



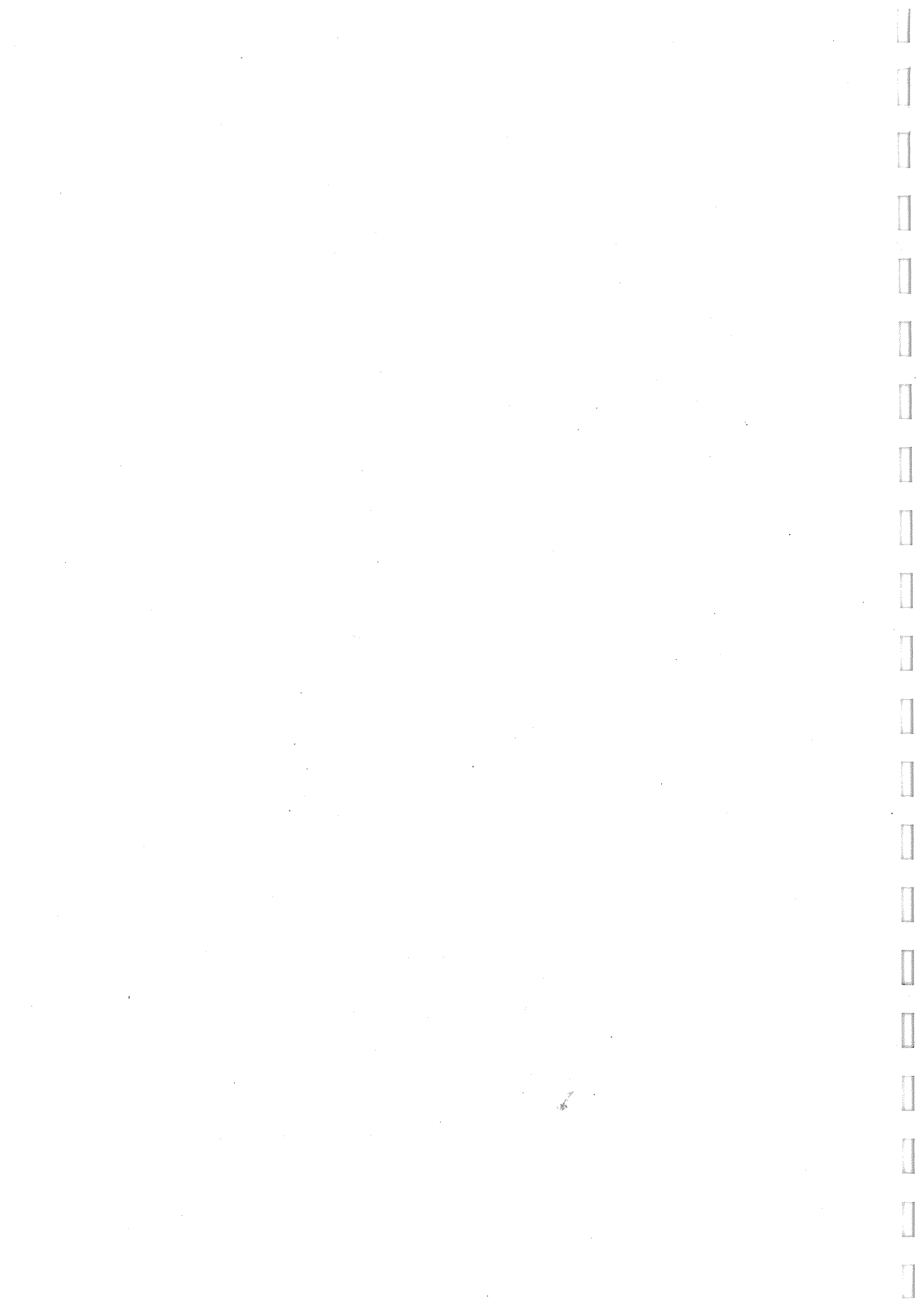
Analysis of kauri dieback soil samples, Phase 1

Final Report

Contract: RFQ 12239



Landcare Research
Manaaki Whenua



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Contents

Summary	v
1 Introduction	1
2 Background	1
3 Objectives	1
4 Methods	2
4.1 Soil receipt protocol	2
4.2 Soil bioassay protocol	2
4.3 DNA isolation, amplification and sequencing.....	3
4.4 Retesting of selected soil samples.....	3
4.5 iButton temperature studies	4
5 Results	4
5.1 QA/QC findings	4
5.2 Soil sample mass variation	4
5.3 PTA presence	5
5.4 Other <i>Phytophthora</i> species.....	5
5.5 Inter-laboratory PTA comparative recoveries.....	6
5.6 Repeat soil bioassays.....	6
5.7 iButton temperature data	8
6 Discussion	8
6.1 Soil sample variability	8
6.2 PTA presence	8
6.3 Other <i>Phytophthora</i> species.....	9
6.4 Establishment of 'cool-chain' for soil transport.....	10
7 Conclusions.....	10

8	Recommendations	10
9	Acknowledgements	11
10	References	11
	Appendix 1A – Sample Receipt and Record Log.....	13
	Appendix 1B – Sample Control Record	18
	Appendix 1C – Sample Shipping Receipt Form.....	35
	Appendix 1D – Analytical Data Sheet.....	36
	Appendix 1E – iButton Receipt and Log	42
	Appendix 1F – Temperature profiles for soil samples.....	43
	Appendix 2 – Soil SOP	47
	Appendix 3A – QA/QC Scion.....	49
	Appendix 3B – QA/QC PFR.....	52
	Appendix 4A – Results spreadsheet.....	55
	Appendix 4B – Soil Detection Plan (SDP) location map	63

Summary

Project

- Analysis of kauri dieback soil samples, Phase 1, March–August 2011.

Objectives

- Using the extended soil baiting SOP, bioassay soil samples collected as part of the delimitation survey for presence of *Phytophthora* taxon Agathis (PTA)
- Provide interpretation of results in relation to PTA status of the soil samples.

Methods

- Soil samples received from Wildland Consultants were logged at Landcare Research, Tamaki, provided a discrete sample number, weighed and stored at 10°C before bioassay.
- Soil samples were thoroughly mixed in the bag and sub-sampled for analysis by at least one of three diagnostic laboratories: Landcare Research (Tamaki); Scion (Rotorua) and Plant and Food Research (Havelock North). Soil samples were packaged and sent via overnight courier to Scion and Plant and Food Research (PFR).
- A standardised, extended soil baiting bioassay protocol using germinated lupin seed (*Lupinus angustifolius*) and Himalayan cedar needles (*Cedrus deodara*) was employed at all three laboratories. The bait tissues were plated to *Phytophthora*-selective media and characteristic PTA-cultures recovered.
- Eighteen soil samples that recorded negative for PTA were reanalysed using the extended baiting protocol.

Results

- Phase 1 comprised 91 samples representing 25 sites.
- Soil samples ranged in mass from 1 to 6 kg, most being between 1 and 4 kg.
- PTA was recovered from 15 of the 91 samples, representing seven of the 25 sites and coming from five forest areas. The five forest areas with PTA-positive sites were Waipoua, Omahuta, Glenbervie, Punaruku (Russell Forest) and Great Barrier Island.
- There was marked clustering of PTA-positive recoveries from within an infested site.
- *Phytophthora cinnamomi* was recovered from 60% of the samples.
- *P. multivora* was recovered from 5.5% of the samples.
- 30% of samples had no *Phytophthora* recoveries.
- We obtained the same results for the repeated soil bioassays for selected previously PTA-negative sites – these remained negative for PTA.

Conclusions

- Using the extended soil baiting method, PTA was recovered from the following soil samples submitted by Wildlands Consultants:
 - Waipoua Site 5

- Omahuta Site 6
 - Glenbervie Sites 19A, 19C, 19D
 - Punaruku (Russell Forest) Site 28
 - Great Barrier Island Site 21.
- There was marked clustering of PTA-positive recoveries from within an infested site.
 - There was considerable variation between the sizes of soil samples and standardisation would be desirable.
 - Preventing the overheating of soil samples is vital as PTA mycelium is killed at 29°C and viability of oospores will likely be reduced at temperatures above 45°C.

Recommendations

- Standardise soil volume at point of sampling (1–1.5 kg).
- Modify the QA/QC procedure to include temperature monitoring of soil from the point of sampling through to the analytical laboratory. In this way, temperature data can be analysed upon receipt of each sample, to establish if significant temperature variations (i.e. >30°C) have occurred in transit.
- Establish a ‘cool chain’ of custody to maintain soil sample temperatures below 25°C and preferably within the range 10°C ± 50%.
- Temperature tags (e.g. iButtons®) should accompany soil from the point of sampling, through to laboratories.
- Delimit extent of contaminated sites through further sampling (including, where appropriate, tissue sampling).

1 Introduction

Phytophthora taxon Agathis (PTA) is an oomycete fungus associated with dieback in kauri *Agathis australis* trees in Auckland, Northland and Great Barrier Island and possibly other sites where dieback occurs but PTA has not yet been identified.

The Ministry of Agriculture and Forestry (MAF) is working in partnership with the Department of Conservation, regional councils and local iwi to deliver a long-term management programme for kauri dieback. As part of this programme, and on behalf of the programme partnership, MAF requires analysis of soil and tissue samples taken from approximately 20 forests throughout the natural range of kauri. This final report provides a summary of results from Phase 1 of the Soil Detection Plan (SDP), and incorporates feedback from the Planning and Intelligence Committee of the Kauri Dieback Joint Agency Response.

2 Background

PTA has been identified as a causal agent of kauri dieback (Beever et al. 2009) and new sites of kauri dieback continue to be identified across the Auckland and Northland regions. The current distribution of PTA includes sites in Northland (Ratea Plantation, Waipoua, Trounson, Mangawhai) and Auckland (Waitakere Ranges, Great Barrier Island, Awhitu and the Hunua Ranges). Not all kauri forests throughout the North Island have been surveyed for PTA, and these could represent disease-free remnants that need to be identified and protected appropriately.

Through a process of consultation, the Kauri Dieback Joint Agency Response (KDJAR) has gained access to survey the kauri estate of the North Island. This first stage of the soil sampling process is being carried out by Wildland Consultants, and covers sites from Northland, Coromandel and Great Barrier Island.

3 Objectives

- Using the extended soil baiting SOP, bioassay soil samples collected as part of the delimitation survey for presence of *Phytophthora* taxon Agathis (PTA).
- Provide interpretation of results in relation to PTA status of soils.

4 Methods

4.1 Soil receipt protocol

Soils were sampled by representatives of Wildland Consultants according to a protocol provided by the KDJAR (Dick & Bellgard 2010) and delivered to Landcare Research, Tamaki, where they were inspected to ensure they were intact. The waterproof labels were removed from the individually bagged samples, which were given unique sample identity numbers. These were recorded on a hard copy of the Sample Receipt and Record Log (Appendix 1A) and their weight recorded on the Sample Control Record (Appendix 1B). The samples were then stored at 10°C in the Ecology Laboratory cool room (Figure 1). The data from the hard copies was uploaded to the electronic databases.



Figure 1 Soil storage at Landcare Research Tamaki 10°C cool room.

4.2 Soil bioassay protocol

Just prior to analysis, the soils were removed from the cool room and this movement recorded on the Sample Control Record (Appendix 1B). The samples were individually hand-mixed in their bag to ensure that the clods were broken and organic matter and roots combined. Subsamples were weighed into labelled zip-lock bags, the weight recorded on the Sample Control Record (Appendix 1B), and the remaining soil weighed. The sample date was written

on the waterproof label and put back in the bag, and the remainder of the soil samples returned to the cool room (date, time and mass recorded on Sample Control Record, Appendix 1B).

The soil samples for Scion and Plant and Food Research (PFR) were packed into cardboard boxes, secured with bubble-wrap and sent by registered overnight courier. An email was sent advising Scion and PFR that the samples had been dispatched. Scion and PFR confirmed receipt of samples via follow-up email or telephone communication. An example Shipping Receipt Form is given in Appendix 1C.

At the commencement of the soil bioassay analysis, the *sample* information was captured on the Analytical Data Sheet (Appendix 1D). The samples were bioassayed via the extended baiting protocol (Appendix 2). The extended baiting protocol was designed specifically for PTA detection – it utilises a soil-drying step and a moist-incubation step: specifically-tailored to recover oospore-forming species of *Phytophthora* (see Jeffers & Aldwinkle 1987). Further, the utilisation of a *Phytophthora*-specific agar (i.e. P₅ARPH) also helps target *Phytophthora* spp. by excluding *Pythium* spp. and higher fungi (such as basidiomycetes and ascomycetes; Jeffers 2006). Pure mycelia isolates were transferred and stored on PDA.

4.3 DNA isolation, amplification and sequencing

Mycelia was scraped off the PDA plates using a pipette tip and put into sterile Eppendorf tubes containing 420 µl of tissue extract buffer and 4.2 µl protease K enzyme from the Corbette robot DNA purification kit (Qiagen). After a 30-s vortex, the tubes were incubated at 56°C for 1 h, and centrifuged at 16000 rpm for 3 min. Then 220 µl of the supernatant was removed and loaded onto Corbette's DNA purification robot for DNA extraction. The robot was run according to the manufacturer's instructions.

The region spanning the internal transcribed spacer (ITS) 1-5.8S-ITS2 of the ribosomal DNA was amplified using ITS6 (Cooke & Duncan 1997) and ITS4 (White et al. 1990) primers. Successful amplifications were then confirmed by running the PCR products on a 1.5% agarose gel stained with ethidium bromide at 150V for 30 min. A sequencing PCR reaction was then undertaken and the completed reaction cleaned using Applied Biosystem's Big Dye Xterminator purification kit and loaded onto an ABI Genetic Analyser 3031XL sequencing machine (Applied Biosystems).

Pure isolates suspected to be PTA fungi had their ITS region sequenced and a NCBI/BLAST® search undertaken to compare with a known, validated PTA sequence deposited in GenBank®. These data were added to the Sample Control Record (Appendix 1B) and Analytical Data Sheet (Appendix 1D).

4.4 Retesting of selected soil samples

Upon completion of the first-round of testing, 18 soil samples were retested upon request of the KDJAR. The reasons this were various and as follows:

- No oomycete fungi recovered the first time

- Consistent 'negatives' (suspect 'false negatives')
- Only one lab bioassayed the sample soil
- Samples came from beneath / next to trees with PTA-lesions, but no PTA recovered from the soil sample
- Discretionary samples taken near, or adjacent to, sites with tree symptoms / known contaminated sites

4.5 iButton temperature studies

Following on from recommendations of the Planning and Intelligence Team, a temperature study was instigated to track the temperature profile of soil samples as they travelled from the field sample sites to Landcare Research and between labs. The intent was to monitor temperature throughout transit in case high temperatures occurred that might affect detection of PTA. The Thermochron iButton® was selected for this operation. Thermochron iButtons are self-contained, waterproof, portable temperature data loggers that record and store time and temperature data, for later analysis (see Appendix 1E).

5 Results

5.1 QA/QC findings

The internal audit held on 17 May 2011 found that all soil samples were in place and accounted for as recorded in the Sample Control Record (Appendix 1B). The internal audit held on 20 June 2011 found there to be no inconsistencies on the Sample Control Record (Appendix 1B). Out of 15 random soil samples stored at Landcare Research (LCR), there was found to be between 0.1 and 2% difference in sample weights. The slight differential is attributed to additional plastic bagging and condensation within the bags.

The individual QA/QC sample reports of Scion and PFR are provided in Appendices 3A and 3B. The samples received and analysed correspond to the Sample Control Record (Appendix 1B). All samples excess to the bioassay, provided to both laboratories, have been disposed of appropriately.

The temperature tag download for the 10°C cool room showed that there was between 5 and 10% variation in temperature around 10°C.

5.2 Soil sample mass variation

The first 15 soil samples received had a mass of c. 1.5 kg. As the programme progressed, soil samples increased in mass (see Figure 2). While the majority of samples ranged between 1 and 4 kg, there were some samples received that exceeded 5 kg.

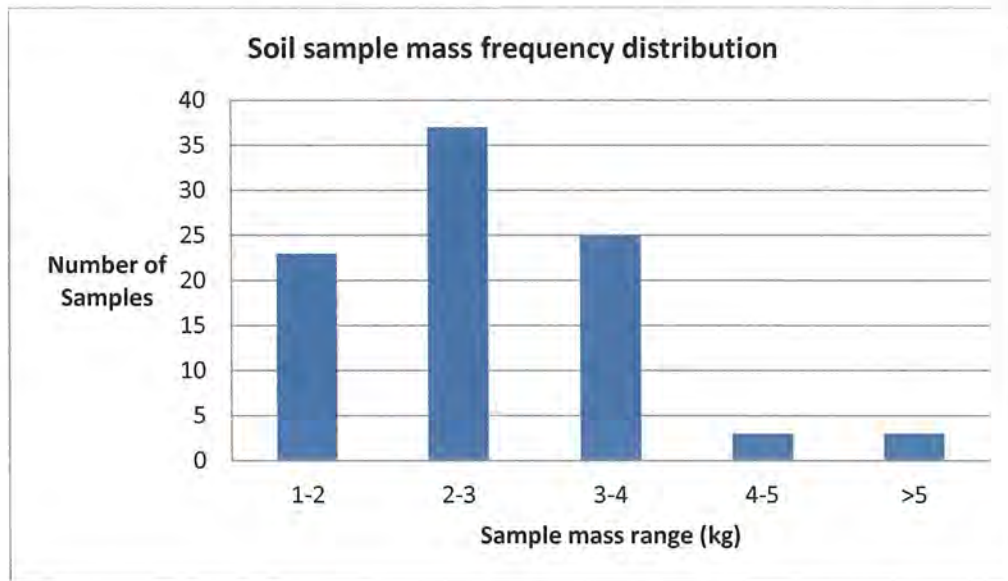


Figure 2 Soil sample mass variation received from Wildlands Consultants.

5.3 PTA presence

Phase 1 consisted of 91 soil samples from 24 sites (Appendix 4A) from which 15 PTA-positive samples were recovered. These 15 samples came from 7 of the 24 sites. These PTA-positive sites occur in the following five forest areas (see also Appendices 4A and 4B):

1. Waipoua Site 5 (Tree 1)
2. Omahuta Site 6 (Tree 1,2,3, Discretionary Sample 2)
3. Glenbervie Site 19A (Tree 2)
4. Glenbervie Site 19C (Tree 1-3)
5. Glenbervie Site 19D (Tree 1)
6. Punaruku (Russell Forest) Site 28 (Tree 1)
7. Great Barrier Island Site 21 (Tree 1-3).

5.4 Other *Phytophthora* species

Phytophthora cinnamomi was recovered from 60% of soil samples (e.g. Puketi, Paranui). On four occasions *P. cinnamomi* was recovered with PTA (e.g. Omahuta 6 Tree 3). *P. multivora* was recovered on five occasions (e.g. Puketi 2 Site 12, Tree 1). At Waipoua Site 5 and Great Barrier Site 21, *P. multivora* was recovered together with PTA. *P. multivora*, PTA, and *P. cinnamomi* were all recovered from the soil sample taken from Glenbervie Site 19C, Tree 1. While this information is outside of the contracted outputs, this information was requested by the Planning and Intelligence Team of the KDJAR.

5.5 Inter-laboratory PTA comparative recoveries

A total of 33 soil samples were run by all three laboratories (i.e. three replicates). Of these, 23 samples returned negative results by all three laboratories. Ten PTA-positive samples were identified but only once did all laboratories recover PTA simultaneously. On two occasions, two out of three laboratories recovered PTA, and seven times only one laboratory out of three recovered PTA (Table 1).

Scion and PFR received several soil samples from which they did not recover any oomycetes (Scion samples: 28–53, 67–77; PFR: 51, 52; 60–91). These samples came from the following sites and were part of two particular consignments:

Northland:

Coromandel:

Russell 3

Manaia 24

Omahuta 7, 8, 9, 10

Lynch Stream 25

AH Reed

Kauaeranga Valley 2

Glenbervie 19B

Punaruku 28, 29

Table 1 Breakdown of PTA recoveries between laboratories

	All negative	One lab positive PTA	Two labs positive PTA	Three labs positive PTA
Triplicate (<i>n</i> = 33)	23	7	2	1
Duplicate: LCR v. Scion (<i>n</i> = 10)	10	0	0	-
Duplicate: LCR v. PFR (<i>n</i> = 28)	26	1	1	-
Duplicate: Scion v. PFR (<i>n</i> = 6)	5	1	0	-
LCR (<i>n</i> = 1)	1	0	-	-
Scion (<i>n</i> = 10)	10	0	-	-
PFR (<i>n</i> = 3)	1	2	-	-

LCR = Landcare Research; PFR = Plant and Food Research

5.6 Repeat soil bioassays

Eighteen soil samples were duplicated and each lab carried out 12 bioassays (Table 2).

Table 2 Results of repeat bioassays

Laboratory code	Sample number	Lab	June result	LCR repeat	Scion repeat	PFR repeat
1	29	LCR, PFR	Nil	Pc	Not tested	Nil
2	33	LCR, Scion	Nil	Pc	Pc, Pyth	Not tested
3	34	LCR, PFR	Nil	Pc	Not tested	Pyth
4	35	LCR, Scion	Nil	Pc	Pc	Not tested
5	37	LCR, PFR	Nil	Septate fungus	Not tested	Nil
6	38	LCR, Scion	Nil	Pc	Pc	Not tested
7	45	PFR, LCR	Nil	Zygomycetous fungus	Not tested	Pyth
8	47	PFR, Scion	Nil	Not tested	Pyth	Pyth & Pm
9	48	PFR, LCR	Nil	Pc	Not tested	Pyth
10	49	PFR, Scion	Nil	Not tested	Pc, Pyth	Pyth & Pm
11	50	PFR, LCR	Nil	Pc	Not tested	Pyth
12	61	PFR, Scion	Nil	Not tested	Nil	Nil
13	62	Scion, LCR	Nil	Pc	Pc, Pyth	Not tested
14	63	Scion, PFR	Nil	Not tested	Pyth	Pyth
15	64	Scion, LCR	Nil	Pc	Nil	Not tested
16	89	Scion, PFR	Pc	Not tested	Pyth	Pyth
17	90	Scion, LCR	Pc	Pc	Pc, Pyth	Not tested
18	91	Scion, PFR	Pc	Not tested	Nil	Pyth

NB: Pc = *P. cinnamomi*, Pm = *P. multivora*, Pyth = *Pythium* sp.

We did not recover PTA from any of the samples that were repeated. This is in support of the June analysis results. The recovery of other by-catch oomycete fungi from at least one of the laboratories supports the validity of the negative PTA result, and suggests that the sample(s) had not been compromised by temperature or other harmful factors.

5.7 iButton temperature data

Appendix 1F-1–4, provides the temperature profiles within consignments of soil – two consignments sent to LCR and one each to Scion (1F-1), LCR to PFR (1F-2), Corromandel to LCR (1F-3), and Waipoua to LCR (1F-4). The first two profiles represent uninsulated (i.e. cardboard box with no chill-bricks) soil transport from LCR to the diagnostic labs of Scion and PFR. Both plots show a similar trend of the temperature falling to around 10°C overnight (in transit on 3 August 2011), and then a rise in temperature as the samples were unpacked on the 4 August 2011, around lunchtime (Appendix 1F-1, 1F-2). Temperatures during transit ranged from 8° to 18°C.

Appendix 1F-3 plots the temperature profile from the Corromandel region back to LCR – this represents an insulated transit (with chill-bricks). The temperature range for this trip was between 2° and 25°C, with a period of constant temperature around 8°C. This sort of temperature variation is worth noting on the soil samples associated with this consignment.

The final temperature profile is from the Waipoua region (Dargaville) to LCR via in an insulated (polystyrene container) with insulated chill-bricks (Appendix 1F-4). This profile demonstrates the combined efficacy of using insulated containers (i.e. polystyrene) in combination with insulated chill-bricks (i.e. chill-bricks wrapped in newspaper or bubble-wrap to prevent direct cold shock on the soil sample). The temperature profile has a gradual decline in temperature from 14°C to the optimum temperature of 10°C.

6 Discussion

6.1 Soil sample variability

The recommended soil sampling procedure, designed as part of the SOP, proposed obtaining composite soil samples in the range of 1–1.5 kg from each tree (Dick & Bellgard 2010). The evidence of variability in soil sample mass, which is occurring at the point of sampling, means that certain sites (and particular trees) are being over-represented. This also has implications with respect to the relative representativeness of the sub-sampled aliquots used for the soil bioassay.

6.2 PTA presence

Among the forest areas with PTA, there was a marked clustering of PTA recoveries from four of the sites. These clusters occurred in the following forest areas:

1. Waipoua Site 5 2 PTA recoveries
2. Omahuta Site 6 4 PTA recoveries
3. Glenbervie Site 19 5 PTA recoveries
4. Great Barrier Island Site 21 3 PTA recoveries.

6.3 Other *Phytophthora* species

The extended baiting protocol we are using was designed specifically for PTA extraction and recovery. Any other *Phytophthora* spp. we get is ‘by-catch’, and frankly, should be considered as a contaminant in the process. The differences in extraction rates of other *Phytophthora* spp. (such as *P. cinnamomi*), from the recent round of retested soil samples, almost certainly reflects slightly different drying conditions, and nothing else. In the PFR laboratory in Hawke’s Bay, the soil is very thoroughly air-dried in the very dry Hawke’s Bay environment. The other labs are probably in moister environments, so the drying may not be as thorough, and *P. cinnamomi* suppression not as great. As such, interpretation of the ‘by-catch’ data from a technique that is designed to *minimise* that by-catch should be done with extreme caution (as is beyond the scope of this brief). We provide the following discussion on ‘other’ *Phytophthora* spp. to highlight the risks posed by these ‘other’ introduced plant pathogens to the native plants of New Zealand’s kauri forests.

6.3.1 *Phytophthora cinnamomi*

Phytophthora cinnamomi is considered to have been introduced into New Zealand sometime during the last 1000 years. *P. cinnamomi* is now widely distributed in New Zealand indigenous forests, being isolated from soils in apparently undisturbed forests in isolated situations (Johnston et al. 2003). *P. cinnamomi* is widely distributed in kauri forests, having been isolated from soil beneath mature, apparently undisturbed stands of kauri in remote localities, as well as from beneath young, regenerating stands (Podger & Newhook 1971). It has been speculated that *P. cinnamomi* may be influencing kauri forest establishment and succession through pre- and post-emergence damping-off, as well as causing disease in stands of older trees (Podger & Newhook 1971; Horner 1984). *P. cinnamomi* may also be influencing other susceptible plant species, known to be associated with kauri in infested sites. Robertson (1970) identified the following species as ‘severely infected’ by *P. cinnamomi* after a 9-month inoculation trial; puka *Meryta sinclairii*, taraire *Beilschmiedia tarairi*, tawa *B. tawa*, ramarama *Lophomyrtus bullata*, pohutukawa *Metrosideros excelsa*, kōwhai *Sophora tetraptera*, titoki *Alectryon excelsus* and puriri *Vitex lucens*.

6.3.2 *Phytophthora multivora*

Phytophthora multivora is a new species recognised from Western Australia, where it is associated with *Eucalyptus* decline as well as disease of a range of other native plant species (Scott et al. 2009). It is morphologically similar to *P. citricola*, which has been known to occur in New Zealand since the 1930s (Dingley 1969; Beever et al. 2006). A number of New Zealand *P. citricola* isolates collected over many years and curated in culture collections have been re-examined in light of the new descriptions and gene sequence data and found to be *P. multivora*. The host-range and risk that *P. multivora* poses to kauri and native plant species are at present unknown. Recently, Ho et al. (2010) recovered *P. multivora* from kawakawa *Macropiper excelsum* trees displaying symptoms of leaf yellowing, branch wilt, and sudden collapse in the Auckland Region and Whangarei. Kawakawa trees in Oratia and Auckland initially showing signs of decline have subsequently all died (Ho et al. 2010). Newhook (1989) noted that *Phytophthora* species invade chiefly unsuberised tips of feeder rootlets, and that rootlet death may be followed by rootlet replacement. Further studies are necessary to ascertain the infection/disease implications for other currently unknown, but potentially susceptible plant taxa occurring with kauri in these sites infested with *P. multivora*.

6.4 Establishment of 'cool-chain' for soil transport

In order to obtain consistent conditions for the transport of soils samples, it is clear that an insulated container and the use of insulated chill-bricks results in gradual cooling and then maintenance of optimum temperature conditions around 10°C ($\pm 50\%$).

The repeated bioassays of 18 soil samples resulted in recovery of no PTA; this was consistent with the earlier June results. The presence of a variety of 'by-catch' oomycetes supports the validity of the sample and suggests that high temperatures had not occurred in transit (Table 2).

7 Conclusions

- Using the extended soil baiting method, PTA was recovered from the following soil samples submitted by Wildlands Consultants:
 - Waipoua Site 5
 - Omahuta Site 6
 - Glenbervie Sites 19A, 19C and 19D
 - Punaruku (Russell Forest) Site 28
 - Great Barrier Island Site 21.
- There was marked clustering of PTA-positive recoveries from within an infested site.
- *P. cinnamomi* was recovered from 60% of the soil samples.
- *P. multivora* was recovered from 5.5% of the soil samples – with *P. multivora*, *P. cinnamomi* and PTA being recovered together from one soil sample.
- There was considerable variation between the sizes of soil samples and standardisation would be desirable.
- Preventing the overheating of soil samples is vital as PTA mycelium is killed at 29°C and viability of oospores will likely be reduced at temperatures above 45°C.
- Retesting of 18 samples did not alter the results as reported in June 2011 (across all three labs).

8 Recommendations

- Standardise soil volume at point of sampling (1–1.5 kg).
- Modify the QA/QC procedure to include temperature monitoring of soil from the point of sampling through to the analytical laboratory. Temperature data can be analysed upon receipt of each sample, to establish if significant temperature variations (i.e. $>30^\circ\text{C}$) have occurred in transit.
- Establish a 'cool chain' of custody to maintain soil sample temperatures below 25°C and preferably within the range $10^\circ\pm 50\%$.
- Temperature tags (e.g. iButtons®) should accompany soil from the point of sampling, through to laboratories.

- Delimit extent of contaminated sites through further sampling (including, where appropriate, tissue sampling).

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Appendix 1A – Sample Receipt and Record Log

Spreadsheet used to log date of receipt, date analysed, and date reported.

Sample no.	Sample identification & type	Date received	Date analysed	Date reported
001	Site 16, Taheke Tree 2	18/03/11	22/03/11	18/04/11
002	Site 16, Taheke Tree 1	18/03/11	22/03/11	18/04/11
003	Site 16, Taheke Tree 3	18/03/11	22/03/11	18/04/11
004	Site 16, Taheke Discretionary sample 1	18/03/11	22/03/11	18/04/11
005	Site 16, Taheke Discretionary sample 2	18/03/11	22/03/11	18/04/11
006	Site 5 Waipoua Tree 1	01/04/11	4/04/2011	05/05/11
007	Site 5 Waipoua Tree 2	01/04/11	4/04/2011	05/05/11
008	Site 5 Waipoua Tree 3	01/04/11	4/04/2011	05/05/11
009	Site 5 Waipoua Disc 1	01/04/11	4/04/2011	05/05/11
010	Site 5 Waipoua Disc 2	01/04/11	4/04/2011	05/05/11
011	Site 32 Paranui 2 Tree 1	01/04/11	4/04/2011	05/05/11
012	Site 32 Paranui 2 Tree 2	01/04/11	4/04/2011	05/05/11
013	Site 32 Paranui 2 Tree 3	01/04/11	4/04/2011	05/05/11
014	Site 32 Paranui 2 Disc 1	01/04/11	4/04/2011	05/05/11
015	Site 11 Puketi 1 Tree 1	01/04/11	4/04/2011	05/05/11
016	Site 11 Puketi 1 Tree 2	01/04/11	4/04/2011	05/05/11
017	Site 11 Puketi 1 Tree 3	01/04/11	4/04/2011	05/05/11
018	Site 12 Puketi 2 Tree 1	01/04/11	4/04/2011	05/05/11
019	Site 12 Puketi 2 Tree 2	01/04/11	4/04/2011	05/05/11
020	Site 12 Puketi 2 Tree 3	01/04/11	4/04/2011	05/05/11
021	Site 13 Puketi 3 Tree 1	01/04/11	4/04/2011	05/05/11

Sample no.	Sample identification & type	Date received	Date analysed	Date reported
022	Site 31 Paranui 1 Tree 1	01/04/11	4/04/2011	05/05/11
023	Site 31 Paranui 1 Tree 2	01/04/11	4/04/2011	05/05/11
024	Site 31 Paranui 1 Tree 3	01/04/11	4/04/2011	05/05/11
025	Site 15 Coopers Tree 1	01/04/11	4/04/2011	05/05/11
026	Site 15 Coopers Tree 2	01/04/11	4/04/2011	05/05/11
027	Site 15 Coopers Tree 3	01/04/11	4/04/2011	05/05/11
028	Site 30 Russell 3 Tree 1	08/04/11	4/05/2011	24/06/11
029	Site 30 Russell 3 Disc 1	08/04/11	4/05/2011	24/06/11
030	Site 9 Tree 1 Omahuta	08/04/11	4/05/2011	24/06/11
031	Site 9 Tree 2 Omahuta	08/04/11	4/05/2011	24/06/11
032	Site 9 Tree 3 Omahuta	08/04/11	4/05/2011	24/06/11
033	Site 10 Tree 1 Omahuta	08/04/11	4/05/2011	24/06/11
034	Site 10 Tree 2 Omahuta	08/04/11	4/05/2011	24/06/11
035	Site 10 Tree 3 Omahuta	08/04/11	4/05/2011	24/06/11
036	Site 7 Tree 1 Omahuta	08/04/11	4/05/2011	24/06/11
037	Site 7 Tree 2 Omahuta	08/04/11	4/05/2011	24/06/11
038	Site 7 Tree 3 Omahuta	08/04/11	4/05/2011	24/06/11
039	Site 8 Tree 1 Omahuta	08/04/11	4/05/2011	24/06/11
040	Site 8 Tree 2 Omahuta	08/04/11	4/05/2011	24/06/11
041	Site 8 Tree 3 Omahuta	08/04/11	4/05/2011	24/06/11
042	Site 6 Tree 1 Omahuta	08/04/11	4/05/2011	24/06/11
043	Site 6 Tree 2 Omahuta	08/04/11	4/05/2011	24/06/11
044	Site 6 Tree 3 Omahuta	08/04/11	4/05/2011	24/06/11

Sample no.	Sample identification & type	Date received	Date analysed	Date reported
045	Site 6 Disc 1 Omahuta	08/04/11	4/05/2011	24/06/11
046	Site 6 Disc 2 Omahuta	08/04/11	4/05/2011	24/06/11
047	Site 17 Tree 1 AH Reed	08/04/11	4/05/2011	24/06/11
048	Site 17 Tree 2 AH Reed	08/04/11	4/05/2011	24/06/11
049	Site 17 Tree 3 AH Reed	08/04/11	4/05/2011	24/06/11
050	Site 18 Tree 1 AH Reed	08/04/11	4/05/2011	24/06/11
051	Site 18 Tree 2 AH Reed	08/04/11	4/05/2011	24/06/11
052	Site 18 Tree 3 AH Reed	08/04/11	4/05/2011	24/06/11
053	180 Driving Creek Road, Coromandel	12/04/11	4/05/2011	24/06/11
054	Site 22 Tree 1 Great Barrier 1	14/04/2011	4/05/2011	24/06/11
055	Site 22 Tree 2 Great Barrier 1	14/04/2011	4/05/2011	24/06/11
056	Site 22 Tree 3 Great Barrier 1	14/04/2011	4/05/2011	24/06/11
057	Site 22 Disc 1 Great Barrier 1	14/04/2011	4/05/2011	24/06/11
058	Site 21 Tree 1 Great Barrier 2	14/04/2011	4/05/2011	24/06/11
059	Site 21 Tree 2 Great Barrier 2	14/04/2011	4/05/2011	24/06/11
060	Site 21 Tree 3 Great Barrier 2	14/04/2011	4/05/2011	24/06/11
061	Site 14 Tree 1 Puketi	29/04/2011	2/06/2011	24/06/11
062	Site 14 Tree 2 Puketi	29/04/2011	2/06/2011	24/06/11
063	Site 14 Tree 3 Puketi	29/04/2011	2/06/2011	24/06/11
064	Site 14 Discretionary 1	29/04/2011	2/06/2011	24/06/11
065	Site 19 A Tree 1 Glenbervie	29/04/2011	2/06/2011	24/06/11
066	Site 19 A Tree 2 Glenbervie	29/04/2011	2/06/2011	24/06/11
067	Site 19 A Tree 3 Glenbervie	29/04/2011	2/06/2011	24/06/11

Sample no.	Sample identification & type	Date received	Date analysed	Date reported
068	Site 19 B Tree 1 Glenbervie	29/04/2011	2/06/2011	24/06/11
069	Site 19 B Tree 2 Glenbervie	29/04/2011	2/06/2011	24/06/11
070	Site 19 B Tree 3 Glenbervie	29/04/2011	2/06/2011	24/06/11
071	Site 19 C Tree 1 Glenbervie	29/04/2011	2/06/2011	24/06/11
072	Site 19 C Tree 2 Glenbervie	29/04/2011	2/06/2011	24/06/11
073	Site 19 C Tree 3 Glenbervie	29/04/2011	2/06/2011	24/06/11
074	Site 19 D Tree 1 Glenbervie	29/04/2011	2/06/2011	24/06/11
075	Site 19 D Tree 2 Glenbervie	29/04/2011	2/06/2011	24/06/11
076	Site 19 D Tree 3 Glenbervie	29/04/2011	2/06/2011	24/06/11
077	Site 28 Tree 1 Punaruku/Russell	29/04/2011	2/06/2011	24/06/11
078	Site 28 Tree 2 Punaruku/Russell	29/04/2011	2/06/2011	24/06/11
079	Site 28 Tree 3 Punaruku/Russell	29/04/2011	2/06/2011	24/06/11
080	Site 29 Tree 1 Punaruku/Russell	29/04/2011	2/06/2011	24/06/11
081	Site 29 Tree 2 Punaruku/Russell	29/04/2011	2/06/2011	24/06/11
082	Site 29 Tree 3 Punaruku/Russell	29/04/2011	2/06/2011	24/06/11
083	Site 29 Tree 3 Punaruku/Russell	16/05/2011	2/06/2011	24/06/11
084	Site 24 Tree 1 Manaia	16/05/2011	2/06/2011	24/06/11
085	Site 24 Tree 2 Manaia	16/05/2011	2/06/2011	24/06/11
086	Site 24 Tree 3 Manaia	16/05/2011	2/06/2011	24/06/11
087	Site 25 Tree 1 Lynch Stream	16/05/2011	2/06/2011	24/06/11
088	Site 25 Tree 2 Lynch Stream	16/05/2011	2/06/2011	24/06/11
089	Site 25 Tree 3 Lynch Stream	16/05/2011	2/06/2011	24/06/11
090	Site 27 Tree 1 Kauaeranga	16/05/2011	2/06/2011	24/06/11

Sample no.	Sample identification & type	Date received	Date analysed	Date reported
091	Site 27 Tree 2 Kauaeranga	16/05/2011	2/06/2011	24/06/11

Appendix 1B – Sample Control Record

Spreadsheet documenting the date and time samples arrived at LCR. This spreadsheet also documents the inter-laboratory movements, and the mass of soil remaining in storage at LCR Tamaki

Sample no.	Lab name	Date & time removed	Reason	Sample location	Date; time returned; mass of stored sample
001	Ecol Lab	20/03/11; 11:00 am	194 g for PFR	Posted to PFR	20/03/11; 11:05 am; 686 g
001	Ecol Lab	20/03/11; 11:00 am	195 g for Scion	Posted to Scion	20/03/11; 11:05 am; 686 g
001	Ecol Lab	20/03/11; 11:00 am	175 g for LCR	BIOASSAY	20/03/11; 11:05 am; 686 g
002	Ecol Lab	20/03/11; 11:10 am	178 g for LCR	BIOASSAY	20/03/11; 11: 15 am; 883 g
002	Ecol Lab	20/03/11; 11:10 am	192 g for PFR	Posted to PFR	20/03/11; 11:15 am; 883 g
002	Ecol Lab	20/03/11; 11:10 am	195 g for Scion	Posted to Scion	20/03/11; 11:15 am; 883 g
003	Ecol Lab	20/03/11; 11:20 am	200 g for PFR	Posted to PFR	20/03/11; 11:30 am; 973 g
003	Ecol Lab	20/03/11; 11:20 am	180 g for Scion	Posted to Scion	20/03/11; 11:30 am; 973 g
003	Ecol Lab	20/03/11; 11:20 am	180 g for LCR	BIOASSAY	20/03/11; 11:30 am; 973 g
004	Ecol Lab	20/03/11; 11:35 am	180 g for LCR	BIOASSAY	20/03/11; 11:45 am; 1103 g
004	Ecol Lab	20/03/11; 11:35 am	186 g for PFR	Posted to PFR	20/03/11; 11:45 am; 1103 g
004	Ecol Lab	20/03/11; 11:35 am	195 g for Scion	Posted to Scion	20/03/11; 11:45 am; 1103 g
005	Ecol Lab	20/03/11; 11:35 am	216 g for LCR	BIOASSAY	20/03/11; 11:51 am; 897 g
005	Ecol Lab	20/03/11; 11:00 am	216 g for PFR	Posted to PFR	20/03/11; 11:51 am; 897 g

Sample no.	Lab name	Date & time removed	Reason	Sample location	Date; time returned; mass of stored sample
005	Ecol/Lab	20/03/11; 11:35 am	222 g for Scion	Posted to Scion	20/03/11; 11:51 am; 897 g
006	Ecol/Lab	02/04/11; 10:00 am	300 g for PFR	Posted to PFR	02/04/11; 10:15 am; 1903 g
006	Ecol/Lab	02/04/11; 10:00 am	120 g for LCR	BIOASSAY	02/04/11; 10:15 am; 1903 g
007	Ecol/Lab	02/04/11; 10:16 am	120 g for LCR	BIOASSAY	02/04/11; 10:20 am; 937 g
007	Ecol/Lab	02/04/11; 10:16 am	300 g for PFR	Posted to PFR	02/04/11; 10:20 am; 937 g
008	Ecol/Lab	02/04/11; 10:21 am	133 g for LCR	BIOASSAY	02/04/11; 10:40 am; 2047 g
008	Ecol/Lab	02/04/11; 10:21 am	300 g to PFR	Posted to PFR	02/04/11; 10:40 am; 2047 g
009	Ecol/Lab	02/04/11; 10:47 am	300 g to PFR	Posted to PFR	02/04/11; 10:48 am; 1513 g
009	Ecol/Lab	02/04/11; 10:47 am	400 g to Scion	Posted to Scion	02/04/11; 10:48 am; 1513 g
009	Ecol/Lab	02/04/11; 10:47 am	130 g to LCR	BIOASSAY	02/04/11; 10:48 am; 1513 g
010	Ecol/Lab	02/04/11; 10:50 am	400 g to PFR	Posted to PFR	02/04/11; 10:54 am; 1481 g
010	Ecol/Lab	02/04/11; 10:50 am	400 g to Scion	Posted to Scion	02/04/11; 10:54 am; 1481 g
010	Ecol/Lab	02/04/11; 10:50 am	140 g to LCR	BIOASSAY	02/04/11; 10:54 am; 1481 g
011	Ecol/Lab	02/04/11; 10:57 am	300 g to PFR	Posted to PFR	02/04/11; 11:00 am; 951 g
011	Ecol/Lab	02/04/11; 10:57 am	140 g to LCR	BIOASSAY	02/04/11; 11:00 am; 951 g
012	Ecol/Lab	02/04/11; 11:01 am	200 g to PFR	Posted to PFR	02/04/11; 11:04 am; 1379 g
012	Ecol/Lab	02/04/11; 11:01 am	140 g to LCR	BIOASSAY	02/04/11; 11:04 am; 1379 g
013	Ecol/Lab	02/04/11; 11:03 am	222 g to PFR	Posted to PFR	02/04/11; 11:08 am; 1078 g

Sample no.	Lab name	Date & time removed	Reason	Sample location	Date; time returned; mass of stored sample
013	Ecol Lab	02/04/11; 11:03 am	140 g to LCR	BIOASSAY	02/04/11; 11:08 am; 1078 g
014	Ecol Lab	02/04/11; 11:11 am	138 g to LCR	BIOASSAY	02/04/11; 11:13 am; 1143 g
014	Ecol Lab	02/04/11; 11:11 am	247 g to PFR	Posted to PFR	02/04/11; 11:13 am; 1143 g
015	Ecol Lab	02/04/11; 11:16 am	170 g to LCR	BIOASSAY	02/04/11; 11:19 am; 1652 g
015	Ecol Lab	02/04/11; 11:16 am	250 g to PFR	Posted to PFR	02/04/11; 11:19 am; 1652 g
016	Ecol Lab	02/04/11; 11:21 am	200 g to LCR	BIOASSAY	02/04/11; 11:24 am; 1633 g
016	Ecol Lab	02/04/11; 11:21 am	290 g to PFR	Posted to PFR	02/04/11; 11:24 am; 1633 g
017	Ecol Lab	02/04/11; 11:26 am	148 g to LCR	BIOASSAY	02/04/11; 11:30 am; 1061 g
017	Ecol Lab	02/04/11; 11:26 am	300 g to PFR	Posted to PFR	02/04/11; 11:30 am; 1061 g
018	Ecol Lab	02/04/11; 11:31 am	211 g to Scion	Posted to Scion	02/04/11; 12:00 pm; 1331 g
018	Ecol Lab	02/04/11; 11:31 am	140 g to LCR	BIOASSAY	02/04/11; 12:00 pm; 1331 g
019	Ecol Lab	02/04/11; 12:01 pm	140 g to LCR	BIOASSAY	02/04/11; 12:04 pm; 1159 g
019	Ecol Lab	02/04/11; 12:01 pm	333 g to Scion	Posted to Scion	02/04/11; 12:04 pm; 1159 g
020	Ecol Lab	02/04/11; 12:05 pm	192 g to LCR	BIOASSAY	02/04/11; 12:08 pm; 925 g
020	Ecol Lab	02/04/11; 12:05 pm	480 g to Scion	Posted to Scion	02/04/11; 12:08 pm; 925 g
021	Ecol Lab	02/04/11; 12:10 pm	240 g to LCR	BIOASSAY	02/04/11; 12:12 pm; 1840 g
021	Ecol Lab	02/04/11; 12:10 pm	322 g to Scion	Posted to Scion	02/04/11; 12:12 pm; 1840 g
022	Ecol Lab	02/04/11; 12:13 pm	177 g to LCR	BIOASSAY	02/04/11; 12:16 pm; 1157 g

Sample no.	Lab name	Date & time removed	Reason	Sample location	Date; time returned; mass of stored sample
022	Ecol Lab	02/04/11; 12:13 pm	280 g to Scion	Posted to Scion	02/04/11; 12:16 pm; 1157 g
023	Ecol Lab	02/04/11; 12:17 pm	140 g to LCR	BIOASSAY	02/04/11; 12:20 pm; 2707 g
023	Ecol Lab	02/04/11; 12:17 pm	333 g to Scion	Posted to Scion	02/04/11; 12:20 pm; 2707 g
024	Ecol Lab	02/04/11; 12:22 pm	140 g to LCR	BIOASSAY	02/04/11; 12:24 pm; 1145 g
024	Ecol Lab	02/04/11; 12:22 pm	288 g to Scion	Posted to Scion	02/04/11; 12:24 pm; 1145 g
025	Ecol Lab	02/04/11; 12:25 pm	130 g to LCR	BIOASSAY	02/04/11; 12:28 pm; 862 g
025	Ecol Lab	02/04/11; 12:25 pm	250 g to Scion	Posted to Scion	02/04/11; 12:28 pm; 862 g
026	Ecol Lab	02/04/11; 12:28 pm	160 g to LCR	BIOASSAY	02/04/11; 12:32 pm; 1076 g
026	Ecol Lab	02/04/11; 12:28 pm	291 g to Scion	Posted to Scion	02/04/11; 12:32 pm; 1076 g
027	Ecol Lab	02/04/11; 12:33 pm	140 g to LCR	BIOASSAY	02/04/11; 12:33 pm; 1723 g
028	Ecol Lab	Sample arrival			08/04/11; 3:15 pm; 1745 g
029	Ecol Lab	Sample arrival			08/04/11; 3:17 pm; 1403 g
030	Ecol Lab	Sample arrival			08/04/11; 3:18 pm; 1200 g
031	Ecol Lab	Sample arrival			08/04/11; 3:19 pm; 1870 g
032	Ecol Lab	Sample arrival			08/04/11; 3:20 pm; 3050 g
033	Ecol Lab	Sample arrival			08/04/11; 3:21 pm; 3335 g
034	Ecol Lab	Sample arrival			08/04/11; 3:22 pm; 2575 g
035	Ecol Lab	Sample arrival			08/04/11; 3:23 pm; 2185 g

Sample no.	Lab name	Date & time removed	Reason	Sample location	Date; time returned; mass of stored sample
036	Ecol Lab	Sample arrival			08/04/11; 3:24 pm; 2330 g
037	Ecol Lab	Sample arrival			08/04/11; 3:25 pm; 2315 g
038	Ecol Lab	Sample arrival			08/04/11; 3:26 pm; 2900 g
039	Ecol Lab	Sample arrival			08/04/11; 3:27 pm; 3545 g
040	Ecol Lab	Sample arrival			08/04/11; 3:28 pm; 4050 g
041	Ecol Lab	Sample arrival			08/04/11; 3:30 pm; 3395 g
042	Ecol Lab	Sample arrival			08/04/11; 3:31 pm; 3570 g
043	Ecol Lab	Sample arrival			08/04/11; 3:32 pm; 6405 g
044	Ecol Lab	Sample arrival			08/04/11; 3:33 pm; 5630 g
045	Ecol Lab	Sample arrival			08/04/11; 3:35 pm; 4775 g
046	Ecol Lab	Sample arrival			08/04/11; 3:37 pm; 3795 g
047	Ecol Lab	Sample arrival			08/04/11; 3:38 pm; 2920 g
048	Ecol Lab	Sample arrival			08/04/11; 3:39 pm; 3650 g
049	Ecol Lab	Sample arrival			08/04/11; 3:40 pm; 2570 g
050	Ecol Lab	Sample arrival			08/04/11; 3:42 pm; 4750 g
051	Ecol Lab	Sample arrival			08/04/11; 3:44 pm; 2360 g
052	Ecol Lab	Sample arrival			08/04/11; 3:45 pm; 3620 g
053	Ecol Lab	Sample arrival			11/04/11; 9:25 am; 1078 g

Sample no.	Lab name	Date & time removed	Reason	Sample location	Date; time returned; mass of stored sample
054	Ecol Lab	Sample arrival			14/04/11; 11:15 am; 5100 g
055	Ecol Lab	Sample arrival			14/04/11; 11:17 am; 1600 g
056	Ecol Lab	Sample arrival			14/04/11; 11:14 am; 1900 g
057	Ecol Lab	Sample arrival			14/04/11; 11:16 am; 4000 g
058	Ecol Lab	Sample arrival			14/04/11; 11:10 am; 3150 g
059	Ecol Lab	Sample arrival			14/04/11; 11:12 am; 4800 g
060	Ecol Lab	Sample arrival			14/04/11; 11:14 am; 3350 g
028	Ecol Lab	11/04/11; 2:10 pm	290 g to Scion	Posted to Scion	11/04/11; 2:20 pm; 1457 g
029	Ecol Lab	11/04/11; 2:20 pm	256 g to Scion	Posted to Scion	11/04/11; 2:22 pm; 1156 g
030	Ecol Lab	11/04/11; 2:23 pm	279 g to Scion	Posted to Scion	11/04/11; 2:29 pm; 928 g
031	Ecol Lab	11/04/11; 2:30 pm	423 g to Scion	Posted to Scion	11/04/11; 2:32 pm; 1430 g
032	Ecol Lab	11/04/11; 2:32 pm	308 g to Scion	Posted to Scion	11/04/11; 2:34 pm; 2733 g
033	Ecol Lab	11/04/11; 2:32 pm	290 g to Scion	Posted to Scion	11/04/11; 2:37 pm; 2533 g
033	Ecol Lab	12/04/11; 8:39 am	217 g to PFR	Posted to PFR	12/04/11; 8:41 am; 2533 g
033	Ecol Lab	12/04/11; 8:39 am	160 g to LCR	BIOASSAY	12/04/11; 8:41 am; 2533 g
034	Ecol Lab	11/04/11; 2:39 pm	293 g to Scion	Posted to Scion	11/04/11; 2:41 pm; 2263 g
035	Ecol Lab	11/04/11; 2:42 pm	273 g to Scion	Posted to Scion	11/04/11; 2:45 pm; 1893 g
036	Ecol Lab	11/04/11; 2:46 pm	274 g to Scion	Posted to Scion	11/04/11; 2:47 pm; 2036 g

Sample no.	Lab name	Date & time removed	Reason	Sample location	Date; time returned; mass of stored sample
036	Ecol Lab	12/04/11; 8:43 am	184 g to PFR	Posted to PFR	12/04/11; 8:45 am; 1708 g
036	Ecol Lab	12/04/11; 8:43 am	144 g to LCR	BIOASSAY	12/04/11; 8:45 am; 1708 g
037	Ecol Lab	11/04/11; 2:47 pm	478 g to Scion	Posted to Scion	11/04/11; 2:50 pm; 1786 g
038	Ecol Lab	11/04/11; 2:52 pm	349 g to Scion	Posted to Scion	11/04/11; 2:53 pm; 2540 g
039	Ecol Lab	11/04/11; 3:01 pm	273 g to PFR	Posted to PFR	11/04/11; 3:05 pm; 2754 g
040	Ecol Lab	11/04/11; 3:07 pm	274 g to PFR	Posted to PFR	11/04/11; 3:09 pm; 3777 g
041	Ecol Lab	11/04/11; 3:10 pm	272 g to PFR	Posted to PFR	11/04/11; 3:11 pm; 3104 g
042	Ecol Lab	11/04/11; 3:12 pm	302 g to PFR	Posted to PFR	11/04/11; 3:15 pm; 3252 g
043	Ecol Lab	11/04/11; 3:15 pm	283 g to PFR	Posted to PFR	11/04/11; 3:17 pm; 6122 g
044	Ecol Lab	11/04/11; 3:20 pm	302 g to PFR	Posted to PFR	11/04/11; 3:21 pm; 5228 g
044	Ecol Lab	12/04/11; 8:46 am	184 g to Scion	Posted to Scion	12/04/11; 8:48 am; 4910 g
044	Ecol Lab	12/04/11; 8:46 am	134 g to LCR	BIOASSAY	12/04/11; 8:48 am; 4910 g
045	Ecol Lab	11/04/11; 3:22 pm	343 g to PFR	Posted to PFR	11/04/11; 3:24 pm; 4432 g
046	Ecol Lab	11/04/11; 3:26 pm	309 g to PFR	Posted to PFR	11/04/11; 3:28 pm; 3486 g
047	Ecol Lab	11/04/11; 3:29 pm	308 g to PFR	Posted to PFR	11/04/11; 3:30 pm; 3612 g
048	Ecol Lab	11/04/11; 3:31 pm	275 g to PFR	Posted to PFR	11/04/11; 3:32 pm; 3371 g
049	Ecol Lab	11/04/11; 3:34 pm	272 g to PFR	Posted to PFR	11/04/11; 3:35 pm; 2286 g
050	Ecol Lab	11/04/11; 3:36 pm	287 g to Scion	Posted to Scion	11/04/11; 3:39 pm; 4469 g

Sample no.	Lab name	Date & time removed	Reason	Sample location	Date; time returned; mass of stored sample
051	Ecol Lab	12/04/11; 8:16 am	122 g to LCR	BIOASSAY	12/04/11; 8:22 am; 1888 g
051	Ecol Lab	12/04/11; 8:16 am	178 g to PFR	Posted to PFR	12/04/11; 8:22 am; 1888 g
051	Ecol Lab	12/04/11; 8:16 am	157 g to Scion	Posted to Scion	12/04/11; 8:22 am; 1888 g
052	Ecol Lab	12/04/11; 8:27 am	126 g to LCR	BIOASSAY	12/04/11; 8:36 am; 3045 g
052	Ecol Lab	12/04/11; 8:27 am	225 g to PFR	Posted to PFR	12/04/11; 8:36 am; 3045 g
052	Ecol Lab	12/04/11; 8:27 am	224 g to Scion	Posted to Scion	12/04/11; 8:36 am; 3045 g
053	Ecol Lab	12/04/11; 8:22 am	223 g to Scion	Posted to Scion	12/04/11; 8:25 am; 608 g
053	Ecol Lab	12/04/11; 8:22 am	204 g to PFR	Posted to PFR	12/04/11; 8:25 am; 608 g
053	Ecol Lab	12/04/11; 8:15 am	175 g to LCR	BIOASSAY	12/04/11; 8:15 am; 1036 g
054	Ecol Lab	15/04/11; 10:08 am	138 g to LCR	BIOASSAY	15/04/11; 10:14 am; 2614 g
054	Ecol Lab		165 g to Scion	Posted to Scion	15/04/11; 10:14 am; 2614 g
054	Ecol Lab		193 g to PFR	Posted to PFR	15/04/11; 10:14 am; 2614 g
055	Ecol Lab	15/04/11; 12:52 pm	171 g to Scion	Posted to Scion	15/04/11; 12:56 pm; 1324 g
055	Ecol Lab		162 g to PFR	Posted to PFR	15/04/11; 12:56 pm; 1324 g
056	Ecol Lab	15/04/11; 12:47 pm	214 g Scion	Posted to Scion	15/04/11; 12:51 pm; 1586 g
056	Ecol Lab		216 g to PFR	Posted to PFR	15/04/11; 12:51 pm; 1586 g
057	Ecol Lab	15/04/11; 10:17 am	140.3 g to LCR	BIOASSAY	15/04/11; 10:26 am; 1565 g
057	Ecol Lab		168.9 g to PFR	Posted to PFR	15/04/11; 10:26 am; 1565 g

Sample no.	Lab name	Date & time removed	Reason	Sample location	Date; time returned; mass of stored sample
057	Ecol Lab		180 g to Scion	Posted to Scion	15/04/11; 10:26 am; 1565 g
058	Ecol Lab	15/04/11; 12:42 pm	226 g to Scion	Posted to Scion	15/04/11; 12:46 pm; 2792 g
058	Ecol Lab		206 g to PFR	Posted to PFR	15/04/11; 12:46 pm; 2792 g
059	Ecol Lab	15/04/11; 12:35 pm	145 g to LCR	BIOASSAY	15/04/11; 12:40 pm; 2343 g
059	Ecol Lab		145 g to PFR	Posted to PFR	15/04/11; 12:40 pm; 2343 g
059	Ecol Lab		153 g to Scion	Posted to Scion	15/04/11; 12:40 pm; 2343 g
060	Ecol Lab	15/04/11; 12:29 pm	129 g to LCR	BIOASSAY	15/04/11; 12:34 pm; 3208 g
060	Ecol Lab		134 g to Scion	Posted to Scion	15/04/11; 12:34 pm; 3208 g
060	Ecol Lab		150 g to PFR	Posted to PFR	15/04/11; 12:34 pm; 3208 g
061	Ecol Lab	Sample arrival			29/04/11; 9:00 am; 1905 g
062	Ecol Lab	Sample arrival			29/04/11; 9:02 am; 3440 g
063	Ecol Lab	Sample arrival			29/04/11; 9:04 am; 3175 g
064	Ecol Lab	Sample arrival			29/04/11; 9:07 am; 2060 g
065	Ecol Lab	Sample arrival			29/04/11; 9:10 am; 1405 g
066	Ecol Lab	Sample arrival			29/04/11; 9:12 am; 2310 g
067	Ecol Lab	Sample arrival			29/04/11; 9:14 am; 1765 g
068	Ecol Lab	Sample arrival			29/04/11; 9:16 am; 2530 g
069	Ecol Lab	Sample arrival			29/04/11; 9:20 am; 1635 g

Sample no.	Lab name	Date & time removed	Reason	Sample location	Date; time returned; mass of stored sample
070	Ecol Lab	Sample arrival			29/04/11; 9:22 am; 2350 g
071	Ecol Lab	Sample arrival			29/04/11; 9:24 am; 2275 g
072	Ecol Lab	Sample arrival			29/04/11; 9:26 am; 2925 g
073	Ecol Lab	Sample arrival			29/04/11; 9:30 am; 2430 g
074	Ecol Lab	Sample arrival			29/04/11; 9:33 am; 3315 g
075	Ecol Lab	Sample arrival			29/04/11; 9:36 am; 3335 g
076	Ecol Lab	Sample arrival			29/04/11; 9:40 am; 2635 g
077	Ecol Lab	Sample arrival			29/04/11; 9:42 am; 3805 g
078	Ecol Lab	Sample arrival			29/04/11; 9:50 am; 3475 g
079	Ecol Lab	Sample arrival			29/04/11; 9:52 am; 2815 g
080	Ecol Lab	Sample arrival			29/04/11; 9:56 am; 2780 g
081	Ecol Lab	Sample arrival			29/04/11; 9:58 am; 3390 g
082	Ecol Lab	Sample arrival			29/04/11; 1000 am; 2995 g
061	Ecol Lab	10/05/11; 0930	252 g to PFR	Posted to PFR	10/05/11;
061	Ecol Lab	10/05/11;	180 g to Scion	Posted to Scion	10/05/11; 9:45 am; 1444 g
062	Ecol Lab	10/05/11; 0946	241 g to PFR	Posted to PFR	10/05/11;
062	Ecol Lab	10/05/11;	296 g to Scion	Posted to Scion	10/05/11; 9:54 am; 2877 g
063	Ecol Lab	10/05/11; 0951	212 g to Scion	Posted to Scion	10/05/11;

Sample no.	Lab name	Date & time removed	Reason	Sample location	Date; time returned; mass of stored sample
063	Ecol Lab	10/05/11;	262 g to PFR	Posted to PFR	10/05/11; 9:53 am; 2677 g
064	Ecol Lab	10/05/11; 0955	260 g to PFR	Posted to PFR	10/05/11;
064	Ecol Lab	10/05/11;	284 g to Scion	Posted to Scion	10/05/11; 10:09 am; 1490 g
065	Ecol Lab	10/05/11; 1012	151 g to LCR	BIOASSAY	10/05/11
065	Ecol Lab	10/05/11;	205 g to PFR	Posted to PFR	10/05/11
065	Ecol Lab	10/05/11;	229 g to Scion	Posted to Scion	10/05/11; 10:15 am; 818 g
066	Ecol Lab	10/05/11; 1027	176 g to LCR	BIOASSAY	10/05/11;
066	Ecol Lab	10/05/11;	290 g to PFR	Posted to PFR	10/05/11;
066	Ecol Lab	10/05/11;	250 g to Scion	Posted to Scion	10/05/11; 10:20 am; 1590 g
067	Ecol Lab	10/05/11; 1022	243 g to Scion	Posted to Scion	10/05/11;
067	Ecol Lab	10/05/11;	176 g to LCR	BIOASSAY	10/05/11;
067	Ecol Lab	10/05/11;	199 g to PFR	Posted to PFR	10/05/11; 10:25 am; 1128 g
068	Ecol Lab	10/05/11; 1028	205 g to LCR	BIOASSAY	10/05/11;
068	Ecol Lab	10/05/11;	268 g to PFR	Posted to PFR	10/05/11;
068	Ecol Lab	10/05/11;	206 g to Scion	Posted to Scion	10/05/11; 10:30 am; 1842 g
069	Ecol Lab	10/05/11; 1032	205 g to LCR	BIOASSAY	10/05/11;
069	Ecol Lab	10/05/11;	230 g to PFR	Posted to PFR	10/05/11;
069	Ecol Lab	10/05/11;	241 g to Scion	Posted to Scion	10/05/11; 10:36 am; 922 g

Sample no.	Lab name	Date & time removed	Reason	Sample location	Date; time returned; mass of stored sample
070	Ecol Lab	10/05/11; 1038	216 g to LCR	BIOASSAY	10/05/11;
070	Ecol Lab	10/05/11;	276 g to PFR	Posted to PFR	10/05/11;
070	Ecol Lab	10/05/11;	240 g to Scion	Posted to Scion	10/05/11; 10:41 am; 1603 g
071	Ecol Lab	10/05/11; 1043	256 g to LCR	BIOASSAY	10/05/11;
071	Ecol Lab	10/05/11;	226 g to PFR	Posted to PFR	10/05/11;
071	Ecol Lab	10/05/11;	239 g to Scion	Posted to Scion	10/05/11; 10:46 am; 1549 g
072	Ecol Lab	10/05/11; 1047	201 g to LCR	BIOASSAY	10/05/11;
072	Ecol Lab	10/05/11;	290 g to Scion	Posted to Scion	10/05/11;
072	Ecol Lab	10/05/11;	305 g to PFR	Posted to PFR	10/05/11; 10:50 am; 2107 g
073	Ecol Lab	10/05/11; 1051	284 g to LCR	BIOASSAY	10/05/11;
073	Ecol Lab	10/05/11;	336 g to PFR	Posted to PFR	10/05/11;
073	Ecol Lab	10/05/11;	221 g to Scion	Posted to Scion	10/05/11; 10:54 am; 1589 g
074	Ecol Lab	10/05/11; 1056	200 g to LCR	BIOASSAY	10/05/11;
074	Ecol Lab	10/05/11;	294 g to PFR	Posted to PFR	10/05/11;
074	Ecol Lab	10/05/11;	223 g to Scion	Posted to Scion	10/05/11; 10:59 am; 2594 g
075	Ecol Lab	10/05/11; 1100	197 g to LCR	BIOASSAY	10/05/11;
075	Ecol Lab	10/05/11;	222 g to PFR	Posted to PFR	10/05/11;
075	Ecol Lab	10/05/11;	300 g to Scion	Posted to Scion	10/05/11; 11:03 am; 2595 g

Sample no.	Lab name	Date & time removed	Reason	Sample location	Date; time returned; mass of stored sample
076	Ecol Lab	10/05/11; 1105	188 g to LCR	BIOASSAY	10/05/11;
076	Ecol Lab	10/05/11;	266 g; to PFR	Posted to PFR	10/05/11;
076	Ecol Lab	10/05/11;	192 g to Scion	Posted to Scion	10/05/11; 11:08 am; 1937 g
077	Ecol Lab	10/05/11; 1110	198 g to LCR	BIOASSAY	10/05/11;
077	Ecol Lab	10/05/11;	374 g to Scion	Posted to Scion	10/05/11; 11:12 am; 3199 g
078	Ecol Lab	10/05/11; 1113	220 g to LCR	BIOASSAY	10/05/11;
078	Ecol Lab	10/05/11;	265 g to Scion	Posted to Scion	10/05/11; 11:15 am; 2982 g
079	Ecol Lab	10/05/11; 1117	201 g to LCR	BIOASSAY	10/05/11;
079	Ecol Lab	10/05/11;	279 g to Scion	Posted to Scion	10/05/11; 11:21 am; 2324 g
080	Ecol Lab	10/05/11; 1122	181 g to LCR	BIOASSAY	10/05/11;
080	Ecol Lab	10/05/11; 1122	215 g to PFR	Posted to PFR	10/05/11; 11:25 am; 2364 g
081	Ecol Lab	10/05/11; 1126	224 g to LCR	BIOASSAY	10/05/11;
081	Ecol Lab	10/05/11; 1126	275 g to PFR	Posted to PFR	10/05/11; 11:28 am; 2907 g
082	Ecol Lab	10/05/11; 1129	174 g to LCR	BIOASSAY	10/05/11;
082	Ecol Lab	10/05/11; 1129	287 g to PFR	Posted to PFR	10/05/11; 11:33 am; 2478 g
083	Ecol Lab	Sample arrival			16/05/11; 11:13 am; 3072 g
084	Ecol Lab	Sample arrival			16/05/11; 11:14 am; 2707 g
085	Ecol Lab	Sample arrival			16/05/11; 11:14 am; 3281 g

Sample no.	Lab name	Date & time removed	Reason	Sample location	Date; time returned; mass of stored sample
086	Ecol Lab	Sample arrival			16/05/11; 11:15 am; 3525 g
087	Ecol Lab	Sample arrival			16/05/11; 11:17 am; 4464 g
088	Ecol Lab	Sample arrival			16/05/11; 11:18 am; 3690 g
089	Ecol Lab	Sample arrival			16/05/11; 11:19 am; 2951 g
090	Ecol Lab	Sample arrival			16/05/11; 11:19 am; 2312 g
091	Ecol Lab	Sample arrival			16/05/11; 11:21 am; 2469 g
009	Ecol Lab	17/05/11; 10:00 am	136 g to LCR	REPEAT BIOASSAY	17/05/11; 10:01 am; 1434 g
083	Ecol Lab	17/05/11; 11:41 am	223 g to LCR	BIOASSAY	
083	Ecol Lab	17/05/11; 11:41 pm	234 g to PFR	Posted to PFR	17/05/11; 12:11 pm; 2618 g
084	Ecol Lab	17/05/11; 12:11 pm	202 g to LCR	BIOASSAY	
084	Ecol Lab		238 g to PFR	Posted to PFR	17/05/11; 12:18 pm; 2267 g
085	Ecol Lab	17/05/11; 12:19 pm	159 g to LCR	BIOASSAY	
085	Ecol Lab		230 g to PFR	Posted to PFR	17/05/11; 12:22 pm; 2897 g
086	Ecol Lab	17/05/11; 12:23 pm	219 g to LCR	BIOASSAY	
086	Ecol Lab		268 g to PFR	Posted to PFR	17/05/11; 12:26 pm; 3043 g
087	Ecol Lab	17/05/11; 12:27 pm	223 g to LCR	BIOASSAY	
087	Ecol Lab		241 g to PFR	Posted to PFR	17/05/11; 12:31 pm; 4000 g
088	Ecol Lab	17/05/11; 12:32 pm	222 g to LCR	BIOASSAY	

Sample no.	Lab name	Date & time removed	Reason	Sample location	Date; time returned; mass of stored sample
088	Ecol Lab		302 g to PFR	Posted to PFR	17/05/11; 12:35 pm; 3166 g
089	Ecol Lab	17/05/11; 12:36 pm	280 g to LCR	BIOASSAY	
089	Ecol Lab		308 g to PFR	Posted to PFR	17/05/11; 12:40 pm; 2413 g
090	Ecol Lab	17/05/11; 12:40 pm	200 g to LCR	Bioassay	
090	Ecol Lab		300 g to PFR	Posted to PFR	17/05/11; 12:43 pm; 1814 g
091	Ecol Lab	17/05/11; 12:44 pm	260 g to LCR	BIOASSAY	
091	Ecol Lab		349 g to PFR	Posted to PFR	17/05/11; 12:47 pm; 1902 g
092	Ecol Lab	1015; 22/06/11	1528 g		
093	Ecol Lab	1016; 22/06/11	1601 g		
094	Ecol Lab	1015; 22/06/11	3017 g		
029	Ecol Lab	1300; 03/08/11	150 g to LCR	BA	
029	Ecol Lab	1300; 03/08/11	156 g to PFR	Posted to PFR	1310; 03/08/11; 1854 g
033	Ecol Lab	1300; 03/08/11	156 g to LCR	BA	
033	Ecol Lab	1300; 03/08/11	224 g to Scion	Posted to Scion	1314; 03/08/11; 2147
034	Ecol Lab	1300; 03/08/11	166 g to LCR	BA	
034	Ecol Lab	1300; 03/08/11	196 g to PFR	Posted to PFR	1318; 03/08/11; 1901 g
035	Ecol Lab	1300; 03/08/11	178 g to LCR	BA	
035	Ecol Lab	1300; 03/08/11	232 g to Scion	Posted to Scion	1322; 03/08/11; 1495 g

Sample no.	Lab name	Date & time removed	Reason	Sample location	Date; time returned; mass of stored sample
037	Ecol/Lab	1300; 03/08/11	172 g to LCR	BA	
037	Ecol/Lab	1300; 03/08/11	181 g to PFR	Posted to PFR	1327; 03/08/11; 1433 g
038	Ecol/Lab	1300; 03/08/11	171 g to LCR	BA	
038	Ecol/Lab	1300; 03/08/11	201 g to Scion	Posted to Scion	1331; 03/08/11; 2169 g
045	Ecol/Lab	1300; 03/08/11	168 g to LCR	BA	
045	Ecol/Lab	1300; 03/08/11	280 g to PFR	Posted to PFR	1335; 03/08/11; 3943 g
047	Ecol/Lab	1300; 03/08/11	214 g to PFR	Posted to PFR	
047	Ecol/Lab	1300; 03/08/11	227 g to Scion	Posted to Scion	1338; 03/08/11; 2156 g
048	Ecol/Lab	1300; 03/08/11	200 g to LCR	BA	
048	Ecol/Lab	1300; 03/08/11	250 g to PFR	Posted to PFR	1343; 03/08/11; 2907 g
049	Ecol/Lab	1300; 03/08/11	188 g to PFR	Posted to PFR	
049	Ecol/Lab	1300; 03/08/11	212 g to Scion	Posted to Scion	1345; 03/08/11; 1882 g
050	Ecol/Lab	1300; 03/08/11	163 g to LCR	BA	
050	Ecol/Lab	1300; 03/08/11	194 g to PFR	Posted to PFR	1349; 03/08/11; 4038 g
061	Ecol/Lab	1300; 03/08/11	238 g to PFR	Posted to PFR	
061	Ecol/Lab	1300; 03/08/11	217 g to Scion	Posted to Scion	1352; 03/08/11; 1002 g
062	Ecol/Lab	1300; 03/08/11	222 g to LCR	BA	
062	Ecol/Lab	1300; 03/08/11	247 g to Scion	Posted to Scion	1356; 03/08/11; 2414 g

Sample no.	Lab name	Date & time removed	Reason	Sample location	Date; time returned; mass of stored sample
063	Ecol Lab	1300; 03/08/11	313 g to PFR	Posted to PFR	
063	Ecol Lab	1300; 03/08/11	260 g to Scion	Posted to Scion	1359; 03/08/11; 2112 g
064	Ecol Lab	1300; 03/08/11	176 g to LCR	BA	
064	Ecol Lab	1300; 03/08/11	211 g to Scion	Posted to Scion	1402; 03/08/11; 1121 g
089	Ecol Lab	1300; 03/08/11	210 g to PFR	Posted to PFR	
089	Ecol Lab	1300; 03/08/11	268 g to Scion	Posted to Scion	1406; 03/08/11; 1896 g
090	Ecol Lab	1300; 03/08/11	182 g to LCR	BA	
090	Ecol Lab	1300; 03/08/11	208 g to Scion	Posted to Scion	1409; 03/08/11; 1343 g
091	Ecol Lab	1300; 03/08/11	189 g to Scion	Posted to Scion	
091	Ecol Lab	1300; 03/08/11	217 g to PFR	Posted to PFR	1413; 03/08/11; 1450 g

Appendix 1C – Sample Shipping Receipt Form

Suggested additional QA/QC form to accompany soil consignment from point of sampling through to inter-laboratory movements

1. Sender	2. Carrier	3. Receiver
Signature _____ Date _____	Company _____	Courier from depot Signature _____
Sent from _____ _____ _____	Signature _____ Date _____	Date _____
	B/L no. _____	Lab Custodian Signature _____
	Pkg tracking no. _____ _____	Date _____
		Condition upon receipt _____ _____

4. Shipment description	Temp tag no. (if any)	Seal intact?
Number of packages _____	_____	_____
Sealed (yes or no) _____	_____	_____
Types of containers _____	_____	_____
Condition prior to shipment _____ _____ _____	_____	_____

5. Contents			
Sample ID number	Type of sample	Temp tag (yes or no)	Condition (damaged, loss of liquid, etc.)

Appendix 1D – Analytical Data Sheet

Spreadsheet tracking the analytical stages for the LCR soil samples

Date	Sample no.	Air-dried	Moist incubated	Flooded / baited	Plated to phyt. selective media	PTA	DNA seq. confirmed
20/03/11	001	20/03/11	22/03/11	25/03/11	28/03/11	No	Yes
20/03/11	002	20/03/11	22/03/11	25/03/11	28/03/11	No	Yes
20/03/11	003	20/03/11	22/03/11	25/03/11	28/03/11	No	Yes
20/03/11	004	20/03/11	22/03/11	25/03/11	28/03/11	No	Yes
20/03/11	005	20/03/11	22/03/11	25/03/11	28/03/11	No	Yes
02/04/11	006	02/04/11	04/04/11	08/04/11	11/04/11	Yes	Yes
02/04/11	007	02/04/11	04/04/11	08/04/11	11/04/11	No	Yes
02/04/11	008	02/04/11	04/04/11	08/04/11	11/04/11	No	No
02/04/11	009	02/04/11	04/04/11	08/04/11	11/04/11	Yes	Yes
02/04/11	010	02/04/11	04/04/11	08/04/11	11/04/11	No	No
02/04/11	011	02/04/11	04/04/11	08/04/11	11/04/11	No	No
02/04/11	012	02/04/11	04/04/11	08/04/11	11/04/11	No	Yes
02/04/11	013	02/04/11	04/04/11	08/04/11	11/04/11	No	No
02/04/11	014	02/04/11	04/04/11	08/04/11	11/04/11	No	Yes
02/04/11	015	02/04/11	04/04/11	08/04/11	11/04/11	No	Yes
02/04/11	016	02/04/11	04/04/11	08/04/11	11/04/11	No	No
02/04/11	017	02/04/11	04/04/11	08/04/11	11/04/11	No	Yes
02/04/11	018	02/04/11	04/04/11	08/04/11	11/04/11	No	No
02/04/11	019	02/04/11	04/04/11	08/04/11	11/04/11	No	No

Date	Sample no.	Air-dried	Moist incubated	Flooded / baited	Plated to phyt. selective media	PTA	DNA seq. confirmed
02/04/11	020	02/04/11	04/04/11	08/04/11	11/04/11	No	No
02/04/11	021	02/04/11	04/04/11	08/04/11	11/04/11	No	Yes
02/04/11	022	02/04/11	04/04/11	08/04/11	11/04/11	No	Yes
02/04/11	023	02/04/11	04/04/11	08/04/11	11/04/11	No	Yes
02/04/11	024	02/04/11	04/04/11	08/04/11	11/04/11	No	No
02/04/11	025	02/04/11	04/04/11	08/04/11	11/04/11	No	Yes
02/04/11	026	02/04/11	04/04/11	08/04/11	11/04/11	No	Yes
02/04/11	027	02/04/11	04/04/11	08/04/11	11/04/11	No	Yes
04/05/11	028	04/05/11	06/05/11	10/05/11	13/05/11	No	No
04/05/11	029	04/05/11	06/05/11	10/05/11	13/05/11	No	No
04/05/11	030	04/05/11	06/05/11	10/05/11	13/05/11	No	No
04/05/11	031	04/05/11	06/05/11	10/05/11	13/05/11	No	No
04/05/11	032	04/05/11	06/05/11	10/05/11	13/05/11	No	No
04/05/11	033	04/05/11	06/05/11	10/05/11	13/05/11	No	No
04/05/11	034	04/05/11	06/05/11	10/05/11	13/05/11	No	No
04/05/11	035	04/05/11	06/05/11	10/05/11	13/05/11	No	No
04/05/11	036	04/05/11	06/05/11	10/05/11	13/05/11	No	No
04/05/11	037	04/05/11	06/05/11	10/05/11	13/05/11	No	No
04/05/11	038	04/05/11	06/05/11	10/05/11	13/05/11	No	No
04/05/11	039	04/05/11	06/05/11	10/05/11	13/05/11	No	No
04/05/11	040	04/05/11	06/05/11	10/05/11	13/05/11	No	No

Date	Sample no.	Air-dried	Moist incubated	Flooded / baited	Plated to phyt. selective media	PTA	DNA seq. confirmed
04/05/11	041	04/05/11	06/05/11	10/05/11	13/05/11	No	No
04/05/11	042	04/05/11	06/05/11	10/05/11	13/05/11	Yes	Yes
04/05/11	043	04/05/11	06/05/11	10/05/11	13/05/11	Yes	Yes
04/05/11	044	04/05/11	06/05/11	10/05/11	13/05/11	Yes	Yes
04/05/11	045	04/05/11	06/05/11	10/05/11	13/05/11	No	No
04/05/11	046	04/05/11	06/05/11	10/05/11	13/05/11	Yes	Yes
04/05/11	047	04/05/11	06/05/11	10/05/11	13/05/11	No	No
04/05/11	048	04/05/11	06/05/11	10/05/11	13/05/11	No	No
04/05/11	049	04/05/11	06/05/11	10/05/11	13/05/11	No	No
04/05/11	050	04/05/11	06/05/11	10/05/11	13/05/11	No	No
04/05/11	051	04/05/11	06/05/11	10/05/11	13/05/11	No	No
04/05/11	052	04/05/11	06/05/11	10/05/11	13/05/11	No	No
04/05/11	053	04/05/11	06/05/11	10/05/11	13/05/11	No	Yes
04/05/11	054	04/05/11	06/05/11	10/05/11	13/05/11	No	Yes
04/05/11	055	04/05/11	06/05/11	10/05/11	13/05/11	No	No
04/05/11	056	04/05/11	06/05/11	10/05/11	13/05/11	No	No
04/05/11	057	04/05/11	06/05/11	10/05/11	13/05/11	No	No
04/05/11	058	04/05/11	06/05/11	10/05/11	13/05/11	Yes	No
04/05/11	059	04/05/11	06/05/11	10/05/11	13/05/11	Yes	Yes
04/05/11	060	04/05/11	06/05/11	10/05/11	13/05/11	Yes	Yes
2/06/2011	061	2/06/2011	04/06/11	08/06/11	11/06/11	No	No

Date	Sample no.	Air-dried	Moist incubated	Flooded / baited	Plated to phyt. selective media	PTA	DNA seq. confirmed
2/06/2011	062	2/06/2011	04/06/11	08/06/11	11/06/11	No	No
2/06/2011	063	2/06/2011	04/06/11	08/06/11	11/06/11	No	No
2/06/2011	064	2/06/2011	04/06/11	08/06/11	11/06/11	No	No
2/06/2011	065	2/06/2011	04/06/11	08/06/11	11/06/11	No	Yes
2/06/2011	066	2/06/2011	04/06/11	08/06/11	11/06/11	Yes	No
2/06/2011	067	2/06/2011	04/06/11	08/06/11	11/06/11	No	No
2/06/2011	068	2/06/2011	04/06/11	08/06/11	11/06/11	No	No
2/06/2011	069	2/06/2011	04/06/11	08/06/11	11/06/11	No	No
2/06/2011	070	2/06/2011	04/06/11	08/06/11	11/06/11	No	No
2/06/2011	071	2/06/2011	04/06/11	08/06/11	11/06/11	Yes	No
2/06/2011	072	2/06/2011	04/06/11	08/06/11	11/06/11	Yes	Yes
2/06/2011	073	2/06/2011	04/06/11	08/06/11	11/06/11	Yes	No
2/06/2011	074	2/06/2011	04/06/11	08/06/11	11/06/11	Yes	No
2/06/2011	075	2/06/2011	04/06/11	08/06/11	11/06/11	No	No
2/06/2011	076	2/06/2011	04/06/11	08/06/11	11/06/11	No	No
2/06/2011	077	2/06/2011	04/06/11	08/06/11	11/06/11	Yes	Yes
2/06/2011	078	2/06/2011	04/06/11	08/06/11	11/06/11	No	No
2/06/2011	079	2/06/2011	04/06/11	08/06/11	11/06/11	No	Yes
2/06/2011	080	2/06/2011	04/06/11	08/06/11	11/06/11	No	No
2/06/2011	081	2/06/2011	04/06/11	08/06/11	11/06/11	No	No
2/06/2011	082	2/06/2011	04/06/11	08/06/11	11/06/11	No	No

Date	Sample no.	Air-dried	Moist incubated	Flooded / baited	Plated to phyt. selective media	PTA	DNA seq. confirmed
2/06/2011	083	2/06/2011	04/06/11	08/06/11	11/06/11	No	No
2/06/2011	084	2/06/2011	04/06/11	08/06/11	11/06/11	No	No
2/06/2011	085	2/06/2011	04/06/11	08/06/11	11/06/11	No	No
2/06/2011	086	2/06/2011	04/06/11	08/06/11	11/06/11	No	No
2/06/2011	087	2/06/2011	04/06/11	08/06/11	11/06/11	No	No
2/06/2011	088	2/06/2011	04/06/11	08/06/11	11/06/11	No	No
2/06/2011	089	2/06/2011	04/06/11	08/06/11	11/06/11	No	Yes
2/06/2011	090	2/06/2011	04/06/11	08/06/11	11/06/11	No	No
2/06/2011	091	2/06/2011	04/06/11	08/06/11	11/06/11	No	Yes
05/08/2011	029	05/08/2011	08/08/11	12/08/11	15/08/11	No	No
05/08/2011	033	05/08/2011	08/08/11	12/08/11	15/08/11	No	No
05/08/2011	034	05/08/2011	08/08/11	12/08/11	15/08/11	No	No
05/08/2011	035	05/08/2011	08/08/11	12/08/11	15/08/11	No	No
05/08/2011	037	05/08/2011	08/08/11	12/08/11	15/08/11	No	No
05/08/2011	038	05/08/2011	08/08/11	12/08/11	15/08/11	No	No
05/08/2011	045	05/08/2011	08/08/11	12/08/11	15/08/11	No	No
05/08/2011	048	05/08/2011	08/08/11	12/08/11	15/08/11	No	No
05/08/2011	050	05/08/2011	08/08/11	12/08/11	15/08/11	No	No

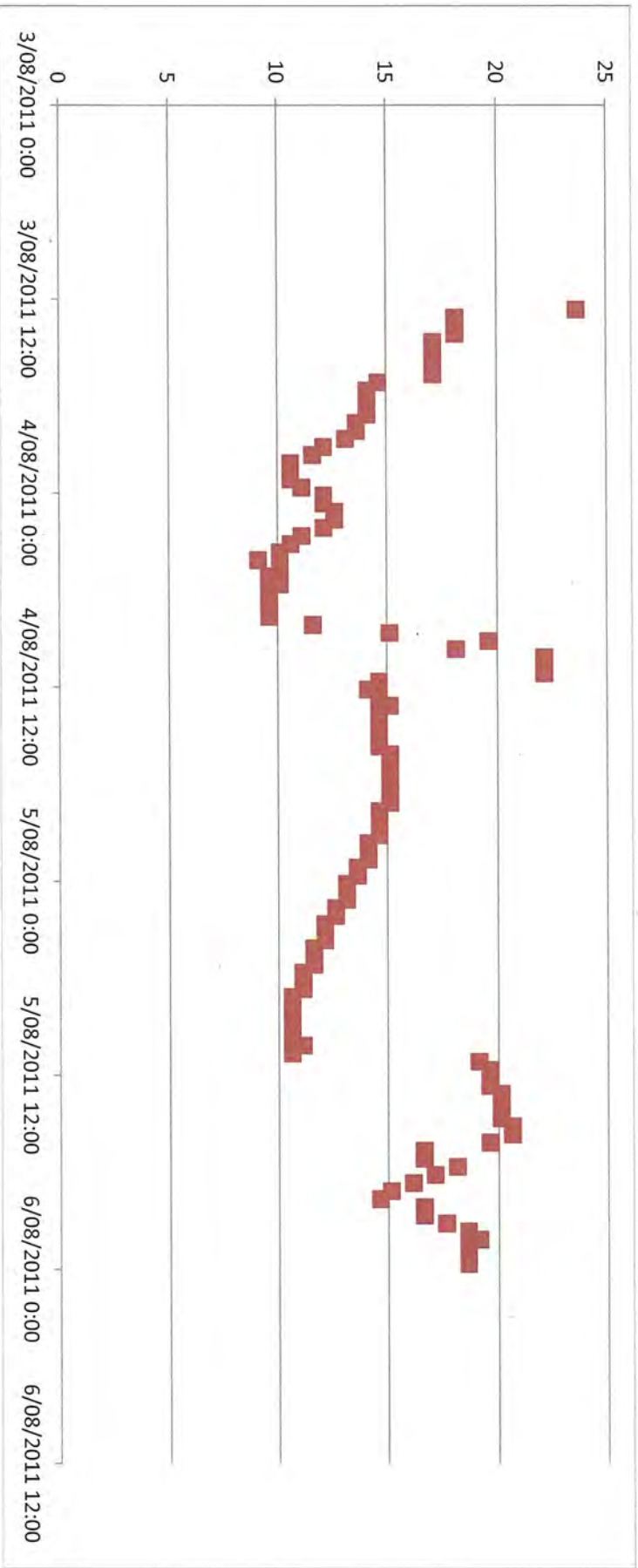
Date	Sample no.	Air-dried	Moist incubated	Flooded / baited	Plated to phyt. selective media	PTA	DNA seq. confirmed
05/08/2011	062	05/08/2011	08/08/11	12/08/11	15/08/11	No	No
05/08/2011	064	05/08/2011	08/08/11	12/08/11	15/08/11	No	No
05/08/2011	090	05/08/2011	08/08/11	12/08/11	15/08/11	No	No

Appendix 1E – iButton Receipt and Log

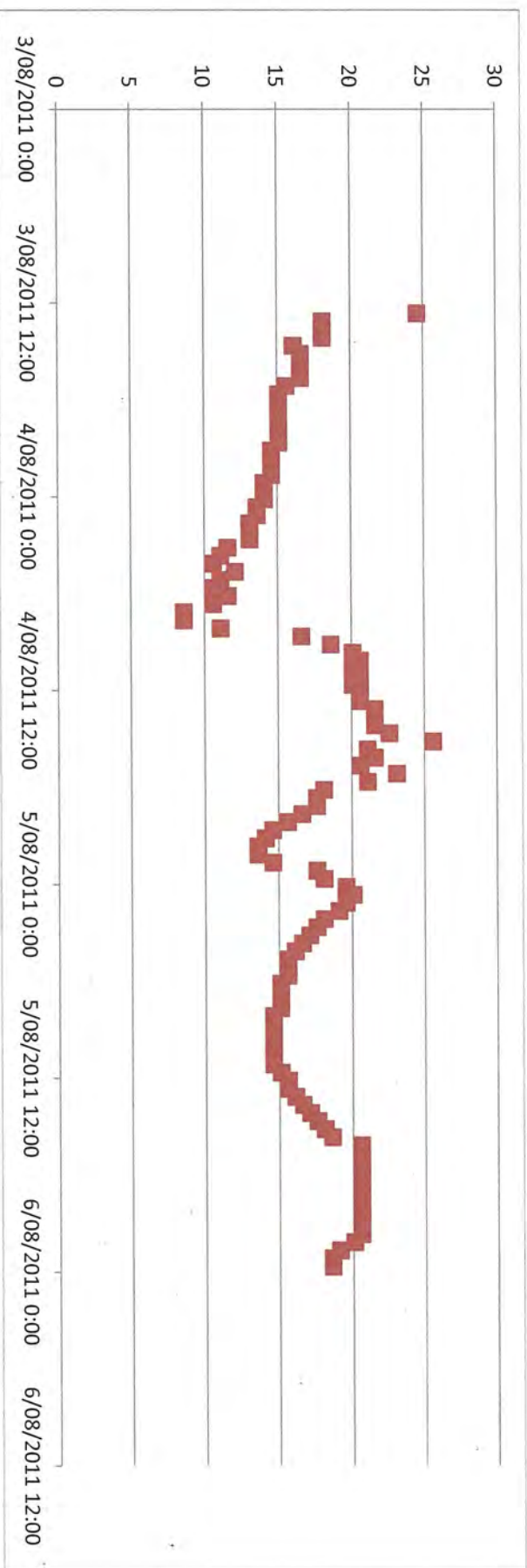
iButton Number	From whom	Date Received	Date down-loaded	By whom	Data sent onto MAF
1B1BA241	Lance Salt	18/8/11	18/8/11	SB	Yes
1B089741	Lance Salt	18/8/11	18/8/11	SB	Yes
23AEA021	Te Roroa	24/08/11	24/08/11	KH	Yes
1B089741	Ellena Hough	29/08/11	29/08/11	SB	No
1B1BA241	Pam Taylor	30/08/11	30/08/11	SB	No
23D50421	Trevor Birch (under inside of lid)	2/09/11	2/09/11	EP	Yes
23F32C21	Trevor Birch (inside sample 105)	2/09/11	2/09/11	EP	Yes
23AEA021	Trevor Birch (inside sample 108)	2/09/11	2/09/11	EP	Yes

Appendix 1F – Temperature profiles for soil samples

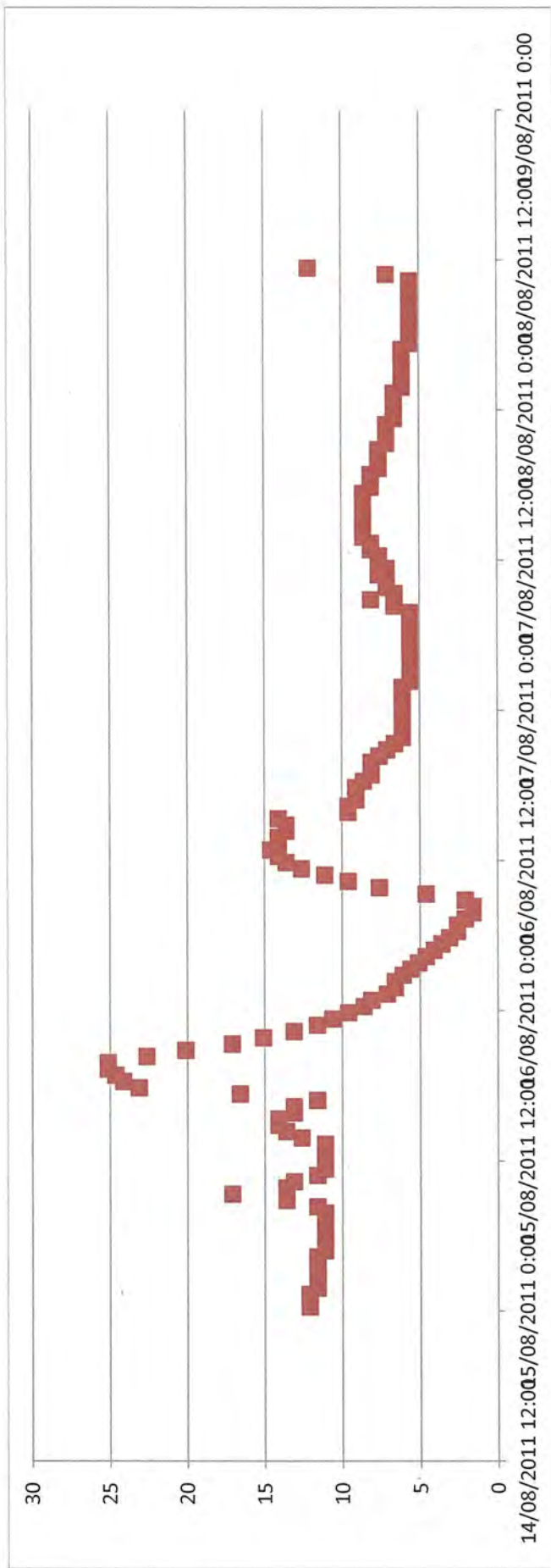
Appendix 1F-1: LCR to Scion



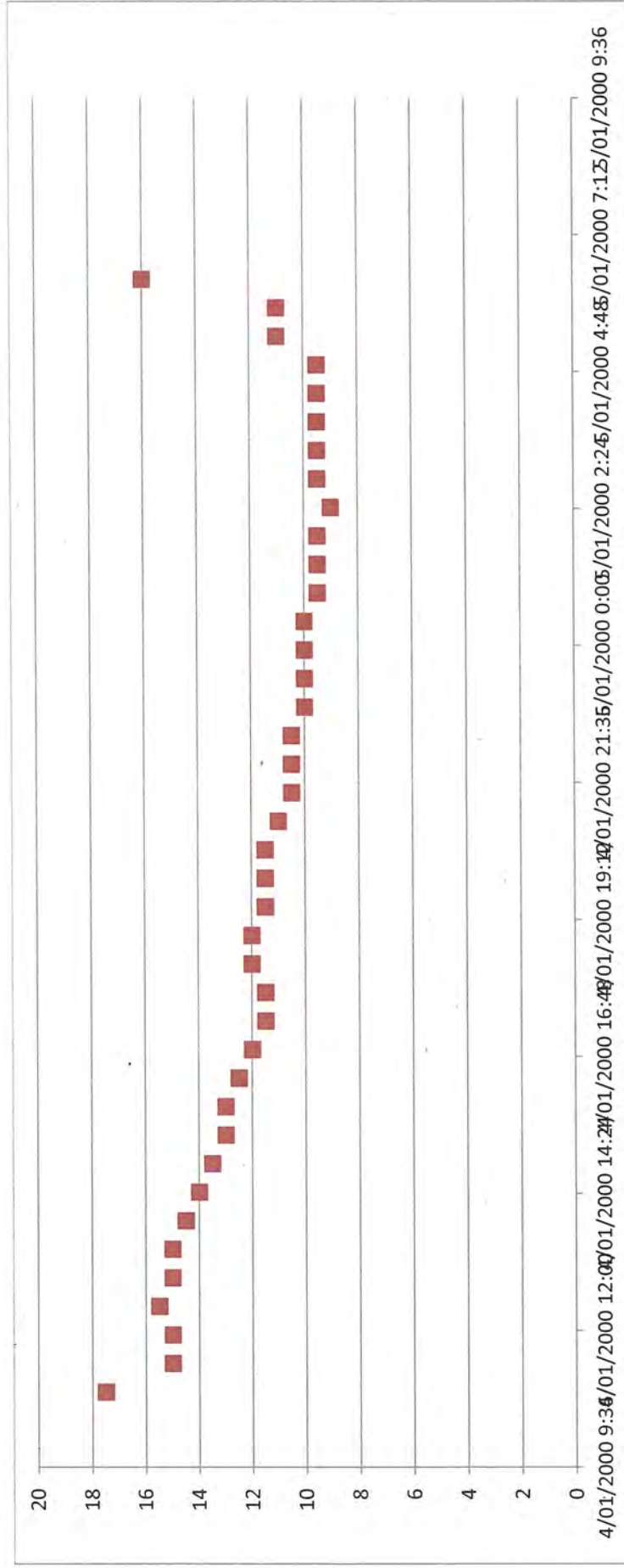
Appendix 1F-2: LCR to PFR



Appendix 1F-3: Corromandel to LCR



Appendix 1F-4: Waipoua to LCR



Appendix 2 – Soil SOP

Drying of soil samples (pretreatment-phase)

- Thoroughly mix soil samples in their bag to remove lumps
- Label container, measure out at least 100 g
- Air-dry on lab bench for 2 days
- Check soil each day and crumble clods with pop-sticks

Moist incubation (stimulating-phase):

- Using a spray-squirt bottle, moisten soil samples in containers with RO water (using a fine mist)
- Spray enough moisture to make soil surface shine. Respray after 1 h, targeting dry spots / clods of soil
- Apply lid loosely
- Incubate in light for 4 days at room temperature (20–22°C)

Bait tissue preparation

- One day after the commencement of moist incubation, prepare desired amount of lupin seed, allowing for five lupins per soil bioassay.
- Needles of Himalayan cedar (*Cedrus deodara*), harvested directly off tree
 - Pull off whorls
 - Pull needles off from leaf base
 - Five needles per soil bioassay

Bioassay

- Inundate the soil very slowly with RO or distilled water to cover soil (approx. 500 ml for 1-L take-away container)
- Minimise soil disturbance and water turbulence
- The soil must not be mixed once flooded
- Sprinkle five 2-cm lengths of Himalayan cedar leaflets on water surface
- Add five lupin radicles to the water surface
- Incubate at 20°C in light for 2 days.

Bait processing

- After 2 days remove the bait tissues
- Wash in single rinse of sterile RO water
- Soak in 70% ethanol (ETOH) for 30 seconds
- Remove from ETOH, rinse in sterile RO water
- Blot dry on paper towels
- Place needles/lupins onto *Phytophthora* selective agar (P₅ARPH)
- Label and seal plates and incubate in the dark at 18–20°C for 2–4 days

Colony isolation

- Check agar plates after 4 days for characteristic cultures
- Sub-culture to PDA
- If cultures are free of contamination, sub-culture to PDA

N.B. If using V8-enriched PARPH, then oospores produced in 4 days.

Appendix 3A – QA/QC Scion

Spreadsheet detailing soil bioassay analysis details of Scion

Sample no.	Date received at Scion	Date set to dry	Date flooded and baited	Date plated	Result
1	22/03/2011	22/03/2011	29/03/2011	31/32011	<i>P. cinnamomi</i> (2 lupin)
2	22/03/2011	22/03/2011	29/03/2011	31/32011	<i>P. cinnamomi</i> (4 lupin)
3	22/03/2011	22/03/2011	29/03/2011	31/32011	<i>P. cinnamomi</i> (3 lupin)
4	22/03/2011	22/03/2011	29/03/2011	31/32011	<i>P. cinnamomi</i> (1 lupin)
5	22/03/2011	22/03/2011	29/03/2011	31/32011	<i>P. cinnamomi</i> (2 lupin)
9	5/04/2011	5/04/2011	11/04/2011	13/04/2011	PTA (mixed)
10	5/04/2011	5/04/2011	11/04/2011	13/04/2011	<i>P. cinnamomi</i> & other
17	5/04/2011	5/04/2011	11/04/2011	13/04/2011	nil
18	5/04/2011	5/04/2011	11/04/2011	13/04/2011	other
19	5/04/2011	5/04/2011	11/04/2011	13/04/2011	other
20	5/04/2011	5/04/2011	11/04/2011	13/04/2011	nil
21	5/04/2011	5/04/2011	11/04/2011	13/04/2011	<i>P. cinnamomi</i> and other
22	5/04/2011	5/04/2011	11/04/2011	13/04/2011	<i>P. cinnamomi</i>
23	5/04/2011	5/04/2011	11/04/2011	13/04/2011	<i>P. cinnamomi</i> and other
24	5/04/2011	5/04/2011	11/04/2011	13/04/2011	nil
25	5/04/2011	5/04/2011	11/04/2011	13/04/2011	other
26	5/04/2011	5/04/2011	11/04/2011	13/04/2011	<i>P. cinnamomi</i> and other
28	12/04/2011	12/04/2011	18/04/2011	20/04/2011	<i>P. cinnamomi</i>
29	12/04/2011	12/04/2011	25/04/2011	27/04/2011	nil
30	12/04/2011	12/04/2011	25/04/2011	27/04/2011	nil
31	12/04/2011	12/04/2011	18/04/2011	20/04/2011	<i>P. cinnamomi</i>
32	12/04/2011	12/04/2011	25/04/2011	27/04/2011	nil
33	12/04/2011	12/04/2011	25/04/2011	27/04/2011	nil
34	12/04/2011	12/04/2011	25/04/2011	27/04/2011	nil

Sample no.	Date received at Scion	Date set to dry	Date flooded and baited	Date plated	Result
35	12/04/2011	12/04/2011	18/04/2011	20/04/2011	<i>P. cinnamomi</i>
36	12/04/2011	12/04/2011	25/04/2011	27/04/2011	nil
37	12/04/2011	12/04/2011	18/04/2011	20/04/2011	nil
38	12/04/2011	12/04/2011	25/04/2011	27/04/2011	nil
44	12/04/2011	12/04/2011	18/04/2011	20/04/2011	<i>P. cinnamomi</i> and <i>Pythium spinosum</i>
50	12/04/2011	12/04/2011	25/04/2011	27/04/2011	<i>Pythium</i> sp.
51	12/04/2011	12/04/2011	18/04/2011	20/04/2011	<i>P. cinnamomi</i>
52	12/04/2011	12/04/2011	18/04/2011	20/04/2011	other
53	12/04/2011	12/04/2011	18/04/2011	20/04/2011	<i>P. cinnamomi</i> and other
54	26/04/2011	27/04/2011	3/05/2011	5/05/2011	<i>Phytophthora</i> sp., <i>Pythium spinosum</i>
55	26/04/2011	27/04/2011	3/05/2011	5/05/2011	<i>P. cinnamomi</i> <i>Pythium</i> sp.
56	26/04/2011	27/04/2011	3/05/2011	5/05/2011	<i>Pythium spinosum</i>
57	26/04/2011	27/04/2011	3/05/2011	5/05/2011	<i>P. cinnamomi</i>
58	26/04/2011	27/04/2011	3/05/2011	5/05/2011	PTA (mixed), <i>Pythium spinosum</i> & <i>Pythium</i> sp.
59	26/04/2011	27/04/2011	3/05/2011	5/05/2011	PTA & <i>Pythium</i> sp.
60	26/04/2011	27/04/2011	3/05/2011	5/05/2011	<i>P. cinnamomi</i> <i>Pythium</i> sp.
61	11/05/2011	11/05/2011	16/05/2011	18/05/2011	<i>Pythium</i> sp.
62	11/05/2011	11/05/2011	16/05/2011	18/05/2011	<i>Pythium</i> sp.
63	11/05/2011	11/05/2011	3/06/2011	5/06/2011	other
64	11/05/2011	11/05/2011	16/05/2011	18/05/2011	<i>Pythium</i> sp.
65	11/05/2011	11/05/2011	16/05/2011	18/05/2011	<i>Pythium</i> sp.
66	11/05/2011	11/05/2011	16/05/2011	18/05/2011	<i>P. cinnamomi</i> , <i>Pythium</i> sp.
67	11/05/2011	11/05/2011	16/05/2011	18/05/2011	<i>Pythium</i> sp.
68	11/05/2011	11/05/2011	3/06/2011	5/06/2011	nil
69	11/05/2011	11/05/2011	3/06/2011	5/06/2011	nil
70	11/05/2011	11/05/2011	3/06/2011	5/06/2011	nil
71	11/05/2011	11/05/2011	3/06/2011	5/06/2011	other
72	11/05/2011	11/05/2011	16/05/2011	18/05/2011	<i>P. cinnamomi</i>
73	11/05/2011	11/05/2011	3/06/2011	5/06/2011	nil

Sample no.	Date received at Scion	Date set to dry	Date flooded and baited	Date plated	Result
74	11/05/2011	11/05/2011	3/06/2011	5/06/2011	nil
75	11/05/2011	11/05/2011	3/06/2011	5/06/2011	nil
76	11/05/2011	11/05/2011	3/06/2011	5/06/2011	nil
77	11/05/2011	11/05/2011	3/06/2011	5/06/2011	nil
78	11/05/2011	11/05/2011	16/05/2011	18/05/2011	<i>P. cinnamomi</i>
79	11/05/2011	11/05/2011	16/05/2011	18/05/2011	<i>P. cinnamomi</i>
33	04/08/2011	05/08/2011	12/08/2011	15/08/2011	<i>P. cinnamomi</i> , <i>Pythium</i> sp.
35	04/08/2011	05/08/2011	12/08/2011	15/08/2011	<i>P. cinnamomi</i>
38	04/08/2011	05/08/2011	12/08/2011	15/08/2011	<i>P. cinnamomi</i>
47	04/08/2011	05/08/2011	12/08/2011	15/08/2011	<i>Pythium</i> sp.
49	04/08/2011	05/08/2011	12/08/2011	15/08/2011	<i>P. cinnamomi</i> ,
61	04/08/2011	05/08/2011	12/08/2011	15/08/2011	nil
62	04/08/2011	05/08/2011	12/08/2011	15/08/2011	<i>P. cinnamomi</i> ,
63	04/08/2011	05/08/2011	12/08/2011	15/08/2011	<i>Pythium</i> sp.
64	04/08/2011	05/08/2011	12/08/2011	15/08/2011	nil
89	04/08/2011	05/08/2011	12/08/2011	15/08/2011	<i>Pythium</i> sp.
90	04/08/2011	05/08/2011	12/08/2011	15/08/2011	<i>P. cinnamomi</i> , <i>Pythium</i> sp.
91	04/08/2011	05/08/2011	12/08/2011	15/08/2011	nil

Appendix 3B – QA/QC PFR

Spreadsheet detailing soil bioassay analysis details of PFR

Sample code	Date arrived at PFR	Analysis started	Results reported	Result
1	22/03/2011	22/03/2011	13/04/2011	<i>Phy.cinnamomi</i>
2	22/03/2011	22/03/2011	13/04/2011	<i>Phy.cinnamomi</i>
3	22/03/2011	22/03/2011	13/04/2011	<i>Phy.cinnamomi</i>
4	22/03/2011	22/03/2011	13/04/2011	<i>Phy.cinnamomi</i>
5	22/03/2011	22/03/2011	13/04/2011	<i>Phy.cinnamomi</i>
6	5/04/2011	5/04/2011	29/04/2011	PTA
7	5/04/2011	5/04/2011	29/04/2011	<i>Pythium</i> sp.
8	5/04/2011	5/04/2011	29/04/2011	<i>Pythium</i> sp.
9	5/04/2011	5/04/2011	29/04/2011	PTA
10	5/04/2011	5/04/2011	29/04/2011	<i>Pythium</i> sp.
11	5/04/2011	5/04/2011	29/04/2011	<i>Pythium</i> sp.
12	5/04/2011	5/04/2011	29/04/2011	<i>Phy.cinnamomi</i>
13	5/04/2011	5/04/2011	29/04/2011	Nil
14	5/04/2011	5/04/2011	29/04/2011	Nil
15	5/04/2011	5/04/2011	29/04/2011	Nil
16	5/04/2011	5/04/2011	29/04/2011	Nil
33	13/04/2011	13/04/2011	9/05/2011	Nil
36	13/04/2011	13/04/2011	9/05/2011	Nil
39	13/04/2011	13/04/2011	9/05/2011	Nil
40	13/04/2011	13/04/2011	9/05/2011	Nil
41	13/04/2011	13/04/2011	9/05/2011	<i>Phy.cinnamomi</i>
42	13/04/2011	13/04/2011	9/05/2011	PTA
43	13/04/2011	13/04/2011	9/05/2011	PTA & <i>Phy.cinnamomi</i>
44	13/04/2011	13/04/2011	9/05/2011	PTA & <i>Phy.cinnamomi</i>
45	13/04/2011	13/04/2011	9/05/2011	<i>Pythium</i> sp.
46	13/04/2011	13/04/2011	9/05/2011	PTA

Sample code	Date arrived at PFR	Analysis started	Results reported	Result
47	13/04/2011	13/04/2011	9/05/2011	<i>Pythium</i> sp.
48	13/04/2011	13/04/2011	9/05/2011	<i>Pythium</i> sp.
49	13/04/2011	13/04/2011	9/05/2011	<i>Pythium</i> sp.
51	13/04/2011	13/04/2011	9/05/2011	<i>Phy.cinnamomi</i>
52	13/04/2011	13/04/2011	9/05/2011	<i>Pythium</i> sp.
53	13/04/2011	13/04/2011	9/05/2011	<i>Phy. multivora</i>
54	19/04/2011	19/04/2011	9/05/2011	<i>Pythium</i> sp.
55	19/04/2011	19/04/2011	9/05/2011	<i>Pythium</i> sp.
56	19/04/2011	19/04/2011	9/05/2011	<i>Phy.cinnamomi</i>
57	19/04/2011	19/04/2011	9/05/2011	<i>Phy.cinnamomi</i>
58	19/04/2011	19/04/2011	9/05/2011	<i>Pythium</i> sp.
59	19/04/2011	19/04/2011	9/05/2011	PTA & <i>Phy. multivora</i>
60	19/04/2011	19/04/2011	9/05/2011	PTA
61	12/05/2011	12/05/2011	13/06/2011	Nil
62	12/05/2011	12/05/2011	13/06/2011	Nil
63	12/05/2011	12/05/2011	13/06/2011	Nil
64	12/05/2011	12/05/2011	13/06/2011	Nil
65	12/05/2011	12/05/2011	13/06/2011	Nil
66	12/05/2011	12/05/2011	13/06/2011	Nil
67	12/05/2011	12/05/2011	13/06/2011	Nil
68	12/05/2011	12/05/2011	13/06/2011	Nil
69	12/05/2011	12/05/2011	13/06/2011	Nil
70	12/05/2011	12/05/2011	13/06/2011	Nil
71	12/05/2011	12/05/2011	13/06/2011	Nil
72	12/05/2011	12/05/2011	13/06/2011	Nil
73	12/05/2011	12/05/2011	13/06/2011	Nil
74	12/05/2011	12/05/2011	13/06/2011	Nil
75	12/05/2011	12/05/2011	13/06/2011	Nil
76	12/05/2011	12/05/2011	13/06/2011	Nil
80	12/05/2011	12/05/2011	13/06/2011	Nil

Sample code	Date arrived at PFR	Analysis started	Results reported	Result
81	12/05/2011	12/05/2011	13/06/2011	Nil
82	12/05/2011	12/05/2011	13/06/2011	Nil
83	19/05/2011	19/05/2011	13/06/2011	Nil
84	19/05/2011	19/05/2011	13/06/2011	Nil
85	19/05/2011	19/05/2011	13/06/2011	Nil
86	19/05/2011	19/05/2011	13/06/2011	Nil
87	19/05/2011	19/05/2011	13/06/2011	Nil
88	19/05/2011	19/05/2011	13/06/2011	Nil
89	19/05/2011	19/05/2011	13/06/2011	Nil
90	19/05/2011	19/05/2011	13/06/2011	Nil
91	19/05/2011	19/05/2011	13/06/2011	Nil
29	04/08/2011	05/08/2011	12/08/2011	Nil
34	04/08/2011	05/08/2011	12/08/2011	<i>Pythium sp.</i>
37	04/08/2011	05/08/2011	12/08/2011	Nil
45	04/08/2011	05/08/2011	12/08/2011	<i>Pythium sp., Phy. multivora</i>
47	04/08/2011	05/08/2011	12/08/2011	<i>Pythium sp., Phy. multivora</i>
48	04/08/2011	05/08/2011	12/08/2011	<i>Pythium sp.</i>
49	04/08/2011	05/08/2011	12/08/2011	<i>Pythium sp., Phy. multivora</i>
50	04/08/2011	05/08/2011	12/08/2011	<i>Pythium sp.</i>
61	04/08/2011	05/08/2011	12/08/2011	Nil
63	04/08/2011	05/08/2011	12/08/2011	<i>Pythium sp.</i>
89	04/08/2011	05/08/2011	12/08/2011	<i>Pythium sp.</i>
91	04/08/2011	05/08/2011	12/08/2011	<i>Pythium sp.</i>

Appendix 4A – Results spreadsheet

PTA recoveries highlighted in yellow were confirmed by ITS sequence confirmation. PTA recoveries highlighted in red were identified by morphology. The 'Valid Sample' column is a designation based upon the interpretation of soil recoveries from all samples from within a site (n/t = not tested by that lab).

Sample code	Sample name	Site location	GPS	Region	Field collection date	LCR	PFR	Scion	DNA confirm	Valid sample	Repeat samples August 2011
1	Site 16, Tree 2	Taheke	E1728749 N6051102	Northland	17/03/2011	No PTA	No PTA	No PTA	Yes	Yes	
2	Site 16, Tree 1	Taheke	E1728718 N6051084	Northland	17/03/2011	No PTA	No PTA	No PTA	Yes	Yes	
3	Site 16, Tree 3	Taheke	E1728696 N6051055	Northland	17/03/2011	No PTA	No PTA	No PTA	Yes	Yes	
4	Site 16, Disc 1	Taheke	E1728324 N6050694	Northland	17/03/2011	No PTA	No PTA	No PTA	Yes	Yes	
5	Site 16, Disc 2	Taheke	E1727894 N6050716	Northland	17/03/2011	No PTA	No PTA	No PTA	Yes	Yes	
6	Site 5 Tree 1	Waipoua	E1651706 N6054494	Northland	31/03/2011	PTA	PTA	n/t	Yes	Yes	
7	Site 5 Tree 2	Waipoua	E1651722 N6054503	Northland	31/03/2011	No PTA	No PTA	n/t	n/t	Yes	
8	Site 5 Tree 3	Waipoua	E1651679 N6054503	Northland	31/03/2011	No PTA	No PTA	n/t	n/t	Yes	
9	Site 5 Disc 1	Waipoua	E1620236 N6054573	Northland	31/03/2011	PTA	PTA	PTA	Yes	Yes	
10	Site 5 Disc 2	Waipoua	E1651459 N6054440	Northland	31/03/2011	No PTA	No PTA	No PTA	n/t	Yes	

Sample code	Sample name	Site location	GPS	Region	Field collection date	LCR	PFR	Scion	DNA confirm	Valid sample	Repeat samples August 2011
11	Site 32 Tree 1	Paranui 2	E1642021 N6117997	Northland	30/03/2011	No PTA	No PTA	n/t	n/t	Yes	
12	Site 32 Tree 2	Paranui 2	E1641990 N6118006	Northland	30/03/2011	No PTA	No PTA	n/t	Yes	Yes	
13	Site 32 Tree 3	Paranui 2	E1642066 N6118014	Northland	30/03/2011	No PTA	No PTA	n/t	n/t	Yes	
14	Site 32 Disc 1	Paranui 2	E1642213 N6118043	Northland	30/03/2011	No PTA	No PTA	n/t	Yes	Yes	
15	Site 11 Tree 1	Puketi 1	E1672869 N6104391	Northland	28/03/2011	No PTA	No PTA	n/t	Yes	Yes	
16	Site 11 Tree 2	Puketi 1	E1672888 N6104368	Northland	28/03/2011	No PTA	No PTA	n/t	n/t	Yes	
17	Site 11 Tree 3	Puketi 1	E1672843 N6104411	Northland	28/03/2011	No PTA	n/t	No PTA	Yes	Yes	
18	Site 12 Tree 1	Puketi 2	E1672772 N6104626	Northland	28/03/2011	No PTA	n/t	No PTA	n/t	Yes	
19	Site 12 Tree 2	Puketi 2	E1672767 N6104591	Northland	28/03/2011	No PTA	n/t	No PTA	n/t	Yes	
20	Site 12 Tree 3	Puketi 2	E1672768 N6104572	Northland	28/03/2011	No PTA	n/t	No PTA	n/t	Yes	
21	Site 13 Tree 1	Puketi 3	E1671227 N6106327	Northland	28/03/2011	No PTA	n/t	No PTA	Yes	Yes	
22	Site 31 Tree 1	Paranui 1	E1640742 N6119470	Northland	29/03/2011	No PTA	n/t	No PTA	Yes	Yes	
23	Site 31	Paranui 1	E1640741	Northland	29/03/2011	No PTA	n/t	No PTA	Yes	Yes	

Sample code	Sample name	Site location	GPS	Region	Field collection date	LCR	PFR	Scion	DNA confirm	Valid sample	Repeat samples August 2011
	Tree 2		N6119468								
24	Site 31 Tree 3	Paranui 1	E1640753 N6119439	Northland	29/03/2011	No PTA	n/t	No PTA	n/t	Yes	
25	Site 15 Tree 1	Coopers	E1646565 N6124317	Northland	29/03/2011	No PTA	n/t	No PTA	Yes	Yes	
26	Site 15 Tree 2	Coopers	E1646595 N6124307	Northland	29/03/2011	No PTA	n/t	No PTA	Yes	Yes	
27	Site 15 Tree 3	Coopers	E1646517 N6124328	Northland	29/03/2011	No PTA	n/t	n/t	Yes	Yes	
28	Site 30 Tree 1	Russell 3	E1714691 N6090679	Northland	4/04/2011	n/t	n/t	No PTA	n/t	Yes	
29	Site 30 Disc 1	Russell 3	E1713387 N6092122	Northland	4/04/2011	n/t	n/t	No PTA	n/t	Yes	No PTA
30	Site 9 Tree 1	Omahuta 4	E1657180 N6100172	Northland	5/04/2011	n/t	n/t	No PTA	n/t	Yes	
31	Site 9 Tree 2	Omahuta 4	E1657192 N6100141	Northland	5/04/2011	n/t	n/t	No PTA	n/t	Yes	
32	Site 9 Tree 3	Omahuta 4	E1657137 N6100207	Northland	5/04/2011	n/t	n/t	No PTA	n/t	Yes	
33	Site 10 Tree 1	Omahuta 5	E1657277 N6099899	Northland	5/04/2011	No PTA	No PTA	No PTA	n/t	Yes	No PTA
34	Site 10 Tree 2	Omahuta 5	E1657282 N6099883	Northland	5/04/2011	n/t	n/t	No PTA	n/t	Yes	No PTA

Sample code	Sample name	Site location	GPS	Region	Field collection date	LGR	PFR	Scion	DNA confirm	Valid sample	Repeat samples August 2011
35	Site 10 Tree 3	Omahuta 5	E1657259 N6099932	Northland	5/04/2011	n/t	n/t	No PTA	n/t	Yes	No PTA
36	Site 7 Tree 1	Omahuta 2	E1657218 N6100773	Northland	5/04/2011	No PTA	No PTA	No PTA	n/t	Yes	
37	Site 7 Tree 2	Omahuta 2	E1657249 N6100828	Northland	5/04/2011	n/t	n/t	No PTA	n/t	Yes	No PTA
38	Site 7 Tree 3	Omahuta 2	E1657272 N6100874	Northland	5/04/2011	n/t	n/t	No PTA	n/t	Yes	No PTA
39	Site 8 Tree 1	Omahuta 3	E1656098 N6104288	Northland	6/04/2011	No PTA	No PTA	n/t	n/t	Yes	
40	Site 8 Tree 2	Omahuta 3	E1656132 N6104279	Northland	6/04/2011	No PTA	No PTA	n/t	n/t	Yes	
41	Site 8 Tree 3	Omahuta 3	E1656048 N6104302	Northland	6/04/2011	No PTA	No PTA	n/t	n/t	Yes	
42	Site 6 Tree 1	Omahuta 1	E1653776 N6101227	Northland	6/04/2011	No PTA	PTA	n/t	Yes	Yes	
43	Site 6 Tree 2	Omahuta 1	E1653767 N6101232	Northland	6/04/2011	n/t	PTA	n/t	Yes	Yes	
44	Site 6 Tree 3	Omahuta 1	E1653757 N6101260	Northland	6/04/2011	No PTA	PTA	No PTA	Yes	Yes	
45	Site 6 Disc 1	Omahuta 1	E1653872 N6101302	Northland	6/04/2011	n/t	No PTA	n/t	n/t	Yes	No PTA
46	Site 6 Disc 2	Omahuta 1	E1653834 N6101259	Northland	6/04/2011	n/t	PTA	n/t	Yes	Yes	
47	Site 17	A H Reed	E1721407	Northland	7/04/2011	No PTA	No PTA	n/t	n/t	Yes	No PTA

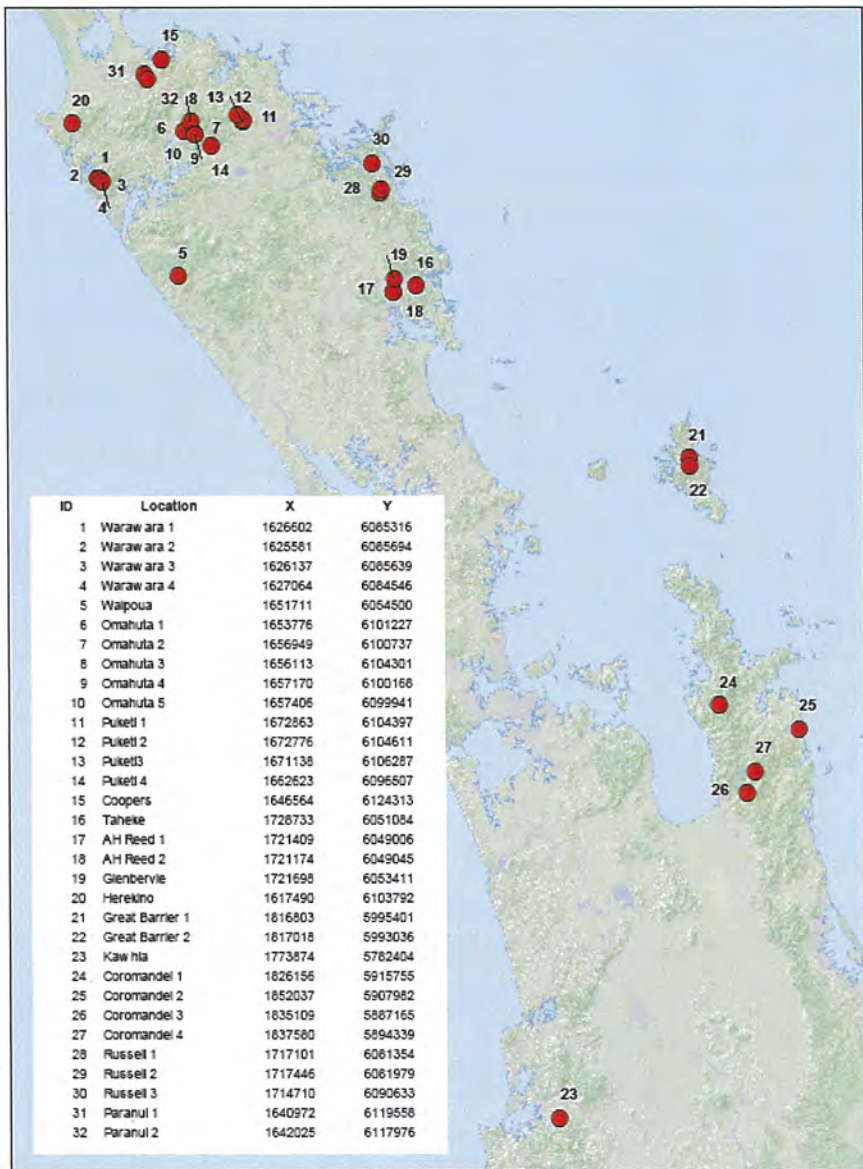
Sample code	Sample name	Site location	GPS	Region	Field collection date	LCR	PFR	Scion	DNA confirm	Valid sample	Repeat samples August 2011
	Tree 1	1	N6049018								
48	Site 17 Tree 2	A H Reed 1	E1721360 N6049026	Northland	7/04/2011	No PTA	No PTA	n/t	n/t	Yes	No PTA
49	Site 17 Tree 3	A H Reed 1	E1721443 N6049040	Northland	7/04/2011	No PTA	No PTA	n/t	n/t	Yes	No PTA
50	Site 18 Tree 1	A H Reed 2	E1721259 N6049073	Northland	7/04/2011	n/t	n/t	No PTA	n/t	Yes	No PTA
51	Site 18 Tree	A H Reed 2	E1721302 N6049060	Northland	7/04/2011	n/t	No PTA	No PTA	n/t	Yes	
52	Site 18 Tree 3	A H Reed 2	E1721225 N6049054	Northland	7/04/2011	n/t	No PTA	No PTA	Yes	Yes	
53	180 Driving Creek Road	180 Driving Creek Road	180 Driving Creek Road	Coromandel	8/04/2011	No PTA	No PTA	No PTA	Yes	Yes	
54	Site 22 Tree 1	Gt Barrier 1	E1817018 N5993036	Great Barrier Island	11/04/2011	No PTA	No PTA	No PTA	Yes	Yes	
55	Site 22 Tree 2	Gt Barrier 1	E1817001 N5993009	Great Barrier Island	11/04/2011	No PTA	No PTA	No PTA	n/t	Yes	
56	Site 22 Tree 3	Gt Barrier 1	E1817014 N5993061	Great Barrier Island	11/04/2011	No PTA	No PTA	No PTA	n/t	Yes	
57	Site 22 Disc 1	Gt Barrier 1	E1817148 N5993164	Great Barrier Island	11/04/2011	No PTA	No PTA	No PTA	n/t	Yes	
58	Site 21 Tree 1	Gt Barrier 2	E1816803 N5995401	Great Barrier Island	12/04/2011	n/t	No PTA	PTA	No isolate	Yes	

Sample code	Sample name	Site location	GPS	Region	Field collection date	LCR	PFR	Scion	DNA confirm	Valid sample	Repeat samples August 2011
59	Site 21 Tree 2	Gt Barrier 2	E1816805 N5995388	Great Barrier Island	12/04/2011	No PTA	PTA	PTA	Yes	Yes	
60	Site 21 Tree 3	Gt Barrier 2	E1816755 N5995397	Great Barrier Island	12/04/2011	PTA	PTA	No PTA	Yes	Yes	
61	Site 14 Tree 1	Puketi 4	E1662648 N6096488	Northland	26/04/2011	n/t	No PTA	No PTA	n/t	Yes	No PTA
62	Site 14 Tree 2	Puketi 4	E1662722 N6096421	Northland	26/04/2011	n/t	No PTA	No PTA	n/t	Yes	No PTA
63	Site 14 Tree 3	Puketi 4	E1662664 N6096477	Northland	26/04/2011	No PTA	No PTA	No PTA	n/t	Yes	No PTA
64	Site 14 Discretionary 1	Puketi 4 (Disc.)	E1662629 N6096098	Northland	26/04/2011	n/t	No PTA	No PTA	n/t	Yes	No PTA
65	Site 19 A Tree 1	Glenbervie	E1721586 N6053510	Northland	27/04/2011	No PTA	No PTA	No PTA	Yes	Yes	
66	Site 19 A Tree 2	Glenbervie	E1721559 N6053466	Northland	27/04/2011	PTA	No PTA	No PTA	No isolate	Yes	
67	Site 19 A Tree 3	Glenbervie	E1721582 N6053545	Northland	27/04/2011	No PTA	No PTA	No PTA	n/t	Yes	
68	Site 19 B Tree 1	Glenbervie	E1721633 N6053496	Northland	27/04/2011	No PTA	No PTA	No PTA	n/t	Yes	
69	Site 19 B Tree 2	Glenbervie	E1721615 N6053444	Northland	27/04/2011	No PTA	No PTA	No PTA	n/t	Yes	
70	Site 19 B Tree 3	Glenbervie	E1721626 N6053549	Northland	27/04/2011	No PTA	No PTA	No PTA	n/t	Yes	

Sample code	Sample name	Site location	GPS	Region	Field collection date	LCR	PFR	Scion	DNA confirm	Valid sample	Repeat samples August 2011
71	Site 19 C Tree 1	Glenbervie	E1721696 N6053321	Northland	27/04/2011	PTA	No PTA	No PTA	No isolate	Yes	
72	Site 19 C Tree 2	Glenbervie	E1721719 N6053363	Northland	27/04/2011	PTA	No PTA	No PTA	Yes	Yes	
73	Site 19 C Tree 3	Glenbervie	E1721650 N6053343	Northland	27/04/2011	PTA	No PTA	No PTA	No isolate	Yes	
74	Site 19 D Tree 1	Glenbervie	E1722291 N6053070	Northland	27/04/2011	PTA	No PTA	No PTA	No isolate	Yes	
75	Site 19 D Tree 2	Glenbervie	E1722320 N6053028	Northland	27/04/2011	No PTA	No PTA	No PTA	n/t	Yes	
76	Site 19 D Tree 3	Glenbervie	E1722349 N6053084	Northland	27/04/2011	No PTA	No PTA	No PTA	n/t	Yes	
77	Site 28 Tree 1	Punaruku/ Russell 1	E1717100 N6081353	Northland	28/04/2011	PTA	No PTA	No PTA	Yes	Yes	
78	Site 28 Tree 2 Russell	Punaruku/ Russell 1	E1717157 N6081352	Northland	28/04/2011	No PTA	No PTA	No PTA	n/t	Yes	
79	Site 28 Tree 3	Punaruku/ Russell 1	E1717051 N6081394	Northland	28/04/2011	No PTA	No PTA	No PTA	Yes	Yes	
80	Site 29 Tree 1	Punaruku/ Russell 2	E1717448 N6081987	Northland	28/04/2011	No PTA	No PTA	n/t	n/t	Yes	
81	Site 29 Tree 2	Punaruku/ Russell 2	E1717407 N6082008	Northland	28/04/2011	No PTA	No PTA	n/t	n/t	Yes	

Sample code	Sample name	Site location	GPS	Region	Field collection date	LCR	PFR	Scion	DNA confirm	Valid sample	Repeat samples August 2011
82	Site 29 Tree 3	Punaruku/Russell 2	E1717484 N6081944	Northland	28/04/2011	No PTA	No PTA	n/t	n/t	Yes	
83	Site 24 Tree 1	Manaia	E1826506 N5914436	Coromandel	12/05/2011	No PTA	No PTA	n/t	n/t	Yes	
84	Site 24 Tree 2	Manaia	E1826461 N5914412	Coromandel	12/05/2011	No PTA	No PTA	n/t	n/t	Yes	
85	Site 24 Tree 3	Manaia	E1826570 N5914514	Coromandel	12/05/2011	No PTA	No PTA	n/t	n/t	Yes	
86	Site 25 Tree 1 Lynch Stream	Tairua	E1851716 N5908157	Coromandel	13/05/2011	No PTA	No PTA	n/t	n/t	Yes	
87	Site 25 Tree 2 Lynch Stream	Tairua	E1851780 N5908190	Coromandel	13/05/2011	No PTA	No PTA	n/t	n/t	Yes	
88	Site 25 Tree 3 Lynch Stream	Tairua	E1851651 N5908126	Coromandel	13/05/2011	No PTA	No PTA	n/t	n/t	Yes	
89	Site 27 Tree 1	Kauaeranga Valley 2	E1838618 N5894159	Coromandel	11/05/2011	No PTA	No PTA	n/t	Yes	Yes	No PTA
90	Site 27 Tree 2	Kauaeranga Valley 2	E1838621 N5894125	Coromandel	11/05/2011	No PTA	No PTA	n/t	n/t	Yes	No PTA
91	Site 27 Tree 3	Kauaeranga Valley 2	E1838674 N5894145	Coromandel	11/05/2011	No PTA	No PTA	n/t	Yes	Yes	No PTA

Appendix 4B – Soil Detection Plan (SDP) location map



SDP Locations

 Public Conservation Land

Map prepared: December 2010



