

**Table S1.** Hydrogeochemical components.

Water Sample Category	Serial Number	Hydrochemical Composition (mg/L)								
		PH	TDS	HCO <sub>3</sub> <sup>-</sup>	SO <sub>4</sub> <sup>2-</sup>	Cl <sup>-</sup>	K <sup>+</sup> +Na <sup>+</sup>	Ca <sup>2+</sup>	Mg <sup>2+</sup>	NO <sub>3</sub> <sup>-</sup>
Quaternary pore water (P)	P1	7.70	276.54	178.24	13.58	4.48	17.32	43.50	7.08	12.00
	P2	7.60	275.51	174.53	11.94	3.48	13.02	49.50	2.96	20.00
Fissure water of Middle Jurassic Zhiluo Formation (J <sub>2z</sub> )	J <sub>2z</sub> 1	8.38	287.92	201.40	7.20	7.10	21.80	38.10	9.70	2.50
	J <sub>2z</sub> 2	8.38	249.49	161.70	9.60	7.10	10.60	43.10	7.30	9.96
	J <sub>2z</sub> 3	8.11	258.86	155.60	4.80	7.10	15.40	44.70	4.50	26.58
	J <sub>2z</sub> 4	8.16	417.58	158.60	114.30	7.10	63.90	42.10	5.80	25.55
	J <sub>2z</sub> 5	8.14	278.93	173.90	1.00	7.10	12.70	50.10	5.50	28.49
	J <sub>2z</sub> 6	8.43	224.87	128.10	13.40	7.10	11.10	40.90	4.40	19.56
	J <sub>2z</sub> 7	8.30	231.16	134.00	18.30	7.10	13.80	38.10	6.10	13.60
	J <sub>2z</sub> 8	8.31	198.27	97.60	14.40	7.10	11.20	52.10	2.40	13.32
	J <sub>2z</sub> 9	8.07	258.53	164.70	16.30	7.10	10.50	44.10	8.50	7.16
	J <sub>2z</sub> 10	8.21	325.40	213.60	14.40	14.20	28.90	36.10	14.60	3.40
	J <sub>2z</sub> 11	8.10	229.36	128.10	16.30	7.10	10.20	38.90	7.30	21.31
	J <sub>2z</sub> 12	8.20	254.98	146.40	25.90	7.10	13.80	40.10	9.00	12.54
	J <sub>2z</sub> 13	8.36	279.38	152.50	32.70	7.10	16.70	42.90	9.70	17.65
	J <sub>2z</sub> 14	7.94	286.77	164.70	12.50	14.20	14.80	48.10	8.50	23.84
	J <sub>2z</sub> 15	8.35	229.65	146.40	9.60	3.50	9.00	40.10	6.60	14.32
	J <sub>2z</sub> 16	8.25	295.20	174.88	17.50	17.47	21.07	40.04	12.14	12.00
Fissure water of Middle Jurassic Yan'an Formation (J <sub>2y</sub> )	J <sub>2y</sub> 1	7.99	337.89	191.70	55.42	6.90	35.93	34.90	11.67	0.93
	J <sub>2y</sub> 2	7.75	328.14	216.31	29.43	3.84	28.93	36.88	12.37	0.00
	J <sub>2y</sub> 3	7.87	264.90	82.65	84.63	17.69	46.36	24.77	4.06	4.04
	J <sub>2y</sub> 4	8.05	612.34	316.12	76.15	41.35	168.41	6.67	3.04	0.00
	J <sub>2y</sub> 5	8.06	275.17	158.60	28.80	12.40	23.60	43.10	8.50	0.03
	J <sub>2y</sub> 6	7.90	274.08	182.53	12.76	3.00	12.75	44.55	8.41	10.00
	J <sub>2y</sub> 7	7.80	269.21	181.07	11.32	3.93	11.94	41.69	10.37	13.00
	J <sub>2y</sub> 8	8.00	179.25	103.69	10.09	0.55	33.65	14.10	5.11	19.00
	J <sub>2y</sub> 9	8.40	1165.80	505.47	93.02	183.70	351.13	6.82	4.42	15.00
	J <sub>2y</sub> 10	8.30	963.90	484.27	66.27	91.26	285.94	6.01	1.21	22.00
	J <sub>2y</sub> 11	7.50	4324.95	283.46	356.03	2101.94	1267.67	299.96	15.31	16.00
	J <sub>2y</sub> 12	8.40	1252.11	593.87	70.79	199.00	376.58	7.18	1.98	20.90
	J <sub>2y</sub> 13	7.30	15,283.78	51.84	1188.70	8350.40	4010.69	1592.18	88.33	20.00
Surface water (S)	S1	8.24	345.21	223.65	23.54	7.54	12.59	58.70	10.83	6.30
	S2	8.20	356.44	200.65	48.11	12.29	22.50	57.91	8.88	5.71
	S3	7.79	1058.81	447.78	270.40	32.69	239.85	48.56	12.31	7.12
Gushing water (G)	G1	7.19	1832.23	910.25	371.06	32.78	446.54	56.76	11.08	0.00
	G2	7.82	502.63	249.58	104.80	9.42	91.17	32.18	11.34	3.68
	G3	7.07	2693.39	1152.98	712.20	47.92	686.04	72.24	13.28	0.00
	G4	7.20	876.19	533.42	98.76	11.04	189.19	35.39	6.65	0.00
	G5	6.14	1704.04	172.26	1049.92	22.64	99.48	235.24	90.92	0.00
	G6	7.80	512.98	243.64	117.30	20.39	42.60	65.09	23.29	0.60