

Research on the Capacity of Underground Reservoirs in Coal Mines to Protect the Groundwater Resources : A Case of Zhangshuanglou Coal Mine in Xuzhou, China

Chenghang Zhang^{1,2}, Bin Luo^{2,3,*}, Zhimin Xu², Yajun Sun² and Lin Feng²

¹ School of Earth Sciences and Engineering, Sun Yat-sen University, Zhuhai, 519080, China

² School of Resources and Geosciences, China University of Mining and Technology, Xuzhou, 221116, China

³ College of Ecology, Taiyuan University of Technology, Taiyuan, 030024, China

* Corresponding author: 13685165782@163.com

Table S1 Major chemical constituents of water samples in different zones of Coal Mine.

Group	Sample name	sampling place	pH	DO mg/L	ORP mV	K ⁺ +Na ⁺ mg/L	Ca ²⁺ mg/L	Mg ²⁺ mg/L	Fe ³⁺ mg/L	Fe ²⁺ mg/L	NH ₄ ⁺ mg/L	Sr mg/L	Cl ⁻ mg/L	SO ₄ ²⁻ mg/L	HCO ₃ ⁻ mg/L	CO ₃ ²⁻ mg/L	NO ₃ ⁻ mg/L	NO ₂ ⁻ mg/L	TDS mg/L	CO ₂ mg/L	H ₂ SiO ₃ mg/L	COD mg/L
goaf	XJL12	goaf closure in 2023	8.4	4.75	161.7	1412.5	261.2	135.5	0.06	<LQ	0.01	6.3	131.7	3626.6	372.1	7.2	2.26	0.05	6016	<LQ	10.6	1.14
	XJL15	goaf closure in 2022	7.2	2.84	171.4	1665.5	339.9	120.4	0.49	<LQ	0.45	8.5	147.1	4268.3	380.4	—	<LQ	3.74	6950	12.9	10.7	3.38
	XJL16	goaf closure in 2021	7.3	2.96	254.6	2013.5	245.1	85.3	0.19	0.19	4.63	5.4	97.9	4500.9	646.1	—	<LQ	0.35	7614	9.4	9.5	1.34
	XJL23	goaf closure in 2010	7.1	2.86	117.7	1157.7	345.6	157.4	0.07	0.05	2.80	6.3	235.0	3239.3	403.8	—	<LQ	0.06	5462	23.6	14.5	1.67
	XJL24	goaf closure in 2012	7.5	3.22	230.5	1066.4	313.4	129.1	0.08	<LQ	<LQ	9.5	246.8	2900.1	321.9	—	1.12	0.01	4918	14.6	15.4	1.30
	XJL25	goaf closure in 2009	7.1	2.70	98.5	869.7	365.7	117.0	0.09	<LQ	2.03	9.3	258.2	2559.3	319.4	—	<LQ	0.01	4428	24.8	15.4	1.14

Note: TDS and COD refer to dissolved oxygen, oxidation-reduction potential, total dissolved solids and chemical oxygen demand, respectively.