

Annex F5

Groundwater Monitoring Results

Table F5.1 Groundwater Monitoring Results (January 2022)

Parameters	Units	MWX-1	MWX-2	MWX-3	MWX-4	MWX-5	MWX-6	MWX-7	MWX-8	MWX-9	MWX-10	MWX-11	MWX-12	MWX-13	MWX-14
Water Level	mPD	2.61	2.72	2.70	2.61	2.58	2.51	2.48	2.37	2.68	2.66	2.98	6.29	35.86	43.21
Bicarbonate Alkalinity as CaCO ₃	mg/L	134	301	161	<1	<1	<1	50	<1	74	163	146	59	15	10
Carbonate Alkalinity as CaCO ₃	mg/L	<1	<1	<1	91	75	94	15	79	16	<1	<1	<1	<1	<1
Total Alkalinity as CaCO ₃	mg/L	134	301	161	144	106	211	65	110	90	163	146	59	15	10
pH Value	pH Unit	7.7	7.8	7.8	10.9	10.6	11.1	8.8	10.3	8.7	7.7	8	6.6	5.4	5.5
Electrical Conductivity @ 25Â°C	µS/cm	752	786	1060	1220	1210	1400	2770	3070	2330	1150	374	311	95	92
Ammonia as N	mg/L	0.17	<0.01	1.07	7.6	1.9	3.83	6.26	13.3	6.42	<0.01	0.11	<0.01	0.02	<0.01
Chloride	mg/L	118	30	181	270	215	183	889	983	658	231	26	23	16	18
Nitrite as N	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Reactive Phosphorus as P	mg/L	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	0.02	<0.01	0.03	0.04	0.02	0.04	<0.01	<0.01
Sulphate as SO ₄ - Turbidimetric	mg/L	59	85	95	55	158	96	45	43	152	82	7	54	3	3
Sulphide as S ₂ -	mg/L	<0.1	<0.1	<0.1	6.4	3.3	11	1	10.9	0.5	<0.1	<0.1	<0.1	<0.1	<0.1
Total Kjeldahl Nitrogen as N	mg/L	0.2	0.1	1.2	7.8	2	4.3	6.6	14	6.5	<0.1	0.2	0.1	<0.1	0.1
Nitrate as N	mg/L	0.05	0.29	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.1	0.12
Total Nitrogen as N	mg/L	0.3	0.4	1.2	7.8	2	4.3	6.6	14	6.5	<0.1	0.2	0.2	0.2	0.2
Boron	µg/L	120	200	170	160	180	170	630	530	500	100	50	20	10	10
Calcium	mg/L	56.5	59.3	84.2	55.4	32	33.5	34.6	67.5	39	86.4	46.8	27.1	0.87	0.86
Mercury	µg/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Magnesium	mg/L	5.68	52.4	5.58	<0.05	<0.05	<0.05	8.86	0.05	12.6	11.4	2.97	4.18	0.98	0.74
Sodium	mg/L	92.4	36.9	102	144	172	166	484	439	352	133	29.4	25.4	14	13.6
Iron	mg/L	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.14	0.59	<0.04	<0.04
Potassium	mg/L	20.3	10.5	26.2	37.1	58.8	59.3	54.3	45.8	43.5	11.2	7.15	2.95	4	3.51
Cadmium	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Chromium	µg/L	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Copper	µg/L	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	1	<1
Lead	µg/L	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Manganese	µg/L	554	142	974	<1	<1	<1	4	<1	9	2550	567	770	28	7
Nickel	µg/L	<1	<1	<1	2	<1	2	<1	<1	<1	<1	<1	<1	<1	<1
Zinc	µg/L	<10	2930	<10	<10	<10	<10	27	<10	<10	<10	<10	14	11	<10
Biochemical Oxygen Demand	mg/L	<2	<2	<2	4	4	9	<2	5	2	<2	<2	<2	<2	<2
Chemical Oxygen Demand	mg/L	9	<2	15	34	25	44	15	20	26	20	2	7	<2	<2
Total Organic Carbon	mg/L	4	2	10	13	8	12	6	10	11	6	3	2	2	1

Table F5.2 Groundwater Monitoring Results (February 2022)

Parameters	Units	MWX-1	MWX-2	MWX-3	MWX-4	MWX-5	MWX-6	MWX-7	MWX-8	MWX-9	MWX-10	MWX-11	MWX-12	MWX-13	MWX-14
Water Level	mPD	2.59	2.66	2.62	2.54	2.53	2.34	2.18	2.23	2.33	2.20	2.71	6.11	35.31	41
Bicarbonate Alkalinity as CaCO3	mg/L	152	307	92	<1	<1	<1	66	<1	78	160	166	62	15	11
Carbonate Alkalinity as CaCO3	mg/L	<1	<1	<1	91	54	147	10	89	8	<1	<1	<1	<1	<1
Total Alkalinity as CaCO3	mg/L	152	307	92	141	64	201	76	121	87	160	166	62	15	11
pH Value	pH Unit	7.8	7.8	7.9	10.7	10.3	11.2	8.6	10.7	8.5	7.7	7.8	6.5	5.5	5.4
Electrical Conductivity @ 25Â°C	µS/cm	851	800	1010	1250	1510	1230	2900	3160	1200	1280	406	307	95	97
Ammonia as N	mg/L	0.34	<0.01	1.25	7.29	2.39	3.86	5.7	14.2	5.14	0.03	0.12	<0.01	<0.01	<0.01
Chloride	mg/L	136	31	209	277	366	192	917	1010	287	282	25	23	16	19
Nitrite as N	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Reactive Phosphorus as P	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	0.02	0.01	0.02	0.04	0.02	0.04	<0.01	<0.01
Sulphate as SO4 - Turbidimetric	mg/L	65	92	82	52	110	79	42	39	78	88	5	46	3	4
Sulphide as S2-	mg/L	<0.1	<0.1	0.2	7.8	2.8	9	0.8	6.9	0.8	<0.1	<0.1	<0.1	<0.1	<0.1
Total Kjeldahl Nitrogen as N	mg/L	0.3	<0.1	1.5	8.4	2.8	4.8	6.3	15	5.3	<0.1	0.2	0.2	<0.1	<0.1
Nitrate as N	mg/L	0.07	0.27	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.09	0.07
Total Nitrogen as N	mg/L	0.4	0.3	1.5	8.4	2.8	4.8	6.3	15	5.3	<0.1	0.2	0.2	0.1	0.1
Boron	µg/L	140	210	190	170	180	180	680	560	390	110	60	20	10	10
Calcium	mg/L	43.4	58.9	68.3	60	26.3	33.2	30.3	71	22.9	88.8	46.5	28.2	0.95	1.23
Mercury	µg/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Magnesium	mg/L	7.35	48.1	3.5	<0.05	0.06	<0.05	12.6	<0.05	6.58	11.5	3.38	4.09	1.04	0.99
Sodium	mg/L	91.8	35	125	160	215	153	477	525	182	156	29.6	27.2	15.4	17.2
Iron	mg/L	<0.04	<0.04	0.08	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.41	<0.04	<0.04
Potassium	mg/L	18.8	10.7	26	39	54.1	53.9	47.4	54.5	29.5	10.7	6.8	2.78	3.91	3.9
Cadmium	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Chromium	µg/L	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Copper	µg/L	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	1	1
Lead	µg/L	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Manganese	µg/L	952	144	564	<1	<1	<1	8	<1	10	3130	371	718	18	9
Nickel	µg/L	<1	<1	<1	2	<1	1	<1	<1	<1	<1	<1	<1	<1	<1
Zinc	µg/L	<10	50	<10	<10	<10	<10	<10	<10	<10	<10	<10	11	<10	<10
Biochemical Oxygen Demand	mg/L	<2	<2	<2	<2	<2	2	<2	2	<2	<2	<2	<2	<2	<2
Chemical Oxygen Demand	mg/L	10	4	16	43	24	50	14	45	18	10	2	4	5	4
Total Organic Carbon	mg/L	4	6	7	12	5	9	4	8	6	6	6	<1	1	1

Table F5.3 Groundwater Monitoring Results (March 2022)

Parameters	Units	MWX-1	MWX-2	MWX-3	MWX-4	MWX-5	MWX-6	MWX-7	MWX-8	MWX-9	MWX-10	MWX-11	MWX-12	MWX-13	MWX-14
Water Level	mPD	2.27	2.41	2.3	2.36	2.34	2.43	2.12	2.21	2.36	2.43	2.66	6.19	35.2	40.94
Bicarbonate Alkalinity as CaCO3	mg/L	136	333	138	<1	<1	<1	61	<1	85	187	81	59	15	11
Carbonate Alkalinity as CaCO3	mg/L	<1	<1	<1	81	87	128	12	67	2	<1	<1	<1	<1	<1
Total Alkalinity as CaCO3	mg/L	136	333	138	155	163	217	72	104	87	187	81	59	15	11
pH Value	pH Unit	8	7.8	8.1	11.2	11.2	11.3	8.7	10.5	8.4	7.6	8.1	6.8	5.5	5.3
Electrical Conductivity	µS/cm	939	920	945	1160	1330	1310	2900	2720	1460	1700	395	306	95	99
Ammonia as N	mg/L	0.17	0.02	1.45	5.91	3.8	3.95	6.18	11.8	3.29	0.02	0.06	<0.01	0.11	<0.01
Chloride	mg/L	172	34	212	220	211	192	828	697	296	312	33	23	15	18
Nitrite as N	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.55	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Reactive Phosphorus as P	mg/L	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	0.01	0.02	0.01	0.04	<0.01	<0.01
Sulphate as SO4 - Turbidimetric	mg/L	65	120	81	52	119	80	41	73	178	216	56	53	3	4
Sulphide as S2	mg/L	<0.1	<0.1	<0.1	6.6	4.6	9.9	0.6	6.1	0.8	<0.1	<0.1	<0.1	<0.1	<0.1
Total Kjeldahl Nitrogen as N	mg/L	0.3	0.1	1.7	6.8	4.4	5	6.4	12.3	3.8	0.2	0.2	<0.1	0.2	<0.1
Nitrate as N	mg/L	<0.01	0.88	<0.01	<0.01	<0.01	<0.01	<0.01	0.09	<0.01	<0.01	<0.01	<0.01	0.1	0.08
Total Nitrogen as N	mg/L	0.3	1	1.7	6.8	4.4	5	6.4	12.9	3.8	0.2	0.2	<0.1	0.2	0.2
Boron	µg/L	140	220	200	170	180	180	690	470	320	160	70	20	20	20
Calcium	mg/L	48.2	43.8	61.1	51.8	44.5	31.9	31.3	42.1	63.8	124	38	22.4	0.7	0.91
Mercury	µg/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Magnesium	mg/L	8.33	41.9	3.8	<0.05	<0.05	<0.05	14.3	0.05	6.43	11.6	2.23	3.78	0.84	0.9
Sodium	mg/L	119	35	116	140	159	167	513	378	206	192	31.1	23	12.9	14.5
Iron	mg/L	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.07	<0.04	<0.04	0.29	0.11	<0.04
Potassium	mg/L	21.3	9	26.9	36.3	56.6	58.3	50.5	47	36.5	14.5	8.72	2.41	3.32	3.7
Cadmium	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Chromium	µg/L	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Copper	µg/L	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	1	<1
Lead	µg/L	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Manganese	µg/L	804	355	777	1	<1	<1	10	<1	35	1850	207	764	122	8
Nickel	µg/L	<1	<1	<1	1	1	2	<1	1	<1	<1	<1	<1	<1	<1
Zinc	µg/L	<10	192	<10	<10	<10	<10	<10	<10	<10	<10	168	<10	18	<10
Biochemical Oxygen Demand	mg/L	<2	<2	<2	<2	<2	<2	<2	5	<2	<2	<2	2	<2	<2
Chemical Oxygen Demand	mg/L	4	<2	17	38	28	46	11	29	17	9	8	5	5	3
Total Organic Carbon	mg/L	4	4	11	11	9	12	4	11	9	7	4	3	3	3

Figure F5.1 Graphical Presentation for Groundwater Monitoring (MWX-1)

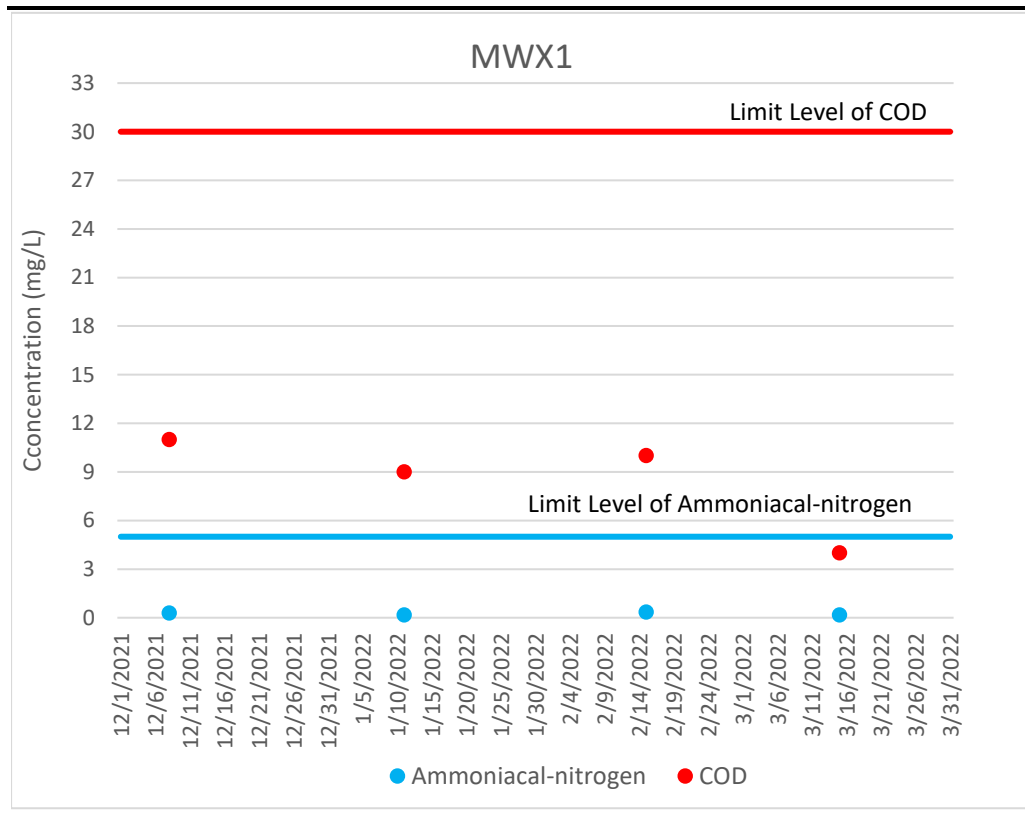


Figure F5.2 Graphical Presentation for Groundwater Monitoring (MWX-2)

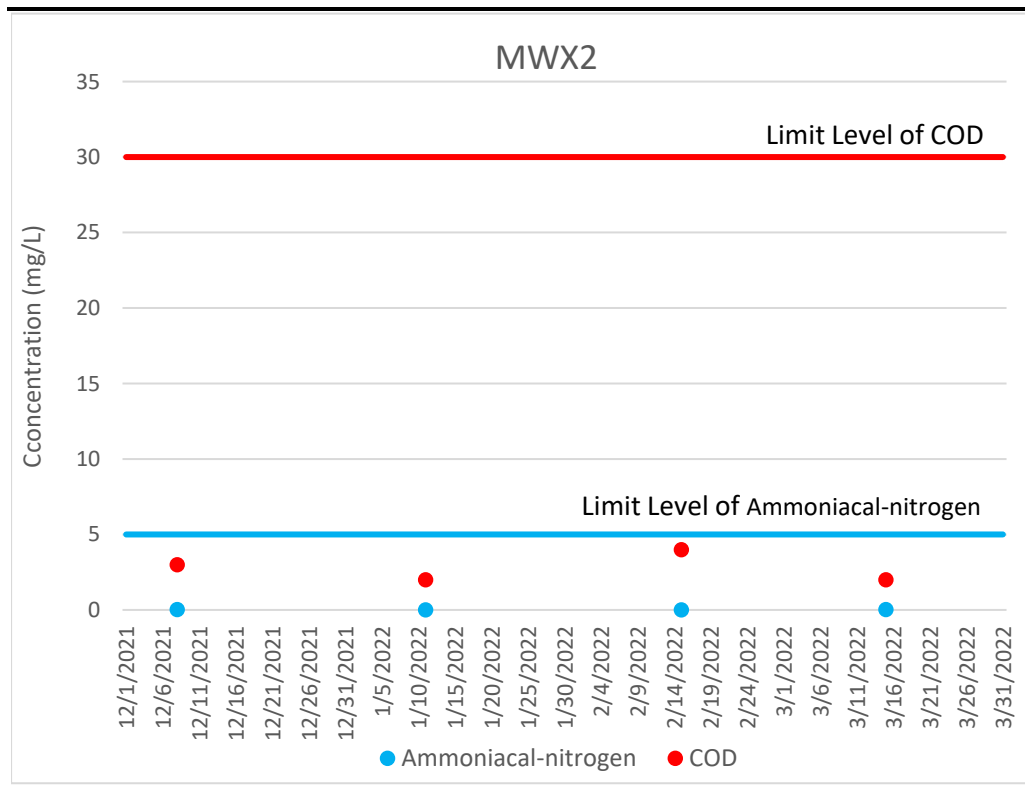


Figure F5.3 Graphical Presentation for Groundwater Monitoring (MWX-3)

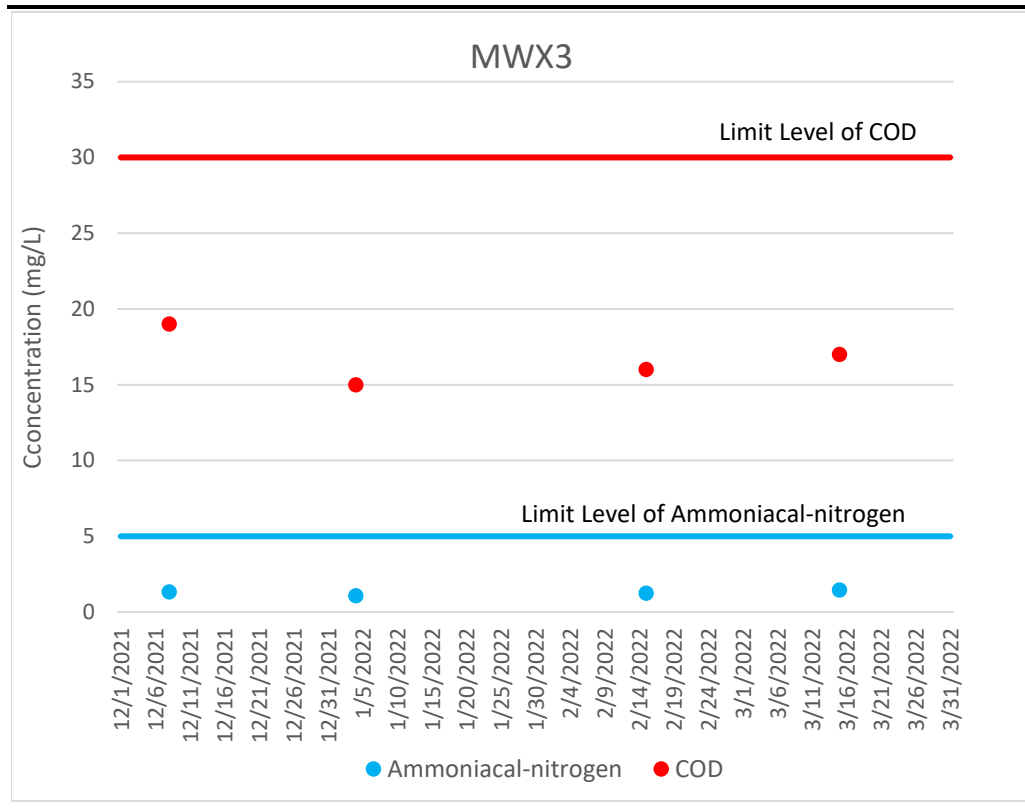


Figure F5.4 Graphical Presentation for Groundwater Monitoring (MWX-4)

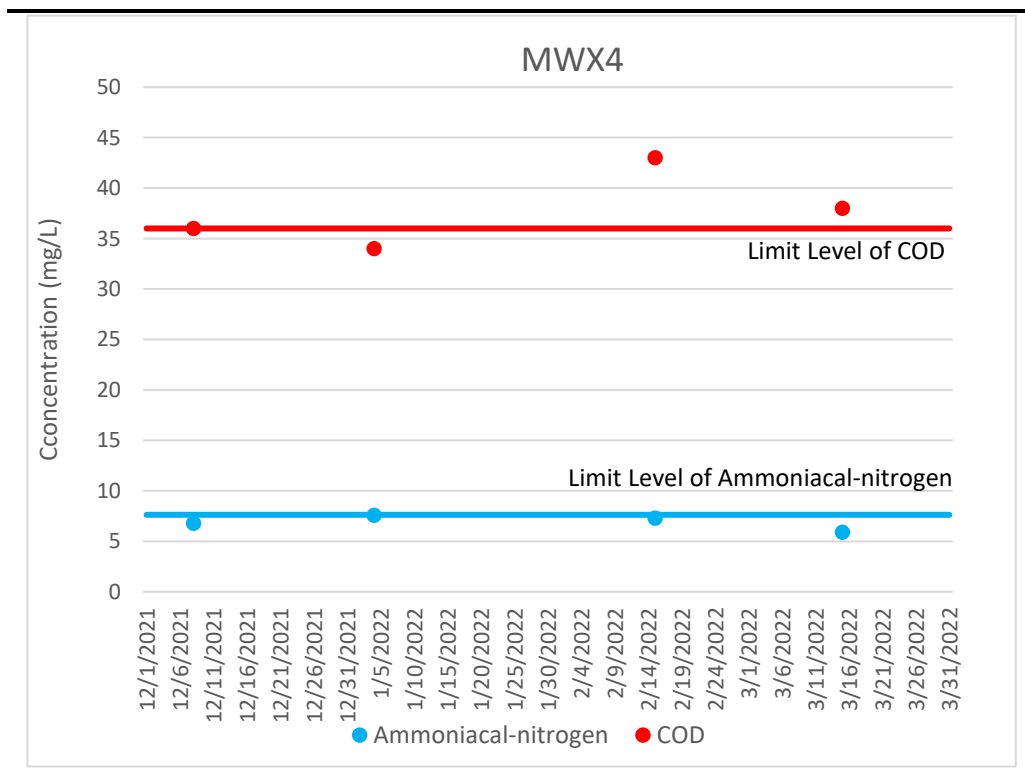


Figure F5.5 Graphical Presentation for Groundwater Monitoring (MWX-5)

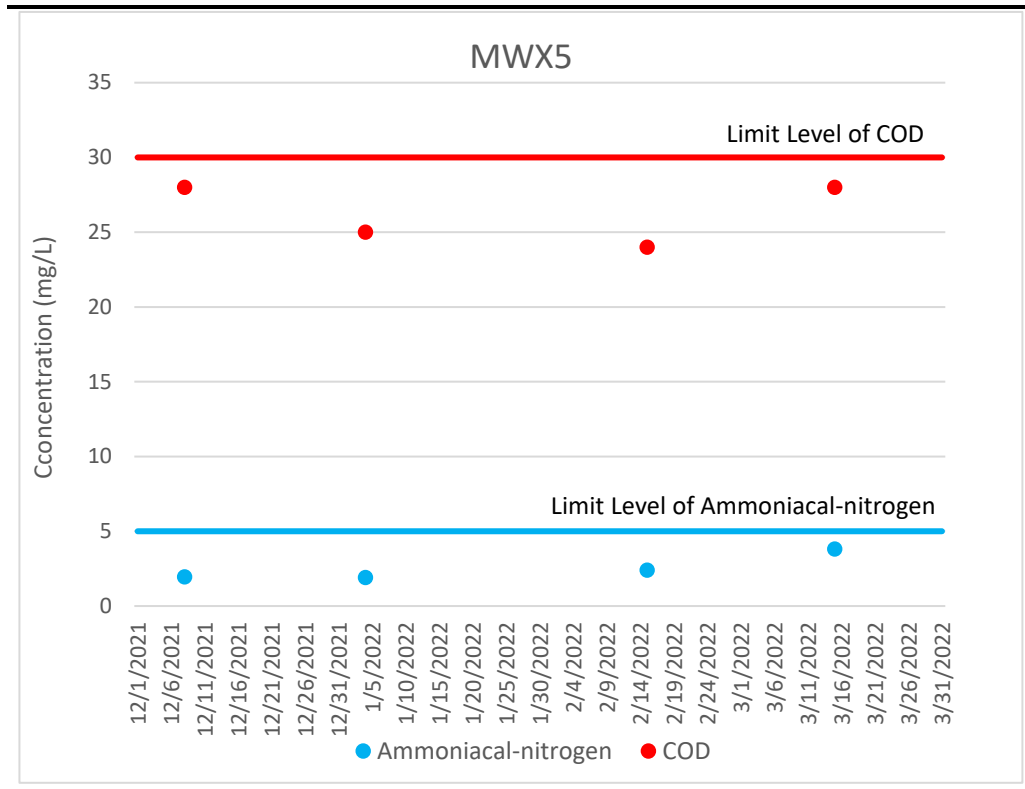


Figure F5.6 Graphical Presentation for Groundwater Monitoring (MWX-6)

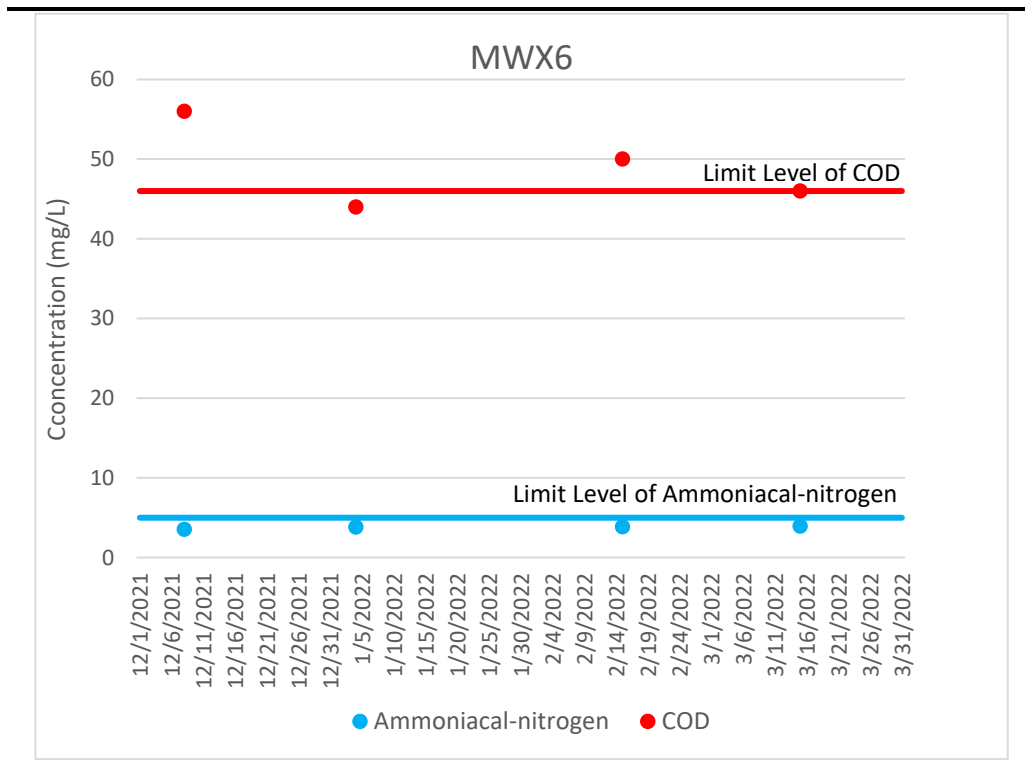


Figure F5.7 Graphical Presentation for Groundwater Monitoring (MWX-7)

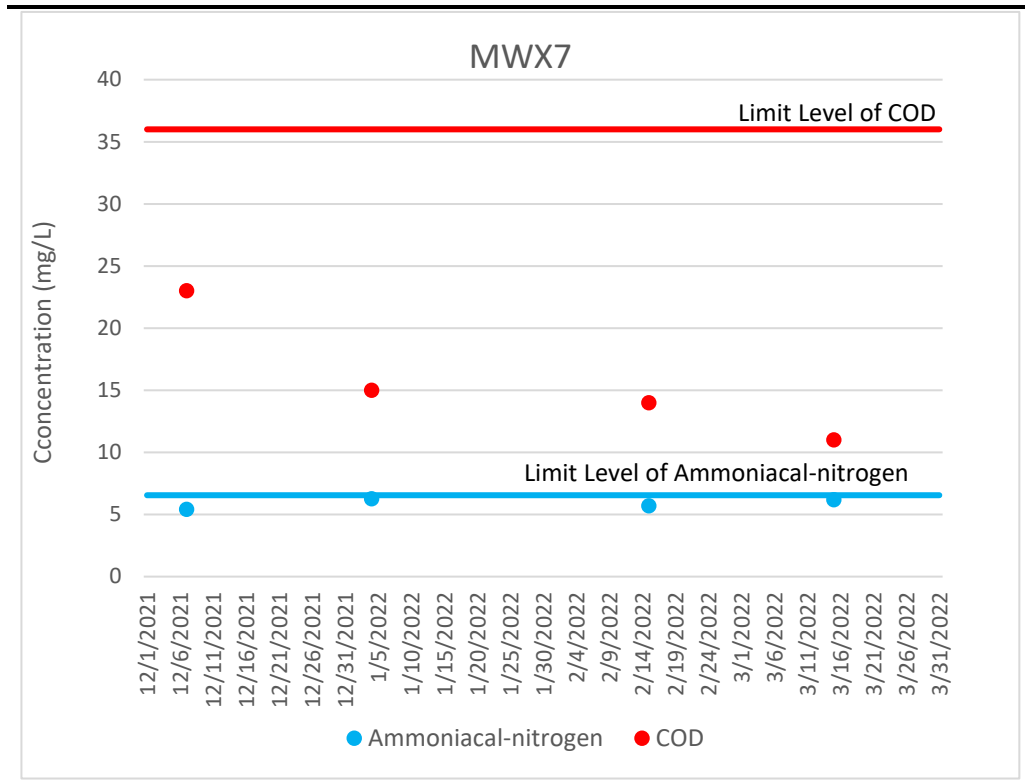


Figure F5.8 Graphical Presentation for Groundwater Monitoring (MWX-8)

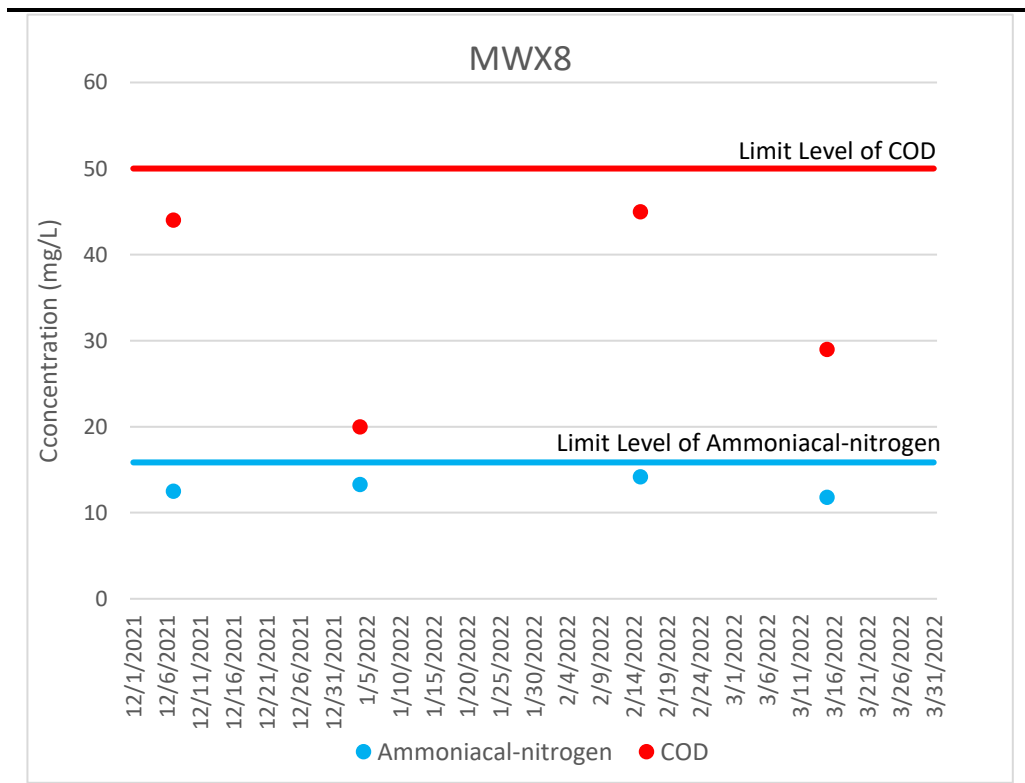


Figure F5.9 Graphical Presentation for Groundwater Monitoring (MWX-9)

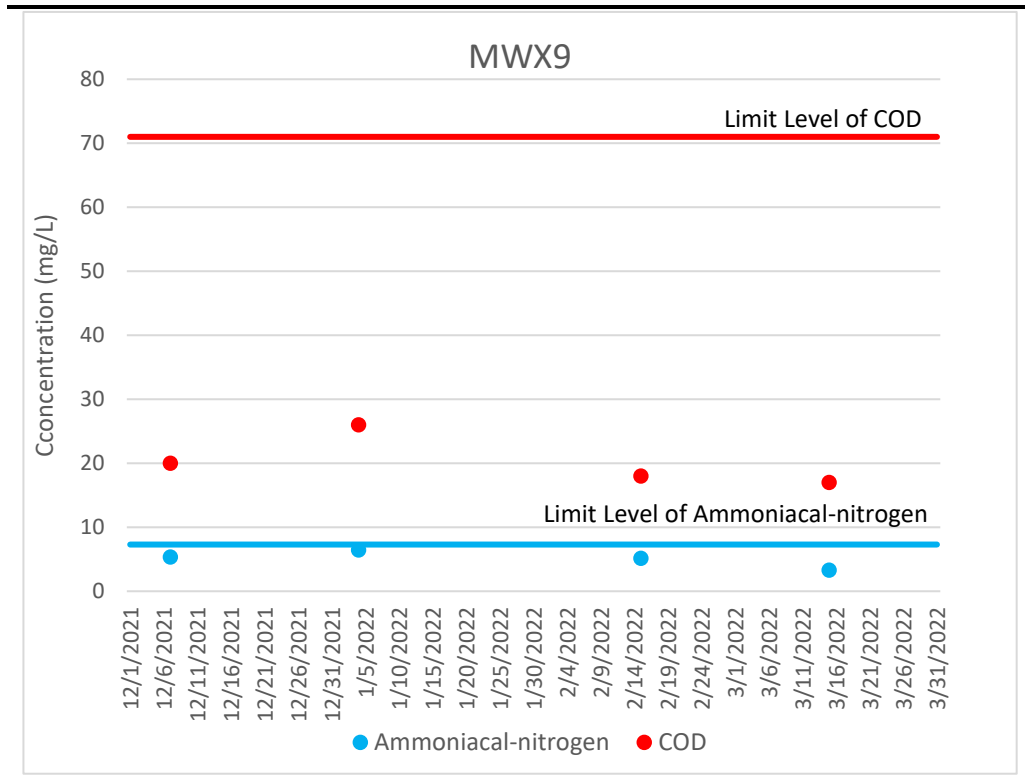


Figure F5.10 Graphical Presentation for Groundwater Monitoring (MWX-10)

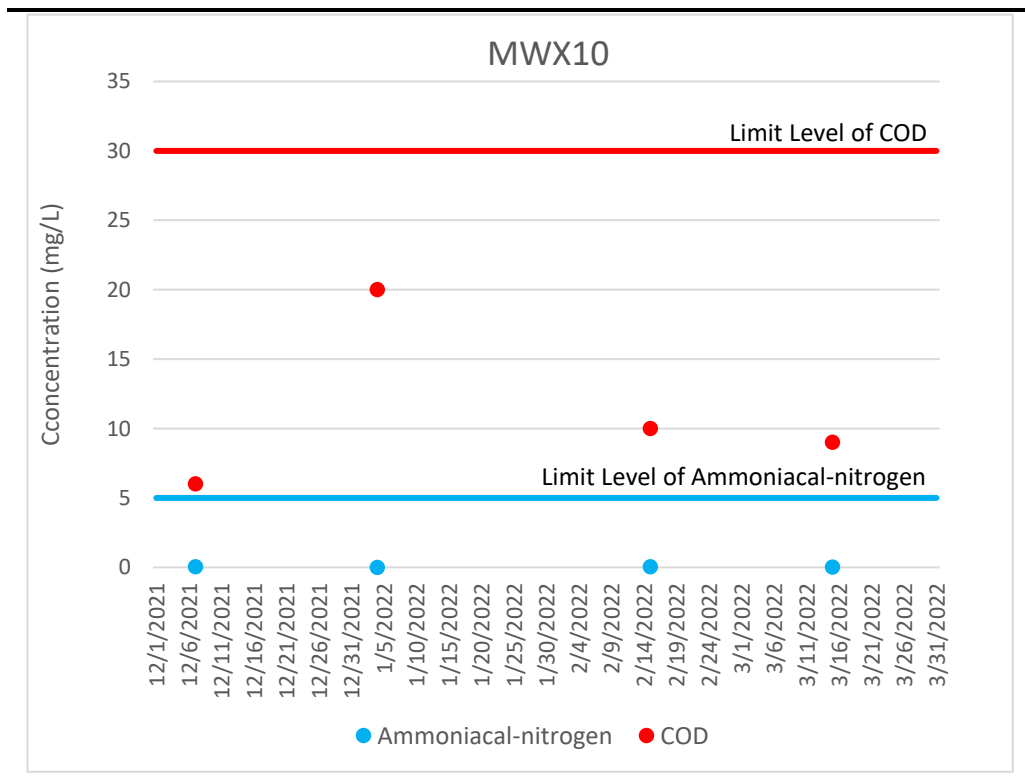


Figure F5.11 Graphical Presentation for Groundwater Monitoring (MWX-11)

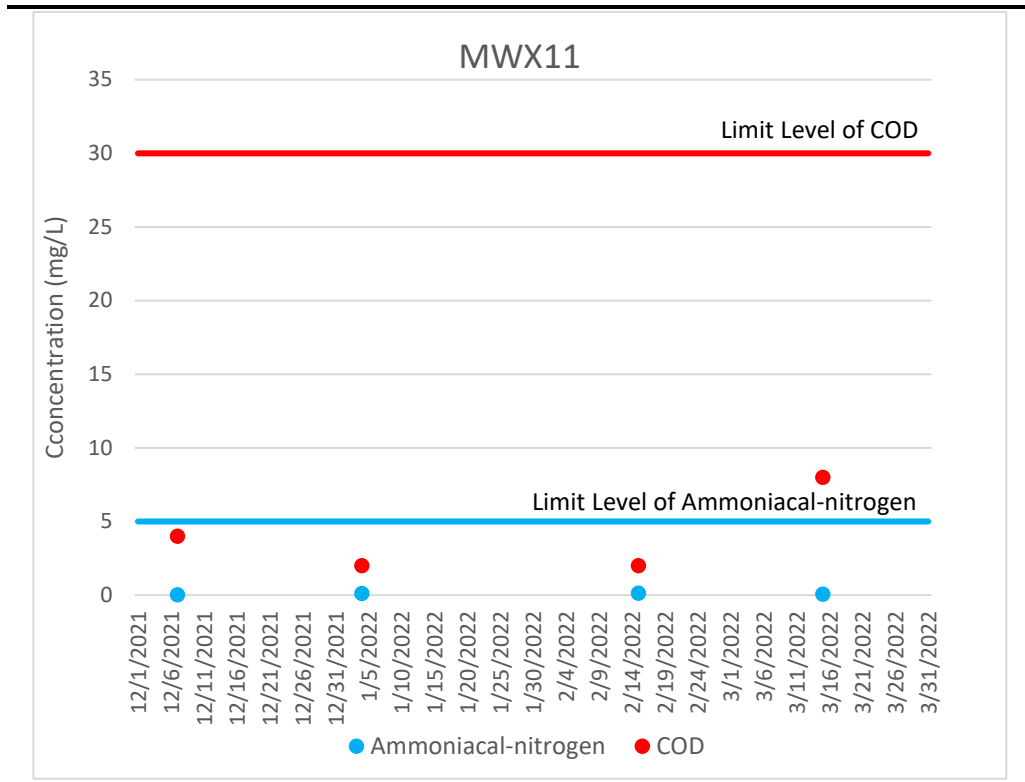


Figure F5.12 Graphical Presentation for Groundwater Monitoring (MWX-12)

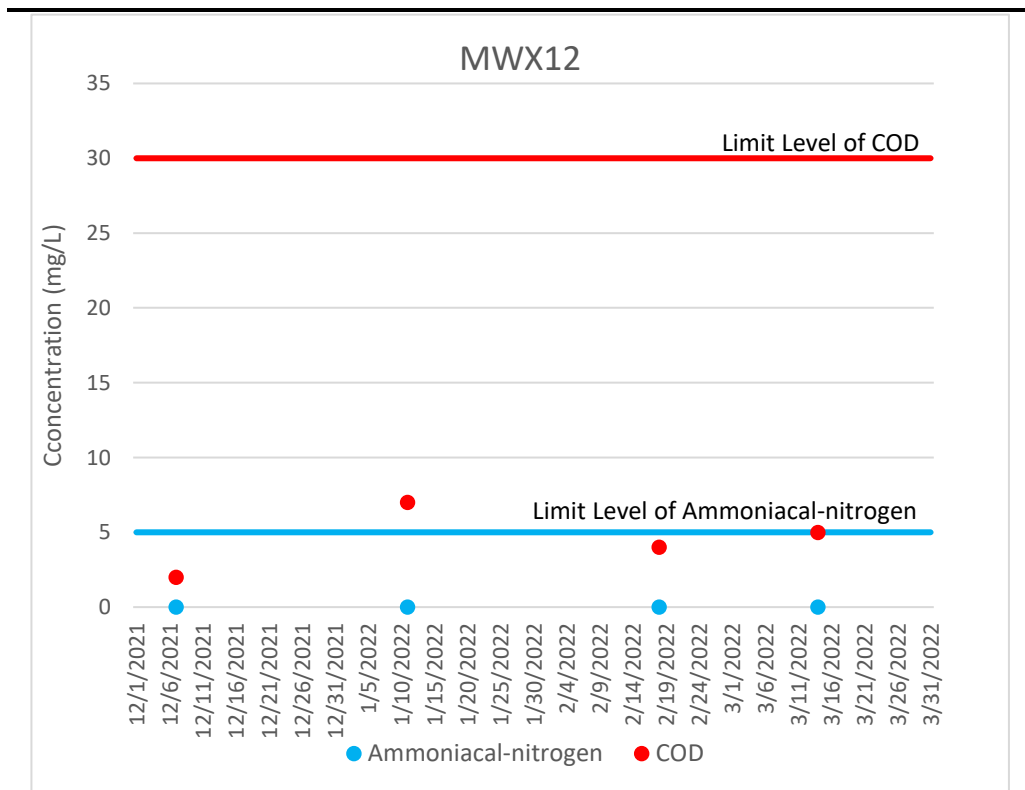


Figure F5.13 Graphical Presentation for Groundwater Monitoring (MWX-13)

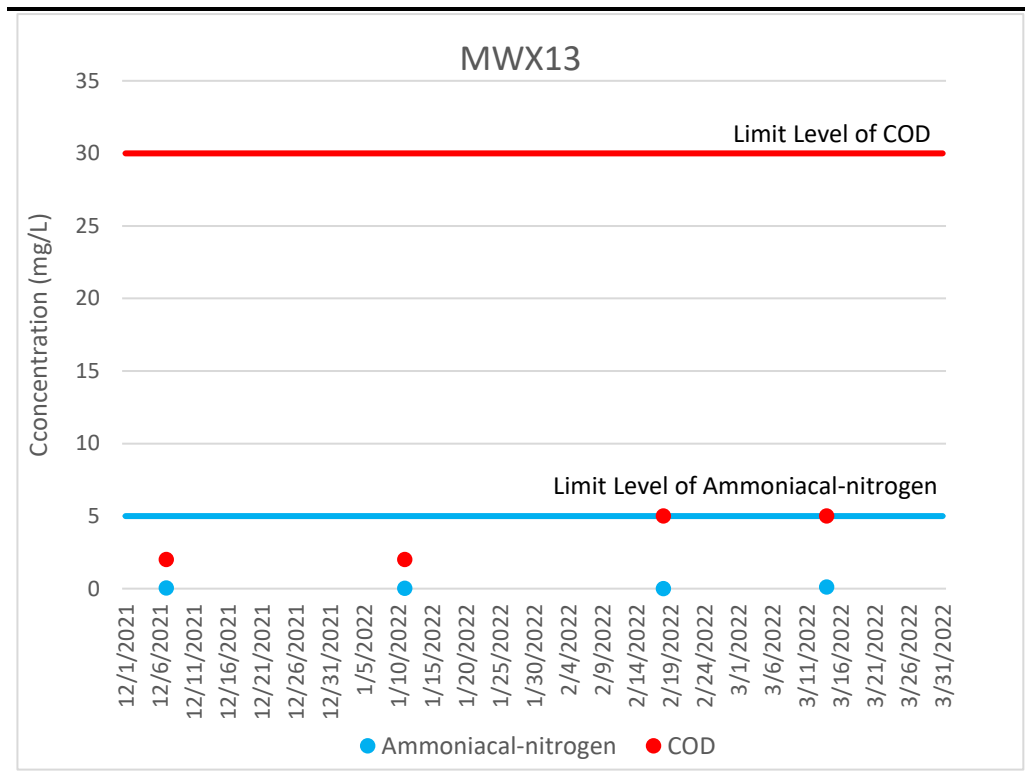


Figure F5.14 Graphical Presentation for Groundwater Monitoring (MWX-14)

