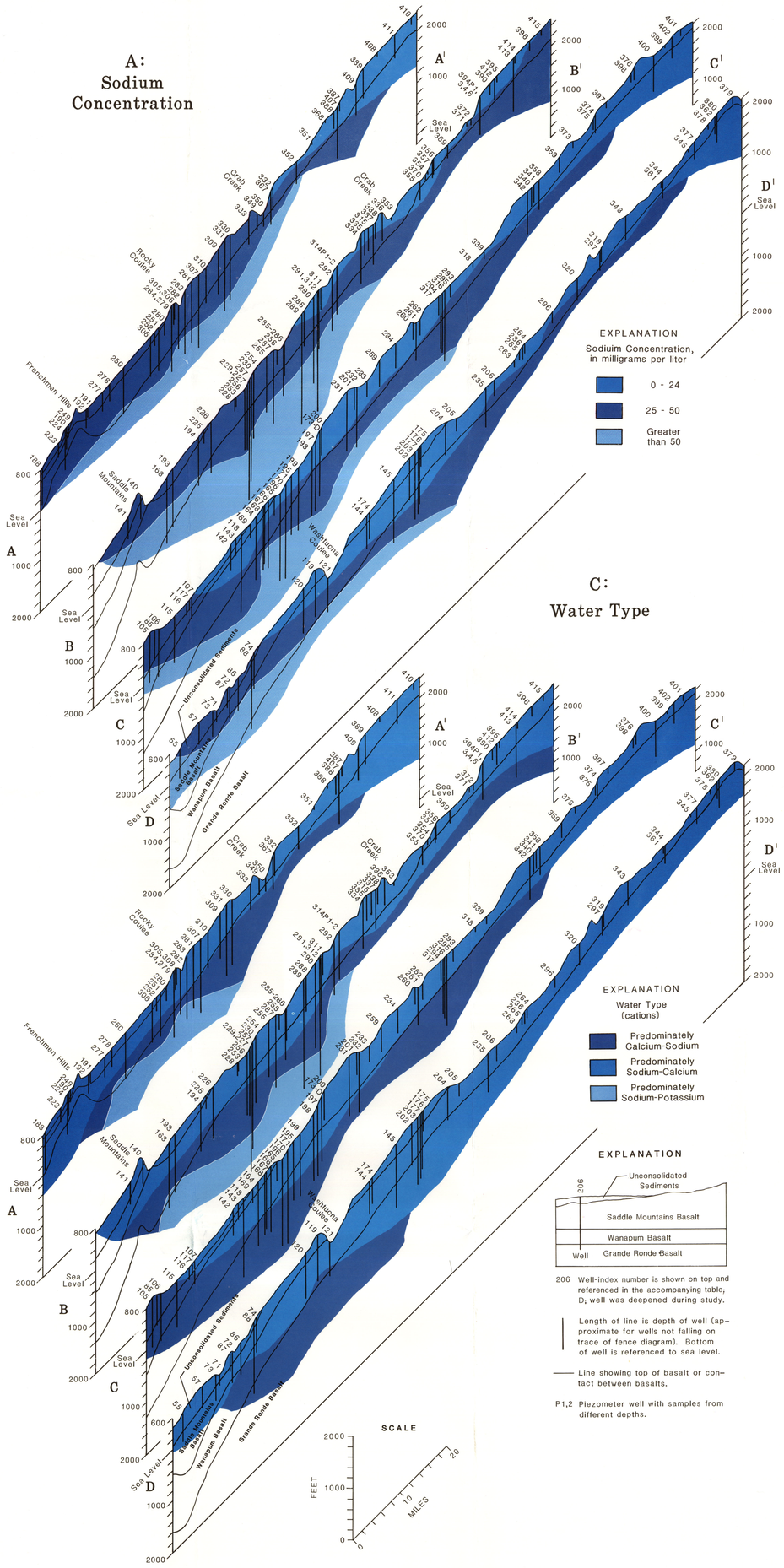
Prepared in Cooperation With
STATE OF WASHINGTON DEPARTMENT OF ECOLOGY



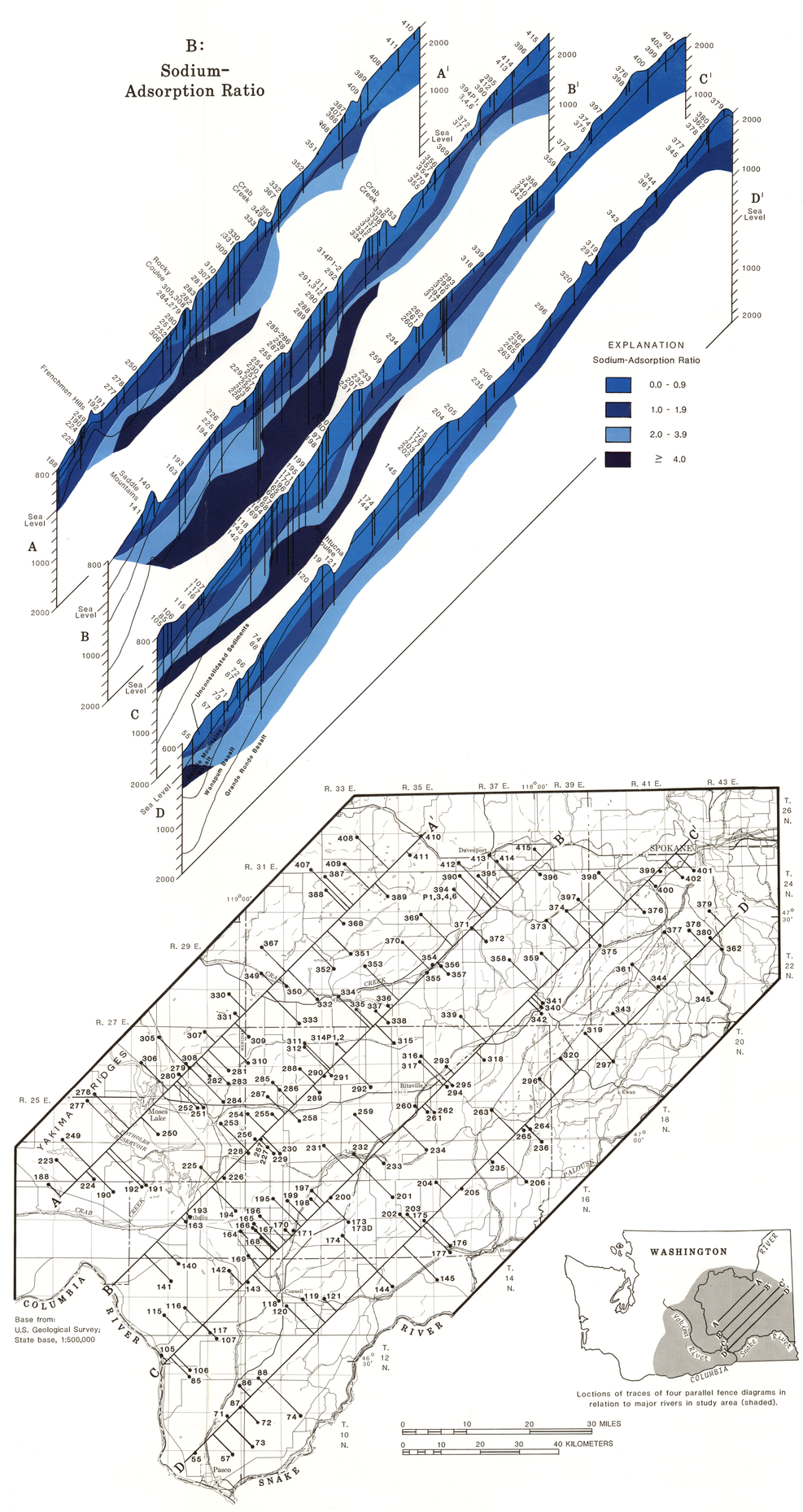


TABLE 1.--Index numbers and data plotted on fence diagrams of regional flow path

Index map number[1]	Well Number	Geologic unit[2]	Depth (feet)	Sodium-adsorption ratio	Dissolved sodium (mg/L)	Ionic Species[3,4] Cation type	Anion type
			Fence diagram A-A'				
188	16/25E-01Q01	S/W	907	1.4	41	Ca-Na	HCO3-Cl-SO4
223	17/26E-18A01	W	310	2.0	22	↓	↓
224	17/27E-31D01	W/G	810	1.2	39		Cl-SO4-HCO3
190	16/27E-10A01	S	250	1.0	39		HCO3-Cl-SO4
249	18/26E-32C01	W	490	0.3	30		
192	16/28E-05A01	W	250	0.7	47		
191	16/28E-04B01	W	179	0.7	31		
277	19/27E-36A01	W	515	1.3	35		
278	19/27E-35D01	W	460	1.1	33		
250	18/28E-26F01	W/G	801	9.0	84	Na	
306	20/28E-32A01	W/G	712	1.6	37	Na-Ca	
282	18/29E-02A01	W	270	3.7	68	Na-Ca	
251	18/29E-01AD101	W/G	865	1.9	44	Na-Ca	
280	19/29E-08L01	W	273	0.9	27	Ca-Na	
279	19/29E-03B01	W/G	1300	9.7	67	Na	
284	19/30E-33B01	W	245	1.3	30	Ca-Na	C1-SO4
305	20/28E-11A01	W	110	0.6	19	↓	HCO3
308	20/29E-33B01	W	112	1.0	29		C1-SO4
282	19/30E-07L01	W/G	930	13.4	78	Na	HCO3-C1-SO4
283	19/30E-15L01	W/G	1170	14.8	81		
281	19/30E-03K01	W/G	1100	9.0	79		
307	20/29E-01A01	W/G	1360	1.9	39	Na-Ca	
310	20/31E-31A03	W/G	630	1.6	34	Na-Ca	
309	20/31E-07M02	W/G	800	1.7	44	Ca-Na	
331	21/30E-23J01D1	G	1330	3.6	56	Na-Ca	
330	21/30E-03E02	G	1340	2.7	50	↓	
333	21/32E-31C01	W/G	744	1.9	44		
349	22/31E-21F01	G	100	1.2	36	Ca-Na	
350	22/32E-30D01	W/G	505	1.6	33	↓	
332	21/32E-12H01D1	W/G	225	0.7	23		
397	23/31E-33E01	G	685	4.7	54	Na-Ca	
352	22/33E-17W01	W/G	815	1.1	22	↓	
351	22/33E-05W01	W	145	0.8	22	Ca-Na	
368	23/33E-13A01	W	160	0.5	23	↓	C1-SO4-HCO3
366	23/33E-24D01	W	365	0.9	18		HCO3-C1-SO4
407	25/32E-35P01	G	1130	2.4	39		
387	24/33E-06Q01	W	185	0.7	16		
409	25/33E-27AQ2	W/G	865	1.4	28		
389	24/34E-23L01	W/G	596	0.6	14		
408	25/33E-01B01	W	60	0.7	19		
411	25/35E-20D01	W/G	410	0.7	16		
410	25/35E-03D101	W	200	0.9	23		
			Fence diagram B-B'				
141	14/29E-19Q01	S	420	1.2	41	Ca-Na	HCO3-C1-SO4
140	14/29E-05A01	S	305	1.0	32	↓	
163	15/29E-04AA02	W/G	1210	8.3	88	Na	
193	16/29E-34D01	W/G	1040	14.5	79	↓	
194	16/30E-26AAD201	W/G	1050	11.6	72		
223	17/29E-24C01	W	210	3.9	86	Na-Ca	
226	17/30E-33A01	W/G	1000	2.2	69	Ca-Na	
228	17/31E-07E01	W	126	1.1	45	↓	
253	18/30E-14B01	W	185	0.9	43	Ca-Na	C1-SO4-HCO3
256	18/31E-32B01	W/G	1200	2.0	43	Na-Ca	HCO3-C1-SO4
229	17/31E-11Q01	W/G	1380	3.2	42	↓	
227	17/31E-03B01	W/G	1380	3.9	52		
257	18/31E-12A01	W	2400	17.0	88	Na	
254	18/31E-33D01	G	1950	2.6	46	Na-Ca	
255	18/31E-03TC0101	W/G	1160	2.6	68	Na-Ca	
255	18/31E-13C01	W/G	982	3.3	56	Na-Ca	
287	19/31E-27CD101	W/G	1410	10.0	76	Na	
258	18/32E-14CC0	W	280	3.9	51	Na-Ca	
286	19/31E-24H01	W/G	1060	5.9	83	Na-Ca	
285	19/31E-14H02	W/G	630	1.4	50	Ca-Na	C1-SO4-HCO3
289	19/32E-24N01	G	2240	25.5	89	Na	HCO3-C1-SO4
288	19/32E-04H02	W/G	710	1.4	33	Ca-Na	
290	19/33E-07B01	G	1720	5.8	59	Na-Ca	
291	19/33E-08D02	G	2430	12.6	68	Na	HCO3
312	20/32E-15L01D2	W/G	1040	4.0	55	Na-Ca	HCO3-C1-SO4
311	20/32E-11D02	W	220	0.7	19	Ca-Na	
292	19/34E-20B02	W/G	1120	7.1	60	Na	HCO3
314-P1	20/33E-14E03	W	310	2.2	43	Na-Ca	
314-P2	20/33E-16E06	G	704	5.4	62	↓	
334	21/33E-08K03	W/G	595	2.1	48		HCO3-C1-SO4
335	21/33E-24B01	W	120	2.0	113	Ca-Na	C1-SO4-HCO3
315	20/34E-13B01	W	340	1.7	31	↓	HCO3-C1-SO4
337	21/34E-21K01	W/G	737	1.2	27		
338	21/34E-33A01	W	337	1.0	31		C1-SO4-HCO3
336	21/34E-14M01	W	150	0.8	24		HCO3-C1-SO4
353	22/34E-19M01	W	146	0.9	19		
355	22/35E-23E01D1	W/G	340	0.7	16		
370	23/35E-13A01	W	240	0.5	16		
354	22/35E-33K01	W	67	6.1	122	Na-Ca	
352	22/36E-18N02D1	W/G	212	0.5	13	Ca-Na	
357	22/36E-05A01	W/G	400	0.4	11	↓	
369	23/35E-03H01D1	W/G	445	1.4	34		
371	23/36E-13K01	W	247	0.5	19		
372	23/37E-29F01	W	213	0.8	21		
394-P1	24/36E-14AA02	W	160	0.5	12		
394-P3	24/36E-16AD4	W	261	1.0	17		
394-P4	24/36E-14AD5	W	365	2.1	38	Na-Ca	
394-P6	24/36E-16AD8	G	750	3.0	40	Ca-Na	
390	24/36E-02D01	W	125	0.5	9.2	↓	HCO3-C1-SO4
412	25/36E-27Q01	W	324	0.5	11		
395	24/37E-04Q01	W	165	0.7	15		
413	25/37E-21L04	G	975	3.1	45	Na-Ca	HCO3
414	25/37E-27E01	W	100	0.6	11	Ca-Na	HCO3-C1-SO4
396	24/38E-02D01	W	85	1.0	26	↓	
415	25/38E-19A01	W	121	0.9	26		
			Fence diagram C-C'				
105	12/28E-23N01D1	S	413	3.8	62	Na-Ca	HCO3-C1-SO4
85	11/29E-03A01	S	552	1.7	31	↓	
106	12/29E-34B01D1	S/W	997	16.6	75	Na	
115	13/28E-13N01	W	1110	18.0	76	↓	
116	13/29E-08N01	S	450	1.2	38	Na-Ca	C1-SO4-HCO3
107	12/30E-31M01	S/W	464	0.6	21	Ca-Na	HCO3-C1-SO4
142	14/30E-13P01	W	235	0.2	51	↓	
143	14/31E-19B01	W	433	0.8	21		
118	13/31E-01E01	G	1300	0.2	25	Na-Ca	C1-SO4-HCO3
169	15/31E-31B01	W	304	0.4	18	Ca-Na	HCO3-C1-SO4
164	15/30E-31J01	W/G	1370	2.2	44	Na-Ca	
166	15/31E-08AD101	W/G	1210	3.0	54	↓	
167	15/31E-08W01	W/G	1030	4.7	67	Na	
168	15/31E-16D01	W/G	1410	9.5	78	↓	
165	15/31E-05J01	W/G	1330	1.9	61	Na-Ca	
196	16/31E-33P01	W	540	1.4	31	Ca-Na	
170	15/32E-07J01	G	1890	3.2	57	Na-Ca	
171	15/32E-08E01	W/G	1980	3.4	50	↓	
195	16/31E-14K01	W/G	1340	5.5	61	Na	
199	16/32E-18Q01D2	W/G	1540	10.0	77	Na-Ca	
198	16/32E-14D01	W/G	1310	3.3	57	↓	
197	16/32E-11D01D1	W/G	1400	3.1	47		
173	15/33E-02A01	W/G	830	0.7	19	Ca-Na	
173-D	15/33E-02A01D1	W/G	830	0.7	18	Ca-Na	
200	16/33E-17B01	W	120	0.4	15	Na-Ca	HCO3
231	19/33E-13D02	W/G	1200	2.8	41	Na-Ca	
201	16/34E-13D02	W	400	0.4	9.4	Ca-Na	
232	17/33E-12F02	G	1020	4.2	53	Na-Ca	HCO3-C1-SO4
233	17/34E-23F01	W	165	1.1	52	Ca-Na	C1-SO4-HCO3
259	18/33E-12C02	W	500	1.1	24	↓	HCO3-C1-SO4
234	17/35E-11N01D2	W	349	0.6	13		HCO3
260	18/35E-04B01	W	180	0.5	11		HCO3-C1-SO4
261	18/35E-11E01	W/G	747	1.6	33	Na-Ca	
262	18/35E-12D01	W	256	0.6	26	Ca-Na	
317	20/35E-34M02	W	320	0.4	11	↓	
294	19/36E-20N01D1	W/G	1020	4.1	49	Na-Ca	
316	20/35E-27A01	W/G	1260	3.1	46	↓	
295	19/36E-21C01D1	W/G	1280	3.9	51		
293	19/36E-05B01	W	155	1.9	67	Ca-Na	
318	20/37E-32D01	W	180	0.5	14	↓	
339	21/36E-27P02	W	200	1.2	29		
342	21/38E-23L01	G	502	2.1	34	Na-Ca	HCO3
340	21/38E-14J01	W	178	0.7	16	Ca-Na	HCO3-C1-SO4
341	21/38E-14E01	W	353	0.7	20	↓	
358	22/37E-12D2D01	W/G	510	1.5	33		
359	22/38E-02D0101	W	300	0.5	14		
373	23/38E-12A01	W	100	0.8	18		
375	23/40E-28K0101	W	160	0.6	15		
361	22/41E-10B01	W/G	510	0.5	12		HCO3
397	24/39E-26K03	W	300	0.4	12		HCO3-C1-SO4
398	24/40E-09D1	W	90	0.9	24		HCO3
376	23/41E-04P01	W	100	0.4	8.2		HCO3-C1-SO4
400	24/41E-14D01	G	775	0.8	16		HCO3
399	24/41E-01J02	W	60	0.9	24	Ca-Mg	HCO3-C1-SO4
402	24/42E-09D03	G	325	0.1	4.2	Ca-Na	HCO3
401	24/42E-02E02	W	100	0.9	24	Na	HCO3-C1-SO4
			Fence diagram D-D'				
55	09/29E-02D02	S	473	8.4	90	Na	HCO3-C1-SO4
57	09/30E-02B01	S	211	0.9	31	Ca-Na	
73	10/31E-32L02	S	350	1.1	29	↓	
71	10/30E-03D01	S	230	1.0	35		
87	11/30E-30M01	S	237	0.6	26		
86	11/30E-12D01	S/W	410	3.4	80	Na-Ca	
72	10/31E-09D01	S/W	310	0.9	31	Ca-Na	
88	11/31E-04P01	W/G	1310	2.4	46	Na-Ca	
74	10/32E-02B01	W	540	1.8	61	Ca-Na	C1-SO4-HCO3
120	13/32E-07E02	W	652	0.7	18	↓	HCO3-C1-SO4
119	13/32E-03C01	W	300	2.1	50	Na-Ca	
121	13/33E-06M0101	W/G	380	5.3	72	↓	
144	14/34E-29P0101	W	220	1.0	16	Ca-Na	
174	15/33E-15K02	W	480	0.4	16		
145	14/35E-19A01	W/G	680	0.5	81		
252	16/35E-31B01	W/G	690	0.5	12		HCO3
202	16/35E-32N0101	W/G	1100	0.5	12		HCO3-C1-SO4
177	15/36E-33A02	G	510	1.4	39		HCO3
176	15/36E-28N0101	W/G	380	1.5	47		HCO3-C1-SO4
175	15/35E-02D01	W	342	1.2	26		HCO3
204	16/36E-06B02	W/G	560	0.4	13		HCO3-C1-SO4
205	16/36E-11H01D1	W	250	0.3	8.3		
235	17/37E-21G01	W/G	755	2.6	39	Na-Ca	
206	16/38E-04A0101	W	300	1.0	40	Ca-Na	
263	18/37E-09C02	W	294	0.6	15	↓	
265	18/38E-29D01	W	125	0.4	8.9		
236	17/38E-02K03	W	140	0.5	18		
264	18/38E-28N02	W	155	0.4	9.0		
296	19/38E-14K02	W	200	1.2	28		
320	20/39E-32A0101	W/G	363	1.3	33		
319	20/39E-12N02	W	284	0.6	13		HCO3
297	19/40E-02B01	W/G	421	1.3	28		
343	21/40E-27B01	W/G	400	1.1	23		
361	22/41E-18D0101	W	196	0.4	15		HCO3-C1-SO4
344	21/41E-02Q01	W/G	450	1.1	27		HCO3
345	21/43E-07G01	W	225	0.5	10		
377	23/41E-24F02D1	G	300	0.6	20		
378	23/42E-22H01	W	142	1.4	7.5		HCO3-C1-SO4
380	23/42E-30K01	W/G	540	0.7	17		HCO3
362	23/43E-30R03	G	360	0.7	16		
379	23/43E-06G01	W	125	0.4	8.1		

[1]Underscore indicates well with corresponding data that do not conform to shaded zone indicated on map.

[2]Symbols for formations are G, Grande Ronde Basalt; W, Wanapum Basalt; and S, Saddle Mountains Basalt.

[3]Ionic species, adapted from Back (1961):

Ionic species	Percentage of constituents, in equivalents per million Ca+Mg	Na+K	HCO3+CO3	Cl+SO4
Cation type:				
Calcium plus magnesium	90-100	0-10	--	--
Calcium plus sodium	50-90	10-50	--	--
Sodium plus calcium	10-50	50-90	--	--
Sodium plus potassium	0-10	90-100	--	--
Anion type:				
Bicarbonate	--	--	90-100	0-10
Bicarbonate plus chloride plus sulfate	--	--	50-90	10-50
Chloride plus sulfate plus bicarbonate	--	--	10-50	50-90
Chloride plus sulfate	--	--	0-10	90-100

Symbols: Ca, calcium; Mg, magnesium; Na, sodium; K, potassium; HCO3, bicarbonate; CO3, carbonate; Cl, chloride; SO4, sulfate.

[4]Asterisk indicates no data available.

*U.S. GOVERNMENT PRINTING OFFICE: 1985--597-397

PLATE 1.--FENCE DIAGRAMS SHOWING VARIATION OF SODIUM CONCENTRATION, SODIUM-ADSORPTION RATIO, AND WATER TYPE IN BASALT AQUIFERS, COLUMBIA PLATEAU, WASHINGTON.