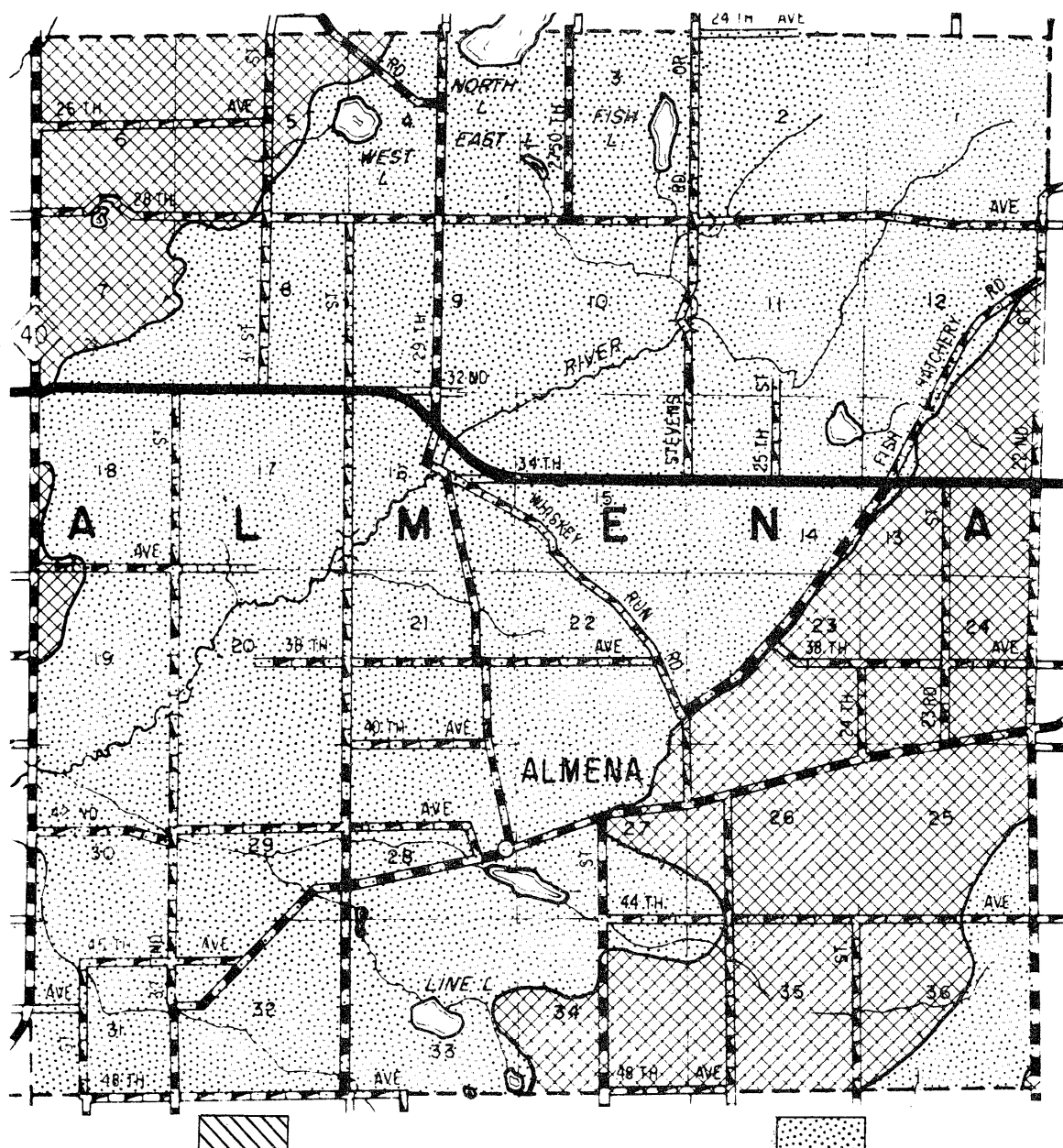


APPENDIX B.--Ground water availability maps and tables of wells
(alphabetically by townships)

Table 7.--Records of selected wells in Alma Township (T. 2S, R. 13W.)

e - estimated; Analyst--Field, not accurate to laboratory standards; USGS, U. S. Geological Survey; MDH, Michigan Dept. of Health; Boring--LOG, record of materials penetrated on file; ANM, also see table of chemical analyses of ground water.

Location T. & sec	Owner	Driller	Year drilled	Depth (in ft)	Diam (in inches)	Water level (in feet)	Month and year measured	Yield (in gpm)	Use	Screen openings (inches)	Pump	Water- bearing materials	Altitude (in m)	Quality of Water			Analyst	Remarks
														Iron (as Fe)	Hardness (as CaCO ₃)	Chloride (Cl)		
NW 2	Co. Rd. Commission	USGS	1963	23	1 1/2	17.12	4-63		Obs	Drive Pt	Piston	Sand	730	tr	240	5	Field	Used as observation well
SW 4	G. Stoughton	W. Goble	1939	36	2	24	5-39		Dom	.007	Piston	Gravel	760	2.5	250	5	Field	
SE 5	E. Berggren			e60	3	50	-50		Dom		Jet	Sand, gravel	790	0.6	220	10	Field	Through clay at 33'
SE 10	B. Penny	Omer	1963	38	1 1/2	+3	10-63		Dom	.007	Jet	Sand, gravel	720	0.4	200	10	Field	
SW 12	G. Vander Molen	B. Sanders	1958	46	2	e41	-58		Dom		Jet	Sand	760					
SW 13	Wolf Lake Fish Hatch.	T. Newman	1948	60	4	2.3	-48	55	Pub	.014	Jet	Sand	770					
SE 14	Wolf Lake Fish Hatch.	L. Sanders		60	3	flows			Pub		Jet	Sand, gravel	720	1.0	220	20	Field	100' gpm flow; hydrogen sulfide odor reported
SW 15	G. Cox	D. Walte	1962	45	2	3	8-62		Dom		Jet	Sand, gravel	720	0.5	220	10	Field	Restaurant supply
NW 16	O. Ketchum			140	2	40-60	-61		Dom		Jet	Sand, gravel	760	0.4	220	10	Field	Has 2 wells
NW 18	C. Leonard	E. Brindley	1962	85	2				Dom		Jet	Sand, gravel	722	0.4	220	10	Field	
SE 21	H. Livingston		1953	e35	2				Dom		Jet	Sand, gravel	735	0.8	180	10	Field	
SE 22	E. Wertler	Omer	1958	72	2				Dom		Jet	Sand, gravel	810	tr	180	5	Field	
SE 23	R. Oversacker	E. Sanders	1936	73	2				Dom, Stk		Piston	Gravel	840	0.2	170	5	Field	May use for Irrigation
SE 24	R. Williams	Rice	1938	86	3	e46	-59		Dom		Jet	Gravel	820	0.4	200	10	Field	
SE 26	M. Vandersaalm	E. Sanders	1959	86	3				Dom		Jet	Gravel	820	0.1	200	10	Field	
SE 27	E. Ritter	E. Sanders	1958	25	2				Dom		Jet	Gravel	760					
SE 28	L. Howard	E. Sanders		25	2				Dom		Jet	Gravel	710					
SE 29	V. Miller	E. Sanders	1963	18	2	11	7-63		Dom		Jet	Gravel	710					
SW 29	F. Beyer			22	1 1/2	15	-40		Dom, Stk		Centr	Sand	720					
NW 31	P. Churchill	Omer	1940	22	1 1/2	16	-59		Dom	.005	Jet	Sand	730					
SW 32	M. Filifanus	Omer	1959	22	1 1/2	16	-59		Dom		Jet	Sand	730					
SE 36	H. Boven	L. Nolan	1963	44	2	e30	9-63	10	Spray		Jet	Sand	860					Also has well 57' deep



AREA I. Enough water for domestic, stock, and spraying supplies (up to 10 gpm) generally can be obtained from wells less than 75 feet deep. Water in the well usually is less than 30 feet below land surface. Enough water for irrigation, municipal, or industrial supplies (more than 100 gpm) generally can be obtained from deeper, large-diameter wells (more than 6 inches in diameter and 100 to 200 feet deep).

AREA II. Enough water for domestic, stock, or spraying supplies generally can be obtained from wells less than 125 feet deep. Depth to water in about half the wells is more than 30 feet below land surface. Large-diameter wells less than 200 feet deep generally yield enough water for irrigation, municipal, and industrial supplies.

AREA III. Enough water for domestic, stock, or spraying supplies generally can be obtained from wells less than 200 feet deep. Wells for irrigation, industrial, or municipal supplies generally would have to be drilled to depths greater than 150 feet, and probably less than half of these would be successful.

AREA IV. Enough water for domestic, stock, and spraying supplies generally can be obtained from wells less than 75 feet deep. Water in the well generally is less than 30 feet below land surface. Exploratory drilling would be needed to determine where large supplies can be obtained.

AREA V. It is difficult to obtain enough potable water for domestic supplies in this area. It may be necessary to drill several wells before a successful domestic well is obtained. Chances of obtaining large supplies are poor.

AREA VI. Similar to surrounding areas except that thick glacial drift in deep bedrock valleys may yield moderate to large supplies of water (50 to more than 100 gpm). Exploratory drilling would be needed to determine where large supplies are available. Test wells should be drilled to bedrock unless salt water is found at shallower depths. Bedrock may be more than 500 feet deep in places.

Swamps and marshes

FIGURE 28.--MAP OF ALMENA TOWNSHIP SHOWING THE GENERAL AVAILABILITY OF GROUND WATER TO WELLS.

Table 8.--Records of selected wells in Antwerp Township (T. 3S., R. 13W.)

Explanation: e - estimated; Analyses--Field, not accurate to laboratory standards; USGS, U. S. Geological Survey; MDH, Michigan Dept. of Health; Remarks--LOG, record of materials penetrated on file; MDH, also see table of chemical analyses of ground water.

Location 1/4 sec	Owner	Driller	Year drilled	Depth (in ft)	Diam (in inches)	Water level (in feet)	Month and year measured	Yield (in gpm)	Use	Screen openings (inches)	Pump	Water- bearing material	Altitude (in msl)	Quality of Water				Remarks
														Iron (as Fe)	Hardness (as CaCO ₃)	Chloride (Cl)	Analyses	
SE NE 1	R. Boven	E. Sanders	1962	50	2	30	6-62	9	Dom, Irrig	.010	Jet	Sand	850		150	10	Field	Used for greenhouse
NW SW 2	L. Deleuw	Do.	1948	50	2	e 57	-45	e 5	Dom, Stk		Jet	Sand, gravel	800		300	25	Field	Also used for spraying
NW SW 4	R. Areux	Owner	1945	157	2	e 30	-59	15	Dom, Stk	.012	Jet	Sand	735	0.1	200	25	Field	NO ₃ = 31.5 ppm (MDH)
SE NE 6	A. Stam	E. Sanders	1959	62	4	e 16	5-60	20	Irrig	.010	Jet	Sand, gravel	770	1.0	200	15	Field	90 ₄ -34; pH 7.8
SE NE 7	F. Henningsen	G. Tinker	1960	50	2	36	9-62	20	Dom	.008	Jet	Gravel	760	0	170	5	Field	
SE NE 7	G. Eddington		1963	63	2	40-60	-43		Dom, Spray	.015-.020	Jet	Gravel	820		150	5	Field	LOG
SW NW 10	A. Glacyz	Bogart	1962	100	2	26	11-62	120	Ind	.070	Subm	Gravel	840	0.1	150	5	Field	LOG; Anal. by driller
NW SW 12	Internat. Research	Ohio Drilling Co.	1961	87	6	65.15	11-62	400	Pub, Ind		Turb	Sand, gravel	880	0.4	167	4.0	USGS	Water level 67.1 Nov. '62 (recently pumped); ANAL
SW NW 13	Glaser-Grandall Co. Do # 2	Layne-Northern Co.	1937	114	10	61.1	7-37	250	Pub, Ind		Turb	Sand, gravel	875					
NW NE 14	Mattawan High Sch.	Layne-Northern Co.	1958	70	6				Pub		Turb		830	.05	195	2	MDH	Trailer Park
NE NE 14	Carpenter	Val's Pump Serv.	1955	45	4	e 40			Pub	.010	Jet	Sand	830	0	150	10	Field	Use 2,000 gals per day when spraying
SE SE 16	W. Bevore	E. Sanders	1955	80	4				Dom, Spray		Jet	Sand	793	0.3	130	5	Field	#Hardpan" rept. at 20 feet
SE NE 18	G. Davis	E. Sanders	1963	52	3	33	7-63	30	Dom	.012	Piston	Sand	780	1.0	200	20	Field	Has 2-inch test 5 ft. from well
SW SW 20	D. Angel	E. Sanders	1961	28	2				Dom	.012	Jet	Sand	800	0.0	140	15	Field	ANAL
SW NE 21	L. Brown	E. Sanders	1956	116	3	e 86	4-63	200	Dom	.012	Jet	Sand, gravel	800	0.0	150	10	Field	LOG; ANAL
NW NW 24	V. Shultz	J. Newman	1963	147	8	52			Dom, Spray	.008-.010	Turb	Sand, gravel	920	tr	250	10	Field	LOG; ANAL
NW NW 24	Do.	H. Dibble	1922	104	2	30			Irrig		Jet	Sand	880	tr	170	10	Field	ANAL
SW NE 25	S. Twarog	Owner	1948	31	2	19	-61	6	Dom, Spray	.010	Centr	Sand	920	tr	36	2.5	USGS	LOG; ANAL
SW SE 29	E. Sanders	Ind-Mich Water Co	1946	105	12	6.5	4-46	655	Mun	.010	Turb	Sand	790	0.8	260	6	MDH	LOG; ANAL
SW SE 29	Do.	Dunbar Drig. Co.	1961	125	36	5.8	11-62	1,000	Mun	.035	Turb	Sand	780	0.5	280	18	MDH	ANAL; LOG
NW NE 32	Do.	Kelly Well Co.	1928	39	24	4.5	6-28	250	Mun		Turb	Sand	785	0	240	7	MDH	LOG; ANAL; Concrete well
NW NE 32	Do.	Do.	1924	44	24	6.5	7-24	500	Mun		Turb	Sand	785					Abandoned well; 9 1/2' water level 1942; LOG
NW SE 32	Do.	Ind-Mich Water Co	1953	110	12	27.15	11-62	930	Mun	.014-.030	Turb	Sand	785	1.4	240	10	MDH	LOG; ANAL
SW SE 33	J. Giddings	A. Bishop	1940	100	2	70			Dom, Spray		Jet	Gravel	930	1.0	200	10	MDH	LOG; ANAL
SW NE 34	E. Blum	E. Sanders	1960	105	3				Dom, Stk	.010	Jet	Gravel	920	tr	200	10	Field	LOG; ANAL
SE SE 35	D. Abbott		1960	84	2				Dom, Stk		Jet		965	0	250	10	Field	

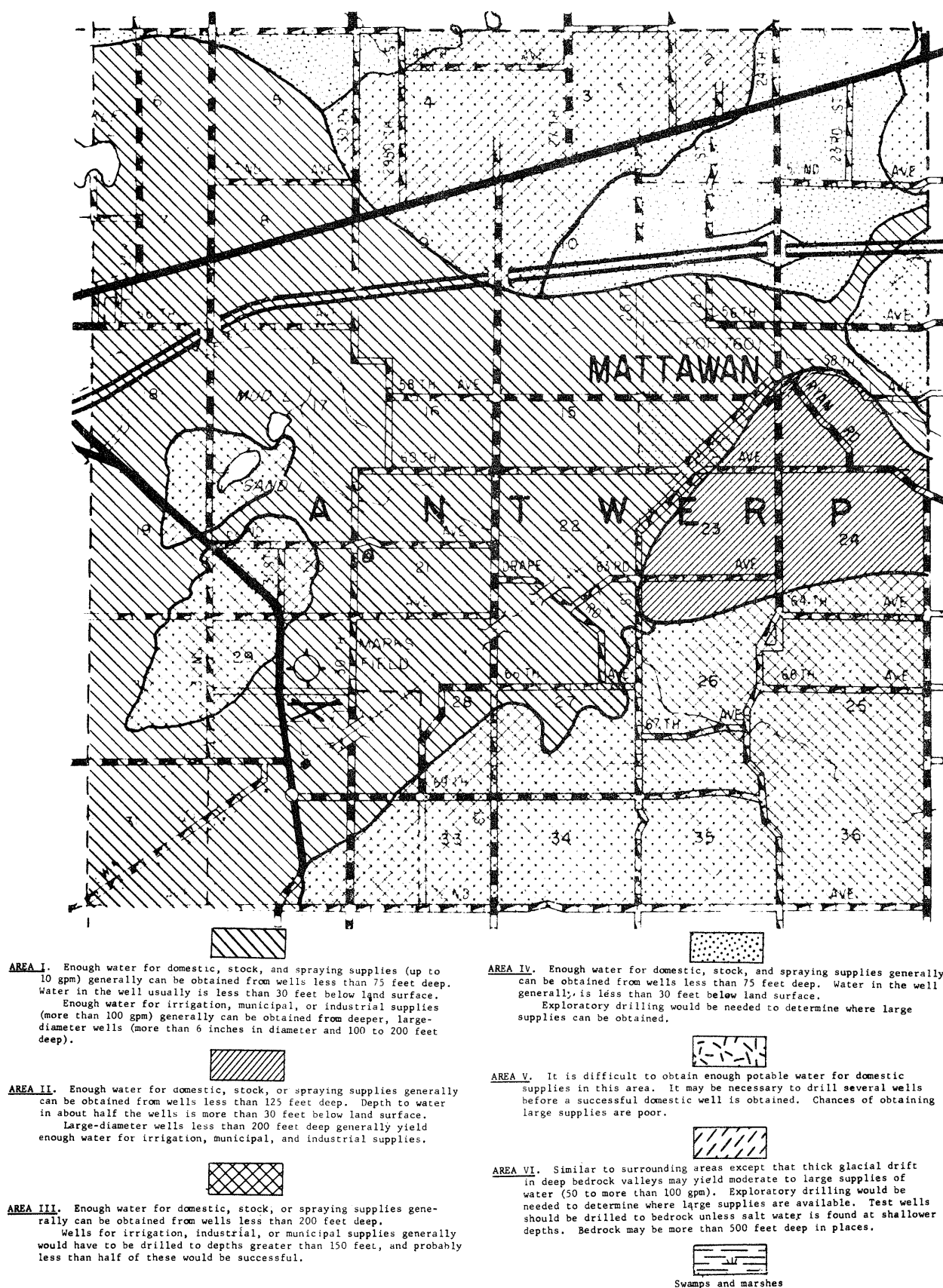


FIGURE 29.--MAP OF ANTWERP TOWNSHIP SHOWING THE GENERAL AVAILABILITY OF GROUND WATER TO WELLS.

Table 9.--Records of selected wells in Arlington Township (T. 2S., R. 15W.)

Explanation: e - estimated; Analyst--Field, not accurate to laboratory standards; USGS, U. S. Geological Survey; MDH, Michigan Dept. of Health; Remarks--LOG, record of materials penetrated on file; ANM, also see table of chemical analyses of ground water.

Location 1/4 sec	Owner	Driller	Year Drilled	Depth (In ft)	Diam (In inches)	Water Level (In feet)	Month and Year measured	Yield (In gpm)	Use	Screen openings (Inches)	Pump	Water- bearing materials	Altitude (In feet)	Quality of Water			Remarks
														Iron (as Fe) (in ppm)	Hardness (as CaCO ₃)	Chloride (Cl) (in ppm)	Analyst
SE 1	K. Saito	U. S. G. S.	1963	86	2	22.30	5-63		Dom		Jet	Sand	688	1.5	240	10	Field
NW 3	Co. Rd. Commission			37	1 1/4				Obs		Jet		689	2	220	10	Field
SE 3	M. Mayer			26	2	60	-61		Dom		Piston	Sand	750	1.5	220	10	Field
SW 5	L. and M. Sealey			180	2			125	Test			Sand, gravel	660	0.2	237	11	USGS
NW 6	Village of Bangor	Godfrey Oil Co.	1947	206	8	14	2-62	350	Ind	.014	Turb	Sand	660	0.25	260	7	MDH
SW 7	Du-Well Metal Products	G. Cole	1962	80	12	15.80	11-62	250	Mun	.020	Turb	Sand	660	0.25	235	2	MDH
NE 7	Village of Bangor #1	Ind.-Mich Water	1958	60	8	18.37	11-62	225	Mun	.010	Jet	Sand	680	0.2	240	15	Field
NE 7	Village of Bangor #5	Do.	1958	64	8	e 4	10-63	20	Test		None	Sand	680	1.5	135	40	Field
SE 7	S. Kraus	J. Taylor	1963	54	2	3	-43		Dom	Open bott	Jet		710	2	170	10	Field
NE 7	Village of Bangor	Ind.-Mich Water Co.	1958	190	6				Dom		Jet		720	0.2	340	35	Field
SE 8	O. Hildebrandt	Owner		16	30				Spray	.020	Turb	Sand	705	1.0	200	5	Field
NE 8	M. Pickenhain			70	2	40	1-49		Dom,Stk		Jet		700	0.3	200	10	MDH
SE 8	E. Root	Dunbar Drig. Co.	1949	86	5	18	-62	40	Dom		Jet	Gravel	690	0.73	250	16	USGS
NE 9	K. Drake	R. Sanders	1962	70	2	29	-61		Dom,Stk		Jet	Gravel	680	1.5	270	15	Field
SW 10	G. Hasty	H. Starbeck	1938	67	2	2	7-63		Dom		Jet	Sand	720	1.5	355	30	Field
NW 13	J. Zirbel	J. Taylor	1963	30	4	2			Dom,Stk		Jet	Gravel	680	1.5	270	15	Field
NE 14	A. Duda	R. Sanders	1957	46	2	e20	-51	400	Dom,Stk	.010	Piston	Gravel	660	1.0	260	5	Field
SE 16	S. Baker	Owner	1938	25	1 1/2		6-63		Dom	.010	Subm	Sand	800	1.0	260	5	Field
SE 17	B. Hills	J. Taylor	1963	88	7	30			Dom	.010	Subm	Sand	800	1.5	375	5	Field
SE 20	W. Hover	D. Rose	1963	212	4			9	Dom		Jet		800	1.2	250	5	Field
SE 22	A. Bregger	R. Sanders	1954	126	2	3.2			Dom		Jet		740	1.2	300	1.0	USGS
SW 24	K. Judd		1941	290	3		-61		Dom	.010	Jet	Sand	760	0.5	300	5	Field
SW 24	J. Tomcala	H. Starbeck	1959	100	2	60			Dom,Stk		Piston	Sand	780	5	400	5	Field
SW 26	P. Gurnsey	C. Raymond	1903	118	2	52		540	Irrig	.012-.030	Turb	Sand, gravel	780	0.1	497	9	USGS
SW 26	H. Hutchins	E. Richcreek	1951	132	2				Dom,Stk		Jet	Sand	720	1.5	340	5	USGS
SW 27	M. Blum	A. Bishop	1936	170	4	100	8-61		Dom		Jet	Sand	750	1.0	301	1	USGS
NW 28	H. Wakeman	Dunbar Drig. Co.	1961	215	12				Dom		Jet	Sand	740	0.2	220	10	Field
SW 29	G. Mehr			85	2	e70	-61		Dom,Stk	.006	Jet	Sand	680	0.2	371	1	USGS
SW 30	P. Hay	H. Starbeck	1955	90	2	e85	4-62		Dom,Stk	.010	Jet	Sand	760	0.2	200	10	Field
SW 31	Dorovan Lake Farms	D. Rose	1962	112	2	28	11-63		Dom		Jet	Sand	680	0.2	200	10	Field
SW 32	W. Jordan		1962	54	2	28			Dom		Jet	Sand	760	0.2	200	10	Field
SW 33	P. Nicholas	E. Sanders	1957	60	2	86			Dom		Jet	Sand	680	0.2	200	10	Field
SW 34	H. Harris	E. Richcreek	1963	126	2				Dom		Jet	Sand	680	0.2	200	10	Field
SE 36	G. Richardson	E. Richcreek	1963	36	2				Dom		Jet	Sand	680	0.2	200	10	Field

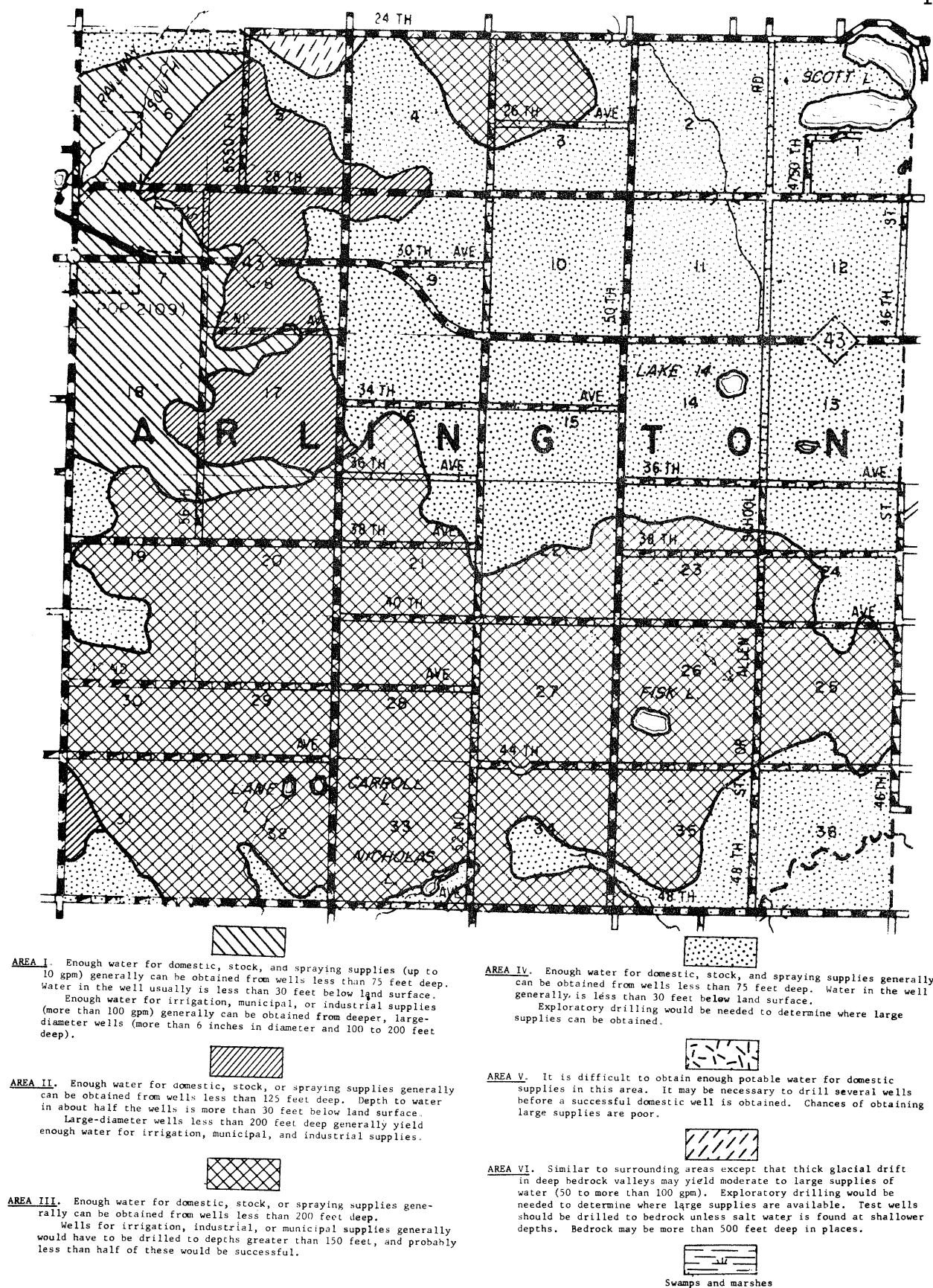
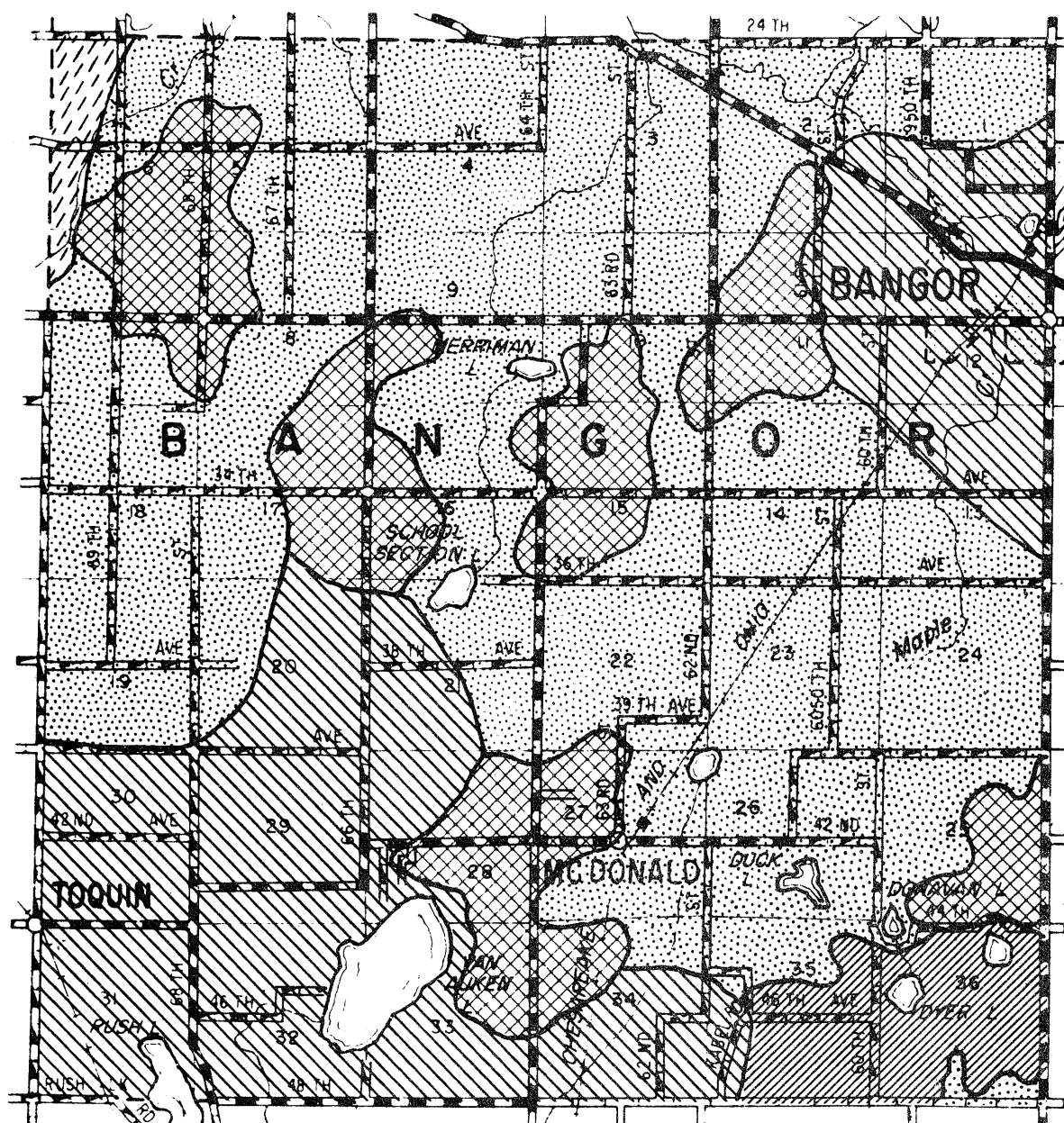


FIGURE 30.--MAP OF ARLINGTON TOWNSHIP SHOWING THE GENERAL AVAILABILITY OF GROUND WATER TO WELLS.

Table 10.--Records of selected wells in Bangor Township (T. 2S, R. 16W.)

Explanation: e - estimated; Analyst--Field, not accurate to laboratory standards; USGS, U. S. Geological Survey; MDH, Michigan Dept. of Health; Remarks--LOG, record of materials penetrated on file; ANAL, also see table of chemical analyses of ground water.

Location + sec	Owner	Driller	Year drilled	Depth (in ft)	Diam (in inches)	Water level (in feet)	Month and year measured	Yield (in gpm)	Use	Screen openings (inches)	Pump	Water- bearing materials	Altitude (in msl)	Quality of Water Iron (as Fe) Hardness (as CaCO ₃) Chloride (Cl)	Analyst	Remarks
NE SE 1	Village of Bangor #3	Dunbar Drl. Co.	1948	75	12	15.15	11-62	350	Mun	.020-.080	Turb.	Gravel, Sand	680	18	MDH	LOG, ANAL
NW NW 3	Triple S (Stein)	Calay, H.	1963	85	2	30	4-63	30,85	Ind, Spray	.010	Piston	Sand	650	40	Field	5 wells total
NW SE 4	A. Debest	J. Taylor	1963	85	2	30	-59	6/15	Dom, Stk	.006	Jet	Sand	660	5	Field	Cond. 550; Specific Conductance 550
NW SE 5	M. Mettr	J. Taylor	1961	42-50	2	6			Dom		Jet	Sand	640	10	Field	Specific Cond. 440; LOG
NW SE 6	R. Hillman	H. Starbeck	1944	75	2				Dom, Stk		Jet	Sand	680	10	Field	Specific Conductance 370
NW SE 8	R. Hillman	H. Starbeck	1944	75	2				Dom, Stk		Jet	Sand	660	10	Field	Specific Conductance 440
NW SE 9	R. Hillman	H. Starbeck	1944	75	2				Dom, Stk		Jet	Sand	660	10	Field	Specific Conductance 420
NW SE 10	R. Hillman	H. Starbeck	1944	75	2				Dom, Stk		Jet	Sand	660	10	Field	ANAL
NW SE 11	Piper Bros.	Dunbar Drilg Co.	1955	120	10	30	5-56	1,100	Irrig.	.010-.045	Turb.	Sand, Gravel	670	6.2	USGS	LOG
NW SE 12	Village of Bangor do. #1 & 2	Godfrey Oil Co.	1947	126	8	16		400	Mun		Centr.	Gravel	660		LOG	LOG; ANAL; both wells pumped together, 440 each
NE SE 12	A. Schiele	E. Sanders	1960	38	2			4 1/2	Dom, Stk	.005-.007	Jet	Sand	575	12	MDH	LOG; ANAL; both wells pumped together, 440 each
SW SE 13	H. Atkins	C. Jones	1962	40	2				Dom, Stk		Piston	Sand	680	20	Field	pH 7.2
SW SE 17	P. Overton	E. Sanders	1948	35 e	2				Dom, Stk		Jet	Sand	700	52	USGS	ANAL
NW SE 18	J. Randolph	Vanderbooth	1962	52	2	35 e	6-62	6	Dom	.010	Jet	Sand	680	141	USGS	ANAL
SW SE 19	O. Watkins	D. Rose	1962	52	2	20 e	4-62	12	Dom	.010	Jet	Sand	693	10	Field	pH 7.2
NW NW 22	L. Westcott	do	1962	40	2				Dom, Stk		Suct	Sand	700	10	Field	ANAL
SW SE 24	F. Hardin	do	1962	35	2	30 e	-63	5	Dom, Stk		Jet	Sand	600	5.0	USGS	Specific conductance 420; also has 2 wells 105 ft
NE SE 28	I. Westcott	D. Rose	1963	108	2				Dom, Stk		Jet	Sand	690	10	Field	Rept Clay to 105 ft
NW NW 29	W. Nutting	Owner	1946	18	1 1/2	5	-46	40	Dom		Piston	Gravel	670	15	Field	14 ft of clay above gravel
NW NE 29	R. Jackson	R. Sanders	1956	21	2	10			Irrig.		Piston	Sand	671		Field	3 wells pumped together; same depth
NE SE 31	Mrs. E. Kemp	D. Rose	1963	38	2				Dom		Jet	Sand	650		Field	at Rush Lake
SW SE 33	D. Moore	do	1962	49	2	10 e	8-62	12	Dom	.010	Jet	Sand	660	10	Field	
SE NE 33	C. Drake	do	1962	97	2	52	6-62	10	Dom, Spray	.007	Jet	Sand	700		Field	Farm ponds used for Irrig.
NW SW 34	T. Robinson	do	1962	97	2	45	10-62	8	Dom	.006	Jet	Sand	720		Field	
SE SW 35	K. Coon	Owner	1952	54	2	5	-52		Dom		Jet	Gravel	740	2	Field	pH 7.4; Springs in area
SE SW 36	J. Mulholland	C. Griffens	1927	15	36	flows	-63		Pub.		Centr.	Sand	680	5	Field	pH 7.3; Dug well w/open bottom



AREA I. Enough water for domestic, stock, and spraying supplies (up to 10 gpm) generally can be obtained from wells less than 75 feet deep. Water in the well usually is less than 30 feet below land surface. Enough water for irrigation, municipal, or industrial supplies (more than 100 gpm) generally can be obtained from deeper, large-diameter wells (more than 6 inches in diameter and 100 to 200 feet deep).

AREA II. Enough water for domestic, stock, or spraying supplies generally can be obtained from wells less than 125 feet deep. Depth to water in about half the wells is more than 30 feet below land surface. Large-diameter wells less than 200 feet deep generally yield enough water for irrigation, municipal, and industrial supplies.

AREA III. Enough water for domestic, stock, or spraying supplies generally can be obtained from wells less than 200 feet deep. Wells for irrigation, industrial, or municipal supplies generally would have to be drilled to depths greater than 150 feet, and probably less than half of these would be successful.

AREA IV. Enough water for domestic, stock, and spraying supplies generally can be obtained from wells less than 75 feet deep. Water in the well generally is less than 30 feet below land surface. Exploratory drilling would be needed to determine where large supplies can be obtained.

AREA V. It is difficult to obtain enough potable water for domestic supplies in this area. It may be necessary to drill several wells before a successful domestic well is obtained. Chances of obtaining large supplies are poor.

AREA VI. Similar to surrounding areas except that thick glacial drift in deep bedrock valleys may yield moderate to large supplies of water (50 to more than 100 gpm). Exploratory drilling would be needed to determine where large supplies are available. Test wells should be drilled to bedrock unless salt water is found at shallower depths. Bedrock may be more than 500 feet deep in places.

Swamps and marshes

FIGURE 31.--MAP OF BANGOR TOWNSHIP SHOWING THE GENERAL AVAILABILITY OF GROUND WATER TO WELLS.

Table 11.--Records of selected wells in Bloomingdale Township (T. 1S., R. 14W.)

Explanation: e - estimated; Analyst--Field, not accurate to laboratory standards; USGS, U. S. Geological Survey; MDH, Michigan Dept. of Health; Remarks--LOG, record of materials penetrated on file; ANAL, also see table of chemical analyses of ground water.

Location T. 1S. R. 14W.	Owner	Driller	Year drilled	Depth (in ft.)	Diam (in inches)	Water level (in feet)	Month and year measured	Yield (in gpm)	Use	Screen openings (inches)	Pump	Water- bearing materials	Altitude (in feet)	Quality of Water			T Remarks
														Iron (as Fe)	Hardness (as CaCO ₃)	Chloride (Cl)	Analyst
SE 1	L. Healey	E. Brindley	1956	85	2	65			Dom, Stk	.015	Jet	Gravel	754	0.8	200	15	Field
SW 3	G. Van Horn		1956	125	2	40			Dom, Stk		Jet	Sand	780	1	190	10	Field
SW 5	W. Greiffendorff		1956	87	2	20			Dom, Stk		Piston		780		270	20	Field
SE 5	G. Pearson		1956	45	2	20			Dom, Stk		Jet		780		260	15	Field
SW 7	D. English	E. Brindley	1956	60	2	20			Dom, Stk		Jet		780		290	50	Field
SW 7	P. & J. Stassek	Do.	1956	75	2	e 20			Dom, Stk		Jet		780		250	25	Field
SE 8	H. Kugel		1956	60	2	e 70			Dom, Stk		Piston		780		260	15	Field
SE 10	E. Harris		1956	115	2	e 70			Dom, Stk		Jet		780		260	15	Field
SW 11	E. Brindley		1956	84	2	e 2			Dom, Stk		Jet		780		220	10	Field
SW 12	V. Lindquist		1956	85	2	e 2			Dom, Stk		Jet		780		357	136	USGS
SW 13	J. Lindquist		1956	92	2	e 1			Dom, Stk		Jet		780		170	65	Field
SW 14	Mrs. H. Valeko		1956	85	2	e 1			Dom, Stk		Jet		780		120	282	Field
SW 14	E. Brindley		1956	140	2	e 30			Dom, Stk		Jet		780		412	282	USGS
SW 15	Dickerson Greenhouse	Cole & Lynch	1956	140	2	e 30			Dom, Stk		Turb		780		216	38	USGS
SW 15	R. Esler		1956	30	2	e 5			Dom, Stk		Hand		780		216	38	USGS
SW 16	Bloomingdale High Sch.	J. Newman	1956	127	6	e 16			Dom, Stk		Subm		780		113	288	USGS
SW 16	V. Ferguson		1956	89	2	e 15			Dom, Stk		Piston		780		340	tr	MDH
SW 16	Vict's Out Rate	Do.	1956	42	2	e 32			Dom, Stk		Jet		780		330	20	Field
SW 16	Thomas Oil Co.	Do.	1956	67	2	e 32			Dom, Stk		Jet		780		270	25	Field
SW 17	R. Brush	C. Cooley	1956	36	2	e 32			Dom, Stk		Jet		780		270	25	Field
SW 17	L. Page	Do.	1956	60	2	e 32			Dom, Stk		Jet		780		180	15	Field
SW 19	R. Schendel	Do.	1956	137	2	e 35			Dom, Stk		Centr		780		396	10	Field
SW 20	J. Kopterski	A. Wesler	1956	75	2	e 57			Dom, Stk		Jet		780		270	25	Field
SW 21	G. Kridler	E. Brindley	1956	50	2	e 60			Dom, Stk		Jet		780		240	15	Field
SW 23	J. Cusack	Do.	1956	108	2	e 57			Dom, Stk		Jet		780		220	10	Field
SW 24	J. Rosenberg	E. Brindley	1956	115	2	e 60			Dom, Stk		Subm		780		310	15	Field
SW 24	G. Sutton	E. Sanders	1956	82	2	e 56			Dom, Stk		Jet		780		310	15	Field
SW 27	T. Gibbons	H. Starbeck	1956	68	2	e 56			Dom, Stk		Jet		780		310	15	Field
SW 28	A. Shaw	Do.	1956	90	2	e 56			Dom, Stk		Jet		780		310	15	Field
SW 29	W. Hendricks	Do.	1956	26	2	e 11			Dom, Stk		Jet		780		310	15	Field
SW 30	J. Effner	Owner	1956	26	2	e 11			Dom, Stk		Jet		780		310	15	Field
SW 31	J. Abernathy	H. Starbeck	1956	116	2	e 70			Dom, Stk		Jet		780		280	20	Field
SW 31	C. Doney	E. Brindley	1956	60	2	e 6			Dom, Stk		Centr		780		210	10	Field
SW 31	A. Jones	Do.	1956	60	2	e 15			Dom, Stk		Jet		780		210	10	Field
SW 31	W. Fritz	E. Brindley	1956	42	2	e 22			Dom, Stk		Jet		780		220	20	Field
SW 36	R. Baxter	Do.	1956	60	2	e 22			Dom, Stk		Jet		780		220	20	Field
SW 6	R. Austin	E. Brindley	1962	31	2	e 20			Dom, Stk		Piston		780		717		
SW 2	Shannon	Do.	1962	112	2	e 7			Dom, Stk		Jet		780		760		

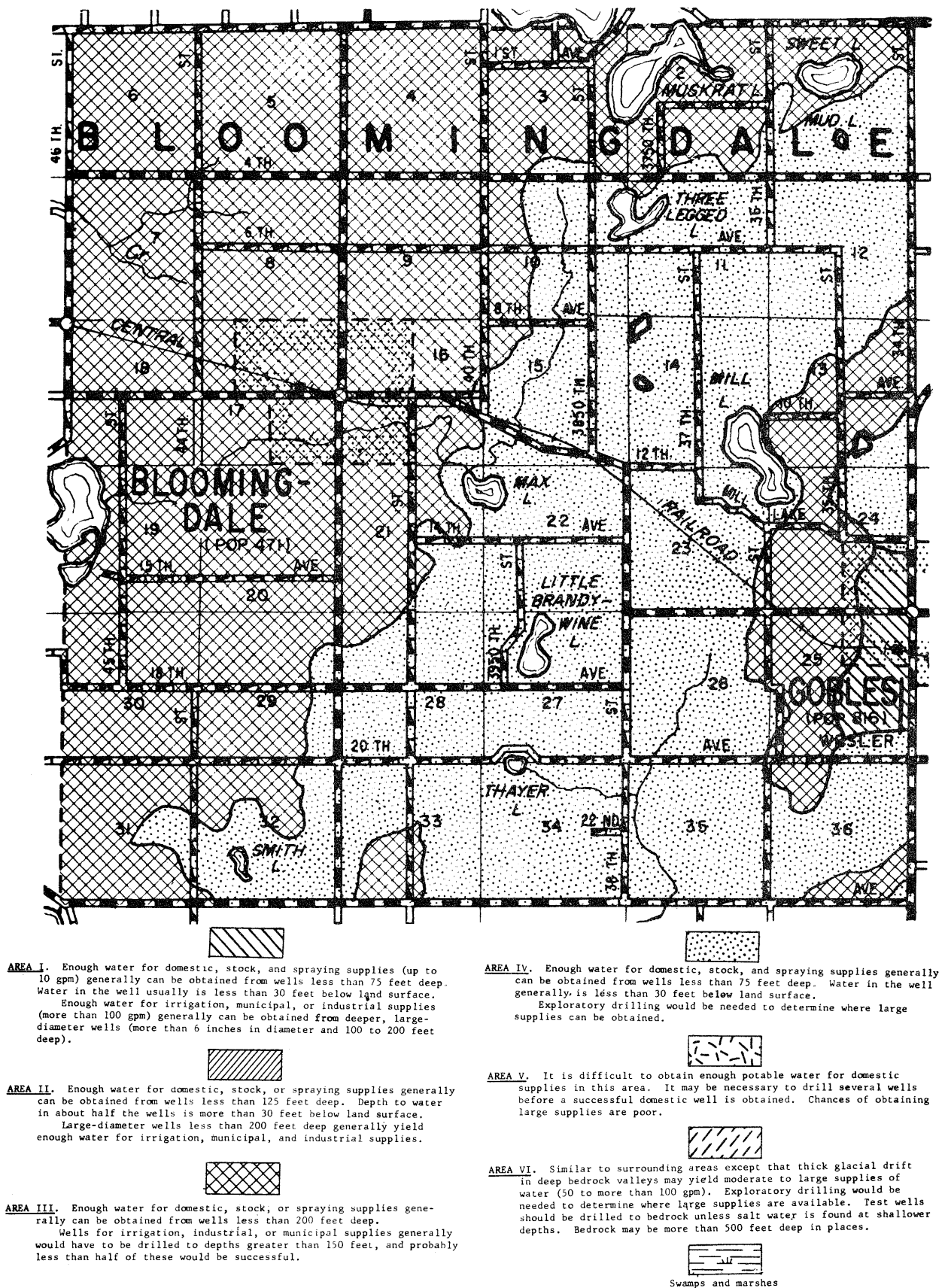
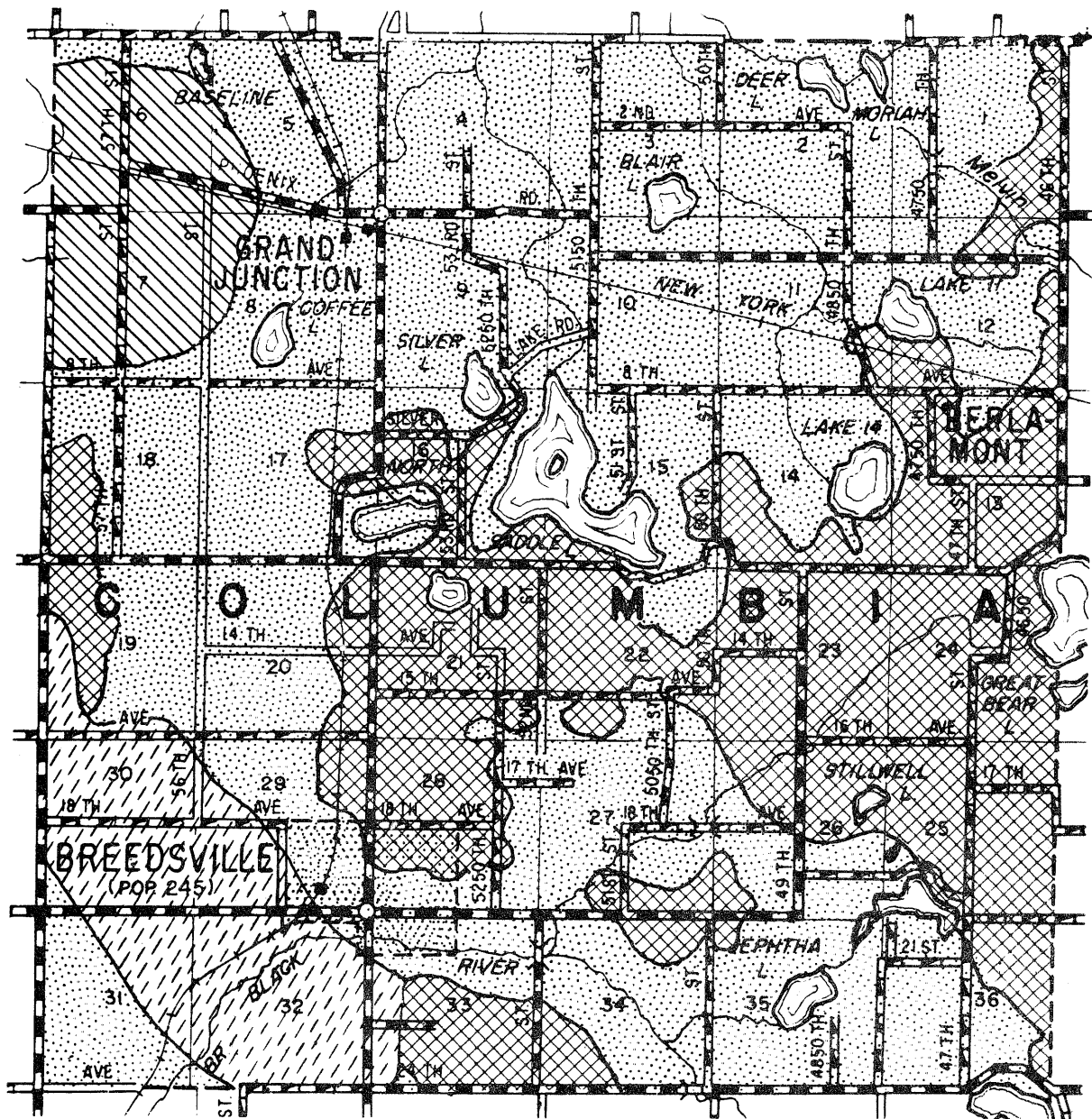


Table 12.--Records of selected wells in Columbia Township (T. 1S., R. 15W.)

Explanation: e - estimated; Analyst--Field, not accurate to laboratory standards; USGS, U. S. Geological Survey; MDH, Michigan Dept. of Health; Remarks--LOG, record of materials penetrated on file; ANAL, also see table of chemical analyses of ground water.

Location T. R. sec	Owner	Driller	Year drilled	Depth (in ft)	Diam (in inches)	Water level (in feet)	Month and year	Yield (in gpm)	Use	Screen openings (inches)	Pump	Water- bearing materials	Altitude (in msl)	Quality of Water				Remarks
														Iron (as Fe)	Hardness (as CaCO ₃)	Chloride (Cl)	Analyst	
SE SW 3	B. Graney		1954	44	2	7-8			Pub	.007	Jet	Sand	670		101	3.0	USGS	at Little Bear Lake; ANAL
SW SW 4	C. Kreiger	Sanders	1922	25	1 1/4				Dom		Jet	Sand	680					
NW NE 5	G. Burns		1977	100-	2				Dom, Spray		Jet							
SW SW 6	W. Warner	H. Starbeck	1955	120	2			125	Irrig		Jet		675		200	15		
SW SW 6	W. Warner			37	4				Dom		Jet		670					
S 1/4 NW 7	A. Thomas	Dunbar Drig. Co.	1947	90	8			325	Irrig	.008	Jet		670	1.5	180	10	Field	pH 7.5
SE 8	N. Lake Blueberry Fm.	Regler Drig. Co.	1956	90	8	5	8-47	285	Irrig		Turb	Sand	670					well drilled to 100; LOG
SE 17	N. Lake Blueberry Fm.	Dunbar Drig. Co.	1945	140	8			500	Irrig		Turb		680					
NW SW 9	Jones Bros.		1943	70	2	8		50	Irrig				680					
SE SE 9	Covey	H. Starbeck	1939	30	1 1/4				Dom		Jet	Sand	685		352	38	USGS	3 wells hooked together
SE SW 11	M. Korpak, Jr.		1960	80	1 1/4				Dom, Stk		Piston	Sand	710					ANAL; clay above sand
NE NE 11	H. Lucas	Sanders	1960	68	2	e 10			Dom	.012		Sand	700	0.2	280	16	USGS	ANAL
SE SE 12	A. Harris	E. Brindley	1962	68	2	20	8-62		Dom		Jet	Sand	675					
NW SE 15	L. Puccio	Owner	1950	28	1 1/2	5-6	-50	16	Dom		Piston	Sand	700		130	10	Field	pH 7.5
NE SE 17	J. Davids		1952	40	2				Dom		Jet	Sand	690		220	30	Field	
N 1/4 NE 18	K. Thys			25	1 1/2				Dom		Jet	Sand	690		100	10	Field	pH 7.0
NE NE 19	O. Cummins	Owner	1963	30	2	e 10	-63		Dom, Stk		Piston	Sand	640		220	3	MDH	NO ₃ -1.6
SE NW 21	M. Meyer			100	2				Dom		Hand		760		210	5	Field	
NW SE 22	L. Pietrykowski	H. Starbeck	1948	90	2	30	-48	9	Dom	.010	Jet	Sand	700		280			
NE NE 23	C. Cooley	Owner		36	2				Dom		Jet		685					wells in area 100' and 180' deep
SW NE 24	A. Bolar	H. Starbeck	1958	83	2	4-5	-58		Dom, Stk		Piston	Sand	780					ANAL
NW SE 25	A. Gackowski		1928	105	1 1/4				Dom		Jet		680		279	1.0	USGS	
NE NW 26	H. Ashbrook		1928	110	2	90			Dom		Piston		710					
SE NW 26	E. Carlson	J. Taylor	1963	55	1 1/4				Dom	.012-.015	Jet	Sand, gravel	670					6 ft of screen
SW SE 29	J. Lehardt	E. Brindley	1962	104	2	12	8-62	15	Irrig		Jet	Gravel	690					
NW SW 30	T. Ruckes	H. Starbeck	1960	60	1 1/4		10-63		Dom, Spray		Jet		690					
SW SW 33	D. Palmer	H. Starbeck	1930	70	2	e 35			Dom, Spray		Jet		700					
NE NE 34	P. Barker			90	2				Dom		Jet		695		170	5	USGS	
SE SW 36	C. Schlemmer	Kelly	1960	80	2				Dom		Jet	Gravel		1.5	305	2.0	USGS	ANAL



AREA I. Enough water for domestic, stock, and spraying supplies (up to 10 gpm) generally can be obtained from wells less than 75 feet deep. Water in the well usually is less than 30 feet below land surface. Enough water for irrigation, municipal, or industrial supplies (more than 100 gpm) generally can be obtained from deeper, large-diameter wells (more than 6 inches in diameter and 100 to 200 feet deep).

AREA II. Enough water for domestic, stock, or spraying supplies generally can be obtained from wells less than 125 feet deep. Depth to water in about half the wells is more than 30 feet below land surface. Large-diameter wells less than 200 feet deep generally yield enough water for irrigation, municipal, and industrial supplies.

AREA III. Enough water for domestic, stock, or spraying supplies generally can be obtained from wells less than 200 feet deep. Wells for irrigation, industrial, or municipal supplies generally would have to be drilled to depths greater than 150 feet, and probably less than half of these would be successful.

AREA IV. Enough water for domestic, stock, and spraying supplies generally can be obtained from wells less than 75 feet deep. Water in the well generally is less than 30 feet below land surface. Exploratory drilling would be needed to determine where large supplies can be obtained.

AREA V. It is difficult to obtain enough potable water for domestic supplies in this area. It may be necessary to drill several wells before a successful domestic well is obtained. Chances of obtaining large supplies are poor.

AREA VI. Similar to surrounding areas except that thick glacial drift in deep bedrock valleys may yield moderate to large supplies of water (50 to more than 100 gpm). Exploratory drilling would be needed to determine where large supplies are available. Test wells should be drilled to bedrock unless salt water is found at shallower depths. Bedrock may be more than 500 feet deep in places.

Swamps and marshes

FIGURE 33.--MAP OF COLUMBIA TOWNSHIP SHOWING THE GENERAL AVAILABILITY OF GROUND WATER TO WELLS.

Table 13.--Records of selected wells in Covert Township (T. 1S, R. 17 & 18W.)

Explanation: e - estimated; Anal. - Field, not accurate to laboratory standards; USGS, U. S. Geological Survey; MDH, Michigan Dept. of Health; Boring - LOG, record of materials penetrated on file; MHU, also see table of chemical analyses of ground water.

Location T. 1S, R. 17 & 18W.	Owner	Driller	Year drilled	Depth (in ft.)	Diam (in inches)	Water level (in feet)	Month and year measured	Yield (in gpm)	Use	Screen openings (inches)	Pump	Water- bearing materials	Altitude (in feet)	Iron (as Fe) (in ml)	Hardness (as CaCO ₃) (in gpm)	Chloride (Cl) (in gpm)	Analyst	Remarks
NE SW 1	V. Gudrevic	A. Vanderbough	1958	150	2	2	35	20	Dom. Stk	.010	Piston	Sand	710	0.3	50	5	Field	Specific Conductance 320
SW NE 2	A. Lloyds	J. Taylor	1962	173	2	2	35	20	Dom. Stk	.010	Jet	Sand	683	0.2	70	15	Field	Specific Conductance 170, pH 6.8; LOG
SW NE 3	E. Anderson	Owner	Old	18	1 1/2	1 1/2	2	5-64	Dom		Jet	Sand	655	0.1	50	10	Field	Specific Conductance 75, pH 6.8
SW SE 4	W. Krauski	Owner	Old	50	2	2	2	5-64	Dom		Piston	Sand	640	0.2	50	10	Field	Specific Conductance 200, pH 7.5; Dug well
SW SE 5	F. Podgorny	Richerick	1961	50	2	2	32	4-52	Dom, Pub	.019	Centr	Sand	610	4	70	50	Field	Specific Conductance 360, pH 7.0
SW SE 6	F. Palades County Club	Wayne-Northern Co.	1952	55	16	16	8	5-64	Dom, Pub	.019	Jet	Sand	622	2.0	240	10	Field	Specific Conductance 300, pH 7.2; LOG
SW SE 7	F. Frakes	G. Thompson	1951	55	2	2	8	5-64	Dom	.007	Jet	Sand	611	2.0	50	10	Field	Sand dune topography
SW SE 8	B. Jones	Owner	1957	118	1 1/2	1 1/2	45	5-64	Dom	.007	Jet	Sand	611	2.0	50	10	Field	Specific Conductance 140, pH 6.5
SW SE 9	F. Williams	D. Rose	1956	98	4	4	45	5-64	Dom	.007	Jet	Sand	736	0.8	340	5	Field	Specific Conductance 790, pH 7.2
SW SE 10	F. Rod	D. Rose	1956	85	36	36	12	5-64	Dom	.007	Jet	Sand	736	0.8	340	5	Field	2 wells are 40' apart; LOG
SW SE 11	C. Spellman	Covert School	1956	230	1 1/2	1 1/2	60	5-64	Dom	.007	Jet	Sand	700	3.0	190	5	Field	Specific Conductance 550; Springs in area rept.
SW SE 12	Do	Do	1956	128	1 1/2	1 1/2	46	5-64	Dom	.007	Jet	Sand	700	3.0	190	5	Field	Pulled back to 200 feet (not used)
SW SE 13	Mrs. B. Mitchell	A. Vanderbough	1953	102	2	2	26	5-64	Dom	.025	Turb	Sand	680	0.3	70	5	Field	Specific Conductance 160
SW SE 14	T. Silvers	Owner	1954	30	1 1/2	1 1/2	at surf	5-64	Dom	.025	Jet	Sand	640	1.0	100	5	Field	Specific Conductance 135, pH 7.8; bottomed in clay
SW SE 15	I. Hanson	Owner	1954	30	1 1/2	1 1/2	at surf	5-64	Dom	.025	Jet	Sand	615	0.3	70	5	Field	Specific Conductance 170, pH 7.0
SW SE 16	B. Dales	Owner	1953	25	2	2	7-5	5-64	Dom	.025	Jet	Sand	615	0.3	70	5	Field	Sand dune topography, iron present
SW SE 17	Mrs. M. Braisher	Owner	1953	12	1 1/2	1 1/2	5	5-64	Dom	.025	Jet	Sand	615	0.3	70	5	Field	Specific Conductance 88, pH 7.2
SW SE 18	R. Depriest	Owner	1953	12	1 1/2	1 1/2	5	5-64	Dom	.025	Jet	Sand	615	0.3	70	5	Field	Specific Conductance 235, pH 7.2
SW SE 19	F. Thar	Leach & Cole	1956	117	1 1/2	1 1/2	5	5-64	Dom	.025	Jet	Sand	615	0.3	70	5	Field	Specific Conductance 600, pH 7.2
SW SE 20	Do	Do	1956	117	1 1/2	1 1/2	5	5-64	Dom	.025	Jet	Sand	615	0.3	70	5	Field	Specific Conductance 480, pH 7.5
SW SE 21	Do	Do	1956	117	1 1/2	1 1/2	5	5-64	Dom	.025	Jet	Sand	615	0.3	70	5	Field	Specific Conductance 480, pH 7.5
SW SE 22	Do	Do	1956	117	1 1/2	1 1/2	5	5-64	Dom	.025	Jet	Sand	615	0.3	70	5	Field	Specific Conductance 480, pH 7.5
SW SE 23	Do	Do	1956	117	1 1/2	1 1/2	5	5-64	Dom	.025	Jet	Sand	615	0.3	70	5	Field	Specific Conductance 480, pH 7.5
SW SE 24	Do	Do	1956	117	1 1/2	1 1/2	5	5-64	Dom	.025	Jet	Sand	615	0.3	70	5	Field	Specific Conductance 480, pH 7.5
SW SE 25	Do	Do	1956	117	1 1/2	1 1/2	5	5-64	Dom	.025	Jet	Sand	615	0.3	70	5	Field	Specific Conductance 480, pH 7.5
SW SE 26	Do	Do	1956	117	1 1/2	1 1/2	5	5-64	Dom	.025	Jet	Sand	615	0.3	70	5	Field	Specific Conductance 480, pH 7.5
SW SE 27	Do	Do	1956	117	1 1/2	1 1/2	5	5-64	Dom	.025	Jet	Sand	615	0.3	70	5	Field	Specific Conductance 480, pH 7.5
SW SE 28	Do	Do	1956	117	1 1/2	1 1/2	5	5-64	Dom	.025	Jet	Sand	615	0.3	70	5	Field	Specific Conductance 480, pH 7.5
SW SE 29	Do	Do	1956	117	1 1/2	1 1/2	5	5-64	Dom	.025	Jet	Sand	615	0.3	70	5	Field	Specific Conductance 480, pH 7.5
SW SE 30	Do	Do	1956	117	1 1/2	1 1/2	5	5-64	Dom	.025	Jet	Sand	615	0.3	70	5	Field	Specific Conductance 480, pH 7.5
SW SE 31	Do	Do	1956	117	1 1/2	1 1/2	5	5-64	Dom	.025	Jet	Sand	615	0.3	70	5	Field	Specific Conductance 480, pH 7.5
SW SE 32	Do	Do	1956	117	1 1/2	1 1/2	5	5-64	Dom	.025	Jet	Sand	615	0.3	70	5	Field	Specific Conductance 480, pH 7.5
SW SE 33	Do	Do	1956	117	1 1/2	1 1/2	5	5-64	Dom	.025	Jet	Sand	615	0.3	70	5	Field	Specific Conductance 480, pH 7.5
SW SE 34	Do	Do	1956	117	1 1/2	1 1/2	5	5-64	Dom	.025	Jet	Sand	615	0.3	70	5	Field	Specific Conductance 480, pH 7.5
SW SE 35	Do	Do	1956	117	1 1/2	1 1/2	5	5-64	Dom	.025	Jet	Sand	615	0.3	70	5	Field	Specific Conductance 480, pH 7.5
SW SE 36	Do	Do	1956	117	1 1/2	1 1/2	5	5-64	Dom	.025	Jet	Sand	615	0.3	70	5	Field	Specific Conductance 480, pH 7.5
SW SE 37	Do	Do	1956	117	1 1/2	1 1/2	5	5-64	Dom	.025	Jet	Sand	615	0.3	70	5	Field	Specific Conductance 480, pH 7.5
SW SE 38	Do	Do	1956	117	1 1/2	1 1/2	5	5-64	Dom	.025	Jet	Sand	615	0.3	70	5	Field	Specific Conductance 480, pH 7.5
SW SE 39	Do	Do	1956	117	1 1/2	1 1/2	5	5-64	Dom	.025	Jet	Sand	615	0.3	70	5	Field	Specific Conductance 480, pH 7.5
SW SE 40	Do	Do	1956	117	1 1/2	1 1/2	5	5-64	Dom	.025	Jet	Sand	615	0.3	70	5	Field	Specific Conductance 480, pH 7.5
SW SE 41	Do	Do	1956	117	1 1/2	1 1/2	5	5-64	Dom	.025	Jet	Sand	615	0.3	70	5	Field	Specific Conductance 480, pH 7.5
SW SE 42	Do	Do	1956	117	1 1/2	1 1/2	5	5-64	Dom	.025	Jet	Sand	615	0.3	70	5	Field	Specific Conductance 480, pH 7.5
SW SE 43	Do	Do	1956	117	1 1/2	1 1/2	5	5-64	Dom	.025	Jet	Sand	615	0.3	70	5	Field	Specific Conductance 480, pH 7.5
SW SE 44	Do	Do	1956	117	1 1/2	1 1/2	5	5-64	Dom	.025	Jet	Sand	615	0.3	70	5	Field	Specific Conductance 480, pH 7.5
SW SE 45	Do	Do	1956	117	1 1/2	1 1/2	5	5-64	Dom	.025	Jet	Sand	615	0.3	70	5	Field	Specific Conductance 480, pH 7.5
SW SE 46	Do	Do	1956	117	1 1/2	1 1/2	5	5-64	Dom	.025	Jet	Sand	615	0.3	70	5	Field	Specific Conductance 480, pH 7.5
SW SE 47	Do	Do	1956	117	1 1/2	1 1/2	5	5-64	Dom	.025	Jet	Sand	615	0.3	70	5	Field	Specific Conductance 480, pH 7.5
SW SE 48	Do	Do	1956	117	1 1/2	1 1/2	5	5-64	Dom	.025	Jet	Sand	615	0.3	70	5	Field	Specific Conductance 480, pH 7.5
SW SE 49	Do	Do	1956	117	1 1/2	1 1/2	5	5-64	Dom	.025	Jet	Sand	615	0.3	70	5	Field	Specific Conductance 480, pH 7.5
SW SE 50	Do	Do	1956	117	1 1/2	1 1/2	5	5-64	Dom	.025	Jet	Sand	615	0.3	70	5	Field	Specific Conductance 480, pH 7.5
SW SE 51	Do	Do	1956	117	1 1/2	1 1/2	5	5-64	Dom	.025	Jet	Sand	615	0.3	70	5	Field	Specific Conductance 480, pH 7.5
SW SE 52	Do	Do	1956	117	1 1/2	1 1/2	5	5-64	Dom	.025	Jet	Sand	615	0.3	70	5	Field	Specific Conductance 480, pH 7.5
SW SE 53	Do	Do	1956	117	1 1/2	1 1/2	5	5-64	Dom	.025	Jet	Sand	615	0.3	70	5	Field	Specific Conductance 480, pH 7.5
SW SE 54	Do	Do	1956	117	1 1/2	1 1/2	5	5-64	Dom	.025	Jet	Sand	615	0.3	70	5	Field	Specific Conductance 480, pH 7.5
SW SE 55	Do	Do	1956	117	1 1/2	1 1/2	5	5-64	Dom	.025	Jet	Sand	615	0.3	70	5	Field	Specific Conductance 480, pH 7.5
SW SE 56	Do	Do	1956	117	1 1/2	1 1/2	5	5-64	Dom	.025	Jet	Sand	615	0.3	70	5	Field	Specific Conductance 480, pH 7.5
SW SE 57	Do	Do	1956	117	1 1/2	1 1/2	5	5-64	Dom	.025	Jet	Sand	615	0.3	70	5	Field	Specific Conductance 480, pH 7.5
SW SE 58	Do	Do	1956	117	1 1/2	1 1/2	5	5-64	Dom	.025	Jet	Sand	615	0.3	70	5	Field	Specific Conductance 480, pH 7.5
SW SE 59	Do	Do	1956	117	1 1/2	1 1/2	5	5-64	Dom	.025	Jet	Sand	615	0.3	70	5	Field	Specific Conductance 480, pH 7.5
SW SE 60	Do	Do	1956	117	1 1/2	1 1/2	5	5-64	Dom	.025	Jet	Sand	615	0.3	70	5	Field	Specific Conductance 480, pH 7.5
SW SE 61	Do	Do	1956	117	1 1/2	1 1/2	5	5-64	Dom	.025	Jet	Sand	615	0.3	70	5	Field	Specific Conductance 480, pH 7.5
SW SE 62	Do	Do	1956	117	1 1/2	1 1/2	5	5-64	Dom	.025	Jet	Sand	615	0.3	70	5	Field	Specific Conductance 480, pH 7.5
SW SE 63	Do	Do	1956	117	1 1/2	1 1/2	5	5-64	Dom	.025	Jet	Sand	615	0.3	70	5	Field	Specific Conductance 480, pH 7.5
SW SE 64	Do	Do	1956	117	1 1/2	1 1/2	5	5-64	Dom	.025	Jet	Sand	615	0.3	70	5	Field	Specific Conductance 480, pH 7.5
SW SE 65	Do	Do	1956	117	1 1/2	1 1/2	5	5-64	Dom	.025	Jet	Sand	615	0.3	70	5	Field	Specific Conductance 480, pH 7.5
SW SE 66	Do	Do	1956	117	1 1/2	1 1/2	5	5-64	Dom	.025	Jet	Sand	615	0.3	70	5	Field	Specific Conductance 480, pH 7.5
SW SE 67	Do	Do	1956	117	1 1/2	1 1/2	5	5-64	Dom	.025	Jet	Sand	615	0.3	70	5	Field	Specific Conductance 480, pH 7.5
SW SE 68	Do	Do	1956	117	1 1/2	1 1/2	5	5-64	Dom	.025	Jet	Sand	615	0.3	70	5	Field	Specific Conductance 480, pH 7.5
SW SE 69	Do	Do	1956	117	1 1/2	1 1/2	5	5-64	Dom	.025	Jet	Sand	615	0.3	70	5	Field	Specific Conductance 480, pH 7.5
SW SE 70	Do	Do	1956	117	1 1/2	1 1/2	5	5-64	Dom	.025	Jet	Sand	615	0.3	70	5	Field	Specific Conductance 480, pH 7.5
SW SE 71	Do	Do	1956	117	1 1/2	1 1/2	5	5-64	Dom	.025	Jet	Sand	615	0.3	70	5	Field	Specific Conductance 480, pH 7.5
SW SE 72	Do	Do	1956	117	1 1/2	1 1/2	5	5-64	Dom	.025	Jet	Sand	615	0.3	70	5	Field	Specific Conductance 480, pH 7.5
SW SE 73	Do	Do	1956	117	1 1/2	1 1/2	5	5-64	Dom	.025	Jet	Sand	615	0.3	70	5	Field	Specific Conductance 480, pH 7.5
SW SE 74	Do	Do	1956	117	1 1/2	1 1/2	5	5-64	Dom	.025	Jet	Sand	615	0.3	70	5	Field	Specific Conductance 480, pH 7.5
SW SE 75	Do	Do	1956	117	1 1/2	1 1/2	5	5-64	Dom	.025	Jet	Sand	615	0.3	70	5	Field	Specific Conductance 480, pH 7.5
SW SE 76	Do	Do	1															

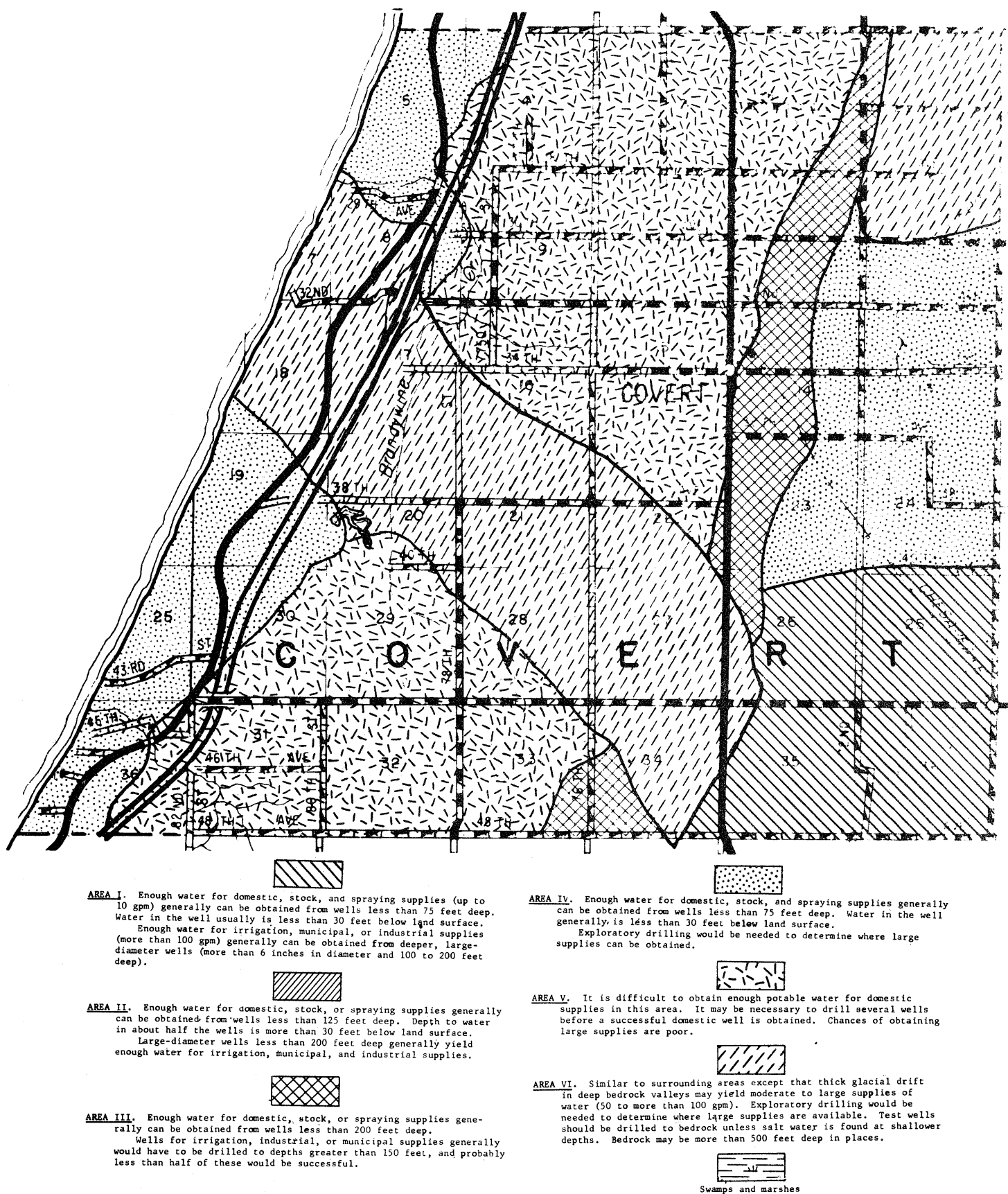
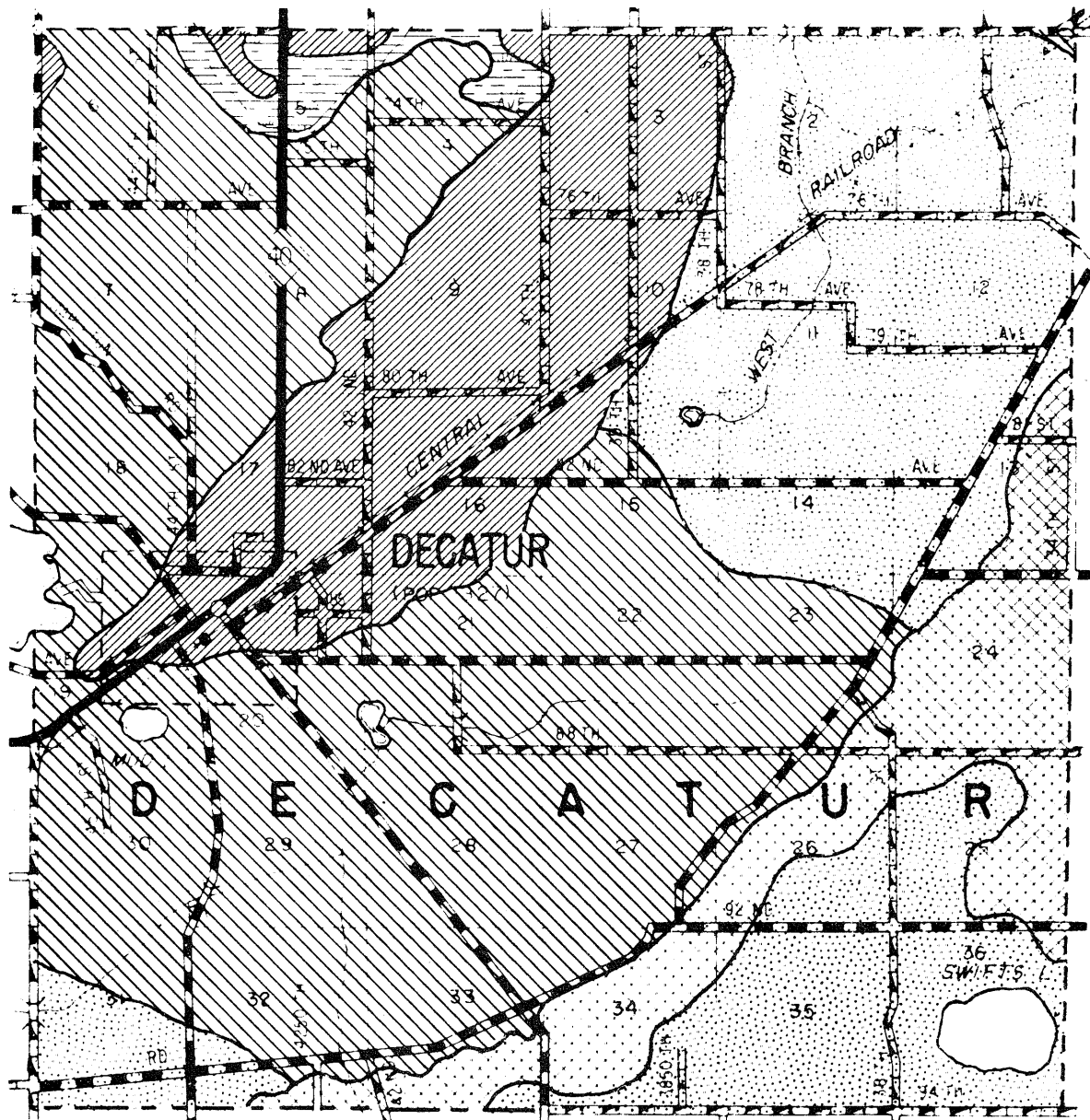


FIGURE 34.--MAP OF COVERT TOWNSHIP SHOWING THE GENERAL AVAILABILITY OF GROUND WATER TO WELLS.

Table 14.--Records of selected wells in Decatur Township (T. 4S., R. 14W.)

Explanation: e - estimated; Analyst--Field, not accurate to laboratory standards; USGS, U. S. Geological Survey; MDH, Michigan Dept. of Health; Remark--LOG, record of materials penetrated on file; ANAL, also see table of chemical analyses of ground water.

Location T. R. S.	Owner	Driller	Year drilled	Depth (in ft.)	Diam (in inches)	Water level (in feet)	Month and year measured	Yield (in gpm)	Use	Screen openings (inches)	Pump	Water- bearing materials	Altitude (in msl)	Quality of Water			Remarks
														Iron (as Fe)	Hardness (as CaCO ₃)	Chloride (Cl)	
SE NW 3	P. Hoffman	E. Sanders	1963	57	2	32	8-63	10	Dom		Jet	Gravel	790		141	2.5	ANAL.
SE SE 4	E. Blake		1922	52	2	8	8-63		Dom		Jet	Gravel	780	0.5	200	15	Water yellowish; well near dried-up swamp
SE SE 5	S. Neath		1961	45	2		8-63	7	Dom, Stk		Jet	Sand, gravel	770				Blue clay below 32 feet
SE NE 6	D. Orr	Owner	1963	32	2	22	8-63		Stk		Jet	Sand, gravel	775				
SE NE 8	G. Kramack	E. Sanders	1963	90	2				Dom, Stk		Jet	Sand, gravel	770		200	10	
NW NW 11	J. Motyska	J. Brigham	1930	30	1 1/2	17			Dom		Jet	Gravel	765	2.5	135	15	
NW NW 12	G. Strutzel	R. Smith	1960	62	2				Dom		Jet	Sand	765		255	15	Neighbor has flowing well at 80 feet
SW SE 12	N. Waite	Owner	1959	25	1 1/2	21	10-59	10 1/2	Dom	.010	Jet	Sand	810				Inadequate supply
SW SE 13	S. Ed. Forbes	G. Tinker	1961	71	2	61			Dom		Jet	Gravel	780	4	682	8.0	Water yellowish
NW SW 14	H. Mroczek	Owner	1961	25	2	935		9	Dom, Stk		Jet	Sand, gravel	775		319	23	ANAL; muckland area
NW SE 15	A. Koziele	G. Lewis	1968	77	2	21	-59	14	Dom	.010	Jet	Sand, gravel	775				ANAL.
NE NW 17	E. Kroska	G. Tinker	1963	55	2	41	3-63	12	Dom		Jet	Sand, gravel	770	1.6	200	4	Seasonal use
SE NW 17	Kolas Storage	G. Tinker	1961	90	2			250	Ind	.030	Turb	Sand, gravel	790				ANAL.
SE NW 19	Village of Decatur #1	R. Kersey	1927	120	1 1/2	37	5-28	325	Mun	.020	Turb	Sand, gravel	790	0	200	4	LOG; ANAL
NW NW 20	Do.	Ind-Mich Water Co	1929	116	1 1/2	37	3-63	790	Mun	.020	Turb	Sand, gravel	790				Have 5 wells--4 are 10', 1 is 150' deep
NW NE 21	Do.	Owner	1952	111	1 1/2	22.04		9	Dom, Ind		Jet	Gravel	790				Complete anal by Brookside Labs (2 wells, same pump)
SE NE 21	A. Houtman	Owner		10	1 1/2	5			Dom, Ind		Piston	Sand	750	0.35	338	13	
SE NE 22	E. Lozier Greenhouse	J. Lewis		40	2	4											
SW SE 23	R. Martinez	G. Tinker	1959	55	2	18	6-59		Dom	.010	Jet	Gravel	790		270	15	Rept. springs in area
NW NW 24	L. Parkner	U. S. G. S.	1963	33	1 1/2	25.28	5-63		Obs	.010	Jet	Sand	790		340	20	See hydrograph; LOG
SW NW 25	G. MacCallar	G. Lewis	1968	72	2			500	Dom		Jet	Sand	800				Top of marlsine
SW NW 25	C. Henderson	Do.	1960	128	6		5-60	1,000	Irrig	.012	Turb	Gravel, sand	900				*Not used--capped
NE NE 25	G. Henderson	Dunbar Drig. Co.	1960	166	1 1/2	54			Dom, Stk		Jet	Gravel, sand	900		255	15	LOG
NE NE 25	K. Schur	G. Tinker	1913e	40	2	32	7-59	10	Dom	.010	Jet	Gravel	900				
NW NE 26	F. Magyar	Do.	1959	52	2	22	8-56		Dom, Spry	.010	Jet	Gravel	790				
SE SE 27	J. Miller	J. Brigham	1944	24	1 1/2			13	Dom		Jet	Sand	790				Many flowing wells in area
NW SW 28	M. Hockstra	C. Lewis	1962	43	2	10	8-63	*12	Ind		Jet	Sand	750		211	22	Use for celery washing
SW NW 29	J. Feenstra	A. Jacobs	1929	135	2	flows			not used		Jet	Sand	750	3	570	18	*Flows less at present; ANAL
SW NW 29	J. Feenstra	Owner	1935	35	1 1/2	6-7	8-49	575	Dom	.100	Jet	Sand, gravel	770				ANAL.
NW NW 30	E. Kramus	Dunbar Drig. Co.	1969	125	8	17	-59		Dom		Turb	Gravel, sand	800		255	10	Rept. many springs in area
SE NE 32	E. Meyer	Owner	1959	56	2	e38			Dom		Jet	Gravel, sand	760		650	2.550	ANAL; Finished in blue rock 394-400 ft.
SE NE 32	Dr. C. Reading		1931e	400	10	flowed			Dom, Stk		Jet	Gravel, sand	900		205	10	Also have 2" x 100' well for stock
SE NE 34	C. Kern		1961	70	2				Dom, Stk		Jet	Gravel, sand	900				
SW SE 36	R. Matthews	H. Riegel		20	2				Dom, Stk		Jet	Gravel, sand	900				



AREA I. Enough water for domestic, stock, and spraying supplies (up to 10 gpm) generally can be obtained from wells less than 75 feet deep. Water in the well usually is less than 30 feet below land surface. Enough water for irrigation, municipal, or industrial supplies (more than 100 gpm) generally can be obtained from deeper, large-diameter wells (more than 6 inches in diameter and 100 to 200 feet deep).

AREA II. Enough water for domestic, stock, or spraying supplies generally can be obtained from wells less than 125 feet deep. Depth to water in about half the wells is more than 30 feet below land surface. Large-diameter wells less than 200 feet deep generally yield enough water for irrigation, municipal, and industrial supplies.

AREA III. Enough water for domestic, stock, or spraying supplies generally can be obtained from wells less than 200 feet deep. Wells for irrigation, industrial, or municipal supplies generally would have to be drilled to depths greater than 150 feet, and probably less than half of these would be successful.

AREA IV. Enough water for domestic, stock, and spraying supplies generally can be obtained from wells less than 75 feet deep. Water in the well generally is less than 30 feet below land surface. Exploratory drilling would be needed to determine where large supplies can be obtained.

AREA V. It is difficult to obtain enough potable water for domestic supplies in this area. It may be necessary to drill several wells before a successful domestic well is obtained. Chances of obtaining large supplies are poor.

AREA VI. Similar to surrounding areas except that thick glacial drift in deep bedrock valleys may yield moderate to large supplies of water (50 to more than 100 gpm). Exploratory drilling would be needed to determine where large supplies are available. Test wells should be drilled to bedrock unless salt water is found at shallower depths. Bedrock may be more than 500 feet deep in places.

Swamps and marshes

FIGURE 35.--MAP OF DECATUR TOWNSHIP SHOWING THE GENERAL AVAILABILITY OF GROUND WATER TO WELLS.

Table 15.--Records of selected wells in Geneva Township (T. 1S., R. 16W.)

Explanation: e - estimated; Analyst--Field, not accurate to laboratory standards; USGS, U. S. Geological Survey; MDH, Michigan Dept. of Health; Remarks--LOG, record of materials penetrated on file; AMAL, also see table of chemical analyses of ground water.

Location T. R. S. Sec.	Owner	Driller	Year drilled	Depth (ft)	Water level (in feet)	Month and year measured	Yield (in gpm)	Use	Screen openings (inches)	Pump	Water- bearing materials	Altitude (in feet)	Quality of Water			Remarks
													Iron (as Fe)	Hardness (as CaCO ₃)	Chloride (Cl)	Analyst
NW SE 1	I. Lewis	J. Taylor	1943	30	18	9-63		Dom	.006	Jet	Sand	640		486	64	USGS
SW SE 1	J. Brown		1928	33	23	11-63		Dom		Jet	Sand	625				
SE NE 2	M. Stein		1953	90	2			Dom		Hand	Sand	730				
SE NE 3	C. Krennan	J. Taylor	1955	90	2	9-63		Dom, Stk		Jet	Sand	655				
SE SW 3	A. Heberg	Sanders	1947	33	3		9	Dom, Stk		Jet	Sand	640		220	10	Field
NW SW 4	A. Hope		1960	33	3		20	Dom, Stk		Jet	Sand	620		120	10	Field
NW SW 4	G. Kinkel	H. Haney	1954	28	24	-64	e12	Dom		Jet	Gravel	620		85	10	Field
SE SE 6	J. Stephenson		1946	28-35	3			Dom		Jet	Sand	620				
SE SE 7	L. Banaszak	H. Starbeck	1960	42	2		7	Dom, Stk		Suct	Sand	640				
SE SE 9	M. Kinney		1958	28	2	11-63	300	Dom, Spray Irrig		Jet	Sand	700		270	10	
SE NE 11	M. Stein		1956	95	8			Dom		Turb	Sand	690				
SE NE 11	E. Putnam	R. Sanders	1938	60	2	-61		Dom	.010	Jet	Sand	680	0.6	200	5	Field
SE NE 14	H. Tolles estate	H. Starbeck	1905	60	2	11-63	e250	Dom	.006	Jet	Sand	670	1.7	355	3.8	USGS
SE NE 15	Tolles estate		1956	43	4			Dom		Jet	Sand	640				
SW SE 17	I. Bennett	H. Haney	1958	45	2	20-25		Dom		Jet	Sand	630	0.4	110	5	Field
SE SW 18	M. Stein		1954	38-40	2			Dom		Jet	Sand	630	0.5	312	820	USGS
SE SW 18	S. Remick	R. Sanders	1928	20	14	11-63		Dom, Stk		Hand	Sand	650				
SE SW 20	S. Sollitt	H. Haney	1963	79	2	8-62	20	Dom	.006	Jet	Sand, gravel	670	0.4	118	29	USGS
NW NE 22	A. Fellows	H. Brown	1962	48	2			Dom	.010	Piston	Sand	670				
NW NE 23	M. Woods	J. Taylor	1947	22	14	7-53	125	Dom	.015	Jet	Sand	670				
NW NE 24	E. Empson	H. Starbeck	1953	48	8	11-63	e20	Dom	.010	Turb	Sand	665				
SW SE 25	S. Scoggins	Dunbar Drig. Co.	1963	95	2			Dom		Jet	Sand	640				
SE NE 26	Z. White		1947	80	2	9-63	4	Dom, Stk		Piston	Sand	630	0.7	85	5	MDH
SE NE 28	M. Listiak	J. Taylor	1947	80	2	9-63	4	Dom, Stk		Jet	Sand	657				
SE SE 29	F. Riemer	R. Sanders	1963	121	2	9-62	e10	Dom, Ind		Jet	Gravel	665		456	29	Field
NW SE 30	G. Heinze	D. Rose	1962	50	2			Dom, Ind		Cent	Sand	670				
NE SE 32	V. Selvidge		1952	75	5		45	Dom		Cent	Sand	675				
SE SW 33	D. Funk Packing			58	3		5	Dom, Irrig		Jet	Sand	665				
SE SW 34	M. Stein	R. Sanders						Dom, Stk		Jet	Sand					
SW NW 35	R. White	H. Starbeck														
SW SW 36	J. Rainey															
N4 NE 12	A. Bagalla (4 wells)	H. Starbeck & Barnes		54-64	2-4			Dom, Irrig		Cent	Gravel	680	0.7	170	5	Field

Specific conductance 460; drilled 1940-55

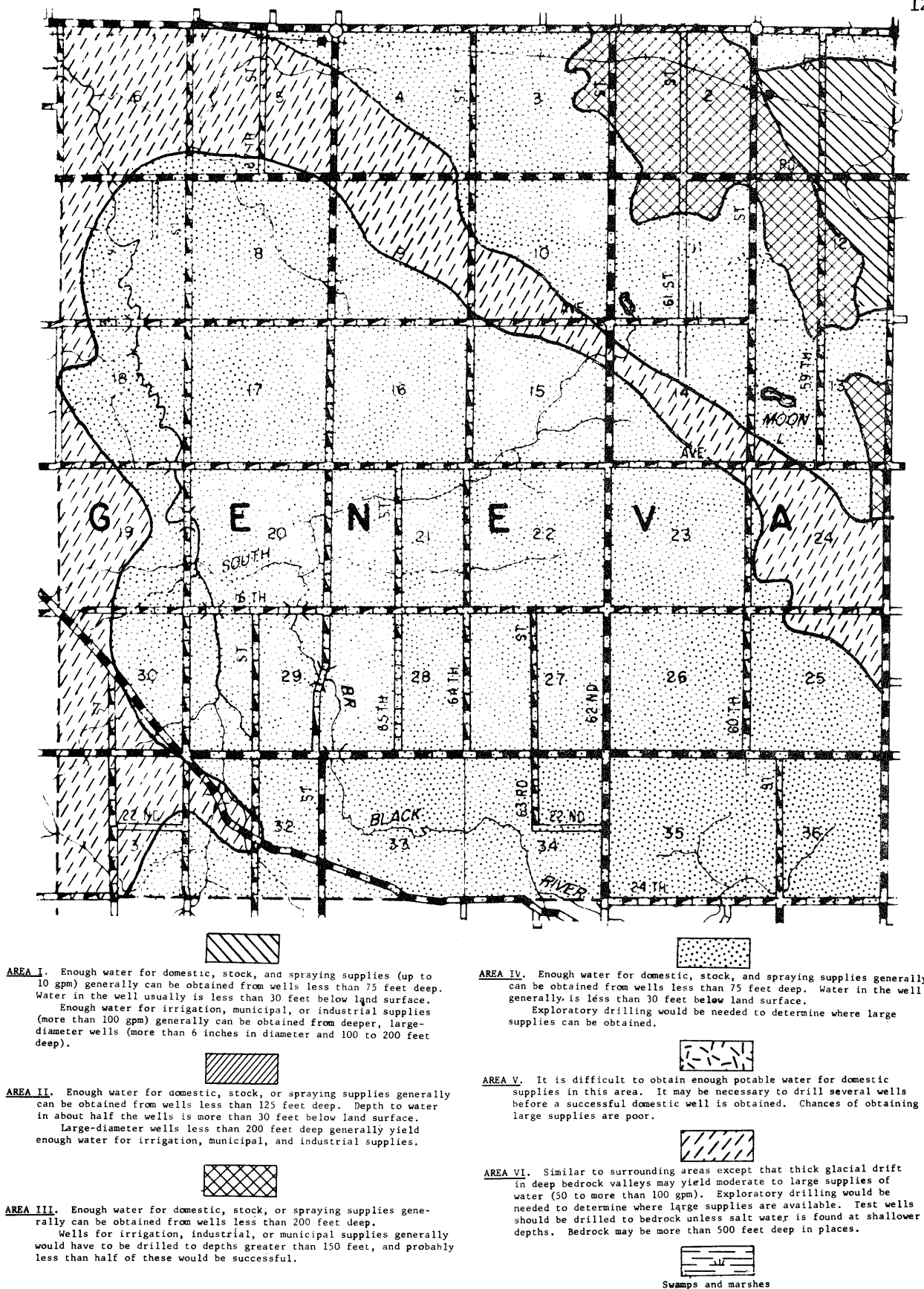


FIGURE 36.--MAP OF GENEVA TOWNSHIP SHOWING THE GENERAL AVAILABILITY OF GROUND WATER TO WELLS.

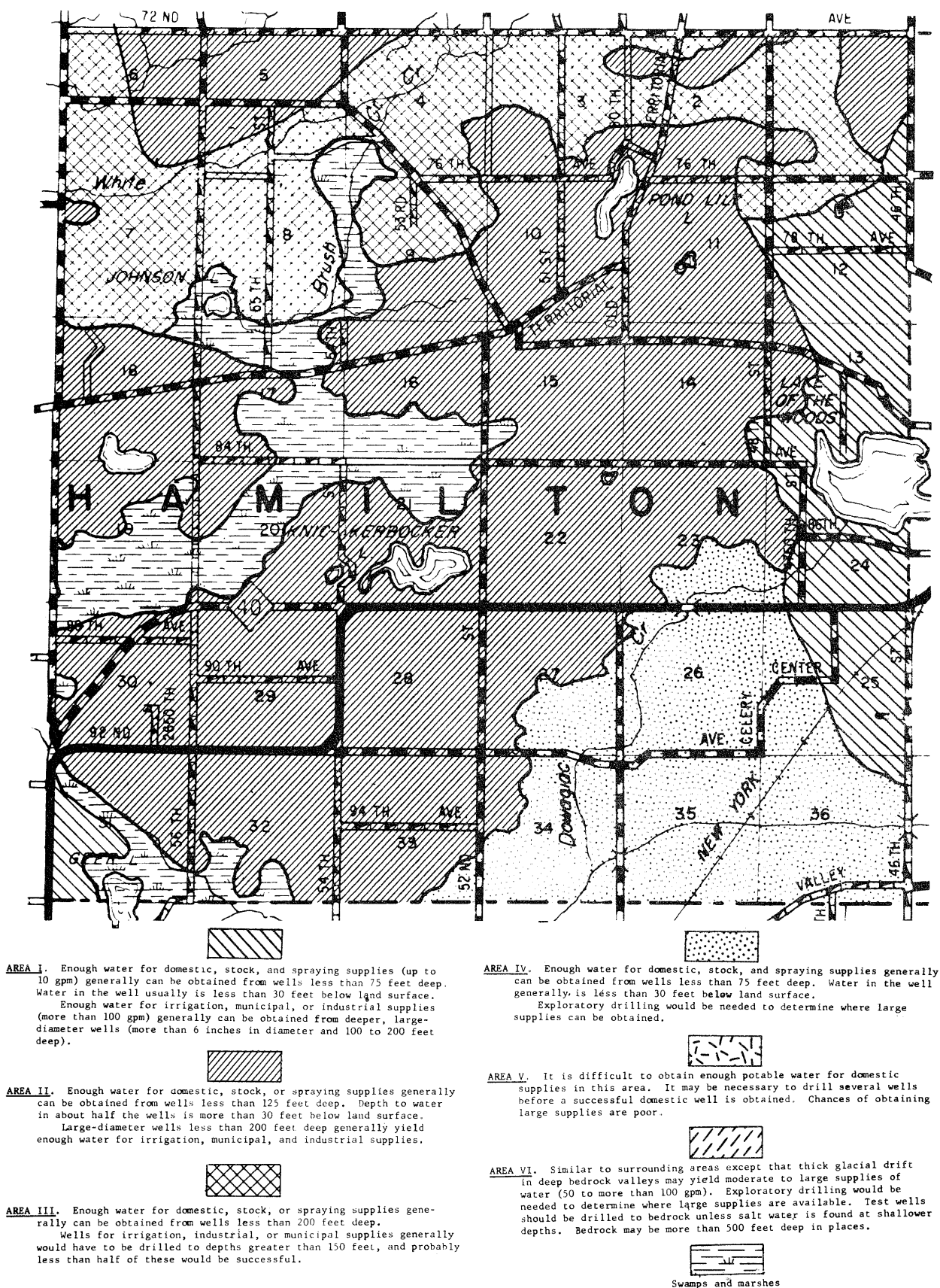


FIGURE 37.--MAP OF HAMILTON TOWNSHIP SHOWING THE GENERAL AVAILABILITY OF GROUND WATER TO WELLS.

Table 17.--Records of selected wells in Hartford Township (T. 3S., R. 16W.)

Explanation: e - estimated; ANALYT--Field, not accurate to laboratory standards; USGS, U. S. Geological Survey; MDH, Michigan Dept. of Health; Remarks--LOG, record of materials penetrated on file; ANAL, also see table of chemical analyses of ground water.

Location		Owner	Driller	Year drilled	Depth (in ft.)	Diam (in inches)	Water level (in feet)	Month and year measured	Yield (in gpm)	Use	Screen openings (inches)	Pump	Water-bearing materials	Altitude (in feet)	Quality of Water			Remarks
T.	S.														Iron (as Fe)	Hardness (as CaCO ₃)	Chloride (Cl)	
NE SW 1	1	Hilltop Orchards	G. Tinker	1961	58	2	25	10-61	10	Dom	.010	Jet	Gravel	690				
SE NE 1	1	C. Jackson	D. Rose	1961	47	2	21			Dom	.010	Jet	Sand	670				
SE SE 1	2	R. Clausell	Owner		36					Dom								
SE SE 2	3	P. Evans		1962	150	2				Dom						353	6.0	USGS
SW SW 3	2	D. Childs Garage	D. Rose	1962	60	4	18	10-62	50	Ind	.010	Subm	Sand	660		340	2.0	USGS
SW SW 4	3	G. Rice	Owner	1962	27	2	e10	6-62	12	Dom	.010	Jet		660				ANAL
SW NW 5	3	W. Knebel	C. Kreitner	1961	11	1 1/2	flow	10-63		Dom				645		0.8	4.0	USGS
NE NE 6	6	G. Bessler	C. Clapsaddle		65	4				Dom		Subm		660				ANAL
NE NE 7	7	E. Kerlikowsky	D. Rose	1962	85	8			400	Irr	.010	Turb	Sand, gravel	680				USGS
NE NE 8	8	D. Carny			64	2			4	Dom		Jet	Sand, gravel	680				
NE SE 9	9	V. Kaucher			100	3				Dom		Jet	Sand, gravel	680		247	1.0	USGS
NE SE 10	10	Do			18	2			12	Spray	.010	Jet	Sand, gravel	670				Well in gravel pit
NE NE 11	11	C. Drake	D. Rose	1962	140	4	92	9-62				Jet	Sand, gravel	770				Springs rept. nearby
NE NE 12	12	W. King, Jr.	D. Rose	1962	70	3	e20	5-62	12	Dom	.010	Subm	Gravel	700				Springs rept. nearby
NE NE 13	13	Mrs. L. Stagg	D. Rose	1962	31	2	e20			Dom	.010	Jet	Sand	660				Springs rept. nearby
NE SE 14	14	H. Haney	Owner	1962	35	1 1/2	64	4-59	18	Dom	.010	Jet	Gravel	660				Seasonal use
NE SE 15	15	Hilltop Orchards	G. Tinker	1959	99	2	71	4-59	e1000	Dom	.010	Jet	Sand, gravel	680				
NE NW 16	16	Hartford Farm Supply	G. Cole	1959	80	8	15	10-62	12	Irr	.010	Turb	Gravel	660				
NE NW 17	17	Springdale Manor	D. Rose	1962	24	2	e18	7-62	65	Dom	.010	Jet	Sand	640				
NE NW 18	18	Springdale Manor	D. Rose	1962	24	2	flow	7-62	65	Dom	.010	Jet	Sand	640				
NE NW 19	19	M. Schreier	D. Tinker	1963	55	3	10	7-63	100	Irr	.010	Jet	Gravel	665				
NE NW 20	20	Water Lake Farms	Handy Bros.	1963	61	4	18	7-63	100	Ind	.020	Subm	Sand	665				Screen stripped to allow flow
NE NW 21	21	Village of Hartford	Ind-Mich Water Co.	1929	60	10	18	4-29	300	Mun	.060-.080	Turb	Sand, gravel	660		tr	14	MDH
NE NW 22	22	J. Fehlmayer	Dunbar Dr.-lg. Co.	1956	167	14	28	4-56	1,180	Irr				660				Seasonal use; 2nd well same depth
NE NW 23	23	Mrs. R. Peters																2 wells in pit; ANAL; LOG
NE NW 24	24	Village of Hartford	Ind-Mich Water Co.	1939	89	12	15.82	3-63	200	Mun	.025	Turb	Sand	660		1.0	5	MDH
NE NW 25	25	Do	Do	1947	93	12	12	7-47	375	Mun	.020	Turb	Sand, gravel	660		0.8	250	5
NE NW 26	26	Do	Do	1956	108	12	10	2-56	940	Mun	.060-.032	Turb	Sand, gravel	660		0.8	260	8
NE NW 27	27	Do	Do	1954	140	6	16	10-54	550	Test			Sand, gravel	660		1.2	270	7
NE NW 28	28	G. Huffman	D. Rose	1962	105	2	e15	9-62		Dom	.010	Jet	Sand, gravel	660				ANAL; LOG
NE NW 29	29	V. Williams	D. Rose	1962	140	3				Dom		Jet	Sand, gravel	660				LOG
NE NW 30	30	C. O. Drake	D. Rose	1963	50	3	30	7-63	20	Irr		Jet	Sand, gravel	675				Large use for Motel, Pool
NE NW 31	31	V. Rre	Wayne Northern Co.	1963	135	8				Ind		Horse	Sand	660				Abandoned R.R. well; LOG
NE NW 32	32	Auto Specialties West	Ind-Mich Water Co.	1915	144	12	35	6-59	700	Ind		Turb		670				Restaurant & gas station use
NE NW 33	33	Do	Do	1958	115	15	25	7-58	700	Ind		Turb		670				Pumped into surface pond
NE NW 34	34	Do	Do	1964	145	12	37.50	7-63		Ind		Turb		670				6 wells now abandoned
NE NW 35	35	H. Pokor	R. Sanders	1960	55	4				Pub		Jet		675				
NE NW 36	36	Village of Hartford	E. Richtsreek	1955	14	4	flow	50-100		Irr	.010	Jet		670				
NE NW 37	37	Do			264.3	6				Dom,Stk		Jet	Sand, gravel	720				
NE NW 38	38	A. Dowd	G. Tinker	1956	89	2	45	8-56	12	Dom	.010	Jet	Sand	720				
NE NW 39	39	F. Hallah	D. Rose	1963	89	2	47.82	7-63	67	Spray	.012	Subm	Sand	745				
NE NW 40	40	Dowd Orchards	D. Rose	1962	105	2	flows	9-62		Dom	.010	Jet	Sand, gravel	805				
NE NW 41	41	L. Page	D. Rose	1962	87	2	e10	7-62	12	Dom	.010	Jet	Sand	700				
NE NW 42	42	J. Johnson	D. Rose	1962	94	2	e50	7-62	12	Dom	.010	Jet	Sand	695				
NE NW 43	43	D. Johnson	D. Rose	1962	52	2	e50	7-62	8	Dom	.010	Jet	Gravel	710				
NE NW 44	44	D. Johnson	D. Rose	1962	85	2	e50	7-62	12	Dom	.010	Jet	Sand	695				
NE NW 45	45	K. Kling	Dunbar Dr.-lg. Co.	1949	146	8	63	7-49	235	Irr	.010-.020	Turb	Sand	770				Was drilled to 166'; LOG
NE NW 46	46	R. Smith			44	2	e15	-63		Dom	.010	Jet	Sand	690		322	5.0	USGS
NE NW 47	47	C. Hathaway	D. Strong	1942	69	4			150	Spray		Jet	Sand, gravel	700				ANAL
NE NW 48	48	C. Geisler	Wayne-Northern Co.	1945	83	8	38	11-45	180	Irr		Turb	Sand	720				20 ft screen, fine gauze; LOG
NE NW 49	49	C. Geisler	Wayne-Northern Co.	1945	97	8-6				Dom		Jet	Sand, gravel	720				Dry hole - abandoned; LOG
NE NW 50	50	C. Geisler	C. Kreitner	1953	42	2			300	Irr		Hand	Sand, gravel	700				
NE NW 51	51	C. Hathaway	Ind-Mich Water Co.	1940	159	10	40		7	Spray	.010	Subm		740				
NE NW 52	52	L. Fisher	Ind-Mich Water Co.	1940	80	4				Dom,Stk		Jet		735				
NE NW 53	53	R. Reichenman		1956	80	2				Dom		Jet		780				
NE NW 54	54	D. Ritchie	E. Richtsreek	1956	22	1 1/2				Dom		Jet				295	4.0	USGS
NE NW 55	55	E. Phillips																

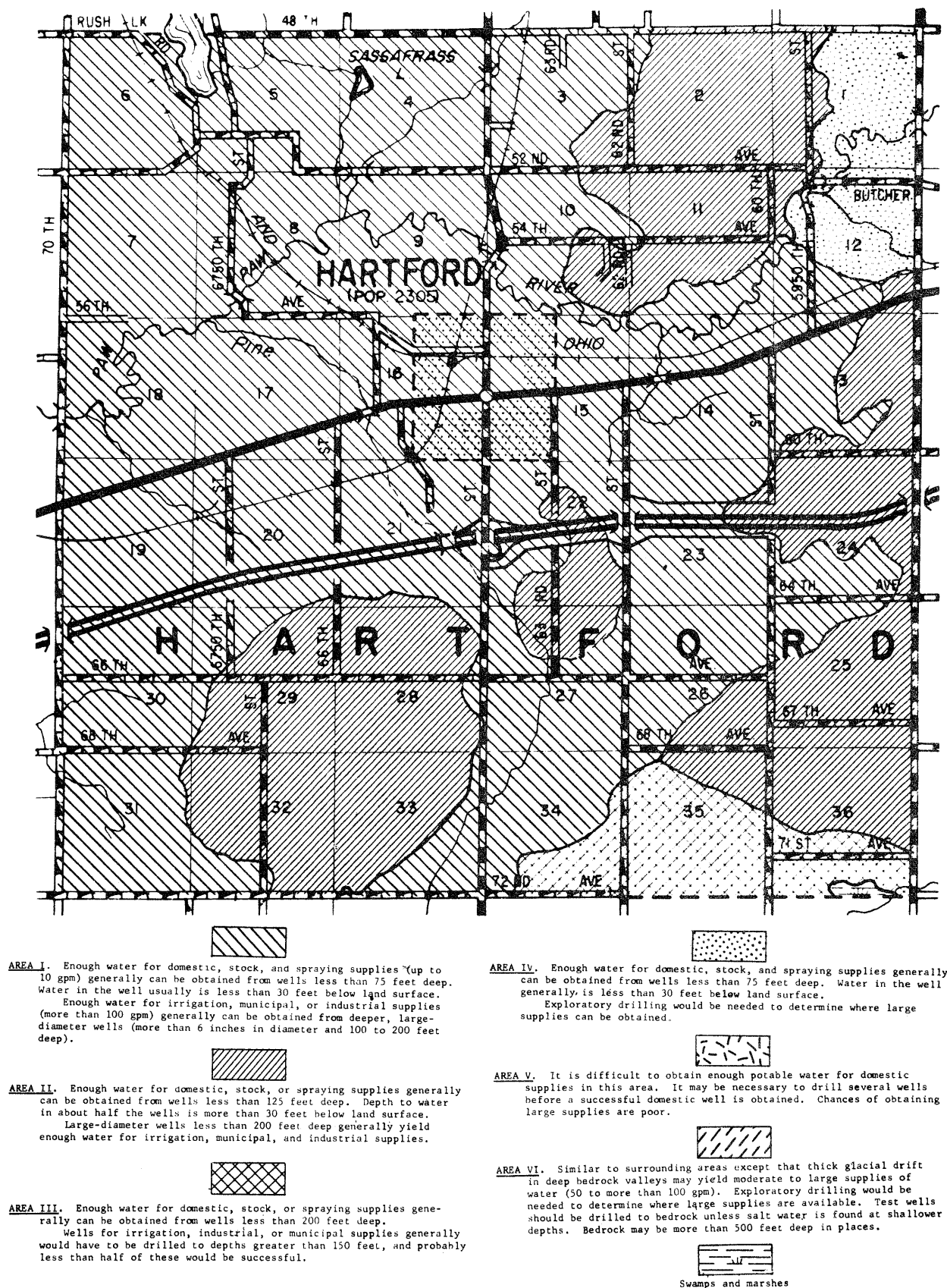


FIGURE 38.--MAP OF HARTFORD TOWNSHIP SHOWING THE GENERAL AVAILABILITY OF GROUND WATER TO WELLS.

Table 18.--Records of selected wells in Keeler Township (T. 4S., R. 16W.)

Explanation: e - estimated; Analyst--Field, not accurate to laboratory standards; USGS, U. S. Geological Survey; MDH, Michigan Dept. of Health; Remarks--LOG, record of materials penetrated on file; ANAL, also see table of chemical analyses of ground water.

Location T. & R.	Owner	Driller	Year drilled	Depth (in ft.)	Diam (in inches)	Water level (in feet)	Month and year measured	Yield (in gpm)	Use	Screen openings (inches)	Pump	Water- bearing materials	Altitude (in feet)	Quality of Water				Remarks
														Hardness (as CaCO ₃)	Iron (as Fe)	Chloride (Cl)	Analyt	
SE SE 1	J. Thar	Ind-Mich Water Co.	1945	156	10	34	7-63	180	Irrig	.007	Turb	Sand	800	0.1	150	10	Field	Water level 35' in 1945; pumps sand; LOG
SE SE 2	C. Stagers	E. Richcreek	1942	151	2			50	Irrig	.010	Subm		790	0.2	250	15	Field	For 4 acres of blueberries
SE SE 3	J. Baccok	D. Rose	1963	78	4	17-25	7-63	300	Irrig	.006	Subm		820				Field	Water temp. 52.7°F.
SE SE 4	G. & S. Geisler	Ind-Mich Water Co.	1937	77	8	36.1	7-63	300	Irrig		Turb		700				Field	
NW NW 6	D. Saucidin	D. Fredenhagen	1935	90	8	flow		700	Irrig		Turb		720				Field	
NE SE 7	E. Zirk	E. Richcreek		1050	10								705			5	Field	Flowed at 55'-95'; Small flow 1963; Oil test
SW SW 8	E. Klett	Dunbar Drig. Co.		88	2	6	-63		Irrig		Turb		740	0.2	295	10	Field	ph 7.2
NW NW 9	L. Kolberg	E. Richcreek		225	8	flow		200	Irrig		Turb		740				Field	
NW NW 10	C. Kolberg	E. Richcreek		90	2	12	-61	10	Irrig		Jet		730	115			Field	Flowed 10 gpm when drilled
SW SE 10	A. Faloner	Godfrey (Bangor)	1961	62	2			600	Irrig		Jet		730	230			Field	Flows 10 gpm to creek; screen only 12' down
SW SE 11	J. Faloner	Dunbar Drig. Co.	1946	165	8	28	4-56	1180	Irrig	.080-.060	Turb	Sand, gravel	800				Field	LOG
SW SE 12	C. Ganfield	J. C. Newman	1950	25	2	8		450	Irrig	.007	Jet	Sand	800	tr	270	20	Field	ph 7.1
SW SE 13	C. Ganfield	E. Richcreek	1950	182	8	26	-56	el, 100	Irrig		Turb		800				Field	
NW SW 13	T. Rosevelt	Dunbar Drig. Co.	1956	128	4				Irrig		Turb		800				Field	
SE SW 13	W. Foster Farm	Do.	1961	147	12-	24.39	4-63	2,000	Irrig	.200	Turb	Gravel	800				Field	LOG
SE NE 14	M. Seel	Do.	1958	181	10	22	4-55	1,000	Irrig	.016-.020	Turb	Sand	790				Field	LOG
SE SW 14	O. Klett	Do.	1955	170	14				Irrig	.040-.016	Turb	Sand	800				Field	LOG
SE SW 14	O. Klett	J. Newman		135	8	19	2-55	660	Irrig	.018	Turb	Sand, gravel	800	0.5	290	10	Field	LOG; used as observation well
NW SE 14	M. Poland	Dunbar Drig. Co.	1955	193	12	34	1-59	900	Irrig	.020-.015	Turb	Sand	800				Field	Water temp. 52.0; LOG; ph 7.3
SE SE 14	H. Anthony	Do.	1959	188	12	30	-46	900	Irrig	.125	Turb	Sand	800				Field	60' of blue clay above sand and gravel
SW NW 15	D. Foster	J. Newman	1946	200	8	40			Irrig	.008	Turb	Sand	810	205			Field	Seasonal use; ph 7.5
SW SW 15	Bronte Champagne Co.	Lewis & Sons	1962	130	8				Irrig		Turb		805				Field	Well abandoned
SW SW 15	Bronte Champagne Co.	Dunbar Drig. Co.	1944	72	4	37	6-48	500	Irrig	.040-.016	Turb	Sand, gravel	805				Field	Sample 25 gal for Pest. 6/18/63; Temi. 51.5;
NE NE 15	A. Wendzel	Ind-Mich Water Co.	1961	193	10	20.52	6-63	460	Irrig	.125	Turb	Sand	800				Field	LOG
NE SE 15	Hartford Farms # 1	J. Newman		192	8			400	Irrig	.060	Jet		800				Field	Water temp 55.5; LOG
NE SE 15	Hartford Farms # 2	Do.		185	8			400	Irrig	.060	Jet		800				Field	Used as Observation well; LOG
SW NW 17	J. Dannefel	Sanders Bros.	1958	80	2	18-20	-58		Irrig	.030	Jet		740				Field	Water temp 54; LOG; ANAL
SE NE 18	J. Dannefel	Owner	1900	60	2	15-18	-62		Irrig	.016-.030	Jet		800				Field	LOG
NW SW 19	P. Weber	Do.	1930	136	2	76			Irrig	.010	Jet		740				Field	LOG
SW NE 20	F. Neff	E. Richcreek	1948	154	8	35	8-56	750	Irrig	.040-.016	Turb	Sand, gravel	805				Field	Also used as observation well
SE NE 21	M. Seel	Dunbar Drig. Co.	1948	154	8	35			Irrig	.040-.016	Turb	Sand, gravel	805				Field	LOG
NW NW 22	Frigid Foods # 1	Dunbar Drig. Co.	1956	134	10	24			Irrig	.125	Jet		805	tr	170	75	Field	Water temp 55.5; LOG
NW NW 22	Do, Drillers # 2	Do.	1953	135	10	25.46	7-63	1225	Irrig	.060	Jet		805				Field	Used as Observation well; LOG
SW SW 22	Burnette Farms Packing	Ind-Mich Water Co.	1955	127	10	32	2-55	615	Irrig	.060	Turb	Sand, gravel	800	243		6.0	USGS	Water temp 54; LOG; ANAL
SW SW 22	Do.	Do.	1952	123	10	28	6-52		Irrig	.030	Turb	Sand, gravel	800				Field	LOG
SW SW 22	Do.	J. Newman	1950	125	8	32	7-50	400	Irrig	.016-.030	Turb	Sand, gravel	800				Field	LOG
SW NW 22	Q. Burnette Farm	Dunbar Drig. Co.	1956	160	10	30	3-56	750	Irrig	.040	Turb	Sand, gravel	805				Field	Also used as observation well
SE SE 23	M. DeMorrow	Owner	1961	24	11	17.75	7-63		Irrig	.005-.020	Jet		805				Field	LOG
SE NE 24	Adams	Dunbar Drig. Co.	1956	25	11	6	-56		Irrig	.030-.060	Jet		790				Field	LOG
SE NE 27	R. Bisnett	Do.	1955	135	10	25	2-55	1300	Irrig	.060	Jet		790				Field	LOG
SE NE 27	R. Blannett	Do.		28	2	33	6-54	780	Irrig	.060	Turb	Gravel	800				Field	Pesticide sample taken
NW SW 27	G. Kays	Do.	1954	139	12			650	Irrig		Turb		800				Field	LOG
SW SE 28	J. Shaver	B. J. Lewis & Sons	1956	173	8				Irrig		Turb		807				Field	
SW SW 29	M. Seel	Do.	1954	167	10				Irrig		Turb		805				Field	
NW NE 30	H. Utrup	Fun & Sun Resort		65	2				Irrig		Jet		820				Field	
NW NW 31	Fun & Sun Resort	Do.		65	2				Irrig		Jet		780	0.1	76	3.0	Field	USGS
NW NE 31	Bay's Cabins	Do.	1962	69	11	21	5-62		Irrig		Jet		780				Field	
NW NE 31	Do.	Do.		55	12				Irrig		Jet		780				Field	
NW SW 32	Melabb Cottages	B. J. Lewis & Sons	1954	50	2				Irrig		Jet		800				Field	Supplies 6 cottages
NW NW 34	L. Scherer	Dunbar Drig. Co.	1948	196	8	20	-48	400	Irrig	.080	Jet	Gravel	800				Field	
NW SE 34	H. Krohn	Pritchard	1948	89	2	10			Irrig		Jet		800				Field	Supplies 8 cottages; ph 7.2
SW SW 35	Bob's Harbor Resort	Owner	1949	43	2	10	-49		Irrig		Jet		780	0.1	170	10	Field	
SE NW 37	L. Parquette	Owner	1956	25	11	15			Irrig		Jet		780				Field	Shallow wells in area; sand below hardpan
SE NW 38	C. Garver	Owner	1956	26	11				Irrig		Jet		780				Field	
NW SW 38	C. Moulton	F. Dohme	1961	32	2	20	-61		Irrig		Jet		780				Field	

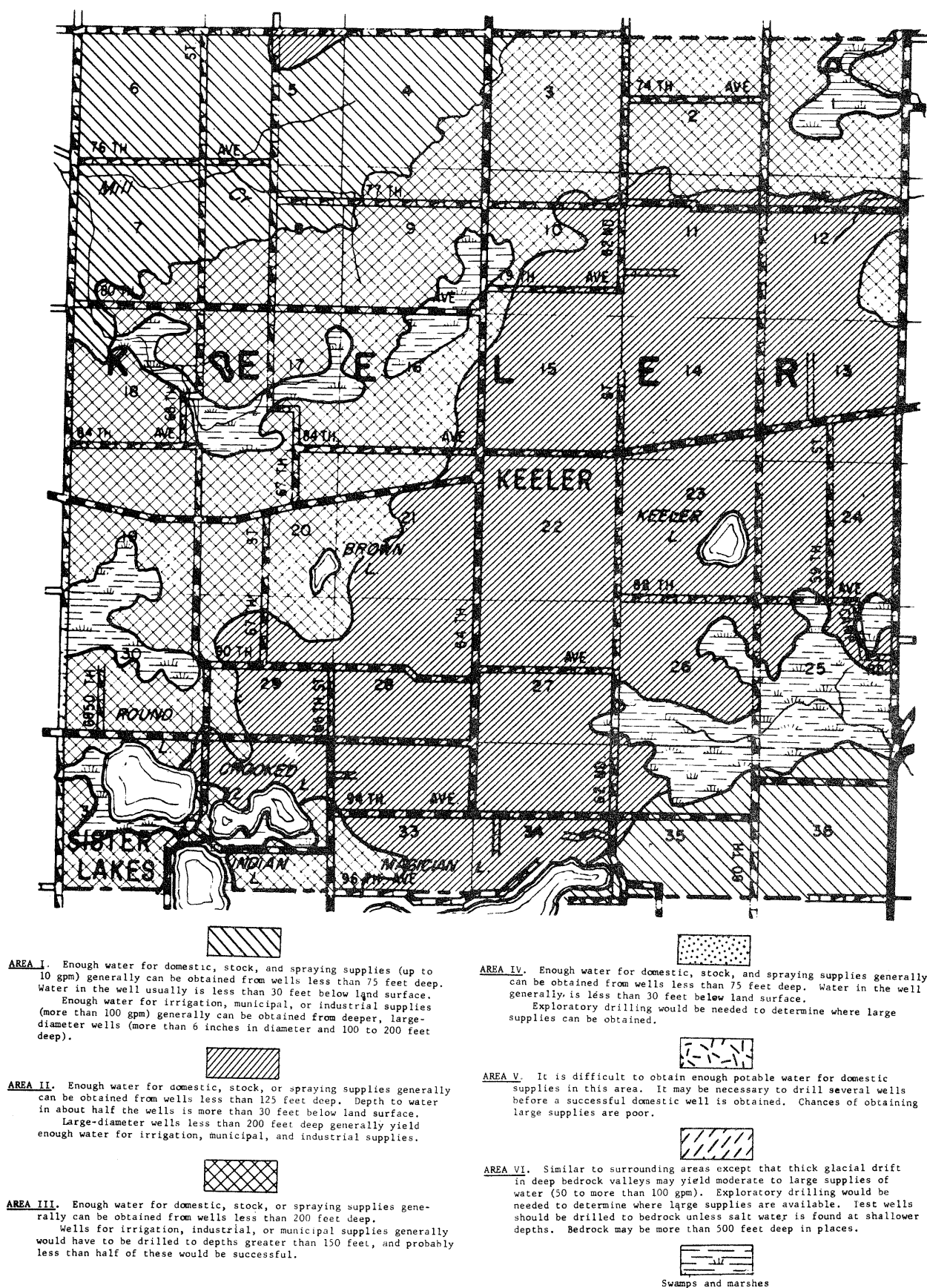


FIGURE 39.--MAP OF KEELER TOWNSHIP SHOWING THE GENERAL AVAILABILITY OF GROUND WATER TO WELLS.

Table 19.--Records of selected wells in Lawrence Township (T. 3S., R. 15W.)

Explanation: e - estimated; Analyst--Field, not accurate to laboratory standards; USGS, U. S. Geological Survey; MDH, Michigan Dept. of Health; Remarks--LOG, record of materials penetrated on file; ANAL, also see table of chemical analyses of ground water.

Location T. 3S. R. 15W.	Owner	Driller	Year drilled	Depth (in ft.)	Diam (in inches)	Water level (in feet)	Month and year measured	Yield (in gpm)	Use	Screen (inches)	Pump	Water- bearing materials	Altitude (in msl)	Quality of water			Remarks
														Iron (as Fe)	Hardness (as CaCO ₃)	Chloride (Cl)	
SW NE 2	R. Monroe	G. Tinker	1958	35	2	22	-58		Dom, Stk	.010	Jet	Sand, gravel	680	0	250	10	Field
NE NE 3	G. Florian	G. Tinker	1960	50	4	40	7-60	.10	Dom, Stk	.008	Jet	Sand	765	0	340	30	Field
SE NE 4	G. Fargo	M. Cook	1941	100	2	e 30	-63		Dom, Stk	.008	Jet	Sand, gravel	720	0	250	5	Field
NE NE 5	N. L. Haaseth	Butcher	1950	123	11	16	7-47	400	Dom	.015	Turb	Sand	730	0.7	250	5.0	MDH
SE NE 6	T. Napodano	E. Sanders	1947	80	12	15.5	5-44	625	Mun	.012-.035	Turb	Gravel	680	0.65	252	7.0	MDH
SE NE 7	Village of Lawrence W	Ind-Mich Water Co.	1944	79	12	15.5	11-62	550	Ind	.020	Turb	Sand, gravel	680	0.3	359	12	Layne
SE NE 8	Ind-Mich Water Co.	Ind-Mich Water Co.	1957	104	10	10.4	11-62	600	Pub, Ind	.025	Turb	Sand, gravel	690	0.5	290	25	Layne
SE NE 9	Ind-Mich Water Co.	Layne-Northern Co.	1955	54	4	16.18	4-63	100	Ind, Stk	.016	Subm	Gravel	685				LOG
SE NE 10	Lawrence Pack Co. NW	Ind-Mich Water Co.	1947	102	3	62	-63		Dom, Stk	.010-.060	Jet	Sand, gravel	810				LOG; seasonal use
SE NE 11	Sill Farm Market	A. Mesler	1963	75	2	40	9-62		Dom	.010	Jet	Sand, gravel	780				LOG; ANAL
SE NE 12	F. Lamphar	G. Tinker	1951	85	2	40	2-61	30	Dom, Stk	.010	Jet	Sand, gravel	760	4	260	2.0	USGS
SE NE 13	G. Krasovich	H. Starbeck	1962	73	2	14	8-62	6	Dom	.010	Jet	Sand, gravel	720	1.5	265	1.5	USGS
SE NE 14	Murdinger	G. Tinker	1961	56	3	17	-63		Dom, Stk	.010	Jet	Sand	730				LOG
SE NE 15	C. Sill	H. Dillenbeck	1983	23	11	14	8-62		Dom	.010	Jet	Sand, gravel	780				PH 7.5
SE NE 16	S. Stuckey	G. Tinker	1962	56	2	50			Dom	.006-.008	Turb	Sand, gravel	780				LOG
SE NE 17	D. Miller	E. Sanders	1960	294	8	113	2-60	480	Irrig	.010	Jet	Sand, gravel	780				LOG
SE NE 18	Hilltop Orchards	G. Tinker	1958	58	2	48	9-58	12	Dom, Stk	.007	Jet	Sand, gravel	720				ANAL
SE NE 19	R. Schwab	G. Tinker	1963	180	2	99	4-63	9	Dom	.007	Jet	Sand, gravel	720				LOG
SE NE 20	G. Gould	G. Tinker	1963	75	2	28	7-63	12	Dom	.010	Jet	Sand, gravel	710				LOG; at Shafer Lake
SE NE 21	Hilltop Orchards	G. Tinker	1962	112	3	70	9-59	25	Dom	.007-.010	Jet	Sand, gravel	770	0.6	220	5	Field
SE NE 22	F. Carlson	E. Richcreek	1961	120	4	50	8-60	30	Ind, Dom	.010	Subm	Sand, gravel	760				Field
SE NE 23	G. Dillenbeck	G. Tinker	1960	90	2	70	5-62	15	Dom	.010	Jet	Sand	770				Field
SE NE 24	C. E. Denton	G. Tinker	1962	113	2	50	8-63		Dom, Spr	.010	Jet	Sand	800				LOG
SE NE 25	F. Strubel	G. Tinker	1948	97	2	35	9-57	20	Dom	.010	Jet	Sand	760				Has 4 wells, one 172 ft in gravel
SE NE 26	T. Hagberg	G. Tinker	1963	114	10	26	5-59	1,000	Irrig	.010	Turb	Sand	780				LOG
SE NE 27	H. Blougett	G. Tinker	1957	100	2	26	8-63	250	Dom, Spr	.010-.012	Jet	Sand	780				Also Dom well, 110 ft deep
SE NE 28	D. M. Noble	W. Sanders	1953	78	6	26.85	8-59		Dom, Stk	.016	Jet	Sand	792				LOG
SE NE 29	L. Cole	G. Tinker	1959	63	2	51	9-59	575	Irrig	.007	Turb	Sand	800				Loose limestone rocks at 45 ft.
SE NE 30	Hilltop Orchards	Dunbar Drig. Co.	1959	188	8	42	5-63	12	Dom	.007	Jet	Sand	770				LOG
SE NE 31	M. Johnson	G. Tinker	1963	94	2	20	10-60	20	Dom, Stk	.010	Jet	Sand	770				LOG
SE NE 32	G. Anderson	E. Richcreek	1954	85	2	34	8-58		Dom	.010	Jet	Sand	770				LOG
SE NE 33	R. H. Vangelder	G. Tinker	1960	112	2	10	4-62		Dom, Stk	.010	Jet	Sand, gravel, sand	770				LOG
SE NE 34	P. Howard	G. Tinker	1958	143	2	32	8-63		Dom	.010	Jet	Sand, gravel	795				Edge of lake
SE NE 35	R. Barrett	G. Tinker	1962	67	2	32			Dom, Stk	.010	Jet	Sand, gravel	779				
SE NE 36	T. Tallant	J. Goens	1951	30	11	13			Dom, Stk	.010	Jet	Sand, gravel	779				

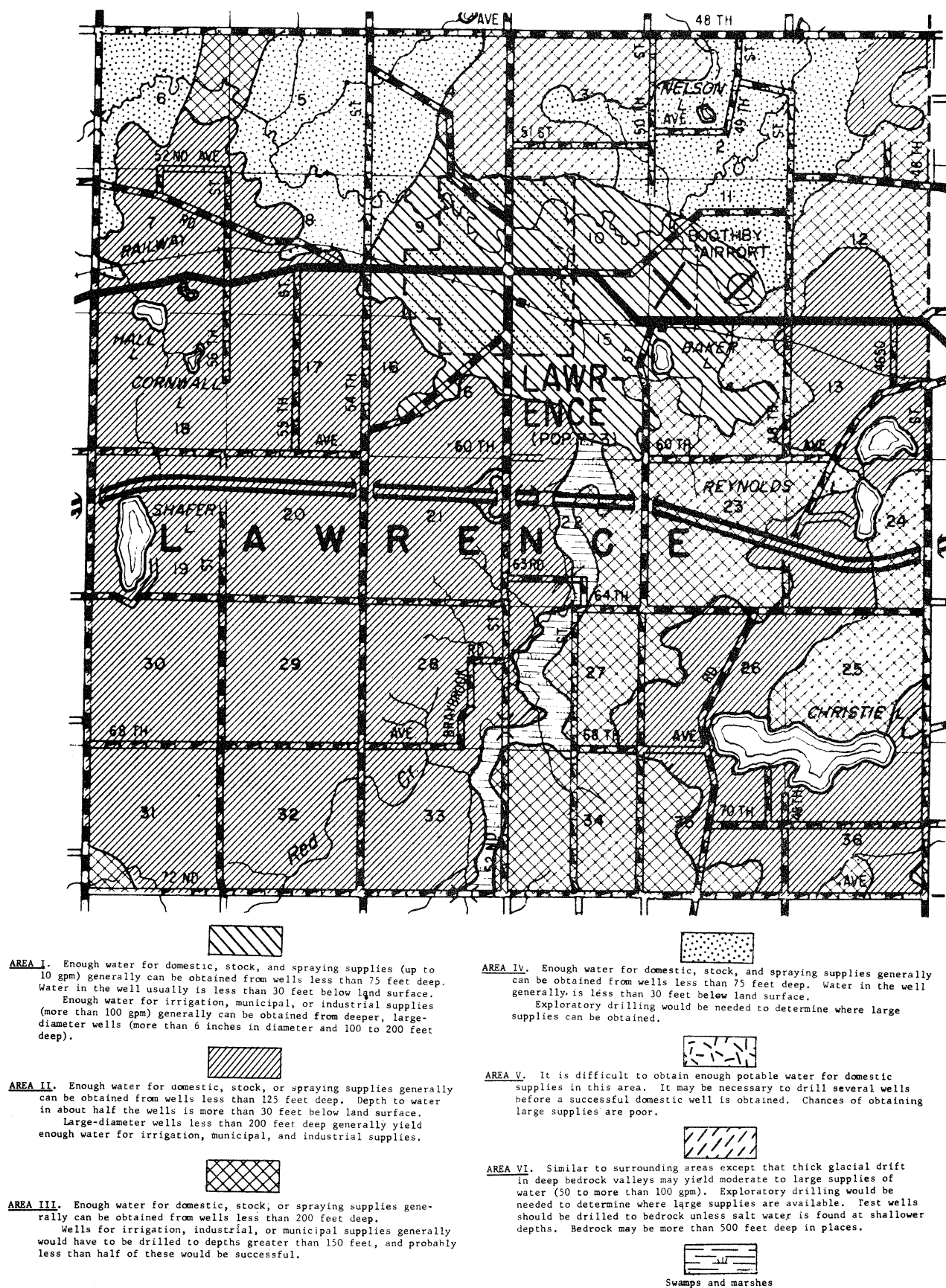


FIGURE 40.--MAP OF LAWRENCE TOWNSHIP SHOWING THE GENERAL AVAILABILITY OF GROUND WATER TO WELLS.

Table 20.---Records of selected wells in Paw Paw Township (T. 3S., R. 14W.)

Explanation: e - estimated; Analyst--Field, not accurate to laboratory standards; USGS, U. S. Geological Survey; MDH, Michigan Dept. of Health; Remarks--LOG, record of materials penetrated on file; ANAL, also see table of chemical analyses of ground water.

Location T. & Sec.	Owner	Driller	Year Drilled	Depth (in ft.)	Water level (in feet)	Month and year measured	Yield (in gpm)	Use	Screen opening (inches)	Pump	Water- bearing materials	Altitude (in m)	Hardness (as CaCO ₃)	Chloride (Cl) (ppm)	Iron (ppm)	Anal- yzed by	Remarks
SE SE 1	G. C. Cole	G. Tinker	1960	56	2	31	10	Dom	.010	Jet	Gravel	800	250	50	0.0	Field	NO ₃ - 4.0; NO ₂ - 0.00
NE NW 2	J. Cutler	E. Sanders	1948	50	2	12		Dom Stk		Jet	Sand	703	370	10		Field	
SE SW 4	M. Wojciechowski	Do.	1947	85	2	12		Dom Stk	.010	Piston	Sand	725	290	10		Field	
SW NW 5	A. Panizzo	Do.	1947	75	2	12		Dom Stk		Jet	Sand	725	290	10		Field	
NE NW 6	A. Stine	U. S. G. S.	1963	59	14	11.43		Obs.	.010	Subm	Sand	745	170	10		Field	See fig. ---
SE NE 7	C. Pugley Farm	G. Tinker	1961	122	4	60	55	Irrig.	.015	Turb	Sand & gravel	795	260	10		Field	Sand entire depth
NE SE 9	P. Pervanger	Dunbar Drig. Co.	1948	149	4	59.05	35	Irrig.	.125	Jet	Gravel	800	240	10		Field	Water level 53 ft in 1948; LOG
NE SW 10	H. J. Webb	E. Sanders	1946	83	3	53	25	Dom		Jet	Gravel	731	240	10		Field	Well abandoned; LOG
SW SE 11	Maple Dairy Co. # 1	Do.	1946	51	4	14		Ind		Turb	Sand	740	260	40	0	Field	Well not in use
SW SE 11	Maple Dairy Co. # 2	Do.	1957	110	4			Ind		Turb	Sand	740	260	40	0	Field	pH 8.0
SW SE 11	Maple Dairy Co. # 3	Do.	1942	95	12	13.55	420	Dom		Turb	Sand	740	260	40	0	Field	1962 yield 100 gpm; LOG; ANAL
SW SE 12	Village of Paw Paw # 1	F. Chapman	1946	108	16	3	576	Dom	.105	Turb	Sand	720	210	11	0.8	MDH	LOG
SW SE 12	Village of Paw Paw # 2	Do.	1949	62	34	10.83	120	Dom		Turb	Sand	720	210	11	0.2	MDH	LOG
SW SE 12	Village of Paw Paw # 3	Layne-Northern	1949	108	16	3	576	Dom		Turb	Sand	720	210	11	0.2	MDH	LOG
NE SE 11	Village of Paw Paw # 4	Do.	1961	110	34	15.53	400	Dom	.105	Turb	Sand	720	210	11	0.3	MDH	LOG; ANAL
NE SE 11	Village of Paw Paw	Do.	1949	152	8	6.3	649	Test		Turb	Sand	730	230	15	0.3	MDH	LOG; ANAL
SW SE 12	Village of Paw Paw	Do.	1942	155	7			Test		Turb	Sand	730	230	15	0.3	MDH	LOG; ANAL
SW SE 12	Village of Paw Paw	Do.	1942	155	7			Test		Turb	Sand	730	230	15	0.3	MDH	LOG; ANAL
NE NW 13	Village of Paw Paw	F. Chapman	1945	112	6	11	142	Test		Turb	Sand	720	220	10		Field	LOG; Test for # 4 well
NE NW 13	Village of Paw Paw	E. Sanders	1928	100	8	2.5	728	Test		Turb	Sand	720	220	10		Field	LOG; Test for # 2 well
NE NW 13	St. Julian Mine Co. #1	Do.	1928	100	8	2.5	728	Test		Turb	Sand	720	220	10		Field	LOG; Test for # 2 well
NE NW 13	St. Julian Mine Co. #2	Do.	1928	100	8	2.5	728	Test		Turb	Sand	720	220	10		Field	LOG; Test for # 2 well
NE NW 13	St. Julian Mine Co. #3	Do.	1928	100	8	2.5	728	Test		Turb	Sand	720	220	10		Field	LOG; Test for # 2 well
NE NW 13	St. Julian Mine Co. #4	Do.	1928	100	8	2.5	728	Test		Turb	Sand	720	220	10		Field	LOG; Test for # 2 well
NE NW 13	St. Julian Mine Co. #5	Do.	1928	100	8	2.5	728	Test		Turb	Sand	720	220	10		Field	LOG; Test for # 2 well
NE NW 13	St. Julian Mine Co. #6	Do.	1928	100	8	2.5	728	Test		Turb	Sand	720	220	10		Field	LOG; Test for # 2 well
NE NW 13	St. Julian Mine Co. #7	Do.	1928	100	8	2.5	728	Test		Turb	Sand	720	220	10		Field	LOG; Test for # 2 well
NE NW 13	St. Julian Mine Co. #8	Do.	1928	100	8	2.5	728	Test		Turb	Sand	720	220	10		Field	LOG; Test for # 2 well
NE NW 13	St. Julian Mine Co. #9	Do.	1928	100	8	2.5	728	Test		Turb	Sand	720	220	10		Field	LOG; Test for # 2 well
NE NW 13	St. Julian Mine Co. #10	Do.	1928	100	8	2.5	728	Test		Turb	Sand	720	220	10		Field	LOG; Test for # 2 well
NE NW 13	St. Julian Mine Co. #11	Do.	1928	100	8	2.5	728	Test		Turb	Sand	720	220	10		Field	LOG; Test for # 2 well
NE NW 13	St. Julian Mine Co. #12	Do.	1928	100	8	2.5	728	Test		Turb	Sand	720	220	10		Field	LOG; Test for # 2 well
NE NW 13	St. Julian Mine Co. #13	Do.	1928	100	8	2.5	728	Test		Turb	Sand	720	220	10		Field	LOG; Test for # 2 well
NE NW 13	St. Julian Mine Co. #14	Do.	1928	100	8	2.5	728	Test		Turb	Sand	720	220	10		Field	LOG; Test for # 2 well
NE NW 13	St. Julian Mine Co. #15	Do.	1928	100	8	2.5	728	Test		Turb	Sand	720	220	10		Field	LOG; Test for # 2 well
NE NW 13	St. Julian Mine Co. #16	Do.	1928	100	8	2.5	728	Test		Turb	Sand	720	220	10		Field	LOG; Test for # 2 well
NE NW 13	St. Julian Mine Co. #17	Do.	1928	100	8	2.5	728	Test		Turb	Sand	720	220	10		Field	LOG; Test for # 2 well
NE NW 13	St. Julian Mine Co. #18	Do.	1928	100	8	2.5	728	Test		Turb	Sand	720	220	10		Field	LOG; Test for # 2 well
NE NW 13	St. Julian Mine Co. #19	Do.	1928	100	8	2.5	728	Test		Turb	Sand	720	220	10		Field	LOG; Test for # 2 well
NE NW 13	St. Julian Mine Co. #20	Do.	1928	100	8	2.5	728	Test		Turb	Sand	720	220	10		Field	LOG; Test for # 2 well
NE NW 13	St. Julian Mine Co. #21	Do.	1928	100	8	2.5	728	Test		Turb	Sand	720	220	10		Field	LOG; Test for # 2 well
NE NW 13	St. Julian Mine Co. #22	Do.	1928	100	8	2.5	728	Test		Turb	Sand	720	220	10		Field	LOG; Test for # 2 well
NE NW 13	St. Julian Mine Co. #23	Do.	1928	100	8	2.5	728	Test		Turb	Sand	720	220	10		Field	LOG; Test for # 2 well
NE NW 13	St. Julian Mine Co. #24	Do.	1928	100	8	2.5	728	Test		Turb	Sand	720	220	10		Field	LOG; Test for # 2 well
NE NW 13	St. Julian Mine Co. #25	Do.	1928	100	8	2.5	728	Test		Turb	Sand	720	220	10		Field	LOG; Test for # 2 well
NE NW 13	St. Julian Mine Co. #26	Do.	1928	100	8	2.5	728	Test		Turb	Sand	720	220	10		Field	LOG; Test for # 2 well
NE NW 13	St. Julian Mine Co. #27	Do.	1928	100	8	2.5	728	Test		Turb	Sand	720	220	10		Field	LOG; Test for # 2 well
NE NW 13	St. Julian Mine Co. #28	Do.	1928	100	8	2.5	728	Test		Turb	Sand	720	220	10		Field	LOG; Test for # 2 well
NE NW 13	St. Julian Mine Co. #29	Do.	1928	100	8	2.5	728	Test		Turb	Sand	720	220	10		Field	LOG; Test for # 2 well
NE NW 13	St. Julian Mine Co. #30	Do.	1928	100	8	2.5	728	Test		Turb	Sand	720	220	10		Field	LOG; Test for # 2 well
NE NW 13	St. Julian Mine Co. #31	Do.	1928	100	8	2.5	728	Test		Turb	Sand	720	220	10		Field	LOG; Test for # 2 well
NE NW 13	St. Julian Mine Co. #32	Do.	1928	100	8	2.5	728	Test		Turb	Sand	720	220	10		Field	LOG; Test for # 2 well
NE NW 13	St. Julian Mine Co. #33	Do.	1928	100	8	2.5	728	Test		Turb	Sand	720	220	10		Field	LOG; Test for # 2 well
NE NW 13	St. Julian Mine Co. #34	Do.	1928	100	8	2.5	728	Test		Turb	Sand	720	220	10		Field	LOG; Test for # 2 well
NE NW 13	St. Julian Mine Co. #35	Do.	1928	100	8	2.5	728	Test		Turb	Sand	720	220	10		Field	LOG; Test for # 2 well
NE NW 13	St. Julian Mine Co. #36	Do.	1928	100	8	2.5	728	Test		Turb	Sand	720	220	10		Field	LOG; Test for # 2 well
NE NW 13	St. Julian Mine Co. #37	Do.	1928	100	8	2.5	728	Test		Turb	Sand	720	220	10		Field	LOG; Test for # 2 well
NE NW 13	St. Julian Mine Co. #38	Do.	1928	100	8	2.5	728	Test		Turb	Sand	720	220	10		Field	LOG; Test for # 2 well
NE NW 13	St. Julian Mine Co. #39	Do.	1928	100	8	2.5	728	Test		Turb	Sand	720	220	10		Field	LOG; Test for # 2 well
NE NW 13	St. Julian Mine Co. #40	Do.	1928	100	8	2.5	728	Test		Turb	Sand	720	220	10		Field	LOG; Test for # 2 well
NE NW 13	St. Julian Mine Co. #41	Do.	1928	100	8	2.5	728	Test		Turb	Sand	720	220	10		Field	LOG; Test for # 2 well
NE NW 13	St. Julian Mine Co. #42	Do.	1928	100	8	2.5	728	Test		Turb	Sand	720	220	10		Field	LOG; Test for # 2 well
NE NW 13	St. Julian Mine Co. #43	Do.	1928	100	8	2.5	728	Test		Turb	Sand	720	220	10		Field	LOG; Test for # 2 well
NE NW 13	St. Julian Mine Co. #44	Do.	1928	100	8	2.5	728	Test		Turb	Sand	720	220	10		Field	LOG; Test for # 2 well
NE NW 13	St. Julian Mine Co. #45	Do.	1928	100	8	2.5	728	Test		Turb	Sand	720	220	10		Field	LOG; Test for # 2 well
NE NW 13	St. Julian Mine Co. #46	Do.	1928	100	8	2.5	728	Test		Turb	Sand	720	220	10		Field	LOG; Test for # 2 well
NE NW 13	St. Julian Mine Co. #47	Do.	1928	100	8	2.5	728	Test		Turb	Sand	720	220	10		Field	LOG; Test for # 2 well
NE NW 13	St. Julian Mine Co. #48	Do.	1928	100	8	2.5	728	Test		Turb	Sand	720	220	10		Field	LOG; Test for # 2 well
NE NW 13	St. Julian Mine Co. #49	Do.	1928	100	8	2.5	728	Test		Turb	Sand	720	220	10		Field	LOG; Test for # 2 well
NE NW 13	St. Julian Mine Co. #50	Do.	1928	100	8	2.5	728	Test		Turb	Sand	720	220	10		Field	LOG; Test for # 2 well
NE NW 13	St. Julian Mine Co. #51	Do.	1928	100	8	2.5	728	Test		Turb	Sand	720	220	10		Field	LOG; Test for # 2 well
NE NW 13	St. Julian Mine Co. #52	Do.	1928	100	8	2.5	728	Test		Turb	Sand	720	220	10		Field	LOG; Test for # 2 well
NE NW 13	St. Julian Mine Co. #53	Do.	1928	100	8	2.5	728	Test		Turb	Sand	720	220	10		Field	LOG; Test for # 2 well
NE NW 13	St. Julian Mine Co. #54	Do.	1928	100	8	2.5	728	Test		Turb	Sand	720	220	10		Field	LOG; Test for # 2 well
NE NW 13	St. Julian Mine Co. #55	Do.	1928	100	8	2.5	728	Test		Turb	Sand	720	220	10		Field	LOG; Test for # 2 well
NE NW 13	St. Julian Mine Co. #56	Do.	1928	100	8	2.5	728	Test		Turb	Sand	720	220	10		Field	LOG; Test for # 2 well
NE NW 13	St. Julian Mine Co. #57	Do.	1928	100	8	2.5	728	Test		Turb	Sand	720	220	10		Field	LOG; Test for # 2 well
NE NW 13	St. Julian Mine Co. #58	Do.	1928	100	8	2.5	728	Test		Turb	Sand	720	220	10		Field	LOG; Test for # 2 well
NE NW 13	St. Julian Mine Co. #59	Do.	1928	100	8	2.5	728	Test		Turb	Sand	720	220	10		Field	LOG; Test for # 2 well
NE NW 13	St. Julian Mine Co. #60	Do.	1928	100	8	2.5	728	Test		Turb	Sand	720	220	10		Field	LOG; Test for # 2 well
NE NW 13	St. Julian Mine Co. #61	Do.	1928	100	8	2.5	728	Test		Turb	Sand	720	220	10		Field	LOG; Test for # 2 well
NE NW 13	St. Julian Mine Co. #62	Do.	1928	100	8	2.5	728	Test		Turb	Sand	720	220	10		Field	LOG; Test for # 2 well
NE NW 13	St. Julian Mine Co. #63	Do.	1928	100	8	2.5	728	Test		Turb	Sand	720	220	10		Field	LOG; Test for # 2 well
NE NW 13	St. Julian Mine Co. #64	Do.	1928	100	8	2.5	728	Test		Turb	Sand	720	220	10		Field	LOG; Test for # 2 well
NE NW 13	St. Julian Mine Co. #65	Do.															

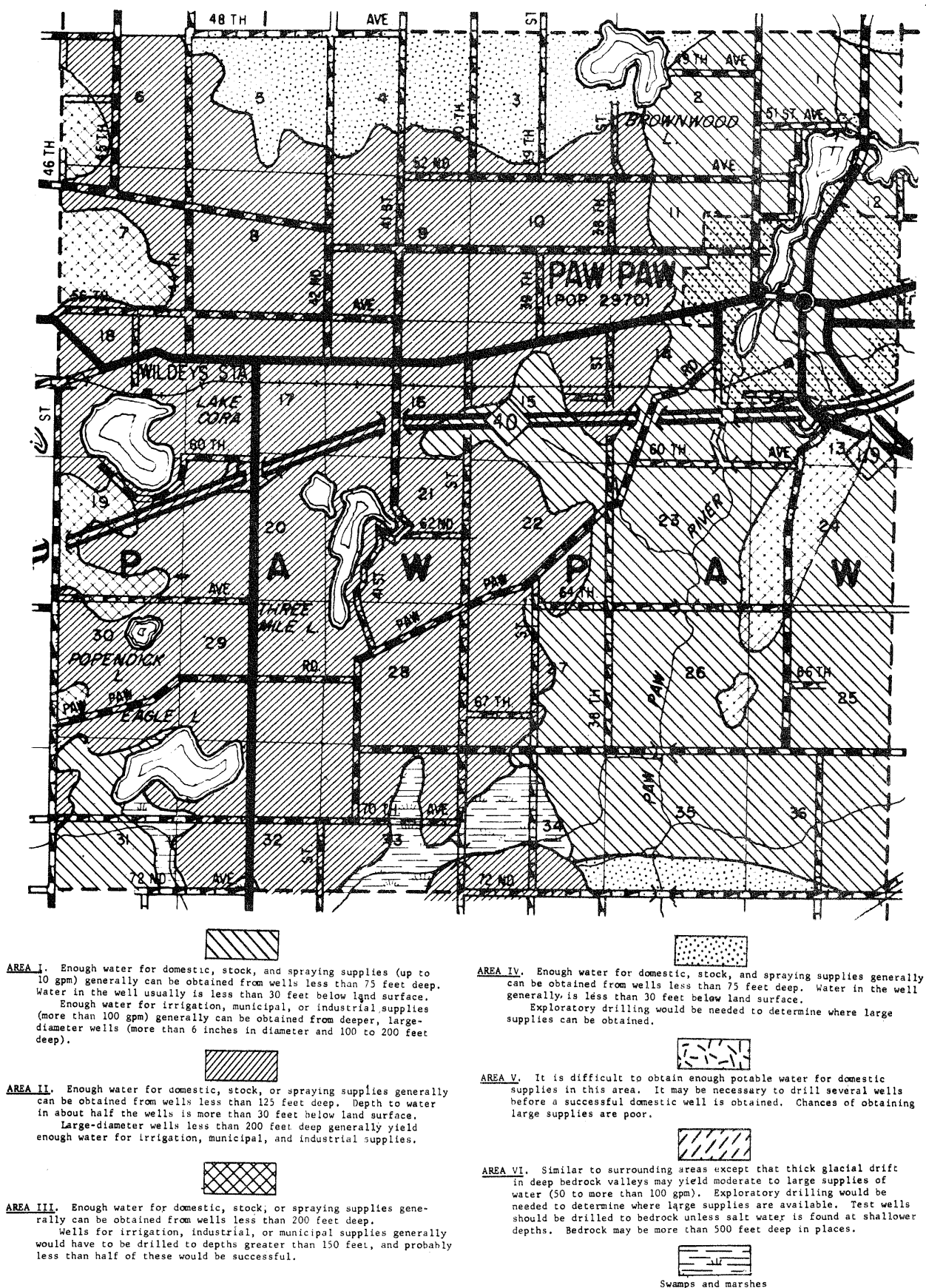


Table 21.--Records of selected wells in Pine Grove Township (T. 1S., R. 13W.)

Explanation: e - estimated; Analyst--Field, not accurate to laboratory standards; USGS, U. S. Geological Survey; MDH, Michigan Dept. of Health; Remarks--LOG, record of materials penetrated on file; ANAL, also see table of chemical analyses of ground water.

Location + sec	Owner	Driller	Year drilled	Depth (in ft.)	Diam (in inches)	Water level (in feet)	Month and year measured	Yield (in gpm)	Use	Screen openings (inches)	Pump	Water- bearing materials	Altitude (in msl)	Quality of Water				Remarks
														Iron (as Fe)	Hardness (as CaCO ₃)	Chloride (Cl)	Analyst	
NW 1/4 1	G. Bedford		1927	18	2	27			Dom		Jet		724	0	120		Field	pH 7.2
NW 1/4 2	R. Karnes		1943	105	2	70			Dom		Jet		730		250	10	Field	Well went dry - *Driller deepened fr 80'-105'
NE 1/4 5	R. Orell	*E. Brindley	1943	82	2	31	10-62	*25	Dom	.015	Jet		780		280	15	Field	*Pumped w/drilling machine
SE 1/4 6	Sobana	E. Brindley	1947	90	2				Dom		Piston		780				Field	Well deeper but pulled back to 90'
SE 1/4 8	S. Merz		1947	91	2				Dom		Piston		780	1.5	272	4.0	USGS	
NW 1/4 8	A. Boothby	G. Huff	1955	95	4	17	-55		Dom	.010	Sum	Gravel	790	1.0	200	10	Field	Ski Lodge
SW 1/4 12	R. Bantz	Scott	1962	40	2	10	-62		Dom		Sum		801	1.0	170	10	Field	Need more water
SW 1/4 14	R. Bricker	Owner	1960	24	2	44	-60		Dom	.007	Jet	Sand	790	1.0	240	10	Field	Is old well deepened to 60 feet
NE 1/4 16	C. Birdsall	J. Newman	1947	113	8	76	-48	300	Dom		Turb	Sand	860		405	18	USGS	*Pumped by driller; pH 7.1
NE 1/4 16	M. Weston	E. Brindley	1962	49	2	41	-62	*30	Dom	.015	Jet	Gravel, sand	810		260	10	Field	
NW 1/4 18	S. Mojewnik	H. Tuck	1953	98	3	30	8-63		Dom	.007	Jet	Gravel	800	0.4	270	15	Field	
SE 1/4 21	C. Laviolette	Owner	1961	28	1 1/2	16	-61		Dom		Jet	Sand	790		130	15	Field	
SW 1/4 21	C. Adams	C. Cooley	1956	43	2	109	-62	*20	Dom	.010	Centr	Sand	785		150	15	Field	
NW 1/4 22	C. Leversee	E. Brindley	1962	136	4	109	9-62		Dom	.030	Sum		860	1.0	260	15	Field	*Pumped by driller
NE 1/4 22	H. Griffin	E. Brindley	1977	194	2	e154		*50	Dom	.012	Centr		730				Field	
NE 1/4 25	Mentha Plantation Co.	E. White	1952	90	8	10	10-62		Irrig		Turb	Gravel	728	1.0	250	25	Field	pH 7.4; flowed 1 gpm; Temp 51.0°F
SW 1/4 26	C. Ray	Owner	1956	39	2	32	-56	250	Dom	.010	Jet	Gravel	765	1.5	250	10	Field	Temp 51.5°F at pump
NE 1/4 27	C. Leversee & Sons	E. Brindley	1962	71	2	8	4-62		Dom		Piston	Sand	780	0	220	15	Field	
SW 1/4 29	Fotesch	E. Brindley	1962	27	2	10	8-62	*30	Dom	.007	Jet	Sand	780	1.5	150	10	Field	Hardness at 21' deep nearby well 100; Fe 2.0
NW 1/4 30	City of Gobles # 1	A. Kersey	1917	105	8	49	10-63		Dom	.010	Piston		780				Field	*Pumped by driller
NW 1/4 30	Do.	Layne-Northern	1958e	124	8	45		340	Mun	.015-.020	Centr		815	None	272	10	MDH	LOG; Municipal well abandoned
SE 1/4 30	Do.	Dunbar Drig. Co.	1958e	110	10	45		405	Mun	.025-.050	Turb	Sand, gravel	812	0.2	235	5	MDH	ANAL; LOG; Drilled to 135' pulled back
SE 1/4 30	C. Stratton	Val's Pump Serv.	1953	22	1 1/2	14	-56		Dom		Turb	Sand	780	0	170	10	Field	Area wells 18'-40' deep
SW 1/4 31	G. Burza		1953	22	1 1/2	14			Dom		Jet	Sand	770	0.1	170	9.0	USGS	ANAL.
SW 1/4 33	F. Nash		1953	36	2	8			Dom		Jet	Sand	810		260	10	Field	
SW 1/4 35	C. Covault		1920e	95	2	8		350	Dom		Jet	Sand	740		415	39	USGS	ANAL; Oil wells nearby
SE 1/4 35	Mentha Plantation Co.	J. Newman	1912e	23	1 1/2	6	-56		Dom		Piston	Sand	720	0.46	271	8.0	USGS	ANAL; Temp 51.5°F
SE 1/4 36	Mentha Plantation Co.		1947	90	8	6			Ind, Irrig		Turb	Gravel	728				USGS	Many company house wells in area 2" x 90'-100'

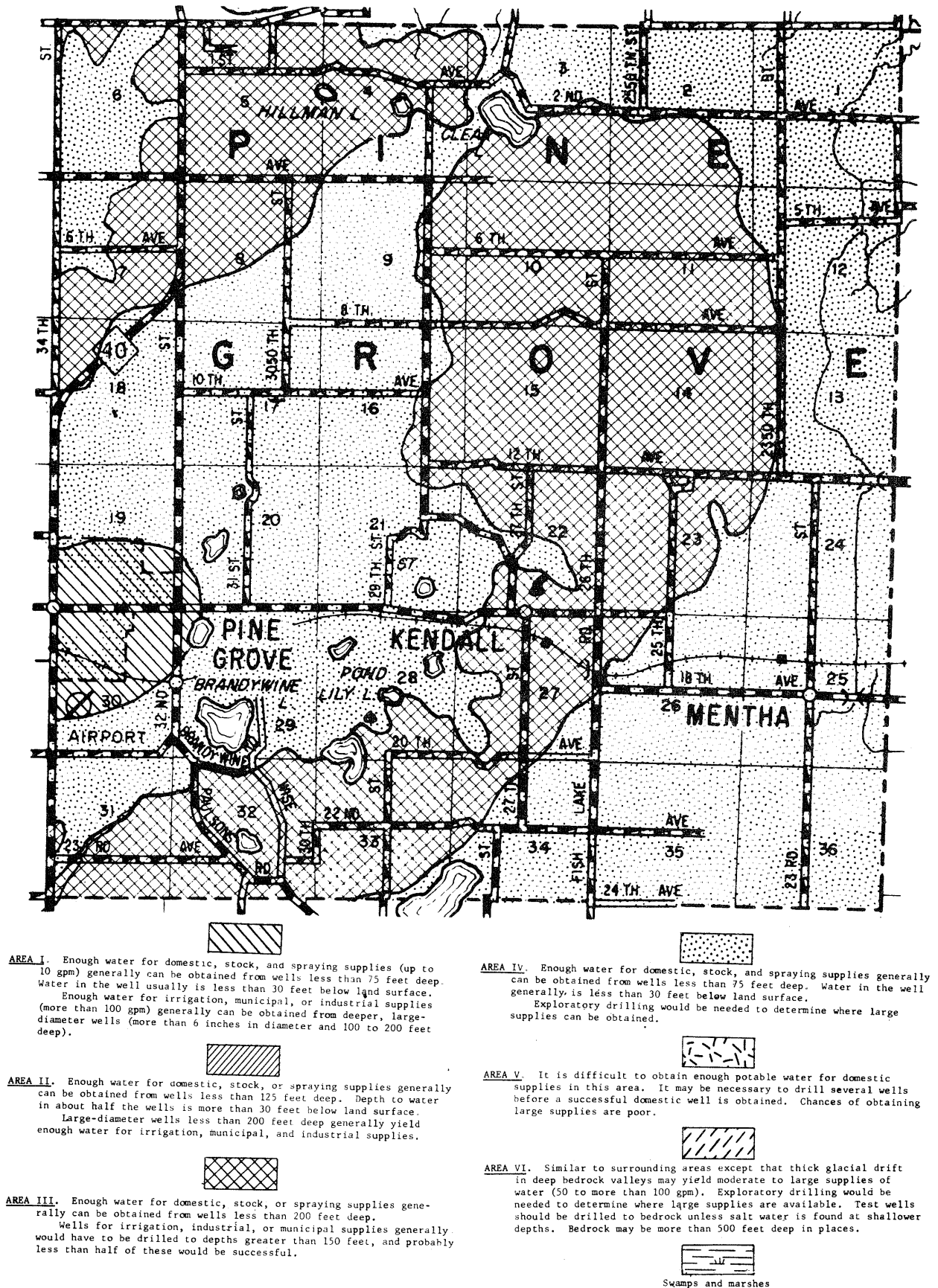


FIGURE 42.--MAP OF PINE GROVE TOWNSHIP SHOWING THE GENERAL AVAILABILITY OF GROUND WATER TO WELLS.

Table 22.--Records of selected wells in Porter Township (T. 4S., R. 13W.)

Explanation: e - estimated; Analyst--Field, not accurate to laboratory standards; USGS, U. S. Geological Survey; MDH, Michigan Dept. of Health; Remarks--LOG, record of materials penetrated on file; AMI, also see table of chemical analyses of ground water.

Location T. 4S., R. 13W.	Owner	Driller	Year drilled	Depth (in ft.)	Diam (in inches)	Water level (in feet)	Month and year measured	Yield (in gpm)	Use	Screen openings (inches)	Pump	Water- bearing materials	Altitude (in msl)	Iron (as Fe)	Hardness (as CaCO ₃)	Chloride (Cl)	Analyst	Remarks
SE SE 2	L. Turner & Sons	E. Sanders	1962	78	2	e 59	-62	10	Dom, Stk	.010	Jet	Sand	960	tr	270	5	Field	pH 7.2
NE NE 3	W. Shoemaker	E. Sanders, Val's Pump Serv.				120	7-61	10	Dom, Spray	.010	Centr Jet	Sandy clay Sand	1,000 860		200	5	Field	umps gray clay
NE NE 5	L. Gibson	E. Sanders	1951	85	2	e 61	-61		Dom, Spray	.010	Jet	Sand	830	0	300	10	Field	pH 7.2
SE SW 5	L. Hazleton		1886	74	2	22	-48		Dom				790	2.0	250	15	Field	LOG
NE NW 5	Honeybear Packing Co.	Layne-Northern	1958	109	8	9	-58	164	Pub, Ind	.010 & .015	Turb	Sand, gravel	790	tr	205	15	Field	16 2" wells (incl. 1-4") 27-37 ft deep.
NE NW 6	Honeybear Packing Co.	E. Sanders & others								.012, .010	Suct		780	0.4	325	25	Field	pH 7.5
SE SE 6	R. Franks	Owner	1959	30-37	2				Dom		Jet	Sand, gravel	900		390	25	Field	pH 7.2
SE SE 7	D. Perkins	E. Sanders		140	2	126	-50		Dom, Stk		Piston	Sand, gravel	820	0.4	250	5	Field	ph 7.5; supply inadequate
NE NW 8	R. Rife	E. Sanders	1961	115	2	e 85	-61		Dom, Spray	.010	Jet	Sand, gravel	953	tr	290	15	Field	Uses pond for spray water
NE NW 9	W. Cummings	E. Sanders		132	2	e 118	-55		Dom	.010	Jet		950		200	5	Field	Had dug well w/60' of pipe for 80 yrs.
NE NW 10	R. Cornish	E. Sanders		87	2	75	-60		Dom	.010	Jet		942	tr	340	10	Field	Old windmill well
NE NE 11	C. Frick	E. Sanders	1958e	80	2	90	-63		Dom		Piston		940		360	10	Field	LOG; see hydrographs
SE NW 11	Girl Scouts SW Mich			e 80	2				Dom				926	0	390	10	Field	Old windmill well
SE NW 13	L. Dalley	U. S. G. S.	1963	83	1 1/2	47.15	5-63		Dom	.010	None	Sand	910		220	5	Field	pH 7.5
SE SW 15	Porter Township		1880	72	2	e 59			Dom, Spray	.010	Piston		940		410	10	Field	Have 2 wells same depth
NE NW 16	H. Mooney	E. Sanders	1956	108	2	51	-63		Dom, Spray	.010	Jet		910		300	10	Field	Have 3 wells same depth
NE NW 20	J. & G. Nesbitt	E. Sanders	1953	65	2	14	-63		Dom, Stk	.010	Jet	Sand	915	tr	300	10	Field	pH 7.1; have 2 wells
NE NW 21	R. Alexander	Owner	1944	e 30	2	67	-59		Dom		Jet	Gravel	920		388	18	Field	ANAL.
NE NW 24	R. Coppenhaver	E. Sanders	1945e	73	2	e 45	-63	10	Dom, Stk	.010	Jet	Sand	910		270	5	Field	Have total of 4 wells - 2-48', 1-113'
NE NW 25	K. Wellborn			72	2				Dom, Stk	.010	Jet	Sand, gravel	930					
SE NW 27	E. Shugars			75	2				Dom, Stk	.010	Jet	Sand, gravel	920	2.5				
NE NW 28	L. Cornish	E. Sanders	1962	73	2	53	-62		Dom, Stk	.010	Jet	Sand, gravel	905					
NE NW 29	E. Cornish	E. Sanders	1956	82	2	e 48	-58		Dom	.010	Jet	Sand, gravel	890					
NE NW 30	J. Turner	E. Sanders	1956	45	3			ell	Dom, Stk	.010	Jet	Gravel	905					
NE NW 31	C. Allett	E. Sanders	1961	45	4	11		75	Spray		Jet	Gravel	890					
NW NW 33	A. Bays	E. Sanders	1945	65	2	e 27			Pub	.010	Jet	Gravel	900					
NW NW 34	S. Green	E. Sanders		65	2				Dom, Stk		Jet	Gravel	880		350	5	Field	Trailer Court Cabins at lake edge
SE SE 36	E. Abernathy			e 25	2				Dom, Stk		Jet		895	tr	230	10	Field	pH 7.2
SW NW 36	E. Stratton	E. Sanders	1948	28	2	22			Dom, Stk		Piston	Gravel	910					

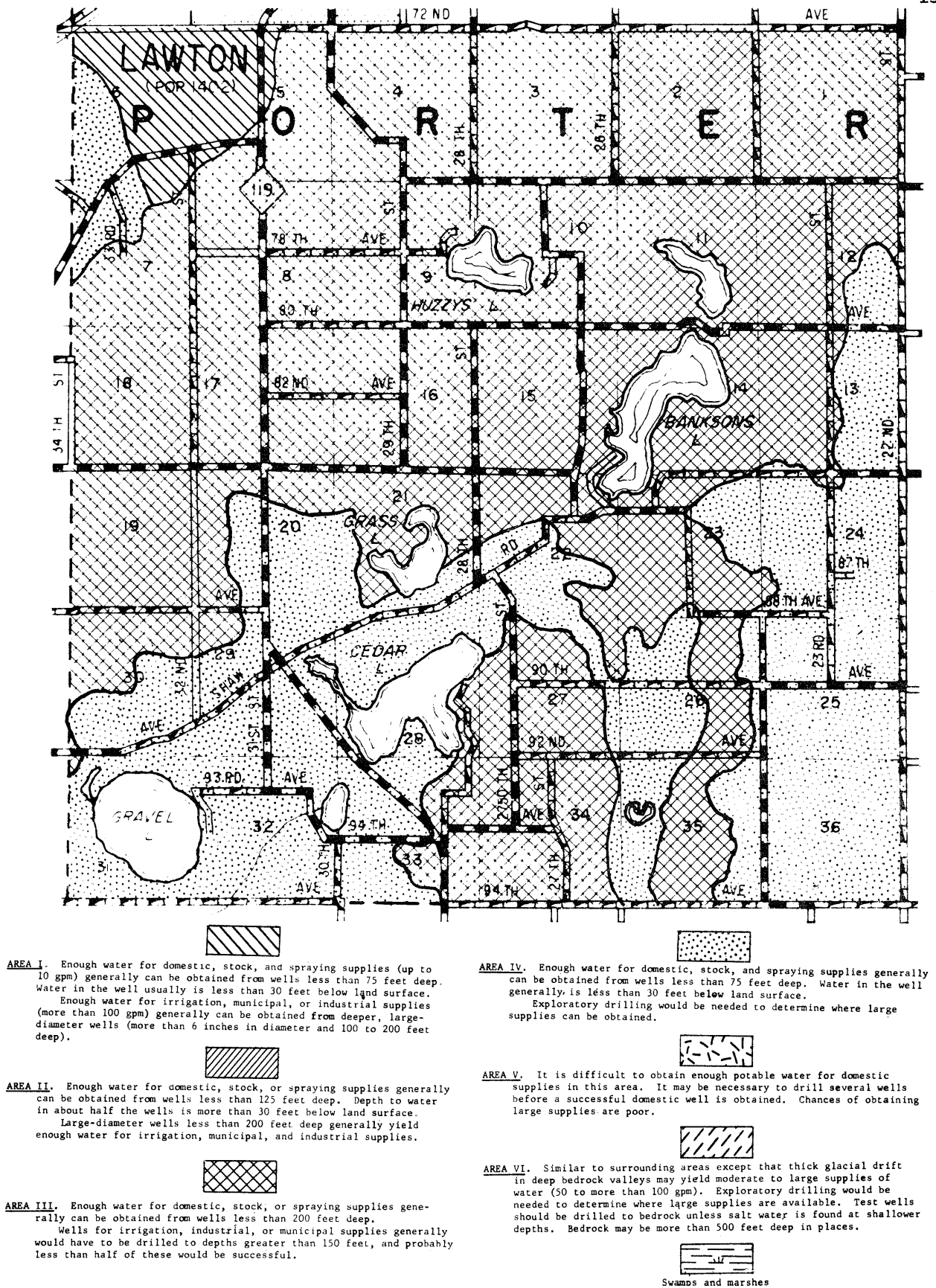


FIGURE 43.--MAP OF PORTER TOWNSHIP SHOWING THE GENERAL AVAILABILITY OF GROUND WATER TO WELLS.

Table 23.--Records of selected wells in South Haven Township (T. 1S., R. 17W.)

Explanation: e - estimated; Analyst--Field, not accurate to laboratory standards; USGS, U. S. Geological Survey; MDH, Michigan Dept. of Health; Remarks--LOG, record of materials penetrated on file; ANAL, also see table of chemical analyses of ground water.

Location T. R. Sec	Owner	Driller	Year drilled	Depth (in ft)	Water level (in feet)	Month and year measured	Yield (in gpm)	Use	Screen opening (inches)	Pump	Water bearing materials	Altitude (in msl)	Quality of Water			Analyst	Remarks
													Iron (as Fe)	Hardness (as CaCO ₃)	Chloride (Cl)		
SW SE 1	A. Stogiera		1949	60	2			Dom		Piston	Sand	635	0.5	190	30	Field	Specific Conductance 440
SW SE 2	E. Dykstra		1929	96	2		60	Dom	.007	Jet	Sand	630	0.6	310	5	Field	Specific Conductance 700
SW SE 3	Do.		1963	145	4		25	Ind	.007	Subm	Sand	639					
NW SE 1	Mich Fruit Can Co # 1	J. Taylor	1937	36	38		90	Stk	.018	Subm	Gravel	637					
NW SE 2	Do.	Layne-Northern	1938	42	12	6-37	150	Ind	.155	Subm	Sand	580					
NW SE 3	Do.	Do.	1951	42	12	1-38	250	Ind			Sand	580					
NW SE 10	Aldo Hotel	H. Geer	1927	1716	10	3-51	140	Ind			Sand	580	1.	240	30	Field	Drilled 7 test wells; LOGS; # 1 gravel packed
SW SW 10	Everett Piano Co.		1932	193	6	5-32	75	Ind		Turb	Gravel	625	0.1	37,000	103,700	Field	LOG; gravel packed
NE SE 11	City of South Haven	Layne-Northern	1963	96	2			Test		None		630	0.1	240	99	MDH	Specific Conductance 680; LOG; gravel packed
NE SE 12	J. Gordon	R. Sanders	1953	84	2			Dom		Jet	Sand	635	2.5	290	Tr	MDH	LOG; Anal. on file; Mineral Water
NE NE 12	R. Bailey	Owner	1953	30	1 1/2			Dom		Jet	Sand	660	0.5	170	Tr	Field	LOG; Anal. at 786'; ANAL.
NE NE 12	J. Stachnik			80	2			Stk, Dom	.007	Jet	Sand	630					
NE NE 12	T. Gency			50	2			Stk, Dom	.007	Jet	Sand	630					
NE NE 13	A. Sevastius	J. Taylor	1943	90	2		3	Ind, Dom	.006	Jet	Sand	670					
SW NW 14	I. Stein	C. Jones	1952	100	2	-63		Dom, Spray		Jet	Sand	685					
NE SE 15	Mich. State Highway	J. Newman	1941	100	4			Pub		Turb	Sand	640	0.2	140	20	Field	Specific Conductance 380; for greenhouse
NE SE 15	Lambert Subdivision	Do.		87	6			Pub		Jet	Sand	630					
SW SW 15	Do.			86	2			Pub		Jet	Sand	630					
SW SW 15	M. Steive		1940	180	38			Dom		Jet		620					
SW SW 21	C. Jones	H. Starbeck	1962	38	1 1/2			Dom		Jet		620	0.2	86	Tr	Field	LOG; Abandoned well
SW NE 22	E. Cooper		1922	80	1 1/2			Stk, Dom		Piston		645	0.7	241	35	Field	Specific Conductance 200
SW NE 22	Phillips Gas Station			78	2	8-63	5	Dom	.010		Gravel	650					
SW NE 23	Stevie Bros.	G. Taylor	1963	132	4	9-63	40	Obs	.010		Gravel	640					
SW NE 23	R. Nelson	J. Taylor	1960	286	2	-60	20	Dom	.010	Jet	Sand	645	4.	172	590	Field	Well abandoned
NE NE 25	T. Nuffer	Thomson	1948	68	2	-63		Dom, Ind	.006	Jet	Sand	650	0.7	138	365	Field	LOG; see hydrographs
NE SE 27	J. Jakubs		1955	91	2			Ind		Jet	Sand	645	1.0	172	30	Field	LOG; Specific Conductance 440
NW NE 33	Black River Orchids			20	2			Ind		Jet	Sand	620	1.7	120	30	Field	Specific Conductance 1,000
NW NW 36	J. Mucha	H. Starbeck	1957	143	2			Dom	.010	Jet		680	0.4	121	370	Field	Have 10 shallow wells

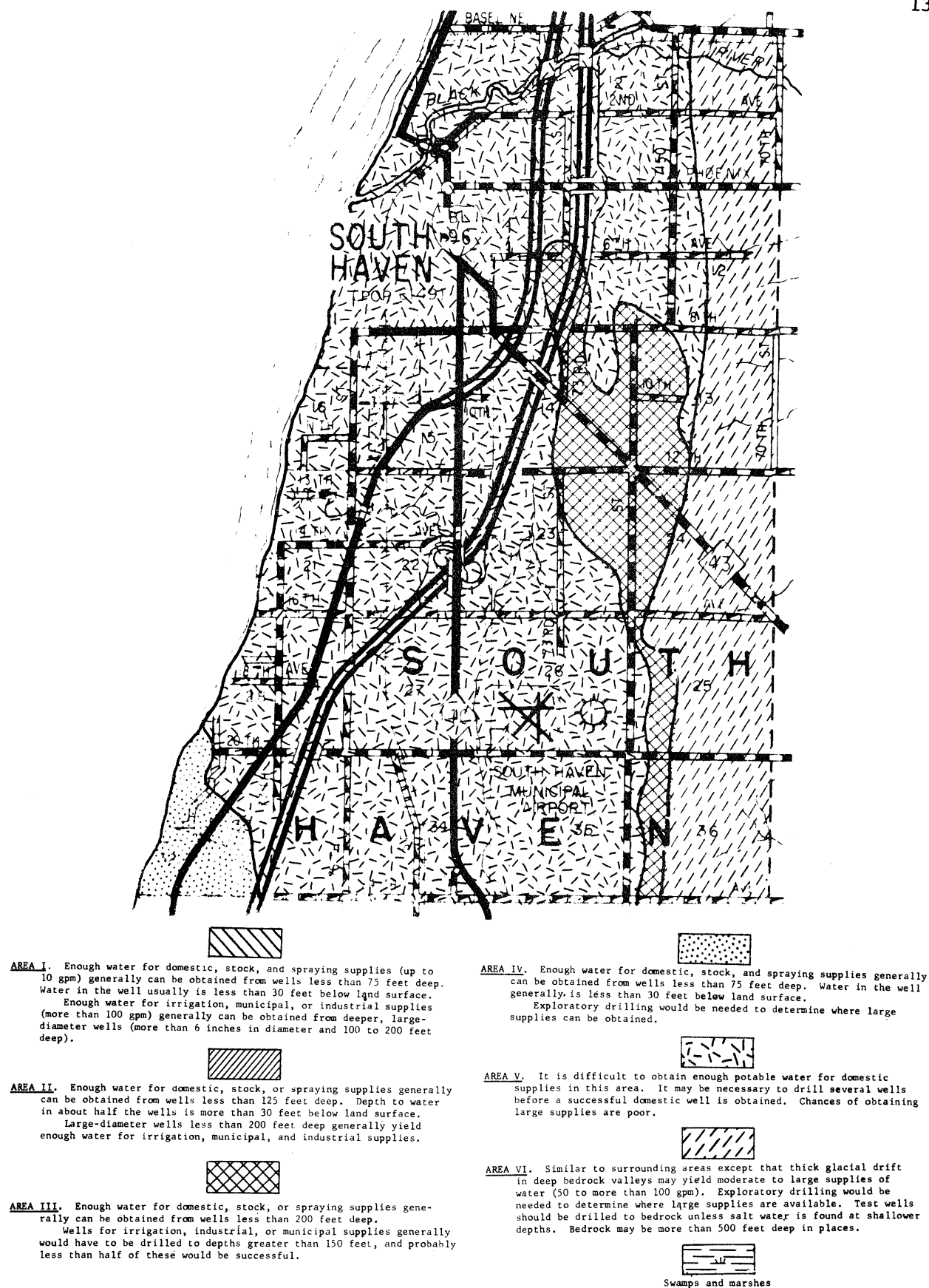


Table 24.--Records of selected wells in Waverly Township (T. 2S., R. 14W.)

Explanation: e - estimated; Analyst--Field, not accurate to laboratory standards; USGS, U. S. Geological Survey; MDH, Michigan Dept. of Health; Remarks--LOG, record of materials penetrated on file; ANAL, also see table of chemical analyses of ground water.

Location T. R. S.	Owner	Driller	Year drilled	Depth (in ft.)	Diam (in inches)	Water level (in feet)	Month and year measured	Yield (in gpm)	Use	Screen openings (inches)	Pump	Water- bearing materials	Altitude (in mal	Quality of Water				Remarks
														Iron (as Fe)	Hardness (asCaO3)	Chloride (Cl)	Analyst	
SW SE 1	V. Johnson	E. Brindley		35	3	30	-53		Dom,Stk		Jet	Sand, gravel	770	tr	240	15	Field	ANAL ANAL ANAL
SW SE 2	R. Leedy	Do.	1955	e 60	3	62	-55	16	Dom		Jet	Sand	770	0.4	240	10	Field	
SW SE 4	T. Kiefer	C. Cooley		118	2				Dom		Jet		760	0.6	255	10	Field	
NE NE 5	M. Fourn	R. Sanders	1933	120	2				Dom,Stk		Piston	Gravel	730	0.1	305	10	Field	
SW SE 7	C. Santello	P. Groth	1945	85	2				Dom,Stk		Piston	Sand	735	4.5	315	5	USGS	
SW SE 10	P. Groth	J. Newman	1961	60	2				Dom,Stk	.010	Jet		780	0.4	223	7	USGS	
SE SE 12	L. Ringel			184	3				Dom		Jet		770	0	306	50	USGS	
SW SE 13	C. Janosek			35	2				Dom		Jet		740	0	220	15	Field	
SW SE 14	D. Beach			28	1 1/2	29	-62		Dom,Stk		Jet	Sand	700	0.4	240	10	Field	
NE NW 14	M. Anthony	E. Sanders	1946	165	2	80	-46		Dom,Stk		Piston	Gravel	780	0.7	240	15	Field	
NE NW 17	G. McKnight			35	1 1/2				Dom,Stk	.010	Jet		710	1.5	240	10	Field	
NE NW 20	N. Trull			e 30	2				Dom,Stk		Jet		700	1.5	270	10	Field	
NE NW 21	L. Chase	Owner	1960	28	1 1/2	10	-60		Dom,Stk		Jet	Gravel	720	2.5	375	10	Field	
NE NW 22	B. Donora	E. Sanders	1958	54	2	29	-58		Dom,Stk		Jet	Sand	700	1.5	220	10	Field	
NE NE 22	F. Kester	E. Brindley	1963	46	2	20	-63		Dom,Stk		Piston		710	0	190	25	Field	
NE NE 25	L. Peacock			27	2				Dom,Stk		Jet		690	0.6	170	15	Field	
SW SE 27	W. Jala		1953	20	2 1/2				Dom		Jet	Gravel	689	0.5	190	20	Field	
SW SE 28	W. Fytczyk	G. Tinker		18	1 1/2	16	-60	e16	Dom		Jet		695	0	280	20	Field	
SW NW 30	M. Mills	G. Tinker	1960	65	2	4	-60		Dom,Stk	.010	Piston	Gravel					LOG	
SE NW 31	Sernatinger		1958	64	2	4	10-58		Dom		Jet	Gravel	680	0.4	214	10	USGS	
NE NW 32	W. Fleeman	Owner	1959	48	1 1/2	flow	-59		Dom	.010	Piston	Sand	690	150	85	Field	flow 1/2 gal a minute; ANAL	
NE NW 35	Co. Rd. Comm.	U.S.G.S.	1963	12	1 1/2	7.05	5-63		Obs.		Piston	Sand	700	0.6	125	3	See hydrograph; Drilled to 82'-pulled back	
NE NW 36	E. Mallek		1918	35	1 1/2				Dom		Piston	Sand					See USGS anal.	

Table . Records of selected wells in Alma Township (T. 2 S., R. 13 W.)

Explanation: e - estimated; Analyst--Field, not accurate to laboratory standards; USGS, U. S. Geological Survey; MDH, Michigan Dept. of Health; Remarks--LOG, record of materials penetrated on file; ANAL, also see table of chemical analyses of ground water.

Location T. R. S.	Owner	Driller	Year drilled	Depth (in ft.)	Diam (in inches)	Water level (in feet)	Month and year measured	Yield (in gpm)	Use	Screen openings (inches)	Pump	Water- bearing materials	Altitude (in msl)	Quality of Water				Remarks	
														Iron (as Fe)	Hardness (as CaCO ₃)	Chloride (Cl)	Analyst		
Co. Rd. Commission	USGS																		
NW 2	Co. Rd. Commission	USGS	1963	23	1 1/2	17.12	4-63		Obs	Drive Pt	Piston	Sand	730	tr	240	5	Field	Used as observation well	
SW 4	G. Stoughton	W. Goble	1939	36	2	24	5-39		Dom	.007	Piston	Gravel	760	2.5	250	5	Field		
SW 5	E. Bergen			e60	3	50	-50		Dom		Jet	Sand, gravel	790	0.6	220	10	Field	Through clay at 33'	
SE 10	B. Penny	Owner	1963	38	1 1/2	+3	10-63		Dom	.007	Jet	Sand, gravel	720	0.6	220	10	Field		
SW 12	G. Vander Molen		1958	46	2	e-1	-58	55	Dom		Jet	Sand, gravel	760	0.4	200	10	Field	LOG	
SW 13	Wolf Lake Fish Hatch.	T. Newman	1948	60	4	2.3	-48		Pub	.014	Jet	Sand	770					4 gpm flow; hydrogen sulfide odor reported	
SE 14	Wolf Lake Fish Hatch.	L. Sanders		60	3	flows	8-62		Pub		Jet	Sand, gravel	720	1.0	220	20	Field	Restaurant supply	
NW 15	G. Cox	D. Waite	1962	45	2	3	-61		Dom		Piston	Sand, gravel	760	0.8	220	10	Field	Has 2 wells	
NW 16	O. Ketchum	E. Brindley	1962	110	2	40-60	-61		Dom		Jet	Sand, gravel	760	0.5	220	10	Field		
NW 18	C. Leonard		1953	85	2				Dom		Jet	Sand, gravel	722	0.4	220	10	Field		
SE 21	H. Livingston	Owner	1958	15	2				Dom		Jet	Sand, gravel	735	0.8	180	5	Field		
SE 22	R. Wertzler	E. Sanders	1936	72	2				Dom		Jet	Sand, gravel	810	tr	180	5	Field		
SE 23	R. Overacker	Rice	1938	73	2				Dom, Stk		Piston	Sand, gravel	840	0.2	170	5	Field		
NE 24	M. Williams	E. Sanders	1959	86	3	e46	-59		Dom		Jet	Gravel	840	0.4	200	10	Field	May use for Irrigation	
NE 26	M. Vandersalm	E. Sanders	1959	86	3				Dom		Jet	Gravel	820	0.4	200	10	Field		
SE 27	E. Rittner	R. Sanders	1958	60	2				Dom		Jet	Gravel	840	0.4	200	10	Field		
SE 28	L. Vandersalm	E. Sanders	1958	60	2				Dom		Jet	Gravel	820	0.4	200	10	Field		
NE 28	L. Howard	E. Sanders	1958	25	2				Dom		Jet	Gravel	760	0.1	180	200	Field		
SE 29	V. Miller	E. Sanders	1963	40	2	11	7-63		Dom		Jet	Gravel	710	170	200	10	Field		
NW 29	F. Beyer			18	2				Dom		Jet	Gravel	710	170	200	10	Field		
SW 31	P. Churchill	Owner	1940	22	1 1/2	15	-40		Dom	.005	Centr	Sand	720	200	200	200	Field		
SW 32	M. Fillifanus	Owner	1959	22	1 1/2	16	-59		Dom		Jet	Sand	730	180	180	200	Field	Also has well 57' deep	
SE 36	H. Boyen	L. Nolan	1963	44	2	e30	9-63	10	Spray		Jet	Sand	860	200	200	200	Field		

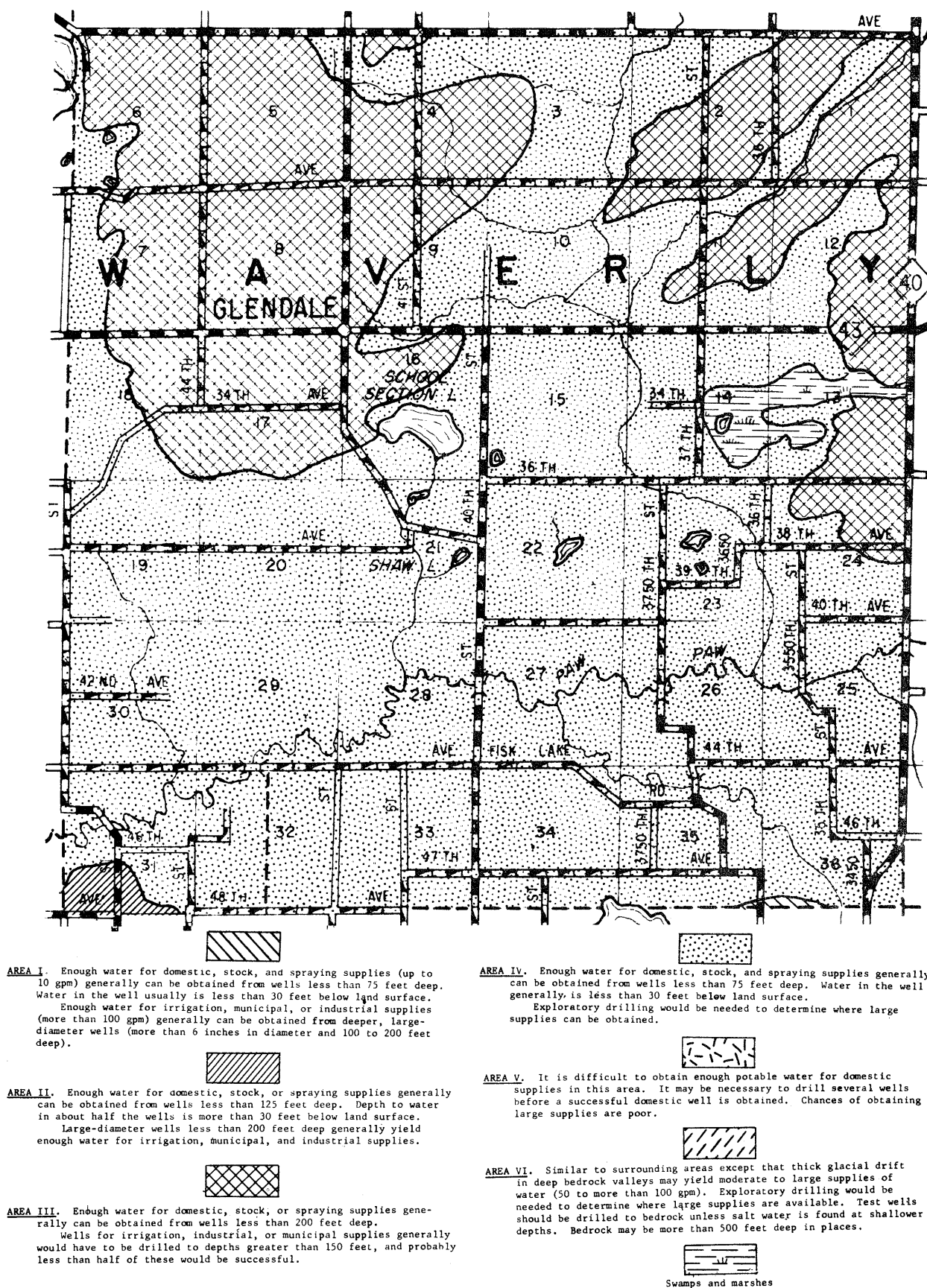


FIGURE 45.--MAP OF WAVERLY TOWNSHIP SHOWING THE GENERAL AVAILABILITY OF GROUND WATER TO WELLS.

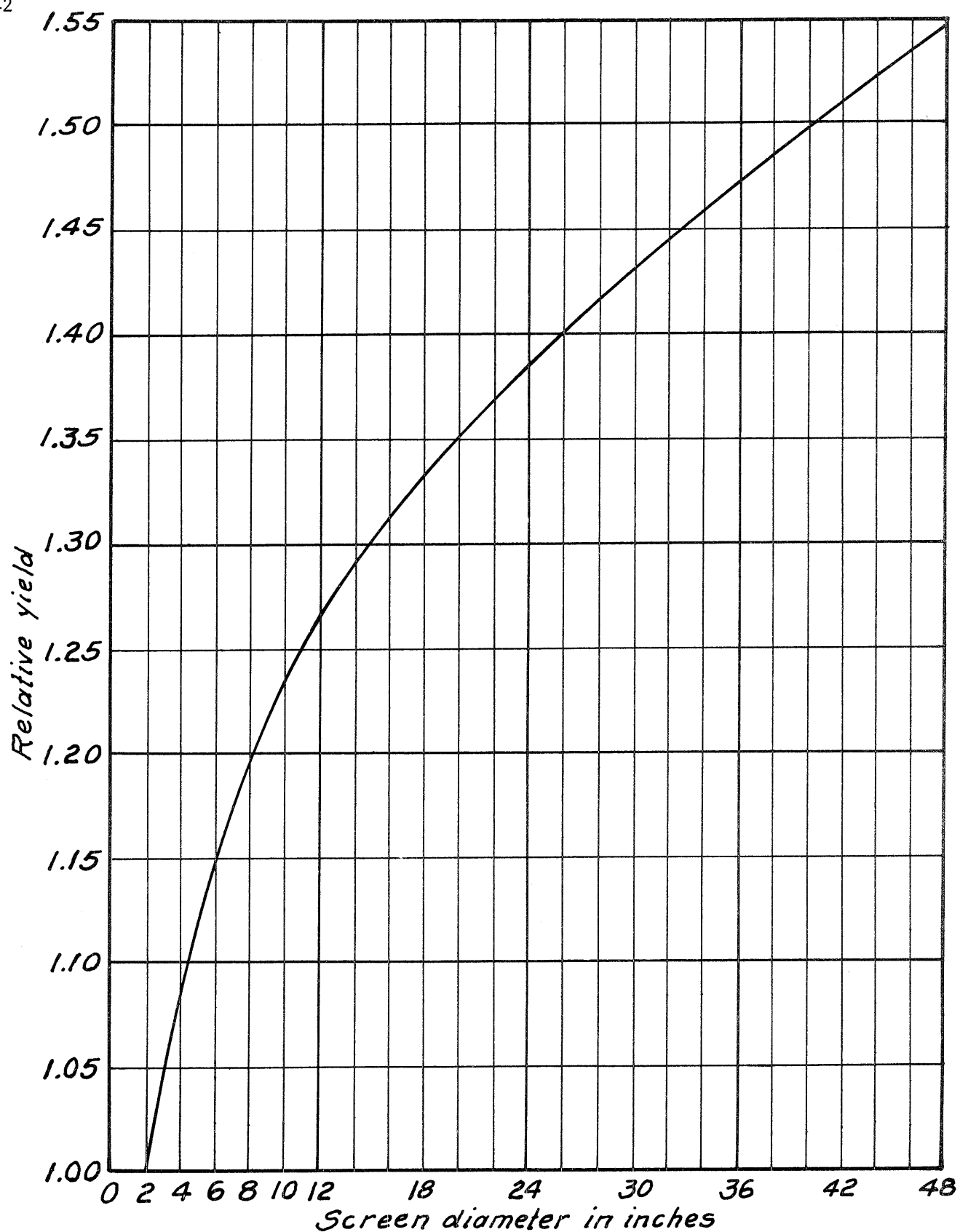


FIGURE 46.--CURVE SHOWING RELATION BETWEEN DIAMETER AND YIELD IN WELLS HAVING SAME DEPTH, SAME SCREENS, AND IN SAME FORMATION (after Theis, C. V., 1953).

The relative yield of a 12-inch and a 24-inch diameter well is 1.27 and 1.38, or an advantage in yield of only 10 percent in the 24-inch well.