WILLIAMSON
WATER & LAND ADVISORY

Groundwater Take Assessment

Auckland Surf Park Community - Groundwater Take

AW HOLDINGS (LP) PARTNERSHIPS

WWLA1623 | Rev. 4

19 February 2026

Auckland Surf Park Community - Groundwater Take

Project no:	WWLA1623
Revision:	4
Date:	19 February 2026
Client name:	AW Holdings (LP) Partnerships
Project manager:	Jon Williamson
Author(s):	Asanka Thilakerathne
File name:	G:\Shared drives\Projects\AW Holdings 2021 (LP) Partnership\WWLA1623_Surf Park Water Supply Services\Deliverables\Reports\Groundwater take consent\WWLA Report_Groundwater Take Consent Application_v2_19022026.docx

Williamson Water & Land Advisory

Auckland | Whangārei | Tauranga
New Zealand
www.wwla.kiwi

Document history and status

Rev	Date	Description	By	Review	Approved
1	30 October 2025	First draft for internal review	Asanka Thilakerathne	Jon Willamson	Jon Willamson
2	17 November 2025	Second draft for internal review	Asanka Thilakerathne	Jon Willamson	Jon Willamson
3	04 December 2025	Third draft for internal review	Asanka Thilakerathne	Jon Williamson	Jon Williamson
4.	19 February 2026	Address the client's comments	Asanka Thilakerathne	Jon Williamson	Jon Williamson

Distribution of copies

Rev	Date issued	Issued to	Comments
1	30 October 2025	Inovo Ltd / Barkers Ltd	For review on behalf of the client.
2	17 November 2025	Inovo Ltd / Barkers Ltd	For review on behalf of the client.
3.	19 February 2026	Inovo Ltd / Barkers Ltd	For review on behalf of the client.

Contents

1. Statement of Qualifications

1.1 Jon Williamson – Project Technical Director

Jonathan (Jon) Williamson holds a Bachelor of Science in Earth Science, and a Master of Science and Technology first class honours in Hydrology and Geology from the University of Waikato.

Jon is the Managing Director of Williamson Water & Land Advisory (WWLA), a firm he founded in January 2015. Jon has 30 years of professional experience in New Zealand, Australia and the Pacific regions. For the 15 years prior to WWLA he held various technical and managerial roles in the water resource management and irrigation sectors within the Auckland office of Sinclair Knight Merz (now Jacobs). Prior to that, Jon was employed in a global multidisciplinary consulting firm in Sydney and undertook a range of hydrogeological work in the mining and municipal water supply sectors.

Jon has specialist technical expertise in geology, hydrogeology, hydrology and irrigation engineering over a wide spectrum of services including data collection and analysis; field investigations and testing; modelling; engineering design; construction contract management; technical report writing, community and stakeholder consultation; resource consent hearings; and technical working panels.

Of key relevance to this project would be Jon's bore design, procurement and construction experience for a range of project types, including municipal, irrigation, stock and domestic bores. WWLA also owns and operates an Electrical Resistivity Tomography system, hence Jon is well versed in geophysical prospecting for groundwater. Jon also owned and managed a drilling company (WWLA Drilling Services Ltd) for three years that specialised in construction of water supply bores, hence has an innate understanding of the practical and theoretical sides of developing a groundwater supply.

Examples of Jon's previous relevant work experience includes assessment of groundwater effects from bore pumping and dewatering of mines, quarries, highways, tunnels, wind farms, and site developments. Key projects include:

• Dury South Expansion Sutton Block – Hydrogeological reviewer for the EPA	• Auckland International Airport – dewatering of various underground infrastructure developments over recent years
• Taharoa Ironsand Mine	• Maramarua, Rotowaro and Bathurst Coal Mines;
• Oceana Gold's WKP Mine	• Kings Quarry Auckland
• Southland Lignite Mines	• Pike River Underground Coal Mine
• Ihumatao Quarry Expansion	• Waverley Wind Farm
• Grey Lynn Tunnel Central Interceptor Extension	• Waipori Falls Hydroelectric Power Station Penstock Tunnels
• Victoria Park (Roading) Tunnel	• Waterview (Roading) Tunnel
• Puhoi to Wellsford Highway	• Hobson Bay Sewer Tunnel
• Numerous opencut coal mines in the Hunter Valley NSW	• Various gold and iron ore mines in other parts of Australia

Jon confirms that, in his capacity as reviewer of this report, he has read and will abide by the Environment Court of New Zealand's Code of Conduct for Expert Witnesses Practice Note 2023.

1.2 Asanka Thilakerathne – Intermediate Hydrogeologist

The author of the report, Asanka Thilakerathne is an Intermediate Hydrogeologist employed with WWLA since February 2024.

Asanka holds a Bachelor of Science in Geology (University of Peradeniya, Sri Lanka, 2007) and a Master of Science in Hydrogeology and Environmental Management from the Technical University of Darmstadt, Germany (2013). In addition, he completed a Certificate Course in Numerical Groundwater Modelling at the IHE Delft Institute for Water Education, Netherlands (2019).

Asanka has over 13 years of professional experience in hydrogeology, with expertise in groundwater management, geophysical exploration, groundwater recharge studies, borehole construction, and pumping test analysis.

Since joining WWLA, Asanka has contributed to a range of groundwater and environmental projects, including:

- Assisting with the development of groundwater models for the Whanganui District Council and the Rotowaro Extension Mining Project for Bathurst Resources Ltd.
- Conducting groundwater assessments for the Milldale Stage 10–13 development for Fulton Hogan Land Development.
- Assessing dewatering requirements for a wastewater pipeline diversion project in Hamilton.
- Evaluating hydrogeological impacts of sand quarry operations and managing various groundwater consent renewal applications.

2. Introduction

2.1 Overview

This groundwater take assessment has been prepared on behalf of AW Holdings (LP) 2021 Partnerships (the Applicant). The assessment supports a resource consent application under the Fast-track Approvals Act 2024 (FTAA) for a groundwater take for a maximum daily volume of 1,303 m^3, with a maximum annual take of 256,230 m^3, for the purposes of supplying water to the Auckland Surf Park Community including a surf lagoon and associates amenities, a hyperscale artificial intelligence data centre, approximately 500 residential units and subdivision, accommodation, a town centre, and two industrial precincts at 1320 and 1350 Dairy Falt Highway, 89 and 105 Lascelles Drive and 253 and 237 Postman Road, Dairy Flat (the Site).

2.2 Applicant and Property Details

Table 1. Applicant and property details.

Applicant	AW Holdings (LP) 2021 Partnerships
Site address	1350 Dairy Falt Highway, Dairy Flat
Owner / occupier of application site	AW Holdings (LP) 2021 Partnerships
Site area	54.2 ha
Legal Description	Pt Allot 189 Parish of Pukeatua SO 1118A, Pt Allot S264 Parish of Pukeatua SO 1118A, PT ALLT 189 PARO Pukeatua, & Lot 15 DP 65979

2.3 Background

The Applicant is developing the Auckland Surf Park Community which includes a surf lagoon and associates amenities, a hyperscale artificial intelligence data centre, approximately 500 residential units and subdivision, accommodation, a town centre, and two industrial precincts.

Two land use consents were granted in April and May 2025, each permitted the drilling and construction of a bore on the site to facilitate water requirements (Council reference: LUC60444889 and LUC60446994, respectively), as summarised in **Table 1**. Copies of the bore consents are included at **Appendix A**. To date only Bore 1 has been constructed.

The consent document noted that a further resource consents would be required to enable the taking of groundwater from these bores, which is the focus of this technical assessment of effects report.

Table 1. Bore Locations

Bore ID	Status	Coordinate (East)	Coordinate (North)
Bore 1	Drilled	1747217	5942222
Bore 2	Not Drilled	1746739	5942032

Groundwater testing following construction of Bore 1 confirmed that this bore alone has sufficient yield to meet the water requirement needs of the surf park and its associated activities, subject to obtaining the necessary approvals. The bore comprises the following key construction details:

- a bore casing diameter of 154 mm;
- a casing depth of 400 m (cement grouted in place);
- an open hole from 400 m to the base of bore at 680 m.

A copy of the as-built drilling log is included in **Appendix B**.

3. Environmental Setting

3.1 Site Location and Description

The proposed development site, as shown in **Figure 1**, covers an area of 54.2 hectares and was previously used for residential, agricultural and livestock farming purposes. Earthworks to support the planned development of Stage 1 have already commenced on the site.

The site is bounded by Postman's Road to the east and Dairy Flat Highway to the west, with rural lifestyle properties located to the north and south. Two unnamed tributaries, which receive water from farm drains, flow across the site and discharge into the Rangitopuni Stream, located approximately 100 m west of the site (refer to **Figure 1**). A recently constructed bore is situated near the centre of the site, approximately 88 m north and 200 m east of the two unnamed tributaries flows through the site.

3.2 Geology

The geology from the QMAP[1] database of the Auckland area is shown in **Figure 2** and summarised from the published text for the 1:250 000 geology map for Auckland[2] in **Table 2**

Table 2. Lithological classification for the area.

Unit	Main Rock	Sub Rock	Strata name	Description	Age Million Years	
					Min.	Max
Q5+Q2.und	mud	sand, silt, clay, peat	Tauranga Group	Predominantly pumiceous sand, silt, mud and clay, with interbedded gravel and peat.	0.014	0.128
lElOl.lst_all	limestone	sandstone, greensand	Mahurangi Limestone	Blue-grey to white, micritic, coccolith foraminiferal, muddy limestone, commonly with thin glauconitic sandstone beds: commonly closely shattered. Rare crystalline limestone.	16.4	49
eMi.sst7	turbidite	sandstone, mudstone, grit	East Coast Bays Formation	Alternating sandstone and mudstone with variable volcanic content and interbedded volcaniclastic grits.	16.4	23.8
lKPa.mst2_all	mudstone		Hukerenui Mudstone	Red, brown, green and grey, typically noncalcareous, commonly highly sheared mudstone, with small serpentinite bodies.	37	98.9
lKeE.mst_all	mudstone	siltstone	Whangai Formation	Cream to grey, siliceous and sometimes calcareous mudstone to fine sandy siltstone.	54.8	98.9

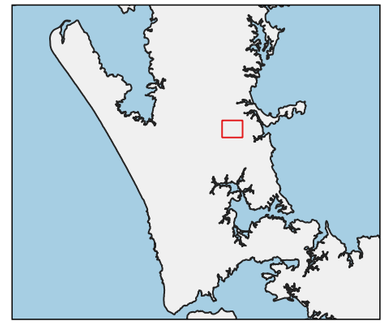
The area is directly underlain by older (Late-Middle Pleistocene) Tauranga Group alluvium (lQa) comprising mostly locally derived stream alluvium. The alluvial deposits are underlain by Mahurangi Limestone (lElOl.lst_all) of Northland Allochthon, which also outcrops in north and eastern part of the site where no alluvium is present.

[1] GNS Science. (2012). 1:250 000 Geological Map of New Zealand [Data set]. GNS Science. https://doi.org/10.21420/QF82-7D42
[2] Edbrooke. S.W. (compiler) 2001: Geology of the Auckland area. Institute of Geological & Nuclear Sciences 1:250 000 geological map 3. 1 sheet +74 p. Lower Hutt,, New Zealand. Institute of Geological & Nuclear Sciences Limited.

Map Title:
Location Map

Project:
Surf Park Water Supply Services

Client:
AW Holdings (LP) 2021 Partnerships



Legend

Applicant Bore Locations

- **Drilled**
- **Road**
- **State Highway**
- **River/Stream**
- **Lake/Pond**
- **Wetlands**
- **Land Parcells**

Data Provenance
Aerial Imagery from Land Information New Zealand

Drawn by: Asanka Thilakerathne
19/02/2026

Layout & Project File
Surface Water

WILLIAMSON
WATER & LAND ADVISORY

Figure 1

N

lKeE.mst_all
lKPa.mst2_all
lKeE.mst_all
eMi.sst7
lKPa.mst2_all
lKPa.mst2_all
Q5+Q2.und
lElOl.lst_all
eMi.sst7
Q5+Q2.und
lElOl.lst_all
lKPa.mst2_all

Selman Road
Turley Road
Wilks Road West
Kahikatea Flat Road
Horseshoe Bush Road
Line Access Road
Landfill Access Road
Richards Road
Dairy Flat Highway
Rangitopuni Stream
Bore 1
Bore 2
Dairy Stream Road
Leaselles Drive
Wilks Road
Postman Road
Auckland-Wellsford Motorway
State Highway 1
Aileron Rise
Aeropark Drive
Spur Road
East Coast Road
Wairio Way
Worsnop Way
Top Road
Dairy Stream
Oregon Park
Bobs Way
Bawden Road

0 250 500 m

Map Title:
Geological Overview

Project:
Surf Park Water Supply Services

Client:
AW Holdings (LP) 2021 Partnerships

Legend

Applicant Bore Locations
- **Drilled**

- **Road**
- **State Highway**
- **River/Stream**
- **Lake/Pond**
- **Wetlands**
- **Land Parcells**

Geology
- **Faults**

Geological units
- **Q5+Q2.und (mud)**
- **eMi.sst7 (turbidite)**
- **lElOl.lst_all (limestone)**
- **lKPa.mst2_all (mudstone)**
- **lKeE.mst_all (mudstone)**

Data Provenance
Aerial Imagery from Land Information New Zealand

Drawn by: Asanka Thilakerathne
19/02/2026

Layout & Project File
Surface Water

WILLIAMSON WATER & LAND ADVISORY

Figure 2

The Mahurangi Limestone represents a marine sedimentary formation composed mainly of micritic, coccolith-foraminiferal, muddy limestone, with interbedded thin glauconitic sandstone layers. The rock is typically blue-grey to white, micritic, and commonly shattered, which can enhance secondary porosity and permeability, allowing for moderate groundwater yield through fractures and dissolution zones, if not infilled with clay - which is more typical of this rock. The formation's age ranges from approximately 16.4 to 49 million years (Eocene to Miocene), reflecting deposition in a shallow marine environment.

It is likely that the East Coast Bays Formation sandstone of the Waitematā Group, that outcrops to the west of site, underlies the Northland Allochthon mudstone. The adjacent Hukerenui Mudstone (lKPa.mst2_all), located west of the site, is red to grey, non-calcareous, and highly sheared, indicating low permeability and limited groundwater potential.

The basement rock in the area is inferred to be greywacke, although no outcrops have been observed in the vicinity. There are two faults mapped immediately to the west and east the site, which pre-date the alluvial deposits (**Figure 2**).

3.3 Geomorphology

The Dairy Flat area is characterised by a broad alluvial valley, gently rolling hills to the sides and weathered marine sediments overlain by volcanic and alluvial materials. The site lies along the flat terrain with an elevation ranging from approximately 49 to 68 mAMSL, the highest elevation was observed in northern and eastern boundaries of the site. Surface water flow direction is east to west.

3.4 Hydrogeology

Based on information available on the Auckland Council website, the aquifer underlying the site is Rangitopuni Aquifer[3], characterised as a sub group of the Waitemata Aquifer.

In Auckland Unitary Plan Operative in Part (AUP-OP) (Appendix 3: *Table 1. Aquifer water availabilities*), no specific water allocation limit is mentioned for Rangitopuni Waitemata Aquifer. Orewa Waitemata Aquifer is located north of the above aquifer, which has an allocation limit assigned and for context the quantum of this is 858,000 m^3/year.

Shallow groundwater discharges into unnamed tributaries at the middle of the site and ultimately flows to Rangitopuni Stream.

The production aquifer intersected by the applicant's bore comprises a 317 m thick greywacke formation that is overlain by approximately 290 m of Waitemata Group mudstone and siltstone, encountered between 73 m and 363 m below ground level (BGL), which given its limited fracturing and yield potential (hence reason for drilling deeper) forms an effective confining layer above the production aquifer. A shallow limestone bed, approximately 73 m thick, also contributes to the overall confinement. The static water level (SWL) measured upon completion of bore construction was 54 mBGL.

3.5 Surface Water

Raigitopuni Stream, which runs about 100 m from the western boundary to the site is approximately 17 km long and connect to the ocean at Riverhead. It is the primary surface drainage for the catchment.

The New Zealand Ministry for the Environment GIS database indicates that there are four wetlands within a 3 km radius of the current bore location, with wetland types classified as swamp and gumland. The closest wetland is a swamp 1,750 m to the south-west (**Figure 1**).

[3] https://geomapspublic.aucklandcouncil.govt.nz/viewer/?utm_source

3.6 Surrounding Bore and Water Take

A review of bore logs from WellsNZ data base[4] for bores confirmed there are 33 bores including monitoring wells within 3 km radius of the newly constructed bore (**Figure 3**). The potential effects on other groundwater users are discussed further in **Section 5.2.1.2.**

Based on the available data, bores in the area have been drilled to depths ranging from 3.25 m to 135 m below ground level (m BGL). The recorded static water level (SWL) data indicates an average SWL of 13.5 m BGL and a maximum of 37 m BGL. The nearest bore (Council ID 22128) is located approximately 709 m northeast of the site and is likely a monitoring bore with a depth of 3.25 m.

Table 3. Details of the bores within 3 Km radius of Surf Park production bore

Council well number	Easting (NZTM)	Northing (NZTM)	Depth (m)	Diameter (mm)	Static water level (mBGL)	Drilling date	Distance from the Applicant's Bore (m)
22128	1746790	5942820	3.25	Not available	0.2	24/06/2004	709
5468	1747800	5942950	60	Not available	Not available	Not available	963
1119	1746100	5941700	Not available	Not available	Not available	Not available	1,191
1121	1746100	5941700	Not available	Not available	Not available	Not available	1,191
487	1746400	5941300	10	50	Not available	Not available	1,201
20251	1746000	5941600	13.5	Not available	Not available	4/06/1998	1,325
954	1746300	5941100	Not available	Not available	Not available	Not available	1,420
1074	1746000	5941400	Not available	Not available	Not available	Not available	1,430
1076	1746000	5941400	Not available	Not available	Not available	Not available	1,430
2294	1745700	5942200	85	Not available	Not available	1/01/1900	1,470
927	1746300	5941000	56	150	Not available	6/09/1988	1500
4799	1745540	5941885	Not available	Not available	Not available	Not available	1665
21761	1745490	5941800	Not available	Not available	Not available	23/09/2002	1732
21462	1748880	5941594	9.23	Not available	2.6	6/07/2001	1822
21241	1745442.1	5941574.9	59.4	165	7.9	29/06/2000	1845
485	1745300	5942100	10	50	Not available	Not available	1874
4940	1745300	5942000	13.5	100	Not available	12/12/1995	1883
5219	1745300	5942000	20.3	100	Not available	5/03/1996	1883
713	1745500	5941200	7.5	200	Not available	30/05/1991	1958
5272	1745300	5941600	29	Not available	Not available	10/04/1996	1971
29248	1745319	5941466	40	Not available	Not available	11/02/2004	2000
263	1745200	5941600	60	25	Not available	Not available	2066
2284	1745100	5942200	85	Not available	Not available	1/01/2000	2070
21529	1745168	5941624	36	32	0.3	15/12/2000	2090
29247	1745127	5941563	40	Not available	Not available	7/09/2006	2147

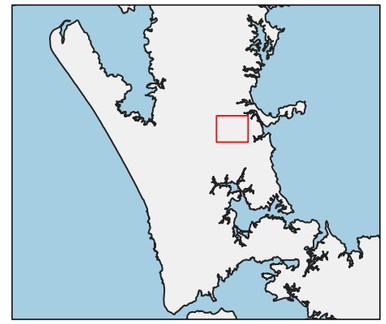
[4] https://wellsnz.teurukahika.nz/

Council well number	Easting (NZTM)	Northing (NZTM)	Depth (m)	Diameter (mm)	Static water level (mBGL)	Drilling date	Distance from the Applicant's Bore (m)
21528	1745288	5941046	40.5	32	2.5	7/12/2000	2220
21527	1744996	5941702	49.6	32	2	10/01/2001	2236
21323	1745206	5941150	40.5	32	3.2	2/12/2000	2238
27858	1744970.8	5941664.5	Not available	Not available	Not available	5/02/2010	2269
5218	1744900	5941700	10.5	100	Not available	25/03/1996	2330
20250	1745010	5941330	35.5	Not available	Not available	29/05/1998	2337
5309	1745000	5941200	8	100	Not available	8/03/1996	2399
21725	1749660	5941660	135	Not available	37	26/02/2003	2553

Map Title:
Bores within 3 km radius

Project:
Surf Park Water Supply Services

Client:
AW Holdings (LP) 2021 Partnerships



Legend

- Applicant Bore
- Surrounding Bores
- Road
- State Highway
- River/Stream
- Lake/Pond
- Wetlands
- Land Parcells
- 3 km buffer

Data Provenance
Aerial Imagery from Land Information New Zealand

Drawn by: Asanka Thilakerathne
28/10/2025

Layout & Project File
Surface Water

WILLIAMSON WATER & LAND ADVISORY

Figure 3

4. Description of Proposed Activity

4.1 Overview

It is proposed to abstract up to 1,303 m^3/day, with an annual take of up to 256,230 m^3/year of groundwater from the Rangitopuni Waitemata aquifer by the constructed bore.

4.2 Existing Bore

The existing bore was drilled and constructed on 11 September 2025 by DrillForce NZ Ltd.

The production bore (Permit No: LUC60444889) has the following specifications:

- Casing diameter of 154 mm;
- Total depth 680 m;
- Open hole from 400 to 680 mBGL; and
- Static water level at the time of drilling was 54 mBGL.

4.3 Water Use Requirement and Efficiency

The 256,230 m^3/year annual allocation requested is based largely on the water demand calculation prepared by the Mackenzie & Co (**Table 4**).

The Surf Park development has a total average day water demand of approximately 701.5 m^3/year (equivalent to around 8 L/s) and a peak day demand of about 1,303 m^3/year (approximately 15 L/s). The peak hour flow is estimated to reach 21.5 L/s for about 2.5 hours within a day, which will be met by on site storage in addition to the bore flows.

The highest water consumers are the planned residential neighbourhoods, particularly the North-East and South Precincts, which together contribute the majority of the total demand. The Surf Lagoon and associated amenities also account for a significant portion of the water use, due to the operational nature of this facility. Commercial and hospitality components such as the Lagoon Restaurant, Hotel, and Wellness Centre add moderate demand, while smaller uses like light industry, and data centre operations contribute relatively minor amounts.

Overall, the water demand pattern is dominated by residential and recreational uses, with daily consumption expected to increase substantially during peak periods.

Table 4. Water demand calculation.[5]

Demand Area	Type	Area	Units	No: of People	Water Demand	Average Day Demand		Peak Day Factor	Peak Day Demand	Peak Hour Factor	Peak Hour Demand
		(m^2)			(L/p/day)	(m^3/day)	(L/s)		(m^3/day)		(L/s)
Accommodation Precinct (Stream Park)		**22,823**									
Stream Park Villa Accommodation	Residential	-	60	180	220	39.6	0.46	2	79.2	2.5	1.15

[5] WATER AND WASTEWATER SERVICING REPORT, Auckland Surf Park, AW Holdings Limited by Mackenzie &Co

Demand Area	Type	Area	Units	No: of People	Water Demand	Average Day Demand		Peak Day Factor	Peak Day Demand	Peak Hour Factor	Peak Hour Demand
		(m^2)			(L/p/day)	(m^3/day)	(L/s)		(m^3/day)		(L/s)
Member Clubhouse with Dining/Pool/Social Area	Wet Retail	700	-	-	-	7.5	0.12	2	15	2.5	0.3
Surf Lagoon + Amenity Precinct		**58,792**									
Surf Lagoon		-	-	-	-	100	1.74	1	100	1.5	2.6
Surf Park Operation	Dry Retail	1,410	1	28	65	1.8	0.02	2	3.67	2.5	0.05
Ticketing/Administration	Office Building	350	1	23	65	1.5	0.02	2	3.03	2.5	0.04
Changing	Specific	280	1	-	-	8.4	0.1	2	16.8	2.5	0.24
Surf Rental	Dry Retail	260	1	5	65	0.3	0.004	2	0.68	2.5	0.01
Surf Academy	Dry Retail- II	660	1	44	65	2.9	0.03	2	5.72	2.5	0.08
Surf Retail	Dry Retail	260	1	5.2	65	0.3	0.004	2	0.68	2.5	0.01
Lagoon Restaurant/F&B	Wet Retail	675	2	-	-	10.1	0.12	2	20.25	2.5	0.29
Hotel Accommodation	Hotels & Motels	1,102	81	-	-	18.2	0.21	2	36.4	2.5	0.53
Surf Village Centre Precinct		**42,986**									
Wellness Centre	Dry Retail- II	750	1	50	65	3.3	0.04	2	6.5	2.5	0.09
Food & Beverage Pavillion Building check for Brewery	Wet Retail	780	1	-	-	5	0.14	2	10	2.5	0.34
Apartment Accommodation	Residential	5,000	115	288	220	63.3	0.73	2	126.5	2.5	1.83
Small Scale Retail Units on Ground Floor	Dry Retail	1,400	1	28	65	1.8	0.02	2	3.64	2.5	0.05
Market	Wet Retail	700	1	-	-	10.5	0.12	2	21	2.5	0.3
Day Care	Child Day Care (Student)			50	45	2.25	0.03	2	4.5	2.5	0.07
	Child Day Care (Staff)			10	50	0.5	0.01	2	1	2.5	0.01
Live/Work/Precinct		**19,870**									
Work Terraces	Residential	3,000	30	60	220	13.2	0.15	2	26.4	2.5	0.38
Light Industrial/Workshops	Dry Industry Light	3,700	8	-	-	10	0.26	2	10	2.5	0.64
Data Center		**87,537**									
Data Centre Campus	Dry Retail	30,111	3	-	-	2.8	0.03	2	5.54	2.5	0.08
Industrial Subdivision	Dry Industry Light	15,252	9	-	-	40	0.79	2	80	2.5	1.98

Demand Area	Type	Area	Units	No: of People	Water Demand	Average Day Demand		Peak Day Factor	Peak Day Demand	Peak Hour Factor	Peak Hour Demand
		(m^2)			(L/p/day)	(m^3/day)	(L/s)		(m^3/day)		(L/s)
Neighbourhood Precinct (North-West)		**53,194**									
Residential Neighbourhood	Residential	-	73	329	220	72.3	0.84	2	144.54	2.5	2.09
Neighbourhood Precinct (North-East)		**44,404**									
Residential Neighbourhood	Residential	-	180	810	220	178.2	2.06	2	356.4	2.5	5.16
Neighbourhood Precinct (South)		25,825									
Residential Neighbourhood	Residential	-	111	500	220	109.9	1.27	2	219.78	2.5	3.18
Stream Park		**58,374**									
Water & Wastewater Treatment Plant	Dry Retail	850	4	17	65	1.1	0.01	2	2.21	2.5	0.03
Total						**701.5**	**9**		**1,303**		**21.57**

The applicant acknowledges the importance of using water efficiently and minimising wastage, and will implement the following conservation practices:

- ***Regular Maintenance*** - Regularly maintain irrigation systems, and other water-using equipment to prevent leaks and improve efficiency.
- ***Water Monitoring*** – The take will be installed with a water meter at the headworks and will record the volume of water taken on a 15 minute basis, with the data transmitted to Auckland Council via automatic telemetry on a daily basis.

5. Assessment of Effects

This section details the assessment of effects associated with the proposed groundwater take. This assessment also outlines the measures that the applicant proposes to avoid, remedy or mitigate any potential adverse effects on the environment.

5.1 Positive Effect

The proposed groundwater take will enable the Applicant to secure a reliable source of water to support operation of the Surf Park. This will be achieved by using water in an efficient manner, which will also enable existing users in the area to continue to be able to meet their reasonable and foreseeable needs. Therefore, it is concluded that the proposed groundwater take will contribute to the economic and social well-being of the area.

5.2 Resource and Allocation Availability

The aquifer underlying the site is classified in the AUP (Appendix 3. Table 1) as the Rangitopuni Waitemata Aquifer. Water availability from this aquifer has been provided by Auckland Council (Louwrens Le Roux, 17/11/25) as summarised in **Table 5**.

Table 5. Water Availability (m^3/year) for Rangitopuni Waitemata Aquifer.

Supply	Allocation Limit	530,000
Demand	Consented allocation	42,650
	Permitted Activity Takes	40,000
	AC model S14(3)(b)	81,423
	Total water demand	164,073
Remaining availability		365,927

AC has reported that the current allocation limit is 530,000 m^3/year, and consented and permitted allocation accounted for is 164,073 m^3/year. Therefore, 365,927 m^3/year remains available for allocation.

The current application seeks a maximum annual take of 256,230 m^3/year, which is well within the available allocation. Therefore, sufficient allocation remains to support the proposed take.

5.2.1 Effects on Groundwater

The following sections summarise the maximum level of effects that can be anticipated to result from the proposed groundwater take.

To assist in the assessment of pumping effects of the proposed water take, an analytical groundwater model was developed to simulate the groundwater response from the proposed maximum abstraction rate (256,230 m^3/annum). The modelling methodology and results are detailed in **Appendix C**, and the effects predicted by the model are summarised in the following sections.

5.2.1.1 Groundwater Drawdown

Predictive modelling undertaken for this assessment calculated 200 m of drawdown in the deep aquifer (represented by Layer 3 in the model) adjacent to the bore after 197 days of continuous pumping at the maximum rate, reducing to 1 m at a distance of 2.7 km from the bore. The details of the model setup and hydraulic parameters applied in the analytical model are provided in **Appendix C**.

After 197 days of pumping, model results show 0.13 m of shallow aquifer or water table drawdown (represented by Layer 1 in the model) adjacent to the bore, reducing to less than 0.1 m at a radius of 500 m from the bore.

5.2.1.2 Neighbouring Bores

Based on the data available in Wells Aotearoa NZ database, there are currently 36 bores within the 0.2 drawdown contour, extending 3,900 m from the pumping bore. **Table 6** lists the interference effects on neighbouring bores from pumping of the Applicant's bore and the estimated available drawdown remaining in these bores.

The assumptions applied for the calculations in **Table 6** are as follows:

- Bore pump has been positioned 2 m above the casing bottom
- The FWM (as described in **Appendix C**) has been used to calculate drawdown directly adjacent to the bore;
- The cumulative drawdown at neighbouring bores was determined from FWM results at the radius corresponding to the distance between the given bore and the application bore.

Available static water level (SWL) measurements were interpolated to estimate the SWL of all 36 bores within the potentially affected area, which was then used to assess the potential drawdown impact from the proposed take.

The closest bore of meaningful depth (#5468) located 963 m from the applicant's bore and screen within layer 1 is predicted to experience a drawdown of 0.05 m, representing 0.1% of its available drawdown. This is the maximum anticipated impacts for shallow bores in the area.

Greater potential drawdown effects occur with increasing depth, although there are no other bores located in the greywacke aquifer represented by Layer 3 of the model. There are twelve bores located in Layer 2 of the model. Examination of the anticipated drawdown in the closest of these (#1119) at a radius of 1,191 m indicates a potential drawdown of up to 4.5 m after 197 days of continuous pumping at the proposed rate. This represents 6% of the available drawdown in the bore and given there is 73.5 m of available drawdown remaining, is unlikely to impact on its production.

All other bores have a lesser drawdown impact. Based on the analysis, the drawdown effect on neighbouring bores within the zone of influence of the Applicant's bore are considered negligible.

Table 6. Maximum drawdown in neighbouring bores based on pumping in the Applicant bore.

Bore ID	Distance	Bore Depth	Model Layer	Base of Casing*	Static Water Level	Drawdown due to proposed take	Available drawdown**	Remaining available drawdown	% of impact
	(m)	(m)		(mBGL)	(mBGL)	(m)	(m)	(m)	
22128	709	3.25	1	0.25	0.2	Bore positioned in Layer 1 (Shallow bore < 20 m deep)			
5468	963	60	1	57	3.7	0.04	51.30	51.25	0.1
1119	1191	*100*	2	80	4.5	1.79	73.48	71.69	2.5
1121	1191	*100*	2	80	4.5	1.79	73.48	71.69	2.5
487	1201	10	1	7	3.7	Bore positioned in Layer 1 (Monitoring bore)			
20251	1325	13.5	1	10.5	5.1	Bore positioned in Layer 1 (Shallow bore < 20 m deep)			
954	1420	*100*	2	80	3.8	1.32	74.17	72.85	1.8
1074	1430	*100*	2	80	5.0	1.30	73.00	71.70	1.8
1076	1430	*100*	2	80	5.0	1.30	73.00	71.70	1.8
2294	1470	85	2	82	3.8	1.23	76.25	75.01	1.6
927	1500	56	1	53	3.7	0.02	47.26	47.25	0.0
4799	1665	*100*	2	80	5.1	0.94	72.88	71.94	1.3
21761	1732	*100*	2	80	5.5	0.85	72.51	71.66	1.2

Bore ID	Distance	Bore Depth	Model Layer	Base of Casing*	Static Water Level	Drawdown due to proposed take	Available drawdown**	Remaining available drawdown	% of impact
	(m)	(m)		(mBGL)	(mBGL)	(m)	(m)	(m)	
21462	1822	9.23	1	6.23	2.7	Bore positioned in Layer 1 (Shallow bore < 20 m deep)			
21241	1845	59.4	1	56.4	7.8	0.01	46.61	46.60	0.0
485	1874	10	1	7	3.3	Bore positioned in Layer 1 (Monitoring bore)			
4940	1883	13.5	1	10.5	3.4	Bore positioned in Layer 1 (Shallow bore < 20 m deep)			
5219	1883	20.3	1	17.3	3.4	0.01	11.87	11.86	0.1
713	1958	7.5	1	4.5	4.6	Bore positioned in Layer 1 (Shallow bore < 20 m deep)			
5272	1971	29	1	26	3.9	0.01	20.05	20.05	0.0
29248	2000	40	1	37	4.6	0.01	30.37	30.37	0.0
263	2066	60	1	57	1.3	0.01	53.69	53.68	0.0
2284	2070	85	2	82	2.7	0.51	77.33	76.82	0.7
21529	2090	36	1	33	0.4	0.01	30.60	30.59	0.0
29247	2147	40	1	37	1.1	0.01	33.90	33.90	0.0
21528	2220	40.5	1	37.5	2.5	0.00	32.96	32.95	0.0
21527	2236	49.6	1	46.6	2.0	0.00	42.64	42.64	0.0
21323	2238	40.5	1	37.5	3.2	0.00	32.30	32.30	0.0
27858	2269	*100*	2	80	1.8	0.37	76.23	75.87	0.5
5218	2330	10.5	1	7.5	1.9	Bore positioned in Layer 1 (Shallow bore < 20 m deep)			
20250	2337	35.5	1	32.5	2.1	0.00	28.44	28.44	0.0
5309	2399	8	1	5	2.2	Bore positioned in Layer 1 (Shallow bore < 20 m deep)			
21725	2553	135	2	80	37.0	0.23	41.00	40.77	0.6
2323	3067	216	2	80	21.5	0.09	56.53	56.45	0.2
4653	3666	85	1	82	6.1	0.00	73.89	73.89	0.0
21584	3742	22.84	1	19.84	32.7	0.00	-14.86	-14.86	0.0

*Base of the casing assumes 80 mBGL, if bore depth is more than 100 m else 3 m below bore depth.

**Available drawdown calculation assumes pump is 2 m above the bottom of the casing.

Italic underline- Assumed bore depth of 100 m.

Italic – Measured SWL

Bold – Bore diameter <= to 50 mm. Probably monitoring bores.

5.2.2 Stream Depletion Effects

Potential effects on surface water bodies were considered by calculating the portion of the groundwater take that is derived from each hydrogeological layer represented within the model, as presented in **Figure 6**. To produce a conservative assessment of potential stream depletion, it was assumed that all of the water deriving from Model Layer 1 was directly contributing to stream depletion.

The simulation results indicate that after 197 days of continuous pumping, about 14% of the abstraction volume derives from Layer 1, equating to a stream depletion effect of 182 m^3/day (2.1 L/s). A stream is typically considered to be an indirectly connected groundwater system if less than 60% of the water produced from the bore was derived from connection to a stream after a significant period of pumping. On that basis, the allocation would be considered as groundwater for consenting purposes and surface water regulations would not apply.

NIWA's NZ River Maps Web Application indicates the mean annual low flow (MALF) in the Rangitopuni Stream immediately downgradient of the site is 22.0 L/s or 1,900 m^3/day. The predicted impact is expected to be distributed over a large area and may also derive some of the water from Dairy Stream to the southeast, which has a MALF of 12.7 L/s (1,097 m^3/day). In the context of this application, the potential effects assuming 60% is experienced within Rangitopuni Stream and the remainder in Dairy Stream represent a weighted average stream depletion of 5.8% and a maximum of 6.7% of MALF.

Furthermore, i) the model does not account for recharge and ii) the assumed pumping rate of 1,303 m^3/year represents a maximum scenario, which is unlikely to occur continuously over the 197-day period. Therefore, given the estimated effect on MALF is less than the default surface water take allocation (30% MALF), no adverse effects on aquatic habitats are considered likely.

On this basis any stream depletion effects arising from the proposed take are considered to be insignificant.

5.2.3 Effects on Wetlands

The greatest drawdown predicted to wetland mapped by LENZ and is classified as 'Swamp', approximately 1,750 m south from the bore location. The maximum drawdown from Model Layer 1 at this location is predicted to be 0.012 m, which would reduce further when accounting for drainable porosity.

Given that the model does not account for the rainfall recharge and surface water flow which are the dominant water sources for wetlands in this area, given the disconnection from deep groundwater, the predicted drawdown is considered to be conservative. The overall effect on wetland is considered imperceptible.

5.2.4 Saline Intrusion Effects

This assessment considered potential for saline intrusion to occur as a result of the proposed take in the context of the lateral distance from any seawater source, the depth of the bore, and the hydrogeological conditions. The analysis of potential saline intrusion is presented in detail in **Section C.9** of **Appendix C**.

While the pumped water level was simulated to be on the order of 198 m below sea level, the closest sea water source, the estuary is approximately 7 km away. Given that the bore is cased to a depth of 400 m with impermeable materials vertically separating the deep Waitemata Aquifer from surface features such as the estuary and the coast, which are both also separated by a significant lateral distance, the actual risk of saline intrusion developing is considered low.

5.2.5 Ground Settlement Effects

Land settlement effects have the potential to occur when compressible layers within the ground are dewatered.

For this proposal the maximum drawdown occurs at depth in the Greywacke, which very stiff and of low compressibility. No subsidence is anticipated for this units of those above it which experience lesser subsidence rates, hence ground settlement effects would be irrelevant.

6. Conclusion

The proposal involves a groundwater take to support supplying water to Auckland Surf Park Community at 1320 and 1350 Dairy Falt Highway, 89 and 105 Lascelles Drive and 253 and 237 Postman Road, Dairy Flat. Based on the above report it is considered that any adverse effects in relation to the proposed groundwater take will be negligible.

Appendix A. Bore Drilling Consents (LUC60444889 and LUC60446994)

Decision on an application for resource consent under the Resource Management Act 1991

Controlled activity

1. Application description

Application number:	LUC60444889 (s9 land use consent)
Applicant:	ASP Bei Land Co Limited
Site address:	237 Postman Road, Dairy Flat 0794
Legal description:	Lot 3 DP 607404
Site area:	23.9523 hectares

Auckland Unitary Plan (Operative in part)

Zoning and precinct:	Future Urban Zone
Overlays, controls, special features, designations, etc:	**Overlays** Infrastructure: Airport Approach Surface Overlay - North Shore Airport Infrastructure: Aircraft Noise Overlay - North Shore Airport - air noise boundary (65dBA) Infrastructure: Aircraft Noise Overlay - North Shore Airport - Outer control boundary (55dBA) **Controls** Controls: Macroinvertebrate Community Index – Rural

2. Proposal

The Applicant proposes to drill and construct a water bore on the application site to enable water take for a surf park and tourism amenities. The proposed bore is to target the Rangitopuni Waitemata Aquifer.

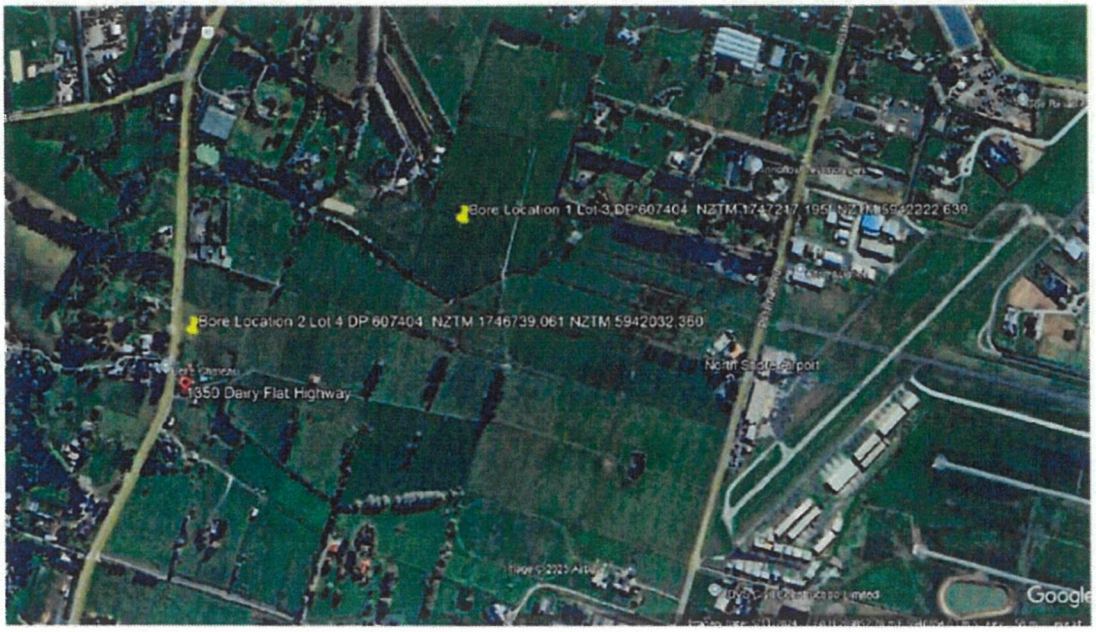


Figure 1: The locality plan with the proposed bore location *(yellow pin, labelled "Bore Location 1").*

The bore will be located 1747217 mE, 5942222 mN within the subject site 237 Postman Road Dairy Flat 0794.

The 150mm diameter bore will be drilled to a depth of 600m. Steel (slotted screen 380-595m) will be installed to a depth of 400m. The proposed maximum daily water take is 720m^3 and annual quantity of 216,000m^3. These quantities are above permitted activity levels and will require the granting of a resource consent to take groundwater before the bore can be used.

3. Reasons for the application

Resource consent is required for the following reason:

Land use consent (s9) – LUC60444889

Auckland Unitary Plan (Operative in part)

Regional land use consent (operative plan provisions)

Taking, using, damming and diversion of water and drilling

- To establish a new bore for a surf park and tourism amenities, which is a purpose not otherwise specified and is a controlled activity under rule E7.4.1(A41).

The reason for consent is considered a **controlled** activity.

4. Background

Specialist Input

The proposal has been reviewed and assessed by the following specialists:

- Nicola Jones – Specialist Coastal and Water Allocation

5. Decision

I have read the application, supporting documents, and the recommendation on the application for resource consent. I am satisfied that I have sufficient information to consider the matters required by the Resource Management Act 1991 (RMA) and make a decision under delegated authority on the application.

Acting under delegated authority, and for the reasons set out below, under sections 95A and 95C to 95D, and 95B and 95E to 95G of the RMA this application shall be processed **non-notified**.

Acting under delegated authority, under sections 104, 104A and Part 2 of the RMA the resource consent is **GRANTED**.

6. Reasons

The reasons for this decision are:

1. In accordance with an assessment following the steps set out in sections 95A and 95C to 95D the application need not be publicly notified because:

    a. Under step 1, public notification is not mandatory as the applicant has not requested it, there are no outstanding or refused requests for further information, and the application does not involve any exchange of recreation reserve land under s15AA of the Reserves Act 1977.

    b. Under step 2, public notification is precluded as the application is exclusively for controlled activity resource consent.

    c. Step 3 is not applicable given public notification being precluded by step 2.

    d. Under step 4, there are no special circumstances to warrant public notification because the application relates to the drilling of a bore to be used in association with a water take. There is nothing unusual or unique about the application.

2. In accordance with an assessment following the steps set out in sections 95B and 95E to 95G the application need not be limited notified because:

    a. Under step 1, limited notification is not mandatory as there are no protected customary rights groups or customary marine title groups affected by the proposed activity, nor any affected person to whom a statutory acknowledgement is made under schedule 11.

    b. Under step 2, limited notification is precluded by E7.5(1) in the Auckland Unitary Plan (Operative in Part).

    c. Step 3 is not applicable given limited notification is precluded by step 2.

    d. Under step 4, there are no special circumstances that warrant the application being limited notified to any other persons because as noted above, the application relates to the drilling of bores in association with a water take. There is nothing unusual or unique about the application.

3. The application is for controlled activity resource consent, and as such under s104A only those matters over which council has reserved its control have been considered. Those matters can be found in the Auckland Unitary Plan (Operative in Part) – E7.7.1(1) and (4) and are as follows:

    - the effects on Mana Whenua values;
    - the location, depth and design of the bore and the design of the head works;
    - effects on areas any scheduled historic heritage place;
    - the provision for bore identification;
    - maintenance of the bore;
    - monitoring and reporting requirements; and
    - the duration of the consent and the timing and nature of reviews of consent conditions.

4. In accordance with an assessment under s104(1)(a) and (ab) of the RMA the actual and potential effects from the proposal will be less than minor because:

    a. Council's Coastal and Water Allocation Specialist has reviewed the proposed location, depth and design of the bore, including the design of the head works, and concludes the proposal is appropriate and will not lead to adverse effects on other groundwater users or the surrounding environment.

    b. The bore is to be constructed and maintained and records kept in accordance with NZS 4411:2001, Environmental Standard for Drilling of Soil and Rock. For resource management and administrative purposes, the bore should be labelled with a Bore Identification Number etched into the outer PVC casing or etched into the steel casing should the bore be cased in steel.

    c. A search of Auckland Council's database and review of the lodged application documents did not identify any septic tanks or associated disposal fields, contaminated sites, storage of contaminants, flood prone areas, wetlands or underground services in the near vicinity of the proposed bore site. The risk of contamination of the aquifer from the presence of the wastewater infrastructure or any other vectors is negligible.

    d. There are no cultural heritage features located in the near vicinity of the proposed bore site, as identified by Council's GIS. No mana whenua groups have indicated their interest in the proposal. Therefore there are no concerns regarding the design and location of the bore in regard to mana whenua values. Thus adverse effects on mana whenua values are considered to be less than minor.

    e. In terms of positive effects:

        - The construction of the bore will facilitate the taking of groundwater and provide for the economic wellbeing of the applicant.

    f. There are no specific offsetting or environmental compensation measures within the matters of control proposed or agreed to by the applicant.

5. Overall, it is considered that any actual or potential effects generated by the proposal are acceptable within the context and character of the surrounding environment.

6. In accordance with an assessment under s104(1)(b) of the RMA the proposal is consistent with the relevant statutory documents, being the Auckland Unitary Plan (Operative in Part). In particular:

   a. Objectives E1.2 & E2.2 and Policies E1.3, & E2.3

7. As a controlled activity, the other matters that can be considered under s104(1)(c) of the RMA must relate to the matters reserved for control under the plan. In this case, there are no other relevant matters.

8. The relevant statutory documents above were prepared having regard to Part 2 of the RMA and capture all relevant planning considerations and contain a coherent set of policies designed to achieve clear environmental outcomes. They provide a clear framework for assessing all relevant potential effects from the proposal, and thus there is no need to go beyond these provisions and look to Part 2 in making this decision, as an assessment against Part 2 would not add anything to the evaluative exercise.

9. Overall, any actual or potential effects generated by the proposal are acceptable within the context and character of the surrounding environment.

7. Conditions

Under sections 108 and 108AA of the RMA, this consent is subject to the following conditions:

1. This resource consent must be carried out in accordance with the documents and drawings and all supporting additional information submitted with the application, detailed below, and all referenced by the council as resource consent number LUC60444889.

   - Application Form, and Assessment of Environmental Effects prepared by David McIntosh, dated 6 March 2025.

Report title and reference	Author	Rev	Dated
Environmental Policy	Bruce McKeown	-	08 January 2019
Archaeological and Culturally Sensitive Material Discovery Policy	Bruce McKeown	-	08 January 2019

Drawing title and reference	Author	Rev	Dated
Bore Locations	David McIntosh	-	06 March 2025

2. Under section 125 of the RMA, this consent lapses two years after the date it is granted unless:

   a. The consent is given effect to; or

   b. The council extends the period after which the consent lapses.

3. The consent holder must pay the council an initial consent compliance monitoring charge of $390 inclusive of GST), plus any further monitoring charge or charges to recover the actual and reasonable costs that have been incurred to ensure compliance with the conditions attached to this / these consent/s.

Advice note:

The initial monitoring deposit is to cover the cost of inspecting the site, carrying out tests, reviewing conditions, updating files, etc., all being work to ensure compliance with the resource consent. In order to recover actual and reasonable costs, monitoring of conditions, in excess of those covered by the deposit, must be charged at the relevant hourly rate applicable at the time. The consent holder will be advised of the further monitoring charge. Only after all conditions of the resource consent have been met, will the council issue a letter confirming compliance on request of the consent holder.

4. Bore location and construction

The bore is to be generally (within 10m of the specified location) located and constructed as detailed below:

Name	Bore ID	NZTM Easting (mE)	NZTM Northing (mN)	Depth (m)
ASP Bei Land Co Limited	31647	1747217	5942222	600
Bore diameter (mm)	**Aquifer**	**Casing depth (m)**	**Casing material**	**Grouting**
150	Rangitopuni Waitemata	400	Steel	400

5. Bore completion date

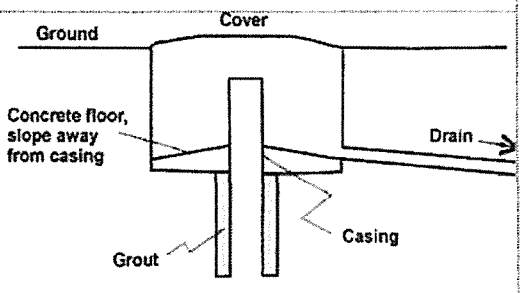
The bore must be completed within 30 days of the commencement of its construction.

6. Bore design, construction, maintenance, and record keeping

The bore must be constructed, maintained (periodically checking the integrity of the headworks), tested, and records kept (drilling log), in accordance with the application submitted and NZS 4411:2001, Environmental Standard for Drilling of Soil and Rock. Adequate provisions for groundwater water level measurement and water sampling must be provided at the bore head.

Advice note: Bore headworks

Bore headworks constructed in accordance with the diagram and explanation provided below will be considered to meet the NZS 4411:2001 Section 2.5.5.3-5.

Above ground	*Below ground*
• *The top of the casing shall extend at least 0.3m above the natural ground level or pump house floor, whichever is the lower* • *A concrete pad of 0.3m radius and 0.1m thick, graded to drain surface water away from the bore, is to be constructed around the bore head*	

Advice note: Water level measurement and water quality sampling

NZS 4411:2001 Section 2.5.5.7 (water level measurement) can be met by strapping a 20mm diameter (minimum) tube (polypipe) to the main riser, power and support stay for the pump, the provision of a hole in the headworks of a minimum of 20mm diameter and a removable, screw-type cap. Provision at the top of the bore for water quality sampling can be achieved by fitting a tap or hand valve as close to the pump outlet as possible and before the water enters any storage tank or filter. It should have at least 0.3 metre clearance above ground level or other obstruction to allow a sample bottle to be filled.

7. Bore identification

Bore identification number 31647 must be permanently affixed, in a clearly visible location and in a form that will remain legible, to the bore head structure.

8. Information to be supplied to the Council

The following information must be supplied to the Council, within 20 working days of completion of the bore:

a. the drilling log.

b. a digital photograph(s) legibly showing:

   i. the bore number affixed to the bore head structure;

   ii. the length of the casing protruding above the concrete pad; and

   iii. the concrete pad around the bottom of the bore head.

c. an annotated map, or aerial photograph, that accurately and clearly shows the physical location and coordinates for the bore.

d. the following as built details for each bore –

Name	Bore ID	NZTM Easting (mE)	NZTM Northing (mN)	Depth (m)
	31647			
Bore diameter (mm)	**Aquifer**	**Casing depth (m)**	**Casing material**	**Grouting**

Advice note:

An aerial map can be downloaded from Auckland Council's web site if an aerial photograph is required.

8. Advice notes

1. *Any reference to number of days within this decision refers to working days as defined in s2 of the RMA.*
2. *For the purpose of compliance with the conditions of consent, "the council" refers to the council's monitoring officer unless otherwise specified. Please email monitoring@aucklandcouncil.govt.nz to identify your allocated officer.*
3. *For more information on the resource consent process with Auckland Council see the council's website: www.aucklandcouncil.govt.nz. General information on resource consents, including making an application to vary or cancel consent conditions can be found on the Ministry for the Environment's website: www.mfe.govt.nz.*
4. *If you disagree with any of the above conditions, and/or disagree with the additional charges relating to the processing of the application(s), you have a right of objection pursuant to sections 357A and/or 357B of the Resource Management Act 1991. Any objection must be made in writing to the council within 15 working days of your receipt of this decision (for s357A) or receipt of the council invoice (for s357B).*
5. *The consent holder is responsible for obtaining all other necessary consents, permits, and licences, including those under the Building Act 2004, and the Heritage New Zealand Pouhere Taonga Act 2014. This consent does not remove the need to comply with all other applicable Acts (including the Property Law Act 2007 and the Health and Safety at Work Act 2015), regulations, relevant Bylaws, and rules of law. This consent does not constitute building consent approval. Please check whether a building consent is required under the Building Act 2004.*
6. *The consent holder is responsible for ensuring that all development and associated works (including mobile plant and scaffolding) complies with the minimum safe distances from overhead electric lines in compliance with the New Zealand Electrical Code of Practice for Electrical Safe Distances (NZECP 34:2001) (NZECP34). Resource consent does not confirm compliance with NZECP34. The consent holder should ensure that minimum safe distances are achieved before commencing construction where there are overhead electrical lines nearby.*

You can search your site address at https://www.ena.org.nz/lines-company-map/ to identify your local lines company.

Vector network: https://www.vector.co.nz/personal/help-safety/near-our-network/building-near-overhead-lines

Counties Energy network: https://www.countiesenergy.co.nz/forms/close-approach-permit

7. *Email contact details*

   All information required by the council in this consent can be sent to monitoring@aucklandcouncil.govt.nz

8. *Drinking water standards*

   The consent holder is advised that groundwater supplied for human consumption should meet the requirements of the Drinking Water Standards for New Zealand (2022), the Health Act 1956, as amended by the Health (Drinking Water) Amendment Act 2007 (HDWAA) and any other Ministry of Health requirements, such as those contained in the Health (Drinking Water) Amendment Act 2007.

9. *Compliance with regional rules*

   There are regional rules that cover the ongoing use, maintenance, restoration, alteration, replacement or decommissioning of the bore which must be complied with. These rules are detailed in the Auckland Unitary Plan (Operative in Part).

10. *Avoiding contamination of aquifer*

    The consent holder is advised to install a non-return valve of acceptable NZ Standards on the proposed bore to prevent the backflow of water into the bore.

11. *Use of water*

    The taking and use of water is regulated by s14(3)(b) of the RMA and the Auckland Unitary Plan. If your proposed water take is not provided for by s14(3)(b) or by a permitted activity rule in the AUP(OP) then you require a resource consent to lawfully take and use water. See Chapter E7 of the AUP(OP).

Decision prepared by:

Vivian Tang
Planner
Resource Consents

Date: 4 April 2025

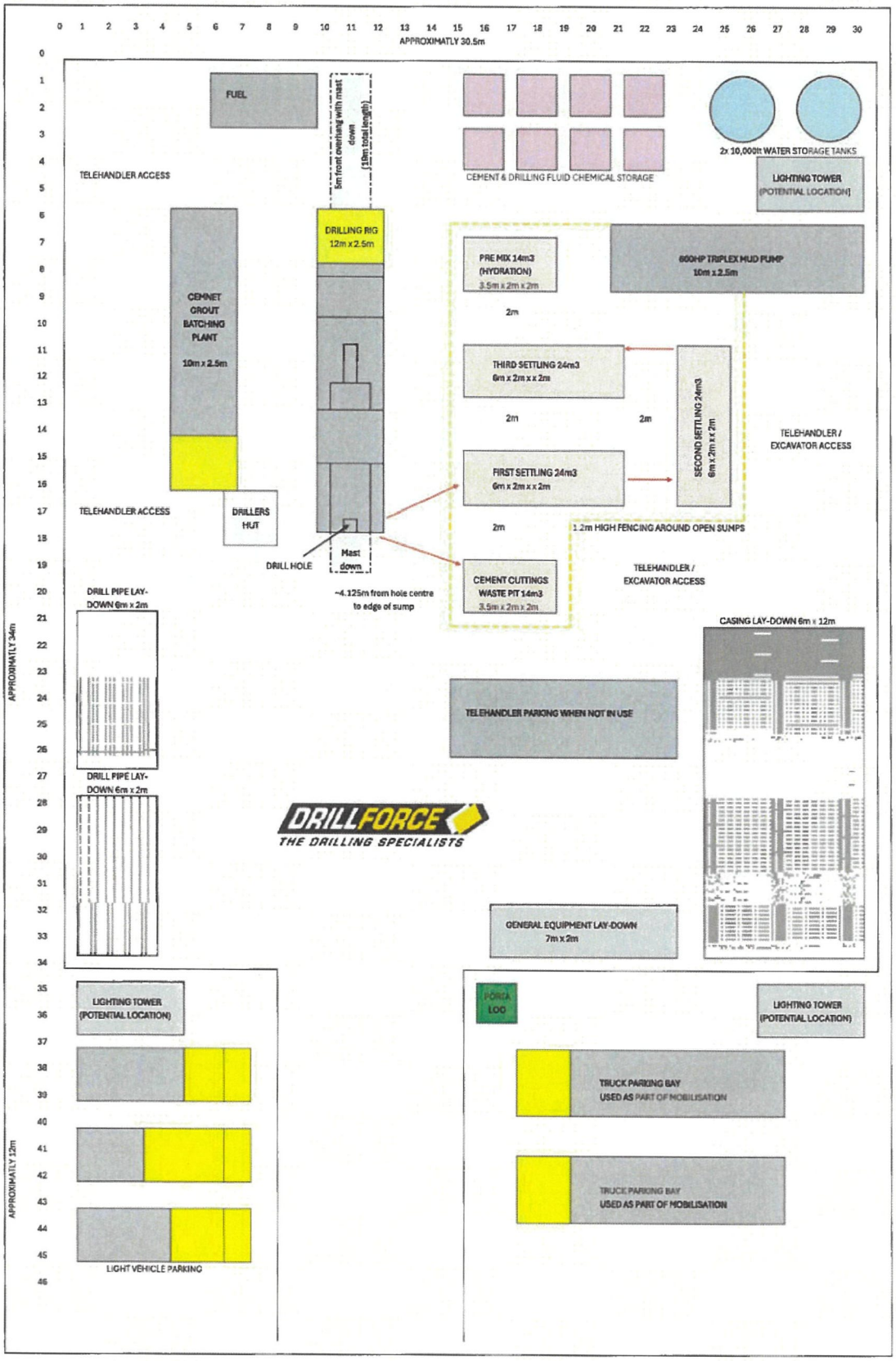
Delegated decision maker:

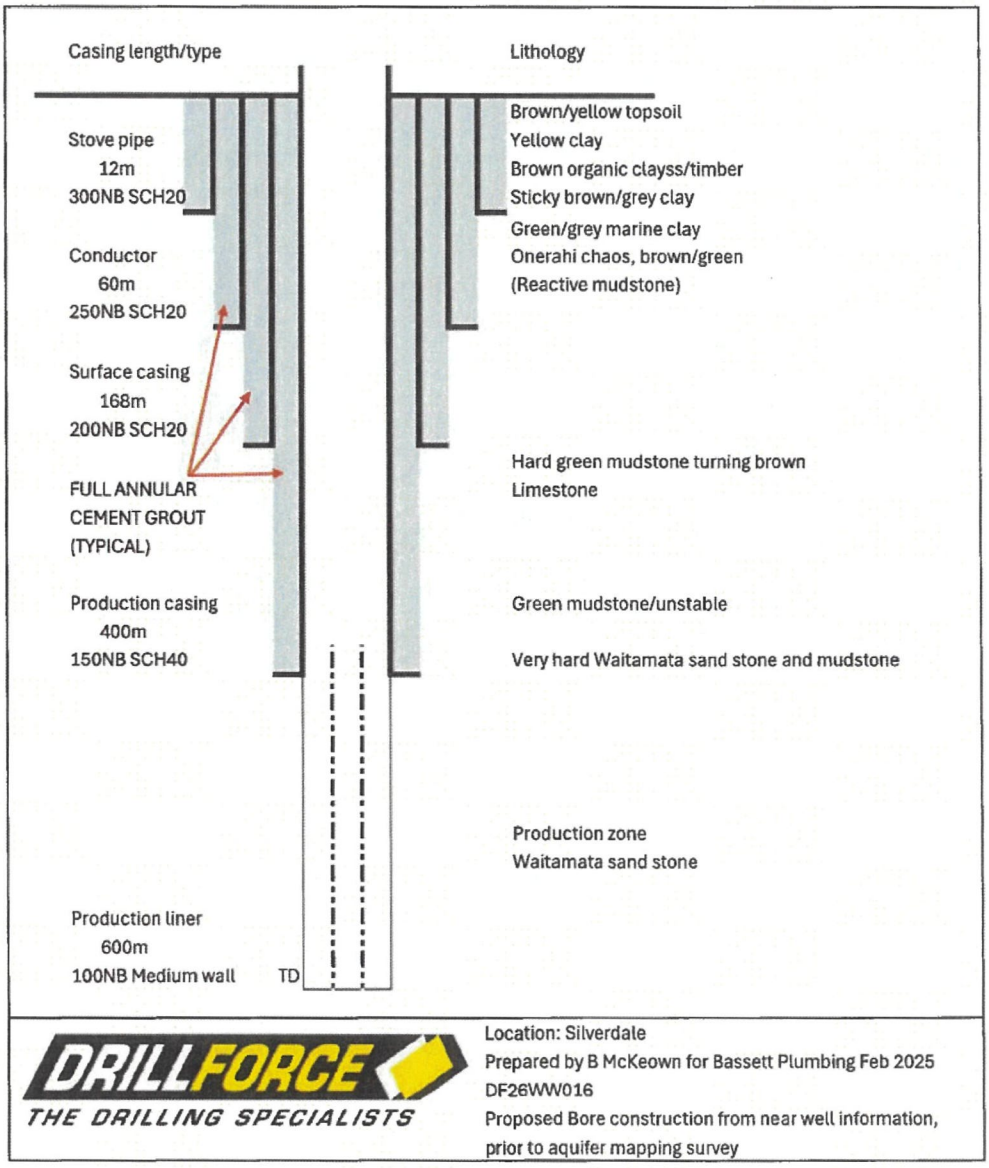
Name: Helen McCabe

Title: Team Leader, Resource Consents

Signed:

Date: 7 April 2025


APPROXIMATLY 30.5m
APPROXIMATLY 34m
APPROXIMATLY 12m
FUEL
5m front overhang with mast down (19m total length)
2x 10,000lt WATER STORAGE TANKS
CEMENT & DRILLING FLUID CHEMICAL STORAGE
LIGHTING TOWER (POTENTIAL LOCATION)
TELEHANDLER ACCESS
DRILLING RIG 12m x 2.5m
PRE MIX 14m3 (HYDRATION) 3.5m x 2m x 2m
600HP TRIPLEX MUD PUMP 10m x 2.5m
CEMNET GROUT BATCHING PLANT 10m x 2.5m
THIRD SETTLING 24m3 6m x 2m x x 2m
SECOND SETTLING 24m3 6m x 2m x x 2m
FIRST SETTLING 24m3 6m x 2m x x 2m
TELEHANDLER / EXCAVATOR ACCESS
TELEHANDLER ACCESS
DRILLERS HUT
DRILL HOLE
Mast down
1.2m HIGH FENCING AROUND OPEN SUMPS
CEMENT CUTTINGS WASTE PIT 14m3 3.5m x 2m x 2m
TELEHANDLER / EXCAVATOR ACCESS
~4.125m from hole centre to edge of sump
DRILL PIPE LAY-DOWN 6m x 2m
DRILL PIPE LAY-DOWN 6m x 2m
CASING LAY-DOWN 6m x 12m
TELEHANDLER PARKING WHEN NOT IN USE
DRILLFORCE
THE DRILLING SPECIALISTS
GENERAL EQUIPMENT LAY-DOWN 7m x 2m
LIGHTING TOWER (POTENTIAL LOCATION)
PORTA LOO
LIGHTING TOWER (POTENTIAL LOCATION)
TRUCK PARKING BAY USED AS PART OF MOBILISATION
TRUCK PARKING BAY USED AS PART OF MOBILISATION
LIGHT VEHICLE PARKING



DRILLFORCE
THE DRILLING SPECIALISTS

Location: Silverdale
Prepared by B McKeown for Bassett Plumbing Feb 2025
DF26WW016
Proposed Bore construction from near well information, prior to aquifer mapping survey

Decision on an application for resource consent under the Resource Management Act 1991

Controlled activity

1. Application description

Application number:	LUC60446994 (s9 land use consent)
Applicant:	ASP Bei Land Co Limited
Site address:	1350 Dairy Flat Highway, Dairy Flat 0792
Legal description:	LOT 4 DP 607404
Site area:	14.7085 hectares

Auckland Unitary Plan (Operative in part)

Zoning and precinct:	Future Urban Zone
Overlays, controls, special features, designations, etc:	**Overlays** Infrastructure: Airport Approach Surface Overlay - North Shore Airport Infrastructure: Aircraft Noise Overlay - North Shore Airport - air noise boundary (65dBA) Infrastructure: Aircraft Noise Overlay - North Shore Airport - Outer control boundary (55dBA) **Controls** Controls: Macroinvertebrate Community Index – Rural

2. Proposal

The Applicant proposes to drill and construct a water bore on the application site to enable water take for a surf park and tourism amenities. The proposed bore is to target the Rangitopuni Waitemata Aquifer.

Figure 1: The locality plan with the proposed bore location (yellow pin)

The bore will be located 1746739.061mE, 5942032.360mN within the subject site 1350 Dairy Flat Highway, Dairy Flat 0794.

The 150mm diameter bore will be drilled to a depth of 600m. 400 steel (slotted screen 380-595m) will be installed to a depth of 400m. The proposed maximum daily water take is 720m^3 and annual quantity of 216,000m^3. These quantities are above permitted activity levels and will require the granting of a resource consent to take groundwater before the bore can be used.

3. Reasons for the application

Resource consent is required for the following reason:

Land use consent (s9) – LUC60446994

Auckland Unitary Plan (Operative in part)

Regional land use consent (operative plan provisions)

Taking, using, damming and diversion of water and drilling

- To establish a new bore for a surf park and tourism amenities, which is a purpose not otherwise specified and is a controlled activity under rule E7.4.1(A41).

The reason for consent is considered a **controlled** activity.

4. Background

Specialist Input

The proposal has been reviewed and assessed by the following specialist:

- Nicola Jones – Specialist Coastal and Water Allocation

5. Decision

I have read the application, supporting documents, and the recommendation on the application for resource consent. I am satisfied that I have sufficient information to consider the matters required by the Resource Management Act 1991 (RMA) and make a decision under delegated authority on the application.

Acting under delegated authority, and for the reasons set out below, under sections 95A and 95C to 95D, and 95B and 95E to 95G of the RMA this application shall be processed **non-notified**.

Acting under delegated authority, under sections 104, 104A and Part 2 of the RMA the resource consent is **GRANTED**.

6. Reasons

The reasons for this decision are:

1. In accordance with an assessment following the steps set out in sections 95A and 95C to 95D the application need not be publicly notified because:

    a. Under step 1, public notification is not mandatory as the applicant has not requested it, there are no outstanding or refused requests for further information, and the application does not involve any exchange of recreation reserve land under s15AA of the Reserves Act 1977.

    b. Under step 2, public notification is precluded as the application is exclusively for controlled activity resource consent.

    c. Step 3 is not applicable given public notification being precluded by step 2.

    d. Under step 4, there are no special circumstances to warrant public notification because the application relates to the drilling of a bore to be used in association with a water take. There is nothing unusual or unique about the application.

2. In accordance with an assessment following the steps set out in sections 95B and 95E to 95G the application need not be limited notified because:

    a. Under step 1, limited notification is not mandatory as there are no protected customary rights groups or customary marine title groups affected by the proposed activity, nor any affected person to whom a statutory acknowledgement is made under schedule 11.

    b. Under step 2, limited notification is precluded by notification E7.5(1) in the Auckland Unitary Plan (Operative in Part).

    c. Step 3 is not applicable given limited notification is precluded by step 2.

    d. Under step 4, there are no special circumstances that warrant the application being limited notified to any other persons because as noted above, the application relates to the drilling of bores in association with a water take. There is nothing unusual or unique about the application.

3. The application is for controlled activity resource consent, and as such under s104A only those matters over which council has reserved its control have been considered. Those matters can be found in the Auckland Unitary Plan (Operative in Part) – E7.7.1(1) and (4) and are as follows:

    i. the effects on Mana Whenua values;

    ii. the location, depth and design of the bore and the design of the head works;

    iii. effects on areas any scheduled historic heritage place;

    iv. the provision for bore identification;

    v. maintenance of the bore;

    vi. monitoring and reporting requirements; and

    - the duration of the consent and the timing and nature of reviews of consent conditions.

4. In accordance with an assessment under s104(1)(a) and (ab) of the RMA the actual and potential effects from the proposal will be less than minor because:

    a. Council's Coastal and Water Allocation Specialist has reviewed the proposed location, depth and design of the bore, including the design of the head works, and concludes the proposal is appropriate and will not lead to adverse effects on other groundwater users or the surrounding environment.

    b. The bore is to be constructed and maintained and records kept in accordance with NZS 4411:2001, Environmental Standard for Drilling of Soil and Rock. For resource management and administrative purposes, the bore will be labelled with a Bore Identification Number etched into the outer casing for bores cased in steel.

    c. A search of Auckland Council's database and review of the lodged application documents identified that the proposed bore is located on a potentially contaminated site associated with an onsite above ground storage tank for contaminants in 2010. Given the size of the property and layout, and that the finished bore will be cased and fully grouted to approximately 400m with the bore head finished at least 0.3m above the ground, the risk of contamination of the aquifer from the presence of the wastewater infrastructure or any other vectors is negligible.

    d. There are no cultural heritage features located in the near vicinity of the proposed bore site, as identified by Council's GIS. No mana whenua groups have indicated their interest in the proposal. Therefore there are no concerns regarding the design and location of the bore in regard to mana whenua values. Thus adverse effects on mana whenua values are considered to be less than minor.

    e. In terms of positive effects:

    - The construction of the bore will facilitate the taking of groundwater and provide for the economic wellbeing of the applicant.

    f. There are no specific offsetting or environmental compensation measures within the matters of control proposed or agreed to by the applicant.

5. Overall, it is considered on balance that any actual or potential effects generated by the proposal are acceptable within the context and character of the surrounding environment.

6. In accordance with an assessment under s104(1)(b) of the RMA the proposal is consistent with the relevant statutory documents, being the Auckland Unitary Plan (Operative in Part). In particular:

   a. Objectives E1.2 & E2.2 and Policies E1.3, & E2.3

7. As a controlled activity, the other matters that can be considered under s104(1)(c) of the RMA must relate to the matters reserved for control under the plan. In this case, there are no other relevant matters.

8. The relevant statutory documents above were prepared having regard to Part 2 of the RMA and capture all relevant planning considerations and contain a coherent set of policies designed to achieve clear environmental outcomes. They provide a clear framework for assessing all relevant potential effects from the proposal, and thus there is no need to go beyond these provisions and look to Part 2 in making this decision, as an assessment against Part 2 would not add anything to the evaluative exercise.

9. Overall, any actual or potential effects generated by the proposal are acceptable within the context and character of the surrounding environment.

7. Conditions

Under sections 108 and 108AA of the RMA, this consent is subject to the following conditions:

1. This resource consent must be carried out in accordance with the documents and drawings and all supporting additional information submitted with the application, detailed below, and all referenced by the council as resource consent number LUC60446994.

   - Application Form, and Assessment of Environmental Effects prepared by David McIntosh, dated 7 April 2025.

Report title and reference	Author	Rev	Dated
Environmental Policy	Bruce McKeown	-	08 January 2019
Archaeological and Culturally Sensitive Material Discovery Policy	Bruce McKeown	-	08 January 2019

Drawing title and reference	Author	Rev	Dated
1350 Dairy Flat Highway Bore Location	David McIntosh	-	April 2025

2. Under section 125 of the RMA, this consent lapses two years after the date it is granted unless:

   a. The consent is given effect to; or

   b. The council extends the period after which the consent lapses.

3. The consent holder must pay the council an initial consent compliance monitoring charge of $390 (inclusive of GST), plus any further monitoring charge or charges to recover the

actual and reasonable costs that have been incurred to ensure compliance with the conditions attached to this consent.

Advice note:

The initial monitoring deposit is to cover the cost of inspecting the site, carrying out tests, reviewing conditions, updating files, etc., all being work to ensure compliance with the resource consent. In order to recover actual and reasonable costs, monitoring of conditions, in excess of those covered by the deposit, must be charged at the relevant hourly rate applicable at the time. The consent holder will be advised of the further monitoring charge. Only after all conditions of the resource consent have been met, will the council issue a letter confirming compliance on request of the consent holder.

4. Bore location and construction

The bore is to be generally (within 10m of the specified location) located and constructed as detailed below:

Name	Bore ID	NZTM Easting (mE)	NZTM Northing (mN)	Depth (m)
ASP BEI Land Co Limited	31657	1746739	5942032	600
Bore diameter (mm)	**Aquifer**	**Casing depth (m)**	**Casing material**	**Grouting**
150	Rangitopuni Waitemata	400	Steel	400

5. Bore completion date

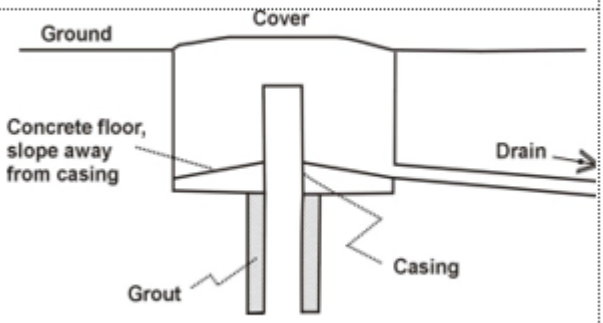
The bore must be completed within 30 days of the commencement of its construction.

6. Bore design, construction, maintenance, and record keeping

The bore must be constructed, maintained (periodically checking the integrity of the headworks), tested, and records kept (drilling log), in accordance with the application submitted and NZS 4411:2001, Environmental Standard for Drilling of Soil and Rock. Adequate provisions for groundwater water level measurement and water sampling must be provided at the bore head.

Advice note: Bore headworks

Bore headworks constructed in accordance with the diagram and explanation provided below will be considered to meet the NZS 4411:2001 Section 2.5.5.3-5.

Above ground	*Below ground*
• *The top of the casing shall extend at least 0.3m above the natural ground level or pump house floor, whichever is the lower* • *A concrete pad of 0.3m radius and 0.1m thick, graded to drain surface water away from the bore, is to be constructed around the bore head*	

Advice note: Water level measurement and water quality sampling

NZS 4411:2001 Section 2.5.5.7 (water level measurement) can be met by strapping a 20mm diameter (minimum) tube (polypipe) to the main riser, power and support stay for the pump, the provision of a hole in the headworks of a minimum of 20mm diameter and a removable, screw-type cap. Provision at the top of the bore for water quality sampling can be achieved by fitting a tap or hand valve as close to the pump outlet as possible and before the water enters any storage tank or filter. It should have at least 0.3 metre clearance above ground level or other obstruction to allow a sample bottle to be filled.

7. Bore identification

Bore identification number 31657 must be permanently affixed, in a clearly visible location and in a form that will remain legible, to the bore head structure.

8. Information to be supplied to the Council

The following information must be supplied to the Council, within 20 working days of completion of the bore:

a. the drilling log.

b. a digital photograph(s) legibly showing:

   i. the bore number affixed to the bore head structure;

   ii. the length of the casing protruding above the concrete pad; and

   iii. the concrete pad around the bottom of the bore head.

c. an annotated map, or aerial photograph, that accurately and clearly shows the physical location and coordinates for the bore.

d. the following as built details for each bore –

Name	Bore ID	NZTM Easting (mE)	NZTM Northing (mN)	Depth (m)
	31657			
Bore diameter (mm)	Aquifer	Casing depth (m)	Casing material	Grouting

Advice note:

An aerial map can be downloaded from Auckland Council's web site if an aerial photograph is required.

8. Advice notes

1. *Any reference to number of days within this decision refers to working days as defined in s2 of the RMA.*

2. *For the purpose of compliance with the conditions of consent, "the council" refers to the council's monitoring officer unless otherwise specified. Please email monitoring@aucklandcouncil.govt.nz to identify your allocated officer.*

3. *For more information on the resource consent process with Auckland Council see the council's website: www.aucklandcouncil.govt.nz. General information on resource consents, including making an application to vary or cancel consent conditions can be found on the Ministry for the Environment's website: www.mfe.govt.nz.*

4. *If you disagree with any of the above conditions, and/or disagree with the additional charges relating to the processing of the application(s), you have a right of objection pursuant to sections 357A and/or 357B of the Resource Management Act 1991. Any objection must be made in writing to the council within 15 working days of your receipt of this decision (for s357A) or receipt of the council invoice (for s357B).*

5. *The consent holder is responsible for obtaining all other necessary consents, permits, and licences, including those under the Building Act 2004, and the Heritage New Zealand Pouhere Taonga Act 2014. This consent does not remove the need to comply with all other applicable Acts (including the Property Law Act 2007 and the Health and Safety at Work Act 2015), regulations, relevant Bylaws, and rules of law. This consent does not constitute building consent approval. Please check whether a building consent is required under the Building Act 2004.*

6. *The consent holder is responsible for ensuring that all development and associated works (including mobile plant and scaffolding) complies with the minimum safe distances from overhead electric lines in compliance with the New Zealand Electrical Code of Practice for Electrical Safe Distances (NZECP 34:2001) (NZECP34). Resource consent does not confirm compliance with NZECP34. The consent holder should ensure that minimum safe distances are achieved before commencing construction where there are overhead electrical lines nearby.*

You can search your site address at https://www.ena.org.nz/lines-company-map/ to identify your local lines company.
Vector network: https://www.vector.co.nz/personal/help-safety/near-our-network/building-near-overhead-lines
Counties Energy network: https://www.countiesenergy.co.nz/forms/close-approach-permit

6. Email contact details

All information required by the council in this consent can be sent to monitoring@aucklandcouncil.govt.nz

7. Drinking water standards

The consent holder is advised that groundwater supplied for human consumption should meet the requirements of the Drinking Water Standards for New Zealand (2022), the Health Act 1956, as amended by the Health (Drinking Water) Amendment Act 2007 (HDWAA) and any other Ministry of Health requirements, such as those contained in the Health (Drinking Water) Amendment Act 2007.

8. Compliance with regional rules

There are regional rules that cover the ongoing use, maintenance, restoration, alteration, replacement or decommissioning of the bore which must be complied with. These rules are detailed in the Auckland Unitary Plan (Operative in Part).

9. Avoiding contamination of aquifer

The consent holder is advised to install a non-return valve of acceptable NZ Standards on the proposed bore to prevent the backflow of water into the bore.

10. Use of water

The taking and use of water is regulated by s14(3)(b) of the RMA and the Auckland Unitary Plan. If your proposed water take is not provided for by s14(3)(b) or by a permitted activity rule in the AUP(OP) then you require a resource consent to lawfully take and use water. See Chapter E7 of the AUP(OP).

Decision prepared by:

Vivian Tang
Planner
Resource Consents

Date: 16 May 2025

Delegated decision maker:

Name: Lexie Li

Title: Team Leader, Resource Consents

Signed:

Date: 22 May 2025

Resource Consent Notice of Works Starting

Please email this form to **monitoring@aucklandcouncil.govt.nz at least *5* days prior to work starting** on your development or post it to the address at the bottom of the page.

Site address:				
AREA (please tick the box)	**Auckland CBD☐**	**Auckland Isthmus☐**	**Hauraki Gulf Islands ☐**	**Waitakere ☐**
Manukau ☐	**Rodney ☐**	**North Shore ☐**	**Papakura ☐**	**Franklin ☐**

Resource consent number:	**Associated building consent:**
Expected start date of work:	**Expected duration of work:**

Primary contact	**Name**	**Mobile / Landline**	**Address**	**Email address**
Owner				
Project manager				
Builder				
Earthmover				
Arborist				
Other (specify)				

Signature: Owner / Project Manager (indicate which)	**Date:**

Once you have been contacted by the Monitoring Officer, all correspondence should be sent directly to them.

SAVE $$$ minimise monitoring costs!

The council will review your property for start of works every three months from the date of issue of the resource consent and charge for the time spent. You can contact your Resource Consent Monitoring Officer on 09 301 0101 or via monitoring@aucklandcouncil.govt.nz to discuss a likely timetable of works before the inspection is carried out and to avoid incurring this cost.

Appendix B. Production Bore as Built Drill Log

Production Bore As Built Design

Bore: Water Supply Production Bore (31647 BH1)

Project Name:	Auckland Surf Park	**Location:**	1350 Dairyflat highway, Silverdale
Project Number:	WWLA1623	**Designer:**	Basset Plumbing Limited

BORE DRILLING DETAILS

Drilling Company:	Drill Force	**Diameter (mm):**	154	**Depth (m):**	680
Drilling Date:	Sept-2025	**Easting (m):**	17472170	**Northing (m):**	5942222
Drilling Method:	Mud Rotary	**Ground Elev.(approx.):**			

Depth (m)	Lithology	Unit	Lithological Description	Bore Construction Details
0 – 40		LIMESTONE	Weak / Fractured Mahurangi Limestone. Thin hard Limestome bands observed.	No details on bore completion. [0-1 m] 450NB SCH 10 Stove Pipe. Cement pressure grouted all the casings. [0- 7.5 m] 300NB SCh 20 Conductor Casing. [0 -56 m] 250NB SCH 20 Surface Casing.
40 – 120		MUDSTONE / SILTSTONE	Onerahi Chaos- Breccia (Northland Allochthon) High percentage of hard drill cuttings (Siltstone) of 10 to 15 mm diameter mixed with muddy water.	[0 to 167 m] 200NB SCh 10 Intermediate Casing. 14.5 ppg Cement grout.
120 – 280		MUDSTONE / SILTSTONE	Low or no hard drill cuttings. Mudstone percentage is higher than that of Siltstone.	[0 to 400 m] 150NB SCH 40 Production Casing.
280 – 320		MUDSTONE / SILTSTONE	percentage of hard drill cuttings gradually increased to about 20 %. Dark greay coloured Siltsone. Temperature of the water is arround 34 °C.	
320 – 360		SANDSTONE / MUDSTONE	Interbedded Mudstone and Sandstone with some shell bands.	
360 – 400		GREYWACKE	About 10% of the drill cuttings area Siltstone chips.	
400 – 680		GREYWACKE	Interlayerd hard Sandstone and soft Siltstone bands.	[400 to 680 m] Drilling diameter 154 mm open hole. [389.5 to 680 m] 114 mm OD Perforated Liner (25 mm x 2 mm slots at 25 mm centres, 3 rows). [608 m] End of the hole and base of the Perforated Liner.

Grainsize Classification (mm):

Boulders	Cobbles	Gravel			Sand			Silt			Clay
		Coarse	Medium	Fine	Coarse	Medium	Fine	Coarse	Medium	Fine	
200	60	20	6	2	0.6	0.2	0.06	0.02	0.006	0.002	

Appendix C. Groundwater Response Modelling

C.1 Introduction

This assessment used the Feather & Williamson Analytical Model (FWM), calibrated to measured flow and drawdown during test pumping, to simulate the proposed groundwater take in order to evaluate the potential effects on groundwater conditions.

C.2 Feather Williamson Analytical Model

The Feather and Williamson Model (FWM) is an analytical solution for drawdown calculation in a multi-layer aquifer system. By assigning the hydrogeologic parameters and thicknesses of individual layers based on the documented geology, drawdown is calculated for each individual layer the inverse Laplace transform of the groundwater flow equation. The model is available as freeware at https://www.wwla.kiwi/softwaredetail/fwm and we encourage Council staff or appointed peer reviewers of this application to download the software and confirm/test sensitivity of our predictions if desired.

In response to s92 requests on other recent groundwater take applications, which sought a comparison of the FWM to the Theis model, we provide the following comments:

- The Feather-Williamson Model (FWM) computes the drawdown through multiple layers in the bore.
- This approach is more accurate than Theis due to consideration of storage and leakage effects from overlying and underlying layers;
- The model provides a similar response to that of a numerical model.
- The FWM has been used widely throughout New Zealand for groundwater take applications and has passed scrutiny through the technical reviewer at Northland Regional Council, Waikato Regional Council, Bay of Plenty Regional Council, Hawkes Bay Regional Council, Gisborne District Council and Greater Wellington Regional Council by virtue of numerous consents being granted in these regions.
- Furthermore, it has recently been used in the Auckland region for the following consents, without any concerns:
  - ***Watercare Services Limited*** - Rautawhiri Park irrigation bore;
  - ***Tapora Resources Limited*** – Sand quarry groundwater supply;
  - ***Parakai Birds Limited*** – Chicken farm drinking water supply;
  - ***Summerset Retirement Villages*** – Landscaped area groundwater irrigation supply, for Milldale; and Warkworth developments.
  - ***Kumeu River Wines*** – Renewal for wine processing facility.
  - ***Zaknich Farms Limited*** – Renewal for strawberry growing operation in Taupaki.
  - ***Murray Jones & Lyn Thackwray*** – Farm take renewal in Kumeu.
  - ***Nga Raukau Nurseries*** – Irrigation for plant growing operation in Taupaki.
  - ***DG & BD Speedy Enterprises Limited*** – for potable water cartage operator in Waimauku.

C.3 Analytical Model Set-up

The FWM based analysis for the Surf Park bore was developed based on the geological layers documented in the bore log. Although bore log recorded 3 layers, for modelling purposes, the extra layer was added below the production zone for model stability, with each layer assumed to be homogeneous across the model domain.

The thickness for each model layer was determined from the corresponding layers noted in the bore log (**Appendix B**) while the hydraulic parameters, transmissivity and storativity, were set to be representative of the bulk material represented by the given layer of the FWM model. The thickness and material descriptions represented by each of the model layers is summarised below:

- Layer 0: The unsaturated zone extending from the surface to 56 mBGL. This layer intersects limestone layer. The water table before the test pumping begin was measured at 55.87 mBGL.
- Layer 1: From 56 to 73 mBGL comprised a moderate permeability limestone layer.
- Layer 2: alternating Mudstone and Siltstone layer from 73 to 400 mBGL most likely separates the production aquifer of the bore from overlying layer.
- Layer 3: The Greywacke layer encountered between 400 to 680 mBGL comprises the bore production zone.
- Layer 4: A 50 m thick bottom layer from 680 to 730 mBGL was incorporated as the final layer of the FWM.

As a conceptual summary, the low-permeability mudstone within Layer 2 is considered to effectively act as an aquitard causing confinement in underlying layers and effectively separating the productive aquifer from surface water and shallow groundwater.

C.4 Airlift Test and Test Pumping

Airlifting is a method of bore development and yield testing where compressed air is injected into the bore, causing water to be lifted up to the surface where it is discharged. The purpose of the test was twofold:

1. To provide an indicative flow rate upon which further analysis could be based; and
2. to provide a basis for production bore design.

The airlift test was run for 8 hours and produced a constant yield of 10.3 L/s. Thereafter, Step Test followed by a continues pumping test was conducted on 15 September 2025[6]. The results were used as calibration data for the modelling analysis detailed in the following sections of this report.

C.5 Model Calibration

The FWM was calibrated by simulating the measured average abstraction rate during Step Testing and calculated hydraulic parameters for the production layer. Other parameterisation was based on the aquifer hydraulic parameters for the geologic units in the development area as summarised in Jacobs (2019[7]), all the parameters was slightly adjusted and kept within the range of reported values to replicate the observed drawdown. The outcome of the calibration process was that the 100 m drawdown that was measured after long duration test producing a flow rate of 11.45 L/s was replicated using the hydrogeological parameters shown in **Table 7**.

Table 7. Hydrogeologic parameterisation in the FWM.

Model Layer	Transmissivity (m^2/day)	Storativity (-)	Thickness (m)	Depth at base (mBGL)	Anisotropy Kh:Kv (-)	Horizontal conductivity (m/s)	Geologic unit
0	n/a	n/a	56	56	n/a	n/a	Unsaturated Zone
1	0.25	0.085	17	73	10	1.7E-7	Limestone
2	9.4	0.00164	327	400	10	3.33E-7	Mudstone / Siltstone
3	10.3	0.0019	280	680	10	4.24E-07	Greywacke (Production Zone)
4	0.01	0.00034	50	730	10	2.31E-09	Deep Greywacke Basement

C.6 Proposed Pumping Scenario

[6] WWLA letter, Bore Sustainable Yield Analysis – Auckland Surf Park, Dairy Flat, 25 September 2025.
[7] Jacobs GHD Joint Venture (2019). Warkworth to Wellsford Hydrogeology Assessment.

The calibrated model was applied to simulate abstraction at the proposed maximum groundwater take rate of 1,303 m^3/day for a duration of 197 days, such that the total abstraction was equal to the annual take of 256,230 m^3/annum that is specified in the application.

The following details assure that the simulation is conservative:

- The annual abstraction occurs over a period of 197 consecutive days, so that maximum effect is simulated; whereas in practice the maximum abstraction would not occur on a daily basis; and
- The model does not include recharge.

C.7 Groundwater Drawdown

The simulated drawdown adjacent to the production bore after 197 days of continuous pumping is represented for each model layer in **Figure 4.**

The maximum drawdown, 200 m, occurs in Model Layer 3, which is the layer with assigned discharge representing the production zone. The magnitude of drawdown reduces towards the surface, with less than 0.1 m of drawdown calculated to propagate to the surface. This is consistent with the interbedded nature of the Waitemata Group lithology, and the significant casing depth of the bore.

Furthermore, it is noted that all potential drawdown calculated by the model is a conservative estimate due to the lack of rainfall recharge included in the FWM model.

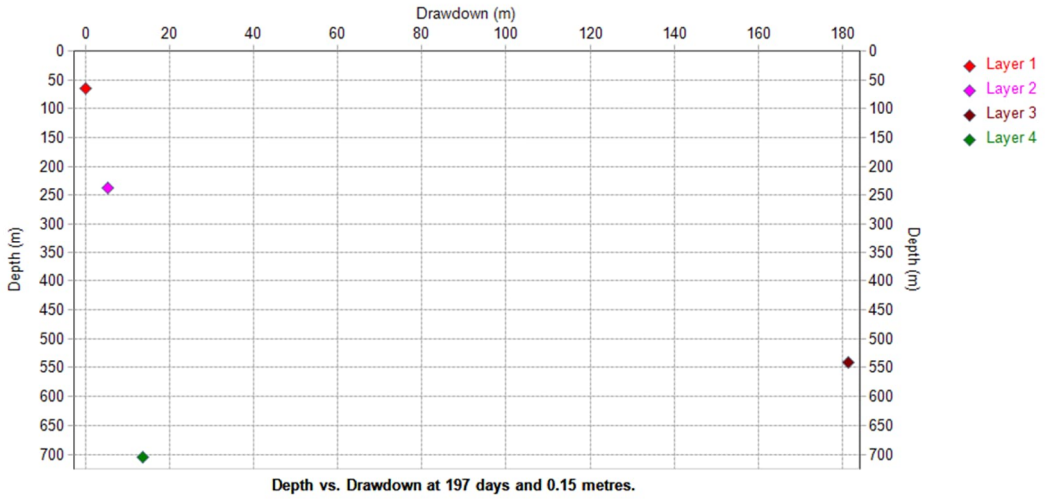


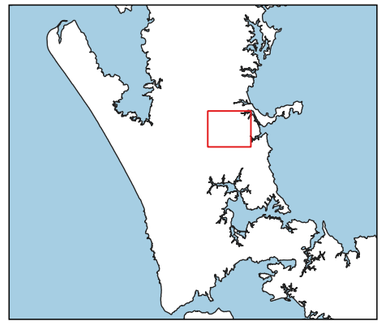
Figure 4. Simulated drawdown in each model layer at the Applicant's bore.

The lateral extent of drawdown in the production zone is presented in **Figure 5**. The drawdown is greatest in close proximity to the bore, reducing with distance, implicating that bore interference effects will only occur within close proximity to the bore and other groundwater users will not be effected, as noted in **Section 5.2.1.2** of the AEE. Simulation results indicate that after 197 days of continuous pumping (with no recharge), the 0.2 m drawdown contour in Model Layer 3 will be at approximately 3.9 km from the pumping bore.

Map Title:
Maximum Simulate Drawdown in the Production Zone

Project:
Surf Park Water Supply Services

Client:
AW Holdings (LP) 2021 Partnerships



Legend

Applicant Bore Locations
- **Drilled**
- **Surrounding Bores**
- **Road**
- **State Highway**
- **River/Stream**
- **Lake/Pond**
- **Wetlands**
- **Land Parcells**
- **3 km buffer**

Data Provenance
Aerial Imagery from Land Information New Zealand

Drawn by: Asanka Thilakerathne
19/02/2026

Layout & Project File
Surface Water

WILLIAMSON WATER & LAND ADVISORY

Figure 5

C.8 Surface Water Connectivity

The FWM calculates the percentage of pumped groundwater derived from each layer in the model, as shown in **Figure 6**. The key features to note from this analysis are as follows:

- As pumping begins, 100% of the pumped water is derived from the production zone (Layer 3);
- Over time, the contribution of Layer 3 gradually decreases while and the Layer 2 contribution increases until this reaches a steady state of leakage after approximately 150 days pumping;
- After 197 days of continues pumping, contribution of Layer 2 and Layer 3 is respectively, 17% and 67%, as the cone of depression migrates upwards. The FWM has been calibrated for the maximum pumping scenario, therefore this magnitude of abstraction is unlikely to occur;
- After 197 days of continuous pumping, Layer 1 contributes 14% of the total flow from the bore.

For assessing the potential groundwater and surface water effects, it is assumed that Layer 1 is hydraulically connected with surface water bodies.

The implications of this analysis for surface water depletion are discussed in the assessment of hydrological effects in **Section 5.2.2**.

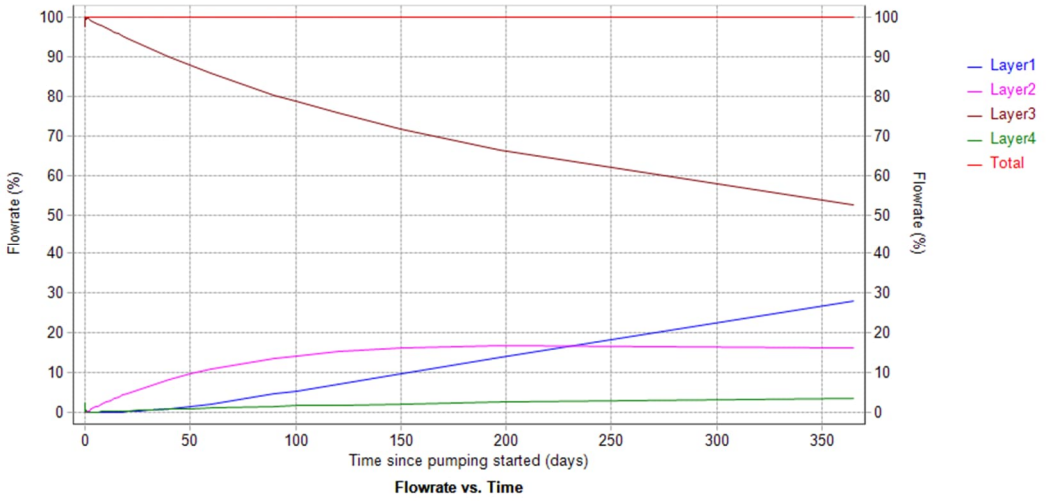


Figure 6. Flow partitioning of abstracted groundwater within the FWM layers.

C.9 Saline Intrusion Analysis

The bore is located approximately 6 km from the estuary situated at the mouth of the Okura River and approximately 7 km from the shore of the east coast. At this distance, the drawdown in the deep aquifer would be in the order of 0.008 m at the estuary and no drawdown at the coast. The Layer 1 drawdown at this distance is immeasurable.

The elevation of the pumping bore is 58 mAMSL and the static water level (SWL) measured at 56 mBGL, meaning that the SWL at the time of measurement was 2 mAMSL. The maximum drawdown, as modelled was 200 m, meaning that the water level in this case would be on the order of 198 m below sea level. Given that the bore is cased to a depth of 400 m with impermeable materials vertically separating the deep Waitemata Aquifer from surface features such as the estuary and the coast, which are both also separated by a significant lateral distance, the actual risk of saline intrusion developing is considered low.

C.10 Land Settlement Analysis

Land settlement effects have the potential to occur when compressible layers within the ground are dewatered.

The maximum drawdown for the proposed abstraction occurs at within the Waitemata Group Mudstone / Siltstone and Greywacke production zone. Both material types have low compressibility as is typical for siltstone / sandstone / mudstone materials ranging from 10-16 GPA[8]. Therefore, in practice there cannot be any compression of the units with dewatering, and consequently subsidence will not occur.

C.11 Conclusion

WWLA has developed a modelling application for the new production bore on the Surf Park development in Silverdale. The FWM was calibrated to flow and drawdown data collected during the test pumping on the bore, using a 4-layer modelling approach where the primary geologic units are represented with simulated abstraction sourced from the production zone within the Greywacke.

The model was applied to simulate the maximum abstraction that is being sought in the proposal, amounting to 1,303 m^3/day or 256,230 m^3/year, which equates to 197 days of pumping at the maximum rate. Model results were used to support an assessment of groundwater effects in terms of the potential level of impact on neighbouring groundwater users, and potential saline intrusion or land settlement resulting from the proposed take.

[8] Malkowski P, Ostrowski L, Brodny J (2018). Analysis of Young's Modulus for Carboniferous Sedimentary Rocks and its Relationship with Uniaxial Compressive Strength Using Different Methods of Modulus Determination. Journal of Sustainable Mining vol 17(3).