

Annex F5

Groundwater Monitoring Results

Table F5.1 Groundwater Monitoring Results (April 2023)

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	3.51	2.91	2.84	2.97	2.52	2.41	2.44	2.46	2.34	3.23	2.77	6.39	35.42	42.11
Bicarbonate Alkalinity as CaCO ₃	mg/L	180	265	175	41	47	126	38	17	126	199	232	54	17	13
Carbonate Alkalinity as CaCO ₃	mg/L	<1	<1	<1	<1	<1	<1	<1	30	<1	<1	<1	<1	<1	<1
Total Alkalinity as CaCO ₃	mg/L	180	265	175	46	66	196	38	48	126	199	232	54	17	13
pH Value	pH Unit	7.7	8	8	10	10.6	11.4	8.2	9.4	8.3	7.9	7.9	7.2	5.9	5.6
Electrical Conductivity	µS/cm	978	843	1080	1140	1670	1290	1810	1780	890	818	676	297	91	98
Ammonia as N	mg/L	0.18	0.01	1.04	3.91	2.24	3.74	0.48	7.07	1.6	<0.01	0.14	0.02	<0.01	<0.01
Chloride	mg/L	177	42	145	251	407	218	359	410	175	114	50	23	15	18
Nitrite as N	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.95	<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	<0.01	<0.01	0.1	0.02	0.01	0.04	0.01	0.01
Sulphate as SO ₄ - Turbidimetric	mg/L	56	122	91	140	118	78	290	160	57	51	54	50	3	4
Sulphide as S ₂	mg/L	<0.1	<0.1	<0.1	4.1	5.3	19.4	<0.1	<0.1	0.4	<0.1	<0.1	<0.1	<0.1	<0.1
Total Kjeldahl Nitrogen as N	mg/L	0.3	<0.1	1.2	4.5	2.7	4.6	<1.0	7.8	1.7	<0.1	0.2	0.4	<0.1	<0.1
Nitrate as N	mg/L	0.06	0.21	<0.01	<0.01	<0.01	<0.01	2.98	<0.01	<0.01	<0.01	<0.01	0.02	0.09	0.06
Total Nitrogen as N	mg/L	0.3	0.2	1.2	4.5	2.7	4.6	4.4	7.8	1.7	<0.1	0.2	0.4	0.2	0.1
Boron	µg/L	150	190	220	210	180	180	280	250	340	100	80	30	20	20
Calcium	mg/L	59.1	55	81.3	44.6	46.9	37.4	61.7	23.4	42.4	73.9	65.5	26.3	0.82	1.03
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	9.65	47.8	4.7	1.44	0.17	<0.05	2.6	0.32	5.48	7.4	6.23	4.09	1.03	0.91
Sodium	mg/L	101	40.7	102	140	229	150	240	263	104	71.6	52.3	25.1	14.1	15
Iron	mg/L	<0.04	<0.04	0.11	<0.04	<0.04	<0.04	<0.04	<0.04	0.07	<0.04	0.11	0.19	<0.04	<0.04
Potassium	mg/L	18.2	9.69	26.1	33.4	58.6	54.4	63.1	59.3	16.9	7.15	8.62	2.93	4.06	3.86
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	2	<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	1560	47	659	<1	<1	<1	2	1	116	1360	544	414	5	5
Nickel	µg/L	<1	<1	<1	<1	<1	1	1	3	<1	<1	<1	<1	<1	<1
Zinc	µg/L	<10	<10	<10	<10	<10	<10	<10	17	<10	<10	<10	<10	<10	<10
Biochemical Oxygen Demand	mg/L	<2	<2	<2	<2	<2	8	<2	3	<2	<2	<2	<2	<2	<2
Chemical Oxygen Demand	mg/L	5	4	17	22	27	54	27	25	13	7	7	7	<2	4
Total Organic Carbon	mg/L	4	2	7	8	7	10	9	11	5	4	5	4	<1	2

Table F5.2 Groundwater Monitoring Results (May 2023)

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	2.81	3.21	2.74	2.87	3.12	3.01	2.54	2.46	3.04	2.43	2.77	5.89	34.82	41.51
Bicarbonate Alkalinity as CaCO ₃	mg/L	187	258	183	<1	<1	<1	25	<1	124	226	190	56	17	14
Carbonate Alkalinity as CaCO ₃	mg/L	<1	<1	<1	62	62	126	9	84	<1	<1	<1	<1	<1	<1
Total Alkalinity as CaCO ₃	mg/L	187	258	183	111	76	172	35	96	124	226	190	56	17	14
pH Value	pH Unit	7.7	8	8	10.9	10.7	11.3	9.2	10.5	8.2	7.9	8	7	5.8	5.7
Electrical Conductivity	µS/cm	1020	955	1090	1060	1570	1230	1630	1740	1090	1120	597	293	92	100
Ammonia	mg/L	0.32	<0.01	0.91	4.9	2.44	3.51	0.29	8.63	1.05	<0.01	0.14	<0.01	<0.01	<0.01
Chloride	mg/L	123	50	158	191	350	192	266	343	151	124	44	21	14	17
Nitrite	mg/L	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	0.29	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Phosphorus	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	0.02	<0.01	<0.01
Sulphate	mg/L	43	148	100	58	109	85	164	151	81	111	47	44	3	5
Sulphide	mg/L	<0.1	<0.1	<0.1	7.9	5.5	13.7	<0.1	4.4	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Kjeldahl Nitrogen	mg/L	0.4	<0.1	1.2	5.4	2.8	4.4	1.6	9.7	1.3	0.1	0.2	<0.1	<0.1	<0.1
Nitrate	mg/L	<0.01	0.41	<0.01	<0.01	<0.01	<0.01	3.96	0.01	<0.01	<0.01	<0.01	<0.01	0.08	0.07
Total Nitrogen	mg/L	0.4	0.4	1.2	5.4	2.8	4.4	5.8	9.7	1.3	0.1	0.2	<0.1	<0.1	<0.1
Boron	µg/L	140	180	190	170	170	160	240	170	300	250	70	20	20	10
Calcium	mg/L	64.2	61.7	84.6	45.3	44.6	41	28.5	33	59.7	96	65.9	24.7	1.07	1.1
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	11.9	54.7	5.55	0.14	0.08	<0.05	0.59	<0.05	5.14	7.11	5.22	4	1	0.87
Sodium	mg/L	103	52.7	98.8	117	212	147	241	236	121	118	42.4	23.9	13.2	14.1
Iron	mg/L	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Potassium	mg/L	18.7	11	24.8	31.8	57.7	55.8	63.5	61.9	20.4	11.9	8.17	2.86	3.84	3.68
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	2	<1	<1	2	<1	<1	1	<1
Lead	µg/L	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Manganese	µg/L	2070	102	773	<1	<1	<1	<1	<1	127	495	577	133	14	9
Nickel	µg/L	<1	<1	<1	1	<1	2	1	5	<1	<1	<1	<1	<1	<1
Zinc	µg/L	<10	<10	<10	<10	<10	<10	<10	<10	<10	11	11	<10	17	12
Biochemical Oxygen Demand	mg/L	<2	<2	<2	<2	<2	4	<2	<2	<2	<2	<2	<2	<2	<2
Chemical Oxygen Demand	mg/L	4	3	16	29	38	36	29	70	6	9	5	<2	5	<2
Total Organic Carbon	mg/L	3	<1	5	9	8	10	11	14	5	2	3	<1	3	<1

Table F5.3 Groundwater Monitoring Results (June 2023)

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	2.91	3.31	3.04	4.07	3.12	2.01	2.74	3.06	2.84	2.43	3.67	6.19	35.02	40.61
Bicarbonate Alkalinity as CaCO ₃	mg/L	165	259	162	35	<1	<1	29	<1	126	250	215	55	17	14
Carbonate Alkalinity as CaCO ₃	mg/L	<1	<1	<1	29	52	129	18	101	<1	<1	<1	<1	<1	<1
Total Alkalinity as CaCO ₃	mg/L	165	259	162	64	98	161	48	112	126	250	215	55	17	14
pH Value	pH Unit	7.7	8.1	8	9.5	10.8	11.3	9.6	10.9	7.9	7.9	8.1	7.1	5.8	5.7
Electrical Conductivity	µS/cm	1210	1060	1100	863	1450	1170	1590	1860	1640	1010	774	294	93	100
Ammonia	mg/L	0.17	<0.01	1.05	3.02	2.58	3.44	0.48	7.28	0.24	0.03	0.17	0.02	0.04	<0.01
Chloride	mg/L	237	44	148	172	285	133	258	403	275	122	51	23	15	18
Nitrite	mg/L	<0.01	0.01	<0.01	<0.01	<0.01	0.01	0.57	0.01	0.05	<0.01	<0.01	0.01	<0.01	0.01
Phosphorus	mg/L	<0.01	0.02	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	0.01	0.04	<0.01	<0.01
Sulphate	mg/L	64	150	74	96	127	72	165	173	316	90	71	44	3	4
Sulphide	mg/L	<0.1	<0.1	<0.1	4.7	7.9	15.1	<0.1	5.8	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Kjeldahl Nitrogen	mg/L	0.2	<0.1	1.4	3.8	3.2	4.4	2.1	8.6	0.9	0.2	0.3	0.2	0.2	<0.1
Nitrate	mg/L	<0.01	0.64	<0.01	<0.01	<0.01	<0.01	3.23	<0.01	0.83	0.01	<0.01	<0.01	0.09	0.06
Total Nitrogen	mg/L	0.2	0.7	1.4	3.8	3.2	4.4	5.9	8.6	1.7	0.2	0.3	0.2	0.2	0.2
Boron	µg/L	170	210	230	240	220	190	280	200	410	220	110	30	20	20
Calcium	mg/L	76	61.3	65.8	18.4	33.6	39.6	17.8	50.1	98.4	88.6	86.2	24	0.83	1.07
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	13	55.7	5.73	2.03	<0.05	<0.05	0.93	<0.05	4.64	8.11	6.91	3.79	0.96	0.84
Sodium	mg/L	122	51.9	94.4	104	154	135	215	248	161	91.6	50	24	13.1	14
Iron	mg/L	<0.04	<0.04	0.06	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.05	0.48	<0.04	<0.04
Potassium	mg/L	19.9	12.1	31.2	26.2	44.5	48.3	52.8	62.9	28.6	11.4	8	2.9	3.89	3.73
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	4	<1	5	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	1400	4	961	<1	<1	<1	<1	<1	48	278	768	710	18	8
Nickel	µg/L	<1	<1	<1	<1	<1	2	2	5	<1	<1	<1	<1	<1	<1
Zinc	µg/L	<10	<10	<10	34	<10	<10	<10	<10	<10	<10	<10	11	19	12
Biochemical Oxygen Demand	mg/L	<2	<2	<2	<2	3	3	<2	3	<2	<2	<2	<2	<2	<2
Chemical Oxygen Demand	mg/L	7	<2	14	18	26	44	28	36	22	3	5	2	<2	5
Total Organic Carbon	mg/L	2	<1	6	7	8	9	11	12	9	2	<1	<1	<1	1

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

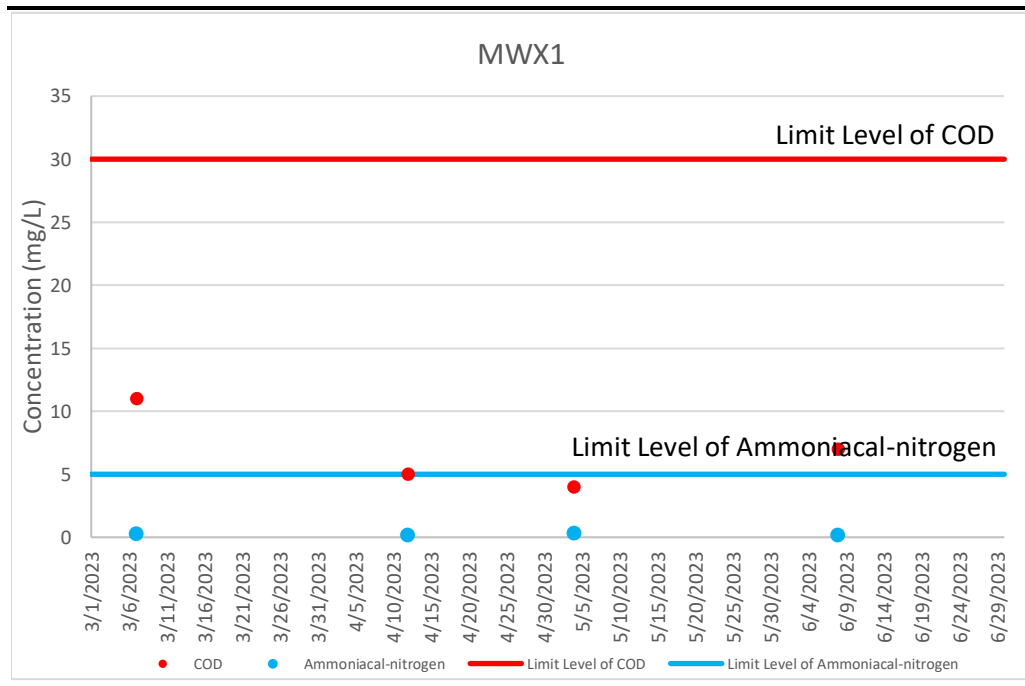


Figure F5.2 Graphical Presentation for Groundwater Monitoring (MWX-2)

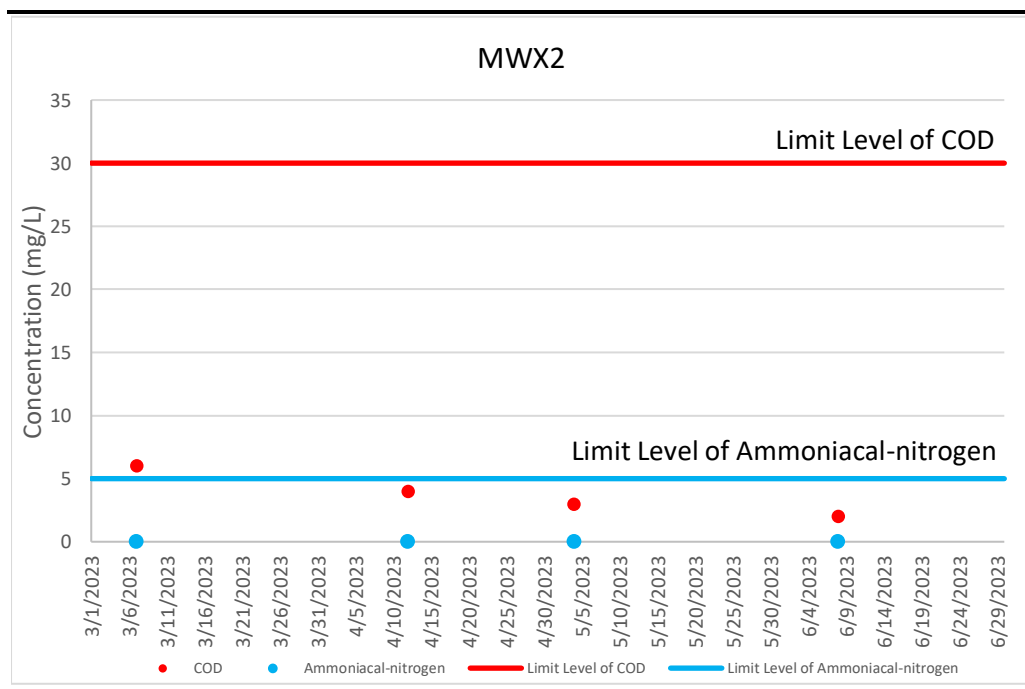


Figure F5.3 Graphical Presentation for Groundwater Monitoring (MWX-3)

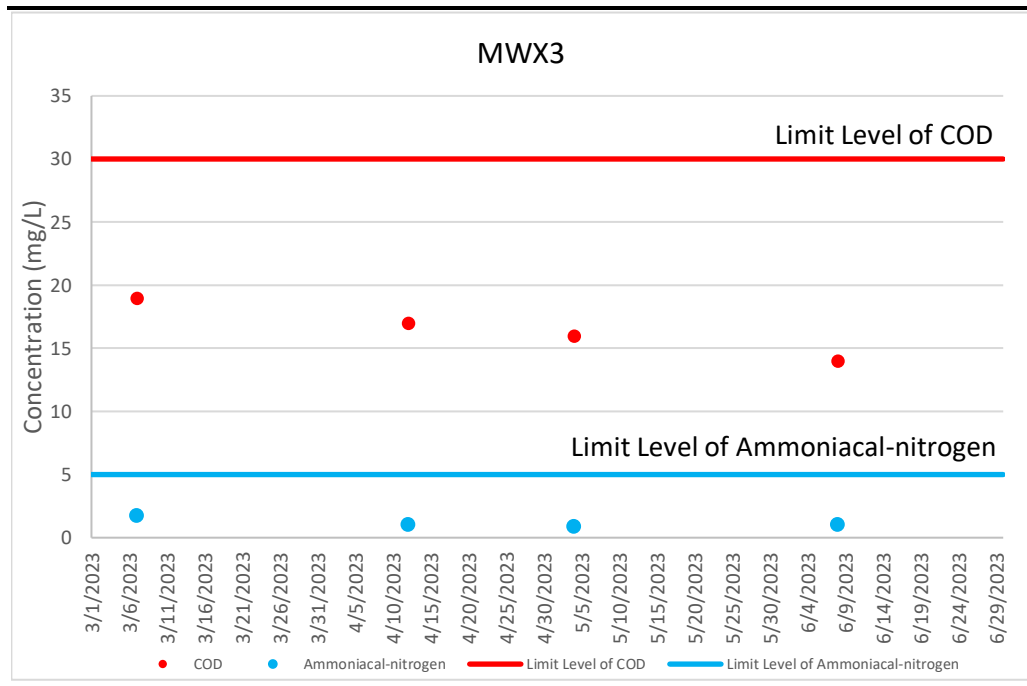


Figure F5.4 Graphical Presentation for Groundwater Monitoring (MWX-4)

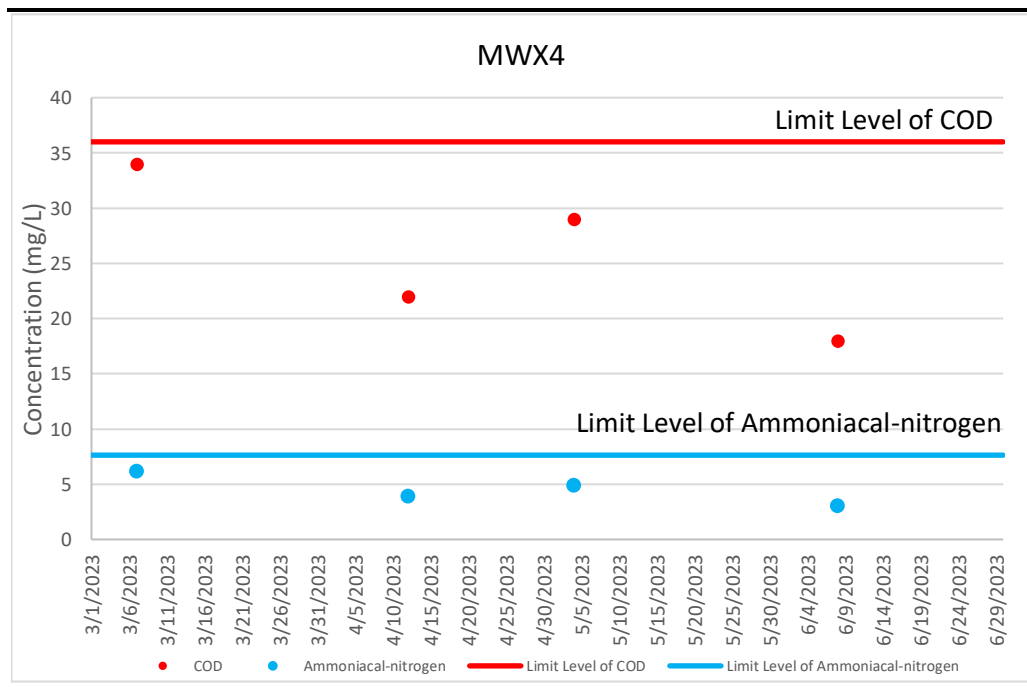


Figure F5.5 Graphical Presentation for Groundwater Monitoring (MWX-5)

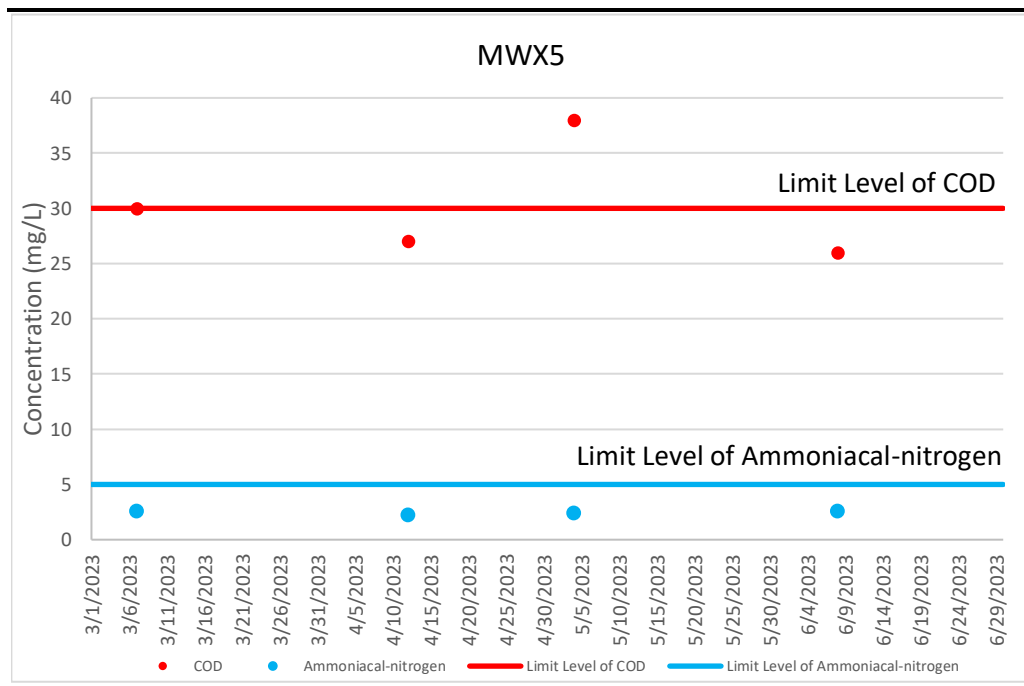


Figure F5.6 Graphical Presentation for Groundwater Monitoring (MWX-6)

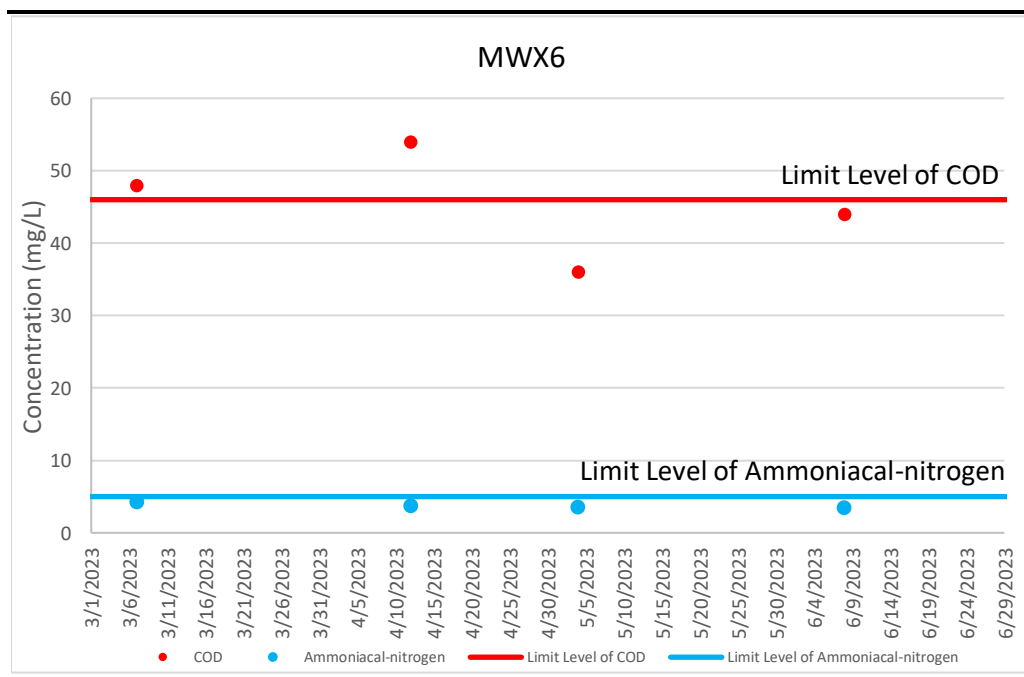


Figure F5.7 Graphical Presentation for Groundwater Monitoring (MWX-7)

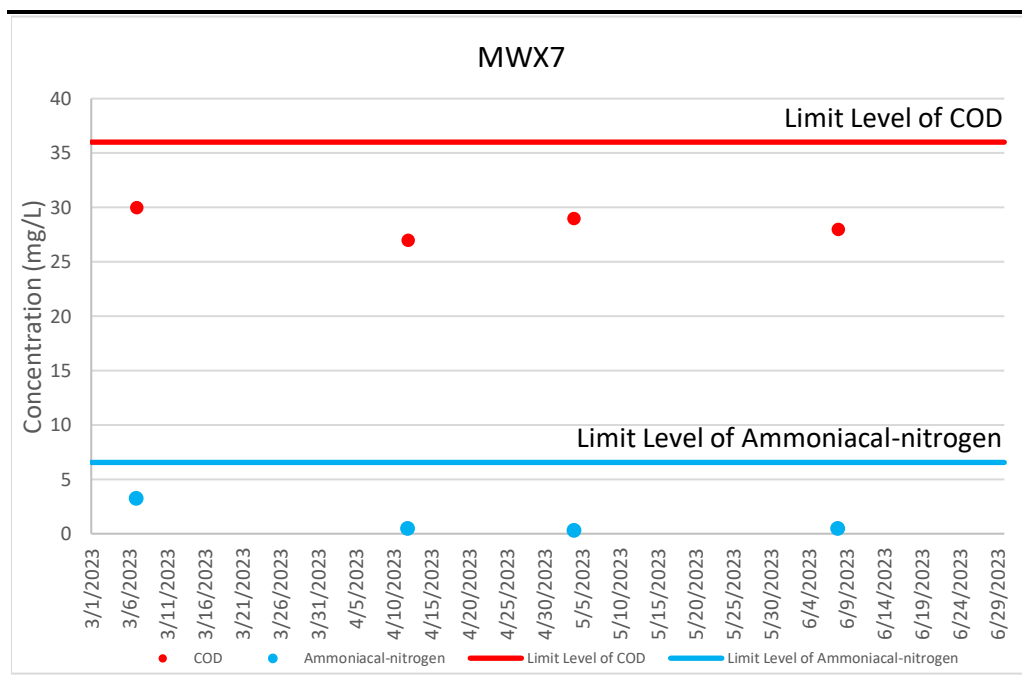


Figure F5.8 Graphical Presentation for Groundwater Monitoring (MWX-8)

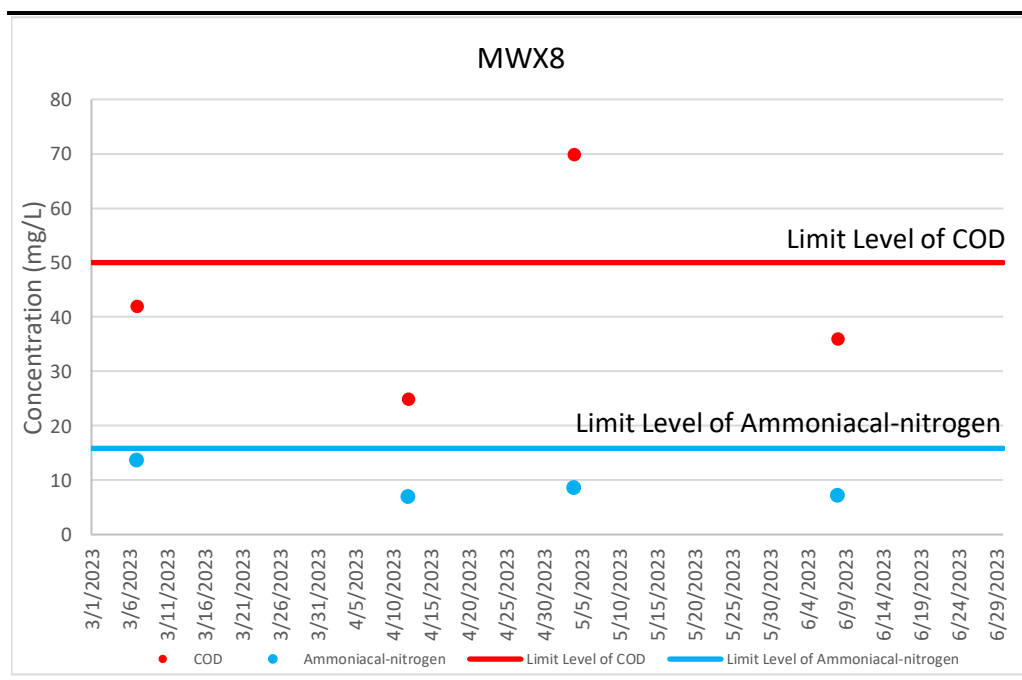


Figure F5.9 Graphical Presentation for Groundwater Monitoring (MWX-9)

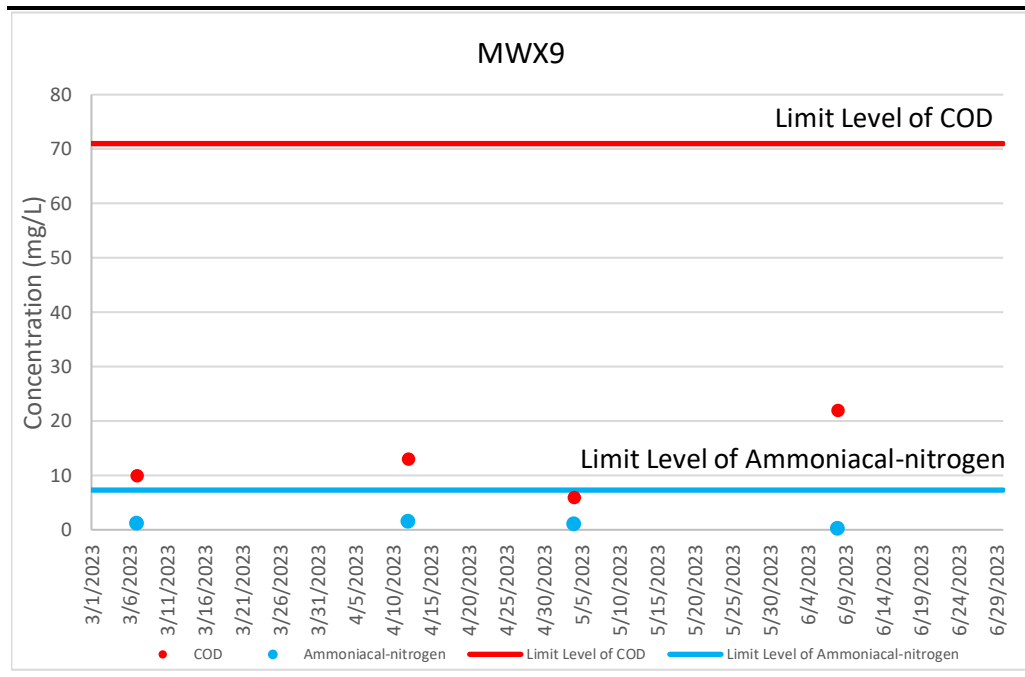


Figure F5.10 Graphical Presentation for Groundwater Monitoring (MWX-10)

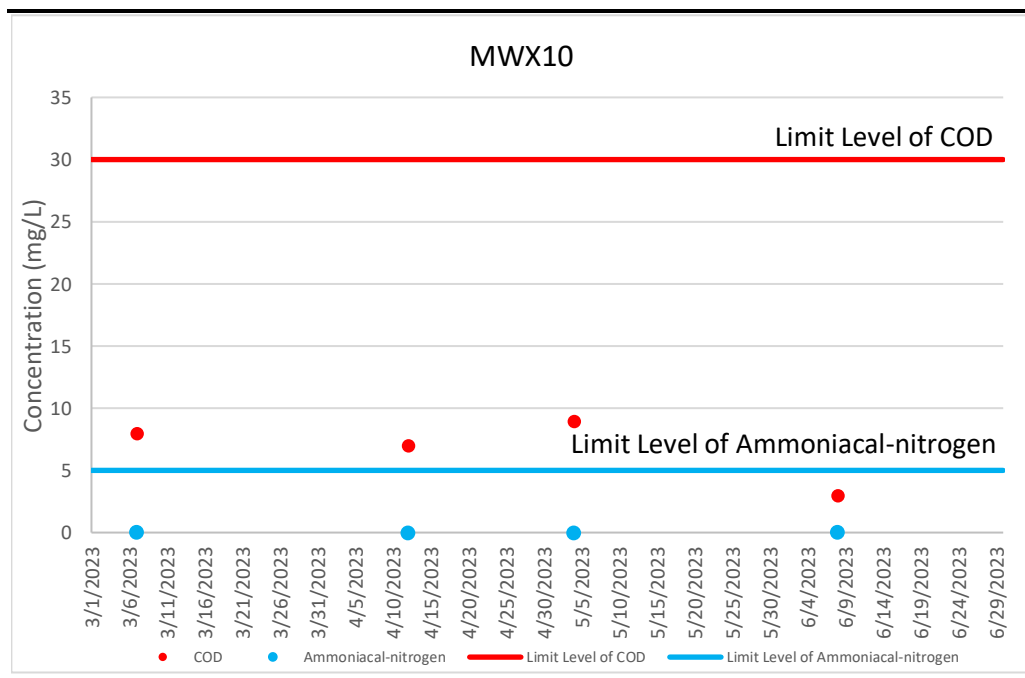


Figure F5.11 Graphical Presentation for Groundwater Monitoring (MWX-11)

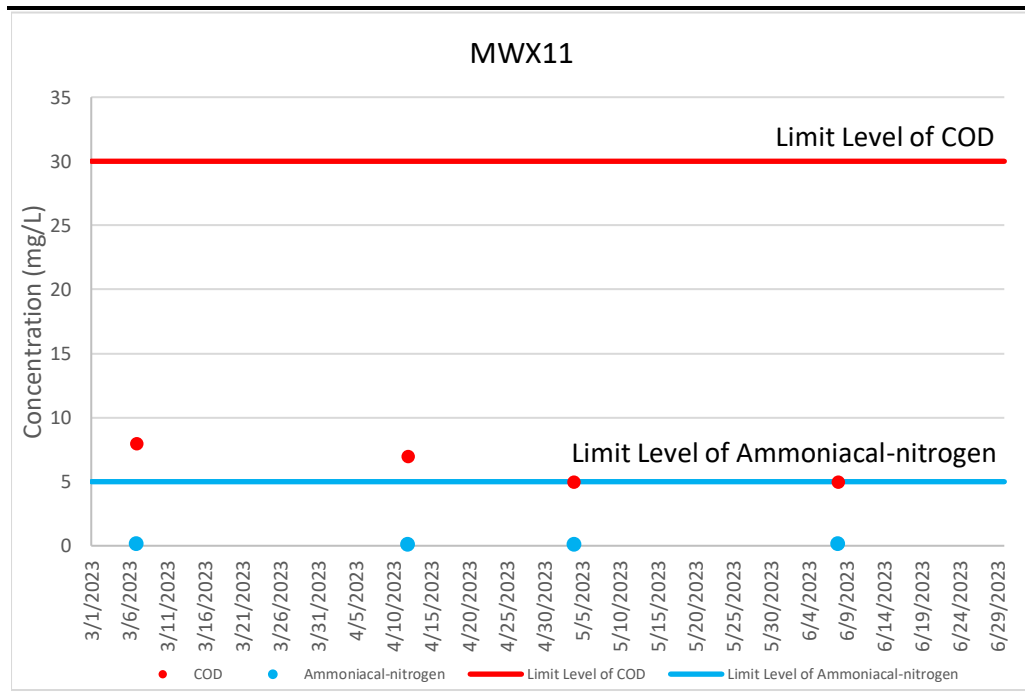


Figure F5.12 Graphical Presentation for Groundwater Monitoring (MWX-12)

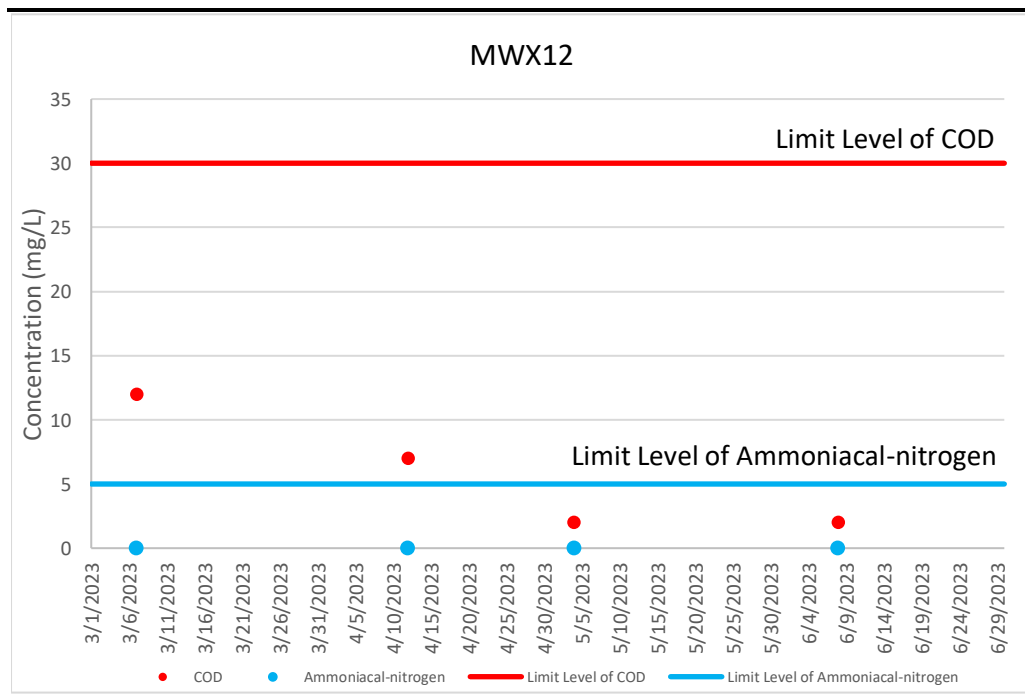


Figure F5.13 Graphical Presentation for Groundwater Monitoring (MWX-13)

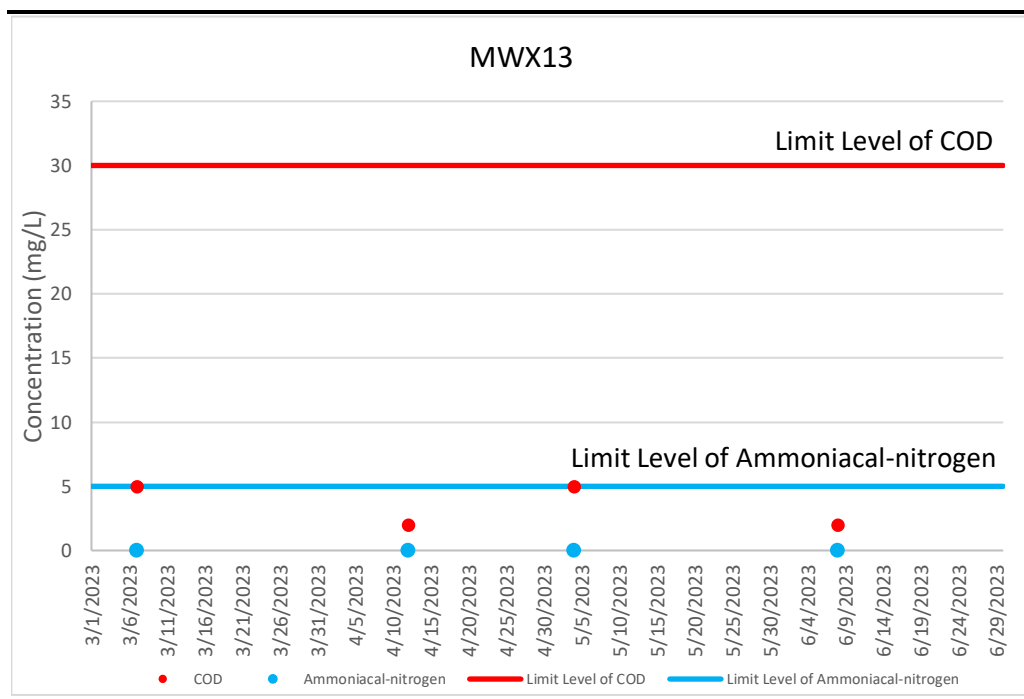


Figure F5.14 Graphical Presentation for Groundwater Monitoring (MWX-14)

