b>11</b> 19	R. 24E	
		County	selshell	
		OF MINES AND GEOI e, Montana	OGY DECEL	1 11 1
	Water	Well Log	STATE EN	GINEER
	Graves Ranch	Company Add	koundup, Mon	tanga
· ·	Driller Eugene Ric	e Ado	Roundup, Mon	rtana
		8. 1960	e Completed Same	
		10 T. 111 R. 241		
Type of well	111ed	Equipment used	Rotary	
	Dug, driven, bored, or drilled)	Lquipment used_	(Churn, drill, rotar	y, other)
Water use: Do	omestic Munici	pal Stock	Irrigation	
Indi	strial 40 Drain	age Other		
Casing:	_ft. toft	20 Ga. Ga. Ga.	Size	
	_fttoft		Size	
	ft. toft	the state of the s	Size	
Perforated or s	creened: Ft.	40 to ft Ft	to ft	
	or perforations	* •		
Static water le	evel, for non-flowing	well:		feet
Shut-in pressur	e, for flowing well:	lb./sq.	in. on:	
Pumping water 1		30 et at	gal. per min	
How tested:	Compressed air on dr	L11		-
Length of test	1 hour			
Remarks: (Grav	rel packing, cementin aut-off)	g, packers, type o	of shut-off, dept	h of
	<del> </del>			·

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**第五条的基础的现在分** 

Log of Well

		feet	Depth,	3 14 24.
	Description of Material Drilled	То	om	Fr
	Red clay	5	0	
# 12 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Grey shale	25	5	
	Red rock	27	5	í
	Grey sandstone	35	7	,
	Red "	40	5	3
				_ :

11. Form No. 18 County Mascalshell

DECEIVED 8-60 UN 441 15 1961 MONTANA BUREAU OF MINES AND GEOLOGY Butte, Montana STATE ENGINEER Water Well Log Owner Graves Reach Company Address Loundup, Contana Driller Hestern Goobhysical Co. Address L.A. Calif Date Started August 1952 Date Completed same Location: Sec. 17 T. 17 R. 21 4 sec. 124 Equipment used Rotary (Churn, drill, rotary, other) Type of well prilled (Dug, driven, bored, or drilled) Domestic Municipal Stock X Irrigation Water use: Industrial Drainage Other Casing: 0 ft. to 75 ft. Type 20 ga. Galv Size 4" Casing: ft. to ft. Type Size Casing: ____ft. to ____ft. Type ____Size____ Perforated or screened: Ft. to ft. to ft. to ft. Type of screen or perforations None ____feet. Static water level, for non-flowing well: Ground level Shut-in pressure, for flowing well: _____lb./sq. in. on: _____(date) Pumping water level 200 feet at 20 gal. per min. How tested: bir pressure Length of test 1 hour Remarks: (Gravel packing, cementing, packers, type of shut-off, depth of No log was kept on this well, as it was drilled as a test hole for an artesial flow.

(over)

Form No. 18 8-60 County Musselshell MONTANA BUREAU OF MINES AND GEOLOGY DECEIVED Water Well Log STATE ENGINEER Address Foundup, Montana Owner Graves Ranch Company Driller Matt Jasbeck Address Boundup, Montana Date Started November 1956 Date Completed Nov. 1956 Location: Sec. 14 T. 11 R. 21 4 sec. NE. Equipment used Churn (Churn, drill, rotary, other) Type of well (Dug, driver, bored, or drilled) ___ Stock ___ Water use: Domestic Municipal Irrigation ___ Industrial Drainage Other Casing: ft. to 3/ ft. Type 20 Ga. Galv Size 6" Casing: ft. to ft. Type Size Casing: ____ft. to ____ft. Type____Size___ Perforated or screened: Ft. 16 to ft. 34 . Ft. to ft. Type of screen or perforations 20 Ga. Galv. Screen type Static water level, for non-flowing well: 15 Shut-in pressure, for flowing well: _____lb./sq. in. on:_____(date) Pumping water level 25 feet at 30 gal. per min. How tested: hailer Length of test 1 hour Remarks: (Gravel packing, cementing, packers, type of shut-off, depth of shut-off)

(over)

Log of Well

Depth.	feet	
Depth, From	То	Description of Material Drilled
0	12	Surface
12	<b>PP</b> 34	Grey Sandstone
	,	
	·	

e No			T. 11N R. 24E
PLICATE		. :	County MUSSELSHELL
		TATE OF MONTANA	
		TOR OF GROUNDWATER CODE	DECEIVED
	OFFIC	E OF STATE ENGINEER	
	Declaration of	Vesied Groundwater Right	s DEC 7.
·	(Under Chapter	r 237, Montana Session Laws, 1961)	STATE FNGINEED
		<del></del>	COUNTER
CRAVES PANCH COMPAN	NTV	of ROUNDUP	
(Name of Ar	propriator)	(Address)	(Town)
County of MUS	SHELL.	State of MONTANA ng to the Montana laws in effect pr	
lows:	nawater accordi	is to the montana laws in circo p	101 to tulidary 2, 1502, as 101
N N	g	The handicial use on which the si	nim in hound
	<b>—</b>	The beneficial use on which the cl	the state of the s
		Date or approximate date of earlies	
		tinuous the use has beenNOVE	MPER 1956
		••	***************************************
<b>\$</b>	E		
	4.	The amount of groundwater claime	
		per minute)30 gal per minut	o belor tost
	5.	If used for irrigation, give the adlands to which water has been ap	reage and description of the plied and name of the owner
	and the second s	•	
		thereof	
-,14 Sec - T - I	<b>.</b>	thereof	
Sec. 14 T. 11. Indicate point of appropri		thereof	
ndicate point of appropri nd place of use, if pos	ation sible. 6.	The means of withdrawing such w	rater from the ground and the
ndicate point of appropri	ation sible. 6.	The means of withdrawing such w	rater from the ground and the
ndicate point of appropri nd place of use, if pos ach small square represen	ation sible. 6.	The means of withdrawing such w	rater from the ground and the
ndicate point of appropri nd place of use, if pos- ach small square represen- cres.	ation sible. 6. its 10	The means of withdrawing such w location of each well or other mea	rater from the ground and the
ndicate point of appropri nd place of use, if pos- ach small square represen- cres.  The date of commencen	ation sible. 6. its 10	The means of withdrawing such we location of each well or other means to the construction of the well,	rater from the ground and the
ndicate point of appropri nd place of use, if pos- ach small square represen- cres.  The date of commencen	ation sible. 6. ts 10 nent and complet	The means of withdrawing such w location of each well or other mea	rater from the ground and the
ndicate point of appropri nd place of use, if pos- ach small square represen- cres.  The date of commencen drawal of groundwater	ation sible. 6. tts 10  nent and complet	The means of withdrawing such w location of each well or other means to the construction of the well,	rater from the ground and thens of withdrawalwells, or other works for with-
ndicate point of appropri nd place of use, if pos- ach small square represen- cres.  The date of commences drawal of groundwater  The depth of water tab	ation sible. 6. tts 10  nent and complet NOVEMBLE	The means of withdrawing such w location of each well or other means of the construction of the well, ion of the construction of the well, ion	rater from the ground and thens of withdrawalwells, or other works for with
ndicate point of appropri nd place of use, if pos- ach small square represen- cres.  The date of commences drawal of groundwater  The depth of water tab.  So far as it may be available of the works for the wife.	ation sible. 6. tts 10  nent and complet NOVEMBLE le XXXXX	The means of withdrawing such we location of each well or other means ion of the construction of the well, ize and depth of each well or the edwater 34 f	rater from the ground and thens of withdrawal
ndicate point of appropri nd place of use, if pos- ach small square represen- cres.  The date of commences drawal of groundwater  The depth of water tab.  So far as it may be available of the works for the wife.	ation sible. 6. tts 10  nent and complet NOVEMBLE le XXXXX	The means of withdrawing such w location of each well or other means ion of the construction of the well, ize and depth of each well or the idwater 34 f	rater from the ground and thens of withdrawal
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The depth of water table  The depth of water table  The estimated amount of the position of the property of the position of the property of th	ation sible. 6.  Its 10  In the sible of groundwater we countered in the	The means of withdrawing such w location of each well or other means ion of the construction of the well, ize and depth of each well or the adwater withdrawn each year as need of circling of each well if available	general specifications of any
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Please answer all questions. If not applicable, so state, otherwise the form will be returned.

Original to the County Clerk and Recorder; duplicate to the State Engineer; Triplicate to the Montana Bureau of M. nes and Geology and Quadruplicate for the Appropriator. 13603

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March 29, 1974

Mr. Thomas M. Ask Attorney at Law Wall Building P.O. Box 685 Roundup, Montana 59072

Dear Mr. Ask:

This is in response to your letter of November 21, 1973, which stated the following:

"Enclosed herewith is Notice of Completion of Water Development and Well Log Report pertaining to the Graves Ranch Company's water right. They received a permit prior to July 1, 1973, instrument number 184971.

"Also enlosed is our check in the sum of \$35, which I believe is the correct amount for the filing of this water development. If there is any further information that you need, please advise."

This De. rtment has reviewed your letter and enclosures and find your situation to be rather unique.

First, the permit number you referred to in your letter as being received prior to July 1, 1973, is the Musselshell County Clerk and Recorder's recording instrument number for the form filed by Graves Ranch Company. The form (see enclosed Xerox copy) that was filed was the Notice of Appropriation of Groundwater. This form was filed at 2:24 p.m. on January 16, 1973, instrument number 184971. This particular form was designed and used pursuant to Section 89-2913, R.C.M. 1947 (this section was repealed in 1973 by the Montana Water Use Act, Section 89-865, R.C.M. 1947, et seq.). This Notice of Appropriation of Groundwater form is merely a notice form of intention to develop groundwater. Section 89-2913(d), R.C.M. 1947, stated, "After filing a notice of appropriation, in order to acquire a right based thereon, the person must, within ninety (90) days, commence actual excavation and diligently prosecute construction of a well

March 29, 1974

and, upon its completion, file a notice of completion with the county clerk and recorder of the county in which the appropria

county clerk and recorder of the county in which the appropriation is located. The county clerk shall handle and transmit such filed notices as in the case of a filed notice of appropriation. The first sentence of Section 89-2913(e), R.C.M. 1947, stated, "A failure to file a notice of appropriation deprives the appropriator of his right to relate his date of appropriation back, and results in the dating of his appropriation as of when he files a notice of completion."

It appears that Graves Ranch Company's intentions were good and intended to follow through with the filing of the notice of completion after the well was completed. Unfortunately, in the meantime the Montana Water Use Act of 1973 was passed and became effective on July 1, 1973. This Act repealed many previous surface-and ground-water laws, including Section 89-2913 R.C.M. 1947. Since this section was repealed the forms prepared pursuant to that section could no longer be used. It also appears apparent that Graves Ranch Company did the best they could under the circumstances and filed with this Department the Form 602, Notice of Completion of Water Development, prepared pursuant to Section 89-865, R.C.M. 1947, et seq.

Assuming then, since the well was started under the provisions of Section 89-2913 (now repealed) and the Notice of Appropriation of Groundwater form was filed and subsequently the water laws changed and the Notice of Completion of Water Development Form 602, was filed with this Department pursuant to the Montana Water Use Act, it appears Graves Ranch Company has fulfilled the requirements of the law as in existence when the well was started to be constructed. In this case, it appears the priority date of this well was the date the Notice of Appropriation of Groundwater form was filed at 2:24 p.m. on January 16, 1973, instrument number 184971.

Based on the foregoing discussion, we would suggest that the following action be taken:

1. We are returning the enclosed Form 602, Notice of Completion of Water Development. (We will retain a Xerox copy and attach it to our copy of the Notice of Appropriation of Groundwater form.) We would suggest that the Form 602 be taken to the county clerk and recorder and have it filed to fulfill the requirements of Section 89-2913, R.C.M. 1947 (now repealed), and preferably have it attached to the original filing. This Department would appreciate receiving a notice to the effect showing the time and date the completion form was recorder and its instrument number.

March 29, 1974

5 to you, as sent to us
73. This will be done

Mr. Thomas M. Ask

- 2. We will be refunding the \$35 to you, as sent to us with your letter dated November 21, 1973. This will be done by a state warrant at a later date.
- 3. We will retain our copy of Well Log Report, Form with Section 89-292833, sent to us on the well in compliant with Section 89-292833, R.C.M. 1947.

As you can see, this is a rather unique problem. If we can be of further assistance or if you disagree with the foregoing discussion, feel free to contact us at your convenience.

Sincerely,

Ronald J. Guse, Assistant Chief Water Rights Bureau

RG/slp Enclosures (2) CC. Graves Ranch Company

ASK & PRATT
ATTORNEYS AT LAW
WALL BLDG. - P.O. BOX 805
ROUNDUP, MONTANA 59072
TELEPHONE 323-1600

THOMAS M. ASK

November 21, 1973

Montana Department of Natural Resources and Conservation Water Resources Division Mitchell Building Helena, Montana 59601 NOV 2 6 1973

MONT, DEPT. OF NATURAL RESOURCES & CONSERVATION

Re: Graves Ranch Company Water Right

Gentlemen:

Enclosed herewith is Notice of Completion of Water Development and Well Log Report pertaining to the Graves Ranch Company's water right. They received a permit prior to July 1, number 184971.

Also enclosed is our check in the sum of \$35.00 which I believe is the correct amount for the filing of this water development. If there is any further information that you need, please advise.

Very truly yours,

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Encs.

MONTANA NATIONAL BANK

ROUNDUP, MONTANA 55072

November 21 19 73 993-507

PAY TO THE TO THE ORDER OF MONTANA 55072

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Filing Graves Ranch Co. Water Development

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File No... County Musselshell TRIPLICATE ees. STATE OF MONTANA ADMINISTRATOR OF GROUNDWATER CODE OFFICE OF STATE ENGINEER Notice of Appropriation of Groundwater (Under Chapter 237, Montana Session Laws, 1961) 1. I. Graves Ranch Company of Box 746 Roundup (Name of Appropriator) (Town) County of Misselshell , State of Montana .., intend to appropriate groundwater in accordance with Chapter 237, Montana Session Laws of 1961. of lands in Sections 3,9,10,11,14,15 Township 11 North Range 24 E. (describe lands to be benefited, if for irrigation) That are now owned by the appropriator. The rate of use in gallons per minute or miner's inches of groundwater claimed..... 750 Montana statutory miner's inches 4. The annual period (inclusive dates) of intended use _____April 1 to November 1. The probable or intended date of first beneficial use April 1. 1374 The probable or intended date of commencement and completion of the well* or wells* ..... Commencement, January 6, 1973. Intended completion, Sept.1, 1973. 7. The location, type, size and depth of well or wells contemplated Location: SEC-NET Sec. 15 T.11 h-24. Size: 100 feet by 100 feat by 40 foot depth 8. The probable or estimated depth of the water table or artesian aquifer 10 fact 9. Name, address and license number of the driller engaged .. Kelley Drilling Co. Roundup, Montana , license No 169 10. Give such other similar information as may be useful in carrying out the policy of this act..... RECEIVED JAN 23 1973 MOTIFANA DEPARTMENT OF NATURAL NE 14 Sec. 15 T 11R Doc. Ma._ Locate well or other means of Filed " record development as accurately as Ladday of gan possible on the plat. A. D. 19_73 , at 2:24 Signature of Appropriator Date // / 7 / 7 As defined in the Code Sec. 1 (c) "Well" means any artificial opening or excavation in the ground, however made, by which groundwater can be obtained or through which it flows under natural pressures or is artifically withdrawn." Three copies of this notice are to be filed with County Clerk and Recorder of the county in which the well is located. Please answer all questions. If not applicable, so state, otherwise the form will be returned. Original to the County Clerk and Recorder; duplicate to the State Frigineer; Triplicate to the School of Mines and Quadruplicate for the Appropriator.

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FORM NO. 603 New 7-73

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File No.

STATE OF MONTANA

Department of Natural Resources and Convertion White—Department

MOUT OFF

CANARY—WELL OWNER

AND DESIRED — DRILLER

WELL LOG REPORT MONT, DEPT. of NATURAL OWNER State law requires that this form be filed by the water well driller on and after July 1, 1973 within sixty (60) days after completion of the well.

Name Graves Ranch Co. Address D. 245 2. WELL LOCATION: County Musselshell ; SF4 SF 4NF 4, Sec. 15, Twp. 11 N-S, Rg. 24 Municipal Industrial Lawn and Garden 3. PROPOSED USE: Domestic Stock Other (if other, specify) x Irrigation Cable 4. METHOD DRILLED: 8. WELL LOG: Bored Forward Rotary Reverse Rotary

Jetted X Other (if other, specify)

Back hos & Dozers Depth (ft.) From Formation n Red Soil Grey & Brown Sandstone 5. WELL CONSTRUCTION: with Red Cliay Beds Diameter of hole 100 fine Depth Casing: Steel Plastic Concrete
Threaded Welded Other (if other, specify) None specify)_ Pipe Weight:Dia.: From: feet_ _lb/ft.____inches_ lb/ft. inches lb/ft. inches ___feet feet lb/ft. feet feet Was perforated pipe used? Length of pipe perforated_ Was casing left open end? ___No Was a well screen installed? ___Yes Material Dia. (stainless steel, bronze, etc.) Perforation type: slots _ feet to_ ___set from_ Size feet ___feet to __set from__ feet feet to feet
Yes No set from Was a packer or seal used? If so, what material Well type: Straight screen Was the well grouted? (Use separate sheet if necessary) Graveled Yes No 9. DATE STARTED: 1-6-73 To what depth? Material used in grouting_ 10. DATE COMPLETED: 10-20-73 Well head completion: Pitless adapter 12" above grade____ Other_ 11. WAS WELL PLUGGED OR ABANDONED? (If other, specify) If so, how_ Was the well disinfected? DRILLER'S CERTIFICATION: 6. WATER LEVEL: This well was drilled under my jurisdiction Static water level 6 ft.below land surface and this report is true to the best of my If flowing: closed-in pressure knowledge. __through_ inch pipe GPM flow Controlled by:
___Other, specify_ Reducers Kally Drilling Co. Driller's or Firm Name 169 License No. 7. WELL TEST DATA: X Pump Box 246 Roundup, Montana Bailer Address (If other, specify) Pumping level below land surface: 38 ft. after 200 hrs. pumping ft. after hrs. pumping

~	No.	602	Nes	7-7	

Application	No.
Permit	No.
Notice	No.

## STATE OF MONTANA Department of Natural Resources and Conservation

## NOTICE OF COMPLETION OF WATER DEVELOPMENT

(Please Type or Frint in Ink)  1. Name of Appropriator or Permit Holder Graves Reach Company  2. Post Office Address Box 746, Roundup, Nghtana  3. Date of Priority that you are prepared to establish (if applicable————————————————————————————————————	tyring seeming to the first of the control terminal to the control of the control	
2. Post Office Address Box 746, Roundup, Nontana  3. Date of Priority that you are prepared to establish (if applicable	(Please Type or Frint in Ink)	
4. Permit Number (if applicable) 184971.  5. Source from which water was appropriated Well and dam  6. Location of the point of diversion: SE k of NE k of Section 15 Township 11 North , Range 24 East; Other points of diversion:  7. The amount of water and use to which the water has been applied: Amount 2 fs for irrigation purpose from April 1 to November 1 incl. (ofs analoxy ker annum)(use) (month-day) (month-day) Amount for purpose from (month-day) (month-day)  8. Total amount appropriated 300 PINNAMATER acre feet per annum.  9. Describe how and by whom measurement of rate of flow or amount of storage was made and the qualifications of the person making the measurement: 500 gallons per minute in flow - determined by Cleon Graves by pumpine from well for 200 hours.  10. If the means of diversion and conveyance are owned by someone other than the Appropriator or Permit Holder: a) Give the name or description of the canal, ditch or other works by which the water is conducted to the place of use;  b) Describe the agreement or understanding by which you take water from the works:  11. Briefly describe the works for diverting and conveying the water to the place of use; b) Describe the diversion structure and/or canal or ditch) wall is 100 feet long by thind for the diversion structure and/or canal or ditch) wall is 100 feet long by which which will have deen and a 50H.P. pump will be used to pump the water from the well to the irricated field nearby which woult pump through an 8 inch pipeline. The land will be irricated field nearby which will take the water from the 3 done the dury used deen and a 50H.P. pump will he used to pump the water from the well to the irricated field nearby which was constructed across the coulce above the dury used description of storing water for the well and to divert excess water in t's coulce from a runoff	1. Name of Appropriator or Permit Holder Graves Ranch Company 2. Post Office Address Box 746, Roundup, Montana	<u>-</u> :
6. Location of the point of diversion: Set of NE to Section 15 Township 11 North , Range 24 East; Other points of diversion:  7. The amount of water and use to which the water has been applied: Amount 2 of a for irrigation purpose from April 1 to November 1 incl. (of a guaractarata per annum) (use) Amount for purpose from to (month-day) (month-day)  Amount for purpose from to (month-day) (month-day)  8. Total amount appropriated 300  FINIMATION acre feet per annum.  9. Describe how and by whom measurement of rate of flow or amount of storage was made and the qualifications of the person making the measurement: 500 gallons per minute in flow - determined by Gleon Graves by pumping from well for 200 hours.  10. If the means of diversion and conveyance are owned by someone other than the Appropriator or Permit Holder: a) Give the name or description of the canal, ditch or other works by which the water is conducted to the place of use;  b) Describe the agreement or understanding by which you take water from the works:  11. Briefly describe the works for diverting and conveying the water to the place of use, (If from a ground-water source, give the pump size, motor size, size of well easing, depth of well; if from a surface-water source, give a brief description of the diversion structure and/or canal or ditch) Wall is 100 feet long by.  10. If the used to pump the water from the well to the irrigated field mearby which woult pump through an 8 inch pipaline. The land will be irrigated field mearby which woult pump through an 8 inch pipaline. The land will be irrigated field mearby which woult pump through an 8 inch pipaline. The land will be irrigated field mearby which woult pump through an 8 inch pipaline from the well.  10. The water from the 8 inch pipaline from the well.  20 var's earthed and so of the very coule a for the very coule from a runoff	3. Date of Priority that you are prepared to establish (if applicablesee instruction sheet): January 15, 1973	
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