

**TRANSPower OTA-WKM A Tower 0190, B  
Tower 0179 AND C Tower 0180:  
ARCHAEOLOGICAL INVESTIGATION OF SITE S15/68  
(HNZPTA AUTHORITY 2016/649)**

**REPORT TO  
TRANSPower NEW ZEALAND LTD  
AND  
HERITAGE NEW ZEALAND POUHERE TAONGA**

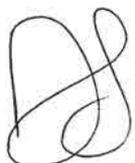
**DANIELLE TRILFORD**



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Prepared by:



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Danielle Trilford

Reviewed by:



.....  
Matthew Campbell

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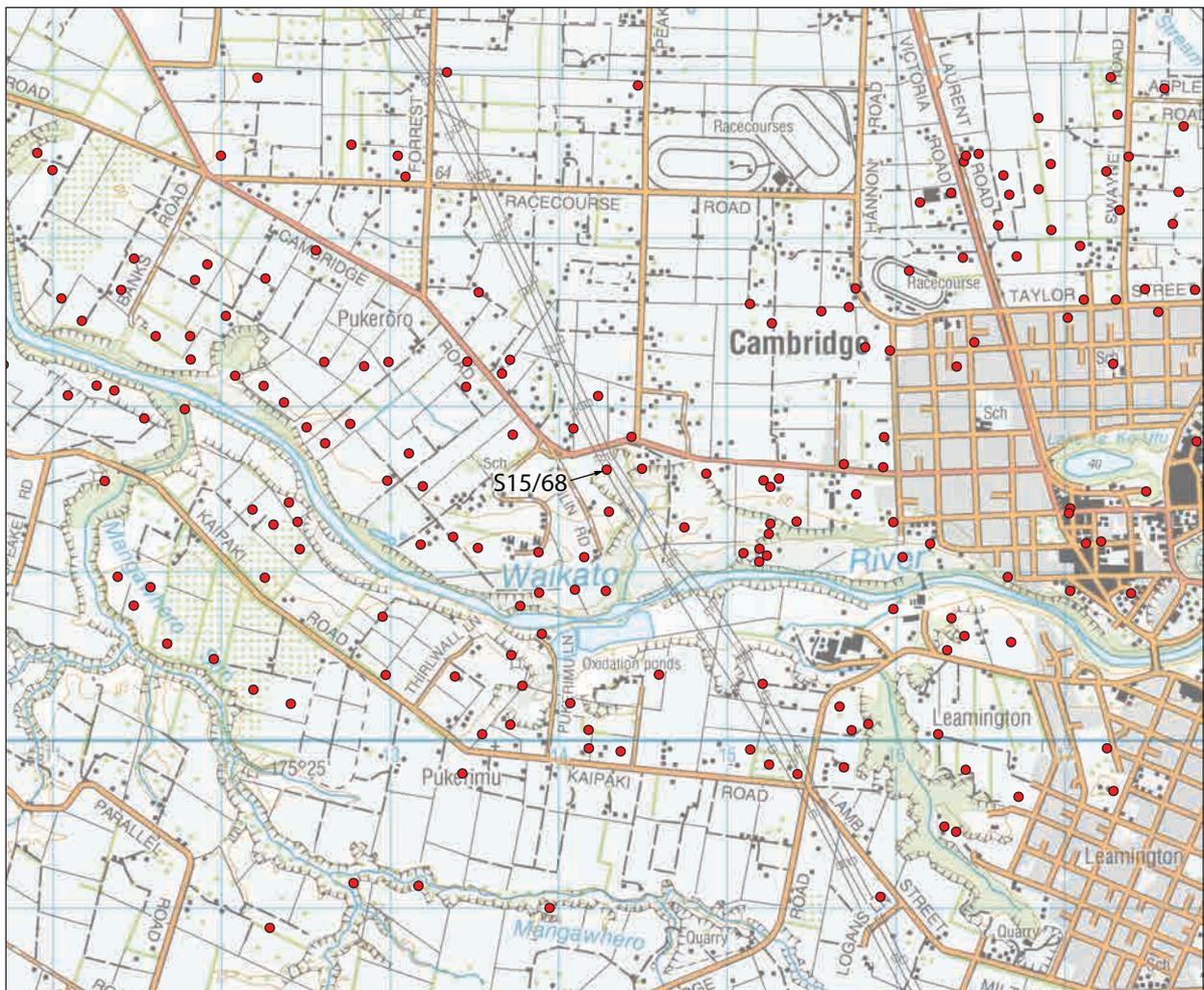
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# TRANSPower OTA-WKM A TOWER 0190, B TOWER 0179 AND C TOWER 0180: ARCHAEOLOGICAL INVESTIGATION OF SITE S15/68 (HNZPTA AUTHORITY 2016/649)

DANIELLE TRILFORD

Transpower is currently carrying out foundation maintenance works on approximately 180 towers located in the upper North Island regions (Northland, Auckland, Waikato and Bay of Plenty) as part of its ongoing maintenance programme. This work generally involves excavating each of the four tower legs, remedying any corrosion sometimes followed by embedment with concrete. Towers A 0190, B 0179 and C 0180 on the OTA-WKM transmission lines are located on an archaeolog-

*1. Location of S15/68 and nearby archaeological sites.*



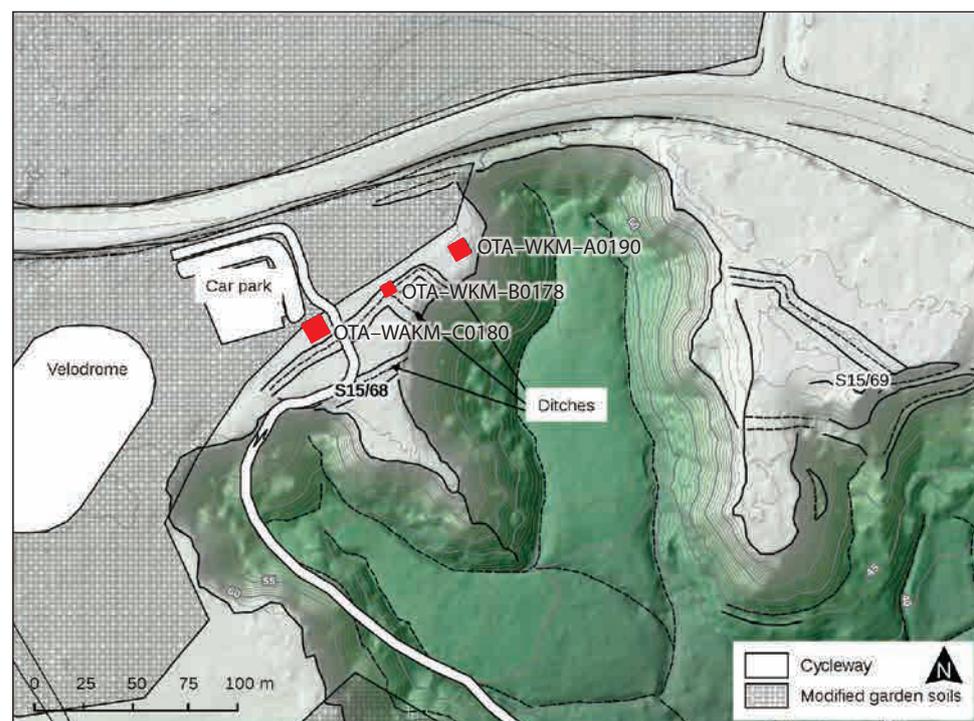
ical site recorded as S15/68, a pa, in the New Zealand Archaeological Association (NZAA) Site Recording Scheme (SRS), on Lot 2 DP 458241 and Lot 1 DPS 88412. Transpower applied to Heritage New Zealand Pouhere Taonga for an archaeological authority to modify the site and authority 2016/649 was granted 4 February 2016. Monitoring of the works was undertaken by Danielle Trilford of CFG Heritage from 8–16 March 2016. Iwi monitoring was conducted by Teri Whaiapu and Tama Te Hau of Ngati Haua, and Marilyn Tairi of Ngati Koroki Kahukura.

## Background

### *Pre-European Maori history*

Most sites in the Middle Waikato Basin are pa and horticultural sites (Figure 1). Most of the pa in the area are along the margins of the Waikato and Waipa Rivers, but are also along the margins of other water ways and around the elevated edges of the basin. Site S15/68 is an unnamed pa occupying a promontory near the head of a wide gully emptying into the Waikato River near Cambridge (Gumbley and Hutchinson 2014). The site was originally recorded by Steve Edson from aerial photographs dating to the 1940s. Most of the pa is on Lot 2 DP 458241 and Lot 1 DPS 88412. Maori horticultural sites (principally garden soils and borrow pits) are commonly recorded near or with Waikato pa sites, such as S15/68, these would be expected elsewhere on the level land of the Waikato Basin and along the river; but garden sites would be much less visible in the hillier land and different soils around the hill where works will take place (Gumbley and Hutchinson 2014). Pit and terrace sites would be expected to be present in the area, but as the area has not been subject to intensive field survey the more visible pa sites predominate in the record - most of the identification of pa around this area are based off the 1940s aerials.

There is very limited archaeological investigation into pa at the Middle Waikato Basin, but some into the distribution of pre-European Maori gardens in the Waipa District. A study by Gumbley and Hoffmann (2013) showed that these sites are



2. Plan of S15/68 and features found during the 2014 investigation (Gumbley and Hutchinson 2014: Figure 5). The Transpower towers are highlighted in red.

strongly clustered to the Waikato River, with 80 % located within one kilometre of the river and 50 % within 500 meters, and most others are in close range to the gullies and streams flowing into the River. S15/68 is a pa and garden system which fits the latter description.

Pre-European Maori gardening evidence in the Waikato is often clearer archaeologically than in other parts of New Zealand. This is because borrow pits and modified soils are present. A description by Gumbley and Hutchinson (2014: 4-5) clearly explains both of these archaeological features:

Borrow pits are sub-circular depressions in the ground surface from which the underlying sand and gravel alluvium has been quarried. These sands and gravels were applied to the gardens in a labour intensive process which, it is believed, helped to produce conditions more conducive to growing the sub-tropical kumara in an environment that is relatively marginal for its cultivation. The resulting made-soils are classified as Tamahere gravelly sandy loam, and were first identified by soil scientists of the Department of Scientific and Industrial Research (DSIR) in the 1930s (Grange et al. 1939). They are found close to the borrow pits, generally within 100 metres and are recognizable because of the elevated levels of sand and gravel, along with charcoal, compared to the parent soils.

These gardening sites often host other archaeological features and evidence. Plant microfossils have shown the kumara, taro, and a single example of yam were cultivated in the area. Post-holes for associated structures, drains, fireplaces and storage pits show people here were conducting high level gardening processes. In addition, paleo-environmental reconstruction based on archaeological evidence has shown there was intentional bush clearance of tawa/podocarp forest through the Middle Waikato Basin created gardening spaces (Gumbley and Hoffmann 2013).

Based on environmental variables, the probable vegetation composition was predicted and mapped by Landcare Research to have been beeches, and Kahikatea-pukatea-tawa forest before human contact. South of where the Waikato River runs was a wetland. The ranges at Maungataurtari nearby hosted at the lowland wetland / steepland and Highland Softwood-Hardwoods such as Rimu, tawa and kamahi forest. (Potential Vegetation of New Zealand - Informatics Team New Zealand, Environment and Land GIS, LRIS Portal).

### *19th and 20th century history*

Much of the surrounding land was converted to farming in the late 19th century. Early in the 20th century the potential for harnessing the Waikato River for hydro-electric power production was realised with the construction of the Horahora power station in 1913, built primarily to provide power to the Waihi gold fields. This was superseded, and drowned, by the construction of the Karapiro Dam in 1941, which was created to provide power for Hamilton and Auckland (Petchey 2013). A series of more than 500 towers were constructed to carry the power to Auckland. These towers were completed by 1927, including Towers A 0190, B 0179 and C 0180.

### *Previous archaeological investigation at the site*

The site was archaeologically investigated in 2014 by Gumbley and Hutchinson ahead of the Te Awa cycleway construction. During these works four archaeological features were discovered, these were a firescoop, a basin-shaped depression, the outer defensive ditch, and a pit (Gumbley and Hutchinson 2014) (Figure 2).

Radiocarbon results from the excavation suggest the site was occupied between AD 1630 and 1670 (Gumbley and Hutchinson 2014).

### Methodology

Archaeological monitoring of the site undertaken by Danielle Trilford of CFG Heritage from 8–16 March 2016. Each tower had four footings which were originally installed in the mid20th century. The maintenance works involved removal of the soil with a 3 or 8 tonne hydraulic excavator around each footing, creating a 3500 mm wide, 3500 mm long, and 1 – 2 m deep square hole for foundation and maintenance works before reinstating the holes. Excavation of the hole would cease while investigation and recording of any archaeological features were found. As well as the holes, a 500 mm wide and 800 mm deep trench was excavated around Tower C 0180 for an earthing strap to be laid.

Each hole was labelled Footing 1–4 for each tower, starting at the north leg and counting clockwise. Features were excavated either in full or in half section, then photographed and recorded following standard archaeological recording methodology. Spatial information was recorded using a hand held GPS with an error of  $\pm$  5 m, as well as scaled hand drawings using both GPS points and permanent onsite markers references. All spatial information was uploaded to the project GIS. A number of charcoal samples were retained for dating and analysis.

### Results

During monitoring prehistoric gardening soils and six archaeological features were identified. The features were three postholes and three firescoops. No artefacts or midden were recovered. Charcoal samples were recovered from all of these features.

Seven pre-European Maori archaeological features were uncovered during the investigation.

#### *Firescoops*

Features 4, 5 and 6 were firescoops isolated within a 2.5 x 2.5 m excavation at Tower A 0190, Footing 2 (Figure 3). The features were excavated in half section; Feature 5 was a long thin sub rectangular scoop which ran into the south western baulk of the hole and was not exposed completely (Figure 4). Excavated material from all three firescoops was sampled for charcoal analysis.

Feature 4 was a round, bowl shaped firescoop containing charcoal and occasional heat fractured fragments of rock, measuring 600 x 450 mm x 110 mm deep.

The exposed part of Feature 5 measured 700 x 1510 x 70 mm deep, but the full length could not be determined. It contained charcoal and occasional heat fractured fragments of rock.

Feature 6 was bowl shaped firescoop containing charcoal and fire cracked rock, although it was larger than Feature 4 and deeper, measuring 890 x 905 mm x 210 mm deep. It had a reddish-pink base below the charcoal stained fill, evidence of burning.

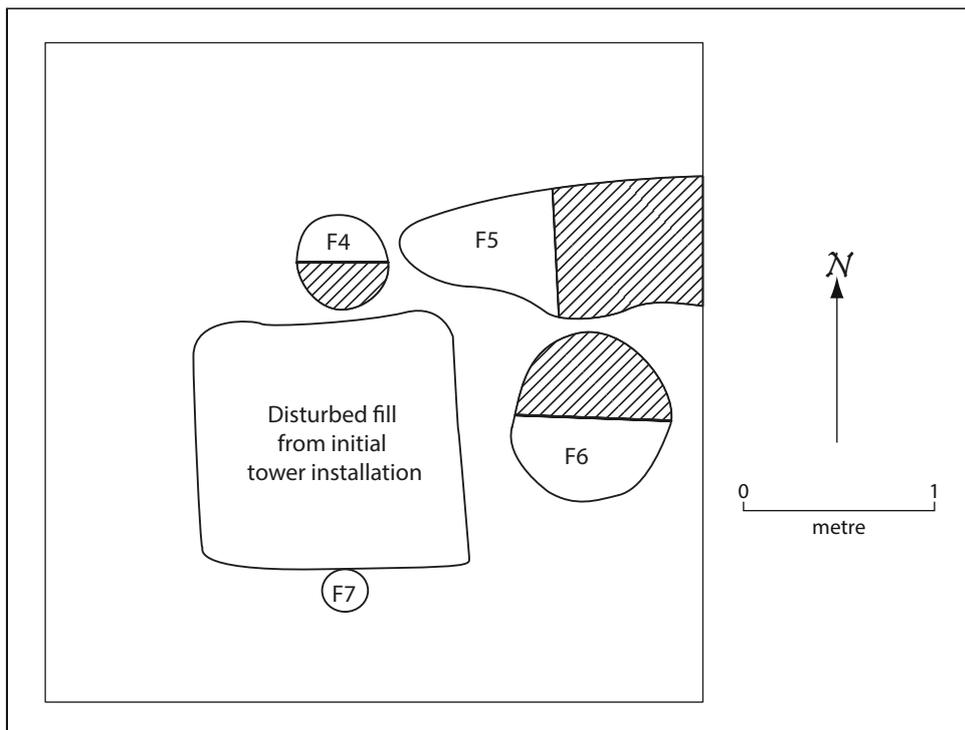
#### *Postholes*

Four postholes were exposed during the monitoring of the site, two at Tower C 0180, one at Tower A 0190, and one along the track cut for machinery access.

Feature 7 was a posthole found near the three firescoops at Tower A 0190, Footing 2 (Figure 4), with a charcoal stained fill, measuring 280 x 200 mm x 220



3. Features 4, 5 and 6, excavated in half section, facing east. Scale = 1 m.

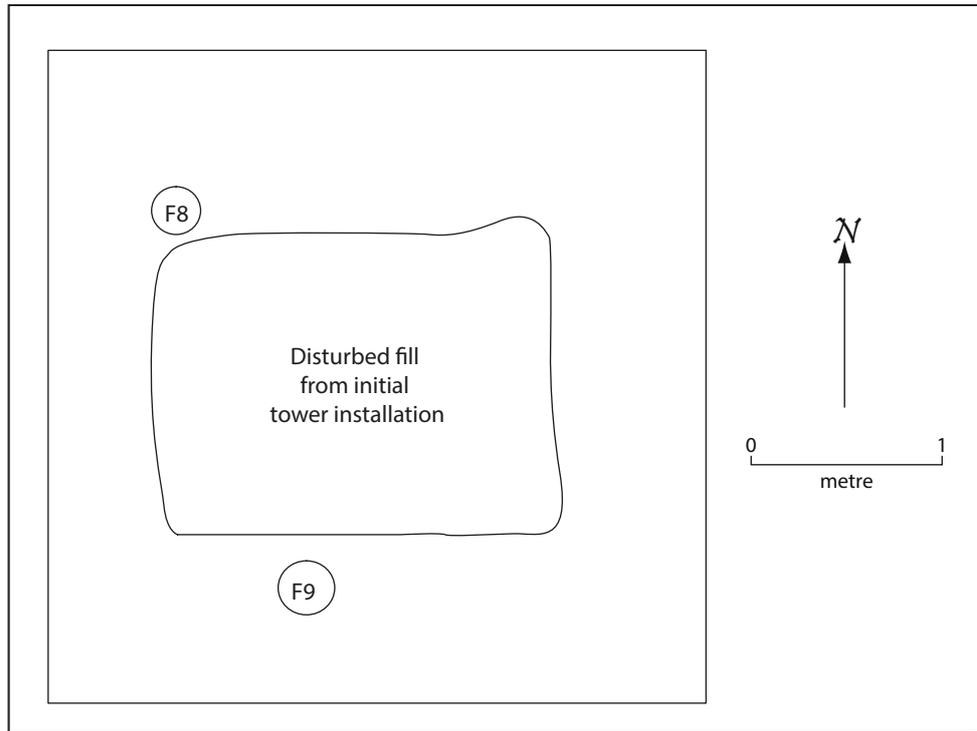


4. Plan of the archaeological features found at Tower A 0190, Footing 2.

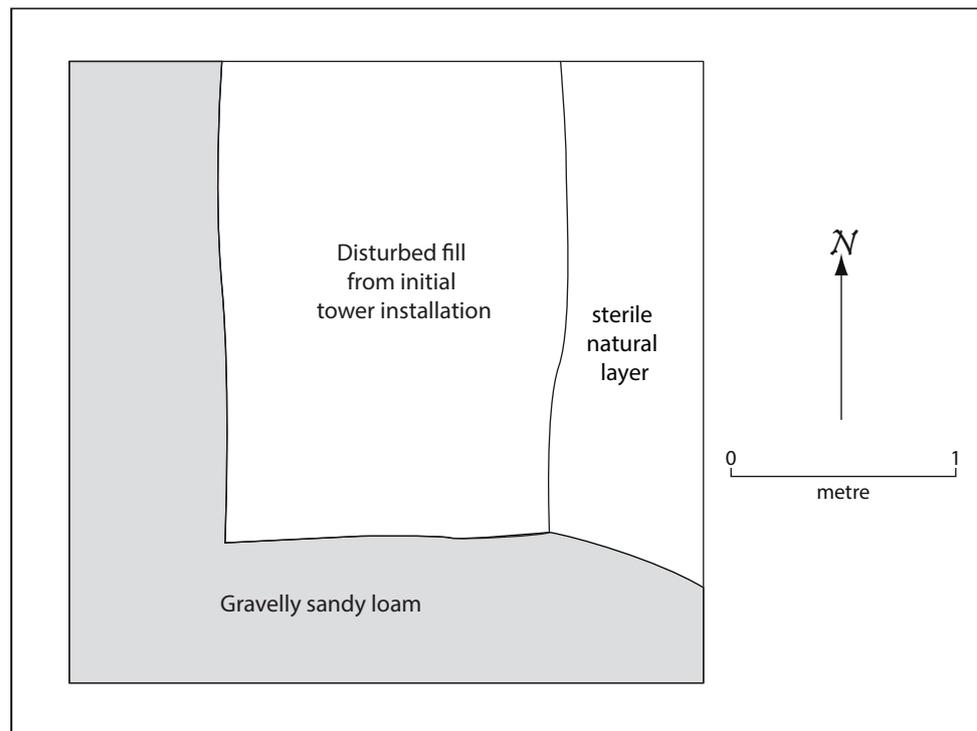
mm deep. Feature 8 and 9 were postholes found at Tower C 0180, Footing 3 (Figure 5). Feature 8 measured 150 x 140 mm x 400 mm deep; Feature 9 measured 250 x 250 mm x 130 mm deep

#### *Gardening soils*

In the north and west of Tower A 0190, Footing 1, Tamahere sandy gravelly loam was exposed (Figure 6). The same soils were found during the 2014 works by



5. Plan of the archaeological features found at Tower C 0180, Footing 2.



6. Plan of the garden soil found at Tower A 0190, Footing 1.

Gumbley and Hutchinson. Borrow pits nearby and around the pa indicate that sands and gravels had been used to modify the natural soils gardens. The site is likely to have included a substantial garden northeast of the pa, from Tower A through to Cambridge Road, and toward the borrow pits recorded nearby (S15/676 and S15/606).

## Charcoal

Charcoal samples from three firescoops (Features 4, 5 and 6) were submitted to Dr Rod Wallace of the Anthropology Department, University of Auckland, for species identification and environment reconstruction (Appendix A). The samples indicate a tawa and matai dominated broadleaf podocarp bush was present locally.

## Chronology

A sample of charcoal (*Coprosma* sp.) from Feature 5 was submitted to the University of Waikato Radiocarbon Laboratory for radiocarbon dating. The results provided a bimodal distribution, with one mode from cal AD 1510–1580 and one from 1620–1670 at a 68% confidence interval (Table 2). Both date ranges are roughly equally likely. However, when comparing the dates to Gumbley and Hutchinson’s two dates for the same site, it appears that Feature 5 is earlier. It is notable that Feature 5 charcoal indicated a mixed podocarp broadleaf forest, while Gumbley and Hutchinson’s charcoal included tawa but also small shrubs such as Hebe. Our interpretation is that Feature 5 represents the first incursion into this area in the mid-16th century (the first peak in the date), when large stands of ‘virgin’ bush still stood, while the features dated by Gumbley and Hutchinson are about a century later (the first peaks in their dates) when large trees still stood nearby but secondary growth shrubs were also common. In other words, a century of gardening had changed the landscape.

Lab No.	$\delta^{13}\text{C}$	CRA BP	cal AD 68%	cal AD 95%
Wk 43693	$-36.9 \pm 2.4\text{‰}$	$302 \pm 20$	1520–1540 1620–1660	1510–1580 1620–1670
Wk 38946	$-33.3 \pm 3.3\text{‰}$	$272 \pm 27$	1630–1680 1740–1760 1780–1800	1510–1540 1620–1680 1730–1800
Wk 38947	$-33.6 \pm 2.9\text{‰}$	$274 \pm 25$	1630–1670 1780–1800	1510–1540 1620–1680 1730–1800

Table 1. Radiocarbon dating result (Wk 43693), compared to Gumbley and Hutchinson’s dates (Wk 38946 and 38947).

## Discussion and conclusion

This small scale investigation, along with Gumbley and Hutchinson’s (2014) investigation, of S15/68 indicates that the site was occupied in the 16th and 17th centuries by a group of highly skilled gardeners, typical of pre-European Maori communities in the Waikato. The early occupation was cut into virgin bush in the 16th century, and probably predates the pa, while the later date is more likely to be associated with the pa.

## Site damage

The defensive ditches of the pa and neighbouring borrow pits have been heavily disturbed due to farming, Cambridge road installation, work by Fonterra in 2012 for a service line, the velodrome and associated infrastructure, Te Awa Cycleway

and similar small projects, and the three transmission towers. The 1940 aerial photographs show the pa was protected by two main ditches that are, apart from a south western portion of one of them, no longer visible. The deepest portions are likely to have been filled and will survive. Should these ditches have had associated banks (which is highly likely) these have been removed, probably due to ploughing.

#### *Site use and function*

The 2014 works by Gumbley and Hutchinson provided evidence that S15/68 was used for cooking and food storage. The results from the current work supported this interpretation, although about a century earlier, indicating continued, though not necessarily continuous, occupation. Neither excavation discovered any faunal remains, but the extent of excavation is small. Despite this, it appears that gardening and cooking were carried out from an early (16th century) date, and that these activities continued as the pa was developed.

#### **References**

- Gumbley, W. and M. Hutchinson 2014. Te Awa Cycleway – Cambridge to Velodrome: archaeological investigations on S15/68, S15/669, S15/676, S15/680. Unpublished W. Gumbley Ltd report to Te Awa Trust.
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- Petchey, P. 2013. The industrial archaeology of power: the gold mining industry's search for power and the development of early hydro-electric generation in New Zealand. In M. Campbell, S. Holdaway and S. Macready (eds) *Finding our Recent Past: Historical Archaeology in New Zealand*, 191–212. New Zealand Archaeological Association Monograph, 29. New Zealand Archaeological Association Monograph, Auckland.
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## APPENDIX A CHARCOAL ANALYSIS

### Introduction

3 charcoal samples from excavations at site S15/68, Cambridge, were submitted for identification and C14 dating sample extraction. The results are given below.

#### S15/68 – Feature 6

Mahoe	4
Towai/Tawheowheo	2 ( <i>Weinmannia</i> or <i>Quintinia</i> )
Tawa	5
Tawa seed	1
Matai	5
Kauri	1

NB. The Tawa seed was separated out as a 0.1 gram C14 dating sample.

#### S15/68 – Feature 4

Mahoe	1
Tawa	20

NB. The small diameter stem of Mahoe was separated out as a 0.09 gram C14 dating sample.

#### S15/68 – Feature 5

Coprosma	15
Mahoe	1
Tawa	3
Matai	2

NB. The small diameter Coprosma was separated out as a 2.3 gram C14 dating sample.

### Discussion

The samples indicate tawa and matai dominated broadleaf podocarp bush was present locally.

Species	# pieces	Plant type
Coprosma	15	Shrubs
Mahoe	6	
Towai/Tawheowheo	2	Broadleaf trees
Tawa	29	
Matai	7	
Kauri	1	Conifers
Total	60	

#### Summary of Charcoal Results



## Radiocarbon Dating Laboratory

Monday, 27 June 2016

### Report on Radiocarbon Age Determination for Wk- 43693

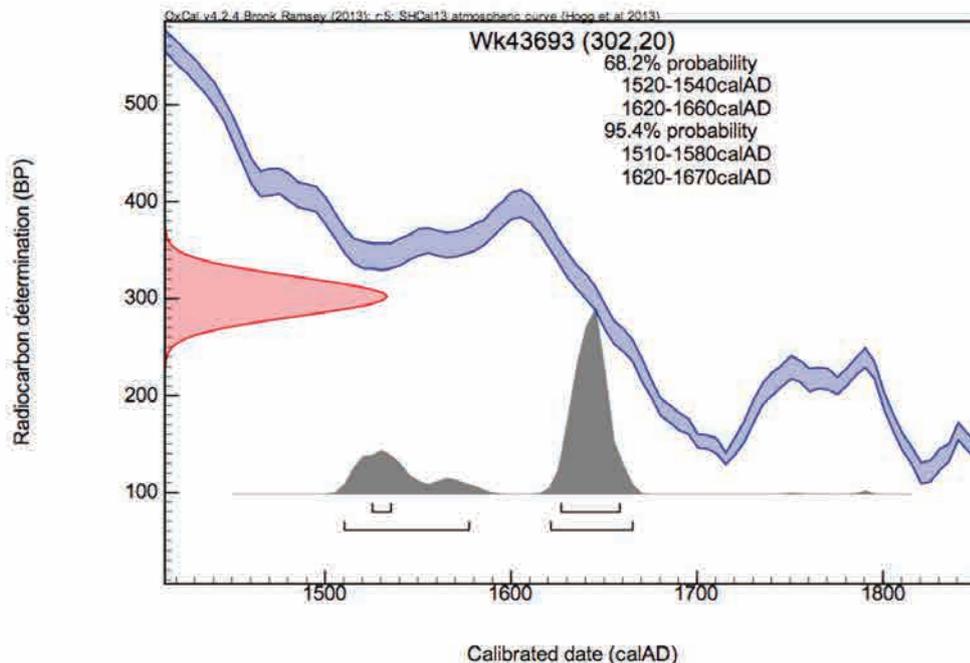
<b>Submitter</b>	M Campbell
<b>Submitter's Code</b>	S15/68 Feature 5
<b>Site &amp; Location</b>	,
<b>Sample Material</b>	Charcoal
<b>Physical Pretreatment</b>	Sample cleaned.
<b>Chemical Pretreatment</b>	Sample washed in hot HCl, rinsed and treated with multiple hot NaOH washes. The NaOH insoluble fraction was treated with hot HCl, filtered, rinsed and dried.

D<sup>14</sup>C                    -36.9 ± 2.4 ‰  
F<sup>14</sup>C%                    96.3 ± 0.2 %  
**Result**                    **302 ± 20 BP**

( AMS measurement )

#### Comments

Please note: The Carbon-13 stable isotope value ( $\delta^{13}\text{C}$ ) was measured on prepared graphite using the AMS spectrometer. The radiocarbon date has therefore been corrected for isotopic fractionation. However the AMS-measured  $\delta^{13}\text{C}$  value can differ from the  $\delta^{13}\text{C}$  of the original material and it is therefore not shown.



- Explanation of the calibrated Oxcal plots can be found at the Oxford Radiocarbon Accelerator Unit's calibration web pages (<http://c14.arch.ox.ac.uk/embed.php?File=explanation.php>)
- Result is *Conventional Age or Percent Modern Carbon (pMC)* following Stuiver and Polach, 1977, Radiocarbon 19, 355-363. This is based on the Libby half-life of 5568 yr with correction for isotopic fractionation applied. This age is normally quoted in publications and must include the appropriate error term and Wk number.
- Quoted errors are 1 standard deviation due to counting statistics multiplied by an experimentally determined Laboratory Error Multiplier.
- The isotopic fractionation,  $\delta^{13}\text{C}$ , is expressed as ‰ wrt PDB and is measured on sample CO<sub>2</sub>.
- F<sup>14</sup>C% is also known as *Percent Modern Carbon (pMC)*.

*F. Patten*