KANSAS GEOLOGICAL SURVEY
OPEN-FILE REPORT 80-18

CHEMICAL QUALITY DATA FOR GROUNDWATERS FROM THE SMOKY HILL RIVER, BIG CREEK, AND THE PAWNEE RIVER, WET WALNUT CREEK AREAS

by

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Location	County	Temp °C	Field pH	Lab pH	Field sp. Cond.	Lab sp Cond.	SiO_2	Ca	Mg	Na	K	Sr	HCO_3	SO_4	Cl	F	NO_3	PO_4	Fe ppb	Mn ppb	Li ppb	B ppb	TH as $CaCO_3$	NCH as $CaCO_3$	SAR	Tot. Solids 180°C		Field #
14-17-35	CCB-El	14.6	7.25	7.40	515	518	57	80	9.7	18	4.0	0.50	271	27	18	0.5	7.2	0.09	<8	<2	18	47	240	18	0.51	324		#29
12-26-24	CAC-Go	12.8	7.05	7.30	1680	1670	45	212	39	106	10	1.4	424	298	101	0.5	127	0.30	8	<2	52	144	691	343	1.75	1146		#30
12-26-24	CBA-Go	13.5	7.05	7.20	980	955	44	137	23	40	6.4	0.88	325	127	69	0.4	25	0.20	<8	<2	26	67	437	171	0.83	620		#31
13-19-17	BCA-El	14.2	7.20	7.40	875	870	39	125	16	41	7.6	1.1	319	107	62	0.3	1.6	0.54	122	144	19	58	379	118	0.92	542		#32
13-19-7	CCB-El	14.2	7.05	7.20	1150	1140	38	180	18	42	5.7	1.3	308	166	102	0.3	37	0.28	<8	<2	22	48	525	272	0.80	732		#33
13-22-26	ABA-Tr	13.0	6.95	7.10	2700	2700	30	344	47	254	11	2.2	359	977	210	0.4	3.2	0.50	878	486	66	216	1054	760	3.40	2096	8139.4	#34
																	LQL		8	2	10	14						

Smoky Hill River & Big Creek (Gove, Trego, Ellis counties)
Irrigation Wells Collected July 13-17, 1981

Location T(S)-R(W)-Sec	County	Temp °C	Field pH	Lab pH	Field Sp. Cond.	Lab Sp. Cond.	SiO_2	Ca	Mg	Na	K	Sr	HCO_3	SO_4	Cl	F	NO_3	PO_4	Fe ppb	Mn ppb	Li ppb	B ppb	TH as $CaCO_3$	NCH as $CaCO_3$	SAR	Tot. solids at 180°		Field #
13-25-28 BAC	Tr	14.5	7.05	7.30	710	700	39	112	14	17	5.3	0.75	271	41	47	0.4	46	0.10	<8	<2	13	46	338	116	0.40	416	81370	#1
15-24-36 DAA	Go	15.0	7.05	7.15	1700	1810	33	305	54	67	14	3.8	232	870	29	0.8	0.7	0.21	6460	575	50	152	987	797	0.93	1465		#2
14-24-14 CBD	Tr	15.0	7.35	7.75	451	435	37	70	7.9	12	4.5	0.55	215	36	12	0.4	16	0.13	<8	<2	10	30	208	32	0.36	279		#3
14-24-34 AAD	Tr	15.0	7.15	7.25	1150	1135	32	158	33	47	11	2.1	200	407	28	0.8	0.8	0.52	3630	488	33	119	532	368	0.89	786		#4
14-23-30 CDC	Tr	15.0	7.25	7.80	580	560	45	85	11	16	5.5	0.79	226	51	32	0.4	15	0.13	<8	2	13	38	258	73	0.43	333		#5
14-21-33 BBC	Tr	15.0	7.20	7.50	1790	1790	29	275	46	77	12	3.6	346	668	61	0.6	1.9	0.45	2660	524	78	172	879	596	1.13	1329		#6
15-19-21 BAB	El	15.0	7.10	7.20	1455	1405	30	230	30	50	8.8	2.5	242	512	73	0.5	0.7	0.39	4820	521	35	119	700	502	0.82	1008		#7
15-19-25 BDC	El	16.0	7.20	7.20	1600	1490	28	209	30	73	11	2.4	223	454	109	0.5	2.1	0.33	4340	696	43	132	648	465	1.25	1030		#8
15-17-32 ADB	El	15.5	7.25	7.30	1630	1580	26	245	39	65	11	2.5	221	613	85	0.6	2.9	0.18	3620	626	39	116	775	593	1.02	1137		#9
15-23-5 ABA	Tr	14.5	7.45	7.50	878	855	43	113	22	43	9.8	1.5	246	231	17	0.7	0.3	0.68	2920	454	32	114	374	173	0.97	606		#10
15-25-3 ACA	Go	14.5	7.40	7.20	1660	1600	39	256	52	58	14	3.3	219	744	17	0.9	0.8	0.19	6960	548	44	145	856	677	0.86	1312		#11
12-23-20 CCC	Tr	13.2	7.05	7.20	780	769	39	125	15	25	6.8	0.65	411	48	28	0.3	1.8	0.40	1290	671	18	42	374	37	0.56	478		#21
12-24-36 AAC	Tr	14.5	7.55	7.80	405	405	43	62	12	9.0	4.2	0.56	220	27	10	0.5	7.5	0.08	12	<2	14	45	205	24	0.27	284		#22
12-23-28 CAC	Tr	14.0	7.20	7.40	570	569	41	84	14	17	4.5	0.67	269	38	10	0.4	34	0.09	<8	<2	<10	58	268	48	0.45	358		#23
13-22-16 AAB	Tr	13.2	7.15	7.60	710	700	51	113	16	20	7.0	0.58	357	47	31	0.4	0.4	0.89	1000	644	13	49	348	56	0.47	462		#24
13-21-18 AAB	Tr	13.8	7.10	7.20	790	790	49	123	16	25	5.8	0.62	325	72	50	0.3	9.6	0.26	<8	<2	16	45	373	107	0.56	502		#25
14-18-15 CBA	El	14.3	7.25	7.40	790	789	33	116	19	36	4.8	1.1	322	95	38	0.4	18	0.26	<8	<2	27	112	369	105	0.82	514		#26
14-18-4 CAB	El	14.8	7.10	7.25	925	910	45	126	17	42	8.4	0.93	360	60	86	0.3	10	0.91	280	164	22	77	385	90	0.93	551		#27
15-16-5 ABC	El	14.0	7.10	7.30	730	810	55	116	14	41	6.1	0.68	317	80	53	0.4	14	0.21	<8	<2	13	60	348	88	0.96	555		#28

Pawnee Valley July, 1980

Location	SiO_2 ppm	Ca ppm	Mg ppm	Na ppm	K ppm	Sr ppm	HCO_3 ppm	SO_4 ppm	Cl ppm	F ppm	NO_3 ppm	PO_4 ppm	Fe ppb	Mn ppb	Li ppb	B ppb	Hardness Tot. @$CaCO_3$	Hardness Non-CO_3 @$CaCO_3$	Calc. T.D.S.	Temp. °C	Field pH	Field Sp. Cond. umho	SAR	Date Collect.	Lab #
21-25-16 CA Hodgeman	51	254	41	58	18	2.40	338	544	105	0.3	1.3	1.60	4282	1106	74	122	805	528	1241	14.2	7.45	1700	0.89	7/9	80463
21-24-7CB Hodgeman	47	180	30	86	12	2.02	380	303	73	0.4	43	0.40	<12	<11	55	212	574	263	963	14.5	7.20	1430	1.56	7/9	80464
20-24-36CBB Ness	41	135	22	54	12	1.32	368	178	44	0.4	0.7	0.58	501	241	47	137	429	127	669	15.0	7.20	1030	1.13	7/9	80465
20-23-27DCD Ness	45	174	22	41	11	1.21	328	259	47	0.4	38	0.48	<12	<11	54	98	526	257	800	14.5	7.10	1180	0.78	7/9	80466
20-22-19CC Ness	40	120	17	29	9.0	0.95	335	102	23	0.4	20	0.45	<12	<11	38	80	370	96	526	14.1	7.25	805	0.66	7/9	80467
20-22-33DAA Ness	46	171	21	32	9.7	1.16	366	170	73	0.3	15	0.46	<12	<11	47	81	514	214	719	15.0	7.05	1110	0.61	7/9	80468
21-22-2AB Hodgeman	47	147	22	62	13	1.30	383	233	22	0.6	5.1	0.29	22	<11	66	164	459	145	741	14.5	7.15	1090	1.26	7/9	80469
21-21-18AAB Hodgeman	86	168	30	101	12	1.51	379	360	62	0.7	12	0.33	26	278	85	207	544	234	970	14.2	7.25	1430	1.88	7/9	80470
21-21-26CB Hodgeman	34	125	17	43	10	0.90	386	132	22	0.6	5.3	0.50	<12	63	60	118	383	66	580	15.0	7.10	905	0.96	7/9	80471
23-24-11ABB Hodgeman	47	144	21	27	8.5	1.09	384	122	43	1.0	0.4	0.51	526	87	59	90	447	132	604	14.0	7.25	935	0.56	7/9	80472
23-23-4DBD Hodgeman	11	57	14	185	11	0.65	289	150	161	2.3	3.8	0.10	16	244	92	356	201	0	738	16.0	7.15	1280	5.68	7/9	80473 Dakota Well
23-22-5CAB Hodgeman	44	198	27	80	12	1.28	445	281	89	0.8	34	0.44	<12	<11	93	156	607	242	986	15.0	6.85	1500	1.41	7/9	80474
22-22-13BBC Hodgeman	41	171	21	81	9.0	1.08	347	291	60	0.3	42	0.32	<12	<11	62	135	514	230	888	14.2	7.15	1320	1.55	7/9	80475
22-22-4AAA Hodgeman	52	75	12	21	4.6	0.59	252	28	26	0.5	24	0.11	<12	<11	27	52	237	31	368	15.0	7.30	560	0.59	7/9	80476
22-21-9BAA Hodgeman	34	136	29	92	12	1.20	413	155	122	0.9	0.4	0.50	1047	273	98	210	460	122	786	14.2	7.15	1310	1.87	7/9	80477
21-20-29B Pawnee	39	139	22	49	10	1.25	384	163	40	0.6	0.3	0.27	166	263	66	118	439	124	653	14.5	7.15	1020	1.02	7/9	80478
21-20-13DB Pawnee	39	82	11	15	3.0	0.65	281	32	14	0.6	4.6	0.11	<12	<11	30	60	251	20	340	15.0	7.30	515	0.41	7/9	80479
21-21-36DBA Hodgeman	34	140	23	38	6.2	0.97	394	104	62	0.6	28	0.29	<12	<11	69	132	445	122	631	14.5	7.25	1110	0.78	7/10	80480
21-19-26ADA Pawnee	14	58	16	64	5.8	0.76	290	55	44	1.1	0.1	0.07	740	67	72	198	211	0	401	15.0	7.35	700	1.91	7/10	80481

Pawnee Valley July, 1980

Location	SiO_2 ppm	Ca ppm	Mg ppm	Na ppm	K ppm	Sr ppm	HCO_3 ppm	SO_4 ppm	Cl ppm	F ppm	NO_3 ppm	PO_4 ppm	Fe ppb	Mn ppb	Li ppb	B ppb	Hardness Tot. @$CaCO_3$	Hardness Non-CO_3 @$CaCO_3$	Calc TDS	Temp °C	Field pH	Sp. Cond. umho.	SAR	Date Collect.	Lab #
21-18-33 BCB Pawnee	36	119	16	32	5.4	0.82	377	52	38	0.4	2.3	0.55	<12	276	45	94	364	55	508	14.0	7.35	820	0.73	7/10	80482
22-18-9 BBD Pawnee	28	96	23	151	7.9	0.99	340	80	220	1.0	3.6	0.22	<12	56	78	168	335	57	779	14.3	7.35	1370	3.59	7/10	80483
22-18-11 ABC Pawnee	29	143	28	133	8.9	1.26	433	185	161	0.7	0.4	0.16	429	236	94	190	473	119	903	14.3	7.35	1500	2.66	7/10	80484
22-17-17 BAC Pawnee	20	86	23	101	4.9	0.87	283	145	96	0.7	19	0.14	<12	<11	47	81	310	78	636	15.0	7.45	1065	2.49	7/10	80485
21-17-31 BAD Pawnee	27	124	14	52	4.8	0.68	337	77	77	0.4	9.6	0.48	103	68	44	69	368	92	552	14.2	7.35	920	1.18	7/10	80486
22-17-4 BBB Pawnee	38	124	34	145	9.7	1.58	416	145	221	0.8	0.6	0.16	676	290	98	190	459	118	924	15.0	7.25	1560	2.95	7/10	80487
22-16-6 B Pawnee	21	223	54	206	6.8	1.92	357	794	57	0.6	46	0.12	<12	<11	83	118	781	488	1586	13.8	7.10	2150	3.21	7/10	80488

Walnut Valley July, 1980

Location	SiO_2 ppm	Ca ppm	Mg ppm	Na ppm	K ppm	Sr ppm	Cation	HCO_3 ppm	SO_4 ppm	Cl ppm	F ppm	NO_3 ppm	PO_4 ppm	Fe ppb	Mn ppb	Li ppb	B ppb	Anion	Hardness Tot. @$CaCO_3$	Hardness Non-CO_3 @$CaCO_3$	calc. TDS	Temp °C	Field pH	Sp. Cond µmho	SAR	Date collect.	Lab #
19-13-26 DD Barton	18	115	28	119	6.2	1.07	-	273	291	96	0.7	4.9	0.10	<10	344	40	96	-	403	180	814	14.2	7.25	1260	2.58	7/7	80434
18-14-35 AD Barton	36	97	10	45	5.1	0.50	-	288	25	92	0.5	0.2	0.06	55	848	26	65	-	284	48	453	15.2	7.10	770	1.16	7/7	80435
19-14-6 BB Barton	28	260	33	154	7.6	1.17	-	393	165	465	0.4	86	0.33	<10	45	100	132	-	786	464	1343	14.2	6.90	2250	2.39	7/7	80436
18-15-28 BB Barton	35	109	12	42	4.8	0.60	-	370	47	32	0.4	8.4	0.20	<10	<7	31	76	-	322	19	473	14.2	7.05	765	1.02	7/7	80437
18-16-14 DD Rush	34	156	17	54	7.2	0.90	-	366	98	133	0.3	0.5	0.44	1501	1085	44	85	-	460	160	681	14.3	7.05	1145	1.10	7/7	80438
18-17-13 CD Rush	30	196	23	99	8.5	1.08	-	401	341	108	0.5	1.6	0.75	2755	410	69	160	-	585	256	1006	14.0	7.10	1500	1.78	7/7	80439
18-18-27 CC Rush	31	123	15	103	9.9	0.77	-	430	187	52	0.6	4.1	0.46	21	108	62	196	-	369	17	738	14.2	7.10	1160	2.33	7/7	80440
18-18-25 CB Rush	33	164	19	65	8.0	0.97	-	435	209	63	0.3	5.4	0.71	1115	170	55	178	-	488	132	782	14.0	7.00	1240	1.28	7/7	80441
18-17-29 AA Rush	28	134	13	51	5.7	0.71	-	359	144	48	0.3	0.3	0.55	2426	118	38	84	-	389	94	602	14.2	7.05	955	1.13	7/7	80442
18-18-30 DAC Rush	31	161	15	62	6.6	0.77	-	385	135	62	0.3	91	0.38	<10	<7	34	124	-	464	149	754	14.2	7.05	1180	1.25	7/7	80443
18-19-27 AAA Rush	34	159	14	41	6.8	0.83	-	314	172	61	0.2	34	0.56	<10	<7	29	76	-	455	198	677	14.0	7.05	1030	0.84	7/7	80444
18-19-18 CCC Rush	46	160	21	50	8.1	0.92	-	375	188	64	0.4	18	0.56	<10	<7	44	104	-	487	179	741	14.2	7.05	1140	0.99	7/7	80445
18-20-17 DCC Rush	43	112	15	40	5.9	0.75	-	318	101	33	0.4	38	0.50	<10	<7	33	113	-	342	81	545	14.0	7.25	855	0.94	7/7	80446
18-22-36 AB Ness	51	173	22	63	11	1.18	-	325	271	85	0.3	3.8	0.65	<10	<7	43	102	-	523	257	841	14.3	7.15	1260	1.20	7/7	80447
18-23-30 DD Ness	41	116	22	46	14	0.93	-	343	146	45	0.6	0.8	1.03	36	241	69	108	-	381	100	601	15.0	7.40	840	1.03	7/8	80448
18-24-25 BBA Ness	48	173	24	50	9.3	1.10	-	325	218	108	0.3	17	0.61	38	<7	49	92	-	532	265	809	14.0	7.15	1220	0.94	7/8	80449
18-24-22 CC Ness	38	135	33	98	13	1.45	-	337	321	52	0.6	43	0.41	<10	<7	77	227	-	474	198	901	14.0	7.20	1320	1.96	7/8	80450
18-17-15 DBB Rush	30	150	19	74	11	0.92	-	425	197	44	0.4	5.4	0.56	1328	224	60	124	-	453	105	741	14.5	7.10	1130	1.51	7/8	80451
18-17-13 CBC Rush	29	149	17	72	8.0	0.85	-	426	199	46	0.4	1.3	0.59	1746	342	58	124	-	443	93	732	14.3	7.20	1150	1.49	7/8	80452

Walnut Valley July, 1980

Location	SiO_2 ppm	Ca ppm	Mg ppm	Na ppm	K ppm	Sr ppm	HCO_3 ppm	SO_4 ppm	Cl ppm	F ppm	NO_3 ppm	PO_4 ppm	Fe ppb	Mn ppb	Li ppb	B ppb	Hardness Tot. @$CaCO_3$	Hardness Non-CO_3 @$CaCO_3$	Calc. T.D.S.	Temp. °C	Field pH	Sp. Cond. µmho	SAR	Date Collect.	Lab #.
18-16-18DD Rush (18-16-7DD)	46	139	16	71	8.3	0.71	346	156	68	0.3	53	0.32	<10	<7	44	115	413	130	728	14.0	7.00	1110	1.52	7/8	80453
18-16-22BBB Rush	28	165	16	67	8.7	0.87	381	121	127	0.3	4.7	0.56	1044	256	53	124	479	166	726	14.0	7.25	1210	1.33	7/8	80454
18-15-30DC Barton	38	168	18	39	5.5	0.78	342	101	119	0.2	21	0.69	<10	<7	38	72	494	214	679	14.0	7.05	1100	0.76	7/8	80455
18-15-23CC Barton	46	85	7.9	21	4.0	0.42	303	18	11	0.4	4.2	0.15	11	<7	19	46	245	0	347	15.0	7.15	520	0.58	7/8	80456
18-14-32B Barton	40	84	12	33	4.6	0.51	274	29	51	0.3	8.6	0.36	<10	<7	30	58	260	35	398	14.0	7.20	735	0.89	7/8	80457
19-14-20AAB Barton	26	143	20	138	4.6	0.68	386	91	217	0.3	17	0.58	<10	<7	45	85	440	124	847	15.0	7.25	1450	2.86	7/8	80458
20-14-8BBD Barton	27	133	29	107	6.2	1.14	375	177	122	0.6	27	0.22	<10	<7	37	157	452	145	814	14.3	7.10	1280	2.19	7/8	80459
20-15-13ADD Barton	29	114	25	88	6.2	0.98	346	118	97	0.5	27	0.27	<10	<7	37	123	388	105	676	14.0	7.15	1100	1.94	7/8	80460
19-14-25BB Barton	20	103	25	239	6.5	0.98	308	117	343	0.6	16	0.11	14	<7	49	114	361	109	1023	14.0	7.20	1800	5.47	7/8	80461
19-13-9C Barton	28	110	17	78	6.0	0.67	385	68	84	0.4	0.4	0.30	496	208	32	97	345	30	582	14.0	7.15	970	1.83	7/8	80462