



# **Matapihi UFB2 build (HNZPT authority 2019/099): final report**

**report to  
Heritage New Zealand Pouhere Taonga  
and  
Ultrafast Fibre**

**Arden Cruickshank and Ella Ussher**

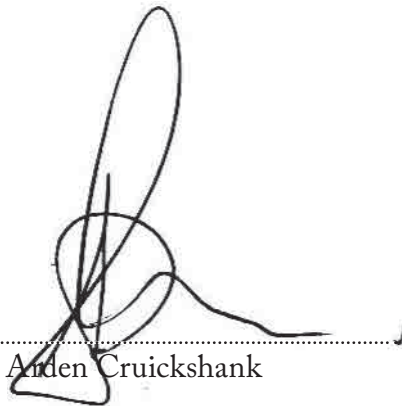


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# Matapihi UFB2 build (HNZPT authority 2019/099): final report

Arden Cruickshank and Ella Ussher

Ultrafast Fibre Ltd have installed a new fibre optic cable network around Matapihi as part of the second stage of the National Ultra-Fast Fibre project (UFB2). The installation of the cable mainly involved excavating small pits at regular intervals (usually in line with every second property boundary) within existing service trenches, and directional drilling between these. Other pits were opened to locate services or extend the cable to property boundaries. Twelve recorded archaeological sites were identified in the project area (Figure 1) with potential to be affected by the works (Trilford 2018). Ultrafast Fibre applied to Heritage New Zealand Pouhere Taonga (HNZPTA) for an archaeological authority to modify or destroy these sites under section 44 of the Heritage New Zealand Pouhere Taonga Act (2014). Authority 2019/099 was granted by HNZPT on 5 September 2018.

Work commenced on 17 October 2018 and was completed in early 2019. Ground disturbance associated with the archaeological sites identified in the project was monitored or inspected prior to drilling to ensure that any archaeological features that were encountered were recorded and mapped for future site management.

## Background

Matapihi is a north-east to south-west aligned promontory on the western side of the tombolo which connects Mauao to the mainland. It is elevated from the coastline with occasional and steep ridgelines. Matapihi separates this portion of Tauranga harbour into Waipu and Rangataua Bays, with Welcome Bay tucked in the south-east coastline of Maungatapu.

The deeper solid geology of Tauranga consists of Pleistocene era, fluvial sand and silt (Healy et al. 1964). The dominant soil type of Matapihi is Katikati sandy loam, a Typic Orthic Allophanic Soil derived from rhyolitic tephra. This is a well drained soil which is ideal for horticulture (Rijkse and Guinto 2010).

According to Landcare Research New Zealand, the probable vegetation composition of Matapihi before human contact is likely to have been an understorey of scrub, shrubland and grasses below a canopy of kauri, taraire, kohekohe and tawa. Horticultural expansion by pre-European Maori required forest clearance, after which fern and manuka flourished on land left to fallow. A large swamp is predicted to have existed on the coastline of Waipu Bay on the north western coastline of Matapihi (Potential Vegetation of New Zealand - Informatics Team New Zealand, Environment and Land GIS, LRIS Portal).

### *Pre-European Māori background*

Several waka are recorded as having visited Tauranga, including *Takitumu*, *Tainui* and *Te Arawa*. Waitaha a Hei and Ngāti Ranginui are descended from the crews of these waka, par-

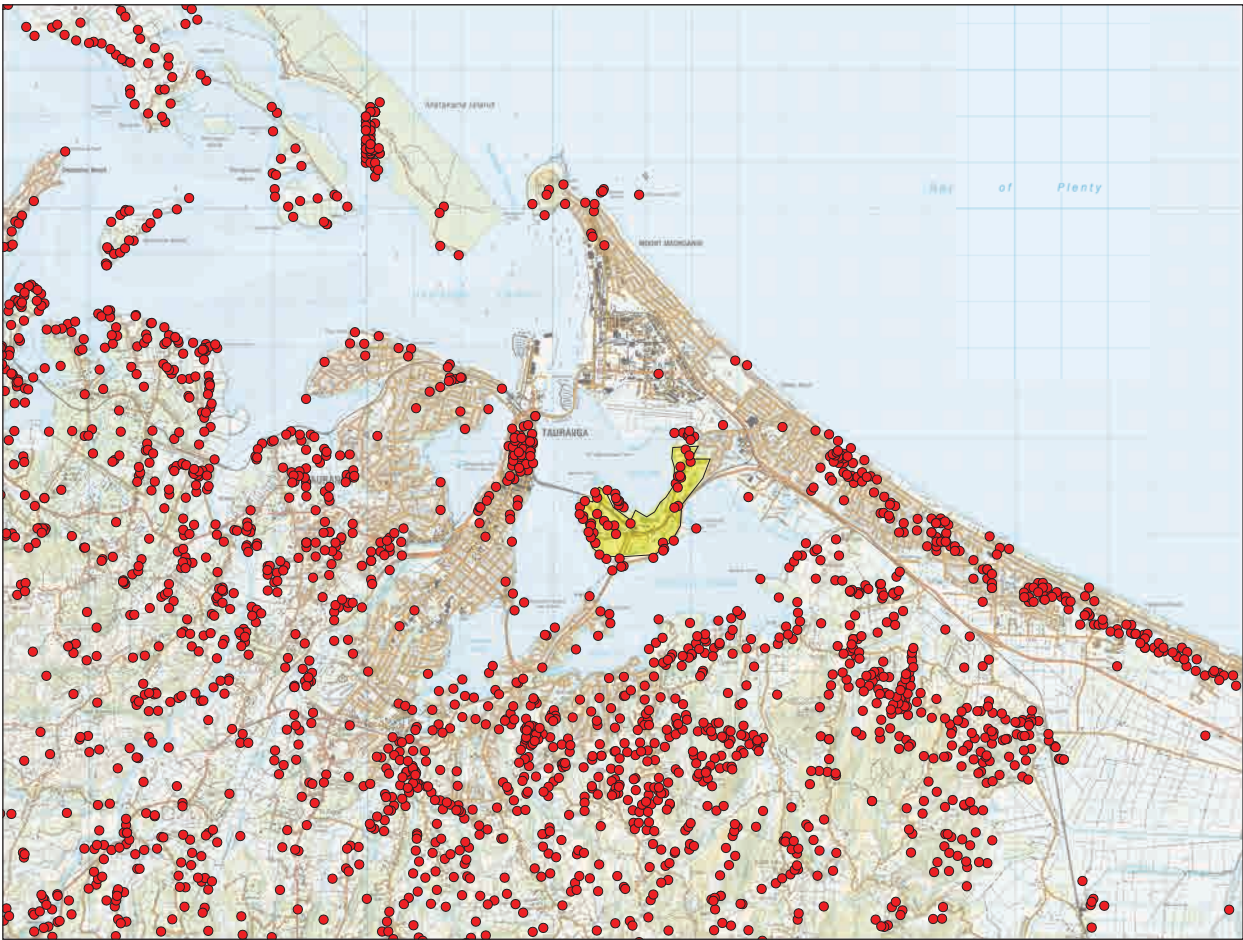


Figure 1. Location of the Matapihi works showing archaeological sites recorded in the vicinity.

ticularly *Takitumu*. These hapu occupied Mt Maunganui and Mauao until they were displaced by Ngāiterangi in the 18th century (Stokes 1980). The Bay of Plenty is well known for its mild climate, fertile soils and abundant shellfish and fish populations, which supported a large pre-European population, and the region has one of the highest densities of archaeological sites in the country (McFadgen 2007: 173).

At the time of European contact (mid to late 1820s) Ngāiterangi were in possession of the area although Waitaha and Ranginui identities survived. Ngāti Maru and Ngāti Tamaterā attacked Otumoetai, Te Papa and Maungatapu pā in 1828 killing many inhabitants and enslaving others (Phillips and Arabin 2004: 4). Very little is recorded on the pre-European Māori land use of Matapihi, most accounts lie in oral traditions with iwi.

### *European contact and historic period*

The first European to visit Tauranga was the Rev. Samuel Marsden in 1820 (Gifford and Williams 1940). Marsden journeyed overland from the Waihou River via the Karangahake Gorge guided by local Māori. On this arrival, he was informed that no European ships had visited the Bay of Plenty since James Cook in the late 18th century, who didn't enter Tauranga Harbour. Upon noting that the area was fertile, and that the local Maori were eager to trade

with Europeans, Marsden organised with the Church Missionary Society (CMS) to get a mission station established.

The CMS schooner *Herald* was the first European vessel known to have entered Tauranga Harbour in 1826 (Stokes 1980: 45). The first mission was set up in the 1830s at Te Papa, with a standing presence from 1838 onwards. The mission house is still standing on Mission Road. The first organised trade in the region began in 1830 when Phillip Tapsell settled at Maketu as a flax agent for Sydney based firm Jones and Walker. This became a large operation, employing hundreds of local Māori in the cultivation and preparation of flax fibre (Stokes 1980: 53).

Following the development of trade in the Bay of Plenty, the first large scale industry in the area was timber milling, with rimu being the main species. There were already three timber mills working in the hills behind Tauranga at the beginning of the 20th century when a fourth, the Tauranga Rimu Company set up in the area later to be known as Tauriko (Cruickshank 2016). Very little is recorded on European occupation of the Matapihi, other than a rowboat ferry service established in 1873 between Matapihi and Te Papa (Bellamy 1982).

### *Previous archaeological work*

Most recorded sites in the wider landscape of the project area are pā, midden and horticultural sites. Much of Tauranga and the surrounding suburbs were contoured and developed prior to archaeological recording and survey being undertaken, adversely affecting the archaeological landscape. The first systematic survey of Matapihi was in the early 1980s when archaeologists directed by Bruce McFadgen surveyed land around Tauranga, on behalf of the New Zealand Historic Places Trust. Another survey followed in 2002 when Ken Phillips and Don Prince revisited recorded sites as part of the New Zealand Archaeological Association Site Recording Scheme Upgrade Project.

There have been several archaeological investigations in Matapihi, mainly associated with upgrades to State Highway 29a and services in the road reserve. Pā U14/201, at the southern tip of the Matapihi peninsula, was first recorded as an archaeological site in 1973 by Ken Moore, lying on the end of the spur facing Te Pā o te Ariki across the water at Maungatapu. However, earthworks monitoring by Cable (2005) showed the pā is larger and an undefended portion extends north and east. It is bisected by SH 29a. The pā has a trench, terraces, a traverse trench and bank, pits, and midden eroding both from the top and the western scarp. Sandstone files, flakes, adze portions, drill points and worked bone have been collected near the pā on the beach front by a local fossicker (SRS). The cultural impact assessment for the 2005 works assessed a high cultural value due to the presence of an urupā; currently there is no urupā recorded on the NZAA SRS record (Cable 2005).

The earthworks associated with a mains water supply upgrade on the Matapihi Peninsula were monitored by Chris Mallows of Opus in 2008 and 2009. The works exposed midden as an extension of known pit U14/2560 and a new site U14/3324, an obsidian find spot (Mallows 2009).

Geotechnical testing for earthworks associated with transmission tower relocation was monitored by Danielle Trilford in 2017. The works involved a series of 150 mm wide holes augured into the ground around Matapihi. The works were within the known extents of some recorded archaeological sites, but no archaeological material was identified during this project.

More recently, Keith (2019) conducted an archaeological investigation in the SH 29a road reserve of sites U14/309, U14/3226 and U14/3559 under HNZPT Authority 2017/70 during the

construction of a median barrier. From this, 258 pre-European Māori features were recorded including rectangular storage pits, bin pits and associated post-holes, stake-holes and pit-floor sumps; midden deposits and fire features; and a number of post-holes and stake-holes from a building or structure with an associated floor. These features were concentrated into two clusters assigned to two already recorded sites, U14/3226 and U14/309 Wharekaia Pā. A third site, U14/3559, was discovered during monitoring and is likely an outer defensive line of the gun-fighter Tukiata Pā, historically documented as having been occupied from 1855–60 during the Ohuki Land Dispute.

## Methodology

During the initial assessment a desktop study was undertaken to identify areas within the build where archaeological sites would potentially be impacted during works (Figure 2). This was not a full assessment of all sites within the peninsula. The assessment and evaluation for the archaeological sites was based on the current information and supporting documentation in Archsite, the online database of the New Zealand Archaeological Association (NZAA) Site Recording Scheme (SRS) as accessed on 30 May 2017.

As a result of the desktop evaluation, 12 sites were identified as having a moderate to high potential of being affected by works. One of these was pā and had a 200 m buffer monitoring buffer placed around it. The remaining 11 sites had a 50 m buffer was placed around the central site point to demarcate areas within the road reserve in which any ground disturbance should be monitored by an archaeologist.

### *Construction Methodology*

Installation of the ultrafast fibre network consisted primarily of directional drilling to minimise ground disturbance. These consisted of insertion and receiving pits which were generally 1.2 x 1.2 m, with varying depths, generally around 1 m. These pits also housed the underground cabinets which centralised the connections for a neighbourhood. Although drill shots were capable of being in excess of 200 m long, they were generally at distances of 40 m to allow for individual house connections. In addition to the drill pits, a number of ‘potholes’ were required to identify the location of services prior to a drill shot being made. Because of the inherent risk of sub-surface drilling near existing services, the drill shots were often made next to existing service trenches to allow for accepted minimum distances from high voltage cables and other potentially hazardous services. It cannot be assumed that the areas where the fibre is being installed have been previously disturbed. Drill shots were generally run 600–900 mm beneath the ground surface and have the potential to run through sub-surface archaeological features such as storage pits and fire scoops.

The level of ground disturbance associated with this project depended on the complexity of services in a particular street and cannot be seen as consistent over the build but is still less than traditional trenching methods for installation of services.

Due to this type of ground disturbance, assessing the archaeological effects and interpreting features and the landscape is not as straight forward as typical archaeological monitoring projects. Trenching would traditionally be used for installation projects of this magnitude which would allow an archaeologist to view soil profiles over a significant length and identify subtle landscape modifications that would indicate human activity. Similarly, large scale topsoil strip-

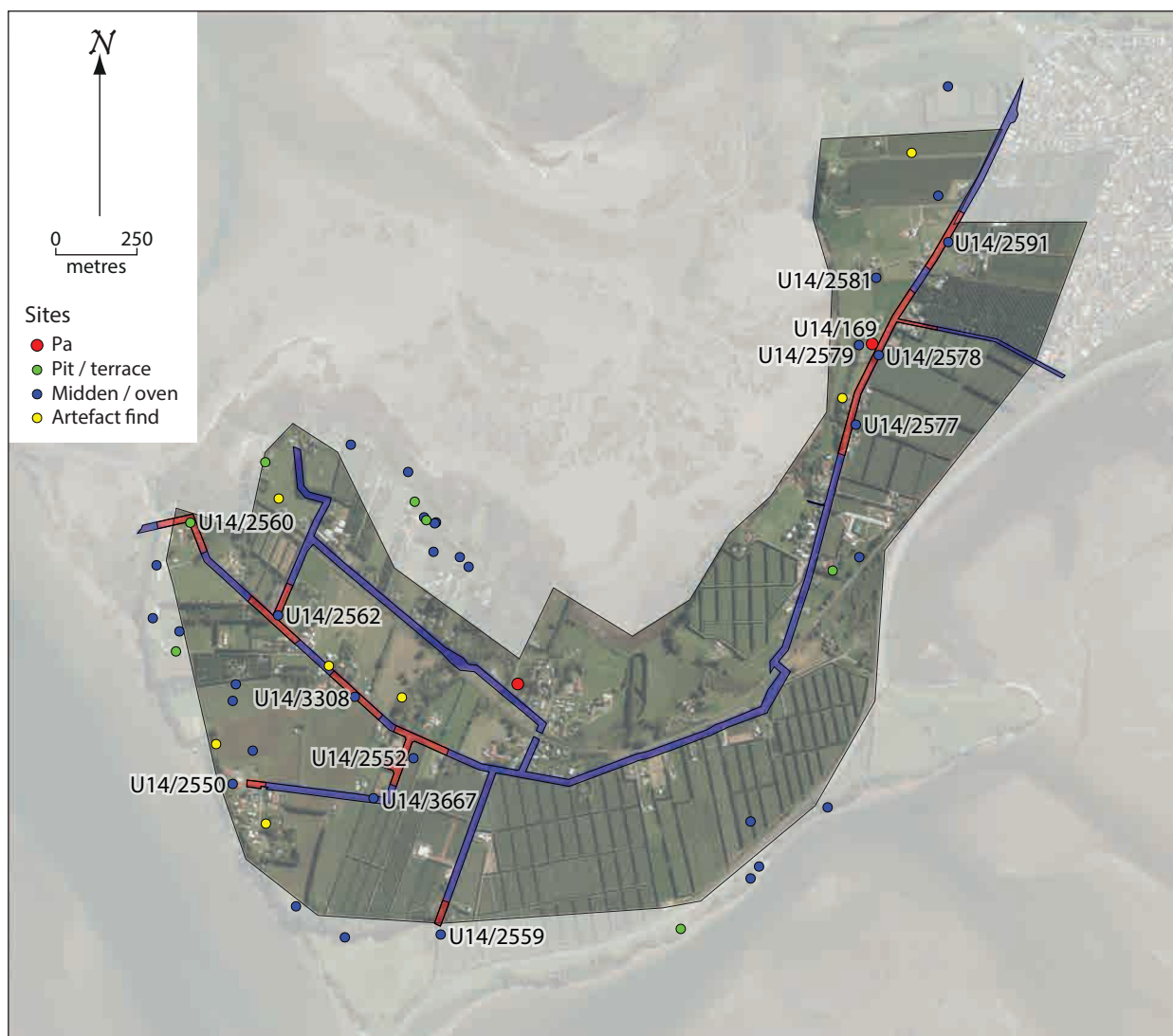


Figure 2. Location of 12 recorded archaeological sites within the footprint of fibre optic cable installation, and newly recorded site U14/3677.

ping such as with housing developments provide an archaeologist with a more complete knowledge of the sub-surface archaeological deposits within the project extent.

The drawback of those methods of exposing the entire extent of works is that any archaeological features that are within it are significantly modified. The purpose of the Heritage New Zealand Pouhere Taonga Act (2014) is "...the identification, protection, preservation and conservation of the historical and cultural heritage of New Zealand", with avoidance and minimisation of damage the preferred approaches to archaeological landscapes. With this in mind, the approach for these projects is to manage the archaeological landscape and minimise the effects on it, rather than to create a robust record of all archaeological sites within a build.

Archaeological monitoring and investigation procedures were developed to ensure disturbance to both archaeological features and council assets was minimised.

1. If archaeological features are discovered during works, the archaeologist will not extend the hole beyond its intended size. This was a two-fold limitation, as this would increase



the modification of the feature, and has the potential of destabilisation of the road and other infrastructure. The only exception to this would be if koiwi were encountered, which would be dealt with after discussion with mana whenua, the New Zealand Police, Heritage New Zealand and Western Bay Of Plenty Regional Council.

2. Where archaeological features are discovered, drilling will be done at a depth of 1200 mm, or a suitable depth determined by the archaeologist as likely to avoid archaeological features.

The results of this project should not be seen as an exhaustive list of archaeological sites that exist within the road reserves around Matapihi, or even a representative sample; but rather an exercise in minimising potential effects on the archaeological landscape of Matapihi.

## Monitoring results

One in situ midden deposit was encountered during works, which was recorded as a new site, U14/3677, and is discussed below. Another site, U14/2591 was tentatively relocated, but not affected by the cable installation works. The site record was updated within the NZAA Site Recording Scheme (SRS).

### *U14/2591*

The site was recorded by O’Keefe and Hall in 1985 as a shell midden lens, approximately 4 m long and within a small scarp at the entrance to a driveway 1.5 km along Matapihi Road from



Figure 3. Location of fragmented shell associated with U14/2591. Photo scale = 0.5m.

the intersection with the Main Road. The midden was described as being composed of 70% tuatua, with some cockle and charcoal, with a large proportion of shell being burned. There had been some recorded disturbance of the site during construction of the driveway.

Works in the vicinity of this site were monitored and the site was tentatively relocated on the driveway of 159 Matapihi Road. There were several pieces of fragmented shell visible near a fence post approximately 5 m from the road reserve. One of the hinges appeared to be from a tuangi (*Austrovenus stutchburyi*), with the rest of the fragments probably also from bivalves. Probing was not possible in the driveway surface, and no sub-surface deposits appear to exist in the road reserve. No material was identified in the insertion hole outside of the property boundary.

### U14/3677

Shell was encountered in the topsoil exposing services on the 90 degree bend on Waikari Road on Friday 30 November 2018. Works on this hole were suspended and the project archaeologist was contacted. Following the procedures in the on call protocol, the crew moved onto the next insertion hole which was located approximately 30 m from this discovery, but encountered more shell and stopped. The two deposits were inspected by Arden Cruickshank on Monday 3 December 2018.

### Deposit 1

Shell was observed in topsoil, which was uniformly 150 mm deep above a level loam layer. The area appears to have been cut down for road batter and power line installation. The shell was not in situ, and consisted of fragmented and weathered tuangi. As there was no in situ material, no samples were taken. Probing indicated that the redeposited shell extended approximately 1 m either side of the hole.

### Deposit 2

This deposit appears to be a shell lens at the base of a storage pit, which had been heavily modified with two galvanised water pipes, an alkathene water pipe, a telecom conduit and tree roots all within exposed area. On initial inspection prior to sampling, it was noted that the shell was dominated by tuangi with lesser quantities of pipi (*Paphies australis*) and various gastropods. A 10 litre bulk sample of the midden was retained for analysis. The extent of storage pit was unclear, as the 1400 x 420 mm insertion hole did not expose any feature edges, but the base of the pit appeared to be 760 mm beneath surface. The insertion hole was relocated 10 m west of this hole, and no archaeological material was noted.

### Summary

These two midden deposits have been combined as a single site (U14/3677). Although the material associated with Deposit 1 was not in situ and is approximately 30 m from Deposit 2, it is likely that associated features are within the vicinity of these deposits, including in the neighbouring paddocks. An indicative extent for the site has been noted on the NZAA SRS. The drill shot was run intentionally deep (1200mm) through this section to avoid any other related archaeological material that may be present.



Figure 4. Redeposited shell of Deposit 1, U14/3677.



Figure 5. Shell-lined storage pit, Deposit 2, U14/3677, with modern services above. Photo scale = 0.5 m.



Figure 6. Closer view of shell-lining in base of storage pit, Deposit 2, U14/3677. Photo scale = 0.5 m.

## Analysis

A single 10 litre bulk sample of midden was retained from Deposit 2, U14/3677, and returned to the lab for analysis.

## Methodology

This midden sample was analysed following the guidelines for midden sampling and analysis set out by HNZPT (2014). The bulk sample was wet sieved through a 6 mm screen, and the dried material was sorted by hand to class. Only shell and charcoal were recovered, with no bone or lithics recovered. Each class was weighed and bagged separately. Each bag was then passed on to the relevant specialist for analysis.

The shellfish recovered from the midden samples was analysed by Jennifer Graydon and Danielle Trilford of CFG Heritage Ltd, with species identification based on Morley (2006). Shellfish species were identified using diagnostic units, for bivalves this was single hinge units, and for gastropods with included the apex, operculum, or aperture.

Charcoal recovered was analysed by Ella Ussher of CFG Heritage following the methodology outlined in Chabal et al. (1999), Théry-Parisot et al. (2010) and Dotte-Sarout et al. (2015).

A 100 g sample of tuangi from U14/3677 was submitted for dating to the University of Waikato Radiocarbon Dating Laboratory.

### Shellfish

The sample was dominated by tuangi, which constituted 95% of the total assemblage. All harvested from within the Tauranga Harbour. There was also evidence of burning observable on the cat's eye (*Turbo smaragdus*).

Table 1. Counts of shell from Deposit 2, U14/3677.

Common name	Taxon	MNI
Small ostrich foot	<i>Pellicaria vermis</i>	3
Large wedge shell	<i>Macomona liliana</i>	18
Mud whelk	<i>Cominella gladiiformis</i>	3
Cat's eye	<i>Turbo smaragdus</i>	13
Smooth slipper shell	<i>Maoricrypta monoxyla</i>	3
Pipi	<i>Paphies australis</i>	32
Tuangi cockle	<i>Austrovenus stutchburyi</i>	1320
Total		1392

### Charcoal

The species identified indicate an environment of secondary regrowth dominated by small shrubs such as hebe and manuka. The presence of very small numbers of larger conifers indicates that the process of firewood collection also included the extraction of old stumps from cleared primary forest.

Table 2. Identification and quantification of charcoal sample from Deposit 2, U14/3677.

Common name	Taxon	Count	Percent
Hebe	<i>Hebe</i> sp.	22	81.5
Manuka	<i>Leptospermum scoparium</i>	1	3.7
Tarairi	<i>Beilschmiedia tarairi</i>	1	3.7
Mahoe	<i>Melicytus ramiflorus</i>	2	7.4
Conifer	Podocarpaceae sp.	1	3.7
Total		27	

### Radiocarbon dating

A sample of tuangi was submitted to the University of Waikato Radiocarbon Laboratory for radiometric dating. This sample had a relatively tight distribution suggesting the midden was deposited between the early 15th and early 16th centuries.

Table 3. Radiocarbon date for Deposit 2, U14/3677.

Lab number	Material	CRA	Cal AD 68%	Cal AD 95%
Wk-50301	Shell	843 ± 25	1434–1511	1395–1595 (97.4%) 1605–1615 (0.7%)

## Discussion and conclusions

No in situ archaeological deposits related to the 12 sites identified during the assessment (Trilford 2018) were encountered during works. Evidence of U14/2591 was identified near to the road reserve, this was redeposited and outside the scope of works. There was however, a site encountered on Waikari Road that had not previously been recorded and was subsequently recorded as a new archaeological site, U14/3677, in the SRS.

The deposit dated to the early 15th to early 16th centuries. Charcoal analysis showed the area to be under secondary regrowth with some firewood collection from larger tree species, probably stump wood. Shellfish, mostly tuangi, were collected from the adjacent harbour.

Although there was only one site encountered during this project, the information gained from U14/3677 adds to the previous information gathered by Cable (2005), Mallows (2009) and Keith (2019) for Matapihi. The lack of archaeological sites encountered during works should be seen as a result of the minimal ground disturbance approach of directional drilling compared to traditional trenching, and any other projects undertaken in the area utilising trenching is likely to encounter and modify a greater number of sites.

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