

Pre- and post-mining inspections and reports of dams, boreholes and natural features set out by the Appin Longwalls 709 to 711 and 905 Extraction Plan (EP) are conducted by the Illawarra Metallurgical Coal Environmental Field Team (IMCEFT) with the consent of the relevant property/infrastructure owner and tenant (where applicable).

This post-mining report includes field observations and laboratory data recorded for relevant features on Lot 16 DP251063, including borehole GW105534 and property dam F08d01.

Additional inspections may be conducted at the request of the landowner upon observations of events possibly linked to subsidence, or if required by the various triggers in the Extraction Plan (EP).

### **Pre-mining Inspection**

On 23 August 2017, a pre-mining inspection of Lot 16 DP251063 was undertaken. A single borehole was identified (GW105534), as was a dam (MSEC ID: F08d01). Observations were recorded and water samples collected for laboratory analysis (Photo 1, Photo 3, Photo 5, Photo 7 and Photo 9).

### **Post-Mining Inspections**

An additional inspections of Lot 16 DP251063 was conducted on 25 July 2018 following the extraction of Longwall 707, on 5 September 2022 following the extraction of Longwall 904 as well as on 20 April 2023 following completion of Longwall 905. With the latest inspection on 28 September 2023 following the completion of Longwall 709. The borehole and dam were inspected to identify any potential changes due to mining. Water samples were also collected for laboratory analysis.

### **Borehole GW105534**

**Location:** E288637, N6217300

### **Borehole Properties:**

Borehole GW105534 is located on the eastern side of the property (Figure 1). An outlet from the borehole pipe flows into the dam. According to the Water NSW report, the borehole is 207m deep and was drilled in 2003. On 23 August 2017 a pre-mining inspection was completed on the property and field water quality was measured, with water samples taken for laboratory analysis (Photo 5 and Photo 7). On 25 July 2018, 5 September 2022, 20 April 2023 and 28 September 2023 post-mining inspections were completed including measurements of field water quality parameters and samples being taken for laboratory analysis.

### **Bore Pumping Purpose and Performance:**

Water from the bore is transferred by pipes (Photo 2) into multiple storage tanks on the property. The water is also used to irrigate the property and for domestic uses including supplying drinking and cleaning water for dog kennels and providing water to the dam that houses freshwater Silver Perch (Photo 4).

On 5 September 2022 the landholder advised that the borehole has currently used very limitedly due to some pump issues and the strong sulfide-type odour exiting the borehole when the pump is turned on. During the inspection some fish were identified in the dam.

### **Water properties:**

No signs of iron staining or salinity were observed in the water, or around the borehole outlet during the pre-mining inspection on 23 August 2017 or subsequent inspections (Photo 1, Photo 5 and Photo 7). A sulfur-type odour was present around the borehole outlet during the pre-mining inspection while it was dispelling water however this dissipated after approximately 10 minutes of use. No odour was present during the additional inspection on 25 July 2018. Field water quality was measured, and samples were collected after the water was purged for approximately 5 minutes during both pre-mining and additional inspection on 25 July 2018. No signs of subsidence impacts were observed to the dam wall during the inspection on 25 July 2018.

During an additional inspection on 5 September 2022 a sulfur-type odour was present while purging water from the borehole. Water quality parameters were measured, and water samples were collected after the water was purged through the pump for approximately 12 minutes. The water from the borehole appeared cloudy. Field parameter results and water sample analysis results are included below (Table 1 and Table 2). No signs of subsidence impacts were observed to the dam wall during the inspection on 5 September 2022.

During an additional inspection on 20 April 2023 water was pumped directly from the borehole. A sulfur-type odour was present when pumping the bore, however dissipated after 5 minutes. The water was clear with no discolouration or cloudiness. Field water quality was measured, and water samples collected for laboratory analysis with results included below (Table 1 and Table 2). No sample was collected from the dam. No signs of subsidence impacts to the dam wall were observed during the inspection.

During the most recent inspection on 28 September 2023 water was pumped directly from the borehole (Photo 6). A sulfur-type odour was present when pumping the bore but dissipated after 1 minute. The bore was purged for only 2 minutes after a request from the landowner to stop purging. This is considerably shorter than the purge time on previous inspections. The water had a very slight yellow colour. Field water quality was measured, and water samples collected for laboratory analysis with

results included below (Table 1 and Table 2). No signs of subsidence impacts to the dam wall were observed during the inspection.

IMC cannot provide advice regarding water quality requirements for specific domestic or agricultural uses. Table 1 and Table 2 includes analyte levels from the *Australian Drinking Water Guidelines 6 2011*, for human consumption. It is recommended that these results be read in conjunction with ADWG 6 (2011) for a detailed assessment of the suitability of usage in various scenarios along with other relevant recommendations.

## References

- Australian Drinking Water Guidelines 6 2011

<https://www.nhmrc.gov.au/sites/default/files/documents/reports/aust-drinking-water-guidelines.pdf>



Photo 1: Borehole GW105534 and pump. Taken on 23 August 2017.



Photo 2: Borehole GW105534 and pump. Taken on 28 September 2023.



Photo 3: Main property dam where GW105534 outlet flows to. Taken on 23 August 2017.



Photo 4: Main property dam where GW105534 outlet flows to. Taken on 28 September 2023.





Photo 5: GW105534 outlet discharge. Taken on 23 August 2017.



Photo 6: GW105534 outlet discharge. Taken on 28 September 2023.



Photo 7: Water collected and sampled from GW105534. Taken on 23 August 2017.



Photo 8: Water collected and sampled from GW105534. Taken on 28 September 2023.

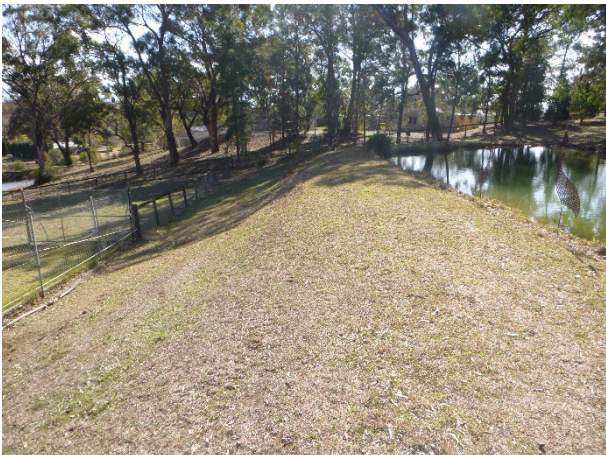


Photo 9: Dam Wall. Taken at 010 degrees on 23 August 2017.



Photo 10: Dam Wall. Taken at 010 degrees on 28 September 2023.

Table 1: water chemistry analysis and field water quality results pre- and post-mining from property dam F08d01.

Analyte	Dissolved or Total	Unit	Australian Drinking Water Guidelines 6 2011	Results				
				Pre-Mining	Post-Mining			
				23/08/2017	25/07/2018	05/09/2022	20/04/2023	28/09/2023
Aluminium	Dissolved	mg/L	No health guidelines*		< 0.01	0.24		
Aluminium	Total	mg/L	No health guidelines*		0.08	0.73		
Ammonia	NA	mg/L	No health guidelines*		0.08	0.11		
Arsenic	Dissolved	mg/L	<0.01		< 0.001	< 0.001		
Barium	Dissolved	mg/L	<2		1.09	0.298		
Bicarbonate Alkalinity as CaCO3	NA	mg/L	No health guidelines		463	143		
Calcium	Dissolved	mg/L	No health guidelines		84	32		
Carbonate Alkalinity as CaCO3	NA	mg/L	No health guidelines		< 1	< 1		
Chloride	NA	mg/L	No health guidelines*		544	32		
Copper	Dissolved	mg/L	<2		< 0.001	0.001		
Dissolved Organic Carbon	NA	mg/L	No health guidelines*		4	8		
Dissolved Oxygen - Field	NA	%	No health guidelines	84.4	88.7	73.9	63.2	77.9
Electrical Conductivity - Field	NA	µS/cm	No health guidelines*	2100	2320	373	1440	1760
Electrical Conductivity @ 25°C	NA	µS/cm	No health guidelines*		2280	403		
Final ORP	NA	mV	No health guidelines	256.561	204.893	393.086	337.466	287.389
Hydroxide Alkalinity as CaCO3	NA	mg/L	No health guidelines		< 1	< 1		
Iron	Dissolved	mg/L	No health guidelines*		< 0.05	0.26		
Iron	Total	mg/L	No health guidelines*		0.05	1.05		
Lead	Dissolved	mg/L	<0.01		< 0.001	< 0.001		
Lithium	Dissolved	mg/L	No health guidelines		0.082	0.006		
Magnesium	Dissolved	mg/L	No health guidelines		53	10		
Manganese	Dissolved	mg/L	No health guidelines		< 0.001	0.047		
Manganese	Total	mg/L	<0.5		0.003	0.062		
Nickel	Dissolved	mg/L	<0.02		< 0.001	< 0.001		
Nitrite + Nitrate as N	NA	mg/L	<3		0.15	0.15		
pH- lab	NA	pH Unit	No health guidelines*		8.28	7.96		
pH - field	NA	pH Unit	No health guidelines*	8.09	8.31	7.39	8.11	8.03
Phosphate as P	Total	mg/L	No health guidelines		< 0.01	< 0.01		
Potassium	Dissolved	mg/L	No health guidelines*		13	4		
Redox (mV) - Field	NA	mV	No health guidelines	42	-13	178	127	77
Silicon	Dissolved	mg/L	No health guidelines*		1.94	1.48		
Sodium	Dissolved	mg/L	No health guidelines*		317	31		
Strontium	Dissolved	mg/L	No health guidelines		1.39	0.319		

Analyte	Dissolved or Total	Unit	Australian Drinking Water Guidelines 6 2011	Results				
				Pre-Mining	Post-Mining			
				23/08/2017	25/07/2018	05/09/2022	20/04/2023	28/09/2023
Sulfate	Dissolved	mg/L	<250		24	11		
Suspended Solids (SS)	NA	mg/L	No health guidelines			8		
Temperature - Field	NA	degC	No health guidelines			12.02	18.62	18.73
Total Alkalinity as CaCO <sub>3</sub>	NA	mg/L	No health guidelines*		463	143		
Total Anions	NA	meq/L	No health guidelines		25.1	3.99		
Total Cations	NA	meq/L	No health guidelines		22.7	3.87		
Total Dissolved Solids @180°C	Total	mg/L	No health guidelines*			248		
Total Kjeldahl Nitrogen as N	NA	mg/L	No health guidelines*		< 0.1	0.6		
Total Phosphorus as P	Total	mg/L	No health guidelines*		0.02	0.03		
Zinc	Dissolved	mg/L	No health guidelines		< 0.005	< 0.005		

\*No specific health guidelines are included Australian Drinking Water Guidelines 6 2011. Additional considerations are noted in ADWG 6 (2011) and the document should be referred to for specific advice.



Table 2: water chemistry analysis and field water quality results pre- and post-mining from borehole GW105534.

Analyte	Dissolved or Total	Unit	Australian Drinking Water Guidelines 6 2011	Results				
				Pre-Mining	Post-Mining			
				23/08/2017	25/07/2018	05/09/2022	20/04/2023	28/09/2023
Aluminium	Dissolved	mg/L	No health guidelines*		< 0.01	< 0.01	< 0.01	< 0.01
Aluminium	Total	mg/L	No health guidelines*		< 0.01	0.42	< 0.01	< 0.01
Ammonia	NA	mg/L	No health guidelines*		1.33	2.06	1.25	1.33
Arsenic	Dissolved	mg/L	<0.01		< 0.001	< 0.001	< 0.001	< 0.001
Barium	Dissolved	mg/L	<2		1.04	5.46	1.80	2.33
Bicarbonate Alkalinity as CaCO3	NA	mg/L	No health guidelines		624	493	478	453
Calcium	Dissolved	mg/L	No health guidelines		111	199	118	112
Carbonate Alkalinity as CaCO3	NA	mg/L	No health guidelines		< 1	< 1	< 1	< 1
Chloride	NA	mg/L	No health guidelines*		527	964	438	382
Copper	Dissolved	mg/L	<2		< 0.001	< 0.001	< 0.001	< 0.001
Dissolved Organic Carbon	NA	mg/L	No health guidelines*		3	13	< 1	2
Dissolved Oxygen - Field	NA	%	No health guidelines	64.6	35.8	26.1	41.4	36
Electrical Conductivity - Field	NA	µS/cm	No health guidelines*	3530	2460	3590	1970	2160
Electrical Conductivity @ 25°C	NA	µS/cm	No health guidelines*		2530	3700	1970	1940
Final ORP	NA	mV	No health guidelines	109.675	134.912	133.535	222.437	100.989
Hydroxide Alkalinity as CaCO3	NA	mg/L	No health guidelines		< 1	< 1	< 1	< 1
Iron	Dissolved	mg/L	No health guidelines*		1.18	0.60	0.40	5.26
Iron	Total	mg/L	No health guidelines*		1.52	1.13	0.44	6.01
Lead	Dissolved	mg/L	<0.01		< 0.001	< 0.001	< 0.001	< 0.001
Lithium	Dissolved	mg/L	No health guidelines		0.094	0.138	0.081	0.066
Magnesium	Dissolved	mg/L	No health guidelines		53	82	44	40
Manganese	Dissolved	mg/L	No health guidelines		0.014	0.013	0.025	0.036
Manganese	Total	mg/L	<0.5		0.015	0.021	0.023	0.032
Nickel	Dissolved	mg/L	<0.02		< 0.001	< 0.001	< 0.001	0.002
Nitrite + Nitrate as N	NA	mg/L	<3		0.04	< 0.01	0.03	0.11
pH- lab	NA	pH Unit	No health guidelines*		7.84	7.96	8.02	8.22
pH - field	NA	pH Unit	No health guidelines*	6.9	7.15	6.73	7.41	7.24
Phosphate as P	Total	mg/L	No health guidelines		< 0.01	< 0.01	< 0.01	< 0.01
Potassium	Dissolved	mg/L	No health guidelines*		12	18	12	11
Redox (mV) - Field	NA	mV	No health guidelines	-100	-74	-76	13	-108
Silicon	Dissolved	mg/L	No health guidelines*		4.71	4.75	4.42	4.59
Sodium	Dissolved	mg/L	No health guidelines*		352	426	238	211

Analyte	Dissolved or Total	Unit	Australian Drinking Water Guidelines 6 2011	Results				
				Pre-Mining	Post-Mining			
				23/08/2017	25/07/2018	05/09/2022	20/04/2023	28/09/2023
Strontium	Dissolved	mg/L	No health guidelines		1.72	3.06	1.42	1.42
Sulfate	Dissolved	mg/L	<250		38	5	6	< 1
Suspended Solids (SS)	NA	mg/L	No health guidelines			68	< 5	12
Temperature - Field	NA	degC	No health guidelines			19.95	20.09	20.73
Total Alkalinity as CaCO <sub>3</sub>	NA	mg/L	No health guidelines*		624	493	478	453
Total Anions	NA	meq/L	No health guidelines		28.1	37.1	22.0	19.8
Total Cations	NA	meq/L	No health guidelines		25.5	35.7	20.2	18.3
Total Dissolved Solids @180°C	Total	mg/L	No health guidelines*			2220	1010	899
Total Kjeldahl Nitrogen as N	NA	mg/L	No health guidelines*		1.4	2.3	1.3	1.8
Total Phosphorus as P	Total	mg/L	No health guidelines*		< 0.01	0.04	0.02	0.16
Zinc	Dissolved	mg/L	No health guidelines		< 0.005	< 0.005	< 0.005	0.007

\*No specific health guidelines are included Australian Drinking Water Guidelines 6 2011. Additional considerations are noted in ADWG 6 (2011) and the document should be referred to for specific advice.



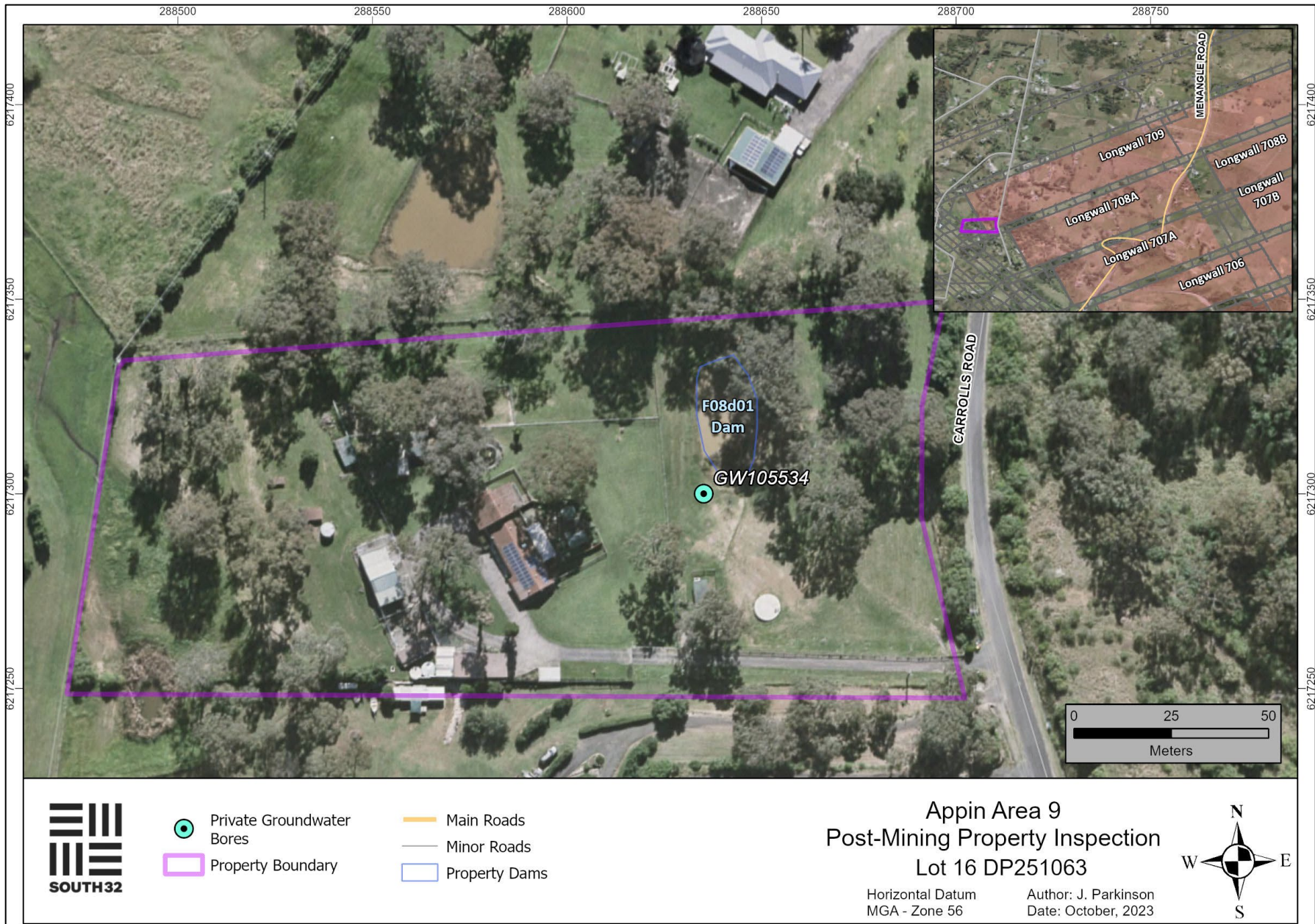


Figure 1: Map showing location of inspected borehole GW105534 and dam on Lot 16 DP251063.

Pre- and post-mining inspections are undertaken for private boreholes as prescribed in the Appin Longwall 709 to 711 and 905 Environmental Management Plan (EMP). Inspections can also focus on other property features as required, including farm dams, and are undertaken in consultation with the property owner or tenant, where access is approved. Inspections are conducted by the Illawarra Metallurgical Coal Environmental Field Team (IMCEFT). Additional inspections may be conducted by IMCEFT at the request of the landholder and/or in response to any trigger in the EMP.

This post-mining report includes observations and field data recorded for relevant features on Lot 73 DP883462, including borehole GW105376 and the property dam (MSEC ID: D21d01).

#### **Pre-mining Inspection**

On 19 February 2018, a pre-mining inspection was undertaken. A follow-up inspection was undertaken on 25 July 2018. On both inspections, borehole GW105376 and the property dam were inspected, with key observations recorded. Samples were also taken for laboratory analysis.

#### **Post-mining Inspections**

A Longwall 708 and 709 post-mining inspection was completed on 17 March 2022 and 28 September 2023. The borehole and dam were inspected to compare key observations and water chemistry results to those found in the pre-mining inspection.

#### **Borehole (GW105376)**

**Location:** E289486, N6218358

**Borehole/Aquifer Properties:** The borehole is located to the southeast of the residence and water is pumped around the property via several pipes (Figure 1 and Photo 1). The landholder has advised that the borehole was drilled in 2002 to a depth of 218m and had a standing water level of 76m following installation.

**Bore Pumping Purpose and Performance:** Water is extracted from the borehole consistently on a daily basis. The landowner has advised that on occasion when day-time temperatures are high, the borehole is used only at night. Water is extracted from the bore for multiple uses, including land maintenance, dam water supply, and care of horses also kept on the property. The property owner

advised that the pressure of the borehole has generally been consistent since it's installation. During each inspection, water from the bore was allowed to purge for 5 - 10 minutes before water quality measurements, samples and observations were taken (Photo 2). Water samples and field parameters for the borehole were taken from the water tank, to which the borehole directly flows. This was due to restricted access to the bore directly.

**Water Properties:** No signs of iron, salinity staining, or gas were observed in the water or around the borehole on this inspection. Water quality parameters were measured in-situ and water samples were taken for laboratory analysis during both pre-mining and post-mining inspections (Table 1 and Table 2).

### **Property Dam (D21d01)**

The dam is located to the northeast of the residence (Figure 1, Photo 3 and Photo 4), and is routinely supplied with water from the borehole. During the pre-mining inspection the landholder advised that the dam was relatively low. Soil cracking was found around the extent of the dam during the pre-mining inspection (Photo 5), with major soil cracking also found on the walls of the dam. In the post-mining inspection, on 28 September 2023, the water level was low compared to the previous inspection on 17 March 2022. The soil cracking was present around the dam during this inspection (Photo 6). Water quality parameters were measured in-situ and water samples were taken for laboratory analysis.

IMC cannot provide advice regarding water quality requirements for specific domestic or agricultural uses. Table 1 and Table 2 includes analyte levels from the *Australian Drinking Water Guidelines 6 2011*, for human consumption. It is recommended that these results be read in conjunction with ADWG 6 (2011) for a detailed assessment of the suitability of usage in various scenarios along with other relevant recommendations.

### **References**

- Australian Drinking Water Guidelines 6 2011

<https://www.nhmrc.gov.au/sites/default/files/documents/reports/aust-drinking-water-guidelines.pdf>

Table 1: Results of sample analysis and field water quality parameters collected at borehole GW105376 Note- pre-mining electrical conductivity readings were removed from table following comparison with laboratory conductivity for the same date (19/02/2018). It is likely that the instrument was reading incorrectly. Post-mining conductivity parameters appear consistent with those from the laboratory.

Analyte	Dissolved or Total	Unit	Australian Drinking Water Guidelines 6 2011	Results			
				Pre-Mining	Post-Mining		
				19/02/2018	25/07/2018	17/03/2022	28/09/2023
Aluminium	Dissolved	mg/L	No health guidelines*	< 0.01	< 0.01	< 0.01	< 0.01
Aluminium	Total	mg/L	No health guidelines*	< 0.01	0.02	0.04	< 0.01
Ammonia	NA	mg/L	No health guidelines*	0.940	1.35	0.42	0.90
Arsenic	Dissolved	mg/L	<0.01	< 0.001	< 0.001	< 0.001	< 0.001
Barium	Dissolved	mg/L	<2		1.06	1.18	1.36
Bicarbonate Alkalinity as CaCO3	NA	mg/L	No health guidelines	486.000	646	590	509
Calcium	Dissolved	mg/L	No health guidelines	101.000	104	117	109
Carbonate Alkalinity as CaCO3	NA	mg/L	No health guidelines	< 1	< 1	< 1	< 1
Chloride	NA	mg/L	No health guidelines*	485.000	716	685	505
Copper	Dissolved	mg/L	<2	0.005	< 0.001	< 0.001	< 0.001
Dissolved Organic Carbon	NA	mg/L	No health guidelines*	1.000	2.000	2	2
Dissolved Oxygen - Field	NA	%	No health guidelines	63	32	59.7	26.3
Electrical Conductivity - Field	NA	µS/cm	No health guidelines*		3070	3060	2540
Electrical Conductivity @ 25°C	NA	µS/cm	No health guidelines*	2280.000	3070	3110	2450
Final ORP	NA	mV	No health guidelines	291.121	179.936	368.101	276.542
Hydroxide Alkalinity as CaCO3	NA	mg/L	No health guidelines	< 1	< 1	< 1	< 1
Iron	Dissolved	mg/L	No health guidelines*	0.070	0.37	< 0.05	0.11
Iron	Total	mg/L	No health guidelines*	0.130	0.39	0.93	0.20
Lead	Dissolved	mg/L	<0.01	< 0.001	< 0.001	< 0.001	< 0.001
Lithium	Dissolved	mg/L	No health guidelines		0.110	0.122	0.096
Magnesium	Dissolved	mg/L	No health guidelines	46.000	64	77	56
Manganese	Dissolved	mg/L	No health guidelines	0.031	0.020	0.012	0.054
Manganese	Total	mg/L	<0.5	0.030	0.023	0.018	0.055
Nickel	Dissolved	mg/L	<0.02	< 0.001	< 0.001	< 0.001	< 0.001
Nitrite + Nitrate as N	NA	mg/L	<3	0.150	0.03	0.78	0.32
pH- lab	NA	pH Unit	No health guidelines*	7.870	7.66	8.00	8.09
pH - field	NA	pH Unit	No health guidelines*	7.15	7.2	7.12	6.74
Phosphate as P	Total	mg/L	No health guidelines		< 0.01	< 0.01	< 0.01



Analyte	Dissolved or Total	Unit	Australian Drinking Water Guidelines 6 2011	Results			
				Pre-Mining	Post-Mining		
				19/02/2018	25/07/2018	17/03/2022	28/09/2023
Potassium	Dissolved	mg/L	No health guidelines*	10.000	10	14	11
Redox (mV) - Field	NA	mV	No health guidelines	83	-32	159	67
Silicon	Dissolved	mg/L	No health guidelines*		4.11	4.27	4.57
Sodium	Dissolved	mg/L	No health guidelines*	275.000	393	439	319
Strontium	Dissolved	mg/L	No health guidelines		1.98	1.98	1.55
Sulfate	Dissolved	mg/L	<250		17	16	12
Suspended Solids (SS)	NA	mg/L	No health guidelines	8.000		< 5	< 5
Temperature - Field	NA	degC	No health guidelines			20.57	19.94
Total Alkalinity as CaCO <sub>3</sub>	NA	mg/L	No health guidelines*	486	646	590	509
Total Anions	NA	meq/L	No health guidelines	23.7	33.4	31.4	24.7
Total Cations	NA	meq/L	No health guidelines	21	27.8	31.6	24.2
Total Dissolved Solids @180°C	Total	mg/L	No health guidelines*	1100.000		1620	1240
Total Kjeldahl Nitrogen as N	NA	mg/L	No health guidelines*	0.9	1.4	0.5	1.1
Total Phosphorus as P	Total	mg/L	No health guidelines*	0.030	0.04	< 0.01	0.01
Zinc	Dissolved	mg/L	No health guidelines	0.008	< 0.005	0.007	0.006

\*No specific health guidelines are included Australian Drinking Water Guidelines 6 2011. Additional considerations are noted in ADWG 6 (2011) and the document should be referred to for specific advice.

Table 2: Results of chemical analyses for water samples collected from property dam. *Note- pre-mining electrical conductivity readings were removed from table following comparison with laboratory conductivity for the same date (19/02/2017). It is likely that the instrument was reading incorrectly. Post-mining conductivity parameters appear consistent with those from the laboratory. Error with field pH reading (28/09/2023), see lab results below for pH.*

Analyte	Dissolved or Total	Unit	Australian Drinking Water Guidelines 6 2011	Results			
				Pre-Mining	Post-Mining		
				19/02/2018	25/07/2018	17/03/2022	28/09/2023
Aluminium	Dissolved	mg/L	No health guidelines*	0.030	0.01	0.36	0.09
Aluminium	Total	mg/L	No health guidelines*	2.500	0.25	1.25	1.51
Ammonia	NA	mg/L	No health guidelines*	0.130	0.40	0.27	0.04
Arsenic	Dissolved	mg/L	<0.01	0.002	0.001	0.001	0.001
Barium	Dissolved	mg/L	<2		0.775	0.119	0.267
Bicarbonate Alkalinity as CaCO3	NA	mg/L	No health guidelines	249.000	260	110	168
Calcium	Dissolved	mg/L	No health guidelines	34.000	44	19	30
Carbonate Alkalinity as CaCO3	NA	mg/L	No health guidelines	< 1	8	< 1	2
Chloride	NA	mg/L	No health guidelines*	494.000	690	18	165
Copper	Dissolved	mg/L	<2	0.003	< 0.001	0.002	< 0.001
Dissolved Organic Carbon	NA	mg/L	No health guidelines*	16	19	10	18
Dissolved Oxygen - Field	NA	%	No health guidelines	38.2	95.3	28.6	83.4
Electrical Conductivity - Field	NA	µS/cm	No health guidelines*		2500	265	788
Electrical Conductivity @ 25°C	NA	µS/cm	No health guidelines*	1950.000	2470	264	814
Final ORP	NA	mV	No health guidelines	184.636	270.596	346.835	323.199
Hydroxide Alkalinity as CaCO3	NA	mg/L	No health guidelines	< 1	< 1	< 1	< 1
Iron	Dissolved	mg/L	No health guidelines*	< 0.05	< 0.05	0.69	0.07
Iron	Total	mg/L	No health guidelines*	5.240	0.97	2.33	3.04
Lead	Dissolved	mg/L	<0.01	< 0.001	< 0.001	< 0.001	< 0.001
Lithium	Dissolved	mg/L	No health guidelines		< 0.001	< 0.001	< 0.001
Magnesium	Dissolved	mg/L	No health guidelines	29.000	40	8	18
Manganese	Dissolved	mg/L	No health guidelines	0.200	0.018	0.250	0.168
Manganese	Total	mg/L	<0.5	0.248	0.079	0.259	0.298
Nickel	Dissolved	mg/L	<0.02	0.002	0.001	0.001	0.001
Nitrite + Nitrate as N	NA	mg/L	<3	< 0.01	0.13	0.06	< 0.01
pH- lab	NA	pH Unit	No health guidelines*	8.050	8.32	7.38	8.33

Analyte	Dissolved or Total	Unit	Australian Drinking Water Guidelines 6 2011	Results			
				Pre-Mining	Post-Mining		
				19/02/2018	25/072018	17/03/2022	28/09/2023
<b>pH - field</b>	NA	pH Unit	No health guidelines*	7.47	8.33	7.63	
<b>Phosphate as P</b>	Total	mg/L	No health guidelines		< 0.01	< 0.01	< 0.01
<b>Potassium</b>	Dissolved	mg/L	No health guidelines*	22.000	23	10	10
<b>Redox (mV) - Field</b>	NA	mV	No health guidelines	-21	56	138	114
<b>Silicon</b>	Dissolved	mg/L	No health guidelines*		0.92	7.46	2.78
<b>Sodium</b>	Dissolved	mg/L	No health guidelines*	271.000	374	24	93
<b>Strontium</b>	Dissolved	mg/L	No health guidelines		0.484	0.121	0.261
<b>Sulfate</b>	Dissolved	mg/L	<250		21	1	4
<b>Suspended Solids (SS)</b>	NA	mg/L	No health guidelines	114.000		8	27
<b>Temperature - Field</b>	NA	degC	No health guidelines			20.95	20.43
<b>Total Alkalinity as CaCO<sub>3</sub></b>	NA	mg/L	No health guidelines*	249	269	110	169
<b>Total Anions</b>	NA	meq/L	No health guidelines	19.1	25.3	2.73	8.11
<b>Total Cations</b>	NA	meq/L	No health guidelines	16.4	22.3	2.91	7.44
<b>Total Dissolved Solids @180°C</b>	Total	mg/L	No health guidelines*	985.000		182	425
<b>Total Kjeldahl Nitrogen as N</b>	NA	mg/L	No health guidelines*	1.6	1.0	1.2	1.6
<b>Total Phosphorus as P</b>	Total	mg/L	No health guidelines*	0.140	0.03	0.09	0.09
<b>Zinc</b>	Dissolved	mg/L	No health guidelines	< 0.005	< 0.005	0.009	< 0.005

\*No specific health guidelines are included Australian Drinking Water Guidelines 6 2011. Additional considerations are noted in ADWG 6 (2011) and the document should be referred to for specific advice.





Photo 1: Borehole GW105376. Taken on 19/02/2018.



Photo 2: Borehole during post-mining inspection. Taken on 28/09/2023



Photo 3: Dam located east of the residence during pre-mining inspection. Taken on 19/02/2018



Photo 4: Dam during post-mining inspection. Taken on 28/09/2023



Photo 5: Soil cracking present around extent of dam edges observed during pre-mining inspection. Taken on 19/02/2018.



Photo 6: Soil cracking present around dam edges. Taken on 28/09/2023





Photo 7: Water collected and sampled from GW105376 during pre-mining inspection. Taken on 19/02/2018.



Photo 8: Water collected and sampled from GW105376 during post-mining inspection. Taken on 28/09/2023.

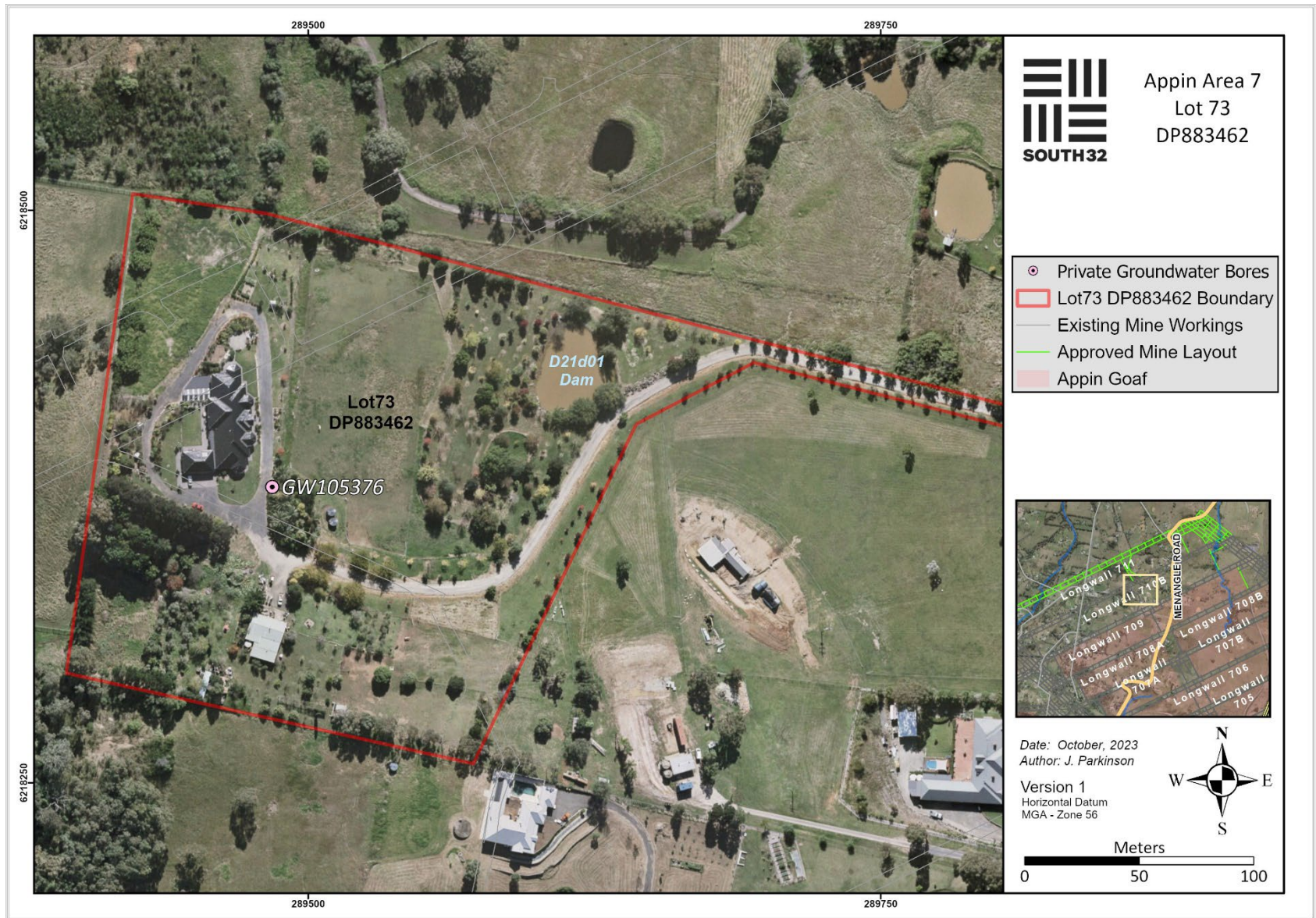


Photo 9: Dam wall during initial post-mining inspection, looking west. Taken on 25/7/2018



Photo 10: Dam wall during post-mining inspection, looking west. Taken on 28/09/2023





Pre - and post-mining inspections are undertaken for private boreholes as prescribed in the Appin Longwalls Longwall 709 to 711 and 905 Extraction Plan (EP). Inspections can also focus on other property features as required, including farm dams, and are undertaken in consultation with the property owner or tenant, where access is approved. Inspections are typically conducted by the Illawarra Metallurgical Coal Environmental Field Team (IMCEFT). Additional inspections may be undertaken at the request of the landholder and/or in response to any trigger in the EP.

This post-mining report includes observations and field data recorded for relevant features on Lot 900 DP1072947, including borehole GW101986 and property dam (MSEC ID: F17d01) (Figure 1).

### **Pre-mining Inspection**

On 22 February 2018, a pre-mining inspection of property Lot 900 DP1072947 was undertaken. The borehole on the property was inspected. During this inspection water quality was measured using the water in the tub, to which water flows from the bore (Photo 1). Water samples were collected from water that was pumped directly from the bore into a glass container (Photo 2).



Photo 1: Photo of GW101986 and pump. Taken on 22/2/2018.



Photo 2: Photo of water sample taken from GW101986. Taken on 22/2/2018.

## **Post-mining Inspections**

A Longwall 707 post-mining inspection of the property was conducted by IMCEFT on 6 August 2018 and a follow-up inspection undertaken on 14 September 2018. Water pumped directly from the bore to a bucket was used to measure field water quality and collect water samples from. No changes to the borehole or water were observed.

A Longwall 708 post-mining inspection of the property was conducted on 17 March 2022. During this inspection the samplers were unable to use the borehole pump without the property owner and therefore a water sample was unable to be collected.

A Longwall 905 post-mining inspection of the property was conducted on 20 April 2023. Water from the bore is pumped into a water tank. During the inspection water was piped from the tank into a bucket to measure field water quality parameters and collect a water sample.

The most recent inspection was undertaken on 28 September 2023 following the completion of Longwall 709. The borehole was inspected to compare key observations with those from the pre-mining inspection. Water from the bore is pumped into a water tank. During the inspection, water was piped from the tank into a bucket to measure field water quality parameters and collect a water sample (Photo 4 & Photo 7). A direct feed of water from the bore was not able to be obtained, hence the reason for sampling from piped water from the tank (an indirect supply from the bore).





Photo 3: Borehole GW101986 and pump. Taken on 6/08/2018.



Photo 4: Borehole GW101986. Taken on 29/09/2023.



Photo 5: Borehole GW101986 outflow. Taken on 28/09/2023.



Photo 6: Water sample from borehole GW101986. Taken on 14/09/2018.



Photo 7: Water sample from borehole GW101986. Taken on 28/09/2023



Photo 8: Property dam. Taken on 14/09/2018



Photo 9: Property dam. Taken on 17/03/2022



Photo 10: Property dam. Taken on 28/09/2023

### **Property Borehole (GW101986)**

**Location:** E288261, N6217360

**Borehole Properties:** The borehole is located approximately 200 metres northeast of the residence (Figure 1). According to the NSW Office of Water report, the borehole was drilled to a depth of 210m and was completed on 20 February 1998. On 22 February 2018 a pre-mining inspection was completed on the property with field water quality measured and water samples collected for laboratory analysis. On 6 August 2018, 14 September 2018 and 20 April 2023 post-mining inspections were completed on the property, with field water quality measured and water samples collected (Photo 3 and Photo 6). The Longwall 709 post-mining inspection was undertaken on 28 September 2023. During this inspection, water was piped from the tank into a bucket to measure field water quality parameters and collect a water sample, as the borehole was not able to directly accessed (Photo 4 & Photo 5).

**Water Properties:** No signs of iron, salinity staining or gas release were observed in the water, around the borehole or around the outlet. Sample results from laboratory analysis and field parameters are included below (Table 1 and Table 2).

### **Dam (F17d01)**

On 17 March 2022, the dam was full and surrounding banks were saturated following recent heavy rainfall (Photo 9). The water was brown in colour. On 28 September 2023 the dam level was high, with the water a green/brown colour (Photo 10). The dam wall appeared to be in a good condition. Field water quality parameters were recorded and compared with results from previous inspections (Table 2).

IMC cannot provide advice regarding water quality requirements for specific domestic or agricultural uses. Table 1 and Table 2 includes analyte levels from the *Australian Drinking Water Guidelines 6 2011*, for human consumption. It is recommended that these results be read in conjunction with ADWG 6 (2011) for a detailed assessment of the suitability of usage in various scenarios along with other relevant recommendations.

## References

- Australian Drinking Water Guidelines 6 2011

<https://www.nhmrc.gov.au/sites/default/files/documents/reports/aust-drinking-water-guidelines.pdf>



Table 1: Results of field results and water chemistry analyses for samples collected from the property borehole (GW101986).

Analyte	Dissolved or Total	Unit	Australian Drinking Water Guidelines 6 2011	Results				
				Pre-Mining 22/02/2018	Post-Mining			
					06/08/2018	14/09/2018	20/04/2023	28/09/2023
Aluminium	Dissolved	mg/L	No health guidelines*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aluminium	Total	mg/L	No health guidelines*	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Ammonia	NA	mg/L	No health guidelines*	1.760	1.67	1.83	0.01	0.06
Arsenic	Dissolved	mg/L	<0.01	< 0.001			< 0.001	< 0.001
Barium	Dissolved	mg/L	<2		0.298	0.966	0.372	0.403
Bicarbonate Alkalinity as CaCO3	NA	mg/L	No health guidelines	722.000	612	640	662	633
Calcium	Dissolved	mg/L	No health guidelines	118.000	144	147	158	167
Carbonate Alkalinity as CaCO3	NA	mg/L	No health guidelines	< 1	< 1	< 1	< 1	< 1
Chloride	NA	mg/L	No health guidelines*	1460.000	804	906	888	778
Copper	Dissolved	mg/L	<2	0.001	< 0.001	0.017	0.010	< 0.001
Dissolved Organic Carbon	NA	mg/L	No health guidelines*	2.000	10	8	3	4
Dissolved Oxygen - Field	NA	%	No health guidelines	51	55.9	70.7	87.4	27.9
Electrical Conductivity - Field	NA	µS/cm	No health guidelines*		3780	7310	3510	3700
Electrical Conductivity @ 25°C	NA	µS/cm	No health guidelines*	5650.000	3570	4110	3520	3650
Final ORP	NA	mV	No health guidelines	288.555	204.089	350.978	406.878	351.089
Hydroxide Alkalinity as CaCO3	NA	mg/L	No health guidelines	< 1	< 1	< 1	< 1	< 1
Iron	Dissolved	mg/L	No health guidelines*	0.140	0.72	< 0.05	< 0.05	< 0.05
Iron	Total	mg/L	No health guidelines*	0.290	0.82	0.67	0.08	< 0.05
Lead	Dissolved	mg/L	<0.01	< 0.001			0.001	< 0.001
Lithium	Dissolved	mg/L	No health guidelines		0.134	0.142	0.151	0.145
Magnesium	Dissolved	mg/L	No health guidelines	122.000	80	80	88	85
Manganese	Dissolved	mg/L	No health guidelines	0.008	0.008	0.010	< 0.001	0.004
Manganese	Total	mg/L	<0.5	0.007	0.006	0.010	0.003	0.004
Nickel	Dissolved	mg/L	<0.02	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Nitrite + Nitrate as N	NA	mg/L	<3	0.120	0.06	0.02	1.76	1.70
pH- lab	NA	pH Unit	No health guidelines*	7.760	7.34	7.28	8.19	7.99
pH - field	NA	pH Unit	No health guidelines*	8.25	6.99	7.84	7.78	7.15
Phosphate as P	Total	mg/L	No health guidelines		< 0.01	< 0.01	< 0.01	< 0.01

Analyte	Dissolved or Total	Unit	Australian Drinking Water Guidelines 6 2011	Results				
				Pre-Mining	Post-Mining			
				22/02/2018	06/08/2018	14/09/2018	20/04/2023	28/09/2023
Potassium	Dissolved	mg/L	No health guidelines*	29.000	12	13	16	14
Redox (mV) - Field	NA	mV	No health guidelines	80	-7	139	197	140
Silicon	Dissolved	mg/L	No health guidelines*		4.27	4.49	4.42	4.74
Sodium	Dissolved	mg/L	No health guidelines*	879.000	453	464	487	460
Strontium	Dissolved	mg/L	No health guidelines		2.70	2.55	2.40	2.65
Sulfate	Dissolved	mg/L	<250		28	22	29	31
Suspended Solids (SS)	NA	mg/L	No health guidelines	28.000	8	< 5	< 5	< 5
Temperature - Field	NA	degC	No health guidelines				19.46	17.73
Total Alkalinity as CaCO <sub>3</sub>	NA	mg/L	No health guidelines*	722	612	640	662	633
Total Anions	NA	meq/L	No health guidelines	56.600	35.5	38.8	38.9	35.2
Total Cations	NA	meq/L	No health guidelines	54.900	33.8	34.4	36.7	35.7
Total Dissolved Solids @180°C	Total	mg/L	No health guidelines*	2900.000	1900	2080	1950	1920
Total Kjeldahl Nitrogen as N	NA	mg/L	No health guidelines*	1.6	1.7	1.8	0.2	0.4
Total Phosphorus as P	Total	mg/L	No health guidelines*	< 0.01	< 0.01	< 0.01	0.02	0.01
Zinc	Dissolved	mg/L	No health guidelines	0.011	0.008	0.156	0.026	0.010

\*No specific health guidelines are included Australian Drinking Water Guidelines 6 2011. Additional considerations are noted in ADWG 6 (2011) and the document should be referred to for specific advice.

Table 2: Results of field results and water chemistry analyses for samples collected from property dam (L900\_D1072947 DAM).

Analyte	Dissolved or Total	Unit	Australian Drinking Water Guidelines 6 2011	Results			
				Post-Mining			
				14/09/2018	17/03/2022	20/04/2023	28/09/2023
Aluminium	Dissolved	mg/L	No health guidelines*		0.26		< 0.01
Aluminium	Total	mg/L	No health guidelines*		1.09		0.96
Ammonia	NA	mg/L	No health guidelines*		0.03		0.05
Arsenic	Dissolved	mg/L	<0.01		< 0.001		< 0.001
Barium	Dissolved	mg/L	<2		0.058		0.445
Bicarbonate Alkalinity as CaCO3	NA	mg/L	No health guidelines		79		320
Calcium	Dissolved	mg/L	No health guidelines		16		62
Carbonate Alkalinity as CaCO3	NA	mg/L	No health guidelines		< 1		22
Chloride	NA	mg/L	No health guidelines*		28		662
Copper	Dissolved	mg/L	<2		0.001		< 0.001
Dissolved Organic Carbon	NA	mg/L	No health guidelines*		9		6
Dissolved Oxygen - Field	NA	%	No health guidelines	100.2	80.2	98.2	100.7
Electrical Conductivity - Field	NA	µS/cm	No health guidelines*	4080	246	1900	2760
Electrical Conductivity @ 25°C	NA	µS/cm	No health guidelines*		248		2730
Final ORP	NA	mV	No health guidelines	329.614	398.072	353.165	344.493
Hydroxide Alkalinity as CaCO3	NA	mg/L	No health guidelines		< 1		< 1
Iron	Dissolved	mg/L	No health guidelines*		0.15		< 0.05
Iron	Total	mg/L	No health guidelines*		1.03		1.16
Lead	Dissolved	mg/L	<0.01		< 0.001		< 0.001
Lithium	Dissolved	mg/L	No health guidelines		0.002		0.097
Magnesium	Dissolved	mg/L	No health guidelines		8		66
Manganese	Dissolved	mg/L	No health guidelines		0.020		0.044
Manganese	Total	mg/L	<0.5		0.112		0.116
Nickel	Dissolved	mg/L	<0.02		0.001		< 0.001
Nitrite + Nitrate as N	NA	mg/L	<3		< 0.01		0.15
pH- lab	NA	pH Unit	No health guidelines*		7.15		8.55



Analyte	Dissolved or Total	Unit	Australian Drinking Water Guidelines 6 2011	Results			
				Post-Mining			
				14/09/2018	17/03/2022	20/04/2023	28/09/2023
<b>pH - field</b>	NA	pH Unit	No health guidelines*	8.45	7.85	8.43	8.5
<b>Phosphate as P</b>	Total	mg/L	No health guidelines		0.01		< 0.01
<b>Potassium</b>	Dissolved	mg/L	No health guidelines*		11		15
<b>Redox (mV) - Field</b>	NA	mV	No health guidelines	118	190	143	135
<b>Silicon</b>	Dissolved	mg/L	No health guidelines*		5.81		0.19
<b>Sodium</b>	Dissolved	mg/L	No health guidelines*		21		370
<b>Strontium</b>	Dissolved	mg/L	No health guidelines		0.205		1.59
<b>Sulfate</b>	Dissolved	mg/L	<250		3		22
<b>Suspended Solids (SS)</b>	NA	mg/L	No health guidelines		< 5		10
<b>Temperature - Field</b>	NA	degC	No health guidelines		22.04	19.05	20.01
<b>Total Alkalinity as CaCO<sub>3</sub></b>	NA	mg/L	No health guidelines*		79		342
<b>Total Anions</b>	NA	meq/L	No health guidelines		2.43		26.0
<b>Total Cations</b>	NA	meq/L	No health guidelines		2.65		25.0
<b>Total Dissolved Solids @180°C</b>	Total	mg/L	No health guidelines*		140		1360
<b>Total Kjeldahl Nitrogen as N</b>	NA	mg/L	No health guidelines*		0.8		0.5
<b>Total Phosphorus as P</b>	Total	mg/L	No health guidelines*		0.06		0.03
<b>Zinc</b>	Dissolved	mg/L	No health guidelines		0.009		< 0.005

\*No specific health guidelines are included Australian Drinking Water Guidelines 6 2011. Additional considerations are noted in ADWG 6 (2011) and the document should be referred to for specific advice.

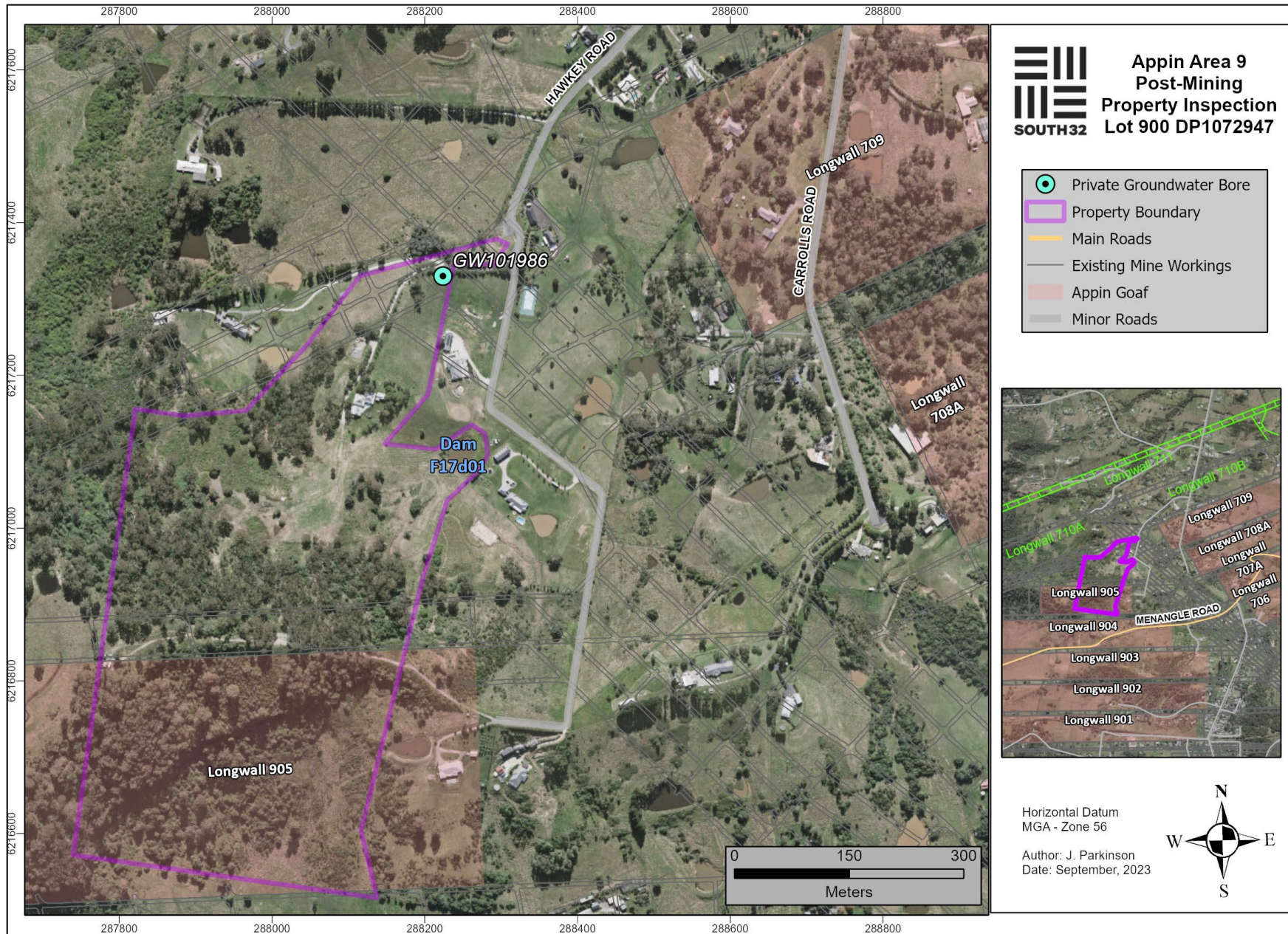


Figure 1: Map showing location of inspected borehole GW101986 and dam F17d01 on Lot 900 DP1072947.