

Characteristics and formation mechanisms of large volcanic rock oil reservoirs: A case study of the Carboniferous rocks in the Kebai fault zone of Junggar Basin, China

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Table 1. Locations, Depths, and Lithology of All Samples from the Carboniferous System in the Study

Sample Type	Sampled Well	Depth (m [ft])	Lithology	Sample Type	Sampled Well	Depth (m [ft])	Lithology
Microphotographs	B17	556–584 (1824–1915)	Andesite	Well test	G108	595 (1952)	Tuff
Microphotographs	B8	704–728 (2309–2388)	Basalt	Well test	G59	605 (1984)	Tuff
Microphotographs	K105	571(1874)	Basalt	Well test	B010	620 (2034)	Tuff
Microphotographs	B4	655(2149)	Tuff	Well test	G95	902 (2958)	Tuff
Microphotographs	B002	719 (2357)	Andesite	Well test	B1	1200 (3937)	Andesite
Microphotographs	K92	527 (1728)	Tuff	Well test	B7	1400 (4592)	Tuff
Microphotographs	K94	1378 (4518)	Tuff	Well test	532	1150 (3772)	Metamorphic rock
Microphotographs	439	2119 (6950)	Volcanic breccia	Well test	8620	1650 (5412)	Andesite
Microphotographs	417	2439 (8000)	Volcanic breccia	Well test	K92	575 (1886)	Andesite
Microphotographs	417	2272 (7452)	Andesite	Well test	K112	530 (1738)	Andesite
Microphotographs	417	2512 (8239)	Volcanic breccia	Well test	K120	530 (1738)	Andesite
Microphotographs	G25	1200 (3937)	Basalt	Well test	K116	595 (1952)	Andesite
Microphotographs	534	1893 (6208)	Volcanic breccia	Well test	K117	515 (1689)	Andesite
Microphotographs	534	1892 (6206)	Volcanic breccia	Well test	K110	460 (1509)	Tuff
Microphotographs	K121	641 (2102)	Basalt	Well test	K108	560 (1837)	Andesite
Microphotographs	K118	613 (2011)	Andesite	Well test	K105	605 (1984)	Andesite
Microphotographs	K92	511 (1677)	Andesite	Well test	K123	620 (2034)	Andesite
Microphotographs	K120	533 (1748)	Volcanic breccia	Well test	K111	692 (2270)	Andesite
Microphotographs	K123	525 (1721)	Tuff	Well test	K122	650 (2132)	Andesite
Microphotographs	K123	605 (1985)	Tuff	Well test	K109	745 (2444)	Andesite
Microphotographs	K122	880 (2887)	Sandy conglomerate	Well test	K113	815 (2673)	Tuff
Well test	B4	495 (1624)	Tuff	Well test	K127	885 (2903)	Andesite
Well test	B008	480 (1574)	Tuff	Well test	K131	860 (2821)	Andesite

Abbreviations: B = Bai; G = Gu; K = Ke.

Table 2. Logging and Testing Information of the Carboniferous Volcanic Rocks of Some Wells in the Kebai Fault Zone

Lithology	Well	Production			Interval		Oil			Formation Pressure	Production Rate (bbl)
		Production Testing Section (m [ft])	Testing Results	Sampling Interval (m [ft])	Resistivity (Ω .m)	Transit Time (μ s/ft)	Porosity (%)	Saturation (%)	Pressure Coefficient		
Tuff	416	828-868 (2716-2847)	OL	843-845 (2765-2772)	190	63	6.62	49.96	1.18	10.01	50.94
Tuff	G59	439-459 (1440-150)	OL	442-446 (1450-1463)	200	64	7.21	55.43	1.16	5.21	158.76
Tuff	G107	936-950 (3070-3116)	OL	941-944 (3086-3096)	50	71	11.27	42.93	1.18	11.13	24.41
Tuff	B008	734-762 (2407-2499)	OL	751-752 (2463-2466)	250	67	8.95	68.32	1.18	8.83	200.7
Tuff	B009	819-852 (2686-2795)	OL	833-835 (2732-2739)	100	66	8.37	45.5	1.14	9.52	31.91
Tuff	B010	609-632 (1997-2073)	OL	618-620 (2027-2034)	80	67	8.95	42.99	1.16	7.20	41.72
Tuff	B010	898-920 (2945-3018)	OL	901-904 (2955-2965)	110	66	8.37	48.11	1.17	10.64	61.52
Tuff	B006	923-941 (3027-308)	OBL	923-924 (3027-3031)	150	61.5	5.75	34.5	1.26	11.74	22.84
Tuff	B002	1100-1123 (3608-3683)	OBL	1111-1113 (3644-3651)	110	63	6.62	33.68	1.31	14.56	36.62
Tuff	438	1469-1487 (4818-4877)	OWL	1481-1483 (4858-4864)	170	62	6.04	41.67	1.31	19.36	191.72
Tuff	406	1578-1600 (5176-5248)	OWL	1585-1587 (5199-5205)	47	70	10.69	55.24	1.28	20.34	21.70
Tuff	B17	1814-1834 (5950-6015)	OBL	1815-1817 (5953-5960)	100	60	4.88	31.58	1.28	23.35	38.38
Tuff	B17	1694-1724 (5556-5655)	OL	1696-1697 (5563-5566)	55	74	13.02	66.55	1.27	21.70	74.53
Tuff	8065	1662-1742 (5451-5714)	OL	1720-1725 (5642-5658)	100	64	7.21	54.64	1.26	21.45	35.28
Tuff	7551	1285-1313 (4215-4307)	OL	1306-1308 (4284-4290)	200	64	7.21	68.63	1.24	16.11	25.47
Tuff	G48	1213-1246 (3979-4087)	OL	1218-1219 (3995-3998)	130	65	7.79	63.64	1.27	15.61	229.32
Tuff	7560	1199-1243 (3933-4077)	OL	1222-1228 (4008-4028)	200	66	8.37	73.19	1.16	14.16	29.77
Tuff	B003	1498-1526 (4913-5005)	OL	1519-1523 (4982-4995)	250	64	7.21	72.14	1.18	17.84	38.48
Tuff	B011	1352-1368 (4435-4487)	OL	1366-1368 (4480-4487)	180	63	6.62	63.7	1.12	15.23	117.75
Tuff	B4	756-780 (2480-2558)	OL	762-764 (2499-2506)	150	66	6.55	52.65	1.20	9.25	137.2
Tuff	G108	873-888 (2863-2913)	OL	882-884 (2893-2899)	300	65	5.91	64.27	1.20	10.57	20.8
Tuff	G95	1148-1164 (3765-3818)	OL	1154-1156 (3785-3792)	130	65	5.91	52.34	1.21	13.99	14.2
Andesite	G59	494-506 (1620-1660)	OL	495-497 (1624-1630)	95	69	8.5	53.25	1.14	5.70	121.16
Andesite	G59	869-899 (2850-2949)	OL	879-885 (2883-2903)	160	68	7.85	62.08	1.18	10.43	22.3
Andesite	G110	1075-1100 (3526-3608)	OBL	1092-1094 (3582-3588)	180	66	6.55	37.24	1.16	12.62	21.92
Andesite	9660	974-1024 (3195-3359)	OL	984-986 (3227-3234)	150	64.5	5.58	44.17	1.18	11.79	26.62
Andesite	9655	1033-1120 (3388-3674)	OL	1077-1078 (3532-3536)	190	67	7.2	62.36	1.12	12.06	30.87
Andesite	G100	760-790 (2493-2591)	OL	761-762 (2496-2499)	140	69	8.5	62.36	1.16	5.51	19.40
Andesite	J218	1020-1052 (3346-3451)	OL	1032-1033 (3385-3388)	120	65	5.91	40.39	1.21	12.54	31.97
Andesite	B19118	970-1006 (3182-3300)	OL	974-975 (3195-3198)	100	69	8.5	54.57	1.12	11.07	40.79
Andesite	B19118	777-809 (2549-2653)	OL	786-788 (2578-2585)	100	66.5	6.88	43.54	1.08	8.56	131.20

(continued)

Table 2. Continued

Lithology	Well	Production Testing Section			Production Testing Results			Interval			Oil		
		(m [ft])	(m [ft])	(m [ft])	Testing Results	Sampling Interval (m [ft])	Resistivity (Ω .m)	Transit Time (μ s/ft)	Porosity (%)	Saturation (%)	Pressure Coefficient	Formation Pressure	Production Rate (bbl)
Andesite	K95	893-904 (2929-2965)			DL	901-903 (2955-2962)	100	62	3.96	0.39	1.06	9.52	/
Andesite	K95	831-851 (2726-2791)			DL	838-841 (2749-2758)	90	63	4.61	9.63	1.08	9.08	/
Andesite	G108	506-521 (1660-1709)			OL	510-513 (1673-1683)	450	66	6.55	74.37	1.18	6.06	394.70
Andesite	K94	1440-1466 (4723-4808)			OL	1454-1456 (4769-4776)	140	66	6.55	58.32	1.19	17.23	119.18
Andesite	B004	1678-1712 (5504-5615)			OL	1678-1680 (5504-5510)	150	67	7.2	63.17	1.20	20.34	86.99
Andesite	G48	1115-1137 (3657-3729)			OL	1121-1122 (3677-3680)	120	65	5.91	50.34	1.29	14.57	220.50
Andesite	B001	1230-1250 (4034-4100)			OL	1244-1246 (4080-4087)	90	67	7.2	52.14	1.10	13.64	26.46
Andesite	B001	1270-1294 (4166-4244)			OL	1272-1276 (4172-4185)	200	65	5.91	61.79	1.12	14.36	67.82
Andesite	7555	1300-1370 (4264-4494)			OL	1300-1301 (4264-4267)	110	65	5.91	48.08	1.26	16.82	42.34
Andesite	B014	1808-1836 (5930-6022)			OL	1823-1824 (5979-5983)	220	68	7.85	72.08	1.26	22.96	124.69
Andesite	7556	1267-1390 (4156-4559)			OL	1347-1350 (4418-4428)	140	64	5.26	48.85	1.16	15.41	14.99
Andesite	7552	1215-1494 (3985-4900)			OL	1240-1242 (4067-4074)	190	64.5	5.58	58.61	1.18	15.98	18.08
Andesite	7561	1152-1308 (3778-4290)			OL	1276-1280 (4185-4198)	160	64	5.26	52.23	1.08	13.28	23.60
Andesite	BJ1142	1429-1451 (4687-4759)			OL	1448-1451 (4749-4759)	110	70	9.15	65.47	1.20	11.28	259.09

Abbreviations: B = Bai; BJ = Bajjian; G = Gu; J = Jin; K = Ke; OBL = oil-bearing layer (test results show commercial exploitation value and water content is in the range 5%-30%); OL = oil layer (test results show commercial exploitation value and water content is <5%).