GROUND-WATER LEVELS IN ANCHORAGE, ALASKA, 1985

By Roy L. Glass

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Approximately 244,000 people live in the Anchorage, Alaska area, where about half the water used for domestic and commercial/industrial purposes is from ground water. This report presents water-level data for 146 wells deeper than 40 ft. Hydrographs of water levels in 20 wells during the period 1970 through 1985 are also presented. Ground-water levels are a measure of the amount of water in storage in aquifers. This report was prepared in cooperation with the Municipality of Anchorage, as a product of ongoing studies that collect water-resources data to provide a better understanding of the area's hydrologic environment. The data were collected during 1985 in the Anchorage area by the U.S. Geological Survey and the Alaska Division of Geological and Geophysical Surveys.

Previous reports on ground-water levels in Anchorage by the U.S. Geological Survey include annual summaries of water levels in selected observation wells, beginning with water year 1971 (U.S. Geological Survey, 1972-86), and annual summaries of water levels in all observation wells, beginning with water year 1983 (Brunett, 1986; Still and Brunett, 1987). Generalized potentiometric surfaces in the principal confined aquifers in 1955 and 1969 were presented in "Water for Anchorage" (Barnwell and others, 1972). Water-level data are also available on request from U.S. Geological Survey, Water Resources Division offices in Anchorage.

Water levels in most wells fluctuate continuously, primarily as a result of changes in the amount of water in storage in the aquifer. Changes in storage are caused by differences in the rates of ground-water recharge and discharge. Recharge occurs when water from rain, snowmelt, streams, or lakes infiltrates the ground. Ground-water discharge occurs by evaporation, by transpiration, by seepage into streams, lakes, or Cook Inlet, or by pumping of wells.

Precipitation is the ultimate source of water for recharge. At Anchorage International Airport, average annual precipitation, which includes both rain and snow, is about 15 in. (National Oceanic and Atmospheric Administration, 1986), but up to 160 in. may fall in mountains east of the city. During 1985, Anchorage received 15.51 in. of precipitation; the wettest months were August and September when 3.54 and 3.17 in. of rain fell.

A large amount of ground water, about 75 to 100 Mgal/d, is lost naturally to evaporation, plant transpiration, and seepage, whereas about 17 to 20 Mgal/d is withdrawn by man for domestic and commercial/industrial purposes. During 1985, approximately 15 Mgal/d were pumped from 32 public-supply wells (U.S. Geological Survey, 1987) and an additional 2 to 5 Mgal/d were pumped from private wells.

Most of the ground water used in Anchorage is pumped from wells completed in saturated sand and gravel units within the unconsolidated glacial and fluvial sediments that underlie the lowland area of Anchorage. The unconsolidated

sediments range in thickness from less than 50 ft along the mountain front east and south of the metropolitan area to greater than 1,000 ft near Point Woronzof and Point Campbell. In general, the sediments are a poorly sorted mixture of rock particles ranging in size from clay to boulders, and they generally have low permeabilities. Water in sand and gravel aquifers is commonly confined by the low-permeability sediments. The water surface in a well completed in a confined aquifer is above the top of the aquifer.

Water levels measured in 146 wells ranging in depth from 41 to 470 ft are presented in this report. Well locations, depths to water, and altitudes of water surface (above sea level) are shown on sheet 1. For wells that had more than one water-level measurement, the level measured closest to July 31 was used. Table 1 summarizes well-construction data for all wells and lists water levels measured during 1985 for wells not equipped with water-level recording instruments. Table 2 summarizes water-level data for 12 wells equipped with water-level recorders. Hydrographs of water levels in 20 wells for the period 1970-85 are shown on sheet 2.

The approximate direction of ground-water flow through saturated ground in the Anchorage area can be inferred from the altitudes of the water surface in wells. A contoured surface of the altitudes of water levels in wells that penetrate an aquifer depicts the head in that aquifer and is called the potentiometric surface. Ground water moves in the direction of decreasing head. Throughout the Anchorage area, the hydraulic gradient of the confined ground-water body closely conforms to the regional topographic gradient. As the altitude of the ground surface decreases toward Cook Inlet, so does the altitude of the potentiometric surface of the confined aquifer.

The depth to water and altitude of water in wells vary widely, even over short distances, especially in the lower hillside area. For example, in the western half of section 22 (T. 12 N., R. 3 W.) water levels in wells 50 to 77 ft deep ranged from 8.97 to 51.42 ft below land surface whereas water levels in wells 223 to 272 ft deep were 222.04 to 270.42 ft below land surface. These differences in water levels suggest subsurface structural complexity that retards the movement of water from one water-bearing zone to another. In all areas, differences in depths to water are also influenced by local topography. For example, a well drilled on a hill may have a greater depth-to-water value than a nearby well drilled in a valley, even though both wells are completed in the same aquifer.

Seasonal fluctuations of water levels are caused by variations in recharge or discharge during the year. Water levels generally rise during autumn when recharge by rains is greater than evaporation and transpiration. Water levels are commonly at their highest in November or December. Conversely, water levels decline during winter and early spring when precipitation is commonly in the form of snow and recharge is impeded by frozen soils. Typical seasonal water-level fluctuation ranges from 1 to 5 ft.

Intermittent high pumping rates of wells completed in confined aquifers cause large water-level fluctuations. These fluctuations are commonly greater than 30 ft throughout much of the midtown and downtown areas, as shown by hydrographs of water levels in wells 1279, 1134, and 35.

Long-term fluctuations in water levels reflect cumulative differences in recharge and discharge during a longer period of time. Water levels rise in years of above-normal precipitation and decline in years of below-normal precipitation or during extended periods of high rates of ground-water discharge. For example, water levels in many wells rose during 1979-81 when precipitation was above normal. Precipitation totals for the years 1979, 1980, and 1981 were 21.15, 19.17, and 21.34 in. respectively.

Hydrographs of water levels in wells 1389, 2360, 4223, 1200, and 1307 show that a general long-term water-level decline is occurring in south Anchorage. In contrast, water levels in the Nunaka Valley area, as shown by the hydrograph for well 1617, have risen and are returning to a level similar to the time when the well was drilled in 1959. Hydrographs for wells east of Hillside Drive and south of Rabbit Creek Road show no long-term water level declines or rises.

REFERENCES CITED

Barnwell, W.W., George, R.S., and others, 1972, Water for Anchorage: U.S. Geological Survey open-file report, 76 p.

Brunett, J.O., 1986, Ground-water levels in Alaska, water year 1983: U.S. Geological Survey Open-File Report 86-56, 225 p.

National Oceanic and Atmospheric Administration, 1986, Climatological data--annual summary, Alaska, 1985: National Climatic Data Center, v. 71, no. 13.

Still, P.J., and Brunett, J.O., 1987, Ground-water levels in Alaska, water year 1984: U.S. Geological Survey Open-File Report 87-230, 308 p.

U.S. Geological Survey, 1972-86, Water resources data for Alaska, water years 1971-85: U.S. Geological Survey Water-Data Reports (published annually).

U.S. Geological Survey, Water Resources Division, Alaska District, 1987, Pumpage data from public-supply wells at Anchorage, Alaska, 1957-1985: U.S. Geological Survey Open-File Report 86-542, 48 p.

CONVERSION TABLE

For the convenience of readers who may prefer to use metric (International System) units rather than the inch-pound units used in this report, values may be converted by using the following factors:

Multiply inch-pound unit	by	to obtain metric unit
inch (in.)	25.40	millimeter (mm)
foot (ft)	0.3048	meter (m)
million gallons per day (Mgal/d)	0.04381	cubic meter per second (m^3/s)

Sea level:

In this report "sea level" refers to the National Geodetic Vertical Datum of 1929 (NGVD of 1929) -- a geodetic datum derived from a general adjustment of the first-order level nets of both the United States and Canada, formerly called "Mean Sea Level of 1929."

Table 1.--Summary of well and water-level data

[See explanation following teble]

Local well number	Other identifier	Depth of well (feet)	Primary use of water	Type of finish	Altitude of land surface (feet)	Water-level date	Water level (feet)	Altitude of water level (feet)	Site status	Method of measure-ment	Remarks
SB01100301ACAA1	025	228	155	H	X	1,280	01-25-85	20.42	1,260	-	S	Bedrock at
							02-22-85	22.60	1,257	-	S	9 ft
							03-22-85	24.67	1,255	-	S	Hydrograph
							04-26-85	26.61	1,253	-	S	
							05-24-85	13.53	1,266	-	S	
							06-20-85	10.55	1,269	-	S	
							07-24-85	13.11	1,267	-	S	
							08-26-85	12.72	1,267	-	S	
							09-24-85	14.58	1,265	R	S	
							10-24-85	15.20	1,265	-	S	
							11-21-85	16.30	1,264	-	S	
							12-23-85	16.30	1,264	-	S	
SB01100301CABB1	024		58	H	O	1,215	06-20-85	2.18	1,213	-	S	
							07-24-85	7.35	1,208	-	S	
							08-26-85	10.29	1,205	-	S	
							09-24-85	4.25	1,211	-	S	
							10-24-85	2.34	1,213	-	S	
							12-23-85	2.99	1,212	-	S	
SB01100311CAAD2	003		150	H	X	1,020	01-25-85	28.35	992	-	S	Bedrock at
							02-22-85	28.14	992	-	S	20 ft
							03-22-85	28.25	992	-	S	
							04-26-85	26.05	994	-	S	
							05-24-85	18.78	1,001	-	S	
							06-20-85	20.14	1,000	-	S	
							07-24-85	25.57	994	-	S	
							08-26-85	26.42	994	-	S	
							09-24-85	25.29	995	-	S	
							10-24-85	22.75	997	-	S	
							11-21-85	24.79	995	-	S	
							12-23-85	27.21	993	-	S	
SB01200302DDBD1	001		260	U	S	395	04-30-85	97.86	297	-	S	
							11-25-85	96.05	299	-	T	
SB01200308DACA1	025	2360	153	H	O	195	01-03-85	81.27	114	-	S	Hydrograph
							01-25-85	80.06	115	-	S	
							04-30-85	85.61	110	-	S	
							05-24-85	89.40	106	-	S	
							06-20-85	89.81	105	-	S	
							07-24-85	90.00	105	-	S	
							08-26-85	88.84	106	-	S	
							09-24-85	84.89	110	-	S	
							10-24-85	85.38	110	-	S	
							11-21-85	75.70	119	P	S	
							12-23-85	86.05	109	-	S	
SB01200310CACB1	017		141	H	O	284	07-25-85	110.83	173	-	S	
SB01200310CACB5	017		74	H	O	273	05-25-85	58.86	214	-	S	
SB01200310CACD1	032		165/164	H	O	313	07-25-85	151.65	161	-	S	
SB01200310CBBA1	002		110	H	O	262	07-31-85	92.00	170	-	S	
SB01200310CBBB1	005		68	H	O	252	07-25-85	43.46	209	-	S	
SB01200310CBBD1	034		112	H	O	268	07-25-85	96.80	171	-	S	
SB01200310CBBD2	034		112	H	O	269	07-25-85	98.04	171	-	S	
SB01200310CBCB1	029	4223	163/162	H	O	275	01-25-85	116.65	158	-	S	Hydrograph
							02-22-85	117.90	157	-	S	
							03-22-85	118.82	156	-	S	
							04-30-85	119.39	156	-	S	
							05-24-85	125.65	149	-	S	
							06-20-85	120.52	154	-	S	
							07-24-85	121.04	154	-	S	
							07-31-85	124.82	150	-	S	
							08-26-85	123.91	151	-	T	
							09-24-85	121.40	154	-	T	
							10-24-85	119.00	156	-	T	
							11-21-85	117.66	157	-	T	
							12-23-85	119.64	155	-	S	
SB01200310CBDA1	037		137	H	O	288	07-31-85	115.86	172	-	S	
SB01200310CBDB1	004		94	H	O	287	07-31-85	62.09	225	-	S	
SB01200310CBDC1	003		96	H	O	291	07-31-85	65.98	225	-	S	
SB01200310CBDC4	003		164	H	O	302	07-31-85	127.53	174	-	S	

Table 1.--Summary of well and water-level data -- Continued

[See explanation following table]

Local well number	Other identifier	Depth of well (feet)	Primary use of water	Type of finish	Altitude of land surface (feet)	Water-level date	Water level (feet)	Altitude of water level (feet)	Site status	Method of measurement	Remarks
SB01200310CBDD1	038	135	H	O	297	07-31-85	127.37	170	-	S	
SB01200310CCBB1	010	88	H	O	295	07-25-85	77.18	218	-	S	
SB01200310CCBB2	010	86	H	O	295	07-31-85	81.85	213	-	S	
SB01200310CCBD1	040	128	H	O	314	07-31-85	96.94	217	-	S	
SB01200310CCDA2	007	160	H	O	306	07-31-85	131.02	175	-	S	
SB01200310CDBA1	020	161	H	O	330	07-25-85	157.19	173	-	S	
SB01200310CDBA2	020	164	H	O	327	07-25-85	155.04	172	-	S	
SB01200310CDBB2	018	163	H	O	316	07-31-85	145.05	171	-	S	
SB01200310CDBB3	018	176	H	O	318	07-31-85	146.43	172	-	S	
SB01200310CDBC4	026	155	H	O	327	07-25-85	149.38	178	-	S	
SB01200310CDBC5	026	196	H	O	327	07-31-85	154.82	172	-	S	
SB01200315ACDC1	034	110	H	-	443	09-05-85	69.94	373	-	S	
SB01200315ACDD2	035	140	H	O	448	08-13-85	54.19	394	-	S	
SB01200315ADCB1	019	85	H	O	456	07-24-85	47.17	409	-	S	
SB01200315ADDA2	021	62	H	O	469	08-13-85	34.74	434	-	S	
SB01200315ADDD1	004	55	H	O	467	08-13-85	32.97	434	-	S	
SB01200315BBBB1	054	173/169	H	O	307	07-31-85	135.14	172	-	S	
SB01200315BBDB1	011	192	H	-	341	08-13-85	169.44	172	-	S	
SB01200315BCAA1	012	227	H	O	373	08-14-85	200.20	173	-	S	
SB01200315BCAB1	041	240	H	-	359	08-13-85	195.02	164	-	S	
SB01200315CAAB1	007	267.8	H	O	432	07-09-85	256.65	175	-	S	
SB01200315CACB1	020	199	H	O	377	07-11-85	189.00	188	-	S	
SB01200315CADD1	045	268	H	O	430	07-11-85	250.04	180	-	S	
SB01200315CCAC1	025	195	H	O	385	08-13-85	178.22	207	-	S	
SB01200315CCCD1	117	221	H	O	402	08-26-85	208.5	193	-	R	
SB01200315DAAB1	038	72	H	O	482	07-09-85	50.27	432	-	S	
SB01200315DAAB2	038	65	H	O	480	07-09-85	43.21	437	-	S	
SB01200315DBCD1	050	268/264	H	O	430	07-09-85	250.58	179	-	S	
SB01200315DBDA1	052	44/41	H	O	445	07-11-85	14.15	431	-	S	
SB01200315DBDD3	051	42/41	H	O	452	07-11-85	26.31	426	-	S	
SB01200315DDCC1	029	260	H	-	500	08-13-85	233.79	266	-	S	
SB01200316DBDD1	003	240	C	S	374	11-07-85	178.12	196	-	S	
						11-08-85	178.24	196	-	S	
						11-26-85	177.31	197	-	S	
						11-27-85	177.22	197	-	S	
						12-06-85	175.96	198	-	S	
						12-23-85	177.46	197	-	S	
SB01200320CCDA1	026	550/298	U	Z	160	01-25-85	18.00	142	-	S	
						02-22-85	18.37	142	-	S	
						03-22-85	18.74	141	-	S	
						04-26-85	18.75	141	-	S	
						05-24-85	18.67	141	-	S	
						06-20-85	18.59	141	-	S	
						07-23-85	19.26	141	-	S	
						08-26-85	18.43	142	-	S	
						09-24-85	17.30	142	-	S	
						10-24-85	16.44	144	-	S	
						11-21-85	16.98	143	-	S	
						12-23-85	16.02	144	-	S	
SB01200321ACDC1	040	89	H	O	327	08-20-85	78.31	249	-	S	

Table 1.--Summary of well and water-level data -- Continued

[See explanation following table]

Local well number	Other identifier	Depth of well (feet)	Primary use of water	Type of finish	Altitude of land surface (feet)	Water-level date	Water level (feet)	Altitude of water level (feet)	Site status	Method of measurement	Remarks
SB01200321ACDD1	032	99	H	O	345	08-20-85	93.76	251	-	S	
SB01200321ADAA1	029	168	H	O	379	08-20-85	162.65	216	-	S	
SB01200321ADAB1	049	176	H	O	378	08-20-85	161.73	216	-	S	
SB01200321DCCA1	006	51	H	O	331	08-20-85	38.20	293	-	S	
SB01200321DDBB1	046	63.7	H	-	372	08-20-85	14.03	358	-	S	
SB01200321DDBC1	047	67	H	-	376	08-20-85	27.44	349	-	S	
SB01200322ACAA1	055	152	H	O	542	08-14-85	63.60	478	-	S	
SB01200322ADDA1	073	146	H	O	641	07-16-85	119.72	521	-	S	
SB01200322ADDB1	048	203/202	H	O	622	08-14-85	129.20	493	-	S	
SB01200322BABA1	005	1200 242	H	O	412.5	04-30-85 11-26-85	231.61 231.06	180.9 181.4	- -	T T	Hydrograph
SB01200322BBAA2	013	255	H	O	410	07-16-85	233.00	177	-	S	
SB01200322BBBD2	015	224/ 223	H	O	419	07-25-85	222.04	197	-	S	
SB01200322BBDD1	078	249	H	O	418	07-16-85	242.58	175	-	S	
SB01200322BDBB2	031	278/268	H	O	444	07-24-85	270.42	174	-	S	
SB01200322BDBC1	026	64	H	O	452	07-24-85	18.09	434	-	S	
SB01200322BDCB2	056	68/ 67	H	O	461	07-16-85	26.83	434	-	S	
SB01200322CBBC2	007	280/272	H	O	437	07-16-85	249.59	187	-	S	
SB01200322CBBD2	047	50	H	O	445	07-16-85	8.97	436	-	S	
SB01200322CBCA8	049	51/50.3	H	O	452	07-16-85	12.40	440	-	S	
SB01200322CBDC1	081	78/76.7	H	O	483	07-16-85	51.42	432	-	S	
SB01200322CBDD2	067	115/114	H	O	506	09-05-85	70.85	435	-	S	
SB01200322DABA1	077	175	H	O	624	08-14-85	131.96	492	-	S	
SB01200322DACA1	071	198	H	O	663	08-14-85	187.60	475	-	S	
SB01200322DACC1	072	194	H	O	652	07-24-85	154.67	497	-	S	
SB01200322DADA1	044	216	H	-	686	07-24-85	191.96	494	-	S	
SB01200322DCDA3	017	214	H	O	690	09-05-85	191.02	499	-	S	
SB01200322DDCD2	036	250	H	O	690	08-20-85	213.10	477	-	S	
SB01200323ABBA1	015	1523 170	H	O	722	04-26-85 11-26-85	131.19 132.06	591 590	- R	S S	Hydrograph
SB01200323BDCD1	038	207	H	O	724	06-25-85	140.25	584	-	S	
SB01200323CAAC1	073	149	H	O -	750	06-24-85 06-26-85	87.67 83.32	662 667	- -	T T	
SB01200323CABA1	041	158	H	O	744	06-24-85	139.10	605	-	S	
SB01200323CACA1	033	285	H	X	771	09-25-85	150.37	621	-	S	
SB01200323CBDA1	079	186	H	O	730	07-09-85	160.27	570	-	S	
SB01200323CCAA1	042	193/187	H	P	758	06-25-85	162.45	596	-	S	
SB01200323CCDD1	020	126	H	O	806	06-20-85	112.09	694	-	S	
SB01200323CDBB1	024	320	H	P	780	06-25-85	90.40	690	-	S	
SB01200323CDCD1	075	78	P	P	804	07-09-85	25.15	779	-	R	Bedrock at 75 ft
SB01200323DBDC1	053	72	H	O	870	06-20-85	18.10	852	-	S	
SB01200323DCAC1	001	80	H	O	864	06-25-85	7.95	856	-	S	Bedrock at 79 ft
SB01200323DCBD1	057	78	H	O	858	06-25-85	4.23	854	-	T	Bedrock at 74 ft

Table 1.--Summary of well and water-level data -- Continued

[See explanation following table]

Local well number	Other identifier	Depth of well (feet)	Primary use of water	Type of finish	Altitude of land surface (feet)	Water-level date	Water level (feet)	Altitude of water level (feet)	Site status	Method of measurement	Remarks
SB01200324BAAD1	015 2014	75	H	X	1060	04-26-85	22.29	1038	-	S	Bedrock at 24 ft
						11-26-85	19.58	1040	-	S	Hydrograph
SB01200325BCCD1	028	173	H	O	970	01-25-85	129.18	841	-	S	
						03-22-85	128.07	842	-	S	
						04-26-85	128.45	842	-	S	
						05-24-85	128.63	841	-	S	
						06-20-85	129.54	840	-	S	
						07-24-85	129.32	841	-	S	
						08-26-85	130.67	839	-	S	
						09-24-85	128.96	841	-	S	
						10-24-85	128.55	841	-	S	
						11-21-85	129.36	841	-	S	
						12-23-85	128.89	841	-	S	
SB01200327BADC1	043	150/148	H	O	610	08-22-85	120.79	489	-	S	
SB01200327BBDB1	045	93	H	O	472	08-22-85	75.49	397	-	S	
SB01200327BCAA1	083	136	H	O	478	08-22-85	126.49	352	-	S	
SB01200327BCAA2	083	140	H	O	480	08-22-85	122.51	357	-	S	
SB01200327BCBB1	080	110	H	O	420	08-22-85	66.94	353	-	S	
SB01200327BCBD1	047	95	H	O	418	08-22-85	72.64	345	-	S	
SB01200327CAAC1	057	350	H	X	540	08-22-85	234.36	306	-	S	Bedrock at 244 ft
SB01200328AABD2	058	193	H	O	390	08-29-85	179.70	210	-	S	
SB01200328AADA1	026	115	H	O	444	08-29-85	94.97	349	-	S	
SB01200328ABAB1	029	89	H	O	352	08-29-85	60.93	291	-	S	
SB01200328ABBA1	030	83	H	O	340	08-29-85	55.90	284	-	S	
SB01200328ACCA1	037	76	H	O	336	08-29-85	59.01	277	-	S	
SB01200328ACDD2	040	78	H	O	337	08-29-85	65.95	271	-	S	
SB01200328ADAA1	041	79.5	H	O	395	08-29-85	53.89	341	-	S	
SB01200328ADAB3	042	184	H	O	395	08-29-85	182.24	213	-	S	
SB01200328ADBB4	045	100	H	O	360	04-30-85	84.50	276	-	T	
						05-31-85	85.16	275	-	S	
						07-02-85	85.87	274	-	S	
						08-20-85	86.33	274	-	S	
						09-25-85	86.65	273	-	S	
						10-18-85	86.46	274	-	S	
						11-08-85	86.73	273	-	S	
						11-26-85	86.60	273	-	S	
						12-21-85	86.46	274	-	S	
SB01200328ADBD1	047	177	H	O	382	08-29-85	165.17	217	-	S	
SB01200328ADCD1	051	87	H	O	369	08-29-85	64.58	304	-	S	
SB01200328BAAB1	053	55/53	H	O	306	08-29-85	23.45	283	-	S	
SB01200328DDDD1	005	142	H	O	353	08-29-85	133.00	220	-	S	
SB01200329DBAD1	016 1307	140	P	S	200	01-25-85	108.21	92	-	S	Hydrograph
						02-22-85	108.72	91	-	S	
						03-22-85	109.12	91	-	S	
						04-26-85	109.12	91	-	S	
						05-24-85	108.86	91	-	S	
						06-20-85	108.81	91	-	S	
						07-24-85	108.32	92	-	S	
						08-26-85	105.77	94	-	S	
						09-24-85	103.69	96	-	S	
						10-24-85	103.05	97	-	S	
						11-21-85	103.26	97	-	S	
						12-23-85	100.24	100	-	S	

Table 1.--Summary of well and water-level data -- Continued

[See explanation following table]

Local well number		Other identifier	Depth of well (feet)	Primary use of water	Type of finish	Altitude of land surface (feet)	Water-level date	Water level (feet)	Altitude of water level (feet)	Site status	Method of measurement	Remarks
SB01200335ACCA2	015	4222	190	H	X	910	01-25-85	116.64	793	-	S	Bedrock at 108 ft
							03-22-85	114.26	796	-	S	Hydrograph
							04-26-85	116.51	793	-	S	
							05-24-85	116.69	793	-	S	
							06-20-85	115.48	795	-	S	
							07-24-85	117.12	793	-	S	
							08-26-85	114.56	795	-	S	
							09-24-85	109.70	800	-	S	
							10-24-85	110.14	800	-	S	
							11-21-85	118.92	791	-	S	
							12-23-85	109.84	800	-	S	
SB01200401DDAA1	004		243	P	O	98	See table 2					
SB01200403BABD1	001	606	270/268	T	S	106	04-30-85	86.46	20	-	S	Hydrograph
							11-25-85	86.70	19	-	S	
SB01200411BDBC1	010	1430	307	U	S	112	See table 2					Hydrograph
SB01300206DBBA1	004	17	670/134	U	P	294	See table 2					Hydrograph
SB01300207DBCB1	003		129/124	U	S	308.84	See table 2					
SB01300207DBCC1	005		50/43	U	T	307.18	01-24-85	28.26	278.92	-	S	
							02-21-85	29.78	277.40	-	S	
							03-21-85	31.20	275.98	-	S	
							04-25-85	32.69	274.49	-	S	
							05-23-85	32.59	274.59	-	S	
							06-21-85	31.70	275.48	-	S	
							07-23-85	30.67	276.51	-	S	
							08-27-85	29.69	277.49	-	S	
							09-23-85	27.93	279.25	-	S	
							10-23-85	21.84	285.34	-	S	
							11-22-85	22.22	284.96	-	S	
							12-20-85	23.82	283.36	-	S	
SB01300208DBCB2	006	2127	190	U	P	370.39	See table 2					
SB01300309BCCD1	006	35	336	U	O	144	See table 2					Hydrograph
SB01300309CDCD2	001		476/370	U	P	142	04-25-85	123.42	19	S	S	
							11-25-85	61.38	81	-	T	
SB01300311BDCB2	001		52	U	T	197	04-25-85	34.01	163	-	S	
							11-25-85	30.70	166	-	S	
SB01300312BCCC1	001		225/145	U	O	224	04-25-85	38.38	186	S	S	
							11-25-85	34.63	189	-	T	
SB01300316CADD1	001		470	U	P	117	04-25-85	50.14	67	-	S	
							11-25-85	38.39	79	-	T	
SB01300316CCBC1	006		95	U	O	101.42	01-24-85	23.92	77.50	-	S	
							02-21-85	22.69	78.73	-	S	
							03-21-85	23.21	78.21	-	S	
							04-30-85	39.85	61.57	-	S	
							05-24-85	38.06	63.36	-	S	
							06-20-85	39.54	61.88	-	S	
							07-23-85	42.43	58.99	-	S	
							08-27-85	39.04	62.38	-	S	
							09-23-85	32.69	68.73	-	S	
							10-15-85	30.63	70.79	-	S	
							10-23-85	33.73	67.69	-	S	
							11-22-85	23.16	78.26	-	S	
							12-23-85	42.70	58.72	-	S	
SB01300316CCBC2	006		70	U	O	101.06	10-15-85	30.11	70.95	-	S	
							11-25-85	21.74	79.32	-	S	
SB01300317ACBB1	001		210/142	U	O	128.50	04-25-85	80.08	48.42	-	S	
							11-25-85	26.08	102.42	-	T	
SB01300317BDAD1	003		415/230	U	P	129.30	01-25-85	67.74	61.56	-	S	
							02-22-85	50.79	78.51	-	S	
							03-21-85	51.23	78.07	-	S	
							04-25-85	98.36	30.94	-	T	
							05-23-85	97.88	31.42	-	T	
							06-20-85	68.74	60.56	-	T	
							07-24-85	100.58	28.72	-	T	
							08-27-85	85.14	44.16	-	T	
							09-23-85	61.75	67.55	-	T	
							10-23-85	97.73	31.57	-	T	
							11-21-85	51.49	77.81	-	T	
							12-20-85	106.44	22.86	-	S	

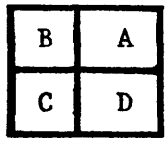
Table 1.--Summary of well and water-level data -- Continued

[See explanation following table]

Local well number	Othar identifier	Depth of well (feet)	Primary use of water	Type of finish	Altitude of land surface (feet)	Water-level dete	Weter level (feet)	Altitude of water level (feet)	Site status	Method of measure-ment	Remarks
SB01300317DADA1	012	305	U	O	129.20	See table 2					
SB01300317DCDC1	011	49.3	U	P	121.50	10-04-85	29.20	92.30	-	S	
						10-15-85	29.15	92.35	-	S	
SB01300317DDDD1	002	69.5	U	P	129.17	10-04-85	40.03	89.14	-	T	
						10-15-85	39.32	89.85	-	S	
SB01300318BDCC1	008	190	U	S	103	04-25-85	79.59	23	-	S	
						11-25-85	79.36	24	-	S	
SB01300320AADA1	003	44.5	U	P	96.76	10-15-85	8.69	88.07	-	S	
SB01300320ABDD1	033	91	U	O	85.60	10-15-85	16.99	68.6	-	S	
SB01300321CDDC1	001	400/166	U	S	140	04-30-85	45.85	94	-	S	
						11-25-85	37.64	102	-	S	
SB01300323BAAA1	001	150	U	S	216	See table 2					
SB01300330DBDD1	030	300/261	U	O	108	See table 2					
SB01300333ADAD1	027	210/194	U	S	173.50	See table 2					
SB01300335BBAD1	004	224	F	S	241.80	04-30-85	79.85	161.95	-	S	
						11-26-85	74.60	167.20	-	S	
SB01300335DCCC2	005	52/48	U	S	286	04-25-85	10.78	275	-	S	
						11-25-85	9.71	276	-	S	
SB01300336AAAD1	010	151	U	X	385	See table 2					
SB01300336ADDA1	001	112	U	Z	414	01-24-85	55.26	359	-	S	
						02-21-85	56.33	358	-	S	
						03-21-85	56.38	358	-	S	
						04-25-85	57.70	356	-	S	
						05-23-85	66.55	347	-	S	
						06-21-85	69.28	345	-	S	
						07-23-85	68.18	346	-	S	
						08-27-85	56.51	357	-	T	
						09-23-85	53.10	361	-	T	
						10-23-85	59.65	354	-	T	
						11-22-85	61.29	353	-	T	
						12-20-85	64.95	349	-	S	
SB01300423DDDB1	002	283	U	S	44	See table 2					

EXPLANATION OF TABLE HEADINGS

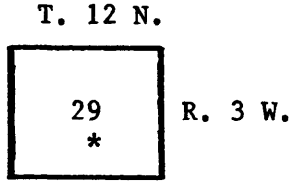
WELL NUMBER: The well-numbering system used in this column is the Alaska Water Resources Division's local well-numbering system and is based on the rectangular subdivision of public lands. The first two letters indicate the well's position in reference to a base and meridian (first letter) and the quadrant formed by the intersection of the base line and the principal meridian (second letter), lettered counter-clockwise from the northeast corner:



In this report, all wells are in the Seward base and meridian (S) and in its northwestern quadrant (B). The first three digits indicate the township in which the well is located, the next three digits the range, and the last two digits the section. For example, a well in

south Anchorage numbered SB01200329DBAD1 is located in township 12 north, range 3 west, section 29. Letters following the section number indicate further subdivision: the quarter section, the quarter-quarter section, and so forth to the fourth section subdivision. Like the quadrants formed by the base and meridian, each succeeding subdivision is lettered counter-clockwise from the northeast corner. The number after the letters refers to the sequential listing of wells in the smallest subdivision. Thus, well SB01200329DBAD1 was the first well located in the southeast quarter (D) of the northeast quarter (A) of the northwest quarter (B) of the southeast quarter (D) of section 29. The location of wells plotted on sheet 1 are at the center of their respective fourth-order quarter section, thus each well symbol may represent more than one well.

The last three digits refer to the sequential listing of wells within a square-mile section. Thus, well SB01200329DBAD1 016 was the sixteenth well recorded in section 29.



SB01200329DBAD1 016
1307

OTHER IDENTIFIER: A less cumbersome number than the local number is used to uniquely identify wells that have hydrographs shown on sheet 2.

WELL DEPTH: Depth of well, from land surface, as reported by the driller or owner. For wells completed in unconsolidated sediments, it is the distance from land surface at the well to the bottom of the casing or screen; for wells completed in bedrock it is the depth drilled. Where two depths are listed, the first number refers to the depth to which the well was drilled and the second number refers to the depth to which the well is cased. Most domestic wells in this area are completed with steel casings that are 6 inches in diameter.

PRIMARY USE OF WATER: H, domestic; P, public supply; C, commercial; T, institutional; U, unused. Most wells listed are privately owned and are used to provide water for domestic purposes (H) or are wells drilled by the U.S. Geological Survey or Municipality of Anchorage to observe changes in water level and water is not pumped from these wells (U).

TYPE OF FINISH: Describes how the well casing is open to the aquifer: O, open end; P, perforated or slotted; S, screen; T, sand point; X, open hole; Z, other; -, unknown. Most domestic wells in Anchorage have an open-end finish, that is, the casing is open at the bottom and the well casing is not perforated. Wells completed in bedrock

have an open-hole finish -- the well is cased only at the top of the well where the well penetrates unconsolidated sediments, casing does not extend into consolidated rock.

ALTITUDE: Altitudes of land surface, in feet above sea level. Most altitudes were determined from topographic maps that have contour intervals ranging from 4 to 25 feet. A few altitudes were determined by level surveys.

WATER LEVEL: Depth to water from land surface, in feet, in the completed well. Water levels were measured by U.S. Geological Survey or Alaska Division of Geological and Geophysical Surveys personnel.

ALTITUDE OF WATER LEVEL: Altitude of water level in well, in feet above sea level.

SITE STATUS: All water levels are assumed to be a static water surface (-), that is, a natural level not influenced by any recent withdrawal of water from the well, otherwise they are noted here: P, well was pumping; R, well was recently pumped; S, a nearby well was pumping.

METHOD OF MEASUREMENT: S, steel tape; T, electric tape.

REMARKS: Wells having hydrographs of water levels shown on sheet 2 are noted here. Wells that penetrated bedrock and the depth (in feet below land surface) at which bedrock was encountered are also indicated.

Table 2.–Summary of water levels in wells equipped with continuous water-level recorders, 1985

[Water-level value is highest recorded in well on day indicated;
---, Value unknown; EOM, last day of month]

SB01200401DDAA1 004

WATER LEVEL (FEET BELOW LAND SURFACE) JANUARY 1985 TO DECEMBER 1985
MINIMUM VALUES

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
5	20.00	---	---	---	---	27.91	27.91	---	25.69	22.07	21.68	14.91
10	21.74	---	---	---	---	27.11	27.94	28.34	---	20.16	18.46	16.36
15	22.09	---	---	---	26.18	27.66	28.95	---	---	19.47	15.90	18.51
20	21.11	---	---	---	26.86	26.98	31.47	---	---	18.70	14.45	19.78
25	---	---	---	---	27.83	---	28.72	---	23.10	20.41	14.11	21.92
EOM	---	---	---	25.61	27.12	---	---	25.82	21.64	22.94	15.95	21.97

CAL YR 1985 HIGH 14.11 NOV 25 LOW 31.47 JUL 20

SB01200411BDBC1 010 (1430)

WATER LEVEL (FEET BELOW LAND SURFACE) JANUARY 1985 TO DECEMBER 1985
MINIMUM VALUES

DAY	JAN	FEB	MAR	APR
5	65.00	65.41	65.89	67.23
10	65.13	65.43	65.78	67.27
15	65.17	65.32	66.01	67.17
20	65.35	65.48	66.29	67.23
25	65.45	65.54	66.46	---
EOM	65.39	65.70	66.76	---

NO DATA AVAILABLE FOR REMAINDER OF YEAR; WELL DESTROYED

CAL YR 1985 HIGH 65.00 JAN 5 LOW 67.27 APR 10

SB01300206DBBA1 004 (17)

WATER LEVEL (FEET BELOW LAND SURFACE) JANUARY 1985 TO DECEMBER 1985
MINIMUM VALUES

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
5	61.98	63.93	65.42	67.52	68.96	68.28	66.01	66.47	65.68	63.99	63.93	63.52
10	62.10	64.31	65.55	67.85	68.88	67.89	66.19	66.07	65.35	63.11	63.43	64.39
15	62.05	64.45	65.97	67.48	68.95	67.77	65.13	66.12	65.49	63.13	63.58	64.51
20	63.10	64.83	66.54	68.09	69.01	67.45	65.45	65.64	64.91	62.92	63.62	64.48
25	63.17	65.20	66.57	68.44	69.08	67.14	65.98	65.47	64.82	63.60	63.24	65.29
EOM	62.87	65.63	66.68	68.82	67.95	66.92	66.17	65.23	64.12	63.84	63.02	64.89

CAL YR 1985 HIGH 61.48 JAN 1 LOW 69.19 MAY 16

SB01300207DBCB1 003

WATER LEVEL (FEET BELOW LAND SURFACE) JANUARY 1985 TO DECEMBER 1985
MINIMUM VALUES

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
5	78.41	80.43	81.76	86.44	88.31	87.25	85.47	86.38	81.87	79.65	85.06	84.81
10	78.42	---	81.56	87.14	87.80	86.69	85.40	83.36	81.25	78.97	84.82	85.93
15	78.24	---	82.08	83.76	88.05	86.60	84.26	84.18	81.36	79.02	85.13	85.90
20	82.45	---	83.20	86.50	88.17	86.33	84.96	82.44	80.32	78.81	85.31	84.27
25	79.53	81.44	82.81	87.58	87.59	85.99	84.67	---	82.39	82.62	84.81	84.74
EOM	78.80	81.72	82.64	88.07	87.50	84.28	85.98	81.76	79.86	84.41	85.45	84.57

CAL YR 1985 HIGH 78.24 JAN 15 LOW 88.31 MAY 5

SB01300208DBCB2 006 (2127)

WATER LEVEL (FEET BELOW LAND SURFACE) JANUARY 1985 TO DECEMBER 1985
MINIMUM VALUES

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
5	76.24	77.37	78.12	79.12	79.34	79.40	78.70	77.91	77.46	75.58	72.85	73.05
10	76.36	77.53	78.21	79.19	79.35	79.21	78.53	77.90	77.28	74.98	72.49	73.33
15	76.45	77.76	78.48	79.30	79.45	79.24	78.42	77.80	77.03	74.23	72.76	73.55
20	76.76	77.84	78.65	79.46	79.48	79.07	78.24	77.68	76.88	73.60	72.70	73.79
25	77.01	77.92	78.80	79.51	79.45	78.96	78.17	---	76.55	73.37	72.73	74.09
EOM	77.15	78.20	78.96	79.49	79.42	78.80	78.01	77.52	76.12	73.03	72.95	74.30

CAL YR 1985 HIGH 72.49 NOV 10 LOW 79.51 APR 25

Table 2.--Summary of water levels in wells equipped with continuous water-level recorders, 1985 --Continued

[Water-level value is highest recorded in well on day indicated;
---, Value unknown; EOM, last day of month]

SB01300309BCCD1 006 (35)

WATER LEVEL (FEET BELOW LAND SURFACE) JANUARY 1985 TO DECEMBER 1985
MINIMUM VALUES

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
5	66.22	62.83	71.59	---	75.41	77.55	73.79	76.82	75.42	66.60	69.36	70.66
10	64.06	62.38	64.12	---	79.05	79.20	79.48	73.03	78.54	65.11	64.25	72.45
15	70.87	62.00	67.84	---	70.73	77.88	75.27	75.35	79.20	65.78	63.32	76.07
20	65.51	62.85	64.08	---	77.77	80.68	76.27	79.31	72.06	64.91	64.30	71.26
25	68.35	62.35	---	78.29	74.92	75.54	78.00	---	69.02	73.54	62.94	68.21
EOM	63.89	67.02	---	79.14	80.08	72.99	74.55	79.10	67.32	69.29	72.81	66.65

CAL YR 1985 HIGH 62.00 FEB 15 LOW 80.68 JUN 20

SB01300317DADA1 012

WATER LEVEL (FEET BELOW LAND SURFACE) JANUARY 1985 TO DECEMBER 1985
MINIMUM VALUES

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
5	---	52.47	59.84	57.00	63.99	---	66.27	68.15	67.22	55.89	60.46	---
10	---	52.06	53.89	54.19	66.61	---	69.08	65.47	62.79	53.58	---	61.39
15	---	51.26	56.41	58.53	62.79	---	68.45	67.57	62.47	56.36	---	65.19
20	---	52.76	53.84	61.62	67.38	---	69.05	67.40	61.82	54.94	---	63.62
25	56.65	52.28	53.39	67.23	67.78	65.02	68.34	---	---	62.67	50.07	62.69
EOM	53.26	54.11	54.37	67.49	71.08	64.88	67.07	66.07	56.48	61.31	58.77	60.53

CAL YR 1985 HIGH 50.07 NOV 25 LOW 71.08 MAY 31

SB01300323BAAA1 001

WATER LEVEL (FEET BELOW LAND SURFACE) JANUARY 1985 TO DECEMBER 1985
MINIMUM VALUES

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
5	33.73	---	---	---	---	---	25.20	25.31	22.22	21.50	---	22.06
10	34.26	---	---	---	---	---	25.11	26.87	21.53	21.21	---	22.10
15	31.91	---	---	---	---	---	25.03	24.27	21.15	---	---	21.46
20	---	---	---	---	---	---	25.06	23.19	21.02	---	---	20.90
25	---	---	---	28.59	---	26.10	25.40	---	20.85	---	22.49	21.60
EOM	---	---	---	---	---	26.03	24.96	22.32	20.21	---	22.60	21.22

CAL YR 1985 HIGH 20.21 SEP 30 LOW 34.26 JAN 10

SB01300330DBDD1 030

WATER LEVEL (FEET BELOW LAND SURFACE) JANUARY 1985 TO DECEMBER 1985
MINIMUM VALUES

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
5	29.10	32.05	30.00	39.98	33.83	---	---	---	---	---	21.41	
10	---	32.96	39.65	40.46	35.85	---	---	---	---	---	12.84	
15	---	33.27	32.29	33.14	40.47	---	---	---	---	---	10.00	
20	---	33.70	37.75	35.92	41.40	---	---	---	---	---	9.77	
25	18.33	34.90	41.99	---	42.00	37.29	44.65	---	32.39	38.17	32.15	
EOM	33.38	25.07	42.29	27.88	43.24	40.68	---	---	35.72	30.16	21.27	

CAL YR 1985 HIGH 9.77 NOV 20 LOW 44.65 JUL 25

SB01300333ADAD1 027

WATER LEVEL (FEET BELOW LAND SURFACE) JANUARY 1985 TO DECEMBER 1985
MINIMUM VALUES

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
5	51.85	53.51	53.17	56.05	55.41	59.28	58.09	59.31	57.39	52.54	---	49.02
10	51.78	54.22	55.30	56.10	56.08	56.23	58.80	57.98	56.10	50.38	---	50.76
15	50.77	54.22	54.76	55.36	56.86	57.73	59.76	58.98	55.35	50.08	---	53.68
20	50.38	54.65	55.35	56.35	56.95	57.85	60.45	58.25	53.88	49.68	---	54.42
25	50.17	54.99	56.78	---	58.22	57.89	---	57.00	53.73	---	48.55	---
EOM	51.62	53.87	56.79	54.62	58.59	57.86	---	56.90	52.02	---	49.27	---

CAL YR 1985 HIGH 48.55 NOV 25 LOW 60.45 JUL 20

Table 2.--Summary of water levels in wells equipped with continuous water-level recorders, 1985 -- Continued

[Water-level value is highest recorded in well on day indicated;
---, Value unknown; EOM, last day of month]

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WATER LEVEL (FEET BELOW LAND SURFACE) JANUARY 1985 TO DECEMBER 1985
MINIMUM VALUES

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
5	---	24.23	23.90	24.51	27.41	30.88	30.90	32.36	26.64	22.73	---	24.06
10	---	24.27	23.55	24.98	27.88	31.76	29.96	30.92	26.10	21.76	---	24.36
15	---	24.75	23.33	24.85	28.13	31.55	29.58	29.58	25.60	22.41	21.72	24.90
20	---	24.58	23.38	26.15	28.33	30.77	30.09	20.71	25.14	22.22	22.49	25.40
25	24.01	24.59	23.62	26.15	29.87	31.33	30.06	---	24.39	24.61	22.85	25.08
EOM	24.20	24.83	25.00	26.59	30.88	32.00	32.00	27.30	23.61	21.58	22.86	23.45

CAL YR 1985 HIGH 20.71 AUG 20 LOW 32.36 AUG 5

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WATER LEVEL (FEET BELOW LAND SURFACE) JANUARY 1985 TO DECEMBER 1985
MINIMUM VALUES

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	
5	6.68	6.94	7.68	8.31	8.51	10.00	10.11	10.66	
10	6.84	7.17	7.40	8.22	8.61	10.22	10.20	10.59	
15	7.02	7.30	7.80	8.08	8.90	10.10	10.48	10.37	NO DATA AVAILABLE
20	6.81	7.45	7.89	8.08	9.24	10.09	10.60	10.35	FOR REMAINDER OF YEAR;
25	6.78	7.59	8.06	---	9.55	10.08	10.67	10.35	WELL DESTROYED
EOM	6.67	7.75	8.22	8.30	9.67	10.15	10.64	---	

CAL YR 1985 HIGH 6.67 JAN 31 LOW 10.67 JUL 25