

ALASKAN GEOLOGY ~~234732~~
TECHNICAL DATA FILE

#352

Form 9-014

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WASHINGTON 25, D. C.

DATA ON WELLS
IN THE
MATANUSKA-SUSITNA BOROUGH AREA, ALASKA

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By
Alvin J. Feulner

Prepared at the request of and on the behalf of the
Alaska Power Administration

Alaska District
Water Resources Division
Open-file Report
1968

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DATA ON WELLS
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ABSTRACT

The principal water supplies for the Matanuska-Susitna Borough area extending from Palmer to Talkeetna, Alaska, are obtained from wells. Data suggest that throughout most of the settled area yields to about 50 gpm (gallons per minute) are obtainable from wells drilled to depths ranging from 30 to 90 feet. Larger yields may be obtained from some wells located adjacent to the principal streams. The entire area covered by this report consists of alluvial, glacial and outwash deposits ranging from only a few feet to more than 600 feet in thickness. Data on depth, depth to water level, diameter, and yield of 125 wells is tabulated. Also presented are 32 well logs and 14 chemical analyses of well waters.

INTRODUCTION

This report represents the compilation of available basic data relating to ground-water development of part of the Matanuska-Susitna Borough area (fig. 1). This reconnaissance study, made in cooperation with the Alaska Power Administration, is intended to supplement an appraisal report on ground-water availability now being prepared.

The study area extends from Palmer about 50 miles west to the Susitna River, and from Cook Inlet about 75 miles north to Talkeetna. Most of the study area is underlain by glacial deposits, but outwash and alluvial deposits occur in and adjacent to the stream valleys.

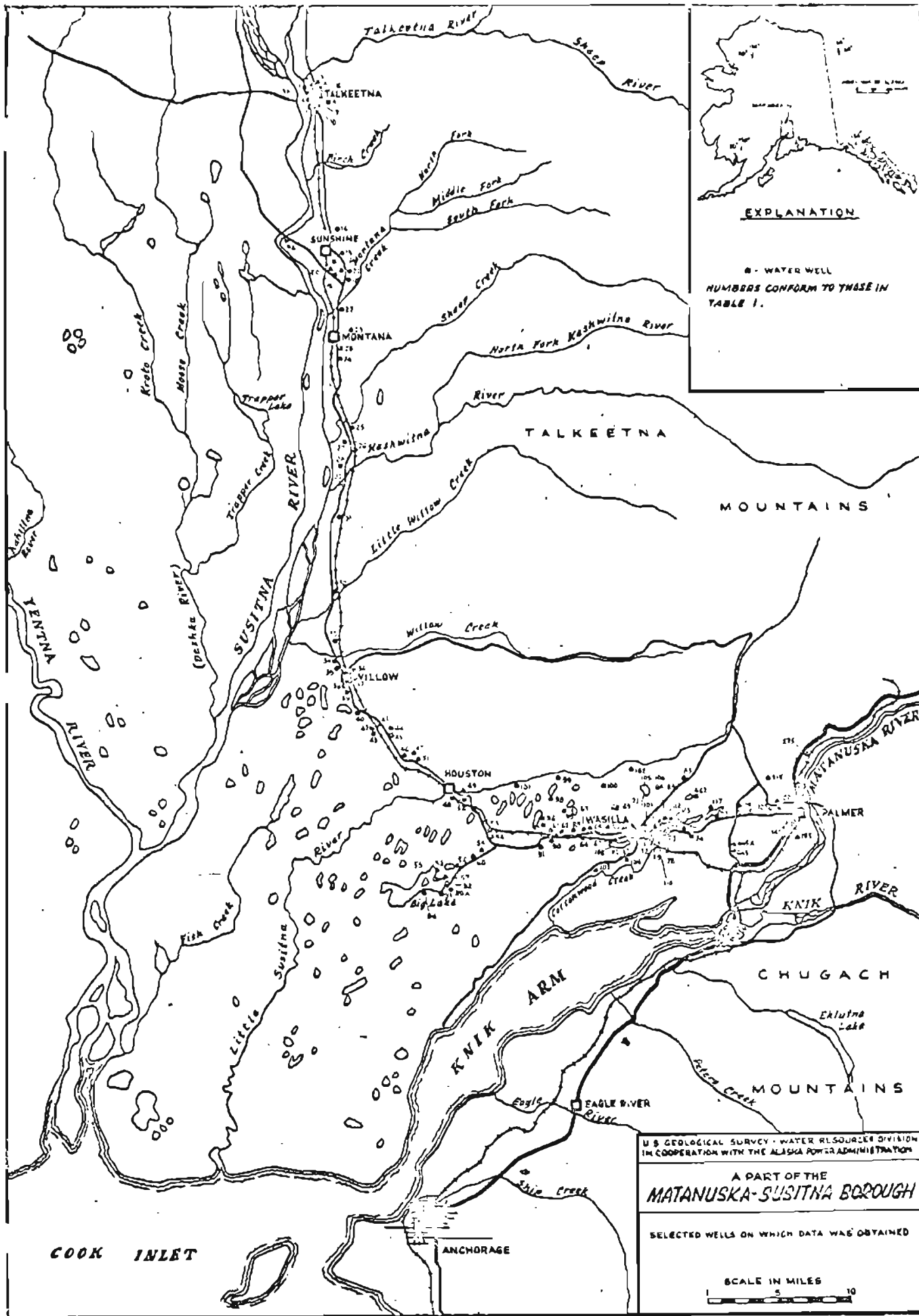
Chemical-quality data show that, in general, the water is a calcium magnesium bicarbonate type water and of good quality.

ACKNOWLEDGMENTS AND SOURCES OF INFORMATION

Information concerning wells in the study area was obtained from records of the U.S. Geological Survey, the State of Alaska, and the U.S. Air Force. Drillers' well logs and well owners' reports were also obtained during a field survey made in 1967 to supplement information for areas where data were lacking.

The list of wells presented in this report is by no means complete, but is representative of the information available to the writer.

A large percentage of data from the Palmer area has been drawn from published data by F. W. Trainer, "Geology and Ground-Water Resources of the Matanuska Valley Agricultural Area, Alaska," Water-Supply Paper 1494.



WELL DATA

Records of 125 water wells in the area are given in table 1 and are located on the map, figure 1. Drillers' logs for some of the wells are given in table 2, and 14 chemical analyses of waters from selected wells are given in table 3.

Three selected properties of well waters are also given in table 3. The specific conductance of a water is a measure of its capacity to conduct an electrical current and is sometimes used as a guide to the concentration of total dissolved minerals.

The term, pH, is used to denote the acidity or alkalinity of a water. In general, a value of 7.0 is neutral, numbers less than 7.0 indicate acidity and those more than 7.0 indicate alkalinity. Values may range from 0 to 14, and the pH of most natural waters is between 6 and 8.

"Color" refers to the appearance of water that is free from suspended solids and is expressed in units on a scale from 0 to more than 500. A color less than 10 units generally passes unnoticed.

Table 1.--Records of wells in the Matanuska-Susitna Borough area.

EXPLANATION AND SYMBOLS

Well number.	.Number assigned to the well for the purposes of this report, shown on figure 1.
Well depth	.Reported or measured depth of the well in feet.
Diameter of well	.Reported or measured diameter of the well in inches.
Depth to water	.Depth to water below land surface reported in feet.
Drawdown	.Reported drawdown of the well (the amount of lowering of water level) at the rate of production shown in the column headed - Pumping rate.
Pumping rate	.Reported production rate in gallons per minute for the well. This figure is either the test-pump rate for which drawdown was determined or the rate measured at the time of the study.
Remarks.	.Remarks to explain data relating to the well. L, reported log of the well given in table 2; C, chemical analysis of the water given in table 3.

Table 1.--Records of wells in the Matanuska-Susitna Borough area

Well no.	Owner or name	Well depth (feet)	Well diameter (inches)	Depth to water (feet)	Pumping rate (gallons per min.)	Drawdown (feet)	Remarks
1	Talkeetna Motel (Alice Powell)	40	6	-	-	-	C
2	Talkeetna Grocery	18	-	-	-	-	
3	Talkeetna Roadhouse	20	6	-	5	-	
3a	USGS Test Well 3 at Airport	47	2	8	15	1	L, C
4	Fairview Inn	20	2	-	5	-	
5	Talkeetna Air Service	21	36	-	-	-	Dug well
6	Alaska Railroad Repeater Station	27	6	-	-	-	L
7	The Hut Cafe	14	1 1/4	-	-	-	Driven well
9	Federal Aviation Agency Sta., Talkeetna	70	4	-	-	-	
9a	State of Alaska	100	6	-	250	-	C (former road const. well)
10	Swanda and Anderson Trailer Court	18	1 1/2	-	5	-	
11	Talkeetna High School	-	-	-	-	-	
14	Joe Heck	62	6	35	11	13	L, C
15	Alfred Hankins	80	6	61	10	5	L
16	Jim Shade	53	6	39	15	5	L
17	Dorothy Nichols	52	6	37	8	3	L
18	Farron Kolb	53	6	33	10	10	L
19	H & H Grocery Store	38	6	18	7 1/2	4	L, C
20	Dr. J. R. Freese	52	6	32	20	5	L
21	Arnol Hein	60	6	45	11	1	L
22	Montana Creek Lodge	40	6	6	5	4	
23	Lloyd Lankford	60	6	-	-	-	
24	A. F. Fischer	81	6	21	10	25	L
25	Sheep Creek Lodge	36	6	-	-	-	
26	Jean King	55	6	10	33	20	L
27	Dean Barker	68	6	18	15	50	L
28	Wayne Becker	30	6	14	7 1/2	4	L

Table 1.--Records of wells in the Matanuska-Susitna Borough area--(Cont.)

Well no.	Owner or name	Well depth (feet)	Well diameter (inches)	Depth to water (feet)	Pumping rate (gallons per min.)	Drawdown (feet)	Remarks
29	F. J. Smith	24	8	-	-	-	
30	A. G. Coleman	77	6	42	-	-	
31	Arnold Echola	72	6	25	11	15	L, C
32	M. and G. Persing	29	6	8	7 1/2	8	L
33	A. M. Hazel	35	2	30	-	-	Highly organic water
34	Alaska Department of Highways	28	6	8	-	-	
35	Homer Springer	47	6	-	-	-	
36	Willow Trading Post	85	-	-	-	-	
37	L. C. Hazel	40	6	-	-	-	
38	Willow Elementary School	80	-	-	-	-	C
39	Willow General Store	64	6	-	-	-	
40	Willow Inn	72	6	-	-	-	
41	White's Crossing	68	6	-	-	-	
42	White's Trailer Court	68	6	-	-	-	
43	Nancy Lake Wayside (State)	130	6	24	10	20	L
44	Huseby's 76 Station	40	6	-	-	-	Small supply of water
45	Harold A. Nelson	46	6	32	5	0	Formerly supplied 100 people
46	Houston Inn	150	6	-	-	-	
47	John Linnebur	50	6	-	-	-	L
48	Calvin Hartman	27	6	9	7 1/2	1	Artesian flow
49	Church of Christ, Houston	100	6	+1	-	-	L
50	Ruby Mattson	118	6	96	10	9	Driven well
51	Houston Lodge	22	1 1/4	11	-	-	
52	Ray Grunert	42	6	-	-	-	
53	Edward Masey	91	6	21	10	62	L
54	Richard Kopack	12	20	16	-	-	Dug well
55							

Table 1.--Records of wells in the Matanuska-Susitna Borough area--(Cont.)

Well no.	Owner or name	Well depth (feet)	Well diameter (inches)	Depth to water (feet)	Pumping rate (gallons per min.)	Drawdown (feet)	Remarks
56	Big Y Grocery and Station	36	6	-	-	-	Supplies 30 people
57	Big Lake Summer Camp	31	6	-	300	-	
58	Ship Ahoy, Big Lake	108	6	-	80	-	
59	Marvin Heikes	50	6	20	-	-	bug well
60	Edward Wasey	22	24	-	-	-	
61	Rainbow Lake Lounge	48	6	-	-	-	
62	Richard Benner	100	6	-	-	-	
63	William Priddy	57	6	-	50	-	
64	Henry Burton	90	6	-	-	-	
65	Meyers Coffee Shop	29	6	-	30	0	
66	William Church	66	6	-	-	-	
67	Hallea Lodge	57	6	-	-	-	
68	Polis Hotel	60	6	-	-	-	
69	Iskimotel	33	6	-	-	-	
71	Cottle's Texaco Station	35	6	-	-	-	
72	Wasilla Bldg. and Farm Supply	42	6	-	-	-	
73	Ernest Sullivan	48	6	-	-	-	
74	William Patrick	92	6	-	-	-	
75	Lutheran Youth Center	175	6	-	-	-	
76	Leslie Green	20	4	-	-	-	
77	Chester Tracy	52	6	-	-	-	
78	Green Acres Resort	65	6	-	-	-	
79	J. C. Wright	74	6	10	7 1/2	4	L
80	Homer Mayo	47	6	-	-	-	C
80a	Big Lake School	48	6	-	-	-	bug well
81	Jack Minnick	35	36	-	-	-	
82	James Calder	43	6	-	-	-	
83	Robert Clarke	170	8	-	-	-	

Table 1.--Records of wells in the Matanuska-Susitna Borough area--(Cont.)

Well no.	Owner or name	Well depth (feet)	Well diameter (inches)	Depth to water (feet)	Pumping rate (gallons per min.)	Drawdown (feet)	Remarks
84	Dennis Crawford	69	8	-	-	-	C
85	Alaska Railroad Station, Wasilla	131	8	16	5	8	
86	Ray Morrison	65	6	-	-	-	
87	Teeland's Store	18	9	-	-	-	Dug well
87a	Lakeside Hotel	40	6	-	-	-	
88	Teeland's Residence	18	24	-	-	-	
89	A. D. Ruff	90	6	35	-	-	
90	Oran McMillan	54	6	-	-	-	
91	Carl Berato	26	6	-	-	-	
92	Big Lake Lodge	35	4	-	200	-	
93	Homer Merchant	14	4	-	-	-	
94	Yacht Club (Big Lake)	42	4	-	-	-	
95	M. Puffer	72	6	32	10	26	L
96	Len Melton	60	6	40	7 1/2	5	L
97	Tom Phillips	43	6	16	7 1/2	4	L
98	John Businoff	170	6	54	1	2	L
99	John Moss	55	6	-	-	-	
100	Raymond Dahm	253	6	-	-	-	
101	Jess Harker	52	6	37	10	5	L
102	Charles Carney	53	20	-	-	-	Dug well
103	Frank Smith	42	6	-	-	-	
104	Frank Smith	110	6	-	-	-	
105	Robert Vroman	70	6	27	15	32	L
106	James Gatewood	107	6	25	10	50	L
107	O. L. Byers	60	6	14	7 1/2	14	L
108	Wasilla Elementary School	87	6	-	-	-	
110	John Wallman	37	6	-	-	-	
111	Barney Locke	65	6	-	30	5	

Table 1.--Records of wells in the Matanuska-Susitna Borough area--(Cont.)

Well no.	Owner or name	Well depth (feet)	Well diameter (inches)	Depth to water (feet)	Pumping rate (gallons per min.)	Drawdown (feet)	Remarks
112	Toyon Country Club	95	8	-	300	-	C
113	Betty Betts	45	6	16	15	10	
117	Barry's Finger Lake Resort	62	6	-	-	-	C
118	Four Corners Taste Freeze	-	6	-	-	-	
119	RCA site, Neklasson Lake	101	-	-	-	-	
121	City of Palmer Well 1	159	6	53	76	40	C
122	City of Palmer Well 2	165	6	42	100	37	C
123	City of Palmer Well 3	624	8	180	325	-	L, C
145	Harold Thuma	27	8	25	-	-	
147	Harold Thuma	146	6	49	1	-	
195	U.S. Geological Survey Test Well	112	4	63	53	23	L
275	Olav Holtet	14	10	9	-	-	
315	V. Yaden	36	4	-	-	-	
443	Alaska Agricultural Experiment Station	36	42	30	-	-	
445a	U.S. Geological Survey Test Well	295	6	9	142	64	L
462	Harry Duff	32	4	8	-	-	

Table 2.--Logs of wells in the Matanuska-Susitna Borough area

Material	Thickness (feet)	Depth (feet)
Well 3a - USGS Test well 3 at Airport		
Soil, brown, silty	4	4
Gravel and sand	33	37
Sand, fine to medium, some fine gravel	3	40
Gravel, gray, medium, little sand	12	52
Well 6 - Alaska Railroad Repeater Station, Talkeetna		
Gravel fill	20	20
Hardpan (gravel, sand, and clay)	2	22
Gravel, medium	5	27
Well 14 - Joe Heck		
Soil and gravel	12	12
Sand and gravel	12	24
Sand, fine	12	36
Till (sand, gravel, and clay)	10	46
Gravel and sand	16	62
Well 15 - Alfred Hankins		
Topsoil and rock	5	5
Sand and gravel	53	58
Sand, water-bearing	19	77
Sand and gravel, water-bearing	3	80

Table 2.--Logs of wells in the Matanuska-Susitna Borough area--Cont.

Material	Thickness (feet)	Depth (feet)
Well 16 - Jim Shade		
Soil, sand and gravel	39	39
Sand and gravel, water-bearing	14	53
Well 17 - Dorothy Nichols		
Topsoil	4	4
Sand and gravel	33	37
Sand and gravel, water-bearing	15	52
Well 18 - Farron Kolb		
Topsoil and rocks	6	6
Sand and gravel	20	26
Rocks	3	29
Sand and gravel	4	33
Sand, water-bearing	15	48
Sand and gravel, water-bearing	5	53
Well 19 - H & H Grocery Store		
Sand and gravel	12	12
Sand	6	18
Sand and pea gravel, water-bearing	17	35
Sand and gravel, water-bearing	3	38

Table 2.--Logs of wells in the Matanuska-Susitna Borough area--Cont.

Material	Thickness (feet)	Depth (feet)
Well 20 - Dr. L. R. Freese		
Topsoil	3	3
Soil, sand and gravel	12	15
Sand	6	21
Sand and gravel	11	32
Sand and gravel, water-bearing	20	52
Well 21 - Arnol Hein		
Topsoil	4	4
Sand and gravel	40	44
Sand and gravel, water-bearing	16	60
Well 24 - A. F. Tischer		
Topsoil	9	9
Sand and gravel	12	21
Clay	48	69
Sand and gravel (hard), water-bearing	5	74
Well 26 - Jean King		
Gravel	30	30
Sand, water-bearing	25	55

Table 2.--Logs of wells in the Matanuska-Susitna Borough area--Cont.

Material	Thickness (feet)	Depth (feet)
Well 27 - Dean Bunker		
Sand and gravel, water-bearing	68	68
Well 28 - Wayne Becker		
Soil, sand and gravel	14	14
Sand and gravel, water-bearing	16	30
Well 31 - Arnold Echola		
Soil, sand and gravel	23	23
Gravel, water-bearing	2	25
Gray till	43	68
Sand and gravel, water-bearing	4	72
Well 32 - M. and G. Persing		
Topsoil	10	10
Sand and gravel, water-bearing	16	26
Sand, water-bearing	3	29
Well 43 - Nancy Lake Wayside (State)		
Brown clay, gravel and rocks	48	48
Gray clay, sand and gravel	61	109
Heaving sand	10	119
Sand, water and gravel	7	126
Water, sand and gravel	4	130

Table 2.--Logs of wells in the Matanuska-Susitna Borough area--Cont.

Material	Thickness (feet)	Depth (feet)
Well 48 - Calvin Hartman		
Sand and gravel	12	12
Sand and gravel, water-bearing	15	27
Well 49 - Church of Christ, Houston		
Topsoil	10	10
Sandstone, gray	20	30
Sandstone, brown	3	33
Sandstone, gray	47	80
Stone, hard, water-bearing	5	85
Sandstone, gray	15	100
Well 51 - Ruby Manion		
Topsoil	5	5
Sand and gravel	13	18
Till, gray	22	40
Clay	26	66
Till, gray	22	88
Clay and gravel, water-bearing	2	90
Till, gray	25	115
Gravel, water-bearing	3	118
Well 54 - Edward Wasey		
Old well	29	29
Till, gray	60	89
Sand, gravel and clay, water-bearing	2	91

Table 2.--Logs of wells in the Matanuska-Susitna Borough area--Cont.

Material	Thickness (feet)	Depth (feet)
Well 79 - J. C. Wright		
Sand and gravel	12	12
Till	6	18
Soil, sand and gravel	12	30
Till	8	38
Clay, sand and gravel	13	51
Till	2	53
Sandy clay, soft	7	60
Sand and pea gravel	3	63
Till	5	68
Sand and gravel	1	69
Till	2	71
Sand and gravel, water-bearing	3	74
Well 95 - M. Fuller		
Sand and gravel	17	17
Sand	21	38
Till, gray	4	42
Sand and gravel, water-bearing	6	48
Clay	2	50
Till, gray	19	69
Sand and gravel, water-bearing	3	72
Well 96 - Len Melton		
Till, brown	15	15
Till and large rocks, gray	27	42
Clay, sand and gravel, water-bearing	14	56
Sand and gravel, water-bearing	2	58
Clay, sand and gravel, water-bearing	2	60

Table 2.--Logs of wells in the Matanuska-Susitna Borough area--Cont.

Material	Thickness (feet)	Depth (feet)
Well 97 - Tom Phillips		
Sand and gravel	26	26
Clay, blue	12	38
Sand and gravel, water-bearing	5	43
Well 98 - John Businoff		
Hand dug	20	20
Till, gray	20	40
Clay and gravel	16	56
Gravel, seepage	1	57
Clay, gray	21	78
Stone, hard	2	80
Clay, gray	3	83
Coal	5	88
Clay, gray	9	97
Stone, hard	7	104
Clay, gray	13	117
Clay, sandy, gray	13	130
Clay, sandy, brown	6	136
Coal	4	140
Clay, gray	12	152
Coal	8	160
Clay, gray	10	170
Well 101 - Jess Harker		
Topsoil	1	1
Sand and gravel	5	6
Sand	3	9
Sand and gravel	11	20
Sand	4	24
Sand and pea gravel	13	37
Sand and gravel, water-bearing	15	52

Table 2.--Logs of wells in the Matanuska-Susitna Borough area--Cont.

Material	Thickness (feet)	Depth (feet)
Well 105 - Robert Vroman		
Rock, sand and gravel	13	13
Sand and gravel	14	27
Sand and gravel, water-bearing	3	30
Fine sand, water-bearing	23	53
Till, gray	4	57
Sand and gravel, water-bearing	6	63
Clay	7	70
Well 106 - James Gatewood		
Soil and rocks	12	12
Till, gray	15	27
Sand and gravel, water-bearing	3	30
Clay, blue	30	60
Clay and gravel	40	100
Fine sand and gravel, water-bearing	7	107
Well 107 - O. L. Byers		
Soil, sand and gravel	15	15
Till, gray, soft	15	30
Gravel, water-bearing	2	32
Mud	8	40
Clay and gravel	9	49
Mud	6	55
Till	3	58
Gravel, water-bearing	2	60

Table 2.--Logs of wells in the Matanuska-Susitna Borough area--Cont.

Material	Thickness (feet)	Depth (feet)
Well 123 - City of Palmer Well 3		
Concrete footing space	5	5
Soil	4	9
Loose gravel, some clay	4	13
Loose medium gravel, moist, clean	41	54
Loose medium gravel, moist sand, some clay	10	64
Large gravel, medium clay	2	66
Soft glacial till, some gravel, gray	11	77
Medium hard glacial till	11	88
Clean gravel	2	90
Glacial till	3	93
Glacial till, intermittent thin layers of pea gravel, water	5	98
Glacial till, no water	9	107
Brown sandy clay, trace of coal	5	112
Gray sandy clay, no water	5	117
Brown sandy clay, some water	6	123
Glacial till, no water	2	125
Quicksand with pea gravel and clay	15	140
Glacial till, no water	3	143
Glacial till, thin layers of pea gravel, water	6	149
Glacial till, sand and gravel	3	152
Sand, gravel, some clay, water, intermittent layers	5	157
Clay and quicksand layers, some pea gravel	5	162
Quicksand, medium gravel, grading to pea gravel to none	28	190
Clay	14	204
No record	31	235
Sand and gravel, water-bearing, good aquifer	3	238
No record, indications are that drilling was in gravel with silt	290	528
Coarse sand and gravel with thin layers of sticky yellowish clay	82	610
Coarse gravel and sand with frequent clay layers	8	618
Coarse gravel and boulders	4	622
Coarse gravel and boulders, mostly boulders	2	624

Table 2.--Logs of wells in the Matanuska-Susitna Borough area--Cont.

Material	Thickness (feet)	Depth (feet)
Well 195 - U.S. Geological Survey Test Well		
Silt, tan to gray	3	3
Gravel, sandy, with pebbles and cobbles; light brown	12	15
Gravel, sandy, with small pebbles; light brown	12	27
Sand, medium to coarse, with pebbles; light brown	2	29
Silt and fine sand, with pebbles; light brown	8	37
Gravel, sandy and pebbly, with streaks of silt and clay; rusty brown	3	40
Sand, medium to coarse, with streaks of silt and clay; rusty brown	9	49
Gravel, with sand, silt, and clay; dark brown; hard; casing drives with difficulty but hole does not stand open ahead of casing	9	58
Silt and clay, with fine to medium sand; brown; hard; hole stands open ahead of casing, 58-77 ft	19	77
Sand, medium to fine, with pebbles and streaks of silt and clay; brown	12	89
Sand, medium to fine, with streaks of silt and clay; brown	14	103
Sand, medium to coarse; pebbly; brown; heaves into casing during drilling	2	105
Sand, with streaks of silt and clay; brown. .	4	109
Sand, medium to coarse, pebbly; brown	2	111
Sand, medium to coarse, with small pebbles and streaks of silt or clay; brown; 60-slot screen set at 110-114 ft; drawdown 23 ft after pumping 27 1/2 hrs at 53 gpm	6	117
Sand, fine to medium, with streaks of silt and clay; dark to rusty brown; heaves into casing during drilling	48	165
Sand, fine to medium, with silt or clay; dark brown; hole stands open ahead of casing . .	6	171
Sand, fine to medium, silty; brown; heaves into casing during drilling	39	210
Sand, fine, silty; brown	8	218
Sand, fine to coarse, with silt, clay, and occasional pebbles; light to dark brown; heaves into casing during drilling	22	240

Table 2.--Logs of wells in the Matanuska-Susitna Borough area--Cont.

Material	Thickness (feet)	Depth (feet)
Well 195 - U.S. Geological Survey Test Well--Cont.		
Sand, fine to medium, and silt or clay; brown to gray or greenish gray; hole stands open 6 to 10 ft ahead of casing during drilling, before walls cave	19	259
Sand, coarse, and small pebbles; gray	2	261
Gravel, fine, and clay; gray	3	264
Greenstone; hard; dry	18	282
Well 445a - U.S. Geological Survey Test Well		
Silt, windblown	3	3
Sand and gravel	18	21
Sand, fine	11	32
Quicksand, fine	7	39
Sand, fine, pebbly	3	42
Sand, fine, with silt and clay	5	47
Quicksand, fine to medium, pebbly	5	52
Clay, sandy, blue-gray	3	55
Quicksand, fine, gray-brown	6	61
Sand, fine, with silt and clay; sporadic pebbles; soft; gray to gray-brown	29	90
Quicksand, fine to medium; gray to dark brown	17	107
Sand and pebbles, with some cobbles; gray-brown; heaves	6	113
Till ("hardpan"): clay, silt, sand, and stones; hard, gray; stands open ahead of casing . .	19	132
Sand, fine to medium	4	136
Sand, fine, silty	4	140
Sand, fine, pebbly	6	146
Sand, fine, with silt and clay; heaves . . .	4	150
Sand, fine, pebbly; heaves	2	152
Sand, fine to coarse, silty, with small pebbles; heaves	7	159
Sand, coarse, pebbly; bailed at 161 ft for 30 min at about 20 gpm, water level dropped from 25 ft below land surface to 60 ft below surface; after bailing, water rose 6 in above surface	2	161

Table 2.--Logs of wells in the Matanuska-Susitna Borough area--Cont.

Material	Thickness (feet)	Depth (feet)
Well 445a - U.S. Geological Survey Test Well--Cont.		
Sand, fine, pebbly	4	165
Gravel with silt and clay	2	167
Till ("hardpan"): clay, silt, sand, and stones; gray; hard till, stands open ahead of casing: 167-185, 196-215, 223-224; soft till, caves: 185-196, 215-223, 244-254 ft	87	254
Sand with pebbles	5	259
Sand, fine to coarse	3	262
Sand, medium to coarse	1	263
Sand and gravel; medium to coarse sand with sporadic pebbles and cobbles; pebbly and cobbly, 287-295 ft; heaves during bailing, 263-269 ft; At 289 ft: drawdown 69 ft after pumping 2 1/2 hrs at an average rate of 73 gpm from open end of 6-in casing	32	295
At 295 ft: with slotted 5-in liner, draw- down 64 ft after pumping 5 days at 142 gpm Till; hard, gray		at 295
Remarks: Material above 52 ft is dominantly brown; material below 52 ft is dominantly gray except where noted.		

Table 3. Chemical analyses of well waters in the Matanuska-Susitna Borough area - Concentrations in milligrams per liter.

Well No.	Owner or name	Date sampled	Silica (SiO ₂)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	Color
																Carbonate	Non-carbonate			
1	Tallies Hotel	9-20-66	34	0.71		16	4.6	6.4	1.6	36	1.1	71	8.1	5.0	96	59	13	155	8.8	9
2	USGS Test Well 3	9-15-67	13	0.10		24	1.0	4.5	2.0	47	6.0	11	0.1	1.1	96	64	7	156	7.5	8
9	State of Alaska		16	1.23		20	1.8	9.2	5.2	98	0	0	0.2	0.1	99	38	4	146	7.9	3
16	Joe Heck	7-21-67	18	0.13		8.0	1.7	3.1	1.0	34	1.0	2.8	0.0	0.5	35	37	0	71	8.3	9
19	M & H Grocery Store	7-27-67	20	0.69		7.6	1.3	2.3	0.9	30	3.0	7.5	0.0	0.8	54	25	0	65	8.1	9
31	Arnold School	7-28-67	17	1.07		38	5.6	4.9	2.3	161	2.5	1.4	0.3	0.2	153	319	0	247	7.3	7
38	Willow River School	7-28-67	23	7.0		44	6.4	1.1	2.2	180	3.0	0.7	0.3	0.5	177	136	0	363	7.7	7
40	Big Lake School	11-15-63	12	0.02	0.02	13	1.9	1.7	0.5	51	1.0	1.5	0.0	1.0	58	40	42	46	7.7	3
94	Dennis Crawford	8-03-67	35	0.12		57	6.8	2.6	0.8	164	17	7.4	0.0	27	209	170	46	329	8.0	8
112	Typon Country Club	8-05-67	12	0.03		40	5.0	3.2	0.3	142	8.0	0.4	0.5	1.4	141	120	4	221	8.0	4
117	Harry's Finger Lake Res.	8-01-66	10	0.00		36	17	3.5	1.0	135	17	1.4	0.1	1.9	159	140	13	260	7.4	10
121	City of Palmer Well 1	11-01-52	35	0.06		34	9.1	6.2	1.2	160	9.9	2.5	0.2	0.2	115	122	0	261	7.3	-
122	City of Palmer Well 2	7-27-66	11	0.02		37	4.7	5.7	1.8	163	5.8	2.3	0.1	0.0	110	120	0	253	8.0	1
123	City of Palmer Well 3	5-23-67	32	0.00		13	4.3	51	1.1	153	34	0.6	0.2	0.1	195	51	0	303	8.1	5