25 August 2023
Job No: 1013050.0000

Beca Limited
21 Pitt Street
Auckland CBD
Auckland 1010

Attention: Jenny Vince

Dear Jenny

Northern Interceptor Package 1 - Pumpstation Dewatering
Discharge Water Quality Assessment

Tonkin & Taylor Ltd (T+T) has been engaged by Beca Limited (Beca) to undertake an assessment of expected water quality of dewatering water associated with the proposed construction of the Northern Interceptor Package 1 (NI1) pumpstation.

This work was completed in accordance with the Beca variation document[1] dated 17 July 2023 to our original contract[2] dated 11 May 2020.

1 Background

Groundwater dewatering will be required to complete construction of the proposed pumpstation at 23-27 Brigham Creek Road. The draft construction methodology is presented in the T+T Groundwater and Settlement Effects Report[3].

Discharge of the dewatering water is proposed to be to a mixture of:

- The adjacent wetland to maintain requisite soil moisture conditions and hydrogeological conditions at the wetland; and
- The local surface water course, Sinton Stream located immediately south of the pump station.

Details regarding the dewatering including expected flow rates, volumes and dewatering effects are presented in the T+T Groundwater and Settlement Effects Report.

Beca has requested T+T review existing groundwater quality data and provide comment on the water quality with regard to discharge to the receiving environments during dewatering.

[1] Beca Limited, Whenuapai Wastewater Servicing Scheme Package 1 – Variation, prepared for Tonkin & Taylor Ltd. 17 July 2023
[2] Beca Limited, Commissioning Letter for Tonkin & Taylor Ltd, prepared for Tonkin & Taylor Ltd. 11 May 2020
[3] T+T, Groundwater and Settlement Effects Report Whenuapai Conveyance - Package 1 V4, prepared for Beca Ltd, 25 August 2023.

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1.1 Information sources

Information was obtained from the following project related reports:

- An assessment of potential sources of contamination is presented in the GHD Ltd Preliminary Site Investigation report[4] (GHD PSI, 2020).
- Piezometer installation details are presented in the T+T geotechnical ground investigation factual report (T+T GFR 2022)[5].
- Groundwater quality information as well as soil quality data was reported in the ground contamination investigation report (T+T Factual 2021)[6].
- GHD Ltd prepared the interpretative Detailed Site Investigation[7] (GHD DSI, 2021) report based on T+T's factual report.

2 Environmental setting

The proposed pumpstation is located at 23-27 Brigham Creek Road, Whenuapai. The land is currently vacant pasture sloping gently downwards to the west (Figure 1).

The Sinton Stream runs southeast to northwest and is 20-30 m to the southwest of the proposed pumpstation. The stream discharges into the Totara Creek and then Totora Inlet to the north.

The ground conditions at the pumpstation comprise Takanini Formation (previously referred to as Tauranga Group) silts and clays to approximately 5 m below ground level (bgl) overlying East Coast Bays Formation residual soils (stiff to very stiff silts and medium dense sand) overlying moderately to slightly weathered rock (siltstone and sandstone).

Groundwater is present at around 2 m bgl with groundwater levels shown to vary seasonally and in response to rainfall events. Groundwater flow is expected to be to the west and south towards Sinton Stream.

A wetland is located to the north of the proposed pumpstation, encompassing an area of approximately 1,400 m^2.

[4] GHD Ltd, Whenuapai-Redhills Wastewater Servicing, Environmental Assessment: Preliminary Site Investigation, prepared for Watercare Services Limited, June 2020.
[5] Tonkin + Taylor Ltd (March 2022), Whenuapai-Redhills Wastewater Servicing Rising Main/Gravity Main and Interim Pump Station - Package 1 - Geotechnical Ground Investigation, V1.1 Job Ref: 1014985.
[6] Tonkin + Taylor Ltd (February 2021), Whenuapai-Redhills Wastewater Servicing Rising Main/ Gravity Main and Interim Pump Station - Package 1 Ground contamination factual report Prepared for Watercare Services Limited, Version 2, Job ref 1014985.v2.
[7] GHD Ltd, Whenuapai-Redhills Wastewater Servicing Package 1 Environmental Assessment: Detailed Site Investigation - Summary Report, prepare for Watercare Services Ltd, June 2021

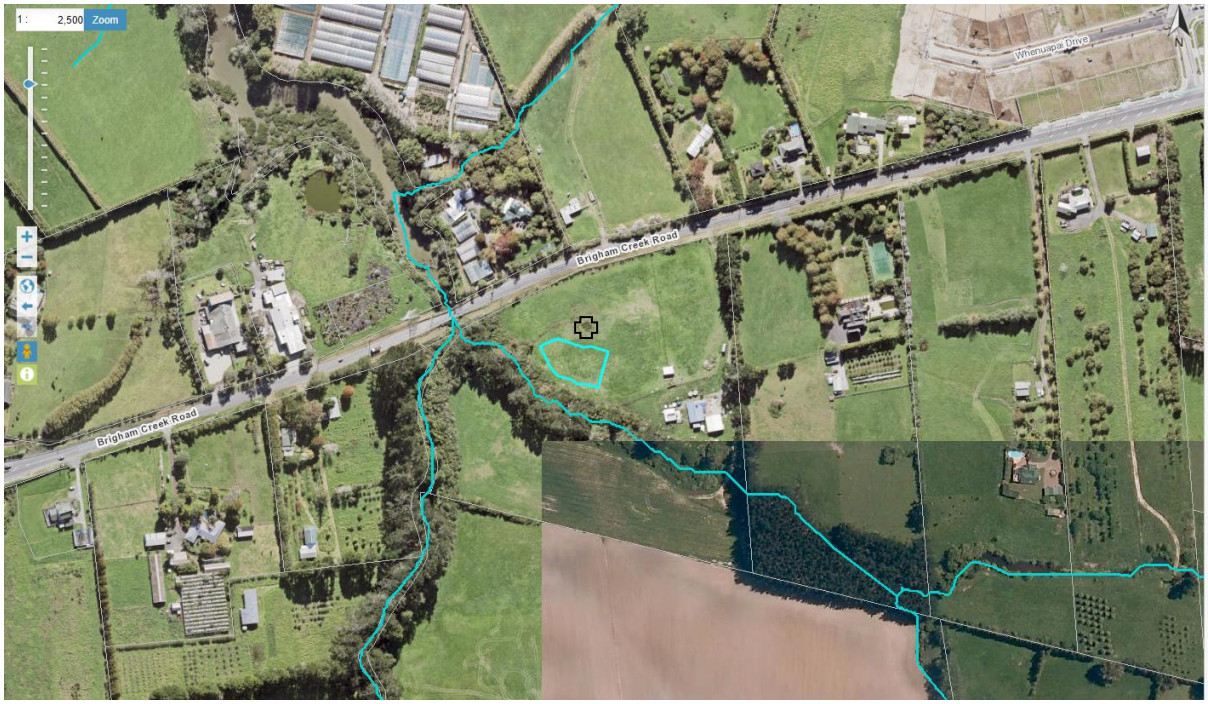

Figure 1: Site location plan – approximate site of pumpstation shown in blue, with location of wetland in black. Sinton Stream is located to the southwest of the site. Brigham Creek Road runs east/west north of the site. (Source: Auckland Council Geomaps)

3 Potential sources of contamination

GHD (GHD PSI 2020) reviewed available desk-based information to identify potentially contaminating activities (as defined by the Ministry for the Environments HAIL[8] list) intercepted by or adjacent to the NI1 pipeline and pumpstation.

While no HAIL sites were identified at the site of the proposed pumpstation, the report identified the following HAIL sites in the vicinity of the proposed pumpstation:

- Orchards (location 2 as shown on the clip below in Figure 2 - ~300 m to southwest of site)
- Horticultural land and orchards (location 6, Figure 2, ~200 m to northeast of site); and
- Skin or wool processing / slaughterhouse, storage of dangerous goods (gases and flammable liquids), and discharge of treated wastewater to ground from commercial activities (location 1, Figure 2, ~200-250 m west of the site).
- A number of other horticultural activities deemed to be “low” risk by GHD and not mapped.

In regards to the potential impact to groundwater quality at the pumpstation site we make the following comments:

- The mapped horticultural land uses including orchards are distant from the pumpstation and are considered to be of low likelihood of impacting groundwater quality at or near the pumpstation site.
- The slaughterhouse and related activities including discharge to ground may have impacted groundwater quality in the area of those activities. However, this is located approximately 200 m to the west, on the other side of the Sinton Stream and Totara Creek. Based on the distance from the site and being downgradient hydraulic gradient of the site the likelihood of this

[8] Hazardous Activities and Industries List, Ministry for the Environment, October 2011

impacting groundwater quality in the area of the proposed works, even during dewatering, is considered to be low.

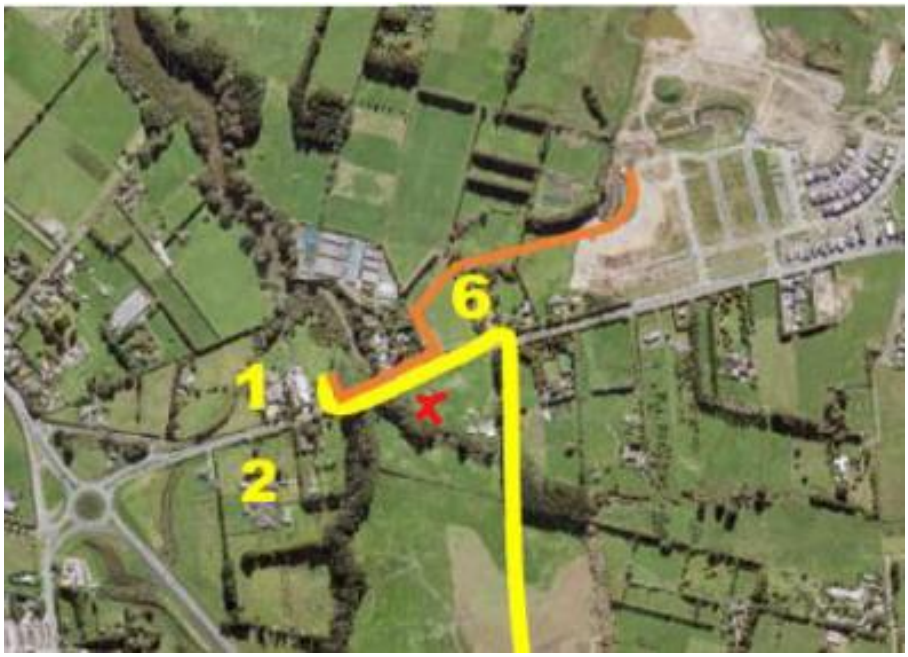

Figure 2: Potentially contaminating land use activities identified by GHD in its Preliminary Site Investigation. The numbered locations are described in the text above. The approximate location of the proposed pumpstation is shown by the red cross. The yellow and orange lines were the alignments of the associated pipelines at the time the PSI was written. (Source: Clip from GHD 2020)

4 Soil quality testing at the pumpstation site

Soil contaminant testing was undertaken at the pumpstation site as part of the ground investigation programme (T+T Factual 2021). The sampling programme and contaminants of concern were prescribed by GHD in its specification[9]. Soil samples from surface and near surface were tested to inform soil disposal during the works. The contaminants of concern for testing were based on a general suite for soil disposal assessment purposes (heavy metals, total petroleum hydrocarbons, polycyclic aromatic hydrocarbons and asbestos). Investigation locations are shown in Figure 3. The testing results from the pumpstation area (BH110, BH111) and surrounds (BH117 and BH05A/BH05B and a number of hand auger locations) indicated concentrations of contaminants were at or below published soil background concentrations (GHD DSI 2021).

[9] GHD, October 2020, Watercare Service Limited Whenuapai-Redhills Wastewater Servicing Rising Main/Gravity Main and Interim Pump Station Ground Investigation Scope (Package 1) REVISION 2

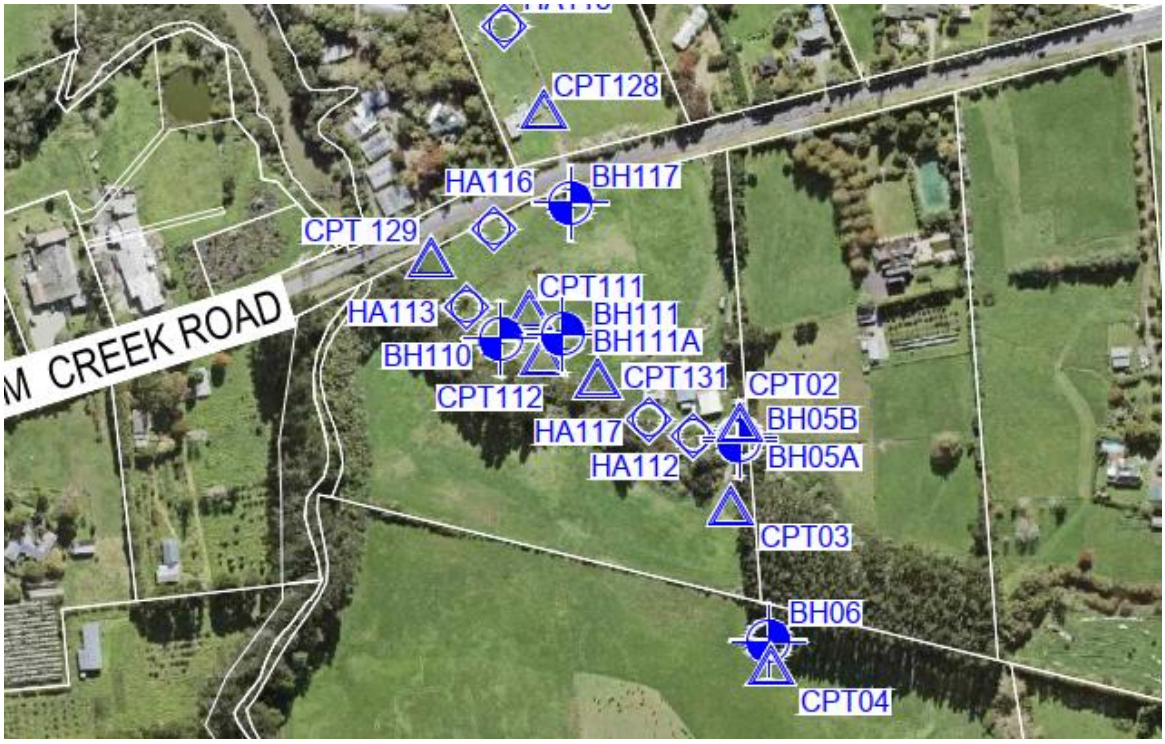

Figure 3: Site investigation location plan (Source: clip from T+T 2021)

5 Groundwater assessment

5.1 Sampling

Piezometers were installed in the area of the proposed pumpstation for the purpose of monitoring groundwater depths and collection of groundwater samples for water quality testing. BH110 and BH111 are in the area of the pumpstation. BH117 is located to the north of the wetland, and BH05A/BH05B is to the east. Investigation locations are shown in Figure 3. Details of the piezometer screen depths and depth to groundwater at the time of sampling are presented in Table 1 summarised from the T+T GFR 2022 and T+T Factual 2021.

Groundwater sampling methodology, QA/QC approaches and field screening data are detailed in the T+T Factual report (2021).

The testing suite for groundwater quality was defined by GHD in its specification. Groundwater samples were tested for a general testing suite comprising pH, dissolved metals, polyaromatic hydrocarbons and total petroleum hydrocarbons. This testing suite is considered appropriate based on the site setting and lack of potential sources of contamination in the area.

Table 1: Piezometer details (T+T GFR 2022)

Borehole ID	Location relative to the proposed pumpstation dewatering area	Screen depth	Groundwater depth at time of sampling
BH110	Within dewatering area	8-11	5.3
BH111	Within dewatering area	3-5	2.8
BH117	Approximately 80 m to the north of the dewatering area, north of the wetland area.	9.5-12	2.9
BH05A	Approximately 150 m from main dewatering area to southeast	8.5-11.8	1m
BH05B		3.5-3.5	3.3
BH06	200 m from the main dewatering area to the southeast	3.5-5	3.2

5.2 Water quality assessment screening criteria

Beca has advised that the discharge of dewatering water to land (including to the wetland) or surface water is a permitted activity under Activity rule E.4.4.1 (activities A2-d[10] and A5[11]) as long as the standards outlined in E.4.6.1 (general standards) and in E.4.6.2.3 and E4.6.2.5 (permitted activity-specific standards) are met. Details of the relevant planning standards for the discharge of dewatering water under the AUP are presented in Appendix A.

The Australia and New Zealand Water Quality Guidelines (ANZG) for freshwater and marine water quality at the 95% species protection level have been adopted for the screening assessment of the likely dewatering water quality. It is important to note that the ANZG apply following reasonable mixing in the receiving environment, so a direct comparison undertaken in this assessment is highly conservative. Adoption of these screening criteria therefore allows for a very conservative assessment against the permitted activity standards for the discharge to be met (E.4.6.1 and E4.6.2.5 standards relating to not giving rise to significant adverse effect on aquatic life, and E4.6.2.3 standards around water quality).

Both the marine and the freshwater screening values have been used in the assessment given the water is entering a freshwater system, but it discharges to the marine environment just north of the site.

Published background concentrations of inorganic contaminants in groundwater have also been adopted in the assessment[12]. The range of results have been used, with the maximum shown in the table in Appendix B.

We note that since the AUP became operative, the ANZECC 2000 Guidelines referenced in the AUP have been superseded by the 2018 revision of the ANZG. Some guideline values in the ANZG have

[10] (A2) Discharge of water onto or into land and/or into water from any of the following: … (d) temporary or permanent discharge of diverted uncontaminated groundwater.
[11] (A5) Discharge onto or into land and/or into water for the purpose of dewatering trenches or other excavations
[12] Auckland Regional Council (2007). State of the Environment Monitoring: Groundwater Quality Data Report 1998-2005. ARC Technical Publication 352. Auckland.

changed while some guideline values are under review. Where applicable the updated guideline values have been adopted for this screening assessment.

5.3 Groundwater quality results

The groundwater quality data is presented in Appendix B. Full laboratory transcripts are available in the T+T Factual report (T+T 2021).

The key findings of the groundwater quality testing at the pumpstation (BH110 and BH111) are:

- Concentrations of metal and metalloids were below the screening assessment criteria (freshwater and marine) and/or the published background concentration; and
- No polyaromatic hydrocarbons were recorded above the laboratory reporting limit in either monitoring well. No other SVOC compounds were recorded in the sample tested from BH111.

Water quality in the vicinity (200 m) of the pumpstation (BH117, BH05A, BH05B and BH06) indicate:

- Metal and metalloids concentrations were below the screening assessment criteria (freshwater and marine) and/or background with the exception of copper and nickel in BH06 which were recorded above published background concentrations, but by less than one order of magnitude.
- A low pH of 4 was recorded in BH06.
- No polyaromatic hydrocarbons were recorded above the laboratory reporting limit in any of the four monitoring wells. No other SVOC compounds were recorded in the samples tested from BH05B and BH06.
- TPH in the C7-C9 range was recorded slightly above the laboratory reporting limits in the sample collected from BH06. A directly comparable assessment criterion is not available for TPH given it represents a range of compounds. Assessment criteria for BTEX[13] compounds (within the TPH C7-C9 range) are presented in the results table for information.

The results indicate that groundwater quality in the pumpstation area meets the initial screening criteria.

The data from around the vicinity of the proposed dewatering area also meet the initial screening criteria. The result of one sampling round from BH06 (approximately 200 m to the southeast of the dewatering area) found concentrations of copper and nickel and TPH slightly above the initial screening criteria and laboratory reporting limit. There was no source of potential contamination identified in the area of BH06. Given the distance that BH06 is from the site we consider that it is unlikely that groundwater from this area would be drawn into the dewatering water for discharge. If groundwater from this area was drawn into the dewatering water, we consider that mixing during dewatering and during discharge would likely reduce concentrations and pH to that which meet the permitted activity requirements.

6 Summary

Groundwater quality in the area of the pumpstation, based on the testing data from 2020, indicates that dewatering water quality is likely to be acceptable for discharge to either the wetland or to Sinton Stream. Sediment removal will be required prior to discharge. The other general permitted activity standards (presented in Appendix A) will also need to be met during the discharge.

It should be noted that these conclusions are based on the results of one sampling round. Some natural variation in water quality should be expected, and collection of additional groundwater quality information, including directly from the respective surface water bodies would provide

[13] Benzene, toluene, ethylbenzene, xylene

greater certainty on the conclusions drawn above. However, given the absence of significant potential contamination sources and that the water quality meets the screening criteria in the area of the pumpstation, the data set is considered appropriate for the assessment.

7 Applicability

This report has been prepared for the exclusive use of our client Watercare Services Ltd, with respect to the particular brief given to us and it may not be relied upon in other contexts or for any other purpose, or by any person other than our client, without our prior written agreement.

We understand and agree that our client will submit this report as part of an application for resource consent and that Auckland Council as the consenting authority will use this report for the purpose of assessing that application.

All recommendations and opinions which are contained in this report are based on data from discrete sampling locations. The nature and continuity of groundwater quality away from the investigation points are inferred but it must be appreciated that actual conditions could vary from the assumed model.

Tonkin & Taylor Ltd

Report prepared by:

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Lucy Hine
Senior Contaminated Land Consultant

Authorised for Tonkin & Taylor Ltd by:

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Tim Coote
Project Director

25-Aug-23
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Appendix A Relevant AUP-OP permitted activity standards

The relevant planning rules for the discharge of dewatering water from the Auckland Unitary Plan (Operative in Part) are summarised in the table below.

Activities	Standards
E4.6.1. General standards for all permitted activities, controlled activities and restricted discretionary activities	All activities listed as permitted, controlled or restricted discretionary in Table E4.4.1 Activity table must comply with the following standards. (1) The discharge must not, after reasonable mixing, give rise to any of the following: (a) the production of any conspicuous oil or grease film, scum or foam, or floatable or suspended materials; (b) any conspicuous change in the colour or visual clarity; (c) any emission of objectionable odour; (d) the rendering of freshwater unsuitable for consumption by farm animals; (e) a change to the natural temperature of the receiving water by more than 3 degrees celsius; (f) a change in the natural pH of the water by more than 1pH unit; and (g) any significant adverse effect on aquatic life. (2) The discharge must not enter into any water supply catchment, or any areas identified in D8 Wetland Management Areas Overlay (excluding Wetland E4 Other discharges of contaminants Auckland Unitary Plan Operative in part 5 Management Area Number 450 Lake Pupuke), D5 Natural Lake Management Areas Overlay or D4Natural Stream Management Areas Overlay except in the case of a discharge by a network utility operator carried out for maintenance, routine operations, or emergency works, provided there are no adverse effects on a Wetland Management Area, Natural Lake Management Area or Natural Stream Management Area. (3) The discharge must not cause erosion or scouring at the point of discharge or alter the natural course of the water body. (4) The discharge must not include washwater used for the external cleaning of a reticulated water supply system. (5) The discharge must be in accordance with best management practice to minimise the contaminants to the extent practicable
E4.6.2.5. Discharge onto or into land and/or into water for the purpose of dewatering trenches or other excavations	(1) The origin of the discharge must be limited to surface water and/or groundwater. (2) Appropriate sediment control measures must be implemented to ensure that the discharge does not result in any of the following: (a) the production of any conspicuous oil or grease film, scum or foam, or floatable or suspended materials; (b) any conspicuous change in the colour or visual clarity; (c) any emission of objectionable odour; (d) the rendering of freshwater unsuitable for consumption by farm animals;

	(e) a change in the natural temperature of the receiving water by more than 3 degrees celsius; (f) a change in the natural pH of the water by more than 1pH unit; and (g) any significant adverse effect on aquatic life.
E4.6.2.3. Discharge of water onto or into land and/or into water from temporary or permanent discharge of diverted uncontaminated groundwater; …	(1) The discharge must not either by itself or in combination with other contaminants after reasonable mixing exceed the greater of the 95 per E4 Other discharges of contaminants Auckland Unitary Plan Operative in part 6 cent trigger values for freshwater (groundwater) specified in the Australian and New Zealand Guidelines for Fresh and Marine Water Quality 2000 (ANZECC 2000 Guidelines), or the natural background level.

Appendix B Groundwater quality data

Extracted data from T+T Ground Contamination Factual Report (February 2021). Full sampling details, QA/QC processes and full laboratory transcripts are available in that report.

Whenuapai Redhills Package 1 - Groundwater quality data around the proposed pumpstation **T+T reference: 1013050**

Location	BH110	BH111	BH117	BH05A	BH05B	BH06	Screeing assessment criteria		
Screen depth (m bgl)	8 - 11 m	3 - 5 m	9.5-12 m	8.5-11.8 m	3.5-3.5 m	3.5-5 m			
	Deep	Shallow	Deep	Deep	Shallow	Shallow			
Location relative to proposed pumpstation	**In pump area**	**In pump area**	~80 m from main pump area to north	~150 m from main pump area to southeast	~150 m from main pump area to southeast	~200 m from pump area (southeast)			
Sample	BH110	BH111	BH117	BH05A	BH05B	BH06	ANZG 2018 95% Freshwater [1]	ANZG 2018 95% Marine [1]	Background, Waitemata, dissolved, max. Published background. [2]
Sample date	2/12/2020	27/11/2020	2/12/2020	2/12/2020	27/11/2020	27/11/2020			
Lab number	2486837.3	2482688.7	2486837.5	2486837.7/ 2486837.8	2482688.4	2482688.5			
pH	8.1	5.5	6.8	7.5	6.4	**4**			
Heavy metals, dissolved, trace As,Cd,Cr,Cu,Ni,Pb,Zn									
Dissolved Arsenic	< 0.0010	< 0.0010	0.0016	0.0016	< 0.0010	< 0.0010	0.024 (AsIII)	ID	0.0101
Dissolved Cadmium	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	0.0002	0.0055	-
Dissolved Chromium	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.0007	0.001 (CrVI)	0.0044 (Cr6)	<0.0005
Dissolved Copper	0.0012	< 0.0005	< 0.0005	< 0.0005	0.0007	**0.003**	0.0014	0.0013	0.001
Dissolved Lead	< 0.00010	< 0.00010	< 0.00010	< 0.00010	0.00011	0.00052	0.0034	0.0044	0.0008
Dissolved Mercury	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	< 0.00008	0.0006	0.0004	-
Dissolved Nickel	0.0012	0.0022	0.0048	0.0015	0.0014	**0.072**	0.011	0.07	0.03
Dissolved Zinc	< 0.0010	**0.0136**	**0.022**	0.0026	**0.022**	**0.042**	0.008	0.008	0.055
Polycyclic Aromatic Hydrocarbons Screening in Water, By Liq/Liq									
Acenaphthene	< 0.00010	< 0.00010	< 0.00010	< 0.00010	< 0.00010	< 0.00010			
Acenaphthylene	< 0.00010	< 0.00010	< 0.00010	< 0.00010	< 0.00010	< 0.00010			
Anthracene	< 0.00010	< 0.00010	< 0.00010	< 0.00010	< 0.00010	< 0.00010			
Benzo[a]anthracene	< 0.00010	< 0.00010	< 0.00010	< 0.00010	< 0.00010	< 0.00010			
Benzo[a]pyrene (BAP)	< 0.00010	< 0.00010	< 0.00010	< 0.00010	< 0.00010	< 0.00010			
Benzo[b]fluoranthene + Benzo[j]fluoranthene	< 0.00010	< 0.00010	< 0.00010	< 0.00010	< 0.00010	< 0.00010			
Benzo[g,h,i]perylene	< 0.00010	< 0.00010	< 0.00010	< 0.00010	< 0.00010	< 0.00010			
Benzo[k]fluoranthene	< 0.00010	< 0.00010	< 0.00010	< 0.00010	< 0.00010	< 0.00010			
Chrysene	< 0.00010	< 0.00010	< 0.00010	< 0.00010	< 0.00010	< 0.00010			
Dibenzo[a,h]anthracene	< 0.00010	< 0.00010	< 0.00010	< 0.00010	< 0.00010	< 0.00010			
Fluoranthene	< 0.00010	< 0.00010	< 0.00010	< 0.00010	< 0.00010	< 0.00010			
Fluorene	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002			
Indeno(1,2,3-c,d)pyrene	< 0.00010	< 0.00010	< 0.00010	< 0.00010	< 0.00010	< 0.00010			
Naphthalene	< 0.0005	< 0.0006	< 0.0005	< 0.0005	< 0.0006	< 0.0006			
Phenanthrene	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004			
Pyrene	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002			
Haloethers in SVOC Water Samples by GC-MS									
Bis(2-chloroethoxy) methane	-	< 0.005	-	-	< 0.005	< 0.005			
Bis(2-chloroethyl)ether	-	< 0.005	-	-	< 0.005	< 0.005			
Bis(2-chloroisopropyl)ether	-	< 0.005	-	-	< 0.005	< 0.005			
4-Bromophenyl phenyl ether	-	< 0.005	-	-	< 0.005	< 0.005			
4-Chlorophenyl phenyl ether	-	< 0.005	-	-	< 0.005	< 0.005			
Nitrogen containing compounds in SVOC Water Samples by GC-MS									
2,4-Dinitrotoluene	-	< 0.010	-	-	< 0.010	< 0.010			
2,6-Dinitrotoluene	-	< 0.010	-	-	< 0.010	< 0.010			
Nitrobenzene	-	< 0.005	-	-	< 0.005	< 0.005			
N-Nitrosodi-n-propylamine	-	< 0.010	-	-	< 0.010	< 0.010			
N-Nitrosodiphenylamine + Diphenylamine	-	< 0.010	-	-	< 0.010	< 0.010			
Organochlorine Pesticides in SVOC Water Samples by GC-MS									
Aldrin	-	< 0.005	-	-	< 0.005	< 0.005			
alpha-BHC	-	< 0.005	-	-	< 0.005	< 0.005			
beta-BHC	-	< 0.005	-	-	< 0.005	< 0.005			
delta-BHC	-	< 0.005	-	-	< 0.005	< 0.005			
gamma-BHC (Lindane)	-	< 0.005	-	-	< 0.005	< 0.005			
4,4'-DDD	-	< 0.005	-	-	< 0.005	< 0.005			
4,4'-DDE	-	< 0.005	-	-	< 0.005	< 0.005			
4,4'-DDT	-	< 0.010	-	-	< 0.010	< 0.010			
Dieldrin	-	< 0.005	-	-	< 0.005	< 0.005			
Endosulfan I	-	< 0.010	-	-	< 0.010	< 0.010			
Endosulfan II	-	< 0.010	-	-	< 0.010	< 0.010			
Endosulfan sulfate	-	< 0.010	-	-	< 0.010	< 0.010			
Endrin	-	< 0.010	-	-	< 0.010	< 0.010			
Endrin ketone	-	< 0.010	-	-	< 0.010	< 0.010			
Heptachlor	-	< 0.005	-	-	< 0.005	< 0.005			
Heptachlor epoxide	-	< 0.005	-	-	< 0.005	< 0.005			
Hexachlorobenzene	-	< 0.005	-	-	< 0.005	< 0.005			
Polycyclic Aromatic Hydrocarbons in SVOC Water Samples by GC-MS									
Acenaphthene	-	< 0.003	-	-	< 0.003	< 0.003			
Acenaphthylene	-	< 0.003	-	-	< 0.003	< 0.003			
Anthracene	-	< 0.003	-	-	< 0.003	< 0.003			
Benzo[a]anthracene	-	< 0.003	-	-	< 0.003	< 0.003			
Benzo[a]pyrene (BAP)	-	< 0.003	-	-	< 0.003	< 0.003			
Benzo[b]fluoranthene + Benzo[j]fluoranthene	-	< 0.003	-	-	< 0.003	< 0.003			
Benzo[g,h,i]perylene	-	< 0.003	-	-	< 0.003	< 0.003			
Benzo[k]fluoranthene	-	< 0.003	-	-	< 0.003	< 0.003			
1&2-Chloronaphthalene	-	< 0.003	-	-	< 0.003	< 0.003			
Chrysene	-	< 0.003	-	-	< 0.003	< 0.003			
Dibenzo[a,h]anthracene	-	< 0.003	-	-	< 0.003	< 0.003			
Fluoranthene	-	< 0.003	-	-	< 0.003	< 0.003			
Fluorene	-	< 0.003	-	-	< 0.003	< 0.003			
Indeno(1,2,3-c,d)pyrene	-	< 0.003	-	-	< 0.003	< 0.003			
2-Methylnaphthalene	-	< 0.003	-	-	< 0.003	< 0.003			
Naphthalene	-	< 0.003	-	-	< 0.003	< 0.003			
Phenanthrene	-	< 0.003	-	-	< 0.003	< 0.003			
Pyrene	-	< 0.003	-	-	< 0.003	< 0.003			
Benzo[a]pyrene Toxic Equivalence (TEF)	-	< 0.008	-	-	< 0.008	< 0.008			
Phenols in SVOC Water Samples by GC-MS									
4-Chloro-3-methylphenol	-	< 0.010	-	-	< 0.010	< 0.010			
2-Chlorophenol	-	< 0.005	-	-	< 0.005	< 0.005			
2,4-Dichlorophenol	-	< 0.005	-	-	< 0.005	< 0.005			
2,4-Dimethylphenol	-	< 0.005	-	-	< 0.005	< 0.005			
3 & 4-Methylphenol (m- + p-cresol)	-	< 0.010	-	-	< 0.010	< 0.010			
2-Methylphenol (o-Cresol)	-	< 0.005	-	-	< 0.005	< 0.005			
2-Nitrophenol	-	< 0.010	-	-	< 0.010	< 0.010			
Pentachlorophenol (PCP)	-	< 0.10	-	-	< 0.10	< 0.10			
Phenol	-	< 0.010	-	-	< 0.010	< 0.010			
2,4,5-Trichlorophenol	-	< 0.010	-	-	< 0.010	< 0.010			
2,4,6-Trichlorophenol	-	< 0.010	-	-	< 0.010	< 0.010			
Plasticisers in SVOC Water Samples by GC-MS									
Bis(2-ethylhexyl)phthalate	-	< 0.03	-	-	< 0.03	< 0.03			
Butylbenzylphthalate	-	< 0.010	-	-	< 0.010	< 0.010			
Di(2-ethylhexyl)adipate	-	< 0.005	-	-	< 0.005	< 0.005			
Diethylphthalate	-	< 0.010	-	-	< 0.010	< 0.010			
Dimethylphthalate	-	< 0.010	-	-	< 0.010	< 0.010			
Di-n-butylphthalate	-	< 0.010	-	-	< 0.010	< 0.010			
Di-n-octylphthalate	-	< 0.010	-	-	< 0.010	< 0.010			
Other Halogenated compounds in SVOC Water Samples by GC-MS									
1,2-Dichlorobenzene	-	< 0.010	-	-	< 0.010	< 0.010			
1,3-Dichlorobenzene	-	< 0.010	-	-	< 0.010	< 0.010			
1,4-Dichlorobenzene	-	< 0.010	-	-	< 0.010	< 0.010			
Hexachlorobutadiene	-	< 0.010	-	-	< 0.010	< 0.010			
Hexachloroethane	-	< 0.010	-	-	< 0.010	< 0.010			
1,2,4-Trichlorobenzene	-	< 0.005	-	-	< 0.005	< 0.005			
Other compounds in SVOC Water Samples by GC-MS									
Benzyl alcohol	-	< 0.05	-	-	< 0.05	< 0.05			
Carbazole	-	< 0.005	-	-	< 0.005	< 0.005			
Dibenzofuran	-	< 0.005	-	-	< 0.005	< 0.005			
Isophorone	-	< 0.005	-	-	< 0.005	< 0.005			
Total Petroleum Hydrocarbons in Water									
C7 - C9	< 0.10	< 0.10	< 0.10	< 0.10	**0.14**	< 0.10	0.7 (Benzene), ID (Toluene) ID (Ethyl benzene) ID (m-xylene) ID (o-xylene) ID (p-xylene)	0.7 (Benzene), 0.18 (Toluene) 0.08 (Ethyl benzene) 0.07 (m-xylene) - (o-xylene) - (p-xylene)	-
C10 - C14	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2			
C15 - C36	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4			
Total hydrocarbons (C7 - C36)	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7			

NOTES ON TABLE:

Bold values exceed the 95% ANZG FRESHWATER values
Underlined values exceed the 95% ANZG MARINE values

Highlighted values exceed the published groundwater concentrations

1. Australia and New Zealand Water Quality Guidelines (ANZG) for freshwater and marine water quality at the 95% species protection level.
2. Auckland Regional Council (2007). State of the Environment Monitoring: Groundwater Quality Data Report 1998-2005. ARC Technical Publication 352. Auckland.

ID Insufficient data