Shoalhaven City Council

Annual Groundwater Monitoring Report (2013-2017)
Conjola Regional Sewerage Scheme
Conjola, NSW

Report E2W-0130 (R001 V2)

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Conjola, NSW

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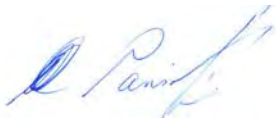

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EXECUTIVE SUMMARY

Earth2Water Pty Ltd (E2W) was engaged by Shoalhaven Water to complete the forth annual monitoring report (2009-2010, 2010-2011, 2011-2012, 2013 to 2017) for the water quality data obtained from ~30 existing monitoring wells at the Conjola Regional Sewerage Scheme (CRSS) site at Lake Conjola, NSW (Figure 1). The purpose of the review was to assess the water quality changes and environmental performance of the CRSS (commenced 2008). Key points are summarised below:

Water Quality

- Conjola STP average water quality in 2016/2017 has improved relative to previous years (2009 to 2014). Water testing at the STP indicates compliance for the key parameters. The average Total Nitrogen (TN= 6.1 mg/L) during 2009 to 2014 has reduced by ~40% during 2015 to 2017 (~3.7 mg/L). The reduction is interpreted to arise from treatment at the STP (i.e. alum for flocculation). The Total Phosherous (TP) is variable over time and averages approximately 3.5 mg/L (ranges from 2 to 5 mg/L in 2009 to 2017), whilst nitrate averages ~3 mg/L and TDS 400 mg/L (combined data from Bendalong/Conjola). The groundwater quality (TDS) is similar to the STP discharge water.
- The total effluent discharged from Bendalong/Conjola increased from 2009/2010 from 150 ML to approximately 218 ML in 2016/2017. Due to the improvements in treatment processes (reducing TN) the actual TN discharged is relatively similar over time. The capacity of the sand aquifer to attenuate the treated effluent is interpreted to diminish due to the large STP volumes and bioaccumulation in the aquifer.
- TN (& nitrate) and TP (total phosphorus) are the key indicators of treated effluent pollution at the site. The groundwater near the trench shows elevated TN/TP/nitrate (over ANZECC 2000) but with decreasing concentrations towards the receptors (i.e. estuary and lagoon). The background groundwater quality is not pristine and similar to the impacted groundwater plume originating from the trench. The groundwater concentrations at the trench (D05S, D05D, MD2D) is similar (TN=7 mg/L, TP=2.5 mg/L) to the average TP/TN concentrations of the treated effluent (TN= 5.7 mg/L, TP= 4.5 mg/L) indicating relatively low dilution of TN (low) and TP (moderate reduction) and high percentage of treated effluent. Current rising (TN) trends are noted at the northern downgradient location (i.e. MB-1S/MB-1D in camping grounds). The bioaccumulation of TN in the groundwater is indicated by the higher TN groundwater concentrations relative to the tests from the STP.

Groundwater Plume

- Based on current information the TN plume extent has expanded (north to estuary and west to the lagoon) relative to the previous reporting period (2012). The nutrient plume is not well delineated due to some wells being dry and the large study site. The TN/TP concentrations at wells (MB1S, MB1D) in camping grounds have increased relative to baseline, and may also reflect some legacy fertiliser use at the caravan park.
- The treated effluent plume is estimated to have migrated some 200m to 300m from the exfiltration trench (groundwater flow rate is estimated at 20 to 30 m/year). Groundwater flow is in a radial fashion at the site due to the mounding of groundwater at a groundwater divide.
- Thermotolerant (faecal) coliforms were within the ANZECC (2000) guidelines for wells within the plume (exfiltration trench). Background wells have reported FC above guidelines.

- Based on the inferred groundwater flow direction and recent water quality trends, E2W interpret that the following groundwater wells show impact from nutrient concentrations due to effluent trench:

    - D28 (down gradient to south west) rising trend for TN and, variable trend for TP and nitrate (D28 is immediately downgradient of the STP);
    - D03 (immediately east) high concentrations of TN, TP, and nitrate;
    - D02 (immediately east) high concentrations of TN, TP, and nitrate;
    - D05s/D05D (immediately down-gradient to north) high concentrations of TN, TP, and nitrate;
    - MB1S/MB1D (immediately down-gradient to north) high concentrations of TN, TP, and nitrate;
    - MB-5 (downgradient to the west) shows a an elevated, variable to rising TN trend (TN ~ 3 mg/L).
    - MW-7B (downgradient to the west) and slight rising TN trend.
    - MB2D (immediately down-gradient to north) rising trend for TN;
    - BH29 (immediately down-gradient to southeast) variable trend for TN and TP; and
    - MW-8S (down-gradient to east) for TN, TP and nitrate.

Plume Stability

The ANZECC (2000) water quality objectives for the key analytes (TN, TP, FC) indicate that the plume expansion (primarily TN) to the north (i.e. MB1D) represents a substantial change in the nutrient plume which may pose risk to aquatic ecosystems. Risks associated with FC are considered minimal due to retardation by dune sands. Analyses and trends for TP indicate high variability and requirement for dissolved phase analyses. The migration of TP is inferred to be limited due to sorption, however requires this data requires further investigation.

The plume is not well delineated to the west, east and south of the exfiltration trench (i.e. sampling of additional or new wells would assist to delineate the plume). The monitoring data indicates that the nutrient plume from the exfiltration trench may have recently intersected the surface water receptors located at the beach, and estuary. The fringe of the STP/nutrient plume at the receptors is difficult to discern due to the background concentrations at the residential area and difficult access at foreshore areas.

E2W suggest that precautionary measures are required for the estuary & lagoon, especially during mouth closure when stagnant conditions may trigger algal blooms. Precautionary measures may include signage for the general public at high risk periods (summer, mouth closures), and potential groundwater extraction to reduce nutrient impact at those sensitive locations.

Plume delineation west of the trench (MW7A/MW7B and MB-5) indicates some variability and potentially multiple sources (fertiliser use or septic at residential properties near V1, V3, V5). The nutrient plume is not well delineated to the east or west.

The rate of plume expansion is estimated at approximately 20 to 30 m/year based on the time series trends at MB1D (TN rise in mid 2014 @ 200m distance from trench). Due to the permeability and low TDS, the groundwater could be extracted for irrigation works at the camping grounds or landscaped gardens to reduce the potential discharges to the estuary. The

plume is inferred to flow radially from the trench and potentially migrated some 200 to 300m since the operations commenced.

Recommendations
E2W offer the following recommendations to improve the monitoring program:

E2W recommend that (7) existing dry wells are developed/deepened to a functional status:

- Replacement or deepening of D01, D02, D03, and MB-3, BH23, MW-8S, MB2S.
- An additional downgradient well is recommended near MB1S/MB1D to assist delineate the nutrient plume near the estuary.

The proposed wells are intended to better delineate and assess the plume expansion from the trench.

Additional monitoring wells (2) are recommended to reduce data gaps:

- Area of BH-23/MB-5. Time series trends near source area (BH-23 as a shallow well) would assist to address the plume status (stability, expansion) in the direction of Pattimores lagoon.
- Area of MB2S/North of D05s. Better delineate the plume fringe and improve plume status (stability, expansion) in direction of the estuary/caravan park. Area north of the trench is sensitive as groundwater may discharge to the estuary over time (Figure 4).

The maintenance of the well network is to aid better plume delineation and assessment of groundwater quality impacts (i.e. replacing or deepening dry wells). Due to the nature of the dune sand aquifer, silting of the wells is likely to continue due to fluctuating water levels and ingress of fine particles through the well screen.

Further improvement in the treated effluent quality (i.e. reduced TP/TN via Alum dosing or improved processes) is likely to have a sympathetic improvement at the trench and immediate surrounds, such as the camping grounds.

The monitoring data indicates that the nutrient plume may be in proximity to the surface water receptors (estuary) given the ~10 year discharge period and estimated flow rate (20 to 30 m/year). E2W recommend a precautionary approach to monitoring and management, which includes site observations and surface water testing to supplement the groundwater monitoring program to enable early detection of any potential environmental impacts (e.g. degrading water quality or algal blooms at the estuary or Pattimores Lagoon).

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1 INTRODUCTION

Earth2Water Pty Ltd (E2W) was engaged by Shoalhaven Water (SW, group of Shoalhaven City Council) to complete an annual monitoring report for the water quality data obtained from ~30 monitoring wells associated with the Conjola Regional Sewerage Scheme (CRSS).

SW commenced discharge of treated effluent into a dune exfiltration system in 2008 and conducted quarterly groundwater monitoring to assess water quality trends in proximity to the exfiltration trench and surrounding areas to assess baseline conditions and comply with environmental objectives (i.e. outlined in the Groundwater Monitoring and Response Plan, Anderson et al, 2009). This includes monitoring and reporting of groundwater levels and quality. E2W understand that the objective for this annual report is to examine whether the ANZECC water quality objectives (TN,TP, FC) are being met and whether there have been any substantial changes in the nutrient plume.

The purpose of this annual monitoring report by E2W is to review and assess the available groundwater data provided by SW for CRSS from 2013 to 2017. The quarterly data from 2013 to 2017 is analysed to provide an updated annual style report for Conjola Regional Sewerage Scheme. The previous annual report was completed by E2W in 2012.

Recommendations are included to assist with future monitoring at the site. This document is the fourth annual report (first "March 2008-October 2010", and second “November 2010-November 2011”, and third “2011-2012”) Groundwater Monitoring Report, Conjola Sewerage Scheme Conjola, NSW.

2 SCOPE OF WORK

The scope of work for this annual monitoring report includes the following;

- A summary of the hydrogeological conditions at the site.
- A summary of the current monitoring bores installed at the premises for monitoring groundwater quality (including location, geology, well construction details, date of installation, condition etc.).
- Tabulation and statistical analysis (minimum, maximum, average values) of monitoring data collected between March 2008 and February 2017 to show groundwater quality trends (e.g. rising or falling nutrient levels).
- Assessment of groundwater flow regime (groundwater gradients, divides, groundwater/saltwater interfaces) and contour plot (1) for a selected period (19 August 2015) with sufficient water level gauging data.
- Graphical analyses with hydrochemical diagrams including multiple time series graphs to highlight changes for key well locations (well identified with rising trends associated with the treated effluent).
- Plan view contour maps (5) showing the extent of TP/TN plumes. A hydrogeological section from the trench to Lake Conjola Caravan Park showing the inferred nutrient plumes.
- Assessment of field chemistry (ph, EC, Eh, DO, and observation) and ion balance for water quality results.
- Conclusions and recommendations in relation to groundwater monitoring.

3 BACKGROUND

The CRSS comprises two wastewater treatment plants and exfiltration of tertiary treated effluent in the dunes behind Conjola Beach and was commissioned in February 2008. Groundwater data collected prior to 2008 was assessed by the Water Research Laboratory (WRL). The baseline groundwater quality was characterised and recommendations for ongoing groundwater monitoring provided (WRL July 2008). WRL recommended a continuation of the groundwater monitoring program to ensure effective operation of the dune exfiltration system and compliance with environmental objectives.

The Groundwater Monitoring and Response Plan (GMRP) by the WRL (March 2009) provides a monitoring plan for the initial operational phase of the CRSS. An operational review of monitoring data was completed by E2W in September 2009. This monitoring report by E2W is guided by previous studies and the GMRP.

E2W conducted well maintenance on several wells at the site as several wells were dry and could not be sampled (i.e. DB-02, BH31, BH23, DB01, BH25). The following was performed on wells to assist with collection of the water samples and standing water levels:

- 20 January 2010: Deepening of well DB-02 by approximately 1m using a vibration hammer technique (groundwater encountered).
- 17 February 2010: Deepening of well BH31 by approximately 1m using a vibration hammer technique (groundwater encountered). Wells attempted to be deepened but not successful to intersect groundwater include DB01 and BH23.
- 29 January 2010: A new well (MW-8S) was installed to approximately 9 m depth and east of the exfiltration trench.
- 29 & 30 August 2011: Two new wells (D05S and D05D) were installed to replace the dry well D05. Additional wells (MW7A and MW7B) were installed at two new locations within the residential area west of the exfiltration trench.

E2W first annual report for "March 2008-October 2010" is outlined in the *Annual Groundwater Monitoring Report (dated 11 January 2011)*, based on E2W's preliminary review of the groundwater monitoring data collected between March 2008 and October 2010, the following conclusions were offered:

- The quality of the final effluent discharged from the Lake Conjola and Bendalong STPs into the dune exfiltration system generally complies with the EPA limits outlined in the CRSS EPL (No. 12357). Only one exceedance was reported in the 2008-2010 period (total phosphorus from the Lake Conjola STP, June 2008). However, this is considered an isolated event as the total phosphorus (and all other analytes) concentrations in the remaining months were at or below the EPL limit.
- Even during peak season, the maximum daily discharges (1050 kL for Lake Conjola STP and 1250 kL for Bendalong STP) were not exceeded, indicating the dune exfiltration system is operating within its volume limits.
- The key indicators of effluent pollution are identified as TN (total nitrogen) and TP (total phosphorus). The groundwater in proximity to the trench show a general and rising TN and/or TP trend (over ANZECC 2000) at eight downgradient locations (MB5, D28, D03, MB-1D/MB-1S, MB2D, BH25, MW-8S). The groundwater flow pattern is interpreted to be radial around the exfiltration trench due to the mounding (~0.3 to 0.5m) arising from discharge volumes (~500 kL per day) versus the natural rainfall pattern of recharge. Elevated nutrient concentrations (TP, TN=5 are inferred to extend ~350 m to the west of the

trench, and a lesser distance to the caravan park (north) and south (STP). Some flow is inferred to the beach (east) due to the location of the groundwater divide (i.e. inferred to be located over the exfiltration trench due to volume and dune topography).

- The potential for adverse risk to the aquatic ecosystems (Conjola beach) arising from discharges at the exfiltration trench to date, is considered to be low due to natural attenuation in the aquifer, reasonable quality of the effluent and high flux of the ocean. E2W interpret a potential (moderate) risk to aquatic ecosystem at Pattimores lagoon and Conjola estuary, especially during periods of low flushing, shallow water and stagnation which occurs during estuary mouth closures (estuary entrance). Excessive nutrients at the lagoon (and estuary) may cause algal blooms due to the TN and TP loads associated with the treated effluent.

3.1 *Effluent Quality*

The dune exfiltration system receives tertiary treated effluent from the Lake Conjola Sewerage Treatment Plant (STP), as well as from the Bendalong STP. Effluent from each STP is sampled monthly and analysed for total nitrogen (TN), ammonia, total phosphorus (TP), biological oxygen demand (BOD-5) , total suspended solids (TSS), thermotolerant faecal coliforms (FC), pH, oil and grease and (free) chlorine residual (CR). The quality of the final effluent discharged from both treatment plants is summarised in Appendices A and B (Lake Conjola and Bendalong, respectively).

The final effluent quality is governed by prescribed limits in the CRSS Environment Protection Licence (EPL, No. 12357). The results indicate the final effluent quality between June 2008 and 2017 complied with the EPL limits.

Key monitoring parameters for both STPs are summarised following (Appendix A and B). The average annual water quality parameters and discharge volumes are presented in Table 33.

Bendalong and Lake Conjola - STP Water Quality

- The annual average for TN decreased from approximately 6.1 mg/L (2009 to 2015) to approximately 4 mg/L from 2015 to 2017. An overall average of TN=5.5 mg/L (2009 to 2017) and 981 kg/annum of TN since commencement to 2017.
- The annual average for ammonia ranges from 0.1 mg/L to 0.45 mg/L from 2009 to 2017.
- The annual average for TP varies from 5 mg/L (2009/2010) to 2 mg/L (2013/2014), with an overall average of approximately 3.3 mg/L (2009 to 2017).
- The annual FC is generally below 10 cfu/10ml for most years, except for 2012/2013 (24 cfu/100ml), 2015/2016 (12 cfu/100ml), and 2016/2017 (67 cfu/100ml). The average FC from 2009 to 2017 is 15 cfu/100ml. The EPL limit is 600 cfu/100 mL.

The STP average water quality for TN reduces from 2015/16, however is TP and ammonia show a marginal improvement. Rainfall ranges from 910 mm to 1380 mm year, with an average of 1173 mm/yr. The above average rainfall in 2015-2017 (1375 mm/yr) is associated with the highest effluent volumes discharged (210/218 ML) but a lower relative annual TN load discharged (740 kg/915 kg). The rainfall and STP (TN data) indicate rainfall dilution in the wetter years. Refer to Table 33.

Based on the water quality of the effluent, the main potential impact of exfiltration discharge on groundwater quality is increased TN and TP above average background concentrations. Effluent

TN and TP concentrations are above ANZECC 2000 trigger values for fresh water (TN = 0.5 mg/L, TP = 0.05 mg/L)[1] and marine water (TN = 0.3 mg/L, TP = 0.03 mg/L)[2].

Average effluent ammonia concentrations (0.22 mg/L from 2009 to 2017) are below ANZECC 2000 guidelines (0.9 mg/L – freshwater ecosystem). Bioaccumulation in the trench and occasional spikes of higher ammonia concentrations (up to 4.2 mg/L) at the STP have the potential to impact upon background average groundwater concentrations.

The potential for leaching of TN, TP and ammonia to groundwater is subject to soil and water chemical processes/interactions in the discharge area, such as phosphorus sorption and denitrification. The exfiltration trench is located within sand dunes, which may have limited phosphorus sorption potential (Figure 4). TP is difficult to measure as it occurs in soluble/insoluble forms and is sensitive to suspended fines in the sample.

CR (LOR 0.01 mg/L) in the effluent is above baseline average groundwater concentrations (e.g. V2/V3) and ANZECC trigger values (0.003 mg/L – freshwater ecosystem). The detection of CR above ANZECC 2000 guidelines in all wells, including background monitoring locations (V3, V2), shows that elevated CR in the existing data is not a reliable indicator of effluent pollution from the trench.

The available effluent data indicates that discharge should not impact groundwater faecal coliform concentrations, based on low (or non-detected) concentrations in the effluent. The cause of the FC in the groundwater wells (detected as least once in all wells) is not clear, and may relate to biological contamination in the wells (insects, birds) or the exfiltration water quality. E2W interpret that faecal contamination (if present) would be localised and be attenuated and filtered-out during groundwater migration (e.g. <100m).

3.2 *STP inflow, recharge and discharge*

Lake Conjola STP & Bendalong STP

The Lake Conjola (southern) STP commenced operations in March 2008. The Bendalong (northern) STP commenced operations in January 2008.

The STP Conjola is licensed to discharge 1250 kL per day. The STP Bendalong is licensed to discharge 1250 kL per day (occasionally exceeded).

The annual effluent discharge volume from 2009/2010 has increased from 150 ML to 218 ML (2016/2017). The average discharge volume is 181 ML/year (2009 to 2017). Due to the high volumes of effluent discharge (equivalent to 6 L/sec over 500m trench) the local groundwater quality would reflect the character of the STP discharge.

Refer to Table C1 of Appendix C.

The approximate area occupied by the trench is 2500 m2. Total (annual) discharge of 181,000 KL (effluent) is greater (~200 times) than the annual groundwater recharge via rainfall (35% of annual rainfall) occurring at the trench. Therefore, groundwater mounding can be expected under

[1] Ecosystem protection (lowland rivers)
[2] Ecosystem protection (estuaries)

the trench (possible 0.3 to 0.5 m rise, however wells are not available under the trench) from the daily effluent discharges, as apposed to the evenly distributed seasonal rainfall.

The treated effluent due to its discharge volume dominates the water quality in the aquifer under the trench (to base of aquifer). Dilution and attenuation (sorption, oxidation-reduction of nitrogen) of the treated effluent occurs continuously along the radial groundwater flow path. Due to the high infiltration/permeability of the sand aquifer the effluent plume is diluted due to the high proportion of rainfall recharge (estimated at 35% of annual rainfall of 1173mm). Based on current monitoring, the effluent plume has migrated occurs between 100m to 500 m from the trench (Figures 3A to 3E).

The groundwater plume (TN) is inferred to have reached the northern caravan park (i.e. TN ~7 mg/L detected at MB1D/MD1S) and possibly has intersected the estuary. The discharge of TN at the beach is likely given the proximity (<300m), however limited data is available in the dune environment. The TN contour (1 mg/L) is relatively imprecise (inferred from limited data set) and may be influenced by other nutrient sources (residential septics or fertiliser use).

4 GROUNDWATER ASSESSMENT GUIDELINES

Comparison of groundwater results to the baseline data set and ANZECC (2000) guidelines was to establish the effects of the CRSS on the local groundwater system. Based on the DECCW's *Guidelines for the Assessment and Management of Groundwater Contamination* (March 2007), the most sensitive receptor dictates which guidelines are appropriate. The groundwater analytical results (individual values from each sampling round and overall median value) are compared to the following guidelines:

- National Health and Medical Research Council (NHMRC) *Australian Drinking Water Guidelines* (ADWG 2011, updated 2016).
- Australian and New Zealand Environment Conservation Council (ANZECC) and Agriculture and Resource Management Council of Australia and New Zealand (ARMCANZ) (2000) *Australian and New Zealand Guidelines for Fresh and Marine Water Quality*:
  - Marine ecosystems (95% protection level) - ocean/beach/estuary.
  - Freshwater ecosystems (95% protection level) - Pattimores Lagoon.
  - Primary industries (water quality for irrigation & general use, short/long term values).
  - Primary industries (livestock drinking water quality).

All monitoring wells at the site are compared to the ANZECC (2000) marine and freshwater trigger values, together with either the ADWG (2011), irrigation or stock watering trigger values, depending on the highest beneficial use of the groundwater at particular discharge areas (Figure 1, caravan park, lagoons, or ocean).

The beneficial uses of the Lake Conjola Groundwater is summarised in Chapter 5 and Table 6 of the WRL report (July 2008). '*The monitored groundwater within the Conjola Lake environs falls into the full range of possible uses, primarily due to variation in salt content (particularly sodium and chloride)*' (WRL, July 2008). The CRSS is considered to be beneficial for the Conjola Lake environments (WRL, March 2009). Table 4.1 details the relevant guidelines for each well:

Table 4.1 Relevant Guidelines Applied to Site Monitoring Wells

Well ID	NHMRC (2011)	ANZECC (2000)		
	ADWG	Marine	Freshwater	Irrigation
Sites 31/32	Yes	Yes	Yes	-

Sites 294/295	Yes	Yes	Yes	-
MB1SHALLOW	-	Yes	Yes	Yes
MB1DEEP ^^	-	Yes	Yes	-
MB2D	Yes	Yes	Yes	-
D28	Yes	Yes	Yes	-
Camp Kitchen	Yes	Yes	Yes	-
MB5	Yes	Yes	Yes	Yes
V5	Yes	Yes	Yes	-
V3 ^^	-	Yes	Yes	-
V1 ^^	-	Yes	Yes	-
V2	-	Yes	Yes	Yes
BH19	Yes	Yes	Yes	-
BH20	Yes	Yes	Yes	-
BH25	Yes	Yes	Yes	-
MW-8S	Yes	Yes	Yes	-
MW-7A	Yes	Yes	Yes	Yes
MW-7B	Yes	Yes	Yes	Yes
D-05S	Yes	Yes	Yes	-
D-05D	Yes	Yes	Yes	-

Notes:
^^ Too saline for a beneficial use (i.e. for comparison to ADWG (2011, updated 2016) or ANZECC (2000) irrigation or livestock trigger values). - Not appropriate (stock watering not relevant for the region).

5 RESULTS

The results of field and laboratory testing from the 2013 to 2017 monitoring period (February, May, August & October) are presented in Tables 1 to 30, Graphs (time series graphs including ammonia, nitrate, TP, TN, PH, SWL) 1 to 23, and Figures 1, 2A, 3A, 3B, 3C, 3D, 3E and Figure 4. The results are summarised in the following subsections.

5.1 *Groundwater Levels*

Based on the quarterly monitoring, the depth to water ranges from approximately from 0.4 to 1.3 m AHD (or 0.27 mbgl (V1) to 10.3 mbgl (MB2D). The reduced water levels (close to sea level) and relatively flat hydraulic gradients reflect the high permeability of the coastal sand aquifer.

Water levels near the trench are expected to fluctuate less because of the constant effluent discharge versus the tidal and seasonal (variable) rainfall away from the exfiltration trench.

Table 5.1 Water level Fluctuations in Selected Wells (June 2008-2017)

Well ID	SWL (mAHD)		
	Minimum	Maximum	Range (m)
MB1S	0.515	1.11	0.595
MB1D	0.45	1.11	0.66
MB2D	0.64	1.06	0.42
D02	0.96	1.51	0.55
D03	0.71	1.19	0.45
D28	0.67	1.25	0.58
MB5	0.56	1.4	0.84
BH19	0.44	1.05	0.61
BH20	0.46	1.09	0.68
V1	0.14	0.72	0.58
V2	0.23	1.0	0.77
V3	0.23	0.73	0.5
V5	0.41	1.18	0.77
MW7A	0.58	1.3	0.72
MW7B	0.73	1.25	0.52
D05S	0.68	1.26	0.58
D05D	0.7	1.25	0.55

Note: These results are based on the quarterly monitoring results and additional monthly SWL monitoring carried out by Shoalhaven Council. Limited water level data is obtained from 2013 to 2017.

Six wells (MB2S, D01, MB3, BH21, BH35, MW8S) were dry each monitoring event from 2013 to 2017. The water level in monitoring wells Caravan Sites 31/32, Caravan Sites 294/295 and Camp Kitchen were not measured as they comprise spear-points (submersible pumps).

Standing water levels (SWL, in mAHD) for selected wells are presented individually in Graphs 1 to 23. The depth to the water table is shallowest (<1 mbgl) at V1 and V2 (immediately north of Pattimores Lagoon) and deepest under the highest sand dunes near the exfiltration trench (e.g. MB2D > 10 mbgl, Figure 4). Groundwater wells in proximity to the trench (DO5-S/D, MW2D, MB1D, MB1S) show a general rise (~0.3m) of the water table since 2008. E2W interpret that the mounding associated with the exfiltration trench is approximately 0.3 to 0.5m higher than background (up to 250m distance from the trench, refer to Graph 25 in Appendix). Groundwater wells are not available under the trench to verify the extent of groundwater mounding.

SWL in all wells is variable over time reflecting seasonal variations and the STP discharges. General rises and falls in groundwater levels at all wells (including V1, V2 and V3, which are not influenced by exfiltration discharge) over the monitoring period correlates with the monthly rainfall patterns.

The inferred groundwater flow regime during August 2015 is presented in Figure 2A. The inferred flow regime is based on water level data recorded by SW (some data gaps and inconsistency are noted in recent years of monitoring). The data indicates that a groundwater mound is situated near the exfiltration trench which is interpreted to correlate with the natural groundwater divide (separating flows to north, east and west, Figures 2A & 4).

The extent of groundwater mounding at and surrounding the exfiltration trench and to the east would be better understood with the construction of additional wells in proximity (and under) the trench. E2W consider the water level measurements and accuracy is satisfactory (using SW acoustic water level probe), however additional information (such as stick-up and depth to bottom of well) should be included for quality control purposes.

5.2 *Field Measurements*

The field parameters[3] (pH, EC, DO, T, Turbidity) were measured by SW staff using calibrated field chemistry meter (Yeo-Kal 611, multiparameter) on a quarterly basis and are summarised as follows:

- MB5, V5, MW7A, MW7B, BH20 and BH19 have slightly acidic groundwater (pH 4.4 to 6.99). The remaining wells were generally slightly acidic to slightly alkaline (pH = 6.24 to 8.8).
- Groundwater is saline in the foreshore tidal discharge areas (e.g. EC from V3 = 2205 to 48,600 µS/cm). The foreshore wells (V1, MB1S, MB1D) fluctuate from fresh to moderately brackish (799 µS/cm to 9,500 µS/cm). The brackish water samples relates to tidal influences. The remaining wells are relatively fresh (Caravan Sites 31/32, Caravan Sites 294/295, Camp Kitchen, D03, MB2D, D02, D28, MB5, V5, V2, BH19, BH20, MW-8S, MW-7A, MW-7B, D-05S, D-05D) with EC <1500 µS/cm.
- The dissolved oxygen content ranged from 0.1 to 9.58 mg/L (MB2D and MW7A, respectively) with generally low aerobic conditions across the site area (e.g. 3-4 mg/L).
- Turbidity[4] is variable, ranging from ~ 0 NTU to 826 NTU (V2) reflecting variable silting in the wells (additional purging can be conducted to reduce the silt content and improve water clarity).

E2W recommend Council to measure the well depths to assess the groundwater column and degree of silting in the well (more consistent results with clear water). Table 34 indicates the wells sampled and the available field chemistry results (~50% of wells).

5.3 *Laboratory Results & Discussion*

The groundwater samples (Table C-3 and 5.1, above) were analysed for the following suite during the 2013 to 2017 monitoring period:

- pH, total suspended solids, BOD5, total dissolved solids.
- Nutrients (ammonia, nitrate, nitrite, total kjeldahl nitrogen, total nitrogen, total phosphorus, enterococcus, thermotolerant (faecal) coliforms, total coliforms).
- Major ions (bicarbonate, calcium, chloride, chlorine free residual (field tested due to short holding time), magnesium, potassium, sodium, sulphate).
- Metals (bromide, iron, selenium).

The analytical results are presented in Tables 1 to 30 and summarised in Table 5.3 (following section). A comparison of the operational data to baseline data (statistics) is presented in Table 31. Multi-parameter (SWL, pH, ammonia, total nitrogen, total phosphorus) time-series graphs (March 2008 to February 2017) for the monitoring wells (note: some wells were dry and could not be sampled) are presented in Graphs 1 to 23.

Reactive phosphorous was conducted at selected wells with elevated TP:

- DO-5s, DO-5D, DO-2, D0-3, D-28, BH-19, BH-20, MW-7A, & MW-7B
- MW-8s (dry well for several years)

[3] Some differences (up to 0.5 pH unit) occur between the field and laboratory pH measurements. It is noted that pH has a short holding time (<4 hrs). Field measurements may be more reliable if calibrated equipment (i.e. on a daily basis) is used.

[4] Negative NTU values indicate transcript errors or calibration issues.

The results of reactive phospherous analyses are significantly lower than the TP, indicating the presence of insoluble TP in the groundwater. The *total phosphorus* test measures all the forms of phosphorus in the sample (orthophosphate, condensed phosphate, and organic phosphate). Because the sample is not filtered, the procedure measures both dissolved and suspended orthophosphate.

E2W recommend that the TP analyses are conducted from filtered groundwater samples (prior to preserving in the sample bottles). Sample filtering occurs prior to the preservation or using an unpreserved bottle and conducting filtering at laboratory (0.45 um). The turbidity in the sample is interpreted to influence the insoluble/soluble concentrations. The ***dissolved phosphorus*** measures that fraction of the total phosphorus which is in solution in the water (as opposed to being attached to suspended particles). It is determined by first filtering the sample, then analyzing the filtered sample for total phosphorus.

Dissolved phase phosphorous concentrations are recommended for the groundwater assessment, as it would represent the mobile component.

The monitoring dates undertaken by SW are summarised in Table 34. The groundwater analytical testing results are summarised in the following subsections

5.3.1 Major Ions and Metals

Chlorine (free residual) concentrations were previously eported in excess of the ANZECC (2000) freshwater trigger value (0.003 mg/L) between March 2008 and November 2012 (Tables 1 to 30). Table 7 (in text) of the WRL technical report (2008/15) indicates chlorine levels in reclaimed water are generally above 0.003 mg/L.

The widespread presence of free chlorine in the wells may indicate some issues with cross-contamination (sample containers, laboratory contamination and precision), multiple contaminant sources (effluent or domestic origins) and precision issues with the testing method (Note: free chlorine is unstable, requires a filtered sample, and has a short holding time of approximately 2 hrs).

Free chlorine analyses was reduced from the monitoring program due to the difficulty in analyses and interpretation. Some selected wells continue to be analysed with elevated concentrations (e.g. DO5D near exfiltration trench with up to 1 mg/L free chlorine). Free chlorine at low concentrations (<0.1 mg/L) is difficult to discern between background and the STP influence.

Iron from Sites 31/32, 294/295, Camp Kitchen, D-03, D-02, D28, MB5, V5, BH19, BH-20, BH-29, MW-8S, MW-7A, MW-7B, D-05S exceeded the ADWG (2011) trigger value (0.3 mg/L, which is an aesthetic guideline) for one or more sampling rounds.

Iron concentrations at V2 (located on river bank, ranged 1.6 to 45.5 mg/L) exceeded the ANZECC (2000) short term (10 mg/) and long term irrigation trigger value (0.2 mg/L), however is reducing and reflect background levels. Iron at MB-1S also exceeded the ANZECC (2000) long term irrigation trigger value, (ranged from 0.3 to 3.98 mg/L), which may be associated with turbidity or the application of fertiliser at the caravan park. Iron is deleted from the analytical program since January 2014.

5.3.2 Microbiological

Detections of enterococcus, thermotolerant (faecal) coliforms or total coliforms in the groundwater wells are likely to reflect the treated effluent near the exfiltration trench and other surrounding natural occurring faecal sources (local fauna, caravan park, residential septic tanks).

Annual average faecal coliforms from the STP are summarised in Table 33. Annual FC ranges from 1 to 67 cfu/100ml with the STP discharges. Migration of faecal coliforms is considered to be limited in the sand aquifer due to the restricted pore spaces and attenuation (sorption).

- Enterococcus, thermotolerant (faecal) coliforms or total coliforms were reported above AWDG 2011 guidelines in one or more samples at all monitoring locations in previous monitoring period up to July 2014. Enterococcus ranged from 2 to 2,200 cfu/100 mL (e.g. MB1S @ 2,200 cfu/100 mL and V3 @ 190 cfu/100 mL on 15 October 2012).
- Monitoring from July 2014 has only included analyses of Faecal coliforms at well locations near the exfiltration trench and at background wells. Faecal coliforms concentrations were detected at diverse locations (trench and background) with variable concentrations.
    - Thermotolerant (faecal) Coliforms: 2 to 8,500 cfu/100 mL (e.g. MB-1S = 920 cfu/100 ml, DO3 =350 cfu/100 mL and 8-2-16, V2= 3600 cfu/100ml in 13 Jan 2014).

Majority of FC results are reported below guidelines or detection limits at wells near the trench. Background wells have variable FC impact and are occasionally over guidelines. E2W consider that FC would be filtered through the sand aquifer and be limited to the proximity of the trench (<200m).

- Thermotolerant (faecal) coliforms were previously reported above ANZECC 2000 trigger values (150 cfu/100 mL – recreational uses) in previous occasions:
    - 294/295: 9 January 2012 @ 600 cfu/100 mL;
    - MB-1S: 9 January 2012 @ 8,500 cfu/100 mL and 15 October 2012 @ 1,400 ml/100ml;
    - MB-1D: 9 January 2012 @ 4,200 cfu/100 mL;
    - V2: 15 October 2012 @ 840 cfu/100 mL;
    - V3: 15 October 2012 @ 150 cfu/100 mL;

Given that MB-1S/MB-1D/294/295 are within the caravan park, and V-2/V-3 are along the foreshore/residential area, other sources (campers, septic tanks) are likely to have contributed to the coliform concentrations.

Detectable concentrations of enterococcus, thermotolerant (faecal) coliforms or total coliforms were reported at least once in all wells previously sampled during March 2008 to 2013, indicating very mild bacterial impact (low concentrations, typically <10 cfu/100 mL) in the aquifer or from local fauna (kangaroos) or possibly septic tanks (high concentrations during peak season).

5.3.3 Nutrients

Rising trends of total nitrogen and total phosphorous concentrations in the groundwater wells in proximity to the trench and flow path are considered to be indicators of treated effluent impact. Refer to Table 31 which compares the baseline and recent monitoring statistics for TN, TP and ammonia (i.e. increasing trends are highlighted).

The average ammonia concentrations from the STP are relatively low and below the ANZECC (2000) guidelines (Table 33). Annual Average of ammonia ranges from 0.11 to 0.45 mg/L (2009 to 2017), with an overall average of 0.22 mg/L.

- **Ammonia** concentrations reported between January 2009 to 2017 were either non-detected or below the ANZECC (2000) fresh and marine water trigger values (0.9 and 0.91 mg/L, respectively) for all locations, except V1, V2 and V3 (background wells). Ammonia concentrations in wells V1 (ranges from 0.79 to 1.58 mg/L), V2 (ranges from 0.02 to 3.21 mg/L) and V3 (ranges from 0.25 to 2.9 mg/L) have exceeded the ANZECC trigger values in majority of sampling events. Elevated concentrations are interpreted to reflect background levels at the developed foreshore or lagoon area (anthropogenic influences such as septic tanks and fertiliser use). Groundwater flow from the exfiltration trench is unlikely to affect V1, V2 and V3.
- Elevated **nitrate** and above the ANZECC (2000) freshwater trigger value (0.7 mg/L) were reported from 31/32, 294/295, Camp Kitchen, MB-1S, MB-2D, D03, D02, D28, V3, V5, BH-19, BH-31, BH-29, MW-8S, D05-S and D05-D in at least one sampling round between January to 2017. Wells including MB-2D (maximum 9.36 mg/L), D-03 (9.42 mg/L), D-02 (6.39 mg/L), MW-8S (6.91 mg/L), D05S (maximum =10.6 mg/L) and D05D (maximum of 12.6 mg/L) reported exceedances in the samples collected in proximity to the exfiltration trench. Background monitoring wells are also associated with elevated nitrogen (TN, TP) and nitrate (V1,V2, V3, MB5 and MB1S) due to the multiple nitrogen rich sources in the catchment area (septic tanks, camping grounds etc).
- Concentrations of **total nitrogen** were reported above ANZECC (2000) fresh and marine water trigger values (0.5 and 0.3 mg/L, respectively) in samples (at least one) from all wells between March 2008 and 2017. Exceedances were reported for sampling rounds at Caravan Site 31/32, Caravan Site 294/295, D-03, MB-1S, MB-1D, D-03, D0-2, D-28, MB-5, V-5, V-3, V-1, V-2, BH-19, BH-20, BH-31, BH-29, MW-8S, MW-7B, D-05S and D-05D. Elevated TN (and TP) at BH-19/BH20 is unlikely to have originated from the exfiltration trench, however may relate to spills/leaks/overflows from the actual STP site (waste water treatment plant).
- Spikes in total nitrogen occurred at MB-5 (13.6 mg/L Nov 2014), V-3 (14.6 mg/L, May 2012), V-2 (11.3 mg/L, May 2012) are interpreted to arise from external background sources (residential septic tanks, fertilisers).
- **Total phosphorus** were above ANZECC (2000) fresh and marine water trigger values (0.05 and 0.03 mg/L, respectively) in one or more samples from all wells during 2008 to 2017. The results indicate background concentrations exists above guidelines, however elevated TP concentrations (>1 mg/L) exist in the monitoring wells situated in proximity to the exfiltration trench (<200m). The TP and reactive phosphorous are at similar concentrations in proximity to the trench location (DO3, DO2). For example, in February 2017 the phosphorous concentrations at DO3 (TP=3.76 mg/L and RP=3.54 mg/L) and DO2 (TP=3.91 mg/L and RP= 3.9 mg/L), however at V5 (TP= 1.5 mg/L and RP=0.02 mg/L). The TP results are generally irratic at the site indicating issues with sample turbidity and variable soluble/insoluble concentrations (filtering of samples recommended and/or RP analyses).

Trends in nutrient water quality and SWL are summarised in Table 31, time-series Graphs 1 to 23, and Table 35 (included in the back of the report).

5.3.4 Hydrochemistry

The hydrochemistry of the groundwater collected from 30 wells (& effluent) were presented in previous annual reports by E2W (2012).

Typical concentrations of major ions in the domestic sewage effluent are as follows;

- TDS 350-400mg/L*, Sodium 70-80mg/L*, Bicarbonate 80-120mg/L*, Sulphate 60-80mg/L*, Calcium 30-40mg/L, Potassium 15-25mg/L, Magnesium 10-15mg/L, Aluminium - <0.05 mg/L*, Chloride 80-140mg/L (*Results from Conjola STP, as provided by client)

The STP water is marginally fresher than the local groundwater quality (groundwater ~ TDS 650 mg/L) and has generally higher bicarbonate and magnesium.

The monitoring data indicates that wells in proximity to lower elevations and discharge areas are predominantly Na-Cl rich (marine tidal water). Wells that are elevated in the dune system may have more carbonate in the lithology (shell grit etc) which may affect water quality (e.g. Ca-HCO3 with higher Mg such as D28, MW-8S).

The effluent water type represents the source water (Cl and HCO3/SO4 and Na/Ca) and trends towards Na-Cl (dominant ions) as groundwater flows towards shorelines. The anion (Bicarbonate) can be dominant (instead of Cl) within the dune aquifer where shell/grit forms part of the lithology (e.g. MB-2D).

The groundwater evolution from the dune/exfiltration system to foreshore discharge areas is shown by an increase in the sodium and chloride ions, which is expected from a rainfall recharge dominated area to an estuarine tidal system.

5.3.5 Baseline & Current Data Comparison

A comparison of the TN and TP maximum and average concentrations to the pre & post operational data (before and after March 2008, respectively) are presented in Table 31. The data shows increased TN and/or TP concentrations at the following locations:

- Total Nitrogen (Trench): MB2D, MB5, MB-1S/MB-1D (related to exfiltration trend). Several wells in proximity to the trench are too shallow/dry (e.g.MW-8S, DO1, D02, D03), however have elevated TP/TN due to the impact from the exfiltration trench.
- Total Nitrogen (Background): V1, V2, V3, Caravan Site 294/295, and Camp Kitchen (background trends due to land use)
- Total Phosphorus: MB5, V5, MB-1S, V1, V2, V3, and D28 (Table 31). The increasing trend at well D28 is interpreted to arise from the exfiltration trench, whilst some influence (fertiliser) may arise from wells at the camping grounds (MB-1S).

TN and TP trends are stable or declining at all other wells in comparison to pre-operational conditions (baseline statistics). Concentrations of TP are generally irratic over time due to suspended fines in the samples.

5.3.6 Background Wells

Effluent discharge is interpreted to have increased the background TN/TP concentrations in local groundwater up to ~ 300 m from the trench (Figures 3A to 3D). The nutrient plume is inferred to be expanding to the north as shown by the increasing TN trends at MB1S/MB1D. Interpretation of plume expansion is not known to the east, west and south due to the gaps in the well network.

The nutrient plume originating from the exfiltration trench is not delineated. Additional monitoring wells are required to delineate the extent of the plume and areas where plume expansion has been identified (MB1D/MB1S) in proximity to the estuary (receptor).

It is noted that fertiliser is applied to residential areas, lawns/camping areas at the caravan park (usually April) and is evident at MB1S (dominated by TKN) and MB5. The TN concentrations at BH19/BH20 may be associated with the STP. The core of TN plume in 2017 is inferred to be larger than E2W previous report (2012).

The impact from fertiliser use at the caravan park potentially merges with the treated effluent plume (Figure 4). The TP/TN plume in 2014 to 2017 are shown on Figures 3A, 3B, 3C, 3D, 3E shows the TP/TN plume which does not includes the fertiliser/residential impacted areas.

Monitoring results away from the exfiltration trench (MB5, V1, V3, MB1S) are considered to reflect impact from residential/background sources. These background sources are difficult to differentiate from effects of STP discharge given the similar chemical characteristics (TP, TN, TKN, FC).

5.3.7 Wells in Proximity to Exfiltration Trench

TN (nitrate) and TP (total phosphorus) are the key indicators of effluent pollution. Highest TP/TN concentrations are located at the trench, such as wells including D-03 (TN/TP maximum, 11.3/0.31 mg/L), D02 (TN/TP maximum, 14.3/6.01 mg/L), and MW8S (TN/TP maximum, 7.1/1.24 mg/L). E2W note that unusually high TN/TP results were reported on 23 February 2010 from D02 (TN=15.4 mg/L, TP=1.51 mg/L) and D03 (TN=30 mg/L, TP=3.52 mg/L) and inferred to relate to STP discharge issues.

The groundwater in proximity to the trench show a general elevated and or rising TN and/or TP trend (over ANZECC 2000) at 7 downgradient locations (D05S/D05D, MW8S, D03, D02, MW1S/MW1D, MB2D, MW7B). The water quality trends of monitoring wells (D02, D03, MW-8S, DO5S, DO5D) located near the trench are likely to reflect the STP discharge quality. The TP/TN and trends at D02/3 are likely to reflect the STP annual averages which have improved over time (TN 6.5 to 3.5 mg/L).

Figures 3A to 3E shows that the TP contour (1 mg/L) exists in proximity to the trench, and is also associated with the TN contour (5 mg/L). The TP concentrations drop off rapidly with distance from the trench due to sorption in the aquifer, whilst TN is more mobile.

The influence (timing, scale) of other locally contributing residential/background sources of nutrients (e.g. residential runoff, tourist activities) are not well known. The TP/TN concentrations at MB-5 is higher than surrounding wells (MW-7A and MW-7B), and may reflect impact from the residential area (orchard, gardens).

5.3.8 Plume Delineation

General delineation of the TN/TP plume from the trench is based on a limited well network, the inferred contours (Figures 3A to 3E) and available monitoring data (Tables 1 to 30). The treated effluent discharge and associated rise of TN/TP in at the exfiltration trench is similar to the background water quality (e.g. V2, V3 which report TN/TP above ANZECC 2000, but to a lesser degree).

North Plume Migration

The TP and TN plume **north** of the exfiltration trench is directed towards the estuary and Lake Conjola shoreline. Average TN and TP concentrations close to the lake (MB1S, 4.52 mg/L and

0.22 mg/L, respectively) have increased relative to baseline statistics (June 2006-January 2008, 0.8 mg/L and 0.07 mg/L, respectively). The well MB1S (and 31/32, 294/295) are vulnerable to impact from fertiliser use given the shallow water table and proximity to camper areas. The recent results from D-05 S (TN=8.1 mg/L, TP3 mg/L) and D-05D (TN=4.5 mg/L, TP=1.24 mg/L) indicate that the plume is relatively shallow at the trench and likely to deepen with regional flow and dispersion. The surface water results from Lake Conjola estuary show no clear pattern related to the discharge of the groundwater plume (Refer to Graphs SW-1 & SW-2).

*West Plume Migration*he TP and TN plume has migrated **west** of the trench (Figures 3A to 3E) and towards Pattimores Lagoon to the lower elevation. Groundwater surface water interaction is inferred at the lagoon, together with dilution from stormwater runoff and some tidal influence.

The surface water results from Pattimores lagoon show no clear pattern related to the discharge of the groundwater plume (Refer to Graphs SW-1 & SW-2).

The nutrient trends and low concentrations at wells (MB-5, MW-7A and MW-7B) provide an indication of plume migration to the west (Figures 3A to 3D). A slight rising TN/ammonia trend is interpreted at MW-7B (TN ~0.8 mg/L), and a variable to rising trend at MB-5 (TN ~ 3 mg/L). The downgradient wells (V1 & V5) are located near residences which are likely to contribute nutrients to the groundwater (septic tanks, fertiliser use). The nutrient plume is not well delineation to the west, however the plume fringe (low concentrations) are unlikely to have reached Pattimores lagoon. The surface water monitoring results from Pattimores lagoon show elevated nutrients, however may also be derived from other locations (residential area, Graphs SW-1 & 2).

East Plume Migration
To the **east** of the trench, nutrients from the effluent also migrate towards the groundwater/salt water interface due to the radial flow direction. Natural attenuation processes (Figure 5.4.4 below) occur prior to nutrient discharge (refer to Figure 4). The TN/TP concentrations are interpreted to be variable over time due to seasonal changes in STP effluent quality and rainfall dilution along the groundwater flow path. TP is more variable (rainfall recharge and dilution) relative to TN. The nutrient plume is not delineated east of the trench, due to dry wells (MW8S, D02, D03) and difficult access (dunes/beach). Highest TP and TN concentrations were detected at D02 & D03 (Figures 3A to 3E).

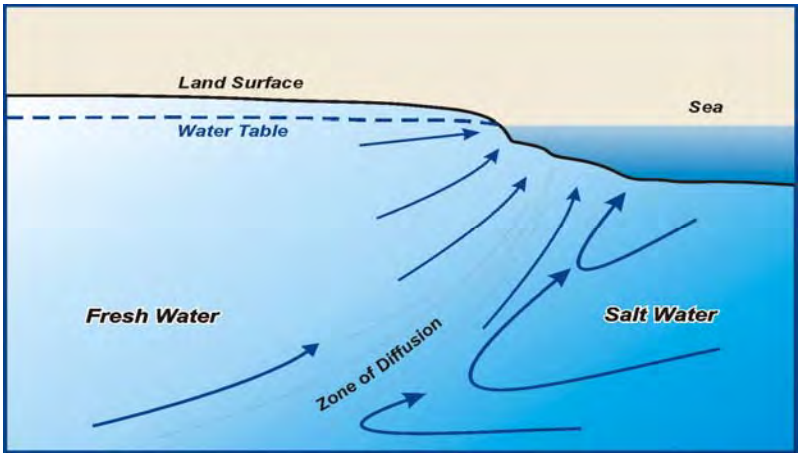

Figure 5.4.4 Circulation of fresh and saline groundwater at a groundwater salt water interface at a coastal location (Fetter, 1998).

South Plume Migration

The extent of plume migration to the south of the trench (Figures 3A to 3E) is not well known due to the limited well network. Elevated concentrations (TP, TN) were previously reported from BH-31, and BH-29 (currently dry wells incl BH-21).

5.3.9 Groundwater Impact from Exfiltration Trench

Based on the inferred groundwater flow direction and water quality trends, E2W interpret that the following wells show impact originating from the exfiltration trench:

- D28 (down gradient to south west) rising trend for TN and, variable trend for TP and nitrate (D28 is immediately downgradient of the STP);
- D03 (immediately east) high concentrations of TN, TP, and nitrate;
- D02 (immediately east) high concentrations of TN, TP, and nitrate;
- D05s/D05D (immediately down-gradient to north) high concentrations of TN, TP, and nitrate;
- MB1S/MB1D (immediately down-gradient to north) high concentrations of TN, TP, and nitrate;
- MB-5 (downgradient to the west) shows a an elevated, variable to rising TN trend (TN ~ 3 mg/L).
- MW-7B (downgradient to the west) and slight rising TN trend.
- MB2D (immediately down-gradient to north) rising trend for TN;
- BH29 (immediately down-gradient to southeast) variable trend for TN and TP; and
- MW-8S (down-gradient to east) for TN, TP and nitrate.

The monitoring results show potential impact at wells (2) situated near Pattimores Lagoon:

- BH-19 (south-east of the lagoon) rising trend for TN and ammonia (possible STP source);
- V1 (entrance to lagoon) rising trend for TN and TP (possible residential source)

Some risk to the environment (nutrient loads, algal blooms) is indicated by the inferred broad extent of the nutrient plume (TN, nitrate, and some TP) and its proximity to surface water bodies (i.e. Pattimores Lagoon and Lakes Entrance, Refer to Figures 3A to 3E). The nutrient plume may have generally stabilised on the fringes given the time series graphs (stable TP/TN trends, graphs 1 to 23) and 10 years of STP discharge. E2W note that plume stability would also relate to the volumes discharged, which has been increasing in recent years (>200 ML in 2016 and 2017).

The capacity of the aquifer and environment (estuary and lagoon) to naturally attenuate the nutrients requires ongoing assessment and monitoring during various conditions (periods of stagnant conditions and lake entrance mouth closure in summer season). The data indicates that TN is relatively mobile and persistent in the aquifer.

The TN comprises primarily the oxidised species including; nitrate, TKN and with minor ammonia.

5.4 *Quality Control*

Quality control information was not provided for the 2013 to 2017 summary laboratory (xls) reports (ion balances, matrix spikes, laboratory duplicates or field duplicates etc). E2W note that laboratory analyses were conducted by ALS Environmental (NATA accredited), whilst sampling conducted by experienced SW staff.

Improvement to the laboratory quality control procedures is expected since ALS Environmental acquired Ecowise Pty Ltd in late 2009. The precision of free chlorine analyses are considered to be unreliable for the groundwater monitoring given the short holding times (e.g. 20 minutes) and requirement for clear water to perform the field test (i.e. no NATA accreditation exist for free or total chlorine).

No field duplicates or interlaboratory duplicates were collected during the 2014 to 2017 monitoring period. E2W consider that a quality control program should be implemented to address laboratory precision. Blind field duplicates and internal laboratory duplicates (including matrix spikes, sample/method controls etc.) should be included, and laboratory reports designed to meet the NEPM (2013) guidelines.

Interpretative quality control reports (QCI) are not available from ALS. ALS QCI reports can indicate satisfactory quality control and no anomalies or data outliers. It is noted that ALS (lab) PH measurements are out of holding times (4 hrs).

6 ADEQUACY OF THE MONITORING PROGRAM AND WELL NETWORK

E2W understand that the existing monitoring network comprises thirty-one (31) monitoring wells which were constructed by multiple consultants (i.e. PPK, Coffey, WRL, E2W, Figure 1).

The purpose of the monitoring wells is summarised in Table 6.1 (below, taken from WRL, March 2009 and updated by E2W).

Table 6.1 Purpose of Monitoring Wells

Well IDs	Purpose of Well
V1, V2, V3	Control bores for groundwater affected by urbanisation and septic tank leakage. The quality of groundwater is expected to improve with CRSS operations.
BH19, BH20, V5	Control bores for groundwater affected by rainfall recharge and the cyclic nature of tides and coastal storms. The expected change in groundwater level and quality due to the CRSS is negligible.
Caravan Sites 31/32, Caravan Sites 294/295, GW031496*, MB1S, MB1D, MB2S, MB2D, (D05), D03, D02, D01, D28, MB3, Camp Kitchen, BH25, BH31, BH35*, BH29*, MW-8S	Monitoring bores dedicated to the detection and assessment of CRSS groundwater impacts.
MW-7A, MW-7B	New monitoring bores (2011) dedicated to the detection and assessment of groundwater impacts at the residential area (MB-5), Pattimores lagoon.
D05-S&D	New monitoring bores (2011) dedicated to the detection and assessment of CRSS groundwater impacts at the trench area.

** Well not part of the monitoring program proposed by WRL. However, GW031496 was gauged on 19/03/08, 24/06/08, 9/12/08, 3/02/09, 19/05/09 and 23/06/09. BH35 was gauged on 23/09/08 and BH29 on 17/03/09 and 23/06/09. BH-29 was sampled on the 21/11/11. Well (D05) was destroyed during construction of the exfiltration trench.*

E2W consider that a minor upgrade to the monitoring network is required given the local (fresh water coastal) aquifer, proximity to surface water bodies (lagoon, estuary) and scale of the nutrient plume (TP,TN - exfiltration trench).

E2W recommend that (6) existing dry wells are developed to a functional status:

- Replacement or deepening of D01, D02, D03, and BH23, MW-8S and MB2S
- An additional downgradient well is recommended near MB1S/MB1D to assist delineate the nutrient plume near the estuary.

Wells are designed to better characterise and assess the plume conditions (stability or expansion) from the trench area.

E2W understand that Shoalhaven Water conduct surface water monitoring at Pattimores Lagoon and at Lake Conjola. E2W recommend that this information is integrated and also utilised to assess potential impact of any nutrient rich discharging groundwater.

The post-commissioning groundwater monitoring program (frequency of monitoring, well network and analytical suite) proposed by the WRL (March 2009) is generally minimal, but sufficient to assess the effect of the CRSS on the local groundwater system. E2W note that the groundwater (TN, TP) plume may not have reached steady state conditions in all areas (plume expansion phase since 2008), and current monitoring should be adequate to delineate the nutrient plume and assess plume conditions (e.g. stability or expansion). Some minor data gaps are noted with the existing well network (north and south of trench i.e. partial plume delineation).

Data Gaps

Data gaps and plume delineation could be improved to address the elevated TN/TP and/or rising trends associated with downgradient locations (MB2D, D05S/D05D, and BH20) with suitable wells.

Additional monitoring wells (2) are recommended;

- Area of BH-23/MB-5. Time series trends near source area (BH-23 as a shallow well) would assist to address the plume status (stability, expansion) in the direction of Pattimores lagoon (not a critical location due to MW7A).
- Area of MB2S/North of D05s. Better delineate the plume fringe and improve plume status (stability, expansion) in direction of the estuary/caravan park. Area north of the trench is sensitive as groundwater may discharge to the estuary over time (Figure 4).

7 CONCLUSIONS AND RECOMMENDATIONS

Based on the review of the available groundwater monitoring data collected between 2013 and 2017, E2W offer the following conclusions[5]:

STP Water Quality

- The quality of the final effluent discharged from the Lake Conjola and Bendalong STPs into the dune exfiltration system complies with the EPA limits outlined in the CRSS EPL (No. 12357).

[5] Refer to Appendix C for limitations

- Conjola STP average annual water quality in 2015-2017 (TN ~4 mg/L) has improved relative to previous years (2009 to 2015, TN ~6.1 mg/L). The annual average TP concentrations for the STP are variable over time and ranges from 2 to 5 mg/L (average 3.5 mg/L). The TN comprises primarily the oxidised nitrogen species including; nitrate, TKN and with minor ammonia (below the ANZECC 2000 guidelines). Average ammonia concentrations in the effluent are low (0.22 mg/L), whilst faecal coliforms range from 1 to 67 cfu/100ml from 2009 to 2017 (average 15 cfu/100ml). E2W interpret that the quality of STP discharge would improve via discharge into the dune sands due to filtering of suspended fines, removal of faecal coliforms and some attenuation of the nutrients (TP, TN). The groundwater data indicates a limited capacity of the aquifer to attenuate the nutrients (TN, TP) due to the large STP annual volumes and 10 year duration (e.g. concentrations of TN/TP at D02, DO3 are similar to the effluent).

Groundwater Flows

- The groundwater table is interpreted to be mounded (estimated 0.3 to 0.5m higher than background) under the exfiltration trench due to the STP discharges. Water levels show mild fluctuations (<1m) during 2009 to 2017, whilst several foreshore/background wells (V1, V2,V3) have low reduced water levels and are tidally influenced.
- Groundwater flows are radial at the trench site and directed to the receptors (lagoon, estuary, beach due to the mounding and the groundwater divide (i.e. generally at the exfiltration trench due to discharges, dune topography, and shoreline).
- Due to the high infiltration/permeability of the sand aquifer the effluent plume is diluted along the flow path due to the high proportion of rainfall recharge (estimated at 35% of annual average rainfall of 1173 mm/year).

Water Quality Impacts

- Based on current monitoring, the effluent plume has potentially migrated between 200 m to 300 m from the exfiltration trench (Figures 3A to 3E) over the 10 years of operations. The extent of the nutrient plume is based on the inferred TN contour of 5 mg/L. The plume is not well delineated, due to data gaps in the well network, natural forest and large scale of the site. The fringe of the nutrient plume from the STP is difficult to differentiate at low concentrations due to the background concentrations at residential areas.
- TN (and nitrate) and TP (total phosphorus) are the key indicators of treated effluent pollution at the site. The groundwater in proximity to the trench shows elevated TN/TP/nitrate (over ANZECC 2000). The groundwater concentrations at the trench area (MB-1S, MB-1D, D0-5S, D0-5D, MD-2D) are similar to the average TP/TN concentrations of the treated effluent indicating low attenuation or bioaccumulation in the aquifer. A recent rising (TP/TN) trend is noted at downgradient locations MB1S/MB1D (TN), indicating plume expansions to the north.
- In general, the plume extent in 2014-2017 is larger than previous years due to the detectable plume expansion to the north and west (MB1S/MB1D and MW7B/MB-5). Plume expansion to the east, west and south is not readily discernible due to the limited well network and dry wells.
- Highest TP/TN concentrations occur at the trench area and decrease along the groundwater flow path due to natural attenuation including dispersion, sorption and oxidation (e.g. D02 TN=14.3 mg/L, TP=6.01 mg/L). The plume fringe is interpreted to potentially discharge along groundwater/salt water interfaces at the estuary (MB1S/MB1D) and beach (MW-8S). Obvious evidence of adverse impacts to aquatic ecosystems has not been observed to date.

- The groundwater nutrient concentrations are likely to be depleted by vegetation uptake around Pattimores lagoon and at lower elevations. The plume east of the trench is not well delineated and is situated under sand dunes and beach (refer to Figures 3A-3E). Favourable hydrogeology exists along the beach to enhance attenuation of the nutrients (groundwater/saltwater interface) to mitigate risks to marine water.
- The TP/TN plume north of the exfiltration trench impinges on the Lake Conjola shoreline (Figure 4). Average TN/TP concentrations at wells (MB1S, MB1D in camping grounds) have increased relative to baseline conditions. The status of plume (expanding) on the north requires further monitoring and investigation to assess risks to the estuary (i.e. algal blooms due to potentially rising nutrient loads).
- The current monitoring data (post operational) indicates that the background groundwater quality (V1, V2, V3 and V5) is not pristine and has elevated nutrients (TP, TN, possibly related to septic tanks, fertiliser use) which are above ANZECC (2000). Background levels are similar to the concentrations detected near the exfiltration trench (except D02, D05S which have the highest TP/TN).
- Thermotolerant (faecal) coliforms were reported above ANZECC 2000 trigger values (150 cfu/100 mL) on several occasions with background wells (V1,V2, V3, V5) located in residential areas or caravan park (e.g. MB-1S: 8 February 2016 @ 920 cfu/100 mL). The faecal coliforms in the groundwater are interpreted to relate to other biological sources (septic tanks etc), and not the STP given the low concentrations (below 150 cfu/100ml) at wells next to the trench.
- Based on the inferred groundwater flow direction and water quality trends, E2W interpret that the following wells show impact originating from the exfiltration trench:
    - D28 (down gradient to south west) rising trend for TN and, variable trend for TP and nitrate (D28 is immediately downgradient of the STP);
    - D03 (immediately east) high concentrations of TN, TP, and nitrate;
    - D02 (immediately east) high concentrations of TN, TP, and nitrate;
    - D05s/D05D (immediately down-gradient to north) high concentrations of TN, TP, and nitrate;
    - MB1S/MB1D (immediately down-gradient to north) high concentrations of TN, TP, and nitrate;
    - MB-5 (downgradient to the west) shows a an elevated, variable to rising TN trend (TN ~ 3 mg/L).
    - MW-7B (downgradient to the west) and slight rising TN trend.
    - MB2D (immediately down-gradient to north) rising trend for TN;
    - BH29 (immediately down-gradient to southeast) variable trend for TN and TP; and
    - MW-8S (down-gradient to east) for TN, TP and nitrate.

The groundwater plume is situated under predominantly forested and foreshore areas (estuary and beach).

- The monitoring results show potential impact at wells (2) situated near Pattimores Lagoon:
    - BH-19 (south-east of the lagoon) rising trend for TN and ammonia (possible leaks from the STP plant);
    - V1 (entrance to lagoon) rising trend for TN and TP (possible residential source).

Adequacy of Monitoring Program

- The groundwater monitoring network and program is considered minimal to assess groundwater pollution associated with the CRSS. The monitoring program is considered

acceptable if surface water monitoring is integrated with the groundwater, and a proactive approach is adopted to address water quality issues at high risk areas such as the lagoon and estuary (e.g. rising trends at MB-1D, MB-1S may require further investigations such as repeat sampling or installing new wells). The previously installed wells (MW-7A, MW-7B, DO5S, DO5D) have improved the delineation of the nutrient plume near the exfiltration trench.

- Wells located in residential areas (MB-5, V-1 to V-5) or camping grounds (MB1S) are influenced by nutrients (TN,TP) which may arise from the STP and other sources (fertiliser use, septic, camping activities).

Discussion of Risks

The risk of adverse impacts at the site depends on the sensitivity or vulnerability of the receptor (lagoon, estuary, beach) to the contaminant loads (nitrogen/phosphorous). The estuary mouth and beach (popular tourist areas) are relatively close to the trench and associated plume. Precautions are required for the estuary/lagoon, especially during mouth closure and stagnation issues (management of algal blooms due to nutrient levels).

Natural attenuation processes are interpreted to mitigate nutrients impacts at Pattimores Lagoon and Caravan Park/estuary due to the hydrodynamics at tidal areas with large flushing effects (i.e. mixing of saline and fresh groundwater at the interface, increased rainfall recharge/runoff, nutrient uptake by vegetation) along the flow path (Figure 4).

E2W interpret that the potential risk to aquatic ecosystems (e.g. higher nutrients/algal blooms at Pattimores Lagoon or estuary) is likely to increase during the periodic mouth closures (especially summer) and the short term (peak) nutrient loads (TP/TN, exfiltration area) associated with summer holidays. Pattimores lagoon is likely to be more vulnerable to water quality degradation due to the poor flushing. The sensitivity or vulnerability of Pattimores Lagoon aquatic ecosystem to additional nutrient discharges is not well known. Incorporating site observations and obtaining photographic records is recommended to address potential adverse risks associated with the lagoon (e.g. algae forming around foreshore discharge areas). Current surface water monitoring (graphs SW-1 & 2) indicate a cyclical nature for nutrients related to the residential area/tourist seasons.

No actual adverse environmental impacts have been documented or known which are attributable to the CRSS operations.

A low risk to domestic groundwater users (west and north of trench) is indicated by the monitoring data (similar to background levels). Beneficial uses of groundwater include ecosystem support (baseflows and vegetation), recreational and domestic use (particularly irrigation of grass/gardens).

Based on current monitoring data, the nutrient plume (TP, TN) associated with the exfiltration trench may be stabilising in most areas given the predominantly stable time series trends. The plume is estimated to have migrated approximately 200 to 600 m from the trench, based on the extent of the inferred TN contour (5 mg/L). Ongoing monitoring is required to verify the plume behaviour and extent. The nutrient plume is interpreted to be located under the caravan park to the north and is potentially discharging to the estuary.

Ongoing improvement and reduction of TN/TP/coliforms is recommended at the STPs to stabilise the treated effluent plume associated with the exfiltration trench (e.g. regulated chlorine dosing and Alum contribution to reduce discharges.

Recommendations

E2W recommend that (7) existing dry wells are developed/deepened to a functional status:

- Replacement or deepening of D01, D02, D03, and MB-3, BH23, MW-8S, MB2S.
- An additional downgradient well is recommended near MB1S/MB1D to assist delineate the nutrient plume near the estuary.

The proposed wells are designed to better characterise and assess the plume conditions (stability or expansion) from the trench area.

Additional monitoring wells (2) are recommended to reduce data gaps:

- Area of BH-23/MB-5. Time series trends near source area (BH-23 as a shallow well) would assist to address the plume status (stability, expansion) in the direction of Pattimores lagoon (not a critical location due to MW7A).
- Area of MB2S/North of D05s. Better delineate the plume fringe and improve plume status (stability, expansion) in direction of the estuary/caravan park. Area north of the trench is sensitive as groundwater may discharge to the estuary over time (Figure 4).

Groundwater Sampling Protocol Recommendations

- Measuring well depths (bottom of bore casing) to assess whether water level changes or bore silting has caused some wells to be dry (i.e. well development is proposed for wells which are silted or highly turbid).
- Record weather conditions at time of sampling (i.e. dry, wet weather). Well stickup should also be recorded in field logs.
- Field chemistry equipment (pH, EC, DO, Eh, T) to be measured using a calibrated instrument prior to use (documentation to be provided).
- Maintenance of well head-works to remove any biological sources.
- Perform total and reactive phosphorus analyses by use of pre- filtered water samples to obtain the dissolved phase phospherous. Filtering can be conducted in the field or at the laboratory using 0.45 um filter medium. The filtered water samples are intended to remove the insoluble TP associated with the suspended fines derived from well construction and purging processing. Unpreserved bottles are required for unfiltered field samples. TN does not require filtering prior to analyses.
- Collection of blind duplicate sample from each monitoring round (per batch) for quality control purposes. The blind field duplicate and possibly a blank sample is to assess the precision of the sampling protocol (including the laboratory analytical procedures).

Surface Water Program

- Site inspection and sampling (as required) of Pattimores Lagoon and Lake Conjola Estuary and assessing any degraded seepage or algal blooms is recommended as part of the groundwater monitoring program.

Figures

earth2water Pty Ltd
Environmental & Groundwater Consulting

Site Layout and Well Locations (2017)

Date: *May 2017*

Reference: *E2W-130_3.cdr* **Source:** *Google Maps*

Conjola Regional Sewerage Scheme - Shoalhaven Water

Figure 1

INFERRED GROUNDWATER FLOW REGIME (19-8-2015)

SHOALHAVEN WATER - CONJOLA REGIONAL SEWERAGE SCHEME

Date: *May 2017*

Reference: *E2W_130_05.cdr*

Figure 2A

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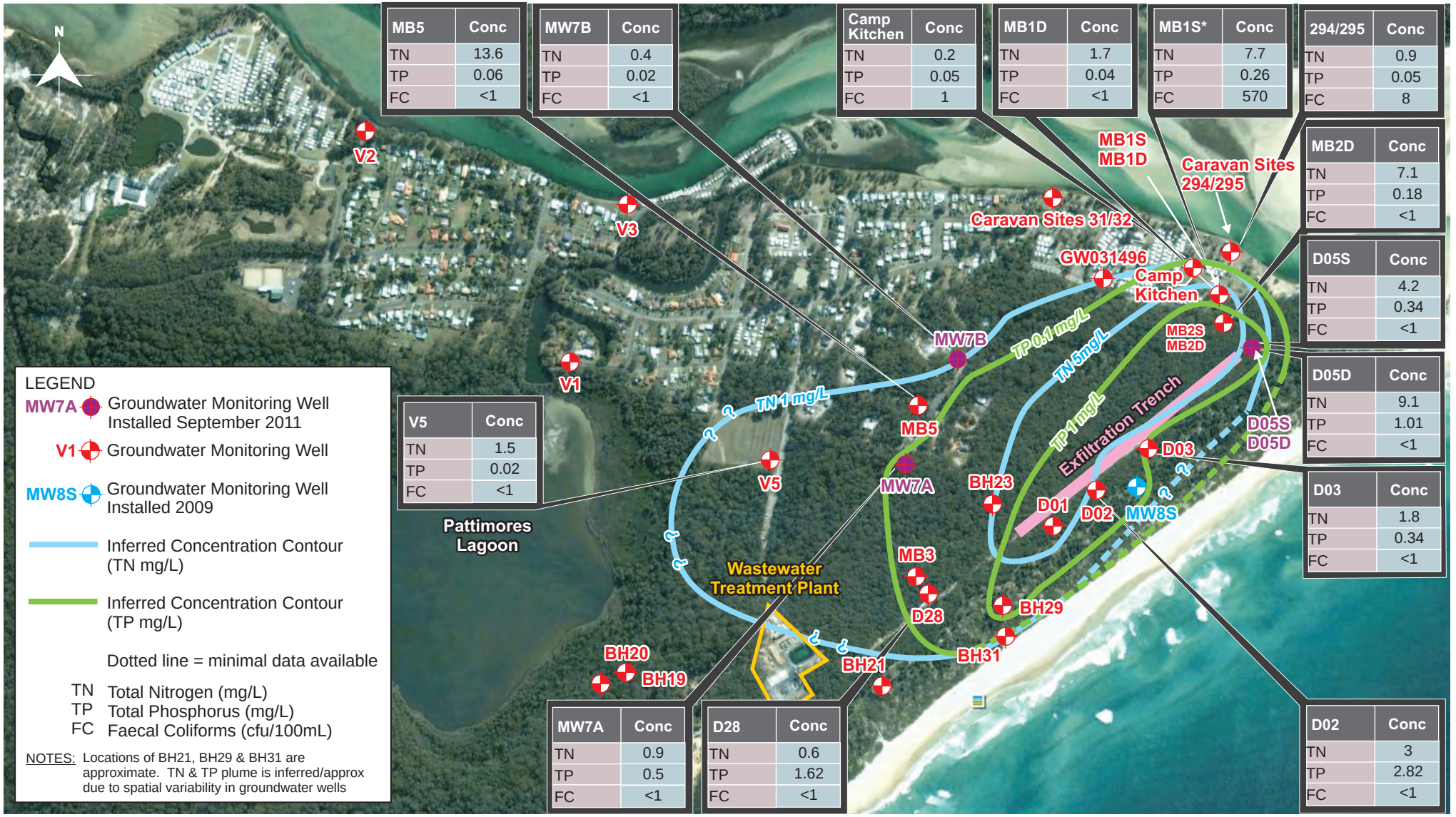

SUMMARY OF GROUNDWATER POLLUTANTS & INFERRED PLUMES (3.11.2014)

SHOALHAVEN WATER - CONJOLA REGIONAL SEWERAGE SCHEME

Date: *May 2017*

Reference: *E2W_130_06.cdr*

Figure 3A

earth2water Pty Ltd
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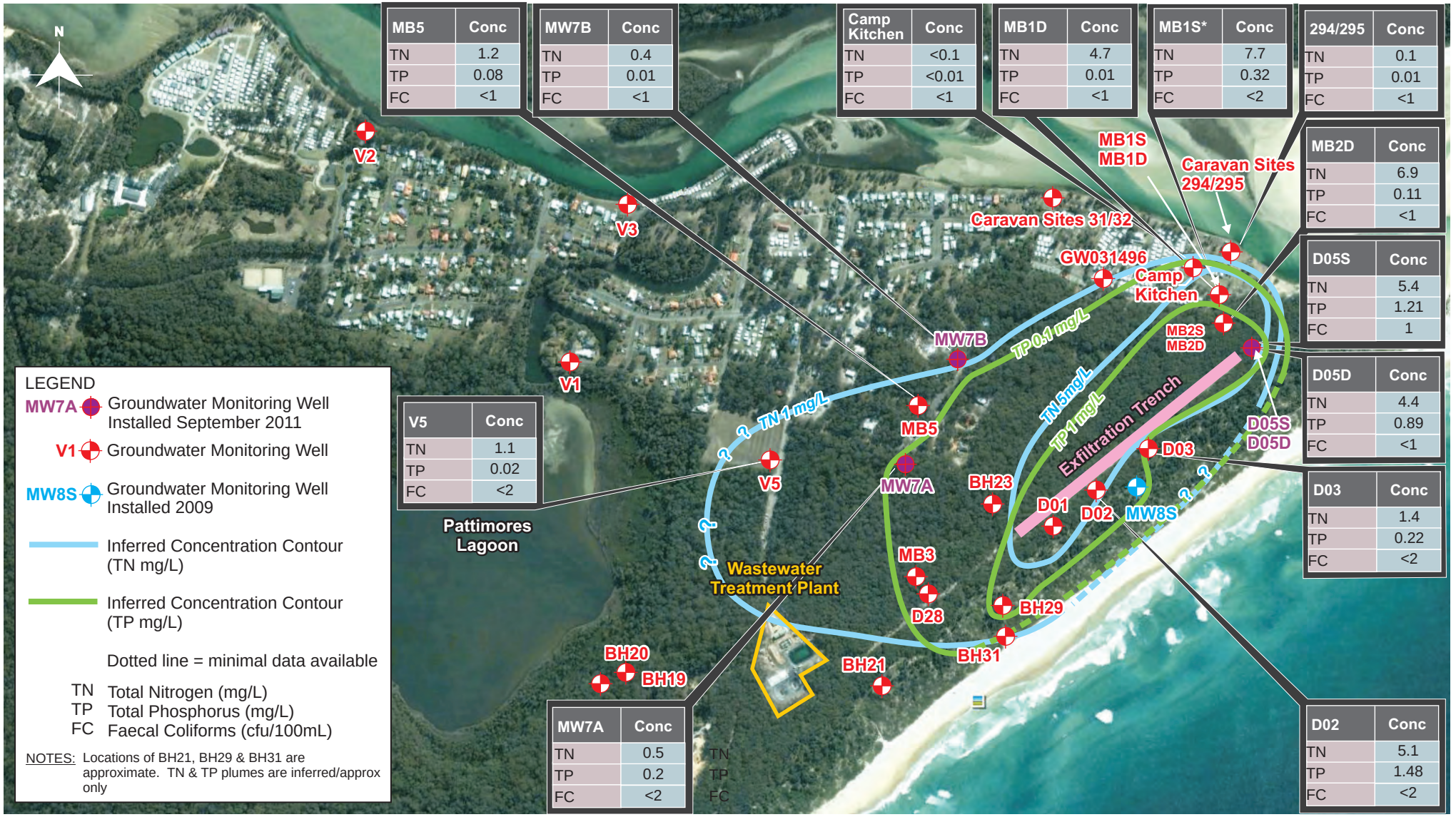

MB5	Conc
TN	1.2
TP	0.08
FC	<1

MW7B	Conc
TN	0.4
TP	0.01
FC	<1

Camp Kitchen	Conc
TN	<0.1
TP	<0.01
FC	<1

MB1D	Conc
TN	4.7
TP	0.01
FC	<1

MB1S*	Conc
TN	7.7
TP	0.32
FC	<2

294/295	Conc
TN	0.1
TP	0.01
FC	<1

MB2D	Conc
TN	6.9
TP	0.11
FC	<1

D05S	Conc
TN	5.4
TP	1.21
FC	1

D05D	Conc
TN	4.4
TP	0.89
FC	<1

D03	Conc
TN	1.4
TP	0.22
FC	<2

V5	Conc
TN	1.1
TP	0.02
FC	<2

MW7A	Conc
TN	0.5
TP	0.2
FC	<2

D02	Conc
TN	5.1
TP	1.48
FC	<2

SUMMARY OF GROUNDWATER POLLUTANTS & INFERRED PLUMES (14.10.2015)

SHOALHAVEN WATER - CONJOLA REGIONAL SEWERAGE SCHEME

Date: *May 2017*

Reference: *E2W_130_06.cdr*

Figure 3B

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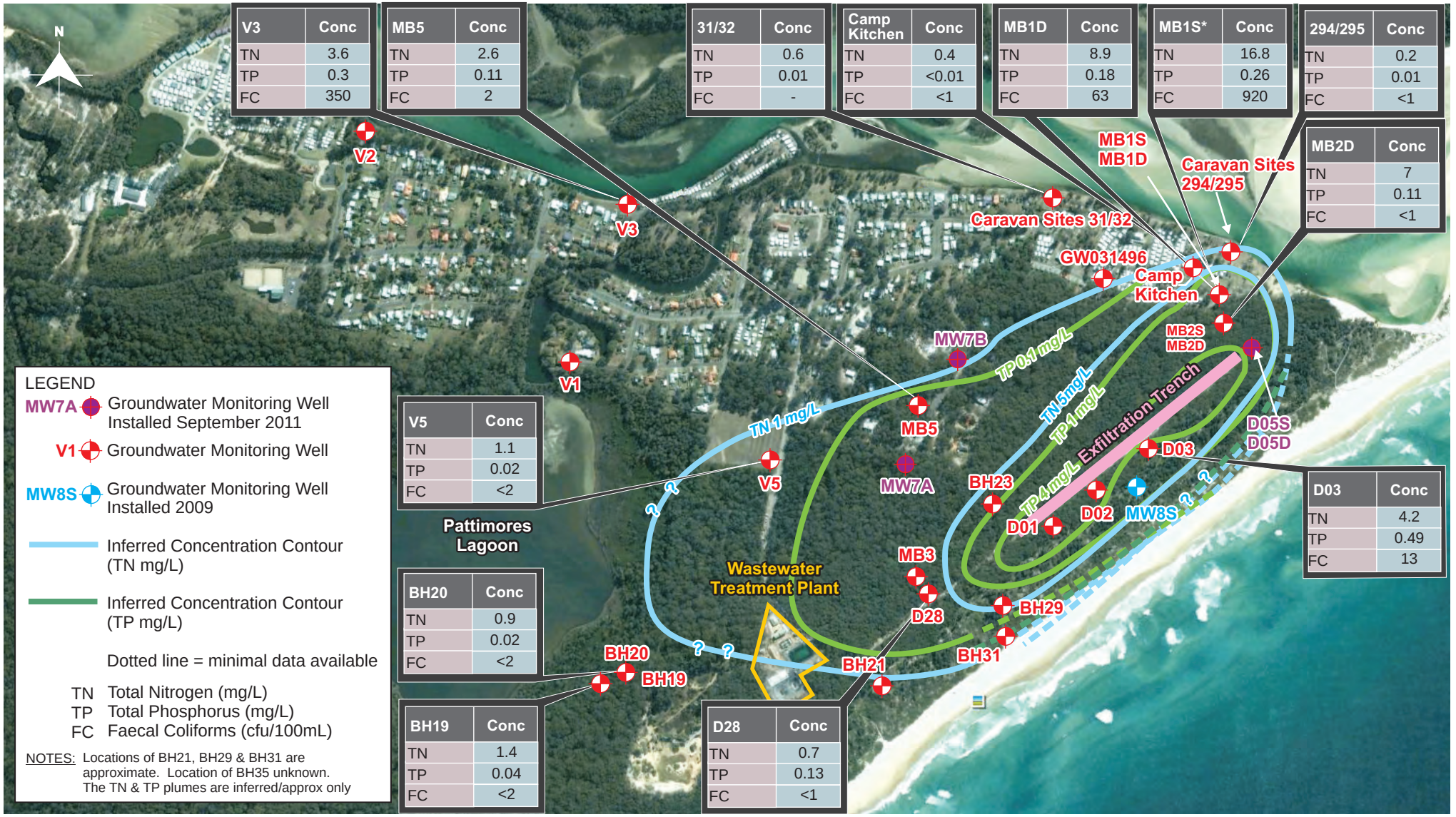
Environmental & Groundwater Consulting



SUMMARY OF GROUNDWATER POLLUTANTS & INFERRED PLUMES (8-2-2016)

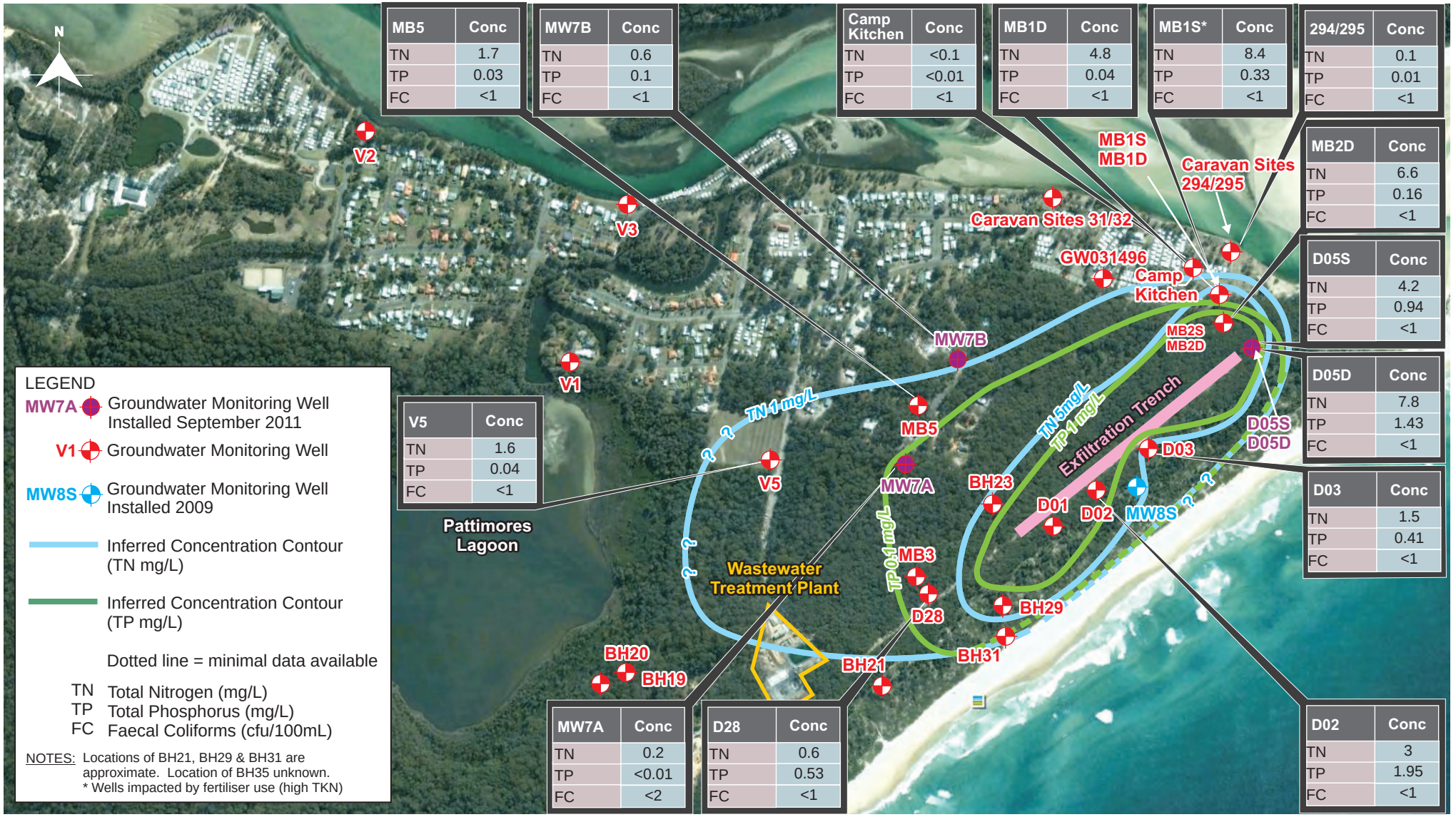
SHOALHAVEN WATER - CONJOLA REGIONAL SEWERAGE SCHEME

Date: *May 2017*

Reference: *E2W_130_06.cdr*

Figure 3C

earth2water Pty Ltd
Environmental & Groundwater Consulting



MB5	Conc
TN	1.7
TP	0.03
FC	<1

MW7B	Conc
TN	0.6
TP	0.1
FC	<1

Camp Kitchen	Conc
TN	<0.1
TP	<0.01
FC	<1

MB1D	Conc
TN	4.8
TP	0.04
FC	<1

MB1S*	Conc
TN	8.4
TP	0.33
FC	<1

294/295	Conc
TN	0.1
TP	0.01
FC	<1

MB2D	Conc
TN	6.6
TP	0.16
FC	<1

D05S	Conc
TN	4.2
TP	0.94
FC	<1

D05D	Conc
TN	7.8
TP	1.43
FC	<1

D03	Conc
TN	1.5
TP	0.41
FC	<1

V5	Conc
TN	1.6
TP	0.04
FC	<1

MW7A	Conc
TN	0.2
TP	<0.01
FC	<2

D28	Conc
TN	0.6
TP	0.53
FC	<1

D02	Conc
TN	3
TP	1.95
FC	<1

SUMMARY OF GROUNDWATER POLLUTANTS (25.7.16)

SHOALHAVEN WATER - CONJOLA REGIONAL SEWERAGE SCHEME

Date: *May 2017*

Reference: *E2W_130_06.cdr*

Figure 3D

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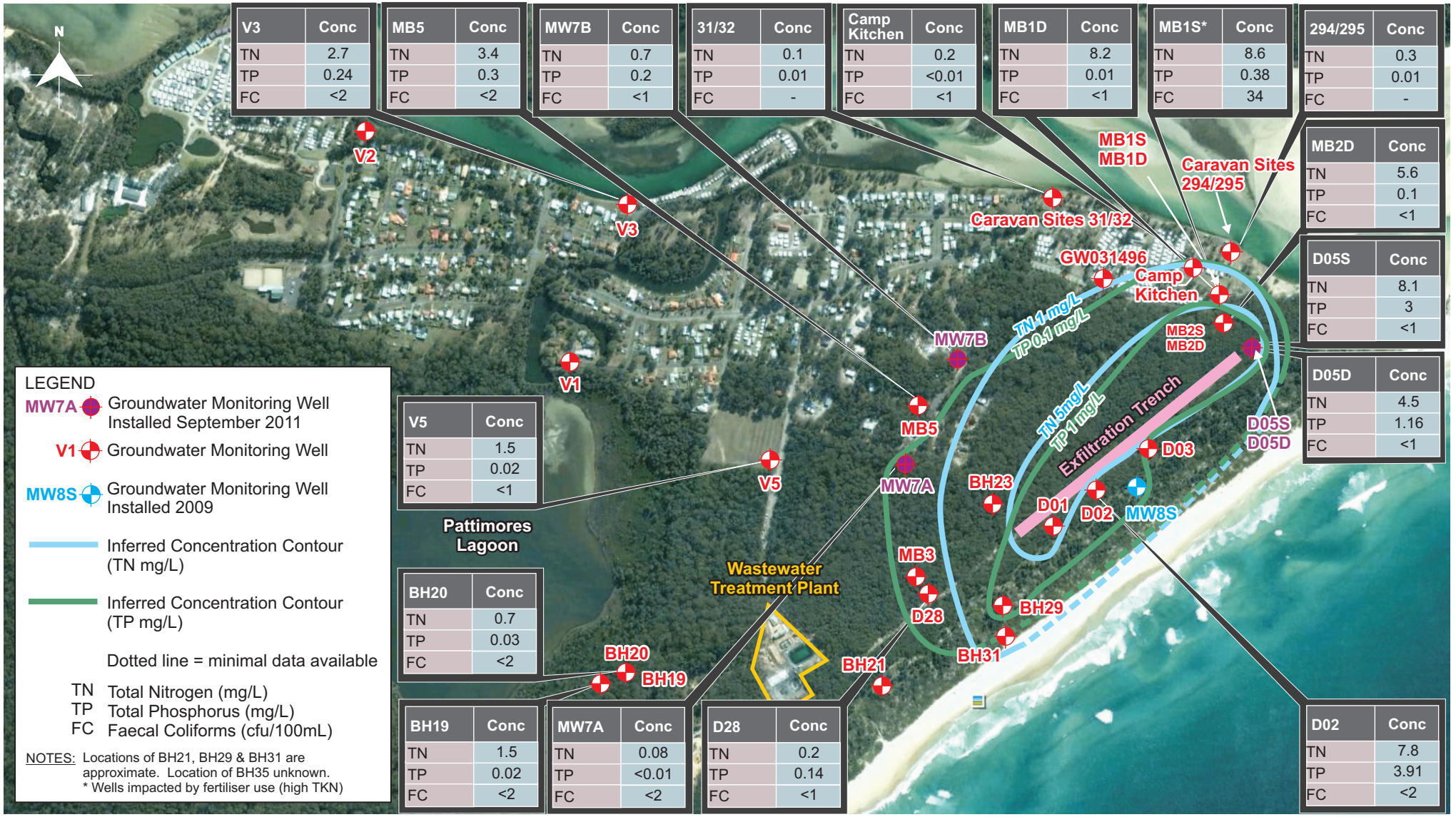

V3	Conc
TN	2.7
TP	0.24
FC	<2

MB5	Conc
TN	3.4
TP	0.3
FC	<2

MW7B	Conc
TN	0.7
TP	0.2
FC	<1

31/32	Conc
TN	0.1
TP	0.01
FC	-

Camp Kitchen	Conc
TN	0.2
TP	<0.01
FC	<1

MB1D	Conc
TN	8.2
TP	0.01
FC	<1

MB1S*	Conc
TN	8.6
TP	0.38
FC	34

294/295	Conc
TN	0.3
TP	0.01
FC	-

MB2D	Conc
TN	5.6
TP	0.1
FC	<1

D05S	Conc
TN	8.1
TP	3
FC	<1

D05D	Conc
TN	4.5
TP	1.16
FC	<1

V5	Conc
TN	1.5
TP	0.02
FC	<1

BH20	Conc
TN	0.7
TP	0.03
FC	<2

BH19	Conc
TN	1.5
TP	0.02
FC	<2

MW7A	Conc
TN	0.08
TP	<0.01
FC	<2

D28	Conc
TN	0.2
TP	0.14
FC	<1

D02	Conc
TN	7.8
TP	3.91
FC	<2

SUMMARY OF GROUNDWATER POLLUTANTS (20-2-2017)

SHOALHAVEN WATER - CONJOLA REGIONAL SEWERAGE SCHEME

Date: *May 2017*

Reference: *E2W_130_06.cdr*

Figure 3E

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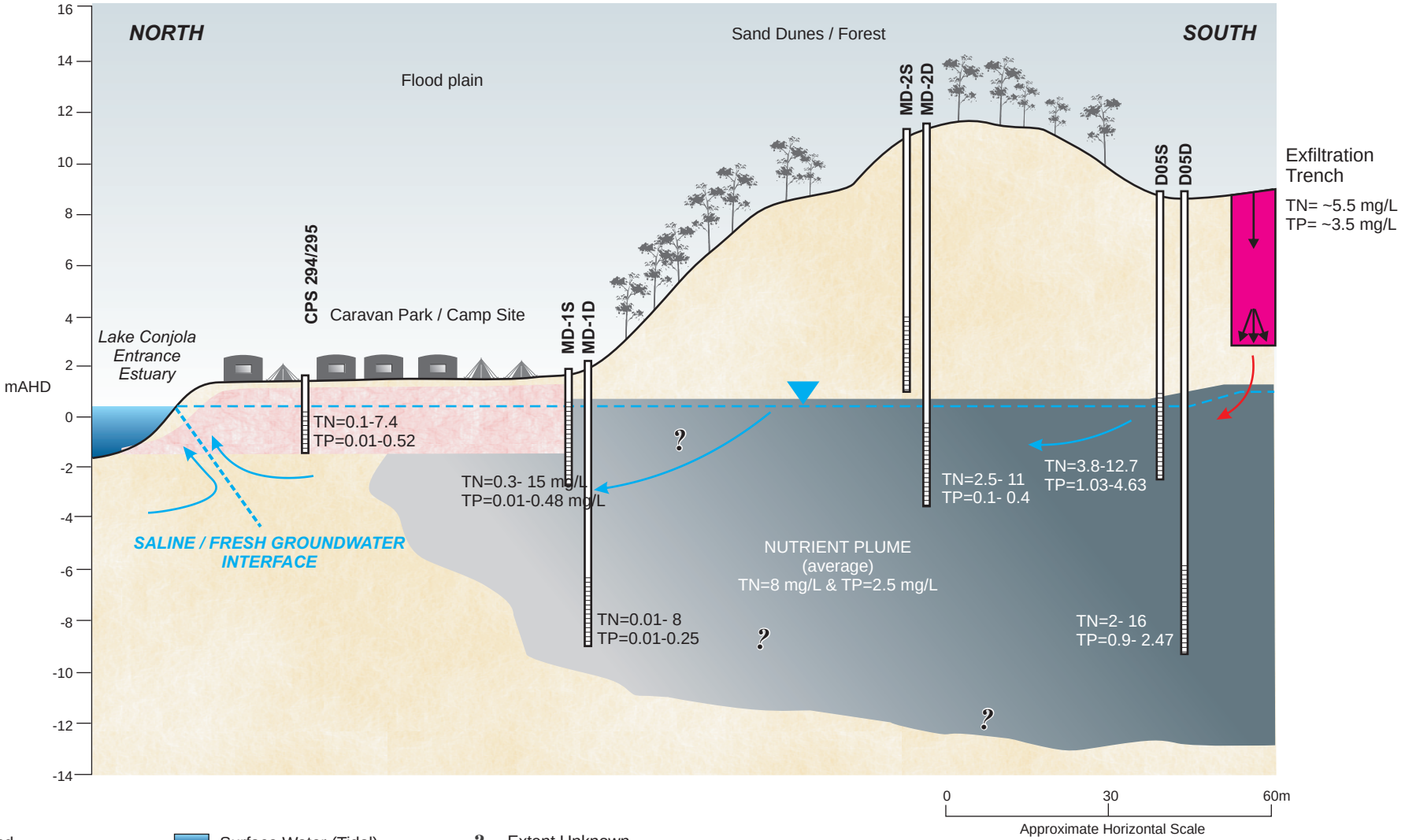

LEGEND

- Sand
- Monitoring Well
- Well Screen Interval
- Surface Water (Tidal)
- Potential Fertiliser Impact
- Groundwater Level
- ? Extent Unknown
- TN / TP 2008-2017 Monitoring Data all concentrations in mg/L

INFERRED HYDROGEOLOGICAL SECTION (2017)

SHOALHAVEN WATER - CONJOLA REGIONAL SEWERAGE SCHEME

Figure 4

Date: *May 2017*

Reference: *E2W_130_10.cdr*

Tables

Table 1: Caravan Park sites 31/32 - field parameters and analytical results

				Caravan Park sites 31/32 (764)																												
			Date	19/03/2008	24/06/2008	23/09/2008	9/12/2008	3/02/2009	17/03/2009	14/04/2009	19/05/2009	23/06/2009	15/01/2010	19/04/2010	12/07/2010	19/10/2010	31/01/2011	18/04/2011	26/07/2011	17/10/2011	9/01/2012	7/05/2012	21/08/2012	15/10/2012	29/04/2013	5/08/2013	18/11/2013	13/01/2014	8/02/2016	20/02/2017
	Units		Time	9.40 am	9.21 am	12.30 pm	10.50 am	-	10.50 am	10.20 am	-	10.35 am	12.14 pm	10.47 am	11.14 am	10.29 am		11.28 am	11.05 am	11.09 am	11.01 am	11.04 am	10.55 am	10.59 am	10.55 AM	-	11.00	10.45 AM		
Field Parameters																																
Ground RL	m AHD			-																												
Stick-up	m			-																												
Well RL	m AHD			-																												
SWL	mtoc			-	-	-	0	-	-	0	-	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
SWL	mbgl			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
SWL	m AHD			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
pH	pH unit			7.22	6.98	7.01	6.96	7.04	7.2	7.03	7.4	6.98	7.3	7.18	7.16	7.12		7.2	7.47	6.91	6.33	7.15	7.86	6.91	Not	Not	Not	6.77		8.21		
EC	µS/cm			472	427	528	557	518	448	436	471	544	697	785	506	503		439	388	855	563	542	335	673	Sampled	Sampled	Sampled	416		6418		
Temp.	°C			19.9	19.25	18.05	18.32	18.94	19.26	19.91	19.76	19.45	21.46	19.96	19.35	18.17		20.48	18.6	22.82	31.97	23.75	17.9	28.19	-	-	-	32.24		23.11		
DO	mg/L			0.4	7.98	2.3	1.59	0.6	1.3	1.94	2.2	2.01	1.4	1.3	1.6	0.2		2.8	2.5	2.3	2.2	3.5	3.5	2.5	-	-	-	1.6		8.96		
DO	%												16.2	14.5	17.6	2.5		30.7	27.1	26.2	30.4	41.6	36.8	31.7	-	-	-	21.9		107		
Turbidity	NTU			-	22.7	11	-	5.4	6.7	46.8	0.7	37	8.5	-0.1	0	0		7	0	0	0	3.6	11.6	8.1	-	-	-	0.19		13.9		
Salinity	mg/L			-	0.28	0.34		0.33	0.3	0.27	0.59	0.24	0.41	0.45	0.33	0.34		0.27	0.25	0.47	0.33	0.32	0.23	0.38	-	-	-	19				
Colour	-			Red/orange	Clear	Straw	Clear	-	Clear	Turbid	Clear	Clear	-	-	-	-		Clear	Clear	-	-	-	-	-	-	-	-	-	-				
Odour				H2S	Slight H2S	-	Slight H2S	-	H2S	H2S	None	None	-	H2S	-	-		H2S	H2S	-	-	-	-	-	-	-	-	-	-				
Laboratory Analyses																															**Statistics**	
		NHMRC (2004) AWDG	ANZECC (2000) marine ecosystem	ANZECC (2000) freshwater ecosystem																											Min	Max	Ave	Std. Dev.	Median
pH	pH unit	6.5 - 8.5			7.2	7.3	7.3	7.2	7.5	7.3	7	7.7	7.2		7.12	7.35	6.99	7.2	7.53	7.5	7.06	7.06	7.49	7.76	7.55	-	-	-				6.99	7.76	7.32	0.23	7.30
TDS	mg/L														450	296	272	276	288	226	514	362	340	198	370	-	-	-	318		370	198	514	325.83	89.62	307.00
Total Suspended Solids	mg/L				3	3	1	1	1	10	6	2	1													-	-	-		<5	<5	1	10	3.11	3.06	2.00
BOD5	O2 mg/L				2	2	2	2	2	2	2	2	2		9	2	2	4	2	2	30	87	2	2	21	-	-	-	97	<2	<2	2	97	13.24	27.20	2.00
Nutrients																																			
Ammonia	mg/L	0.5 #	0.91	0.9	0.44	0.39	**0.64**	0.33	0.32	0.23	0.29	0.02	0.3		0.32	0.25	0.28	0.29	0.3	0.26	0.05	0.01	0.42	0.29	0.05	-	-	-	0.01	0.1	0.05	0.01	0.91	0.30	0.24	0.29
Nitrate (NO3 as N)	mg/L	50		0.7	0.05	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.01		0.02	0.01	0.04	0.3	0.02	0.06	0.04	0.01	3.85	0.01	0.01	-	-	-	0.03	0.05	0.06	0.01	50	2.22	9.98	0.04
Nitrite (NO3 as N)	mg/L	3			0.008	0.002	0.004	0.002	0.002	0.002	0.002	0.002	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	<0.01	0.002	3	0.14	0.64	0.01
Total Kjeldahl Nitrogen	mg/L				0.8	0.64	0.68	0.61	0.43	0.42	0.62	0.11	0.5		0.7	0.6	0.5	0.4	0.8	0.6	0.7	1.9	1.5	2.4	0.5	-	-	-	1.5	0.5	<0.1	0.11	2.4	0.79	0.54	0.62
Total Nitrogen	mg/L		0.3^^^	0.5^	0.79	0.64	0.68	0.61	0.43	0.42	0.62	0.11	0.5		0.7	0.6	0.5	0.7	0.8	0.7	0.7	1.9	5.4	2.4	0.5	-	-	-	1.5	0.6	0.1	0.1	5.4	0.95	1.10	0.68
Total Phosphorus	mg/L		0.03^^^	0.05^	0.06	0.02	0.07	0.06	0.05	0.3	0.03	0.05	0.05		0.14	0.05	0.01	0.01	0.01	0.03	0.06	0.18	0.01	2.1	0.06	-	-	-	0.14	0.01	0.01	0.01	2.1	0.15	0.43	0.05
Enterococcus	cfu/100 mL	Not detected			2	2	2	2	20	2	2	2	2		2	2	2	2	2	2	2	4	2	2	2	-	-	-	-	-	-	2	20	3.00	4.03	2.00
Thermotolerant (Faecal) Coliforms	cfu/100 mL	Not detected	150*	150*	4	2	2	2	90	2	2	2	8		2	2	2	2	2	2	2	42	2	2	2	-	-	-	-			2	90	8.80	21.10	2.00
Total Coliforms	cfu/100 mL	Not detected			20	2	2	2	120	42	120	40	11		2	2	360	2	2	2	2	88	4	2	4 (app)	-	-	-	150			2	360	48.75	87.38	3.00
Major Ions																																			
Bicarbonate as CaCO3	CaCO3/L				110	100	110	110	110	120	110	290	120		107	119	125	1	1	1	112	114	107	108	111	-	-	-	103			1	290	104.24	58.33	110.00
Barium	mg/L	0.7			0.006	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			0.006	0.7	0.35	0.49	0.35
Bromide	mg/L				0.02	0.2	0.4	0.17	0.14	0.18	0.12	0.03	0.06		0.4	0.1	0.3	0.2	0.2	0.3	0.7	0.25	0.3	0.1	0.4	-	-	-	0.2			0.02	0.7	0.23	0.16	0.20
Calcium	mg/L				38	50	40	39	45	60	43	9.6	52		52	57	49	54	46	33	50	42	43	44	50	-	-	-	43			9.6	60	44.74	10.41	45.00
Chloride	mg/L	250 #			92	59	99	90	85	37	59	200	74		162	**638**	71.1	62.3	48	39	203	98.2	92	28	144	-	-	-	-			28	638	119.03	131.97	87.50
Chlorine Free Residual	mg/L	5 (0.6 #)		0.003				0.02	0.01	0.05	0.01	0.04		0.04	0.02	0.07	0.05	0.03	0.01	0.07	0.04	0.05	0.02	0.01	-	-	-				0.003	0.07	0.03	0.02	0.03
Iron	mg/L	0.3 #			**0.59**	**0.54**	**0.82**	**0.81**	**0.99**	**0.86**	**0.7**	0.01	**0.42**		**1.18**	**1.09**	**0.75**	**2.32**	**1.52**	**0.73**	**1.25**	**1.62**	**1.31**	**0.73**	**0.73**	-	-	-	**0.12**			0.01	2.32	0.91	0.52	0.81
Magnesium	mg/L				8.2	6.6	8.1	8.8	8.9	8	9.1	19	6.3		11	7	7	6	5	6	12	7	7	4	10	-	-	-	6			4	19	8.14	3.15	7.00
Potassium	mg/L				3	2.1	2.7	2.7	2.4	2	2.3	4.2	2.2		5	3	6	4	4	5	6	5	4	5	6	-	-	-	5			2	6	3.89	1.39	4.00
Selenium	mg/L	0.01		0.018	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	0.01	0.01	0.01	0.01	0.01	0.01	-	-	-	0.01			0.01	0.018	0.01	0.00	0.01
Sodium	mg/L	180			42	26	42	48	39	29	28	97	35		84	24	38	23	25	29	105	48	48	12	64	-	-	-	38			12	180	50.18	37.59	38.50
Sulphate	mg/L	250			45	42	23	22	16	49	36	22	27		21.6	28.5	23.6	39	18	22	1	4.09	15	13	1	-	-	-	10			1	250	33.13	50.24	22.00

Notes:

Red numbers denote value is <LOR

Individual and median values compared to the trigger values

^ Ecosystem protection (lowland river)

^^^ Ecosystem protection (estuaries)

* Recreational water quality guideline value

Aesthetic guideline value

$$ ProUCL Version 3.0

Bold text = exceeds ADWG trigger value

Bold outline = exceeds marine trigger value

Yellow shading = exceeds freshwater trigger value

Free Chlorine field test (17/10/2012) using Palintest pooltest 25 professional Plus photometer

Table 2: Caravan Park sites 294/295 - field parameters and analytical results

Caravan Park sites 294/295 (763)

	Units			Date	19/03/2008	24/06/08	23/09/08	9/12/08	3/02/09	17/03/2009	14/04/2009	19/05/2009	23/06/09	29/09/09	15/01/10	19/04/2010	12/07/2010	19/10/2010	31/01/2011	18/04/2011	26/07/2011
				Time	9.27 am	9.05 am	12.25 pm	10.30 am	9.35 am	10.45 am	10.10 am	-	10.15 am	10.12 am	11.54 am	11.00 am	11.01 am	10.16 am		11.15 am	10.54 am
Field Parameters																					
Ground RL	m AHD																	-			
Stick-up	m																	-			
Well RL	m AHD																	-			
SWL	mtoc				-	-	-	0	-	Dry	Dry	-	-	-	-	-	-	-		-	-
SWL	mbgl				-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-
SWL	m AHD				-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-
pH	pH unit				7.76	7.17	7.25	7.18	7.21	-	-	Bore broken	7.17	7.46	7.01	7.6	7.43	7.47		7.54	7.74
EC	µS/cm				1095	1012	1096	1223	1194	-	-		1234	1262	3861	1216	12000	1169		1124	1252
Temp.	°C				19.78	19.35	17.95	18.15	19.05	-	-		19.5	17.9	26.02	20.27	19.31	17.81		20.8	19.52
DO	mg/L				2.65	4.5	3.3	1.3	0.39	-	-		1.63	1.6	2.7	1.8	1.9	0.9		3.9	4.2
DO	%													16.6	33.4	19.1	21.1	8.7		43.2	45.5
Turbidity	NTU				-	11	235	-	7.9	-	-		2.1	17.6	16.7	0.5	0	21.5		0.2	7.8
Salinity	mg/L				-	0.58	0.3	-	0.69	-	-		0.61	0.73	2.13	0.69	0.68	0.68		0.63	0.7
Colour					Clear	Clear	Clear	Clear	-	-	-		-	-	-	-	-	Reddy/orange		Clear	Clear
Odour					None	H2S	None	Slight H2S	-	-	-		-	-	-	H2S	-	H2S		None	H2S
Laboratory Analyses																					
		NHMRC (2004) ADWG	ANZECC (2000) marine ecosystem	ANZECC (2000) freshwater ecosystem																	
pH	pH unit	6.5 - 8.5			8.3	7.6	7.8	7.7	7.8				7.6			7.5	7.45	7.47	7.4	7.76	7.79
TDS	mg/L															768	638	636	656	576	696
Total Suspended Solids	mg/L				3	10	6	7	1				1								
BOD5	O2 mg/L				2	2	2	2	2				2			3	7	2	6	2	2
Nutrients																					
Ammonia	mg/L	0.5 #	0.91	0.9	0.35	0.3	0.35	0.25	0.47				0.4			0.28	0.25	0.29	0.28	0.3	0.31
Nitrate (NO3 as N)	mg/L	50		0.7	0.04	0.04	0.04	0.04	0.04				0.01			0.22	0.01	0.03	1.16	0.01	0.02
Nitrite (NO3 as N)	mg/L	3			0.004	0.002	0.002	0.002	0.002				0.01			0.01	0.01	0.01	0.01	0.01	0.01
Total Kjeldahl Nitrogen	mg/L				0.7	0.59	0.87	0.79	0.78				1			0.6	0.6	2.4	0.4	0.5	0.6
Total Nitrogen	mg/L		0.3^^^	0.5^	0.71	0.89	0.87	0.79	0.78				1			0.8	0.6	2.4	1.6	0.5	0.6
Total Phosphorus	mg/L		0.03^^^	0.05^	0.06	0.01	0.09	0.07	0.06				0.06			0.03	0.03	0.01	0.06	0.01	0.04
Enterococcus	cfu/100 mL	Not detected			2	2	8	2	30				2			2	2	2	2	2	2
Thermotolerant (Faecal) Coliforms	cfu/100 mL	Not detected	150*	150*	2	2	2	2	62				4			2	2	2	2	2	2
Total Coliforms	cfu/100 mL	Not detected			2	2	2	2	64				18			2	2	2	2	8	4
Major Ions																					
Bicarbonate as CaCO3	CaCO3/L				300	370	330	390	390				390			348	300	304	1	1	1
Barium	mg/L	0.7			0.01	-	-	-	-				-			-	-	-			
Bromide	mg/L				0.01	0.7	1.3	0.17	0.12				0.05			0.6	0.6	0.8	0.6	1	1
Calcium	mg/L				100	120	110	120	100				130			118	102	113	108	94	105
Chloride	mg/L	250 #			170	130	150	180	130				170			191	185	178	195	187	231
Chlorine Free Residual	mg/L	5 (0.6 #)		0.003	-	-	-	0.04	0.04				-			0.08	0.04	0.05	0.09	0.08	0.02
Iron	mg/L	0.3 #			0.05	0.01	0.16	0.14	0.01				0.05			0.14	0.12	0.05	**2.26**	**1.03**	**0.6**
Magnesium	mg/L				20	24	23	24	26				26			27	22	24	24	23	26
Potassium	mg/L				4.1	3.7	3.8	3.5	4				4.2			5	4	4	4	4	5
Selenium	mg/L	0.01		0.018	0.01	0.01	0.01	0.01	0.01				0.01			0.01	0.01	0.01	0.01	0.01	0.01
Sodium	mg/L	180			88	68	72	86	82				84			97	95	105	93	98	107
Sulphate	mg/L	250			3.1	42	37	47	39				42			51	41	38.8	48.8	32	33

	Units	17/10/2011	9/01/2012	7/05/2012	21/08/2012	15/10/2012	29/04/2013	5/08/2013	18/11/2013	13/01/2014	14/07/2014	3/11/2014	20/01/2015	19/08/2015	14/10/2015	8/02/2016	25/07/2016	18/10/2016	20/02/2017	Min	Max	Ave	Std. Dev.	Median
	Time	10.58 am	10.46 am	10.47 am	10.45 am	10.50 am	10:55 AM	10:54 AM	11:08	-														
Field Parameters																								
Ground RL	m AHD																							
Stick-up	m																							
Well RL	m AHD																							
SWL	mtoc	-	-	-	-	-	-	-	-	-														
SWL	mbgl	-	-	-	-	-	-	-	-	-														
SWL	m AHD	-	-	-	-	-	-	-	-	-														
pH	pH unit	7.22	6.9	7.85	8.13	7.51	7.32	7.32	7.28	7.56		7.45	7.82	7.93	8.7				8.15					
EC	µS/cm	1246	1261	1292	1229	1335	1380	2160	1142	1235		1452	1301	201	179				6404					
Temp.	°C	22.86	25.06	19.34	17.74	27.88	27.48	26.23	18.29	25.41		18.74		13.99	18.6				22.99					
DO	mg/L	2.9	2.6	3.6	4.3	2.7	3.3	2.1	4.8	2.3		3.7	3.2						8.57					
DO	%	34.2	32.1	39	45	34.8	42.7	25.7	52.7	28.7		41	38						102.1					
Turbidity	NTU	0.5	0	1.4	13	10	0	0	39.9	4.3		1.6	4.7	3.1					14					
Salinity	mg/L	0.7	0.72	0.73	0.71	0.72	0.75	1.16	0.83	0.61														
Colour		-	-	-	-	-	-	-	-	-														
Odour		-	-	-	-	-	-	-	-	-														
Laboratory Analyses																				**Statistics**				
pH	pH unit	7.37	7.32	7.86	7.93	7.95	-	-	-	-										7.32	8.30	7.68	0.26	7.70
TDS	mg/L	736	856	760	700	788	910	1190	676	699	648									576.00	1190.00	752.33	148.94	700.00
Total Suspended Solids	mg/L						-	-	-	-		<5	14	<5	<5	<5	<5	9	<5	1.00	10.00	4.67	3.61	4.50
BOD5	O2 mg/L	98	186	2	2	2	96	9	2	34	24	<2	26	<2	<2	<2	<2	<2	<2	2.00	186.00	22.14	47.17	2.00
Nutrients																								
Ammonia	mg/L	0.01	0.01	0.36	0.18	0.02	0.01	0.01	0.11	0.01	0.12	0.4	0.08	0.02	0.02	<0.01	0.01	0.03	0.15	0.01	0.91	0.23	0.23	0.25
Nitrate (NO3 as N)	mg/L	0.05	1.63	5.77	0.01	0.01	0.01	0.01	0.01	0.03	0.11	0.02	0.02	0.12	0.03	0.05	0.04	<0.01	0.07	0.01	5.77	0.35	1.09	0.04
Nitrite (NO3 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	0.12	<0.01	<0.01	<0.01	<0.01	<0.01	0.00	0.12	0.01	0.02	0.01
Total Kjeldahl Nitrogen	mg/L	1.4	1.7	1.6	1	0.5	1.1	0.9	0.4	1.4	2.9	0.9	1.4	<0.1	<0.1	0.2	<0.1	<0.1	0.2	0.20	2.90	0.98	0.64	0.83
Total Nitrogen	mg/L	1.4	3.3	7.4	1	0.5	1.1	0.9	0.4	1.4	3	0.9	1.4	0.1	0.1	0.2	0.1	0.1	0.3	0.10	7.40	1.17	1.41	0.84
Total Phosphorus	mg/L	0.01	0.08	0.01	0.52	0.05	0.06	0.07	0.03	0.14	0.19	0.05	0.14	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.52	0.06	0.10	0.05
Enterococcus	cfu/100 mL	2	6	2	6	2	-	-	-	-	-	-	-	-		-	-	-	-	2.00	30.00	4.47	6.84	2.00
Thermotolerant (Faecal) Coliforms	cfu/100 mL	18	600	2	14	2	-	-	-	-	<1	~ 8	16	<1	<1	<1	<1	<1		2.00	600.00	41.00	140.26	2.00
Total Coliforms	cfu/100 mL	22	960	2	22	2	17000	2	2	2										2.0	17000.0	863.0	3703.3	2.0
Major Ions																								
Bicarbonate as CaCO3	CaCO3/L	263	347	315	330	313	-	-	-	295										1.00	390.00	277.11	131.97	314.00
Barium	mg/L						-	-	-	-										0.01	0.01	0.01	#DIV/0!	0.01
Bromide	mg/L	0.9	0.48	0.8	0.6	0.9	-	-	-	0.7										0.01	1.30	0.63	0.36	0.65
Calcium	mg/L	113	102	112	103	118	-	-	-	109										94.00	130.00	109.83	9.12	109.50
Chloride	mg/L	239	217	248	216	266	-	-	-	-										130.00	266.00	193.12	39.02	187.00
Chlorine Free Residual	mg/L	0.04	0.05	0.03	0.03	0.11	-	-	-	-										0.00	0.11	0.05	0.03	0.04
Iron	mg/L	**0.37**	**1.98**	0.23	**0.46**	0.11	-	-	-	0.05										0.01	2.26	0.43	0.67	0.14
Magnesium	mg/L	29	26	25	26	26	-	-	-	20										20.00	29.00	24.50	2.33	24.50
Potassium	mg/L	5	5	6	5	6	-	-	-	5										3.50	6.00	4.52	0.75	4.15
Selenium	mg/L	0.01	0.01	0.01	0.01	0.01	-	-	-	0.01										0.01	0.02	0.01	0.00	0.01
Sodium	mg/L	120	107	121	119	115	-	-	-	124										68.00	124.00	98.94	17.01	97.50
Sulphate	mg/L	13	8.98	30	32	1	-	-	-	57										1.00	57.00	33.15	16.38	37.90

Notes:

Red numbers denote value is <LOR

Individual and median values compared to the trigger values

^ Ecosystem protection (lowland river)

^^^ Ecosystem protection (estuaries)

* Recreational water quality guideline value

Aesthetic guideline value $$ ProUCL Version 3.0

Bold text = exceeds ADWG trigger value

Bold outline = exceeds marine trigger value

Yellow shading = exceeds freshwater trigger value

Free Chlorine field test (17/10/2012) using Palintest pooltest 25 professional Plus photometer

Earth2Water Pty Ltd

Table 3: GW031496 - field parameters

		GW031496 (762)											
Date		19/03/2008	24/06/2008	9/12/2008	3/02/2009	19/05/2009	23/06/2009	29/09/2009	19/04/2010	31/01/2011	18/04/2011	26/07/2011	17/10/2011
Time	Units	-	12.14 pm	-	1.30 pm	-	12.56 pm	12.25 pm	10.34 am				
Field Parameters													
Ground RL	m AHD	2.62											
Stick-up	m	0.31											
Well RL	m AHD	2.93											
SWL	mtoc	Dry	2.21	Dry	2.395	2.195	Dry	Dry	-				
SWL	mbgl	-	1.9	-	2.085	1.885	-	-	-				
SWL	m AHD	-	0.72	-	0.535	0.735	-	-	-				
pH	pH unit	-	-	-	-	-	-	-	6.75				
EC	µS/cm	-	-	-	-	-	-	-	1244				
Temp.	°C	-	-	-	-	-	-	-	20				
DO	mg/L	-	-	-	-	-	-	-	0.5				
DO	%								5.4				
Turbidity	NTU	-	-	-	-	-	-	-	0				
Salinity	mg/L	-	-	-	-	-	-	-	0.7				
Colour		-	-	-	-	-	-	-	-				
Odour		-	-	-	-	-	-	-	H2S				

Prepared by: DF
Checked by: DP

Table 4: MB1S - field parameters and analytical results

					MB1SHALLOW (761)																	
				Date	19/3/08	24/6/08	23/9/08	9/12/08	3/2/09	17/3/09	14/4/09	19/5/09	23/6/09	29/9/09	12/1/10	29/3/10	19/4/10	12/7/10	22/9/10	19/10/10	31/1/11	18/4/11
	Units			Time	8.20 am	12.00 pm	11.43 am	9.40 am	8.45 am	9.50 am	9.00 am	-	9.30 am	9.21 am	10.13 am		9.47 am	10.07 am		9.17 am		10.23 am
Field Parameters																						
Ground RL	m AHD				1.57																	
Stick-up	m				0.72																	
Well RL	m AHD				2.29																	
SWL	mtoc				1.775	1.57	1.727	1.685	1.71	1.73	0.67 ~~	1.55	1.6	1.61	1.68	1.662	1.64	1.5	1.548	1.6		1.34
SWL	mbgl				1.055	0.85	1.007	0.965	0.99	1.01	-0.05 ~~	0.83	0.88	0.89	0.96	0.942	0.92	0.78	0.828	0.88		0.62
SWL	m AHD				0.515	0.72	0.563	0.605	0.58	0.56	1.62 ~~	0.74	0.69	0.68	0.61	0.628	0.65	0.79	0.742	0.69		0.95
pH	pH unit				7.64	7.21	7.35	7.21	7.41	7.34	7.19	7.72	7.56	7.6	7.62		6.7	7.14		7.29		6.83
EC	µS/cm				1198	1053	1200	1466	1350	1302	2372	1080	1186	1192	1328		1329	1951		2188		7773
Temp.	°C				18.92	17.93	16.6	18.11	18.33	18.9	18.89	18.4	18	17.32	18.78		19.5	17.76		17.15		20.16
DO	mg/L				0.22	1.35	4.5	1.88	0.28	0.29	0.43	0.7	0.14	0.3	0.2		0.76	0.6		8.4		1.4
DO	%													2.8	2.1		27.1	6		87.9		15.8
Salinity	mg/L				-	0.6	0.71	-	0.76	0.75	1.33	0.96	0.59	0.68	0.74		0.76	1.09		1.25		4.46
Turbidity	NTU				-	4.1	2.7	-	4.9	18.4	17	-	1.5	0.2	0		10	3.1		3.4		82.3
Colour					-	Clear	Clear	Yellow tinge	-	Clear	Turbid	-	Clear	Clear	-		-	-		-		Black
Odour					None	Slight H2S	-	Slight H2S	-	None	H2S	None	None	H2S	None		H2S	-		-		H2S
Laboratory Analyses																						
		ANZECC (2000) irrigation #	ANZECC (2000) marine ecosystem	ANZECC (2000) freshwater ecosystem																		
pH	pH unit				8.3	7.5	7.3	7.8	7.7	7.6	7.4	7.5	7.6				7.41	7.38		7.34	7.2	7.15
TDS	mg/L																1640	1070		1360	1120	5030
Total Suspended Solids	mg/L				2	5	1	5	6	3	1	3	9									
BOD5	O2 mg/L				2	2	2	2	2	2	2	2	2				6	5		2	2	31
Nutrients																						
Ammonia	mg/L		0.91	0.9	0.15	0.13	0.06	0.02	0.05	0.08	0.06	0.02	0.1				0.09	0.16		0.21	0.17	0.25
Nitrate (NO3 as N)	mg/L			0.7	0.04	0.04	0.04	0.04	0.04	0.04	1.9	0.04	0.01				0.24	0.03		0.07	0.02	0.01
Nitrite (NO3 as N)	mg/L				0.004	0.002	0.002	0.002	0.005	0.002	0.02	0.002	0.01				0.15	0.01		0.01	0.01	0.03
Total Kjeldahl Nitrogen	mg/L				0.6	0.52	0.41	0.74	0.3	0.31	0.84	0.29	0.3				0.7	0.5		1.3	0.6	8.6
Total Nitrogen	mg/L	25 - 125 (5)	0.3^^^	0.5^	0.57	0.52	0.41	0.74	0.3	0.31	2.8	0.29	0.3				1.1	0.1		1.4	0.6	8.6
Total Phosphorus	mg/L	0.8 - 12 (0.05)	0.03^^^	0.05^	0.08	0.06	0.08	0.02	0.07	0.05	0.04	0.04	0.08				0.06	0.05		0.01	0.07	0.56
Reactive Phospherous			0.004	0.008																		
Enterococcus	cfu/100 mL				2	2	2	2	2	2	56	2	2				2	14		2	2	36
Thermotolerant (Faecal) Coliforms	cfu/100 mL		150*	150*	2	6	2	2	4	2	38	15	2				66	34		4	54	200
Total Coliforms	cfu/100 mL				2	53	2	2	16	6	54	1200	140				100	38		4	60	7200
Major Ions																						
Bicarbonate as CaCO3	CaCO3/L				270	270	310	300	280	280	350	300	290				369	387		360	1	1
Barium	mg/L				0.004	-	-	-	-	-	-	-	-				-	-		-	-	-
Bromide	mg/L				0.08	0.6	0.3	0.1	0.11	0.18	0.12	0.02	0.04				1.4	1.1		1.8	1.3	25
Calcium	mg/L				80	8.3	100	100	92	100	110	80	92				129	125		134	99	202
Chloride	mg/L	<175 **			190	220	210	290	300	250	350	240	200				483	410		466	458	2080
Chlorine Free Residual	mg/L			0.003	-	-	-	0.02	0.02	0.08	0.04	0.03	-				0.06	0.05		0.08	0.07	0.02
Iron	mg/L	10 (0.2)			0.04	0.01	0.04	0.01	0.01	0.02	0.01	0.01	0.01				0.06	0.14		0.05	0.05	2.8
Magnesium	mg/L				25	23	22	22	20	24	32	20	22				57	42		44	40	176
Potassium	mg/L				6.8	5.4	4.9	5.1	4.7	5.1	6.3	4.9	4.8				9	8		10	11	62
Selenium	mg/L			0.018	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
Sodium	mg/L	<115 **			130	110	100	150	160	180	260	130	110				304	226		272	248	1320
Sulphate	mg/L				51	32	34	47	32	36	74	24	22				92.2	45.2		53.9	79.6	3

	26/7/11	17/10/11	9/1/12	7/5/12	21/8/12	15/10/12	29/4/13	5/8/13	18/11/13	13/1/14	14/7/14	3/11/14	20/1/15	19/8/15	######	8/2/16	25/7/16	######	20/2/17					
Time	10.05 am	9.58 am	10.16am	10.27 am	10.19 am	10.26 am	10:55 AM	10:15 AM	10.07 AM	-														
Field Parameters																								
SWL (mtoc)	1.27	1.5	1.5	1.4	1.4	1.3	1.18	1.47	1.43	1.44		1.46	1.38	1.37										
SWL (mbgl)	0.55	0.78	0.78	0.68	0.68	0.58	0.46	0.75	0.71	0.72		0.74	0.66	0.65										
SWL (m AHD)	1.02	0.79	0.79	0.89	0.89	0.99	1.11	0.82	0.86	0.85		0.83	0.91	0.92										
pH	7.3	7.4	7.14	7.23	7.75	7	7.35	7.3	5.98	7.74		7.18	7.54	7.78					7.53					
EC	1804	1840	1710	3520	1872	3398	2922	3225	4893	1235		5532	5082	2939					8000					
Temp.	17.14	16.9	21	17.5	16.67	17.93	20.07	17.8	19.68	20.8				17.33					19.66					
DO (mg/L)	8.9	0.5	4.3	3.5	4	4.5	5.2	2.6	6.1	2.5		4.4	7.2	7.4					2.17					
DO (%)	92.5	4.9	48.2	37.6	41.2	47.8	58.5	27.5	69.3	28.4		47	80	78					24.3					
Salinity	1.01	1.05	0.95	2.2	1.05	1.89	1.59	24	5.24	0.62									111					
Turbidity	600	0	0	1.97	12.7	10.8	1.59	1.8	51.8	0.8														
Colour	Reddy/orange	Clear	-	-	-	-	-	Reddy/orange	Reddy/orange	-														
Odour	None	-	-	-	-	-	-	-	-	Rotten														
Laboratory Analyses																				Statistics				
																				Min	Max	Ave	Std. Dev.	Median
pH	7.29	7.36	7.43	7.45	7.74	7.41	-	-	-											7.15	8.3	7.49	0.26	7.42
TDS	2090	1430	1020	2720	1140	2470	2030	2110	3490	679	366									679	5030	1959.93	1136.59	1640
Total Suspended Solids							-	-	-			21	14	24	17	44	28	17	95	1	9	3.89	2.62	3
BOD5	2	2	21	5	2	9	5	4	3	2	<2	<2	6	3	7	4	3	7	5	2	31	4.96	6.88	2
Nutrients																								
Ammonia	0.01	0.24	0.15	0.75	0.88	0.1	0.39	0.37	0.22	0.16	<0.01	0.55	0.27	0.48	0.13	0.02	0.61	2.22	0.42	0.01	2.22	0.30	0.41	0.15
Nitrate (NO3 as N)	0.01	0.01	1.27	0.01	0.01	0.01	0.01	0.01	2.04	0.01	0.34	<0.01	<0.01	0.03	<0.01	1.74	<0.01	<0.01	<0.01	0.01	2.04	0.30	0.63	0.035
Nitrite (NO3 as N)	0.04	0.01	0.07	0.01	0.01	0.1	0.01	0.01	1.4	0.01	<0.01	<0.01	<0.01	0.03	<0.01	<0.01	<0.01	<0.01	<0.01	0.002	1.4	0.08	0.28	0.01
Total Kjeldahl Nitrogen	9.4	1.6	2.3	7.5	2.8	9.9	8.4	6.4	9.7	0.8	1	7.7	6.2	3.5	7.7	15.1	8.4	7.3	8.6	0.29	15.1	4.25	4.12	0.82
Total Nitrogen	9.4	1.6	3.6	7.5	2.8	9.9	8.4	6.4	13.1	0.8	1.3	7.7	6.2	3.5	7.7	16.8	8.4	7.3	8.6	0.1	16.8	4.52	4.38	1.25
Total Phosphorus	1.13	0.13	0.24	0.48	0.33	0.48	0.43	0.38	0.15	0.1	0.09	0.26	0.18	0.18	0.32	0.26	0.33	0.29	0.38	0.01	1.13	0.22	0.23	0.08
Reactive Phospherous											-	-	-	-		-	-	-	-	0	0			
Enterococcus	170	2	58	2	2	2200 (app)	-	-	-	-					-					2	170	19.05	40.86	2
Thermotolerant (Faecal) Coliforms	130	8	8500	20	2	1400 (app)	170	-	-	-	<1	570	79	<1	<2	920	<1	<1	34	2	8500	452.67	1727.12	11.5
Total Coliforms	540	8	8500	7700	8	1700 (app)	-	11	970	4 (app)										2	8500	1267.33	2760.11	53
Major Ions																								
Bicarbonate as CaCO3	1	369	385	564	404	351	-	-	-	-										1	564	292.10	142.03	305
Barium	-	-	-	-	-	-	-	-	-	257										0.004	257	128.50	181.72	128.5
Bromide	6.9	2.4	1.35	6.9	1.7	5.2	-	-	-	0.5										0.02	25	2.72	5.53	1.1
Calcium	58	115	74	141	97	129	-	-	-	82										8.3	202	102.25	37.33	100
Chloride	828	597	288	897	352	998	-	-	-	-										190	2080	505.35	440.21	351
Chlorine Free Residual	-	0.01	0.02	0.03	0.17	0.07	-	-	-	-										0.01	0.17	0.05	0.04	0.04
Iron	3.98	0.2	0.3	1.6	0.61	2.69	-	-	-	0.05										0.01	3.98	0.60	1.15	0.05
Magnesium	47	58	36	82	43	66	-	-	-	31										20	176	44.38	34.59	36
Potassium	32	13	9	20	12	15	-	-	-	9										4.7	62	12.29	13.09	9
Selenium	0.01	0.01	0.01	0.01	0.01	0.01	-	-	-	0.01										0.01	0.01	0.01	0.00	0.01
Sodium	579	384	220	526	246	528	-	-	-	131										100	1320	300.67	274.16	226
Sulphate	10	40	72.1	8	64	22	-	-	-	100										3	100	44.86	27.32	40

Notes:

~~ The measured SWL (0.67 m, 1.62 m AHD) is an anomaly and has been excluded
Red numbers denote value is <LOR
^^ BOD (mg/L)
Individual and median values compared to the trigger values
^ Ecosystem protection (lowland river)
^^^ Ecosystem protection (estuaries)
* Recreational water quality guideline value
# Short term (<20 years) trigger values, with long term trigger values (<100 years) in brackets
** Salt-sensitive crops $$ ProUCL Version 3.0

Bold text = exceeds short term irrigation trigger value
Bold outline = exceeds marine trigger value
Yellow shading = exceeds freshwater trigger value

Free Chlorine field test (17/10/2012) using Palintest pooltest 25 professional Plus photometer

Table 5: MB1D - field parameters and analytical results

MB1DEEP (768)

	Units	ANZECC (2000) marine ecosystem	ANZECC (2000) freshwater ecosystem	19/3/08	24/6/08	23/9/08	9/12/08	3/2/09	17/3/09	14/4/09	19/5/09	23/6/09	29/9/09	12/1/10	29/3/10	19/4/10	12/7/10
Time				8.37 am	-	11.46 am	9.45 am	8.45 am	10.01 am	9.07 am	-	9.35 am	9.33 am	10.17 am		9.57 am	10.25 pm
Field Parameters																	
Ground RL	m AHD																
Stick-up	m																
Well RL	m AHD																
SWL	mtoc			1.94	-	1.86	1.875	1.95	2.01	1.85	1.735	1.79	1.885	1.85	1.83	1.81	1.72
SWL	mbgl			1.24	-	1.16	1.175	1.25	1.31	1.15	1.035	1.09	1.185	1.15	1.13	1.11	1.02
SWL	m AHD			0.52	-	0.6	0.585	0.51	0.45	0.61	0.725	0.67	0.575	0.61	0.63	0.65	0.74
pH	pH unit			7.5	-	7.31	7.11	7.23	7.23	7.23	7.66	7.38	7.52	7.54		6.75	7.97
EC	µS/cm			7920	-	7684	6581	6619	6296	6882	24700	24790	24200	23100		20600	1386
Temp.	°C			17.96	-	16.7	17.85	17.88	18.08	18.18	17.73	17.79	17.75	18.03		17.9	17.88
DO	mg/L			0.34	-	4.1	1.39	0.16	0.16	0.39	1.7	0.17	0.3	0.6		0.1	4.2
DO	%												3.2	6.2		1.5	44.5
Salinity	mg/L			-	-	4.49	-	3.84	3.63	4.01	15	15.06	14.58	9.65		12.3	0.79
Turbidity	NTU			-	-	14.5	-	21.3	15.7	3.1	-0.8	1.7	1.9	0		-0.1	3.6
Colour				-	-	Clear	-	-	Clear	Clear	-	Clear	Clear	-		-	-
Odour				None	-	-	-	-	None	None	-	None	None	-		H2S	-
Laboratory Analyses																	
pH	pH unit			8	7.6	7.3	7.7	7.5	7.5	7.4	7.6	7.6				7.72	7.80
TDS	mg/L															1160	848
Total Suspended Solids	mg/L			9	46	7	6	12	9	7	2	55					
BOD5	O2 mg/L			2	2	2	2	2	2	2	2	2				8	2
Nutrients																	
Ammonia	mg/L	0.91	0.9	0.03	0.26	0.02	0.02	0.02	0.02	0.02	0.02	0.1				0.01	0.02
Nitrate (NO3 as N)	mg/L		0.7	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.01				0.01	0.01
Nitrite (NO3 as N)	mg/L			0.002	0.002	0.002	0.003	0.002	0.002	0.002	0.002	0.01				0.01	0.01
Total Kjeldahl Nitrogen	mg/L			0.05	0.17	0.06	0.09	0.05	0.06	0.05	0.05	0.1 +				0.1	0.1
Total Nitrogen	mg/L	0.3^^^	0.5^	0.05	0.17	0.06	0.09	0.05	0.05	0.05	0.05	0.1				0.1	0.1
Total Phosphorus	mg/L	0.03^^^	0.05^	0.11	0.14	0.06	0.03	0.02	0.008	0.02	0.02	0.14				0.02	0.06
Reactive Phospherous	mg/L	0.004	0.008														
Enterococcus	cfu/100 mL			2	2	2	2	4	2	2	2	2				2	2
Thermotolerant (Faecal) Coliforms	cfu/100 mL	150*	150*	2	2	2	2	2	2	2	36	2				50	2
Total Coliforms	cfu/100 mL			2	28	2	2	2	2	2	20	120				140	2
Major Ions																	
Bicarbonate as CaCO3	CaCO3/L			240	230	340	350	320	350	340	340	240				342	282
Barium	mg/L			0.011	-	-	-	-	-	-	-	-				-	-
Bromide	mg/L			0.11	33	0.15	0.12	0.12	0.14	0.1	0.01	0.02				1.0	0.7
Calcium	mg/L			180	200	210	180	170	200	190	170	190				60	42
Chloride	mg/L			11000	11000	2200	2200	1100	500	2200	2000	7500				371	278
Chlorine Free Residual	mg/L		0.003	-	-	-	0.02	0.03	0.05	0.04	0.07	-				0.05	0.04
Iron	mg/L			0.04	0.51	0.08	0.72	0.01	0.89	0.81	0.14	0.32				0.16	0.19
Magnesium	mg/L			560	620	99	83	95	98	100	95	510				27	23
Potassium	mg/L			190	190	40	34	38	38	39	39	160				19	14
Selenium	mg/L		0.018	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01				0.01	0.01
Sodium	mg/L			4600	4800	1200	990	1000	1200	1000	990	10000				347	243
Sulphate	mg/L			1600	1300	210	170	170	2	180	160	1100				81.4	112

	Units	22/9/10	19/10/10	31/1/11	18/4/11	26/7/11	17/10/11	9/1/12	7/5/12	21/8/12	15/10/12	29/4/13	5/8/13	18/11/13	13/1/14
Time			9.31 am		10.32 am	10.12 am	10.05 am	10.37 am	10.35 am	10.27 am	10.28 am	-	10:22 AM	10:14 AM	9:55
Field Parameters															
Ground RL	m AHD	1.76													
Stick-up	m	0.7													
Well RL	m AHD	2.46													
SWL	mtoc	1.72	1.8		1.5	1.48	1.8	1.67	1.56	1.56	1.47	1.35	1.64	1.62	1.61
SWL	mbgl	1.02	1.1		0.8	0.78	1.1	0.97	0.86	0.86	0.77	0.65	0.94	0.92	0.91
SWL	m AHD	0.74	0.66		0.96	0.98	0.66	0.79	0.9	0.9	0.99	1.11	0.82	0.84	0.85
pH	pH unit		7.69		7.59	8.14	8.2	7.72	7.47	8.8	8.36	8.57	8.32	7.39	8.76
EC	µS/cm		18700		1014	11100	9400	1111	833	817	799	814	759	808	752
Temp.	°C		17.83		19.51	17.91	17.82	20.43	17.5	16.27	17.27	19.8	17.44	18.38	19.76
DO	mg/L		0.6		3.8	0.5	0.4	3.5	4.9	5.5	5	6.2	3.1	5.4	3.8
DO	%		5.5		41.4	5.7	4.7	38.8	51.2	56.1	51.7	67.7	32.8	57.7	41.4
Salinity	mg/L		11.02		0.59	6.29	5.27	0.63	0.48	0.5	0.46	0.46	0.45	0.67	0.36
Turbidity	NTU		0		~0.1	0	0	0	1.8	10.4	6.6	0	0	13.8	0.4
Colour			Clear		Clear	Clear	Clear	-	-	-	-	-	-	Clear	-
Odour			None		None	None	-	-	-	-	-	-	-	-	-
Laboratory Analyses															
pH	pH unit		7.71	7.1	7.66	8.05	8.07	7.5	8.09	8.17	8.14	-	-	-	-
TDS	mg/L		12200	594	532	494	480	560	456	478	442	500	392	415	409
Total Suspended Solids	mg/L											-	-	-	-
BOD5	O2 mg/L		2	2	4	2	2	4	2	2	2	2	2	2	2
Nutrients															
Ammonia	mg/L		0.1	0.1	0.01	0.01	0.01	0.08	0.02	0.02	0.01	0.01	0.01	0.01	0.01
Nitrate (NO3 as N)	mg/L		0.1	0.1	1.12	0.03	0.01	0.01	0.05	0.02	0.02	0.07	0.03	1.1	0.76
Nitrite (NO3 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
Total Kjeldahl Nitrogen	mg/L		0.2	0.01	0.2	0.2	0.3	1.1	0.2	0.1	0.2	0.1	0.1	0.5	0.2
Total Nitrogen	mg/L		0.3	0.01	1.3	0.2	0.3	1.1	0.2	0.1	0.2	0.2	0.1	1.6	1
Total Phosphorus	mg/L		0.01	0.07	0.01	0.02	0.03	0.16	0.03	0.12	0.08	0.06	0.03	0.04	0.05
Reactive Phospherous	mg/L														
Enterococcus	cfu/100 mL		2	2	2	2	2	12	2	2	8 (app)	-	-	-	-
Thermotolerant (Faecal) Coliforms	cfu/100 mL		2	2	6	2	2	4200	2	2	4 (app)	2	-	-	-
Total Coliforms	cfu/100 mL		2	14	40	2	2	4200	110	2	4 (app)	2	2	2 (app)	2
Major Ions															
Bicarbonate as CaCO3	CaCO3/L		234	1	1	1	176	225	175	185	141	-	-	-	-
Barium	mg/L		-	-	-	-	-	-	-	-	-	-	-	-	131
Bromide	mg/L		23.9	0.4	0.5	0.2	0.2	0.48	0.2	0.1	0.2	-	-	-	0.1
Calcium	mg/L		198	63	62	45	54	53	43	29	37	-	-	-	34
Chloride	mg/L		6790	142	131	94	94	151	91	101	105	-	-	-	-
Chlorine Free Residual	mg/L		0.05	0.03	0.06	0.01	0.01	0.02	0.04	0.02	0.18	-	-	-	-
Iron	mg/L		0.2	0.16	0.42	0.21	0.14	0.46	0.7	0.39	0.05	-	-	-	0.05
Magnesium	mg/L		479	27	24	19	23	24	18	27	23	-	-	-	25
Potassium	mg/L		127	17	14	14	14	14	16	23	17	-	-	-	22
Selenium	mg/L		0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	-	-	-	0.01
Sodium	mg/L		3420	89	99	95	99	128	75	94	75	-	-	-	71
Sulphate	mg/L		1160	31.9	92	104	132	108	48	83	94	-	-	-	86

	Units	14/7/14	3/11/14	20/1/15	19/8/15	14/10/15	8/2/16	25/7/16	18/10/16	20/2/17	Statistics: Min	Max	Ave	Std. Dev.	Median
Field Parameters															
SWL	mtoc		1.6	1.53	1.5	1.65									
SWL	mbgl		0.9	0.83	0.8	0.95									
SWL	m AHD		0.86	0.93	0.96	0.81									
pH	pH unit		8.43	9.02	7.8					8.66					
EC	µS/cm		673	927	1217	660				8000					
Temp.	°C		17.62	19.94	17.62					19.67					
DO	mg/L		3.9	4.6	10					5.89					
DO	%		41	51	105					68.1					
Salinity	mg/L									9.6					
Turbidity	NTU				11.3										
Laboratory Analyses															
pH	pH unit										7.1	8.17	7.71	0.30	7.68
TDS	mg/L	1030									392	12200	1311.88	2912.37	497
Total Suspended Solids	mg/L		<5	8	<5	<5	<5	16	<5	<5	2	55	16.09	17.48	9
BOD5	O2 mg/L	4	<2		<2	4	<2	<2	<2	<2	2	8	2.54	1.33	2
Nutrients															
Ammonia	mg/L	0.39	<0.01	0.04	0.02	0.13	<0.01	0.05	0.03	0.37	0.01	0.39	0.06	0.10	0.02
Nitrate (NO3 as N)	mg/L	<0.01	1.42	4.18	4.71	4	7.31	4.03	6.08	7.23	0.01	7.31	1.34	2.29	0.04
Nitrite (NO3 as N)	mg/L	<0.01	<0.01	<0.01	4.71	<0.01	<0.01	<0.01	<0.01	<0.01	0.002	4.71	0.20	0.94	0.01
Total Kjeldahl Nitrogen	mg/L	3.1	0.3	0.6	0.3	0.7	1.6	0.8	0.8	1	0.01	3.1	0.42	0.62	0.2
Total Nitrogen	mg/L	3.1	1.7	4.8	5	4.7	8.9	4.8	6.9	8.2	0.01	8.9	1.68	2.58	0.2
Total Phosphorus	mg/L	0.24	0.04	0.02	0.03	0.01	0.18	0.04	0.02	0.01	0.008	0.24	0.06	0.06	0.03
Reactive Phospherous	mg/L	-	-	-	-		-	-	-	-		0			
Enterococcus	cfu/100 mL					-					2	12	2.63	2.31	2
Thermotolerant (Faecal) Coliforms	cfu/100 mL	34	<1	<1	<1	<1	63	<1	<1	<1	2	4200	200.95	893.38	2
Total Coliforms	cfu/100 mL										2	4200	213.64	891.36	2
Major Ions															
Bicarbonate as CaCO3	CaCO3/L										1	350	225.65	117.32	237
Barium	mg/L										0.011	131	65.51	92.62	65.506
Bromide	mg/L										0.01	33	2.94	8.61	0.2
Calcium	mg/L										29	210	114.76	73.37	63
Chloride	mg/L										91	11000	2402.40	3621.76	435.5
Chlorine Free Residual	mg/L										0.01	0.18	0.05	0.04	0.04
Iron	mg/L										0.01	0.89	0.32	0.27	0.2
Magnesium	mg/L										18	620	142.81	202.46	27
Potassium	mg/L										14	190	51.38	59.31	23
Selenium	mg/L										0.01	0.01	0.01	0.00	0.01
Sodium	mg/L										71	10000	1457.86	2432.71	347
Sulphate	mg/L										2	1600	334.49	485.28	112

Notes:

Red numbers denote value is <LOR

Individual and median values compared to the trig

Bold outline = exceeds marine trigger value

Yellow shading = exceeds freshwater trigger value

^ Ecosystem protection (lowland river)

^^^ Ecosystem protection (estuaries)

* Recreational water quality guideline value

Free Chlorine field test (17/10/2012) using Palintest pooltest 25 professional Plus photometer

$$ ProUCL Version 3.0

Table 6: MB2S - field parameters

					MB2SHALLOW (760)																											
				Date	19/03/08	23/09/08	9/12/08	3/02/09	17/03/09	14/04/09	19/05/09	23/06/09	29/09/09	29/03/10	19/04/10	20/07/10	22/09/10	19/10/10	31/01/11	18/04/11	26/07/11	17/10/11	9/01/12	7/05/12	21/08/12	15/10/12	29/04/13	5/08/13	18/11/13	13/01/14
	Units			Time	-	-	10.00 am	-	10.18 am	9.20 am	-	-	9.40 am		-	-		-									-	-	-	-
Field Parameters																																
Ground RL	m AHD				11.03																											
Stick-up	m				0.8																											
Well RL	m AHD				11.83																											
SWL	mtoc				Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry		Dry				Dry		Dry	Dry	Dry	Dry	Dry
SWL	mbgl				-	-	-	-	-	-	-	-	-	-	-	-	-	-		-				-		-	-	-	-	-
SWL	m AHD				-	-	-	-	-	-	-	-	-	-	-	-	-	-		-				-		-	-	-	-	-
pH	pH unit				-	-	-	-	-	-	-	-	-	-	-	-	-	-		-				-		-	-	-	-	-
EC	µS/cm				-	-	-	-	-	-	-	-	-	-	-	-	-	-		-				-		-	-	-	-	-
Temp.	°C				-	-	-	-	-	-	-	-	-	-	-	-	-	-		-				-		-	-	-	-	-
DO	mg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-		-				-		-	-	-	-	-
DO	%				-	-	-	-	-	-	-	-	-	-	-	-	-	-		-				-		-	-	-	-	-
Turbidity	NTU				-	-	-	-	-	-	-	-	-	-	-	-	-	-		-				-		-	-	-	-	-
Salinity	mg/L				-	-	-	-	-	-	-	-	-	-	-	-	-	-		-				-		-	-	-	-	-
Colour					-	-	-	-	-	-	-	-	-	-	-	-	-	-		-				-		-	-	-	-	-
Odour					-	-	-	-	-	-	-	-	-	-	H2S	-	-	-		-				-		-	-	-	-	-

Table 7: MB2DEEP - field parameters and analytical results

					MB2DEEP (769)																																									
				Date	19/3/08	24/6/08	23/9/08	9/12/08	3/2/09	17/3/09	14/4/09	19/5/09	23/6/09	29/9/09	12/1/10	29/3/10	19/4/10	12/7/10	22/9/10	19/10/10	31/1/11	18/4/11	26/7/11	17/10/11	9/1/12	7/5/12	21/8/12	15/10/12	29/4/13	5/8/13	18/11/13	13/1/14	14/7/14	3/11/14	20/1/15	19/8/15	14/10/15	8/2/16	25/7/16	18/10/16	20/2/17					
	Units			Time	8.55 am	-	11.59 am	10.00 am	9.00 am	10.18 am	9.24 am	1.00 pm	9.48 am	9.52 am	10.35 am		10.18 am	2.55 pm		9.46 am		10.54 am	10.28 am	10.35 am			10.05 am	10.07 am	0.44375	0.441667	0.452778	0.425694														
Field Parameters																																														
Ground RL	m AHD				10.99																												10.99													
Stick-up	m				0.77																												0.77													
Well RL	m AHD				11.76																												11.76													
SWL	mtoc				11.12	-	11.1	12.75 ~	11.1	11.05	11.1	11.05	11.1	11.1	11.04	11.03	11.1	10.93	10.9	11.1		10.85	10.7	-	No sample	No sample	10.8	10.8	10.7	11	10.9	-			10.8	10.9										
SWL	mbgl				10.35	-	10.33	11.98 ~	10.33	10.28	10.33	10.28	10.33	10.33	10.27	10.26	10.33	10.16	10.13	10.33		10.08	9.93	-			10.03	10.03	9.93	10.23	10.13	-			10.03	10.13										
SWL	m AHD				0.64	-	0.66	-0.99 ~	0.66	0.71	0.71	0.71	0.66	0.66	0.72	0.73	0.66	0.83	0.86	0.66		0.91	1.06	-			0.96	0.96	1.06	0.76	0.86	-			0.96	0.86										
pH	pH unit				7.79	-	7.27	7.21	7.32	7.34	7.36	7.71	7.67	7.7	7.82		6.79	7.63		7.66		7.36	7.84	7.62			8.05	8.1	8.13	8.12	7.31	8.4		7.94	8.52	7.82					8.06					
EC	µS/cm				970	-	1375	1097	1228	1232	1094	980	911	784	1014		759	1096		805		790	795	872			778	989	789	752	809	1002		735	864	811					8000					
Temp.	°C				17.62	-	17.49	17.39	17.55	17.61	17.56	17.53	17.51	17.84	18.09		18.04	17.76		18.19		19.05	18.74	18.53			18.8	19.01	20.68	18.47	18.73	20.39		22.1		17.93					21.27					
DO	mg/L				0.4	-	4.1	0.38	0.21	0.45	1.15	0.4	0.17	0.3	0.2		0.1	8.8		0.1		7.4	0.6	5.6			0.5	3.4	3.8	2.3	5.4	1.9		3.9	5.2						4.47					
DO	%													3.6	2.1		1.5	92.9		4.4		80.2	6	60			6.4	36.6	42	25	58.9	20.6		44	87						52.8					
Salinity	mg/L				-	-	0.78	-	0.72	0.72	0.63	0.91	0.44	0.48	0.59		0.45	0.65		0.5		0.46	0.47	0.5			0.47	0.57	0.45	0.44	1.22	0.49									34.3					
Turbidity	NTU				-	-	5	-	15	193.1	154.5	12.5	56.4	79.6	44.2		35	57		53.1		0.1	35	862.7			15.9	13.8	47.3	117.3	157.7	374.4		57	70.7	4.3										
Colour					Clear	-	Clear	Turbid	-	Turbid	Turbid	Clear	-	Turbid	-		-	-		Turbid		-	Clear	Turbid			-	-	-	Cloudy	-	Turbid														
Odour					None	-	-	None	-	H2S	None	None	-	None	-		H2S	-		None		-	None	-			-	-	-	-	-	-														
Laboratory Analyses																																										**Statistics**				
		NHMRC (2011) AWDG	ANZECC (2000) marine ecosystem	ANZECC (2000) freshwater ecosystem																																						Min	Max	Ave	Std. Dev.	Median
pH	pH unit	6.5 - 8.5			8	7.6	7.2	7.8	7.6	7.5	7.5	7.5	7.7	7.7	7.6		7.68	7.97		7.56	7.6	7.44	7.84	7.58			7.99	7.97	-	-	-	-										7.2	8	7.67	0.21	7.6
TDS	mg/L													-	-		-	426		500	452	482	468	528			442	582	498	439	422	568	589									422	582	483.92	53.37	475
Total Suspended Solids	mg/L				7	8	1	130	64	28	36	5	4	26	770		524												-	-	-	-		57	50	9	24	360	39	28	12	1	770	133.58	248.13	27
BOD5	O2 mg/L				2	2	2	2	2	2	2	2	2	2	2		5	11		2	2	6	2	17			2	2	2	2	2	2	<2	<2	3	<2	3	<2	<2	3	<2	2	17	3.29	3.56	2
Nutrients																																														
Ammonia	mg/L	0.5 #	0.91	0.9	0.1	0.06	0.02	0.02	0.02	0.02	0.02	0.02	0.1	0.02	0.02		0.01	0.05		0.02	0.61	0.3	0.01	0.02			0.01	0.01	0.01	0.01	0.04	0.03	<0.01	0.04	0.01	0.03	0.08	0.02	0.07	0.15	0.04	0.01	0.61	0.06	0.11	0.02
Nitrate (NO3 as N)	mg/L	50		0.7	0.42	0.6	0.71	2.1	1.5	1.2	1.9	1.6	2.4	0.12	0.22		0.31	4.35		5.27	4.56	9.36	4.37	5.66			5.35	6.45	6.06	2.24	6.44	3.05	2.45	5.96	5.98	5.57	6.25	5.94	5.28	1.45	4.51	0.12	9.36	3.63	2.43	4.35
Nitrite (NO3 as N)	mg/L	3			0.074	0.09	0.07	0.08	0.15	0.23	0.13	0.16	0.2	**4.4**	**4.11**		**5.48**	0.2		0.04	0.01	0.02	0.21	0.01			0.1	0.18	0.18	0.09	0.12	0.12	0.24	0.17	0.06	5.79	0.02	<0.01	0.04	0.04	0.24	0.01	5.79	0.72	1.64	0.125
Total Kjeldahl Nitrogen	mg/L				0.1	0.21	0.07	0.04	0.4	0.13	0.2	0.2	0.1 +	4.8	5.5		6.5	2.8		2.7	2.8	2.9	2.4	2.1			1.3	1.9	1.4	0.8	1.8	0.7	1.3	1	1.2	0.9	0.6	1.1	1.3	1.1	0.8	0.04	6.5	1.60	1.58	1.15
Total Nitrogen	mg/L		0.3^^^	0.5^	0.6	0.81	0.85	2.2	2	1.6	2.2	2	3.1	0.29	1.2		0.7	7.4		8	7.4	12.30	7	7.8			6.8	8.5	7.6	3.1	8.4	3.9	4	7.1	7.2	6.7	6.9	7	6.6	2.6	5.6	0.29	12.3	4.83	3.12	5.6
Total Phosphorus	mg/L		0.03^^^	0.05^	0.09	0.07	0.1	0.37	0.22	0.12	0.14	0.04	0.11	0.1	0.14		0.14	0.13		0.02	0.14	0.04	0.28	0.3			0.11	0.1	0.11	0.06	0.22	0.44	0.36	0.18	0.14	0.08	0.11	0.11	0.16	0.15	0.1	0.02	0.44	0.15	0.10	0.12
Reactive Phospherous	mg/L		0.004	0.008																														-	-	-		-	-		-	0	0			
Enterococcus	cfu/100 mL	Not detected			2	2	2	2	2	2	2	2	2	2	2		2	54		2	160	2	2	22			2	2	-	-	-	-					-						160	13.50	36.58	2
Thermotolerant (Faecal) Coliforms	cfu/100 mL	Not detected	150*	150*	2	2	2	2	2	2	4	2	2	2	2		2	6		2	2	26	2	2			2	2	2	2	1	2	<1	<1	<1	<1	<1	<1	<1	<1	<1	1	26	3.21	4.94	2
Total Coliforms	cfu/100 mL	Not detected			2	2	2	2	2	2	6	50	2	2	2		2	4		170	2	22	2	2			2	2	-													2	170	14.10	38.40	2
Major Ions																																														
Bicarbonate as CaCO3	CaCO3/L				310	330	320	420	340	370	370	300	270	220	220		192	193		187	1	1	1	187			170	139	-	-	-	-										1	420	227.05	124.42	220
Barium	mg/L	0.7			0.013	-	-	-	-	-	-	-	-	-	-		-	-		-									-	-	-	196										0.013	196	98.01	138.58	98.007
Bromide	mg/L				0.01	0.5	0.2	0.13	0.13	0.12	0.11	0.03	0.08	0.58	0.432		0.2	0.2		0.2	0.2	0.7	0.4	0.1			0.2	0.3	-	-	-	0.4										0.01	0.7	0.25	0.19	0.2
Calcium	mg/L				110	120	130	140	110	140	110	93	85	100	100		65	73		75	76	67	69	73			60	82	-	-	-	118										60	140	95.05	25.24	93
Chloride	mg/L	250 #			120.0	220.0	**280.0**	170.0	220.0	190.0	140.0	200.0	95.0	92.0	182.0		78.4	92.9		81.1	95.5	104.0	108.0	125.0			94.0	201.0	-	-	-	-										78.4	280	144.45	58.64	122.5
Chlorine Free Residual	mg/L	5 (0.6 #)		0.003	-	-	-	0.01	0.02	0.01	0.01	0.03	-	0.01	0.01		0.01	0.01		0.01	0.01	0.08	0.05	0.01			0.02	0	-	-	-	-		0.9	1.22	0.04				0.26	0.1	0	0.08	0.02	0.02	0.01
Iron	mg/L	0.3 #			0.01	0.01	0.02	**2.8**	0.01	0.1	0.09	0.01	0.19	0.16	**1**		1.37	0.63		0.2	0.87	0.05	0.42	0.05			0.14	0.05	-	-	-	0.05										0.01	2.8	0.39	0.67	0.1
Magnesium	mg/L				18	15	16	15	17	16	13	11	11	11	12		7	8		8	7	7	7	7			7	9	-	-	-	13										7	18	11.19	3.83	11
Potassium	mg/L				4.0	3.7	3.9	3.4	3.3	3.8	3.3	3.3	3.0	3.1	3.1		3.0	5.0		8.0	20.0	12.0	21.0	20.0			18.0	21.0	-	-	-	17.0										3	21	8.71	7.33	3.9
Selenium	mg/L	0.01		0.018	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	0.01	0.01	0.01	0.01			0.01	0.01	-	-	-	0.01										0.01	0.01	0.01	0.00	0.01
Sodium	mg/L	180			69	87	110	91	85	150	120	110	88	85	100		86	80		80	68	74	74	89			69	84	-	-	-	116										68	150	91.19	20.30	86
Sulphate	mg/L	250			21	23	23	25	22	42	51	63	72	**580**	60		65	79.3		85.1	76.6	53	61	49			60	44	-	-	-	58										21	580	76.81	116.98	58

Notes:

Red numbers denote value is <LOR

Bold text = exceeds ADWG trigger value

Individual and median values compared to the trigger values

Bold outline = exceeds marine trigger value

Yellow shading = exceeds freshwater trigger value

^ Ecosystem protection (lowland river)

^^^ Ecosystem protection (estuaries)

* Recreational water quality guideline value

Free Chlorine field test (17/10/2012) using Palintest pooltest 25 professional Plus photometer

Aesthetic guideline value $$ ProUCL Version 3.0

Earth2Water Pty Ltd

Table 8: D05 - field parameters

		D05	D05	D05
Date		23/09/2008	13/10/2015	25/07/2016
Time	Units	-		
Field Parameters				
Ground RL	m AHD			
Stick-up	m			
Well RL	m AHD			
SWL	mtoc	Dry	Dry	
SWL	mbgl	-		
SWL	m AHD	-		
pH	pH unit	-		
EC	µS/cm	-	573	
Temp.	°C	-	15.7	
DO	mg/L	-	161	
Turbidity	NTU	-	0.8	
Salinity	mg/L	-	0.27	
Colour		-		
Odour		-		
BOH	mtoc		8.7	
Free Chlorine			0.92	0.12

Prepared by: DF
Checked by: DP

Table 9: D03 - field parameters and analytical results

					D03 (759)																																							
Date					19/3/08	24/6/08	23/9/08	9/12/08	17/3/09	14/4/09	19/5/09	23/6/09	29/9/09	12/1/10	23/2/10	29/3/10	19/4/10	20/7/10	22/9/10	19/10/10	31/1/11	18/4/11	26/7/11	17/10/11	9/1/12	7/5/12	21/8/12	15/10/12	29/4/13	5/8/13	18/11/13	13/1/14	3/11/14	20/1/15	19/8/15	14/10/15	8/2/16	25/7/16	18/10/16					
Time	Units				10.19 am	-	-	-	12.24 pm	-	-	11.16 am	11.31 am	12.19 pm			13.04 pm	12.37 pm		11.33 am		1.25 pm	12.27 pm	1.03 pm	1.09 pm	1.16 pm	12.56 pm	12.59 pm	1:07 PM	12:50 PM	12:46 PM	1.15 PM												
Field Parameters																																												
Ground RL	m AHD				7.94																																							
Stick-up	m				0.63																																							
Well RL	m AHD				8.57																																							
SWL	mtoc				Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	-	7.86	7.85	7.8	7.785	7.8		7.56	7.48	7.8	7.71	7.54	7.69	7.65	7.38	7.53	7.6	7.7	7.6	7.65	7.6	4.45								
SWL	mbgl				-	-	-	-	-	-	-	-	-	-	-	7.23	7.22	7.17	7.155	7.17		6.93	6.85	7.17	7.08	6.91	7.06	7.02	6.75	6.9	6.97	7.07	6.97	7.02	6.97	3.82								
SWL	m AHD				-	-	-	-	-	-	-	-	-	-	-	0.71	0.72	0.77	0.785	0.77		1.01	1.09	0.77	0.86	1.03	0.88	0.92	1.19	1.04	0.97	0.87	0.97	0.92	0.97	4.12								
pH	pH unit				-	-	-	-	-	-	-	-	-	-	-		7.46	7.17		7.37		7.33	7.62	7.43	7.47	7.56	8.02	7.71	7.6	7.78	6.88	7.74	7.41	7.97	8.41	7.92								
EC	µS/cm				-	-	-	-	-	-	-	-	-	-	-		1234	1186		1126		1002	1154	859	725	648	627	1170	848	663	721	781	710	741	734	757								
Temp.	°C				-	-	-	-	-	-	-	-	-	-	-		20.96	17.56		18.05		19.86	18.16	18.4	19.95	18.42	18.03	19.9	20.19	17.7	17.92	23.21	23.45	20.01	17.61	17.58								
DO	mg/L				-	-	-	-	-	-	-	-	-	-	-		1.5	1.9		3.4		3.6	3.6	4	3.5	3.5	4.7	3.7	4.2	3.1	4.2	2.8	4.3	3.2	3.4									
DO	%				-	-	-	-	-	-	-	-	-	-	-		16.4	19.6		36.2		37.1	37.9	42.6	38.3	37.1	50	40.4	46	32.6	44.8	32.8	51	35	35	162								
Turbidity	NTU				-	-	-	-	-	-	-	-	-	-	-		600	51		103.5		47.7	11.6	6.3	26.5	0.39	18	14.4	0	0	30.1	0.38	45	3.5	0	0								
Salinity	mg/L				-	-	-	-	-	-	-	-	-	-	-		0.71	0.68		0.67		0.56	0.64	0.5	0.43	2.8	0.36	0.67	0.48	0.4	0.79	6.6												
Colour					-	-	-	-	-	-	-	-	-	-	-		-	-		Black		Clear	Clear	-	-	-	-	-	-	-	-	-												
Odour					-	-	-	-	-	-	-	-	-	-	-		-	-		None		None	None	-	-	-	-	-	-	-	-	-												
Laboratory Analyses																																								**Statistics**				
		NHMRC (2011) AWDG	ANZECC (2000) marine ecosystem	ANZECC (2000) freshwater ecosystem																																				Min	Max	Ave	Std. Dev.	Median
pH	pH unit	6.5 - 8.5													7.67		7.36	7.43		7.24	7.1	7.63	7.68	7.55	7.8	7.77	7.9	7.89	-	-	-	-								7.1	7.9	7.59	0.26	7.65
TDS	mg/L														14800		760	636		656	578	518	614	568	440	386	398	792	674	385	459	474								**385**	14800	1446.13	3563.33	573
Total Suspended Solids	mg/L																												-	-	-	-	46	7	42	29	79	58	166	**7**	166	61.00	51.45	46
BOD5	O2 mg/L														9		5	8		4	5	2	3	2	3	2	2	2	8	2	2	2	<2	3	<2	<2	19	<2	6	**2**	19	4.68	4.18	3
Nutrients																																												
Ammonia	mg/L	0.5 #	0.91	0.9											0.59		0.01	0.22		0.07	0.39	0.02	0.02	0.02	0.09	0.02	0.04	0.08	0.05	0.02	0.03	0.01	0.03	0.03	0.06	0.04	0.42	0.22	0.04	**0.01**	0.59	0.11	0.16	0.04
Nitrate (NO3 as N)	mg/L	50		0.7											0.45		0.85	0.26		1.83	9.42	1.54	3.39	5.4	4.28	1.83	1.7	0.85	0.1	0.98	1.39	1.75	0.22	1.22	0.92	0.55	0.85	0.19	1.27	**0.1**	9.42	1.79	2.12	1.22
Nitrite (NO3 as N)	mg/L	3													0.05		0.04	0.01		0.07	0.22	0.12	0.08	0.03	0.11	0.04	0.05	0.04	0.02	0.04	0.03	0.06	0.04	0.02	0.97	0.04	0.12	0.02	<0.01	**0.01**	0.97	0.10	0.20	0.04
Total Kjeldahl Nitrogen	mg/L														29.5		0.6	2		2.6	1.7	1.7	2.3	1.5	2.4	1.3	1	1.5	1	0.7	0.8	0.6	1.5	0.5	0.6	0.8	3.2	1.3	3.9	**0.5**	29.5	2.74	5.90	1.5
Total Nitrogen	mg/L		0.3^^^	0.5^											30		1.5	2.3		4.5	11.3	3.4	5.8	6.9	6.8	3.2	2.8	2.4	1.1	1.7	2.2	2.4	1.8	1.7	1.6	1.4	4.2	1.5	5.2	**1.1**	30	4.60	6.05	2.4
Total Phosphorus	mg/L		0.03^^^	0.05^											3.52		0.45	0.37		0.01	0.31	0.12	0.25	0.08	0.28	0.08	0.19	0.22	0.2	0.13	0.15	0.13	0.34	0.15	0.23	0.22	0.49	0.41	3.76	**0.01**	3.76	0.53	0.99	0.22
Reactive Phosphorus	mg/L		0.004	0.008																		0.05	0.08	0.09	0.08	0.09	0.09	0.14	0.17	0.08	0.12	0.09	0.06	0.07	0.1	0.09	0.19	0.16	3.54	**0.05**	3.54	0.29	0.81	0.09
Enterococcus	cfu/100 mL	Not detected													30		4	2		2	3800	2	2	2	2	2	2	2	44	-	-	-								**2**	3800	299.69	1051.80	2
Thermotolerant (Faecal) Coliforms	cfu/100 mL	Not detected	150*	150*											170000		2	12		2	2	2	2	22	92	2	2	2	-	4(app)	1 (app)	2	<1	<1	<1	<2	13	<1	<2	**2**	170000	12154.07	45431.19	2
Total Coliforms	cfu/100 mL	Not detected													320000		4	10		2	2	900	2	21	300	130	42	2	-	-	-	-								**2**	320000	26784.58	92339.27	15.5
Major Ions																																												
Bicarbonate as CaCO3	CaCO3/L														335		320	313		299	1	1	1	273	314	286	305	409	-	-	-	323								**1**	409	244.62	142.50	305
Barium	mg/L														-		-	-		-									-	-	-	0.6								**0.6**	0.6	0.60	#DIV/0!	0.6
Bromide	mg/L														0.4		0.5	0.5		0.5	0.5	0.8	0.7	1	0.37	0.4	0.3	1.8	-	-	-	120								**0.3**	120	9.83	33.10	0.5
Calcium	mg/L														120		126	119		106	111	112	106	112	108	104	98	149	-	-	-	-								**98**	149	114.25	13.37	111.5
Chloride	mg/L	250 #													218		207	201		170	132	129	196	83	33	23	23	139	-	-	-	-								**23**	218	129.50	73.40	135.5
Chlorine Free Residual	mg/L	5 (0.6 #)		0.003											0.06		0.01	0.03		0.01	0.04	0.07	0.06	0.01	0.01	0.01	0.01	0.25	-	-	-	0.05	0.93	0.07	0.87	0.66		0.17		**0.01**	0.25	0.05	0.06	0.03
Iron	mg/L	0.3 #													**30.2**		**2.35**	**2.55**		**1.27**	**0.74**	**0.89**	0.24	0.2	**1.07**	**0.33**	**0.67**	**0.15**	**-**	**-**	**-**	11								**0.15**	30.2	3.97	8.39	0.89
Magnesium	mg/L														18		19	18		16	14	15	17	12	11	11	10	18	-	-	-	8								**8**	19	14.38	3.64	15
Potassium	mg/L														3		3	3		4	12	4	5	6	6	6	7	12	-	-	-	<0.01								**3**	12	5.92	3.15	5.5
Selenium	mg/L	0.01		0.018											0.01		0.01	0.01		0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	-	-	-	40								**0.01**	40	3.09	11.09	0.01
Sodium	mg/L	180													113		114	110		107	75	69	106	47	22	16	14	80	-	-	-	7								**7**	114	67.69	41.79	75
Sulphate	mg/L	250													27.4		28.6	27		27.4	47.2	28	36	32	18.1	15	10	1	-	-	-	-								**1**	47.2	24.81	12.24	27.4

Notes:

Red numbers denote value is <LOR

Individual and median values compared to the trigger values

^ Ecosystem protection (lowland river)

^^^ Ecosystem protection (estuaries)

* Recreational water quality guideline value

Aesthetic guideline value

$$ ProUCL Version 3.0

Bold text = exceeds ADWG trigger value

Bold outline = exceeds marine trigger value

Yellow shading = exceeds freshwater trigger value

Free Chlorine field test (17/10/2012) using Palintest pooltest 25 professional Plus photometer

Table 10: D02 - field parameters and analytical results

D02 (758)

Date	Units	19/3/08	24/6/08	9/12/08	3/2/09	17/3/09	14/4/09	19/5/09	23/6/09	29/9/09	12/1/10	23/2/10	29/3/10	19/4/10	20/7/10	22/9/10	19/10/10	31/1/11	18/4/11	26/7/11	17/10/11	9/1/12	7/5/12	21/8/12	15/10/12	29/4/13	5/8/13	18/11/13	13/1/14	3/11/14	20/1/15	14/10/15	25/7/16	20/2/17
Time	Units	10.19 am	-	-	-	12.24 pm	-	-	11.16 am	11.31 am	12.19 pm	-		13.04 pm	12.37 pm		11.33 am				12.49 pm	12.46 pm	12.49 pm	12.30 pm	12.38 pm	12:31 PM	12:22 PM	12:27 PM	12.30 pm					
Field Parameters																																		
Ground RL	m AHD	8.6																																
Stick-up	m	0.71																																
Well RL	m AHD	9.31																																
SWL	mtoc	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	-	8.354	8.35	Dry	8.34	Dry		Dry	Not enough to sample	8.3	8.2	8.02	8.22	8.22	7.96	8.02	8.1	8.21	8.06	8.17	7.8		
SWL	mbgl	-	-	-	-	-	-	-	-	-	-	-	7.644	7.64	-	7.63	-		-		7.59	7.49	7.31	7.51	7.51	7.25	7.31	7.39	7.5	7.35	7.46	7.09		
SWL	m AHD	-	-	-	-	-	-	-	-	-	-	-	0.956	0.96	-	0.97	-		-		1.01	1.11	1.29	1.09	1.09	1.35	1.29	1.21	1.1	1.25	1.14	1.51		
pH	pH unit	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-		7.74	7.66	7.42	8.32	8.03	7.66	7.91	7.06	7.91	7.67	7.96	7.96		7.58
EC	µS/cm	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-		653	1249	851	757	707	774	1667	677	815	841	777	1530		939
Temp.	°C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-		18.43	20.22	20.25	17.51	18.35	22.21	17.3	17.03	22.69	19.22	21.02	16.63		23.5
DO	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-		6.8	4.7	3.8	4.7	5.9	4.4	3.3	3.8	3.2	8.4	7.3			7.27
DO	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-		72.5	52.1	41.8	49.1	62.9	50.3	34.4	40	36.9	92	82	174		85.8
Turbidity	NTU	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-		38.6	39.9	107.9	600	9.4	0	5.8	66.8	40.2	3.5	3.5	82.7		69.4
Salinity	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-		0.39	0.69	0.5	0.45	0.42	0.45	0.92	0.73	0.39					
Free Chlorine		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.03	0.67	-	0.87					
Colour		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-		-	-	-	-	-	-	-	-	-					
Odour		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-		-	-	-	-	-	-	-	-	-					

Laboratory Analyses — **Statistics**

		NHMRC (2011) AWDG	ANZECC (2000) marine ecosystem	ANZECC (2000) freshwater ecosystem	23/2/10	17/10/11	9/1/12	7/5/12	21/8/12	15/10/12	29/4/13	5/8/13	18/11/13	13/1/14	3/11/14	20/1/15	14/10/15	25/7/16	20/2/17	Min	Max	Ave	Std. Dev.	Median
pH	pH unit	6.5 - 8.5			7.66	7.7	7.81	7.77	7.89	7.87	-	-	-							7.66	7.89	7.78	0.09	7.79
TDS	mg/L				512	368	686	478	478	372	520	924	395	486						368	924	521.90	168.69	482
Total Suspended Solids	mg/L										-	-	-		8	52	100	113	62	8	113	67.00	41.64	62
BOD5	O2 mg/L				25	3	9	10	7	3	8	4	<2	2	<2	6	8	2	<2	2	25	7.25	6.25	6.5
Nutrients																								
Ammonia	mg/L	0.5 #	0.91	0.9	0.14	0.08	0.02	0.03	0.28	0.01	0.06	0.01	0.04	0.2	0.05	0.02	0.04	0.05	0.16	0.01	0.28	0.08	0.08	0.05
Nitrate (NO3 as N)	mg/L	50		0.7	2.23	2.57	2.16	1.96	3.16	2.19	1.33	2.08	2.37	1.7	2.23	6.39	1.56	0.47	4.16	0.47	6.39	2.44	1.37	2.19
Nitrite (NO3 as N)	mg/L	3			0.01	0.01	0.01	0.13	0.16	0.01	0.1	0.01	0.01	0.01	<0.01	0.01	0.01	0.05	0.06	0.01	0.16	0.04	0.05	0.01
Total Kjeldahl Nitrogen	mg/L				13.2	4	12.1	6.4	3	1.6	2.2	1	1.2	0.7	0.8	1.9	3.5	2.5	3.6	0.7	13.2	3.85	3.88	2.5
Total Nitrogen	mg/L		0.3^^^	0.5^	15.4	6.6	14.3	8.5	6.3	3.8	3.6	3.1	3.6	2.4	3	8.3	5.1	3	7.8	2.4	15.4	6.32	4.03	5.1
Total Phosphorus	mg/L		0.03^^^	0.05^	1.51	3.5	6.01	3.25	3.76	3.75	3.33	2.35	2.23	2.44	2.82	2.56	1.48	1.95	3.91	1.48	6.01	2.99	1.15	2.82
Reactive Phosphorus	mg/L		0.004	0.008		3.18	4.72	2.74	3.67	3.68	3.31	2.07	2.02	1.99	2.62	2.51	1.07	1.47	3.9	1.07	4.72	2.78	1.02	2.68
Enterococcus	cfu/100 mL	Not detected			210	2	2	2	2	2	-	-	-	-						2	210	36.67	84.92	2
Thermotolerant (Faecal)	cfu/100 mL	Not detected	150*	150*	110000	2	2	2	2	2	2	2	-	2	<1	<2	<2	<1	<2	2	110000	12224.00	36666.00	2
Total Coliforms	cfu/100 mL	Not detected			350000	2	2	2	2	24	-	-	2	-										
Major Ions																								
Bicarbonate as CaCO3	CaCO3/L				291	157	175	190	179	158	-	-	-	169						157	291	188.43	46.70	175
Bromide	mg/L				0.2	0.1	0.54	0.3	0.2	0.1	-	-	-	0.1						0.1	0.54	0.22	0.16	0.2
Calcium	mg/L				79	54	73	68	55	46	-	-	-	85						46	85	65.71	14.42	68
Chloride	mg/L	250 #			111	73	227	118	111	100	-	-	-	-						73	227	123.33	53.21	111
Chlorine Free Residual	mg/L	5 (0.6 #)		0.003	0.04	0.04	-	0.01	0.02	0	-	-	-	-	1.06	0.04	1.2	0.24	0.33	0	0.04	0.02	0.02	0.02
Iron	mg/L	0.3 #			**8.57**	**0.51**	**1.43**	**0.91**	**1**	0.05	-	-	-	0.05						0.05	8.57	1.79	3.03	0.91
Magnesium	mg/L				11	4	6	9	6	8	-	-	-	8						4	11	7.43	2.30	8
Potassium	mg/L				27	19	24	13	22	23	-	-	-	29						13	29	22.43	5.29	23
Selenium	mg/L	0.01		0.018	0.01	0.01	0.01	0.01	0.01	0.01	-	-	-	0.01						0.01	0.01	0.01	0.00	0.01
Sodium	mg/L	180			94	63	**184**	84	84	58	-	-	-	72						58	184	91.29	42.80	84
Sulphate	mg/L	250			48.6	39	92.8	41	48	10	-	-	-	122						10	122	57.34	37.52	48

Notes:

Red numbers denote value is <LOR

Bold text = exceeds ADWG trigger value

Individual and median values compared to the trigg

Bold outline = exceeds marine trigger value

Yellow shading = exceeds freshwater trigger value

^ Ecosystem protection (lowland river)

^^^ Ecosystem protection (estuaries)

* Recreational water quality guideline value

Free Chlorine field test (17/10/2012) using Palintest pooltest 25 professional Plus photometer

Aesthetic guideline value

$$ ProUCL Version 3.0

Table 11: D01 - field parameters

		D01 (757)																												
Date		19/3/08	24/6/08	23/9/08	9/12/08	3/2/09	17/3/09	14/4/09	19/5/09	23/6/09	29/9/09	12/1/10	29/3/10	19/4/10	20/7/10	22/9/10	19/10/10	31/1/11	18/4/11	26/7/11	17/10/11	9/1/12	7/5/12	21/8/12	15/10/12	29/4/13	5/8/13	18/11/13	13/1/14
Time	Units	10.31 am	-	-	-	-	12.10 pm	11.34 am	-	11.10 am	11.26 am			12.20 pm	-		11.18 am					-				-	-	-	-
Field Parameters																														
Ground RL	m AHD	10.28																												
Stick-up	m	0.51																												
Well RL	m AHD	10.79																												
SWL	mtoc	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry		Dry	Dry	Dry	9.85	Not enough		Dry	9.5	Dry	Dry	Dry
SWL	mbgl	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	-	to sample		-	8.99	-	-	-
SWL	m AHD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	-			-	1.29	-	-	-
pH	pH unit	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	-			-	-	-	-	-
EC	µS/cm	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	-			-	*Not*	-	-	-
Temp.	°C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	-			-	*enough*	-	-	-
DO	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	-			-	*to sample*	-	-	-
Turbidity	NTU	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	-			-	-	-	-	-
Salinity	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	-			-	-	-	-	-
Colour		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	-			-	-	-	-	-
Odour		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	-			-	-	-	-	-

Table 12: D28 - field parameters and analytical results

					D28 (756)																																						
				Date	19/3/08	24/6/08	23/9/08	9/12/08	3/2/09	17/3/09	14/4/09	19/5/09	23/6/09	29/9/09	15/1/10	29/3/10	19/4/10	12/7/10	22/9/10	19/10/10	31/1/11	18/4/11	26/7/11	17/10/11	9/1/12	7/5/12	21/8/12	15/10/12	29/4/13	5/8/13	18/11/13	13/1/14	14/7/14	3/11/14	8/2/16	25/7/16	18/10/16	20/2/17					
	Units			Time	10.05 am	9.40 am	12.49 pm	11.30 am	10.10 am	11.22 am	10.55 am	-	10.55 am	11.10 am	10.07 am		11.39 am	11.33 am		10.46 am		12.10 pm	11.55 am	12.24 pm	11.41 am	11.49 am	11.48 am	11.55 am	12:00 PM	12:49	11:53 AM	11.45 AM											
Field Parameters																																											
Ground RL	m AHD				7.24																									7.24									
Stick-up	m				0.71																									0.71									
Well RL	m AHD				7.95																									7.95									
SWL	mtoc				7.18	7.1	7.16	7.23 ^^	7.29	7.27	7.28	7.126	7.2	7.23	7.27	7.255	7.2	7.1	7.047	7.1		6.9	6.85	7.1	7.14	6.81	7.04	7.07	6.7	6.75	7.07	7.15		6.81									
SWL	mbgl				6.47	6.39	6.45	6.52	6.58	6.56	6.57	6.416	6.49	6.52	6.56	6.545	6.49	6.39	6.337	6.39		6.19	6.14	6.39	6.43	6.1	6.33	6.36	5.99	6.04	6.36	6.44		6.1									
SWL	m AHD				0.77	0.85	0.79	0.72	0.66	0.68	0.67	0.824	0.75	0.72	0.68	0.695	0.75	0.85	0.903	0.85		1.05	1.1	0.85	0.81	1.14	0.91	0.88	1.25	1.2	0.88	0.8		1.14									
pH	pH unit				7.76	7.17	7.3	7.14	7.34	7.32	7.32	7.32	7.18	7.32	7.38		7.43	7.35		7.32		6.95	7.4	7.39	7.36	7.3	7.78	7.67	7.6	7.62	6.43	7.72		7.35									
EC	µS/cm				792	793	847	885	871	865	854	827	881	916	992		1022	1040		1068		1018	1016	1037	1035	1240	1265	1312	1319	1253	1219	1270		1268									
Temp.	°C				17.77	17.7	17.39	17.61	17.49	17.81	17.87	17.97	17.94	17.92	17.83		18.44	17.83		17.5		20.33	17.99	19.54	20.96	19.5	17.62	19.18	19.5	18.05	17.56	20.75		19.48									
DO	mg/L				0.5	1.14	0.42	0.25	0.15	0.24	0.37	1.2	0.17	0.3	0.4		0.3	1.9		0.8		3.2	0.7	2.8	2.7	3.2	4.5	3	4.2	2	3.4	1.8		1.9									
DO	%													3.3	4.1		2.9	11.3		7.7		35.7	7.6	28.4	30.7	346	48.1	32.5	45.7	21.3	36.2	20.1		20									
Turbidity	NTU				-	54.5	31	-	26	332.1	290.4	59	107	32.4	600		10.5	600		0.7		165.5	10.9	216.1	342	134.1	171.1	51.9	0	0	90.1	208		504									
Salinity	mg/L				-	0.46	0.49	-	0.52	0.51	0.51	0.82	0.42	0.53	0.59		0.58	0.59		0.62		0.58	0.59	0.6	0.6	0.7	0.71	0.74	0.73	0.7	0.94	0.65											
Colour					Clear	Clear	Clear	-	Clear	Turbid	Turbid	Milky	Turbid	-	-		-	-		Clear		Clear	Clear	-	-	-	-	-	-	-	-	-											
Odour					None	None	None	-	None	None	Slight odour	None	None	-	-		-	-		None		None	None	-	-	-	-	-	-	-	-	-											
Laboratory Analyses																																							**Statistics**				
		NHMRC (2011) AWDG	ANZECC (2000) marine ecosystem	ANZECC (2000) freshwater ecosystem																																			Min	Max	Ave	Std. Dev.	Median
pH	pH unit	6.5 - 8.5			7.9	7.7	7.3	7.8	7.7	7.5	7.5	7.4	7.5				7.53	7.39		7.27		7.61	7.62	7.53	7.79	7.77	7.79	7.92	-	-	-	-							7.27	7.92	7.61	0.19	7.61
TDS	mg/L																614	524		654		618	580	656	598	728	746	762	858	695	803	707	636						524	858	681.64	92.66	675.5
Total Suspended Solids	mg/L				17	12	9	9	7	63	62	16	32																-	-	-	-		190	<5	16	<5	10	7	190	36.92	52.08	16
BOD5	O2 mg/L				2	2	2	2	2	2	2	2	2				5	2		3		2	2	2	2	2	2	2	2	2	2	2	<2	<2	<2	<2	<2	<2	2	5	2.17	0.65	2
Nutrients																																											
Ammonia	mg/L	0.5 #	0.91	0.9	0.09	0.06	0.03	0.02	0.02	0.02	0.02	0.02	0.1				0.01	0.03		0.01		0.01	0.01	0.03	0.02	0.02	0.02	0.02	0.02	0.01	0.03	0.01	<0.01	<0.01	0.08	0.03	0.28	0.03	0.01	0.28	0.04	0.05	0.02
Nitrate (NO3 as N)	mg/L	50		0.7	0.05	0.1	0.04	0.04	0.04	0.04	0.04	0.04	0.18				1.3	1.06		0.65		0.3	0.27	2.05	3.08	0.22	0.02	0.1	0.18	0.01	0.12	0.03	0.22	0.14	0.06	0.11	0.02	0.02	0.01	3.08	0.36	0.69	0.1
Nitrite (NO3 as N)	mg/L	3			0.02	0.02	0.002	0.002	0.002	0.002	0.003	0.002	0.02				0.15	0.18		0.06		0.08	0.01	0.01	0.02	0.01	0.01	0.01	0.06	0.01	0.06	0.01	<0.01	<0.01	<0.01	0.03	<0.01	<0.01	0.002	0.18	0.03	0.05	0.01
Total Kjeldahl Nitrogen	mg/L				0.1	0.14	0.13	0.11	0.05	0.12	0.15	0.14	0.1				0.2	0.7		0.3		0.5	0.2	0.6	1.1	0.4	0.4	0.3	0.3	0.3	0.4	0.3	0.3	0.5	0.6	0.5	0.6	0.2	0.05	1.1	0.34	0.23	0.3
Total Nitrogen	mg/L		0.3^^^	0.5^	0.15	0.24	0.13	0.11	0.05	0.12	0.15	0.14	0.3				1.6	1.9		1		0.9	0.5	2.6	4.2	0.7	0.4	0.4	0.5	0.3	0.6	0.3	0.5	0.6	0.7	0.6	0.6	0.2	0.05	4.2	0.71	0.88	0.5
Total Phosphorus	mg/L		0.03^^^	0.05^	0.09	0.1	0.13	0.11	12	0.19	0.16	0.05	0.12				0.12	1.46		0.01		0.4	0.17	0.6	1.04	0.16	0.49	0.24	0.07	0.08	0.14	0.48	0.26	1.62	0.13	0.53	0.1	0.14	0.01	12	0.73	2.20	0.16
Reactive Phosphorus	mg/L		0.004	0.008																		0.05	0.04	0.06	0.05	0.06	0.06	0.07	0.07	0.07	0.08	0.08	0.02	0.06	0.04	0.08	0.08	0.11	0.02	0.11	0.06	0.02	0.06
Enterococcus	cfu/100 mL	Not detected			2	2	2	2	4	2	4	4	10				2	2		2		2	2	2	2	2	2	2	2	-	-	-							2	10	2.70	1.87	2
Thermotolerant (Faecal) Coliforms	cfu/100 mL	Not detected	150*	150*	2	2	2	2	2	2	2	18	42				2	2		2		2	2	2	2	2	2	2	-	2	1	2	<1	<1	<1	<1	<1	<1	1	42	4.50	9.05	2
Total Coliforms	cfu/100 mL	Not detected			2	2	2	2	42	2	80	1600	160				2	4		74		2	2	2	12	2	2	2	-	-	-	-							2	1600	105.05	364.37	2
Major Ions																																											
Bicarbonate as CaCO3	CaCO3/L				240	240	270	250	250	290	290	270	270				277	254		270		1	1	225	293	272	296	268	-	-	-	275							1	296	240.10	83.92	270
Barium	mg/L	0.7			0.012	-	-	-	-	-	-	-	-				-	-		-		-	-	-	-	-	-		-	-	-	0.6							0.012	0.6	0.31	0.42	0.306
Bromide	mg/L				0.06	0.4	0.6	0.11	0.14	0.2	0.09	0.04	0.07				0.5	0.5		0.6		0.7	0.5	0.7	0.5	0.5	0.5	0.8	-	-	-	152							0.04	152	7.98	33.90	0.5
Calcium	mg/L				91	98	89	95	89	130	120	100	110				108	106		117		104	106	118	200	115	104	118	-	-	-	-							89	200	111.47	24.24	106
Chloride	mg/L	250 #			96	160	150	140	120	140	140	130	130				154	161		180		172	186	191	165	255	252	312	-	-	-	-							96	312	170.21	52.52	160
Chlorine Free Residual	mg/L	5 (0.6 #)		0.003	-	-	-	0.01	0.01	0.01	0.01	0.01	-				0.01	0.01		0.04		0.04	0.02	0.02	-	0.01	0.02	0.05	-	-	-	0.01							0.01	0.05	0.02	0.01	0.01
Iron	mg/L	0.3 #			0.04	**1**	**0.31**	**0.75**	0.01	**1.7**	**1.2**	0.16	**0.72**				0.01	**11.9**		0.07		**4.66**	**1.85**	**5.34**	**7.93**	**3.61**	**5.38**	0.05	-	-	-	16							0.01	16	3.13	4.39	1.1
Magnesium	mg/L				8.6	9.4	9.3	9.3	9.2	10	9.1	8.4	9.3				9	9		10		10	11	11	16	11	12	14	-	-	-	2							2	16	9.88	2.64	9.35
Potassium	mg/L				2.2	2	1.9	1.5	1.5	1.5	1.6	1.4	1.6				1	1		2		2	2	2	2	2	3	3	-	-	-	0.01							0.01	3	1.76	0.66	1.95
Selenium	mg/L	0.01		0.018	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	0.01	0.01	0.01	0.01	0.01	-	-	-	144							0.01	144	7.21	32.20	0.01
Sodium	mg/L	180			64	60	60	64	62	82	64	67	64				93	83		101		79	91	96	87	132	144	135	-	-	-	35							35	144	83.15	28.11	80.5
Sulphate	mg/L	250			15	14	14	15	15	17	16	13	14				21.8	18.5		17.5		20	22	23	21	20	29	1	-	-	-	-							1	29	17.20	5.66	17

Notes:

^^ Field sheet says 2.23 mtoc, E2W interpret it more likely it should have been 7.23 mtoc
Red numbers denote value is <LOR
Individual and median values compared to the trigger values
^ Ecosystem protection (lowland river)
^^^ Ecosystem protection (estuaries)
* Recreational water quality guideline value
# Aesthetic guideline value $$ ProUCL Version 3.0

Bold text = exceeds ADWG trigger value
Bold outline = exceeds marine trigger value
Yellow shading = exceeds freshwater trigger value

Free Chlorine field test (17/10/2012) using Palintest pooltest 25 professional Plus photometer

Table 13: MB3 - field parameters

		MB3 (755)													
Date		19/03/2008	24/06/2008	23/09/2008	9/12/2008	3/02/2009	14/04/2009	19/05/2009	29/09/2009	29/03/2010	22/09/2010	31/01/2011	18/04/2011	26/07/2011	17/10/2011
Time	Units	10.00 am	9.35 am	-	-	-	-	-	11.40 am						
Field Parameters															
Ground RL	m AHD	10.29													
Stick-up	m	0.31													
Well RL	m AHD	10.6													
SWL	mtoc	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry				
SWL	mbgl	-	-	-	-	-	-	-	-	-	-				
SWL	m AHD	-	-	-	-	-	-	-	-	-	-				
pH	pH unit	-	-	-	-	-	-	-	-	-	-				
EC	µS/cm	-	-	-	-	-	-	-	-	-	-				
Temp.	°C	-	-	-	-	-	-	-	-	-	-				
DO	mg/L	-	-	-	-	-	-	-	-	-	-				
Turbidity	NTU	-	-	-	-	-	-	-	-	-	-				
Salinity	mg/L	-	-	-	-	-	-	-	-	-	-				
Colour		-	-	-	-	-	-	-	-	-	-				
Odour		-	-	-	-	-	-	-	-	-	-				

Prepared by: DF
Checked by: DP

Table 14: Camp kitchen - field parameters and analytical results

Camp kitchen (754)

	Units	NHMRC (2004) AWDG	ANZECC (2000) marine ecosystem	ANZECC (2000) freshwater ecosystem	19/3/08	24/6/08	23/9/08	9/12/08	3/2/09	17/3/09	14/4/09	19/5/09	23/6/09	29/9/09	12/1/10	19/4/10	12/7/10	19/10/10	31/1/11
Time					9.17 am	8.59 am	12.12 pm	10.45 am	9.25 am	10.35	10.00 am	-	10.02 am	10.04 am	10.59 am		10.53 am	9.54 am	
Field Parameters																			
Ground RL	m AHD				-														
Stick-up	m				-														
Well RL	m AHD				-														
SWL	mtoc				-	-	-	0	-	-	-	-	0	-	-		-	-	-
SWL	mbgl				-	-	-	-	-	-	-	-	-	-	-		-	-	-
SWL	m AHD				-	-	-	-	-	-	-	-	-	-	-		-	-	-
pH	pH unit				7.98	7.25	7.43	7.45	7.44	7.49	7.51	7.85	7.63	7.54	7.8		7.58	7.61	
EC	µS/cm				1010	1055	1063	1145	1095	1071	1107	1094	1125	1103	1235		1221	1254	
Temp.	°C				19.29	19.04	17.75	17.88	18.44	19.03	19.27	19.5	19.15	18.36	18.76		19.08	17.84	
DO	mg/L				3.5	5.04	1.96	1.43	1.66	1.26	1.48	4.1	1.64	0.3	0.2		0.4	0.3	
DO	%													2.8	2.2		4.5	2.8	
Salinity	mg/L				-	0.61	0.63	-	0.64	0.64	0.63	0.95	0.55	0.64	0.72		0.71	0.73	
Turbidity	NTU				-	6.8	36	-	7.6	6.3	1.8	30.1	11.4	11.5	7.5		0	11.1	
Colour					Clear	Clear	-	-	-	Clear	-	Clear	-	-	-		-	Clear	
Odour					Sulfur	H2S	-	H2S	H2S	H2S	-	None	H2S	H2S	-		-	H2S	
Laboratory Analyses																			
pH	pH unit	6.5 - 8.5			8.2	7.8	7.8	8.1	7.9	7.7	7.7	7.2	8			7.71	7.52	7.58	7.4
TDS	mg/L															792	702	688	786
Total Suspended Solids	mg/L				3	3	1	5	1	4	2	3	1						
BOD5	O2 mg/L				2	2	2	22	2	2	2	2	2			4	5	2	2
Nutrients																			
Ammonia	mg/L	0.5 #	0.91	0.9	0.16	0.2	0.35	0.02	0.12	0.07	0.02	0.11	0.1			0.01	0.04	0.04	0.03
Nitrate (NO3 as N)	mg/L	50		0.7	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.01			0.46	0.44	0.14	0.26
Nitrite (NO3 as N)	mg/L	3			0.003	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.01			0.01	0.01	0.01	0.01
Total Kjeldahl Nitrogen	mg/L				0.2	0.4	0.35	0.78	0.28	0.2	0.17	0.3	0.2			0.2	0.3	0.1	0.1
Total Nitrogen	mg/L		0.3^^^	0.5^	0.21	0.4	0.35	0.78	0.28	0.2	0.17	0.3	0.2			0.7	0.7	0.1	0.3
Total Phosphorus	mg/L		0.03^^^	0.05^	0.08	0.05	0.09	0.07	0.07	0.05	0.04	0.02	0.08			0.05	0.05	0.01	0.01
Reactive Phospherous			0.004	0.008															
Enterococcus	cfu/100 mL	Not detected			2	2	2	2	2	2	2	2	2			2	2	2	2
Thermotolerant (Faecal) Coliforms	cfu/100 mL	Not detected	150*	150*	2	2	2	2	2	2	2	2	81			2	2	2	2
Total Coliforms	cfu/100 mL	Not detected			2	2	2	2	6	2	2	23	130			2	2	2	2
Major Ions																			
Bicarbonate as CaCO3	CaCO3/L				260	310	290	49	290	290	290	110	290			352	276	287	1
Barium	mg/L	0.7			0.002	-	-	-	-	-	-	-	-			-	-	-	-
Bromide	mg/L				0.02	0.6	0.5	0.15	0.11	0.22	0.11	0.05	0.03			0.4	0.4	0.6	0.5
Calcium	mg/L				78	89	84	83	88	110	99	52	100			116	108	113	121
Chloride	mg/L	250 #			150	230	190	200	120	170	200	69	180			220	225	248	**285**
Chlorine Free Residual	mg/L	5 (0.6 #)		0.003	-	-	-	0.03	0.02	0.08	0.05	0.05	-			0.06	0.07	0.04	0.11
Iron	mg/L	0.3 #			0.04	0.01	0.04	0.1	0.01	0.07	0.01	**0.43**	0.04			0.07	0.11	0.05	0.05
Magnesium	mg/L				18	21	18	16	21	22	19	6.2	19			21	20	21	24
Potassium	mg/L				4.6	5.1	4.1	3.6	4.1	4.4	3.8	2.1	4.1			5	4	5	6
Selenium	mg/L	0.01		0.018	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
Sodium	mg/L	180			100	93	92	110	90	110	93	32	93			118	107	122	141
Sulphate	mg/L	250			31	28	32	27	28	27	25	25	25			29.3	27.5	30.4	40.6

	18/4/11	26/7/11	17/10/11	9/1/12	7/5/12	21/8/12	15/10/12	29/4/13	5/8/13	18/11/13	13/1/14	3/11/14	20/1/15	19/8/15	14/10/15	8/2/16	25/7/16	18/10/16	20/2/17	Statistics: Min	Max	Ave	Std. Dev.	Median
Time	11.03 am	10.48 am	10.48 am	10.35 am	10.31 am	10.29 am	10.42 am	10:46 AM	10:45am	-	10:24													
Field Parameters																								
Ground RL																								
Stick-up																								
Well RL																								
SWL (mtoc)	-	-	-	-	-	-	-	-	-	-	-													
SWL (mbgl)	-	-	-	-	-	-	-	-	-	-	-													
SWL (m AHD)	-	-	-	-	-	-	-	-	-	-	-													
pH	7.62	7.27	7.89	7.22	7.24	8.17	7.53	7.36	7.38	-	8.27	7.94	7.62	7.82	8.7				8.53					
EC	1039	1408	989	1141	1140	1375	1019	1191	916	-	838	872	1130	266	184				250					
Temp.	20.97	19.42	18.24	23.42	17.7	17.9	23.29	26.12	23.25	-	19.67	17.95	3.3	14.16	18.8				22.05					
DO (mg/L)	3.9	4.8	5.8	2.6	5	4.7	2.8	3.1	2.2	-	3.4	3.9	36						8.55					
DO (%)	43.6	52.4	61.2	31.1	52.6	50	32.6	38.2	25.8	-	37.4	41							97.9					
Salinity	0.6	0.79	0.58	0.64	0.65	0.76	0.57	0.65	0.52	-	0.42	0	3.1	1.9					3.1					
Turbidity	0	11.2	19.68	0	1.9	12.4	11.2	0	0	-	1.6													
Colour	Clear	Clear	-	-	-	-	-	-	-	-	-													
Odour	None	None	-	-	-	-	-	-	-	-	-													
Laboratory Analyses																								
pH	7.84	7.52	7.86	7.64	7.93	7.85	7.9	-	-	-	-									7.2	8.2	7.76	0.24	7.8
TDS	642	750	542	678	658	784	588	742	547	-	481									481	792	670.00	99.70	683
Total Suspended Solids								-	-	-	-	<5	5	<5	<5	<5	9	<5	<5	1	9	3.36	2.38	3
BOD5	2	2	2	13	2	2	3	23	3	-	2	<2	26	<2	<2	<2	<2	<2	<2	2	26	5.46	7.42	2
Nutrients																								
Ammonia	0.03	0.01	0.09	0.02	0.02	0.05	0.02	0.01	0.01	-	0.02	0.02	0.02	0.02	0.04	<0.01	0.03	0.12	0.04	0.01	0.35	0.06	0.07	0.03
Nitrate (NO3 as N)	0.01	0.04	0.05	1.33	0.03	0.06	0.01	0.01	0.01	-	0.02	0.03	0.02	0.12	0.04	0.05	<0.01	0.06	0.05	0.01	1.33	0.12	0.25	0.04
Nitrite (NO3 as N)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	-	0.01	<0.01	<0.01	0.12	<0.01	<0.01	<0.01	<0.01	<0.01	0.002	0.12	0.01	0.02	0.01
Total Kjeldahl Nitrogen	0.1	0.3	0.3	1.2	0.2	0.9	0.4	0.7	0.4	-	0.2	0.2	0.6	<0.1	<0.1	0.4	<0.1	0.2	0.1	0.1	1.2	0.35	0.26	0.29
Total Nitrogen	0.1	0.3	0.4	2.5	0.2	1	0.4	0.7	0.4	-	0.2	0.2	0.6	0.1	<0.1	0.4	<0.1	0.3	0.2	0.1	2.5	0.44	0.46	0.3
Total Phosphorus	0.08	0.06	0.06	0.07	0.02	0.55	0.22	0.28	0.03	-	0.06	0.05	0.07	<0.01	<0.01	<0.01	<0.01	0.33	<0.01	0.01	0.55	0.10	0.12	0.06
Reactive Phospherous																								
Enterococcus	2	2	2	2	2	2	2	-	-	-	-	-	-	-		-	-	-	-	2	2	2.00	0.00	2
Thermotolerant (Faecal) Coliforms	2	2	2	2	2	2	2	35000(app)	2	-	-	~ 1	<1	<1	<1	<1	<1	<1	<1	2	81	5.76	17.24	2
Total Coliforms	2	20	2	4	38	2	2	-	-	-	2									2	130	11.95	28.62	2
Major Ions																								
Bicarbonate as CaCO3	1	1	236	262	246	326	241	-	-	-	-									1	352	220.40	116.72	269
Barium	-	-	-	-	-	-	-	-	-	-	172									0.002	172	86.00	121.62	86.001
Bromide	0.5	0.6	0.4	0.41	0.4	0.5	0.3	-	-	-	0.2									0.02	0.6	0.33	0.20	0.4
Calcium	107	116	79	104	86	107	85	-	-	-	73									52	121	95.14	17.46	99
Chloride	142	**285**	134	167	186	278	169	-	-	-	-									69	285	192.40	56.68	188
Chlorine Free Residual	0.04	0.04	0.01	0.01	0.02	0.01	0.07	-	-	-	-									0.01	0.11	0.04	0.03	0.04
Iron	0.15	**11.1**	**0.97**	**1.02**	**4.2**	**0.54**	**0.17**	**-**	**-**	**-**	0.05									0.01	11.1	0.92	2.51	0.07
Magnesium	22	23	16	18	18	21	19	-	-	-	14									6.2	24	18.91	3.81	19
Potassium	4	5	4	4	5	5	4	-	-	-	4									2.1	6	4.33	0.78	4.1
Selenium	0.01	0.01	0.01	0.01	0.01	0.01	0.01	-	-	-	0.01									0.01	0.01	0.01	0.00	0.01
Sodium	67	127	102	91	115	162	92	-	-	-	83									32	162	101.90	26.38	100
Sulphate	39	76	48	74.6	48	37	31	-	-	-	99									25	99	39.45	20.00	31

Notes:

Red numbers denote value is <LOR

Individual and median values compared to the trigger values

^ Ecosystem protection (lowland river)

^^^ Ecosystem protection (estuaries)

* Recreational water quality guideline value

Aesthetic guideline value $$ ProUCL Version 3.0

Bold text = exceeds ADWG trigger value

Bold outline = exceeds marine trigger value

Yellow shading = exceeds freshwater trigger value

Free Chlorine field test (17/10/2012) using Palintest pooltest 25 professional Plus photometer

Table 15: MB5 - field parameters and analytical results

						MB5 (716)																																									
					Date	19/3/08	24/6/08	23/9/08	9/12/08	3/2/09	17/3/09	14/4/09	19/5/09	23/6/09	29/9/09	12/1/10	29/3/10	19/4/10	12/7/10	22/9/10	19/10/10	31/1/11	18/4/11	26/7/11	17/10/11	9/1/12	7/5/12	21/8/12	15/10/12	29/4/13	5/8/13	18/11/13	13/1/14	14/7/14	3/11/14	20/1/15	19/8/15	14/10/15	8/2/16	25/7/16	18/10/16	20/2/17					
	Units				Time	9.50 am	9.27 am	12.40 pm	11.05 am	9.55 am	11.05 am	10.40 am	-	10.35 am	10.35 am	11.25 am		11.19 am	12.02 pm		11.58 am		11.45 am	11.18 am	11.39 am	11.17 am	11.32am	11.16 am	11.12 am	11:27 AM	11:21 AM	11:37 AM	11.15 am														
Field Parameters																																															
Ground RL	m AHD					1.99																																									
Stick-up	m					0.85																																									
Well RL	m AHD					2.84																																									
SWL	mtoc					2.18	2.11	2.14	2.235	2.275	2.25	2.145	2.14	2.11	2.27	2.2	2.176	2.14	1.9	1.916	2.0		1.71	1.56	2.1	1.99	1.75	1.93	1.85	1.55	1.59	1.82	2.07		1.71	1.91	1.85	1.45									
SWL	mbgl					1.33	1.26	1.29	1.385	1.425	1.4	1.295	1.29	1.26	1.42	1.35	1.326	1.29	1.05	1.066	1.2		0.9	0.7	1.3	1.1	0.9	1.1	1.0	0.7	0.7	1.0	1.2		0.9	1.1	1.0	0.6									
SWL	m AHD					0.66	0.73	0.7	0.605	0.565	0.59	0.695	0.7	0.73	0.57	0.64	0.664	0.7	0.94	0.924	0.8		1.1	1.3	0.7	0.9	1.1	0.9	1.0	1.3	1.3	1.0	0.8		1.1	0.9	1.0	1.4									
pH	pH unit					5.58	5.31	5.37	5.24	-	5.22	5.22	5.11	4.8	5.21	4.94		4.85	5.3		5.53		3.91	4.46	5.06	4.92	4.93	5.93	5.44	5.65	5.35	4.52	5.46		5.11	5.53	7.86	5.83				5.02					
EC	µS/cm					50	113	145	167	-	207	229	229	237	381	276		345	110		281		107	56	129	115	64	112	112	87	90	170	104		96	102	185	106				8000					
Temp.	°C					20.21	17.21	15.56	18.5	-	20.06	19.81	18.38	17.12	17.55	19.82		20.19	16.09		17.27		21.96	15.49	19.09	22.85	21.47	17.76	19.85	22.31	17.93	17.94	22.91		19.56		17.3	17.46				21.77					
DO	mg/L					0.99	6.51	0.5	0.31	-	0.38	1.51	1.4	0.28	8.2	2.3		1.5	0.6		4.2		4.4	6.8	3.1	3.2	3.4	5	7	4.2	2.5	4.8	2		6.1	8.5	8.5					6.11					
DO	%														86.3	25.2		16.6	6.1		43.2		50.3	67.57	33.9	37.4	39.2	53.1	77	48.8	26	51	23.4		66	96	88					71.6					
Salinity	mg/L					-	0.13	0.16	-	-	0.17	0.19	0.49	0.1	0.26	0.22		0.24	0.13		0.23		0.11	0.1	0.12	0.13	0.09	0.12	0.12	0.11	0.12	0.48	0.06									45.6					
Turbidity	NTU					-	9.5	7.6	-	-	6.4	29.4	0.3	80.5	28	514		-0.1	8.8		180.2		96	600	470.8	210.7	51.3	50.8	7	31.5	0	24.9	18.3		0.8	1.9	1.6										
Colour						Red/orange	Straw	Straw	Red/orange	-	Red/orange	Red/orange	Red/orange	Red/orange	Black	-		-	-		Black		Turbid	-	-	-	-	-	-	-	-	-	Reddy/orange														
Odour						H2S	H2S	H2S	H2S	-	H2S	H2S	Slight H2S	None	H2S	H2S		H2S	-		None		None	-	-	-	-	-	-	-	-	-	-														
Laboratory Analyses																																											**Statistics**				
		NHMRC (2011) AWDG	ANZECC (2000) irrigation #	ANZECC (2000) marine ecosystem	ANZECC (2000) freshwater ecosystem																																						Min	Max	Ave	Std. Dev.	Median
pH	pH unit	6.5 - 8.5				4.9	5	4.9	5.2		4.9	5.1	4.8	5	5.2	4.6		4.72	5.07		5.52	4.9	5	5.56	5.01	5.02	5.61	5.99	5.39	-	-	-	-										4.6	5.99	5.11	0.33	5.01
TDS	mg/L																		138		292	182	100	114	160	128	108	99	91	133	116	138	249	170									91	292	146.29	58.67	130.5
Total Suspended Solids	mg/L					11	2	3	7		6	2	1	2	22	300		286												-	-	-	-		7	14	11	<5	<5	<5	31	52	1	300	53.14	102.61	9
BOD5	O2 mg/L					2	2	2	2		2	2	2	2	2	2		8	2		3	2	7	2	5	3	3	2	2	2	2	3	3	<2	<2	5	<2	<2	4	<2	3	27	2	27	3.85	4.89	2
Nutrients																																															
Ammonia	mg/L	0.5 #		0.91	0.9	0.09	0.22	0.14	0.02		0.24	0.26	0.11	0.3	0.31	0.37		0.2	0.04		0.06	0.12	0.04	0.03	0.11	0.17	0.06	0.1	0.1	0.01	0.05	0.16	0.08	0.09	0.14	0.1	0.2	0.31	0.1	0.05	0.14	0.2	0.01	0.37	0.14	0.09	0.11
Nitrate (NO3 as N)	mg/L	50			0.7	0.04	0.04	0.04	0.004		0.04	0.04	0.04	0.61	0.005	0.01		0.01	0.03		0.22	0.05	0.01	0.01	0.39	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	11.5	0.01	0.4	0.01	0.01	0.01	0.01	0.01	0.004	11.5	0.42	2.03	0.01
Nitrite (NO3 as N)	mg/L	3				0.025	0.008	0.007	0.01		0.007	0.008	0.009	0.01	0.04	0.01		0.01	0.01		0.01	0.01	0.05	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	0.4	<0.01	<0.01	<0.01	<0.01	<0.01	0.007	0.4	0.03	0.08	0.01
Total Kjeldahl Nitrogen	mg/L					0.6	0.68	0.72	1.2		0.96	0.87	0.67	0.8	1.2	0.8		0.8	0.5		2.3	0.9	1.3	0.5	10.6	5.5	2.8	2	1	1.7	0.8	1.3	1.6	1.6	2.1	1.4	1.2	1.2	2.6	1.7	2.3	3.4	0.5	10.6	1.82	1.89	1.25
Total Nitrogen	mg/L		**25 - 125 (5)**	0.3^^^	0.5^	0.57	0.68	0.72	1.3		1	0.87	0.67	1.4	1.2	0.8		0.8	0.5		2.5	1	1.3	0.5	11	**5.5**	**2.8**	**2**	**1**	**1.7**	**0.8**	**1.3**	**1.6**	**1.6**	**13.6**	**1.4**	**1.6**	**1.2**	**2.6**	**1.7**	**2.3**	**3.4**	0.5	13.6	2.24	2.84	1.35
Total Phosphorus	mg/L		0.8 - 12 (0.05)	0.03^^^	0.05^	0.07	0.006	0.03	0.06		0.02	0.02	0.01	0.05	0.04	0.09		0.03	0.05		0.01	0.03	0.01	0.02	0.93	**0.42**	**0.08**	**0.2**	**0.06**	**0.11**	**0.06**	0.02	**0.06**	**0.04**	**0.06**	**0.07**	0.03	**0.08**	**0.11**	0.03	**0.07**	**0.3**	0.01	0.93	0.10	0.17	0.055
Reactive Phospherous			0.004	0.008																																											
Enterococcus	cfu/100 mL	Not detected				2	2	2	2		2	2	2	2	2	2		2	2		8	2	2	4	2	2	2	2	2 (app)	-	-	-	-	-	-	-	-		-	-	-	-	2	8	2.44	1.46	2
Thermotolerant (Faecal) Coliforms	cfu/100 mL	Not detected		150*	150*	2	2	2	2		2	2	2	2	2	260		2	2		10	2	2	6	2	2	2	2	4 (app)	-	-	-	140 (app)	<1	<1	<2	<1	<1	2	<1	<1	<2	2	260	16.21	59.07	2
Total Coliforms	cfu/100 mL	Not detected				2	2	2	2		2	32	34	110	2	280		2	2		4	2	22	300	2	2	2	2	1000	8	<2	3 (app)											2	1000	90.60	231.60	2
Major Ions																																															
Bicarbonate as CaCO3	CaCO3/L					15	77	6	11		3	3	8	5	620	1.5		2	6		22	1	1	1	1	2	7	13	4	-	-	-	-										1	620	37.76	141.09	4
Barium	mg/L	0.7				0.005	-	-	-		-	-	-	-												-				-	-	-	7										7	7	7.00	#DIV/0!	7
Bromide	mg/L					0.12	0.2	0.8	0.16		0.18	0.17	0.08	0.07	0.51	0.244		0.2	0.1		0.4	0.2	0.4	0.2	0.5	0.17	0.1	0.2	0.1	-	-	-	0.2										0.07	0.8	0.25	0.18	0.2
Calcium	mg/L					0.84	2	2.5	3.4		3	1.5	2.7	3	5.1	3.7		5	1		10	2	1	1	2	1	2	2	2	-	-	-	3										1	10	2.85	2.07	2.25
Chloride	mg/L	250 #	<175 ~~			41	31	41	52		61	74	66	71	120	91.2		97	27.4		69.3	56.9	11	9	29	21.5	8	21	22	-	-	-	-										8	120	49.91	32.54	52
Chlorine Free Residual	mg/L	5 (0.6 #)			0.003	-	-	-	0.01		0.05	0.04	0.03	-	0.02	0.01		0.05	0.06		0.04	0.05	0.01	0.02	0.01	-	0.04	0.01	0.12	-	-	-	-		1.32	2.2	0.11	1.06				0.3	0.01	0.12	0.04	0.03	0.035
Iron	mg/L	0.3 #	10 (0.2)			**1.2**	**1.9**	**1.4**	**1.3**		**1.4**	**1.2**	**1.3**	**1.3**	**2.1**	**1.7**		**2.31**	**1.43**		**12.3**	**3.83**	**7.75**	**0.95**	**50.2**	**19.1**	**13.3**	**6.36**	**1.72**	-	-	-	**1.81**										0.95	50.2	6.64	11.42	1.765
Magnesium	mg/L					0.89	2.8	2.8	2.9		3.5	3.4	3.3	3.4	5.9	4		5	1		3	2	1	1	2	1	1	1	1	-	-	-	2										1	5.9	2.51	1.46	2.4
Potassium	mg/L					1.2	1.8	2.1	2.3		3.5	4.3	4.3	4.4	6.6	5.9		8	2		4	4	2	2	3	3	1	3	3	-	-	-	3										1	8	3.57	1.71	3
Selenium	mg/L	0.01			0.018	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	0.01	0.01	0.01	0.01	0.01	0.01	0.01	-	-	-	0.01										0.01	0.01	0.01	0.00	0.01
Sodium	mg/L	180	<115 ~~			6.2	12	15	21		36	27	31	31	55	39		44	14		39	27	8	6	16	12	6	13	12	-	-	-	18										6	55	23.50	13.90	19.5
Sulphate	mg/L	250				1.1	0.4	0.4	1		3.6	6.2	4.2	4.2	66	6		2.76	1.32		3.65	1.77	2	10	1	0.67	10	10	1	-	-	-	10										0.4	66	7.29	14.23	3.625

Notes:

Red numbers denote value is <LOR

Individual and median values compared to the trigger values

^ Ecosystem protection (lowland river)

^^^ Ecosystem protection (estuaries)

* Recreational water quality guideline value

Aesthetic guideline value $$ ProUCL Version 3.0

$$ ProUCL Version 3.0

Bold text = exceeds ADWG/ANZECC irrigation trigger value

Bold outline = exceeds marine trigger value

Yellow shading = exceeds freshwater trigger value

Free Chlorine field test (17/10/2012) using Palintest pooltest 25 professional Plus photometer

Earth2Water Pty Ltd

Table 16: V5 - field parameters and analytical results

V5 (715)

	Units	NHMRC (2011) AWDG	ANZECC (2000) marine ecosystem	ANZECC (2000) freshwater ecosystem	19/3/08	24/6/08	23/9/08	9/12/08	3/2/09	17/3/09	14/4/09	19/5/09	23/6/09	29/9/09	15/1/10	29/3/10	19/4/10	12/7/10	22/9/10	19/10/10
				Time	10.45 am	10.13 am	2.14 pm	12.00 pm	10.55 am	12.29 pm	12.00 pm	-	11.26 am	12:04 PM	10:32 AM		1:19 PM	12.54 am		12.19 pm
Field Parameters																				
Ground RL	m AHD				1.84															
Stick-up	m				0.6															
Well RL	m AHD				2.44															
SWL	mtoc				1.87	1.77	1.76	1.95	1.99	2.02	1.77	1.83	1.78	2.03	1.9	1.65	1.86	1.5	1.624	1.65
SWL	mbgl				1.27	1.17	1.16	1.35	1.39	1.42	1.17	1.23	1.18	1.43	1.3	1.05	1.26	0.9	1.024	1.05
SWL	m AHD				0.57	0.57	0.68	0.49	0.45	0.42	0.67	0.61	0.66	0.41	0.54	0.79	0.58	0.94	0.816	0.79
pH	pH unit				5.63	5.41	5.65	5.52	5.9	5.76	5.73	5.38	5.31	-	5.7		5.24	4.07		4.58
EC	µS/cm				321	456	390	427	432	431	414	389	407	-	391		438	750		611
Temp.	°C				18.27	17.23	15.88	16.94	17.6	18.23	18.4	18.1	17.5	-	17.67		18.91	17.3		16.36
DO	mg/L				0.51	2.34	6.9	0.23	0.3	1.82	0.26	3.1	0.19	-	0.3		0.2	0.6		0.3
DO	%														3.5		1.6	6.5		3.1
Salinity	mg/L				-	0.29	0.27	-	0.29	0.28	0.28	0.58	0.19	-	0.26		0.28	0.46		0.41
Turbidity	NTU				-	2.8	9.8	-	5	118.2	2.3	0.4	45	-	64		-0.2	0.2		4.1
Colour					Straw	Clear	Straw	Clear	-	Clear	Clear	Clear	-	-	-		-	-		Turbid
Odour					Sulfur	Slight H2S	H2S	H2S	None	Slight odour	H2S	None	-	-	H2S		H2S	-		H2S
Laboratory Analyses																				
pH	pH unit	6.5 - 8.5			5.7	5.1	5.2	5.8	5.6	5.9	5.5	5.4	5.4		5.4		5.37	4.46		4.69
TDS	mg/L																	424		316
Total Suspended Solids	mg/L				2	1	1	4	2	12	1	2	3		330		330			
BOD5	O2 mg/L				2	2	2	2	3	2	2	2	2		2		13	3		2
Nutrients																				
Ammonia	mg/L	0.5 #	0.91	0.9	0.29	**0.5**	0.26	0.21	0.32	0.31	0.33	0.18	0.3		0.35		0.27	0.14		0.18
Nitrate (NO3 as N)	mg/L	50		0.7	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.01		0.01		0.01	0.01		0.12
Nitrite (NO3 as N)	mg/L	3			0.008	0.004	0.004	0.002	0.003	0.002	0.004	0.003	0.01		0.01		0.01	0.01		0.01
Total Kjeldahl Nitrogen	mg/L				0.6	0.95	0.74	0.76	0.7	0.75	0.75	0.51	0.7		0.6		1	1.2		1.3
Total Nitrogen	mg/L		0.3^^^	0.5^	0.62	0.95	0.74	0.76	0.7	0.75	0.75	0.51	0.7		0.6		1	1.2		1.4
Total Phosphorus	mg/L		0.03^^^	0.05^	0.02	0.44	0.02	0.03	0.007	0.03	0.01	0.008	0.05		0.04		0.04	0.03		0.01
Reactive Phospherous			0.004	0.008																
Enterococcus	cfu/100 mL	Not detected			2	2	2	2	2	2	40	2	2		2		2	2		6
Thermotolerant (Faecal) Coliforms	cfu/100 mL	Not detected	150*	150*	2	2	2	2	16	2	47	2	2		2		2	2		2
Total Coliforms	cfu/100 mL	Not detected			2	2	2	2	11000	2	60	2	60		120		40	4		38
Major Ions																				
Bicarbonate as CaCO3	CaCO3/L				5	11	8	13	21	68	10	13	10		120		93	1		3
Barium	mg/L	0.7			0.005	-	-	-	-	-	-	-	-		-		-	-		-
Bromide	mg/L				0.04	0.3	0.7	0.15	0.16	0.18	0.1	0.03	0.08		0.279		0.2	0.3		0.4
Calcium	mg/L				3.1	3.7	3.9	4.6	3	33	3.2	3.4	3.5		3.3		4	5		4
Chloride	mg/L	250 #			93	190	130	150	110	110	140	120	120		132		123	190		167
Chlorine Free Residual	mg/L	5 (0.6 #)		0.003	-	-	-	0.02	0.01	0.05	0.06	0.03	-		0.02		0.06	0.08		0.04
Iron	mg/L	0.3 #			**0.8**	**2.2**	**1.4**	**1.6**	**1.9**	**1.7**	**1.8**	**1.8**	**1.7**		**1.6**		**1.22**	**2.5**		**2.06**
Magnesium	mg/L				5.3	7.8	6.3	6.78	7	9.3	6.6	6.4	6.2		6.3		6	12		10
Potassium	mg/L				2.1	2.4	2	1.9	2.1	2.2	2.1	2	2		1.9		2	4		4
Selenium	mg/L	0.01		0.018	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
Sodium	mg/L	180			53	66	56	64	56	78	57	60	58		63		66	104		91
Sulphate	mg/L	250			3.1	3.2	5	1	4.3	4.2	3.3	2.6	3.9		3		1.23	30.4		12

	31/1/11	18/4/11	26/7/11	17/10/11	9/1/12	7/5/12	21/8/12	15/10/12	29/4/13	5/8/13	18/11/13	13/1/14	14/7/14	3/11/14	20/1/15	19/8/15	14/10/15	8/2/16	25/7/16	18/10/16	20/2/17	Min	Max	Ave	Std. Dev.	Median
Time		1.40 pm	12.44 pm	1.48 pm	1.41 pm	2.15 pm	1.31 pm	1.37 pm	2:08 PM	13:28	1.53 PM	1.35 PM														
Field Parameters																										
Ground RL																1.84					1.84					
Stick-up																0.6					0.6					
Well RL																2.44					2.44					
SWL (mtoc)		1.38	1.26	1.7	1.72	1.48	1.62	1.52	1.27	1.36	1.45	1.79				1.52										
SWL (mbgl)		0.78	0.66	1.1	1.12	0.88	1.02	0.92	0.67	0.76	0.85	1.19				0.92										
SWL (m AHD)		1.06	1.18	0.74	0.72	0.96	0.82	0.92	1.17	1.08	0.99	0.65				0.92										
pH		4.57	4.57	5.9	6.34	4.73	6.5	5.91	5.53	5.92	5.3	5.82		5.69	5.53	7.96					5.62					
EC		409	457	549	315	285	270	265	281	296	430	449		371	393	407					8000					
Temp.		19.78	16.93	18.76	20.13	18.2	17.27	19.07	19.79	17.37	17.78	22.48		16.59	2.2	16.8					20.06					
DO (mg/L)		3.3	1	4	3.2	3.4	4	3.4	3.8	2.6	5	1.9			24	1.4					3.23					
DO (%)		35.7	9.4	42.6	35.2	35.8	41.9	36.4	42.1	27.2	53.2	21.4				14					36.7					
Salinity		0.27	0.29	0.33	0.22	0.2	0.21	0.2	0.19	0.2	0.66	0.21									14.6					
Turbidity		21.7	0.2	43	0	3.2	10	40	0	17.1	60.8	0.8			1.9	6.2										
Colour		Turbid	Turbid	-	-	-	-	-	-	Cloudy	-	-														
Odour		H2S	H2S	-	-	-	-	-	-	-	-	H2S														
Laboratory Analyses																						**Statistics**				
pH	5	4.95	5.02	6.28	5.76	5.67	6.01	5.87	-	-	-	-	232									4.46	6.28	5.43	0.45	5.4
TDS	340	430	378	364	222	220	224	235	262	225	337	312										220	430	306.36	75.86	314
Total Suspended Solids									-	-	-	-	<2	<5	<5	<5	<5	<5	12	<5	<5	1	330	69.70	137.25	3.5
BOD5	2	3	3	2	2	2	2	2	2	2	3	2		3	19	<2	<2	3	<2	4	<2	2	19	3.37	3.77	2
Nutrients																										
Ammonia	0.15	0.06	0.08	0.2	0.17	0.18	0.1	0.13	0.08	0.15	0.18	0.18	0.15	0.16	0.16	0.22	0.31	0.13	0.06	0.37	0.59	0.06	0.35	0.20	0.08	0.18
Nitrate (NO3 as N)	0.02	0.01	0.01	1.34	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.02	0.01	0.07	0.01	0.02	0.01	0.01	0.01	0.01	0.04	0.01	1.34	0.08	0.28	0.01
Nitrite (NO3 as N)	0.01	0.02	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	0.02	0.01	0.01	0.01	0.01	0.01	0.002	0.02	0.01	0.00	0.01
Total Kjeldahl Nitrogen	1.5	2.4	1.6	2	1.1	1.4	0.8	1.1	1.1	1.4	1.7	1	1.4	1.4	1.1	1.2	1.2	1.8	1.6	1.5	1.5	0.51	2.4	1.14	0.48	1.1
Total Nitrogen	1.5	2.4	1.6	3.3	1.1	1.4	0.8	1.1	1.1	1.4	1.7	1	1.4	1.5	1.1	1.2	1.2	1.8	1.6	1.5	1.5	0.51	3.3	1.26	0.56	1.2
Total Phosphorus	0.3	0.1	0.01	0.07	0.01	0.05	0.1	0.02	0.02	0.07	0.03	0.02	0.05	0.02	0.05	<0.01	<0.01	0.01	0.04	0.03	0.02	0.007	0.3	0.04	0.05	0.03
Reactive Phospherous																										
Enterococcus	2	2	2	2	2	2	2	2	-	-	-	-	-	-	-	-		-	-	-	-	2	40	4.21	8.72	2
Thermotolerant (Faecal) Coliforms	2	2	2	2	2	2	2	2	2	-	-	2	<1	<1	<2	<1	<1	<1	<1	<1	<1	2	47	4.81	10.14	2
Total Coliforms	2	98	21	2	26	2	2	2	-	2	1											1	11000	547.05	2395.32	2
Major Ions																										
Bicarbonate as CaCO3	1	1	1	26	12	8	6	7	-	-	-	-										1	120	22.21	33.60	10
Barium					-				-	-	-	13										13	13	13.00	#DIV/0!	13
Bromide	0.3	0.6	0.4	0.4	0.15	0.2	0.2	0.2	-	-	-	0.3										0.03	0.7	0.27	0.17	0.2
Calcium	4	2	3	16	3	3	4	3	-	-	-	6										2	33	5.75	7.03	3.7
Chloride	155	106	132	134	66	64	51	71	-	-	-	-										51	190	119.53	36.39	123
Chlorine Free Residual	0.04	0.02	0.03	0.02	0.01	0.04	0.03	0.09	-	-	-	-		1.28	0.01	0.93					0.11	0.01	0.09	0.04	0.02	0.03
Iron	**1.49**	**2.04**	**1.5**	**3.97**	**1.32**	**1.22**	**1.17**	**0.96**	-	-	-	**0.92**										0.92	3.97	1.69	0.66	1.6
Magnesium	6	6	8	12	4	5	4	4	-	-	-	6										4	12	6.89	2.32	6.3
Potassium	4	5	6	5	3	3	3	3	-	-	-	2										1.9	6	3.01	1.25	2.6
Selenium	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	-	-	-	0.01										0.01	0.01	0.01	0.00	0.01
Sodium	70	54	62	65	40	36	27	33	-	-	-	70										27	104	60.50	18.33	61
Sulphate	7.74	1	10	21	14.4	9	3	1	-	-	-	1										1	30.4	6.95	7.64	4.05

Notes:

Red numbers denote value is <LOR

Individual and median values compared to the trigger values

^ Ecosystem protection (lowland river)

^^^ Ecosystem protection (estuaries)

* Recreational water quality guideline value

Aesthetic guideline value

$$ ProUCL Version 3.0

Bold text = exceeds ADWG trigger value

Bold outline = exceeds marine trigger value

Yellow shading = exceeds freshwater trigger value

Free Chlorine field test (17/10/2012) using Palintest pooltest 25 professional Plus photometer

Table 17: V3 - field parameters and analytical results

V3 (714)

	Units	ANZECC (2000) marine ecosystem	ANZECC (2000) freshwater ecosystem	19/03/2008	24/06/08	24/09/2008	9/12/2008	3/02/2009	17/03/2009	14/04/2009	19/05/2009	23/06/09	15/01/2010	29/03/2010	19/04/2010	12/07/2010
Time				11.55 am	11.30 am	9.00 am	13.06 pm	12.12 pm	2.00 pm	1.15 pm	-	12.43 pm	11.41 am			1.55 pm
Field Parameters																
Ground RL	m AHD			1.44												
Stick-up	m			0												
Well RL	m AHD			1.44												
SWL	mtoc			1.119	0.993	1.17	1.1	1.525 #	1.18	-	1.03	1.04	1.21	1.045		1.1
SWL	mbgl			1.119	0.993	1.17	1.1	1.525 #	1.18	-	1.03	1.04	1.21	1.045		1.1
SWL	m AHD			0.321	0.447	0.27	0.34	-0.085 #	0.26	-	0.41	0.4	0.23	0.395		0.34
pH	pH unit			7.33	6.85	7.09	6.72	7.03	6.98	6.99	7.36	7.03	7.01			7.22
EC	µS/cm			36550	37970	38880	30500	41960	39110	37780	42800	40710	38700			39900
Temp.	°C			22.09	19.5	17.37	21.26	20.9	21.86	21.72	20.91	19.35	21.6			18.49
DO	mg/L			0.7	5.82	9.5	0.62	0.2	0.15	0.43	0.4	0.42	0.4			1
DO	%												5.6			13.2
Turbidity	NTU			-	4.4	6.5	-	15	26.7	3.3	-0	3.8	15.5			19.1
Salinity	mg/L			-	27.3	29.51	-	29.76	3.6	25.89	27.5	25.92	24.6			25.53
Colour				Clear	Clear	Clear	Clear	-	-	Turbid	Clear	Clear	-			-
Odour				H2S	H2S	H2S	H2S	-	H2S	H2S	None	H2S	-			-
Laboratory Analyses																
pH	pH unit			7.5	7	7	7.4	7.3	7.3	7.2	7.4	7.4			7.22	6.97
TDS	mg/L														30600	25000
Total Suspended Solids	mg/L			33	67	23	22	51	21	49	12	110				
BOD5	O2 mg/L			14	39	11	7	11	5	7	8	8			2	13
Nutrients																
Ammonia	mg/L	0.91	0.9	1.7	2.2	2.7	2.9	1.7	1.7	1.9	2.8	1.5			1.76	1.48
Nitrate (NO3 as N)	mg/L		0.7	0.04	0.04	0.04	0.04	0.04	0.05	0.04	0.04	0.03			0.03	0.14
Nitrite (NO3 as N)	mg/L			0.006	0.002	0.002	0.002	0.002	0.002	0.009	0.002	0.01			0.01	0.01
Total Kjeldahl Nitrogen	mg/L			2	2.4	2.8	2.9	1.7	1.9	2	2.9	1.7			1.8	12.9
Total Nitrogen	mg/L	0.3^^^	0.5^	2	2.4	2.8	2.9	1.7	1.9	2	2.9	1.7			1.8	13
Total Phosphorus	mg/L	0.03^^^	0.05^	0.17	0.14	0.19	0.12	0.17	0.17	0.09	0.14	0.21			0.19	0.52
Enterococcus	cfu/100 mL			2	2	2	4	2	2	22	2	2			2	12
Thermotolerant (Faecal) Coliforms	cfu/100 mL	150*	150*	100	2	2	10	2	2	40	2	2			2	30
Total Coliforms	cfu/100 mL			160	2	2	80	4	130	230	2	170			20	28
Major Ions																
Bicarbonate as CaCO3	CaCO3/L			180	210	340	250	220	210	210	240	200			219	181
Barium	mg/L			0.009	-	-	-	-	-	-	-	-			-	-
Bromide	mg/L			0.05	3.8	0.1	0.12	0.13	0.24	0.14	0.03	0.04			52.9	45.5
Calcium	mg/L			190	220	290	260	340	320	280	310	310			378	307
Chloride	mg/L			16000	21000	18000	13000	16000	10000	11000	16000	16000			18700	13000
Chlorine Free Residual	mg/L		0.003	-	-	-	0.03	0.02	0.08	0.06	0.04	-			0.07	0.04
Iron	mg/L			0.03	0.01	0.14	0.4	0.19	0.21	0.1	0.03	0.05			0.5	3.32
Magnesium	mg/L			870	980	1100	830	410	1100	840	1000	990			1100	865
Potassium	mg/L			310	310	320	250	330	330	260	360	290			368	220
Selenium	mg/L		0.018	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01			0.1	0.01
Sodium	mg/L			7200	7200	8700	7300	8800	9700	6800	7300	8000			9660	7080
Sulphate	mg/L			2200	2200	2200	1800	2300	2500	1700	380	2100			2650	1830

	Units	22/09/2010	19/10/2010	31/01/2011	18/04/2011	26/07/2011	17/10/2011	9/01/2012	7/05/2012	21/08/2012	15/10/2012	29/4/13	5/8/13	18/11/13	13/01/2014	8/02/2016	20/02/2017	Min	Max	Ave	Std. Dev.	Median
Time			1.40 pm		3.07 pm	1.55 pm	3.05 pm	2.46 pm	3.17 pm	2.45 pm	2.52 pm	-	-	-	2:40 PM							
Field Parameters																						
SWL	mtoc	0.995	1		0.86	0.96	1	1	0.85	0.82	0.71	Not	Not	Not	0.95							
SWL	mbgl	0.995	1		0.86	0.96	1	1	0.85	0.82	0.71	Sampled	Sampled	Sampled	0.95							
SWL	m AHD	0.445	0.44		0.58	0.48	0.44	0.44	0.59	0.62	0.73	-	-	-	0.49							
pH	pH unit		7.24		7.39	7.09	7.36	6.62	7.13	7.8	7.5	-	-	-	7.49		6.58					
EC	µS/cm		40100		48600	29600	24100	2205	41100	2783	4085	-	-	-	36.35		8000					
Temp.	°C		18.12		22.08	16.92	18.69	24.5	19.07	17.07	19.62	-	-	-	23.76		23.52					
DO	mg/L		0.6		1.9	4.1	2.8	3.2	3.4	4.9	4.4	-	-	-	0.9		5.87					
DO	%		7		26.5	47.4	32.9	38.4	43.8	51.8	48.5	-	-	-	12		71					
Turbidity	NTU		0		11.6	18.4	5	0	26.29	4.9	1.9	-	-	-	1.2		113.6					
Salinity	mg/L		25.52		31.7	18.32	14.58	1.22	16.2	1.56	2.29	-	-	-	22.9							
Colour			Clear		Clear	Clear	-	-	-	-	-	-	-	-	-							
Odour			None		H2S	H2S	-	-	-	-	-	-	-	-	-							
Laboratory Analyses																		**Statistics**				
pH	pH unit		7.23	6.6	7.48	7.34	7.53	7.17	7.67	7.72	7.78	-	-	-	-			6.6	7.78	7.31	0.28	7.32
TDS	mg/L		25600	1300	34400	24400	15500	1240	29300	1570	2320	-	-	-	28400			1240	34400	18302.50	13115.00	24700.00
Total Suspended Solids	mg/L											-	-	-	-	136	96	12	136	58.70	42.74	50.00
BOD5	O2 mg/L		7	6	6	6	7	5	8	15	3	-	-	-	5	3	<2	2	39	8.67	7.66	7.00
Nutrients																						
Ammonia	mg/L		1.28	1.37	1.99	1.44	2.01	0.39	2.82	2.6	2.48	-	-	-	2.12	0.25	0.26	0.25	2.9	1.80	0.79	1.83
Nitrate (NO3 as N)	mg/L		0.08	1.4	0.01	0.01	0.13	0.08	4.07	1.56	0.13	-	-	-	0.01	0.1	0.42	0.01	4.07	0.39	0.92	0.05
Nitrite (NO3 as N)	mg/L		0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.34	0.02	-	-	-	0.01	<0.01	<0.01	0.002	0.34	0.02	0.07	0.01
Total Kjeldahl Nitrogen	mg/L		2.3	2.5	2	1.8	2.2	1.7	10.5	4.1	3	-	-	-	2.3	3.5	2.3	1.7	12.9	3.24	2.83	2.30
Total Nitrogen	mg/L		2.4	3.9	2	1.8	2.3	1.8	14.6	6	3.2	-	-	-	2.3	3.6	2.7	1.7	14.6	3.62	3.44	2.40
Total Phosphorus	mg/L		0.01	0.11	0.3	0.17	0.1	0.17	1.08	0.16	0.05	-	-	-	0.14	0.3	0.24	0.01	1.08	0.22	0.22	0.17
Enterococcus	cfu/100 mL		2	2	2	6	14	110	44	4	190	-	-	-	-	-	-	2	190	22.42	48.03	2.00
Thermotolerant (Faecal) Coliforms	cfu/100 mL		2	2	2	28	110	60	26	4	150	-	-	-	48	350	<2	2	350	41.71	80.80	4.00
Total Coliforms	cfu/100 mL		32	2	6	110	170	3600	220	26	10000	-	-	-				2	10000	780.74	2375.52	32.00
Major Ions																						
Bicarbonate as CaCO3	CaCO3/L		195	1	1	1	138	48	232	161	128	-	-	-	-			1	340	167.63	93.90	200.00
Barium	mg/L		-									-	-	-	222			222	222	222.00	#DIV/0!	222.00
Bromide	mg/L		51.8	2.2	58.7	57.5	42	2.11	56.7	2.5	4.7	-	-	-	40.6			0.03	58.7	21.09	25.22	3.15
Calcium	mg/L		367	36	348	304	218	32	398	59	62	-	-	-	298			32	398	256.85	116.75	301.00
Chloride	mg/L		15100	699	17200	13300	8260	626	15600	826	1280	-	-	-	-			626	21000	11873.21	6577.44	13300.00
Chlorine Free Residual	mg/L		0.04	0.06	0.07	0.06	0.06	0.02	0.05	0.03	0.14	-	-	-	-			0.02	0.14	0.05	0.03	0.06
Iron	mg/L		0.5	1.48	9.44	3.82	0.39	3.05	5.1	1.78	0.2	-	-	-	0.5			0.01	9.44	1.56	2.38	0.45
Magnesium	mg/L		938	39	1020	861	558	45	1080	42	78	-	-	-	831			39	1100	735.35	391.21	863.00
Potassium	mg/L		320	19	367	283	176	15	364	32	33	-	-	-	246			15	368	244.65	123.70	286.50
Selenium	mg/L		0.1	0.01	0.1	0.01	0.01	0.01	0.1	0.01	0.01	-	-	-	0.1			0.01	0.1	0.03	0.04	0.01
Sodium	mg/L		8940	371	9520	7710	4780	357	9200	490	640	-	-	-	6190			357	9700	6436.90	3303.63	7300.00
Sulphate	mg/L		1880	110	2470	1750	794	98	1720	60	10	-	-	-	1950			10	2650	1525.10	913.98	1815.00

Notes:

Red numbers denote value is <LOR

Individual and median values compared to the trigger values

^ Ecosystem protection (lowland river)

^^^ Ecosystem protection (estuaries)

* Recreational water quality guideline value

$$ ProUCL Version 3.0

Bold outline = exceeds marine trigger value

Yellow shading = exceeds freshwater trigger value

Free Chlorine field test (17/10/2012) using Palintest pooltest 25 professional Plus photometer

Prepared by: DF
Checked by: DP

Table 18: V1 - field parameters and analytical results

				V1 (713)																														
			Date	19/03/2008	24/06/08	24/09/08	9/12/2008	3/02/09	17/03/2009	14/04/2009	19/05/2009	23/06/09	29/09/09	15/01/2010	29/03/2010	19/04/2010	12/07/2010	22/09/2010	19/10/2010	31/01/2011	18/04/2011	26/07/2011	17/10/2011	9/01/2012	7/05/2012	21/08/2012	15/10/2012								
	Units		Time	11.28 am	10.58 am	-	12.40 pm	11.25 am	1.30 pm	12.41 pm	-	12.15 pm	12.07 pm	11.15 am		2.13 pm	2.11 pm		1.05 pm		2.37 pm	1.28 pm	2.38 pm	2.20 pm	2.58 pm	2.13 pm	2.26 pm								
Field Parameters																																		
Ground RL	m AHD													0.99																				
Stick-up	m													0																				
Well RL	m AHD													0.99																				
SWL	mtoc			0.718	0.52	0.79	0.66	0.74	0.85	0.61	0.535	0.52	0.67	0.8	0.619	0.68	0.5	0.54	0.5		0.38	0.45	0.5	0.55	0.45	0.4	0.27								
SWL	mbgl			0.718	0.52	0.79	0.66	0.74	0.85	0.61	0.535	0.52	0.67	0.8	0.619	0.68	0.5	0.54	0.5		0.38	0.45	0.5	0.55	0.45	0.4	0.27								
SWL	m AHD			0.272	0.47	0.2	0.33	0.25	0.14	0.38	0.455	0.47	0.32	0.19	0.371	0.31	0.49	0.45	0.49		0.61	0.54	0.49	0.44	0.54	0.59	0.72								
pH	pH unit			7.23	6.76	6.87	6.71	6.84	6.82	6.83	6.92	6.6	-	6.82		6.97	6.93		6.95		6.7	7.11	7.15	7.1	7.11	7.72	7.27								
EC	µS/cm			6650	8820	9800	13110	16720	18050	18000	25700	25700	-	31500		31600	30800		30800		7838	26.9	6927	7563	8700	9500	8900								
Temp.	°C			18.53	17.26	15.57	17.56	17.56	18.31	18.48	18.15	17.45	-	17.7		18.83	17.17		16.19		20.23	16.59	16.97	20.68	17.19	15.16	18								
DO	mg/L			0.49	8.39	0.8	0.2	0.14	0.17	0.41	5.5	0.14	-	0.3		0.2	0.6		0.6		2.2	0.7	3.7	4.2	4.2	4	4.3								
DO	%												-	3		2.3	7.4		6.8		25.1	8.1	39	47.9	44.8	41.1	46.5								
Turbidity	NTU			-	4.1	4.3	-	5	23.8	52	-0.5	1.7	-	1		19.66	9.3		29.7		600	19.5	564	421.3	289.7	271	28								
Salinity	mg/L			-	5.9	6.83	-	11.64	12.42	12.37	15.65	15.64	-	19.57		0	19.22		19.16		4.49	16.5	3.99	4.32	4.82	5.35	4.96								
Colour				Straw	-	Straw	Clear	Clear	Red/orange	Red/orange	Clear	Red/orange	-	-		-	-		Black		Turbid	Clear	-	-	-	-	-								
Odour				Sulfur	H2S	H2S	H2S	None	H2S	H2S	None	H2S	-	H2S		H2S	-		-		H2S	H2S	-	-	-	-	-								
Laboratory Analyses																															**Statistics**			
		ANZECC (2000) marine ecosystem	ANZECC (2000) freshwater ecosystem																										Min	Max	Ave	Std. Dev.	Median
pH	pH unit			7.1	6.9	7	7.4	7.2	7.1	7.1	7.1	7.3				7.05	6.77		6.98	6.7	7.33	7.06	7.23	7.53	7.53	7.62	7.67	6.7	7.67	7.18	0.27	7.1
TDS	mg/L															9490	3330		20800	3120	5440	5320	4870	4630	4980	4400	5450	3120	20800	6530.00	5013.84	4980
Total Suspended Solids	mg/L			8	14	6	13	5	9	14	8	65																5	65	15.78	18.76	9
BOD5	O2 mg/L			2	4	2	2	2	2	2	2	2				7	6		3	13	11	2	5	7	5	2	2	2	13	4.15	3.23	2
Nutrients																																		
Ammonia	mg/L	0.91	0.9	0.9	0.98	1.1	0.87	1	1.2	1.1	0.99	1				0.79	1.2		0.97	0.91	1.29	1.42	0.9	1.03	1.03	1.58	1.31	0.79	1.58	1.06	0.20	1
Nitrate (NO3 as N)	mg/L		0.7	0.04	0.04	0.04	0.09	0.04	0.04	0.04	0.04	0.01				0.05	0.02		1.43	7.34	0.01	0.01	1.18	0.08	0.22	0.01	0.01	0.01	7.34	0.54	1.61	0.04
Nitrite (NO3 as N)	mg/L			0.01	0.005	0.005	0.03	0.005	0.002	0.005	0.005	0.01				0.01	0.01		0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.002	0.03	0.01	0.01	0.01
Total Kjeldahl Nitrogen	mg/L			2	1.8	1.6	1.7	1.6	1.8	1.8	1.8	1.8				1.4	2.2		1.1	3.6	2.3	2.2	11	8.9	5.1	2.7	1.9	1.1	11	2.92	2.58	1.85
Total Nitrogen	mg/L	0.3^^^	0.5^	2	1.8	1.6	1.8	1.6	1.8	1.9	1.8	1.8				1.4	2.2		2.5	11	2.3	2.2	12.2	9	5.3	2.7	1.9	1.4	12.2	3.44	3.29	1.95
Total Phosphorus	mg/L	0.03^^^	0.05^	0.17	0.04	0.11	0.09	0.16	0.15	0.1	0.12	0.19				0.1	0.07		0.01	0.44	0.56	0.23	1.49	1.12	0.2	0.49	0.11	0.01	1.49	0.30	0.38	0.155
Enterococcus	cfu/100 mL			2	2	2	2	2	2	2	2	2				2	2		2	2	2	2	2	2	2	2	2	2	2	2.00	0.00	2
Thermotolerant (Faecal) Coliforms	cfu/100 mL	150*	150*	2	2	2	2	2	2	2	2	2				2	2		2	2	2	2	2	2	2	2	2	2	2	2.00	0.00	2
Total Coliforms	cfu/100 mL			300	12	2	2	2	32	310	2	170				30	4		30	70	2	2	62	3600	300	210	840	2	3600	299.10	802.54	31
Major Ions																																		
Bicarbonate as CaCO3	CaCO3/L			350	370	360	360	380	400	400	390	390				359	275		339	1	1	1	243	329	260	340	289	1	400	291.85	133.20	345
Barium	mg/L			0.008	-	-	-	-	-	-	-	-																0.008	0.008	0.01	#DIV/0!	0.008
Bromide	mg/L			0.02	11	0.6	0.14	0.18	0.18	0.19	0.04	0.04				14.3	6.1		46.3	4.7	10.6	19.8	10.4	8.41	9.1	9.2	11.4	0.02	46.3	8.14	10.73	7.255
Calcium	mg/L			250	320	220	230	350	370	340	350	360				408	230		452	209	249	231	278	314	249	296	346	209	452	302.60	68.78	305
Chloride	mg/L			2200	2900	1700	1400	6600	6800	7200	8500	7800				4560	1820		12500	1380	2610	3650	2090	2450	2880	3030	2990	1380	12500	4253.00	2993.42	2945
Chlorine Free Residual	mg/L		0.003	-	-	-	0.06	0.05	0.07	0.07	0.04	-				0.09	0.09		0.1	0.06	0.05	0.03	0.03	-	0.03	0.01	0.13	0.003	0.13	0.06	0.03	0.055
Iron	mg/L			0.03	0.01	0.05	0.21	0.01	0.02	0.04	0.01	0.01				0.92	0.43		0.5	1.34	48.8	12.6	75.2	31.5	26.3	22.1	0.05	0.01	75.2	11.01	20.45	0.32
Magnesium	mg/L			100	190	86	83	400	480	450	570	580				236	97		796	79	138	210	123	139	152	162	164	79	796	261.75	208.14	163
Potassium	mg/L			38	55	22	20	120	130	120	160	150				75	29		218	28	42	69	39	43	50	47	50	20	218	75.25	55.15	50
Selenium	mg/L		0.018	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01				0.01	0.01		0.1	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.1	0.01	0.02	0.01
Sodium	mg/L			900	1700	650	600	3400	4000	3600	4000	4500				2140	891		7190	688	1190	1810	1120	1160	1350	1550	1370	600	7190	2190.45	1720.28	1460
Sulphate	mg/L			230	350	170	160	840	1000	920	280	1200				486	230		1920	149	243	403	197	202	241	312	10	10	1920	477.15	470.23	261.5

Notes:

** Reported pH in labortaory report on 3/02/09 is 72 pH units, E2W interpret it should be 7.2 pH units

Red numbers denote value is <LOR

Individual and median values compared to the trigger values

^ Ecosystem protection (lowland river)

^^^ Ecosystem protection (estuaries)

* Recreational water quality guideline value

$$ ProUCL Version 3.0

Bold outline = exceeds marine trigger value

Yellow shading = exceeds freshwater trigger value

Free Chlorine field test (17/10/2012) using Palintest pooltest 25 professional Plus photometer

Table 19: V2 - field parameters and analytical results

V2 (712) — Part 1 (19/03/2008 to 12/07/2010)

	Units	ANZECC (2000) irrigation #	ANZECC (2000) marine ecosystem	ANZECC (2000) freshwater ecosystem	19/03/2008	24/06/08	24/09/2008	9/12/2008	3/02/2009	17/03/2009	14/04/2009	19/05/2009	23/06/09	29/09/09	15/01/2010	29/03/2010	19/04/2010	12/07/2010
Time					11.40 am	10.58 am	8.40 am	12.54 pm	12.30 pm	1.30 pm	1.00 pm	-	12.26 pm	4:48 AM	11.29 am		2.30 pm	1.40 pm
Field Parameters																		
Ground RL	m AHD																	
Stick-up	m																	
Well RL	m AHD																	
SWL	mtoc				0.998	0.788	0.91	0.93	0.74	0.96	0.81	0.8	0.81	0.87	0.9	0.918	0.9	0.7
SWL	mbgl				0.998	0.788	0.91	0.93	0.74	0.96	0.81	0.8	0.81	0.87	0.9	0.918	0.9	0.7
SWL	m AHD				0.232	0.442	0.32	0.3	0.49	0.27	0.42	0.43	0.42	0.36	0.33	0.312	0.33	0.53
pH	pH unit				6.51	6.26	6.37	6.15	-	6.3	6.25	6.42	6.26	-	6.41		6.37	6.19
EC	µS/cm				335	425	597	653	-	780	1039	648	1086	-	485		1254	703
Temp.	°C				20.23	17.12	13.95	19.7	-	20.92	20.47	18.86	17.45	-	19.86		21.14	15.75
DO	mg/L				0.5	1.46	1.6	1.84	-	1.02	1.33	3.4	4.24	-	0.9		1.6	9.7
DO	%													-	9.5		17.6	98
Turbidity	NTU				-	520	416	-	-	392.4	412	600	336	-	600		222.4	73.1
Salinity	mg/L				-	0.29	0.36	-	-	0.45	0.59	0.71	0.48	-	0.3		0.7	0.42
Colour					Straw	Red/orange	-	Turbid	-	Turbid	Black	Turbid	-	-	-		-	-
Odour					None	Rusty	-	H2S	-	None	None	None	-	-	-		H2S	-
Laboratory Analyses																		
pH	pH unit				6.6	6.3	6.2	6.4		6.3	6.3	6.1	6.6				6.4	6.87
TDS	mg/L																914	516
Total Suspended Solids	mg/L				250	500	341	250		340	370	270	190					
BOD5	O2 mg/L				2	2	2	2		2	2	2	2				5	3
Nutrients																		
Ammonia	mg/L		0.91	0.9	0.13	0.15	0.12	0.02		0.16	0.12	0.02	0.2				0.11	0.12
Nitrate (NO3 as N)	mg/L			0.7	0.04	0.04	0.04	0.04		0.04	0.04	0.04	0.01				0.03	0.01
Nitrite (NO3 as N)	mg/L				0.01	0.005	0.007	0.002		0.002	0.009	0.003	0.01				0.01	0.01
Total Kjeldahl Nitrogen	mg/L				0.5	1.6	1.4	1.5		2.1	2.1	0.88	1.6 +				1.3	1.2
Total Nitrogen	mg/L	25 - 125 (5)	0.3^^^	0.5^	0.47	1.6	1.4	1.5		2.1	2.1	0.88	1.6				1.3	1.2
Total Phosphorus	mg/L	0.8 - 12 (0.05)	0.03^^^	0.05^	0.06	0.04	0.11	0.05		0.1	0.06	0.03	0.12				0.03	0.09
Enterococcus	cfu/100 mL				2	2	2	2		2	2	2	16				54	6
Thermotolerant (Faecal) Coliforms	cfu/100 mL		150*	150*	2	2	2	2		22	2	2	70				50	16
Total Coliforms	cfu/100 mL				180	2	2	2		220	540	2	500				190	12
Major Ions																		
Bicarbonate as CaCO3	CaCO3/L				54	50	53	77		63	68	68	99				103	58
Barium	mg/L				0.002	-	-	-		-	-	-	-					
Bromide	mg/L				0.43	0.2	1.9	0.14		0.24	0.21	1	0.18				0.5	0.2
Calcium	mg/L				11	14	10	24		27	26	22	45				61	28
Chloride	mg/L	<175 ~~			160	280	82	260		170	270	150	310				350	148
Chlorine Free Residual	mg/L			0.003	-	-	-	0.01		-	0.1	0.02	-				0.05	0.04
Iron	mg/L	10 (0.2)			**0.9**	**1.3**	**3.7**	**15**		**13**	**3.9**	**8**	**12**				**6.79**	**5.7**
Magnesium	mg/L				2.8	3.8	2.9	7.4		9.3	11	5.6	18				15	7
Potassium	mg/L				1.2	1.9	1.5	2.4		2.7	3.3	2	4.9				4	4
Selenium	mg/L			0.018	0.01	0.01	0.01	0.01		0.01	0.01	0.01	0.01				0.01	0.01
Sodium	mg/L	<115 ~~			47	62	47	100		140	150	88	190				189	93
Sulphate	mg/L				15	7.8	21	20		33	33	22	78				38.2	48

V2 (712) — Part 2 (22/09/2010 to 13/01/2014) and Statistics

	22/09/2010	19/10/2010	31/01/2011	18/04/2011	26/07/2011	17/10/2011	9/01/2012	7/05/2012	21/08/2012	15/10/2012	29/4/13	5/8/13	18/11/13	13/01/2014	Min	Max	Ave	Std. Dev.	Median
Time		1.21 pm		2.54 pm	1.43 pm	2.51 pm	2.34 pm		2.28 pm	2.37 pm	-	-	-	2:30 PM					
Field Parameters																			
Ground RL	1.23																		
Stick-up	0																		
Well RL	1.23																		
SWL (mtoc)	0.78	0.5		0.34	0.23	0.5	0.77	Not enough to sample	0.68	0.38	Not Sampled	Not Sampled	Not Sampled	0.79					
SWL (mbgl)	0.78	0.5		0.34	0.23	0.5	0.77		0.68	0.38				0.79					
SWL (m AHD)	0.45	0.73		0.89	1	0.73	0.46		0.55	0.85	-	-	-	0.44					
pH		6.23		5.95	6.22	6.26	6.24		7.22	6.62	-	-	-	6.64					
EC		653		663	836	567	378		530	868	-	-	-	623					
Temp.		16.84		20.3	15.25	17.75	20.5		16.4	18.52	-	-	-	21.87					
DO (mg/L)		4.1		2.1	9.9	3.8	3.6		3.7	5.6	-	-	-	1.3					
DO (%)		42.8		20.1	99.4	39.4	40.4		37.8	59.7	-	-	-	15.5					
Turbidity		600		600	434.4	206.3	600		826	243	-	-	-	0.32					
Salinity		0.4		0.4	0.48	0.34	0.24		0.5	0.5	-	-	-	233					
Colour		Turbid		Black	Turbid	-	-		-	-	-	-	-	-					
Odour		None		H2S	None	-	-		-	-	-	-	-	-					
Laboratory Analyses								No Sample							**Statistics**				
pH		6.08	5.8	6.23	6.46	6.31	6.4		6.97	6.85	-	-	-	-	5.8	6.97	6.40	0.30	6.355
TDS		368	1010	1230	550	286	310		593	448	-	-	-	366	286	1230	599.18	314.26	516
Total Suspended Solids											-	-	-	-	190	370	293.50	68.45	305
BOD5		2	9	11	2	7	5		4	2	-	-	-	5	2	11	3.94	2.77	2
Nutrients																			
Ammonia		0.21	0.9	0.22	0.05	0.1	0.24		2.55	0.28	-	-	-	3.21	0.02	3.21	0.51	0.92	0.16
Nitrate (NO3 as N)		0.16	**16.8**	0.02	0.04	0.04	0.01		0.01	0.01	-	-	-	0.03	0.01	16.8	1.02	4.07	0.04
Nitrite (NO3 as N)		0.01	0.02	0.01	0.01	0.01	0.01		0.01	0.01	-	-	-	0.01	0.002	0.02	0.01	0.00	0.01
Total Kjeldahl Nitrogen		1.9	7.1	2.1	1.5	2.7	5.9		11.3	1.6	-	-	-	4.7	0.88	11.3	3.08	2.83	2
Total Nitrogen		2.1	23.9	2.1	1.5	2.7	**5.9**		**11.3**	**1.6**	-	-	-	**4.7**	0.88	23.9	3.99	5.73	2.1
Total Phosphorus		0.01	0.68	0.42	0.28	0.3	**0.86**		**3.89**	**0.33**	-	-	-	**0.64**	0.01	3.89	0.47	0.92	0.12
Enterococcus		2	72	180	240	2	8		18	320	-	-	-	-	2	320	58.00	99.12	7
Thermotolerant (Faecal) Coliforms		4	66	14000	16000	1600	74		38	**840 (app)**	-	-	-	3600	2	16000	2221.75	5089.60	44
Total Coliforms		2	70	68000	16000	1600	1300		44	3100	-	-	-		2	68000	5724.00	17069.01	205
Major Ions																			
Bicarbonate as CaCO3		43	1	1	1	38	54		116	53	-	-	-	-	1	116	56.00	34.67	56
Barium							-				-	-	-	98	98	98	98.00	#DIV/0!	98
Bromide		1	1.3	2	1.6	0.9	0.21		0.5	0.6	-	-	-	0.3	0.14	2	0.75	0.63	0.5
Calcium		26	75	32	32	17	18		20	24	-	-	-	15	10	75	29.53	16.65	26
Chloride		174	493	149	245	138	57.3		179	227	-	-	-	-	57.3	493	212.64	108.66	176.5
Chlorine Free Residual		0.04	0.04	Too turbid for CL2	0.04	0.11	0.01		0.01	too turbid	-	-	-	-	0.01	0.11	0.04	0.03	0.04
Iron		**23.7**	**31.9**	**84.2**	**21.1**	7.74	**45.5**		**29.4**	1.6	-	-	-	1.21	1.21	84.2	18.50	20.93	12
Magnesium		7	26	8	8	4	5		10	13	-	-	-	8	2.9	26	9.72	5.71	8
Potassium		3	11	2	2	3	5		5	5	-	-	-	4	1.5	11	3.81	2.20	3.3
Selenium		0.01	0.01	0.01	0.01	0.01	0.01		0.01	0.01	-	-	-	0.01	0.01	0.01	0.01	0.00	0.01
Sodium		98	231	72	131	87	44		129	120	-	-	-	81	44	231	117.06	51.23	100
Sulphate		16	62.6	40	31	13	6.06		23	1	-	-	-	15	1	78	29.46	19.83	23

Notes:

Red numbers denote value is <LOR

Individual and median values compared to the trigger values

^ Ecosystem protection (lowland river)

^^^ Ecosystem protection (estuaries)

* Recreational water quality guideline value

Short term (<20 years) trigger values, with long term trigger values (<100 years) in brackets

~~ Salt-sensitive crops $$ ProUCL Version 3.0

Bold text = exceeds short term irrigation trigger value

Bold outline = exceeds marine trigger value

Yellow shading = exceeds freshwater trigger value

Free Chlorine field test (17/10/2012) using Palintest pooltest 25 professional Plus photometer

Table 20: BH19 - field parameters and analytical results

BH19 (770)

Field Parameters

	Units	19/03/2008	24/06/2008	24/09/2008	9/12/2008	3/02/2009	17/03/2009	14/04/2009	19/05/2009	23/06/2009	29/09/2009	15/01/2010	29/03/2010	19/04/2010	12/07/2010	22/09/2010	19/10/2010	31/01/2011	18/04/2011	26/07/2011	17/10/2011	9/01/2012	7/05/2012	21/08/2012	15/10/2012	29/04/2013	5/08/2013	18/11/2013	13/01/2014	8/02/2016	20/02/2017
Time		11.11 am	10.41 am	-	12.22 pm	11.15 am	1.00 pm	12.25 pm	-	11.55 am	11.50 am	10.57 am		1.58 pm	1.23 pm		12.53 pm		2.18 pm	1.09 pm	2.15 pm	2.01 pm	2.45 pm	1.59 pm	2.12 pm	-	-	-	1.57 PM		
Ground RL	m AHD																1.68														
Stick-up	m																0.7														
Well RL	m AHD																2.38														
SWL	mtoc	1.81	1.733	1.73	1.92	1.94	1.92	1.73	1.81	1.75	1.93	1.9	1.852	1.85	1.6	1.66	1.6		1.45	1.33	1.8	1.72	1.49	1.61	1.5	Not	Not	Not	-		
SWL	mbgl	1.11	1.033	1.03	1.22	1.24	1.22	1.03	1.11	1.05	1.23	1.2	1.152	1.15	0.9	0.96	0.9		0.75	0.63	1.1	1.02	0.79	0.91	0.8	Sampled	Sampled	Sampled	-		
SWL	m AHD	0.57	0.647	0.65	0.46	0.44	0.46	0.65	0.57	0.63	0.45	0.48	0.528	0.53	0.78	0.72	0.78		0.93	1.05	0.58	0.66	0.89	0.77	0.88	-	-	-	-		
pH	pH unit	6.1	6.18	6.42	6.3	6.48	6.53	5.97	6.29	6.08	-	6.25		6.28	5.7		6.05		5.58	6.04	5.46	6.02	4.98	6.81	5.74	-	-	-	6.19		5.98
EC	µS/cm	243	299	196	220	241	256	137	255	287	-	371		454	387		382		343	454	350	363	415	379	453	-	-	-	341		8000
Temp.	°C	17.88	17.5	16.52	17.14	17.24	17.61	18.16	17.76	17.49	-	17.43		18.29	17.44		16.81		19.02	17.17	16.7	19.14	17.36	15.83	18.43	-	-	-	20.23		20.41
DO	mg/L	0.7	0.88	0.53	0.28	0.19	0.21	0.76	0.7	0.17	-	0.4		0.2	0.6		0.6		3.8	0.9	4.2	3	4.5	4.3	3.5	-	-	-	1.8		2.8
DO											-	4.3		1.7	6		6		40.8	9	43.7	32.1	46.7	43.5	37.5	-	-	-	20.5		32.2
Turbidity	NTU	-	8.8	8.5	-	8	77.3	12.1	0.9	4.8	-	18.6		0	0		10.9		41.3	0	0.24	0	3.1	6.3	0.4	-	-	-	6.6		20.1
Salinity	mg/L	-	0.21	0.16	-	0.21	0.21	0.15	0.5	0.12	-	0.26		0.31	0.26		0.29		0.25	0.29	2.7	0.25	0.29	0.27	0.31	-	-	-	0.17		
Colour		Clear	Clear	Straw	-	Clear	-	Clear	Clear	Red/orange	-	-		-	-		Clear		-	Clear	-	-	-	-	-	-	-	-	-		
Odour		Sulfur	None	H2S	-	None	-	None	H2S	None	-	-		-	-		None		-	H2S	-	-	-	-	-	-	-	-	-		

Laboratory Analyses

	Units	NHMRC (2011) AWDG	ANZECC (2000) marine ecosystem	ANZECC (2000) freshwater ecosystem	19/03/2008	24/06/2008	24/09/2008	9/12/2008	3/02/2009	17/03/2009	14/04/2009	19/05/2009	23/06/2009	29/09/2009	15/01/2010	29/03/2010	19/04/2010	12/07/2010	22/09/2010	19/10/2010	31/01/2011	18/04/2011	26/07/2011	17/10/2011	9/01/2012	7/05/2012	21/08/2012	15/10/2012	29/04/2013	5/08/2013	18/11/2013	13/01/2014	8/02/2016	20/02/2017	Statistics: Min	Max	Ave	Std. Dev.	Median
pH	pH unit	6.5 - 8.5			6.5	**6.2**	**6**	**5.9**	6.7	6.5	**6.2**	6.5	6.5				**6.14**	**6.47**		**6.35**	6.3	6.22	6.07	5.41	6.41	5.47	6.95	6.25	-	-	-	-			5.41	6.95	6.25	0.37	6.275
TDS	mg/L																260	278		194	218	244	336	220	178	238	242	294	-	-	-	203			178	336	242.08	44.88	240
Total Suspended Solids	mg/L				8	11	5	3	1	24	5	1	2				-	-		-									-	-	-	-	<5	<5	1	24	5.86	8.17	3
BOD5	O2 mg/L				2	2	2	2	2	2	2	2	2				7	20		2	10	2	2	2	2	2	2	2	-	-	-	2	3	<2	2	20	3.60	4.37	2
Nutrients																																							
Ammonia	mg/L	0.5 #	0.91	0.9	0.44	0.66	0.54	0.2	0.26	0.29	0.35	0.17	0.4				0.42	0.33		0.45	0.43	0.56	0.81	0.4	0.57	0.8	0.46	0.34	-	-	-	0.32	1.05	0.99	0.17	1.05	0.48	0.24	0.42
Nitrate (NO3 as N)	mg/L	50		0.7	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.01				0.03	0.03		0.01	1.08	0.01	0.01	1.34	0.01	0.9	0.01	0.01	-	-	-	0.01	0.03	0.03	0.01	1.34	0.18	0.39	0.03
Nitrite (NO3 as N)	mg/L	3			0.008	0.003	0.006	0.002	0.004	0.002	0.002	0.002	0.01				0.01	0.01		0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	-	-	-	0.01	<0.01	<0.01	0.002	0.02	0.01	0.00	0.01
Total Kjeldahl Nitrogen	mg/L				0.6	0.93	0.72	0.5	0.54	0.56	0.8	0.37	0.6 +				0.6	1		0.5	2	0.8	1.3	1.2	1.1	1.6	1	1.4	-	-	-	0.9	2.3	1.5	0.37	2.3	1.03	0.52	0.95
Total Nitrogen	mg/L		0.3^^^	0.5^	0.63	0.93	0.72	0.5	0.54	0.56	0.8	0.37	0.6				0.6	1		0.5	3.1	0.8	1.3	2.5	1.1	2.5	1	1.4	-	-	-	0.9	2.3	1.5	0.37	3.1	1.17	0.78	0.9
Total Phosphorus	mg/L		0.03^^^	0.05^	0.02	0.02	0.07	0.1	0.01	0.04	0.02	0.009	0.05				0.16	0.04		0.01	0.2	0.01	0.01	0.01	0.01	0.01	0.08	0.04	-	-	-	0.05	0.01	0.02	0.009	0.2	0.05	0.05	0.02
Reactive Phospherous	mg/L		0.004	0.008																														0.01					
Enterococcus	cfu/100 mL	Not detected			2	2	2	2	2	2	2	2	2				2	2		2	250	2	2	2	2	2	2	2	-	-	-	-	-		2	250	15.78	58.45	2
Thermotolerant (Faecal) Coliforms	cfu/100 mL	Not detected	150*	150*	2	2	2	2	2	2	2	2	6				2	2		2	2	60	2	2	2	2	2	2	-	-	-	-	<1	<2	2	60	5.44	13.65	2
Total Coliforms	cfu/100 mL	Not detected			8	2	2	2	2	2	60	2	100				4	2		2	32	320	2	2	2	2	2	2	-	-	-	2			2	320	28.63	75.10	2
Major Ions																																							
Bicarbonate as CaCO3	CaCO3/L				34	42	29	23	73	66	43	94	66				32	52		68	1	1	1	3	24	2	60	10	-	-	-	-			1	94	36.00	30.11	30.5
Barium	mg/L	0.7			0.025	-	-	-	-	-	-	-	-				-	-		-									-	-	-	35			35	35	35.00	NA	35
Bromide	mg/L				0.02	0.2	0.9	0.13	0.14	0.18	0.12	0.05	0.03				0.2	0.2		0.2	0.2	0.2	0.3	0.2	0.3	0.2	0.2	0.4	-	-	-	0.2			0.03	0.9	0.23	0.18	0.2
Calcium	mg/L				7.8	14	4.7	2.5	17	16	7.9	19	17				9	16		20	17	4	9	6	6	4	22	7	-	-	-	10			2.5	22	11.27	6.31	9
Chloride	mg/L	250 #			54	60	25	83	37	33	35	38	55				92.4	85.5		73.3	72.1	76	172	86	85.5	110	66	131	-	-	-	-			25	172	75.32	37.30	74.65
Chlorine Free Residual	mg/L	5 (0.6 #)		0.003	-	-	-	0.02	0.02	0.06	0.03	0.01	-				0.07	0.06		0.05	0.04	0.07	0.03	0.07	0.01	0.08	0.01	0.07	-	-	-	-			0.01	0.08	0.04	0.03	0.045
Iron	mg/L	0.3 #			**1.9**	**5**	**1.6**	**0.84**	**3.1**	**3.2**	**1.6**	**2.9**	**2.7**				**1.97**	**3.09**		**4.04**	**19.9**	**2.69**	**3**	**2.38**	**2.52**	**2.5**	**3.21**	**2.73**	**-**	**-**	**-**	**2.06**			0.84	19.9	3.48	4.04	2.7
Magnesium	mg/L				4.2	6	2.3	1.5	6.3	6	4.4	6.8	6.9				7	8		9	9	6	11	8	7	6	9	9	-	-	-	7			1.5	11	6.85	2.31	7
Potassium	mg/L				2.7	3.4	2.3	1.5	2.5	2.1	2.4	2.1	2.3				3	3		3	5	3	4	3	3	4	3	5	-	-	-	3			1.5	5	3.01	0.93	3
Selenium	mg/L	0.01		0.018	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	0.01	0.01	0.01	0.01	0.01	0.01	-	-	-	0.01			0.01	0.01	0.01	0.00	0.01
Sodium	mg/L	180			30	32	17	15	18	26	19	21	27				52	46		40	47	44	85	43	41	57	33	63	-	-	-	48			15	85	39.05	18.26	41
Sulphate	mg/L	250			13	13	7.1	1	7.7	6.5	6.1	4.8	6.3				10.1	8.4		6.45	5.3	9	11	15	8.09	4	16	1	-	-	-	12			1	16	7.68	3.98	7.1

Notes:

Red numbers denote value is <LOR

Individual and median values compared to the trigger values

^ Ecosystem protection (lowland river)

^^^ Ecosystem protection (estuaries)

* Recreational water quality guideline value

Short term (<20 years) trigger values, with long term trigger values (<100 years) in brackets

~~ Salt-sensitive crops

Bold text = exceeds ADWG trigger value

Bold outline = exceeds marine trigger value

Yellow shading = exceeds freshwater trigger value

$$ ProUCL Version 3.0

Free Chlorine field test (17/10/2012) using Palintest pooltest 25 professional Plus photometer

Prepared by: DF
Checked by: DP

Table 21: BH20 - field parameters and analytical results

					BH20 (771)														
				Date	19/03/2008	24/06/2008	24/09/2008	9/12/2008	3/02/2009	17/03/2009	14/04/2009	19/05/2009	23/06/2009	29/09/2009	15/01/2010	29/03/2010	19/04/2010	12/07/2010	22/09/2010
	Units			Time	11.00 am	10.25 am	2.25 pm	12.11 pm	11.10 am	1.15 pm	12.14 pm	-	11.40 am	12.01 pm	10.46 am		1.38 pm	1.10 pm	
Field Parameters																			
Ground RL	m AHD				2.06														
Stick-up	m				0.6														
Well RL	m AHD				2.66														
SWL	mtoc				2.056	1.984	1.95	2.16	2.195	2.17	2.01	2.06	2.02	2.18	2.1	2.11	2.09	1.85	1.91
SWL	mbgl				1.456	1.384	1.35	1.56	1.595	1.57	1.41	1.46	1.42	1.58	1.5	1.51	1.49	1.25	1.31
SWL	m AHD				0.604	0.676	0.71	0.5	0.465	0.49	0.65	0.6	0.64	0.48	0.56	0.55	0.57	0.81	0.75
pH	pH unit				6.62	6.3	6.35	6.1	6.35	6.32	6.4	6.31	5.86	6.2	6.2		6.28	5.7	
EC	µS/cm				351	334	490	649	569	506	435	427	513	371	333		300	248	
Temp.	°C				17.74	17.17	16.28	17.32	17.25	17.67	17.82	17.7	17.35	16.73	17.54		18.41	17.34	
DO	mg/L				2.92	1.03	1.43	0.28	0.2	0.15	0.35	1	0.13	0.2	0.5		0.1	0.4	
DO	%													2.5	5.3		1.5	3.5	
Turbidity	NTU				-	5.9	7.9	-	8.2	800	5.7	1	3.1	0.1	5.6		17.5	30.4	
Salinity	mg/L				-	0.24	0.33	-	0.38	0.34	0.29	0.6	0.25	0.26	0.23		0.23	0.2	
Colour					-	Clear	Red/orange	Clear	Clear	Red/orange	Red/orange	Clear	Red/orange	Red/orange	-		-	-	
Odour					-	H2S	None	H2S	None	H2S	H2S	None	None	H2S	-		H2S	-	
Laboratory Analyses																			
		NHMRC (2011) AWDG	ANZECC (2000) marine ecosystem	ANZECC (2000) freshwater ecosystem															
pH	pH unit	6.5 - 8.5			6.8	**6.3**	**6.2**	**6.2**	6.5	**6.4**	**6.3**	**6.2**	**6.2**				6.53	7.1	
TDS	mg/L																227	201	
Total Suspended Solids	mg/L				2	2	8	11	3	9	5	3	2						
BOD5	O2/L				2	3	2	2	2	2	2	2	2				5	7	
Nutrients																			
Ammonia	mg/L	0.5 #	0.91	0.9	0.36	**0.61**	**0.74**	**0.51**	**0.51**	**0.5**	0.43	0.36	**0.5**				0.45	0.13	
Nitrate (NO3 as N)	mg/L	50		0.7	0.04	0.04	0.04	0.04	0.04	0.12	0.04	0.04	0.01				0.02	0.09	
Nitrite (NO3 as N)	mg/L	3			0.007	0.004	0.006	0.002	0.008	0.005	0.008	0.004	0.01				0.01	0.01	
Total Kjeldahl Nitrogen	mg/L				0.6	0.93	1	1.1	1.1	0.88	1.1	0.86	1.2				0.6	0.8	
Total Nitrogen	mg/L		0.3^^^	0.5^	0.62	0.92	1	1.1	1.1	1	1.1	0.86	1.2				0.6	0.9	
Total Phosphorus	mg/L		0.03^^^	0.05^	0.01	0.02	0.02	0.02	0.005	0.02	0.01	0.01	0.05				0.02	0.02	
Reactive Phospherous	mg/L		0.004	0.008															
Enterococcus	cfu/100 mL	Not detected			2	2	2	2	40	2	44	2	2				2	2	
Thermotolerant (Faecal) Coliforms	cfu/100 mL	Not detected	150*	150*	2	2	2	2	2	2	2	2	80				2	2	
Total Coliforms	cfu/100 mL	Not detected			30	2	2	2	8000	2	2	2	130				54	2	
Major Ions																			
Bicarbonate as CaCO3	CaCO3/L				64	53	37	43	48	52	57	51	39				43	35	
Barium	mg/L	0.7			0.007	-	-	-	-	-	-	-	-				-	-	
Bromide	mg/L				0.03	0.2	1	0.11	0.17	0.2	0.19	0.08	0.13				0.2	0.2	
Calcium	mg/L				22	21	13	15	13	14	7.9	12	10				8	5	
Chloride	mg/L	250 #			87	82	140	**530**	87	120	110	110	140				68.8	56	
Chlorine Free Residual	mg/L	5 (0.6 #)		0.003	-	-	-	0.01	0.01	0.07	0.04	0.04	-				0.08	0.01	
Iron	mg/L	0.3 #			**0.6**	**0.93**	**1.4**	**3**	**1.3**	**1.2**	**0.6**	**0.74**	**1.8**				**0.41**	**0.66**	
Magnesium	mg/L				8	7.6	8.8	12	10	9.4	6.5	8.4	9.7				8	5	
Potassium	mg/L				2.2	2.3	3.2	3.5	3.2	2.9	2.8	3.2	3.6				3	2	
Selenium	mg/L	0.01		0.018	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01				0.01	0.01	
Sodium	mg/L	180			31	34	59	81	74	83	59	57	69				37	32	
Sulphate	mg/L	250			1.9	1	11	1	7.1	5.4	5	3.3	5.4				0.5	0.52	

	BH20 (771)																			
Date	19/10/2010	31/01/2011	18/04/2011	26/07/2011	17/10/2011	9/01/2012	7/05/2012	21/08/2012	15/10/2012	29/04/2013	5/08/2013	18/11/2013	13/01/2014	8/02/2016	20/02/2017					
Time	12.36 pm		2.04 pm	12.58 pm	2.03 pm	1.55 pm	2.28 pm	1.44 pm	1.58 pm	-	-	-	1:45 PM							
Field Parameters																				
Ground RL																				
Stick-up																				
Well RL																				
SWL (mtoc)	1.90		1.7	1.57	1.9	1.96	1.72	1.87	1.78	Not	Not	Not	2.02							
SWL (mbgl)	1.30		1.10	0.97	1.30	1.36	1.12	1.27	1.18	Sampled	Sampled	Sampled	1.42							
SWL (m AHD)	0.76		0.96	1.09	0.76	0.70	0.94	0.79	0.88	-	-	-	0.64							
pH	5.79		5.23	5.64	6.41	6.31	4.15	6.77	6.2	-	-	-	6.37							
EC	328		823	681	363	541	455	484	523	-	-	-	452							
Temp.	16.63		19.29	16.89	17.83	19.97	17.66	16.43	19.19	-	-	-	21.68							
DO (mg/L)	0.3		3.3	7	3.6	3.1	6.1	4.5	3.3	-	-	-	2							
DO (%)	3.6		35.5	9.9	37.9	33.9	64.7	46.3	36	-	-	-	22.2							
Turbidity	0.2		168.6	0.2	0.26	0	3.9	9	2.2	-	-	-	11.7							
Salinity	0.24		0.49	0.4	54.7	0.35	0.28	0.32	0.33	-	-	-	0.22							
Colour	Red/orange		Turbid	Clear	-	-	-	-	-	-	-	-	-							
Odour	None		H2S	H2S	-	-	-	-	-	-	-	-	-							
Laboratory Analyses																**Statistics**				
																Min	Max	Ave	Std. Dev.	Median
pH	5.92	6	6.06	6.17	6.76	6.6	7.09	6.93	6.79	-	-	-	-			5.92	7.1	6.45	0.36	6.35
TDS	186	188	542	310	201	308	228	288	326	-	-	-	285			186	542	274.17	98.82	256.5
Total Suspended Solids										-	-	-	-	<5	11	2	11	6.50	3.70	6.5
BOD5	2	6	6	2	2	2	3	2	2	-	-	-	2	<2	4	2	7	2.95	1.67	2
Nutrients																				
Ammonia	0.45	0.59	0.37	0.23	0.47	0.29	0.03	0.46	0.27	-	-	-	0.22	0.25	0.27	0.03	0.74	0.38	0.17	0.43
Nitrate (NO3 as N)	0.06	0.09	0.01	0.01	0.01	0.01	0.31	0.01	0.01	-	-	-	0.01	0.01	0.02	0.01	0.31	0.05	0.07	0.02
Nitrite (NO3 as N)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	-	-	-	0.01	<0.01	<0.01	0.002	0.01	0.01	0.00	0.01
Total Kjeldahl Nitrogen	0.6	0.9	1	0.9	1	1	0.6	1.4	0.9	-	-	-	0.8	1.2	0.7	0.6	1.4	0.94	0.21	0.9
Total Nitrogen	0.7	1	1	0.9	1	1	0.9	1.4	0.9	-	-	-	0.8	1.2	0.7	0.6	1.4	0.97	0.19	1
Total Phosphorus	0.03	0.04	0.08	0.02	0.08	0.05	0.01	0.5	0.02	-	-	-	0.02	0.02	0.03	0.005	0.5	0.05	0.10	0.02
Reactive Phospherous															<0.01					
Enterococcus	4	2	2	2	2	2	2	2	2	-	-	-	-	-		2	44	6.56	12.92	2
Thermotolerant (Faecal) Coliforms	2	2	24	12	2	2	2	2	2	-	-	-	2	<1	<2	2	80	7.79	18.30	2
Total Coliforms	2	48	120	12	52	2	2	2	2	-	-	-				2	8000	468.78	1879.99	2
Major Ions																				
Bicarbonate as CaCO3	35	1	1	1	49	49	42	46	29	-	-	-				1	57	36.56	17.77	42.5
Barium	-									-	-	-	44			44	44	44.00	#DIV/0!	44
Bromide	0.3	0.2	0.6	0.5	0.3	0.31	0.2	0.3	0.3	-	-	-	0.3			0.08	1	0.29	0.21	0.2
Calcium	9	4	6	6	12	10	12	11	10	-	-	-	9			4	15	9.84	3.12	10
Chloride	84.2	65.1	232	215	77	134	94	126	152	-	-	-	-			56	530	141.17	108.05	115
Chlorine Free Residual	0.03	0.06	0.02	0.01	0.01	0.01	0.03	0.03	0.01	-	-	-	-			0.01	0.08	0.03	0.02	0.025
Iron	**0.82**	**7.19**	**17.9**	**2.53**	**5.66**	**2.31**	**1.49**	**1.08**	**0.77**	**-**	**-**	**-**	**0.48**			0.41	17.9	2.70	4.09	1.3
Magnesium	9	5	12	10	8	10	10	10	9	-	-	-	8			5	12	8.88	1.90	9
Potassium	3	2	6	5	3	4	4	4	6	-	-	-	4			2	6	3.60	1.10	3.2
Selenium	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	0.00	0.01
Sodium	40	35	133	121	44	69	45	65	77	-	-	-	70			32	133	65.79	26.86	65
Sulphate	0.537	7.34	13	7	1	2.92	1	10	1	-	-	-	10			0.5	13	4.90	4.05	5

Notes:

Red numbers denote value is <LOR

Individual and median values compared to the trigger values

^ Ecosystem protection (lowland river)

^^^ Ecosystem protection (estuaries)

* Recreational water quality guideline value

Aesthetic guideline value

Bold text = exceeds ADWG trigger value

Bold outline = exceeds marine trigger value

Yellow shading = exceeds freshwater trigger value

Free Chlorine field test (17/10/2012) using Palintest pooltest 25 professional Plus photometer

$$ ProUCL Version 3.0

Table 22: BH31 - field parameters

					BH-31																										
Date					23/6/09	29/9/09	29/3/10	3/2/09	17/3/09	19/5/09	20/7/10	22/9/10	31/1/11	18/4/11	26/7/11	17/10/11	21/11/11	9/1/12	7/5/12	21/8/12	15/10/12	29/4/13	5/8/13	18/11/13	13/1/14	20/1/15							
Time	Units				-	11.25 am		-	-	-	-							12.12 pm	12.17 pm	12.03 pm	12.20 pm	-	12:02 PM	-	12.00 PM							
Field Parameters																															
Ground RL	m AHD																-														
Stick-up	m																-														
Well RL	m AHD																-														
SWL	mtoc				Dry	Dry	5.105	Dry	Dry	Dry	Dry	4.883			Dry	Dry		5.11	5.1	4.65	4.1	4.95	Dry	4.9	Dry	5	4.85					
SWL	mbgl				-	-		-	-	-	-				-	-			-	-	-	-	-	-	-	-	-					
SWL	m AHD				-	-		-	-	-	-				-	-			-	-	-	-	-	-	-	-	-					
pH	pH unit				-	-		-	-	-	-				-	-			7.74	7.65	8.13	7.9	-	8.03	-	8	8.15					
EC	µS/cm				-	-		-	-	-	-				-	-		1650	1265	1220	1195	1137	-	1209	-	971	871					
Temp.	°C				-	-		-	-	-	-				-	-			20.35	18.9	16.77	18.45	-	17.3	-	22.63	19.58					
DO	mg/L				-	-		-	-	-	-				-	-			6.3	4.1	6.6	4.3	-	4.4	-	6.6	5.8					
DO	%																		70.3	43.9	68	46	-	46.3	-	76.6	63					
Turbidity	NTU				-	-		-	-	-	-				-	-			0	77.5	9.2	2.2	-	90	-	1.2	1.6					
Salinity	mg/L				-	-		-	-	-	-				-	-			0.72	0.69	0.69	0.64	-	0.69	-	0.47						
Colour					-	-		-	-	-	-				-	-			-	-	-	-	-	-	-	-						
Odour					-	-		-	-	-	-				-	-			-	-	-	-	-	-	-	-						
Laboratory Analyses																														**Statistics**	
		NHMRC (2004) AWDG	ANZECC (2000) marine ecosystem	ANZECC (2000) freshwater ecosystem																								Min	Max	Ave	Std. Dev.	Median
pH	pH unit	6.5 - 8.5															6.80	7.94	7.85	8	8.07	-	-	-	-		6.80	8.07	7.73	0.53	7.94
TDS	mg/L																	672	632	660	616	-	664	-	502		502.00	672.00	624.33	63.58	646.00
Total Suspended Solids	mg/L																	0				-	-	-	-	35	0.00	35.00	17.50	24.75	17.50
BOD5	O2/L																	5	7	2	2	-	3	-	2	7	2.00	7.00	4.00	2.31	3.00
Nutrients																															
Ammonia	mg/L	0.5 #	0.91	0.9													0.06	0.08	0.09	0.03	0.02	-	0.02	-	0.01	0.06	0.01	0.91	0.22	0.36	0.06
Nitrate (NO3 as N)	mg/L	50		0.7													0.80	0.88	0.44	1.77	1.39	-	0.17	-	1.01	0.22	0.17	50.00	5.74	15.56	0.84
Nitrite (NO3 as N)	mg/L	3															0.01	0.01	0.01	0.05	0.01	-	<0.01	-	0.01	<0.01	0.01	3.00	0.44	1.13	0.01
Total Kjeldahl Nitrogen	mg/L																3.2	2.7	4	1	1.2	-	3.8	-	0.5	1	0.50	4.00	2.18	1.40	1.95
Total Nitrogen	mg/L		0.3^^^	0.5^													4.0	3.6	4.4	2.8	2.6	-	4	-	1.5	1.2	1.20	4.40	3.01	1.20	3.20
Total Phosphorus	mg/L		0.03^^^	0.05^													0.26	0.31	0.16	0.14	0.14	-	0.4	-	0.1	0.18	0.10	0.40	0.21	0.10	0.17
Enterococcus	cfu/100 mL	Not detected															40	64	2	2	2	-	-	-	-	-	2.00	64.00	22.00	28.67	2.00
Thermotolerant (Faecal) Coliforms	cfu/100 mL	Not detected	150*	150*													10	2	2	2	2	-	-	-	2	<1	2.00	10.00	3.33	3.27	2.00
Total Coliforms	cfu/100 mL	Not detected															10	2	2	2	2	-	2	-			2.00	10.00	3.33	3.27	2.00
Major Ions																															
Bicarbonate as CaCO3	CaCO3/L																97	250	286	305	319	-	-	-	-		97.00	319.00	251.40	90.11	286.00
Barium	mg/L	0.7																				-	-	-	258		0.70	258.00	129.35	181.94	129.35
Bromide	mg/L																0.8	0.5	0.5	1.3	0.5	-	-	-	0.3		0.30	1.30	0.65	0.36	0.50
Calcium	mg/L																86	83	93	86	96	-	-	-	83		83.00	96.00	87.83	5.42	86.00
Chloride	mg/L	250 #															**382**	242	220	216	194	-	-	-	-		194.00	382.00	250.80	75.29	220.00
Chlorine Free Residual	mg/L	5 (0.6 #)		0.003													0.07	0.01	0.01	0.02	0.04	-	-	-	-		0.00	0.07	0.03	0.03	0.02
Iron	mg/L	0.3 #															0.05	**0.62**	**2.33**	**0.42**	0.05	-	-	-	0.05		0.05	2.33	0.59	0.89	0.24
Magnesium	mg/L																28	28	18	25	28	-	-	-	29		18.00	29.00	26.00	4.15	28.00
Potassium	mg/L																6	6	3	5	4	-	-	-	6		3.00	6.00	5.00	1.26	5.50
Selenium	mg/L	0.01		0.018													0.01	0.01	0.01	0.01	0.01	-	-	-	0.01		0.01	0.02	0.01	0.00	0.01
Sodium	mg/L	180															172	146	119	119	90	-	-	-	82		82.00	180.00	129.71	38.00	119.00
Sulphate	mg/L	250															35	38.3	25	31	1	-	-	-	27		1.00	250.00	58.19	85.45	31.00

Notes:

Red numbers denote value is <LOR

Individual and median values compared to the trigger values

^ Ecosystem protection (lowland river)

^^^ Ecosystem protection (estuaries)

* Recreational water quality guideline value

Aesthetic guideline value

Bold text = exceeds ADWG trigger value

Bold outline = exceeds marine trigger value

Yellow shading = exceeds freshwater trigger value

EC result is from laboratory testing

Free Chlorine field test (17/10/2012) using Palintest pooltest 25 professional Plus photometer

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Table 23: BH21 - field parameters

		BH21
Date		23/09/2008
Time	Units	-
Field Parameters		
Ground RL	m AHD	-
Stick-up	m	-
Well RL	m AHD	-
SWL	mtoc	Dry
SWL	mbgl	-
SWL	m AHD	-
pH	pH unit	-
EC	µS/cm	-
Temp.	°C	-
DO	mg/L	-
Turbidity	NTU	-
Salinity	mg/L	-
Colour		-
Odour		-

Prepared by: DF
Checked by: DP

Earth2Water Pty Ltd

Table 24: BH35 - field parameters

		BH35
Date		23/09/2008
Time	Units	-
Field Parameters		
Ground RL	m AHD	-
Stick-up	m	-
Well RL	m AHD	-
SWL	mtoc	Dry
SWL	mbgl	-
SWL	m AHD	-
pH	pH unit	-
EC	µS/cm	-
Temp.	°C	-
DO	mg/L	-
Turbidity	NTU	-
Salinity	mg/L	-
Colour		-
Odour		-

Prepared by: DF
Checked by: DP

Table 25: BH29 - field parameters and analytical results

					BH-29																												
		Date			3/02/09	17/03/09	14/04/09	19/05/09	23/06/09	29/09/09	12/01/10	19/04/10	20/07/10	22/09/10	19/10/10	31/01/11	18/04/11	26/07/11	17/10/11	21/11/11	9/01/12	7/05/12	21/08/12	15/10/12	29/04/13	5/08/13	18/11/13	13/01/14					
	Units	Time			10.20 am	11.50 am	11.12 am	-	11.02 am	11:20 AM		11.52 pm			10.56 am							12.02 pm	12.10 pm	12.06 pm	-	-	-	-					
Field Parameters																																	
Ground RL	m AHD															-																	
Stick-up	m															-																	
Well RL	m AHD															-																	
SWL	mtoc				9.87	9.85	9.86	Dry	Dry	Dry		9.75	Dry	9.605	Dry		Dry			9.73	9.72	9.36	9.65	9.63	Dry	Dry	Dry	Dry					
SWL	mbgl				-	-	-	-	-	-		-	-		-		-				-	-	-	-	-	-	-	-					
SWL	m AHD				-	-	-	-	-	-	-	-	-		-		-				-	-	-	-	-	-	-	-					
pH	pH unit				7.31	7.3	7.28	-	-	-	-	7.42	-		-		-				7.44	7.07	7.88	7.64	-	-	-	-					
EC	µS/cm				820	806	814	-	-	-	-	877	-		-		-			1210	1202	1172	1256	1623	-	-	-	-					
Temp.	°C				17.97	17.88	18	-	-	-	No field results	18.26	-		-		-				20.15	18.78	16.97	18.88	-	-	-	-					
DO	mg/L				3.3	2.72	3.77	-	-	-		0.7	-		-		-				4.20	3.2	4.70	3.40	-	-	-	-					
DO	%											7.6			-						46.30	34.9	48.40	37.40	-	-	-	-					
Turbidity	NTU				800	94.1	243.7	-	-	-	-	52.4	-		-		-				145.50	166.9	209.40	99.50	-	-	-	-					
Salinity	mg/L				0.48	0.48	0.48	-	-	-	-	0.5	-		-		-				0.69	0.66	0.72	0.91	-	-	-	-					
Colour					Milky red	Turbid	Clear	-	-	-	-	-	-		-		-				-	-	-	-	-	-	-	-					
Odour					None	None	None	-	-	-	-	H2S odour	-		-		-				-	-	-	-	-	-	-	-					
Laboratory Analyses																													Statistics				
		NHMRC (2011) AWDG	ANZECC (2000) marine ecosystem	ANZECC (2000) freshwater ecosystem																									Min	Max	Ave	Std. Dev.	Median
pH	pH unit	6.5 - 8.5			7.7	7.5	7.4				7.69	7.39								7.62	7.8	7.7	7.83	7.89					7.39	7.89	7.65	0.17	7.70
TDS	mg/L										675	578								-	622	606	716.00	942.00					578.00	942.00	689.83	133.14	648.50
Total Suspended Soli	mg/L				900	110	55													-	-								55.00	900.00	355.00	472.78	110.00
BOD5	O2/L				2	2	2				10	22								-	2	4	5.00	9.00					2.00	22.00	6.44	6.60	4.00
Nutrients																																	
Ammonia	mg/L	0.5 #	0.91	0.9	0.02	0.02	0.02				0.1	0.01								0.01	0.01	0.05	0.01	0.01					0.01	0.10	0.03	0.03	0.02
Nitrate (NO3 as N)	mg/L	50		0.7	0.04	2.4	2.4				0.83	2.35								3.52	2.72	0.7	1.44	0.46					0.04	3.52	1.69	1.15	1.90
Nitrite (NO3 as N)	mg/L	3			0.002	0.002	0.002				0.14	0.03								0.01	0.01	0.04	0.01	0.01					0.002	0.14	0.03	0.04	0.01
Total Kjeldahl Nitroge	mg/L				1.8	0.1	0.05				3.8	1.5								2.6	1.8	5.9	1.1	1.2					0.05	5.90	1.99	1.76	1.65
Total Nitrogen	mg/L		0.3^^^	0.5^	1.8	2.5	2.4				4.8	3.9								6.1	4.5	6.6	2.6	1.7					1.70	6.60	3.69	1.76	3.25
Total Phosphorus	mg/L		0.03^^^	0.05^	0.78	0.19	0.11				1.26	0.48								3.02	1.74	0.92	1.05	0.65					0.11	3.02	1.02	0.86	0.85
Enterococcus	cfu/100 mL	Not detected			24	2	2				4	2								10	2	2	2	2					2.00	24.00	5.20	7.07	2.00
Thermotolerant (Faec	cfu/100 mL	Not detected	150*	150*	2	2	2				16	4								10	2	2	2	2					2.00	16.00	4.40	4.79	2.00
Total Coliforms	cfu/100 mL	Not detected			68	24	2				2500000	4								4000	2500	2	2	100 (app)					2.00	2500000.00	278511.33	833059.5	24.00
Major Ions																																	
Bicarbonate as CaCO	CaCO3/L				810	360	330				374	328								251	308	294	315	358.0					251.00	810.00	372.80	157.75	329.00
Bromide	mg/L				0.09	0.2	0.12				0.4	0.3								0.8	0.75	0.6	0.7	1					0.09	1.20	0.52	0.36	0.50
Calcium	mg/L				65	150	110				130	128								123	159	120	113	146					65.00	159.00	124.40	26.35	125.50
Chloride	mg/L	250 #			88	85	96				68.7	73.2								204	190	187	234	355					68.70	355.00	158.09	92.98	141.50
Chlorine Free Residu	mg/L	5 (0.6 #)		0.003	0.04	0.01	0.04				0.09	0.07								0.02	-	0.04	0.01	0.07					0.01	0.09	0.04	0.03	0.04
Iron	mg/L	0.3 #			0.01	0.12	0.01				8.94	2.4								0.05	**18**	**5.84**	**7.98**	0					0.01	18.00	4.34	5.95	1.26
Magnesium	mg/L				8.5	12	9.8				16	14								13	15	12	13	18					8.50	18.00	13.13	2.82	13.00
Potassium	mg/L				1.9	2.1	2				5	2								2	2	2	2	4.00					1.90	5.00	2.50	1.08	2.00
Selenium	mg/L	0.01		0.018	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	0.00	0.01
Sodium	mg/L	180			49	66	49				34	35								112	110	96	126	164					34.00	164.00	84.10	44.02	81.00
Sulphate	mg/L	250			17	20	19				11.6	14.5								23	32.5	26	28	1					1.00	32.50	19.26	9.02	19.50

Notes:

Red numbers denote value is <LOR

Individual and median values compared to the trigger values

^ Ecosystem protection (lowland river)

^^^ Ecosystem protection (estuaries)

* Recreational water quality guideline value

Aesthetic guideline value

Bold text = exceeds ADWG trigger value

Bold outline = exceeds marine trigger value

Yellow shading = exceeds freshwater trigger value

Free Chlorine field test (17/10/2012) using Palintest pooltest 25 professional Plus photometer

Prepared by: DF
Checked by: DP

Earth2Water Pty Ltd

Table 26: MW8S - field parameters and analytical results

					MW8S (782)																
				Date	23/2/10	19/4/10	18/4/11	21/11/11	9/1/12	7/5/12	21/8/12	15/10/12	29/4/13	5/8/13	18/11/13	13/1/14					
	Units			Time		12.44 pm	1.12 pm		2.56 pm	1.01 pm	12.50 pm	12.50 pm	12:50 PM	12:31 PM	1.31 PM	12.40 PM					
Field Parameters																					
Ground RL	m AHD				-																
Stick-up	m				-																
Well RL	m AHD				8.58																
SWL	mtoc					7.73	7.4	7.76	7.63	7.63	7.62	7.57	7.32	7.44	7.57	7.63					
SWL	mbgl					-			-	-	-	-	-	-	-	-					
SWL	m AHD					0.85	1.18	0.82	0.95	0.95	0.96	1.01	1.26	1.14	1.01	0.95					
pH	pH unit					7.72	7.39		7.66	7.63	8.18	7.95	7.59	8.03	7.03	7.98					
EC	µS/cm					997	924	1310	981	852	1209	1107	822	940	1228	966					
Temp.	°C					20.59	20.18		20.62	18.47	17.91	19.03	20.8	17.51	18.73	22.03					
DO	mg/L					4.5	5.6		3.8	3.7	5.2	3.8	5.9	2.8	5.4	3.8					
DO	%					49.7	61.3		42.8	39.1	54.7	41.7	65.7	29.1	58.2	44					
Turbidity	NTU					600++	424.2		408	0.5	4.06	201.7	0	130	1.44	236					
Salinity	mg/L					0.58	0.53		0.55	192	0.67	0.62	0.47	0.54	223.9	0.47					
Free Chlorine	mg/L											0.05	0.05	0.1	-	1.3					
Colour						-	Turbid	clear	-	-	-	-	-	-	-	-					
Odour						None	-		-	-	-	-	-	-	-	-					
Laboratory Analyses																	**Statistics**				
		NHMRC (2011) AWDG	ANZECC (2000) marine ecosystem	ANZECC (2000) freshwater ecosystem	23/02/2010												Min	Max	Ave	Std. Dev.	Median
pH	pH unit	6.5 - 8.5			7.68	7.48	7.67	7.74	7.84	8.00	8.00	8.09	-	-	-	-	7.48	8.09	7.81	0.21	7.79
TDS	mg/L				756	630	578		576	466	730	646	570	569	689	543	466	756	613.91	86.12	578
Total Suspended Solids	mg/L												-	-	-	-	0	0	#DIV/0!	#DIV/0!	#NUM!
BOD5	O2/L				10	14	11		4	3	2	2	12	3	2	3	2	14	6.00	4.69	3
Nutrients																					
Ammonia	mg/L	0.5 #	0.91	0.9	0.2	0.01	0.02	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.04	0.01	0.01	0.2	0.03	0.05	0.01
Nitrate (NO3 as N)	mg/L	50		0.7	1.34	4.93	3.4	6.91	4.43	3.68	2.46	2.15	0.03	2.47	1.88	1.6	0.03	6.91	2.94	1.85	2.465
Nitrite (NO3 as N)	mg/L	3			0.02	0.02	0.1	0.01	0.01	0.04	0.01	0.03	0.01	0.01	0.07	0.03	0.01	0.1	0.03	0.03	0.02
Total Kjeldahl Nitrogen	mg/L				4.9	1.3	1.4	1.8	2.7	2.3	1.1	0.8	2	2.4	0.9	0.7	0.7	4.9	1.86	1.17	1.6
Total Nitrogen	mg/L		0.3^^^	0.5^	6.3	6.3	4.9	8.7	7.1	6	3.6	3	2	4.9	2.8	2.3	2	8.7	4.83	2.12	4.9
Total Phosphorus	mg/L		0.03^^^	0.05^	4.52	3.04	0.66	1.91	1.24	0.3	1.13	0.52	0.42	1.71	0.33	0.33	0.3	4.52	1.34	1.30	0.895
Reactive Phosphorous	mg/L		0.004	0.008					0.06	0.08	0.12	0.09	0.14	0.1	0.1	0.09	0.06	0.14	0.10	0.02	0.095
Enterococcus	cfu/100 mL	Not detected			4	2	2	10	2	2	2	2	-	-	-	-	2	10	3.25	2.82	2
Thermotolerant (Faecal) Coliforms	cfu/100 mL	Not detected	150*	150*	200	40	2	10	42	2	2	2	2	-	2 (app)	6 (app)	2	200	33.56	64.57	2
Total Coliforms	cfu/100 mL	Not detected			40000	54	2	10	44	2	2	2	-	2	-	-	2	40000	4457.56	13328.43	2
Major Ions																					
Bicarbonate as CaCO3	CaCO3/L				400	306	1	225	321	207	270	221	-	-	-	230	1	400	242.33	109.70	230
Bromide	mg/L				0.4	0.3	0.3	0.6	0.28	0.2	2.4	0.4	-	-	-	0.3	0.2	2.4	0.58	0.69	0.3
Calcium	mg/L				119	104	81	103	176	74	91	88	-	-	-	116	74	176	105.78	30.37	103
Chloride	mg/L	250 #			191	108	111	234	126	104	224	222	-	-	-	-	104	234	165.00	58.03	158.5
Chlorine Free Residual	mg/L	5 (0.6 #)		0.003	0.06	0.01	0.01	0.01	-	0.01	0.01	0.05	-	-	-	-	0.01	0.06	0.02	0.02	0.01
Iron	mg/L	0.3 #			**35.6**	**26.3**	**7.78**	0.05	**8.74**	**7.58**	**12.4**	0.05	-	-	-	0.05	0.05	35.6	10.95	12.39	7.78
Magnesium	mg/L				14	13	11	13	17	7	10	10	-	-	-	14	7	17	12.11	2.93	13
Potassium	mg/L				2	2	20	15	18	21	0.01	18	-	-	-	17	0.01	21	12.56	8.60	17
Selenium	mg/L	0.01		0.018	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	-	-	-	0.01	0.01	0.01	0.01	0.00	0.01
Sodium	mg/L	180			131	98	83	145	90	76	151	114	-	-	-	104	76	151	110.22	26.99	104
Sulphate	mg/L	250			29.4	53.4	60	51	59.5	40	61	2	-	-	-	61	2	61	46.37	19.86	53.4

Notes:

Red numbers denote value is <LOR

Individual and median values compared to the trigger values

^ Ecosystem protection (lowland river)

^^^ Ecosystem protection (estuaries)

* Recreational water quality guideline value

Aesthetic guideline value

$$ ProUCL Version 3.0

Bold text = exceeds ADWG trigger value

Bold outline = exceeds marine trigger value

Yellow shading = exceeds freshwater trigger value

EC results are from laboratory testing

Free Chlorine field test (17/10/2012) using Palintest pooltest 25 professional Plus photometer

Prepared by: DF

Checked by: DP

Table 27: MW-7A - field parameters and analytical results

						MW-7A (803)																									
					Date	31/01/2011	18/04/2011	26/07/2011	17/10/2011	9/01/2012	7/05/2012	21/08/2012	15/10/2012	29/04/2013	5/08/2013	18/11/2013	13/01/2014	14/07/2014	3/11/2014	19/08/2015	14/10/2015	25/07/2016	18/10/2016	20/02/2017								
	Units				Time				12.07 pm	12.26 pm	1.51 pm	11.25 am	11.25 am	11:42 AM	11:30 AM	-	11.35 AM														
Field Parameters																															
Ground RL	m AHD												9.43						9.43	9.43				9.43							
Stick-up	m												0.45						0.45	0.45				0.45							
Well RL	m AHD												9.88						9.88	9.88				9.88							
SWL	mtoc					Well installed September 2011			9	9.3	8.76	8.96	8.96	8.61	8.58	Dry	9.09		8.74	8.8											
SWL	mbgl								8.55	8.85	8.31	8.51	8.51	8.16	8.13	-	8.64		8.29	8.35											
SWL	m AHD								0.88	0.58	1.12	0.92	0.92	1.27	1.3	-	0.79		1.14	1.08											
pH	pH unit								6.46	6.83	3.44	5.66	6.99	6.24	5.43	-	4.9		5.22	7.87				5.53							
EC	µS/cm								462	755	795	926	780	915	809	-	528		1000	600				1315							
Temp.	°C								18.23	19.33	18.16	17.96	19.7	20.15	18.78	-	21.2		19.7	17.7				20.54							
DO	mg/L								3.7	4.3	7.7	7.1	3.2	4.7	2.9	-	5.2		4.4	3.9				9.58							
DO	%								39.6	46.5	81.5	75.7	35.1	52	31.1	-	58.7		48	40				106.8							
Turbidity	NTU								482.2	216	171.5	319.9	234	391	80.7	-	400		334	600				95.7							
Salinity	mg/L								0.45	0.46	0.47	0.53	0.46	0.53	0.49	-	0.24														
Colour									-	-	-	-	-	-	-	-	Red/orange														
Odour									-	-	-	-	-	-	-	-	-														
Laboratory Analyses																														**Statistics**	
		NHMRC (2011) AWDG	ANZECC (2000) irrigation #	ANZECC (2000) marine ecosystem	ANZECC (2000) freshwater ecosystem																								Min	Max	Ave	Std. Dev.	Median
pH	pH unit	6.5 - 8.5							6.74	7.13	5.92	6.44	7.74	-	-	-	-												5.92	7.74	6.79	0.69	6.74
TDS	mg/L								514	486	286	347	424	564	443	-	269	440											269	564	416.63	107.22	433.5
Total Suspended Solids	mg/L									-	-			-	-	-	-		704	510	194	224	141	73					73	704	307.67	245.27	209
BOD5	O2/L								2	2	2	2	2	2	10	-	2	<2	<2	<2	3	<2	<2	<2					2	10	3.00	2.65	2
Nutrients																																
Ammonia	mg/L	0.5 #		0.91	0.9				0.04	0.01	0.01	0.01	0.01	0.01	0.01	-	0.01	0.1	0.04	0.03	0.09	0.03	0.03	0.05					0.01	0.1	0.03	0.03	0.03
Nitrate (NO3 as N)	mg/L	50			0.7				0.4	0.02	0.09	0.08	0.02	0.03	0.01	-	0.03	0.04	0.06	0.08	0.01	<0.01	<0.01	0.04					0.01	0.4	0.07	0.10	0.04
Nitrite (NO3 as N)	mg/L	3							0.01	0.01	0.01	0.01	0.01	0.01	0.01	-	0.01	<0.01	<0.01	0.08	<0.01	<0.01	<0.01	<0.01					0.01	0.08	0.02	0.02	0.01
Total Kjeldahl Nitrogen	mg/L								0.5	0.5	0.4	0.6	0.2	0.7	0.2	-	0.4	0.5	0.8	0.6	0.5	0.5	0.4	0.3					0.2	0.8	0.47	0.17	0.5
Total Nitrogen	mg/L		25 - 125 (5)	0.3^^^	0.5^				0.9	0.5	0.5	0.7	0.2	0.7	0.2	-	0.4	0.5	0.9	0.7	0.5	0.5	0.4	0.3					0.2	0.9	0.53	0.22	0.5
Total Phosphorus	mg/L		0.8 - 12 (0.05)	0.03^^^	0.05^				**0.48**	**0.65**	**0.28**	**0.78**	**0.27**	0.84	0.13	-	**0.28**	**0.38**	**0.5**	**0.52**	**0.2**	**0.2**	**0.14**	**0.08**					0.08	0.84	0.38	0.24	0.28
Reactive Phosphorous	mg/l			0.004	0.008					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					0.01	0.01	0.01	0.00	0.01
Enterococcus	cfu/100 mL	Not detected							2	2	2	2	2	-	-	-	-												2	2	2.00	0.00	2
Thermotolerant (Faecal) Coliforms	cfu/100 mL	Not detected		150*	150*				58	2	2	2	2	2	-	-	2	<1	<1	<1	<2	<1	<1	<2					2	58	10.00	21.17	2
Total Coliforms	cfu/100 mL	Not detected							170	48	2	2	2	-	2	-	-												2	170	37.67	67.39	2
Major Ions																																
Bicarbonate as CaCO3	CaCO3/L								50	80	3	8	74	-	-	-	1												1	80	36.00	36.53	29
Bromide	mg/L								0.6	0.44	0.3	0.5	0.5	-	-	-	0.2												0.2	0.6	0.42	0.15	0.47
Calcium	mg/L								30	34	7	7	37	-	-	-	5												5	37	20.00	15.15	18.5
Chloride	mg/L	250 #	<175 ~~						**208**	174	170	296	206	-	-	-	-												170	296	210.80	50.77	206
Chlorine Free Residual	mg/L	5 (0.6 #)			0.003				0.01	-	0.01	0.03	too dark	-	-	-	-												0.01	0.03	0.02	0.01	0.01
Iron	mg/L	0.3 #	10 (0.2)						**19.9**	**10**	**24.1**	**15.3**	<0.05	-	-	-	0.05												0.05	24.1	13.87	9.34	15.3
Magnesium	mg/L								13	13	8	12	12	-	-	-	8												8	13	11.00	2.37	12
Potassium	mg/L								4	4	4	5	5	-	-	-	4												4	5	4.33	0.52	4
Selenium	mg/L	0.01			0.018				0.01	0.01	0.01	0.01	0.01	-	-	-	0.01												0.01	0.01	0.01	0.00	0.01
Sodium	mg/L	180	<115 ~~						107	86	90	165	96	-	-	-	66												66	165	101.67	33.84	93
Sulphate	mg/L	250							19	14.6	13	19	1	-	-	-	33												1	33	16.60	10.40	16.8

Notes:

Red numbers denote value is <LOR

Individual and median values compared to the trigger values

^ Ecosystem protection (lowland river)

^^^ Ecosystem protection (estuaries)

* Recreational water quality guideline value

Aesthetic guideline value

$$ ProUCL Version 3.0

Bold text = exceeds ADWG/ANZECC irrigation trigger value

Bold outline = exceeds marine trigger value

Yellow shading = exceeds freshwater trigger value

Free Chlorine field test (17/10/2012) using Palintest pooltest 25 professional Plus photometer

Table 28: MW-7B - field parameters and analytical results

					MW-7B (802)																					
					Date	31/01/2011	18/04/2011	26/07/2011	17/10/2011	9/01/2012	7/05/2012	21/08/2012	15/10/2012	29/04/13	5/08/13	18/11/2013	13/01/2014	14/07/2014	3/11/2014	20/01/2015	19/08/2015	14/10/2015	25/07/2016	18/10/2016	20/02/2017		
	Units				Time				3.23 pm	2.59 pm	11.11 am	11.07 am	11.26 am	11:14 AM	11:07 AM	11:27 AM	11.00 AM									
Field Parameters																										
Ground RL	m AHD												3.02						3.02	3.02		3.02			3.02	
Stick-up	m												0.58						0.58	0.58		0.58			0.58	
Well RL	m AHD												3.6						3.6	3.6		3.6			3.6	
SWL	mtoc					Well installed September 2011			2.75	2.79	2.61	2.74	2.63	2.35	2.49	2.63	2.87		2.59	2.72		2.4				
SWL	mbgl								2.17	2.21	2.03	2.16	2.05	1.77	1.91	2.05	2.29		2.01	2.14		1.82				
SWL	m AHD								0.85	0.81	0.99	0.86	0.97	1.25	1.11	0.97	0.73		-2.59	0.88		1.2				
pH	pH unit								6.39	5.94	3.84	6.93	6	6.65	6.4	6.2	5.96		5.63	6.26		6.58			5.56	
EC	µS/cm								340	75	151	84	93	90	103	140	83		89	63		67			8000	
Temp.	°C								17.99	20.78	20.52	18.34	18.98	23.44	19.4	17.73	23.3		3.6	1.5		17.3			19.71	
DO	mg/L								3.3	3.1	5.4	4.4	3.3	4.7	2.7	3.8	2		40	16.7					3.23	
DO	%								34.8	35	60.5	47.4	35.1	54.8	29	40.3	23								36.8	
Salinity	mg/L								0.23	0.11	0.14	0.1	0.12	0.11	0.12	0.35	0.04		1.2	0.4					18.8	
Turbidity	NTU								11.4	0	2.2	12.3	1.9	0	1.2	32.9	3.1									
Colour									-	-	-	-	-	-	-	-	-									
Odour									-	-	-	-	-	-	-	-	-									
Laboratory Analyses																									**Statistics**	
		NHMRC (2011) AWDG	ANZECC (2000) irrigation #	ANZECC (2000) marine ecosystem	ANZECC (2000) freshwater ecosystem																				Min	Max	Ave	Std. Dev.	Median
pH	pH unit	6.5 - 8.5							6.26	6.12	6.41	6.56	6.55	-	-	-	-									6.12	6.56	6.38	0.19	6.41
TDS	mg/L								100	89	38	86	94	70	77	74	76	114								38	114	81.80	20.44	81.5
Total Suspended Solids	mg/L													-	-	-	-		<5	<5	6	<5	29	38	<5	6	38	24.33	16.50	29
BOD5	O2/L								3	2	2	2	2	2	2	2	2	<2	<2	3	<2	<2	<2	<2	<2	2	3	2.20	0.42	2
Nutrients																														
Ammonia	mg/L	0.5 #		0.91	0.9				0.02	0.03	0.02	0.09	0.06	0.01	0.08	0.11	0.08	0.11	0.09	0.15	0.21	0.14	0.18	0.16	0.4	0.01	0.4	0.11	0.09	0.09
Nitrate (NO3 as N)	mg/L	50			0.7				0.15	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.2	0.01	0.02	0.04	0.01	0.01	0.02	0.02	0.01	0.2	0.03	0.05	0.01
Nitrite (NO3 as N)	mg/L	3							0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	<0.01	<0.01	<0.01	0.04	<0.01	<0.01	<0.01	<0.01	0.01	0.04	0.01	0.01	0.01
Total Kjeldahl Nitrogen	mg/L								0.5	0.7	0.3	0.5	0.5	0.2	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.6	0.9	0.7	0.2	0.9	0.48	0.17	0.4
Total Nitrogen	mg/L		25 - 125 (5)	0.3^^^	0.5^				0.6	0.7	0.3	0.5	0.5	0.2	0.4	0.4	0.4	0.6	0.4	0.4	0.5	0.4	0.6	0.9	0.7	0.2	0.9	0.50	0.17	0.5
Total Phosphorus	mg/L		0.8 - 12 (0.05)	0.03^^^	0.05^				0.04	**0.06**	0.01	**0.1**	**0.08**	0.03	0.04	0.02	0.03	0.01	0.02	0.02	<0.01	0.01	**0.1**	**0.13**	0.02	0.01	0.13	0.05	0.04	0.03
Reactive Phosphorous	mg/L			0.004	0.008					0.04	0.01	0.02	0.01	0.02	0.02	0.01	0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	0.01	0.01	0.04	0.02	0.01	0.01
Enterococcus	cfu/100 mL	Not detected							2	2	2	2	2	2	-	-	-									2	2	2.00	0.00	2
Thermotolerant (Faecal) Coliforms	cfu/100 mL	Not detected		150*	150*				62	2	4	2	2	-	2	1	2	<1	<1	<2	<1	<1	<1	<1	<1	1	62	9.63	21.18	2
Total Coliforms	cfu/100 mL	Not detected							110	2	10	2	4 (app)	-	-	-	-									2	110	31.00	52.80	6
Major Ions																														
Bicarbonate as CaCO3	CaCO3/L								8	10	7	13	7	-	-	-	5									5	13	8.33	2.80	7.5
Bromide	mg/L								0.1	0.07	0.1	0.1	0.1	-	-	-	0.1									0.07	0.1	0.10	0.01	0.1
Calcium	mg/L								2	1	1	1	1	-	-	-	2									1	2	1.33	0.52	1
Chloride	mg/L	250 #	<175 ~~						14	7.03	7	16	18	-	-	-	-									7	18	12.41	5.12	14
Chlorine Free Residual	mg/L	5 (0.6 #)			0.003				0.04	-	0.05	0.07	0.08	-	-	-	-								0.27	0.04	0.08	0.06	0.02	0.06
Iron	mg/L	0.3 #	10 (0.2)						**1**	**2.48**	**0.48**	**0.82**	**0.32**	-	**-**	**-**	**0.25**									0.25	2.48	0.89	0.83	0.65
Magnesium	mg/L								1	1	1	1	1	-	-	-	2									1	2	1.17	0.41	1
Potassium	mg/L								1	1	1	1	1	-	-	-	1									1	1	1.00	0.00	1
Selenium	mg/L	0.01			0.018				0.01	0.01	0.01	0.01	0.01	-	-	-	0.01									0.01	0.01	0.01	0.00	0.01
Sodium	mg/L	180	<115 ~~						12	7	6	11	11	-	-	-	10									6	12	9.50	2.43	10.5
Sulphate	mg/L	250							<1	2.23	1	10	1	-	-	-	10									1	10	4.85	4.73	2.23

Notes:

Red numbers denote value is <LOR

Individual and median values compared to the trigger values

^ Ecosystem protection (lowland river)

^^^ Ecosystem protection (estuaries)

* Recreational water quality guideline value

Aesthetic guideline value

$$ ProUCL Version 3.0

Bold text = exceeds ADWG/ANZECC irrigation trigger value

Bold outline = exceeds marine trigger value

Yellow shading = exceeds freshwater trigger value

Free Chlorine field test (17/10/2012) using Palintest pooltest 25 professional Plus photometer

Table 29: D-05S - field parameters and analytical results

				D-05S (804)																										
				Date	31/01/2011	18/04/2011	26/07/11	17/10/2011	9/01/12	7/05/12	21/08/12	15/10/2012	29/04/13	5/08/13	18/11/2013	13/01/2014	14/07/2014	3/11/2014	20/01/2015	19/08/2015	14/10/2015	25/07/2016	18/10/2016	20/02/2017							
	Units			Time				1.19 pm	1.20 pm	1.34 pm	1.14 pm	1.20 pm	-	1:07 PM	1.01 PM	12.55 PM														
Field Parameters																														
Ground RL	m AHD											8.93																		
Stick-up	m											0.45																		
Well RL	m AHD											9.38																		
SWL	mtoc				Well installed September 2011			8.7	8.44	8.4	8.42	8.35	8.12	8.46	8.6	8.45		8.44		8.4										
SWL	mbgl							8.25	7.99	7.95	7.97	7.9	7.67	8.01	8.15	8		7.99		7.95										
SWL	m AHD							0.68	0.94	0.98	0.96	1.03	1.26	0.92	0.78	0.93		0.94		0.98										
pH	pH unit							7.8	7.85	7.35	8.42	8.18	8.15	8.05	7.2	7.96		7.82		8.49				7.91						
EC	µS/cm							782	740	622	688	728	597	791	868	861		579		739				8000						
Temp.	°C							18.63	23.2	19.57	17.84	19.69	21.18	16.51	17.47	24.8		22.86		16.7				21.37						
DO	mg/L							6.6	5.6	6.3	6.6	5.1	5.3	4.8	6.5	3.6		6.2		4.3				4.94						
DO	%							70.4	65.3	69.3	69.6	55.4	59.5	49.1	68.5	43.5		73		45				58.6						
Turbidity	NTU							600	600	3.6	600	73.5	570	591.5	600	600		1.6		600				18.1						
Salinity	mg/L							0.47	0.42	0.38	0.39	0.43	0.36	0.46	0.72	0.42														
Colour								-	-	-	-	-	-	-	-	-														
Odour								-	-	-	-	-	-	-	-	-														
Laboratory Analyses																													**Statistics**	
		NHMRC (2011) AWDG	ANZECC (2000) marine ecosystem	ANZECC (2000) freshwater ecosystem																							Min	Max	Ave	Std. Dev.	Median
pH	pH unit	6.5 - 8.5						7.68	8	7.99	8.03	8.04	-	-	-												7.68	8.04	7.95	0.15	8
TDS	mg/L							518	206	348	238	448	442	459	610	516	457										206	610	420.56	133.14	448
Total Suspended Solids	mg/L							-					-	-	-	-		494	2090	322	16	32	47	7			7	2090	429.71	755.73	47
BOD5	O2/L							2	2	2	2	2	2	2	2	2	<2	<2	10	<2	<2	<2	<2	<2			2	10	2.80	2.53	2
Nutrients																														
Ammonia	mg/L	0.5 #	0.91	0.9				0.04	0.02	0.01	0.01	0.01	0.03	0.01	0.02	0.01	<0.01	0.04	0.18	0.07	0.02	0.02	0.09	0.54			0.01	0.54	0.07	0.13	0.02
Nitrate (NO3 as N)	mg/L	50		0.7				7.9	7.48	2.58	2.88	10.6	2.99	5.76	3.38	7.08	6.3	3.4	6.63	2.63	4.82	3.67	2.58	6.92			2.58	10.6	5.15	2.39	4.82
Nitrite (NO3 as N)	mg/L	3						0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	<0.01	<0.01	<0.01	2.63	<0.01	<0.01	<0.01	0.05			0.01	2.63	0.25	0.79	0.01
Total Kjeldahl Nitrogen	mg/L							1.4	2.6	1.2	1.7	2.1	1.7	2.2	1.4	1.1	0.9	0.8	2.6	0.7	0.6	0.5	0.9	1.1			0.5	2.6	1.38	0.67	1.2
Total Nitrogen	mg/L		0.3^^^	0.5^				9.3	10.1	3.8	4.6	12.7	4.7	8	4.8	8.2	7.2	4.2	9.2	3.3	5.4	4.2	3.5	8.1			3.3	12.7	6.55	2.77	5.4
Total Phosphorus	mg/L		0.03^^^	0.05^				2.39	4.63	1.03	3.88	2.45	2.52	1.96	3.08	1.75	0.69	0.34	5.22	1.71	1.21	0.94	0.92	3			0.34	5.22	2.22	1.40	1.96
Reactive Phospherous	mg/L		0.004	0.008													-	-	-	-		-	-	3.03			3.03	3.03			
Enterococcus	cfu/100 mL	Not detected						2	2	2	2	2 (app)	-	-	-	-															
Thermotolerant (Faecal) Coliforms	cfu/100 mL	Not detected	150*	150*				2	2	2	2	2	-	-	-	-	<1	<1	<2	<1	−1	<1	<1	<1			2	2	2.00	0.00	2
Total Coliforms	cfu/100 mL	Not detected						2	2	2	2	2	2	2	11	2											2	11	3.00	3.00	2
Major Ions																														
Bicarbonate as CaCO3	CaCO3/L							147	199	129	166	117	-	-	-	180											117	199	156.33	31.16	156.5
Bromide	mg/L							0.2	0.1	0.2	1.5	0.1	-	-	-	0.1											0.1	1.5	0.37	0.56	0.15
Calcium	mg/L							64	684	58	60	56	-	-	-	305											56	684	204.50	254.62	62
Chloride	mg/L	250 #						110	93.5	72	68	88	-	-	-	-											68	110	86.30	17.00	88
Chlorine Free Residual	mg/L	5 (0.6 #)		0.003				0.01	-	0.01	0.01	No Result	-	-	-	-		1.08						0.21			0.01	0.01	0.01	0.00	0.01
Iron	mg/L	0.3 #						**25**	**13.8**	**0.55**	**13.5**	0.05	-	-	-	0.05											0.05	25	8.83	10.30	7.025
Magnesium	mg/L							7	38	7	8	7	-	-	-	20											7	38	14.50	12.60	7.5
Potassium	mg/L							22	26	16	20	22	-	-	-	32											16	32	23.00	5.48	22
Selenium	mg/L	0.01		0.018				0.01	0.01	0.01	0.01	0.01	-	-	-	0.01											0.01	0.01	0.01	0.00	0.01
Sodium	mg/L	180						63	72	40	66	61	-	-	-	80											40	80	63.67	13.49	64.5
Sulphate	mg/L	250						38	49	36	74	92	-	-	-	54											36	92	57.17	21.86	51.5

Notes:

Red numbers denote value is <LOR

Individual and median values compared to the trigger values

^ Ecosystem protection (lowland river)

^^^ Ecosystem protection (estuaries)

* Recreational water quality guideline value

Aesthetic guideline value

Bold text = exceeds ADWG trigger value

Bold outline = exceeds marine trigger value

Yellow shading = exceeds freshwater trigger value

Free Chlorine field test (17/10/2012) using Palintest pooltest 25 professional Plus photometer

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Table 30: D-05D - field parameters and analytical results

					D-05D (801)																												
				Date	31/01/2011	18/04/2011	26/07/2011	17/10/2011	9/01/2012	7/05/2012	21/08/2012	15/10/2012	29/04/2013	5/08/2013	18/11/2013	13/01/2014	14/07/2014	3/11/2014	20/01/2015	19/08/2015	14/10/2015	25/07/2016	18/10/2016	20/02/2017									
	Units			Time				1.24 pm	1.26 pm	1.26 pm	1.07 pm	1.14 pm	1.28 pm	1:01 PM	12:56 PM	1.00 PM																	
Field Parameters																																	
Ground RL	m AHD				8.97													8.97	8.97	8.97												
Stick-up	m				0.63													0.63	0.63	0.63												
Well RL	m AHD				9.6													9.6	9.6	9.6												
SWL	mtoc				Well installed September 2011			8.9	8.68	8.61	8.65	8.57	8.35	8.69	8.7	8.66		8.67	8.61	8.62												
SWL	mbgl							8.27	8.05	7.98	8.02	7.94	7.72	8.06	8.07	8.03		8.04	7.98	7.99												
SWL	m AHD							0.7	0.92	0.99	0.95	1.03	1.25	0.91	0.9	0.94		0.93	0.99	0.98												
pH	pH unit							7.73	7.61	7.1	8.41	8.22	8.02	8.24	7.32	7.9		7.86	7.93	8.52				7.9								
EC	µS/cm							704	705	549	713	701	649	599	828	786		620	592	707				8000								
Temp.	°C							17.91	22.63	19.68	18.67	20.54	21.71	17.3	17.36	22.23		20.86		17.61				20.49								
DO	mg/L							4.2	4.2	3.5	4.2	3.3	4.5	2.9	4.7	3.3		4.9	6.2	4.7				7.36								
DO	%							44.6	48.4	38.7	51.8	36.5	51.8	30.6	49.4	39		55	69	49				85								
Turbidity	NTU							19.2	0	3.6	6.1	1.2	0	0	58	0.8		1.6	20.6	0				12.8								
Salinity	mg/L							0.42	0.43	0.32	0.48	0.42	0.38	0.37	0.57	0.39																
Colour								-	-	-	-	-	-	-	-	-																
Odour								-	-	-	-	-	-	-	-	-																
Laboratory Analyses																															**Statistics**		
		NHMRC (2011) AWDG	ANZECC (2000) marine ecosystem	ANZECC (2000) freshwater ecosystem																									Min	Max	Ave	Std. Dev.	Median
pH	pH unit	6.5 - 8.5						7.63	7.86	7.81	8.06	8.13	-	-	-	-													7.63	8.13	7.90	0.20	7.86
TDS	mg/L							456	444	302	434	386	470	357	506	430	328												302	506	420.56	62.36	434
Total Suspended Solids	mg/L												-	-	-	-		<5	<5	<5	<5	10	<5	<5	10	10	10.00	#DIV/0!	10
BOD5	O2/L							4	2	2	2	2	2	2	2	2	<2	<2	<2	<2	<2	<2	<2	<2	2	4	2.22	0.67	2
Nutrients																																	
Ammonia	mg/L	0.5 #	0.91	0.9				0.04	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	<0.01	0.08	<0.01	0.02	0.03	1.37	0.49	0.26	0.01	1.37	0.16	0.36	0.01
Nitrate (NO3 as N)	mg/L	50		0.7				5.18	5.42	12.6	3.29	3.48	3.08	3.19	5.55	6.06	2.48	7.74	4.73	6.62	3.93	4.95	3.5	3.8	2.48	12.6	5.04	2.41	4.73
Nitrite (NO3 as N)	mg/L	3						0.15	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	<0.01	0.03	<0.01	6.62	<0.01	0.3	<0.01	<0.01	0.01	6.62	0.60	1.90	0.01
Total Kjeldahl Nitrogen	mg/L							0.1	1.7	3.4	1.4	1.8	1	1.8	1.2	0.9	0.6	1.3	0.8	0.6	0.5	2.6	1	0.7	0.1	3.4	1.26	0.82	1
Total Nitrogen	mg/L		0.3^^^	0.5^				5.3	7.1	16	4.7	5.3	4.1	5	6.8	7	3.1	9.1	5.5	7.2	4.4	7.8	4.5	4.5	3.1	16	6.32	2.94	5.3
Total Phosphorus	mg/L		0.03^^^	0.05^				1.6	1.68	2.47	1.81	1.32	1.36	2.07	2.03	2.02	1.23	1.01	1.13	0.92	0.89	1.43	1.34	1.16	0.89	2.47	1.50	0.45	1.36
Reactive Phosphorous	mg/L		0.004	0.008				-	1.58	1.85	1.91	1.2	1.47	2.04	2.26	1.92	1.24	1	1.17	0.88	0.88	1.22	1.39	1.24	0.88	2.26	1.45	0.43	1.315
Enterococcus	cfu/100 mL	Not detected						2	2	2	2	2	2	-	-	-									2	2	2.00	0.00	2
Thermotolerant (Faecal) Coliforms	cfu/100 mL	Not detected	150*	150*				6	2	2	2	2	-	2	1	2	<1	<1	<1	<1	<1	<1	<1	<1	1	6	2.38	1.51	2
Total Coliforms	cfu/100 mL	Not detected						28	2	2	2	2 (app)	-	-	-	-									2	28	8.50	13.00	2
Major Ions																																	
Bicarbonate as CaCO3	CaCO3/L							108	150	99	192	172	-	-	-	191									99	192	152.00	40.67	161
Bromide	mg/L							0.2	0.12	0.2	0.1	0.2	-	-	-	0.1									0.1	0.2	0.15	0.05	0.16
Calcium	mg/L							59	58	44	63	57	-	-	-	80									44	80	60.17	11.65	58.5
Chloride	mg/L	250 #						111	87.9	75	77	100	-	-	-	-									75	111	90.18	15.32	87.9
Chlorine Free Residual	mg/L	5 (0.6 #)		0.003				0.01	0.01	0.08	0.01	0.14	-	-	-	-		1.08	0	0.92		0.2		0.16	0.01	0.14	0.05	0.06	0.01
Iron	mg/L	0.3 #						0.05	0.1	0.11	0.06	0.05	-	-	-	0.05									0.05	0.11	0.07	0.03	0.055
Magnesium	mg/L							6	7	5	10	7	-	-	-	10									5	10	7.50	2.07	7
Potassium	mg/L							15	16	12	15	14	-	-	-	20									12	20	15.33	2.66	15
Selenium	mg/L	0.01		0.018				0.01	0.01	0.01	0.01	0.01	-	-	-	0.01									0.01	0.01	0.01	0.00	0.01
Sodium	mg/L	180						58	59	46	64	62	-	-	-	65									46	65	59.00	6.93	60.5
Sulphate	mg/L	250						39	45	32	47	10	-	-	-	40									10	47	35.50	13.55	39.5

Notes:
Red numbers denote value is <LOR

Individual and median values compared to the trigger values
^ Ecosystem protection (lowland river)
^^^ Ecosystem protection (estuaries)
* Recreational water quality guideline value
# Aesthetic guideline value
$$ ProUCL Version 3.0

Bold text = exceeds ADWG trigger value
Bold outline = exceeds marine trigger value
Yellow shading = exceeds freshwater trigger value

Free Chlorine field test (17/10/2012) using Palintest pooltest 25 professional Plus photometer

Prepared By: JA
Checked By: DP

Table 31: Comparison of operational statistics to baseline statistics

		Statistics (March 2008 to October 2012)		Baseline statistics (June 2006 to January 2008)		Trend	Statistics (March 2008 to October 2012)		Baseline statistics (June 2006 to January 2008)		Trend	Statistics (March 2008 to October 2012)		Baseline statistics (June 2006 to January 2008)		Trend	Statistics (March 2008 to October 2012)		Baseline statistics (June 2006 to January 2008)		Trend
Analyte	Units	Maximum	Average	Maximum	Average		Maximum	Average	Maximum	Average		Maximum	Average	Maximum	Average		Maximum	Average	Maximum	Average	
		Caravan Sites 31/32					**Caravan Sites 294/295**					**MB1SHALLOW**					**MB1DEEP**				
SWL	m AHD	-	-	-	-	-	-	-	-	-	-	1.02	0.73	0.9	0.59	Stable	0.99	0.7	0.85	0.5	Decline
Ammonia	mg/L	0.64	0.27	0.49	0.29	Stable	0.47	0.26	0.48	0.37	Decline	0.88	0.18	0.21	0.13	Stable	0.26	0.05	0.34	0.16	Stable
Total Nitrogen	mg/L	5.40	0.99	4.7	1.2	Decline	7.40	1.48	1	0.9	Incline	9.90	2.64	1	0.8	Incline	1.30	0.23	0.4	0.3	Decline
Total Phosphorus	mg/L	2.10	0.17	1.3	0.29	Decline	0.52	0.07	0.07	0.06	Stable	1.13	0.20	0.07	0.07	Incline	0.16	0.06	0.1	0.05	Stable
		MB2DEEP					**MB5**					**V1**					**V2**				
SWL	m AHD	1.06	0.75	1.26	0.64	Stable	1.28	0.8	1.34	0.69	Incline	0.72	0.41	0.56	0.32	Stable	1	0.53	0.6	0.35	Decline
Ammonia	mg/L	0.61	0.07	0.28	0.11	Decline	0.37	0.15	0.12	0.09	Incline	1.58	1.08	1	0.75	Incline	2.55	3.20	0.28	0.16	Incline
Total Nitrogen	mg/L	12.30	4.14	0.6	0.4	Incline	11.00	1.81	0.8	0.7	Incline	12.20	3.44	2.5	1.9	Incline	23.90	3.63	3.3	1.6	Incline
Total Phosphorus	mg/L	0.37	0.14	0.28	0.12	Stable	0.93	0.11	0.02	0.02	Incline	1.49	0.30	0.15	0.09	Incline	3.80	0.41	0.16	0.09	Incline
		V3					**V5**					**D28**					**Camp Kitchen**				
SWL	m AHD	0.73	0.43	0.54	0.31	Decline	1.18	0.68	1.9	0.9	Decline	1.14	0.82	1.35	0.89	Stable	-	-	-	-	-
Ammonia	mg/L	2.90	1.94	2.4	1.74	Incline	0.50	0.22	0.35	0.19	Stable	0.10	0.03	0.33	0.33	Decline	0.35	0.08	0.08	0.08	Stable
Total Nitrogen	mg/L	14.60	3.66	3.8	2.5	Incline	3.30	1.14	1.8	1.3	Decline	4.20	0.82	1	1	Decline	2.50	0.48	0.3	0.2	Incline
Total Phosphorus	mg/L	1.08	0.21	0.23	0.14	Incline	0.44	0.07	0.03	0.02	Incline	12.00	0.90	0.02	0.02	Incline	0.55	0.09	1.3	0.41	Decline

Table 32: Lake Conjola Groundwater Monitoring Well Network

Well ID	Location description	Approximate location (AMG)		Constructed by	Date installed	RL (top of casing)	Depth at construction (mbgl)	Screened interval (m)	Gravel pack interval (m)	Bentonite seal (m)	Geology	Aquifer lithology	SWL after construction (mbgl)	Average SWL (June '06 - Jan '08, m AHD)
		Easting	Northing											
MB1S	SE corner of caravan park	272406	6093955	WRL	9/10/2006	Not measured	4.61	0.61 - 3.61	0.25 - 4.61	0.1 - 0.25	0 - 1.7 m: Brownish black fine sand; 1.7 - 4.63 m: As above, with some organic matter	Sand	1.02	0.59
MB1D				WRL	9/10/2006	Not measured	12.93	8.93 - 11.93	1.8 - 12.93	0.36 - 1.8	0 - 1.7 m: Brownish black fine sand; 1.7 - 12.93 m: As above, with some organic matter	Sand	1.3	0.5
MB2S	Between exfiltration trench and caravan park	272463	6093952	WRL	9/10/2006	Not measured	9.16	5.16 - 8.16	3.4 - 8.16	2.9 - 3.4	0 - 0.1 m: Med. grey fine sand, some organic matter; 0.1 - 1 m: Brownish black fine sand; 1 - 6.5 m: Light olive grey fine sand; 6.5 - 9.18 m: Yellow brown sand	Sand	NA	NA
MB2D				WRL	9/10/2006	Not measured	14.59	11.09 - 14.09	11.09 - 14.09	9.4 - 10.3	0 - 0.1 m: Brownish black fine sand, organic matter; 0.1 - 1 m: Brownish black fine sand; 1 - 6.5 m: Light olive grey fine sand; 6.5 - 14.59 m: Yellow brown fine sand	Sand	10.56	0.64
MB3	4WD track from end of Sandgroper Cres	271911	6093360	E2W could not locate information										NA
MB5	Conjola Sands, at end of Sangroper Cres, NE of gate post for access track	271853	6093699	E2W could not locate information										0.69
V1	Conley Ave, west side of Pattimores Lagoon	271074	6093758	PPK	17/02/1999	Not measured	4.0	1.0 - 4.0	0.5 - 4.0	0.3 - 0.5	0 - 0.1 m: Sandy soil; 0.1 - 3 m: Sand, fine-med. grained; 3 - 4 m: Silty sand, fine-med. grained	Sand	0.635	0.32
V2	Norman St, in park by lake	270623	6094225	PPK	17/02/1999	Not measured	3.0	1.0 - 3.0	0.5 - 3.0	0.3 - 0.5	0 - 0.2 m: Sandy soil; 0.2 - 3 m: Sand, fine-med. grained; 3 - 3.6 m: Silty sand clay, ironstone	Sand	-	0.35
V3	Garrad Way, in park near lake	271200	6094089	PPK	17/02/1999	Not measured	5.0	2.0 - 5.0	1.5 - 5.0	1.0 - 1.5	0 - 0.1 m: Sandy soil; 0.1 - 5 m: Sand, fine-med. grained	Sand	-	0.31
V5	Thorne St, half way down road on southern side, east of fence at southern end of paddock	271508	6093565	PPK	18/02/1999	Not measured	5.0	2.0 - 5.0	1.5 - 5.0	1.0 - 1.5	0 - 0.3 m: Sandy soil; 0.3 - 5 m: Sand, fine-med. grained	Sand	1.265	0.9
D01	In bush 15 m SE of exfiltration trench in line with exfiltration piezometers at southern end of trench	272131	6093509	Coffey	15/08/2000	Not measured	10.0	8.5 - 10.0	0.8 - 10.0	0.3 - 0.8	0 - 3 m: Silty sand, fine-med grained; 3 - 10 m: Sand, med. grained	Sand	9.75	NA
D02	In bush 5 m SE of exfiltration trench in ling with second last exfiltration piezometer from southern end of trench	272197	6093585	Coffey	15/08/2000	Not measured	8.8	7.4 - 8.8	0.6 - 8.8	0.2 - 0.6	0 - 2 m: Silty sand, fine-med. grained	Sand	8.05	NA
D03	SE side of foot track along exfiltration trench	272299	6093686	Coffey	15/08/2000	Not measured	8.3	7.2 - 8.3	0.5 - 8.3	0.2 - 0.5	0 - 1.3 m: Silty sand, fine-med. grained; 1.3 - 7 m: Sand, fine-med. grained; 7 - 8.3 m: Sand, med.-coarse grained	Sand	7.35	NA
D05 ^^	Northern end of exfiltration trend	NA	NA											

Table 32: Lake Conjola Groundwater Monitoring Well Network

Well ID	Location description	Approximate location (AMG)		Constructed by	Date installed	RL (top of casing)	Depth at construction (mbgl)	Screened interval (m)	Gravel pack interval (m)	Bentonite seal (m)	Geology	Aquifer lithology	SWL after construction (mbgl)	Average SWL (June '06 - Jan '08, m AHD)
		Easting	Northing											
BH19	East side of Thorne St, beside the quarry	271251	6093126	PPK	16/10/1998	2.47	6.5	3.5 - 6.5	2.5 - 6.5	1.5 - 2.5	0 - 7 m: Clean sand, fine-med. grained	Sand	0.86	0.58
BH20	West side of Thorne St, beside the quarry	271289	6093142	PPK	16/10/1998	2.75	6.0	3 - 6	2 - 6	1 - 2	0 - 6 m: Clean sand, fine-med. grained	Sand	1.12	0.61
BH25	West of D01 and trench	271936	6093327	PPK	16/10/1998	10.64	11.4	8.4 - 11.4	7.4 - 11.4	6.4 - 7.4	0 - 11 m: Clean sand, fine-med. grained, 3 cm clay layer at 0.5 m	Sand	8.865	-
D28	East of MB3, Sangroper Cres	272025	6093557	PPK	17/10/1998	8.03	10.0	6.9 - 9.9	5.5 - 9.9	4.9 - 5.9	0 - 10 m: Clean sand, fine-med. grained	Sand	6.305	-
BH31	East of D01 and trench	271977	6093253	PPK	17/10/1998	5.87	6.0	2.4 - 5.4	1.4 - 5.4	0.4 - 1.4	0 - 6 m: Clean sand, fine-med. grained	Sand	4.09	-
Caravan Site 294-295	Council caravan park near sites 294/295	272596	6094243	Lacking installation information (e.g. screen depth) and are fitted with pumps, with no access for water level measurements.										
Caravan Site 31-32	Council caravan park near sites 31/32 next to office	272185	6094325	Lacking installation information (e.g. screen depth) and are fitted with pumps, with no access for water level measurements.										
Camp Kitchen	Camp kitchen in Council caravan park	272494	6094170											
GW031496	NA	272361	6094145											
BH21 ^^	No details													
BH29 ^^	No details													
BH35 ^^	No details													
MW8S ^^	Approx 50 m east of D2	272344	6093762	E2W	20/01/2010	8.58	9.0	6.0-9.0	All	4.0	0-9 m: Dune sand	Sand	8.0	-
MW7A	Access track- behind residential	271960	6093775	E2W	30/08/2011	9.88	11.0	8.0-11.0	7.5-11.0	0.3-7.5	0 - 11 m: light grey/brown sand, mostly fine to medium grained qtz, & some silt, slight moisture (dune sand)	Sand	~8.8	NA
MW7B	Road- outside 6 Sandgroper Cres	272002	6094020	E2W	30/08/2011	3.60	7.3	4.3-7.3	2.0-7.3	0.3-2.0	0 - 7.3 m: light grey/brown sand, mostly fine to medium grained qtz, & some silt, slight moisture (dune sand)	Sand	~2.5	NA
D05S	Exfiltration Trench	272576	6094039	E2W	29/08/2011	9.38	11.5	8.5-11.5	7.5-11.5	0.3-7.5	0 - 11.5 m: light grey/brown sand, mostly fine to medium grained qtz, & some silt, slight moisture (dune sand)	Sand	~8.7	NA
D05D	Exfiltration Trench	272578	6094040	E2W	29/08/2011	9.60	17.5	14.3-17.3	13.0-17.3	0.3-13.0	0 - 17.5 m: light grey/brown sand, mostly fine to medium grained qtz, & some silt, slight moisture (dune sand), hard layers (gravel/pebbles) at 9 and 13 m	Sand	~8.8	NA

Note: ^^ Well is an addition to the recommended monitoring program

Table 33: Summary of STP Discharges and Water Quality

	Effluent Volume Discharged	Annual TN Load Discharged	Average Annual TN Concentration	Annual TP Load Discharged	Average Annual TP Concentration	Average Annual BOD Concentration	Average Annual Ammonia Concentration	Average Annual Faecal coliform	Annual Rainfall
	ML	kg	mg/L	kg	mg/L	mg/L	mg/L	cfu/100mL	mm
2009/10	150	946	6.3	834	5.0	2.3	0.33	1	910
2010/11	190	1250	6.6	620	3.3	<2	0.28	1	1200
2011/12	190	990	5.2	660	3.5	<2	0.10	9	1190
2012/13	165	910	5.5	560	3.4	<2	0.06	24	1050
2013/14	160	990	6.2	327	2.0	<2	0.14	2	970
2014/15	170	1110	6.5	558	3.3	<2	0.45	5	1320
2015/16	210	740	3.5	610	2.9	<2	0.11	12	1370
2016/17	218	915.6	4.2	710	3.3	<2	0.25	67	1380
Average	181.63	981.45	5.51	609.90	3.34	2.30	0.22	15.13	1173.75

Note: Data are on a 1 June - 31 May year
Data are combined and/or averaged for Bendalong and Conjola WwTPS
Note: TDS= 400 mg/L and Nitrate ~ 3 mg/L annual average - combined from Bendalong/Conjola

Table 34: Summary of Water Monitoring at Lake Conjola (2013 to 2017)

Date	29/4/13	5/8/13	18/11/13	13/1/14	14/7/14	3/11/14	20/1/15	19/8/15	14/10/15	8/2/16	25/7/16	18/10/16	20/2/17	Comments
MB1S	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
MB1D	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
MB2S														No sample - dry well
MB2D	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
MB3														No sample - dry well
MB5	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
V1														Not Sampled
V2				Yes										Not Sampled
V3				Yes						Yes			Yes	
V5	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
D01														No sample - dry well
D02	Yes	Yes	Yes	Yes		Yes	Yes		Yes		Yes		Yes	
D03	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
BH19										Yes			Yes	
BH20	Yes	Yes	Yes	Yes						Yes			Yes	
D28					Yes	Yes				Yes		Yes	Yes	
BH31	Yes	Yes		Yes										No sample - dry well
Caravan 294-295	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Caravan 31-32														
Camp Kitchen		Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
GW031496														No sample - dry well
BH21 ^^														No sample - dry well
BH29 ^^														No sample - dry well
BH35 ^^														No sample - dry well
MW8S ^^	Yes	Yes	Yes	Yes	(last sampled 13 Jan 2014)									No sample - dry well
MW7A	Yes	Yes		Yes	Yes	Yes		Yes	Yes		Yes	Yes	Yes	
MW7B	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
D05S	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	
D05D	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	

Notes

Yes = Samples collected for analyses, but no field chemistry (pH, EC, DO, Eh, T) or SWLs

Prepared By: DP

Table 35 - Summary of Groundwater Chemistry and Trends (2017)

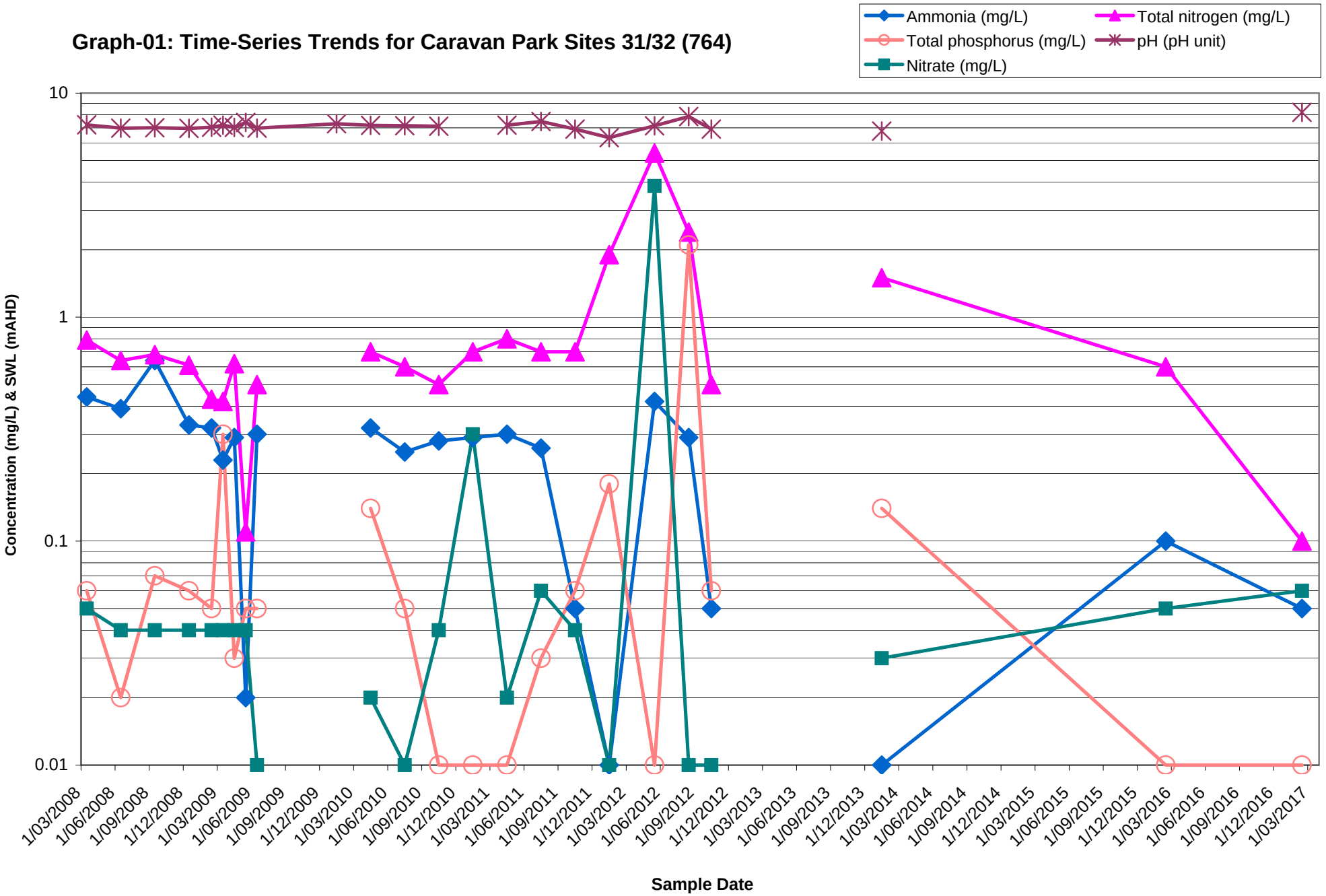
Well ID, Graph and Table	Analyte	WQ Trend (2014 to 2017)	Above ANZECC (2000)[1] since March 2008*	Water Quality	Water Type
Caravan Sites 31/32 Graph-1 Table 1	TN	Variable	TN, TP, Nitrate	Fresh and ph neutral (pH 7.32)	Ca-Cl
	TP	Variable increasing			
	Ammonia	Variable, possibly decreasing			
MB1S Graph-15 Table 4	TN	**Variable & Increasing**	TN, TP, Nitrate FC (Feb 2016)	Brackish, neutral (pH 7.31)	Na-Cl
	TP	**Variable, possibly increasing**			
	Ammonia	Variable, possibly increasing			
MB1D Graph-12 Table 5	TN	**Increasing**	TP, Nitrate, TN, FC (Jan 2012)	Fresh , neutral (pH 7.71)	Na-Cl
	Ammonia	Variable			
	TP	**Variable, possibly increasing**			
MB2D Graph-02 Table 7	TP	Variable, relatively stable	TN, TP, Nitrate,	Fresh (0.976 mS/cm), neutral (pH 7.67)	Ca-HCO_3
	Ammonia	Variable, decreasing			
	TN	Variable & increasing			
D28 Graph-03 Table 12	TN	Variable	TN, TP	Fresh, neutral (pH 7.13)	Ca-HCO3
	TP	Variable			
	Ammonia	Variable			
MB5 Graph-04 Table 15	TN	**Variable & increasing**	TN, TP, FC (Jan 2010)	Fresh (0.179 mS/cm), acidic (pH 5.0)	Na-Cl
	TP	Variable			
	Ammonia	Variable			
V5 Graph-05 Table 16	TN	**Variable, slightly increasing**	TN, Nitrate (Oct 2011), TP	Fresh (0.420 mS/cm), acidic (pH 5.4)	Na-Cl
	TP	Variable			
	Ammonia	Variable			
V3 Graph-06 Table 17	TN	Variable	TN, TP, Ammonia Nitrate, FC	Saline , neutral (pH 7.14)	Na-Cl
	TP	Variable			
	Ammonia	Variable			
V1 Graph-07 Table 18	TN	Increased, decreasing since Jan 2012	TN, TP, Nitrate, Ammonia,	Brackish (15.8 mS/cm), slightly acidic (pH 6.9)	Na-Cl
	TP	Variable			
	Ammonia	Stable			
V2 Graph-11 Table 19	TN	**Variable, possibly increasing**	TN, TP, Ammonia (Aug 2012), FC	Fresh (0.749 mS/cm), slightly acidic (pH 6.35)	Na-Cl
	TP	Variable, increasing			
	Ammonia	Variable, increasing			
BH19 Graph-08 Table 20	TN	Variable	TN, Nitrate, TP,	Fresh (0.324 mS/cm), slightly acidic (pH 6.16)	Na-Cl
	Ammonia	Variable			
	TP	Variable			

BH20 Graph-09 Table 21	TP	**Variable, possibly increasing**	TN, TP,	Fresh (0.458 mS/cm), slightly acidic (pH 5.98)	Na-Cl
	TN	Generally stable			
	Ammonia	**Variable, possibly increasing**			
D03 Graph-13 Table 9	TN	Variable	TN, TP, Nitrate, FC (Feb 2010),	Fresh, neutral (pH 7.5)	Ca-HCO3
	Ammonia	Variable			
	TP	**Variable, & increasing**			
Camp Kitchen Graph-14 Table 14	TN	Variable	TN, TP, Nitrate (Jan 2012) FC (Apr 2013)	Fresh (1.13 mS/cm), neutral (pH 7.6)	Na-HCO3
	TP	Variable			
	Ammonia	Variable, decreasing			
Caravan Sites 294/295 Graph-16 Table 2	TN	Variable	Up to 2015: TN, TP, Nitrate FC (Jan, 2012)	Fresh (1.95 mS/cm), neutral (pH 7.42)	Ca-HCO3
	TP	Variable			
	Ammonia	Variable, possibly decreasing			
BH-29 Graph 10 Table 25	TN	Variable	TN, TP, Nitrate,	Fresh (1.08 mS/cm), neutral (pH 7.41)	Ca-HCO3
	TP	Variable			
	Ammonia	Variable, decreasing			
BH-31 Graph 23 Table 22 *data	TN	Variable, decreasing since Aug 2012	TN, TP, Nitrate,	Fresh (1.2 mS/cm), slightly alkaline (pH 7.8)	Na-HCO3
	TP	Generally stable, decreasing since May 2012			
	Ammonia	Variable			
MW-8S Graph-17 Table 26	TN	Variable	TN, TP, Nitrate, FC (Feb 2010),	Fresh (1.05 mS/cm), slightly alkaline (pH 7.7)	Na-HCO3
	TP	Variable, decreasing			
	Ammonia	Stabilising			
MW-7A Graph-18 Table 27 * data	TN	Variable, possibly decreasing	TN, TP	Fresh (0.743 mS/cm), slightly acidic (pH 5.8)	Na-Cl
	TP	Variable			
	Ammonia	Stable			
MW-7B Graph-19 Table 28 *data	TN	Variable, possibly increasing	TN, TP	Fresh (0.148 mS/cm), slightly acidic (pH 5.82)	Na-Cl
	TP	Variable			
	Ammonia	**Increasing**			
D-05S Graph-20 Table 29 *data	TN	Variable	TN, TP, Nitrate	Fresh (0.712 mS/cm), neutral (pH 7.9)	Ca-HCO3
	TP	Variable			
	Ammonia	Decreasing, relatively stable			
D-05D Graph-21 Table 30 *data	TN	Variable	TN, TP, Nitrate, Ammonia	Fresh (0.674 mS/cm), neutral (pH 7.8)	Na-HCO3
	TP	Variable			
	Ammonia	**Increasing**			
D-02 Graph-22 Table 10 *data	TN	Variable	TN, TP, Nitrate, FC (Feb 2010)	Fresh (0.843 mS/cm), neutral (pH 7.8)	Na-HCO3
	TP	Variable			
	Ammonia	Variable			

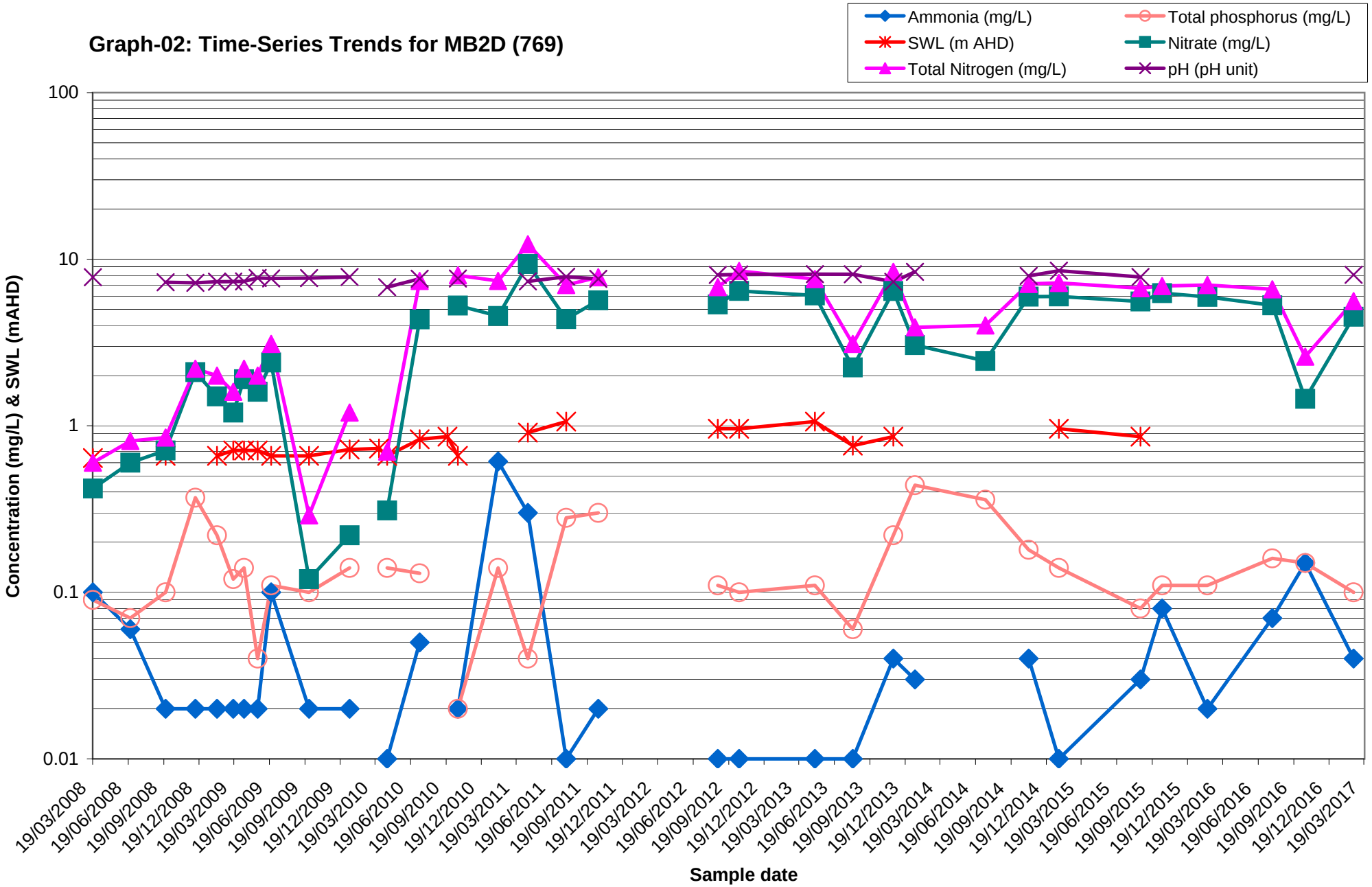
[1] Above ANZECC fresh and/or marine water guidelines in one or more samples
TN = total nitrogen, TP = total phosphorus, FC = faecal coliforms,
* March 2008 or since beginning of sampling.

Graphs

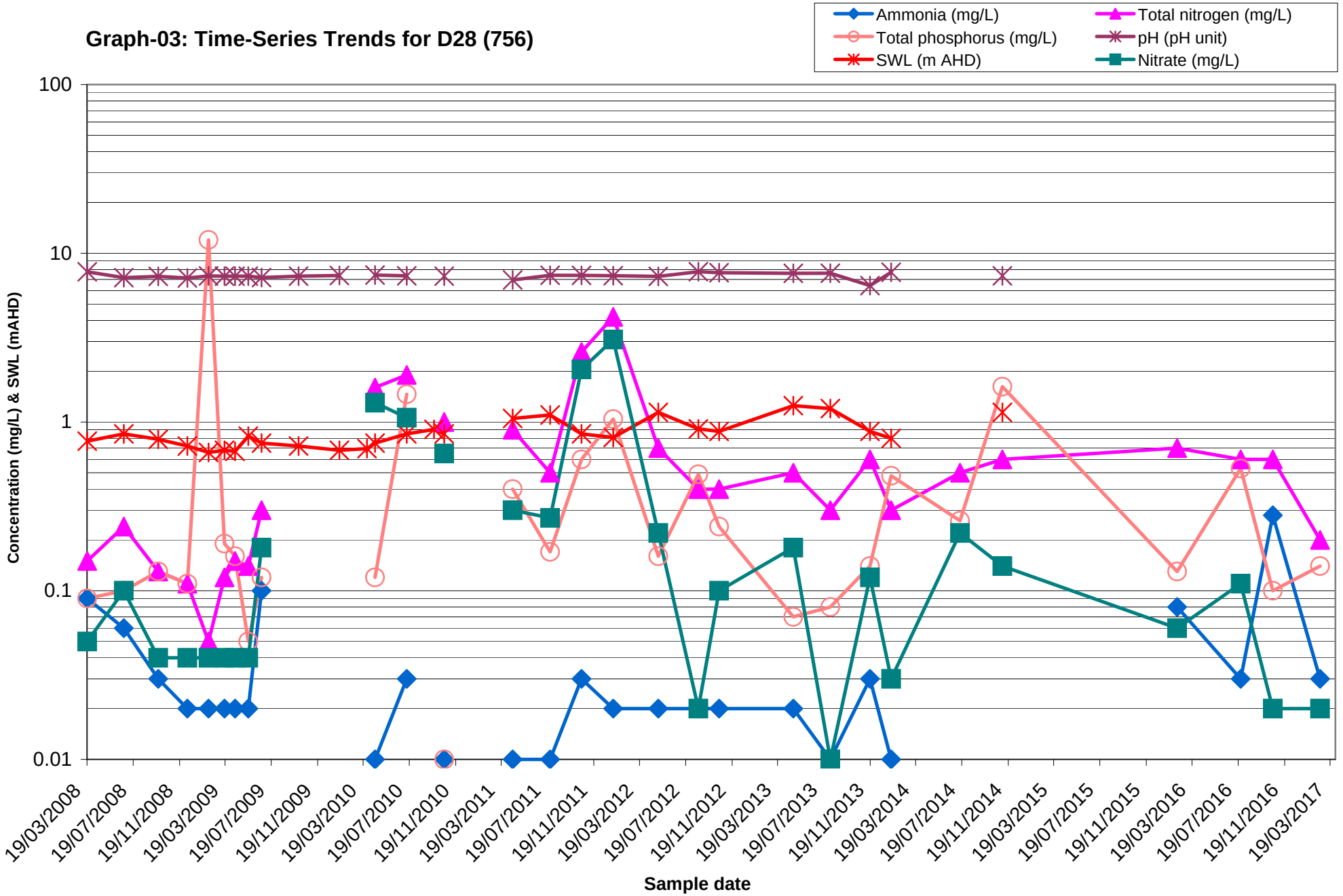
Graph-01: Time-Series Trends for Caravan Park Sites 31/32 (764)



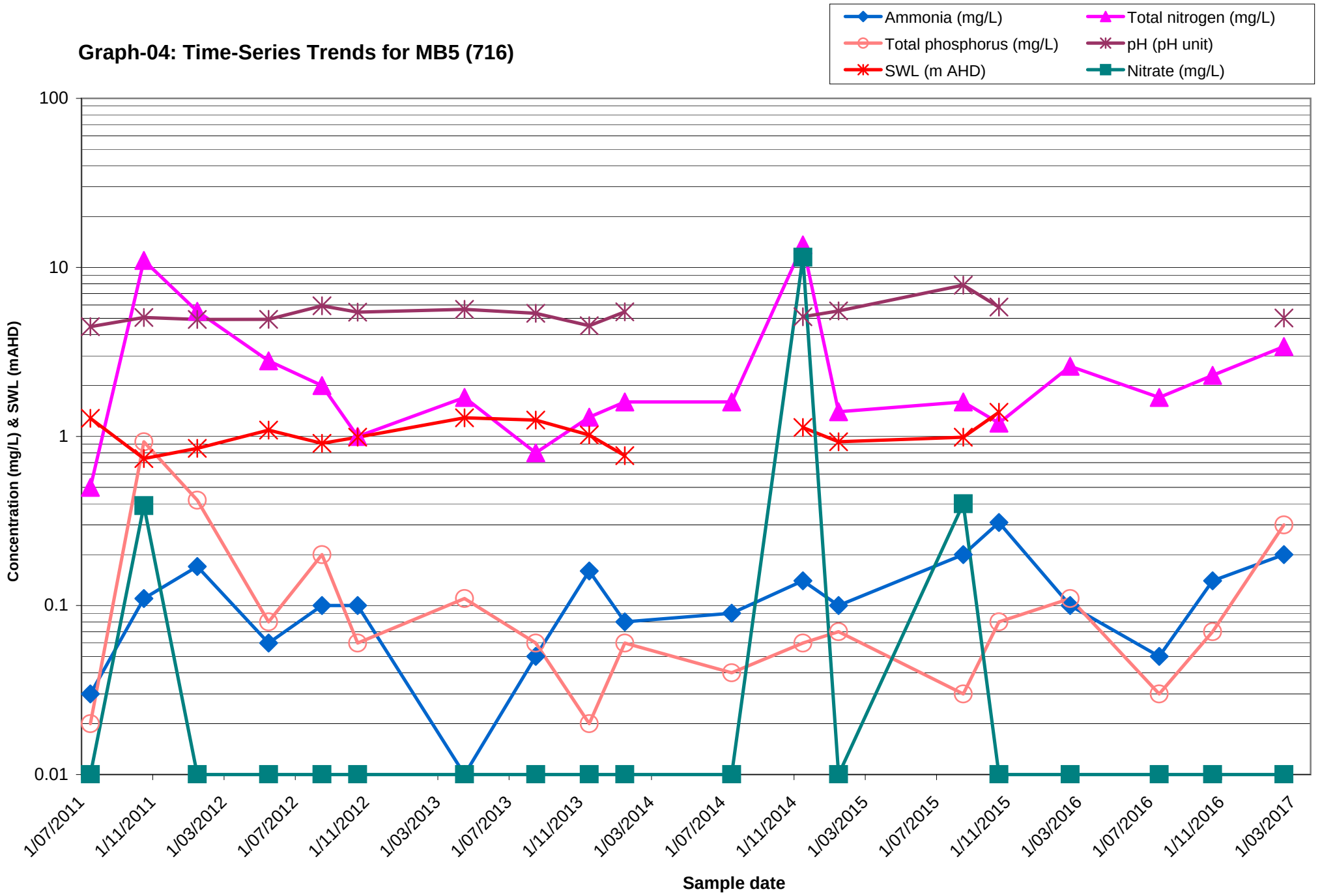
Graph-02: Time-Series Trends for MB2D (769)



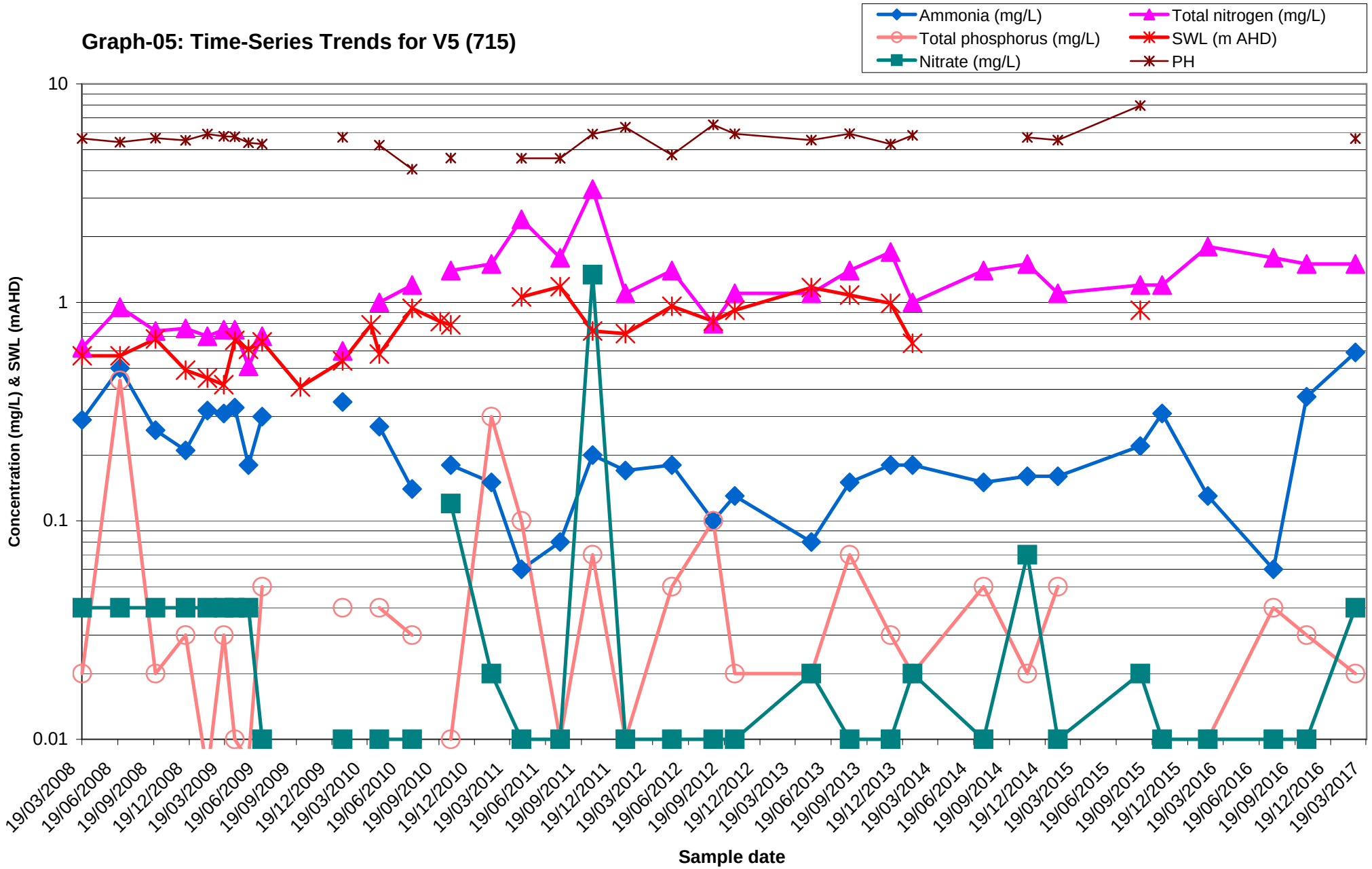
Graph-03: Time-Series Trends for D28 (756)



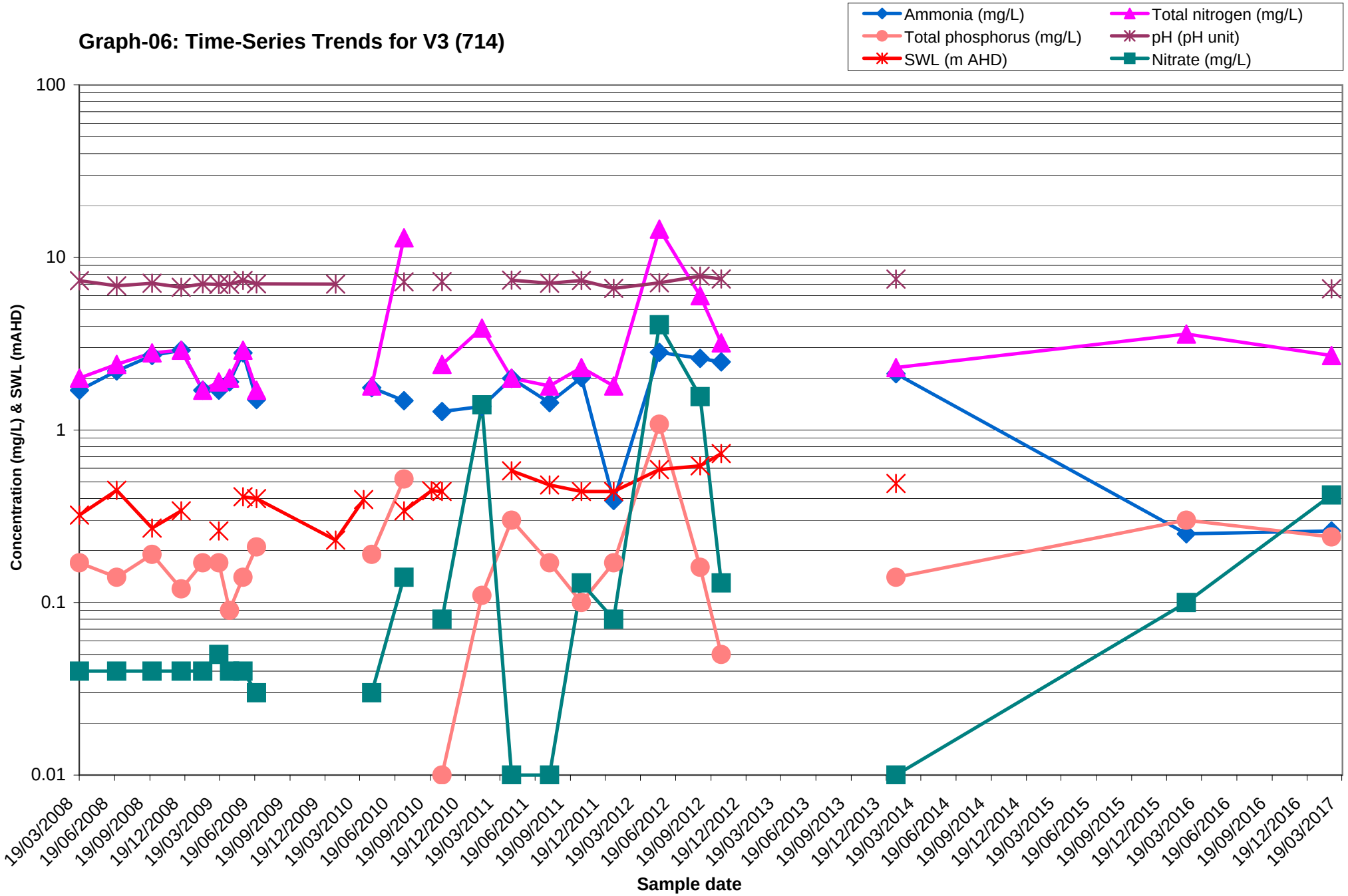
Graph-04: Time-Series Trends for MB5 (716)



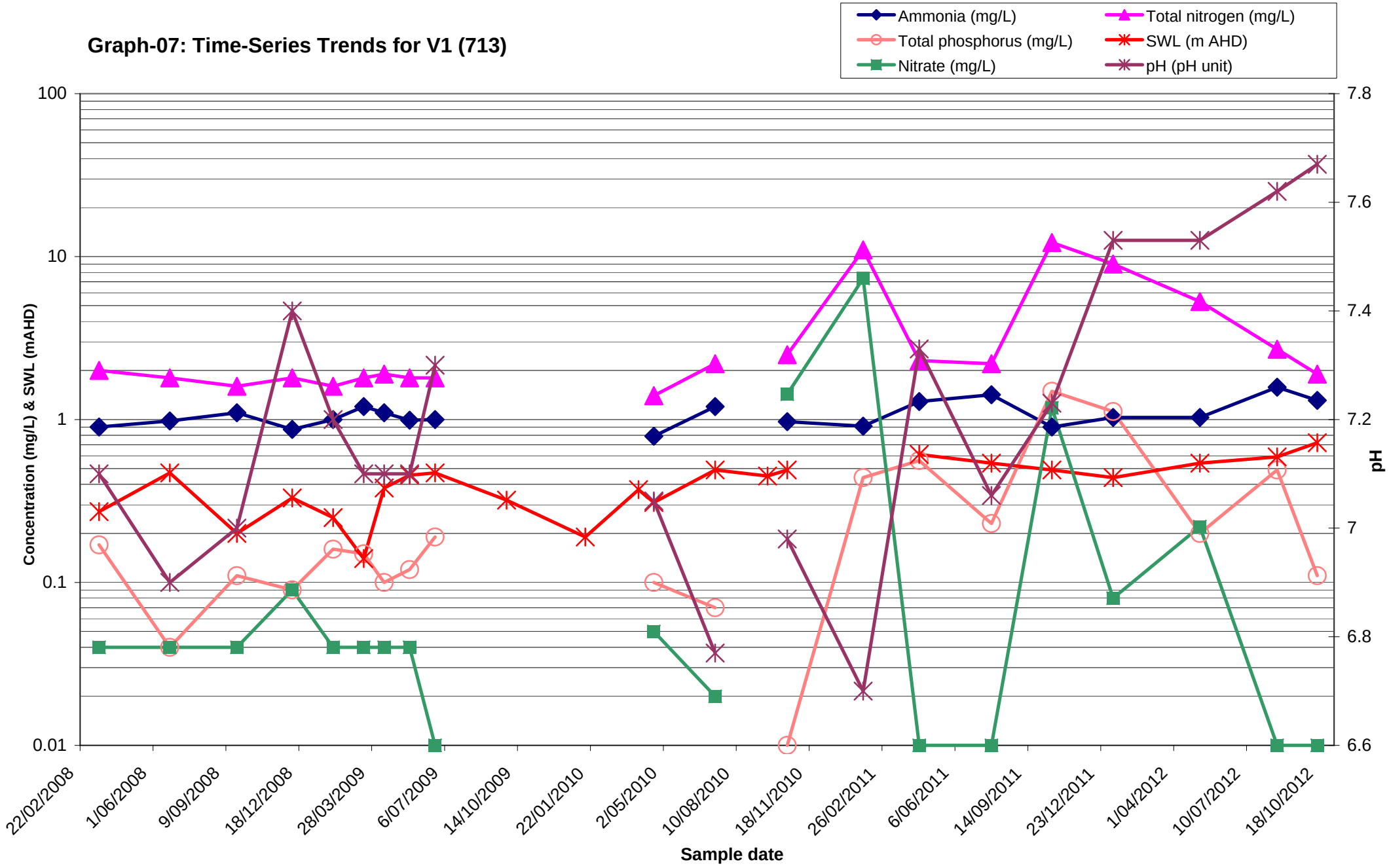
Graph-05: Time-Series Trends for V5 (715)



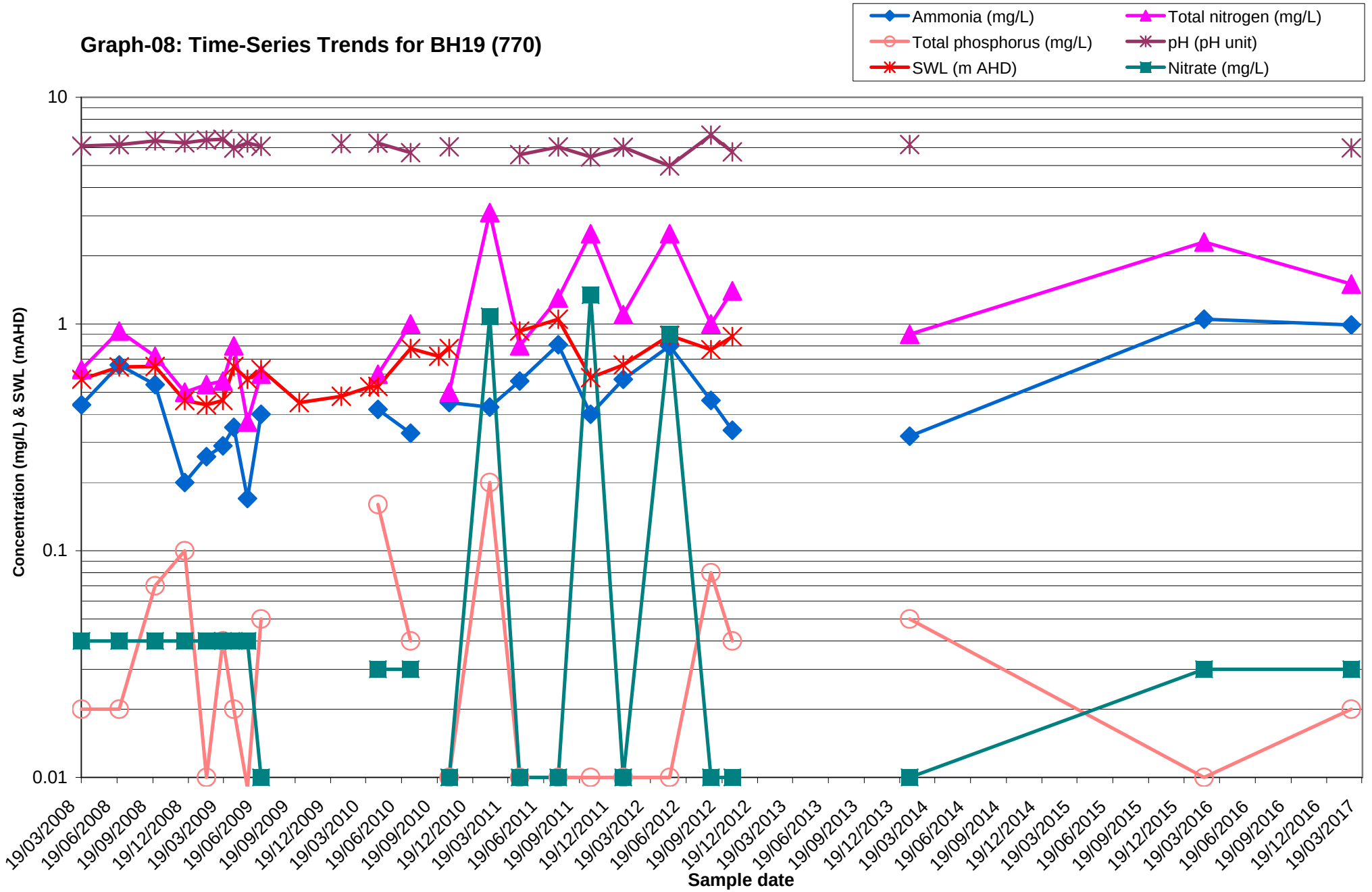
Graph-06: Time-Series Trends for V3 (714)



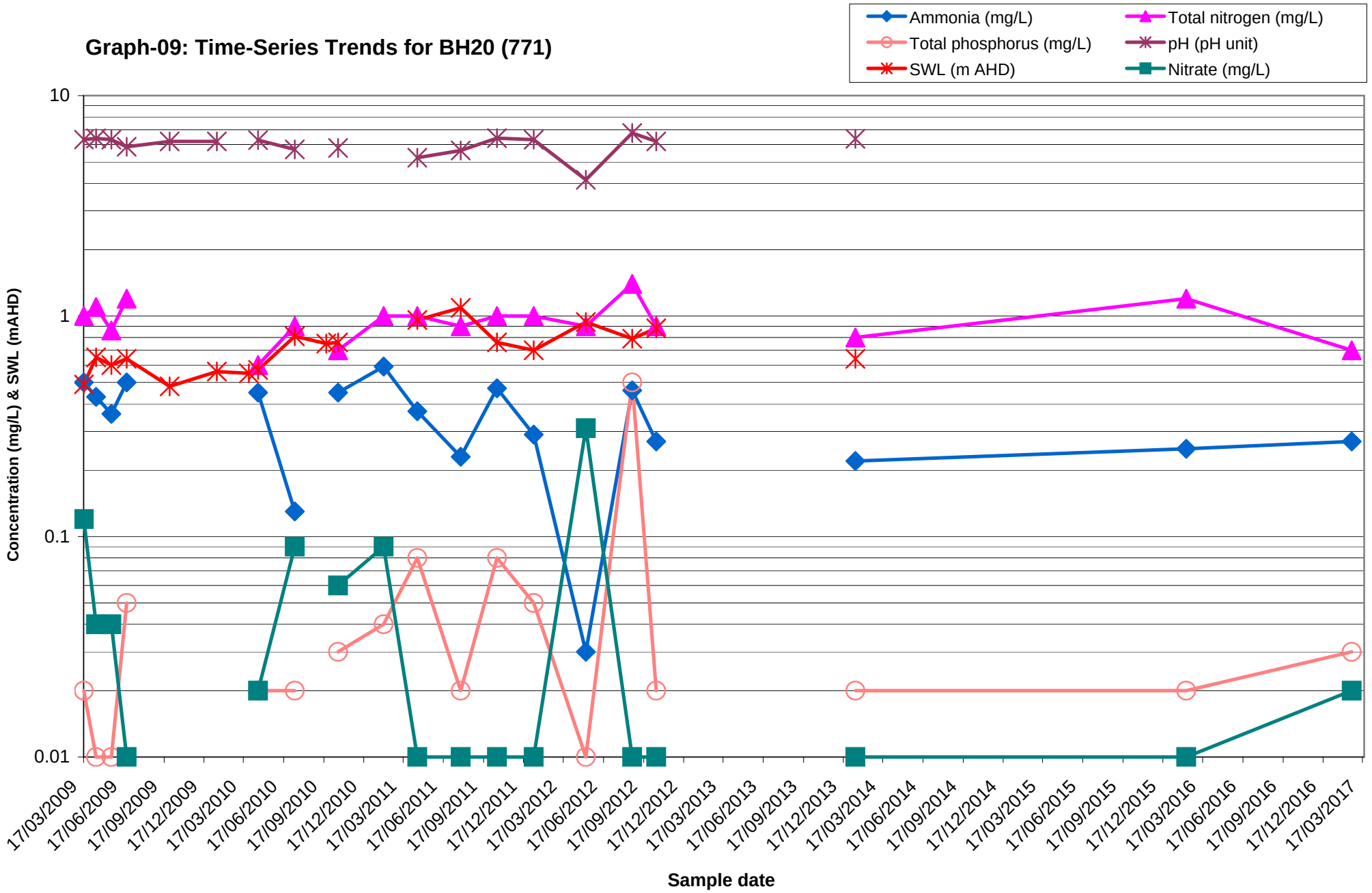
Graph-07: Time-Series Trends for V1 (713)



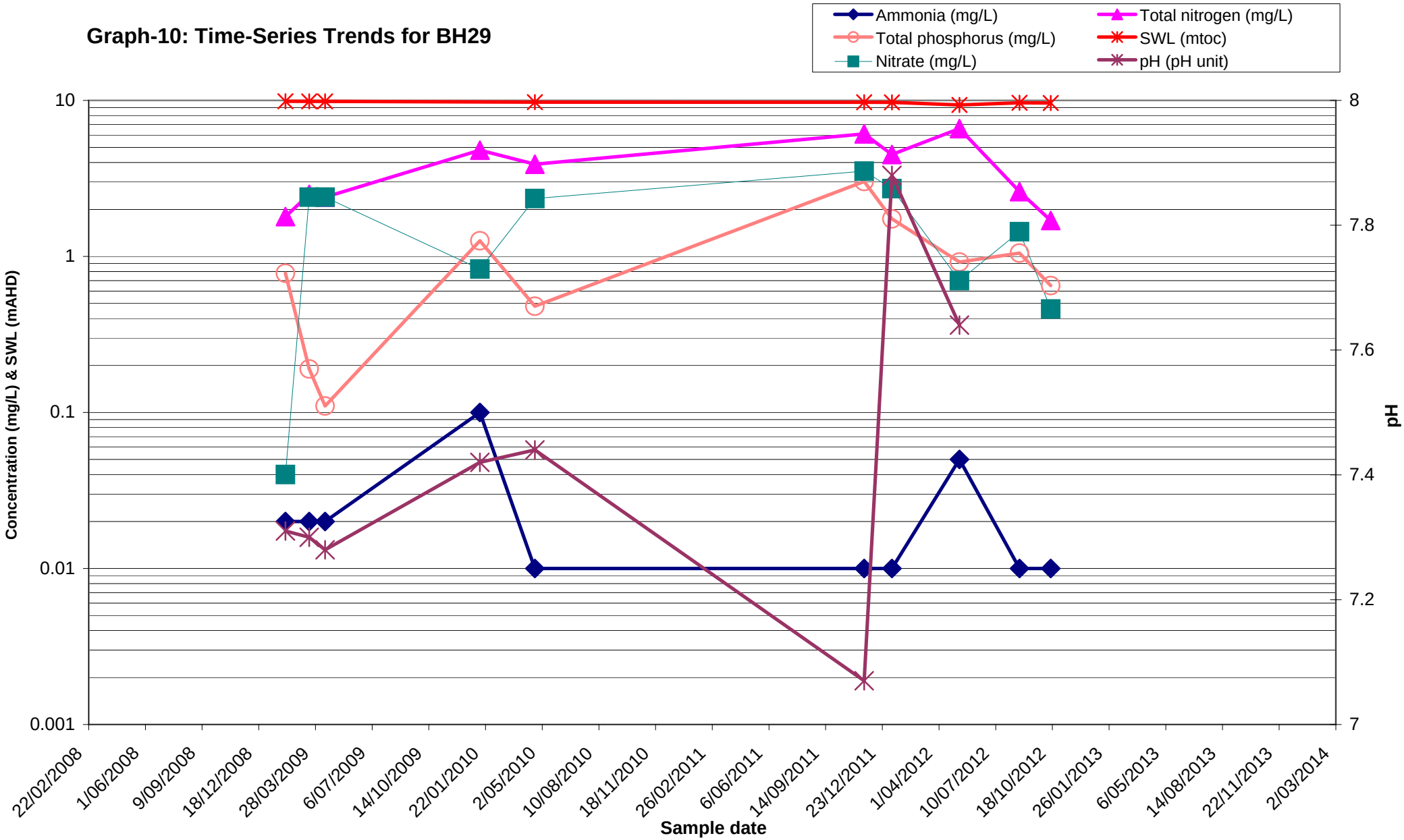
Graph-08: Time-Series Trends for BH19 (770)



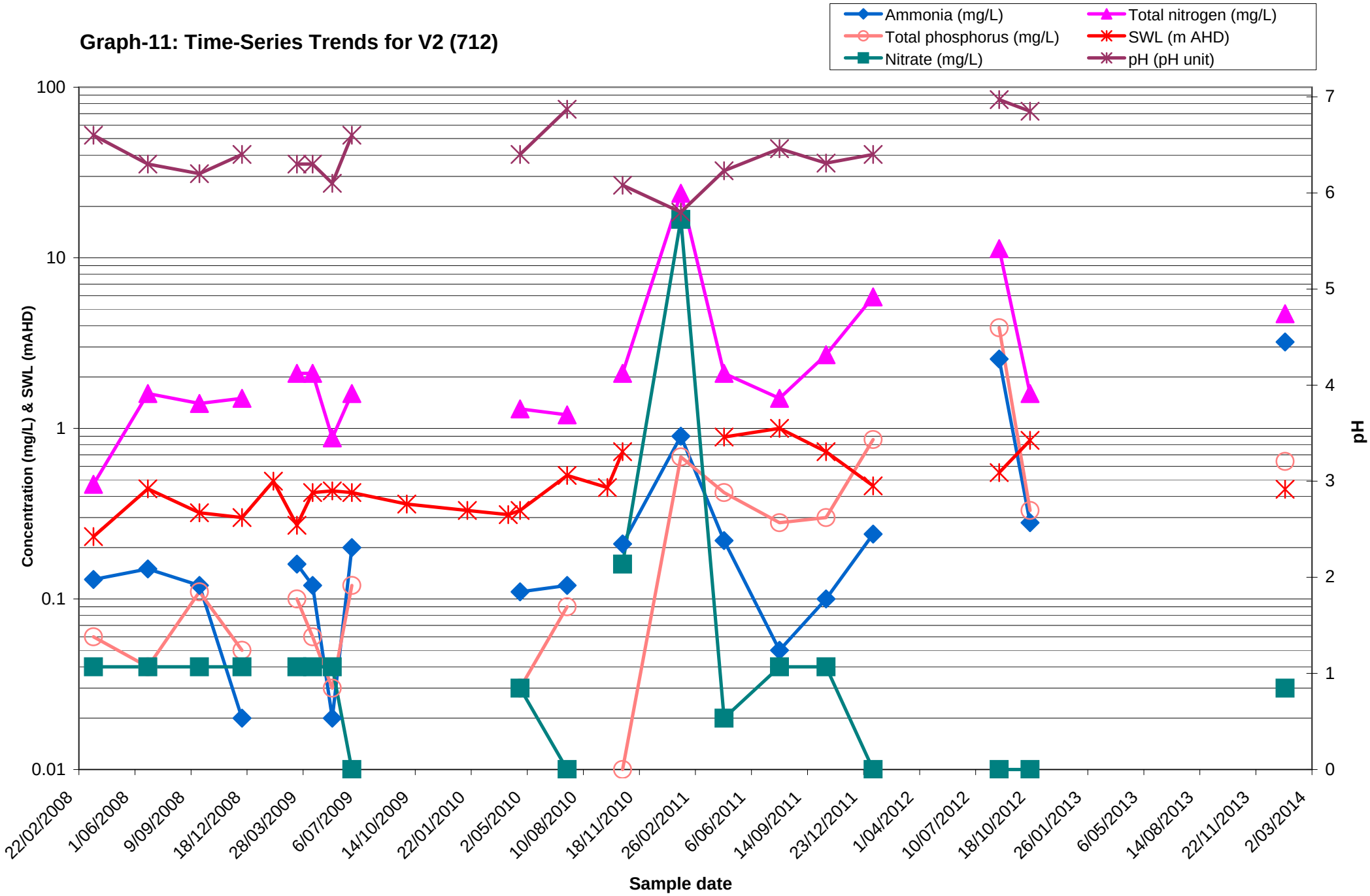
Graph-09: Time-Series Trends for BH20 (771)



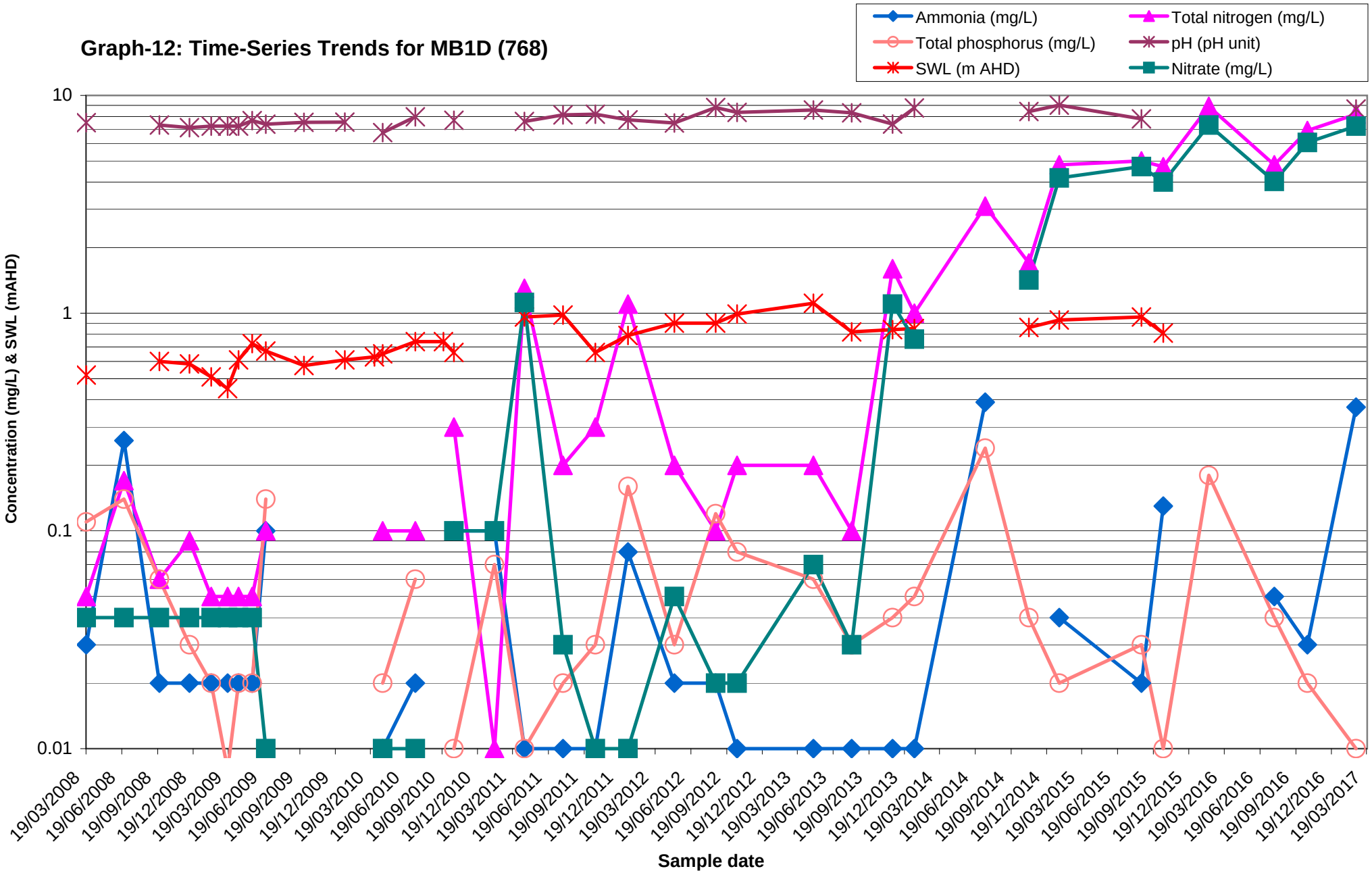
Graph-10: Time-Series Trends for BH29



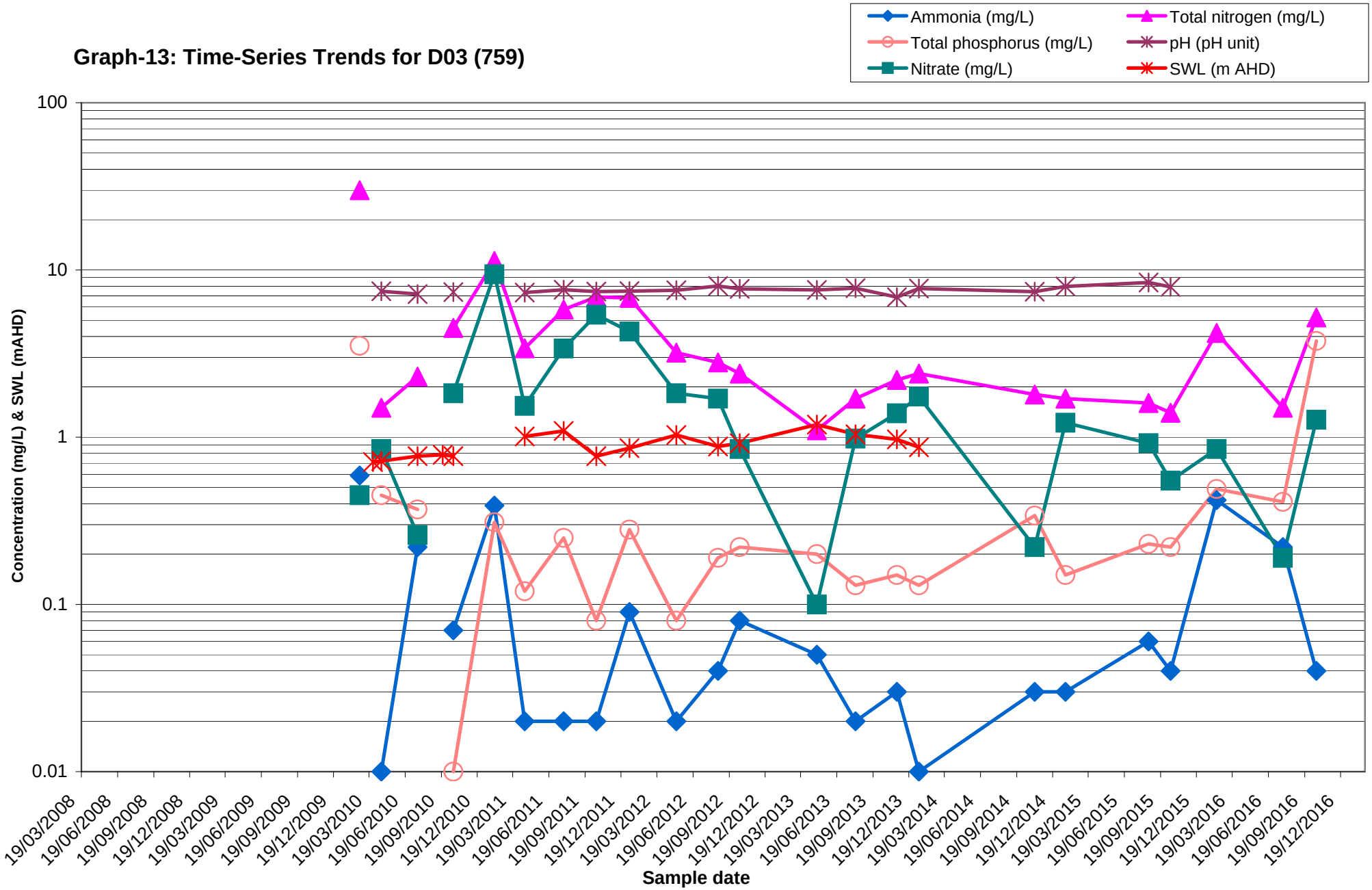
Graph-11: Time-Series Trends for V2 (712)



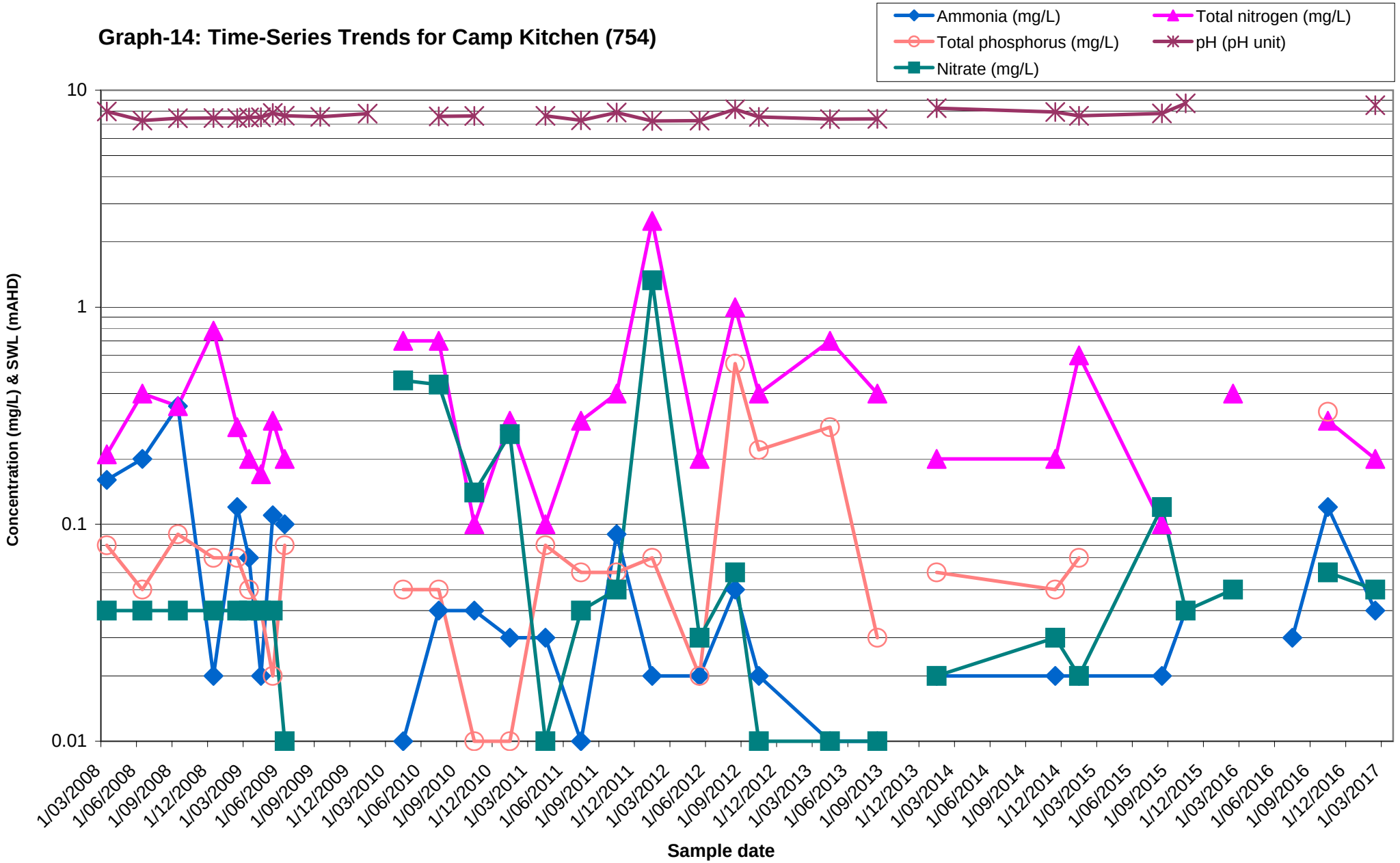
Graph-12: Time-Series Trends for MB1D (768)



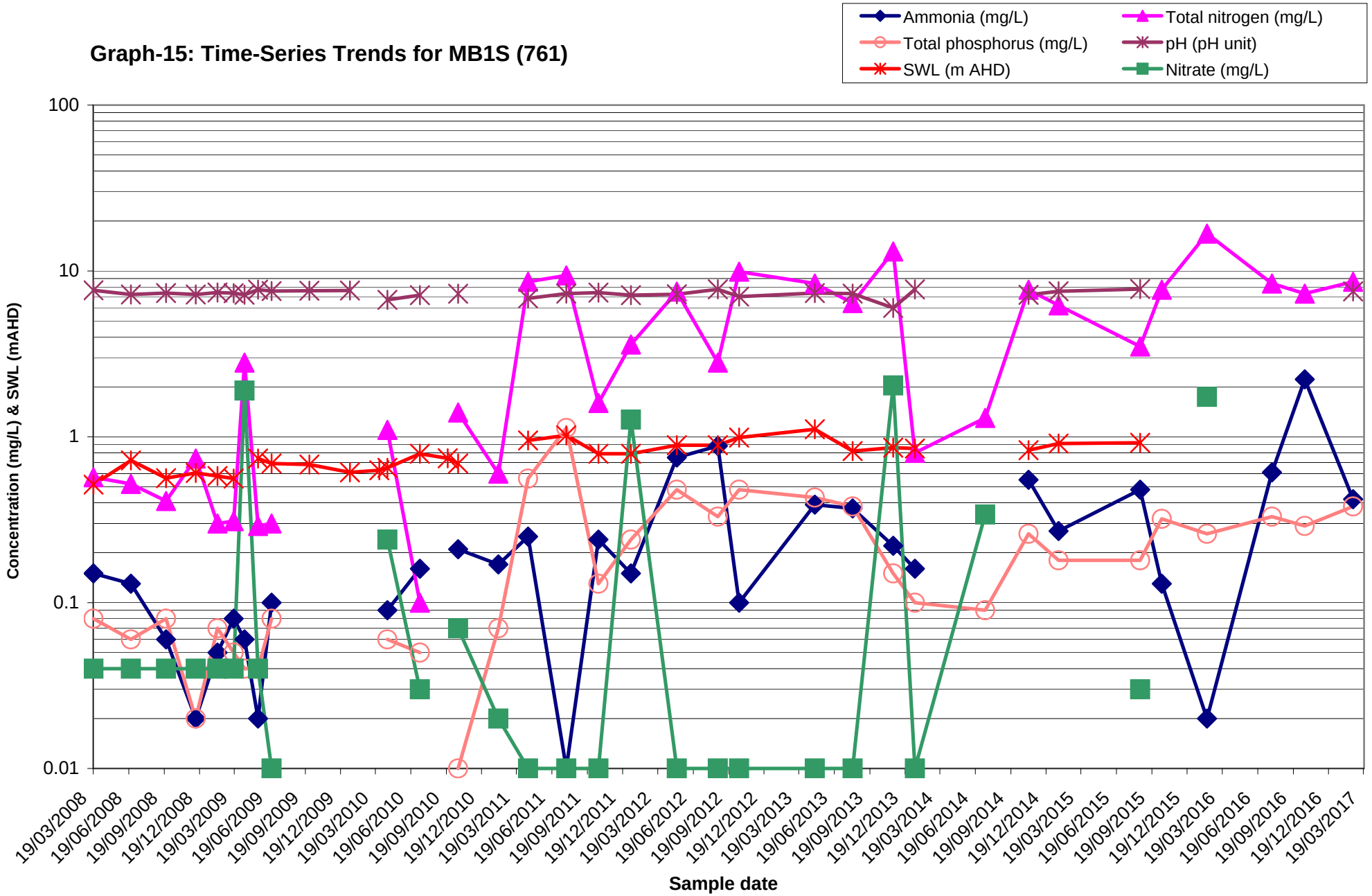
Graph-13: Time-Series Trends for D03 (759)



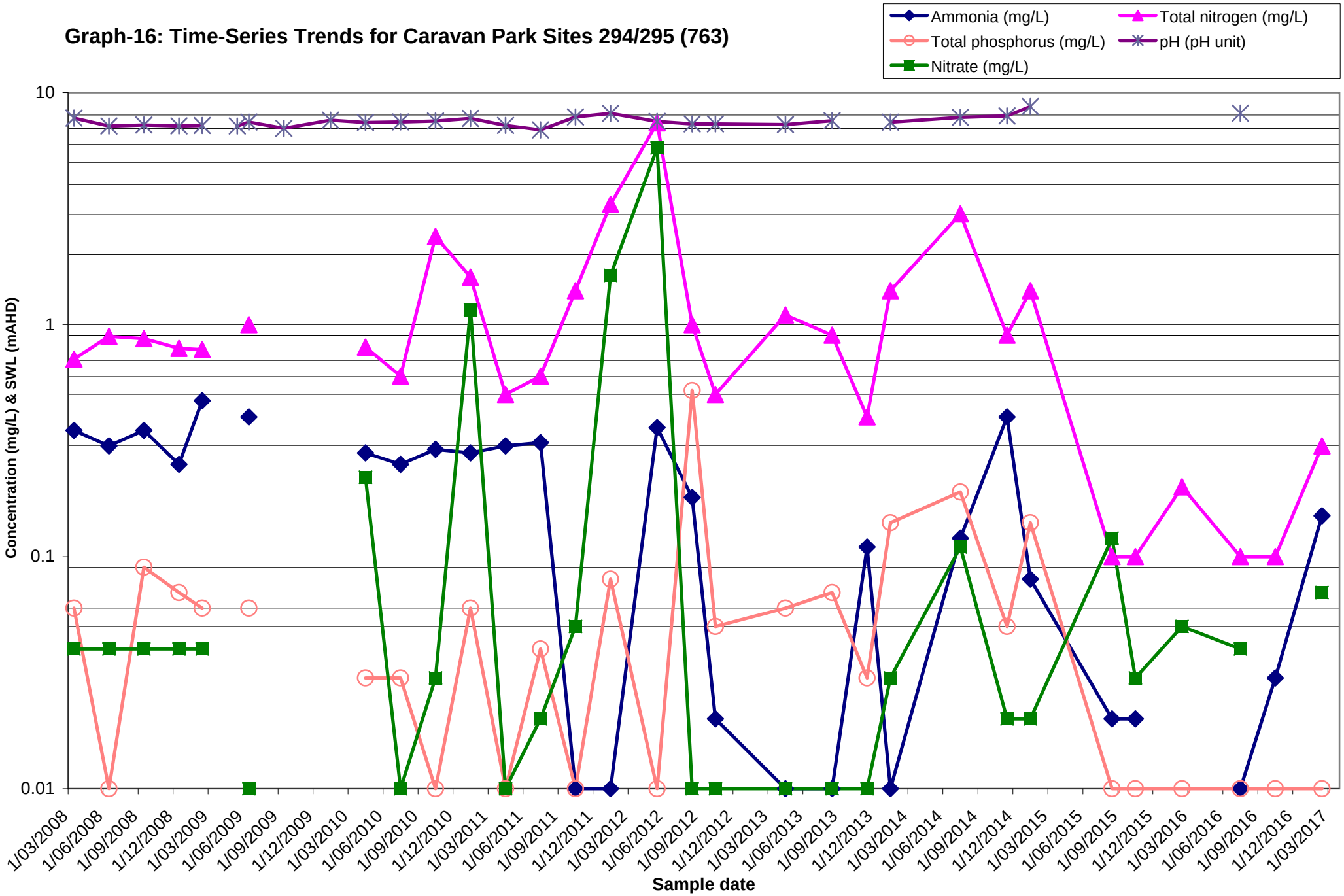
Graph-14: Time-Series Trends for Camp Kitchen (754)



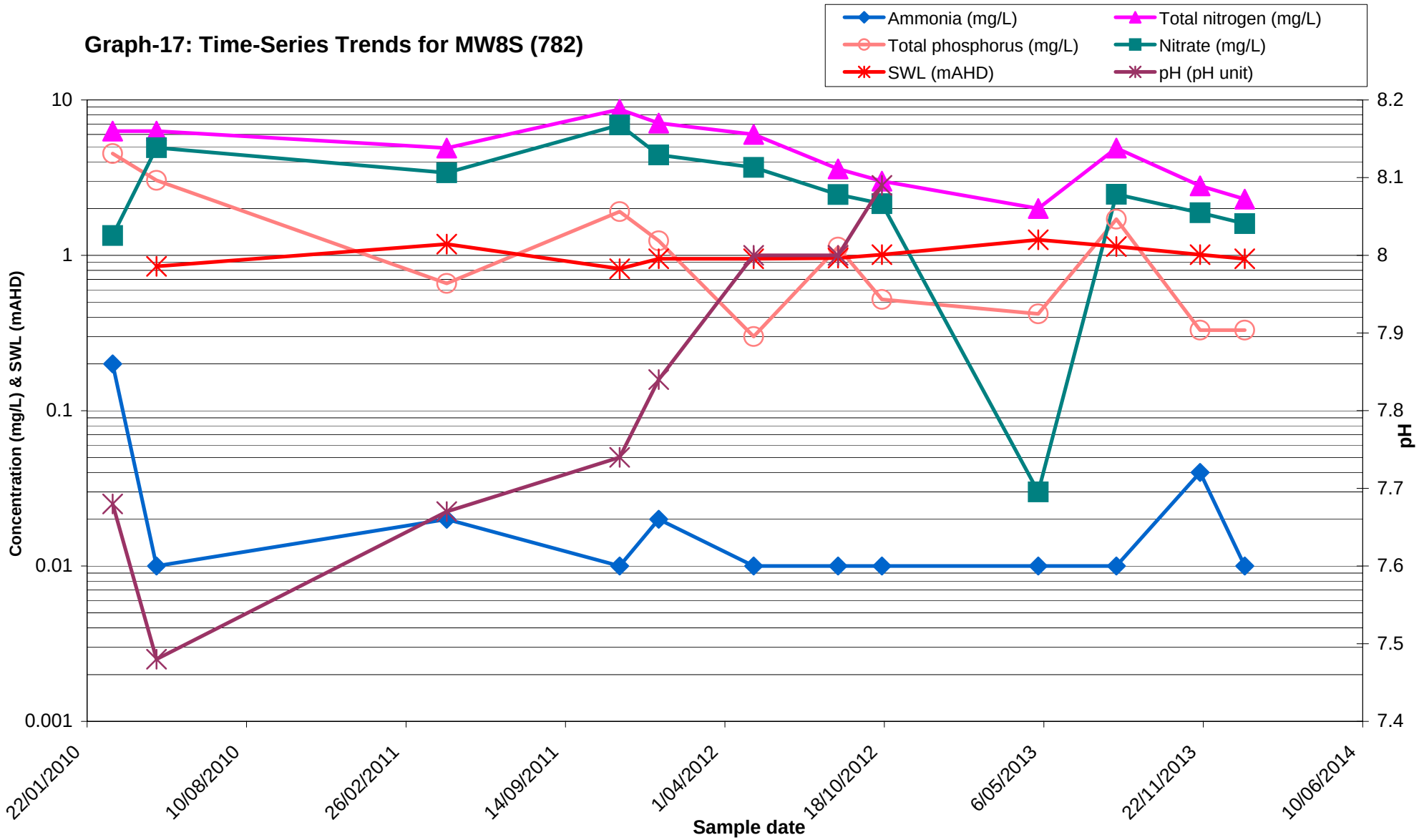
Graph-15: Time-Series Trends for MB1S (761)



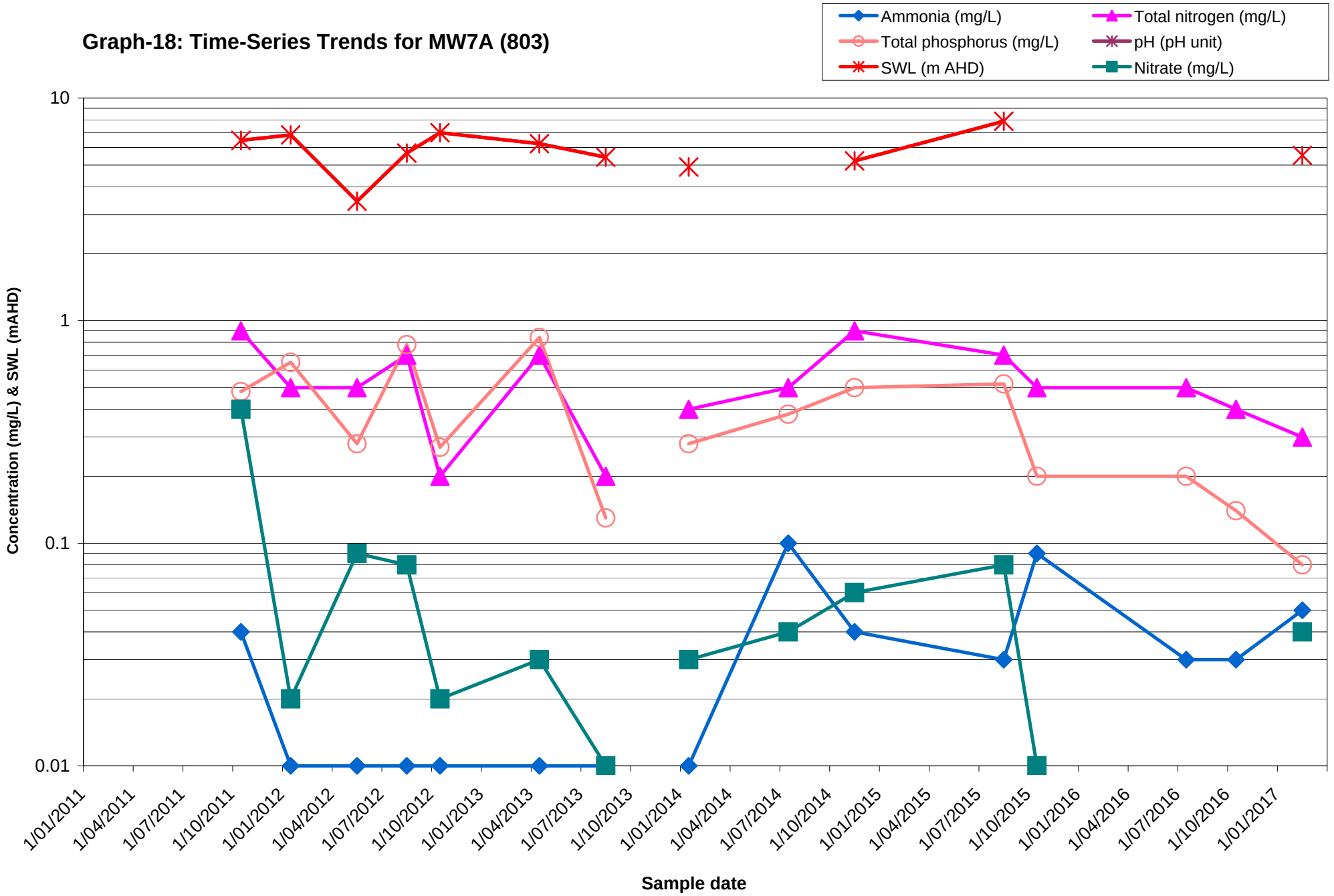
Graph-16: Time-Series Trends for Caravan Park Sites 294/295 (763)



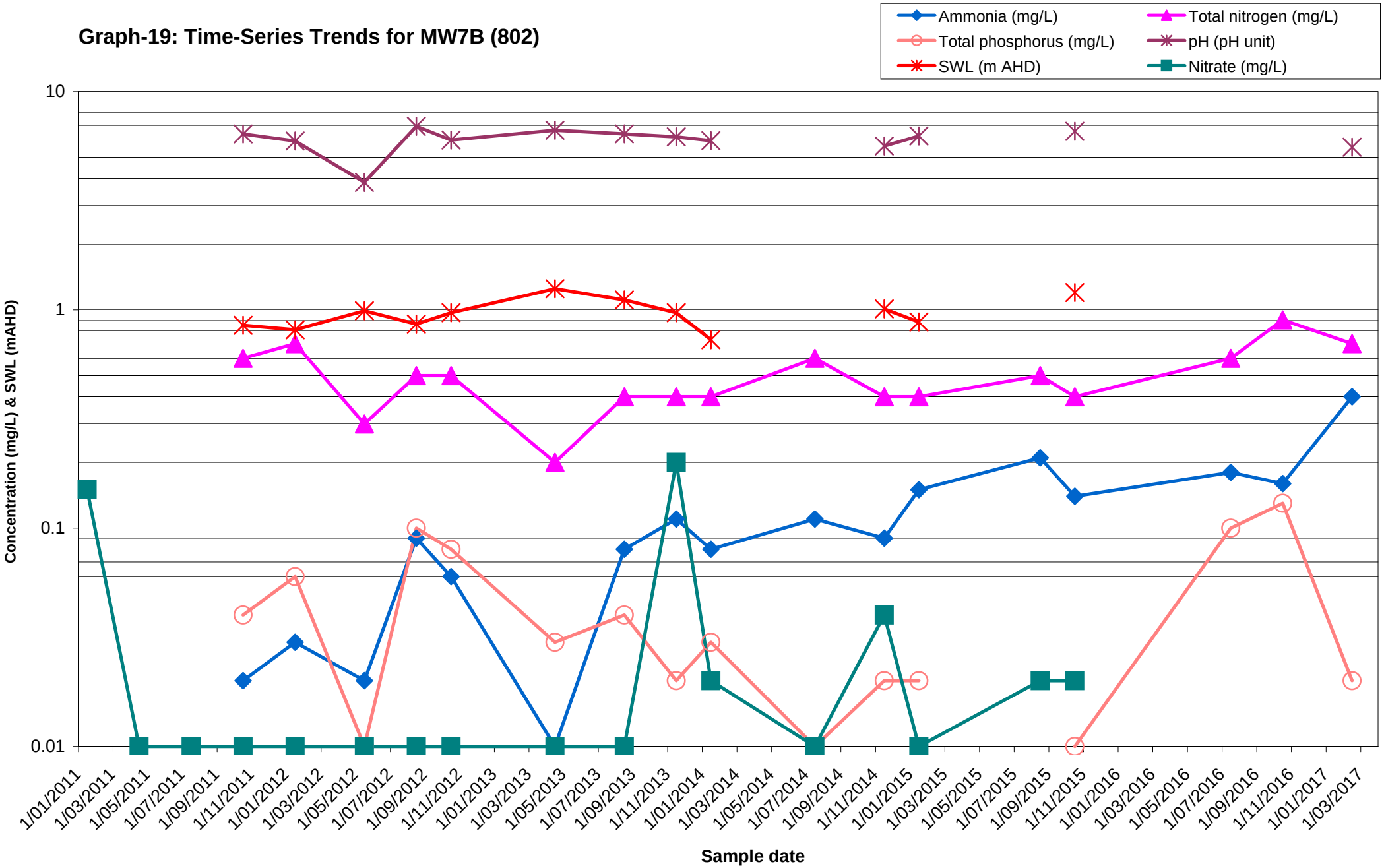
Graph-17: Time-Series Trends for MW8S (782)

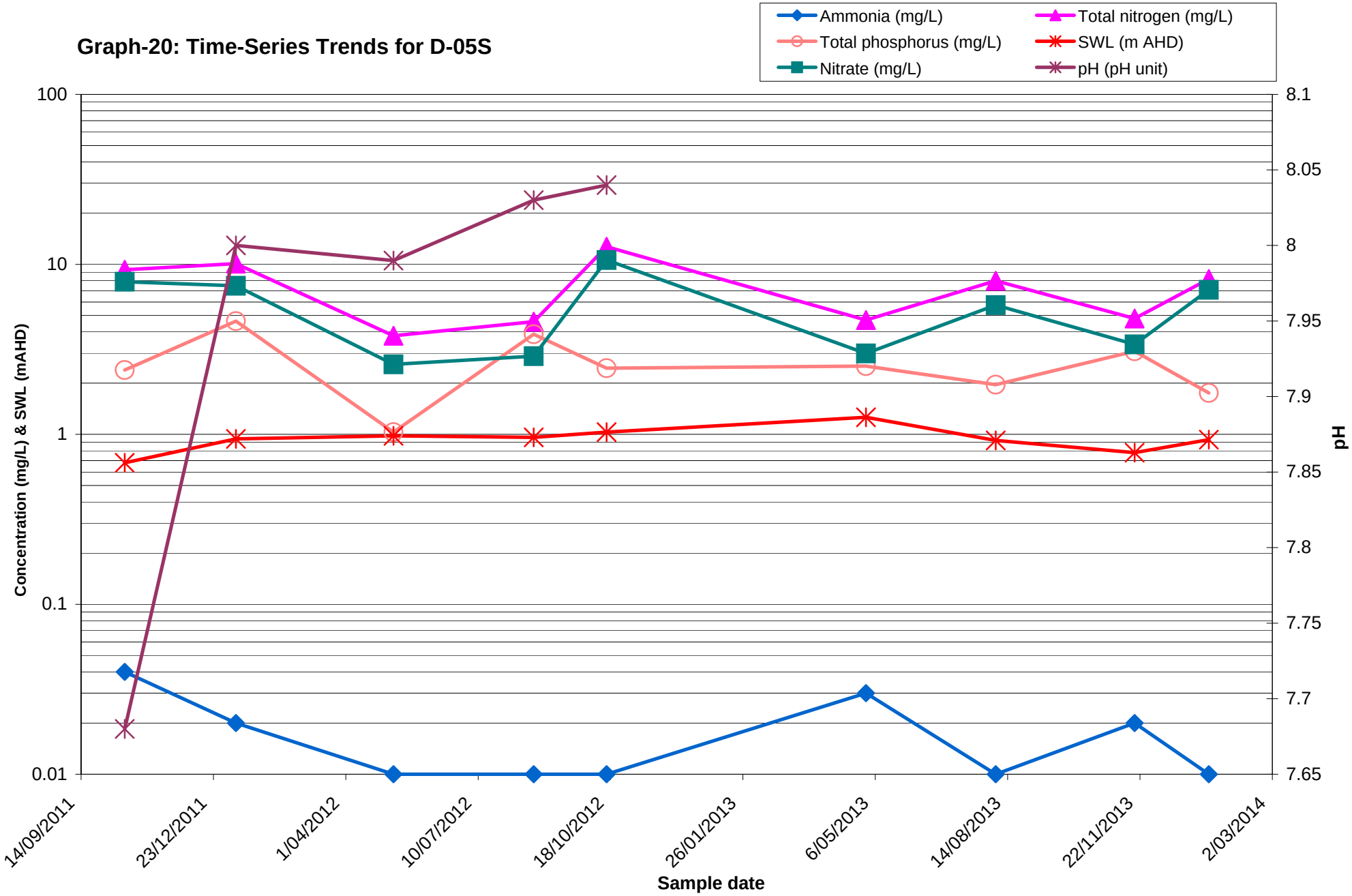


Graph-18: Time-Series Trends for MW7A (803)

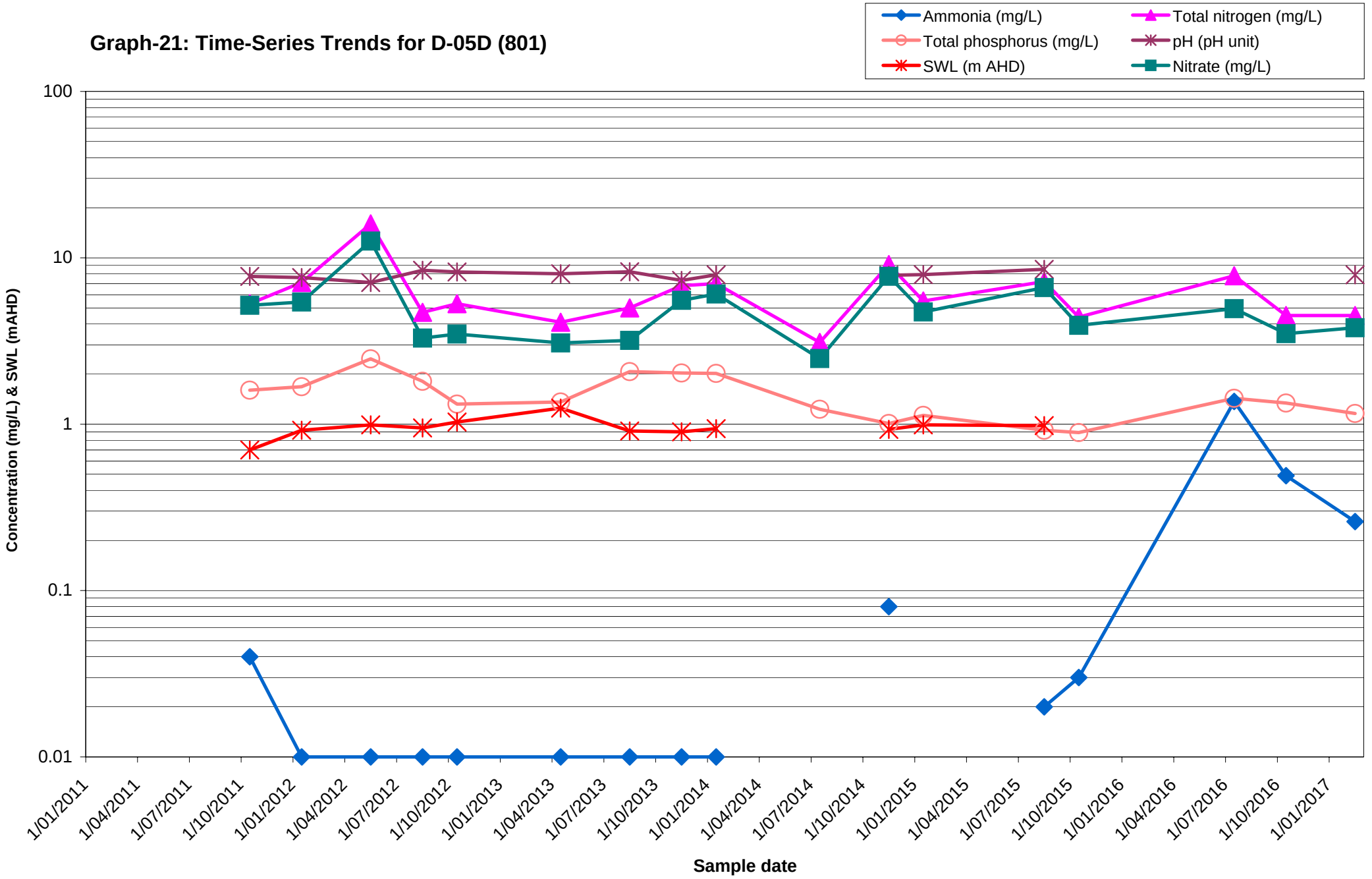


Graph-19: Time-Series Trends for MW7B (802)

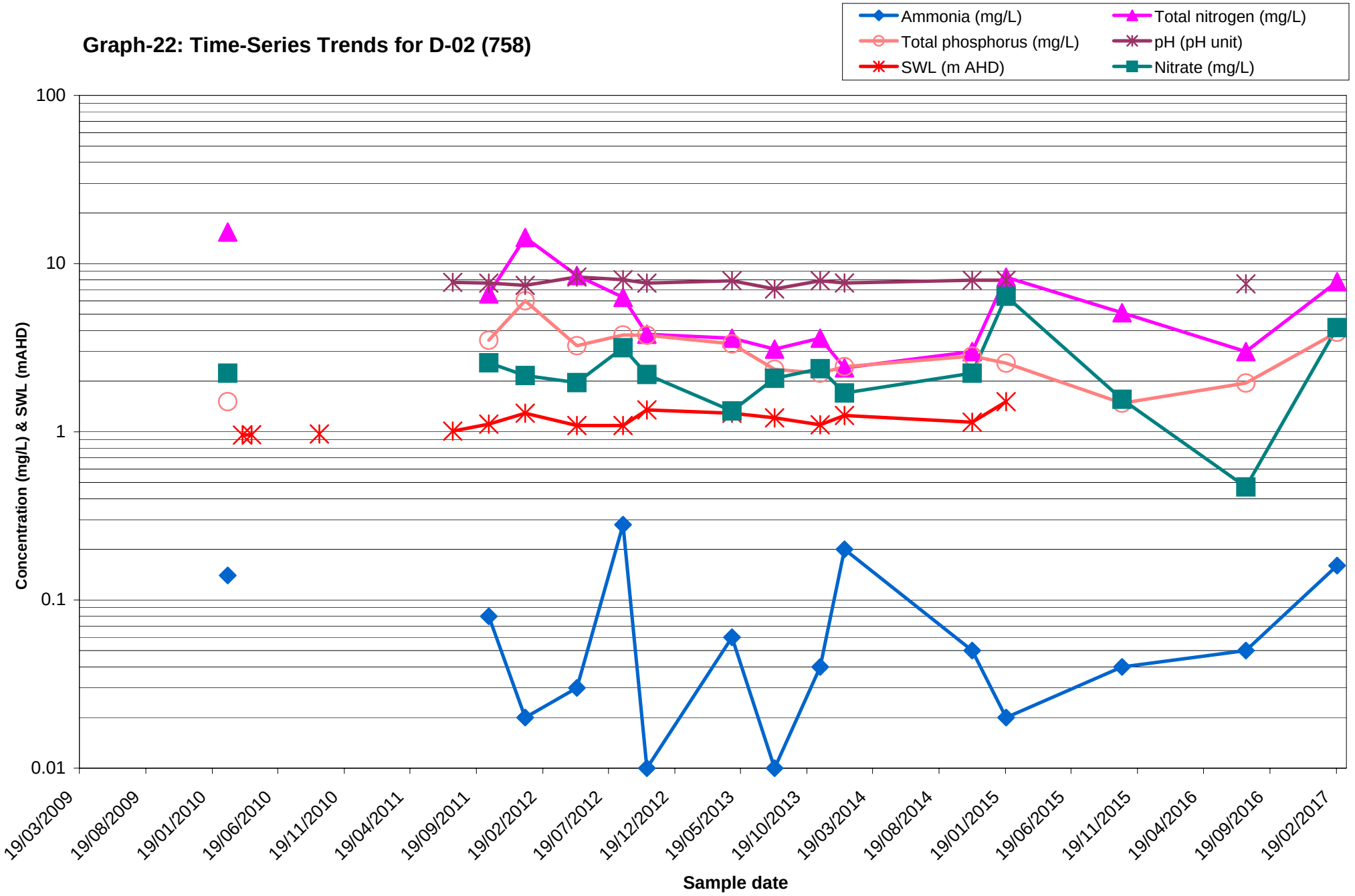



Graph-20: Time-Series Trends for D-05S
Ammonia (mg/L)
Total nitrogen (mg/L)
Total phosphorus (mg/L)
SWL (m AHD)
Nitrate (mg/L)
pH (pH unit)
Concentration (mg/L) & SWL (mAHD)
pH
100
10
1
0.1
0.01
8.1
8.05
8
7.95
7.9
7.85
7.8
7.75
7.7
7.65
14/09/2011
23/12/2011
1/04/2012
10/07/2012
18/10/2012
26/01/2013
6/05/2013
14/08/2013
22/11/2013
2/03/2014
Sample date

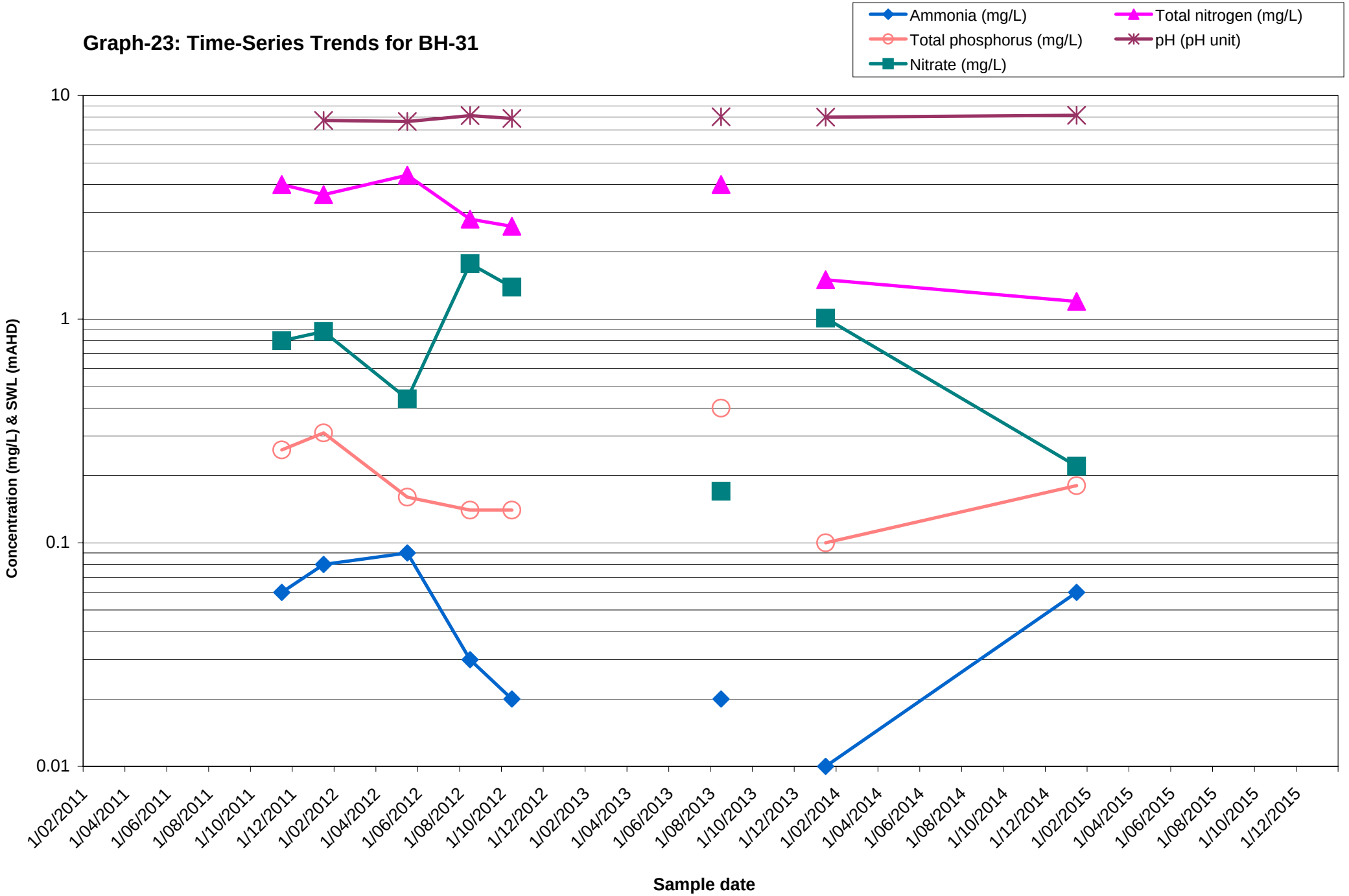
Graph-21: Time-Series Trends for D-05D (801)



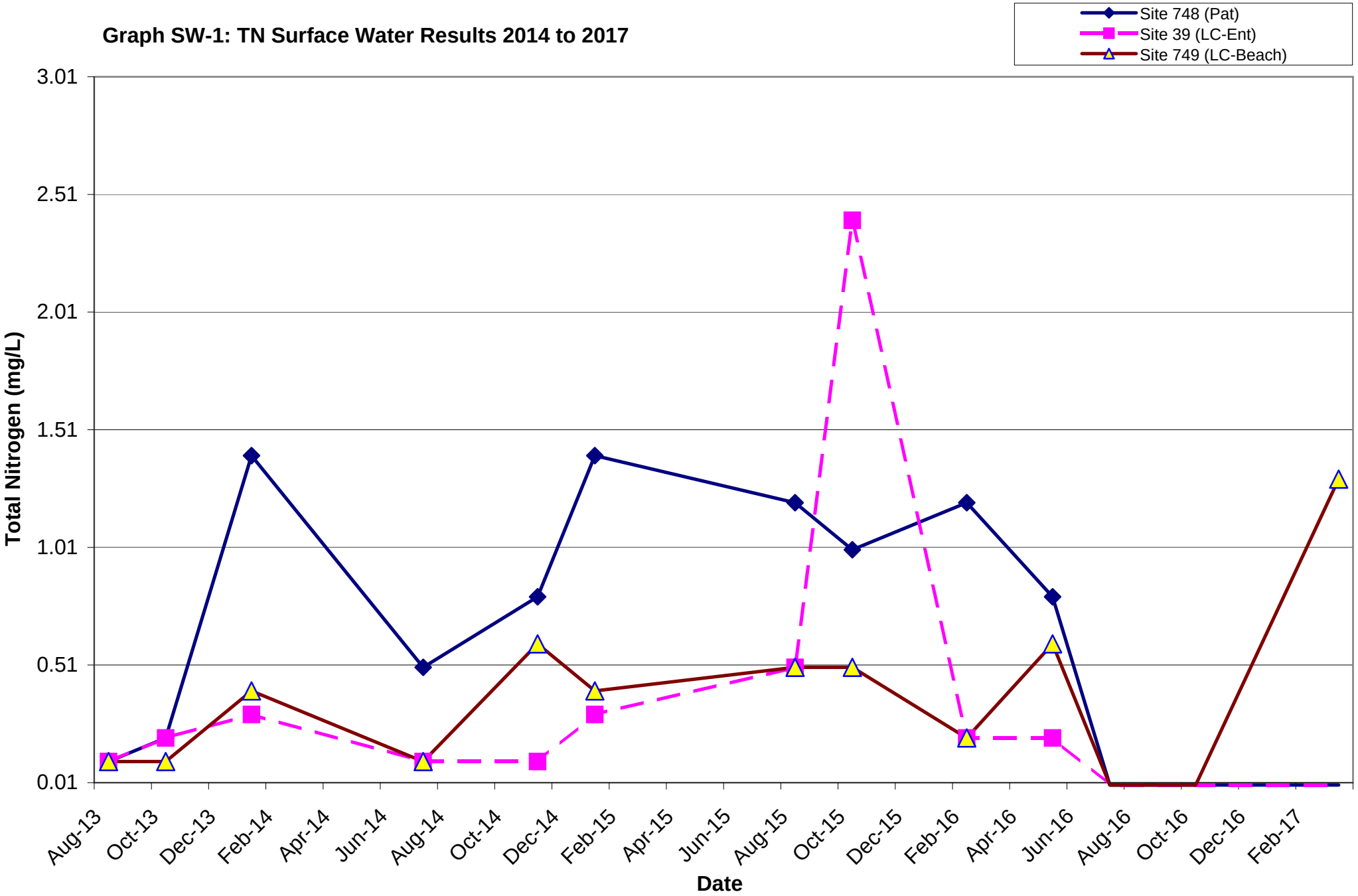
Graph-22: Time-Series Trends for D-02 (758)

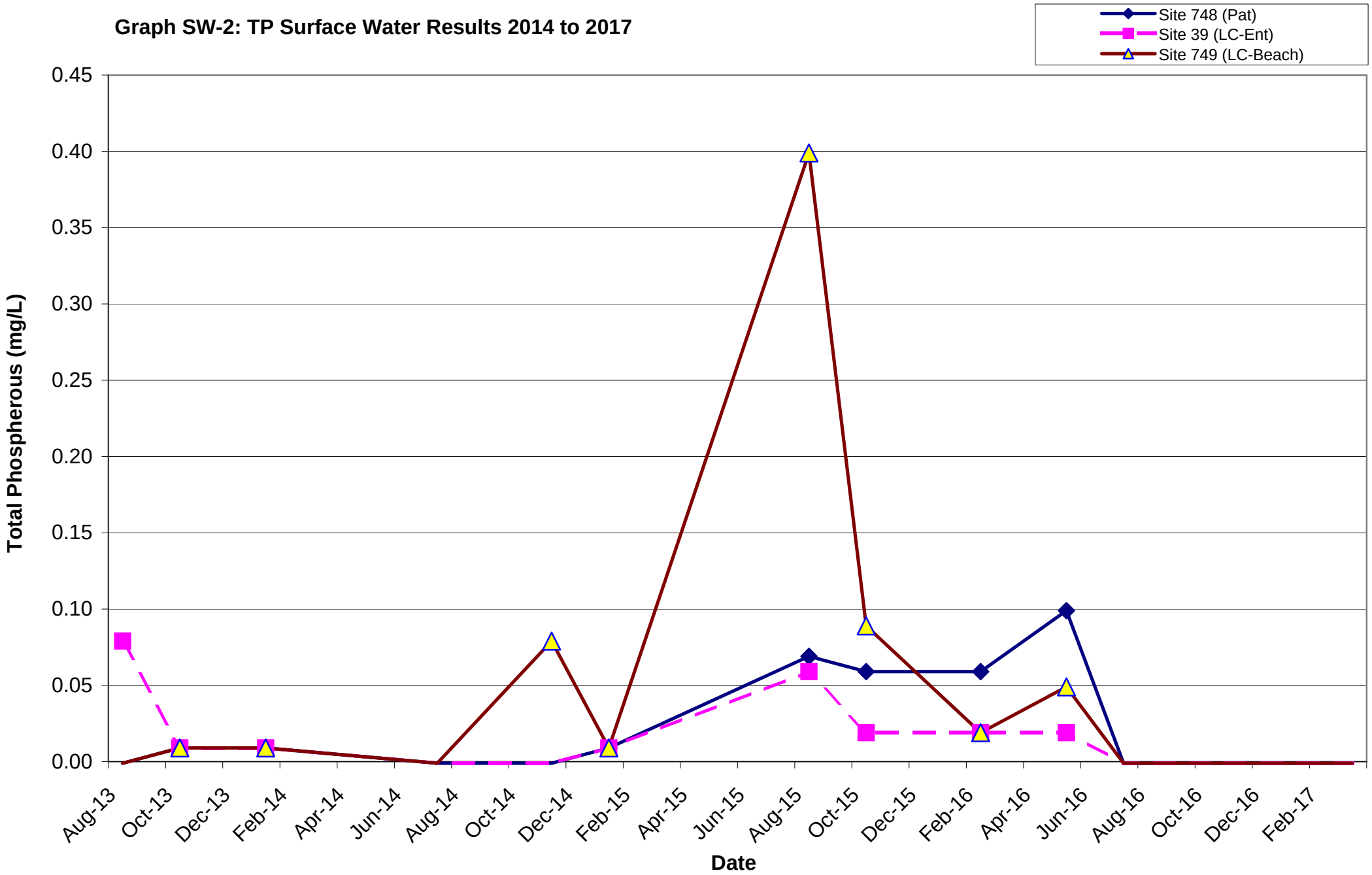


Graph-23: Time-Series Trends for BH-31



Graph SW-1: TN Surface Water Results 2014 to 2017




Graph SW-2: TP Surface Water Results 2014 to 2017
Site 748 (Pat)
Site 39 (LC-Ent)
Site 749 (LC-Beach)
Total Phospherous (mg/L)
0.45
0.40
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
Aug-13
Oct-13
Dec-13
Feb-14
Apr-14
Jun-14
Aug-14
Oct-14
Dec-14
Feb-15
Apr-15
Jun-15
Aug-15
Oct-15
Dec-15
Feb-16
Apr-16
Jun-16
Aug-16
Oct-16
Dec-16
Feb-17
Date

Appendix A:

Lake Conjola STP Final Effluent Quality (2013-2017)

Conjola Regional Sewerage Scheme - Monitoring Summary

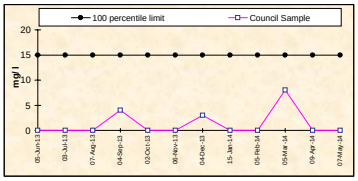
Licensee: Shoalhaven City Council, Shoalhaven Water, PO Box 42, Nowra 2541

Environment Protection Licence No. 12357 **EPA ID No. 7 (Lake Conjola WwTP)**

2013-2014

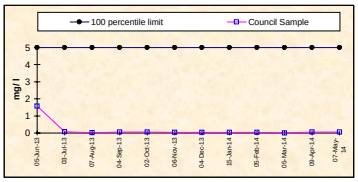
BOD

Frequency	Date Sample Obtained	Date Result Obtained	Unit Of Measurement	100 percentile limit	Council Sample
Monthly	05-Jun-13	20-Jun-13	milligrams per litre	15	<2
Monthly	03-Jul-13	12-Jul-13	milligrams per litre	15	<2
Monthly	07-Aug-13	14-Aug-13	milligrams per litre	15	<2
Monthly	04-Sep-13	13-Sep-13	milligrams per litre	15	4
Monthly	02-Oct-13	11-Oct-13	milligrams per litre	15	<2
Monthly	06-Nov-13	14-Nov-13	milligrams per litre	15	<2
Monthly	04-Dec-13	18-Dec-13	milligrams per litre	15	3
Monthly	15-Jan-14	28-Jan-14	milligrams per litre	15	<2
Monthly	05-Feb-14	19-Feb-14	milligrams per litre	15	<2
Monthly	05-Mar-14	17-Mar-14	milligrams per litre	15	8
Monthly	09-Apr-14	23-Apr-14	milligrams per litre	15	<2
Monthly	07-May-14	19-May-14	milligrams per litre	15	<2



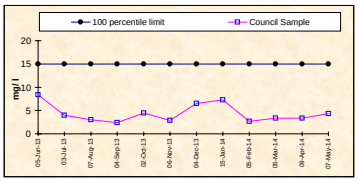
NITROGEN (Ammonia)

Frequency	Date Sample Obtained	Date Result Obtained	Unit Of Measurement	100 percentile limit	Council Sample
Monthly	05-Jun-13	20-Jun-13	milligrams per litre	5	1.58
Monthly	03-Jul-13	12-Jul-13	milligrams per litre	5	0.08
Monthly	07-Aug-13	14-Aug-13	milligrams per litre	5	0.02
Monthly	04-Sep-13	13-Sep-13	milligrams per litre	5	0.05
Monthly	02-Oct-13	11-Oct-13	milligrams per litre	5	0.05
Monthly	06-Nov-13	14-Nov-13	milligrams per litre	5	0.04
Monthly	04-Dec-13	18-Dec-13	milligrams per litre	5	0.04
Monthly	15-Jan-14	28-Jan-14	milligrams per litre	5	0.03
Monthly	05-Feb-14	19-Feb-14	milligrams per litre	5	0.04
Monthly	05-Mar-14	17-Mar-14	milligrams per litre	5	<0.01
Monthly	09-Apr-14	23-Apr-14	milligrams per litre	5	0.05
Monthly	07-May-14	19-May-14	milligrams per litre	5	0.05



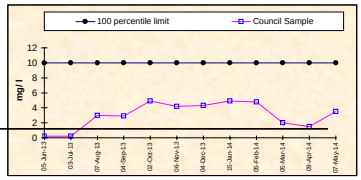
NITROGEN (Total)

Frequency	Date Sample Obtained	Date Result Obtained	Unit Of Measurement	100 percentile limit	Council Sample
Monthly	05-Jun-13	20-Jun-13	milligrams per litre	15	8.4
Monthly	03-Jul-13	12-Jul-13	milligrams per litre	15	4.0
Monthly	07-Aug-13	14-Aug-13	milligrams per litre	15	3.0
Monthly	04-Sep-13	13-Sep-13	milligrams per litre	15	2.4
Monthly	02-Oct-13	11-Oct-13	milligrams per litre	15	4.5
Monthly	06-Nov-13	14-Nov-13	milligrams per litre	15	2.9
Monthly	04-Dec-13	18-Dec-13	milligrams per litre	15	6.5
Monthly	15-Jan-14	28-Jan-14	milligrams per litre	15	7.3
Monthly	05-Feb-14	19-Feb-14	milligrams per litre	15	2.7
Monthly	05-Mar-14	17-Mar-14	milligrams per litre	15	3.4
Monthly	09-Apr-14	23-Apr-14	milligrams per litre	15	3.4
Monthly	07-May-14	19-May-14	milligrams per litre	15	4.3



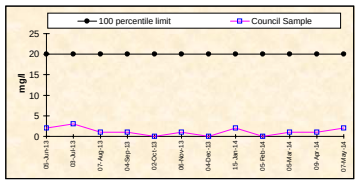
PHOSPHORUS (Total)

Frequency	Date Sample Obtained	Date Result Obtained	Unit Of Measurement	100 percentile limit	Council Sample
Monthly	05-Jun-13	20-Jun-13	milligrams per litre	10	0.2
Monthly	03-Jul-13	12-Jul-13	milligrams per litre	10	0.2
Monthly	07-Aug-13	14-Aug-13	milligrams per litre	10	3.0
Monthly	04-Sep-13	13-Sep-13	milligrams per litre	10	2.9
Monthly	02-Oct-13	11-Oct-13	milligrams per litre	10	4.9
Monthly	06-Nov-13	14-Nov-13	milligrams per litre	10	4.2
Monthly	04-Dec-13	18-Dec-13	milligrams per litre	10	4.3
Monthly	15-Jan-14	28-Jan-14	milligrams per litre	10	4.9
Monthly	05-Feb-14	19-Feb-14	milligrams per litre	10	4.8
Monthly	05-Mar-14	17-Mar-14	milligrams per litre	10	2.0
Monthly	09-Apr-14	23-Apr-14	milligrams per litre	10	1.5
Monthly	07-May-14	19-May-14	milligrams per litre	10	3.5



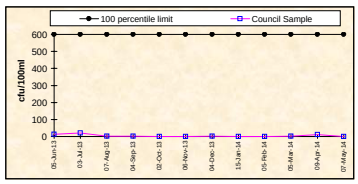
TOTAL SUSPENDED SOLIDS

Frequency	Date Sample Obtained	Date Result Obtained	Unit Of Measurement	100 percentile limit	Council Sample
Monthly	05-Jun-13	20-Jun-13	milligrams per litre	20	2
Monthly	03-Jul-13	12-Jul-13	milligrams per litre	20	3
Monthly	07-Aug-13	14-Aug-13	milligrams per litre	20	1
Monthly	04-Sep-13	13-Sep-13	milligrams per litre	20	1
Monthly	02-Oct-13	11-Oct-13	milligrams per litre	20	<1
Monthly	06-Nov-13	14-Nov-13	milligrams per litre	20	1
Monthly	04-Dec-13	18-Dec-13	milligrams per litre	20	<1
Monthly	15-Jan-14	28-Jan-14	milligrams per litre	20	2
Monthly	05-Feb-14	19-Feb-14	milligrams per litre	20	<1
Monthly	05-Mar-14	17-Mar-14	milligrams per litre	20	1
Monthly	09-Apr-14	23-Apr-14	milligrams per litre	20	1
Monthly	07-May-14	19-May-14	milligrams per litre	20	2



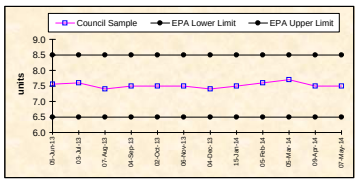
FAECAL COLIFORMS

Frequency	Date Sample Obtained	Date Result Obtained	Unit Of Measurement	100 percentile limit	Council Sample
Monthly	05-Jun-13	20-Jun-13	colony forming units per 100 millilitres	600	14
Monthly	03-Jul-13	12-Jul-13	colony forming units per 100 millilitres	600	21
Monthly	07-Aug-13	14-Aug-13	colony forming units per 100 millilitres	600	2
Monthly	04-Sep-13	13-Sep-13	colony forming units per 100 millilitres	600	1
Monthly	02-Oct-13	11-Oct-13	colony forming units per 100 millilitres	600	<1
Monthly	06-Nov-13	14-Nov-13	colony forming units per 100 millilitres	600	<1
Monthly	04-Dec-13	18-Dec-13	colony forming units per 100 millilitres	600	2
Monthly	15-Jan-14	28-Jan-14	colony forming units per 100 millilitres	600	<1
Monthly	05-Feb-14	19-Feb-14	colony forming units per 100 millilitres	600	<1
Monthly	05-Mar-14	17-Mar-14	colony forming units per 100 millilitres	600	1
Monthly	09-Apr-14	23-Apr-14	colony forming units per 100 millilitres	600	12
Monthly	07-May-14	19-May-14	colony forming units per 100 millilitres	600	<1



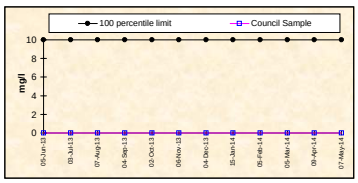
pH

Frequency	Date Sample Obtained	Date Result Obtained	Unit Of Measurement	100 percentile limit	Council Sample
Monthly	05-Jun-13	20-Jun-13	pH	6.5-8.5	7.6
Monthly	03-Jul-13	12-Jul-13	pH	6.5-8.5	7.6
Monthly	07-Aug-13	14-Aug-13	pH	6.5-8.5	7.4
Monthly	04-Sep-13	13-Sep-13	pH	6.5-8.5	7.5
Monthly	02-Oct-13	11-Oct-13	pH	6.5-8.5	7.5
Monthly	06-Nov-13	14-Nov-13	pH	6.5-8.5	7.5
Monthly	04-Dec-13	18-Dec-13	pH	6.5-8.5	7.4
Monthly	15-Jan-14	28-Jan-14	pH	6.5-8.5	7.5
Monthly	05-Feb-14	19-Feb-14	pH	6.5-8.5	7.6
Monthly	05-Mar-14	17-Mar-14	pH	6.5-8.5	7.7
Monthly	09-Apr-14	23-Apr-14	pH	6.5-8.5	7.5
Monthly	07-May-14	19-May-14	pH	6.5-8.5	7.5



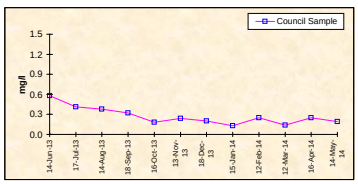
OIL AND GREASE

Frequency	Date Sample Obtained	Date Result Obtained	Unit Of Measurement	100 percentile limit	Council Sample
Monthly	05-Jun-13	07-Jun-13	milligrams per litre	10	<1
Monthly	03-Jul-13	12-Jul-13	milligrams per litre	10	<1
Monthly	07-Aug-13	14-Aug-13	milligrams per litre	10	<1
Monthly	04-Sep-13	13-Sep-13	milligrams per litre	10	<1
Monthly	02-Oct-13	11-Oct-13	milligrams per litre	10	<1
Monthly	06-Nov-13	14-Nov-13	milligrams per litre	10	<1
Monthly	04-Dec-13	18-Dec-13	milligrams per litre	10	<1
Monthly	15-Jan-14	28-Jan-14	milligrams per litre	10	<1
Monthly	05-Feb-14	19-Feb-14	milligrams per litre	10	<1
Monthly	05-Mar-14	17-Mar-14	milligrams per litre	10	<1
Monthly	09-Apr-14	23-Apr-14	milligrams per litre	10	<1
Monthly	07-May-14	19-May-14	milligrams per litre	10	<1



CHLORINE (total residual)

Frequency	Date Sample Obtained	Date Result Obtained	Unit Of Measurement	100 percentile limit	Council Sample
Monthly	14-Jun-13	14-Jun-13	milligrams per litre	Monitoring Condition	0.58
Monthly	17-Jul-13	17-Jul-13	milligrams per litre		0.41
Monthly	14-Aug-13	14-Aug-13	milligrams per litre		0.38
Monthly	18-Sep-13	18-Sep-13	milligrams per litre		0.32
Monthly	16-Oct-13	16-Oct-13	milligrams per litre		0.18
Monthly	13-Nov-13	13-Nov-13	milligrams per litre		0.24
Monthly	18-Dec-13	18-Dec-13	milligrams per litre		0.20
Monthly	15-Jan-14	15-Jan-14	milligrams per litre		0.13
Monthly	12-Feb-14	12-Feb-14	milligrams per litre		0.25
Monthly	12-Mar-14	12-Mar-14	milligrams per litre		0.14
Monthly	16-Apr-14	16-Apr-14	milligrams per litre		0.25
Monthly	14-May-14	14-May-14	milligrams per litre		0.19



Conjola Regional Sewerage Scheme - Monitoring Summary

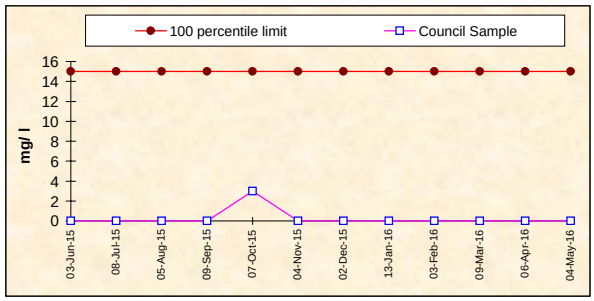
Licensee: Shoalhaven City Council, Shoalhaven Water, PO Box 42 Nowra 2541

Environment Protection License No. 12357

EPA ID No. 7 (Conjola WwTP)

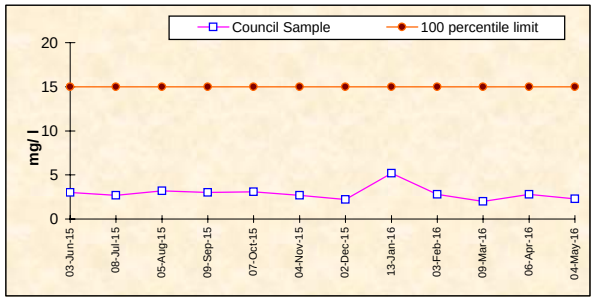
BOD

Frequency	Date Sample Obtained	Date Result Obtained	Unit Of Measurement	100 percentile limit	Council Sample
Monthly	03-Jun-15	18-Jun-15	milligrams per litre	15	<2
Monthly	08-Jul-15	22-Jul-15	milligrams per litre	15	<2
Monthly	05-Aug-15	19-Aug-15	milligrams per litre	15	<2
Monthly	09-Sep-15	22-Sep-15	milligrams per litre	15	<2
Monthly	07-Oct-15	22-Oct-15	milligrams per litre	15	3
Monthly	04-Nov-15	18-Nov-15	milligrams per litre	15	<2
Monthly	02-Dec-15	14-Dec-15	milligrams per litre	15	<2
Monthly	13-Jan-16	27-Jan-16	milligrams per litre	15	<2
Monthly	03-Feb-16	17-Feb-16	milligrams per litre	15	<2
Monthly	09-Mar-16	23-Mar-16	milligrams per litre	15	<2
Monthly	06-Apr-16	20-Apr-16	milligrams per litre	15	<2
Monthly	04-May-16	18-May-16	milligrams per litre	15	<2



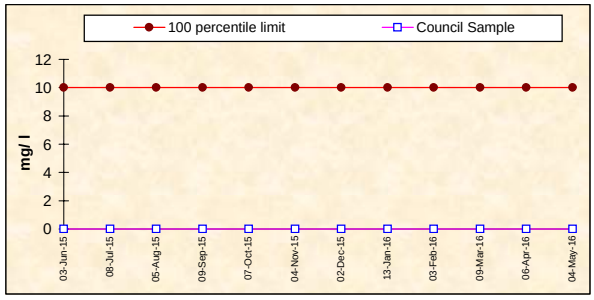
TOTAL NITROGEN

Frequency	Date Sample Obtained	Date Result Obtained	Unit Of Measurement	100 percentile limit	Council Sample
Monthly	03-Jun-15	18-Jun-15	milligrams per litre	15	3.0
Monthly	08-Jul-15	22-Jul-15	milligrams per litre	15	2.7
Monthly	05-Aug-15	19-Aug-15	milligrams per litre	15	3.2
Monthly	09-Sep-15	22-Sep-15	milligrams per litre	15	3.0
Monthly	07-Oct-15	22-Oct-15	milligrams per litre	15	3.1
Monthly	04-Nov-15	18-Nov-15	milligrams per litre	15	2.7
Monthly	02-Dec-15	14-Dec-15	milligrams per litre	15	2.2
Monthly	13-Jan-16	27-Jan-16	milligrams per litre	15	5.2
Monthly	03-Feb-16	17-Feb-16	milligrams per litre	15	2.8
Monthly	09-Mar-16	23-Mar-16	milligrams per litre	15	2.0
Monthly	06-Apr-16	20-Apr-16	milligrams per litre	15	2.8
Monthly	04-May-16	18-May-16	milligrams per litre	15	2.3



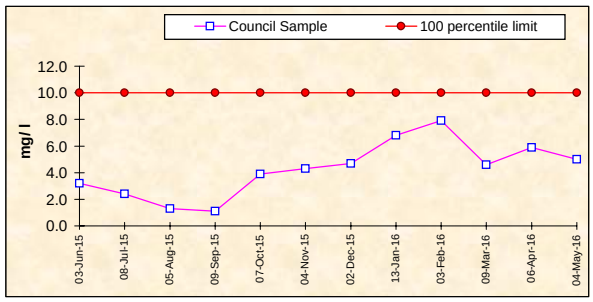
OIL AND GREASE

Frequency	Date Sample Obtained	Date Result Obtained	Unit Of Measurement	100 percentile limit	Council Sample
Monthly	03-Jun-15	18-Jun-15	milligrams per litre	10	<1
Monthly	08-Jul-15	22-Jul-15	milligrams per litre	10	<1
Monthly	05-Aug-15	19-Aug-15	milligrams per litre	10	<1
Monthly	09-Sep-15	22-Sep-15	milligrams per litre	10	<1
Monthly	07-Oct-15	22-Oct-15	milligrams per litre	10	<1
Monthly	04-Nov-15	18-Nov-15	milligrams per litre	10	<1
Monthly	02-Dec-15	14-Dec-15	milligrams per litre	10	<1
Monthly	13-Jan-16	27-Jan-16	milligrams per litre	10	<1
Monthly	03-Feb-16	17-Feb-16	milligrams per litre	10	<1
Monthly	09-Mar-16	23-Mar-16	milligrams per litre	10	<1
Monthly	06-Apr-16	20-Apr-16	milligrams per litre	10	<1
Monthly	04-May-16	18-May-16	milligrams per litre	10	<1



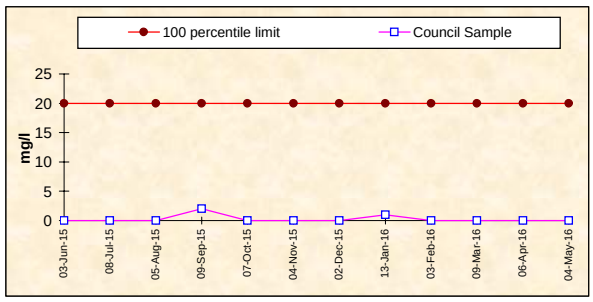
TOTAL PHOSPHORUS

Frequency	Date Sample Obtained	Date Result Obtained	Unit Of Measurement	100 percentile limit	Council Sample
Monthly	03-Jun-15	18-Jun-15	milligrams per litre	10	3.2
Monthly	08-Jul-15	22-Jul-15	milligrams per litre	10	2.4
Monthly	05-Aug-15	19-Aug-15	milligrams per litre	10	1.3
Monthly	09-Sep-15	22-Sep-15	milligrams per litre	10	1.1
Monthly	07-Oct-15	22-Oct-15	milligrams per litre	10	3.9
Monthly	04-Nov-15	18-Nov-15	milligrams per litre	10	4.3
Monthly	02-Dec-15	14-Dec-15	milligrams per litre	10	4.7
Monthly	13-Jan-16	27-Jan-16	milligrams per litre	10	6.8
Monthly	03-Feb-16	17-Feb-16	milligrams per litre	10	7.9
Monthly	09-Mar-16	23-Mar-16	milligrams per litre	10	4.6
Monthly	06-Apr-16	20-Apr-16	milligrams per litre	10	5.9
Monthly	04-May-16	18-May-16	milligrams per litre	10	5.0



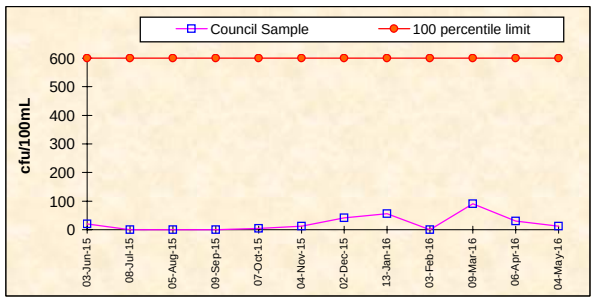
TOTAL SUSPENDED SOLIDS

Frequency	Date Sample Obtained	Date Result Obtained	Unit Of Measurement	100 percentile limit	Council Sample
Monthly	03-Jun-15	18-Jun-15	milligrams per litre	20	<1
Monthly	08-Jul-15	22-Jul-15	milligrams per litre	20	<1
Monthly	05-Aug-15	19-Aug-15	milligrams per litre	20	<1
Monthly	09-Sep-15	22-Sep-15	milligrams per litre	20	2
Monthly	07-Oct-15	22-Oct-15	milligrams per litre	20	<1
Monthly	04-Nov-15	18-Nov-15	milligrams per litre	20	<1
Monthly	02-Dec-15	14-Dec-15	milligrams per litre	20	<1
Monthly	13-Jan-16	27-Jan-16	milligrams per litre	20	1
Monthly	03-Feb-16	17-Feb-16	milligrams per litre	20	<1
Monthly	09-Mar-16	23-Mar-16	milligrams per litre	20	<1
Monthly	06-Apr-16	20-Apr-16	milligrams per litre	20	<1
Monthly	04-May-16	18-May-16	milligrams per litre	20	<1



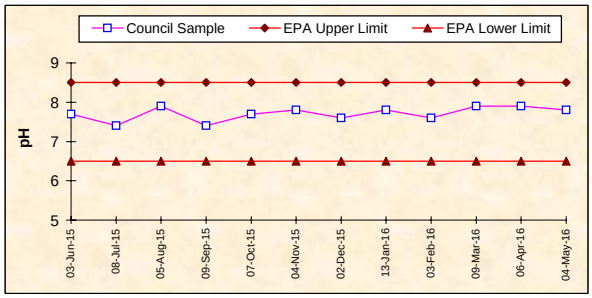
FAECAL COLIFORMS

Frequency	Date Sample Obtained	Date Result Obtained	Unit Of Measurement	100 percentile limit	Council Sample
Monthly	03-Jun-15	18-Jun-15	colony forming units per 100 millilitres	600	20
Monthly	08-Jul-15	22-Jul-15	colony forming units per 100 millilitres	600	<1
Monthly	05-Aug-15	19-Aug-15	colony forming units per 100 millilitres	600	<1
Monthly	09-Sep-15	22-Sep-15	colony forming units per 100 millilitres	600	<1
Monthly	07-Oct-15	22-Oct-15	colony forming units per 100 millilitres	600	4
Monthly	04-Nov-15	18-Nov-15	colony forming units per 100 millilitres	600	12
Monthly	02-Dec-15	14-Dec-15	colony forming units per 100 millilitres	600	41
Monthly	13-Jan-16	27-Jan-16	colony forming units per 100 millilitres	600	56
Monthly	03-Feb-16	17-Feb-16	colony forming units per 100 millilitres	600	<1
Monthly	09-Mar-16	23-Mar-16	colony forming units per 100 millilitres	600	91
Monthly	06-Apr-16	20-Apr-16	colony forming units per 100 millilitres	600	30
Monthly	04-May-16	18-May-16	colony forming units per 100 millilitres	600	12



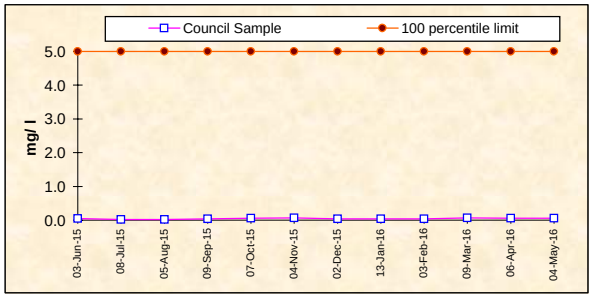
pH

Frequency	Date Sample Obtained	Date Result Obtained	Unit Of Measurement	100 percentile limit	Council Sample
Monthly	03-Jun-15	18-Jun-15	pH	6.5-8.5	7.7
Monthly	08-Jul-15	22-Jul-15	pH	6.5-8.5	7.4
Monthly	05-Aug-15	19-Aug-15	pH	6.5-8.5	7.9
Monthly	09-Sep-15	22-Sep-15	pH	6.5-8.5	7.4
Monthly	07-Oct-15	22-Oct-15	pH	6.5-8.5	7.7
Monthly	04-Nov-15	18-Nov-15	pH	6.5-8.5	7.8
Monthly	02-Dec-15	14-Dec-15	pH	6.5-8.5	7.6
Monthly	13-Jan-16	27-Jan-16	pH	6.5-8.5	7.8
Monthly	03-Feb-16	17-Feb-16	pH	6.5-8.5	7.6
Monthly	09-Mar-16	23-Mar-16	pH	6.5-8.5	7.9
Monthly	06-Apr-16	20-Apr-16	pH	6.5-8.5	7.9
Monthly	04-May-16	18-May-16	pH	6.5-8.5	7.8



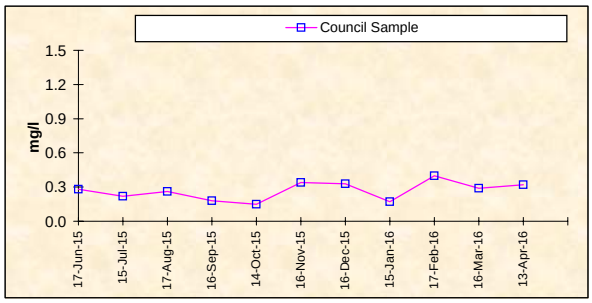
AMMONIA NITROGEN

Frequency	Date Sample Obtained	Date Result Obtained	Unit Of Measurement	100 percentile limit	Council Sample
Monthly	03-Jun-15	18-Jun-15	milligrams per litre	5	0.05
Monthly	08-Jul-15	22-Jul-15	milligrams per litre	5	0.02
Monthly	05-Aug-15	19-Aug-15	milligrams per litre	5	0.02
Monthly	09-Sep-15	22-Sep-15	milligrams per litre	5	0.04
Monthly	07-Oct-15	22-Oct-15	milligrams per litre	5	0.06
Monthly	04-Nov-15	18-Nov-15	milligrams per litre	5	0.07
Monthly	02-Dec-15	14-Dec-15	milligrams per litre	5	0.04
Monthly	13-Jan-16	27-Jan-16	milligrams per litre	5	0.04
Monthly	03-Feb-16	17-Feb-16	milligrams per litre	5	0.04
Monthly	09-Mar-16	23-Mar-16	milligrams per litre	5	0.07
Monthly	06-Apr-16	20-Apr-16	milligrams per litre	5	0.06
Monthly	04-May-16	18-May-16	milligrams per litre	5	0.06



CHLORINE (total residual)

Frequency	Date Sample Obtained	Date Result Obtained	Unit Of Measurement	100 percentile limit	Council Sample
Monthly	17-Jun-15	17-Jun-15	milligrams per litre		0.28
Monthly	15-Jul-15	15-Jul-15	milligrams per litre		0.22
Monthly	17-Aug-15	17-Aug-15	milligrams per litre		0.26
Monthly	16-Sep-15	16-Sep-15	milligrams per litre	MONITORING	0.18
Monthly	14-Oct-15	14-Oct-15	milligrams per litre		0.15
Monthly	16-Nov-15	16-Nov-15	milligrams per litre		0.34
Monthly	16-Dec-15	16-Dec-15	milligrams per litre	CONDITION	0.33
Monthly	15-Jan-16	15-Jan-16	milligrams per litre		0.17
Monthly	17-Feb-16	17-Feb-16	milligrams per litre		0.40
Monthly	16-Mar-16	16-Mar-16	milligrams per litre		0.29
Monthly	13-Apr-16	13-Apr-16	milligrams per litre		0.32
Monthly			milligrams per litre		



Conjola Regional Sewerage Scheme - Monitoring Summary

Licensee: Shoalhaven City Council, Shoalhaven Water, PO Box 42 Nowra 2541

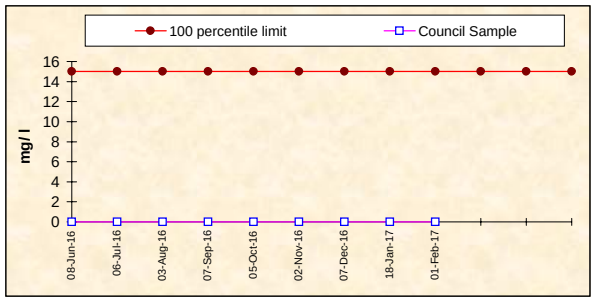
Environment Protection License No. 12357

EPA ID No. 7 (Conjola WwTP)

2016-2017

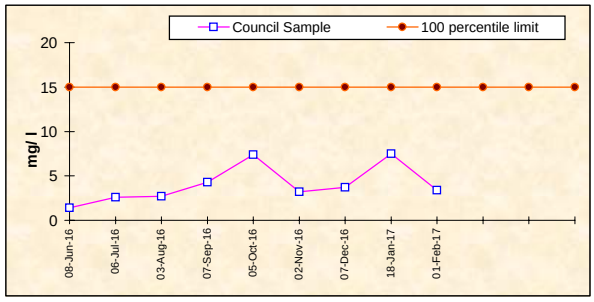
BOD

Frequency	Date Sample Obtained	Date Result Obtained	Unit Of Measurement	100 percentile limit	Council Sample
Monthly	08-Jun-16	22-Jun-16	milligrams per litre	15	<2
Monthly	06-Jul-16	20-Jul-16	milligrams per litre	15	<2
Monthly	03-Aug-16	17-Aug-16	milligrams per litre	15	<2
Monthly	07-Sep-16	21-Sep-16	milligrams per litre	15	<2
Monthly	05-Oct-16	19-Oct-16	milligrams per litre	15	<2
Monthly	02-Nov-16	21-Nov-16	milligrams per litre	15	<2
Monthly	07-Dec-16	21-Dec-16	milligrams per litre	15	<2
Monthly	18-Jan-17	31-Jan-17	milligrams per litre	15	<2
Monthly	01-Feb-17	17-Feb-17	milligrams per litre	15	<2
Monthly			milligrams per litre	15	
Monthly			milligrams per litre	15	
Monthly			milligrams per litre	15	



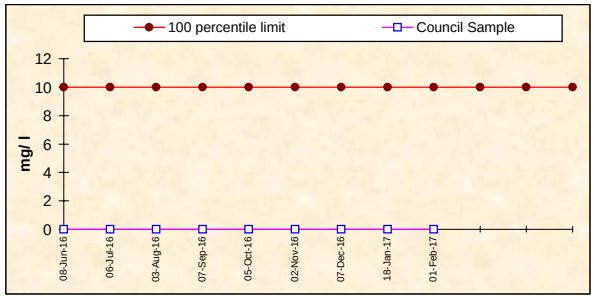
TOTAL NITROGEN

Frequency	Date Sample Obtained	Date Result Obtained	Unit Of Measurement	100 percentile limit	Council Sample
Monthly	08-Jun-16	22-Jun-16	milligrams per litre	15	1.4
Monthly	06-Jul-16	20-Jul-16	milligrams per litre	15	2.6
Monthly	03-Aug-16	17-Aug-16	milligrams per litre	15	2.7
Monthly	07-Sep-16	21-Sep-16	milligrams per litre	15	4.3
Monthly	05-Oct-16	19-Oct-16	milligrams per litre	15	7.4
Monthly	02-Nov-16	21-Nov-16	milligrams per litre	15	3.2
Monthly	07-Dec-16	21-Dec-16	milligrams per litre	15	3.7
Monthly	18-Jan-17	31-Jan-17	milligrams per litre	15	7.5
Monthly	01-Feb-17	17-Feb-17	milligrams per litre	15	3.4
Monthly			milligrams per litre	15	
Monthly			milligrams per litre	15	
Monthly			milligrams per litre	15	



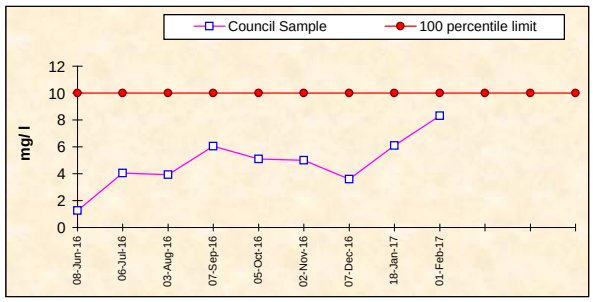
OIL AND GREASE

Frequency	Date Sample Obtained	Date Result Obtained	Unit Of Measurement	100 percentile limit	Council Sample
Monthly	08-Jun-16	22-Jun-16	milligrams per litre	10	<1
Monthly	06-Jul-16	20-Jul-16	milligrams per litre	10	<1
Monthly	03-Aug-16	17-Aug-16	milligrams per litre	10	<1
Monthly	07-Sep-16	21-Sep-16	milligrams per litre	10	<1
Monthly	05-Oct-16	19-Oct-16	milligrams per litre	10	<1
Monthly	02-Nov-16	21-Nov-16	milligrams per litre	10	<1
Monthly	07-Dec-16	21-Dec-16	milligrams per litre	10	<1
Monthly	18-Jan-17	31-Jan-17	milligrams per litre	10	<1
Monthly	01-Feb-17	17-Feb-17	milligrams per litre	10	<1
Monthly			milligrams per litre	10	
Monthly			milligrams per litre	10	
Monthly			milligrams per litre	10	



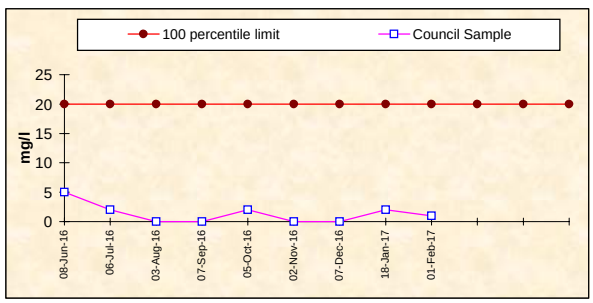
TOTAL PHOSPHORUS

Frequency	Date Sample Obtained	Date Result Obtained	Unit Of Measurement	100 percentile limit	Council Sample
Monthly	08-Jun-16	22-Jun-16	milligrams per litre	10	1.3
Monthly	06-Jul-16	20-Jul-16	milligrams per litre	10	4.0
Monthly	03-Aug-16	17-Aug-16	milligrams per litre	10	3.9
Monthly	07-Sep-16	21-Sep-16	milligrams per litre	10	6.0
Monthly	05-Oct-16	19-Oct-16	milligrams per litre	10	5.1
Monthly	02-Nov-16	21-Nov-16	milligrams per litre	10	5.0
Monthly	07-Dec-16	21-Dec-16	milligrams per litre	10	3.6
Monthly	18-Jan-17	31-Jan-17	milligrams per litre	10	6.1
Monthly	01-Feb-17	17-Feb-17	milligrams per litre	10	8.3
Monthly			milligrams per litre	10	
Monthly			milligrams per litre	10	
Monthly			milligrams per litre	10	



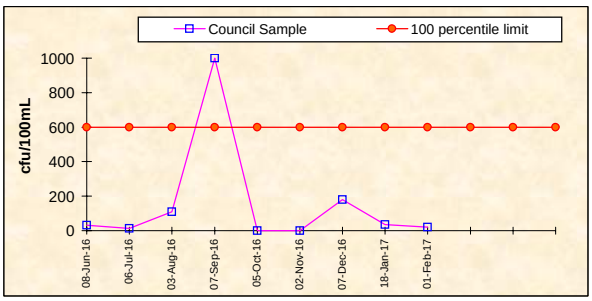
TOTAL SUSPENDED SOLIDS

Frequency	Date Sample Obtained	Date Result Obtained	Unit Of Measurement	100 percentile limit	Council Sample
Monthly	08-Jun-16	22-Jun-16	milligrams per litre	20	5
Monthly	06-Jul-16	20-Jul-16	milligrams per litre	20	2
Monthly	03-Aug-16	17-Aug-16	milligrams per litre	20	<1
Monthly	07-Sep-16	21-Sep-16	milligrams per litre	20	<1
Monthly	05-Oct-16	19-Oct-16	milligrams per litre	20	2
Monthly	02-Nov-16	21-Nov-16	milligrams per litre	20	<1
Monthly	07-Dec-16	21-Dec-16	milligrams per litre	20	<1
Monthly	18-Jan-17	31-Jan-17	milligrams per litre	20	2
Monthly	01-Feb-17	17-Feb-17	milligrams per litre	20	1
Monthly			milligrams per litre	20	
Monthly			milligrams per litre	20	
Monthly			milligrams per litre	20	



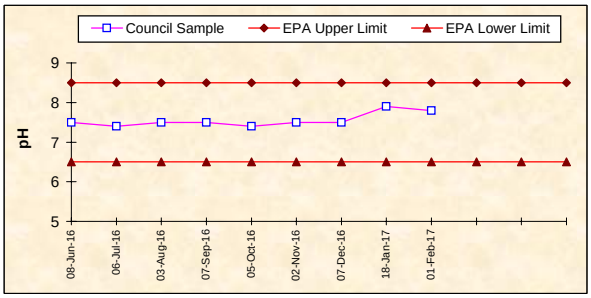
FAECAL COLIFORMS

Frequency	Date Sample Obtained	Date Result Obtained	Unit Of Measurement	100 percentile limit	Council Sample
Monthly	08-Jun-16	22-Jun-16	colony forming units per 100 millilitres	600	31
Monthly	06-Jul-16	20-Jul-16	colony forming units per 100 millilitres	600	13
Monthly	03-Aug-16	17-Aug-16	colony forming units per 100 millilitres	600	110
Monthly	07-Sep-16	21-Sep-16	colony forming units per 100 millilitres	600	1000
Monthly	05-Oct-16	19-Oct-16	colony forming units per 100 millilitres	600	<1
Monthly	02-Nov-16	21-Nov-16	colony forming units per 100 millilitres	600	<1
Monthly	07-Dec-16	21-Dec-16	colony forming units per 100 millilitres	600	180
Monthly	18-Jan-17	31-Jan-17	colony forming units per 100 millilitres	600	35
Monthly	01-Feb-17	17-Feb-17	colony forming units per 100 millilitres	600	20
Monthly			colony forming units per 100 millilitres	600	
Monthly			colony forming units per 100 millilitres	600	
Monthly			colony forming units per 100 millilitres	600	



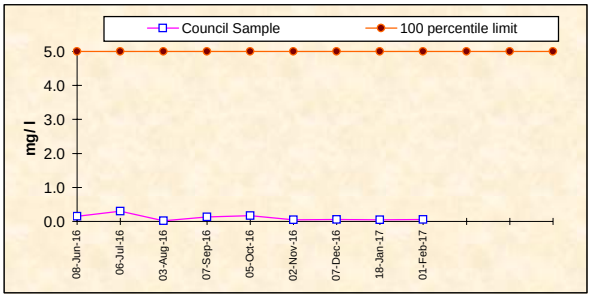
pH

Frequency	Date Sample Obtained	Date Result Obtained	Unit Of Measurement	100 percentile limit	Council Sample
Monthly	08-Jun-16	22-Jun-16	pH	6.5-8.5	7.5
Monthly	06-Jul-16	20-Jul-16	pH	6.5-8.5	7.4
Monthly	03-Aug-16	17-Aug-16	pH	6.5-8.5	7.5
Monthly	07-Sep-16	21-Sep-16	pH	6.5-8.5	7.5
Monthly	05-Oct-16	19-Oct-16	pH	6.5-8.5	7.4
Monthly	02-Nov-16	21-Nov-16	pH	6.5-8.5	7.5
Monthly	07-Dec-16	21-Dec-16	pH	6.5-8.5	7.5
Monthly	18-Jan-17	31-Jan-17	pH	6.5-8.5	7.9
Monthly	01-Feb-17	17-Feb-17	pH	6.5-8.5	7.8
Monthly			pH	6.5-8.5	
Monthly			pH	6.5-8.5	
Monthly			pH	6.5-8.5	



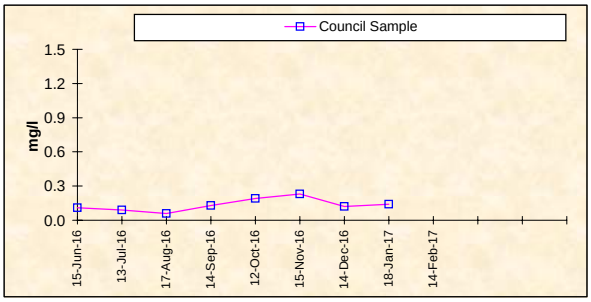
AMMONIA NITROGEN

Frequency	Date Sample Obtained	Date Result Obtained	Unit Of Measurement	100 percentile limit	Council Sample
Monthly	08-Jun-16	22-Jun-16	milligrams per litre	5	0.15
Monthly	06-Jul-16	20-Jul-16	milligrams per litre	5	0.30
Monthly	03-Aug-16	17-Aug-16	milligrams per litre	5	0.02
Monthly	07-Sep-16	21-Sep-16	milligrams per litre	5	0.13
Monthly	05-Oct-16	19-Oct-16	milligrams per litre	5	0.17
Monthly	02-Nov-16	21-Nov-16	milligrams per litre	5	0.05
Monthly	07-Dec-16	21-Dec-16	milligrams per litre	5	0.06
Monthly	18-Jan-17	31-Jan-17	milligrams per litre	5	0.05
Monthly	01-Feb-17	17-Feb-17	milligrams per litre	5	0.06
Monthly			milligrams per litre	5	
Monthly			milligrams per litre	5	
Monthly			milligrams per litre	5	



CHLORINE (total residual)

Frequency	Date Sample Obtained	Date Result Obtained	Unit Of Measurement	100 percentile limit	Council Sample
Monthly	15-Jun-16	15-Jun-16	milligrams per litre		0.11
Monthly	13-Jul-16	13-Jul-16	milligrams per litre		0.09
Monthly	17-Aug-16	17-Aug-16	milligrams per litre		0.06
Monthly	14-Sep-16	14-Sep-16	milligrams per litre	MONITORING	0.13
Monthly	12-Oct-16	12-Oct-16	milligrams per litre		0.19
Monthly	15-Nov-16	15-Nov-16	milligrams per litre		0.23
Monthly	14-Dec-16	14-Dec-16	milligrams per litre	CONDITION	0.12
Monthly	18-Jan-17	18-Jan-17	milligrams per litre		0.14
Monthly	14-Feb-17	14-Feb-17	milligrams per litre		
Monthly			milligrams per litre		
Monthly			milligrams per litre		
Monthly			milligrams per litre		



Appendix B:

Bendalong STP Final Effluent Quality (2013-2017)

Conjola Regional Sewerage Scheme - Monitoring Summary

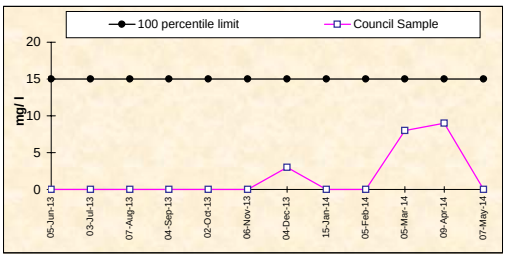
Licensee: Shoalhaven City Council, Shoalhaven Water, PO Box 42, Nowra 2541

Environment Protection Licence No.12357 **EPA ID No. 3 (Bendalong WwTP)**

2013-2014

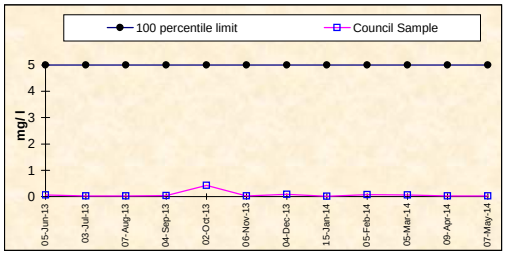
BOD

Frequency	Date Sample Obtained	Date Result Obtained	Unit Of Measurement	100 percentile limit	Council Sample
Monthly	05-Jun-13	20-Jun-13	milligrams per litre	15	<2
Monthly	03-Jul-13	12-Jul-13	milligrams per litre	15	<2
Monthly	07-Aug-13	14-Aug-13	milligrams per litre	15	<2
Monthly	04-Sep-13	13-Sep-13	milligrams per litre	15	<2
Monthly	02-Oct-13	11-Oct-13	milligrams per litre	15	<2
Monthly	06-Nov-13	14-Nov-13	milligrams per litre	15	<2
Monthly	04-Dec-13	18-Dec-13	milligrams per litre	15	3
Monthly	15-Jan-14	28-Jan-14	milligrams per litre	15	<2
Monthly	05-Feb-14	19-Feb-14	milligrams per litre	15	<2
Monthly	05-Mar-14	17-Mar-14	milligrams per litre	15	8
Monthly	09-Apr-14	23-Apr-14	milligrams per litre	15	9
Monthly	07-May-14	19-May-14	milligrams per litre	15	<2



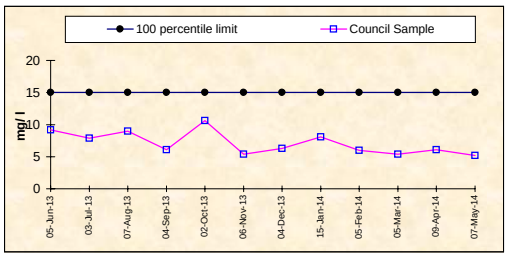
NITROGEN (ammonia)

Frequency	Date Sample Obtained	Date Result Obtained	Unit Of Measurement	100 percentile limit	Council Sample
Monthly	05-Jun-13	20-Jun-13	milligrams per litre	5	0.06
Monthly	03-Jul-13	12-Jul-13	milligrams per litre	5	0.03
Monthly	07-Aug-13	14-Aug-13	milligrams per litre	5	0.03
Monthly	04-Sep-13	13-Sep-13	milligrams per litre	5	0.04
Monthly	02-Oct-13	11-Oct-13	milligrams per litre	5	0.43
Monthly	06-Nov-13	14-Nov-13	milligrams per litre	5	0.03
Monthly	04-Dec-13	18-Dec-13	milligrams per litre	5	0.09
Monthly	15-Jan-14	28-Jan-14	milligrams per litre	5	0.01
Monthly	05-Feb-14	19-Feb-14	milligrams per litre	5	0.07
Monthly	05-Mar-14	17-Mar-14	milligrams per litre	5	0.06
Monthly	09-Apr-14	23-Apr-14	milligrams per litre	5	0.03
Monthly	07-May-14	19-May-14	milligrams per litre	5	0.02



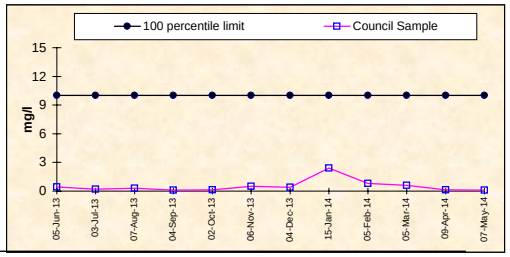
NITROGEN (Total)

Frequency	Date Sample Obtained	Date Result Obtained	Unit Of Measurement	100 percentile limit	Council Sample
Monthly	05-Jun-13	20-Jun-13	milligrams per litre	15	9.2
Monthly	03-Jul-13	12-Jul-13	milligrams per litre	15	7.9
Monthly	07-Aug-13	14-Aug-13	milligrams per litre	15	9.0
Monthly	04-Sep-13	13-Sep-13	milligrams per litre	15	6.1
Monthly	02-Oct-13	11-Oct-13	milligrams per litre	15	10.6
Monthly	06-Nov-13	14-Nov-13	milligrams per litre	15	5.4
Monthly	04-Dec-13	18-Dec-13	milligrams per litre	15	6.3
Monthly	15-Jan-14	28-Jan-14	milligrams per litre	15	8.1
Monthly	05-Feb-14	19-Feb-14	milligrams per litre	15	6.0
Monthly	05-Mar-14	17-Mar-14	milligrams per litre	15	5.4
Monthly	09-Apr-14	23-Apr-14	milligrams per litre	15	6.1
Monthly	07-May-14	19-May-14	milligrams per litre	15	5.2



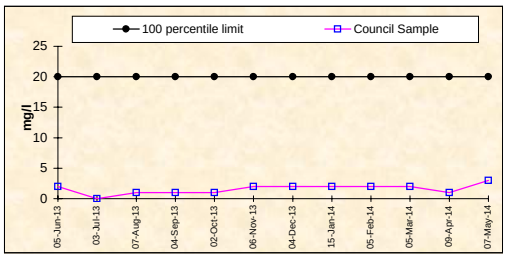
PHOSPHORUS (Total)

Frequency	Date Sample Obtained	Date Result Obtained	Unit Of Measurement	100 percentile limit	Council Sample
Monthly	05-Jun-13	20-Jun-13	milligrams per litre	10	0.4
Monthly	03-Jul-13	12-Jul-13	milligrams per litre	10	0.2
Monthly	07-Aug-13	14-Aug-13	milligrams per litre	10	0.3
Monthly	04-Sep-13	13-Sep-13	milligrams per litre	10	0.1
Monthly	02-Oct-13	11-Oct-13	milligrams per litre	10	0.2
Monthly	06-Nov-13	14-Nov-13	milligrams per litre	10	0.5
Monthly	04-Dec-13	18-Dec-13	milligrams per litre	10	0.4
Monthly	15-Jan-14	28-Jan-14	milligrams per litre	10	2.4
Monthly	05-Feb-14	19-Feb-14	milligrams per litre	10	0.8
Monthly	05-Mar-14	17-Mar-14	milligrams per litre	10	0.6
Monthly	09-Apr-14	23-Apr-14	milligrams per litre	10	0.1
Monthly	07-May-14	19-May-14	milligrams per litre	10	0.1



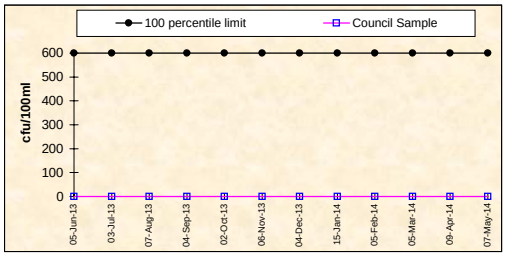
TOTAL SUSPENDED SOLIDS

Frequency	Date Sample Obtained	Date Result Obtained	Unit Of Measurement	100 percentile limit	Council Sample
Monthly	05-Jun-13	20-Jun-13	milligrams per litre	20	2
Monthly	03-Jul-13	12-Jul-13	milligrams per litre	20	<1
Monthly	07-Aug-13	14-Aug-13	milligrams per litre	20	1
Monthly	04-Sep-13	13-Sep-13	milligrams per litre	20	1
Monthly	02-Oct-13	11-Oct-13	milligrams per litre	20	1
Monthly	06-Nov-13	14-Nov-13	milligrams per litre	20	2
Monthly	04-Dec-13	18-Dec-13	milligrams per litre	20	2
Monthly	15-Jan-14	28-Jan-14	milligrams per litre	20	2
Monthly	05-Feb-14	19-Feb-14	milligrams per litre	20	2
Monthly	05-Mar-14	17-Mar-14	milligrams per litre	20	2
Monthly	09-Apr-14	23-Apr-14	milligrams per litre	20	1
Monthly	07-May-14	19-May-14	milligrams per litre	20	3



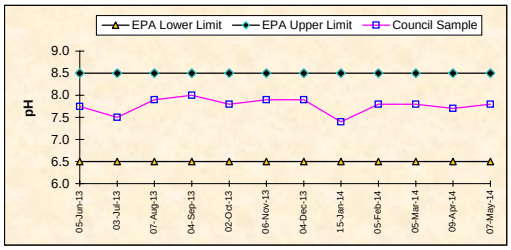
FAECAL COLIFORMS

Frequency	Date Sample Obtained	Date Result Obtained	Unit Of Measurement	100 percentile limit	Council Sample
Monthly	05-Jun-13	20-Jun-13	colony forming units per 100 millilitres	600	<1
Monthly	03-Jul-13	12-Jul-13	colony forming units per 100 millilitres	600	<1
Monthly	07-Aug-13	14-Aug-13	colony forming units per 100 millilitres	600	<1
Monthly	04-Sep-13	13-Sep-13	colony forming units per 100 millilitres	600	<1
Monthly	02-Oct-13	11-Oct-13	colony forming units per 100 millilitres	600	<1
Monthly	06-Nov-13	14-Nov-13	colony forming units per 100 millilitres	600	<1
Monthly	04-Dec-13	18-Dec-13	colony forming units per 100 millilitres	600	<1
Monthly	15-Jan-14	28-Jan-14	colony forming units per 100 millilitres	600	<1
Monthly	05-Feb-14	19-Feb-14	colony forming units per 100 millilitres	600	<1
Monthly	05-Mar-14	17-Mar-14	colony forming units per 100 millilitres	600	<1
Monthly	09-Apr-14	23-Apr-14	colony forming units per 100 millilitres	600	<1
Monthly	07-May-14	19-May-14	colony forming units per 100 millilitres	600	<1



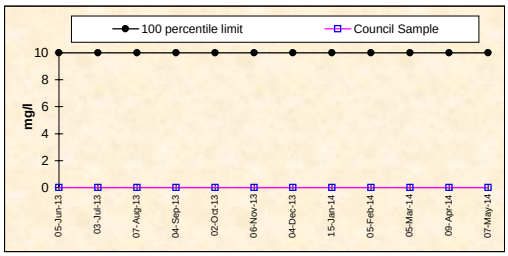
pH

Frequency	Date Sample Obtained	Date Result Obtained	Unit Of Measurement	100 percentile limit	Council Sample
Monthly	05-Jun-13	20-Jun-13	pH	6.5-8.5	7.8
Monthly	03-Jul-13	12-Jul-13	pH	6.5-8.5	7.5
Monthly	07-Aug-13	14-Aug-13	pH	6.5-8.5	7.9
Monthly	04-Sep-13	13-Sep-13	pH	6.5-8.5	8.0
Monthly	02-Oct-13	11-Oct-13	pH	6.5-8.5	7.8
Monthly	06-Nov-13	14-Nov-13	pH	6.5-8.5	7.9
Monthly	04-Dec-13	18-Dec-13	pH	6.5-8.5	7.9
Monthly	15-Jan-14	28-Jan-14	pH	6.5-8.5	7.4
Monthly	05-Feb-14	19-Feb-14	pH	6.5-8.5	7.8
Monthly	05-Mar-14	17-Mar-14	pH	6.5-8.5	7.8
Monthly	09-Apr-14	23-Apr-14	pH	6.5-8.5	7.7
Monthly	07-May-14	19-May-14	pH	6.5-8.5	8



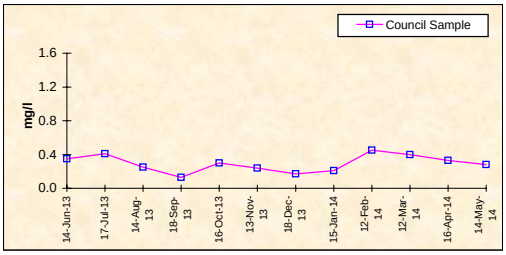
OIL AND GREASE

Frequency	Date Sample Obtained	Date Result Obtained	Unit Of Measurement	100 percentile limit	Council Sample
Monthly	05-Jun-13	07-Jun-13	milligrams per litre	10	<1
Monthly	03-Jul-13	12-Jul-13	milligrams per litre	10	<1
Monthly	07-Aug-13	14-Aug-13	milligrams per litre	10	<1
Monthly	04-Sep-13	13-Sep-13	milligrams per litre	10	<1
Monthly	02-Oct-13	11-Oct-13	milligrams per litre	10	<1
Monthly	06-Nov-13	14-Nov-13	milligrams per litre	10	<1
Monthly	04-Dec-13	18-Dec-13	milligrams per litre	10	<1
Monthly	15-Jan-14	28-Jan-14	milligrams per litre	10	<1
Monthly	05-Feb-14	19-Feb-14	milligrams per litre	10	<1
Monthly	05-Mar-14	17-Mar-14	milligrams per litre	10	<1
Monthly	09-Apr-14	23-Apr-14	milligrams per litre	10	<1
Monthly	07-May-14	19-May-14	milligrams per litre	10	<1



CHLORINE (total residual)

Frequency	Date Sample Obtained	Date Result Obtained	Unit Of Measurement	100 percentile limit	Council Sample
Monthly	14-Jun-13	14-Jun-13	milligrams per litre	Monitoring Condition	0.35
Monthly	17-Jul-13	17-Jul-13	milligrams per litre		0.41
Monthly	14-Aug-13	14-Aug-13	milligrams per litre		0.25
Monthly	18-Sep-13	18-Sep-13	milligrams per litre		0.13
Monthly	16-Oct-13	16-Oct-13	milligrams per litre		0.30
Monthly	13-Nov-13	13-Nov-13	milligrams per litre		0.24
Monthly	18-Dec-13	18-Dec-13	milligrams per litre		0.17
Monthly	15-Jan-14	15-Jan-14	milligrams per litre		0.21
Monthly	12-Feb-14	12-Feb-14	milligrams per litre		0.45
Monthly	12-Mar-14	12-Mar-14	milligrams per litre		0.40
Monthly	16-Apr-14	16-Apr-14	milligrams per litre		0.33
Monthly	14-May-14	14-May-14	milligrams per litre		0.28



Conjola Regional Sewerage Scheme - Monitoring Summary

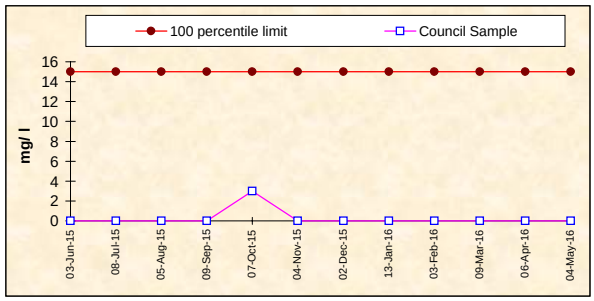
Licensee: Shoalhaven City Council, Shoalhaven Water, PO Box 42 Nowra 2541

Environment Protection License No. 12357

EPA ID No. 3 (Bendalong WwTP)

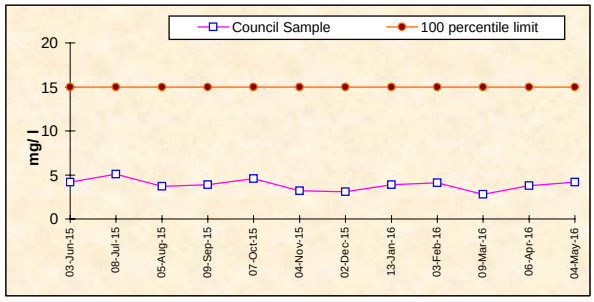
BOD

Frequency	Date Sample Obtained	Date Result Obtained	Unit Of Measurement	100 percentile limit	Council Sample
Monthly	03-Jun-15	18-Jun-15	milligrams per litre	15	<2
Monthly	08-Jul-15	22-Jul-15	milligrams per litre	15	<2
Monthly	05-Aug-15	19-Aug-15	milligrams per litre	15	<2
Monthly	09-Sep-15	22-Sep-15	milligrams per litre	15	<2
Monthly	07-Oct-15	22-Oct-15	milligrams per litre	15	3
Monthly	04-Nov-15	18-Nov-15	milligrams per litre	15	<2
Monthly	02-Dec-15	14-Dec-15	milligrams per litre	15	<2
Monthly	13-Jan-16	27-Jan-16	milligrams per litre	15	<2
Monthly	03-Feb-16	17-Feb-16	milligrams per litre	15	<2
Monthly	09-Mar-16	23-Mar-16	milligrams per litre	15	<2
Monthly	06-Apr-16	20-Apr-16	milligrams per litre	15	<2
Monthly	04-May-16	18-May-16	milligrams per litre	15	<2



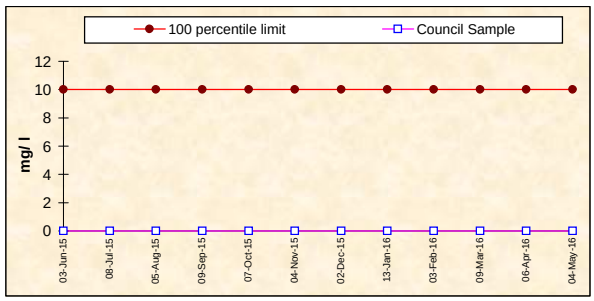
TOTAL NITROGEN

Frequency	Date Sample Obtained	Date Result Obtained	Unit Of Measurement	100 percentile limit	Council Sample
Monthly	03-Jun-15	18-Jun-15	milligrams per litre	15	4.2
Monthly	08-Jul-15	22-Jul-15	milligrams per litre	15	5.1
Monthly	05-Aug-15	19-Aug-15	milligrams per litre	15	3.7
Monthly	09-Sep-15	22-Sep-15	milligrams per litre	15	3.9
Monthly	07-Oct-15	22-Oct-15	milligrams per litre	15	4.6
Monthly	04-Nov-15	18-Nov-15	milligrams per litre	15	3.2
Monthly	02-Dec-15	14-Dec-15	milligrams per litre	15	3.1
Monthly	13-Jan-16	27-Jan-16	milligrams per litre	15	3.9
Monthly	03-Feb-16	17-Feb-16	milligrams per litre	15	4.1
Monthly	09-Mar-16	23-Mar-16	milligrams per litre	15	2.8
Monthly	06-Apr-16	20-Apr-16	milligrams per litre	15	3.8
Monthly	04-May-16	18-May-16	milligrams per litre	15	4.2



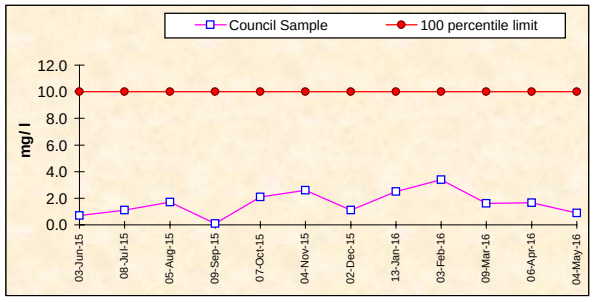
OIL AND GREASE

Frequency	Date Sample Obtained	Date Result Obtained	Unit Of Measurement	100 percentile limit	Council Sample
Monthly	03-Jun-15	18-Jun-15	milligrams per litre	10	<1
Monthly	08-Jul-15	22-Jul-15	milligrams per litre	10	<1
Monthly	05-Aug-15	19-Aug-15	milligrams per litre	10	<1
Monthly	09-Sep-15	22-Sep-15	milligrams per litre	10	<1
Monthly	07-Oct-15	22-Oct-15	milligrams per litre	10	<1
Monthly	04-Nov-15	18-Nov-15	milligrams per litre	10	<1
Monthly	02-Dec-15	14-Dec-15	milligrams per litre	10	<1
Monthly	13-Jan-16	27-Jan-16	milligrams per litre	10	<1
Monthly	03-Feb-16	17-Feb-16	milligrams per litre	10	<1
Monthly	09-Mar-16	23-Mar-16	milligrams per litre	10	<1
Monthly	06-Apr-16	20-Apr-16	milligrams per litre	10	<1
Monthly	04-May-16	18-May-16	milligrams per litre	10	<1



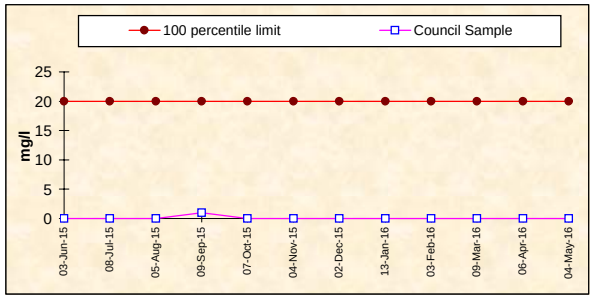
TOTAL PHOSPHORUS

Frequency	Date Sample Obtained	Date Result Obtained	Unit Of Measurement	100 percentile limit	Council Sample
Monthly	03-Jun-15	18-Jun-15	milligrams per litre	10	0.7
Monthly	08-Jul-15	22-Jul-15	milligrams per litre	10	1.1
Monthly	05-Aug-15	19-Aug-15	milligrams per litre	10	1.7
Monthly	09-Sep-15	22-Sep-15	milligrams per litre	10	0.1
Monthly	07-Oct-15	22-Oct-15	milligrams per litre	10	2.1
Monthly	04-Nov-15	18-Nov-15	milligrams per litre	10	2.6
Monthly	02-Dec-15	14-Dec-15	milligrams per litre	10	1.1
Monthly	13-Jan-16	27-Jan-16	milligrams per litre	10	2.5
Monthly	03-Feb-16	17-Feb-16	milligrams per litre	10	3.4
Monthly	09-Mar-16	23-Mar-16	milligrams per litre	10	1.6
Monthly	06-Apr-16	20-Apr-16	milligrams per litre	10	1.7
Monthly	04-May-16	18-May-16	milligrams per litre	10	0.9



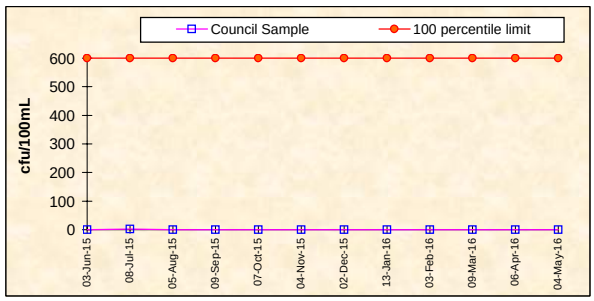
TOTAL SUSPENDED SOLIDS

Frequency	Date Sample Obtained	Date Result Obtained	Unit Of Measurement	100 percentile limit	Council Sample
Monthly	03-Jun-15	18-Jun-15	milligrams per litre	20	<1
Monthly	08-Jul-15	22-Jul-15	milligrams per litre	20	<1
Monthly	05-Aug-15	19-Aug-15	milligrams per litre	20	<1
Monthly	09-Sep-15	22-Sep-15	milligrams per litre	20	1
Monthly	07-Oct-15	22-Oct-15	milligrams per litre	20	<1
Monthly	04-Nov-15	18-Nov-15	milligrams per litre	20	<1
Monthly	02-Dec-15	14-Dec-15	milligrams per litre	20	<1
Monthly	13-Jan-16	27-Jan-16	milligrams per litre	20	<1
Monthly	03-Feb-16	17-Feb-16	milligrams per litre	20	<1
Monthly	09-Mar-16	23-Mar-16	milligrams per litre	20	<1
Monthly	06-Apr-16	20-Apr-16	milligrams per litre	20	<1
Monthly	04-May-16	18-May-16	milligrams per litre	20	<1



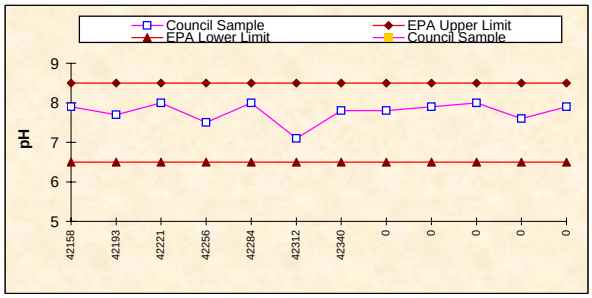
FAECAL COLIFORMS

Frequency	Date Sample Obtained	Date Result Obtained	Unit Of Measurement	100 percentile limit	Council Sample
Monthly	03-Jun-15	18-Jun-15	colony forming units per 100 millilitres	600	<1
Monthly	08-Jul-15	22-Jul-15	colony forming units per 100 millilitres	600	2
Monthly	05-Aug-15	19-Aug-15	colony forming units per 100 millilitres	600	<1
Monthly	09-Sep-15	22-Sep-15	colony forming units per 100 millilitres	600	<1
Monthly	07-Oct-15	22-Oct-15	colony forming units per 100 millilitres	600	<1
Monthly	04-Nov-15	18-Nov-15	colony forming units per 100 millilitres	600	<1
Monthly	02-Dec-15	14-Dec-15	colony forming units per 100 millilitres	600	<1
Monthly	13-Jan-16	27-Jan-16	colony forming units per 100 millilitres	600	<1
Monthly	03-Feb-16	17-Feb-16	colony forming units per 100 millilitres	600	<1
Monthly	09-Mar-16	23-Mar-16	colony forming units per 100 millilitres	600	<1
Monthly	06-Apr-16	20-Apr-16	colony forming units per 100 millilitres	600	<1
Monthly	04-May-16	18-May-16	colony forming units per 100 millilitres	600	<1



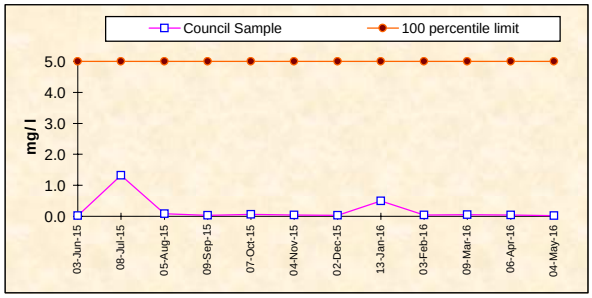
pH

Frequency	Date Sample Obtained	Date Result Obtained	Unit Of Measurement	100 percentile limit	Council Sample
Monthly	03-Jun-15	18-Jun-15	pH	6.5-8.5	7.9
Monthly	08-Jul-15	22-Jul-15	pH	6.5-8.5	7.7
Monthly	05-Aug-15	19-Aug-15	pH	6.5-8.5	8.0
Monthly	09-Sep-15	22-Sep-15	pH	6.5-8.5	7.5
Monthly	07-Oct-15	22-Oct-15	pH	6.5-8.5	8.0
Monthly	04-Nov-15	18-Nov-15	pH	6.5-8.5	7.1
Monthly	02-Dec-15	14-Dec-15	pH	6.5-8.5	7.8
Monthly	13-Jan-16	27-Jan-16	pH	6.5-8.5	7.8
Monthly	03-Feb-16	17-Feb-16	pH	6.5-8.5	7.9
Monthly	09-Mar-16	23-Mar-16	pH	6.5-8.5	8.0
Monthly	06-Apr-16	20-Apr-16	pH	6.5-8.5	7.6
Monthly	04-May-16	18-May-16	pH	6.5-8.5	7.9



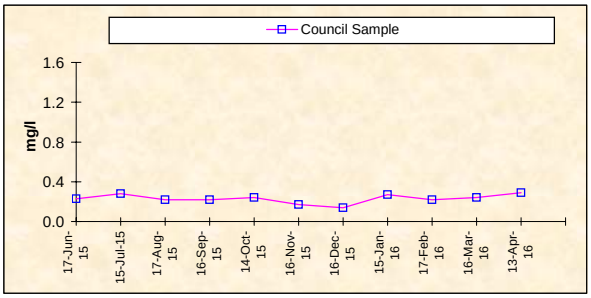
AMMONIA NITROGEN

Frequency	Date Sample Obtained	Date Result Obtained	Unit Of Measurement	100 percentile limit	Council Sample
Monthly	03-Jun-15	18-Jun-15	milligrams per litre	5	0.02
Monthly	08-Jul-15	22-Jul-15	milligrams per litre	5	1.32
Monthly	05-Aug-15	19-Aug-15	milligrams per litre	5	0.08
Monthly	09-Sep-15	22-Sep-15	milligrams per litre	5	0.03
Monthly	07-Oct-15	22-Oct-15	milligrams per litre	5	0.06
Monthly	04-Nov-15	18-Nov-15	milligrams per litre	5	0.04
Monthly	02-Dec-15	14-Dec-15	milligrams per litre	5	0.03
Monthly	13-Jan-16	27-Jan-16	milligrams per litre	5	0.50
Monthly	03-Feb-16	17-Feb-16	milligrams per litre	5	0.04
Monthly	09-Mar-16	23-Mar-16	milligrams per litre	5	0.05
Monthly	06-Apr-16	20-Apr-16	milligrams per litre	5	0.04
Monthly	04-May-16	18-May-16	milligrams per litre	5	0.02



CHLORINE (total residual)

Frequency	Date Sample Obtained	Date Result Obtained	Unit Of Measurement	100 percentile limit	Council Sample
Monthly	17-Jun-15	17-Jun-15	milligrams per litre	Monitoring Condition	0.23
Monthly	15-Jul-15	15-Jul-15	milligrams per litre		0.28
Monthly	17-Aug-15	17-Aug-15	milligrams per litre		0.22
Monthly	16-Sep-15	16-Sep-15	milligrams per litre		0.22
Monthly	14-Oct-15	14-Oct-15	milligrams per litre		0.24
Monthly	16-Nov-15	16-Nov-15	milligrams per litre		0.17
Monthly	16-Dec-15	16-Dec-15	milligrams per litre		0.14
Monthly	15-Jan-16	15-Jan-16	milligrams per litre		0.27
Monthly	17-Feb-16	17-Feb-16	milligrams per litre		0.22
Monthly	16-Mar-16	16-Mar-16	milligrams per litre		0.24
Monthly	13-Apr-16	13-Apr-16	milligrams per litre		0.29
Monthly			milligrams per litre		



Conjola Regional Sewerage Scheme - Monitoring Summary

Licensee: Shoalhaven City Council, Shoalhaven Water, PO Box 42 Nowra 2541

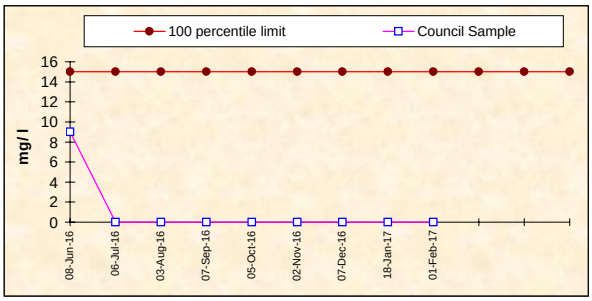
2016-2017

Environment Protection License No. 12357

EPA ID No. 3 (Bendalong WwTP)

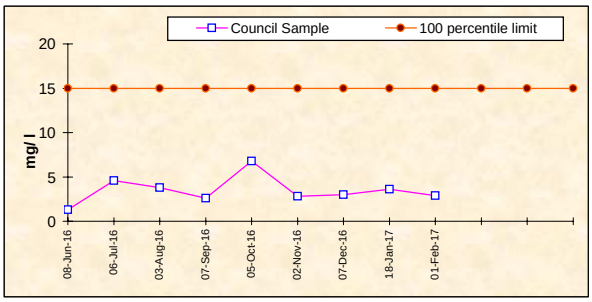
BOD

Frequency	Date Sample Obtained	Date Result Obtained	Unit Of Measurement	100 percentile limit	Council Sample
Monthly	08-Jun-16	22-Jun-16	milligrams per litre	15	9
Monthly	06-Jul-16	20-Jul-16	milligrams per litre	15	<2
Monthly	03-Aug-16	17-Aug-16	milligrams per litre	15	<2
Monthly	07-Sep-16	21-Sep-16	milligrams per litre	15	<2
Monthly	05-Oct-16	19-Oct-16	milligrams per litre	15	<2
Monthly	02-Nov-16	21-Nov-16	milligrams per litre	15	<2
Monthly	07-Dec-16	21-Dec-16	milligrams per litre	15	<2
Monthly	18-Jan-17	31-Jan-17	milligrams per litre	15	<2
Monthly	01-Feb-17	17-Feb-17	milligrams per litre	15	<2
Monthly			milligrams per litre	15	
Monthly			milligrams per litre	15	
Monthly			milligrams per litre	15	



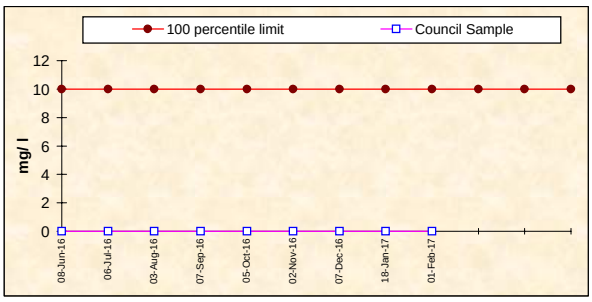
TOTAL NITROGEN

Frequency	Date Sample Obtained	Date Result Obtained	Unit Of Measurement	100 percentile limit	Council Sample
Monthly	08-Jun-16	22-Jun-16	milligrams per litre	15	1.3
Monthly	06-Jul-16	20-Jul-16	milligrams per litre	15	4.6
Monthly	03-Aug-16	17-Aug-16	milligrams per litre	15	3.8
Monthly	07-Sep-16	21-Sep-16	milligrams per litre	15	2.6
Monthly	05-Oct-16	19-Oct-16	milligrams per litre	15	6.8
Monthly	02-Nov-16	21-Nov-16	milligrams per litre	15	2.8
Monthly	07-Dec-16	21-Dec-16	milligrams per litre	15	3.0
Monthly	18-Jan-17	31-Jan-17	milligrams per litre	15	3.6
Monthly	01-Feb-17	17-Feb-17	milligrams per litre	15	2.9
Monthly			milligrams per litre	15	
Monthly			milligrams per litre	15	
Monthly			milligrams per litre	15	



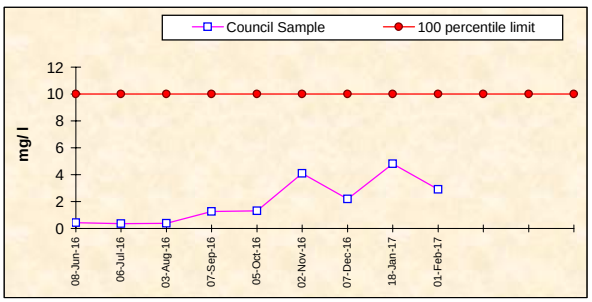
OIL AND GREASE

Frequency	Date Sample Obtained	Date Result Obtained	Unit Of Measurement	100 percentile limit	Council Sample
Monthly	08-Jun-16	22-Jun-16	milligrams per litre	10	<1
Monthly	06-Jul-16	20-Jul-16	milligrams per litre	10	<1
Monthly	03-Aug-16	17-Aug-16	milligrams per litre	10	<1
Monthly	07-Sep-16	21-Sep-16	milligrams per litre	10	<1
Monthly	05-Oct-16	19-Oct-16	milligrams per litre	10	<1
Monthly	02-Nov-16	21-Nov-16	milligrams per litre	10	<1
Monthly	07-Dec-16	21-Dec-16	milligrams per litre	10	<1
Monthly	18-Jan-17	31-Jan-17	milligrams per litre	10	<1
Monthly	01-Feb-17	17-Feb-17	milligrams per litre	10	<1
Monthly			milligrams per litre	10	
Monthly			milligrams per litre	10	
Monthly			milligrams per litre	10	



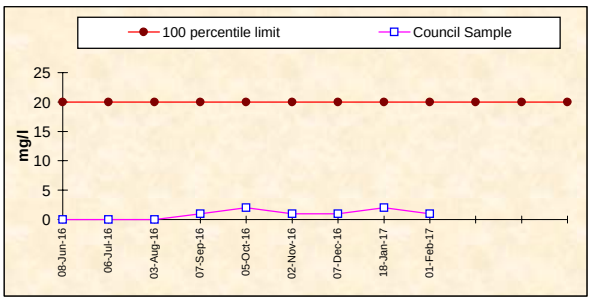
TOTAL PHOSPHORUS

Frequency	Date Sample Obtained	Date Result Obtained	Unit Of Measurement	100 percentile limit	Council Sample
Monthly	08-Jun-16	22-Jun-16	milligrams per litre	10	0.4
Monthly	06-Jul-16	20-Jul-16	milligrams per litre	10	0.4
Monthly	03-Aug-16	17-Aug-16	milligrams per litre	10	0.4
Monthly	07-Sep-16	21-Sep-16	milligrams per litre	10	1.3
Monthly	05-Oct-16	19-Oct-16	milligrams per litre	10	1.3
Monthly	02-Nov-16	21-Nov-16	milligrams per litre	10	4.1
Monthly	07-Dec-16	21-Dec-16	milligrams per litre	10	2.2
Monthly	18-Jan-17	31-Jan-17	milligrams per litre	10	4.8
Monthly	01-Feb-17	17-Feb-17	milligrams per litre	10	2.9
Monthly			milligrams per litre	10	
Monthly			milligrams per litre	10	
Monthly			milligrams per litre	10	



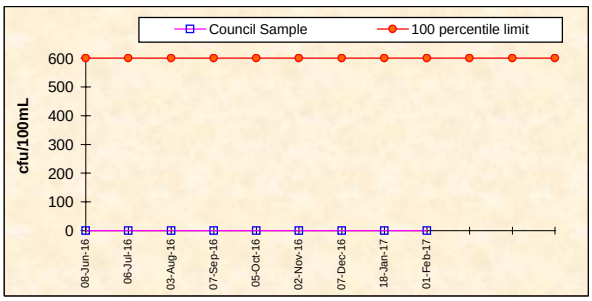
TOTAL SUSPENDED SOLIDS

Frequency	Date Sample Obtained	Date Result Obtained	Unit Of Measurement	100 percentile limit	Council Sample
Monthly	08-Jun-16	22-Jun-16	milligrams per litre	20	<1
Monthly	06-Jul-16	20-Jul-16	milligrams per litre	20	<1
Monthly	03-Aug-16	17-Aug-16	milligrams per litre	20	<1
Monthly	07-Sep-16	21-Sep-16	milligrams per litre	20	1
Monthly	05-Oct-16	19-Oct-16	milligrams per litre	20	2
Monthly	02-Nov-16	21-Nov-16	milligrams per litre	20	1
Monthly	07-Dec-16	21-Dec-16	milligrams per litre	20	1
Monthly	18-Jan-17	31-Jan-17	milligrams per litre	20	2
Monthly	01-Feb-17	17-Feb-17	milligrams per litre	20	1
Monthly			milligrams per litre	20	
Monthly			milligrams per litre	20	
Monthly			milligrams per litre	20	



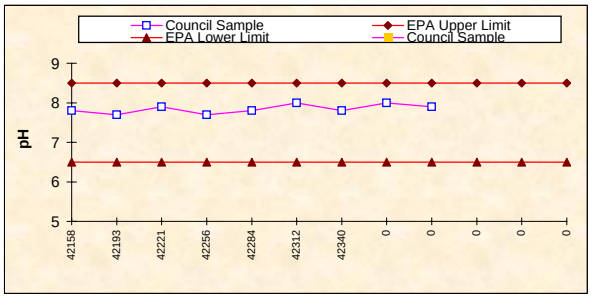
FAECAL COLIFORMS

Frequency	Date Sample Obtained	Date Result Obtained	Unit Of Measurement	100 percentile limit	Council Sample
Monthly	08-Jun-16	22-Jun-16	colony forming units per 100 millilitres	600	<1
Monthly	06-Jul-16	20-Jul-16	colony forming units per 100 millilitres	600	<1
Monthly	03-Aug-16	17-Aug-16	colony forming units per 100 millilitres	600	<1
Monthly	07-Sep-16	21-Sep-16	colony forming units per 100 millilitres	600	<1
Monthly	05-Oct-16	19-Oct-16	colony forming units per 100 millilitres	600	<1
Monthly	02-Nov-16	21-Nov-16	colony forming units per 100 millilitres	600	<1
Monthly	07-Dec-16	21-Dec-16	colony forming units per 100 millilitres	600	<1
Monthly	18-Jan-17	31-Jan-17	colony forming units per 100 millilitres	600	<1
Monthly	01-Feb-17	17-Feb-17	colony forming units per 100 millilitres	600	<1
Monthly			colony forming units per 100 millilitres	600	
Monthly			colony forming units per 100 millilitres	600	
Monthly			colony forming units per 100 millilitres	600	



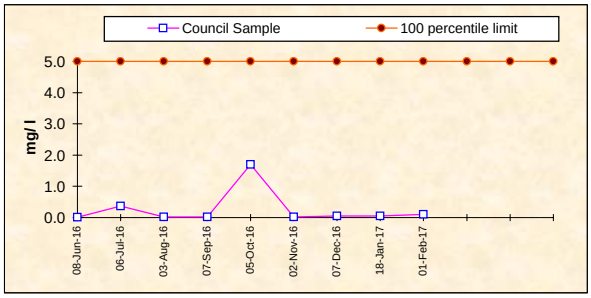
pH

Frequency	Date Sample Obtained	Date Result Obtained	Unit Of Measurement	100 percentile limit	Council Sample
Monthly	08-Jun-16	22-Jun-16	pH	6.5-8.5	7.8
Monthly	06-Jul-16	20-Jul-16	pH	6.5-8.5	7.7
Monthly	03-Aug-16	17-Aug-16	pH	6.5-8.5	7.9
Monthly	07-Sep-16	21-Sep-16	pH	6.5-8.5	7.7
Monthly	05-Oct-16	19-Oct-16	pH	6.5-8.5	7.8
Monthly	02-Nov-16	21-Nov-16	pH	6.5-8.5	8.0
Monthly	07-Dec-16	21-Dec-16	pH	6.5-8.5	7.8
Monthly	18-Jan-17	31-Jan-17	pH	6.5-8.5	8.0
Monthly	01-Feb-17	17-Feb-17	pH	6.5-8.5	7.9
Monthly			pH	6.5-8.5	
Monthly			pH	6.5-8.5	
Monthly			pH	6.5-8.5	



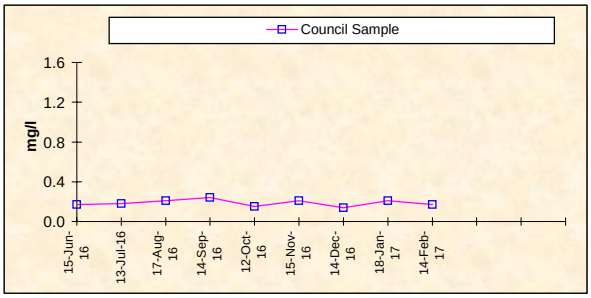
AMMONIA NITROGEN

Frequency	Date Sample Obtained	Date Result Obtained	Unit Of Measurement	100 percentile limit	Council Sample
Monthly	08-Jun-16	22-Jun-16	milligrams per litre	5	0.01
Monthly	06-Jul-16	20-Jul-16	milligrams per litre	5	0.37
Monthly	03-Aug-16	17-Aug-16	milligrams per litre	5	0.02
Monthly	07-Sep-16	21-Sep-16	milligrams per litre	5	0.02
Monthly	05-Oct-16	19-Oct-16	milligrams per litre	5	1.70
Monthly	02-Nov-16	21-Nov-16	milligrams per litre	5	0.02
Monthly	07-Dec-16	21-Dec-16	milligrams per litre	5	0.05
Monthly	18-Jan-17	31-Jan-17	milligrams per litre	5	0.05
Monthly	01-Feb-17	17-Feb-17	milligrams per litre	5	0.10
Monthly			milligrams per litre	5	
Monthly			milligrams per litre	5	
Monthly			milligrams per litre	5	



CHLORINE (total residual)

Frequency	Date Sample Obtained	Date Result Obtained	Unit Of Measurement	100 percentile limit	Council Sample
Monthly	15-Jun-16	15-Jun-16	milligrams per litre	Monitoring Condition	0.17
Monthly	13-Jul-16	13-Jul-16	milligrams per litre		0.18
Monthly	17-Aug-16	17-Aug-16	milligrams per litre		0.21
Monthly	14-Sep-16	14-Sep-16	milligrams per litre		0.24
Monthly	12-Oct-16	12-Oct-16	milligrams per litre		0.15
Monthly	15-Nov-16	15-Nov-16	milligrams per litre		0.21
Monthly	14-Dec-16	14-Dec-16	milligrams per litre		0.14
Monthly	18-Jan-17	18-Jan-17	milligrams per litre		0.21
Monthly	14-Feb-17	14-Feb-17	milligrams per litre		0.17
Monthly			milligrams per litre		
Monthly			milligrams per litre		
Monthly			milligrams per litre		



Appendix C:

Limitations

Earth2Water Pty Ltd has prepared this letter report for the use of Shoalhaven Water and Shoalhaven City Council in accordance with the standard terms and conditions of the consulting profession. This letter report is prepared in accordance with the scope of work and for the purpose outlined in the proposal.

This letter report was prepared in May to August 2017 and is based on the data and information reviewed at the time of preparation. This letter report should be read in full. No responsibility is accepted for use of any part of this report in any other context or for any other purpose or by third parties.

The precision with which conditions are indicated depends largely on the frequency and method of sampling, and the uniformity of conditions as constrained by the project budget limitations. The behaviour of groundwater and some aspects of contaminants groundwater are complex. Our conclusions are based upon the analytical data presented in this report, and our experience.

Where conditions encountered at the site are subsequently found to differ significantly from those anticipated in this letter report, E2W should be notified of any such findings and be provided with an opportunity to review the content and or recommendations of this report.

Appendix D:

ALS Laboratory Reports

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
ALS	**28/11/2013**	**Sample**	**ID 1**	768	761	769	759	758	716	756	715	763	782	804	801	802
			ID 2													
EW1303302	**Results**		**Date Sampled**	18/11/2013	18/11/2013	18/11/2013	18/11/2013	18/11/2013	18/11/2013	18/11/2013	18/11/2013	18/11/2013	18/11/2013	18/11/2013	18/11/2013	18/11/2013
			Order #	EW1303302001	EW1303302002	EW1303302003	EW1303302004	EW1303302005	EW1303302006	EW1303302007	EW1303302008	EW1303302009	EW1303302010	EW1303302011	EW1303302012	EW1303302013
Analyte	**CAS #**	**Units**	**LOR**	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
EA015: Total Dissolved Solids																
Total Dissolved Solids @180°C		mg/L	1	415	3490	422	459	395	138	803	337	676	689	610	506	74
EK055G: Ammonia as N by Discrete Analyser																
Ammonia as N	7664-41-7	mg/L	0.01	0.01	0.22	0.04	0.03	0.04	0.16	0.03	0.18	0.11	0.04	0.02	0.01	0.11
EK057G: Nitrite as N by Discrete Analyser																
Nitrite as N		mg/L	0.01	<0.01	1.4	0.12	0.03	<0.01	<0.01	0.06	<0.01	<0.01	0.07	<0.01	<0.01	<0.01
EK058G: Nitrate as N by Discrete Analyser																
Nitrate as N	14797-55-8	mg/L	0.01	1.1	2.04	6.44	1.39	2.37	<0.01	0.12	<0.01	<0.01	1.88	3.38	5.55	0.01
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser																
Total Kjeldahl Nitrogen as N		mg/L	0.1	0.5	9.7	1.8	0.8	1.2	1.3	0.4	1.7	0.4	0.9	1.4	1.2	0.4
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser																
Total Nitrogen as N		mg/L	0.1	1.6	13.1	8.4	2.2	3.6	1.3	0.6	1.7	0.4	2.8	4.8	6.8	0.4
EK067G: Total Phosphorus as P by Discrete Analyser																
Total Phosphorus as P		mg/L	0.01	0.04	0.15	0.22	0.15	2.23	0.02	0.14	0.03	0.07	0.33	3.08	2.03	0.02
EK071G: Reactive Phosphorus as P by discrete analyser																
Reactive Phosphorus as P	14265-44-2	mg/L	0.01	-	-	-	0.12	2.02	-	0.08	-	-	0.1	-	2.26	0.01
EMMM008: Thermotolerant Coliforms and E.coli by MPN (APHA 21st Ed. 9221E)																
Thermotolerant (Faecal) Coliforms by MPN		mL	2	-	-	-	-	2	-	-	-	-	-	11	-	-
EMMM009: Thermotolerant Coliforms and E.coli by MF (AS/NZS 4276.7 2007)																
Thermotolerant (Faecal) Coliforms by MF		CFU/100mL	1	2 (app)	970	<1	1 (app)	-	3 (app)	<1	<1	2 (app)	2 (app)	-	<1	<1
EP030: Biochemical Oxygen Demand (BOD)																
Biochemical Oxygen Demand		mg/L	2	<2	3	<2	<2	<2	3	<2	3	<2	<2	<2	<2	<2

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
ALS	18/06/2014	Sample	ID 1	768	761	769	759	758	716	756	715	714	712	763	764	754	771	770	31	782	804	801	802	803
			ID 2																					
EW1400112	Results		Date Sampled	13/01/2014	13/01/2014	13/01/2014	13/01/2014	13/01/2014	13/01/2014	13/01/2014	13/01/2014	13/01/2014	13/01/2014	13/01/2014	13/01/2014	13/01/2014	13/01/2014	13/01/2014	13/01/2014	13/01/2014	13/01/2014	13/01/2014	13/01/2014	13/01/2014	13/01/2014
			Order #	EW1400112001	EW1400112002	EW1400112003	EW1400112004	EW1400112005	EW1400112006	EW1400112007	EW1400112008	EW1400112009	EW1400112010	EW1400112011	EW1400112012	EW1400112013	EW1400112014	EW1400112015	EW1400112016	EW1400112017	EW1400112018	EW1400112019	EW1400112020	EW1400112021	EW1400112022
Analyte	CAS #	Units	LOR	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
EA015: Total Dissolved Solids																								
Total Dissolved Solids @180°C		mg/L	10	409	679	568	474	486	249	707	312	28400	366	699	318	481	285	203	502	543	516	430	76	269
ED037P: Alkalinity by PC Titrator																								
Bicarbonate Alkalinity as CaCO3	71-52-3	mg/L	1	131	257	196	323	169	7	275	13	222	98	295	103	172	44	35	258	230	180	191	5	<1
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA																								
Sulfate as SO4 - Turbidimetric	14808-79-8	mg/L	1	86	100	58	7	122	<10	35	<1	1950	15	57	<10	99	<10	12	27	61	54	40	<10	33
ED093T: Total Major Cations																								
Calcium	7440-70-2	mg/L	1	34	82	118	120	85	3	152	6	298	15	109	43	73	9	10	83	116	305	80	2	5
Magnesium	7439-95-4	mg/L	1	25	31	13	11	8	2	16	6	831	8	20	6	14	8	7	29	14	20	10	2	8
Potassium	7/09/7440	mg/L	1	22	9	17	8	29	3	2	2	246	4	5	5	4	4	3	6	17	32	20	<1	4
Sodium	7440-23-5	mg/L	1	71	131	116	40	72	18	144	70	6190	81	124	38	83	70	48	82	104	80	65	10	66
EG020F: Dissolved Metals by ICP-MS																								
Bromine	7726-95-6	mg/L	0.1	0.1	0.5	0.4	0.6	<0.1	0.2	0.6	0.3	40.6	0.3	0.7	0.2	0.2	0.3	0.2	0.3	0.3	0.1	0.1	<0.1	0.2
Iron	7439-89-6	mg/L	0.05	<0.05	<0.05	<0.05	0.05	<0.05	1.81	<0.05	0.92	<0.50	1.21	<0.05	0.12	<0.05	0.48	2.06	<0.05	<0.05	<0.05	<0.05	0.25	<0.05
EG020T: Total Metals by ICP-MS																								
Selenium	7782-49-2	mg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.10	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
EK055G: Ammonia as N by Discrete Analyser																								
Ammonia as N	7664-41-7	mg/L	0.01	<0.01	0.16	0.03	0.01	0.2	0.08	<0.01	0.18	2.12	3.21	<0.01	<0.01	0.02	0.22	0.32	0.01	<0.01	<0.01	0.01	0.08	<0.01
EK057G: Nitrite as N by Discrete Analyser																								
Nitrite as N		mg/L	0.01	<0.01	<0.01	0.12	0.06	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.03	<0.01	<0.01	<0.01	<0.01
EK058G: Nitrate as N by Discrete Analyser																								
Nitrate as N	14797-55-8	mg/L	0.01	0.76	0.01	3.05	1.75	1.7	<0.01	0.03	0.02	0.01	0.03	0.03	0.03	0.02	0.01	<0.01	1.01	1.6	7.08	6.06	<0.01	0.03
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser																								
Total Kjeldahl Nitrogen as N		mg/L	0.1	0.2	0.8	0.7	0.6	0.7	1.6	0.3	1	2.3	4.7	1.4	1.5	0.2	0.8	0.9	0.5	0.7	1.1	0.9	0.4	0.4
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser																								
Total Nitrogen as N		mg/L	0.1	1	0.8	3.9	2.4	2.4	1.6	0.3	1	2.3	4.7	1.4	1.5	0.2	0.8	0.9	1.5	2.3	8.2	7	0.4	0.4
EK067G: Total Phosphorus as P by Discrete Analyser																								
Total Phosphorus as P		mg/L	0.01	0.05	0.1	0.44	0.13	2.44	0.06	0.48	0.02	0.14	0.64	0.14	0.14	0.06	0.02	0.05	0.1	0.33	1.75	2.02	0.03	0.28
EK071G: Reactive Phosphorus as P by discrete analyser																								
Reactive Phosphorus as P	14265-44-2	mg/L	0.01	-	-	-	0.09	1.99	-	0.08	-	-	-	-	-	-	-	-	-	0.09	-	1.92	<0.01	<0.01
EMMM009: Thermotolerant Coliforms and E.coli by MF (AS/NZS 4276.7 2007)																								
Thermotolerant (Faecal) Coliforms by MF		L	1	<2	4 (app)	<2	<2	<2	140 (app)	<2	<2	48	3600 (app)	<2	150	<2	<2	<2	<2	6 (app)	<2	<2	<2	<2
EP030: Biochemical Oxygen Demand (BOD)																								
Biochemical Oxygen Demand		mg/L	2	<2	<2	<2	<2	<2	3	<2	<2	5	5	34	97	<2	<2	<2	<2	3	<2	<2	<2	<2

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
ALS	13/04/2017	Sample	ID 1	768 - MB1D	761 - MB1S	769 - MB2D	716 - MB5	756 - Bh28	715 - V5	763	804 - D05s	801 - D05d	802 - MW7b	803 - MW7a
			ID 2	Ramp	Ramp	trench	Cres	trail	Thorne St	Park	D05S	D05D	Cres	Cres
EW1402119	Results		Date Sampled	14/07/2014	14/07/2014	14/07/2014	14/07/2014	14/07/2014	14/07/2014	14/07/2014	14/07/2014	14/07/2014	14/07/2014	14/07/2014
			Order #	EW1402119001	EW1402119002	EW1402119003	EW1402119007	EW1402119008	EW1402119009	EW1402119010	EW1402119013	EW1402119014	EW1402119015	EW1402119016
Analyte	**CAS #**	**Units**	**LOR**	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
EA015: Total Dissolved Solids														
Total Dissolved Solids @180°C		mg/L	10	1030	366	589	170	636	232	648	457	328	114	440
EK055G: Ammonia as N by Discrete Analyser														
Ammonia as N	7664-41-7	mg/L	0.01	0.39	<0.01	<0.01	0.09	<0.01	0.15	0.12	<0.01	<0.01	0.11	0.1
EK057G: Nitrite as N by Discrete Analyser														
Nitrite as N	14797-65-0	mg/L	0.01	<0.01	<0.01	0.24	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
EK058G: Nitrate as N by Discrete Analyser														
Nitrate as N	14797-55-8	mg/L	0.01	<0.01	0.34	2.45	<0.01	0.22	<0.01	0.11	6.3	2.48	0.2	0.04
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser														
Total Kjeldahl Nitrogen as N		mg/L	0.1	3.1	1	1.3	1.6	0.3	1.4	2.9	0.9	0.6	0.4	0.5
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser														
Total Nitrogen as N		mg/L	0.1	3.1	1.3	4	1.6	0.5	1.4	3	7.2	3.1	0.6	0.5
EK067G: Total Phosphorus as P by Discrete Analyser														
Total Phosphorus as P		mg/L	0.01	0.24	0.09	0.36	0.04	0.26	0.05	0.19	0.69	1.23	0.01	0.38
EK071G: Reactive Phosphorus as P by discrete analyser														
Reactive Phosphorus as P	14265-44-2	mg/L	0.01	-	-	-	-	0.02	-	-	-	1.24	<0.01	<0.01
EMMM009: Thermotolerant Coliforms and E.coli by MF (AS/NZS 4276.7 2007)														
Thermotolerant (Faecal) Coliforms by MF		L	1	34	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
EP030: Biochemical Oxygen Demand (BOD)														
Biochemical Oxygen Demand		mg/L	2	4	<2	<2	<2	<2	<2	24	<2	<2	<2	<2

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
ALS	**13/04/2017**	**Sample**	**ID 1**	E-768	E-761	E-769	E-759	E-758	E-716	E-756	E-715	E-763	E-754	E-784	E-804	E-801	E-802	E-803
			ID 2	MB1D	MB1S	MB2D	D03	D02	MB5	Bh28	V5			31	D05s	D05s	MW7b	MW7a
EW1403305	**Results**		**Date Sampled**	3/11/2014	3/11/2014	3/11/2014	3/11/2014	3/11/2014	3/11/2014	3/11/2014	3/11/2014	3/11/2014	3/11/2014	3/11/2014	3/11/2014	3/11/2014	3/11/2014	3/11/2014
			Order #	EW1403305001	EW1403305002	EW1403305003	EW1403305004	EW1403305005	EW1403305006	EW1403305007	EW1403305008	EW1403305009	EW1403305010	EW1403305011	EW1403305012	EW1403305013	EW1403305014	EW1403305015
Analyte	**CAS #**	**Units**	**LOR**	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
EA025: Suspended Solids																		
Suspended Solids (SS)		mg/L	5	<5	21	57	46	8	7	190	<5	<5	<5	38	494	<5	<5	704
EK055G: Ammonia as N by Discrete Analyser																		
Ammonia as N	7664-41-7	mg/L	0.01	<0.01	0.55	0.04	0.03	0.05	0.14	<0.01	0.16	0.4	0.02	0.12	0.04	0.08	0.09	0.04
EK057G: Nitrite as N by Discrete Analyser																		
Nitrite as N	14797-65-0	mg/L	0.01	<0.01	<0.01	0.17	0.04	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	0.03	<0.01	<0.01
EK058G: Nitrate as N by Discrete Analyser																		
Nitrate as N	14797-55-8	mg/L	0.01	1.42	<0.01	5.96	0.22	2.23	11.5	0.14	0.07	0.02	0.03	5.33	3.4	7.74	0.01	0.06
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser																		
Total Kjeldahl Nitrogen as N		mg/L	0.1	0.3	7.7	1	1.5	0.8	2.1	0.5	1.4	0.9	0.2	2.5	0.8	1.3	0.4	0.8
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser																		
Total Nitrogen as N		mg/L	0.1	1.7	7.7	7.1	1.8	3	13.6	0.6	1.5	0.9	0.2	7.8	4.2	9.1	0.4	0.9
EK067G: Total Phosphorus as P by Discrete Analyser																		
Total Phosphorus as P		mg/L	0.01	0.04	0.26	0.18	0.34	2.82	0.06	1.62	0.02	0.05	0.05	0.26	0.34	1.01	0.02	0.5
EK071G: Reactive Phosphorus as P by discrete analyser																		
Reactive Phosphorus as P	14265-44-2	mg/L	0.01	-	-	-	0.06	2.62	-	0.06	-	-	-	-	-	1	<0.01	<0.01
EMMM009: Thermotolerant Coliforms and E.coli by MF (AS/NZS 4276.7 2007)																		
Thermotolerant (Faecal) Coliforms by MF		L	1	<1	570	<1	<1	<1	<1	<1	<1	~ 8	~ 1	<1	<1	<1	<1	<1
EP030: Biochemical Oxygen Demand (BOD)																		
Biochemical Oxygen Demand		mg/L	2	<2	<2	<2	<2	<2	<2	<2	3	<2	<2	<2	<2	<2	<2	<2

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
ALS	**13/04/2017**	**Sample**	**ID 1**	E-768	E-761	E-769	E-759	E-758	E-716	E-756	E-715	E-754	E-31	E-804	E-801	E-802	E-763	E-764	E-714	E-771	E-770
			ID 2																		
EW1500226	**Results**		**Date Sampled**	20/01/2015	20/01/2015	20/01/2015	20/01/2015	20/01/2015	20/01/2015	20/01/2015	20/01/2015	20/01/2015	20/01/2015	20/01/2015	20/01/2015	20/01/2015	20/01/2015	20/01/2015	20/01/2015	20/01/2015	20/01/2015
			Order #	EW1500226001	EW1500226002	EW1500226003	EW1500226004	EW1500226005	EW1500226006	EW1500226007	EW1500226008	EW1500226009	EW1500226010	EW1500226011	EW1500226012	EW1500226013	EW1500226014	EW1500226015	EW1500226016	EW1500226017	EW1500226018
Analyte	**CAS #**	**Units**	**LOR**	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
EA025: Suspended Solids																					
Suspended Solids (SS)		mg/L	5	8	14	50	7	52	14	42	<5	5	35	2090	<5	<5	14	7	<5	<5	<5
EK055G: Ammonia as N by Discrete Analyser																					
Ammonia as N	7664-41-7	mg/L	0.01	0.04	0.27	0.01	0.03	0.02	0.1	<0.01	0.16	0.02	0.06	0.18	<0.01	0.15	0.08	0.03	1.27	0.27	1.18
EK057G: Nitrite as N by Discrete Analyser																					
Nitrite as N	14797-65-0	mg/L	0.01	<0.01	<0.01	0.06	0.02	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
EK058G: Nitrate as N by Discrete Analyser																					
Nitrate as N	14797-55-8	mg/L	0.01	4.18	<0.01	5.98	1.22	6.39	<0.01	0.02	<0.01	0.02	0.22	6.63	4.73	0.02	0.02	0.01	0.03	<0.01	0.02
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser																					
Total Kjeldahl Nitrogen as N		mg/L	0.1	0.6	6.2	1.2	0.5	1.9	1.4	0.2	1.1	0.6	1	2.6	0.8	0.4	1.4	1.4	1.8	0.8	1.8
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser																					
Total Nitrogen as N		mg/L	0.1	4.8	6.2	7.2	1.7	8.3	1.4	0.2	1.1	0.6	1.2	9.2	5.5	0.4	1.4	1.4	1.8	0.8	1.8
EK067G: Total Phosphorus as P by Discrete Analyser																					
Total Phosphorus as P		mg/L	0.01	0.02	0.18	0.14	0.15	2.56	0.07	0.52	0.05	0.07	0.18	5.22	1.13	0.02	0.14	0.14	0.12	0.02	0.02
EK071G: Reactive Phosphorus as P by discrete analyser																					
Reactive Phosphorus as P	14265-44-2	mg/L	0.01	-	-	-	0.07	2.51	-	0.02	-	-	-	-	1.17	<0.01	-	-	-	-	-
EMMM008: Thermotolerant Coliforms and E.coli by MPN (APHA 21st Ed. 9221E)																					
Thermotolerant (Faecal) Coliforms by MPN		MPN/100 mL	2	-	79	-	-	<2	<2	-	<2	-	-	<2	-	<2	-	-	-	-	-
EMMM009: Thermotolerant Coliforms and E.coli by MF (AS/NZS 4276.7 2007)																					
Thermotolerant (Faecal) Coliforms by MF		CFU/100mL	1	<1	-	<1	<1	-	-	<1	-	<1	<1	-	<1	-	16	40	<1	<1	<1
EP030: Biochemical Oxygen Demand (BOD)																					
Biochemical Oxygen Demand		mg/L	2	In Progress	6	3	3	6	5	<2	19	26	7	10	<2	3	26	56	<2	6	<2
IP = In Progress																					

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
ALS	**13/04/2017**	**Sample**	**ID 1**	E-768	E-761	E-769	E-759	E-716	E-756	E-715	E-763	E-754	E-804	E-801	E-802	E-803
			ID 2													
EW1511385	**Results**		**Date Sampled**	19/08/2015	19/08/2015	19/08/2015	19/08/2015	19/08/2015	19/08/2015	19/08/2015	19/08/2015	19/08/2015	19/08/2015	19/08/2015	19/08/2015	19/08/2015
			Order #	EW1511385001	EW1511385002	EW1511385003	EW1511385005	EW1511385008	EW1511385010	EW1511385011	EW1511385012	EW1511385013	EW1511385017	EW1511385018	EW1511385019	EW1511385020
Analyte	**CAS #**	**Units**	**LOR**	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
EA025: Suspended Solids																
Suspended Solids (SS)		mg/L	5	<5	24	9	42	11	73	<5	<5	<5	322	<5	6	510
EK055G: Ammonia as N by Discrete Analyser																
Ammonia as N	7664-41-7	mg/L	0.01	0.02	0.48	0.03	0.06	0.2	0.04	0.22	0.02	0.02	0.07	0.02	0.21	0.03
EK058G: Nitrate as N by Discrete Analyser																
Nitrate as N	14797-55-8	mg/L	0.01	4.71	0.03	5.57	0.92	0.4	0.05	0.02	0.12	0.12	2.63	6.62	0.04	0.08
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser																
Nitrite + Nitrate as N		mg/L	0.01	4.71	0.03	5.79	0.97	0.4	0.05	0.02	0.12	0.12	2.63	6.62	0.04	0.08
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser																
Total Kjeldahl Nitrogen as N		mg/L	0.1	0.3	3.5	0.9	0.6	1.2	0.4	1.2	<0.1	<0.1	0.7	0.6	0.5	0.6
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser																
Total Nitrogen as N		mg/L	0.1	5	3.5	6.7	1.6	1.6	0.4	1.2	0.1	0.1	3.3	7.2	0.5	0.7
EK067G: Total Phosphorus as P by Discrete Analyser																
Total Phosphorus as P		mg/L	0.01	0.03	0.18	0.08	0.23	0.03	0.37	<0.01	<0.01	<0.01	1.71	0.92	<0.01	0.52
EK071G: Reactive Phosphorus as P by discrete analyser																
Reactive Phosphorus as P	14265-44-2	mg/L	0.01	-	-	-	0.1	-	0.05	-	-	-	-	0.88	<0.01	<0.01
EP030: Biochemical Oxygen Demand (BOD)																
Biochemical Oxygen Demand		mg/L	2	<2	3	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
MW006: Thermotolerant Coliforms and E.coli by MF (AS/NZS 4276.7 2007)																
Thermotolerant (Faecal) Coliforms by MF		L	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
ALS	**13/04/2017**	**Sample**	**ID 1**	E-768	E-761	E-769	E-759	E-758	E-716	E-756	E-715	E-763	E-754	E-804	E-801	E-802	E-803
			ID 2														
EW1512130	**Results**		**Date Sampled**	14/10/2015	14/10/2015	14/10/2015	14/10/2015	14/10/2015	14/10/2015	14/10/2015	14/10/2015	14/10/2015	14/10/2015	14/10/2015	14/10/2015	14/10/2015	14/10/2015
			Order #	EW1512130001	EW1512130002	EW1512130003	EW1512130004	EW1512130005	EW1512130006	EW1512130007	EW1512130008	EW1512130009	EW1512130010	EW1512130011	EW1512130012	EW1512130013	EW1512130014
Analyte	**CAS #**	**Units**	**LOR**	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
EA025: Suspended Solids																	
Suspended Solids (SS)		mg/L	5	<5	17	24	29	100	<5	6	<5	<5	<5	16	<5	<5	194
EK055G: Ammonia as N by Discrete Analyser																	
Ammonia as N	7664-41-7	mg/L	0.01	0.13	0.59	0.08	0.04	0.04	0.13	0.04	0.31	0.02	0.04	0.02	0.03	0.14	0.09
EK057G: Nitrite as N by Discrete Analyser																	
Nitrite as N	14797-65-0	mg/L	0.01	<0.01	<0.01	0.02	0.04	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
EK058G: Nitrate as N by Discrete Analyser																	
Nitrate as N	14797-55-8	mg/L	0.01	4	<0.01	6.25	0.55	1.56	<0.01	<0.01	<0.01	0.03	0.04	4.82	3.93	<0.01	0.01
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser																	
Nitrite + Nitrate as N		mg/L	0.01	4	<0.01	6.27	0.59	1.57	<0.01	<0.01	<0.01	0.03	0.04	4.82	3.93	<0.01	0.01
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser																	
Total Kjeldahl Nitrogen as N		mg/L	0.1	0.7	7.7	0.6	0.8	3.5	1.2	0.2	1.2	<0.1	<0.1	0.6	0.5	0.4	0.5
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser																	
Total Nitrogen as N		mg/L	0.1	4.7	7.7	6.9	1.4	5.1	1.2	0.2	1.2	<0.1	<0.1	5.4	4.4	0.4	0.5
EK067G: Total Phosphorus as P by Discrete Analyser																	
Total Phosphorus as P		mg/L	0.01	0.01	0.32	0.11	0.22	1.48	0.08	0.28	<0.01	<0.01	<0.01	1.21	0.89	0.01	0.2
EK071G: Reactive Phosphorus as P by discrete analyser																	
Reactive Phosphorus as P	14265-44-2	mg/L	0.01	-	-	-	0.09	1.07	-	0.06	-	<0.01	-	-	0.88	0.01	<0.01
EP030: Biochemical Oxygen Demand (BOD)																	
Biochemical Oxygen Demand		mg/L	2	4	7	3	<2	8	<2	<2	<2	<2	<2	<2	<2	<2	3
MW006: Thermotolerant Coliforms and E.coli by MF (AS/NZS 4276.7 2007)																	
Thermotolerant (Faecal) Coliforms by MF		CFU/100mL	1	<1	-	<1	-	-	-	<1	<1	<1	<1	~1	<1	<1	-
MW020: Thermotolerant Coliforms and E.coli by MPN (APHA 21st Ed. 9221E)																	
Thermotolerant (Faecal) Coliforms by MPN		MPN/100 mL	2	-	<2	-	<2	<2	<2	-	-	-	-	-	-	-	<2

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
ALS	**13/04/2017**	**Sample**	**ID 1**	E-768	E-761	E-769	E-759	E-716	E-756	E-715	E-714	E-763	E-764	E-754	E-771	E-770	E-804	E-801	E-802	E-803
			ID 2																	
EW1600537	**Results**		**Date Sampled**	8/02/2016	8/02/2016	8/02/2016	8/02/2016	8/02/2016	8/02/2016	8/02/2016	8/02/2016	8/02/2016	8/02/2016	8/02/2016	8/02/2016	8/02/2016	8/02/2016	8/02/2016	8/02/2016	8/02/2016
			Order #	EW1600537001	EW1600537002	EW1600537003	EW1600537004	EW1600537005	EW1600537006	EW1600537007	EW1600537008	EW1600537009	EW1600537010	EW1600537011	EW1600537012	EW1600537013	EW1600537014	EW1600537015	EW1600537016	EW1600537017
Analyte	**CAS #**	**Units**	**LOR**	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
EA025: Total Suspended Solids dried at 104 ± 2°C																				
Suspended Solids (SS)		mg/L	5	<5	44	360	79	<5	<5	<5	136	<5	<5	<5	<5	<5	5	<5	<5	149
EK055G: Ammonia as N by Discrete Analyser																				
Ammonia as N	7664-41-7	mg/L	0.01	<0.01	0.02	0.02	0.42	0.1	0.08	0.13	0.25	<0.01	0.1	<0.01	0.25	1.05	<0.01	<0.01	0.02	0.03
EK057G: Nitrite as N by Discrete Analyser																				
Nitrite as N	14797-65-0	mg/L	0.01	<0.01	<0.01	<0.01	0.12	<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
EK058G: Nitrate as N by Discrete Analyser																				
Nitrate as N	14797-55-8	mg/L	0.01	7.31	1.74	5.94	0.85	<0.01	0.06	<0.01	0.1	0.05	0.05	0.05	<0.01	0.03	3.44	3.09	0.19	0.04
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser																				
Nitrite + Nitrate as N		mg/L	0.01	7.31	1.74	5.94	0.97	<0.01	0.06	<0.01	0.1	0.05	0.05	0.05	<0.01	0.03	3.44	3.09	0.19	0.04
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser																				
Total Kjeldahl Nitrogen as N		mg/L	0.1	1.6	15.1	1.1	3.2	2.6	0.6	1.8	3.5	0.2	0.5	0.4	1.2	2.3	0.9	0.9	0.6	0.6
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser																				
Total Nitrogen as N		mg/L	0.1	8.9	16.8	7	4.2	2.6	0.7	1.8	3.6	0.2	0.6	0.4	1.2	2.3	4.3	4	0.8	0.6
EK067G: Total Phosphorus as P by Discrete Analyser																				
Total Phosphorus as P		mg/L	0.01	0.18	0.26	0.11	0.49	0.11	0.13	0.01	0.3	<0.01	<0.01	<0.01	0.02	0.01	2.82	0.86	0.02	0.1
EK071G: Reactive Phosphorus as P by discrete analyser																				
Reactive Phosphorus as P	14265-44-2	mg/L	0.01	-	-	-	0.19	-	0.04	-	-	-	-	-	-	-	-	-	-	-
EP030: Biochemical Oxygen Demand (BOD)																				
Biochemical Oxygen Demand		mg/L	2	<2	4	<2	19	4	<2	3	3	<2	<2	<2	<2	3	<2	<2	3	<2
MW006: Thermotolerant Coliforms and E.coli by MF (AS/NZS 4276.7 2007)																				
Thermotolerant (Faecal) Coliforms by MF		CFU/100mL	1	63	-	<1	-	-	<1	<1	-	<1	<1	<1	<1	<1	<1	<1	<1	-
MW020: Thermotolerant Coliforms and E.coli by MPN (APHA 21st Ed. 9221E)																				
Thermotolerant (Faecal) Coliforms by MPN		MPN/100 mL	2	-	920	-	13	2	-	-	350	-	-	-	-	-	-	-	-	<2

0	1	2	3	4	5	6	7	8	9	10
ALS	**13/04/2017**	**Sample**	**ID 1**	E-768	E-761	E-769	E-716	E-715	E-804	E-801
			ID 2							
EW1601750	**Results**		**Date Sampled**	3/05/2016	3/05/2016	3/05/2016	3/05/2016	3/05/2016	3/05/2016	3/05/2016
			Order #	EW1601750001	EW1601750002	EW1601750003	EW1601750004	EW1601750005	EW1601750006	EW1601750007
Analyte	**CAS #**	**Units**	**LOR**	WATER	WATER	WATER	WATER	WATER	WATER	WATER
EA025: Total Suspended Solids dried at 104 ± 2°C										
Suspended Solids (SS)		mg/L	5	<5	22	19	84	6	30	7
EK055G: Ammonia as N by Discrete Analyser										
Ammonia as N	7664-41-7	mg/L	0.01	0.2	0.75	0.04	0.23	0.56	0.25	0.93
EK057G: Nitrite as N by Discrete Analyser										
Nitrite as N	14797-65-0	mg/L	0.01	<0.01	<0.01	0.19	<0.01	<0.01	0.15	<0.01
EK058G: Nitrate as N by Discrete Analyser										
Nitrate as N	14797-55-8	mg/L	0.01	7.54	<0.01	4.83	<0.01	<0.01	3.66	3.28
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser										
Nitrite + Nitrate as N		mg/L	0.01	7.54	<0.01	5.02	<0.01	<0.01	3.81	3.28
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser										
Total Kjeldahl Nitrogen as N		mg/L	0.1	0.9	4.7	1	2.2	1.4	0.7	1.2
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser										
Total Nitrogen as N		mg/L	0.1	8.4	4.7	6	2.2	1.4	4.5	4.5
EK067G: Total Phosphorus as P by Discrete Analyser										
Total Phosphorus as P		mg/L	0.01	<0.01	0.16	0.06	0.02	0.32	2.24	0.7
EK071G: Reactive Phosphorus as P by discrete analyser										
Reactive Phosphorus as P	14265-44-2	mg/L	0.01	-	-	-	-	-	-	0.78
EP030: Biochemical Oxygen Demand (BOD)										
Biochemical Oxygen Demand		mg/L	2	<2	<2	<2	<2	<2	<2	<2
MW006: Faecal Coliforms & E.coli by MF										
Faecal Coliforms		L	1	<1	<1	<1	<1	<1	<1	~<1

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
ALS	13/04/2017	Sample	ID 1	E-768	E-761	E-769	E-759	E-758	E-716	E-756	E-715	E-763	E-754	E-804	E-801	E-802	E-803
			ID 2														
EW1602778	Results		Date Sampled	25/07/2016	25/07/2016	25/07/2016	25/07/2016	25/07/2016	25/07/2016	25/07/2016	25/07/2016	25/07/2016	25/07/2016	25/07/2016	25/07/2016	25/07/2016	25/07/2016
			Order #	EW1602778001	EW1602778002	EW1602778003	EW1602778005	EW1602778006	EW1602778008	EW1602778010	EW1602778011	EW1602778012	EW1602778013	EW1602778017	EW1602778018	EW1602778019	EW1602778020
Analyte	CAS #	Units	LOR	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
EA025: Total Suspended Solids dried at 104 ± 2°C																	
Suspended Solids (SS)		mg/L	5	16	28	39	58	113	<5	16	12	9	9	32	10	29	224
EK055G: Ammonia as N by Discrete Analyser																	
Ammonia as N	7664-41-7	mg/L	0.01	0.05	0.61	0.07	0.22	0.05	0.05	0.03	0.06	0.03	0.03	0.02	1.37	0.18	0.03
EK057G: Nitrite as N by Discrete Analyser																	
Nitrite as N	14797-65-0	mg/L	0.01	<0.01	<0.01	0.04	0.02	0.05	<0.01	0.03	<0.01	<0.01	<0.01	<0.01	0.3	<0.01	<0.01
EK058G: Nitrate as N by Discrete Analyser																	
Nitrate as N	14797-55-8	mg/L	0.01	4.03	<0.01	5.28	0.19	0.47	<0.01	0.11	<0.01	<0.01	<0.01	3.67	4.95	<0.01	<0.01
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser																	
Nitrite + Nitrate as N		mg/L	0.01	4.03	<0.01	5.32	0.21	0.52	<0.01	0.14	<0.01	<0.01	<0.01	3.67	5.25	<0.01	<0.01
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser																	
Total Kjeldahl Nitrogen as N		mg/L	0.1	0.8	8.4	1.3	1.3	2.5	1.7	0.5	1.6	<0.1	<0.1	0.5	2.6	0.6	0.5
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser																	
Total Nitrogen as N		mg/L	0.1	4.8	8.4	6.6	1.5	3	1.7	0.6	1.6	<0.1	<0.1	4.2	7.8	0.6	0.5
EK067G: Total Phosphorus as P by Discrete Analyser																	
Total Phosphorus as P		mg/L	0.01	0.04	0.33	0.16	0.41	1.95	0.03	0.53	0.04	<0.01	<0.01	0.94	1.43	0.1	0.2
EK071G: Reactive Phosphorus as P by discrete analyser																	
Reactive Phosphorus as P	14265-44-2	mg/L	0.01	-	-	-	0.16	1.47	-	0.08	-	-	-	-	1.22	<0.01	<0.01
EP030: Biochemical Oxygen Demand (BOD)																	
Biochemical Oxygen Demand		mg/L	2	<2	3	<2	<2	2	<2	<2	<2	<2	<2	<2	<2	<2	<2
MW006: Faecal Coliforms & E.coli by MF																	
Faecal Coliforms		L	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
ALS	**13/04/2017**	**Sample**	**ID 1**	E-768	E-761	E-769	E-759	E-716	E-756	E-715	E-763	E-754	E-804	E-801	E-802	E-803
			ID 2													
EW1603941	**Results**		**Date Sampled**	18/10/2016	18/10/2016	18/10/2016	18/10/2016	18/10/2016	18/10/2016	18/10/2016	18/10/2016	18/10/2016	18/10/2016	18/10/2016	18/10/2016	18/10/2016
			Order #	EW1603941001	EW1603941002	EW1603941003	EW1603941005	EW1603941008	EW1603941010	EW1603941011	EW1603941012	EW1603941013	EW1603941017	EW1603941018	EW1603941019	EW1603941020
Analyte	**CAS #**	**Units**	**LOR**	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
EA025: Total Suspended Solids dried at 104 ± 2°C																
Suspended Solids (SS)		mg/L	5	<5	17	28	166	31	<5	<5	<5	<5	47	<5	38	141
EK055G: Ammonia as N by Discrete Analyser																
Ammonia as N	7664-41-7	mg/L	0.01	0.03	2.22	0.15	0.04	0.14	0.28	0.37	0.01	0.12	0.09	0.49	0.16	0.03
EK057G: Nitrite as N by Discrete Analyser																
Nitrite as N	14797-65-0	mg/L	0.01	<0.01	<0.01	0.04	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
EK058G: Nitrate as N by Discrete Analyser																
Nitrate as N	14797-55-8	mg/L	0.01	6.08	<0.01	1.45	1.27	<0.01	0.02	<0.01	0.04	0.06	2.58	3.5	0.02	<0.01
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser																
Nitrite + Nitrate as N		mg/L	0.01	6.08	<0.01	1.49	1.27	<0.01	0.02	<0.01	0.04	0.06	2.58	3.5	0.02	<0.01
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser																
Total Kjeldahl Nitrogen as N		mg/L	0.1	0.8	7.3	1.1	3.9	2.3	0.6	1.5	<0.1	0.2	0.9	1	0.9	0.4
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser																
Total Nitrogen as N		mg/L	0.1	6.9	7.3	2.6	5.2	2.3	0.6	1.5	<0.1	0.3	3.5	4.5	0.9	0.4
EK067G: Total Phosphorus as P by Discrete Analyser																
Total Phosphorus as P		mg/L	0.01	0.02	0.29	0.15	3.76	0.07	0.1	0.03	<0.01	0.33	0.92	1.34	0.13	0.14
EK071G: Reactive Phosphorus as P by discrete analyser																
Reactive Phosphorus as P	14265-44-2	mg/L	0.01	-	-	-	3.54	-	0.08	-	-	-	-	1.39	<0.01	<0.01
EP030: Biochemical Oxygen Demand (BOD)																
Biochemical Oxygen Demand		mg/L	2	<2	7	3	6	3	<2	4	<2	<2	<2	<2	<2	<2
MW006: Faecal Coliforms & E.coli by MF																
Faecal Coliforms		L	1	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	<1	<1	<1

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
ALS	**13/04/2017**	**Sample**	**ID 1**	E-768	E-761	E-769	E-758	E-716	E-756	E-715	E-714	E-763	E-764	E-754	E-771	E-770	E-804	E-801	E-802	E-803
			ID 2																	
EW1700742	**Results**		**Date Sampled**	20/02/2017	20/02/2017	20/02/2017	20/02/2017	20/02/2017	20/02/2017	20/02/2017	20/02/2017	20/02/2017	20/02/2017	20/02/2017	20/02/2017	20/02/2017	20/02/2017	20/02/2017	20/02/2017	20/02/2017
			Order #	EW1700742001	EW1700742002	EW1700742003	EW1700742006	EW1700742008	EW1700742010	EW1700742011	EW1700742013	EW1700742015	EW1700742016	EW1700742017	EW1700742018	EW1700742019	EW1700742023	EW1700742024	EW1700742025	EW1700742026
Analyte	**CAS #**	**Units**	**LOR**	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
EA025: Total Suspended Solids dried at 104 ± 2°C																				
Suspended Solids (SS)		mg/L	5	<5	95	12	62	52	10	<5	96	<5	<5	<5	11	<5	7	<5	<5	73
EK055G: Ammonia as N by Discrete Analyser																				
Ammonia as N	7664-41-7	mg/L	0.01	0.37	0.42	0.04	0.16	0.2	0.03	0.59	0.26	0.15	0.05	0.04	0.27	0.99	0.54	0.26	0.4	0.05
EK057G: Nitrite as N by Discrete Analyser																				
Nitrite as N	14797-65-0	mg/L	0.01	<0.01	<0.01	0.24	0.06	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.05	<0.01	<0.01	<0.01
EK058G: Nitrate as N by Discrete Analyser																				
Nitrate as N	14797-55-8	mg/L	0.01	7.23	<0.01	4.51	4.16	0.01	0.02	0.04	0.42	0.07	0.06	0.05	0.02	0.03	6.92	3.8	0.02	0.04
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser																				
Nitrite + Nitrate as N		mg/L	0.01	7.23	<0.01	4.75	4.22	0.01	0.02	0.04	0.42	0.07	0.06	0.05	0.02	0.03	6.97	3.8	0.02	0.04
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser																				
Total Kjeldahl Nitrogen as N		mg/L	0.1	1	8.6	0.8	3.6	3.4	0.2	1.5	2.3	0.2	<0.1	0.1	0.7	1.5	1.1	0.7	0.7	0.3
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser																				
Total Nitrogen as N		mg/L	0.1	8.2	8.6	5.6	7.8	3.4	0.2	1.5	2.7	0.3	<0.1	0.2	0.7	1.5	8.1	4.5	0.7	0.3
EK067G: Total Phosphorus as P by Discrete Analyser																				
Total Phosphorus as P		mg/L	0.01	0.01	0.38	0.1	3.91	0.3	0.14	0.02	0.24	<0.01	<0.01	<0.01	0.03	0.02	3	1.16	0.02	0.08
EK071G: Reactive Phosphorus as P by discrete analyser																				
Reactive Phosphorus as P	14265-44-2	mg/L	0.01	-	-	-	3.9	-	0.11	-	-	-	-	-	<0.01	0.01	3.03	1.24	0.01	<0.01
EP030: Biochemical Oxygen Demand (BOD)																				
Biochemical Oxygen Demand		mg/L	2	<2	5	<2	<2	27	<2	<2	<2	<2	<2	<2	4	<2	<2	<2	<2	<2
MW006: Faecal Coliforms & E.coli by MF																				
Faecal Coliforms		L	1	<1	34	~<1	<2	<2	<1	<1	<2	<1	<1	<1	<2	<2	<1	<1	<1	<2

Appendix E:

Field Chemistry Results

MBIS 761

GROUNDWATER MONITORING RECORD
Lake Conjola

Date: 3 Nov 2014.	**Piezometer no.:**
Time: 9:30am	**SWL (m):** **Bore Depth(m):** 1.46m
Sampling Personnel: Matt Dunn, Thelma Marr	**SWL reference level:** □ Gattic cover □ Lip of steel monument □ Top of PVC pipe

Bore Purging

Pumping method: □ Waterra footvalve □ Hand Bailer	□ 12V electric eg. Monsoon □ Submersible electric 240V
Pump depth (m):	
Height of Water Column: (Depth of bore – SWL)	→ **Volume of Water in Borehole:** Bore Diameter (mm) / Volume of Water/m (L): 50 / 2.0; 100 / 7.9
Pumping period (minutes): **Flow rate (L/min):**	→ **Volume Pumped (L):**

Water Sampling

*Water Quality Meters Calibrated? Yes/No

Water colour □ Clear ☑ Reddy/orange/brown □ Black □ Turbid	**Water odour** □ None ☑ Rotten egg (H_2S) □ Other_____

Time	pH	EC *circle units* (µS/cm or mS/cm)	Temp °C	DO (mg/L)	DO%	Salinity (ppt)	Turbidity (ntu)	Free Cl
9:35am	7.18	5532	17.86°C.	4.5mg/L	47.8%	3.03	0	
9:36am	7.18	5531	17.88°C.	4.4mg/L	47.1%	3.03	0	

Samples for lab analysis:	
□ Major ions	□ BOD, coliforms and total coliform
□ Nutrients	□ CO_2 and alkalinity
□ Metals - filtered □ Yes	□ Suspended solids

Surface ponding check:	**Vegetation check:**
☑ None	☑ Healthy
□ <5 cm deep	□ Unhealthy eg. leaf discolour
□ 5-10 cm deep	□ Dead
□ 10-50 cm deep	
□ >0.5 m deep	
Description of surface ponding:	**Description of unhealthy vegetation:**

MB1D 768

GROUNDWATER MONITORING RECORD
Lake Conjola

Date: 3 November 2014	**Piezometer no.:**
Time: 9:30am	**SWL (m):** **Bore Depth(m):** 1.60m
Sampling Personnel: Natt Dunn, Thelma Marr	**SWL reference level:** ☐ Gattic cover ☐ Lip of steel monument ☐ Top of PVC pipe

Bore Purging

Pumping method:

☐ Waterra footvalve
☐ Hand Bailer
☐ 12V electric eg. Monsoon
☐ Submersible electric 240V

Pump depth (m):

Height of Water Column:
(Depth of bore – SWL)

→ Volume of Water in Borehole:

Bore Diameter (mm)	Volume of Water/m (L)
50	2.0
100	7.9

Pumping period (minutes):

→ Volume Pumped (L):

Flow rate (L/min):

Water Sampling

*Water Quality Meters Calibrated? Yes/No

Water colour
☑ Clear
☐ Reddy/orange
☐ Black
☐ Turbid

Water odour
☑ None
☐ Other_____
☐ Rotten egg (H_2S)

Time	pH	EC *circle units* (µS/cm or mS/cm)	Temp °C	DO (mg/L)	DO%	Salinity (ppt)	Turbidity (ntu)	Free Cl
9:38am	8.43	763	17.61°C	3.9mg/L	40.9%	0.32	0	
9:39am	8.43	673	17.62°C	3.9mg/L	40.9%	0.32	0	

Samples for lab analysis:	
□ Major ions	□ BOD, coliforms and total coliform
□ Nutrients	□ CO_2 and alkalinity
□ Metals - filtered □ Yes	□ Suspended solids

Surface ponding check:	**Vegetation check:**
☑ None	☑ Healthy
□ <5 cm deep	□ Unhealthy eg. leaf discolour
□ 5-10 cm deep	□ Dead
□ 10-50 cm deep	
□ >0.5 m deep	
Description of surface ponding:	**Description of unhealthy vegetation:**

GROUNDWATER MONITORING RECORD
Lake Conjola

754 – camp kitchen

Date: 3 NOV 2014	**Piezometer no.:**
Time: 9:45am	**SWL (m):** **Bore Depth(m):** N/a.
Sampling Personnel: Matt Dunn, Thelma Marr	**SWL referenee level:** ☐ Gattic cover ☐ Lip of steel monument ☐ Top of PVC pipe

Bore Purging

Pumping method:
☐ Waterra footvalve ☐ 12V electric eg. Monsoon
☐ Hand Bailer ☐ Submersible electric 240V

Pump depth (m):

Height of Water Column: (Depth of bore – SWL)

→ **Volume of Water in Borehole:**

Bore Diameter (mm)	Volume of Water/m (L)
50	2.0
100	7.9

Pumping period (minutes): → **Volume Pumped (L):**

Flow rate (L/min):

Water Sampling

*Water Quality Meters Calibrated? Yes/No

Water colour ☑ Clear ☐ Reddy/orange ☐ Black ☐ Turbid

Water odour ☑ None ☐ Other_____ ☐ Rotten egg (H_2S)

Time	pH	EC *circle units* (µS/cm or mS/cm)	Temp °C	DO (mg/L)	DO%	Salinity (ppt)	Turbidity (ntu)	Free Cl
9:45am	7.94	872	17.95°C	3.9mg/L	41%	0.44	0	
9:45am	7.94	872	17.95°C	3.9mg/L	41%	0.44	0	

Samples for lab analysis:	
□ Major ions	□ BOD, coliforms and total coliform
□ Nutrients	□ CO_2 and alkalinity
□ Metals - filtered □ Yes	□ Suspended solids

Surface ponding check:	**Vegetation check:**
☑ None	N/a.
□ <5 cm deep	□ Healthy
□ 5-10 cm deep	□ Unhealthy eg. leaf discolour
□ 10-50 cm deep	□ Dead
□ >0.5 m deep	
Description of surface ponding:	**Description of unhealthy vegetation:**

763 - Site 294-295

763

GROUNDWATER MONITORING RECORD
Lake Conjola

Date: 3 NOV 2014	**Piezometer no.:**
Time: 9:50am	**SWL (m):** **Bore Depth(m):**
Sampling Personnel: Matt Dunn, Thelma Marr	**SWL reference level:** ☐ Gattic cover ☐ Lip of steel monument ☐ Top of PVC pipe

Bore Purging

Pumping method:
☐ Waterra footvalve ☐ 12V electric eg. Monsoon
☐ Hand Bailer ☐ Submersible electric 240V

Pump depth (m):

Height of Water Column: (Depth of bore – SWL)

→ Volume of Water in Borehole:

Bore Diameter (mm)	Volume of Water/m (L)
50	2.0
100	7.9

Pumping period (minutes): **→ Volume Pumped (L):**

Flow rate (L/min):

Water Sampling

*Water Quality Meters Calibrated? Yes/No

Water colour ☐ Reddy/orange ☑ Clear ☐ Black ☐ Turbid → v. pale yellow

Water odour ☐ Other_____ ☐ None ☑ Rotten egg (H_2S) V. slight

Time	pH	EC (µS/cm or mS/cm) *circle units*	Temp °C	DO (mg/L)	DO%	Salinity (ppt)	Turbidity (ntu)	Free Cl
9:50am	7.45	1451	18.63°C	3.7mg/L	40.2%	0.72	1.6	
9:57am	7.44	1452	18.74°C	3.7mg/L	40.1%	0.74	1.6	

Samples for lab analysis:	
□ Major ions	□ BOD, coliforms and total coliform
□ Nutrients	□ CO_2 and alkalinity
□ Metals - filtered □ Yes	□ Suspended solids

Surface ponding check:	**Vegetation check:**
□ None □ <5 cm deep □ 5-10 cm deep □ 10-50 cm deep □ >0.5 m deep	□ Healthy □ Unhealthy eg. leaf discolour □ Dead
Description of surfacc ponding:	**Description of unhealthy vegetation:**

MW76
802

GROUNDWATER MONITORING RECORD
Lake Conjola

Date: 3 NOV 2014	**Piezometer no.:**
Time: 10:15am	**SWL (m):** **Bore Depth(m):** 2.59m
Sampling Personnel: Matt Dunn, Thelma Mar.	**SWL reference level:** □ Gattic cover □ Lip of steel monument □ Top of PVC pipe

Bore Purging

Pumping method:
□ Waterra footvalve
□ Hand Bailer
□ 12V electric eg. Monsoon
□ Submersible electric 240V

Pump depth (m):

Height of Water Column:
(Depth of bore – SWL)

→ Volume of Water in Borehole:

Bore Diameter (mm)	Volume of Water/m (L)
50	2.0
100	7.9

Pumping period (minutes):

→ Volume Pumped (L):

Flow rate (L/min):

Water Sampling

*Water Quality Meters Calibrated? Yes/No

Water colour
□ Clear □ Reddy/orange
□ Turbid Yellow □ Black

Water odour
□ Other_____
~~☑ None~~
☑ Rotten egg (H_2S) slight

Time	pH	EC (µS/cm or mS/cm) *circle units*	Temp °C	DO (mg/L)	DO%	Salinity (ppt)	Turbidity (ntu)	Free Cl
10:15am	5.63	89	20.32°C	3.6mg/L	40.1%	0.04	1.2	
10:15am	5.63	89	20.46°C	3.6mg/L	40.1%	0.04	1.2	

Samples for lab analysis:	
□ Major ions	□ BOD, coliforms and total coliform
□ Nutrients	□ CO_2 and alkalinity
□ Metals - filtered □ Yes	□ Suspended solids

Surface ponding check:	**Vegetation check:**
☑ None	☑ Healthy
□ <5 cm deep	□ Unhealthy eg. leaf discolour
□ 5-10 cm deep	□ Dead
□ 10-50 cm deep	
□ >0.5 m deep	
Description of surface ponding:	**Description of unhealthy vegetation:**

MBS 7/16

GROUNDWATER MONITORING RECORD
Lake Conjola

Date: 30 Nov 2014	**Piezometer no.:**
Time: 10:14am	**SWL (m):** [redacted] **Bore Depth(m):** 1.71m
Sampling Personnel: Natt Dunn, Thelma Marr	**SWL reference level:** ☐ Gattic cover ☐ Lip of steel monument ☐ Top of PVC pipe

Bore Purging

Pumping method:
☐ Waterra footvalve
☐ Hand Bailer
☐ 12V electric eg. Monsoon
☐ Submersible electric 240V

Pump depth (m):

Height of Water Column:
(Depth of bore – SWL)

→ Volume of Water in Borehole:

Bore Diameter (mm)	Volume of Water/m (L)
50	2.0
100	7.9

Pumping period (minutes):

→ Volume Pumped (L):

Flow rate (L/min):

Water Sampling

*Water Quality Meters Calibrated? Yes/No

Water colour
☐ Clear
☑ Reddy/orange
☐ Black
☐ Turbid

Water odour
☐ None
☑ Rotten egg (H_2S)
☐ Other_____

Time	pH	EC *circle units* (µS/cm or mS/cm)	Temp °C	DO (mg/L)	DO%	Salinity (ppt)	Turbidity (ntu)	Free Cl
10:15am	5.08	96	19.55°C	6.1mg/L	66.6%	0.04	0.8	1.32
10:15am	5.11	96	19.56°C	6.1mg/L	66.4%	0.04	0.8	1.32

Samples for lab analysis:	
□ Major ions	□ BOD, coliforms and total coliform
□ Nutrients	□ CO_2 and alkalinity
□ Metals - filtered □ Yes	□ Suspended solids

Surface ponding check:	**Vegetation check:**
□ None	
□ <5 cm deep	□ Healthy
□ 5-10 cm deep	□ Unhealthy eg. leaf discolour
□ 10-50 cm deep	□ Dead
□ >0.5 m deep	
Description of surface ponding:	**Description of unhealthy vegetation:**

GROUNDWATER MONITORING RECORD
Lake Conjola

MW7a
803

Date: 3 NOV 2014	**Piezometer no.:**
Time: 10:40 am	**SWL (m):** **Bore Depth(m):** 8.74m
Sampling Personnel: Matt Dunn, Thelma Marr	**SWL reference level:** ☐ Gattic cover ☐ Lip of steel monument ☐ Top of PVC pipe

Bore Purging

Pumping method:

☐ Waterra footvalve
☐ Hand Bailer
☐ 12V electric eg. Monsoon
☐ Submersible electric 240V

Pump depth (m):

Height of Water Column:
(Depth of bore – SWL)

→ Volume of Water in Borehole:

Bore Diameter (mm)	Volume of Water/m (L)
50	2.0
100	7.9

Pumping period (minutes):

→ Volume Pumped (L):

Flow rate (L/min):

Water Sampling

*Water Quality Meters Calibrated? Yes/No

Water colour
☐ Clear
☑ Turbid
☐ Reddy/orange
☐ Black

Water odour
☑ None
☐ Rotten egg (H_2S)
☐ Other_____

Time	pH	EC *circle units* (µS/cm or mS/cm)	Temp °C	DO (mg/L)	DO%	Salinity (ppt)	Turbidity (ntu)	Free Cl
10:40am	5.22	1001	19.74°C	4.4mg/L	48.7%	0.50	~~338~~	
10:41am	5.22	1000	19.77°C	4.4mg/L	48.8%	0.50	334	

Samples for lab analysis:	
□ Major ions	□ BOD, coliforms and total coliform
□ Nutrients	□ CO_2 and alkalinity
□ Metals - filtered □ Yes	□ Suspended solids

Surface ponding check:	**Vegetation check:**
☑ None	☑ Healthy
□ <5 cm deep	□ Unhealthy eg. leaf discolour
□ 5-10 cm deep	□ Dead
□ 10-50 cm deep	
□ >0.5 m deep	
Description of surface ponding:	**Description of unhealthy vegetation:**

BH08
756

GROUNDWATER MONITORING RECORD
Lake Conjola

Date: 3 NOV 2014	**Piezometer no.:**
Time: 11:15am	**SWL (m):** **Bore Depth(m):** 6.81 m
Sampling Personnel: Matt Dunn, Thelma	**SWL reference level:** ☐ Gattic cover ☐ Lip of steel monument ☐ Top of PVC pipe

Bore Purging

Pumping method:

☐ Waterra footvalve ☐ 12V electric eg. Monsoon

☐ Hand Bailer ☐ Submersible electric 240V

Pump depth (m):

Height of Water Column: (Depth of bore – SWL)

→ Volume of Water in Borehole:

Bore Diameter (mm)	Volume of Water/m (L)
50	2.0
100	7.9

Pumping period (minutes):

→ Volume Pumped (L):

Flow rate (L/min):

Water Sampling

*Water Quality Meters Calibrated? Yes/No

Water colour
☐ Clear ☐ Reddy/orange
☑ Turbid ☐ Black

Water odour
☑ None ☐ Other_____
☐ Rotten egg (H_2S)

Time	pH	EC *circle units* (µS/cm or mS/cm)	Temp °C	DO (mg/L)	DO%	Salinity (ppt)	Turbidity (ntu)	Free Cl
11:15am	7.35	1262	19.39°C	1.9mg/L	20.2%	0.65	510.3	
11:16am	7.35	1268	19.48°C	1.9mg/L	20.2%	0.65	504.9	

Samples for lab analysis:	
□ Major ions	□ BOD, coliforms and total coliform
□ Nutrients	□ CO_2 and alkalinity
□ Metals - filtered □ Yes	□ Suspended solids

Surface ponding check:	**Vegetation check:**
☑ None	☑ Healthy
□ <5 cm deep	□ Unhealthy eg. leaf discolour
□ 5-10 cm deep	□ Dead
□ 10-50 cm deep	
□ >0.5 m deep	
Description of surface ponding:	**Description of unhealthy vegetation:**

GROUNDWATER MONITORING RECORD
Lake Conjola

31

Date: 3 Nov 2014	**Piezometer no.:**
Time: 11:40am	**SWL (m):** **Bore Depth(m):**
Sampling Personnel: Matt Dunn, Thelma Marr	**SWL reference level:** ☐ Gattic cover ☐ Lip of steel monument ☐ Top of PVC pipe

Bore Purging

Pumping method:	
☐ Waterra footvalve	☐ 12V electric eg. Monsoon
☐ Hand Bailer	☐ Submersible electric 240V
Pump depth (m):	
Height of Water Column: (Depth of bore – SWL)	**→ Volume of Water in Borehole:**
Pumping period (minutes):	**→ Volume Pumped (L):**
Flow rate (L/min):	

Bore Diameter (mm)	Volume of Water/m (L)
50	2.0
100	7.9

Water Sampling

*Water Quality Meters Calibrated? Yes/No

Water colour ☑ Clear ☐ Reddy/orange ☐ Black ☐ Turbid

Water odour ☐ None ☐ Rotten egg (H_2S) ☐ Other_____

Time	pH	EC *circle units* (µS/cm or mS/cm)	Temp °C	DO (mg/L)	DO%	Salinity (ppt)	Turbidity (ntu)	Free Cl
11:40am	7.6	856	19.28°C	7mg/L	75.7%	0.42	28.3	
11:41am	7.6	856	19.29°C	6.9mg/L	75.6%	0.42	22.5	

Samples for lab analysis: □ Major ions □ Nutrients □ Metals - filtered □ Yes	□ BOD, coliforms and total coliform □ CO_2 and alkalinity □ Suspended solids

Surface ponding check: ☑ None □ <5 cm deep □ 5-10 cm deep □ 10-50 cm deep □ >0.5 m deep	**Vegetation check:** □ Healthy □ Unhealthy eg. leaf discolour □ Dead
Description of surface ponding:	**Description of unhealthy vegetation:**

GROUNDWATER MONITORING RECORD
Lake Conjola

D01

Date: 3 NOV 2014	**Piezometer no.:**
Time: 12:00pm	**SWL (m):** **Bore Depth(m):**
Sampling Personnel: Matt Dunn Thelma man	**SWL reference level:** □ Gattic cover □ Lip of steel monument □ Top of PVC pipe

Bore Purging

Pumping method:
□ Waterra footvalve
□ Hand Bailer
□ 12V electric eg. Monsoon
□ Submersible electric ~~240V~~

Pump depth (m):

Height of Water Column:
(Depth of bore – SWL)

→ **Volume of Water in Borehole:**

Bore Diameter (mm)	Volume of Water/m (L)
50	2.0
100	7.9

Pumping period (minutes):

→ **Volume Pumped (L):**

Flow rate (L/min):

Water Sampling

*Water Quality Meters Calibrated? Yes/No

Water colour
□ Clear
□ Reddy/orange
□ Black
□ Turbid

Water odour
□ None
□ Rotten egg (H_2S)
□ Other_____

Time	pH	EC *circle units* (µS/cm or mS/cm)	Temp °C	DO (mg/L)	DO%	Salinity (ppt)	Turbidity (ntu)	Free Cl

Samples for lab analysis: □ Major ions □ Nutrients □ Metals - filtered □ Yes	□ BOD, coliforms and total coliform □ CO_2 and alkalinity □ Suspended solids

Surface ponding check: □ None □ <5 cm deep □ 5-10 cm deep □ 10-50 cm deep □ >0.5 m deep	**Vegetation check:** □ Healthy □ Unhealthy eg. leaf discolour □ Dead
Description of surfaee ponding:	**Description of unhealthy vegetation:**

GROUNDWATER MONITORING RECORD
Lake Conjola

29

Date: 3 Nov 2014	**Piezometer no.:**
Time: 12:00pm	**SWL (m):** **Bore Depth(m):**
Sampling Personnel: Matt Dunn, Thelma Marr	**SWL reference level:** ☑ Gattic cover ☐ Lip of steel monument ☐ Top of PVC pipe

Bore Purging

Pumping method: ☐ Waterra footvalve ☐ Hand Bailer	☐ 12V electric eg. Monsoon ☐ Submersible electric 240V
Pump depth (m):	
Height of Water Column: (Depth of bore – SWL)	→ **Volume of Water in Borehole:**
Pumping period (minutes): **Flow rate (L/min):**	→ **Volume Pumped (L):**

Bore Diameter (mm)	Volume of Water/m (L)
50	2.0
100	7.9

Water Sampling

*Water Quality Meters Calibrated? Yes/No

Water colour ☐ Clear ☐ Reddy/orange ☐ Turbid ☐ Black	**Water odour** ☐ None ☐ Rotten egg (H_2S) ☐ Other_____

Time	pH	EC *circle units* (µS/cm or mS/cm)	Temp °C	DO (mg/L)	DO%	Salinity (ppt)	Turbidity (ntu)	Free Cl

Samples for lab analysis:	
□ Major ions	□ BOD, coliforms and total coliform
□ Nutrients	□ CO_2 and alkalinity
□ Metals - filtered □ Yes	□ Suspended solids

Surface ponding check:	**Vegetation check:**
□ None □ <5 cm deep □ 5-10 cm deep □ 10-50 cm deep □ >0.5 m deep	□ Healthy □ Unhealthy eg. leaf discolour □ Dead
Description of surface ponding:	**Description of unhealthy vegetation:**

GROUNDWATER MONITORING RECORD
Lake Conjola

D02
758

Date: 3 NOV 2014	**Piezometer no.:**
Time: 12:05pm	**SWL (m):** **Bore Depth(m):** 8.06m
Sampling Personnel: Matt Dunn, Thelma Marr	**SWL reference level:** □ Gattic cover □ Lip of steel monument □ Top of PVC pipe

Bore Purging

Pumping method:

□ Waterra footvalve	□ 12V electric eg. Monsoon
☑ Hand Bailer	□ Submersible electric 240V

Pump depth (m):

Height of Water Column: (Depth of bore – SWL)

→ Volume of Water in Borehole:

Bore Diameter (mm)	Volume of Water/m (L)
50	2.0
100	7.9

Pumping period (minutes):

→ Volume Pumped (L):

Flow rate (L/min):

Water Sampling

*Water Quality Meters Calibrated? Yes/No

Water colour
□ Clear □ Reddy/orange
□ Turbid □ Black

Water odour
□ None □ Other_____
□ Rotten egg (H_2S)

Time	pH	EC *circle units* (µS/cm or mS/cm)	Temp °C	DO (mg/L)	DO%	Salinity (ppt)	Turbidity (ntu)	Free Cl
12:10pm	7.67	843	19.17°C	8.5mg/L	91.5	0.42	4.3	1.06
12:10pm	7.66	841	19.22°C	8.4mg/L	91.6	0.42	3.5	1.06

Samples for lab analysis:	
□ Major ions	□ BOD, coliforms and total coliform
□ Nutrients	□ CO_2 and alkalinity
□ Metals - filtered □ Yes	□ Suspended solids

Surface ponding check:	**Vegetation check:**
□ None	
□ <5 cm deep	☒ Healthy
□ 5-10 cm deep	□ Unhealthy eg. leaf discolour
□ 10-50 cm deep	□ Dead
□ >0.5 m deep	
Description of surface ponding:	**Description of unhealthy vegetation:**

GROUNDWATER MONITORING RECORD
Lake Conjola

MW8s
782

Date: 30 NOV 2014	**Piezometer no.:**
Time: 12:30pm	**SWL (m):** **Bore Depth(m):**
Sampling Personnel: Matt Dunn, Thelma Marl	**SWL reference level:** ☐ Gattic cover ☐ Lip of steel monument ☐ Top of PVC pipe

Bore Purging

Pumping method: ☐ Waterra footvalve ☑ Hand Bailer	☐ 12V electric eg. Monsoon ☐ Submersible electric 240V
Pump depth (m):	
Height of Water Column: (Depth of bore – SWL)	→ **Volume of Water in Borehole:**

Bore Diameter (mm)	Volume of Water/m (L)
50	2.0
100	7.9

Pumping period (minutes):	→ **Volume Pumped (L):**
Flow rate (L/min):	

Water Sampling

*Water Quality Meters Calibrated? Yes/No

Water colour ☐ Clear ☐ Turbid ☐ Reddy/orange ☐ Black	**Water odour** ☐ None ☐ Rotten egg (H_2S) ☐ Other_____

Time	pH	EC *circle units* (µS/cm or mS/cm)	Temp °C	DO (mg/L)	DO%	Salinity (ppt)	Turbidity (ntu)	Free Cl
12:30pm								
12:30pm								

Samples for lab analysis:	
□ Major ions	□ BOD, coliforms and total coliform
□ Nutrients	□ CO_2 and alkalinity
□ Metals - filtered □ Yes	□ Suspended solids

Surface ponding check:	**Vegetation check:**
□ None □ <5 cm deep □ 5-10 cm deep □ 10-50 cm deep □ >0.5 m deep	□ Healthy □ Unhealthy eg. leaf discolour □ Dead
Description of surface ponding:	**Description of unhealthy vegetation:**

DO5d
S01

GROUNDWATER MONITORING RECORD
Lake Conjola

Date: ~~8/11/10~~ 3 NOV 2014	**Piezometer no.:**
Time: 12:35pm	**SWL (m):** **Bore Depth(m):** 8.67m
Sampling Personnel: Matt Dunn Thelma Marr	**SWL reference level:** ☐ Gattic cover ☐ Lip of steel monument ☐ Top of PVC pipe

Bore Purging

Pumping method:

☐ Waterra footvalve
☐ Hand Bailer
☑ 12V electric eg. Monsoon
☐ Submersible electric 240V

Pump depth (m):

Height of Water Column:
(Depth of bore – SWL)

→ Volume of Water in Borehole:

Bore Diameter (mm)	Volume of Water/m (L)
50	2.0
100	7.9

Pumping period (minutes):

→ Volume Pumped (L):

Flow rate (L/min):

Water Sampling

*Water Quality Meters Calibrated? Yes/No

Water colour
☐ Clear
☐ Reddy/orange
☐ Black
☐ Turbid

Water odour
☐ None
☐ Rotten egg (H_2S)
☐ Other_____

Time	pH	EC *circle units* (µS/cm or mS/cm)	Temp °C	DO (mg/L)	DO%	Salinity (ppt)	Turbidity (ntu)	Free Cl
12:35pm	7.86	621	20.76°C	4.9mg/L	54.5%	0.30	1.6	1.08
12:35pm	7.87	620	20.86°C	4.9mg/L	54.7%	0.30	1.6	1.08

Samples for lab analysis:	
□ Major ions	□ BOD, coliforms and total coliform
□ Nutrients	□ CO_2 and alkalinity
□ Metals - filtered □ Yes	□ Suspended solids

Surface ponding check:	**Vegetation check:**
☑ None	☑ Healthy
□ <5 cm deep	□ Unhealthy eg. leaf discolour
□ 5-10 cm deep	□ Dead
□ 10-50 cm deep	
□ >0.5 m deep	
Description of surface ponding:	**Description of unhealthy vegetation:**

DOSs
804

GROUNDWATER MONITORING RECORD
Lake Conjola

Date: 3 NOV 2014	**Piezometer no.:**
Time: 12:35pm	**SWL (m):** **Bore Depth(m):** 8.44m
Sampling Personnel: Mark Dunn, Thelma Maw	**SWL reference level:** ☐ Gattic cover ☐ Lip of steel monument ☐ Top of PVC pipe

Bore Purging

Pumping method:	
☐ Waterra footvalve	☑ 12V electric eg. Monsoon
☐ Hand Bailer	☐ Submersible electric 240V
Pump depth (m):	
Height of Water Column: (Depth of bore – SWL)	→ **Volume of Water in Borehole:**
Pumping period (minutes):	→ **Volume Pumped (L):**
Flow rate (L/min):	

Bore Diameter (mm)	Volume of Water/m (L)
50	2.0
100	7.9

Water Sampling

*Water Quality Meters Calibrated? Yes/No

* Note battery failed – need to hand bail

Water colour ☑ Clear ☐ Reddy/orange ☐ Black ☐ Turbid then TURBID when hand bailed

Water odour ☑ None ☐ Rotten egg (H_2S) ☐ Other_____

Time	pH	EC (µS/cm or mS/cm) *circle units*	Temp °C	DO (mg/L)	DO%	Salinity (ppt)	Turbidity (ntu)	Free Cl
12:40pm	7.82	579	22.87°C	6.2mg/L	72.7%	0.29	1.6	1.08
12:40pm	7.82	579	22.86°C	6.2mg/L	72.8%	0.29	1.6	1.08

Samples for lab analysis:	
□ Major ions	□ BOD, coliforms and total coliform
□ Nutrients	□ CO_2 and alkalinity
□ Metals - filtered □ Yes	□ Suspended solids

Surface ponding check:	**Vegetation check:**
□ None □ <5 cm deep □ 5-10 cm deep □ 10-50 cm deep □ >0.5 m deep	□ Healthy □ Unhealthy eg. leaf discolour □ Dead
Description of surface ponding:	**Description of unhealthy vegetation:**

MB2 d
DB 769

GROUNDWATER MONITORING RECORD
Lake Conjola

Date: 3 NOV 2014	**Piezometer no.:**
Time: 12:50	**SWL (m):** **Bore Depth(m):**
Sampling Personnel: Thelma Mew Matt Dunn	**SWL reference level:** □ Gattie cover □ Lip of steel monument □ Top of PVC pipe

Bore Purging

Pumping method:

□ ~~Waterra~~ footvalve	□ 12V electric eg. Monsoon
☑ Hand Bailer	□ Submersible electric 240V

Pump depth (m):

Height of Water Column:
(Depth of bore – SWL)

→ Volume of Water in Borehole:

Bore Diameter (mm)	Volume of Water/m (L)
50	2.0
100	7.9

Pumping period (minutes):

→ Volume Pumped (L):

Flow rate (L/min):

Water Sampling

*Water Quality Meters Calibrated? Yes/No

Water colour
☑ Clear
□ Reddy/orange
□ Black
□ Turbid

Water odour
☑ None
□ Other_____
□ Rotten egg (H_2S)

Time	pH	EC *circle units* (µS/cm or mS/cm)	Temp °C	DO (mg/L)	DO%	Salinity (ppt)	Turbidity (ntu)	Free Cl
12·50	7·94	737	21.95°C	3.9mg/L	44.5%	0.37	57.5	0.90
12·50	7·93	735	22.11°C	3.9mg/L	44.5%	0.37	57.1	0.90

Samples for lab analysis:	
□ Major ions	□ BOD, coliforms and total coliform
□ Nutrients	□ CO_2 and alkalinity
□ Metals - filtered □ Yes	□ Suspended solids

Surface ponding check:	**Vegetation check:**
□ None □ <5 cm deep □ 5-10 cm deep □ 10-50 cm deep □ >0.5 m deep	□ Healthy □ Unhealthy eg. leaf discolour □ Dead
Description of surface ponding:	**Description of unhealthy vegetation:**

Mb2s
760

GROUNDWATER MONITORING RECORD
Lake Conjola

Date:	**Piezometer no.:**
Time:	**SWL (m):** **Bore Depth(m):**
Sampling Personnel:	**SWL reference level:** □ Gattic cover □ Lip of steel monument □ Top of PVC pipe

Bore Purging

Pumping method:
□ Waterra footvalve
□ Hand Bailer
□ 12V electric eg. Monsoon
□ Submersible electric 240V

Pump depth (m):

Height of Water Column:
(Depth of bore – SWL)

→ Volume of Water in Borehole:

Bore Diameter (mm)	Volume of Water/m (L)
50	2.0
100	7.9

Pumping period (minutes):

→ Volume Pumped (L):

Flow rate (L/min):

DRY

Water Sampling

*Water Quality Meters Calibrated? Yes/No

Water colour
□ Clear
□ Reddy/orange
□ Black
□ Turbid

Water odour
□ None
□ Rotten egg (H_2S)
□ Other_____

Time	pH	EC *circle units* (µS/cm or mS/cm)	Temp °C	DO (mg/L)	DO%	Salinity (ppt)	Turbidity (ntu)	Free Cl

Samples for lab analysis: □ Major ions □ Nutrients □ Metals - filtered □ Yes	□ BOD, coliforms and total coliform □ CO_2 and alkalinity □ Suspended solids

Surface ponding check: □ None □ <5 cm deep □ 5-10 cm deep □ 10-50 cm deep □ >0.5 m deep	**Vegetation check:** □ Healthy □ Unhealthy eg. leaf discolour □ Dead
Description of surface ponding:	**Description of unhealthy vegetation:**

DO3
759

GROUNDWATER MONITORING RECORD
Lake Conjola

Date: 3 NOV 2014	**Piezometer no.:**
Time: 12:30pm	**SWL (m):** **Bore Depth(m):** 7.6m
Sampling Personnel: Matt Dunn, Thelma Marr	**SWL reference level:** ☐ Gattic cover ☐ Lip of steel monument ☐ Top of PVC pipe

Bore Purging

Pumping method:
- ☐ Waterra footvalve
- ☑ Hand Bailer
- ☐ 12V electric eg. Monsoon
- ☐ Submersible electric 240V

Pump depth (m):

Height of Water Column: (Depth of bore – SWL)

→ Volume of Water in Borehole:

Bore Diameter (mm)	Volume of Water/m (L)
50	2.0
100	7.9

Pumping period (minutes):

→ Volume Pumped (L):

Flow rate (L/min):

Water Sampling

*Water Quality Meters Calibrated? Yes/No

Water colour
- ☑ Clear
- ☐ Reddy/orange
- ☐ Black
- ☐ Turbid

Water odour
- ☐ None
- ☐ Rotten egg (H_2S)
- ☐ Other_____

Time	pH	EC (µS/cm or mS/cm) *circle units*	Temp °C	DO (mg/L)	DO%	Salinity (ppt)	Turbidity (ntu)	Free Cl
1:00pm	7.43	708	23.28°C	4.3mg/L	50.6%	0.33	49.7	0.93
1:00pm	7.41	710	23.45°C	4.3mg/L	50.8%	0.33	45.4	0.93

Samples for lab analysis:	
☐ Major ions	☐ BOD, coliforms and total coliform
☐ Nutrients	☐ CO_2 and alkalinity
☐ Metals - filtered ☐ Yes	☐ Suspended solids

Surface ponding check:	**Vegetation check:**
☐ None	☐ Healthy
☐ <5 cm deep	☐ Unhealthy eg. leaf discolour
☐ 5-10 cm deep	☐ Dead
☐ 10-50 cm deep	
☐ >0.5 m deep	
Description of surface ponding:	**Description of unhealthy vegetation:**

MW7a
803

GROUNDWATER MONITORING RECORD
Lake Conjola

Date:	**Piezometer no.:**
Time:	**SWL (m):** **Bore Depth(m):**
Sampling Personnel:	**SWL reference level:** □ Gattic cover □ Lip of steel monument □ Top of PVC pipe

Bore Purging

Pumping method: □ Waterra footvalve □ Hand Bailer	□ 12V electric eg. Monsoon □ Submersible electric 240V
Pump depth (m):	
Height of Water Column: (Depth of bore – SWL)	→ **Volume of Water in Borehole:** Bore Diameter (mm) / Volume of Water/m (L) 50 / 2.0 100 / 7.9
Pumping period (minutes): **Flow rate (L/min):**	→ **Volume Pumped (L):**

Water Sampling

*Water Quality Meters Calibrated? Yes/No

Water colour □ Clear □ Reddy/orange □ Turbid □ Black	**Water odour** □ None □ Other_____ □ Rotten egg (H_2S)

Time	pH	EC (µS/cm or mS/cm) *circle units*	Temp °C	DO (mg/L)	DO%	Salinity (ppt)	Turbidity (ntu)	Free Cl

Samples for lab analysis:	
□ Major ions	□ BOD, coliforms and total coliform
□ Nutrients	□ CO_2 and alkalinity
□ Metals - filtered □ Yes	□ Suspended solids

Surface ponding check:	**Vegetation check:**
□ None □ <5 cm deep □ 5-10 cm deep □ 10-50 cm deep □ >0.5 m deep	□ Healthy □ Unhealthy eg. leaf discolour □ Dead
Description of surface ponding:	**Description of unhealthy vegetation:**

N/a

770 - BH 20 1.82 metres
20/1/15 1:40pm

ph – 6.51	6.51
temp – 19.3°C	19.36°C
Salin – 0.23	0.23
DO – 2.6mg	2.6mg
DO% – 28.7%	28.7%
EC – 454	459
Turbidity – 3.1	2.7

- Yellow
- Sulphur

770 BH 19 1.57 metres
20/1/15 1:45pm

ph - 6.06	6.06
temp - 19.10°C	19.22°C
Sal - 0.15	0.15
DO - 3.1	3.1
DO% - 33.7%	33.5%
EC - 333	332
Turb - 3.1	2.7

- slightly yellow
- slight smell

Bh28
756

GROUNDWATER MONITORING RECORD
Lake Conjola

Date: 20 January 2015	**Piezometer no.:**
Time: 11:40am	**SWL (m):** 7.02 m **Bore Depth(m):**
Sampling Personnel: Matt Dunn, Thelma Mark, Sarah Kacir	**SWL reference level:** □ Gattic cover □ Lip of steel monument □ Top of PVC pipe

Bore Purging

Pumping method: □ Waterra footvalve □ Hand Bailer	□ 12V electric eg. Monsoon □ Submersible electric 240V
Pump depth (m):	
Height of Water Column: (Depth of bore – SWL)	→ **Volume of Water in Borehole:**
Pumping period (minutes):	→ **Volume Pumped (L):**
Flow rate (L/min):	

Bore Diameter (mm)	Volume of Water/m (L)
50	2.0
100	7.9

Water Sampling

*Water Quality Meters Calibrated? Yes/No

Water colour □ Clear ☑ Turbid cloudy □ Reddy/orange □ Black	**Water odour** ☑ None □ Rotten egg (H_2S) □ Other_____

Time	pH	EC (µS/cm or mS/cm) *circle units*	Temp °C	DO (mg/L)	DO%	Salinity (ppt)	Turbidity (ntu)	Free Cl
11:40am	7.85	1166	19.26°C	1.9mg	20.7%	0.59	76.9	
11:41am	7.85	1164	19.32°C	1.9mg	20.7%	0.59	77.3	

Samples for lab analysis:	
□ Major ions	□ BOD, coliforms and total coliform
□ Nutrients	□ CO_2 and alkalinity
□ Metals - filtered □ Yes	□ Suspended solids

Surface ponding check:	**Vegetation check**:
□ None □ <5 cm deep □ 5-10 cm deep □ 10-50 cm deep □ >0.5 m deep	□ Healthy □ Unhealthy eg. leaf discolour □ Dead
Description of surface ponding:	**Description of unhealthy vegetation:**

E-29
Bh 25 East of Bh 28

GROUNDWATER MONITORING RECORD
Lake Conjola

Date: 20 January 2015	**Piezometer no.:**
Time:	**SWL (m):** **Bore Depth(m):**
Sampling Personnel:	**SWL reference level:** □ Gattic cover □ Lip of steel monument □ Top of PVC pipe

Bore Purging

Pumping method: □ Waterra footvalve □ Hand Bailer	□ 12V electric eg. Monsoon □ Submersible electric 240V
Pump depth (m):	
Height of Water Column: (Depth of bore – SWL)	→ **Volume of Water in Borehole:**
Pumping period (minutes): **Flow rate (L/min):**	→ **Volume Pumped (L):**

Bore Diameter (mm)	Volume of Water/m (L)
50	2.0
100	7.9

Water Sampling

*Water Quality Meters Calibrated? Yes/No

Water colour □ Clear □ Turbid □ Reddy/orange □ Black	**Water odour** ☑ Other_____ □ None □ Rotten egg (H_2S)

Time	pH	EC *circle units* (µS/cm or mS/cm)	Temp °C	DO (mg/L)	DO%	Salinity (ppt)	Turbidity (ntu)	Free Cl

Samples for lab analysis:	
□ Major ions	□ BOD, coliforms and total coliform
□ Nutrients	□ CO_2 and alkalinity
□ Metals - filtered □ Yes	□ Suspended solids

Surface ponding check:	**Vegetation check**:
□ None □ <5 cm deep □ 5-10 cm deep □ 10-50 cm deep □ >0.5 m deep	□ Healthy □ Unhealthy eg. leaf discolour □ Dead
Description of surface ponding:	**Description of unhealthy vegetation:**

E-31
Bh 150m East
Bh 28

GROUNDWATER MONITORING RECORD
Lake Conjola

Date: 20 January 2015	**Piezometer no.:**
Time: 12:09pm	**SWL (m):** 4.85 **Bore Depth(m):**
Sampling Personnel: Matt Dunn, Thelma Marr, Sarah Kacir	**SWL reference level:** ☐ Gattic cover ☐ Lip of steel monument ☐ Top of PVC pipe

Bore Purging

Pumping method:	
☐ Waterra footvalve	☐ 12V electric eg. Monsoon
☐ Hand Bailer	☐ Submersible electric 240V
Pump depth (m):	
Height of Water Column: (Depth of bore – SWL)	→ **Volume of Water in Borehole:**

Bore Diameter (mm)	Volume of Water/m (L)
50	2.0
100	7.9

Pumping period (minutes):	→ **Volume Pumped (L):**
Flow rate (L/min):	

Water Sampling

*Water Quality Meters Calibrated? Yes/No

Water colour ☑ Clear ☐ Turbid ☐ Reddy/orange ☐ Black	**Water odour** ☐ None ☑ Rotten egg (H_2S) (slight) ☐ Other_____

Time	pH	EC *circle units* (µS/cm or mS/cm)	Temp °C	DO (mg/L)	DO%	Salinity (ppt)	Turbidity (ntu)	Free Cl
12:09pm	8.15	874	19.44°C	5.8mg	63.4%	0.42	3.5	
12:01pm	8.15	871	19.55°C	5.8mg	63.3%	0.42	1.6	

Samples for lab analysis: □ Major ions □ Nutrients □ Metals - filtered □ Yes	□ BOD, coliforms and total coliform □ CO_2 and alkalinity □ Suspended solids

Surface ponding check: □ None □ <5 cm deep □ 5-10 cm deep □ 10-50 cm deep □ >0.5 m deep	**Vegetation check**: ☑ Healthy □ Unhealthy eg. leaf discolour □ Dead
Description of surface ponding:	**Description of unhealthy vegetation:**

D01
757

GROUNDWATER MONITORING RECORD
Lake Conjola

Date:	Piezometer no.:
Time:	SWL (m): 9.81m Bore Depth(m):
Sampling Personnel:	SWL reference level: □ Gattic cover □ Lip of steel monument □ Top of PVC pipe

→ hit water — not enough to sample

Bore Purging

Pumping method: □ Waterra footvalve □ Hand Bailer	□ 12V electric eg. Monsoon □ Submersible electric 240V
Pump depth (m):	
Height of Water Column: (Depth of bore – SWL)	→ Volume of Water in Borehole: Bore Diameter (mm) / Volume of Water/m (L) 50 / 2.0 100 / 7.9
Pumping period (minutes): Flow rate (L/min):	→ Volume Pumped (L):

Water Sampling

*Water Quality Meters Calibrated? Yes/No

Water colour □ Clear □ Reddy/orange □ Turbid □ Black	Water odour □ None □ Other_____ □ Rotten egg (H_2S)

Time	pH	EC *circle units* (µS/cm or mS/cm)	Temp °C	DO (mg/L)	DO%	Salinity (ppt)	Turbidity (ntu)	Free Cl

Samples for lab analysis:	
□ Major ions	□ BOD, coliforms and total coliform
□ Nutrients	□ CO_2 and alkalinity
□ Metals - filtered □ Yes	□ Suspended solids

Surface ponding check:	**Vegetation check:**
□ None □ <5 cm deep □ 5-10 cm deep □ 10-50 cm deep □ >0.5 m deep	□ Healthy □ Unhealthy eg. leaf discolour □ Dead
Description of surface ponding: n/a	**Description of unhealthy vegetation:**

D02
758

GROUNDWATER MONITORING RECORD
Lake Conjola

Date: 20 January 2015	**Piezometer no.:**
Time: 12:30 pm	**SWL (m):** 8.17m **Bore Depth(m):**
Sampling Personnel: Matt Dunn, Thelma Mann, Sarah Kacir	**SWL reference level:** ☐ Gattic cover ☐ Lip of steel monument ☐ Top of PVC pipe

Bore Purging

Pumping method:
☐ Waterra footvalve
☐ Hand Bailer
☐ 12V electric eg. Monsoon
☐ Submersible electric 240V

Pump depth (m):

Height of Water Column:
(Depth of bore – SWL)

→ Volume of Water in Borehole:

Bore Diameter (mm)	Volume of Water/m (L)
50	2.0
100	7.9

Pumping period (minutes):

→ Volume Pumped (L):

Flow rate (L/min):

Water Sampling

*Water Quality Meters Calibrated? Yes/No

Water colour
☑ Clear
☐ Reddy/orange
☐ Black
☐ Turbid

Water odour
☐ None
☐ Rotten egg (H_2S)
☐ Other_____

Time	pH	EC *circle units* (µS/cm or mS/cm)	Temp °C	DO (mg/L)	DO%	Salinity (ppt)	Turbidity (ntu)	Free Cl
12:30pm	7.96	777	20.99°C	7.3mg	81.7%	0.38	4.3	0.04
12:31pm	7.96	777	21.02°C	7.3mg	81.8%	0.38	3.5	0.04

Samples for lab analysis: □ Major ions □ Nutrients □ Metals - filtered □ Yes	□ BOD, coliforms and total coliform □ CO_2 and alkalinity □ Suspended solids

Surface ponding check: □ None □ <5 cm deep □ 5-10 cm deep □ 10-50 cm deep □ >0.5 m deep	**Vegetation check**: □ Healthy □ Unhealthy eg. leaf discolour □ Dead
Description of surface ponding:	**Description of unhealthy vegetation:**

782
MW85

GROUNDWATER MONITORING RECORD
Lake Conjola

Date:	**Piezometer no.:**
Time:	**SWL (m):** **Bore Depth(m):**
Sampling Personnel:	**SWL reference level:** □ Gattic cover □ Lip of steel monument □ Top of PVC pipe

Bore Purging

Pumping method: □ Waterra footvalve □ Hand Bailer	□ 12V electric eg. Monsoon □ Submersible electric 240V
Pump depth (m):	
Height of Water Column: (Depth of bore – SWL)	→ **Volume of Water in Borehole:** Bore Diameter (mm) / Volume of Water/m (L) 50 / 2.0 100 / 7.9
Pumping period (minutes): **Flow rate (L/min):**	→ **Volume Pumped (L):**

Water Sampling

*Water Quality Meters Calibrated? Yes/No

Water colour □ Clear □ Reddy/orange □ Turbid □ Black	**Water odour** □ None □ Other_____ □ Rotten egg (H_2S)

Time	pH	EC *circle units* (µS/cm or mS/cm)	Temp °C	DO (mg/L)	DO%	Salinity (ppt)	Turbidity (ntu)	Free Cl

Samples for lab analysis:	
□ Major ions	□ BOD, coliforms and total coliform
□ Nutrients	□ CO_2 and alkalinity
□ Metals - filtered □ Yes	□ Suspended solids

Surface ponding check:	**Vegetation check:**
□ None □ <5 cm deep □ 5-10 cm deep □ 10-50 cm deep □ >0.5 m deep	□ Healthy □ Unhealthy eg. leaf discolour □ Dead
Description of surface ponding:	**Description of unhealthy vegetation:**

D03
759

GROUNDWATER MONITORING RECORD
Lake Conjola

Date: 20 January 2015	**Piezometer no.:**
Time: 1:00pm	**SWL (m):** 7.65m **Bore Depth(m):**
Sampling Personnel: Matt Dunn, Thelma Mar, Sarah Kacir	**SWL reference level:** ☐ Gattic cover ☐ Lip of steel monument ☐ Top of PVC pipe

Bore Purging

Pumping method:
☐ Waterra footvalve ☐ 12V electric eg. Monsoon
☐ Hand Bailer ☐ Submersible electric 240V

Pump depth (m):

Height of Water Column: (Depth of bore – SWL)

→ Volume of Water in Borehole:

Bore Diameter (mm)	Volume of Water/m (L)
50	2.0
100	7.9

Pumping period (minutes):

→ Volume Pumped (L):

Flow rate (L/min):

Water Sampling

*Water Quality Meters Calibrated? Yes/No

Water colour ☑ Clear ☐ Reddy/orange ☐ Black ☐ Turbid

Water odour ☑ None ☐ Other_____ ☐ Rotten egg (H_2S)

Time	pH	EC *circle units* (µS/cm or mS/cm)	Temp °C	DO (mg/L)	DO%	Salinity (ppt)	Turbidity (ntu)	Free Cl
1:00pm	7.97	737	19.95°C	3.2mg	35.3%	0.36	4.3	0.07
1:01pm	7.97	741	20.01°C	3.2mg	35.3%	0.36	3.5	0.07

Samples for lab analysis:	
□ Major ions	□ BOD, coliforms and total coliform
□ Nutrients	□ CO_2 and alkalinity
□ Metals - filtered □ Yes	□ Suspended solids

Surface ponding check:	**Vegetation check**:
□ None	
□ <5 cm deep	□ Healthy
□ 5-10 cm deep	□ Unhealthy eg. leaf discolour
□ 10-50 cm deep	□ Dead
□ >0.5 m deep	
Description of surface ponding:	**Description of unhealthy vegetation:**

; S

GROUNDWATER MONITORING RECORD
Lake Conjola

Date: 20 January 2015	**Piezometer no.:**
Time: 1:10pm	**SWL (m):** 8·38m **Bore Depth(m):**
Sampling Personnel: Matt Dunn Sarah Kacir Thelma Marr	**SWL reference level:** ☐ Gattic cover ☐ Lip of steel monument ☐ Top of PVC pipe

Bore Purging

Pumping method:

☐ Waterra footvalve ☐ 12V electric eg. Monsoon

☐ Hand Bailer ☐ Submersible electric 240V

Pump depth (m):

Height of Water Column: (Depth of bore – SWL)

→ Volume of Water in Borehole:

Bore Diameter (mm)	Volume of Water/m (L)
50	2.0
100	7.9

Pumping period (minutes):

→ Volume Pumped (L):

Flow rate (L/min):

Water Sampling

*Water Quality Meters Calibrated? Yes/No

Water colour ☐ Clear ☑ Turbid ☐ Reddy/orange ☐ Black

Water odour ☑ None ☐ Rotten egg (H_2S) ☐ Other_____

Time	pH	EC *circle units* (µS/cm or mS/cm)	Temp °C	DO (mg/L)	DO%	Salinity (ppt)	Turbidity (ntu)	Free Cl
1:10pm	7·89	822	21·7°C	2·4	27·4%	0·40	600	cannot sample
1:11pm	7·90	821	21·71°C	2·4	27·4%	0·40	600	" "

Samples for lab analysis:	
□ Major ions	□ BOD, coliforms and total coliform
□ Nutrients	□ CO_2 and alkalinity
□ Metals - filtered □ Yes	□ Suspended solids

Surface ponding check:	**Vegetation check**:
□ None □ <5 cm deep □ 5-10 cm deep □ 10-50 cm deep □ >0.5 m deep	□ Healthy □ Unhealthy eg. leaf discolour □ Dead
Description of surface ponding:	**Description of unhealthy vegetation:**

801
DOSd

GROUNDWATER MONITORING RECORD
Lake Conjola

Date: 20 January 2015	**Piezometer no.:**
Time: 1:10pm	**SWL (m):** 8.61m **Bore Depth(m):**
Sampling Personnel: Matt Dunn, Thelma Marr, Sarah Kacir	**SWL reference level:** □ Gattic cover □ Lip of steel monument □ Top of PVC pipe

Bore Purging

Pumping method:
□ Waterra footvalve
□ Hand Bailer
□ 12V electric eg. Monsoon
□ Submersible electric 240V

Pump depth (m):

Height of Water Column:
(Depth of bore – SWL)

→ **Volume of Water in Borehole:**

Bore Diameter (mm)	Volume of Water/m (L)
50	2.0
100	7.9

Pumping period (minutes):

→ **Volume Pumped (L):**

Flow rate (L/min):

Water Sampling

*Water Quality Meters Calibrated? Yes/No

Water colour
☑ Clear
□ Turbid
□ Reddy/orange
□ Black

Water odour
☑ None
□ Rotten egg (H_2S)
□ Other_____

Time	pH	EC (µS/cm or mS/cm) *circle units*	Temp °C	DO (mg/L)	DO%	Salinity (ppt)	Turbidity (ntu)	Free Cl
1:10pm	7.93	592	20.6[illegible]°C	6.2	69.2%	0.27	21	0.00
1:10pm	7.92	592	20.62°C	6.2	69.3%	0.27	20.6	0.00

Samples for lab analysis: □ Major ions □ Nutrients □ Metals - filtered □ Yes	□ BOD, coliforms and total coliform □ CO_2 and alkalinity □ Suspended solids

Surface ponding check: □ None □ <5 cm deep □ 5-10 cm deep □ 10-50 cm deep □ >0.5 m deep	**Vegetation check**: □ Healthy □ Unhealthy eg. leaf discolour □ Dead
Description of surface ponding:	**Description of unhealthy vegetation:**

715
VS

GROUNDWATER MONITORING RECORD
Lake Conjola

Date: 20 January 2015	**Piezometer no.:**
Time: 1:30pm	**SWL (m):** **Bore Depth(m):**
Sampling Personnel: Matt Dunn, Thelma Mann, Sarah Kaesler	**SWL reference level:** ☐ Gattic cover ☐ Lip of steel monument ☐ Top of PVC pipe

Bore Purging

Pumping method:

☐ Waterra footvalve ☐ 12V electric eg. Monsoon

☐ Hand Bailer ☐ Submersible electric 240V

Pump depth (m):

Height of Water Column: (Depth of bore – SWL)

→ Volume of Water in Borehole:

Bore Diameter (mm)	Volume of Water/m (L)
50	2.0
100	7.9

Pumping period (minutes): **→ Volume Pumped (L):**

Flow rate (L/min):

Water Sampling

*Water Quality Meters Calibrated? Yes/No

Water colour ☑ Reddy/orange ☐ Clear ☐ Black ☐ Turbid

Water odour ☐ Other_____ ☐ None ☑ Rotten egg (H_2S) (very)

Time	pH	EC *circle units* (µS/cm or mS/cm)	Temp °C	DO (mg/L)	DO%	Salinity (ppt)	Turbidity (ntu)	Free Cl
1:30 pm	5.51	3.93	19.54°c	2.2mg	23.6%	0.2	2.7	0.01
1:30pm	5.53	393	19.61°c	2.2mg	23.6%	0.2	1.9	0.01

Samples for lab analysis:	
□ Major ions	□ BOD, coliforms and total coliform
□ Nutrients	□ CO_2 and alkalinity
□ Metals - filtered □ Yes	□ Suspended solids

Surface ponding check:	**Vegetation check**:
□ None □ <5 cm deep □ 5-10 cm deep □ 10-50 cm deep □ >0.5 m deep	□ Healthy □ Unhealthy eg. leaf discolour □ Dead
Description of surface ponding:	**Description of unhealthy vegetation:**

716
MB5

GROUNDWATER MONITORING RECORD
Lake Conjola

Date: 20 January 2015	**Piezometer no.:**
Time: 11:20am	**SWL (m):** 1.91m **Bore Depth(m):**
Sampling Personnel: Matt Dunn, Thelma Mar-, Sarah Kacir	**SWL reference level:** ☐ Gattic cover ☐ Lip of steel monument ☐ Top of PVC pipe

Bore Purging

Pumping method: ☐ Waterra footvalve ☐ Hand Bailer	☐ 12V electric eg. Monsoon ☐ Submersible electric 240V
Pump depth (m):	
Height of Water Column: (Depth of bore – SWL)	→ **Volume of Water in Borehole:**

Bore Diameter (mm)	Volume of Water/m (L)
50	2.0
100	7.9

Pumping period (minutes): **Flow rate (L/min):**	→ **Volume Pumped (L):**

Water Sampling

*Water Quality Meters Calibrated? Yes/No

Water colour ☐ Clear ☐ Turbid ☐ Reddy/orange ☐ Black ☑ Yellow	**Water odour** ☐ Other_____ ☐ None ☐ Rotten egg (H_2S)

Time	pH	EC *circle units* (µS/cm or mS/cm)	Temp °C	DO (mg/L)	DO%	Salinity (ppt)	Turbidity (ntu)	Free Cl
11:20am	5.5	108	21.17°C	8.5mg	96.2%	0.04	3.1	2.20
11:21am	5.53	102	21.17°C	8.5mg	95.9%	0.04	≥1.9	2.20

Samples for lab analysis:	
□ Major ions	□ BOD, coliforms and total coliform
□ Nutrients	□ CO_2 and alkalinity
□ Metals - filtered □ Yes	□ Suspended solids

Surface ponding check:	**Vegetation check:**
☑ None	☑ Healthy
□ <5 cm deep	□ Unhealthy eg. leaf discolour
□ 5-10 cm deep	□ Dead
□ 10-50 cm deep	
□ >0.5 m deep	
Description of surface ponding:	**Description of unhealthy vegetation:**

802
MW76

GROUNDWATER MONITORING RECORD
Lake Conjola

Date: 20 January 2015	**Piezometer no.:**
Time: 11:10am	**SWL (m):** 3.72m **Bore Depth(m):**
Sampling Personnel: Matt Dunn, Thelma Mark, Sarah Kaur	**SWL reference level:** ☐ Gattic cover ☐ Lip of steel monument ☐ Top of PVC pipe

Bore Purging

Pumping method:

☐ Waterra footvalve ☐ 12V electric eg. Monsoon

☐ Hand Bailer ☐ Submersible electric 240V

Pump depth (m):

Height of Water Column: (Depth of bore – SWL)

→ **Volume of Water in Borehole:**

Bore Diameter (mm)	Volume of Water/m (L)
50	2.0
100	7.9

Pumping period (minutes):

→ **Volume Pumped (L):**

Flow rate (L/min):

Water Sampling

*Water Quality Meters Calibrated? Yes/No

Water colour ☐ Clear ☐ Reddy/orange ☐ Black ☑ Yellow ☐ Turbid

Water odour ☐ None ☐ Other_____ ☑ Rotten egg (H_2S) (slight)

Time	pH	EC (µS/cm or mS/cm) *circle units*	Temp °C	DO (mg/L)	DO%	Salinity (ppt)	Turbidity (ntu)	Free Cl
11:10am	6.27	63	20.06°C	1.5mg	16.7%	0.02	0.8	
11:11am	6.26	63	20.09°C	1.5mg	16.7%	0.02	0.4	

Samples for lab analysis:	
□ Major ions	□ BOD, coliforms and total coliform
□ Nutrients	□ CO_2 and alkalinity
□ Metals - filtered □ Yes	□ Suspended solids

Surface ponding check:	**Vegetation check**:
☑ None	☑ Healthy
□ <5 cm deep	□ Unhealthy eg. leaf discolour
□ 5-10 cm deep	□ Dead
□ 10-50 cm deep	
□ >0.5 m deep	
Description of surface ponding:	**Description of unhealthy vegetation:**

#764

GROUNDWATER MONITORING RECORD
Lake Conjola

Date: 20 January 2015	**Piezometer no.:**
Time: 10:55am	**SWL (m):** N/a **Bore Depth(m):**
Sampling Personnel: Matt Dunn, Sarah Kacir, Thelma Marr	**SWL reference level:** □ Gattic cover □ Lip of steel monument □ Top of PVC pipe

Bore Purging

Pumping method:	
□ Waterra footvalve	□ 12V electric eg. Monsoon
□ Hand Bailer	□ Submersible electric 240V
Pump depth (m):	
Height of Water Column: (Depth of bore – SWL)	→ **Volume of Water in Borehole:**

Bore Diameter (mm)	Volume of Water/m (L)
50	2.0
100	7.9

Pumping period (minutes):	→ **Volume Pumped (L):**
Flow rate (L/min):	

Water Sampling

*Water Quality Meters Calibrated? Yes/No

Water colour ☑ Clear □ Turbid □ Reddy/orange □ Black	**Water odour** ☑ None □ Rotten egg (H_2S) □ Other_____

Time	pH	EC *circle units* (µS/cm or mS/cm)	Temp °C	DO (mg/L)	DO%	Salinity (ppt)	Turbidity (ntu)	Free Cl
10:55am	7.36	644	22.46°C	3.5mg	39.9%	0.31	3.1	
10:55am	7.36	644	22.45°C	3.5mg	39.9%	0.31	2.3	

Samples for lab analysis: □ Major ions □ Nutrients □ Metals - filtered □ Yes	□ BOD, coliforms and total coliform □ CO_2 and alkalinity □ Suspended solids

Surface ponding check: ☑ None □ <5 cm deep □ 5-10 cm deep □ 10-50 cm deep □ >0.5 m deep	**Vegetation check**: ☑ Healthy □ Unhealthy eg. leaf discolour □ Dead
Description of surface ponding:	**Description of unhealthy vegetation:**

Caravan 294/295
Site 763

GROUNDWATER MONITORING RECORD
Lake Conjola

Date: 20 January 2015	**Piezometer no.:**
Time: 10:40am	**SWL (m):** N/a **Bore Depth(m):**
Sampling Personnel: Matt Dunn, Sarah Kacir, Thelma Marr	**SWL reference level:** ☐ Gattic cover ☐ Lip of steel monument ☐ Top of PVC pipe

Bore Purging

Pumping method:
☐ Waterra footvalve
☐ Hand Bailer
☐ 12V electric eg. Monsoon
☐ Submersible electric 240V

Pump depth (m):

Height of Water Column:
(Depth of bore – SWL)

→ Volume of Water in Borehole:

Bore Diameter (mm)	Volume of Water/m (L)
50	2.0
100	7.9

Pumping period (minutes):

→ Volume Pumped (L):

Flow rate (L/min):

Water Sampling

*Water Quality Meters Calibrated? Yes/No

Water colour
☑ Clear
☐ Reddy/orange
☐ Black
☐ Turbid

Water odour
☑ None
☐ Other_____
☐ Rotten egg (H_2S)

Time	pH	EC *circle units* (µS/cm or mS/cm)	Temp °C	DO (mg/L)	DO%	Salinity (ppt)	Turbidity (ntu)	Free Cl
10:40am	7.82	1303	23.93°C	3.2mg	37.7%	0.66	4.7	
10:41am	7.82	1301	23.8°C	3.2mg	37.9%	0.66	4.7	

Samples for lab analysis:	
□ Major ions	□ BOD, coliforms and total coliform
□ Nutrients	□ CO_2 and alkalinity
□ Metals - filtered □ Yes	□ Suspended solids

Surface ponding check:	**Vegetation check**:
☑ None	☑ Healthy
□ <5 cm deep	□ Unhealthy eg. leaf discolour
□ 5-10 cm deep	□ Dead
□ 10-50 cm deep	
□ >0.5 m deep	
Description of surface ponding:	**Description of unhealthy vegetation:**

MBIS
761

GROUNDWATER MONITORING RECORD
Lake Conjola

Date: 20 January 2015	**Piezometer no.:**
Time: 10:05am	**SWL (m):** 1.38m **Bore Depth(m):**
Sampling Personnel: Matt Dunn, Thelma Marr, Sarah Kuncir	**SWL reference level:** ☐ Gattic cover ☐ Lip of steel monument ☐ Top of PVC pipe

Bore Purging

Pumping method:
☐ Waterra footvalve
☐ Hand Bailer
☐ 12V electric eg. Monsoon
☐ Submersible electric 240V

Pump depth (m):

Height of Water Column:
(Depth of bore – SWL)

→ **Volume of Water in Borehole:**

Bore Diameter (mm)	Volume of Water/m (L)
50	2.0
100	7.9

Pumping period (minutes):

→ **Volume Pumped (L):**

Flow rate (L/min):

Water Sampling

*Water Quality Meters Calibrated? Yes/No

Water colour
☐ Clear
☑ Reddy/orange
☐ Black
☐ Turbid

Water odour
☐ None
☑ Rotten egg (H_2S)
☐ Other_____

Time	pH	EC *circle units* (µS/cm or mS/cm)	Temp °C	DO (mg/L)	DO%	Salinity (ppt)	Turbidity (ntu)	Free Cl
10:05am	7.54	5084	19.72°C	7.2mg	79.9%	2.79	0	
10:06am	7.54	5082	19.78°C	7.2mg	79.7%	2.76	0	

Samples for lab analysis: □ Major ions □ Nutrients □ Metals - filtered □ Yes	 □ BOD, coliforms and total coliform □ CO_2 and alkalinity □ Suspended solids

Surface ponding check: ☑ None □ <5 cm deep □ 5-10 cm deep □ 10-50 cm deep □ >0.5 m deep	**Vegetation check**: ☑ Healthy □ Unhealthy eg. leaf discolour □ Dead
Description of surface ponding:	**Description of unhealthy vegetation:**

MBID
Site 768

GROUNDWATER MONITORING RECORD
Lake Conjola

Date: 20 January 2015	**Piezometer no.:**
Time: 10.00am	**SWL (m):** 1.53m **Bore Depth(m):**
Sampling Personnel: Matt Dunn, Thelma Marr	**SWL reference level:** ☐ Gattic cover ☐ Lip of steel monument ☐ Top of PVC pipe

Bore Purging

Pumping method:
☐ Waterra footvalve ☐ 12V electric eg. Monsoon
☐ Hand Bailer ☐ Submersible electric 240V

Pump depth (m):

Height of Water Column: (Depth of bore – SWL)

→ **Volume of Water in Borehole:**

Bore Diameter (mm)	Volume of Water/m (L)
50	2.0
100	7.9

Pumping period (minutes):

→ **Volume Pumped (L):**

Flow rate (L/min):

Water Sampling

*Water Quality Meters Calibrated? Yes/No

Water colour ☑ Clear ☐ Reddy/orange ☐ Black ☐ Turbid

Water odour ☑ None ☐ Rotten egg (H_2S) ☐ Other_____

Time	pH	EC (µS/cm or mS/cm) *circle units*	Temp °C	DO (mg/L)	DO%	Salinity (ppt)	Turbidity (ntu)	Free Cl
10.00am	9.03	922	19.94°C	~~5.96~~ 4.6mg	51%	0.47	0	
10:00am	9.02	927	19.99°C	4.6mg	51%	0.44	0	

Samples for lab analysis:	
□ Major ions	□ BOD, coliforms and total coliform
□ Nutrients	□ CO_2 and alkalinity
□ Metals - filtered □ Yes	□ Suspended solids

Surface ponding check:	**Vegetation check:**
☑ None	
□ <5 cm deep	☑ Healthy
□ 5-10 cm deep	□ Unhealthy eg. leaf discolour
□ 10-50 cm deep	□ Dead
□ >0.5 m deep	
Description of surface ponding:	**Description of unhealthy vegetation:**

mBGS
760

GROUNDWATER MONITORING RECORD
Lake Conjola

Date:	**Piezometer no.:**
Time:	**SWL (m):** **Bore Depth(m):**
Sampling Personnel:	**SWL reference level:** □ Gattic cover □ Lip of steel monument □ Top of PVC pipe

Bore Purging

Pumping method:
□ Waterra footvalve
□ Hand Bailer
□ 12V electric eg. Monsoon
□ Submersible electric 240V

Pump depth (m):

Height of Water Column:
(Depth of bore – SWL)

→ **Volume of Water in Borehole:**

Bore Diameter (mm)	Volume of Water/m (L)
50	2.0
100	7.9

Pumping period (minutes):

→ **Volume Pumped (L):**

Flow rate (L/min):

Water Sampling

*Water Quality Meters Calibrated? Yes/No

Water colour
□ Clear
□ Reddy/orange
□ Black
□ Turbid

Water odour
□ None
□ Rotten egg (H_2S)
□ Other_____

Time	pH	EC *circle units* (µS/cm or mS/cm)	Temp °C	DO (mg/L)	DO%	Salinity (ppt)	Turbidity (ntu)	Free Cl

Samples for lab analysis:	
□ Major ions	□ BOD, coliforms and total coliform
□ Nutrients	□ CO_2 and alkalinity
□ Metals - filtered □ Yes	□ Suspended solids

Surface ponding check:	**Vegetation check:**
□ None □ <5 cm deep □ 5-10 cm deep □ 10-50 cm deep □ >0.5 m deep	□ Healthy □ Unhealthy eg. leaf discolour □ Dead
Description of surface ponding: N/a	**Description of unhealthy vegetation:**

MB2D
769

GROUNDWATER MONITORING RECORD
Lake Conjola

Date: 20 January 2015	**Piezometer no.:**
Time: 10:15am	**SWL (m):** 10.8m **Bore Depth(m):**
Sampling Personnel: Matt Dunn, Thelma Marr, Sarah Kacir	**SWL reference level:** □ Gattic cover □ Lip of steel monument □ Top of PVC pipe

Bore Purging

Pumping method:
□ Waterra footvalve
□ Hand Bailer
□ 12V electric eg. Monsoon
□ Submersible electric 240V

Pump depth (m):

Height of Water Column:
(Depth of bore – SWL)

→ Volume of Water in Borehole:

Bore Diameter (mm)	Volume of Water/m (L)
50	2.0
100	7.9

Pumping period (minutes):

→ Volume Pumped (L):

Flow rate (L/min):

Water Sampling

*Water Quality Meters Calibrated? Yes/No

Water colour □ Clear ☑ Turbid cloudy □ Reddy/orange □ Black

Water odour ☑ None □ Rotten egg (H_2S) □ Other_____

Time	pH	EC (µS/cm or mS/cm) circle units	Temp °C	DO (mg/L)	DO%	Salinity (ppt)	Turbidity (ntu)	Free Cl
10:15am	8.52	865	19.62°C	5.2mg	57.3%	0.42	70.3	1.22 mg/L
10:16am	8.52	864	19.65°C	5.2mg	57.2%	0.42	70.7	1.22 mg/L

Samples for lab analysis:	
□ Major ions	□ BOD, coliforms and total coliform
□ Nutrients	□ CO_2 and alkalinity
□ Metals - filtered □ Yes	□ Suspended solids

Surface ponding check:	**Vegetation check**:
☑ None	
□ <5 cm deep	☑ Healthy
□ 5-10 cm deep	□ Unhealthy eg. leaf discolour
□ 10-50 cm deep	□ Dead
□ >0.5 m deep	
Description of surface ponding:	**Description of unhealthy vegetation:**

camp kitchen
754

GROUNDWATER MONITORING RECORD
Lake Conjola

Date: 20 January 2015	**Piezometer no.:**
Time: 10:30am	**SWL (m):** n/a **Bore Depth(m):**
Sampling Personnel: Matt Dunn, Thelma Mann, Sarah Kacir	**SWL reference level:** ☐ Gattic cover ☐ Lip of steel monument ☐ Top of PVC pipe

Bore Purging

Pumping method:

☐ Waterra footvalve
☐ Hand Bailer
☐ 12V electric eg. Monsoon
☐ Submersible electric 240V

Pump depth (m):

Height of Water Column:
(Depth of bore – SWL)

→ **Volume of Water in Borehole:**

Bore Diameter (mm)	Volume of Water/m (L)
50	2.0
100	7.9

Pumping period (minutes):

→ **Volume Pumped (L):**

Flow rate (L/min):

Water Sampling

*Water Quality Meters Calibrated? Yes/No

Water colour
☑ Clear
☐ Reddy/orange
☐ Black
☐ Turbid

Water odour
☑ None
☐ Other_____
☐ Rotten egg (H_2S)

Time	pH	EC *circle units* (µS/cm or mS/cm)	Temp °C	DO (mg/L)	DO%	Salinity (ppt)	Turbidity (ntu)	Free Cl
10:30	7.62	1130	20.47°C	3.3mg	36.4%	0.57	2.7	
10:31	7.62	1130	20.47°C	3.3mg	36.4%	0.57	3.1	

Samples for lab analysis:	
□ Major ions	□ BOD, coliforms and total coliform
□ Nutrients	□ CO_2 and alkalinity
□ Metals - filtered □ Yes	□ Suspended solids

Surface ponding check:	**Vegetation check:**
□ None	
□ <5 cm deep	□ Healthy
□ 5-10 cm deep	□ Unhealthy eg. leaf discolour
□ 10-50 cm deep	□ Dead
□ >0.5 m deep	
Description of surface ponding:	**Description of unhealthy vegetation:**

N/a

N/a

DOS d
801

GROUNDWATER MONITORING RECORD
Lake Conjola

Date: 19/9/15	**Piezometer no.:**
Time: 2:35pm	**SWL (m):** 5.6m **Bore Depth(m):**
Sampling Personnel: GH MH TM	**SWL reference level:** ☐ Gattic cover ☐ Lip of steel monument ☐ Top of PVC pipe

Bore Purging

Pumping method:
☐ Waterra footvalve ☐ 12V electric eg. Monsoon
☐ Hand Bailer ☐ Submersible electric 240V

Pump depth (m):

Height of Water Column: (Depth of bore – SWL)

→ **Volume of Water in Borehole:**

Bore Diameter (mm)	Volume of Water/m (L)
50	2.0
100	7.9

Pumping period (minutes): → **Volume Pumped (L):**

Flow rate (L/min):

Water Sampling

*Water Quality Meters Calibrated? Yes/No

Water colour ☐ Clear ☐ Reddy/orange ☐ Black ☐ Turbid

Water odour ☐ None ☐ Other_____ ☐ Rotten egg (H_2S)

Time	pH	EC *circle units* (µS/cm or mS/cm)	Temp °C	DO (mg/L)	DO%	Salinity (ppt)	Turbidity (ntu)	Free Cl
2:40	8.52	766	17.66°C	4.7mg/L	49.7%	0.92	0.4	0.92
2:40	8.52	707	17.61°C	4.7mg/L	49.6%	0.85	0	0.92

Samples for lab analysis:	
□ Major ions	□ BOD, coliforms and total coliform
□ Nutrients	□ CO_2 and alkalinity
□ Metals - filtered □ Yes	□ Suspended solids

Surface ponding check:	**Vegetation check**:
□ None □ <5 cm deep □ 5-10 cm deep □ 10-50 cm deep □ >0.5 m deep	□ Healthy □ Unhealthy eg. leaf discolour □ Dead
Description of surface ponding:	**Description of unhealthy vegetation:**

768
MB1D

GROUNDWATER MONITORING RECORD
Lake Conjola

Date: 19/8/15	**Piezometer no.:**
Time: 12:00pm	**SWL (m):** 1.5m **Bore Depth(m):**
Sampling Personnel: CAH MS TM	**SWL reference level:** ☐ Gattic cover ☐ Lip of steel monument ☐ Top of PVC pipe

Bore Purging

Pumping method:
☐ Waterra footvalve
☐ Hand Bailer
☐ 12V electric eg. Monsoon
☐ Submersible electric 240V

Pump depth (m):

Height of Water Column:
(Depth of bore – SWL)

→ Volume of Water in Borehole:

Bore Diameter (mm)	Volume of Water/m (L)
50	2.0
100	7.9

Pumping period (minutes):

→ Volume Pumped (L):

Flow rate (L/min):

Water Sampling

*Water Quality Meters Calibrated? Yes/No

Water colour
☑ Clear
☐ Turbid
☐ Reddy/orange
☐ Black

Water odour
☑ None
☐ Rotten egg (H_2S)
☐ Other_____

Time	pH	EC *circle units* (µS/cm or mS/cm)	Temp °C	DO (mg/L)	DO%	Salinity (ppt)	Turbidity (ntu)	Free Cl
12:00	7.79	1223	17.63°C	10mg/L	104.8%	0.62	13.2	
12:01	7.8	1217	17.62°C	10mg/L	104.9%	0.62	11.3	

Samples for lab analysis:	
□ Major ions	□ BOD, coliforms and total coliform
□ Nutrients	□ CO_2 and alkalinity
□ Metals - filtered □ Yes	□ Suspended solids

Surface ponding check:	**Vegetation check**:
☑ None	
□ <5 cm deep	☑ Healthy
□ 5-10 cm deep	□ Unhealthy eg. leaf discolour
□ 10-50 cm deep	□ Dead
□ >0.5 m deep	
Description of surface ponding:	**Description of unhealthy vegetation:**

761
mb 15

GROUNDWATER MONITORING RECORD
Lake Conjola

Date: 19/8/15	**Piezometer no.:**
Time: 12:10pm	**SWL (m):** 1.37m **Bore Depth(m):**
Sampling Personnel: GH MS TM	**SWL reference level:** □ Gattic cover □ Lip of steel monument □ Top of PVC pipe

Bore Purging

Pumping method:

□ Waterra footvalve
□ Hand Bailer
□ 12V electric eg. Monsoon
□ Submersible electric 240V

Pump depth (m):

Height of Water Column:
(Depth of bore – SWL)

→ **Volume of Water in Borehole:**

Bore Diameter (mm)	Volume of Water/m (L)
50	2.0
100	7.9

Pumping period (minutes):

→ **Volume Pumped (L):**

Flow rate (L/min):

Water Sampling

*Water Quality Meters Calibrated? Yes/No

Water colour
□ Clear
□ Turbid
□ Reddy/orange
□ Black
☑ Yellow

Water odour
□ None
☑ Rotten egg (H_2S)
□ Other_____

Time	pH	EC *circle units* (µS/cm or mS/cm)	Temp °C	DO (mg/L)	DO%	Salinity (ppt)	Turbidity (ntu)	Free Cl
12:10pm	7.77	2938	17.34°C	7.4mg/L	77.5%	1.54	5.4	
12:11pm	7.78	2939	17.33°C	7.4mg/L	77.8%	1.54	8.9	

Samples for lab analysis:	
□ Major ions	□ BOD, coliforms and total coliform
□ Nutrients	□ CO_2 and alkalinity
□ Metals - filtered □ Yes	□ Suspended solids

Surface ponding check:	**Vegetation check:**
☑ None	☑ Healthy
□ <5 cm deep	□ Unhealthy eg. leaf discolour
□ 5-10 cm deep	□ Dead
□ 10-50 cm deep	
□ >0.5 m deep	
Description of surface ponding:	**Description of unhealthy vegetation:**

MB20
769

GROUNDWATER MONITORING RECORD
Lake Conjola

Date: 19/8/15	**Piezometer no.:**
Time: 12:20pm	**SWL (m):** 10.9m . **Bore Depth(m):**
Sampling Personnel: GH MS TM	**SWL reference level:** ☐ Gattic cover ☐ Lip of steel monument ☐ Top of PVC pipe

Bore Purging

Pumping method:

☐ Waterra footvalve
☐ Hand Bailer
☐ 12V electric eg. Monsoon
☐ Submersible electric 240V

Pump depth (m):

Height of Water Column: (Depth of bore – SWL)

→ Volume of Water in Borehole:

Bore Diameter (mm)	Volume of Water/m (L)
50	2.0
100	7.9

Pumping period (minutes):

→ Volume Pumped (L):

Flow rate (L/min):

Water Sampling

*Water Quality Meters Calibrated? Yes/No

Water colour
☑ Clear
☐ Reddy/orange
☐ Black
☐ Turbid

Water odour
☑ None
☐ Rotten egg (H_2S)
☐ Other_____

Time	pH	EC *circle units* (µS/cm or mS/cm)	Temp °C	DO (mg/L)	DO%	Salinity (ppt)	Turbidity (ntu)	Free Cl
12:20	7.82	810	18.11°C	20.8 mg/L	210%	0.41	5.0	0.04
12:21	7.82	811	17.93°C	21mg/L	210%	0.41	4.3	0.04

Samples for lab analysis:	
□ Major ions	□ BOD, coliforms and total coliform
□ Nutrients	□ CO_2 and alkalinity
□ Metals - filtered □ Yes	□ Suspended solids

Surface ponding check:	**Vegetation check:**
☑ None	
□ <5 cm deep	☑ Healthy
□ 5-10 cm deep	□ Unhealthy eg. leaf discolour
□ 10-50 cm deep	□ Dead
□ >0.5 m deep	
Description of surface ponding:	**Description of unhealthy vegetation:**

MB2 S

760

GROUNDWATER MONITORING RECORD
Lake Conjola

Date: 19/8/15	**Piezometer no.:**
Time: 12:25pm	**SWL (m):** **Bore Depth(m):**
Sampling Personnel: GH MS TM	**SWL reference level:** □ Gattic cover □ Lip of steel monument □ Top of PVC pipe

Bore Purging

Pumping method:

□ Waterra footvalve
□ Hand Bailer
□ 12V electric eg. Monsoon
□ Submersible electric 240V

Pump depth (m):

Height of Water Column:
(Depth of bore – SWL)

DRY

→ Volume of Water in Borehole:

Bore Diameter (mm)	Volume of Water/m (L)
50	2.0
100	7.9

Pumping period (minutes):

→ Volume Pumped (L):

Flow rate (L/min):

Water Sampling

*Water Quality Meters Calibrated? Yes/No

Water colour
□ Clear
□ Reddy/orange
□ Black
□ Turbid

Water odour
□ None
□ Rotten egg (H_2S)
□ Other_____

Time	pH	EC *circle units* (µS/cm or mS/cm)	Temp °C	DO (mg/L)	DO%	Salinity (ppt)	Turbidity (ntu)	Free Cl

Samples for lab analysis:	
□ Major ions	□ BOD, coliforms and total coliform
□ Nutrients	□ CO_2 and alkalinity
□ Metals - filtered □ Yes	□ Suspended solids

Surface ponding check:	**Vegetation check**:
□ None □ <5 cm deep □ 5-10 cm deep □ 10-50 cm deep □ >0.5 m deep	□ Healthy □ Unhealthy eg. leaf discolour □ Dead
Description of surface ponding:	**Description of unhealthy vegetation:**

754
camp
kitchen

GROUNDWATER MONITORING RECORD
Lake Conjola

Date: 19/8/15	**Piezometer no.:**
Time: 12:40pm	**SWL (m):** / **Bore Depth(m):**
Sampling Personnel: GH, MS, TM	**SWL reference level:** □ Gattic cover □ Lip of steel monument □ Top of PVC pipe

Bore Purging

Pumping method:

□ Waterra footvalve
□ Hand Bailer
□ 12V electric eg. Monsoon
□ Submersible electric 240V

Pump depth (m):

Height of Water Column:
(Depth of bore – SWL)

→ Volume of Water in Borehole:

Bore Diameter (mm)	Volume of Water/m (L)
50	2.0
100	7.9

Pumping period (minutes):

→ Volume Pumped (L):

Flow rate (L/min):

Water Sampling

*Water Quality Meters Calibrated? Yes/No

Water colour
☑ Clear
□ Reddy/orange
□ Black
□ Turbid

Water odour
☑ None
□ Other_____
□ Rotten egg (H_2S)

Time	pH	EC *circle units* (µS/cm or mS/cm)	Temp °C	DO (mg/L)	DO%	Salinity (ppt)	Turbidity (ntu)	Free Cl
12:40	7.79	287	14.02°C	13.9mg/L	135.3%	0.11	2.7	
12:41	7.82	266	14.16°C	13.9mg/L	134.8%	0.11	1.9	

Samples for lab analysis:	
□ Major ions	□ BOD, coliforms and total coliform
□ Nutrients	□ CO_2 and alkalinity
□ Metals - filtered □ Yes	□ Suspended solids

Surface ponding check:	**Vegetation check**:
□ None	
□ <5 cm deep	□ Healthy
□ 5-10 cm deep	□ Unhealthy eg. leaf discolour
□ 10-50 cm deep	□ Dead
□ >0.5 m deep	
Description of surface ponding:	**Description of unhealthy vegetation:**

763
Site 294/295
caravan.

GROUNDWATER MONITORING RECORD
Lake Conjola

Date: 19/8/15	**Piezometer no.:**
Time: 12:40	**SWL (m):** **Bore Depth(m):**
Sampling Personnel: GH MS TM .	**SWL reference level:** □ Gattic cover □ Lip of steel monument □ Top of PVC pipe

Bore Purging

Pumping method:

□ Waterra footvalve
□ Hand Bailer
□ 12V electric eg. Monsoon
□ Submersible electric 240V

Pump depth (m):

Height of Water Column:
(Depth of bore – SWL)

→ **Volume of Water in Borehole:**

Bore Diameter (mm)	Volume of Water/m (L)
50	2.0
100	7.9

Pumping period (minutes):

→ **Volume Pumped (L):**

Flow rate (L/min):

Water Sampling

*Water Quality Meters Calibrated? Yes/No

Water colour
☑ Clear
□ Turbid
□ Reddy/orange
□ Black

Water odour
☑ None
□ Rotten egg (H_2S)
□ Other_____

Time	pH	EC *circle units* (µS/cm or mS/cm)	Temp °C	DO (mg/L)	DO%	Salinity (ppt)	Turbidity (ntu)	Free Cl
12:40	7.93	201	13.81°C	12.9mg/L	124.7%	0.08	4.7	
12:41	7.93	~~201~~ 201	13.99°C	12.8mg/L	124.5%	0.08	3.1	

Samples for lab analysis:	
□ Major ions	□ BOD, coliforms and total coliform
□ Nutrients	□ CO_2 and alkalinity
□ Metals - filtered □ Yes	□ Suspended solids

Surface ponding check:	**Vegetation check**:
□ None □ <5 cm deep □ 5-10 cm deep □ 10-50 cm deep □ >0.5 m deep	□ Healthy □ Unhealthy eg. leaf discolour □ Dead
Description of surface ponding:	**Description of unhealthy vegetation:**

TWA 756
Sandgropes

GROUNDWATER MONITORING RECORD
Lake Conjola

Date: 19/8/15	**Piezometer no.:**
Time: 12.51	**SWL (m):** 1.6m **Bore Depth(m):**
Sampling Personnel: GH, MS, TM	**SWL reference level:** □ Gattic cover □ Lip of steel monument □ Top of PVC pipe

Bore Purging

Pumping method:	
□ Waterra footvalve	□ 12V electric eg. Monsoon
□ Hand Bailer	□ Submersible electric 240V
Pump depth (m):	
Height of Water Column: (Depth of bore – SWL)	→ **Volume of Water in Borehole:**
Pumping period (minutes):	→ **Volume Pumped (L):**
Flow rate (L/min):	

Bore Diameter (mm)	Volume of Water/m (L)
50	2.0
100	7.9

Water Sampling

*Water Quality Meters Calibrated? Yes/No

Water colour □ Clear □ Reddy/orange □ Turbid ☑ Yellow □ Black	**Water odour** □ Other_____ ~~□ None~~ ☑ Rotten egg (H_2S)

Time	pH	EC *circle units* (µS/cm or mS/cm)	Temp °C	DO (mg/L)	DO%	Salinity (ppt)	Turbidity (ntu)	Free Cl
12:50	7.91	126	16.68°C	3.1mg/L	31.3%	0.05	4.3	~~0.05~~
12:51	7.91	126	16.62°C	3.0mg/L	31.2%	0.05	3.9	~~0.05~~

Samples for lab analysis:	
□ Major ions	□ BOD, coliforms and total coliform
□ Nutrients	□ CO_2 and alkalinity
□ Metals - filtered □ Yes	□ Suspended solids

Surface ponding check:	**Vegetation check:**
□ None □ <5 cm deep □ 5-10 cm deep □ 10-50 cm deep □ >0.5 m deep	□ Healthy □ Unhealthy eg. leaf discolour □ Dead
Description of surface ponding:	**Description of unhealthy vegetation:**

716

716

GROUNDWATER MONITORING RECORD
Lake Conjola

Date: 19/8/15	**Piezometer no.:**
Time: 1:00pm	**SWL (m):** 1.85m **Bore Depth(m):**
Sampling Personnel: GH, MS, TM.	**SWL reference level:** □ Gattic cover □ Lip of steel monument □ Top of PVC pipe

Bore Purging

Pumping method:

□ Waterra footvalve
□ Hand Bailer
□ 12V electric eg. Monsoon
□ Submersible electric 240V

Pump depth (m):

Height of Water Column:
(Depth of bore – SWL)

→ Volume of Water in Borehole:

Bore Diameter (mm)	Volume of Water/m (L)
50	2.0
100	7.9

Pumping period (minutes):

→ Volume Pumped (L):

Flow rate (L/min):

Water Sampling

*Water Quality Meters Calibrated? Yes/No

Water colour
□ Clear
□ Turbid
□ Reddy/orange
□ Black
☑ Yellow

Water odour
☑ None
□ Rotten egg (H_2S)
□ Other_____

Time	pH	EC *circle units* (µS/cm or mS/cm)	Temp °C	DO (mg/L)	DO%	Salinity (ppt)	Turbidity (ntu)	Free Cl
1:00	7.86	185	17.30°C	8.5mg/L	88.7%	0.10	1.9	0.11
1:01	7.86	185	17.33°C	8.5mg/L	88.8%	0.10	1.6	0.11

Samples for lab analysis:	
□ Major ions	□ BOD, coliforms and total coliform
□ Nutrients	□ CO_2 and alkalinity
□ Metals - filtered □ Yes	□ Suspended solids

Surface ponding check:	**Vegetation check**:
□ None	
□ <5 cm deep	□ Healthy
□ 5-10 cm deep	□ Unhealthy eg. leaf discolour
□ 10-50 cm deep	□ Dead
□ >0.5 m deep	
Description of surface ponding:	**Description of unhealthy vegetation:**

7/5
Thorne

GROUNDWATER MONITORING RECORD
Lake Conjola

Date: 19/9/15	**Piezometer no.:**
Time: 1:15pm	**SWL (m):** 1.52m **Bore Depth(m):**
Sampling Personnel: GH MS TM	**SWL reference level:** ☐ Gattic cover ☐ Lip of steel monument ☐ Top of PVC pipe

Bore Purging

Pumping method:
☐ Waterra footvalve
☐ Hand Bailer
☐ 12V electric eg. Monsoon
☐ Submersible electric 240V

Pump depth (m):

Height of Water Column:
(Depth of bore – SWL)

→ Volume of Water in Borehole:

Bore Diameter (mm)	Volume of Water/m (L)
50	2.0
100	7.9

Pumping period (minutes):

→ Volume Pumped (L):

Flow rate (L/min):

Water Sampling

*Water Quality Meters Calibrated? Yes/No

Water colour
☑ Clear
☐ Turbid
☐ Reddy/orange
☐ Black

Water odour
☐ None
☑ Rotten egg (H_2S)
☐ Other_____

Time	pH	EC *circle units* (µS/cm or mS/cm)	Temp °C	DO (mg/L)	DO%	Salinity (ppt)	Turbidity (ntu)	Free Cl
1:15	7.96	408	16.81°C	1.4mg/L	14.3%	0.19	2.3	0.93
1:16	7.96	407	16.86°C	1.4mg/L	14.4%	0.19	6.2	0.93

Samples for lab analysis:	
□ Major ions	□ BOD, coliforms and total coliform
□ Nutrients	□ CO_2 and alkalinity
□ Metals - filtered □ Yes	□ Suspended solids

Surface ponding check:	**Vegetation check**:
□ None □ <5 cm deep □ 5-10 cm deep □ 10-50 cm deep □ >0.5 m deep	□ Healthy □ Unhealthy eg. leaf discolour □ Dead
Description of surface ponding:	**Description of unhealthy vegetation:**

803
MW1a.

GROUNDWATER MONITORING RECORD
Lake Conjola

Date: 19/9/15	**Piezometer no.:**
Time: 1:20pm	**SWL (m):** 8.8m **Bore Depth(m):**
Sampling Personnel: GH MS TM	**SWL reference level:** ☐ Gattic cover ☐ Lip of steel monument ☐ Top of PVC pipe

Bore Purging

Pumping method:

☐ Waterra footvalve
☐ Hand Bailer
☐ 12V electric eg. Monsoon
☐ Submersible electric 240V

Pump depth (m):

Height of Water Column:
(Depth of bore – SWL)

→ Volume of Water in Borehole:

Bore Diameter (mm)	Volume of Water/m (L)
50	2.0
100	7.9

Pumping period (minutes):

→ Volume Pumped (L):

Flow rate (L/min):

Water Sampling

*Water Quality Meters Calibrated? Yes/No

Water colour
☐ Clear
☑ Turbid
☐ Reddy/orange
☐ Black
☑ Yellow

Water odour
☑ None
☐ Rotten egg (H_2S)
☐ Other_____

Time	pH	EC *circle units* (µS/cm or mS/cm)	Temp °C	DO (mg/L)	DO%	Salinity (ppt)	Turbidity (ntu)	Free Cl
1:20pm	7.87	6	17.77°C	4.1mg/L	42.2%	0	600	
1:22pm	7.87	6	17.78°C	3.9mg/L	40.7%	0.02	600	

Samples for lab analysis:	
□ Major ions	□ BOD, coliforms and total coliform
□ Nutrients	□ CO_2 and alkalinity
□ Metals - filtered □ Yes	□ Suspended solids

Surface ponding check:	**Vegetation check**:
□ None □ <5 cm deep □ 5-10 cm deep □ 10-50 cm deep □ >0.5 m deep	□ Healthy □ Unhealthy eg. leaf discolour □ Dead
Description of surface ponding:	**Description of unhealthy vegetation:**

756
Bh28

GROUNDWATER MONITORING RECORD
Lake Conjola

Date: 9/8/15	**Piezometer no.:**
Time: 1:30pm	**SWL (m):** 6.80m **Bore Depth(m):**
Sampling Personnel: GH MS TM	**SWL reference level:** ☐ Gattic cover ☐ Lip of steel monument ☐ Top of PVC pipe

Bore Purging

Pumping method:	
☐ Waterra footvalve	☐ 12V electric eg. Monsoon
☐ Hand Bailer	☐ Submersible electric 240V
Pump depth (m):	
Height of Water Column: (Depth of bore – SWL)	→ **Volume of Water in Borehole:**
Pumping period (minutes):	→ **Volume Pumped (L):**
Flow rate (L/min):	

Bore Diameter (mm)	Volume of Water/m (L)
50	2.0
100	7.9

Water Sampling

*Water Quality Meters Calibrated? Yes/No

Water colour ☐ Clear ☑ Turbid ☐ Reddy/orange ☐ Black	**Water odour** ☑ None ☐ Rotten egg (H_2S) ☐ Other_____

Time	pH	EC *circle units* (µS/cm or mS/cm)	Temp °C	DO (mg/L)	DO%	Salinity (ppt)	Turbidity (ntu)	Free Cl
1:30	8.24	µ	17.8°C	3.0mg/L	31.3%	0.02	79.8%	
1:31	8.25	µ	17.8°C	3.0mg/L	31.1%	0.02	81.0%	

Samples for lab analysis:	
□ Major ions	□ BOD, coliforms and total coliform
□ Nutrients	□ CO_2 and alkalinity
□ Metals - filtered □ Yes	□ Suspended solids

Surface ponding check:	**Vegetation check**:
□ None	
□ <5 cm deep	□ Healthy
□ 5-10 cm deep	□ Unhealthy eg. leaf discolour
□ 10-50 cm deep	□ Dead
□ >0.5 m deep	
Description of surface ponding:	**Description of unhealthy vegetation:**

783

GROUNDWATER MONITORING RECORD
Lake Conjola

Date:	**Piezometer no.:**
Time:	**SWL (m):** **Bore Depth(m):**
Sampling Personnel:	**SWL reference level:** □ Gattic cover □ Lip of steel monument □ Top of PVC pipe

Bore Purging

Pumping method:	
□ Waterra footvalve □ Hand Bailer	□ 12V electric eg. Monsoon □ Submersible electric 240V
Pump depth (m):	
Height of Water Column: (Depth of bore – SWL)	→ **Volume of Water in Borehole:** Bore Diameter (mm) / Volume of Water/m (L) 50 / 2.0 100 / 7.9
Pumping period (minutes): **Flow rate (L/min):**	→ **Volume Pumped (L):**

Water Sampling

*Water Quality Meters Calibrated? Yes/No

Water colour □ Clear □ Reddy/orange □ Turbid □ Black	**Water odour** □ Other_____ □ None □ Rotten egg (H_2S)

Time	pH	EC *circle units* (µS/cm or mS/cm)	Temp °C	DO (mg/L)	DO%	Salinity (ppt)	Turbidity (ntu)	Free Cl

Samples for lab analysis:	
□ Major ions	□ BOD, coliforms and total coliform
□ Nutrients	□ CO_2 and alkalinity
□ Metals - filtered □ Yes	□ Suspended solids

Surface ponding check:	**Vegetation check:**
□ None □ <5 cm deep □ 5-10 cm deep □ 10-50 cm deep □ >0.5 m deep	□ Healthy □ Unhealthy eg. leaf discolour □ Dead
Description of surface ponding:	**Description of unhealthy vegetation:**

759 D03

GROUNDWATER MONITORING RECORD
Lake Conjola

Date: 19/9/15	**Piezometer no.:**
Time: 2:18pm	**SWL (m):** 7.6m **Bore Depth(m):**
Sampling Personnel: GH MS TM	**SWL reference level:** □ Gattic cover □ Lip of steel monument □ Top of PVC pipe

Bore Purging

Pumping method:

□ Waterra footvalve
□ Hand Bailer
□ 12V electric eg. Monsoon
□ Submersible electric 240V

Pump depth (m):

Height of Water Column:
(Depth of bore – SWL)

→ **Volume of Water in Borehole:**

Bore Diameter (mm)	Volume of Water/m (L)
50	2.0
100	7.9

Pumping period (minutes):

→ **Volume Pumped (L):**

Flow rate (L/min):

Water Sampling

*Water Quality Meters Calibrated? Yes/No

Water colour
☑ Clear
□ Reddy/orange
□ Black
□ Turbid

Water odour
☑ None
□ Other_____
□ Rotten egg (H_2S)

Time	pH	EC *circle units* (µS/cm or mS/cm)	Temp °C	DO (mg/L)	DO%	Salinity (ppt)	Turbidity (ntu)	Free Cl
2:20	8.40	734	17.65°C	3.4mg/L	35.7%	0.35	9.3	6.87
2:21	8.41	734	17.61°C	3.4mg/L	35.6%	0.35	0.8	0.87

Samples for lab analysis:	
□ Major ions	□ BOD, coliforms and total coliform
□ Nutrients	□ CO_2 and alkalinity
□ Metals - filtered □ Yes	□ Suspended solids

Surface ponding check:	**Vegetation check:**
□ None □ <5 cm deep □ 5-10 cm deep □ 10-50 cm deep □ >0.5 m deep	□ Healthy □ Unhealthy eg. leaf discolour □ Dead
Description of surface ponding:	**Description of unhealthy vegetation:**

TSF
DO2

GROUNDWATER MONITORING RECORD
Lake Conjola

Date:	**Piezometer no.:**
Time:	**SWL (m):** **Bore Depth(m):**
Sampling Personnel:	**SWL reference level:** □ Gattic cover □ Lip of steel monument □ Top of PVC pipe

Bore Purging

Pumping method:

□ Waterra footvalve
□ Hand Bailer
□ 12V electric eg. Monsoon
□ Submersible electric 240V

Pump depth (m):

Height of Water Column:
(Depth of bore – SWL)

DRY

Volume of Water in Borehole:

Bore Diameter (mm)	Volume of Water/m (L)
50	2.0
100	7.9

Pumping period (minutes):

Volume Pumped (L):

Not enough to sample

Flow rate (L/min):

Water Sampling

*Water Quality Meters Calibrated? Yes/No

Water colour
□ Clear
□ Reddy/orange
□ Black
□ Turbid

Water odour
□ None
□ Rotten egg (H_2S)
□ Other_____

Time	pH	EC *circle units* (µS/cm or mS/cm)	Temp °C	DO (mg/L)	DO%	Salinity (ppt)	Turbidity (ntu)	Free Cl

Samples for lab analysis:	
□ Major ions	□ BOD, coliforms and total coliform
□ Nutrients	□ CO_2 and alkalinity
□ Metals - filtered □ Yes	□ Suspended solids

Surface ponding check:	**Vegetation check**:
□ None □ <5 cm deep □ 5-10 cm deep □ 10-50 cm deep □ >0.5 m deep	□ Healthy □ Unhealthy eg. leaf discolour □ Dead
Description of surface ponding:	**Description of unhealthy vegetation:**

POS ≤ 804

GROUNDWATER MONITORING RECORD
Lake Conjola

Date: 19/9/15	**Piezometer no.:**
Time: 2:35 pm	**SWL (m):** 8.4m **Bore Depth(m):**
Sampling Personnel: GH TM MS	**SWL reference level:** □ Gattic cover □ Lip of steel monument □ Top of PVC pipe

Bore Purging

Pumping method:
□ Waterra footvalve
□ Hand Bailer
□ 12V electric eg. Monsoon
□ Submersible electric 240V

Pump depth (m):

Height of Water Column:
(Depth of bore – SWL)

→ Volume of Water in Borehole:

Bore Diameter (mm)	Volume of Water/m (L)
50	2.0
100	7.9

Pumping period (minutes):

→ Volume Pumped (L):

Flow rate (L/min):

Water Sampling

*Water Quality Meters Calibrated? Yes/No

Water colour
☑ Clear
☑ Turbid
□ Reddy/orange
□ Black

Water odour
☑ None
□ Rotten egg (H_2S)
□ Other_____

Time	pH	EC *circle units* (µS/cm or mS/cm)	Temp °C	DO (mg/L)	DO%	Salinity (ppt)	Turbidity (ntu)	Free Cl
2:35	8.49	738	16.77	4.3mg/L	44.8%	0.36	600	unable to
2:36	8.49	739.	16.74	4.3mg/L	44.7%	0.36	600	record on machine

Samples for lab analysis:	
□ Major ions	□ BOD, coliforms and total coliform
□ Nutrients	□ CO_2 and alkalinity
□ Metals - filtered □ Yes	□ Suspended solids

Surface ponding check:	**Vegetation check**:
□ None □ <5 cm deep □ 5-10 cm deep □ 10-50 cm deep □ >0.5 m deep	□ Healthy □ Unhealthy eg. leaf discolour □ Dead
Description of surface ponding:	**Description of unhealthy vegetation:**

DOS d
801

GROUNDWATER MONITORING RECORD
Lake Conjola

Date: 19/9/15	**Piezometer no.:**
Time: 2:35pm	**SWL (m):** 5.6m **Bore Depth(m):**
Sampling Personnel: GH MH TM	**SWL reference level:** ☐ Gattic cover ☐ Lip of steel monument ☐ Top of PVC pipe

Bore Purging

Pumping method:
☐ Waterra footvalve ☐ 12V electric eg. Monsoon
☐ Hand Bailer ☐ Submersible electric 240V

Pump depth (m):

Height of Water Column: (Depth of bore – SWL)

→ **Volume of Water in Borehole:**

Bore Diameter (mm)	Volume of Water/m (L)
50	2.0
100	7.9

Pumping period (minutes): → **Volume Pumped (L):**

Flow rate (L/min):

Water Sampling

*Water Quality Meters Calibrated? Yes/No

Water colour ☐ Clear ☐ Reddy/orange ☐ Black ☐ Turbid

Water odour ☐ None ☐ Other_____ ☐ Rotten egg (H_2S)

Time	pH	EC *circle units* (µS/cm or mS/cm)	Temp °C	DO (mg/L)	DO%	Salinity (ppt)	Turbidity (ntu)	Free Cl
2:40	8.52	766	17.66°C	4.7mg/L	49.7%	0.92	0.4	0.92
2:40	8.52	707	17.61°C	4.7mg/L	49.6%	0.85	0	0.92

Samples for lab analysis:	
□ Major ions	□ BOD, coliforms and total coliform
□ Nutrients	□ CO_2 and alkalinity
□ Metals - filtered □ Yes	□ Suspended solids

Surface ponding check:	**Vegetation check**:
□ None □ <5 cm deep □ 5-10 cm deep □ 10-50 cm deep □ >0.5 m deep	□ Healthy □ Unhealthy eg. leaf discolour □ Dead
Description of surface ponding:	**Description of unhealthy vegetation:**

768
MB1D

GROUNDWATER MONITORING RECORD
Lake Conjola

Date: 19/8/15	**Piezometer no.:**
Time: 12:00pm	**SWL (m):** 1.5m **Bore Depth(m):**
Sampling Personnel: CAH MS TM	**SWL reference level:** ☐ Gattic cover ☐ Lip of steel monument ☐ Top of PVC pipe

Bore Purging

Pumping method:
☐ Waterra footvalve
☐ Hand Bailer
☐ 12V electric eg. Monsoon
☐ Submersible electric 240V

Pump depth (m):

Height of Water Column:
(Depth of bore – SWL)

→ Volume of Water in Borehole:

Bore Diameter (mm)	Volume of Water/m (L)
50	2.0
100	7.9

Pumping period (minutes):

→ Volume Pumped (L):

Flow rate (L/min):

Water Sampling

*Water Quality Meters Calibrated? Yes/No

Water colour
☑ Clear
☐ Turbid
☐ Reddy/orange
☐ Black

Water odour
☑ None
☐ Rotten egg (H_2S)
☐ Other_____

Time	pH	EC *circle units* (µS/cm or mS/cm)	Temp °C	DO (mg/L)	DO%	Salinity (ppt)	Turbidity (ntu)	Free Cl
12:00	7.79	1223	17.63°C	10mg/L	104.8%	0.62	13.2	
12:01	7.8	1217	17.62°C	10mg/L	104.9%	0.62	11.3	

Samples for lab analysis:	
□ Major ions	□ BOD, coliforms and total coliform
□ Nutrients	□ CO_2 and alkalinity
□ Metals - filtered □ Yes	□ Suspended solids

Surface ponding check:	**Vegetation check**:
☑ None	
□ <5 cm deep	☑ Healthy
□ 5-10 cm deep	□ Unhealthy eg. leaf discolour
□ 10-50 cm deep	□ Dead
□ >0.5 m deep	
Description of surface ponding:	**Description of unhealthy vegetation:**

761
mb 15

GROUNDWATER MONITORING RECORD
Lake Conjola

Date: 19/8/15	**Piezometer no.:**
Time: 12:10pm	**SWL (m):** 1.37m **Bore Depth(m):**
Sampling Personnel: GH MS TM	**SWL reference level:** □ Gattic cover □ Lip of steel monument □ Top of PVC pipe

Bore Purging

Pumping method:

□ Waterra footvalve
□ Hand Bailer
□ 12V electric eg. Monsoon
□ Submersible electric 240V

Pump depth (m):

Height of Water Column:
(Depth of bore – SWL)

→ **Volume of Water in Borehole:**

Bore Diameter (mm)	Volume of Water/m (L)
50	2.0
100	7.9

Pumping period (minutes):

→ **Volume Pumped (L):**

Flow rate (L/min):

Water Sampling

*Water Quality Meters Calibrated? Yes/No

Water colour
□ Clear
□ Turbid
□ Reddy/orange
□ Black
☑ Yellow

Water odour
□ None
☑ Rotten egg (H_2S)
□ Other_____

Time	pH	EC *circle units* (µS/cm or mS/cm)	Temp °C	DO (mg/L)	DO%	Salinity (ppt)	Turbidity (ntu)	Free Cl
12:10pm	7.77	2938	17.34°C	7.4mg/L	77.5%	1.54	5.4	
12:11pm	7.78	2939	17.33°C	7.4mg/L	77.8%	1.54	8.9	

Samples for lab analysis:	
□ Major ions	□ BOD, coliforms and total coliform
□ Nutrients	□ CO_2 and alkalinity
□ Metals - filtered □ Yes	□ Suspended solids

Surface ponding check:	**Vegetation check:**
☑ None	☑ Healthy
□ <5 cm deep	□ Unhealthy eg. leaf discolour
□ 5-10 cm deep	□ Dead
□ 10-50 cm deep	
□ >0.5 m deep	
Description of surface ponding:	**Description of unhealthy vegetation:**

MB20
769

GROUNDWATER MONITORING RECORD
Lake Conjola

Date: 19/8/15	**Piezometer no.:**
Time: 12:20pm	**SWL (m):** 10.9m . **Bore Depth(m):**
Sampling Personnel: GH MS TM	**SWL reference level:** ☐ Gattic cover ☐ Lip of steel monument ☐ Top of PVC pipe

Bore Purging

Pumping method:

☐ Waterra footvalve
☐ Hand Bailer
☐ 12V electric eg. Monsoon
☐ Submersible electric 240V

Pump depth (m):

Height of Water Column: (Depth of bore – SWL)

→ Volume of Water in Borehole:

Bore Diameter (mm)	Volume of Water/m (L)
50	2.0
100	7.9

Pumping period (minutes):

→ Volume Pumped (L):

Flow rate (L/min):

Water Sampling

*Water Quality Meters Calibrated? Yes/No

Water colour
☑ Clear
☐ Reddy/orange
☐ Black
☐ Turbid

Water odour
☑ None
☐ Rotten egg (H_2S)
☐ Other_____

Time	pH	EC *circle units* (µS/cm or mS/cm)	Temp °C	DO (mg/L)	DO%	Salinity (ppt)	Turbidity (ntu)	Free Cl
12:20	7.82	810	18.11°C	20.8 mg/L	210%	0.41	5.0	0.04
12:21	7.82	811	17.93°C	21mg/L	210%	0.41	4.3	0.04

Samples for lab analysis:	
□ Major ions	□ BOD, coliforms and total coliform
□ Nutrients	□ CO_2 and alkalinity
□ Metals - filtered □ Yes	□ Suspended solids

Surface ponding check:	**Vegetation check:**
☑ None	
□ <5 cm deep	☑ Healthy
□ 5-10 cm deep	□ Unhealthy eg. leaf discolour
□ 10-50 cm deep	□ Dead
□ >0.5 m deep	
Description of surface ponding:	**Description of unhealthy vegetation:**

MB2 S

760

GROUNDWATER MONITORING RECORD
Lake Conjola

Date: 19/8/15	**Piezometer no.:**
Time: 12:25pm	**SWL (m):** **Bore Depth(m):**
Sampling Personnel: GH MS TM	**SWL reference level:** □ Gattic cover □ Lip of steel monument □ Top of PVC pipe

Bore Purging

Pumping method:

□ Waterra footvalve
□ Hand Bailer
□ 12V electric eg. Monsoon
□ Submersible electric 240V

Pump depth (m):

Height of Water Column:
(Depth of bore – SWL)

DRY

→ Volume of Water in Borehole:

Bore Diameter (mm)	Volume of Water/m (L)
50	2.0
100	7.9

Pumping period (minutes):

→ Volume Pumped (L):

Flow rate (L/min):

Water Sampling

*Water Quality Meters Calibrated? Yes/No

Water colour
□ Clear
□ Reddy/orange
□ Black
□ Turbid

Water odour
□ None
□ Rotten egg (H_2S)
□ Other_____

Time	pH	EC *circle units* (µS/cm or mS/cm)	Temp °C	DO (mg/L)	DO%	Salinity (ppt)	Turbidity (ntu)	Free Cl

Samples for lab analysis:	
□ Major ions	□ BOD, coliforms and total coliform
□ Nutrients	□ CO_2 and alkalinity
□ Metals - filtered □ Yes	□ Suspended solids

Surface ponding check:	**Vegetation check**:
□ None □ <5 cm deep □ 5-10 cm deep □ 10-50 cm deep □ >0.5 m deep	□ Healthy □ Unhealthy eg. leaf discolour □ Dead
Description of surface ponding:	**Description of unhealthy vegetation:**

754
camp
kitchen

GROUNDWATER MONITORING RECORD
Lake Conjola

Date: 19/8/15	**Piezometer no.:**
Time: 12:40pm	**SWL (m):** / **Bore Depth(m):**
Sampling Personnel: GH, MS, TM	**SWL reference level:** □ Gattic cover □ Lip of steel monument □ Top of PVC pipe

Bore Purging

Pumping method:

□ Waterra footvalve
□ Hand Bailer
□ 12V electric eg. Monsoon
□ Submersible electric 240V

Pump depth (m):

Height of Water Column:
(Depth of bore – SWL)

→ Volume of Water in Borehole:

Bore Diameter (mm)	Volume of Water/m (L)
50	2.0
100	7.9

Pumping period (minutes):

→ Volume Pumped (L):

Flow rate (L/min):

Water Sampling

*Water Quality Meters Calibrated? Yes/No

Water colour
☑ Clear
□ Reddy/orange
□ Black
□ Turbid

Water odour
☑ None
□ Other_____
□ Rotten egg (H_2S)

Time	pH	EC *circle units* (µS/cm or mS/cm)	Temp °C	DO (mg/L)	DO%	Salinity (ppt)	Turbidity (ntu)	Free Cl
12:40	7.79	287	14.02°C	13.9mg/L	135.3%	0.11	2.7	
12:41	7.82	266	14.16°C	13.9mg/L	134.8%	0.11	1.9	

Samples for lab analysis:	
□ Major ions	□ BOD, coliforms and total coliform
□ Nutrients	□ CO_2 and alkalinity
□ Metals - filtered □ Yes	□ Suspended solids

Surface ponding check:	**Vegetation check**:
□ None	
□ <5 cm deep	□ Healthy
□ 5-10 cm deep	□ Unhealthy eg. leaf discolour
□ 10-50 cm deep	□ Dead
□ >0.5 m deep	
Description of surface ponding:	**Description of unhealthy vegetation:**

763
Site 294/295
caravan.

GROUNDWATER MONITORING RECORD
Lake Conjola

Date: 19/8/15	**Piezometer no.:**
Time: 12:40	**SWL (m):** **Bore Depth(m):**
Sampling Personnel: GH MS TM .	**SWL reference level:** □ Gattic cover □ Lip of steel monument □ Top of PVC pipe

Bore Purging

Pumping method:

□ Waterra footvalve
□ Hand Bailer
□ 12V electric eg. Monsoon
□ Submersible electric 240V

Pump depth (m):

Height of Water Column:
(Depth of bore – SWL)

→ **Volume of Water in Borehole:**

Bore Diameter (mm)	Volume of Water/m (L)
50	2.0
100	7.9

Pumping period (minutes):

→ **Volume Pumped (L):**

Flow rate (L/min):

Water Sampling

*Water Quality Meters Calibrated? Yes/No

Water colour
☑ Clear
□ Turbid
□ Reddy/orange
□ Black

Water odour
☑ None
□ Rotten egg (H_2S)
□ Other_____

Time	pH	EC *circle units* (µS/cm or mS/cm)	Temp °C	DO (mg/L)	DO%	Salinity (ppt)	Turbidity (ntu)	Free Cl
12:40	7.93	201	13.81°C	12.9mg/L	124.7%	0.08	4.7	
12:41	7.93	~~201~~ 201	13.99°C	12.8mg/L	124.5%	0.08	3.1	

Samples for lab analysis:	
□ Major ions	□ BOD, coliforms and total coliform
□ Nutrients	□ CO_2 and alkalinity
□ Metals - filtered □ Yes	□ Suspended solids

Surface ponding check:	**Vegetation check**:
□ None □ <5 cm deep □ 5-10 cm deep □ 10-50 cm deep □ >0.5 m deep	□ Healthy □ Unhealthy eg. leaf discolour □ Dead
Description of surface ponding:	**Description of unhealthy vegetation:**

TWA 756
Sandgropes

GROUNDWATER MONITORING RECORD
Lake Conjola

Date: 19/8/15	**Piezometer no.:**
Time: 12.51	**SWL (m):** 1.6m **Bore Depth(m):**
Sampling Personnel: GH, MS, TM	**SWL reference level:** □ Gattic cover □ Lip of steel monument □ Top of PVC pipe

Bore Purging

Pumping method:	
□ Waterra footvalve	□ 12V electric eg. Monsoon
□ Hand Bailer	□ Submersible electric 240V
Pump depth (m):	
Height of Water Column: (Depth of bore – SWL)	→ **Volume of Water in Borehole:**
Pumping period (minutes):	→ **Volume Pumped (L):**
Flow rate (L/min):	

Bore Diameter (mm)	Volume of Water/m (L)
50	2.0
100	7.9

Water Sampling

*Water Quality Meters Calibrated? Yes/No

Water colour □ Clear □ Reddy/orange □ Turbid ☑ Yellow □ Black	**Water odour** □ Other_____ ~~□ None~~ ☑ Rotten egg (H_2S)

Time	pH	EC *circle units* (µS/cm or mS/cm)	Temp °C	DO (mg/L)	DO%	Salinity (ppt)	Turbidity (ntu)	Free Cl
12:50	7.91	126	16.68°C	3.1mg/L	31.3%	0.05	4.3	~~0.05~~
12:51	7.91	126	16.62°C	3.0mg/L	31.2%	0.05	3.9	~~0.05~~

Samples for lab analysis:	
□ Major ions	□ BOD, coliforms and total coliform
□ Nutrients	□ CO_2 and alkalinity
□ Metals - filtered □ Yes	□ Suspended solids

Surface ponding check:	**Vegetation check:**
□ None □ <5 cm deep □ 5-10 cm deep □ 10-50 cm deep □ >0.5 m deep	□ Healthy □ Unhealthy eg. leaf discolour □ Dead
Description of surface ponding:	**Description of unhealthy vegetation:**

716

716

GROUNDWATER MONITORING RECORD
Lake Conjola

Date: 19/8/15	**Piezometer no.:**
Time: 1:00pm	**SWL (m):** 1.85m **Bore Depth(m):**
Sampling Personnel: GH, MS, TM.	**SWL reference level:** □ Gattic cover □ Lip of steel monument □ Top of PVC pipe

Bore Purging

Pumping method:

□ Waterra footvalve
□ Hand Bailer
□ 12V electric eg. Monsoon
□ Submersible electric 240V

Pump depth (m):

Height of Water Column:
(Depth of bore – SWL)

→ Volume of Water in Borehole:

Bore Diameter (mm)	Volume of Water/m (L)
50	2.0
100	7.9

Pumping period (minutes):

→ Volume Pumped (L):

Flow rate (L/min):

Water Sampling

*Water Quality Meters Calibrated? Yes/No

Water colour
□ Clear
□ Turbid
□ Reddy/orange
□ Black
☑ Yellow

Water odour
☑ None
□ Rotten egg (H_2S)
□ Other_____

Time	pH	EC *circle units* (µS/cm or mS/cm)	Temp °C	DO (mg/L)	DO%	Salinity (ppt)	Turbidity (ntu)	Free Cl
1:00	7.86	185	17.30°C	8.5mg/L	88.7%	0.10	1.9	0.11
1:01	7.86	185	17.33°C	8.5mg/L	88.8%	0.10	1.6	0.11

Samples for lab analysis:	
□ Major ions	□ BOD, coliforms and total coliform
□ Nutrients	□ CO_2 and alkalinity
□ Metals - filtered □ Yes	□ Suspended solids

Surface ponding check:	**Vegetation check**:
□ None	
□ <5 cm deep	□ Healthy
□ 5-10 cm deep	□ Unhealthy eg. leaf discolour
□ 10-50 cm deep	□ Dead
□ >0.5 m deep	
Description of surface ponding:	**Description of unhealthy vegetation:**

7/5
Thorne

GROUNDWATER MONITORING RECORD
Lake Conjola

Date: 19/9/15	**Piezometer no.:**
Time: 1:15pm	**SWL (m):** 1.52m **Bore Depth(m):**
Sampling Personnel: GH MS TM	**SWL reference level:** ☐ Gattic cover ☐ Lip of steel monument ☐ Top of PVC pipe

Bore Purging

Pumping method:
☐ Waterra footvalve
☐ Hand Bailer
☐ 12V electric eg. Monsoon
☐ Submersible electric 240V

Pump depth (m):

Height of Water Column:
(Depth of bore – SWL)

→ Volume of Water in Borehole:

Bore Diameter (mm)	Volume of Water/m (L)
50	2.0
100	7.9

Pumping period (minutes):

→ Volume Pumped (L):

Flow rate (L/min):

Water Sampling

*Water Quality Meters Calibrated? Yes/No

Water colour
☑ Clear
☐ Turbid
☐ Reddy/orange
☐ Black

Water odour
☐ None
☑ Rotten egg (H_2S)
☐ Other_____

Time	pH	EC *circle units* (µS/cm or mS/cm)	Temp °C	DO (mg/L)	DO%	Salinity (ppt)	Turbidity (ntu)	Free Cl
1:15	7.96	408	16.81°C	1.4mg/L	14.3%	0.19	2.3	0.93
1:16	7.96	407	16.86°C	1.4mg/L	14.4%	0.19	6.2	0.93

Samples for lab analysis:	
□ Major ions	□ BOD, coliforms and total coliform
□ Nutrients	□ CO_2 and alkalinity
□ Metals - filtered □ Yes	□ Suspended solids

Surface ponding check:	**Vegetation check**:
□ None □ <5 cm deep □ 5-10 cm deep □ 10-50 cm deep □ >0.5 m deep	□ Healthy □ Unhealthy eg. leaf discolour □ Dead
Description of surface ponding:	**Description of unhealthy vegetation:**

803
MW1a.

GROUNDWATER MONITORING RECORD
Lake Conjola

Date: 19/9/15	**Piezometer no.:**
Time: 1:20pm	**SWL (m):** 8.8m **Bore Depth(m):**
Sampling Personnel: GH MS TM	**SWL reference level:** ☐ Gattic cover ☐ Lip of steel monument ☐ Top of PVC pipe

Bore Purging

Pumping method:

☐ Waterra footvalve
☐ Hand Bailer
☐ 12V electric eg. Monsoon
☐ Submersible electric 240V

Pump depth (m):

Height of Water Column:
(Depth of bore – SWL)

→ Volume of Water in Borehole:

Bore Diameter (mm)	Volume of Water/m (L)
50	2.0
100	7.9

Pumping period (minutes):

→ Volume Pumped (L):

Flow rate (L/min):

Water Sampling

*Water Quality Meters Calibrated? Yes/No

Water colour
☐ Clear
☑ Turbid
☐ Reddy/orange
☐ Black
☑ Yellow

Water odour
☑ None
☐ Rotten egg (H_2S)
☐ Other_____

Time	pH	EC *circle units* (µS/cm or mS/cm)	Temp °C	DO (mg/L)	DO%	Salinity (ppt)	Turbidity (ntu)	Free Cl
1:20pm	7.87	6	17.77°C	4.1mg/L	42.2%	0	600	
1:22pm	7.87	6	17.78°C	3.9mg/L	40.7%	0.02	600	

Samples for lab analysis:	
□ Major ions	□ BOD, coliforms and total coliform
□ Nutrients	□ CO_2 and alkalinity
□ Metals - filtered □ Yes	□ Suspended solids

Surface ponding check:	**Vegetation check**:
□ None □ <5 cm deep □ 5-10 cm deep □ 10-50 cm deep □ >0.5 m deep	□ Healthy □ Unhealthy eg. leaf discolour □ Dead
Description of surface ponding:	**Description of unhealthy vegetation:**

756
Bh28

GROUNDWATER MONITORING RECORD
Lake Conjola

Date: 9/8/15	**Piezometer no.:**
Time: 1:30pm	**SWL (m):** 6.80m **Bore Depth(m):**
Sampling Personnel: GH MS TM	**SWL reference level:** ☐ Gattic cover ☐ Lip of steel monument ☐ Top of PVC pipe

Bore Purging

Pumping method:	
☐ Waterra footvalve	☐ 12V electric eg. Monsoon
☐ Hand Bailer	☐ Submersible electric 240V
Pump depth (m):	
Height of Water Column: (Depth of bore – SWL)	→ **Volume of Water in Borehole:**
Pumping period (minutes):	→ **Volume Pumped (L):**
Flow rate (L/min):	

Bore Diameter (mm)	Volume of Water/m (L)
50	2.0
100	7.9

Water Sampling

*Water Quality Meters Calibrated? Yes/No

Water colour ☐ Clear ☑ Turbid ☐ Reddy/orange ☐ Black	**Water odour** ☑ None ☐ Rotten egg (H_2S) ☐ Other_____

Time	pH	EC *circle units* (µS/cm or mS/cm)	Temp °C	DO (mg/L)	DO%	Salinity (ppt)	Turbidity (ntu)	Free Cl
1:30	8.24	µ	17.8°C	3.0mg/L	31.3%	0.02	79.8%	
1:31	8.25	µ	17.8°C	3.0mg/L	31.1%	0.02	81.0%	

Samples for lab analysis:	
□ Major ions	□ BOD, coliforms and total coliform
□ Nutrients	□ CO_2 and alkalinity
□ Metals - filtered □ Yes	□ Suspended solids

Surface ponding check:	**Vegetation check**:
□ None	
□ <5 cm deep	□ Healthy
□ 5-10 cm deep	□ Unhealthy eg. leaf discolour
□ 10-50 cm deep	□ Dead
□ >0.5 m deep	
Description of surface ponding:	**Description of unhealthy vegetation:**

783

GROUNDWATER MONITORING RECORD
Lake Conjola

Date:	**Piezometer no.:**
Time:	**SWL (m):** **Bore Depth(m):**
Sampling Personnel:	**SWL reference level:** □ Gattic cover □ Lip of steel monument □ Top of PVC pipe

Bore Purging

Pumping method:	
□ Waterra footvalve □ Hand Bailer	□ 12V electric eg. Monsoon □ Submersible electric 240V
Pump depth (m):	
Height of Water Column: (Depth of bore – SWL)	→ **Volume of Water in Borehole:** Bore Diameter (mm) / Volume of Water/m (L) 50 / 2.0 100 / 7.9
Pumping period (minutes): **Flow rate (L/min):**	→ **Volume Pumped (L):**

Water Sampling

*Water Quality Meters Calibrated? Yes/No

Water colour □ Clear □ Reddy/orange □ Turbid □ Black	**Water odour** □ Other_____ □ None □ Rotten egg (H_2S)

Time	pH	EC *circle units* (µS/cm or mS/cm)	Temp °C	DO (mg/L)	DO%	Salinity (ppt)	Turbidity (ntu)	Free Cl

Samples for lab analysis:	
□ Major ions	□ BOD, coliforms and total coliform
□ Nutrients	□ CO_2 and alkalinity
□ Metals - filtered □ Yes	□ Suspended solids

Surface ponding check:	**Vegetation check:**
□ None □ <5 cm deep □ 5-10 cm deep □ 10-50 cm deep □ >0.5 m deep	□ Healthy □ Unhealthy eg. leaf discolour □ Dead
Description of surface ponding:	**Description of unhealthy vegetation:**

759 D03

GROUNDWATER MONITORING RECORD
Lake Conjola

Date: 19/9/15	**Piezometer no.:**
Time: 2:18pm	**SWL (m):** 7.6m **Bore Depth(m):**
Sampling Personnel: GH MS TM	**SWL reference level:** □ Gattic cover □ Lip of steel monument □ Top of PVC pipe

Bore Purging

Pumping method:

□ Waterra footvalve
□ Hand Bailer
□ 12V electric eg. Monsoon
□ Submersible electric 240V

Pump depth (m):

Height of Water Column:
(Depth of bore – SWL)

→ **Volume of Water in Borehole:**

Bore Diameter (mm)	Volume of Water/m (L)
50	2.0
100	7.9

Pumping period (minutes):

→ **Volume Pumped (L):**

Flow rate (L/min):

Water Sampling

*Water Quality Meters Calibrated? Yes/No

Water colour
☑ Clear
□ Reddy/orange
□ Black
□ Turbid

Water odour
☑ None
□ Other_____
□ Rotten egg (H_2S)

Time	pH	EC *circle units* (µS/cm or mS/cm)	Temp °C	DO (mg/L)	DO%	Salinity (ppt)	Turbidity (ntu)	Free Cl
2:20	8.40	734	17.65°C	3.4mg/L	35.7%	0.35	9.3	6.87
2:21	8.41	734	17.61°C	3.4mg/L	35.6%	0.35	0.8	0.87

Samples for lab analysis:	
□ Major ions	□ BOD, coliforms and total coliform
□ Nutrients	□ CO_2 and alkalinity
□ Metals - filtered □ Yes	□ Suspended solids

Surface ponding check:	**Vegetation check:**
□ None □ <5 cm deep □ 5-10 cm deep □ 10-50 cm deep □ >0.5 m deep	□ Healthy □ Unhealthy eg. leaf discolour □ Dead
Description of surface ponding:	**Description of unhealthy vegetation:**

TSF
DO2

GROUNDWATER MONITORING RECORD
Lake Conjola

Date:	**Piezometer no.:**
Time:	**SWL (m):** **Bore Depth(m):**
Sampling Personnel:	**SWL reference level:** □ Gattic cover □ Lip of steel monument □ Top of PVC pipe

Bore Purging

Pumping method:

□ Waterra footvalve
□ Hand Bailer
□ 12V electric eg. Monsoon
□ Submersible electric 240V

Pump depth (m):

Height of Water Column:
(Depth of bore – SWL)

DRY

Volume of Water in Borehole:

Bore Diameter (mm)	Volume of Water/m (L)
50	2.0
100	7.9

Pumping period (minutes):

Volume Pumped (L):

Not enough to sample

Flow rate (L/min):

Water Sampling

*Water Quality Meters Calibrated? Yes/No

Water colour
□ Clear
□ Reddy/orange
□ Black
□ Turbid

Water odour
□ None
□ Rotten egg (H_2S)
□ Other_____

Time	pH	EC *circle units* (µS/cm or mS/cm)	Temp °C	DO (mg/L)	DO%	Salinity (ppt)	Turbidity (ntu)	Free Cl

Samples for lab analysis:	
□ Major ions	□ BOD, coliforms and total coliform
□ Nutrients	□ CO_2 and alkalinity
□ Metals - filtered □ Yes	□ Suspended solids

Surface ponding check:	**Vegetation check**:
□ None □ <5 cm deep □ 5-10 cm deep □ 10-50 cm deep □ >0.5 m deep	□ Healthy □ Unhealthy eg. leaf discolour □ Dead
Description of surface ponding:	**Description of unhealthy vegetation:**

POS ≤ 804

GROUNDWATER MONITORING RECORD
Lake Conjola

Date: 19/9/15	**Piezometer no.:**
Time: 2:35 pm	**SWL (m):** 8.4m **Bore Depth(m):**
Sampling Personnel: GH TM MS	**SWL reference level:** □ Gattic cover □ Lip of steel monument □ Top of PVC pipe

Bore Purging

Pumping method:
□ Waterra footvalve
□ Hand Bailer
□ 12V electric eg. Monsoon
□ Submersible electric 240V

Pump depth (m):

Height of Water Column:
(Depth of bore – SWL)

→ Volume of Water in Borehole:

Bore Diameter (mm)	Volume of Water/m (L)
50	2.0
100	7.9

Pumping period (minutes):

→ Volume Pumped (L):

Flow rate (L/min):

Water Sampling

*Water Quality Meters Calibrated? Yes/No

Water colour
☑ Clear
☑ Turbid
□ Reddy/orange
□ Black

Water odour
☑ None
□ Rotten egg (H_2S)
□ Other_____

Time	pH	EC *circle units* (µS/cm or mS/cm)	Temp °C	DO (mg/L)	DO%	Salinity (ppt)	Turbidity (ntu)	Free Cl
2:35	8.49	738	16.77	4.3mg/L	44.8%	0.36	600	unable to
2:36	8.49	739.	16.74	4.3mg/L	44.7%	0.36	600	record on machine

Samples for lab analysis:	
□ Major ions	□ BOD, coliforms and total coliform
□ Nutrients	□ CO_2 and alkalinity
□ Metals - filtered □ Yes	□ Suspended solids

Surface ponding check:	**Vegetation check**:
□ None □ <5 cm deep □ 5-10 cm deep □ 10-50 cm deep □ >0.5 m deep	□ Healthy □ Unhealthy eg. leaf discolour □ Dead
Description of surface ponding:	**Description of unhealthy vegetation:**

801

DOSd

GROUNDWATER MONITORING RECORD
Lake Conjola

Date: 13-10-25	**Piezometer no.:**
Time: 2:10pm	**SWL (m):** / **Bore Depth(m):** 5.70m
Sampling Personnel: GH MS TM.	**SWL reference level:** □ Gattic cover □ Lip of steel monument □ Top of PVC pipe

Bore Purging

Pumping method:

□ Waterra footvalve
□ Hand Bailer
□ 12V electric eg. Monsoon
□ Submersible electric 240V

Pump depth (m):

Height of Water Column:
(Depth of bore – SWL)

→ **Volume of Water in Borehole:**

Bore Diameter (mm)	Volume of Water/m (L)
50	2.0
100	7.9

Pumping period (minutes):

→ **Volume Pumped (L):**

Flow rate (L/min):

Water Sampling

*Water Quality Meters Calibrated? Yes/No

Water colour
□ Clear
□ Turbid
□ Reddy/orange
□ Black

Water odour
□ None
□ Rotten egg (H_2S)
□ Other_____

	Time	pH	EC *circle units* (µS/cm or mS/cm)	Temp °C	DO (mg/L)	DO%	Salinity (ppt)	Turbidity (ntu)	Free Cl
DOSd	2:10pm	8.10	574	16.74°C	16.1	176%	0.27	6.4	0.92
	2:11pm	8.09	573	16.75°C	15.7	161.2%	0.27	6.8	0.92
DOSs	2:12pm	8.00	730	16.53°C	20	300%	0.36	22.1	0.82
	2:13pm	7.99	735	16.57°C	19.3	198%	0.36	18.3	0.82
5m deep									
MB2S	=DRY								
MB2D	2:40pm	8.32	792	17.80°C	0.38	20	300%	77.3	0.91
13m deep	2:41pm	8.32	792	17.76°C	0.38	20	320%	81.2	0.91

Samples for lab analysis:	
□ Major ions	□ BOD, coliforms and total coliform
□ Nutrients	□ CO_2 and alkalinity
□ Metals - filtered □ Yes	□ Suspended solids

Surface ponding check:	**Vegetation check**:
□ None □ <5 cm deep □ 5-10 cm deep □ 10-50 cm deep □ >0.5 m deep	□ Healthy □ Unhealthy eg. leaf discolour □ Dead
Description of surface ponding:	**Description of unhealthy vegetation:**

761

MB1 S

GROUNDWATER MONITORING RECORD
Lake Conjola

Date: 13 October 2015	**Piezometer no.:**
Time: 11:13 am	**SWL (m):** 1.50m **Bore Depth(m):** ~~1.65m~~ ~~1.80~~
Sampling Personnel: GH, MS, TM	**SWL reference level:** □ Gattic cover □ Lip of steel monument □ Top of PVC pipe

Bore Purging

Pumping method: □ Waterra footvalve □ Hand Bailer	□ 12V electric eg. Monsoon □ Submersible electric 240V
Pump depth (m):	
Height of Water Column: (Depth of bore – SWL)	→ **Volume of Water in Borehole:** Bore Diameter (mm) / Volume of Water/m (L) 50 / 2.0 100 / 7.9
Pumping period (minutes): **Flow rate (L/min):**	→ **Volume Pumped (L):**

Water Sampling

*Water Quality Meters Calibrated? Yes/No

Water colour □ Clear ☑ Reddy/orange □ Black □ Turbid	**Water odour** □ None ☑ Rotten egg (H_2S) V. smelly □ Other_____

Time	pH	EC *circle units* (µS/cm or mS/cm)	Temp °C	DO (mg/L)	DO%	Salinity (ppt)	Turbidity (ntu)	Free Cl
11:13am	7.29	~~961~~	17.89°C	17.6	190%	5.4	20	
11:14am	7.27	~~961~~	17.95°C	16.5	177%	5.39	7	

Samples for lab analysis:	
□ Major ions	□ BOD, coliforms and total coliform
□ Nutrients	□ CO_2 and alkalinity
□ Metals - filtered □ Yes	□ Suspended solids

Surface ponding check:	**Vegetation check**:
☑ None	☑ Healthy
□ <5 cm deep	□ Unhealthy eg. leaf discolour
□ 5-10 cm deep	□ Dead
□ 10-50 cm deep	
□ >0.5 m deep	
Description of surface ponding:	**Description of unhealthy vegetation:**

168
MB10

GROUNDWATER MONITORING RECORD
Lake Conjola

Date: 13 Oct 2015	**Piezometer no.:**
Time: 11:15am	**SWL (m):** **Bore Depth(m):** ~~1.50m~~ 1.65m
Sampling Personnel: GH, MS, TM	**SWL reference level:** □ Gattic cover □ Lip of steel monument □ Top of PVC pipe

Bore Purging

Pumping method: □ Waterra footvalve □ Hand Bailer	 □ 12V electric eg. Monsoon □ Submersible electric 240V
Pump depth (m):	
Height of Water Column: (Depth of bore – SWL)	→ **Volume of Water in Borehole:**
Pumping period (minutes): **Flow rate (L/min):**	→ **Volume Pumped (L):**

Bore Diameter (mm)	Volume of Water/m (L)
50	2.0
100	7.9

Water Sampling

*Water Quality Meters Calibrated? Yes/No

Water colour ☑ Clear □ Reddy/orange □ Turbid □ Black	**Water odour** □ Other_____ ☑ None □ Rotten egg (H_2S)

Time	pH	EC *circle units* (µS/cm or mS/cm)	Temp °C	DO (mg/L)	DO%	Salinity (ppt)	Turbidity (ntu)	Free Cl
11:15am	8.64	~~654~~ 654	17.74°C	~~30~~ 20	300%	0.32	11	~~0.05~~
11:16am	8.63	660	17.75°C	20	300%	0.32	10	~~0.05~~

Samples for lab analysis:	
□ Major ions	□ BOD, coliforms and total coliform
□ Nutrients	□ CO_2 and alkalinity
□ Metals - filtered □ Yes	□ Suspended solids

Surface ponding check:	**Vegetation check**:
☑ None	
□ <5 cm deep	☑ Healthy
□ 5-10 cm deep	□ Unhealthy eg. leaf discolour
□ 10-50 cm deep	□ Dead
□ >0.5 m deep	
Description of surface ponding:	**Description of unhealthy vegetation:**

754
Camp kitchen

GROUNDWATER MONITORING RECORD
Lake Conjola

Date: 13-10-15	**Piezometer no.:**
Time: 11:19am	**SWL (m):** **Bore Depth(m):** N/a
Sampling Personnel: GH, MS, TM	**SWL reference level:** □ Gattic cover □ Lip of steel monument □ Top of PVC pipe

Bore Purging

Pumping method: □ Waterra footvalve □ Hand Bailer	□ 12V electric eg. Monsoon □ Submersible electric 240V
Pump depth (m):	
Height of Water Column: (Depth of bore – SWL)	→ **Volume of Water in Borehole:** Bore Diameter (mm) / Volume of Water/m (L) 50 / 2.0 100 / 7.9
Pumping period (minutes): **Flow rate (L/min):**	→ **Volume Pumped (L):**

Water Sampling

*Water Quality Meters Calibrated? Yes/No

Water colour ☑ Clear □ Turbid □ Reddy/orange □ Black	**Water odour** ☑ None □ Rotten egg (H_2S) □ Other_____

Time	pH	EC *circle units* (µS/cm or mS/cm)	Temp °C	DO (mg/L)	DO%	Salinity (ppt)	Turbidity (ntu)	Free Cl
11:19am	8.70	184	18.90°C	20	300%	0.07	16	
11:20m	8.69	184	18.85°C	20	300%		11	

Samples for lab analysis:	
□ Major ions	□ BOD, coliforms and total coliform
□ Nutrients	□ CO_2 and alkalinity
□ Metals - filtered □ Yes	□ Suspended solids

Surface ponding check:	**Vegetation check**:
□ None	
□ <5 cm deep	□ Healthy
□ 5-10 cm deep	□ Unhealthy eg. leaf discolour
□ 10-50 cm deep	□ Dead
□ >0.5 m deep	
Description of surface ponding:	**Description of unhealthy vegetation:**

@ 294/295
caravan site
763

GROUNDWATER MONITORING RECORD
Lake Conjola

Date: 13-10-15	**Piezometer no.:**
Time: 11:30am	**SWL (m):** [ ] **Bore Depth(m):** N/a
Sampling Personnel: GH, MS, TM	**SWL reference level:** □ Gattic cover □ Lip of steel monument □ Top of PVC pipe

Bore Purging

Pumping method:	
□ Waterra footvalve	□ 12V electric eg. Monsoon
□ Hand Bailer	□ Submersible electric 240V
Pump depth (m):	
Height of Water Column: (Depth of bore – SWL)	→ **Volume of Water in Borehole:**
Pumping period (minutes):	→ **Volume Pumped (L):**
Flow rate (L/min):	

Bore Diameter (mm)	Volume of Water/m (L)
50	2.0
100	7.9

Water Sampling

*Water Quality Meters Calibrated? Yes/No

Water colour ☑ Clear □ Reddy/orange □ Turbid □ Black	**Water odour** ☑ None □ Other_____ □ Rotten egg (H_2S)

Time	pH	EC *circle units* (µS/cm or mS/cm)	Temp °C	DO (mg/L)	DO%	Salinity (ppt)	Turbidity (ntu)	Free Cl
11:30am	8.7	179	18.96°C	20	300%	.07	7	
11:31am	8.8	174	18.66	20	300%	.07	5	

Samples for lab analysis:	
□ Major ions	□ BOD, coliforms and total coliform
□ Nutrients	□ CO_2 and alkalinity
□ Metals - filtered □ Yes	□ Suspended solids

Surface ponding check:	**Vegetation check:**
□ None	
□ <5 cm deep	☑ Healthy
□ 5-10 cm deep	□ Unhealthy eg. leaf discolour
□ 10-50 cm deep	□ Dead
□ >0.5 m deep	
Description of surface ponding:	**Description of unhealthy vegetation:**

MW76
802.

GROUNDWATER MONITORING RECORD
Lake Conjola

Date: 13 - 10 -15	**Piezometer no.:**
Time: 11:45am	**SWL (m):** **Bore Depth(m):** 2.4m
Sampling Personnel: GH, MS, TM	**SWL reference level:** □ Gattic cover □ Lip of steel monument □ Top of PVC pipe

Bore Purging

Pumping method: □ Waterra footvalve □ Hand Bailer	 □ 12V electric eg. Monsoon □ Submersible electric 240V
Pump depth (m):	
Height of Water Column: (Depth of bore – SWL)	→ **Volume of Water in Borehole:**

Bore Diameter (mm)	Volume of Water/m (L)
50	2.0
100	7.9

Pumping period (minutes): **Flow rate (L/min):**	→ **Volume Pumped (L):**

Water Sampling

*Water Quality Meters Calibrated? Yes/No

Water colour □ Clear □ Turbid	 □ Reddy/orange □ Black ☑ Yellow
Water odour □ None ☑ Rotten egg (H_2S)	 □ Other_____

Time	pH	EC *circle units* (µS/cm or mS/cm)	Temp °C	DO (mg/L)	DO%	Salinity (ppt)	Turbidity (ntu)	Free Cl
11:45am	6.68	67 ~~mS/cm~~	17.30°C	20	300%	0.02	4.3	
11:46am	6.58	67	17.35°C	20	300%	0.02	3.9	

Samples for lab analysis:	
□ Major ions	□ BOD, coliforms and total coliform
□ Nutrients	□ CO_2 and alkalinity
□ Metals - filtered □ Yes	□ Suspended solids

Surface ponding check:	**Vegetation check**:
☑ None	
□ <5 cm deep	☑ Healthy
□ 5-10 cm deep	□ Unhealthy eg. leaf discolour
□ 10-50 cm deep	□ Dead
□ >0.5 m deep	
Description of surface ponding:	**Description of unhealthy vegetation:**

716
MBS

GROUNDWATER MONITORING RECORD
Lake Conjola

Date: 13-10-15	**Piezometer no.:**
Time: 11:50am	**SWL (m):** / **Bore Depth(m):** 1.45m
Sampling Personnel: GH, MS, TM	**SWL reference level:** □ Gattic cover □ Lip of steel monument □ Top of PVC pipe

Bore Purging

Pumping method:

□ Waterra footvalve
□ Hand Bailer
□ 12V electric eg. Monsoon
□ Submersible electric 240V

Pump depth (m):

Height of Water Column:
(Depth of bore – SWL)

→ Volume of Water in Borehole:

Bore Diameter (mm)	Volume of Water/m (L)
50	2.0
100	7.9

Pumping period (minutes):

→ Volume Pumped (L):

Flow rate (L/min):

Water Sampling

*Water Quality Meters Calibrated? Yes/No

Water colour
□ Clear
□ Reddy/orange
□ Black
☑ Yellow
□ Turbid

Water odour
□ None
□ Rotten egg (H_2S)
□ Other_____

Time	pH	EC *circle units* (µS/cm or mS/cm)	Temp °C	DO (mg/L)	DO%	Salinity (ppt)	Turbidity (ntu)	Free Cl
11:50am	5.83	101	17.46°C	20	200%	0.05	3.1	1.06
11:51am	5.82	106	17.47°C	20	300%	0.05	1.6	1.06

Samples for lab analysis:	
□ Major ions	□ BOD, coliforms and total coliform
□ Nutrients	□ CO_2 and alkalinity
□ Metals - filtered □ Yes	□ Suspended solids

Surface ponding check:	**Vegetation check:**
☑ None	
□ <5 cm deep	□ Healthy
□ 5-10 cm deep	□ Unhealthy eg. leaf discolour
□ 10-50 cm deep	□ Dead
□ >0.5 m deep	
Description of surface ponding:	**Description of unhealthy vegetation:**

VS
Thorne
715

GROUNDWATER MONITORING RECORD
Lake Conjola

Date: 13-10-15	**Piezometer no.:**
Time: 12:00pm	**SWL (m):** **Bore Depth(m):**
Sampling Personnel: GH MS TM.	**SWL reference level:** □ Gattic cover □ Lip of steel monument □ Top of PVC pipe

Bore Purging

Pumping method:

□ Waterra footvalve
□ Hand Bailer
□ 12V electric eg. Monsoon
□ Submersible electric 240V

Pump depth (m):

Height of Water Column:
(Depth of bore – SWL)

→ Volume of Water in Borehole:

Bore Diameter (mm)	Volume of Water/m (L)
50	2.0
100	7.9

Pumping period (minutes):

→ Volume Pumped (L):

Flow rate (L/min):

Water Sampling

*Water Quality Meters Calibrated? Yes/No

Water colour
□ Clear
□ Turbid
□ Reddy/orange
□ Black
☑ Yellow

Water odour
□ None
☑ Rotten egg (H_2S)
□ Other_____

Time	pH	EC *circle units* (µS/cm or mS/cm)	Temp °C	DO (mg/L)	DO%	Salinity (ppt)	Turbidity (ntu)	Free Cl
12:00	5.69	366	16.53°C	20	300%	0.16	2.7	1.28
12:01	5.69	371	16.59°C	20	300%	0.16	1.9	1.28

Samples for lab analysis: □ Major ions □ Nutrients □ Metals - filtered □ Yes	 □ BOD, coliforms and total coliform □ CO_2 and alkalinity □ Suspended solids

Surface ponding check: □ None □ <5 cm deep □ 5-10 cm deep □ 10-50 cm deep □ >0.5 m deep	**Vegetation check:** □ Healthy □ Unhealthy eg. leaf discolour □ Dead
Description of surface ponding:	**Description of unhealthy vegetation:**

MW7a
803

GROUNDWATER MONITORING RECORD
Lake Conjola

Date: 13-10-15	**Piezometer no.:**
Time: 12:15	**SWL (m):** **Bore Depth(m):** 8.64m
Sampling Personnel: GH MS TM	**SWL reference level:** □ Gattic cover □ Lip of steel monument □ Top of PVC pipe

Bore Purging

Pumping method: □ Waterra footvalve □ Hand Bailer	□ 12V electric eg. Monsoon □ Submersible electric 240V
Pump depth (m):	
Height of Water Column: (Depth of bore – SWL)	→ **Volume of Water in Borehole:** Bore Diameter (mm) / Volume of Water/m (L) 50 / 2.0 100 / 7.9
Pumping period (minutes): **Flow rate (L/min):**	→ **Volume Pumped (L):**

Water Sampling

*Water Quality Meters Calibrated? Yes/No

Water colour
□ Clear
□ Reddy/orange
□ Black
☑ Turbid
Milky

Water odour
□ None
□ Rotten egg (H_2S)
□ Other_____

Time	pH	EC *circle units* (µS/cm or mS/cm)	Temp °C	DO (mg/L)	DO%	Salinity (ppt)	Turbidity (ntu)	Free Cl
12:15	5.95	354	17.90C	20	300%	0.15	184.9	
12:16	5.95	348	17.90C	20	300%	0.15	185.0	

Samples for lab analysis:	
□ Major ions	□ BOD, coliforms and total coliform
□ Nutrients	□ CO_2 and alkalinity
□ Metals - filtered □ Yes	□ Suspended solids

Surface ponding check:	**Vegetation check:**
☑ None	
□ <5 cm deep	□ Healthy
□ 5-10 cm deep	□ Unhealthy eg. leaf discolour
□ 10-50 cm deep	□ Dead
□ >0.5 m deep	
Description of surface ponding:	**Description of unhealthy vegetation:**

MB3
755

GROUNDWATER MONITORING RECORD
Lake Conjola

Date: 13-10-15	**Piezometer no.:**
Time: 12:45pm	**SWL (m):** **Bore Depth(m):**
Sampling Personnel: GH MS TM	**SWL reference level:** □ Gattic cover □ Lip of steel monument □ Top of PVC pipe

Bore Purging

Pumping method: □ Waterra footvalve □ Hand Bailer	□ 12V electric eg. Monsoon □ Submersible electric 240V
Pump depth (m):	
Height of Water Column: (Depth of bore – SWL)	→ **Volume of Water in Borehole:** Bore Diameter (mm) / Volume of Water/m (L) 50 / 2.0 100 / 7.9
Pumping period (minutes): **Flow rate (L/min):**	→ **Volume Pumped (L):**

Water Sampling

*Water Quality Meters Calibrated? Yes/No

Water colour □ Clear □ Turbid □ Reddy/orange □ Black	**Water odour** □ None □ Rotten egg (H_2S) □ Other_____

Time	pH	EC *circle units* (µS/cm or mS/cm)	Temp °C	DO (mg/L)	DO%	Salinity (ppt)	Turbidity (ntu)	Free Cl

Samples for lab analysis:	
□ Major ions	□ BOD, coliforms and total coliform
□ Nutrients	□ CO_2 and alkalinity
□ Metals - filtered □ Yes	□ Suspended solids

Surface ponding check:	**Vegetation check**:
□ None	
□ <5 cm deep	□ Healthy
□ 5-10 cm deep	□ Unhealthy eg. leaf discolour
□ 10-50 cm deep	□ Dead
□ >0.5 m deep	
Deseription of surface ponding:	**Description of unhealthy vegetation:**

Bh28
756

GROUNDWATER MONITORING RECORD
Lake Conjola

Date: 13-10-15	**Piezometer no.:**
Time: 12:45pm	**SWL (m):** **Bore Depth(m):** 6.76m
Sampling Personnel: GH MS TM	**SWL reference level:** □ Gattic cover □ Lip of steel monument □ Top of PVC pipe

Bore Purging

Pumping method:	
□ Waterra footvalve	□ 12V electric eg. Monsoon
□ Hand Bailer	□ Submersible electric 240V
Pump depth (m):	
Height of Water Column: (Depth of bore – SWL)	→ **Volume of Water in Borehole:**
Pumping period (minutes):	→ **Volume Pumped (L):**
Flow rate (L/min):	

Bore Diameter (mm)	Volume of Water/m (L)
50	2.0
100	7.9

Water Sampling

*Water Quality Meters Calibrated? Yes/No

Water colour
□ Clear
□ Reddy/orange
□ Black
☑ ~~Turbid~~ slight

Water odour
□ Other_____
☑ ~~None~~
□ Rotten egg (H_2S)

Time	pH	EC *circle units* (µS/cm or mS/cm)	Temp °C	DO (mg/L)	DO%	Salinity (ppt)	Turbidity (ntu)	Free Cl
12:45	7.32	982	17.47°C	10.1 ~~10.21~~	102.1% ~~102.1%~~	0.47	1-2	
12:46	7.36	976	17.49°C	7.9	82%	0.47	.4	

Samples for lab analysis:	
□ Major ions	□ BOD, coliforms and total coliform
□ Nutrients	□ CO_2 and alkalinity
□ Metals - filtered □ Yes	□ Suspended solids

Surface ponding check:	**Vegetation check:**
☑ None	☑ Healthy
□ <5 cm deep	□ Unhealthy eg. leaf discolour
□ 5-10 cm deep	□ Dead
□ 10-50 cm deep	
□ >0.5 m deep	
Description of surface ponding:	**Description of unhealthy vegetation:**

783
25m E BH28

GROUNDWATER MONITORING RECORD
Lake Conjola

Date: 13-10-15	**Piezometer no.:**
Time: 1:00pm	**SWL (m):** **Bore Depth(m):**
Sampling Personnel: GH MS TM	**SWL reference level:** □ Gattic cover □ Lip of steel monument □ Top of PVC pipe

Bore Purging

Pumping method: □ Waterra footvalve □ Hand Bailer	□ 12V electric eg. Monsoon □ Submersible electric 240V
Pump depth (m):	
Height of Water Column: (Depth of bore – SWL)	→ **Volume of Water in Borehole:** Bore Diameter (mm) / Volume of Water/m (L) 50 / 2.0 100 / 7.9
Pumping period (minutes): **Flow rate (L/min):**	→ **Volume Pumped (L):**

Water Sampling

*Water Quality Meters Calibrated? Yes/No

Water colour □ Clear □ Reddy/orange □ Turbid □ Black	**Water odour** □ Other_____ □ None □ Rotten egg (H_2S)

Time	pH	EC *circle units* (µS/cm or mS/cm)	Temp °C	DO (mg/L)	DO%	Salinity (ppt)	Turbidity (ntu)	Free Cl

Samples for lab analysis:	
□ Major ions	□ BOD, coliforms and total coliform
□ Nutrients	□ CO_2 and alkalinity
□ Metals - filtered □ Yes	□ Suspended solids

Surface ponding check:	**Vegetation check**:
□ None □ <5 cm deep □ 5-10 cm deep □ 10-50 cm deep □ >0.5 m deep	□ Healthy □ Unhealthy eg. leaf discolour □ Dead
Description of surface ponding:	**Description of unhealthy vegetation:**

DO1
757

GROUNDWATER MONITORING RECORD
Lake Conjola

Date: 13-10-15	**Piezometer no.:**
Time: 1:15pm	**SWL (m):** **Bore Depth(m):** 6m.
Sampling Personnel: GH MS TH	**SWL reference level:** Not enough to sample. □ Gattic cover □ Lip of steel monument □ Top of PVC pipe

Bore Purging

Pumping method:
□ Waterra footvalve
□ Hand Bailer
□ 12V electric eg. Monsoon
□ Submersible electric 240V

Pump depth (m):

Height of Water Column:
(Depth of bore – SWL)

→ Volume of Water in Borehole:

Bore Diameter (mm)	Volume of Water/m (L)
50	2.0
100	7.9

Pumping period (minutes):

→ Volume Pumped (L):

Flow rate (L/min):

Water Sampling

*Water Quality Meters Calibrated? Yes/No

Water colour
□ Clear
□ Turbid
□ Reddy/orange
□ Black

Water odour
□ None
□ Rotten egg (H_2S)
□ Other_____

Time	pH	EC *circle units* (µS/cm or mS/cm)	Temp °C	DO (mg/L)	DO%	Salinity (ppt)	Turbidity (ntu)	Free Cl
1:15pm								
1:16pm								

Samples for lab analysis:	
□ Major ions	□ BOD, coliforms and total coliform
□ Nutrients	□ CO_2 and alkalinity
□ Metals - filtered □ Yes	□ Suspended solids

Surface ponding check:	**Vegetation check**:
□ None	
□ <5 cm deep	□ Healthy
□ 5-10 cm deep	□ Unhealthy eg. leaf discolour
□ 10-50 cm deep	□ Dead
□ >0.5 m deep	
Description of surface ponding:	**Description of unhealthy vegetation:**

P02
758

GROUNDWATER MONITORING RECORD
Lake Conjola

Date: 13-10-15	**Piezometer no.:**
Time: 1:15pm	**SWL (m):** / **Bore Depth(m):** 7.8m
Sampling Personnel: GH MS TM.	**SWL reference level:** □ Gattic cover □ Lip of steel monument □ Top of PVC pipe

Bore Purging

Pumping method:

□ Waterra footvalve
□ Hand Bailer
□ 12V electric eg. Monsoon
□ Submersible electric 240V

Pump depth (m):

Height of Water Column:
(Depth of bore – SWL)

→ **Volume of Water in Borehole:**

Bore Diameter (mm)	Volume of Water/m (L)
50	2.0
100	7.9

Pumping period (minutes):

→ **Volume Pumped (L):**

Flow rate (L/min):

Water Sampling

*Water Quality Meters Calibrated? Yes/No

Water colour
□ Clear
□ Reddy/orange
□ Black
~~□ Turbid~~

Water odour
□ None
□ Rotten egg (H_2S)
□ Other_____

Time	pH	EC *circle units* (µS/cm or mS/cm)	Temp °C	DO (mg/L)	DO%	Salinity (ppt)	Turbidity (ntu)	Free.Cl
1:15	7.97	~~1563~~ 1536	16.63°C	17.1	171.6%	0.78	83.4	1.20
1:16	7.96	1530	16.66°C	16.7	174.0%	0.78	82.7	1.20

Samples for lab analysis: □ Major ions □ Nutrients □ Metals - filtered □ Yes	□ BOD, coliforms and total coliform □ CO_2 and alkalinity □ Suspended solids

Surface ponding check: ☑ None □ <5 cm deep □ 5-10 cm deep □ 10-50 cm deep □ >0.5 m deep	**Vegetation check**: □ Healthy □ Unhealthy eg. leaf discolour □ Dead
Description of surface ponding:	**Description of unhealthy vegetation:**

MW58S

782.

GROUNDWATER MONITORING RECORD
Lake Conjola

Date: 13-10-13	**Piezometer no.:**
Time: 1:30pm	**SWL (m):** **Bore Depth(m):** 7.80m
Sampling Personnel: GH MS TM.	**SWL reference level:** □ Gattic cover □ Lip of steel monument □ Top of PVC pipe

not enough to Sample.

Bore Purging

Pumping method: □ Waterra footvalve □ Hand Bailer	□ 12V electric eg. Monsoon □ Submersible electric 240V
Pump depth (m):	
Height of Water Column: (Depth of bore – SWL)	→ **Volume of Water in Borehole:** Bore Diameter (mm) / Volume of Water/m (L) 50 / 2.0 100 / 7.9
Pumping period (minutes): **Flow rate (L/min):**	→ **Volume Pumped (L):**

Water Sampling

*Water Quality Meters Calibrated? Yes/No

Water colour □ Clear □ Turbid □ Reddy/orange ☑ Black	**Water odour** □ None □ Rotten egg (H_2S) □ Other_____

Time	pH	EC *circle units* (µS/cm or mS/cm)	Temp °C	DO (mg/L)	DO%	Salinity (ppt)	Turbidity (ntu)	Free Cl

Samples for lab analysis:	
□ Major ions	□ BOD, coliforms and total coliform
□ Nutrients	□ CO_2 and alkalinity
□ Metals - filtered □ Yes	□ Suspended solids

Surface ponding check:	**Vegetation check**:
□ None □ <5 cm deep □ 5-10 cm deep □ 10-50 cm deep □ >0.5 m deep	□ Healthy □ Unhealthy eg. leaf discolour □ Dead
Description of surface ponding:	**Description of unhealthy vegetation:**

DO3 759

GROUNDWATER MONITORING RECORD
Lake Conjola

Date: 13-10-15	**Piezometer no.:**
Time: 1:55pm	**SWL (m):** **Bore Depth(m):** 4.45m
Sampling Personnel: GH MS TM	**SWL reference level:** □ Gattic cover □ Lip of steel monument □ Top of PVC pipe

Bore Purging

Pumping method: □ Waterra footvalve □ Hand Bailer	□ 12V electric eg. Monsoon □ Submersible electric 240V
Pump depth (m):	
Height of Water Column: (Depth of bore – SWL)	→ **Volume of Water in Borehole:** Bore Diameter (mm) / Volume of Water/m (L): 50 – 2.0; 100 – 7.9
Pumping period (minutes): **Flow rate (L/min):**	→ **Volume Pumped (L):**

Water Sampling

*Water Quality Meters Calibrated? Yes/No

Water colour □ Clear □ Turbid □ Reddy/orange □ Black	**Water odour** □ None □ Rotten egg (H_2S) □ Other_____

Time	pH	EC *circle units* (µS/cm or mS/cm)	Temp °C	DO (mg/L)	DO%	Salinity (ppt)	Turbidity (ntu)	Free Cl
1:55pm	7.92	757	17.60°C	15.9	166%	0.35	0	0.66
1:56pm	7.92	757	17.58°C	15.4	162%	0.35	0	0.66

Samples for lab analysis:	
□ Major ions	□ BOD, coliforms and total coliform
□ Nutrients	□ CO_2 and alkalinity
□ Metals - filtered □ Yes	□ Suspended solids

Surface ponding check:	**Vegetation check**:
□ ✓ None	
□ <5 cm deep	□ ✓ Healthy
□ 5-10 cm deep	□ Unhealthy eg. leaf discolour
□ 10-50 cm deep	□ Dead
□ >0.5 m deep	
Description of surface ponding:	**Description of unhealthy vegetation:**

LAST PAGE OF REPORT

Thank you for the opportunity to work with Shoalhaven Water.

Feedback is Welcomed at Earth2Water (dino@earth2water.com.au)

earth2water Pty Ltd
Environmental & Groundwater Consulting