



# **EPL289 – ANNUAL MONITORING REPORT**

**6 July 2022**

Reporting period: 01 July 2021 – 30 June 2022

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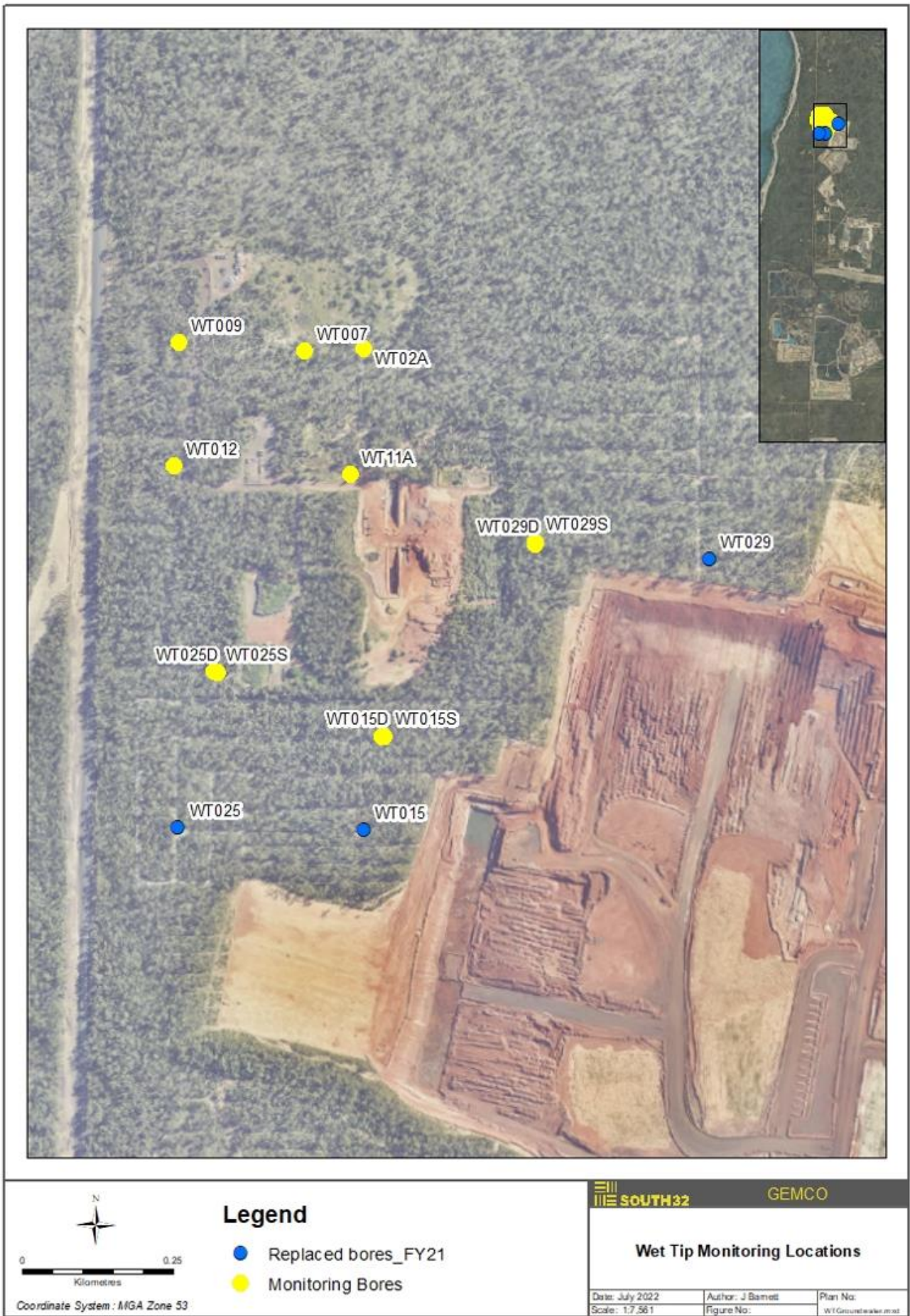
## EXECUTIVE SUMMARY

Groundwater bores within GEMCO's Waste Management Facility were monitored quarterly during FY22 in accordance with the conditions of Environment Protection Licence 289 (EPL289). During FY22 the groundwater program was expanded to include additional bores installed at three sites within the deeper aquifer. Historically groundwater data associated with this facility was limited to the upper aquifer. Based on the available data for the reporting period, there is a general absence of landfill seepage indicators. The lack of water in the shallow aquifer under this facility for the reporting period would also suggest the risk of leachate potentially migrating through this aquifer system is low. The current bore network will enable ongoing monitoring of both the shallow and deeper aquifer during FY23.

## MONITORING PROGRAM

GEMCO conducts quarterly groundwater monitoring at locations in and around the Waste Management Facility as specified in the conditions of EPL289 (**Figure 1**). Eight groundwater bores have historically been monitored at the active landfill. Due to the expansion of the GEMCO mine footprint, three monitoring bores (WT015, WT025 and WT029) were relocated in FY22. This drilling work included the installation of additional bores targeting the deep aquifer which has resulted in a total of 11 bores. In accordance with EPL289, the bores are monitored quarterly for groundwater level and quality to detect contaminated leachate from the site.

The main waste streams that are disposed of at the facility are green waste, construction waste and putrescible/household waste. A minor disposal area is located within the facility for the disposal of sewage sludge following any routine maintenance of the Alyangula sewage treatment facility. Under the conditions of EPL289 tyres and batteries are also stored (not disposed) at the waste management facility.



**Figure 1:** Groundwater monitoring network associated with waste management facility



The groundwater flow direction in the waste facility is to the southwest towards the coast during both wet and dry seasons. Metals, nutrient and bacteria concentrations are analysed for any increasing trends in concentrations/counts which might indicate an increase in the mobilisation of leachate.

Low flow purging of groundwater monitoring bores is carried out using a Sample Pro® Portable Micropurge Pump with combined QED MP50 compressor/controller unit. A Win-Situ Troll® 600 multi-parameter water quality meter with flow-through cell is used to determine when stabilisation criteria have been met and field readings are recorded using a Microsoft application, EQUIS Collect. Field readings are uploaded from the field directly into GEMCO's Environmental Monitoring Database, EQUIS. After stabilisation criteria have been met, samples are collected and stored in an Esky before sending to a NATA Accredited Laboratory (i.e. ALS Laboratories) for analysis.

The monitoring parameters include total and dissolved metalloids (Mn, Zn, Fe, Ni, Pb), pH, dissolved oxygen, Chloride (Cl<sup>-</sup>) potassium (K), total organic nitrogen (TON), total phosphorous, total dissolved solids (TDS), Chemical Oxygen Demand, ammonium, *E Coli*, and *Enterococci*. Water quality data is compared against the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZG 2018) toxicant default guidelines with a 95% level of protection where available (**Table 1**).

**Table 1:** GEMCO Water quality trigger levels for groundwater

Analyte	Water Quality Trigger Value (mg/L)
Ni	0.011
Pb	0.0034
Mn	1.9
Zn	0.008
Fe	NA



# RESULTS AND DISCUSSION

## DATA ANALYSIS

### *Metals*

The concentration of lead was below the trigger value at all bores for the reporting period (**Table 2**). The concentration of nickel was above the trigger value in August 2021 at WT009 and the manganese trigger value was breached on two occasions at WT015S for the reporting period (**Table 2**). The breach of the manganese trigger level is likely to be due to the installation of this bore close to or within manganese ore for this new site (i.e. it is in close proximity of the GEMCO mining cuts). Zinc consistently breached the ANZG trigger value at most bores throughout the reporting period (**Table 2**). It is unlikely that elevated zinc concentrations are indicative of impacts from the waste facility, as groundwater sampling across Groote Eylandt consistently shows variable and elevated zinc concentrations. This is considered to reflect the enrichment of zinc and other metals in the underlying geology of Groote Eylandt. Long term monitoring of metals in groundwater from bores associated with the landfill facility does not show any increasing trends in any of the metals analysed as part of this monitoring program (**Figure 2 - Figure 6**).

### *Nutrients*

Nutrient levels were low during the reporting period (**Table 2**) and in line with historical data (**Table 3**). The nutrient concentrations are likely to reflect levels that naturally occur in the local groundwater.

### *Bacteria*

*Escherichia coli* and *Enterococci* bacteria were not detected in the majority of samples for the reporting period (**Table 2**). Two samples collected in February 2022 contained *Escherichia coli* which were likely to be the result of faecal matter produced by frogs that are observed at times within bores throughout the facility and have previously been reporting through this groundwater program.

## DISCUSSION

The management practices at GEMCO's Waste Management Facility involve regular capping of waste cells. This assists in ensuring only minimal volumes of leachate are produced and that there is a minimal driving gradient of groundwater to mobilise leachate into the aquifer system. Based on the available data, there is a general absence of landfill seepage indicators. Historically the reach of the available groundwater data was limited to the upper aquifer. In below-average rainfall years, the water table does not reach the screened intervals meaning they are not providing groundwater data for extended periods of time. The lack of water in this shallow aquifer under this facility would suggest the risk of leachate potentially migrating through the aquifer system is low. To monitor potential impacts to the deeper aquifer at the tip, deeper bores were installed in FY22 at three sites (i.e. WT029, WT015 and WT025). These sites provided data from the deep and shallow aquifer for this reporting period and will be used on an ongoing basis to monitor potential impacts to both aquifers from the Waste Management Facility.

Monitoring will continue in FY23 to determine any increasing trends in water quality parameters that might be the result of landfill leachate. This will be reported to the N.T. EPA in line with the reporting requirements of EPL289.



Table 2: FY22 water quality results.

Sample Point	Sample Date	Cl (mg/L)	K-Dissolved (mg/L)	Nitrogen as N (mg/L)	P Total (mg/L)	COD (mg/L)	Ammonium as N (mg/L)	Dissolved Metals (mg/L)					Enterococci (CFU/100ml)	Escherichia coli (CFU/100ml)
								Fe	Pb	Mn	Ni	Zn		
WT007	24/05/2021	7	3	0.5	< 0.05	13	< 0.01	< 0.05	0.001	0.062	0.003	0.006	< 1	< 1
WT009	24/05/2021	12	2	< 0.1	< 0.01	< 10	< 0.01	< 0.05	< 0.001	0.049	0.009	0.009	< 1	< 1
WT012	24/05/2021	4	< 1	< 0.1	< 0.01	< 10	0.02	< 0.05	< 0.001	0.063	0.002	0.008	< 1	< 1
WT015	24/05/2021	20	< 1	< 0.1	< 0.01	< 10	< 0.01	< 0.05	< 0.001	0.014	0.006	0.005	< 1	< 1
WT025	24/05/2021	21	< 1	0.1	< 0.01	< 10	< 0.01	< 0.05	0.008	0.015	0.008	< 0.005	< 1	< 1
WT007	25/08/2021	6	2	0.5	0.10	16		0.06	0.001	0.040	0.008	0.010	< 1	< 1
WT009	25/08/2021	8	1	< 0.1	< 0.01	< 10		< 0.05	< 0.001	0.016	0.012	0.007	< 1	< 1
WT012	25/08/2021	4	< 1	0.3	< 0.01	< 10		< 0.05	< 0.001	0.061	0.003	0.009	1	< 1
WT015D	25/08/2021	21	< 1	< 0.5	0.26	< 10		< 0.05	< 0.001	0.433	0.002	0.013	< 10	< 10
WT015S	25/08/2021	23	2	< 2	0.45	28		0.38	< 0.001	5.18	0.002	< 0.005	< 10	< 10
WT025D	25/08/2021	30	< 1	0.1	0.01	< 10		0.08	< 0.001	0.540	0.002	0.011	< 1	< 1
WT025S	25/08/2021	36	< 1	0.1	< 0.01	29		0.17	< 0.001	0.222	0.005	0.010	< 1	< 1
WT029D	25/08/2021	24	< 1	< 2	< 0.20	13		< 0.05	< 0.001	1.13	0.002	0.013	< 10	< 10
WT029S	25/08/2021	29	1	< 5	0.78	53		< 0.05	< 0.001	0.602	0.002	< 0.005	< 100	< 100
WT015D	18/11/2021	21	< 1	< 0.1	0.02	< 10		0.13	< 0.001	0.637	0.002	0.020	< 1	< 1
WT025D	18/11/2021	39	< 1	0.4	0.04	< 10		0.19	< 0.001	0.392	0.004	0.030	< 1	< 1
WT025S	18/11/2021	38	< 1	0.9	0.07	< 10		0.42	< 0.001	0.342	0.005	0.030	< 1	< 1
WT025S	17/02/2022	39	< 1	< 0.5	< 0.05	< 10	0.02	< 0.05	< 0.001	0.205	0.001	0.031	< 10	10
WT025D	17/02/2022	34	< 1	2.0	0.22	13	0.05	< 0.05	< 0.001	0.729	< 0.001	0.012	< 10	< 10
WT029D	17/02/2022	26	< 1	< 1	0.16	< 10	< 0.01	< 0.05	< 0.001	1.44	0.001	0.023	< 10	< 10
WT015S	17/02/2022	16	2	< 1	0.16	10	0.13	< 0.05	< 0.001	4.26	0.003	0.017	< 10	< 10
WT015D	17/02/2022	22	< 1	0.8	0.02	< 10	0.05	0.35	< 0.001	0.686	< 0.001	0.019	< 10	210
WT025D	12/05/2022	35	< 1	0.5	0.10	< 10	0.06	< 0.05	< 0.001	0.289	0.002	0.013	< 2	< 2
WT015D	12/05/2022	21	< 1	0.1	0.03	< 10	0.06	0.72	< 0.001	1.32	0.002	0.029	< 1	< 1
WT025S	12/05/2022	41	< 1	0.6	0.02	< 10	< 0.01	< 0.05	< 0.001	0.199	0.004	0.011	< 1	< 1



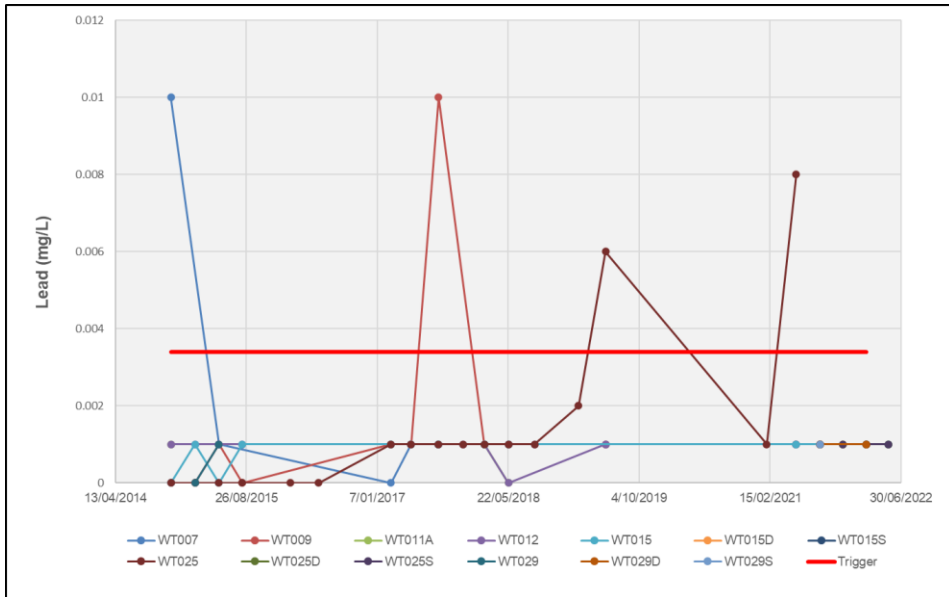


Figure 2: Dissolved lead concentrations in groundwater monitoring bores

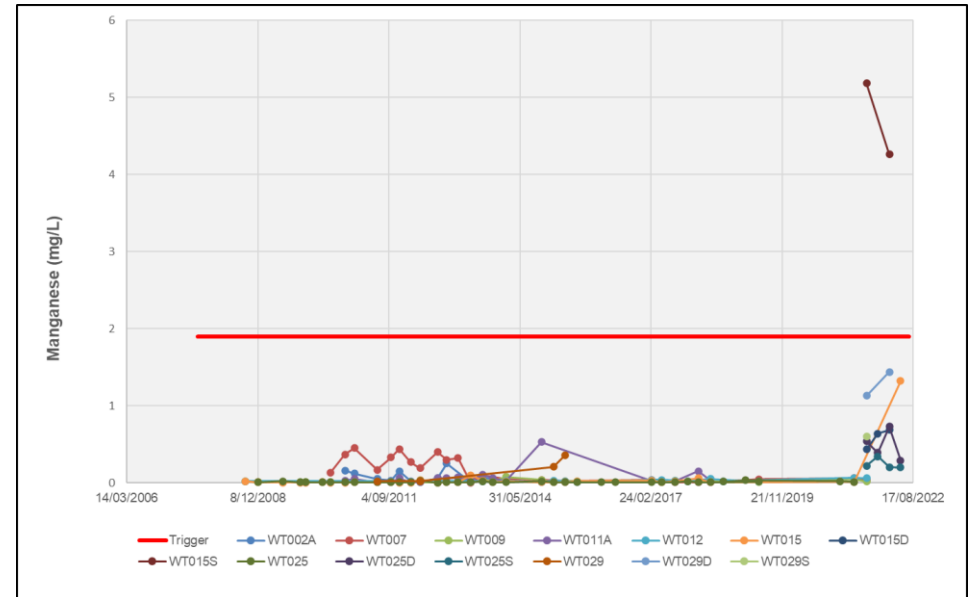


Figure 4: Dissolved manganese concentrations in groundwater monitoring bores

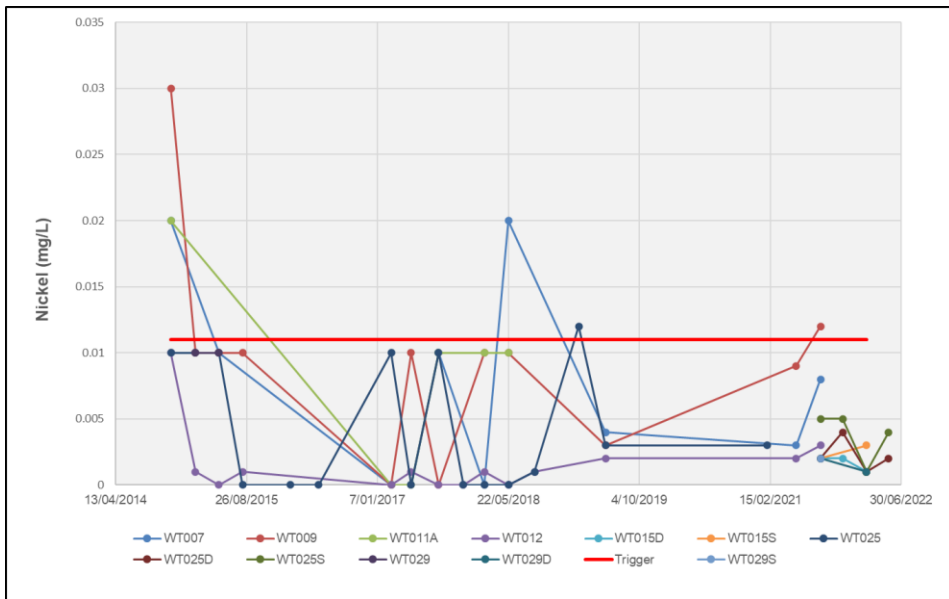


Figure 3: Dissolved nickel concentrations in groundwater monitoring bores

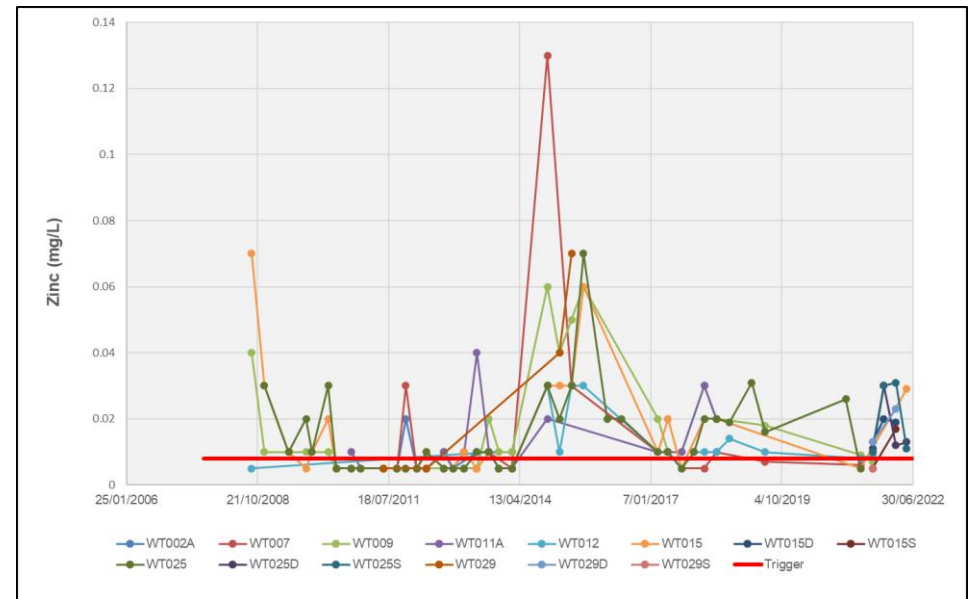


Figure 5: Dissolved zinc concentrations in groundwater monitoring bores

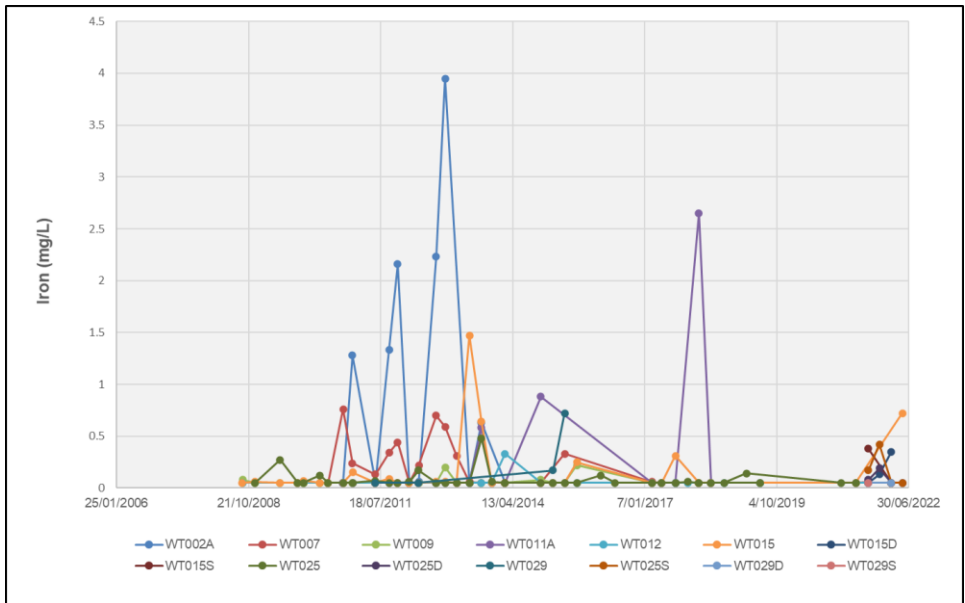


Figure 6: Dissolved iron concentrations in groundwater monitoring bores



**Table 3:** Long term nutrient concentrations in groundwater associated with waste management facility

Sample date	Sample Point	Analyte	Concentration (mg/L)	Sample date	Sample Point	Analyte	Concentration (mg/L)
5/10/2010	WT002A	Ammonium as N	0.03	10/03/2009	WT009	Ammonium as N	< 0.01
15/12/2010	WT002A	Ammonium as N	0.05	10/03/2009	WT009	Ammonium as N	< 0.01
7/06/2011	WT002A	Ammonium as N	0.04	16/06/2009	WT009	Ammonium as N	0.07
19/09/2011	WT002A	Ammonium as N	0.03	26/10/2009	WT009	Ammonium as N	< 0.01
23/11/2011	WT002A	Ammonium as N	0.05	8/12/2009	WT009	Ammonium as N	0.01
16/02/2012	WT002A	Ammonium as N	0.01	8/12/2009	WT009	Ammonium as N	0.01
30/04/2012	WT002A	Ammonium as N	0.03	12/04/2010	WT009	Ammonium as N	< 0.01
10/09/2012	WT002A	Ammonium as N	0.06	12/06/2010	WT009	Ammonium as N	< 0.01
18/11/2012	WT002A	Ammonium as N	0.09	5/10/2010	WT009	Ammonium as N	0.06
20/05/2013	WT002A	Ammonium as N	0.19	14/12/2010	WT009	Ammonium as N	0.02
19/08/2013	WT002A	Ammonium as N	0.18	7/06/2011	WT009	Ammonium as N	0.02
12/02/2014	WT002A	Ammonium as N	0.03	19/09/2011	WT009	Ammonium as N	0.02
13/06/2010	WT007	Ammonium as N	0.05	22/11/2011	WT009	Ammonium as N	0.02
5/10/2010	WT007	Ammonium as N	0.09	16/02/2012	WT009	Ammonium as N	0.02
15/12/2010	WT007	Ammonium as N	0.22	30/04/2012	WT009	Ammonium as N	0.03
7/06/2011	WT007	Ammonium as N	0.06	10/09/2012	WT009	Ammonium as N	0.03
19/09/2011	WT007	Ammonium as N	0.11	18/11/2012	WT009	Ammonium as N	0.09
23/11/2011	WT007	Ammonium as N	0.2	11/02/2013	WT009	Ammonium as N	0.04
16/02/2012	WT007	Ammonium as N	0.06	20/05/2013	WT009	Ammonium as N	0.06
30/04/2012	WT007	Ammonium as N	0.08	19/08/2013	WT009	Ammonium as N	0.04
10/09/2012	WT007	Ammonium as N	0.2	4/11/2013	WT009	Ammonium as N	0.11
18/11/2012	WT007	Ammonium as N	0.2	12/02/2014	WT009	Ammonium as N	0.02
11/02/2013	WT007	Ammonium as N	0.21	10/11/2014	WT009	Ammonium as N	0.05
20/05/2013	WT007	Ammonium as N	0.1	11/02/2015	WT009	Ammonium as N	0.04
19/08/2013	WT007	Ammonium as N	0.08	12/05/2015	WT009	Ammonium as N	< 0.01
12/02/2014	WT007	Ammonium as N	0.01	10/08/2015	WT009	Ammonium as N	< 0.01
10/11/2014	WT007	Ammonium as N	< 0.01	28/02/2017	WT009	Ammonium as N	0.03
12/05/2015	WT007	Ammonium as N	< 0.01	15/05/2017	WT009	Ammonium as N	0.06
28/02/2017	WT007	Ammonium as N	< 0.01	28/08/2017	WT009	Ammonium as N	0.01
15/05/2017	WT007	Ammonium as N	0.05	19/02/2018	WT009	Ammonium as N	0.16
28/08/2017	WT007	Ammonium as N	0.04	22/05/2018	WT009	Ammonium as N	0.04
19/02/2018	WT007	Ammonium as N	0.07	28/05/2019	WT009	Ammonium as N	0.04
22/05/2018	WT007	Ammonium as N	0.04	24/05/2021	WT009	Ammonium as N	< 0.01
28/05/2019	WT007	Ammonium as N	< 0.01	5/10/2010	WT011A	Ammonium as N	0.03
24/05/2021	WT007	Ammonium as N	< 0.01	16/12/2010	WT011A	Ammonium as N	0.22
4/09/2008	WT009	Ammonium as N	0.02	7/06/2011	WT011A	Ammonium as N	0.01
9/12/2008	WT009	Ammonium as N	< 0.01	19/09/2011	WT011A	Ammonium as N	0.02

23/11/2011	WT011A	Ammonium as N	0.06	13/06/2010	WT015	Ammonium as N	0.05
16/02/2012	WT011A	Ammonium as N	0.02	6/10/2010	WT015	Ammonium as N	0.08
30/04/2012	WT011A	Ammonium as N	0.04	16/12/2010	WT015	Ammonium as N	0.1
10/09/2012	WT011A	Ammonium as N	0.03	7/06/2011	WT015	Ammonium as N	0.02
18/11/2012	WT011A	Ammonium as N	0.09	19/09/2011	WT015	Ammonium as N	< 0.01
11/02/2013	WT011A	Ammonium as N	0.07	22/11/2011	WT015	Ammonium as N	0.05
20/05/2013	WT011A	Ammonium as N	0.08	16/02/2012	WT015	Ammonium as N	0.02
19/08/2013	WT011A	Ammonium as N	0.12	30/04/2012	WT015	Ammonium as N	0.03
4/11/2013	WT011A	Ammonium as N	0.07	10/09/2012	WT015	Ammonium as N	0.02
12/02/2014	WT011A	Ammonium as N	0.12	18/11/2012	WT015	Ammonium as N	0.07
10/11/2014	WT011A	Ammonium as N	< 0.01	11/02/2013	WT015	Ammonium as N	0.05
28/02/2017	WT011A	Ammonium as N	0.09	20/05/2013	WT015	Ammonium as N	0.15
15/05/2017	WT011A	Ammonium as N	0.06	19/08/2013	WT015	Ammonium as N	1.22
28/08/2017	WT011A	Ammonium as N	0.04	4/11/2013	WT015	Ammonium as N	0.07
19/02/2018	WT011A	Ammonium as N	0.14	12/02/2014	WT015	Ammonium as N	0.06
22/05/2018	WT011A	Ammonium as N	0.02	10/11/2014	WT015	Ammonium as N	< 0.01
4/09/2008	WT012	Ammonium as N	0.04	11/02/2015	WT015	Ammonium as N	0.01
19/08/2013	WT012	Ammonium as N	0.1	12/05/2015	WT015	Ammonium as N	< 0.01
4/11/2013	WT012	Ammonium as N	0.06	10/08/2015	WT015	Ammonium as N	0.04
12/02/2014	WT012	Ammonium as N	0.05	28/02/2017	WT015	Ammonium as N	0.21
10/11/2014	WT012	Ammonium as N	< 0.01	15/05/2017	WT015	Ammonium as N	0.05
11/02/2015	WT012	Ammonium as N	0.01	28/08/2017	WT015	Ammonium as N	0.04
12/05/2015	WT012	Ammonium as N	< 0.01	19/02/2018	WT015	Ammonium as N	0.04
10/08/2015	WT012	Ammonium as N	< 0.01	22/05/2018	WT015	Ammonium as N	0.04
28/02/2017	WT012	Ammonium as N	0.03	24/05/2021	WT015	Ammonium as N	< 0.01
15/05/2017	WT012	Ammonium as N	0.1	12/05/2022	WT015	Ammonium as N	0.06
28/08/2017	WT012	Ammonium as N	0.06	17/02/2022	WT015D	Ammonium as N	0.05
30/11/2017	WT012	Ammonium as N	0.27	17/02/2022	WT015S	Ammonium as N	0.13
19/02/2018	WT012	Ammonium as N	0.36	9/12/2008	WT025	Ammonium as N	< 0.01
22/05/2018	WT012	Ammonium as N	0.07	9/03/2009	WT025	Ammonium as N	< 0.01
28/05/2019	WT012	Ammonium as N	< 0.01	9/03/2009	WT025	Ammonium as N	< 0.01
24/05/2021	WT012	Ammonium as N	0.02	16/06/2009	WT025	Ammonium as N	0.08
3/09/2008	WT015	Ammonium as N	0.04	25/10/2009	WT025	Ammonium as N	< 0.01
9/12/2008	WT015	Ammonium as N	< 0.01	8/12/2009	WT025	Ammonium as N	0.01
9/03/2009	WT015	Ammonium as N	< 0.01	12/04/2010	WT025	Ammonium as N	< 0.01
9/03/2009	WT015	Ammonium as N	< 0.01	13/06/2010	WT025	Ammonium as N	0.02
16/06/2009	WT015	Ammonium as N	0.08	6/10/2010	WT025	Ammonium as N	0.05
25/10/2009	WT015	Ammonium as N	0.03	16/12/2010	WT025	Ammonium as N	0.06
8/12/2009	WT015	Ammonium as N	0.03	7/06/2011	WT025	Ammonium as N	0.03
12/04/2010	WT015	Ammonium as N	< 0.01	19/09/2011	WT025	Ammonium as N	< 0.01

Sample date	Sample Point	Analyte	Concentration (mg/L)	Sample date	Sample Point	Analyte	Concentration (mg/L)
22/11/2011	WT025	Ammonium as N	0.02	16/02/2012	WT002A	Potassium	< 1
16/02/2012	WT025	Ammonium as N	0.03	30/04/2012	WT002A	Potassium	< 1
30/04/2012	WT025	Ammonium as N	0.05	10/09/2012	WT002A	Potassium	< 1
10/09/2012	WT025	Ammonium as N	0.03	18/11/2012	WT002A	Potassium	1
18/11/2012	WT025	Ammonium as N	0.06	20/05/2013	WT002A	Potassium	< 1
11/02/2013	WT025	Ammonium as N	0.06	19/08/2013	WT002A	Potassium	1
20/05/2013	WT025	Ammonium as N	0.05	12/02/2014	WT002A	Potassium	< 1
19/08/2013	WT025	Ammonium as N	0.05	13/06/2010	WT007	Potassium	4
4/11/2013	WT025	Ammonium as N	0.06	5/10/2010	WT007	Potassium	4
12/02/2014	WT025	Ammonium as N	0.04	15/12/2010	WT007	Potassium	4
10/11/2014	WT025	Ammonium as N	0.04	7/06/2011	WT007	Potassium	3
11/02/2015	WT025	Ammonium as N	0.02	19/09/2011	WT007	Potassium	3
12/05/2015	WT025	Ammonium as N	< 0.01	23/11/2011	WT007	Potassium	3
10/08/2015	WT025	Ammonium as N	< 0.01	16/02/2012	WT007	Potassium	4
8/02/2016	WT025	Ammonium as N	0.03	30/04/2012	WT007	Potassium	3
27/05/2016	WT025	Ammonium as N	0.02	10/09/2012	WT007	Potassium	2
28/02/2017	WT025	Ammonium as N	0.14	18/11/2012	WT007	Potassium	2
15/05/2017	WT025	Ammonium as N	0.05	11/02/2013	WT007	Potassium	3
28/08/2017	WT025	Ammonium as N	0.08	20/05/2013	WT007	Potassium	3
30/11/2017	WT025	Ammonium as N	0.12	19/08/2013	WT007	Potassium	2
19/02/2018	WT025	Ammonium as N	0.16	12/02/2014	WT007	Potassium	2
22/05/2018	WT025	Ammonium as N	0.01	10/11/2014	WT007	Potassium	2
28/05/2019	WT025	Ammonium as N	0.06	12/05/2015	WT007	Potassium	2
2/02/2021	WT025	Ammonium as N	< 0.01	28/02/2017	WT007	Potassium	3
24/05/2021	WT025	Ammonium as N	< 0.01	15/05/2017	WT007	Potassium	3
17/02/2022	WT025D	Ammonium as N	0.05	28/08/2017	WT007	Potassium	3
12/05/2022	WT025D	Ammonium as N	0.06	19/02/2018	WT007	Potassium	2
17/02/2022	WT025S	Ammonium as N	0.02	22/05/2018	WT007	Potassium	3
12/05/2022	WT025S	Ammonium as N	< 0.01	28/05/2019	WT007	Potassium	2
7/06/2011	WT029	Ammonium as N	0.02	24/05/2021	WT007	Potassium	3
30/04/2012	WT029	Ammonium as N	0.04	25/08/2021	WT007	Potassium	2
11/02/2015	WT029	Ammonium as N	0.03	4/09/2008	WT009	Potassium	3
12/05/2015	WT029	Ammonium as N	< 0.01	9/12/2008	WT009	Potassium	3
17/02/2022	WT029D	Ammonium as N	< 0.01	10/03/2009	WT009	Potassium	2
5/10/2010	WT002A	Potassium	< 1	10/03/2009	WT009	Potassium	2
15/12/2010	WT002A	Potassium	1	16/06/2009	WT009	Potassium	2
7/06/2011	WT002A	Potassium	< 1	26/10/2009	WT009	Potassium	2
19/09/2011	WT002A	Potassium	< 1	8/12/2009	WT009	Potassium	2
23/11/2011	WT002A	Potassium	< 1	8/12/2009	WT009	Potassium	2

Sample date	Sample Point	Analyte	Concentration (mg/L)	Sample date	Sample Point	Analyte	Concentration (mg/L)
12/04/2010	WT009	Potassium	1	19/08/2013	WT011A	Potassium	< 1
12/06/2010	WT009	Potassium	2	4/11/2013	WT011A	Potassium	< 1
5/10/2010	WT009	Potassium	2	12/02/2014	WT011A	Potassium	< 1
14/12/2010	WT009	Potassium	1	10/11/2014	WT011A	Potassium	< 1
7/06/2011	WT009	Potassium	1	28/02/2017	WT011A	Potassium	< 1
19/09/2011	WT009	Potassium	2	15/05/2017	WT011A	Potassium	< 1
22/11/2011	WT009	Potassium	1	28/08/2017	WT011A	Potassium	< 1
16/02/2012	WT009	Potassium	1	19/02/2018	WT011A	Potassium	< 1
30/04/2012	WT009	Potassium	1	22/05/2018	WT011A	Potassium	< 1
10/09/2012	WT009	Potassium	1	4/09/2008	WT012	Potassium	< 1
18/11/2012	WT009	Potassium	2	19/08/2013	WT012	Potassium	< 1
11/02/2013	WT009	Potassium	2	4/11/2013	WT012	Potassium	< 1
20/05/2013	WT009	Potassium	1	12/02/2014	WT012	Potassium	< 1
19/08/2013	WT009	Potassium	2	10/11/2014	WT012	Potassium	< 1
4/11/2013	WT009	Potassium	2	11/02/2015	WT012	Potassium	< 1
12/02/2014	WT009	Potassium	1	12/05/2015	WT012	Potassium	< 1
10/11/2014	WT009	Potassium	1	10/08/2015	WT012	Potassium	< 1
11/02/2015	WT009	Potassium	1	28/02/2017	WT012	Potassium	< 1
12/05/2015	WT009	Potassium	1	15/05/2017	WT012	Potassium	< 1
10/08/2015	WT009	Potassium	1	28/08/2017	WT012	Potassium	< 1
28/02/2017	WT009	Potassium	1	30/11/2017	WT012	Potassium	< 1
15/05/2017	WT009	Potassium	1	19/02/2018	WT012	Potassium	< 1
28/08/2017	WT009	Potassium	1	22/05/2018	WT012	Potassium	< 1
19/02/2018	WT009	Potassium	1	30/08/2018	WT012	Potassium	< 1
22/05/2018	WT009	Potassium	1	28/05/2019	WT012	Potassium	< 1
28/05/2019	WT009	Potassium	1	24/05/2021	WT012	Potassium	< 1
24/05/2021	WT009	Potassium	2	25/08/2021	WT012	Potassium	< 1
25/08/2021	WT009	Potassium	1	3/09/2008	WT015	Potassium	< 1
5/10/2010	WT011A	Potassium	< 1	9/12/2008	WT015	Potassium	< 1
16/12/2010	WT011A	Potassium	< 1	9/03/2009	WT015	Potassium	< 1
7/06/2011	WT011A	Potassium	< 1	9/03/2009	WT015	Potassium	< 1
19/09/2011	WT011A	Potassium	< 1	16/06/2009	WT015	Potassium	< 1
23/11/2011	WT011A	Potassium	< 1	25/10/2009	WT015	Potassium	< 1
16/02/2012	WT011A	Potassium	< 1	8/12/2009	WT015	Potassium	< 1
30/04/2012	WT011A	Potassium	< 1	12/04/2010	WT015	Potassium	< 1
10/09/2012	WT011A	Potassium	< 1	13/06/2010	WT015	Potassium	< 1
18/11/2012	WT011A	Potassium	< 1	6/10/2010	WT015	Potassium	< 1
11/02/2013	WT011A	Potassium	< 1	16/12/2010	WT015	Potassium	< 1
20/05/2013	WT011A	Potassium	< 1	7/06/2011	WT015	Potassium	< 1

Sample date	Sample Point	Analyte	Concentration (mg/L)	Sample date	Sample Point	Analyte	Concentration (mg/L)
19/09/2011	WT015	Potassium	< 1	22/11/2011	WT025	Potassium	< 1
22/11/2011	WT015	Potassium	< 1	16/02/2012	WT025	Potassium	< 1
16/02/2012	WT015	Potassium	< 1	30/04/2012	WT025	Potassium	< 1
30/04/2012	WT015	Potassium	< 1	10/09/2012	WT025	Potassium	< 1
10/09/2012	WT015	Potassium	< 1	18/11/2012	WT025	Potassium	< 1
18/11/2012	WT015	Potassium	< 1	11/02/2013	WT025	Potassium	< 1
11/02/2013	WT015	Potassium	< 1	20/05/2013	WT025	Potassium	< 1
20/05/2013	WT015	Potassium	< 1	19/08/2013	WT025	Potassium	< 1
19/08/2013	WT015	Potassium	< 1	4/11/2013	WT025	Potassium	< 1
4/11/2013	WT015	Potassium	< 1	12/02/2014	WT025	Potassium	< 1
12/02/2014	WT015	Potassium	< 1	10/11/2014	WT025	Potassium	< 1
10/11/2014	WT015	Potassium	< 1	11/02/2015	WT025	Potassium	< 1
11/02/2015	WT015	Potassium	< 1	12/05/2015	WT025	Potassium	< 1
12/05/2015	WT015	Potassium	< 1	10/08/2015	WT025	Potassium	< 1
10/08/2015	WT015	Potassium	< 1	8/02/2016	WT025	Potassium	< 1
28/02/2017	WT015	Potassium	< 1	27/05/2016	WT025	Potassium	< 1
15/05/2017	WT015	Potassium	< 1	28/02/2017	WT025	Potassium	< 1
28/08/2017	WT015	Potassium	< 1	15/05/2017	WT025	Potassium	< 1
19/02/2018	WT015	Potassium	< 1	28/08/2017	WT025	Potassium	< 1
22/05/2018	WT015	Potassium	< 1	30/11/2017	WT025	Potassium	< 1
24/05/2021	WT015	Potassium	< 1	19/02/2018	WT025	Potassium	< 1
12/05/2022	WT015	Potassium	< 1	22/05/2018	WT025	Potassium	< 1
25/08/2021	WT015D	Potassium	< 1	30/08/2018	WT025	Potassium	< 1
18/11/2021	WT015D	Potassium	< 1	14/02/2019	WT025	Potassium	< 1
17/02/2022	WT015D	Potassium	< 1	28/05/2019	WT025	Potassium	< 1
25/08/2021	WT015S	Potassium	2	2/02/2021	WT025	Potassium	< 1
17/02/2022	WT015S	Potassium	2	24/05/2021	WT025	Potassium	< 1
9/12/2008	WT025	Potassium	< 1	25/08/2021	WT025D	Potassium	< 1
9/03/2009	WT025	Potassium	< 1	18/11/2021	WT025D	Potassium	< 1
9/03/2009	WT025	Potassium	< 1	17/02/2022	WT025D	Potassium	< 1
16/06/2009	WT025	Potassium	< 1	12/05/2022	WT025D	Potassium	< 1
25/10/2009	WT025	Potassium	< 1	25/08/2021	WT025S	Potassium	< 1
8/12/2009	WT025	Potassium	< 1	18/11/2021	WT025S	Potassium	< 1
12/04/2010	WT025	Potassium	< 1	17/02/2022	WT025S	Potassium	< 1
13/06/2010	WT025	Potassium	< 1	12/05/2022	WT025S	Potassium	< 1
6/10/2010	WT025	Potassium	< 1	7/06/2011	WT029	Potassium	< 1
16/12/2010	WT025	Potassium	< 1	30/04/2012	WT029	Potassium	< 1
7/06/2011	WT025	Potassium	< 1	11/02/2015	WT029	Potassium	< 1
19/09/2011	WT025	Potassium	< 1	12/05/2015	WT029	Potassium	< 1

Sample date	Sample Point	Analyte	Concentration (mg/L)	Sample date	Sample Point	Analyte	Concentration (mg/L)
25/08/2021	WT029D	Potassium	< 1	28/02/2017	WT015	Total Nitrogen as N	< 0.1
17/02/2022	WT029D	Potassium	< 1	15/05/2017	WT015	Total Nitrogen as N	< 0.1
25/08/2021	WT029S	Potassium	1	28/08/2017	WT015	Total Nitrogen as N	0.2
5/10/2010	WT002A	Total Nitrogen as N	0.7	19/02/2018	WT015	Total Nitrogen as N	< 0.1
5/10/2010	WT007	Total Nitrogen as N	0.4	22/05/2018	WT015	Total Nitrogen as N	< 0.1
12/05/2015	WT007	Total Nitrogen as N	< 0.1	6/10/2010	WT025	Total Nitrogen as N	< 0.1
28/02/2017	WT007	Total Nitrogen as N	0.8	11/02/2015	WT025	Total Nitrogen as N	< 0.1
15/05/2017	WT007	Total Nitrogen as N	0.2	12/05/2015	WT025	Total Nitrogen as N	< 0.1
28/08/2017	WT007	Total Nitrogen as N	0.7	10/08/2015	WT025	Total Nitrogen as N	0.2
19/02/2018	WT007	Total Nitrogen as N	0.1	8/02/2016	WT025	Total Nitrogen as N	< 0.1
22/05/2018	WT007	Total Nitrogen as N	0.6	27/05/2016	WT025	Total Nitrogen as N	< 0.1
5/10/2010	WT009	Total Nitrogen as N	0.2	28/02/2017	WT025	Total Nitrogen as N	< 0.1
11/02/2015	WT009	Total Nitrogen as N	0.2	15/05/2017	WT025	Total Nitrogen as N	< 0.1
12/05/2015	WT009	Total Nitrogen as N	< 0.1	28/08/2017	WT025	Total Nitrogen as N	< 0.1
10/08/2015	WT009	Total Nitrogen as N	0.2	30/11/2017	WT025	Total Nitrogen as N	0.4
28/02/2017	WT009	Total Nitrogen as N	< 0.1	19/02/2018	WT025	Total Nitrogen as N	< 0.1
15/05/2017	WT009	Total Nitrogen as N	0.2	22/05/2018	WT025	Total Nitrogen as N	< 0.1
28/08/2017	WT009	Total Nitrogen as N	0.2	11/02/2015	WT029	Total Nitrogen as N	0.2
19/02/2018	WT009	Total Nitrogen as N	0.1	12/05/2015	WT029	Total Nitrogen as N	< 0.1
22/05/2018	WT009	Total Nitrogen as N	< 0.1	5/10/2010	WT002A	Total Phosphorus as P	0.56
5/10/2010	WT011A	Total Nitrogen as N	2.2	5/10/2010	WT007	Total Phosphorus as P	0.21
28/02/2017	WT011A	Total Nitrogen as N	< 0.1	10/11/2014	WT007	Total Phosphorus as P	0.01
15/05/2017	WT011A	Total Nitrogen as N	< 0.1	12/05/2015	WT007	Total Phosphorus as P	< 0.01
28/08/2017	WT011A	Total Nitrogen as N	0.2	28/02/2017	WT007	Total Phosphorus as P	0.05
19/02/2018	WT011A	Total Nitrogen as N	< 0.1	15/05/2017	WT007	Total Phosphorus as P	< 0.01
22/05/2018	WT011A	Total Nitrogen as N	0.2	28/08/2017	WT007	Total Phosphorus as P	0.15
11/02/2015	WT012	Total Nitrogen as N	0.2	19/02/2018	WT007	Total Phosphorus as P	0.03
12/05/2015	WT012	Total Nitrogen as N	< 0.1	22/05/2018	WT007	Total Phosphorus as P	0.04
10/08/2015	WT012	Total Nitrogen as N	0.5	28/05/2019	WT007	Total Phosphorus as P	0.02
28/02/2017	WT012	Total Nitrogen as N	< 0.1	24/05/2021	WT007	Total Phosphorus as P	< 0.05
15/05/2017	WT012	Total Nitrogen as N	0.1	25/08/2021	WT007	Total Phosphorus as P	0.10
28/08/2017	WT012	Total Nitrogen as N	0.1	5/10/2010	WT009	Total Phosphorus as P	0.05
30/11/2017	WT012	Total Nitrogen as N	0.3	10/11/2014	WT009	Total Phosphorus as P	0.02
19/02/2018	WT012	Total Nitrogen as N	< 0.1	11/02/2015	WT009	Total Phosphorus as P	0.04
22/05/2018	WT012	Total Nitrogen as N	0.1	12/05/2015	WT009	Total Phosphorus as P	< 0.01
6/10/2010	WT015	Total Nitrogen as N	< 0.1	10/08/2015	WT009	Total Phosphorus as P	< 0.01
11/02/2015	WT015	Total Nitrogen as N	0.2	28/02/2017	WT009	Total Phosphorus as P	< 0.01
12/05/2015	WT015	Total Nitrogen as N	< 0.1	15/05/2017	WT009	Total Phosphorus as P	0.02
10/08/2015	WT015	Total Nitrogen as N	< 0.1	28/08/2017	WT009	Total Phosphorus as P	0.03



Sample date	Sample Point	Analyte	Concentration (mg/L)	Sample date	Sample Point	Analyte	Concentration (mg/L)
19/02/2018	WT009	Total Phosphorus as P	0.01	18/11/2021	WT015D	Total Phosphorus as P	0.02
22/05/2018	WT009	Total Phosphorus as P	0.02	17/02/2022	WT015D	Total Phosphorus as P	0.02
28/05/2019	WT009	Total Phosphorus as P	0.02	25/08/2021	WT015S	Total Phosphorus as P	0.45
24/05/2021	WT009	Total Phosphorus as P	< 0.01	17/02/2022	WT015S	Total Phosphorus as P	0.16
25/08/2021	WT009	Total Phosphorus as P	< 0.01	6/10/2010	WT025	Total Phosphorus as P	0.04
5/10/2010	WT011A	Total Phosphorus as P	0.02	10/11/2014	WT025	Total Phosphorus as P	< 0.01
10/11/2014	WT011A	Total Phosphorus as P	0.02	11/02/2015	WT025	Total Phosphorus as P	0.04
28/02/2017	WT011A	Total Phosphorus as P	< 0.01	12/05/2015	WT025	Total Phosphorus as P	< 0.01
15/05/2017	WT011A	Total Phosphorus as P	0.01	10/08/2015	WT025	Total Phosphorus as P	< 0.01
28/08/2017	WT011A	Total Phosphorus as P	0.11	8/02/2016	WT025	Total Phosphorus as P	< 0.01
19/02/2018	WT011A	Total Phosphorus as P	0.02	27/05/2016	WT025	Total Phosphorus as P	< 0.01
22/05/2018	WT011A	Total Phosphorus as P	< 0.01	28/02/2017	WT025	Total Phosphorus as P	0.05
10/11/2014	WT012	Total Phosphorus as P	0.01	15/05/2017	WT025	Total Phosphorus as P	< 0.01
11/02/2015	WT012	Total Phosphorus as P	0.06	28/08/2017	WT025	Total Phosphorus as P	< 0.01
12/05/2015	WT012	Total Phosphorus as P	0.01	30/11/2017	WT025	Total Phosphorus as P	0.03
10/08/2015	WT012	Total Phosphorus as P	< 0.01	19/02/2018	WT025	Total Phosphorus as P	< 0.01
28/02/2017	WT012	Total Phosphorus as P	< 0.01	22/05/2018	WT025	Total Phosphorus as P	< 0.01
15/05/2017	WT012	Total Phosphorus as P	0.01	30/08/2018	WT025	Total Phosphorus as P	< 0.01
28/08/2017	WT012	Total Phosphorus as P	0.14	14/02/2019	WT025	Total Phosphorus as P	< 0.01
30/11/2017	WT012	Total Phosphorus as P	0.02	28/05/2019	WT025	Total Phosphorus as P	< 0.01
19/02/2018	WT012	Total Phosphorus as P	< 0.01	2/02/2021	WT025	Total Phosphorus as P	< 0.01
22/05/2018	WT012	Total Phosphorus as P	< 0.01	24/05/2021	WT025	Total Phosphorus as P	< 0.01
30/08/2018	WT012	Total Phosphorus as P	< 0.01	25/08/2021	WT025D	Total Phosphorus as P	0.01
28/05/2019	WT012	Total Phosphorus as P	< 0.01	18/11/2021	WT025D	Total Phosphorus as P	0.04
24/05/2021	WT012	Total Phosphorus as P	< 0.01	17/02/2022	WT025D	Total Phosphorus as P	0.22
25/08/2021	WT012	Total Phosphorus as P	< 0.01	12/05/2022	WT025D	Total Phosphorus as P	0.10
6/10/2010	WT015	Total Phosphorus as P	0.01	25/08/2021	WT025S	Total Phosphorus as P	< 0.01
10/11/2014	WT015	Total Phosphorus as P	0.11	18/11/2021	WT025S	Total Phosphorus as P	0.07
11/02/2015	WT015	Total Phosphorus as P	0.04	17/02/2022	WT025S	Total Phosphorus as P	< 0.05
12/05/2015	WT015	Total Phosphorus as P	< 0.01	12/05/2022	WT025S	Total Phosphorus as P	0.02
10/08/2015	WT015	Total Phosphorus as P	< 0.01	11/02/2015	WT029	Total Phosphorus as P	0.04
28/02/2017	WT015	Total Phosphorus as P	0.12	12/05/2015	WT029	Total Phosphorus as P	0.08
15/05/2017	WT015	Total Phosphorus as P	< 0.01	25/08/2021	WT029D	Total Phosphorus as P	< 0.20
28/08/2017	WT015	Total Phosphorus as P	0.02	17/02/2022	WT029D	Total Phosphorus as P	0.16
19/02/2018	WT015	Total Phosphorus as P	< 0.01	25/08/2021	WT029S	Total Phosphorus as P	0.78
22/05/2018	WT015	Total Phosphorus as P	< 0.01				
24/05/2021	WT015	Total Phosphorus as P	< 0.01				
12/05/2022	WT015	Total Phosphorus as P	0.03				
25/08/2021	WT015D	Total Phosphorus as P	0.26				