

**Archaeological investigation of sites T12/172 and  
T12/173, Pt Whakatete No 3 Block,  
Ngarimu Heights, Thames Coast**

**report to  
The New Zealand Historic Places Trust  
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Prepared by:

*Andrew Hoffmann*  
.....  
Andrew Hoffmann

Reviewed by:

*M.C. Campbell*  
.....  
Matthew Campbell

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**CFG**  
HERITAGE

CFG Heritage Ltd.  
7 Plunket Terrace  
Hamilton  
ph. (07) 856 4877  
andrew.h@cfgheritage.com

# Archaeological investigation of sites T12/172 and T12/173, Pt Whakatete No 3 Block, Ngarimu Heights, Thames Coast

Andrew Hoffmann

The excavation of sites T12/172 and T12/173 at the Ngarimu Heights subdivision, Thames, Pt Whakatete No 3 Block, was carried out over seven days between 28 June and 4 July 2007. This investigation was carried out under authority No.2006/190 issued by New Zealand Historic Places Trust under section 14 of the Historic Places Act 1993.

Both sites were initially recorded by Larryn Diamond in 1977 as part of a larger archaeological survey of the Thames–Manaia Coast (Diamond 1981). They were identified as exposures of midden deposits on the slopes of the two spur ridges located in this block. Along with these midden deposits Gumbley (2005) identified terraces at T12/172. Much of that site, however, spans the No 3 Block's southern boundary and only the low terrace portion of this site was subject to the current investigation. At T12/173 Gumbley (2005) also identified a rectangular pit on the spur crest and a large flat natural slip terrace forming the terminus of the spur was thought to preserve other archaeological features. The entirety of site T12/173 is within the Pt Whakatete No 3 Block and was investigated in whole. As a result, the bulk of this report relates to the investigation of T12/173. Diamond identified two further midden sites in No 3 Block, T12/171 and T12/174. The former was described as a midden deposit damaged by tree root growth in 1977. This site was not re-located by Gumbley in 2005. T12/174, located on the south bank of the Pupurakau Stream, was identified by Gumbley but was considered to be a part of T12/173 (Gumbley 2005) and is reported as such here.

Middens, often associated with pits and terraces as at T12/172 and T12/173, are the most common class of archaeological site along the Thames Coast, and are also a common site type across Coromandel Peninsula. The investigation of T12/173 provided an opportunity to compare the nature and chronology of the settlement of this ridge top site with similar excavated sites on the Peninsula (Crosby et al. 1987; Furey 1987a, 1987b; Gumbley 1998; Leahy 1970, 1972; Phillips 1997).

## Environment and landscape

The sites were located at Ngarimu Bay approximately 7.5 km north of Thames, approximately halfway between Tararu and Te Puru townships (Figure 1). Along this part of the Firth of Thames the land generally slopes steeply down to the sea with little development of a coastal platform. The largest areas of coastal flats are at Tararu and Te Puru, where significant alluvial fans have developed at the mouths of the streams of the same names. This coastal environment contrasts with that present on the northern and eastern side of the Coromandel Peninsula, where well

developed bays, harbours and estuaries are present along with expanses of flat to moderately sloping coastal land.

At Ngarimu Bay a minor coastal platform has developed and the coastal relief across the seaward portion of the block is more moderate than over most of the adjacent coastline. From State Highway 25 the terrain of the north west portion of the block rises moderately in an easterly direction until reaching the toes of two ridges. Manuka and kowhai cover the slopes of both ridgelines. The majority of No 3 Block has been cleared in the past and was under long grass at the time of this investigation. A minor ephemeral creek runs through a steep gully in approximately the centre of the block separating the two ridges. The Pupurakau Stream is a perennial watercourse and marks the eastern boundary of No 3 Block. Large stream boulders and quantities of smaller rubble are present in the topsoil adjacent the stream, indicating this lower lying area has been subject to flood events in the past. Evidence of slips are also visible above the toes of the two ridges.

## T12/172

The toe of the ridge line on which T12/172 was located rises from the south west corner of No 3 Block, south of the ephemeral creek line (see Figure 2). The slopes of this ridge rise to the south east and the majority of the terraces and possible pit features associated with this site lie above 20 m ASL, on the crest of the ridge beyond the block's southern boundary line. The part of T12/172 that was investigated lay between 10 and 15 m ASL, just above the toe of the ridge. Two terraced areas were investigated, designated Areas F1 and F2 (note these terraces were labelled H and I respectively in Gumbley 2005). Area F2 is a terrace approximately 15 x 7 m, while Area F1 is a smaller terrace, approximately 8 x 9 m, which lay immediately downhill from Area F2.

## T12/173

Site T12/173 is located on the crest of the ridge north of the ephemeral creek and south of the Pupurakau Stream. Four areas were excavated, Areas A–D. Areas A, B and C are located along the ridge crest between 35 and 50 m ASL (see Figure 2). Area A is the uppermost part of the site and lies along the flat crest of the ridge. A single pit, measuring approximately 5 x 3 m prior to excavation, was visible on the ground at the northern end of Area A prior to excavation. Testing with a screw-type soil auger indicated the pit had 550 mm of fill in it. This was the only visible surface feature, other than shell midden, visible across the entire site prior to excavation. Area B was an approximately 15 m wide band of midden deposit covering

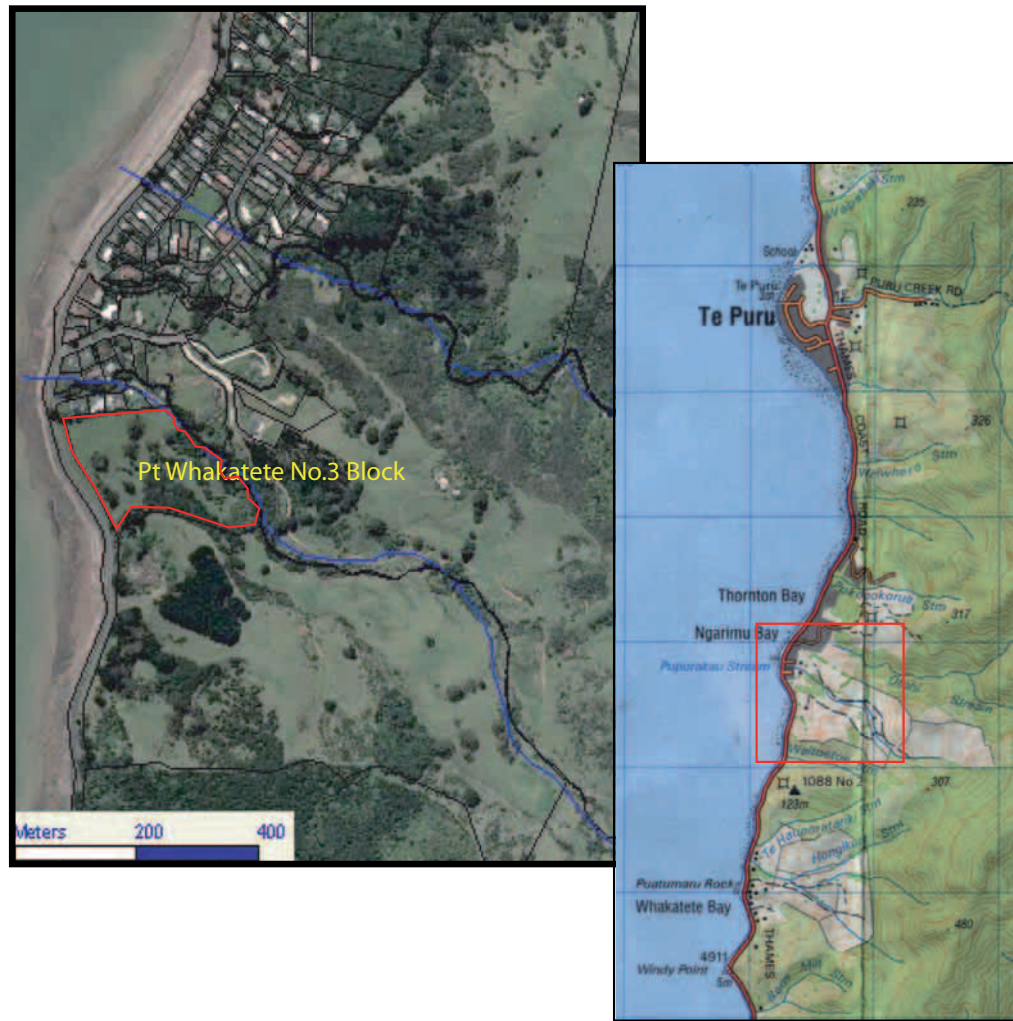


Figure 1. Location of Pt Whakatete No 3 Block at Ngarimu Bay, Thames Coast.

the slopes of the ridge below Area A. Area C was the flat slip terrace, approximately 10 m wide by 16 m long, situated below Areas A and B. The Area D midden deposit is at approximately 15 m ASL at the toe of the ridge, adjacent the Pupurakau Stream flood plain. This was the part originally recorded by Diamond. The midden there was probed and estimated to cover approximately 300 m<sup>2</sup>.

#### Excavation method

A mechanical excavator was used to strip the turf from the excavated areas. Following topsoil stripping from each area the exposed surfaces were cleaned down using hand tools (shovel and trowel). All potential features were marked and subsequently excavated by hand. The spatial extent of Areas A, B and C were chosen such that they covered the terminal end crest of this ridge line, equating to all land surfaces potentially suited to pre-European Maori occupation. A 2 x 10 m trench was stripped across a portion of Area D. A similar sized trench was stripped across

Area F2 and the flat portion of Area F1 was completely exposed.

A self-tracking robotic total station (Leica 1205) was used to plot the relative positions of each designated area and of the archaeological features identified and excavated within them. A separate paper record of the dimensions and attributes of each feature was also kept. The locations of each stone flake were individually plotted on the survey plan. Single obsidian flakes were bagged and numbered individually, while associated groups of flakes were numbered and bagged as a group. Features were photographed with a digital camera before, during and after excavation.

Samples of the midden deposits in T12/173 Areas B and D were taken. In Area B, three 1 m squares were excavated and a 10 litre sample was retained from each square. In Area D, a single 1 m square was excavated and one 10 litre sample was retained. During the excavation of these sample squares, identifiable charcoal pieces were retained and bagged separately. The 10 litre midden samples were wet sieved through 5 mm mesh and analysed and recorded.



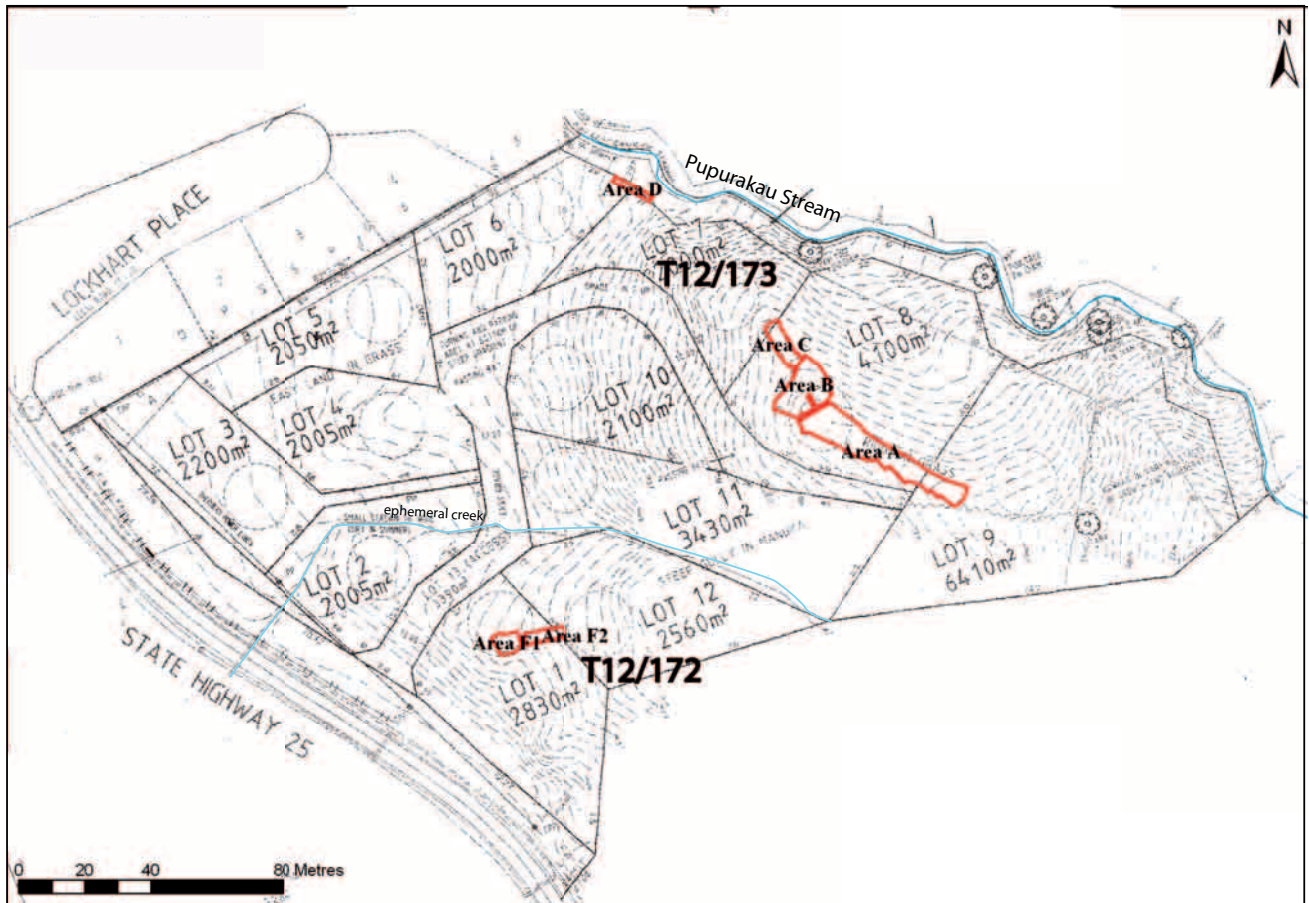


Figure 2. Investigated areas of T12/172 and T12/173 overlaid on topographic plan of Pt Whakatete No 3 Block.

Shell and charcoal from the floor of the larger pit feature in Area A were also retained. The charcoal samples were analysed by Dr Rod Wallace (Anthropology Department, University of Auckland). A selection of the shells from the 10 litre midden samples and from the pit feature were processed and radiocarbon dated by the Waikato Radiocarbon Laboratory. In T12/172 Area F2 a deposit of 19th century European material was identified and collected, cleaned and sorted according to type.

**Excavation results**

The excavation of T12/173 Areas A, B and C constitutes a complete investigation of the timing and phases of settlement of the ridge crest, and of the types of activities undertaken there throughout the site’s occupation. The majority of features and artefacts were concentrated across Areas A and B, and at least two phases of occupation were evident. A preserved portion of a stone-working/house floor was discovered in Area A and contained a high concentration of chert stone working debitage on its surface. Area B was predominantly a midden deposit and a number of fire scoops were identified. Area C revealed very little evi-

dence of any associated occupation across the slip terrace. Area D was disturbed by recent dumping activities and past river bank flood events. A single obsidian waste flake was recovered from T12/172 Area F1, and the investigation of Areas F1 and F2 revealed no features related to pre-European occupation. The only feature present across the investigated portion of T12/172 was an incinerated deposit of domestic historic material, which indicated a 19th century house site in the vicinity.

The natural stratigraphy across both sites was simple: a thin (100–150 mm) topsoil of greyish-brown clay loam overlay a very weathered and cracked yellow clay subsoil; the cracks formed in the clay were infilled with topsoil. A small (approximately 30 m<sup>2</sup>) area of tephra deposit was identified and mantled a portion of the ridge crest within Area A. Approximately 500 mm deep, the restricted area of tephra deposit was interpreted as having formed through an air fall tephra having infilled a minor depression in the ridge crest. The preserved portion of a stone-working/house floor discovered in Area A was on this tephra surface.

A complete catalogue of the excavated features is given in Appendix A. Dimensions and other details omitted in the comments below are provided in the appendix.

#### T12/173 Area A

##### Feature 1

A small (900 x 1100 mm), roughly rectangular and shallow (250 mm deep) feature was located approximately in the centre of Area A (Figure 5). The sides of the feature and its floor were irregular. The south east side had been extended wider and is out of proportion to the other sides. Its size, only 1.2 m<sup>2</sup>, indicates it is not a typical rectangular kumara storage-pit. No artefacts were present in the dense clay fill, and no post holes or other features were present on the pit floor. This feature is similar to Feature 2a identified at site T10/753, Whangapoua Beach (Gumbley, in preparation) both in dimension but also in the association of a drain extending from one of the sides. A tentative interpretation of them as drain sumps or similar seems to be viable.

##### Features 2 and 3

These two features comprise parallel linear channel-like features present along the higher, eastern end of Area A. They were either modern channels created by vehicle tyres or are older water channels. A single water-worn chert flake was recovered from the fill of Feature 2. No other clear archaeological features are related to them and it is not possible to adequately relate them to any archaeological occupation at the site. A similar set of two linear features was evident across the eastern side of Area B (Feature 25).

##### Feature 9

Feature 9 was a pit located at the north west end of Area A and was the only storage pit present at either site. The excavation of this feature was considerably hampered by the effects of rainy weather on the heavy local clay. Moreover, the cracked natural sub-soil clays, in-filled with topsoil,



Figure 3. T12/173 Area A showing location of archaeological features.



Figure 4. T12/173 Area A showing distribution of artefacts. Area B also shown.



Figure 5. T12/173 Area A Feature 1.



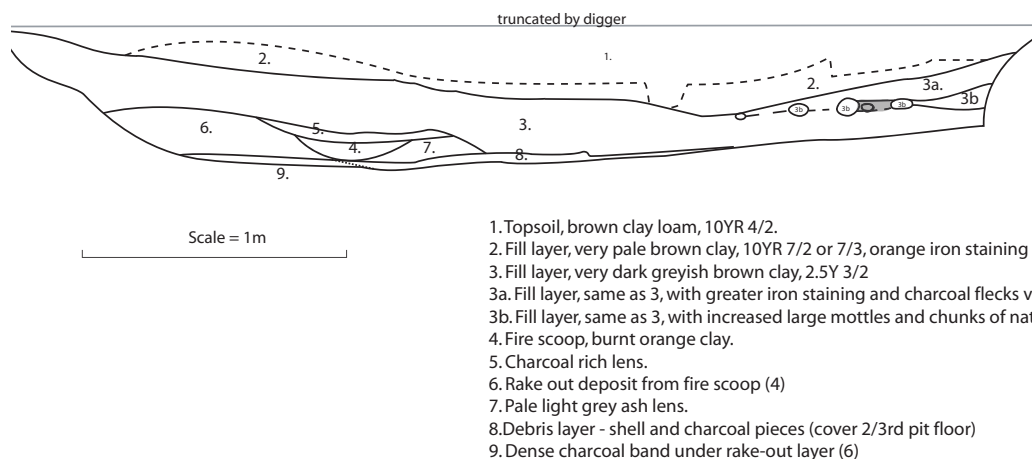


Figure 6. Profile of Feature 9 showing fill layers and areas of cooking related burning.



Figure 7. Feature 9 in half-section. Note the shell floor across far side (south) of exposed pit floor. The bulk of the charcoal deposit (Layer 9) across near side of exposed pit floor had been excavated at the time of photograph.

made precise definition of the pit sides difficult. Feature 9 was approximately 3800 x 2200 mm in plan, and 450–550 mm deep. The sides of the pit were not straight and the floor surface was uneven, both attributes are most likely to be the result of digging into these clays with the available pre-European technology. Feature 9 was initially excavated in half-section. Figure 6 shows the fill layers drawn in profile.

Two post holes were present along the centre of the floor, one was filled with a single stone cobble, the other in-filled with clay clods. Care was taken during excavation

to detect the presence of drains on the pit floor but none were found.

On top of and pressed into the clay floor, and covering about two thirds of it, was a layer of pipi (*Paphies australis*) and charcoal (Layer 8) that may have been deliberately laid to improve drainage (see Figure 6). Alternatively, the shell and charcoal deposit are a debris surface relating to a cooking/fire place excavated on the pit floor and associated with the dense band of charcoal visible along the western edge of the floor (Layer 9). The centre of the cooking/fire place was located in the excavated half-section of Feature 9 and



associated with Layer 9. The cooking/fire place left a distinct burnt orange/red clay at the centre of burning. Layers 6 and 7 were raked out deposits of ash and fragmented burnt shell, between 150–250 mm thick, and presumably related to the cooking/fire place aforementioned. Layers 4 and 5 relate to a later fire scoop which was cut through the rake out deposits Layer 6 and 7. Several obsidian and chert flakes were also recovered from the pit floor.

After it had been used for cooking the pit was deliberately part filled (Layer 3). Layers 3a and 3b are fill lenses of dark greyish brown clay and marked by the presence of clods of the natural yellow clay sub-soil, and are part of the same fill episode. At the eastern end of the pit Layer 3 included numerous rounded cobbles as well as some preserved green lip mussel (*Perna canaliculus*) periostracum (skins). Layer 2 was also a deliberate fill layer of pale brown clay.

Layer 1 was the topsoil that had naturally filled the pit.

#### Features 10 and 14

The base of a fire scoop, Feature 10, approximately 800 mm in diameter and 200 mm deep, was cut into the clay natural clay. A post hole, Feature 14, was present adjacent to the fire scoop which contained a flaked chert core within the topsoil fill.

#### Features 7, 11, 13, 59–65 and 68

An approximately 20 m<sup>2</sup> area of compacted tephra soil was identified in association with a high-density of chert cobble flaking debris, several obsidian flakes, a large (400 x 500 x 150 mm thick) flat stone slab (Figure 8), two fire

scoops (Features 11 and 13) and seven post holes (Features 59–65). The compacted nature of the tephra surface is interpreted as being formed by treading/trampling and is consistent with its having been an occupation surface. The density of stone waste flakes across this surface indicates stone working activities occurred in the immediate area. The hearth features and post holes further suggest household domestic occupation across this surface. This living surface was preserved under a clay cap which had evidently been dumped there during the original excavation of Feature 9 (adjacent to it). The clay cap peeled off the compacted tephra soils during stripping, and left the stone flaking debris readily visible on the surface of the tephra. The tephra was trowelled down and the flaking debris was recovered up to approximately 50 mm below the initially exposed tephra surface, indicating slight downward movement of the artefacts, probably related in part to repeated walking over the surface.

The complete sample of the worked stone included 158 chert/chalcedony flakes and waste flakes, a sandstone abradier, five obsidian flakes and two small quartz crystals.

The stone working floor was probably part of a wider living surface which incorporated the rest of the Area A ridge crest. Clearly, however, only the portion under the clay cap was well enough preserved, or perhaps more correctly, easily enough identified given the stripping method employed; immediately outside the clay cap's boundaries the density of stone material was much less, or the stone material was not recognised within the topsoil when it was stripped back to expose the sub soil. The recovery of the



Figure 8. Stone working-floor in Area A.

flaked chert core within the post hole (Feature 14) adjacent to the fire scoop (Feature 10) is at least suggestive of a continuation of stone working activities across the north west end of Area A. The association of stone-working, post holes and fire scoops, is interpreted here as indirect evidence of the presence of house structures across this portion of Area A.

*T12/173 Area B*

Area B consisted entirely of shell midden deposit between 60 and 100 mm thick. A concentrated area of cooking activity was clearly evident across the south east (high) portion of Area B where eleven fireplace features were present and arranged close together (Features 19, 22, 32, 33, 35, 38, 39, 44, 48, 47 and 50). The charcoal staining of the clay subsoil was noticeably greater across this area than the remaining portions of Area B. A number of these fireplaces contained cooking stones and several more stones were present on the moderate eastern slopes in this area. An alignment of four or five postholes ran down the slope of Area B immediately to the west of the concentrated area of fireplaces, probably a wind break to deflected the south west winds and protected the cooking hearths.

Another five fireplace features and a single cache of cooking stones were identified outside this concentrated cooking activity area. Five flakes of obsidian, one flake of chert and two quartz crystals were recovered from within the midden. The location of these finds is shown in Figure 4.

Feature 25 was a pair of linear features similar to Features 2 and 3 in Area A and are either water channels or recent vehicle tracks.

*T12/173 Area C*

No artefacts were identified across this portion of the site. A total of five postholes were identified and were all located in the upper (southern) half of this area (Figure 10). It is not possible to determine any functional relationship between these post-holes. Indeed, the lack of features was surprising.

*T12/173 Area D*

The midden deposit across this area relates to cooking activities in the vicinity, however, the shells had been re-deposited by flood events of the Pupurakau Stream. Two modern disturbance areas were visible in the exposed sur-

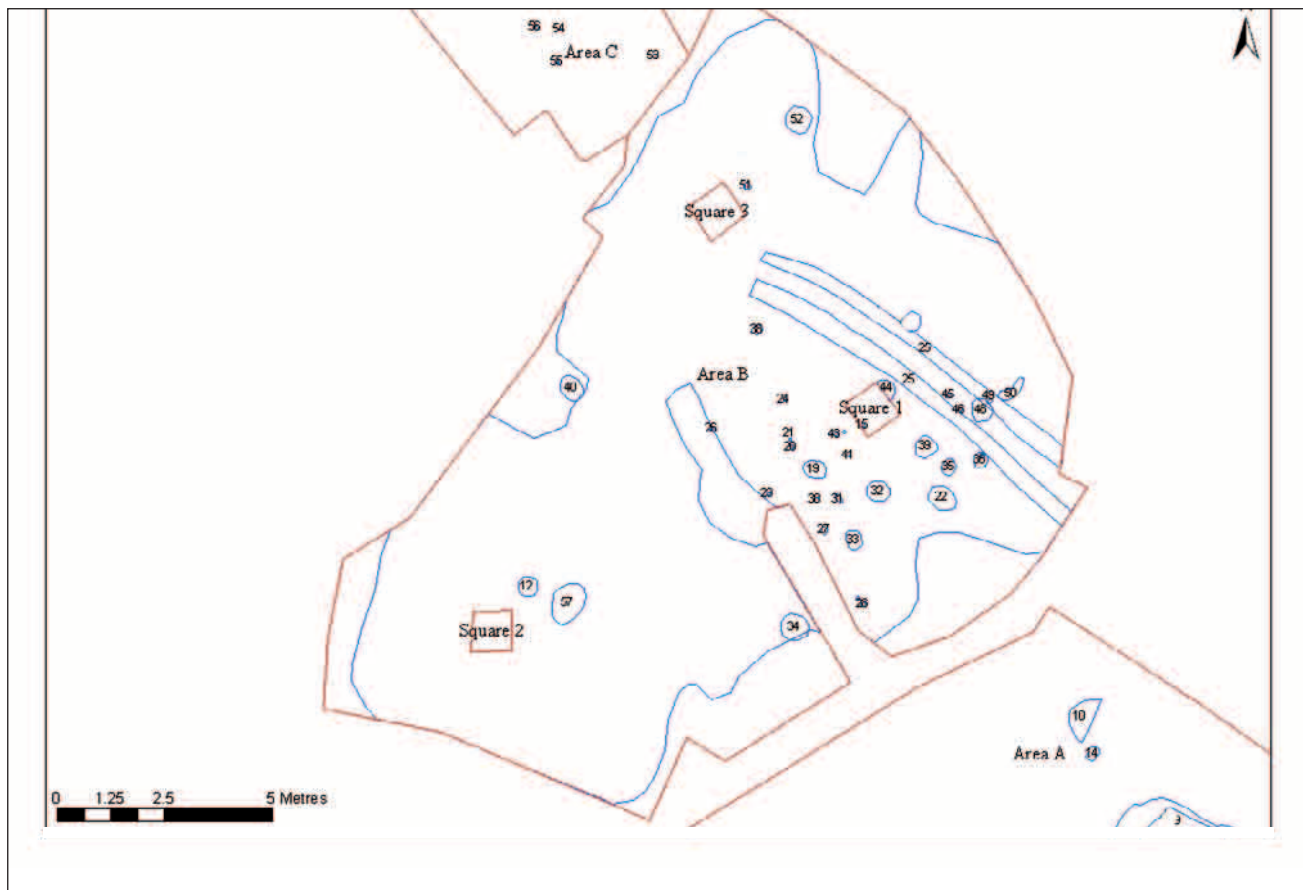


Figure 9. T12/173 Area B showing location of identified features.

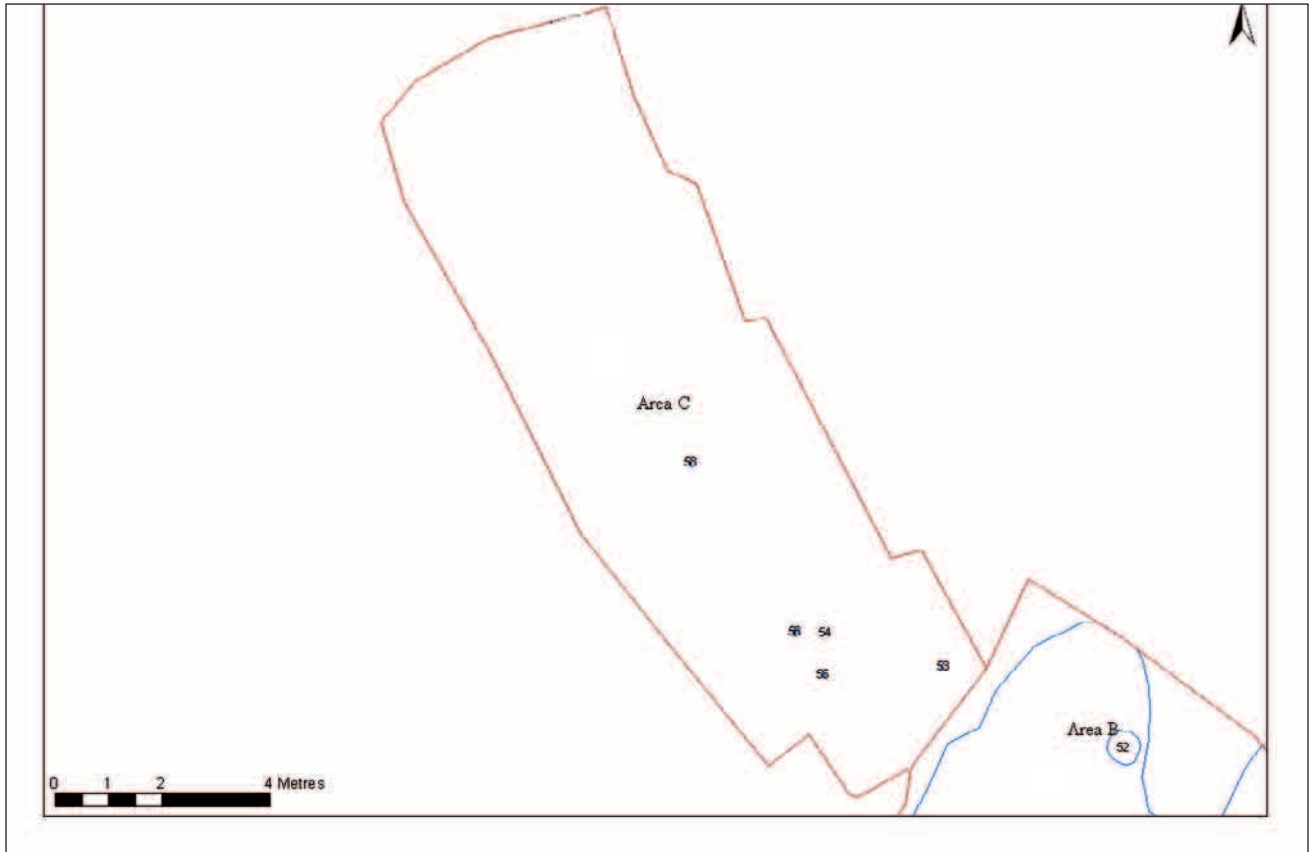


Figure 10. T12/173 Area C showing location of identified features.

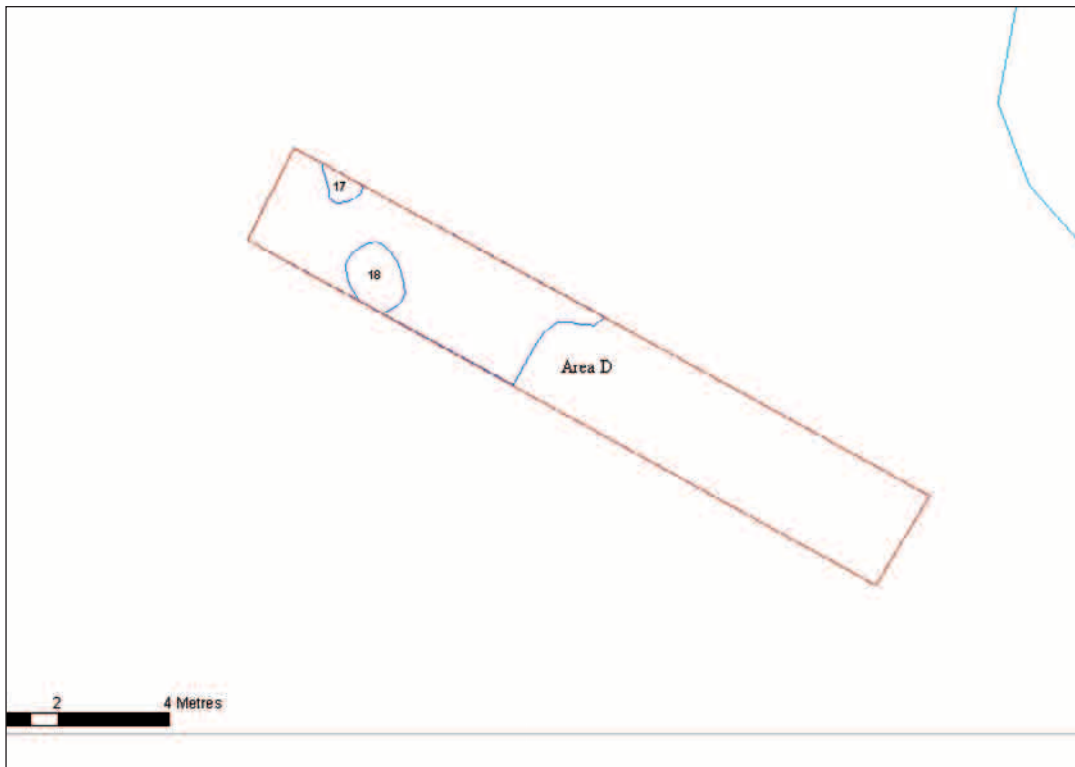


Figure 11. T12/173 Area D showing location of identified features.

face and related to dumping of modern refuse (Features 17 and 18). A sample of this midden deposit was taken for radiocarbon dating to establish the relationship in the chronology of occupation of this area adjacent to the Pupurakau Stream with the ridge crest above.

#### T12/172 Areas F1 and F2

No features were identified across Area F1. A scatter of late 19th century material (Feature 16) was recovered from Area F2 (Figure 12). Much of the historic material had been affected by fire/heat and it is likely it are the remains of an incinerated rubbish pile.

#### Pre-European Maori artefacts

A single small fragment of a ground adze was recovered from Area A. The stone has been identified as Tahanga basalt (Marianne Turner pers. comm.). Otherwise all of the other artefacts were associated with the making and use of flake tools.

Obsidian flakes were found scattered across Areas A, B and D. Six were recovered from the Area A surface outside of the preserved stone-working/house floor, five from Area B, and two from Area D. Another five flakes

were recovered from the floor of the rectangular storage pit (Feature 9) in Area A, and a further five were present on the preserved stone-working/house floor in Area A. A single obsidian flake was recovered from T12/172 Area F1. Of the 25 flakes of obsidian recovered during this investigation, eighteen were a transparent green colour typical of the Mayor Island source, and the other six were banded grey colour and probably originate from the Coromandel Peninsula east coast, or possibly Great Barrier Island. Two of the Mayor Island flakes, one each from Areas B and D, showed edge wear consistent with use and are shown in Figure 13.

The chert/chalcedony flaking debris recovered from the preserved stone-working floor (Area A) consisted of 144 flakes, many with cortex visible and ranging in size from 150–200 mm<sup>2</sup> down to less than 10 mm<sup>2</sup>. Fourteen of the flakes had definite bulbs of percussion. Of the latter only seven were well formed flakes longer than 50 mm and potentially classed as tools, the others are waste flakes. Chert naturally ranges in colour, and the colours of the chert material from the stone-working floor suggested waste from between one and three separate cobbles was present there (Figure 14). No cores were present

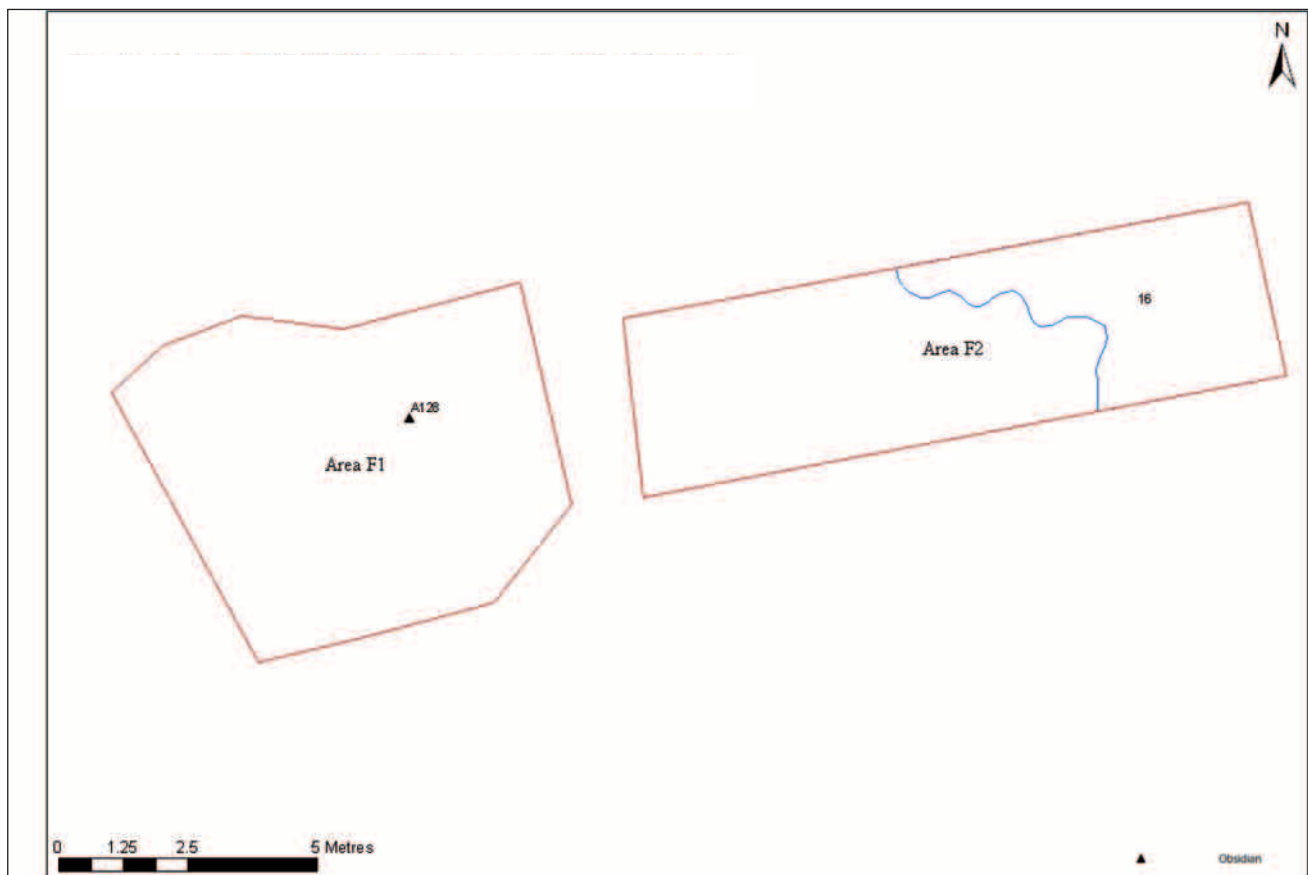


Figure 12. T12/173 Areas F1 and F2 showing location of identified features and artefacts.



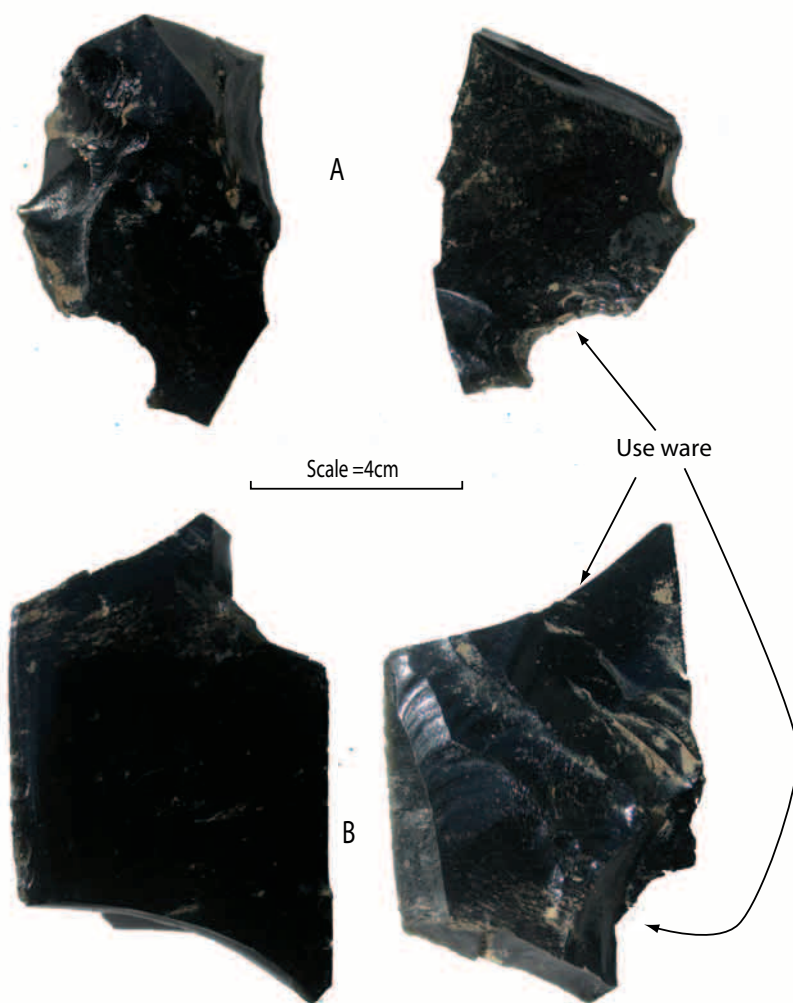


Figure 13. Obsidian flakes showing edge wear.

on the working floor. A chert chip with cortex and a chert waste flake were also recovered from the floor of Feature 9. The colours of this material were very similar to the chert found on the tephra surface. A large chert waste flake was found at Area D along with another red jasper waste flake.

A fragment of a sandstone abrader was also found on the stone working floor (Figure 16). Three sides had been ground to a slightly concave, almost flat, surface. This fragment appears to have broken from over-use: two deep ground grooves are present on the 'upper' and 'lower' surface and the fractured edges seem to approximately follow this line.

A single fragment of a quartz cobble with cortex was found on the preserved stone working/house floor surface in Area A. It is difficult to draw any interpretations from this artefact, however, it is possible that the fragment is flake waste off a larger quartz cobble. The discovery of

another complete quartz cobble on the preserved stone-working floor further suggests that flaked quartz, a poor quality flaking material, was utilised for tools.

### Historic period artefacts

*Jaden Harris*

A complete collection of the artefacts present across the exposed surface of Area F2 was taken. The small assemblage of historic material from T12/172 was highly fragmented and has been subject to burning. Much of the glass was melted into lumps and the heat appears to have been intense enough to partially re-fire the glaze on the ceramics. Despite these factors a few general points can be made about the assemblage. The style of the decoration on the ceramics suggests manufacturing dates in the period 1860s to 1880s. The few items of bottle glass where identification

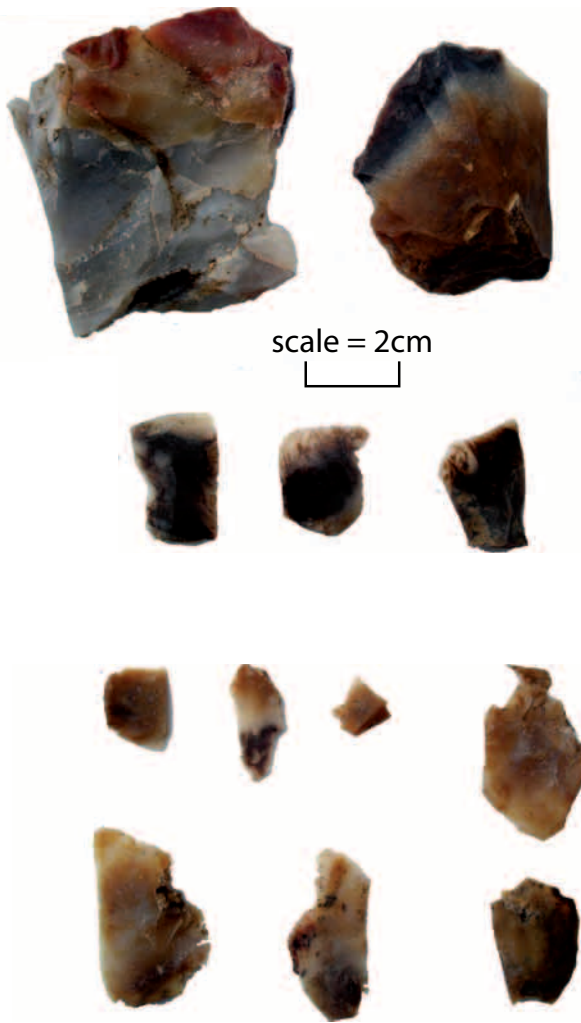


Figure 14. Chert material from two possible sources.

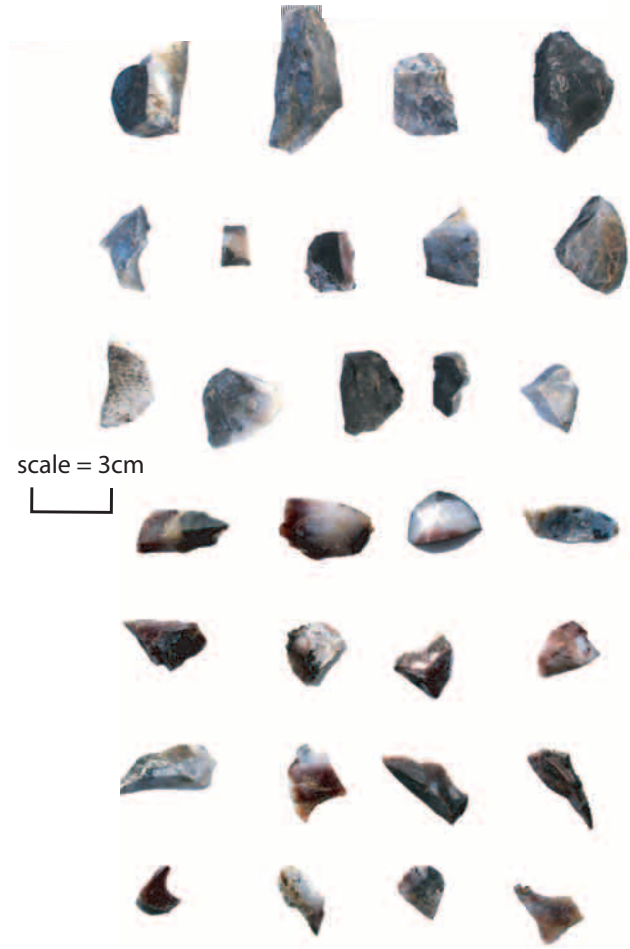


Figure 15. Chert material from third possible source type.



Figure 16. Sandstone abrader.

was possible also fit into this date range. A catalogue of the collected material is given in Appendix C.

### *Ceramics*

A total of 186 ceramic sherds were collected representing a minimum number of 15 vessels. All are of forms commonly recovered from domestic contexts and include three saucers, a cup, three plates, a jug, a bowl, a chamberpot, a bowl or washbasin, a bottle and a couple of miscellaneous items. All are made of whiteware fabrics apart from the stoneware bottle and a small decorative porcelain item (Figure 17). The ceramics are highly fragmented, with over 60 sherds alone being attributed to the large bowl or washbasin.

All of the vessels are decorated with transfer prints, except the decorative porcelain item, the bottle and one plain bowl. A saucer in black and a side plate in grey are decorated in the Rhine pattern. Both are marked with the pattern name in a border on the base (Figure 18a). Rhine was most popular around the middle of the 19th century but continued to be produced until late in the century. Fragments of an Asiatic Pheasants plate probably date to between the 1860s and 1880s when this pattern was most popular. Five other unidentified patterns are also present. Each of these was given an alphanumeric code beginning 'NH' (Ngarimu Heights) and a number for the pattern. NH 001 is an abstract style pattern in green present only as fragments from the middle of a plate or similar flatware vessel. The plate is backmarked with a John Meir

& Son printed mark (Figure 18b). In the centre of the mark is what appears to read 'HONIT...' which may well be the title of the pattern, although no reference could be found to a pattern fitting this lettering. NH 002 is a similar style pattern on a heavy bowl with a handle, which is probably a chamberpot (Figure 18c). Three vessels were found in the NH 003 pattern in green, which features a Greek key design. One vessel is a jug, one is a large bowl or washbowl and the other is a small oval shaped dish. The minimalist decoration on the bowls and chamberpot is typical of utilitarian ware (Figure 18d). NH 004 is another abstract border design printed in brown on a saucer (Figure 18f). A cup and a saucer were also found in blue in a unidentified pattern previously recorded from other archaeological sites in New Zealand (Figure 18e). Fragments of three cups and two saucers were identified in this pattern from the Blomfield House site in Russell from contexts dated to the 1870s and 1880s (Blom 128, CFG Heritage report in preparation).

### *Glass*

All of the bottle glass is very fragmentary, with few diagnostic portions. It would appear that half a dozen or so vessels are represented, including a black beer, a green champagne-style ring-seal, an aqua glass spirit bottle, and fragments of a cobalt blue castor oil bottle. These items most likely date to the 1870s or 1880s. A few fragments of 8 mm thick flat glass are also present, but of little use for dating purposes.



*Figure 17. Recovered portions of small decorative porcelain item.*



Figure 18. Transfer print ceramics from Area F2. a; refit of side plate in grey decorated in the Rhine pattern marked with the pattern name in a border on the base; b, fragments of NH001 with backmark showing 'John Meir & Son' and 'HONIT...' in centre; c, NH 002 on a heavy bowl with a handle, probably a chamberpot; d, NH 003 in green featuring a Greek key design; 'utilitarian ware'; e, Blom 128, fragments of cup and a saucer in blue unidentified pattern; f, NH 004, abstract border design printed in brown.



### Other Artefacts

A small number of other artefacts were also present. Of the 40 nails represented five are machine-made wire nails and 35 machine-made cut nails. All of the nails have roseheads with the wire nails ranging in length from 55–65 mm and the cut nails 55–100 mm. A small piece of writing slate has 14 mm wide lines spaced 7 mm apart. A small piece of cast iron is also present but is not diagnostic.

### Midden analysis

Detailed results of a analysis of the midden samples are given in Appendix D.

#### T12/173 Area B

Discussion on the analysis of three separate 10-litre samples, one from each of the three excavation squares within the Area B midden deposit (see Figure 9), is presented below.

The predominant shell species present in the Area B midden deposit was pipi (*Paphies australis*). This sandy and muddy shore shellfish species typically reaches a maximum length of 60 mm. Across the three samples, the pipi shell size ranged between 10 and 50 mm length. Approximately one-third were smaller than 30 mm, one third were 30–40 mm and the remainder 40–50 mm in length. This range of pipi shell sizes perhaps reflects the exploitation of an effectively complete local population, that is, one that contains shells from juvenile to adult stages, and that shell size was not a controlling factor in the exploitation of the shellfish populations. If so, the presence of a ‘complete’ population may also implicitly reflect periods of hiatus in their exploitation, enabling the population to achieve that size diversity. The cockle (*Austrovenus stutchburyi*), a muddy shore species, was another targeted species and appeared in significant numbers in both Squares 2 and 3. The presence of a minor percentage in all squares of green lipped mussel (*Perna canaliculus*), a rocky shore species, shows this species was also exploited. The common poor preservation of this species’ shell, however, means the actual level of its exploitation is likely to be under represented to some degree. A total of 20 ribbed slipper shells (*Crepidula costata*) were present in Square 1, which possibly indicates the targeted exploitation of this species also. The remain-

der of species identified within the midden samples are a range of rocky and muddy shore varieties, including: small circular slipper shell (*Zegalerus tenuis*); speckled whelk (*Comminella adpersa*); spotted whelk (*Comminella maculosa*) and wheel shell (*Zethalia zelandica*). None of these species occurred in significant numbers within any of the three samples, and their presence is most easily explained as a result of by-catch.

The weight of fragmented shell from each sample was also recorded. Comparison of the relative amounts of the fragmented portion of each sample is helpful in interpreting the general level of trampling activity across Area B. As discussed above, the upper, eastern, portion of Area B was the main area for cooking activity as indicated by the high density of fire scoops there. In turn, a higher level of walking and trampling would have occurred across this portion of Area B. The level of fragmented shell from Sample Square 2 (27% by weight), located away from the cooking area, is significantly less than from both Sample Squares 1 (42%) and 3 (44%) located within the cooking area.

No fish bone or other animal bone was recovered from the midden.

#### Area D

A single 10 litre sample was taken from the Area D midden deposit. The constituent shell species are effectively identical to the Area B midden deposit. The only significant variation in Area D is the presence of a single cat’s eye (*Turbo smaragdus*) and five fish bones. Of the fish bones, only a single snapper (*Pagrus auratus*) dentary is identifiable.

### Chronology

Three radiocarbon dates on shell were processed from T12/173 samples and indicate that the site was occupied sometime between the late 17th and early 19th centuries (Table 1). Appendix E contains details of the three date determinations.

All three dates are effectively identical. The calibration curve over the range is quite flat and the calibrated age determination for occupation at T12/173 therefore cannot be confidently attributed to a specific short period, but rather, is most likely to have taken place during the 18th century.

Lab no	Context	CRA BP	$\delta^{13}\text{C}$	Cal AD, 68%	Cal AD, 95%
Wk 21803	Area A Pit 9	572 ± 35	1.0 ± 0.2	1670–1820	1620–modern
Wk 21804	Area B Square 1	574 ± 38	1.3 ± 0.2	1660–1820	1610–modern
Wk 21805	Area D midden	589 ± 35	0.9 ± 0.2	1660–1810	1560–1890 (94.4%) 1940–modern (1.0%)

Table 1. Radiocarbon results.

## Charcoal identification

The analysis of four charcoal samples is presented in Appendix G. A summary of these results as outlined by Rod Wallace is present here. This charcoal assemblage suggests that vegetation consisted of a pohutukawa and coastal re-growth scrub dominated by kanuka. The kauri root or branch wood present is likely to be the nearly indestructible resinous remains that are found as sub-fossil deposits everywhere kauri once grew. The assemblage suggests vegetation similar to the current woody cover. It is unclear however, if the ridge slopes in the immediate area of the site were under cover at the time of occupation or if the wood for was brought in from some distance away. Therefore, the woody shrubland should not be considered specific to the site but generally representative of a wider area.

## Discussion and Conclusions

The available calibrated radiocarbon dates from T12/173 are archaeologically indistinguishable and indicate the one to three phases of occupation over a short period during the 18th century, or slightly before. The archaeological deposits reflect activities including stone-working, cooking and occupation of a living surface/house floor. No evidence of defensive structures were identified. Overall, the site reflects household type domestic activities and occupation by a single family, or small extended family (whanau) group of Maori.

Unfortunately, no datable material was recovered from the preserved stone-working/house floor. Nonetheless, this living surface stratigraphically pre-dates the construction of the rectangular storage pit (Feature 9), though perhaps not by much. The timing of the construction of Feature 9 is also unclear, but was presumably related to the need for storage of kumara or other garden produce and so would have been used following kumara harvest in autumn and through the winter. The latter re-use of Feature 9 for cooking with no evidence of other storage structures perhaps suggests a change in focus of occupation away from a semi-permanent household unit toward a more temporary camp.

The identification of a Tahanga basalt adze fragment from Area A, outside the stone-working floor, likely suggests a continued presence of hand-me-down adzes made of this material during the late period occupation of the site.

Only a small number of sites on the western Coromandel Peninsula coast have been excavated and adequately dated to conclude if the T12/173 dates are representative of the timing of settlement of ridge crest sites in this area.

Tentatively, however, dates from T11/836 located in a similar topographical location and environment further north T12/173 near the Te Mata settlement indicate occupation occurred there during the 17th century (Gumbley 1998 Appendix 3), slightly earlier than at T12/173. Furthermore, similar sites excavated on the peninsula's eastern coast suggest that occupation of the T12/173 ridge crest occurred quite late, between one and two centuries later than is typical of eastern coast sites (cf. Crosby et al. 1987; Furey 1987a, 1987b; Leahy 1970, 1972; Phillips 1997). In comparison to the eastern side of the Coromandel Peninsula, the topography and soils of the Thames coastline are factors limiting the settlement potential of this area, and the region's permanent settlements may have been located on the restricted areas of coastal flats at Tararu, Te Puru, Waiomu, Tapu and Te Mata. Early archaeological deposits along this coastline are also most probably located on these restricted coastal deltas where soils suitable for gardening were more extensive. Investigation of sites on ridges closer to these coastal flats may help expand this outline of the settlement pattern and spread of population from these presumed 'centres' in a possibly similar manner as shown at Te Mata (Gumbley 1998).

The chance discovery of the preserved stone-working/house floor surface, and the lack of similar quantities of stone material from adjacent portions of the site, raises questions about the loss of archaeological data during turf stripping of the site and similar sites such as this one on clay soils with little topsoil development. The likely association of a fire-scoop and post hole, Features 10 and 14, and the presence of the flaked chert core in the post hole fill, is suggestive of a wider area of stone working activities across Area A. Certainly, it is feasible to assume that the stone working debitage extended wider than the area under the clay spoil. Nonetheless, no significant quantities of stone flakes were identified outside the area under the clay spoil. Furthermore, it was the presence of the clay deposit that permitted the close inspection of the underlying preserved surface because the clay cap had protected the underlying deposit. Consequently, it is very likely that stone debitage was present outside the clay cap area, and that this material was not recognised within the topsoil deposits as they were stripped off. In retrospect, excavations without time constraints would ideally proceed by hand-stripping the turf and topsoil. Had this been done a more accurate picture of the house floor and extent of stone working may have been gained.

The discovery of 1860–80 European domestic wares was not expected and indicates the presence of a European occupation of that age in the general vicinity of T12/172.

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## Appendix A Summary of archaeological features

Feature	Area	Description
T12/173		
F1	A	Small bin-pit?, irregular rectangular shape, 1100 x 900 mm, by 250 mm deep. One side wider (150cm) with irregular side. Feature fill was dense packed clay.
F2	A	Possible vehicle track or water channel. Lower region and bottom surface irregular, looks like water erosion.
F3	A	Possible vehicle track or water channel, running parallel to F2, lower region bottom surface irregular.
F4	A	removed
F5	A	P/hole, irregular, 200 x 150 mm x 160 mm deep.
F6	A	P/hole, irregular, maybe two p/holes intercutting, irregular rectangular, max dimensions 110 x 160 mm by 100 mm deep.
F7	A	Large flat weathered basaltic stone slab present under clay cap, disturbed by digger during stripping during initial recognition of clay cap. Surveyed into approx. primary context location. 400 x 500 mm by 150 mm wide.
F8	A	Post hole, regular circular 200 mm diameter x 100 mm deep, in tephra soil.
F9	A	Large pit in Area A.
F10	A	Fire scoop, truncated by digger.
F11	A	Base of fire scoop. Visible evidence of cooked or burnt ground. Within preserved surface area.
F12	B	Cache of cooking stones within midden deposit, 12 stones (13kg) of basalt cobbles.
F13	A	Base of fire scoop, Visible evidence of cooked or burnt ground on preserved surface area.
F14	A	Post hole, adjacent F10 hearth, chert core found in brown clay fill, also charcoal and burnt clay within fill
F15	B	Post hole, 100 mm, diameter at least 150 mm deep, Tapers to base depth not fully reached, cuts through brown clay cap in Sample Sq 1, filled with overlying midden.
F16		see T12/172 list below
F17	D	Disturbance 400 x 400 mm by 70 mm deep, filled with several broken pieces ceramic drain pipe.
F18	D	Historic shallow pit with spade head at base, 600 x 600 mm by 60 mm deep.
F19	B	Umu fire scoop, clear evidence of burning present.
F20	B	Post hole, 80 mm diameter, 50 mm deep.
F21	B	Post hole, 80 mm diameter, 60 mm deep.
F22	B	Fire scoop, 700 x 500 mm, 100 mm deep.
F23	B	Post hole, 60 mm diameter x 50 mm deep
F24	B	Post hole, 100 mm diameter, 80 mm deep
F25	B	Tyre tracks or water channel, two channels running parallel, 10–120 mm deep, 400 mm wide, 20- 60 mm deep, 250 mm wide - same as F2 and F3
F26	B	Post hole, 80 mm diameter, 60 mm deep
F27	B	Post hole, 130 mm wide, 200 mm deep.
F28	B	Post hole, 100 mm diameter, 200 mm deep, sits at oblique angle sloping to north.
F29	B	Post hole, 120 mm diameter, 100 mm deep.
F30	B	Post hole, 130 mm wide, 200 mm deep.
F31	B	cache cooking stones, stained with charcoal.
F32	B	Fire scoop. Fill of stones, burnt shell, charcoal. 400 mm diameter.
F33	B	Large clay block, looked out of place, possibly a seat inside cooking a area represented by post holes and hearths.
F34	B	Fire scoop. 600 x 650 mm diameter, 50 mm deep, but was truncated by digger.
F35	B	Fire scoop, circular 300 mm diameter.
F36	B	Fire scoop, circular 400 mm diameter, Cooks turbans in fill of scoop.
F37	B	Post hole, within F36, visible at base of scoop - circular 10cm diameter, 10cm deep.



Feature	Area	Description
F38	B	Post hole, circular, 200 mm diameter, 200 mm deep.
F39	B	Fire scoop, charcoal, few stones only, 500 mm diameter.
F40	B	Fire scoop, minor charcoal present, represents single burning event only, 500 mm diameter, 60 mm deep.
F41	B	Post hole, 50 x 70 x 60 mm deep.
F42	B	Post hole, circular 80 mm diameter x 100 mm deep.
F43	B	Post hole, square 100 x 100 mm by 70 mm deep.
F44	B	Fire scoop, 500 mm diameter, fill of burnt stones, charcoal and crushed shell.
F45	B	Post hole, 80 x 100 mm.
F46	B	Post hole, 80 x 70 mm deep.
F47	B	Base of fire scoop, circular 300 mm diameter- burnt stone, shell charcoal fill.
F48	B	Fire scoop, 500 mm diameter x 100 mm deep.
F49	B	Post hole, overlaid by midden in scoop of F48, 150 x 100 mm, 150 mm deep.
F50	B	Stone cache, assoc. with F48 fire scoop.
F51	B	P/hole, 200 mm diameter x 50 mm deep.
F52	B	Fire scoop, 600 mm diameter, 50 mm deep.
F53	C	Post hole, 200 mm diameter, 70 mm deep.
F54	C	Post hole, 50 mm diameter, 100 mm deep.
F55	C	Post hole, 50 mm diameter, 100 mm deep.
F56	C	Post cast visible, 120 mm diameter, 290 mm deep, oval 170 x 130 mm.
F57	B	Fire scoop, oval 900 x 700 mm, stones in fill, burnt shell, charcoal.
F58	C	Post hole, 50 mm x 100 mm deep.
F59	A	Post hole, in preserved surface, 100 mm diameter x 150 mm deep.
F60	A	Post hole, in preserved surface, 130 mm diameter x 170 mm deep.
F61	A	Post hole, in preserved surface, 60 mm diameter x 100 mm deep.
F62	A	Post hole, in preserved surface, 60 mm diameter x 80 mm deep.
F63	A	Post hole, in preserved surface, 120 mm diameter x 80 mm deep.
F64	A	Post hole, in preserved surface, 80 mm diameter x 70 mm deep.
F65	A	Post hole, in preserved surface, 120 mm diameter x 100 mm deep.
F66	A	Central, large post hole in floor of Feature 9, regular circular, 200 mm diameter by 250 mm deep. Two large basalt cobbles in fill feature.
F67	A	Possible post/h in floor of Feature 9, 200 mm square, 60 mm deep.
F68	A	Working floor preserved surface.
<hr/>		
T12/172		
<hr/>		
F16	F2	c. 1860 debris scatter. No clear pit feature, only a shallow area of burn off indicated by charcoal staining & incineration marks. Probably associated with European house on terrace in immediate area.
<hr/>		

## Appendix B T12/173 artefact catalogue

Artefact/ sample	Area	Description
100	A	Obsidian flake, transparent green, Mayor Island.
101	A	Adze flake, smooth ground surface. Light grey basalt, Tahanga?
102	A	Obsidian flake, transparent green, Mayor Island.
103	A	Sample of natural quartz pebbles (Moa gut stones).
104	A	Chert flake, weathered, found during stripping.
105	A	Two chert flakes found during stripping, adjacent preserved surface.
106	A	Chert flakes in situ from preserved surface 'flaking floor'.
107	A	Flake quartz, cortex, knapped from a quartz cobble.
108	A	Obsidian flake - grey banded - source unknown.
109	A	Quartz crystal, possible natural soil constituent.
110	A	Obsidian flake, transparent green, Mayor Island.
111	A	Obsidian flake, transparent green, Mayor Island.
112	B	Sample square, midden bulk sample (10lt).
113	A	Sample of shell debris layer on floor of pit F.9, same as #135.
114	A	5 obsidian flakes (4, transparent green, Mayor Island; 1 grey banded source unknown), 2 chert flakes, from shell debris surface layer at floor F.9.
115	B	Midden sample 10lt Sample Square 2.
116	A	Obsidian flake, transparent green, Mayor Island.
117	B	Burnt bone (or charcoal) from Sample Square 1.
118	B	Charcoal for ID from Sample Square 2.
119	A	Obsidian recovered near F13 on preserved surface - grey banded source?
120	A	Chert core (with cortex) from within fill of F14.
121	A	Chert flake .
122	B	Sample 10lt midden square 3.
123	A	Chert from floor F9, c. 500 mm depth. Two pieces foud together on debris surface layer. One piece is cortex from cobble.
124	A	Charcoal sample from floor F.9 pit, assoc with shell debris layer.
125	A	Obsidian from flaking floor, grey banded, source unknown.
126	A	Obsidian from flaking floor, transparent green, Mayor Island.
127	F2	Large unworked quartz cobble, manuport, possibly for stone working .
128	F1	Obsidian flake from surface, F1, lower portion of area, transparent green, Mayor Island.
129	D	Two obsidian flakes found on surface of, transparent green, Mayor Island. One piece shows 'burin' (arch) type use-ware. located in proximity of midden, bottle glass, nails and other European material also present at this level.
130	D	Piece writing slate.
131	D	Chert core (with cortex) found in D spoil.
132	D	Bone from D.
133	-	-
134	A	Sand-stone abrader in preserved occupation floor.
135	A	Shell for dating from F9 floor layer, same as #113.
136	B	Charcoal from Sample Square 2 recovered after wet-sieving.
137	A	Single burnt pipi from F11 scoop on preserved surface.
138	B	Charcoal from sample square 3 recovered after wet-sieving.
139	B	Charcoal from sample square #?
140	B	Charcoal from F32, hearth.
141	A	Two obsidian flakes, on preserved surface one piece, transparent green, Mayor Island. One grey banded source?

Artefact/ sample	Area	Description
142	A	Obsidian flake, on preserved surface.
143	B	Obsidian flake, transparent green, Mayor Island, shows minor use-ware on one edge.
144	B	Chert flakes .
145	B	Obsidian flake, near find #143, transparent green, Mayor Island.
146	B	Obsidian flake B in F47 fire scoop - grey banded, cortex present.
147	B	Obsidian flake, transparent green, Mayor Island.
148	B	Obsidian flake, transparent green, Mayor Island.
149	A	Collection 1800-1900 artefacts, glass, ceramis, black smith nails from incinerated area.
150	A	Charcoal associated directly with cooking, burnt, area on floor of Pit Feature 9.
151	B	Charcoal from F32 fire scoop. Dating sample. 6 pieces grey banded obsidian 18 pieces, transparent green, Mayor Island obsidian. only two pieces (#129/#143) show use-ware on edges. All others are really just flaking debris with no signs of use.

## Appendix C T12/172 artefact catalogue

Bag	Category	Sub-category	Vessel/ object	Pattern	Decoration	Colour	NISP	MNV	Notes
15	Ceramic	Stoneware	Bottle				1	1	
19	Ceramic	Earthenware	Bowl				7	1	base fragments only, medium sized bowl
10	Ceramic	Earthenware	Bowl/Basin	NH 003	Transfer print	Green	61	1	Greek key type design, heavy rim and footring, large enough to be a washbasin
4	Ceramic	Earthenware	Chamber pot	NH 002	Transfer print	Green	31	1	handled bowl with heavy rim, probably more likely to be chamber pot
1	Ceramic	Earthenware	Cup	Blom 128	Transfer print	Blue	6	1	previously recorded from Blomfield House site in Russell
16	Ceramic	Porcelain	Decorative				9	2	very fragmented, relief moulded elements with hand painted colour
6	Ceramic	Earthenware	Dish?	NH 003	Transfer print	Green	2	1	Greek key type design, small dish with inset rim for lid, probably oval in shape
5	Ceramic	Earthenware	Jug	NH 003	Transfer print	Green	19	1	Greek key type design
12	Ceramic	Earthenware					92		mainly fragments from the NH 003 vessels
15	Ceramic	Earthenware					1		
2	Ceramic	Earthenware	Plate	NH 001	Transfer print	Green	6	1	John Meir & Son printed backmark (c.1837-97, Kowalsky and Kowalsky 1999: 282) probably the pattern name in the middle '[HONIT...]' but couldn't find any reference for it
3	Ceramic	Earthenware	Plate	Asiatic Pheasants	Transfer print	Blue	23	1	probably 1860s-80s
1	Ceramic	Earthenware	Saucer	Blom 128	Transfer print	Blue	1	1	abstract geometric border design, same pattern recorded from Blomfield House site in Russell
7	Ceramic	Earthenware	Saucer	NH 004	Transfer print	Brown	5	1	abstract border design
8	Ceramic	Earthenware	Saucer	Rhine	Transfer print	Black	7	1	pattern name printed in border on back



Bag	Category	Sub-category	Vessel/ object	Pattern	Decoration	Colour	NISP	MNV	Notes
9	Ceramic	Earthenware	Side plate	Rhine	Transfer print	Grey	1	1	edge of pattern name border
13	Glass	Bottle glass	Black beer			Olive		1	fragments only
14	Glass	Bottle glass	Ringseal			Green		1	champagne style ring seal, high kickup with mamelon
17	Glass	Bottle glass	Castor oil			Cobalt blue		1	melted fragments, most likely to be from castor oil bottle
18	Glass	Other				Aqua			some fragments possibly melted window glass, others bottle glass
20	Glass	Bottle glass	Ring-Seal			Green		1	either cognac or champagne style
21	Glass	Bottle glass	Spirit			Aqua		1	taper/skirt hand finished top, thicker fragments probably from near base of bottle, probably tall spirit bottle with bulge neck
22	Glass	Other				Aqua		1	thick flat glass fragments, many melted, 8 mm thick
23	Glass	Other				Aqua		1	fragment flat glass 4.5 mm thick with raised parallel lines on one side
24	Glass	Other							miscellaneous fragments melted glass, probably all bottle glass, aqua, green and clear glass
26	Glass	Bottle glass				Aqua		1	possibly from a condiments bottle
25	Metal	Cast iron	Decorative					1	fragments only
27	Metal	Ferrous	Screw					1	countersunk head >64 mm in length
28	Metal	Ferrous	Nails					5	wire nails, roseheads, 55 mm and c. 65 mm in length
29	Metal	Ferrous	Nails					35	rectangular section cut nails, roseheads, 50–100 mm in length
11	Slate	Writing Slate					2	1	7 mm wide lines spaced 14 mm apart, or 14 mm wide lines spaced 7 mm apart

## Appendix D Midden analysis

	Area B, Square 2		Area B, Square 3		Area D midden	
	weight (g)	%	weight (g)	%	weight (g)	%
5 mm sieved fraction	3400	38%	1500	17%	4000	40%
residue	5500	61%	7500	83%	6000	60%
Total	9000		9000		10000	

Table D1. Weight statistics for midden samples from T12/173.

Species	Area B, Square 2			Area B, Square 3			Area D midden		
	length (mm)	NISP	weight (g)	length (mm)	NISP	weight (g)	length (mm)	NISP	weight (g)
Pipi ( <i>Paphies australis</i> )	10-55	1045	1855	10-55	545	475	30-50	125	315
Ribbed slipper shell ( <i>Crepidula costata</i> )	10-20	3	5	10-20	6	5	10-20	6	5
Small circular slipper shell ( <i>Zegalerus tenuis</i> )	5-15	3	5				5-10	7	5
Cockle ( <i>Austrovenus stutchburyi</i> )	25-35	11	10	25-35	22	35	15-40	10	25
Speckled whelk ( <i>Comminella adspersa</i> )	20	1	2.5	20	2	2.5	20	2	2.5
Spotted whelk ( <i>Comminella maculosa</i> )	20	1	2.5				30-40	8	30
Wheel shell ( <i>Zethalia zelandica</i> )	20	1	2.5						
Common cat's eye ( <i>Turbo smaragdus</i> )							30	1	5
Green lipped mussel ( <i>Perna canaliculus</i> )							hinge only	1	2.5
residue	n/a	-	930	n/a	-	665	n/a	-	1450
fish bone							-	-	5
stone	n/a	-	400	n/a	-	315	n/a	-	2000
Total		1065	3212.5		575	1497.5		160	3845

Table D2. Size, count and weight statistics for all shellfish species for midden samples from T12/173.

length (mm)	Area B, Square 2			Area B, Square 3		
	NISP	weight (g)	% total weight	NISP	weight (g)	% total weight
40-55	200	795	24.7	25	90	6
30-40	425	745	23.2	100	175	11.7
10-30	420	315	9.8	420	210	14
Total	1045	1855	57.7	545	475	31.7

*Table D3. Count and weight statistics for pipi (Paphies australis) by size class, for two midden samples from T12/173.*

## ***Appendix E Radiocarbon determinations***



*The University of Waikato*  
*Radiocarbon Dating Laboratory*



Private Bag 3105  
Hamilton,  
New Zealand.  
Fax +64 7 838 4192  
Ph +64 7 838 4278  
email c14@waikato.ac.nz  
Head: Dr Alan Hogg

**Report on Radiocarbon Age Determination for Wk- 21803**

**Submitter** W. Gumbley  
**Submitter's Code** Feature 9, Area A  
**Site & Location** T12/173, Ngarimu Heights, Thames, New Zealand  
**Sample Material** Pipi  
**Physical Pretreatment** Surfaces cleaned. Washed in an ultrasonic bath. Tested for recrystallization: Surface recrystallization removed. Aragonite selected for dating.  
**Chemical Pretreatment** Sample acid washed using 2 M dil. HCl for 300 seconds, rinsed and dried.

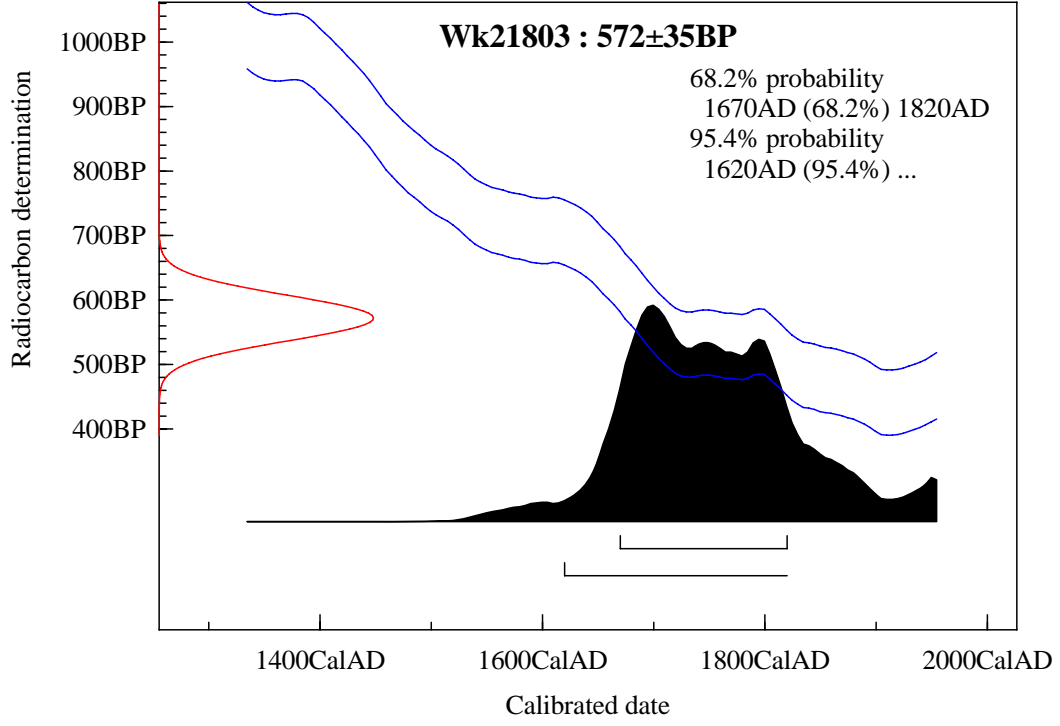
$\delta^{14}\text{C}$	$-18.4 \pm 4.3$	$\text{‰}$
$\delta^{13}\text{C}$	$1.0 \pm 0.2$	$\text{‰}$
$\text{D}^{14}\text{C}$	$-68.8 \pm 4.1$	$\text{‰}$
% Modern	$93.1 \pm 0.4$	%
<b>Result</b>	<b>572 <math>\pm</math> 35 BP</b>	

**Comments**

21/8/07

- Result is *Conventional Age or % Modern* as per 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 of 1.
- The isotopic fractionation,  $\delta^{13}\text{C}$ , is expressed as  $\text{‰}$  wrt PDB.
- Results are reported as *% Modern* when the conventional age is younger than 200 yr BP.

Marine data from Hughen et al (2004);Delta\_R -7±45;OxCal v3.10 Bronk Ramsey (2005); cub r:5 sd:12 prob usp[chron]



*The University of Waikato*  
*Radiocarbon Dating Laboratory*



Private Bag 3105  
Hamilton,  
New Zealand.  
Fax +64 7 838 4192  
Ph +64 7 838 4278  
email c14@waikato.ac.nz  
Head: Dr Alan Hogg

**Report on Radiocarbon Age Determination for Wk- 21804**

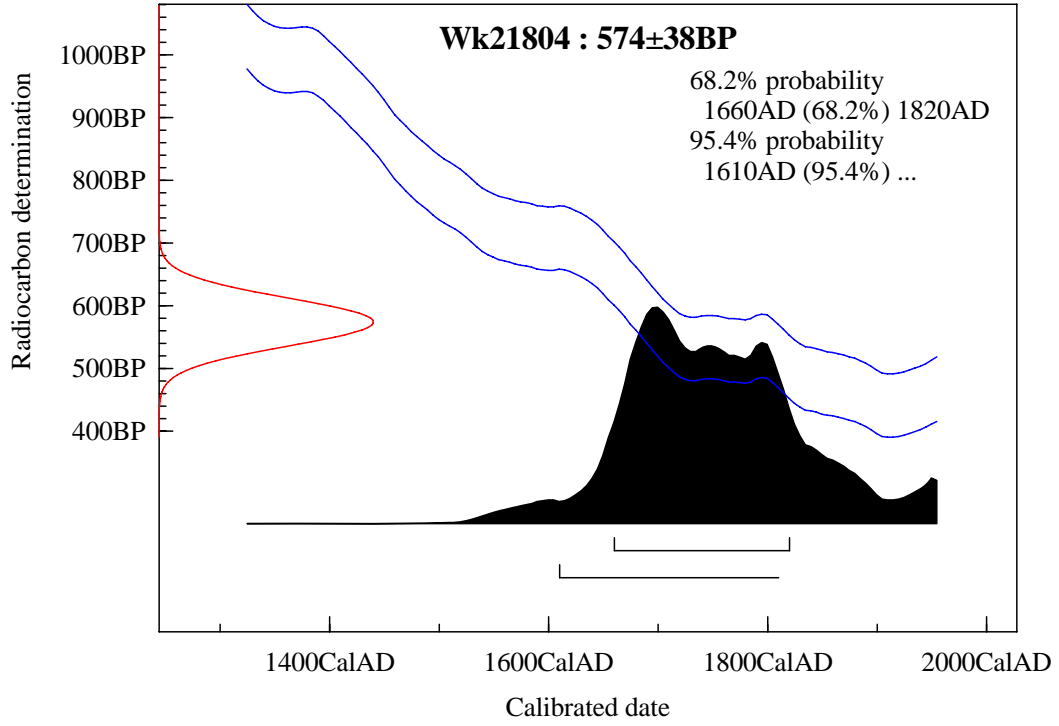
**Submitter** W. Gumbley  
**Submitter's Code** Area B, Sample sq 1  
**Site & Location** T12/173, Ngarimu Heights, Thames, New Zealand  
**Sample Material** Pipi  
**Physical Pretreatment** Surfaces cleaned. Washed in an ultrasonic bath. Tested for recrystallization: aragonite.  
**Chemical Pretreatment** Sample acid washed using 2 M dil. HCl for 350 seconds, rinsed and dried.

$\delta^{14}\text{C}$	$-17.9 \pm 4.6$	$\text{‰}$
$\delta^{13}\text{C}$	$1.3 \pm 0.2$	$\text{‰}$
$\text{D}^{14}\text{C}$	$-68.9 \pm 4.4$	$\text{‰}$
% Modern	$93.1 \pm 0.4$	%
<b>Result</b>	<b>574 ± 38 BP</b>	

**Comments**

21/8/07

- Result is *Conventional Age or % Modern* as per 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 of 1.
- The isotopic fractionation,  $\delta^{13}\text{C}$ , is expressed as ‰ wrt PDB.
- Results are reported as % Modern when the conventional age is younger than 200 yr BP.





*The University of Waikato*  
*Radiocarbon Dating Laboratory*



Private Bag 3105  
Hamilton,  
New Zealand.  
Fax +64 7 838 4192  
Ph +64 7 838 4278  
email c14@waikato.ac.nz  
Head: Dr Alan Hogg

**Report on Radiocarbon Age Determination for Wk- 21805**

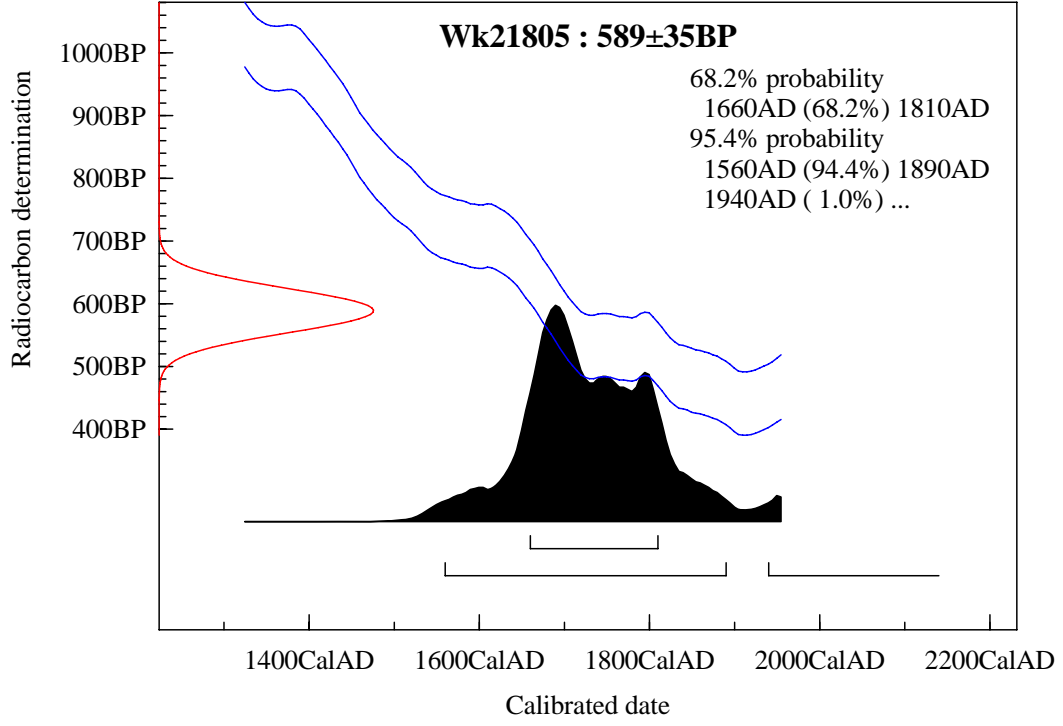
**Submitter** W. Gumbley  
**Submitter's Code** Area D  
**Site & Location** T12/173, Ngarimu Heights, Thames, New Zealand  
**Sample Material** Pipi  
**Physical Pretreatment** Surfaces cleaned. Washed in an ultrasonic bath. Tested for recrystallization: aragonite.  
**Chemical Pretreatment** Sample acid washed using 2 M dil. HCl for 300 seconds, rinsed and dried.

$\delta^{14}\text{C}$	$-20.7 \pm 4.3$	$\text{‰}$
$\delta^{13}\text{C}$	$0.9 \pm 0.2$	$\text{‰}$
$\text{D}^{14}\text{C}$	$-70.7 \pm 4.0$	$\text{‰}$
% Modern	$92.9 \pm 0.4$	%
<b>Result</b>	<b>589 <math>\pm</math> 35 BP</b>	

**Comments**

21/8/07

- Result is *Conventional Age or % Modern* as per 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 of 1.
- The isotopic fractionation,  $\delta^{13}\text{C}$ , is expressed as  $\text{‰}$  wrt PDB.
- Results are reported as % Modern when the conventional age is younger than 200 yr BP.



## ***Appendix F NZAA site record forms***

## SITE RECORD FORM

Map number N49  
 Map name Thames  
 Map edition 3rd ed., 1967  
 Grid Reference 019335

SITE NUMBER N49/204

T12/171

SITE NAME: MAORI  
 OTHER Woods Bay

SITE TYPE Midden

343554

1. Aids to relocation of site On steep northern bank of small creek, halfway between Pupurakau and Waitoetoe Streams, 75m east of main Thames-Coromandel Highway, Woods Bay.

Sketch attached to N49/210

2. State of site; possibility of damage or destruction Poor condition. Site covered in pine trees with water and tree root damage.

3. Description of site (NOTE: This section is to be completed ONLY if no separate Site Description Form is to be prepared.)

Eroded bed of broken pipi shells and black earth, 5-15cm thick. Main concentration exposed over 6 x 20m with large fan of scattered shell leading to creek below. Bed lies 100m east of Firth of Thames and 25m a.s.l.

4. Owner Mr K. Edmonds  
 Address Seaview Ave.,  
 Te Puru,  
 Thames Coast.

Tenant/Manager  
 Address

Attitude Cooperative

Attitude

5. Methods and equipment used Site examined on foot with tape and compass.

Photographs taken: ~~Yes~~/No (Describe on Photograph Record Form)

Date recorded 25/11/77

6. Aerial photograph or mosaic No. 978/1 1944

Site shows:

~~Clearly~~/not at all

7. Reported by Larryn Diamond  
 Address 25 Waipa Street,  
 Birkenhead,  
 Auckland 10.

Filekeeper

SUSAN BULMER

Date

15/12/77

Date

July 1981



<b>NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION SITE RECORD FORM</b>  <b>NZMS260 map number</b> T12 <b>NZMS260 map name</b> Thames <b>NZMS260 map edition</b>	<b>NZAA METRIC SITE NUMBER</b> T12/171  <b>DATE VISITED</b> Sept2005 & July2007  <b>SITE TYPE</b> midden  <b>SITE NAME:</b> MAORI  OTHER
<i>Grid Reference</i> E ..   .. N ..   .. GPS EPE +/- m.	
<b>1. Aids to relocation of site (<i>attach a sketch map</i>)</b> see original SRF	
<b>2. State of site and possible future damage</b> Since Daimond's description of this site as having been damaged by tree root etc in 1977, this site has probably been completely lost due to continued damage, slip and farm land-use. In any case, site will be completely destroyed by proposed sub-division of Pt Whakatete No.3 Block.	
<b>3. Description of site (<i>Supply full details, history, local environment, references, sketches, etc. If extra sheets are attached, include a summary here</i>)</b>  UPDATE – Site not re-identified during Gumbley's 2005 assessment of block. No investigation of this site took place during 2007 investigation of T12/173 and T12/172. Judging by Daimond's proposed location and description of this site, the midden deposit was probably redeposited material moved downslope from the T12/173 occupation on ridge above.	
<b>4. Owner Address</b>	<b>Tenant/Manager Address</b>
<b>5. Nature of information (<i>hearsay, brief or extended visit, etc.</i>)</b>	Site visited by archaeologists
<b>Photographs (<i>reference numbers and where they are held</i>)</b>	N/a
<b>Aerial photographs (<i>reference numbers and clarity of site</i>)</b>	
<b>6. Reported by</b> Warren Gumbley & Andrew Hoffmann <b>Address</b> CFG, Hamiton	<b>Filekeeper</b> Neville Ritchie <b>Date</b>
<b>7. Department of Conservation (<i>for office use</i>)</b> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <b>Type of site</b> <span style="margin-left: 200px;"><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <b>Present condition &amp; future danger of destruction</b></span> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <b>Local environment today</b> <span style="margin-left: 200px;"><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <b>Local body</b></span> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <b>Land classification</b>	

## SITE RECORD FORM

SITE NUMBER N49/205

T12/  
172

Map number N49  
 Map name Thames  
 Map edition 3rd ed., 1967  
 Grid Reference 020335

SITE NAME: MAORI  
 OTHER Central Woods Bay

SITE TYPE Midden 344554

1. Aids to relocation of site On north west slope of broad spur in the centre of Woods Bay, 100m east of the main Thames-Coromandel Highway.

Sketch attached to N49/210

2. State of site; possibility of damage or destruction Fair condition; exposed by cutting for farm road but well grassed on top.

3. Description of site (NOTE: This section is to be completed ONLY if no separate Site Description Form is to be prepared.)

Bed of black soil 10cm thick containing large number of intact pipishells with fragments of shattered rock. The bed is exposed for 4m and lies on a slope 35m a.s.l. and overlooking the Firth of Thames 120m west.

4. Owner Mr K. Edwards  
 Address Seaview Ave,  
 Te Puru,  
 Thames Coast.
- Tenant/Manager  
 Address

Attitude Cooperative Attitude

5. Methods and equipment used Site examined on foot with tape and compass.

Photographs taken: ~~Yes~~/No (Describe on Photograph Record Form)

Date recorded 25/11/77

6. Aerial photograph or mosaic No. 978/1 1944 Site shows:  
 Clearly/Not clearly/not at all

7. Reported by Larryn Diamond  
 Address 25 Waipa Street,  
 Birkenhead,  
 Auckland 10.
- Filekeeper

SUSAN BULMER

July 1981

Date 15/12/77 Date

<b>NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION SITE RECORD FORM</b>  <b>NZMS260 map number</b> T12 <b>NZMS260 map name</b> Thames <b>NZMS260 map edition</b>	NZAA METRIC SITE NUMBER T12/172  DATE VISITED Sept2005 & July 2007  SITE TYPE terraces/pits/midden  SITE NAME: MAORI  OTHER						
<i>Grid Reference</i> E .2.7 3 4 4 5.0. N .6.4 5 5 5 8.0. GPS EPE 6+/- m.							
<b>1. Aids to relocation of site (<i>attach a sketch map</i>)</b> See attached investigation report							
<b>2. State of site and possible future damage</b> Lower terraces of site (i.e. area within Pt Whakatete No.3 Block) was partially excavated in July 2007. Site to be destroyed by location of several house sites as part of sub-division.							
<b>3. Description of site (<i>Supply full details, history, local environment, references, sketches, etc. If extra sheets are attached, include a summary here</i>)</b>  See investigation report attached with T12/173 SRF.  Note – Gumbley’s 2005 assessment resulted in allocation of site number T12/205 for this site. Diamond, however, had previously recorded the site and it was allocated site number T12/172.  Recommendation – alter Gumbley’s T12/205 record to show T12/172 and add to the latter’s files.							
<b>4. Owner Address</b>	<b>Tenant/Manager Address</b>						
<b>5. Nature of information (<i>hearsay, brief or extended visit, etc.</i>)</b>	Investigated by archaeologist						
<b>Photographs (<i>reference numbers and where they are held</i>)</b>							
<b>Aerial photographs (<i>reference numbers and clarity of site</i>)</b>							
<b>6. Reported by</b> Warren Gumbley <b>Address</b> and Andrew Hoffmann CFG, Hamilton	<b>Filekeeper</b> Neville Ritchie <b>Date</b>						
<b>7. Department of Conservation (<i>for office use</i>)</b> <table border="0" style="width: 100%;"> <tr> <td style="width: 50%;"><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <b>Type of site</b></td> <td style="width: 50%;"><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <b>Present condition &amp; future danger of destruction</b></td> </tr> <tr> <td><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <b>Local environment today</b></td> <td><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <b>Local body</b></td> </tr> <tr> <td><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <b>Land classification</b></td> <td></td> </tr> </table>		<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <b>Type of site</b>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <b>Present condition &amp; future danger of destruction</b>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <b>Local environment today</b>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <b>Local body</b>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <b>Land classification</b>	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <b>Type of site</b>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <b>Present condition &amp; future danger of destruction</b>						
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <b>Local environment today</b>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <b>Local body</b>						
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <b>Land classification</b>							

## SITE RECORD FORM

Map number N49  
 Map name Thames  
 Map edition 3rd ed., 1967  
 Grid Reference 021336

SITE NUMBER N49/206

T12/  
173

MAORI  
 SITE NAME: OTHER Pupurakau South

SITE TYPE Midden

345555

1. Aids to relocation of site Site lies on western slope of spur south of the Pupurakau Stream, 200m east of the main Thames-Coromandel Highway, Woods Bay, Thames Coast.

Sketch attached to N49/210

2. State of site; possibility of damage or destruction Site exposed in scarp of large land slip. Well grassed farmland on top but slipping likely to continue. Poor condition.

3. Description of site (NOTE: This section is to be completed ONLY if no separate Site Description Form is to be prepared.)  
 Bed of black soil (5cm thick) overlying clay and containing shattered rock and shells. Mainly cockle present but also pipi, mussel and paryphanta. The bed is exposed for 4.5m and lies 60m a.s.l., 220m east of the Firth of Thames and 30m south of the Pupurakau Stream.

4. Owner Mr K. Edmonds  
 Address Seaview Ave.,  
 Te Puru,  
 Thames Coast.

Tenant/Manager  
 Address

Attitude Cooperative

Attitude

5. Methods and equipment used Site examined on foot with tape and compass.

Photographs taken: ~~Yes~~/No (Describe on Photograph Record Form)

Date recorded 25/11/77

6. Aerial photograph or mosaic No. 978/1

Site shows:

~~clearly~~/badly/~~not at all~~

7. Reported by Larryn Diamond  
 Address 25 Waipa Street,  
 Birkenhead,  
 Auckland 10.

Filekeeper

SUSAN BULMER

Date 15/12/77

Date

July 1981

<p><b>NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION SITE RECORD FORM</b></p> <p>NZMS260 map number T12  NZMS260 map name Thames  NZMS260 map edition</p>	<p>NZAA METRIC SITE NUMBER T12/173</p> <p>DATE VISITED Sept2005 &amp; July 2007</p> <p>SITE TYPE terraces/pits/midden</p> <p>SITE NAME: MAORI</p> <p>OTHER</p>						
<p><i>Grid Reference</i> E .2.7 3 4 5 0.0. N .6.4 5 5 6 5.0. GPS EPE 8+/- m.</p>							
<p><b>1. Aids to relocation of site (<i>attach a sketch map</i>)</b>  See attached investigation report</p>							
<p><b>2. State of site and possible future damage</b>  Site completely excavated in July 2007. Site to be location of several house sites as part of sub-division</p>							
<p><b>3. Description of site (<i>Supply full details, history, local environment, references, sketches, etc. If extra sheets are attached, include a summary here</i>)</b></p> <p>See attached investigation report</p> <p>Note – Gumbley’s 2005 assessment resulted in allocation of site number T12/206 for this site. Diamond, however, had previously recorded the site and it was allocated site number T12/173.</p> <p>Recommendation – alter Gumbley’s T12/206 record to show T12/173 and add to the latter’s files.</p>							
<p><b>4. Owner Address</b></p>	<p><b>Tenant/Manager Address</b></p>						
<p><b>5. Nature of information (<i>hearsay, brief or extended visit, etc.</i>)</b></p>	<p>Investigated by archaeologist</p>						
<p><b>Photographs (<i>reference numbers and where they are held</i>)</b></p>							
<p><b>Aerial photographs (<i>reference numbers and clarity of site</i>)</b></p>							
<p><b>6. Reported by</b> Warren Gumbley  <b>Address</b> and Andrew Hoffmann  CFG, Hamilton</p>	<p><b>Filekeeper</b> Neville Ritchie  <b>Date</b></p>						
<p><b>7. Department of Conservation (<i>for office use</i>)</b></p> <table border="0"> <tr> <td data-bbox="204 1823 432 1861"> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Type of site </td> <td data-bbox="868 1823 1315 1895"> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Present condition &amp; future danger of destruction </td> </tr> <tr> <td data-bbox="204 1899 619 1937"> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Local environment today </td> <td data-bbox="868 1899 1098 1937"> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Local body </td> </tr> <tr> <td data-bbox="204 1968 533 2007"> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Land classification </td> <td></td> </tr> </table>		<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Type of site	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Present condition & future danger of destruction	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Local environment today	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Local body	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Land classification	
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<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Local environment today	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Local body						
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Land classification							



## SITE RECORD FORM

Map number N49  
 Map name Thames  
 Map edition 3rd ed., 1967  
 Grid Reference 021337

SITE NUMBER N49/207

T12/174

SITE NAME: MAORI Pupurakau Stream  
 OTHER

SITE TYPE Midden

345556

1. Aids to relocation of site Site lies in the south bank of the Pupurakau Stream, 250m east of the main Thames-Coromandel Highway, Woods Bay, Thames Coast.

Sketch attached to N49/210

2. State of site; possibility of damage or destruction Poor condition: grassed in farm-land but heavy erosion by water and stock movement.

3. Description of site (NOTE: This section is to be completed ONLY if no separate Site Description Form is to be prepared.)

Discontinuous beds of black soil 5-15cm thick containing pipi, cockle, mussel, cat's eye and cominella shells with charcoal. Main concentrations exposed in south bank of stream but also smaller beds and scattered shell further upstream in north bank. The site lies 270m east of the Firth of Thames, 40m a.s.l. and 75m from the alluvial flat of the Pupurakau and Otohi Streams.

4. Owner Mr K. Edmonds  
 Address Seaview Ave.,  
 Te Puru,  
 Thames Coast.

Tenant/Manager  
 Address

Attitude Cooperative

Attitude

5. Methods and equipment used Site examined on foot with tape and compass.

Photographs taken: ~~Yes~~ No (Describe on Photograph Record Form)

Date recorded 25/11/77

6. Aerial photograph or mosaic No. 978/1 1944

Site shows:

~~Clearly~~ ~~badly~~ / not at all

7. Reported by Larryn Diamond  
 Address 25 Waipa Street,  
 Birkenhead,  
 Auckland, 10.

Filekeeper

SUSAN BULMER

Date 15/12/77

Date

July 1981

<b>NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION SITE RECORD FORM</b>  <b>NZMS260 map number</b> T12 <b>NZMS260 map name</b> Thames <b>NZMS260 map edition</b>	<b>NZAA METRIC SITE NUMBER</b> T12/174  <b>DATE VISITED</b> Sept2005 & July 2007  <b>SITE TYPE</b> midden  <b>SITE NAME:</b> MAORI  OTHER
<i>Grid Reference</i> E .2.7 3 4 4 7.2. N .6.4 5 5 7 3.5. GPS EPE 8+/- m.	
<b>1. Aids to relocation of site (<i>attach a sketch map</i>)</b> See attached investigation report.	
<b>2. State of site and possible future damage</b> Site partially excavated in July 2007. Will be destroyed as site to be location of several house sites as part of sub-division.	
<b>3. Description of site (<i>Supply full details, history, local environment, references, sketches, etc. If extra sheets are attached, include a summary here</i>)</b>  See investigation report attached with T12/173 SRF.  Note – T12/174 was interpreted by Gumbley as part of site T12/173 and was allocated as Area D in investigation report.	
<b>4. Owner Address</b>	<b>Tenant/Manager Address</b>
<b>5. Nature of information (<i>hearsay, brief or extended visit, etc.</i>)</b>	Investigated by archaeologist
<b>Photographs (<i>reference numbers and where they are held</i>)</b>	
<b>Aerial photographs (<i>reference numbers and clarity of site</i>)</b>	
<b>6. Reported by</b> Warren Gumbley <b>Address</b> and Andrew Hoffmann CFG, Hamilton	<b>Filekeeper</b> Neville Ritchie <b>Date</b>
<b>7. Department of Conservation (<i>for office use</i>)</b> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <b>Type of site</b> <span style="margin-left: 200px;"><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <b>Present condition &amp; future danger of destruction</b></span> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <b>Local environment today</b> <span style="margin-left: 200px;"><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <b>Local body</b></span> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <b>Land classification</b>	

# Appendix Charcoal identification

Rod Wallace, Anthropology Department, University of Auckland

## Introduction

Four charcoal samples from archaeological site Site T12/173 Ngarimu Heights were submitted for identification. The results are given below.

### [1] T12/173 – area B – Sample square 3 - #138

Coprosma sp.	1
Fivefinger	2
Mapau	2
Kanuka	7
Pohutukawa	1
Kohekohe	1

### [2] T12/173 – area B – Sample square 1 - #117

Kanuka	12
Pohutukawa	3
Mahoe	1

### [3] T12/173 – area B – Sample square 2 - #136

Manuka	5
Pittosporum	1
Olearia	3
Kanuka	6
Pohutukawa	3
Kauri (branch or root wood)	1

### [4] T12/173 – area A – F9 Pit floor shell - #124

Manuka	4
Fivefinger	5
Akeake	3
Kanuka	6
Pohutukawa	2

Species	# Pieces	Plant type
Manuka	9	
Coprosma	1	
Akeake	3	
Fivefinger	7	
Pittosporum	1	
Olearia	3	
Mahoe	1	
Kanuka	31	Shrub/Scrub spp. (83%)
Kohekohe	1	
Pohutukawa	9	Broadleaf trees (15%)
Kauri	1	Conifer (1.5%)
Totals	67	

Table G1. Summary of charcoal identifications.

## Comments

This charcoal assemblage suggests vegetation consisted of a pohutukawa and coastal re-growth scrub dominated by kanuka. The kauri root or branch wood present is likely to be the nearly indestructible resinous remains that are found sub-fossil everywhere kauri once grew. The assemblage suggests vegetation similar to the current woody cover.

Coprosma	One of several possible <i>Coprosma</i> species
Pittosporum	One of several possible <i>Pittosporum</i> species
Olearia	One of several possible <i>Olearia</i> species
Manuka	<i>Leptospermum scoparium</i>
Fivefinger	<i>Pseudopanax arboreus</i>
Akeake	<i>Dodonaea viscosa</i>
Kanuka	<i>Kunzea ericoides</i>
Mahoe	<i>Melicytus ramiflorus</i>
Kohekohe	<i>Dysoxylum spectabile</i>
Pohutukawa	<i>Metrosideros excelsa</i>
Kauri	<i>Agathis australis</i>