

ARCHAEOLOGICAL ASSESSMENT

RUAKIWI RESERVOIR

PREPARED FOR HAMILTON CITY COUNCIL
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HAMILTON CITY COUNCIL

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EXECUTIVE SUMMARY

Hamilton City Council (HCC) commissioned Sian Keith Archaeology Ltd (SKA) to provide an archaeological assessment of the proposed construction of two new reservoirs on Ruakiwi Rd and associated pump station on Clarence St. This assessment has been prepared to form the basis of Notice of Requirement applications under the RMA and for an archaeological authority application to Heritage New Zealand Pouhere Taonga (HNZPT).

This assessment has involved a review of historic documents including aerial photographs, historic maps, and archaeological data including the New Zealand Archaeological Association's (NZAA) national database (ArchSite), and consultant's reports for the wider area. A review of the relevant council plans has been undertaken, and a field visit to the project site has been made.

There are no recorded archaeological sites within the footprint, and no sites are known closer than 820m from the proposal. However, the proposal is located on a prominent ridgeline which is stated to have been an important focus for pre-European Māori, and the project location is well placed overlooking Rotoroa (Hamilton Lake) and the Waikato River. The land has been modified to the south, where a 1920s house once stood, and to the north where three reservoirs have been constructed between c.1901-1931, two of which are extant. The effects of these earlier developments on the project footprint are not well understood.

Based on the available published information, and the results of the recent fieldwork, it is concluded in this report that there is a risk that archaeological sites, features or deposits are present within the proposed footprint, however the risk of intact or widespread archaeological evidence is likely to be low. This is based on two main factors – in the first instance the prominent location is considered a likely place for Māori landuse; but this is tempered by the probable significant modifications to this land in the 20th century. While there are no known archaeological values associated with this land, there is a risk, albeit low, of encountering pre-European evidence.

There are built heritage values present, the current Ruakiwi Water tower is a listed site, and is included on the Hamilton City Operative District Plan (HCODP). A Built Heritage Assessment report has been commissioned and provided independently of this archaeological assessment.

It is recommended in this report that:

- That an archaeological authority from HNZPT is obtained for the earthworks required to form the reservoirs.
 - This is as a precautionary measure and should be undertaken to avoid costly delays should archaeological evidence be encountered.
 - Archaeological works under this authority should include monitoring of topsoil removal/ overburden to the top of natural subsoil at the discretion of the archaeologist.
- That a requirement for an Accidental Discovery Protocol (ADP) is imposed as a consent condition for the pump station development.
- That HCC as Requiring Authority seek input from affected iwi and hapu to discuss this assessment and the recommended approach.

1. INTRODUCTION

1.1. PURPOSE & SCOPE

In November 2022, HCC secured Government Infrastructure Acceleration Fund (IAF) support for specific infrastructure projects. The purpose of the IAF agreement is to enable infrastructure development that facilitates the delivery of residential housing in the central city. The Reservoirs and Pump Station project (Project) is a critical infrastructure initiative aimed at improving the efficiency of water supply from the reservoir into the central city, thereby supporting residential and commercial/office development along with fire fighting water pressure requirements.

This Project is essential to meet the demands of a growing population. Current growth projections and modelling indicate that the 25 megalitre reservoir will be sufficient to meet population needs until at least 2041. Beyond that point, a second 25 megalitre water reservoir will be required to ensure continued service capacity.

HCC in its capacity as a Requiring Authority (HCC) will undertake the planning work for both reservoirs at this time but will only construct one reservoir under the Agreement. The design and construction of the second reservoir will be determined at a later date based on existing and forecast population growth in the central city.

HCC has conducted a comprehensive investigation and site assessment to identify a preferred location for the new reservoir and an associated booster pump station. The evaluation considered 30 potential sites situated between the existing Waiora Water Treatment Plant (WTP) and the Ruakiwi Road Reservoir (RRR). Each site was assessed based on several key criteria, including land ownership, site size, elevation, proximity to the bulk water network and the WTP, energy efficiency (a critical factor for resilience and operations), distance to the central city, and underlying geological conditions.

Based on the outcomes of the investigation and site assessment, HCC has identified the Ruakiwi Road Reserve site as the preferred location. As a result, further investigation and concept design work have been initiated for this site to support the next phase of project development. A further options analysis was undertaken for the Ruakiwi Road site to refine the site layout to best meet the project objectives while striving to address effects on the Lake Domain Reserve and the surrounding residential area as much as possible, with the concept site layout reflecting that balance.

The purpose of this report is to provide sufficient technical information in relation to Archaeology to support the Notice of Requirement for an Alteration to Designation.

This report is an assessment of the archaeological values of the two proposed new reservoirs and associated pump station on Ruakiwi Rd and Clarence St respectively, and the effects of the proposal those values. This assessment has been commissioned by Hamilton City Council (HCC). It has been prepared to form the basis of an application to Heritage New Zealand Pouhere Taonga (HNZPT) for an archaeological authority, and to support applications for a Notice of Requirement (NOR) under the Resource Management Act (RMA).

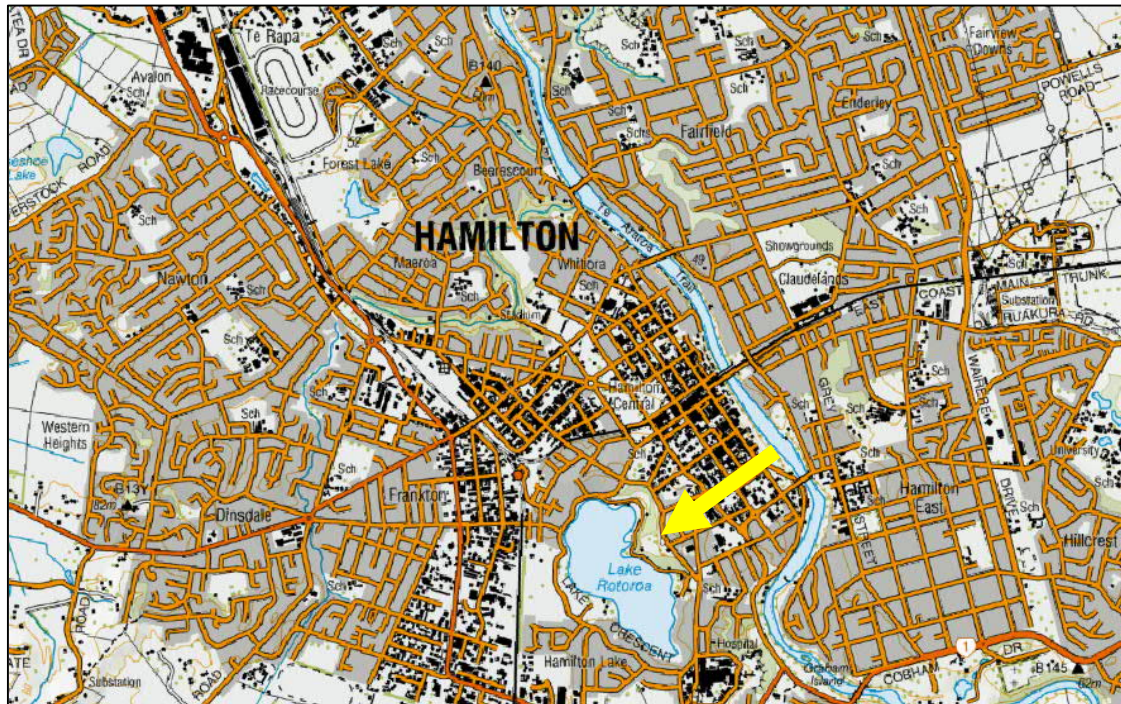


Figure 1: Site Location (yellow arrow)

2. STATUTORY REQUIREMENTS

There are two main pieces of legislation in New Zealand that control work affecting archaeological sites. These are the *Heritage New Zealand Pouhere Taonga Act 2014* (HNZPTA) and the *Resource Management Act 1991* (RMA).

2.1. HERITAGE NZ POUHERE TAONGA ACT 2014

The purpose of the HNZPTA is to promote the identification, protection, preservation, and conservation of the historical and cultural heritage of New Zealand (HNZPTA section 3). Emphasis is placed on avoiding effects on heritage.

The HNZPTA provides blanket protection to all archaeological sites meeting the definition in the Act, whether they are recorded or not. Protection and management of sites is managed by the archaeological authority process, administered by Heritage New Zealand Pouhere Taonga (HNZPT). It is illegal to destroy or modify archaeological sites without an authority to do so from HNZPT.

The HNZPTA 2014 (s6) defines an archaeological site as:

(a) Any place in New Zealand including any building or structure (or part of a building or structure) that:

(i) was associated with human activity that occurred before 1900 or is the site of the wreck of any vessel where that wreck occurred before 1900; and

(ii) provides, or may provide through investigation by archaeological methods, evidence relating to the history of New Zealand; and

(b) Includes a site for which a declaration is made under Section 43(1) of the Act¹.

Any person who intends carrying out work that may modify or destroy an archaeological site, or to investigate an archaeological site using invasive archaeological techniques, must first obtain an authority from HNZPT. The process applies to sites on land of all tenure including private, public and designated land. The HNZPTA contains penalties for unauthorised site damage.

The archaeological authority process applies to all archaeological sites that fit the HNZPTA definition regardless of whether the site is recorded in the NZAA Site Recording Scheme or registered with HNZPT; or if the site only becomes known about as a result of ground disturbance; and/or the activity is permitted under a district or regional plan, or a resource or building consent has been granted, or the ground is subject to a designation.

The HNZPTA replaced the *Historic Places Act 1993* (HPA) in May 2014.

HNZPT also maintain the New Zealand Heritage List/Rārangi Kōrero (The List). The List can include archaeological sites. The purpose of The List is to inform members of the public about such places, and to assist with their protection under the RMA.

It is possible that archaeological sites, as defined in the HNZPTA, may be disturbed by this project. Any archaeological sites identified during the ground works at this site will be protected under the HNZPTA, and their discovery may pose delays to works unless an archaeological authority has been issued that allows the work.

2.2. THE RESOURCE MANAGEMENT ACT 1991

The *Resource Management Act 1991* (RMA) requires City, District and Regional Councils to manage the use, development, and protection of natural and physical resources in a way that provides for the wellbeing of today's communities while sustaining the potential of natural and physical resources for future generations. The protection of historic heritage from inappropriate subdivision, use, and development is identified as a matter of national importance (section 6f).

Historic heritage is defined as those natural and physical resources that contribute to an understanding and appreciation of New Zealand's history and cultures, derived from archaeological, architectural, cultural, historic, scientific, or technological qualities.

Historic heritage includes:

- historic sites, structures, places, and areas;
- archaeological sites;
- sites of significance to Māori, including wahi tapu;
- surroundings associated with the natural and physical resources (RMA section 2).

These categories are not mutually exclusive and some archaeological sites may include above ground structures or may also be places that are of significance to Māori.

Where an NOR is required for any activity, the assessment of effects is required to address cultural and historic heritage matters (RMA 4th Schedule).

¹ Such declarations usually pertain to important post-1900 remains with archaeological values.

2.3. STATUTORY PLANNING INSTRUMENTS

The study area falls within the boundaries of HCC. The HCODP is relevant to the project.

3. METHODOLOGY

This assessment has used the following sources to provide a historical and archaeological background of the project area:

- The NZAA's online database ArchSite
- The New Zealand Heritage List/Rarangi Kōrero (The List);
- The HCODP
- Historic LINZ maps using the program QuickMaps.
- Historic aerial photographs
- Historic survey maps and plans
- Previous consultant's reports.

A site visit was undertaken in September 2023 by archaeologists Siân Keith and Isabella Caldwell. The site visit was primarily a visual inspection; four augers were inserted to test the soil profiles.

4. PHYSICAL ENVIRONMENT AND SETTING

The pump station is located on Part Lot 1 DP21360, 139 Clarence St. This is the location of a current dwelling and is all in hard-stand.

The reservoir site is within a council Municipal Domain and Recreational Reserve on Lot 2 DP16167 and on Lot 74 Hamilton West Town Belt. The receiving environment is mowed grass and mature trees. The site is on a ridge top and the land slopes from Ruakiwi Road west towards Rotoroa (Hamilton Lake) and east towards the Waikato River. Innes Common, to the west, is 28 hectares (68 acres) of former wetland. It was bought by the Domain Board to protect the lake and drained sometime after 1883.

The reservoir is located on elevated topography on the east side of Rotoroa. Rotoroa is a peat lake and is the largest of three lakes located within Kirikiriroa/Hamilton City. It has a surface area of about 54 hectares, a maximum depth of six metres and an average depth of two metres.² The lake was formed about 20,000 years ago, after the Waikato changed course to flow out at Port Waikato, rather than at Thames. At this time the Waikato was a high-energy, braided river carrying large volumes of volcanogenic sediment (Hinuera Formation), which was deposited over and around a pre-existing hilly landscape to form an alluvial plain. In the process of depositing the alluvium, small basins were formed adjacent to the hills, and water then accumulated from local drainage and groundwater in these small basins (Low 2020).

Soil maps indicate that the subject site has underlying Kainui series (Hamilton Ash) subsoil (Figure 2). These are considered to be moderately well-draining soils. They are not the types of soils known to have been favoured for traditional gardening.

² <https://www.waikatoregion.govt.nz/environment/water/lakes/shallow-lakes-of-the-waikato-region/peat-lakes/lake-rotoroa/>

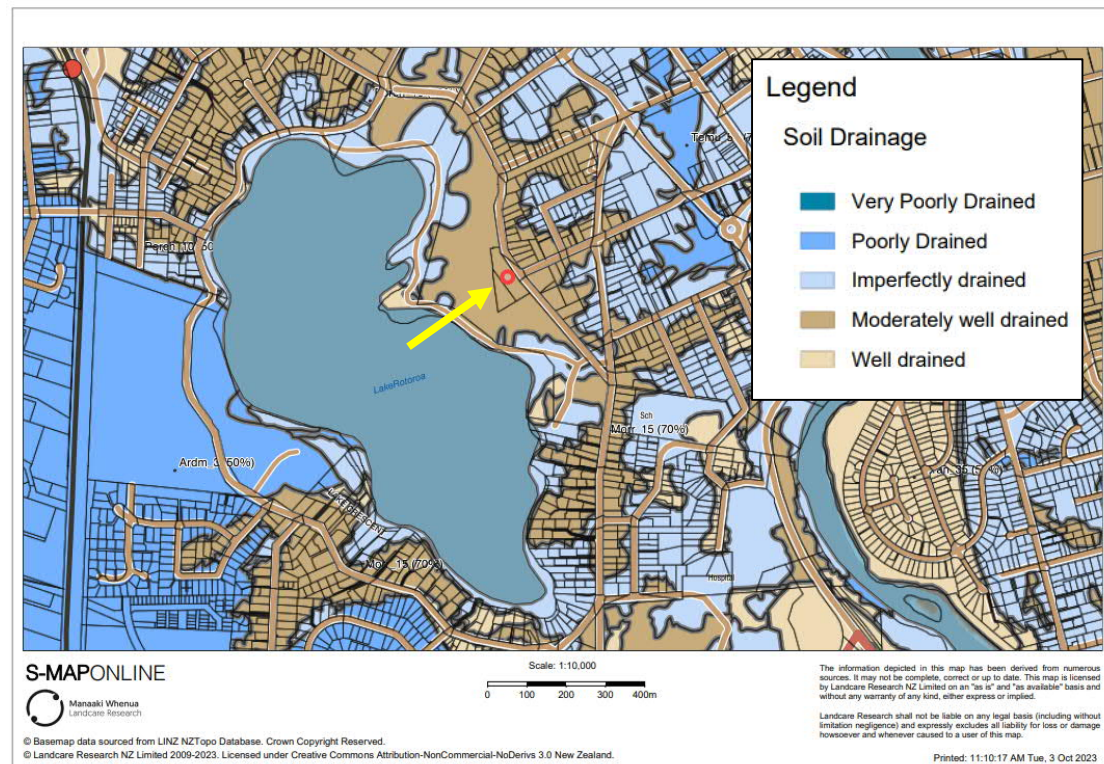


Figure 2: Soil Map, subject site arrowed³

5. HISTORICAL BACKGROUND

The following section summarises the known history of the subject site and immediate environs. It does not provide a detailed history of the occupation in the wider area. No attempt has been made to synthesise the rich and detailed record of Māori oral traditions and whakapapa concerning the area or the various perspectives of the tangata whenua representatives involved as this is best done by tangata whenua.

5.1. MĀORI ERA

Rotorua was an important resource for iwi, who caught kākahi (freshwater mussels), kōura (freshwater crayfish), and short-finned eels, which still reside in the lake. Raupō is stated to have been collected from the river edge for making baskets, and it is reported that there was a walking track on the eastern side of the lake which led to Te Rapa Pā (the current Graham Park).^{4, 5}

Simmons (2015), quoting Wiremu Puke from a file held with the NZAA notes that:

‘Evidence of Māori habitations has been found. . . on Garden Place Hill and the ridge running east and north of Lake Rotorua. Stone artifacts have been found in these localities but there have been no reports of defence positions.’

³ <https://smap.landcareresearch.co.nz/>

⁴ Hamilton Lake Domain Draft Management Plan 2016

⁵ <https://www.stuff.co.nz/environment/75575279/lake-rotorua-an-ancient-lake-makes-a-comeback>

'This ridge system was a significant landmark in the area and was recorded in ancient Māori waiata (songs). The people of Ngāti Wairere gave different parts of the ridge system different names. The tongue that stretched through Garden Place to the river bank was known as Te Awaawa O Kirikiriroa and a sacred altar (Te Ahurewa) was constructed at the highest point of the hill, overlooking the river. The continuation of the hill range from Garden Place to the south, as far as the present location of the Cathedral, was known as Pukerangiora. The greater part of this ridge system, particularly in the area of Garden Place was removed during the development of Hamilton City. The only remains in this location is the mound upon which the Waikato Polytechnic buildings now stand' (Puke 2000, p.2 in NZAA file 2005: #50)⁶

Mr. Puke has further described the ridge system before significant earthworks were undertaken:

'...The hill was originally part of a steep sided (1 in 14 gradient), long ridge or promontory that extended from what is now Ruakiwi Road down Hill Street, Tristram Street, through to Garden Place and onwards to Victoria Street. The promontory that was bulldozed away was known to pre-European Māori as Te Kōpū Mania O Kirikiriroa (the smooth belly of Kirikiriroa). The fertility of its soils was famous throughout the district and allowed the development of extensive cultivations of kāmara, and rauruhe (fern root), particularly on the northern slopes of the ridge. It dominated the landscape to the southern end of Kirikiriroa Pā between London Street and Bryce Street and was revered by Ngāti Wairere as a tribal landmark. The lower parts of the hill were generally swampy areas where taro were planted and cultivated. There were also numerous water springs (puna) along the lower slopes of the hill. At various times, the ancestors of Ngāti Wairere who were buried at various localities on this hill were exhumed by Hakopa Te Waharoa (died 1877) and Te Puke Waharoa from the time of the arrival of the settlers in 1864. In pre-European times the hill was covered with rangiora and other native trees and ferns with isolated stands of kahikatea and tawa trees. The berries provided food for a whole variety of native birds such as the kākū (native pigeon) and the kōmako (bellbird), which were hunted and trapped in this vicinity...'⁷

5.2. EUROPEAN ERA

European settlement began in 1864 with the arrival of British troops during the Waikato Campaign of the NZ Land Wars. Initial settlements were focused in Hamilton West at Ferrybank and at Hamilton East. This early phase of European settlement is not known to have expanded into the current study area.

The development of Rotorua as a public amenity from the late 19th century was widely reported in the newspapers. Initiating this, on the 17th of April 1886, it was published in the New Zealand Herald that *The Hamilton Lake, 141 acres, which lies on the borders of the borough, has just been vested, by notification in the New Zealand Gazette, as the property of the borough*, and the area became a public reserve.⁸ The lake and surrounding domain were developed into a recreational area and during the late 19th century there were activities including swimming, boating, and athletics held. One of the first public events was held

⁶ Information sheet is from the NZ Historic Places Trust Branch Committee files, copy held in the NZAA site record files 2005: #50 & #49.

⁷ WINTEC A History of the Land on Which Our City Campus Sits (<https://wintecprodpublicwebsite.blob.core>.)

⁸ New Zealand Herald, 17 April 1886, Page 7

in January 1888, when a merry-go-round, shooting gallery, and Russian swing to launch people into the water were in action.⁹ In August 1888 one of the first tree planting events took place at the domain, which approximately 250 people attended. The first tree to be planted was a large oak, and then around 1500 pre-prepared holes were filled with a variety of different trees.¹⁰

A regatta held on the 30th of January 1889 was highly successful with more than 1300 people present. It was published in the Waikato Argus that the lake was *one of the finest waters for rowing on imaginable, and the picturesque grounds at the back provide a natural grandstand for viewing the contests and no place could be more suited for such a gathering.*¹¹ Volunteers from the Hamilton community cleared and burned off scrub in 1901 to make more room for recreational activities.¹² During 1923 the gardens were enhanced, with around 700 trees planted.¹³

The level of the water in Rotoroa notably fluctuated over time. In April 1921 the low level was becoming a real concern. The Railway Department used water from the lake for its engines, and had been instructed by the Domain Board to build a dam in order to keep the lake at a proper level, and this had been effective.¹⁴ Draining of the lake was also being undertaken for private housing. In August 1921, it was decided that the Hamilton Chamber would support the idea of protecting Lake Rotoroa from being drained, to achieve this the Hamilton Domain Board would try to purchase the land from the private owners who were carrying out the drainage works. In 1923 the land was taken under the Public Works Act.¹⁵

In 1931 a large amount of work had been completed at the Domain. New changing sheds had been erected, miniature golf links had been formed, lawns extended, additions to the boat sheds made, weeping willows were planted, old trees were cleared, new trees were planted, the road was improved, and fences were built.

5.3. SUBJECT SITE

5.3.1. PUMP STATION

No relevant history related to the use of the pump station site on Clarence St has been identified in the course of research for this report.

5.3.2. RESERVOIR

By 1890 complaints were being made of a shortage of water in the wells and tanks of the town.¹⁶ In 1901 the Hamilton Borough Council heard a report into the town water supply in which was mentioned a 'reservoir reserve near the upper end of Clarence St' on which it was proposed that a reservoir be erected. This was to be 'about 90ft. above the level of Victoria St., to contain 75,000 gallons of water, with all necessary valves, inlet, outlet, cleansing pipes, etc., so arranged as to make the 8 in pipe serve both as pump column and distributing main'.¹⁷ The following year a poll of ratepayers approved borrowing £5,000 to set up a water supply¹⁸, and tender to build the reservoir

⁹ Waikato Times, 28 January 1888, Page 3

¹⁰ Waikato Times, 18 August 1888, Page 2

¹¹ Hamilton Regatta. Waikato Argus, 1 January 1898, Page 3

¹² Waikato Argus, 29 October 1901, Page 2

¹³ Weeds in a Lake. New Zealand Herald, 7 February 1924, Page 11

¹⁴ *ibid*

¹⁵ Hamilton Lake. Auckland Star, 1 December 1923, Page 13

¹⁶ The New Zealand Herald. 14 February 1890. p. 6

¹⁷ Waikato Argus, Volume X, Issue 880, 15 February 1901, Page 2

¹⁸ Press, Volume LIX, Issue 11190, 3 February 1902, Page 5

was awarded.¹⁹ By 1903, 3.2 km of pipes supplied water to 80 properties in Victoria, Anglesea, Collingwood, Clarence and Selkirk streets.²⁰ By 1908 nearly all of Hamilton West had piped water, and this was extended to Frankton and Claudelands in 1912 (Gibbons, 1977).

Hamilton continued to grow, and it was not long before a new reservoir was being called for. An Engineer's Report from 1920 asserted that a new reservoir was needed, and that this 'would be of similar design to the old one, being kept below the surface of the ground with overhanging roof to keep the heat of the sun away, but having reinforced concrete and without a division in the centre for cleaning, as they could be cleaned at different times'.²¹ By the following year it is reported that the reservoir was close to completion.²² This reservoir was also considered to be inadequate relatively soon after completion. In a 1928 letter to editor of the Waikato Times, the following history was provided of the reservoirs at Ruakiwi:

To anyone who has endeavoured to keep in touch with the question of Hamilton's water supply since its initiation 25 years ago, present conditions must appear most unsatisfactory. From the beginning it was evident the supply must come from the Waikato River pumped into a reservoir situated at the highest convenient point obtainable. With this somewhat circumscribed policy forced on it the Hamilton Borough Council, about the year 1901, propounded a scheme ...for a water supply for a small part of the borough, and principally the business portion in Hamilton West. ... An integral part of this scheme was the erection of a reservoir on high ground purchased from the Hamilton Domain Board in Ruakiwi Street, with a capacity of 140,000 gallons. This served for about 20 years, at the expiration of which time a second reservoir was built holding an additional 440,000 gallons, making a total capacity of 580,000 gallons, or about half an ordinary day's consumption.²³

In 1929 it was reported that the first reservoir was being demolished to make way for a new larger structure:

Fourteen Borough Council workmen have started demolishing the old reservoir on the hill above Ruakiwi Street, constituting the first step towards Hamilton's new waterworks scheme involving £4 0,670. The demolition work will be a slow and delicate job. It is impossible to charge large sections of the concrete walls with explosive because the present reservoir lies only a few feet away. ... The level of the old reservoir will, of course, be the base of the new one .. The latter has been built for about 20 years, and, with the exception of the Frankton water tower, was the sole source of the town supply up to the time when the present reservoir was built nine years ago...²⁴

The system upgrades were completed by 1931, with larger pipes and an 86 ft (26 m) tower on Ruakiwi Rd, holding 2,600,000 imp gal.²⁵ The reservoir was designed by Hamilton Borough engineers Rupert Worley and James Baird and was recognised internationally for its unique structural features.²⁶ It is still present today and the remains of the demolished reservoir are located immediately to the

¹⁹ Waikato Argus, Volume XIII, Issue 1378, 9 October 1902, Page 2

²⁰ New Zealand Herald, Volume XI, Issue 12399, 12 October 1903, Page 3

²¹ Waikato Times, Volume 93, Issue 14503, 28 October 1920, Page 5

²² Waikato Times, Volume 94, Issue 14616, 17 March 1921, Page 7

²³ Waikato Times, Volume 103, Issue 17311, 25 January 1928, Page 6

²⁴ Waikato Times, Volume 105, Issue 17733, 10 June 1929, Page 6

²⁵ New Zealand Herald, Volume LXVIII, Issue 20967, 2 September 1931, Page 13

²⁶ <https://heritage.hamiltonlibraries.co.nz/objects/145/hamilton-lake>

north.

There are no known images of the first reservoir or images showing the construction of the second or third reservoirs. An undated image shows construction workers laying pipe to one of the reservoirs (Figure 3). There are many images of the third and current reservoir (Figure 4). There are no known contemporary reports on any archaeological findings during the formation of these reservoirs.



Figure 3: Hamilton waterworks - laying pipeline to reservoir (no date) (HCL_11584).

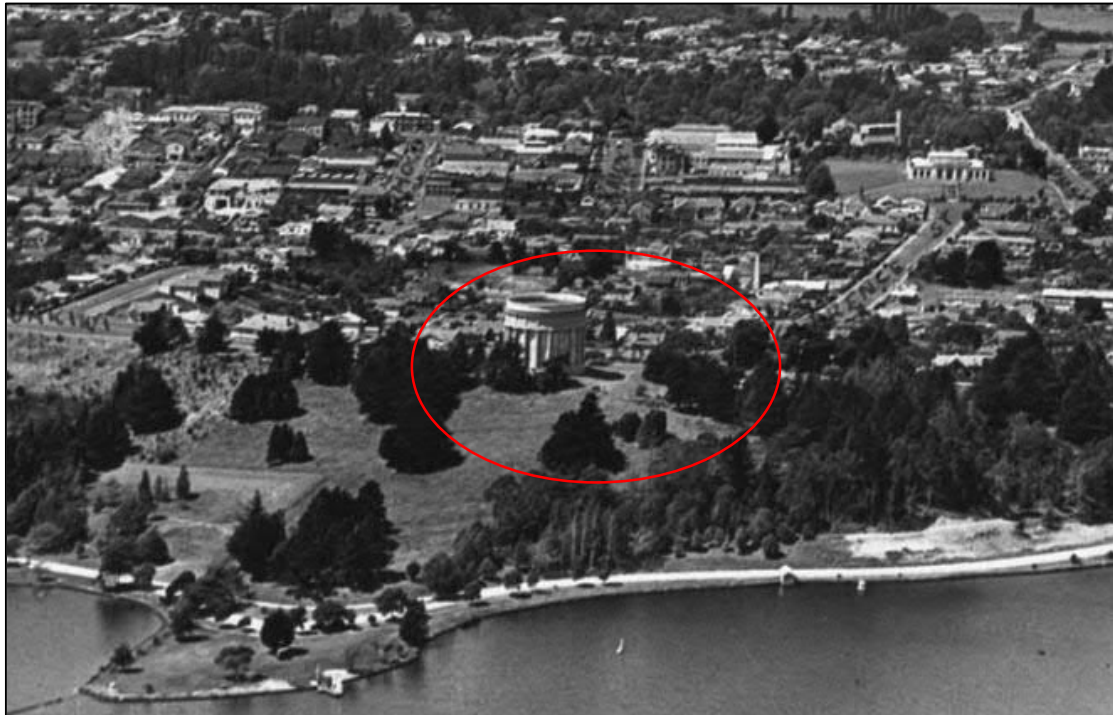


Figure 4: Oblique view of subject site in 1947 showing the extant Ruakiwi Reservoir (HCL_11115). Subject site circled.

5.3.3. Dwelling

A dwelling was previously located within the subject site. It was located just to the south of the extant reservoir and was built around 1926. It was the home of town clerk Lindo Waddel from 1926 and was a California style bungalow designed by local architect Charles Lambeth.²⁷ The house fell into disuse and was demolished sometime after 2019 (Figure 5).



Figure 5: Waddle House c.2019 (Waikato Times 26th July 2019), the extant reservoir can be seen in the background.

²⁷ Waikato Times 26th July 2019

6. PREVIOUS ARCHAEOLOGICAL WORK

6.1. RECORDED ARCHAEOLOGICAL SITES

6.1.1. NZAA ARCHSITE

Figure 6 identifies the archaeological sites recorded on the NZAA site recording scheme (ArchSite) within and immediately surrounding the project area. Table 1 summarises the archaeological sites that are recorded within approximately 1500 m of the project area. There are no recorded archaeological sites within the boundary or immediate vicinity of the reservoir or pump station sites. The closest site is 720m northeast and is an AC magazine (S14/57). The only archaeological site recorded on the lake edge is an 1870s house (S14/223).

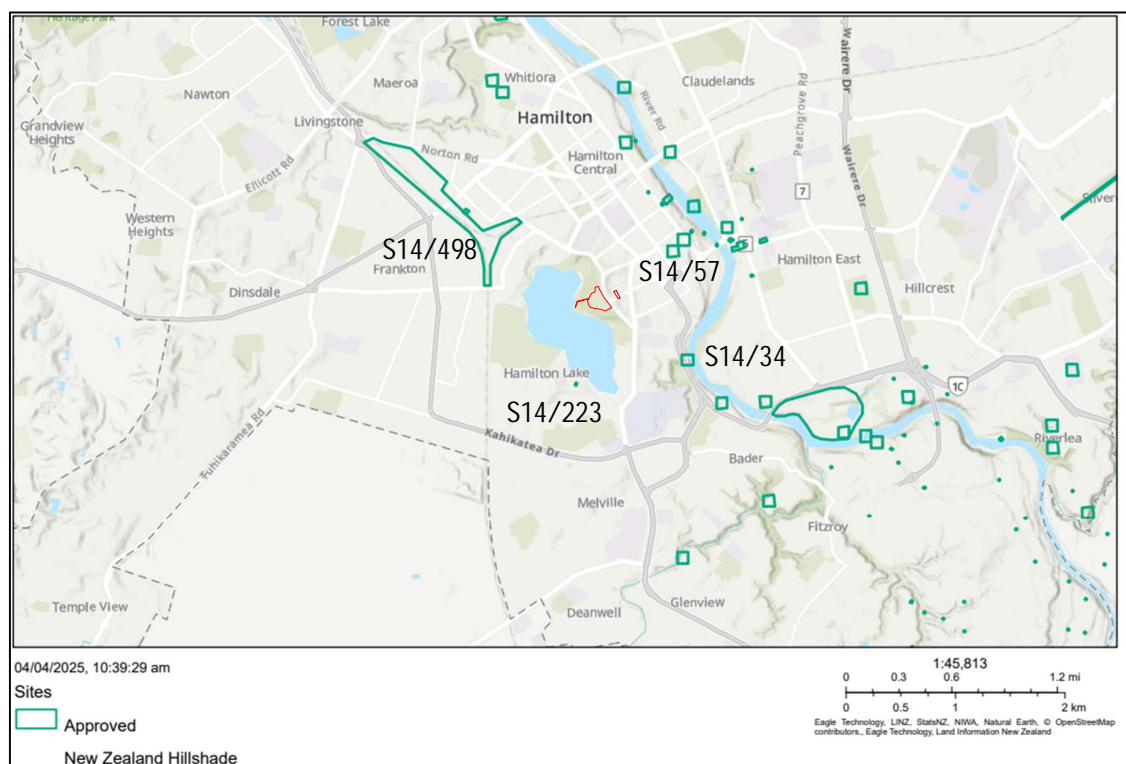


Figure 6: ArchSite map showing recorded archaeological sites immediately surrounding the project area (highlighted red).

Table 1: Recorded archaeological sites within c. 1500m of subject site.

NZAA	Type/ description	Distance to subject site
S14/34	Te Rapa Pā, mostly destroyed by formation of Cobham Drive.	920m
S14/57	Armed Constabulary Magazine.	720m
S14/223	Lake House and associated buildings, constructed in 1873	820m
S14/498	Main Trunk Railway Frankton Railway Station and yards, station master's house. Extant elements: plantings, kerbs, concrete slabs, drain:	1340m

6.1.2. THE LIST

The extant reservoir is identified on The List (HNZPT) as no. 4210. The site was entered in 1985 and is a Historic Place Category 2. This is not an archaeological site. It is the subject of a separate Built Heritage Assessment.

6.1.3. HCODP

The reservoir (listed as a Water Tower) is listed site as H27, it has an A listing. Its qualities have been assessed as including Historic, Physical /Aesthetic/Architectural, Context or Group, Technological and Cultural. It is the subject of a separate Built Heritage Assessment.

6.2. INVESTIGATIONS

There are two previous investigations reported which are relevant to the current study due to their topographic locations on the ridge between the Waikato River and Rotorua (Figure 7).

Alexy Simmons monitored new building work at the Waikato Hospital (Simmons 2015a), this work was located on 'Hospital Hill' between the lake and river, and in proximity to Te Rapa Pā. Despite there being attested pre-1900 activity on this hill, she did not identify any intact remains, determining that this was a result of continuous land modifications within the hospital grounds over the preceding decades.

Simmons monitored redevelopment works at the WINTEC city campus; this was similarly located on the ridgeline. Based on the information detailed by Mr Puke (from the NZAA file - see Section 5.1), this was the ridge top and would have been a focus of pre-European activity. Due to the fact that the campus has been subject to significant earthworks over the 20th century, Simmons considered that there was a low chance of identifying archaeological material. The only find was a deposit of ink bottles (Simmons 2015b).

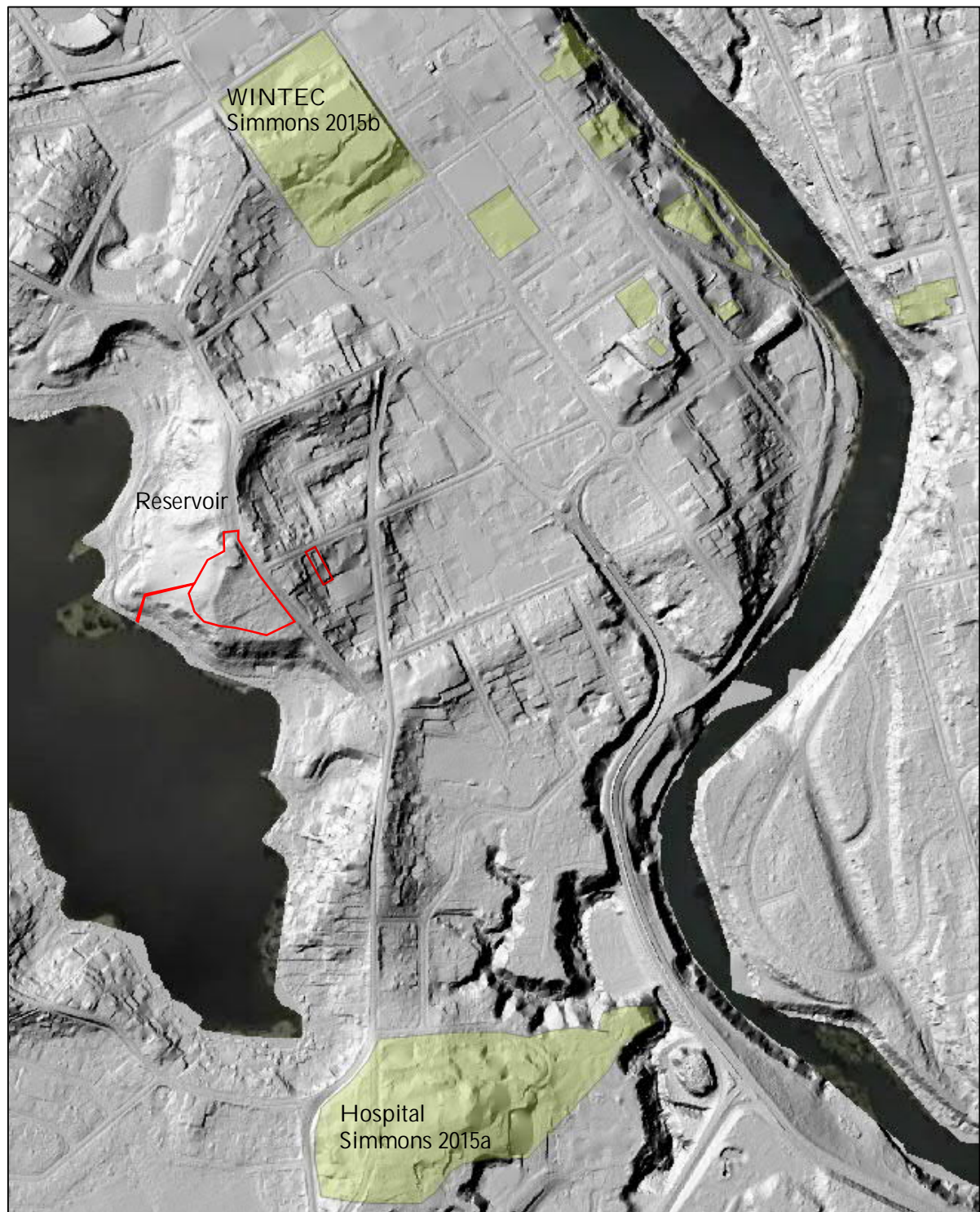


Figure 7: LiDAR showing the ridgeline and previous archaeological investigations at the Hospital and WINTERC sites in relation to the subject site (highlighted red).

7. HISTORIC SURVEY PLANS, AERIAL IMAGE, & LIDAR

7.1. HISTORIC PLANS

The initial survey plans of Hamilton from c.1865 do not provide evidence for landuse around the lake (Figure 9 - Figure 8). Clarence Street was surveyed but there are no annotations suggesting occupation from this time. The SO380 plan appears to show a trig station marked by a triangle with a connecting chain line, the trig was probably where the current water tower/s are located. A map of the Waikato from c.1873 shows a dwelling with the name *Jolly* annotated at the north side of the lake, one annotated *Cox* to the west and a stable to the south (Figure 10). The western side of the lake is shown as swamp. There are no features of archaeological interest identified within or close to the subject site.

DP16167 (1921) shows detail at the reservoir site (Figure 11). Both the first and second reservoirs are shown, but the dwelling has not yet been built. The rectangular reservoir is the one dated to c.1901, this was demolished and replaced with the current structure. There are no pre-1900 features identified on this plan.

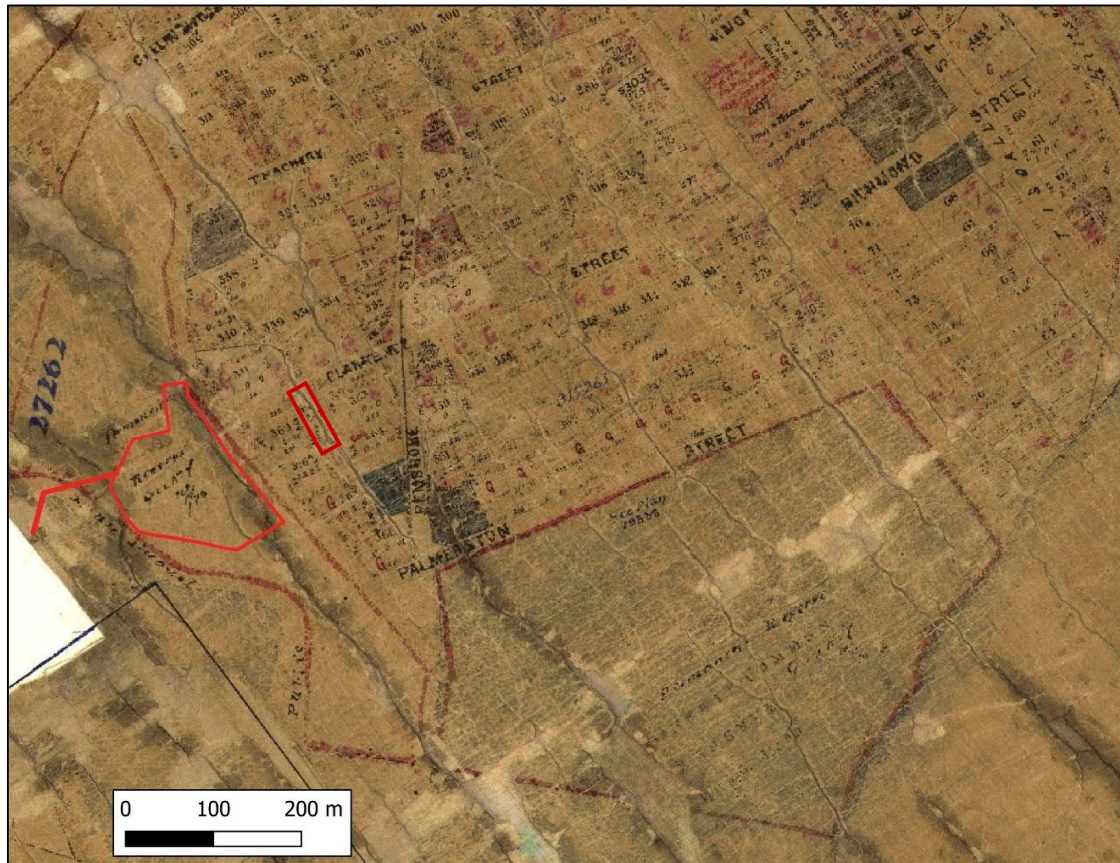


Figure 8: SO378 (1865). The annotation within the study area appears to say 'permanent raupo swamp'.

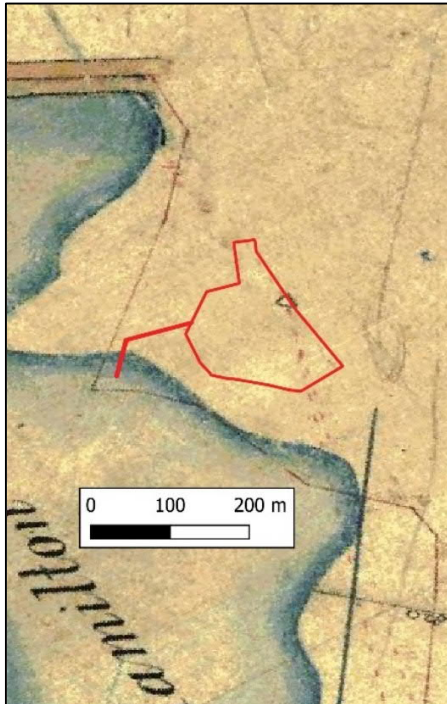


Figure 9: SO380 (1865) Showing probable trig station within subject site and dashed survey line.



Figure 10: Extract of 'Captain Newell's Sketch Map of the Waikato'. 1874. Approximate location of study area highlighted blue.²⁸

²⁸ Paper and ink reproduction from the collection of the Waikato Museum. The detail provided from the museum states: This map, thought to have been drawn by military leader Captain Stuart Newall, shows the Waikato as John Callaghan and the Gibbons brothers new it in the early 1870s.

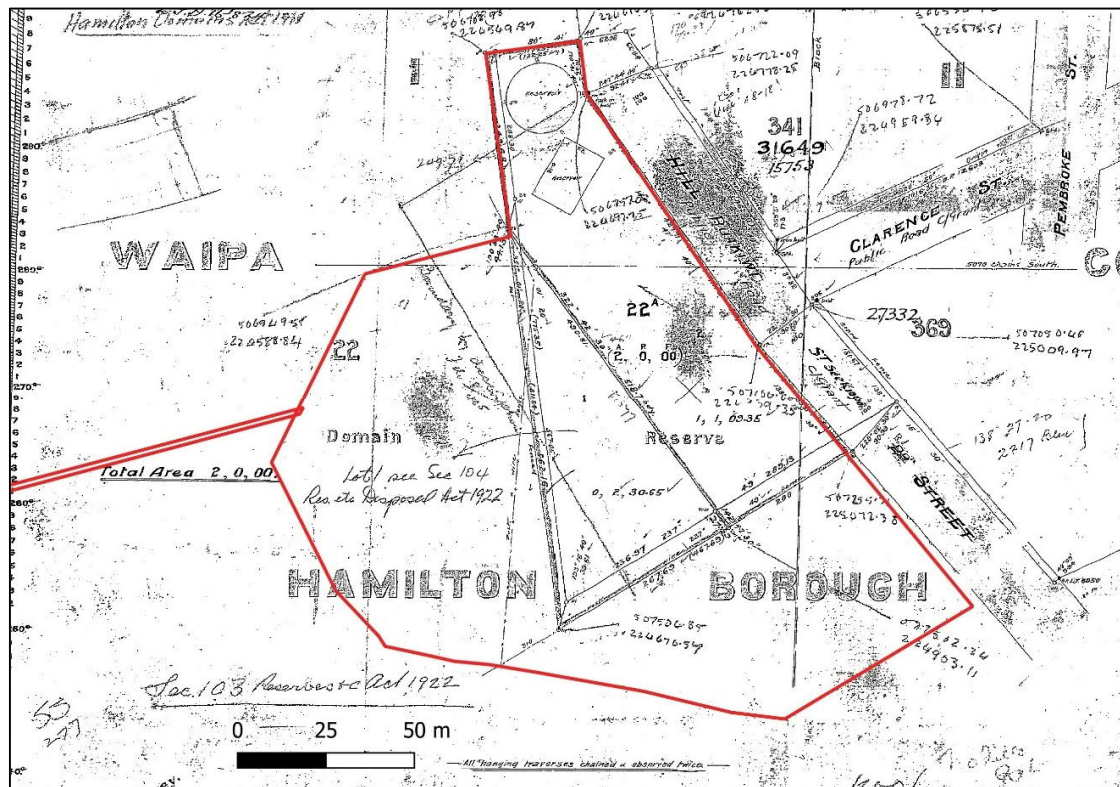


Figure 11: DP16167 (1921), showing the first and second reservoirs – rectangular and circular respectively.

7.2. HISTORIC AERIAL PHOTOGRAPHS

The 1940s aerial photographs show the second and the third reservoirs and the Waddell dwelling (Figure 12). The adjacent reserve is planted in mature trees and there are maintained lawns. The pump station site remains undeveloped; a search of Google Earth indicates that the current dwelling has been in situ since at least 2008.



Figure 12: 1940s aerial image shows two water towers and dwelling (831-39 source: retrolens.nz).

7.3. LIDAR

LiDAR data from Waikato Regional Council is provided above in Figure 7. This shows the ridgeline heading between the Waikato Hospital, along the east side of Lake Rotoroa and to the WINTEC campus. The ridge continued towards the Waikato River but was removed in the 1930s and Garden Place was formed. The reservoir site is placed on a high point of this ridge.

8. SITE VISIT

A site visit was undertaken on 5th September 2023 by archaeologists Siân Keith and Isabella Caldwell. The receiving environment is open parkland with lawns, mature trees and a paved driveway (Figure 13).

Hand-held screw-augering was undertaken in the general location of the new infrastructure. This determined a soil profile of clay subsoil below topsoil. In the location of the former dwelling a mixed soil profile was noted, which was not unexpected. The reservoirs were briefly inspected. Of note there are substantial concrete foundations present between the two extant circular reservoirs. These must be related to the first reservoir which was demolished. No archaeological sites, features or deposits were identified during the field survey.

No site survey has been undertaken to the proposed pump station site on Clarence St. There are no known risks associated with this section, furthermore the section is heavily developed with a complete covering of hard stand and a modern dwelling (Figure 14). This would hinder any archaeological survey.



Figure 13: Photo taken across the location of the proposed reservoir, looking south.



Figure 14: Image from the street of 139 Clarence Street.²⁹

9. CONSTRAINTS AND LIMITATIONS

This report is an assessment of the impacts of a proposed reservoir at Ruakiwi Rd and pump station on Clarence St on archaeological values. There are no statements on the cultural significance of the project area nor are the views of tangata whenua represented in this report.

Statements are made as to the location and nature of recorded archaeological sites and their archaeological values. The archaeological information is derived from both published materials including the HNZPT Digital Archaeological Report Library and New Zealand Archaeological Association (NZAA) ArchSite Database as well as information from archaeologists who have undertaken research and HNZPT authority work in this part of the Waikato.

Archaeological site location data should be regarded as a guide only as the locational accuracy of archaeological sites recorded in ArchSite is variable. Accuracy for some recorded sites is only to 100 m grid squares and many of these have been recalculated from earlier 100-yard coordinates which can increase the location error. Those sites that have not been recorded accurately are indicated on the ArchSite maps with a square and are only accurate to within, at best, 100 m of the actual site location. Archaeological sites that have been visited since the advent of GPS may have more accurate recorded locations. The full extent of recorded sites is often not known, and the single point coordinate provided by ArchSite is often based on only the visible surface archaeological remains. This does not necessarily represent the true subsurface extent of archaeological sites as defined in the *Heritage New Zealand Pouhere Taonga Act 2014* (HNZPTA), as most archaeological remains lie below the ground surface.

²⁹ <https://www.colliers.co.nz/en-nz/properties/occupy-invest-or-develop/nzl-139-clarence-street-hamilton-city-central-hamilton-waikato/nzl67027729>

10. ARCHAEOLOGICAL AND OTHER VALUES

10.1. SUMMARY OF EVIDENCE

There is no evidence for archaeological activity at the proposed pump station at 139 Clarence Street. There is no recorded evidence for archaeological sites, features, or deposits within the reservoir site. There is no evidence for archaeological sites on aerial or cartographic sources.

It has been stated that the ridge connecting the current Waikato Hospital hill to what is now Garden Place, was a significant focal point for Māori prior to 1864. Previous archaeological monitoring at the hospital and at the WINTEC campus have not led to the discovery of Māori-era archaeology. However, both of these locations had seen significant modification in the 20th century, and the archaeological reports for these two developments determine this is the most likely reason no evidence was uncovered.

The reservoir site appears to have been a survey trig in 1865. 19th century European activity within the subject site appears to have been limited to tree planting, in association with the recreational activity focused on Rotoroa. Three reservoirs have been built within the property. The first one was built around 1901, a second around 1920, and a third in 1931. The latter reservoir was constructed over the first and is the current tower. In the 20th century a house was built towards the south-east corner of the property, this was recently removed.

There are no available images of the reservoirs under construction, so it is difficult to determine if these activities affected the footprint to the south or the west, where the new infrastructure is proposed. The former dwelling will have modified the ground to some extent, but this house was likely built on piles, and therefore archaeological evidence may have survived.

10.2. ARCHAEOLOGICAL VALUES

Whilst the current study has not determined the presence of archaeology in this location, the prominent position of the land overlooking Rotoroa / Hamilton Lake suggests that subsurface archaeological features could be present. The following is an assessment of the archaeological values criteria recommended by HNZPT in regard to the *potential* for archaeological evidence to be present.

- *Condition:* Likely modified in places by the formation of a dwelling in the southeast corner and the construction of three reservoirs to the north.
- *Rarity:* With the exception of an 1870s house, there are no archaeological sites recorded around Rotoroa. It is expected that this lake was a focal point for resource gathering, and other possibly less clear cultural practices. Any evidence for pre-European archaeological activity in this location is assessed as having high rarity values.
- *Contextual Value:* It is anticipated that archaeological evidence would be related to the pre-1865 Māori-era occupation of Kirikiriroa/Hamilton. There is no cause to suspected European era archaeology will be present.
- *Information Potential:* Should archaeological material be uncovered, this potentially will hold important information of Māori land use of this ridgeline.

- *Amenity Value:* The reservoir site is designated a Municipal Domain and Recreational Reserve). Whilst the land has high amenity value, there is no known associated archaeological amenity values.
- *Cultural Associations:* This is left for tangata whenua to determine.

10.3. OTHER VALUES

The Ruakiwi Reservoir/ Water Tower is listed with HNZPT and on the HCODP. A built heritage specialist has been commissioned to determine the effects on the values of this structure by the current proposal. This report is being provided independently.

11. ASSESSMENT OF EFFECTS

11.1. DESCRIPTION OF PROPOSAL

The proposal is for completion of two new Ruakiwi Road Reservoirs to be located at 18 Ruakiwi Road, south of the existing reservoir. A pump station will also be required located at 139 Clarence Street, with infrastructure connecting the two sites to operate efficiently. The proposed footprint currently encompasses Lot 1 and 2 DP16167, and Allotment 74 Hamilton West Town Belt. Figure 15 and Figure 16 provide current schematic plans and images.

The project is to be formed in stages, however for the purpose of this report the entire footprint is considered as all of this land could be subject to earthworks from the initial set-out. It is anticipated that the entire footprint will be subject to earthworks including for working areas, laydown, foundations, and levelling.

The proposal provides for construction of:

- Reservoir: 2 x 25 megalitres water reservoir to be located at 18 Ruakiwi Road, south of the existing Ruakiwi Road Reservoir.
- Valve chamber: 430m² valve chamber located at the site, between the existing reservoir and future reservoir, to support the operation of the reservoirs.
- Ancillary pipelines: includes clean water scour discharge pipeline to Lake Rotorua and connections to public three water systems from the site.
- Booster pump station: A booster pump station to be located at 139 Clarence Street on land already purchased by Council for the project.

Ruakiwi Reservoir AAE

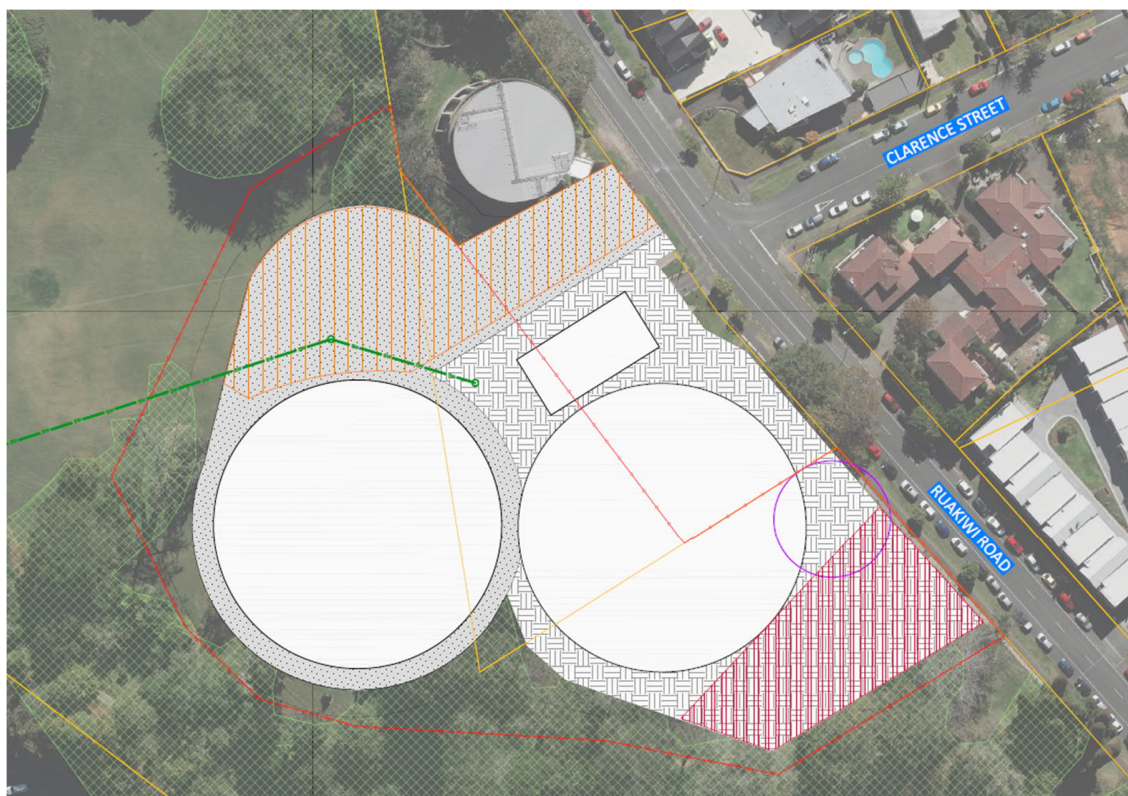
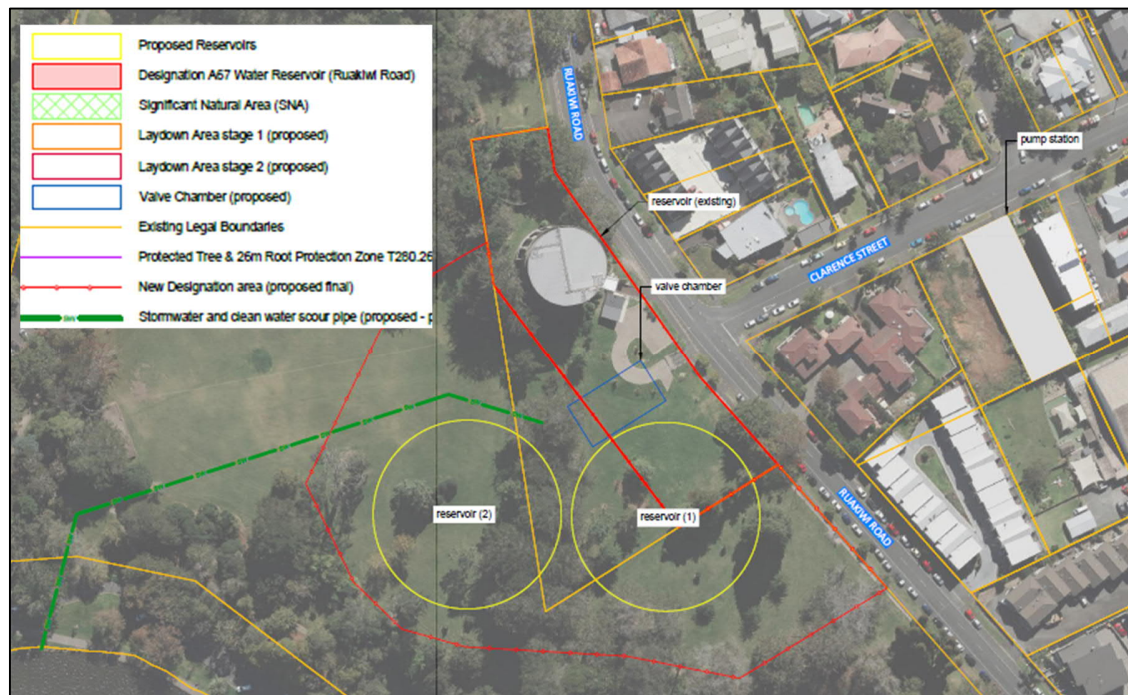


Figure 15: Aerial views of proposed layout



Figure 16: Concept view of proposal³⁰

11.2. ASSESSMENT OF EFFECTS

The reservoir infrastructure will require significant earthworks across the proposed footprint for levelling, working areas, laydown, and foundations. There are currently no known archaeological sites, features or deposits within the footprint of the proposal. However, traditional knowledge points to the ridge on which the infrastructure is to be built being a focus for Māori movement across the landscape, and a place where people gathered. Such activities may have left a physical trace in the form of artefacts, fires and hangi. Hearsay evidence has told of occupation evidence and stone tools being collected from this ridgeline, although what and where these findings were is not provided.

The proposed reservoir footprint has seen some past modification in particular a removed 20th century dwelling and the construction of three reservoirs close by, two of which are extant. The reservoirs do not intersect with the current footprint but is not clear if during their construction the proposed reservoirs' footprint was modified.

Based on a combination of the scale of earthworks and the prominent location of the ridge, overlooking Rotorua and the Waikato River, there is considered to be a risk of uncovering archaeological evidence, however the magnitude of risk is considered to be moderately low.

The effect on any underlying archaeological evidence is likely to be low and be limited to minor occupational evidence such as fires, hangi and artefacts.

³⁰ Brodie Hailwood & Edwards White

There are no known risks associated with the pump station at 139 Clarence St.

12. CONCLUSIONS & RECOMMENDATIONS

There are no known archaeological values associated with the pump station at 139 Clarence St and therefore there is no known reason to modify the proposal based on archaeological values.

There are no recorded or identified archaeological values associated with the reservoir site. However the ridge line is a prominent geographical feature and is stated to have been a focus of pre-1854 Māori activity. There have been significant earthworks undertaken for three former reservoirs within the designation. There is a risk, albeit low, of encountering pre-European evidence. There is no known risk of affecting European era archaeological evidence.

It is recommended that:

- That an archaeological authority from HNZPT is obtained for the earthworks required to form the reservoir.
 - This is as a precautionary measure and should be undertaken to avoid costly delays should archaeological evidence be encountered.
 - Archaeological works under this authority should include monitoring of topsoil removal/ overburden to the top of natural subsoil at the discretion of the archaeologist.
- Earthworks to form the pump station be undertaken under the provisions of an Accidental Discovery Protocol (ADP).
- That HCC seek input from local iwi to discuss this assessment and the recommended approach.

13. REFERENCES

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