

Appendix A the molecular and carbon isotopic compositions of natural gases in the
NWJB (Yang et al., 2008; Tao et al., 2016; Chen et al., 2014).

Area	NO.	Well	Depth	Formation	Classification	CH ₄	C ₂ H ₆	C ₃ H ₈	δ ¹³ C ₁	δ ¹³ C ₂	δ ¹³ C ₃	δ ¹³ C ₄
Zhongguai uplift	72	K 305	3403	P _{1j}	Group A	94.05	2.14	0.45	-26.6	-24.7	-20.9	/
Zhongguai uplift	71	K 82	4070-4084	P1j	Group A	91.33	3.74	1.09	-29.7	-23.0	-20.1	-20.0
Zhongguai uplift	70	K 77	2763	P _{2w}	Group A	94.49	3.13	0.92	-32.9	-26.4	-24.0	-24.8
Zhongguai uplift	69	K 75	2672	P _{2w}	Group A	94.40	3.11	0.77	-35.1	-26.9	-24.0	-24.5
Zhongguai uplift	68	K 76	2964.6	P _{2w}	Group A	94.27	2.83	0.90	-32.5	-26.1	-22.5	/
Zhongguai uplift	67	JL2	4605-4625	P1j	Group A	93.30	2.39	0.52	-32.0	-25.3	-21.1	/
Zhongguai uplift	64	K 004	3195	P _{2w}	Group A	95.63	2.10	0.49	-33.9	-27.3	-25.4	-26.0
Zhongguai uplift	63	XG2	3754-3766	P2w	Group A	94.78	2.04	0.72	-33.1	-26.6	-26.1	/
Zhongguai uplift	62	G3	4610-4634	P2w	Group A	93.82	1.93	0.72	-31.6	-26.6	-26.5	-26.5
Zhongguai uplift	61	XG1	4552-4566	P1j	Group A	91.70	2.56	0.98	-32.4	-27.3	-26.6	-26.9
Zhongguai uplift	66	K 305	3200	P _{1j}	Group A	95.06	1.77	0.39	-28.4	-25.0	/	/
Zhongguai uplift	65	K82	4166-4184	P1j	Group A	90.51	3.55	0.90	-30.0	-24.2	/	/
Zhongguai uplift	58	K 79	3521	P _{2w}	Group B	94.08	2.46	0.85	-37.4	-29.1	-29.4	-28.3
Zhongguai uplift	57	K 78	3264	P _{2w}	Group B	92.89	3.37	1.12	-35.7	-28.2	-28.6	-28.4
Zhongguai uplift	56	CP3	3600-3674	P1j	Group B	92.44	2.98	1.07	-34.1	-28.6	-27.6	-28.3
Zhongguai uplift	52	G5	3116-3126	P1j	Group B	93.61	2.10	0.71	-39.6	-26.8	-24.4	-26.8
Wu-Xia fault zone	51	X 69	1468	P _{1f}	Group B	93.78	2.50	0.68	-41.0	-28.9	-27.6	-27.3
Mahu sag	50	M 154	3026	T _{1b}	Group B	92.74	2.84	0.83	-43.3	-28.8	-27.7	-28.6
Wu-Xia fault zone	47	X 94	2835	T _{1b}	Group B	91.02	2.70	0.85	-42.0	-27.4	-26.7	-26.5
Wu-Xia fault zone	46	X 93	2680-2712	T _{1b}	Group B	90.38	3.08	0.94	-42.0	-28.3	-27.0	-26.8
Mahu sag	45	M 134	3169	T _{1b}	Group B	89.90	3.18	1.01	-42.0	-27.5	-27.2	-26.0
Zhongguai uplift	54	K 007	3109	P _{1j}	Group B	91.52	4.78	1.76	-34.7	-27.5	-26.7	-27.9
Zhongguai uplift	53	K 001	2913	P _{2w}	Group B	86.61	5.62	3.34	-33.0	-27.5	-28.3	-29.4
	60	K302	3642-3670	P2w	Group C	92.31	2.90	0.88	-38.0	-31.2	-29.8	-30.3
Zhongguai uplift	59	K 82	3532-3548	P2w	Group C	93.25	3.15	0.61	-38.5	-31.8	-30.7	-30.6
Mahu sag	49	M 13	3106	T _{1b}	Group C	92.18	3.04	0.83	-42.9	-29.2	-27.4	-26.4
Mahu sag	48	M 139	3261	T _{1b}	Group C	90.39	2.82	0.79	-43.6	-29.5	-27.6	-26.5
Zhongguai uplift	55	K 009	3408	P _{2w}	Group C	88.48	4.60	2.22	-37.3	-29.7	-28.0	-29.4
Zhongguai uplift	44	K 120	516	C	Group C	92.30	3.41	1.22	-45.7	-32.2	-31.1	-29.6
Wu-Xia fault zone	43	W 002	795	T _{2k}	Group C	90.80	2.26	1.31	-45.4	-31.7	-30.0	-29.7
Zhongguai uplift	42	K 116	524	C	Group C	95.28	2.00	1.16	-49.1	-31.9	-30.7	-29.7
Wu-Xia fault zone	41	W 33	749	T _{2k}	Group C	94.47	1.54	0.65	-45.1	-31.9	-29.9	-29.8
Ke-Bai fault zone	40	B (jt) 3	629	C	Group C	94.00	2.72	0.52	-45.6	-31.5	-29.2	-28.3
Zhongguai uplift	39	K 108	546	C	Group C	88.61	3.26	2.79	-45.2	-30.3	-29.3	-30.1
Wu-Xia fault zone	38	W 005	967.5	T _{2k}	Group C	89.19	3.15	1.84	-44.8	-31.2	-28.3	-29.0
Wu-Xia fault zone	37	F 7	3153.5	P _{1f}	Group C	86.88	3.70	1.21	-39.9	-31.9	-29.9	/
Mahu sag	36	M 18	3854	T _{1b}	Group C	86.71	4.77	2.04	-42.9	-30.8	-28.7	-27.6
Mahu sag	35	AH 011	3848	T _{1b}	Group C	85.93	5.06	2.18	-43.1	-31.0	-29.2	-28.3
Ke-Bai fault zone	34	B (jt) 4	756	C	Group C	88.84	2.55	4.70	-43.1	-32.2	-30.0	-29.8

Wu-Xia fault zone	33	FC 1	4193.9	P _{1f}	Group C	88.22	5.28	2.08	-50.2	-32.8	-31.9	-30.2
Mahu sag	32	M 006	3544	P _{2w}	Group C	83.40	5.18	1.85	-48.8	-29.7	-30.3	-30.0
Wu-Xia fault zone	31	W 27	2311	P _{2x}	Group C	89.81	3.13	2.11	-48.9	-35.4	-32.9	-31.9
Zhongguai uplift	29	K 127	870	C	Group C	84.85	6.96	3.29	-39.2	-29.8	-28.9	-29.0
Ke-Bai fault zone	28	B (jt) 1	1458	C	Group C	83.08	6.27	3.71	-42.4	-32.1	-30.2	-29.8
Mahu sag	27	M 6	3880	T _{1b}	Group C	84.38	6.23	3.10	-46.8	-31.9	-28.7	-28.7
Mahu sag	26	M 2	3425	T _{1b}	Group C	84.75	6.81	3.12	-46.9	-31.3	-28.5	-27.8
Wu-Xia fault zone	25	X 72	4808	P _{1f}	Group C	81.56	6.48	3.31	-46.4	-32.9	-31.8	-31.3
Ke-Bai fault zone	24	B (jt)17	1694	C	Group C	83.44	7.13	3.20	-44.5	-33.7	-31.6	-31.1
Wu-Xia fault zone	23	FN 2	4037.8	P _{1f}	Group C	82.78	6.56	2.81	-48.1	-34.4	-29.8	-33.2
Wu-Xia fault zone	22	W 35	2152	P _{2x}	Group C	80.90	7.60	3.63	-49.2	-35.0	-33.5	/
Wu-Xia fault zone	20	FN 052	2205.5	P _{2x}	Group C	74.11	4.61	3.34	-46.3	-34.5	-31.2	-34.2
Wu-Xia fault zone	19	X 91-H	2796	T _{1b}	Group C	74.24	7.52	4.35	-44.5	-33.6	-32.1	-30.3
Zhongguai uplift	18	K 112	520	C	Group C	69.98	11.31	9.12	-43.2	-31.2	-28.9	-29.1
Ke-Bai fault zone	17	K 94	1440	C	Group C	71.05	12.42	7.02	-45.9	-34.0	-31.7	-31.0
Zhongguai uplift	16	K 110	456	C	Group C	74.44	8.31	7.24	-45.8	-30.1	-27.7	-29.4
	15	K101	3681-3691	P _{2w}	Group C	72.56	8.69	5.84	-36.8	-30.6	-28.0	-28.2
Mahu sag	14	AH 1	3848	T _{1b}	Group C	70.65	7.99	5.20	-39.3	-30.9	-29.5	-29.0
Mahu sag	13	AH 013	3798	T _{1b}	Group C	70.23	7.70	5.23	-40.4	-31.4	-30.2	-29.4
Ke-Bai fault zone	12	K 92	524	C	Group C	79.29	8.55	5.44	-40.9	-30.4	-29.0	-28.3
Ke-Bai fault zone	11	B (jt) 7	1656	C	Group C	77.57	8.10	5.16	-40.1	-33.4	-30.6	-31.1
Wu-Xia fault zone	10	W 35	2927	P _{2x}	Group C	73.40	9.75	5.60	-48.4	-32.3	-29.2	/
Ke-Bai fault zone	9	B (jt)18	1712	C	Group C	76.33	10.08	4.92	-47.9	-33.3	-31.3	-31.7
Wu-Xia fault zone	8	W 35	2778	P _{2x}	Group C	76.51	9.48	4.99	-47.6	-32.1	-29.4	/
Mahu sag	7	M 2	3561	P _{2w}	Group C	77.50	8.74	4.68	-47.8	-30.5	-29.5	-29.1
Mahu sag	6	MH 1	3284–3310	T _{1b}	Group C	79.52	8.91	3.38	-46.0	-30.8	-29.7	-28.8
Wu-Xia fault zone	21	FC 1	3855	P _{1f}	Group C	69.89	5.52	2.56	-52.7	-37.5	-34.0	-33.6
Wu-Xia fault zone	1	F 501	972	P _{1f}	Group C	78.36	6.65	5.88	-53.0	-40.9	-37.7	-34.6
Wu-Xia fault zone	5	FN 7	4296	P _{1f}	Group C	77.13	11.00	4.97	-52.1	-37.3	-35.1	-34.0
Wu-Xia fault zone	4	BQ 1	4724	P _{1f}	Group C	77.99	9.34	5.35	-52.8	-36.2	-32.7	-31.7
Wu-Xia fault zone	3	FN 5	4394.2	P _{1f}	Group C	75.24	11.27	6.91	-54.4	-38.6	-35.1	-33.5
Wu-Xia fault zone	2	FN 5	4418	P _{1f}	Group C	64.68	10.20	7.21	-54.2	-37.9	-34.5	-36.8

Note: “/” = below detection limit