SLIGHTLY SALINE WATER UNIT (1–3 GRAMS PER LITER)

EXPLANATION

Igneous and uplifted sedimentary rocks that generally have low yields of water to wells

1000 — Contour, approximately located. *Shows altitude of 1-gram per liter isosaline surface (base of fresh-water unit). Contour interval 500 to 1000 feet. Datum is mean sea level*

Basin boundary

Control point

EXPLANATION

0-25 | 25-100 | 100-500 | More than 500

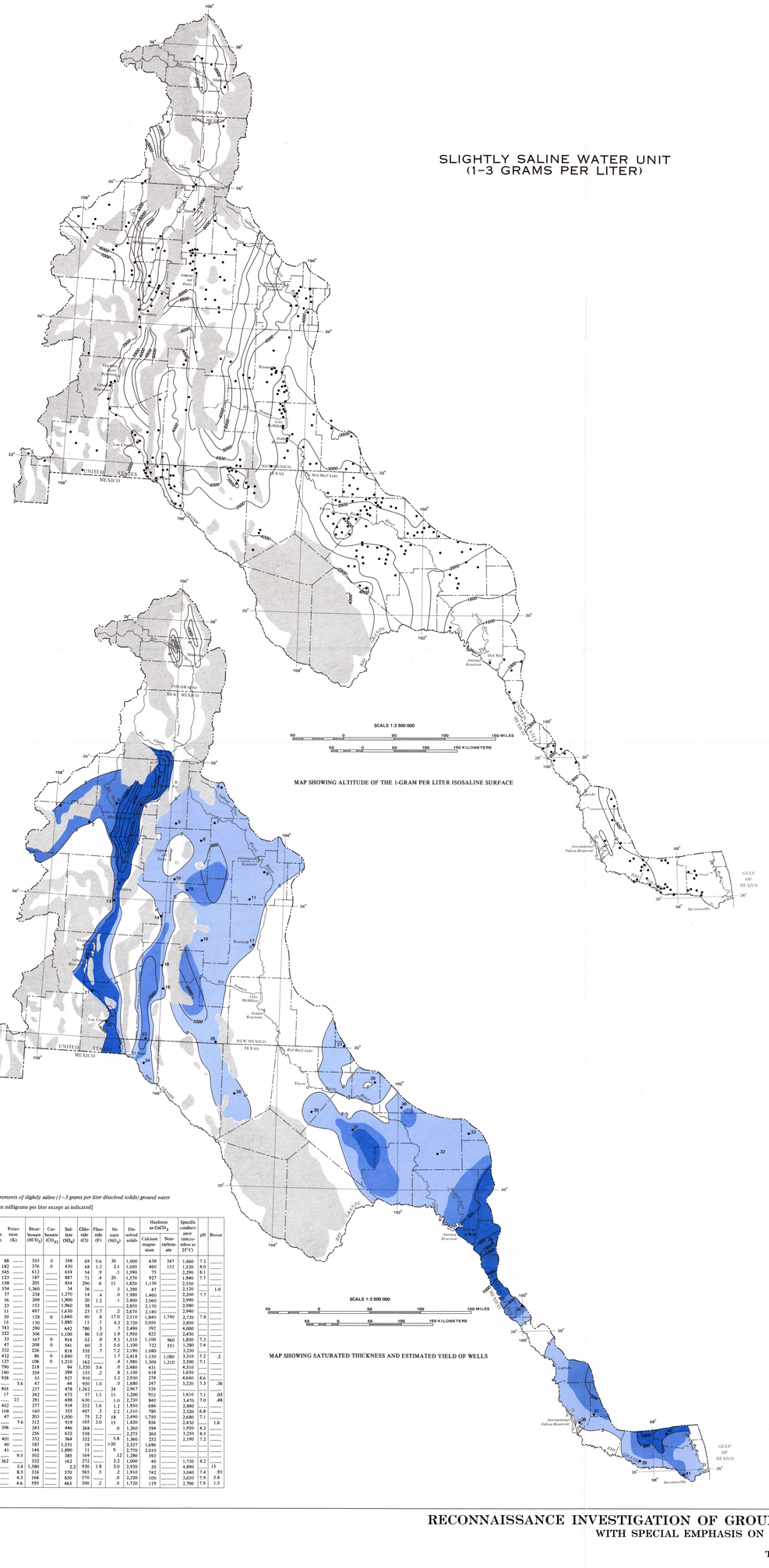
Estimated potential yield, in gallons per minute

Igneous and uplifted sedimentary rocks that generally have low yields of water to wells

1000 — Line of equal saturated thickness, approximately located. *Interval 500 and 1000 feet*

Basin boundary

41 Collection point. *Number corresponds to sample number in table*



Chemical analyses and related physical measurements of slightly saline (1–3 grams per liter dissolved solids) ground water

[Analyses in milligrams per liter except as indicated]

Sample number	Sampling depth or source (feet)	Date of collection	Temperature (°C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$: Calcium magnesium	Hardness as $CaCO_3$: Noncarbonate	Specific conductance (micromhos at 25°C)	pH	Boron
1	350	3–10–65	16	0.10	177	48	88	355	0	398	69	0.6	30	1,000	638	347	1,460	7.2	
2	150	3–18–65	28	.04	97	53	182	376	0	430	68	1.3	2.1	1,020	460	152	1,530	8.0	
3	200	5– 7–50	12		17	7.9	545	612		654	54	.9	.1	1,590	75		2,290	8.1	
4	55	7–26–52	22		281	55	123	187		887	71	.4	20	1,570	927		1,940	7.7	
5	?	7– 7–50	21		276	108	158	205		854	290	.6	11	1,820	1,130		2,550		
6	134	11– 3–47			9.0	5.9	534	1,360		34	36			1,290	47		2,120		1.0
7	506	7–11–47	15	14	436	90	37	238		1,270	14	.4	.0	1,980	1,460		2,200	7.7	
8	200	7–14–50		16	512	190	56	209		1,900	20	1.2	.1	2,800	2,060		2,990		
9	Spring	12–12–39			570	183	23	153		1,960	38			2,850	2,170		2,980		
10	295	1–26–51	27		562	194	11	497		1,630	23	1.7	.2	2,670	2,140		2,940		
11	?	9–65	17		600	83	30	128	0	1,660	40	.8	17.0	2,510	1,840	1,740	2,720	7.8	
12	120	2– 3–50	10		586	184	15	130		1,880	13	.7	4.3	2,720	2,050		2,850		
13	89	9–12–51	46		98	36	743	290		642	780	.5	.7	2,490	392		4,000		
14	70	2–25–54	16		176	93	322	306		1,100	86	1.0	1.9	1,950	822		2,430		
15	365	9–14–61	14	19	.07	338	62	33		167	0	914	52	.9	9.3	1,510	1,100	960	1,830	7.3	
16	110	9–12–57	14	12		187	62	47		208	0	541	60	.5	5.0	1,100	722	551	1,380	7.4	
17	430	11–28–50		14		282	91	332		226		818	535	.7	7.2	2,190	1,080		3,230		
18	1,300	3–24–49	24	16		330	79	432		86	0	1,840	72		1.7	2,818	1,150	1,080	3,310	7.2	.2
19	91	9–68		14		242	169	127		106	0	1,210	162		.4	1,980	1,300	1,210	2,500	7.1	
20	138	1–24–48				143	18	790		218		94	1,320	3.6	.0	2,480	431		4,310		
21	69	8–11–47	18			200	29	140		354		399	153	.2	.8	1,100	618		1,650		
22	1,200	2–19–55	32	19	.02	110	1.1	928		55		927	910		3.3	2,930	279		4,640	8.6	
23	852	3–22–53		21	.00	90	5.5	541	5.6	47		44	950	1.0	.0	1,680	247		3,220	7.3	.36
24	500	3– 2–36			3.1	136	45	905		237		478	1,262		24	2,967	524				
25	333	4–11–56	20			230	92	17		242		672	57	1.1	11	1,200	952		1,610	7.1	.05
26	280	4–28–60		18		175	98	448	22	291		698	630		1.0	2,220	845		3,470	7.0	.48
27	747	3–11–53		13		121	93	402		277		934	252	1.6	1.2	1,950	684		2,840		
28	115	3–13–59			22	258	44	160		355		407	5		2.2	1,510	780		2,520	6.8	
29	68	9–26–54		68		648	33	47		203		1,500	75	2.2	18	2,490	1,750		2,680	7.1	
30	170	9–22–48				150	117	276	7.6	212		919	165	3.0	15	1,820	856		2,430		1.6
31	360	1–14–50		18	.01	151	53	206		243		446	268		.0	1,260	594		1,950	8.2	
32	400	7–27–60								256		632	538			2,275	260		3,250	8.5	
33	520	9– 9–60		13		50	31	401		332		364	332		5.8	1,360	252		2,190	7.2	
34	520	4– 6–39				630	27	40		183		1,531	19		>20	2,337	1,686				
35	1,605	1–14–43				694	67	41		144		1,890	11		0	2,770	2,010				
36	475	5–20–30		33	.10	116	25	291	9.5	502		385	169		.12	1,280	392		1,730	8.2	
37	275	?		13	.00	8.8	4.2	362		332		162	272		3.2	1,000	40		1,330		
38	210	?		13		5.0	1.7	1,180	3.4	1,580		2.2	920	1.8	2.0	2,920	20		4,890		15
39	438	9– 1–53		32	.01	187	67	376	8.3	216		570	563	.5	.2	1,910	742		3,040	7.4	.93
40	1,054	9–23–53		16		26	8.4	771	4.3	166		830	570		.0	2,320	100		3,650	7.9	5.8
41	203	10– 6–53		34		26	18	574	4.6	595		465	300	.2	.0	1,720	139		2,700	7.9	1.5

Note: Values for sodium (Na) and potassium (K) are combined totals except where determined separately.

MODERATELY SALINE WATER UNIT (3–10 GRAMS PER LITER)

EXPLANATION

Igneous and uplifted sedimentary rocks that generally have low yields of water to wells

1000 — Contour, approximately located. *Shows altitude of 3-gram per liter isosaline surface. Contour interval 500 and 1000 feet. Datum is mean sea level*

Basin boundary

Control point

EXPLANATION

0-25 | 25-100 | 100-500 | More than 500

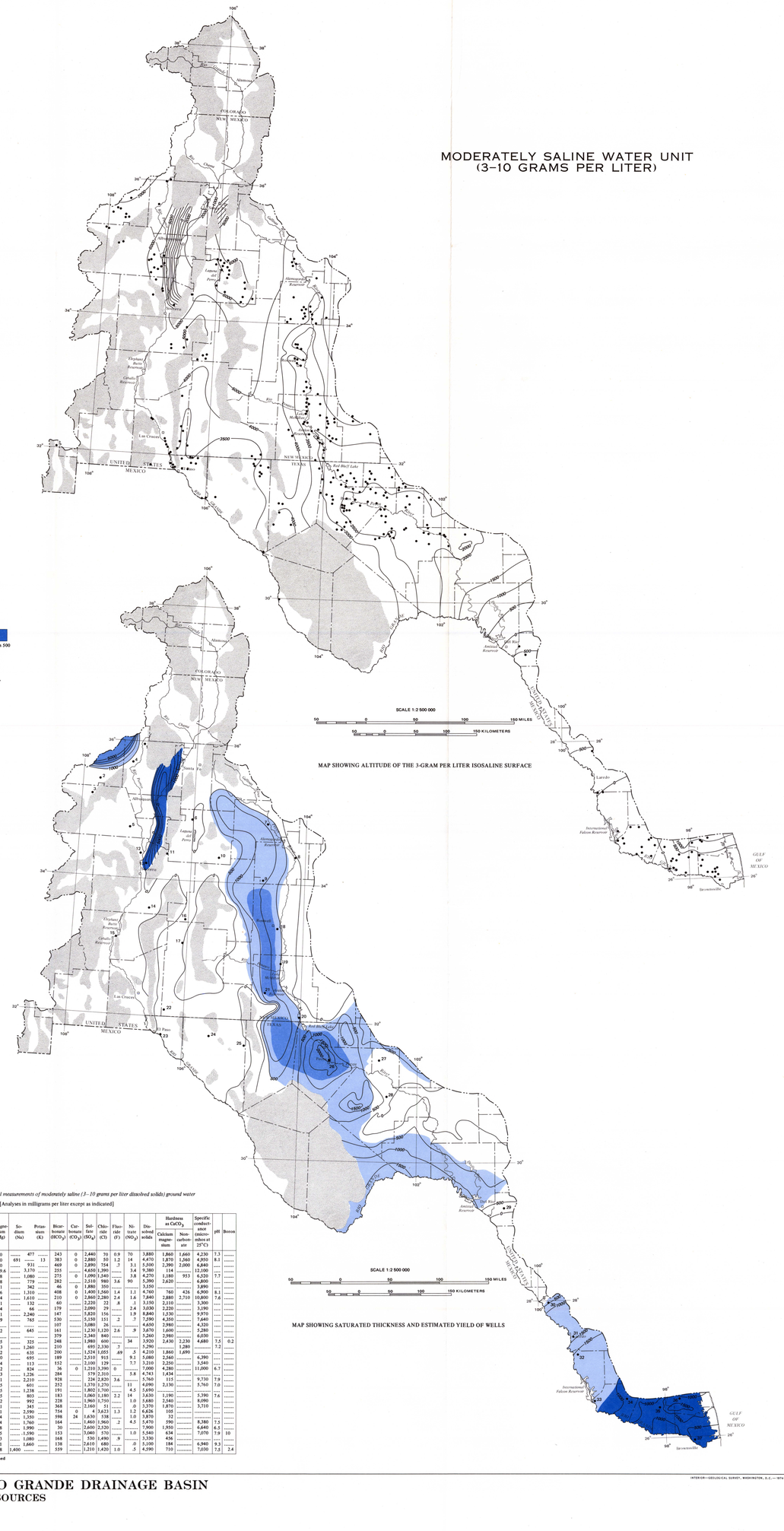
Estimated potential yield, in gallons per minute

Igneous and uplifted sedimentary rocks that generally have low yields of water to wells

1000 — Line of equal saturated thickness, approximately located. *Interval 500 and 1000 feet*

Basin boundary

27 Collection point. *Number corresponds to sample number in table*



Chemical analyses and related physical measurements of moderately saline (3–10 grams per liter dissolved solids) ground water

[Analyses in milligrams per liter except as indicated]

Sample number	Sampling depth or source (feet)	Date of collection	Temperature (°C)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids	Hardness as $CaCO_3$: Calcium magnesium	Hardness as $CaCO_3$: Noncarbonate	Specific conductance (micromhos at 25°C)	pH	Boron
1	70	8–28–59				548	120	477		243	0	2,440	70	0.9	70	3,880	1,860	1,660	4,230	7.3	
2	1,320	10–16–62	12	11		420	200	691	13	383	0	2,880	50	1.2	14	4,470	1,870	1,360	4,950	8.1	
3	76	12– 8–50	14	30		330	380	931		469	0	2,890	754	.7	3.1	5,500	2,390	2,000	6,840		
4	3,445	10–23–48				300	96	3,170		255		4,650	1,290		3.4	9,300	1,160	114	12,100		
5	10	9–13–50		25		278	118	1,080		275	0	1,090	1,540		3.8	4,270	1,180	953	6,520	7.7	
6	30	8–22–50		21		590	278	779		282		2,510	980	3.6	90	5,390	2,620		8,890		
7	90	10–18–40				320	231	342		46	0	1,880	350			3,150			3,890		
8	170	2– 4–48	17	43		146	96	1,310		408	0	1,400	1,560	1.4	1.1	5,360	760	426	6,900	8.1	
9	845	4–46	16	16		670	294	1,610		210	0	2,860	2,280	2.4	1.6	7,940	2,880	2,710	10,800	7.6	
10	525	7–18–50		14		546	181	60		60		2,220	22	.8	.1	3,350	2,110		3,300		
11	200	12–19–49	14			538	254	66		179		2,090	29		2.4	3,030	2,220		3,590		
12	90	11–30–49				462	91	2,240		147		3,820	156		1.9	8,840	1,530		9,970		
13	13	2–22–50		28		438	779	765		530		5,350	151	.2	.7	7,590	4,350		7,640		
14	?	2– 3–54	21					601		252		3,080	24			4,650	2,980		4,520		
15	120	4– 6–49	21	21		472	102	645		161		1,230	1,120	2.6	.9	3,670	1,600		5,280		
16	63	6– 2–55	19							379		2,340	840			5,240	2,980		6,030		
17	200	2– 4–49	17	19		620	215	325		248		1,980	600		34	3,920	2,630	2,230	6,680	7.5	0.2
18	440	5– 9–57	16			361	133	1,260		210		695	2,330	.7		5,290		1,280		7.2	
19	1,134	7–22–40				461	172	635		200		1,524	1,055	.69	.5	4,210	1,860	1,690	4,290		
20	21	12– 6–48				612	250	695		189		2,510	915		9.1	5,080	2,560		6,390		
21	11	2– 6–48				600	184	113		152		2,100	129		7.7	5,210	2,250		5,940		
22	489	3–31–53		24	0	1,250	282	824		36	0	1,210	3,390	0		7,000	4,280		11,000	6.7	
23	299	3–13–36				339	143	1,226		284		579	2,310		5.8	4,743	1,434				
24	2,308	10– 5–58		11	.01	28	11	2,210		928		224	2,820	3.6		5,760	115		9,730	7.9	
25	250	7–26–60		19		448	265	601		252		1,370	1,270		11	4,090	2,130		5,760	7.0	
26	115	5–17–40				476	135	1,238		191		1,802	1,700		4.5	5,690			6,430		
27	51	11–17–54		64		320	95	803		183		1,060	1,180	2.2	14	3,630	1,190		5,390	7.6	
28	68	2– 3–47				636	232	992		228		1,960	1,750		1.0	5,680	2,540		8,090		
29	1,700	1–28–48				452	181	345		368		2,160	51		0	3,370	1,870		3,710		
30	1,387	11–24–34				24	11	2,590		754	0	4	3,623	1.3	1.2	6,626	105				
31	145	10–18–38			16	6	4	1,350		598	24	1,630	538		1.0	3,870	32				
32	143	?		13	.64	131	64	1,760		164		1,460	1,960	.2	4.5	5,470	590		8,380	7.5	
33	250	?		24		702	48	1,990		30		2,600	2,520			7,900	1,950		6,640	6.5	
34	963	9–15–50		26		213	25	1,590		153		3,060	570		1.0	5,540	634		7,070	7.9	10
35	1,100	9– 4–39				112	43	1,080		168		530	1,490	.9		3,330	456				
36	1,128	10–18–57		17		56	11	1,660		138		2,610	680		.0	5,100	184		6,940	9.3	
37	200	10– 2–52		47		156	78	1,400		539		1,210	1,420	1.0	.5	4,590	710		7,030	7.5	2.4

Note: Values for sodium (Na) and potassium (K) are combined totals except where determined separately.

RECONNAISSANCE INVESTIGATION OF GROUND WATER IN THE RIO GRANDE DRAINAGE BASIN
WITH SPECIAL EMPHASIS ON SALINE GROUND-WATER RESOURCES

By
T. E. Kelly

1974

INTERIOR—GEOLOGICAL SURVEY, WASHINGTON, D.C.—1974—W72177