In the matter of: Clauses 6 and 8 of Schedule 1 – Resource Management Act 1991 – Submissions on publicly notified plan change and variation – Proposed Plan Change 1 and Variation 1 to Waikato Regional Plan – Waikato and Waipa River Catchments

And: **Wairakei Pastoral Ltd**

Submitter

And: **Waikato Regional Council**

Local Authority

Statement of evidence of Nicholas Ashley Conland

Dated: 15 February 2019

STATEMENT OF EVIDENCE OF NICHOLAS CONLAND

SUMMARY AND CONCLUSIONS

1 WPL own a significant pastoral and forestry holding on the Central Plateau of New Zealand's North Island, occupying 25,723 ha within the Upper Waikato River catchment between Lake Taupo and the Reporoa.

2 Since 2004, 15,734 hectares have been converted from forestry to mixed land use encompassing a variety of activities including, ovine and bovine dairy farming, sheep and beef dry-stock farming, lucerne cropping, and geothermal energy generation carried out by both WPL and its lessees.

3 In my evidence I address the concerns from WPL in the interests of the Estate which although large in area represents the livelihoods of hundreds of employees who manage the equivalent of 100 "average" New Zealand farms across the property.

4 The Estate has invested considerable time and effort to prepare a sustainable management framework for farming which will be resilient to changes in land use demands while meeting environmental outcomes. This approach has developed five protocols for land management highlighted in Figures 8-11 and produced the RDST.

5 I agree with the observations from the s42A report that parts of the Waikato and Waipā Rivers are degraded, and that a revised management framework is needed to meet the NPS-FM and the Vision and Strategy.

6 My following summary and recommendations are suggestions for the operational improvement of the PC1 provisions in the first Block of the hearing based on my experience managing the natural resources at one of New Zealand's largest farm estates.

7 I am concerned that without an appropriate definition for springs in the proposed plan it will be confusing for resource managers and farmers if springs are to be protected or returned to pasture if they are ephemeral seeps. A definition will help to make informed land management decisions for retiring and setting fences around springs.

8 I have reviewed the sub-catchments in Table 3.11-2 and am concerned that the spatial extent for many of the catchments is arbitrary. The Estate for instance is in sub-catchment 66 which starts by Te Mihi bridge and runs all the way to the Ohakuri Tailrace.

9 The enormous size of sub-catchment 66 means it will be difficult to align mitigation actions with the FWO's to determine effectiveness and performance.

10 I understand the Upper FMU ends at the Karapiro Tailrace, however Table 3.11-1 provides for managing and meeting FWO's at a much finer scale. Managing at the scale of Table 3.11-1 is a practical application for resource management and matches the level of mitigation efforts with the difference between the desired state and the current state of water quality.

11 As such I'm concerned if there is an ongoing requirement to go beyond the desired states set by the FWO's. This would imply an ongoing requirement to undertake mitigation actions and mean taking responsibility for the lack of actions of by other landowners and sub-catchments.

12 For example, the retirement of land for riparian buffers won't occur if neighbouring properties don't all agree to a similar standard. Similarly, the retirement of land in the Upper FMU sub-catchments where the FWO's are met is a cost to the local landowner and a benefit to down river landowners.

13 I recommend that the Panel consider the benefits of greater participation in catchment management at a realistic scale for actions to be undertaken and measured during the 10 year plan cycle and the longer term of the Vision and Strategy.

14 I note from the evidence of Dr Neale that the FWO's in Table 3.11-1 are inconsistent with the observed data. This is a concern for resource management on the Estate where the proposed FWO's in PC1 will define environmental performance and targets for mitigation actions.

15 The consequence for WPL and other landowners in the Upper FMU is that where the attribute levels for the FWO's in Table 3.11-1 appear to include conservative numbers it will bias the level of mitigations required in these catchments to achieve the FWO's.

16 In practice, this may mean that reductions (through mitigations) in TN and TP loads from the Upper FMU provides much of the "Vision and Strategy work" for the middle FMU's.

17 WPL has been in farm operations since 2004 with most land conversions completed in 2016. The high risk or critical source areas have been either avoided, retired, or shifted to lower intensity land use through the environmental protocols 1 to 5.

18 I note from the evidence of Mr Williamson that a focus on riparian mitigations will significantly improve the health of the river.

19 I believe the introduction of resource limits will provide a discrete mechanism for determining the effectiveness of resource management decision making and avoiding degradation of the existing and future water quality.

20 I have read the evidence from the expert witnesses for WPL and agree with their conclusions and recommendations, and seek that PC1 should be amended accordingly. The changes sought are critical to the approach by WPL for sustainable land management.

21 I make the following specific recommendations:

21.1 A definition for springs from Mr Williamson is included to allow for normal farm practices to continue with appropriate guidance in PC1;

21.2 The Ohakuri sub-catchment (Number 66) is split to provide two separate management units (sub-catchments 66A Tahorakuri and 66B Ohakuri);

21.3 The Objective 3 provision is modified to include both temporal (10 year) and spatial (sub-catchment) elements to provide guidance to landowners, resource managers and regulators alike.

21.4 The Objective 4 provision includes an outcome for adaptive management solutions at a sub-catchment level.

21.5 The attribute levels for the FWO's are confirmed by expert witness conferencing during Block 2.

EVIDENCE

BACKGROUND

22 My name is **Nicholas Ashley Conland**. I hold the qualifications of Bachelor of Science (Chemistry, Information Systems) from the University of Waikato, Diploma of Design (3D) from Waikato Polytechnic, and Postgraduate Certificate of Proficiency (Environmental Planning and Law) from Victoria University of Wellington.

23 I have been engaged by Wairakei Pastoral Limited (**WPL**) since 2015 to manage the Natural Resources division of the company in relation to the Wairakei Estate. I have been authorised by WPL to give evidence on behalf of the company.

24 Previously, I was a Senior Environment Consultant at Jacobs New Zealand Limited in Wellington for 7 years, and before that I was with Wellington Regional Council for 8 years.

25 During this time I have managed science teams to determine the effectiveness of plan instruments under the NPS FM since 2012.

Focus of my evidence

26 My evidence will cover the following matters:

26.1 Description of the Wairakei Estate;

26.2 Description of the activities occurring on the Wairakei Estate as at 22 October 2016 (Plan Change 1 (**PC1**) notification date);

26.3 Natural resource and land use suitability decisions;

26.4 Decision process for the land use change application made by WPL under Rule 3.11.5.7;

26.5 Managing risk through adaptive management;

26.6 Scenarios to explore options to the meet the anticipated environmental outcomes desired by PC1; and

26.7 Conclusions.

26.8 Appendix 1 Development of the Ruahuwai Decision Support Tool (**RDST**)

WAIRAKEI ESTATE

27 As noted by Mr Green in his evidence WPL owns approximately 25,723 hectares on land in the upper Waikato River catchment on three blocks known as Tauhara, Tahorakuri and Broadlands (**the Wairakei Estate**). For the purposes of PC1 the Estate is defined as an "Enterprise". I will now provide a detailed description of the Wairakei Estate:

28 WPL operates a significant pastoral and forestry complex on the central plateau, occupying 25,723 hectares between Taupo and Reporoa in the Waikato region. The site on which the Estate is located on is dominated by free draining Taupo pumice soils and was comprised of pine plantation, which consisted of the Tahorakuri and Broadlands Forests in the north (the Tahorakuri Block) and the forest east of Mt Tauhara in the south (the Tauhara Block). Each area has distinctively different characteristics.

28.1 The Tahorakuri Block comprises of gently undulating broad plateaus of pumice, with a mean land surface slope of 5 degrees. For the most part, this block is crossed by a few streams due to the highly permeable nature of the soils, which limits surface runoff.

28.2 The Tauhara Block comprises of generally steeper land with a mean land surface slope of 9.5 degrees and a greater propensity of steeply incised drainage valleys. The topographic contour of this block is significantly more variable than that of the Tahorakuri Block.

28.3 The Broadlands Block is a predominantly flat river terrace adjacent to the Waikato River.

28.4 Steeply incised drainage valleys disturb the topographic pattern in the west (Orakonui Stream) and in the South (Pueto, Sexton and Paetataramoa Streams. All of these streams are spring-fed and have strong and steady base flow components.

29 The Estate is located within the larger Waikato River catchment (refer to **Figure 1** on the following page), and the river runs along the north-east of the Estate and through the centre.

30 The Estate is within a sub-catchment of the Waikato River known as the Ruahuwai Sub-Catchment[1] comprising the Geothermal Area of the Upper Waikato.

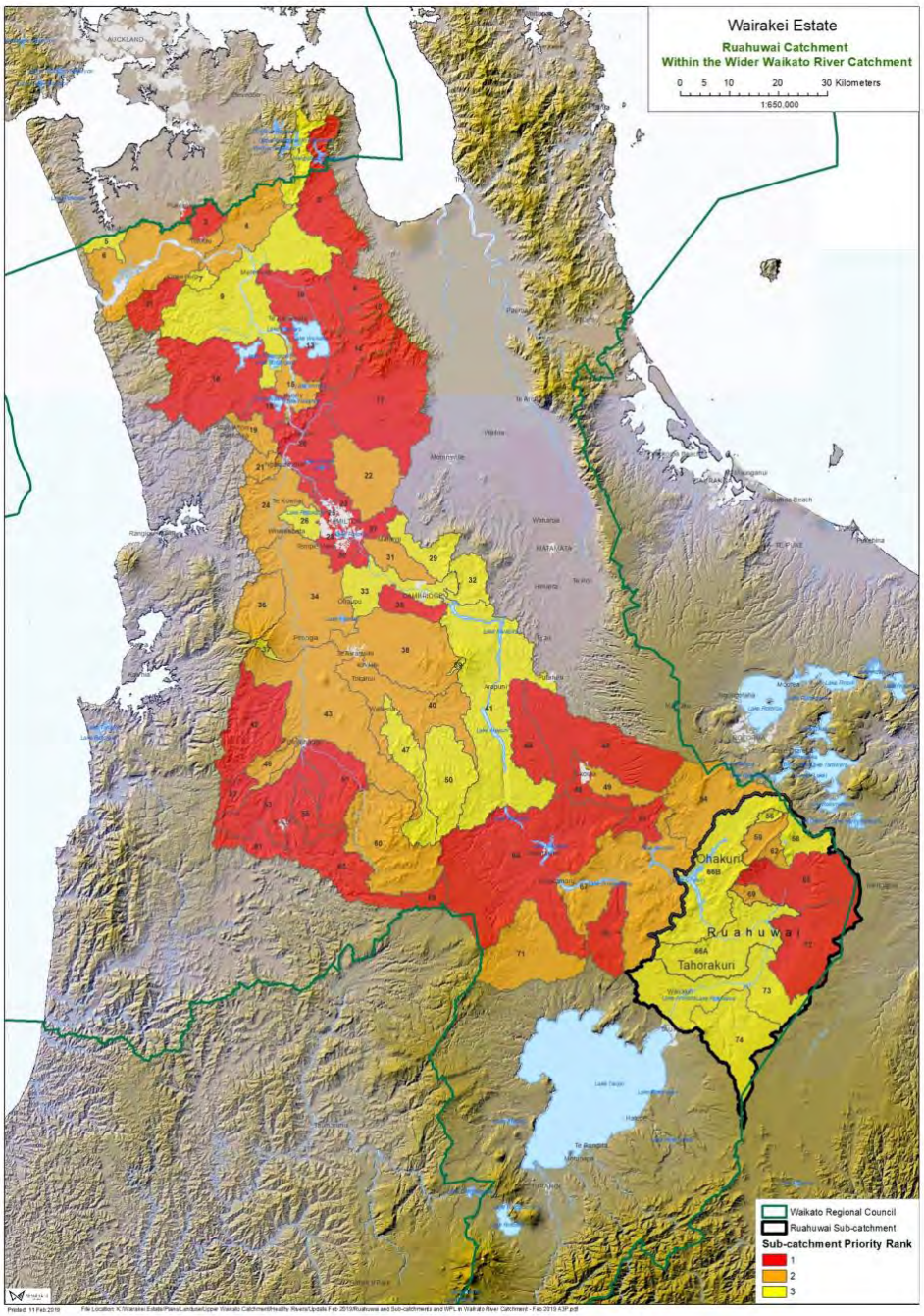

Figure 1: The location of the Ruahuwai Sub-Catchment

[1] While the Ruahuwai Sub-catchment is not a PC1 sub-catchment per se, it is identified and acknowledged by Ngāti Tahu – Ngāti Whaoa as a sub-catchment.

31 The Ruahuwai Sub-catchment is approximately 162,560ha and encompasses 10 sub-catchments identified in PC1 (Map 3.11-2 and Table 3.11-2 , including 56 (Whirinaki), 58 (Waiotapu at Campbell), 59 (Otamakokore), 62 (Kawaunui), 65 (Waiotapu and Homestead), 66 (Waikato at Ohakuri), 69 (Mangakara), 72 (Torepatutahi), 73 (Waikato at Ohaaki) and 74 (Pueto).

32 The Estate occupies ca. 16% percent of the Ruahuwai Sub-Catchment and sits across 3 of the proposed sub-catchments (66, 73 and 74).

33 The Estate is located on Broadlands Road, approximately 10 kilometres to the northeast of Taupo and south of Rotorua, as shown in **Figure 2** below. The Estate is in the Taupo District and is surrounded largely by rural and lifestyle land.

34 Figure 2 illustrates the location of the Estate within the Ruahuwai Sub-Catchment area.

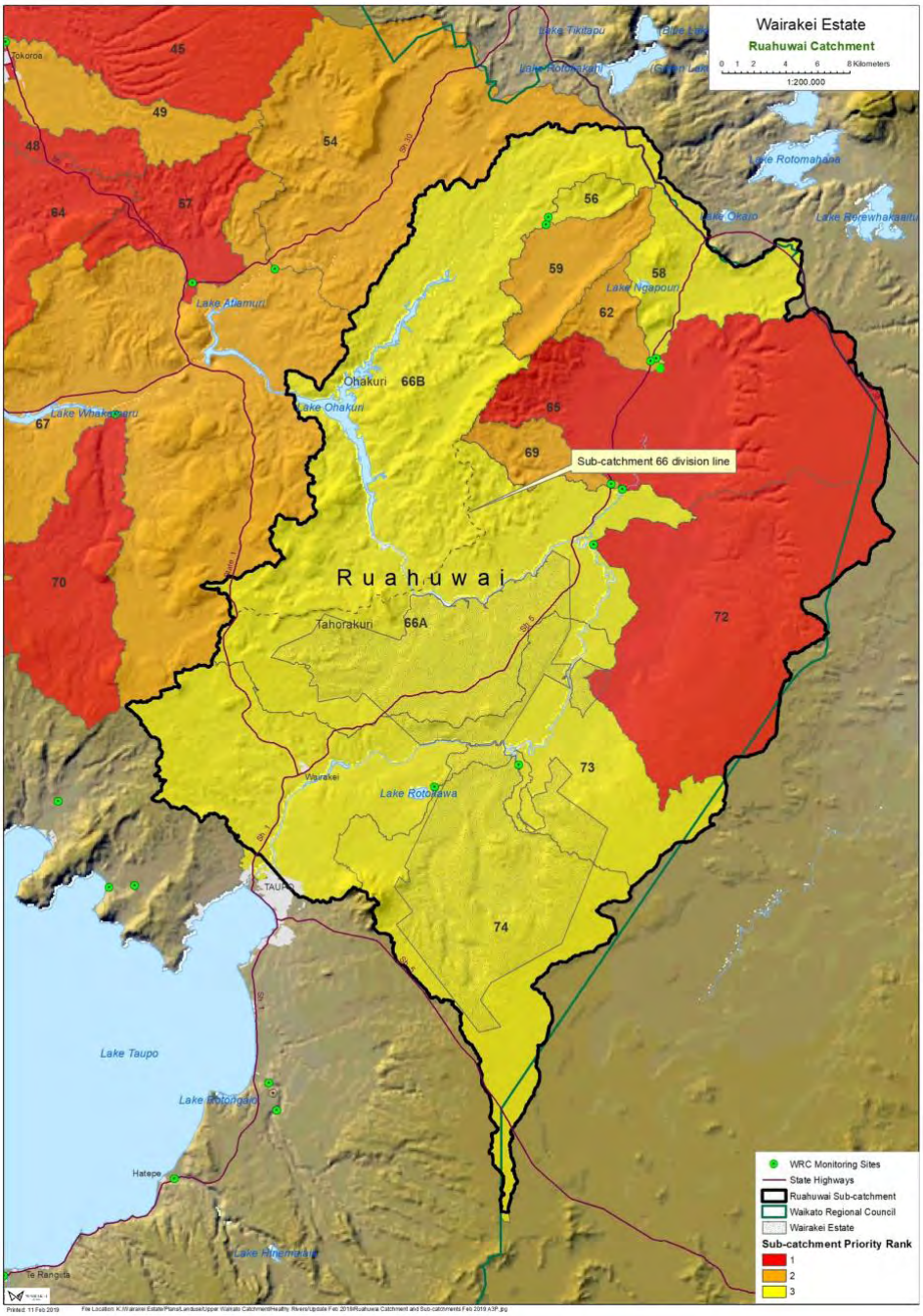

Figure 2: Location of Wairakei Estate within the Ruahuwai Sub-Catchment

35 The Ruahuwai Sub-Catchment includes the headwaters for the Waikato River. The sub-catchment also includes a significant geothermal resource, and the upper reaches of the Waikato River are used for hydropower generation, with eight hydro dams between Taupo and Cambridge.

36 The Ruahuwai Sub-catchment is particularly relevant for PC1 as it reflects the portion of the Waikato catchment that has been modelled by WPL with regards to water and nutrient flows through the RDST, as further discussed below.

ACTIVITIES OCCURING ON THE WAIRAKEI ESTATE ON 22 OCTOBER 2016

37 Since the establishment of the Estate in 2004, 15,734ha or 61% of the property has been progressively developed for farming activities, with the land now primarily used for dairy farming. The dairy platforms occupy flat land, mostly at 350 to 450 metres above sea level.

38 The land use of the Estate as at the 22 October 2016 (when PC1 was notified) primarily consisted of farming activities (**Figure 3** and **Figure 4**), with approximately 61% of the Estate area being used for dairy, dairy support, dairy sheep and lucerne, followed by 39% used for plantation forestry and retired areas.

39 The Estate also supports geothermal energy generation (identified as built development in Figures 3 and 4 below).

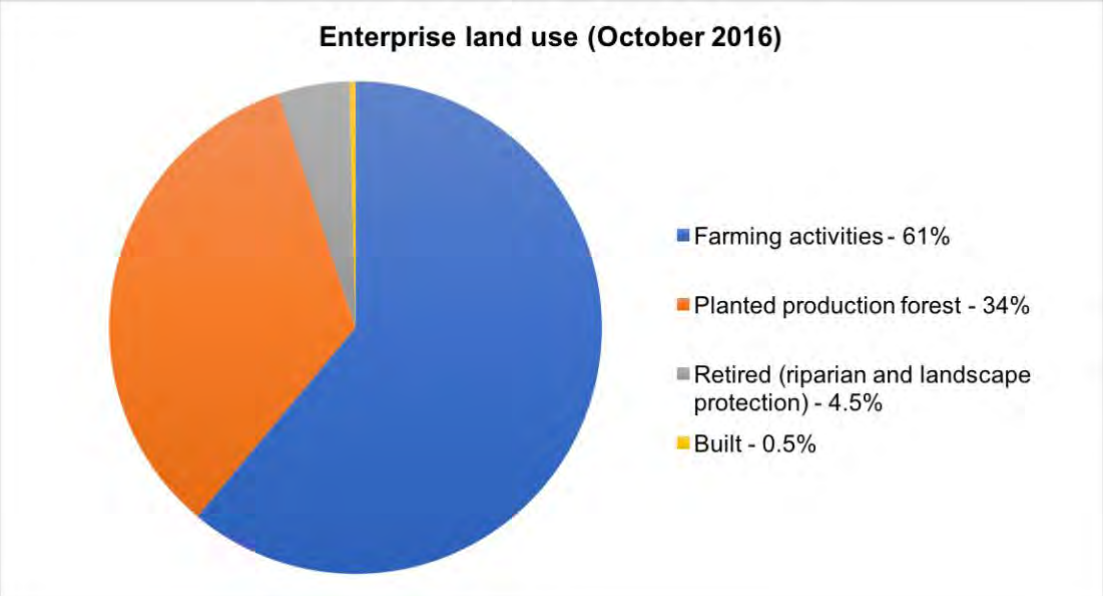

Figure 3: Current Estate land use (as of October 2016).

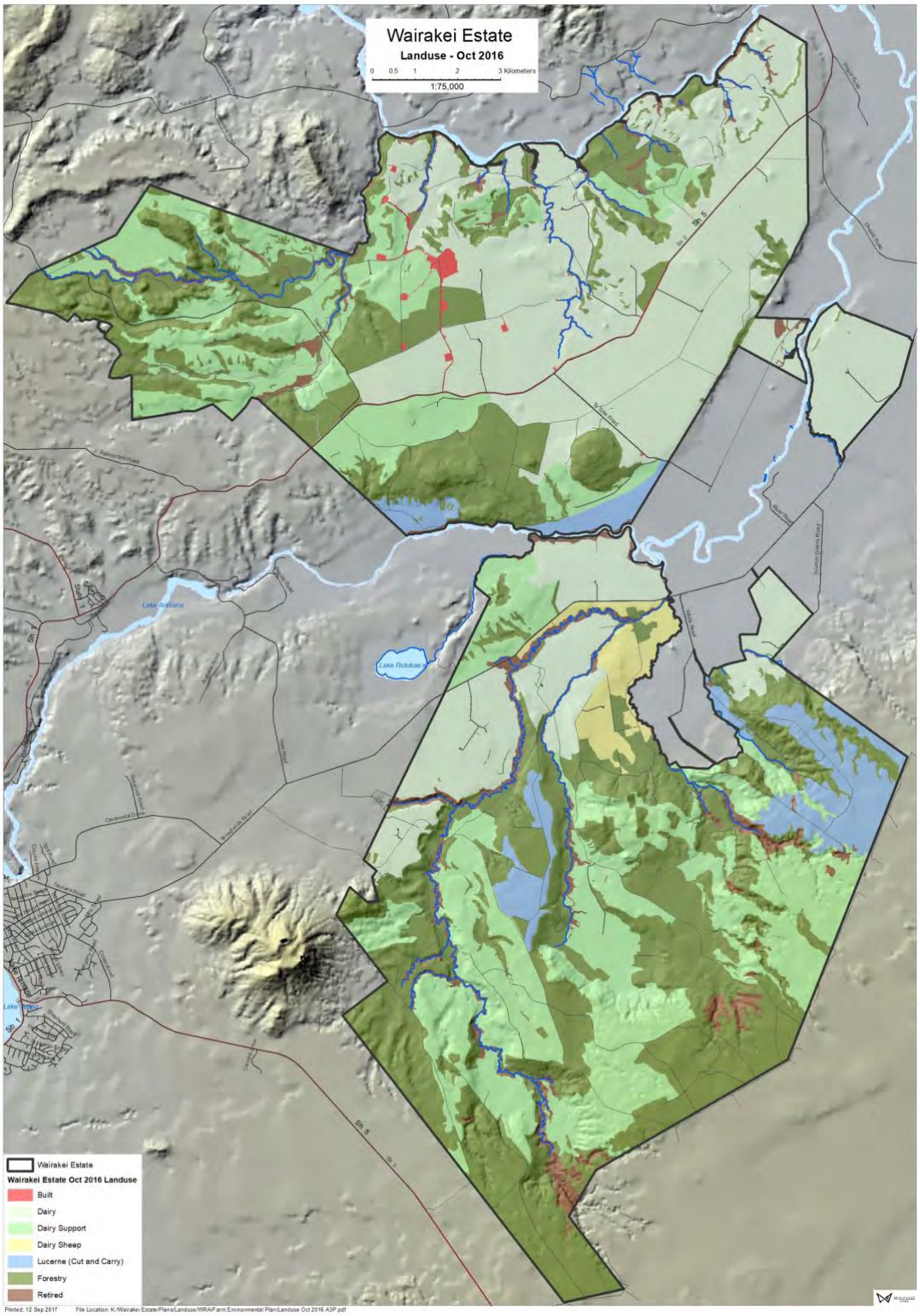

Figure 4: Land use on the Estate (22 October 2016)

40 At notification of PC1 the Estate operated 16 dairy platforms and 1 sheep dairy platform, which are leased to and farmed by Landcorp Farming Limited (**PAMU**) New Zealand's largest corporate farmer.

41 PAMU currently operates 19 bovine dairy platforms on the Estate.

42 Dairy support land complements the dairy platforms by raising the dry stock, growing supplementary feed and wintering cows from on winter forage crops. Both PAMU and Kiwi Grazing Limited lease the farm dairy support areas. In addition, Kiwi Grazing Limited also operates a beef grazing business.

43 Other farming activities on the Estate include:

43.1 A sheep dairy unit, Spring Sheep Milk, which was developed in 2015 within the PAMU lease area. The business unit (St Kilda) is currently milking 4,000 East Friesian ewes.

43.2 A lucerne cropping operation across four business units (Luthridge, Raroa, Perseverance and Sheffield), which is operated by Fiber Fresh Limited. This operation is located at the southern end of the property on an undulating plateau. Fiber Fresh grows a variety of crops inside the lease areas, but mainly focuses on lucerne. Fiber Fresh also undertakes winter grazing of animals in June, July and August.

44 After farming activities; forestry, including pine production forest and retired areas, is the second largest land use and occupies 39% of the Estate (site area). The future development of the Estate will involve changes to forestry areas within the Enterprise with up to a further 1,590ha to be set aside for forestry.

45 WPL obtained a range of certificates of compliance from WRC under s.139 of the Resource Management Act 1991 (**RMA**) relating to future farming operations and associated activities within the Estate. The certificates of compliance, which are summarised in **Table 1** below, authorise WPL to use land for farming activities, including farming, grazing, stock and crops.

Table 1: Farming activities - Certificates of Compliance

Ref.	Consent number	Activity
C	AUTH136968.01.01	Use of land for farming including animal and arable farming
D	AUTH136969.01.01	Use of land for animal farming, including dry stock, dairy (milking platform), grazing and raising livestock

E	AUTH136971.01.01	Use of land for grazing, including winter forage crops
F	AUTH136972.01.01	Use of land for pastoral farming
G	AUTH136973.01.01	Use of land for stock (animals), including up to 2.8 dairy cows per hectare
H	AUTH136974.01.01	Use of land for arable farming, including raising crops
I	AUTH136975.01.01	Use of land for cropping
J	AUTH136976.01.01	Use of land for horticulture
R	AUTH136988.01.01	Use of land for market gardens and orchard produce
S	AUTH136989.01.01	Use of land for increased stock (animals) up to 2.8 dairy cows per hectare (where land is currently stocked with less than 2.8 cows per hectare)
T	AUTH136990.01.01	Use of land for stock (beef and sheep) up to 27 animals per hectare
U	AUTH136991.01.01	Use of land for increased stock (beef and sheep) up to 27 animals per hectare (where land is currently stocked with less than 27 animals per hectare)

46 Land use change activities and associated diffuse discharges have previously occurred within the Estate. These land use change activities were lawfully established before PC1 was notified on 22 October 2016 and no retrospective consent is required for these activities. Ongoing farming activities and associated diffuse discharges are currently permitted activities under Rule 3.11.5.4.

47 Beyond that, WPL also has certificates of compliance from the Taupo District Council relating to farming, forestry and associated activities on the Estate, including for vegetation clearance, earthworks, grazing, fuel transport and storage, effluent holding ponds, fertiliser application, effluent disposal, pastoral irrigation, infrastructure, and other accessory buildings and equipment.

48 WPL also obtained certificates of compliance from WRC relating to future conversion activities, as summarised in Table 2 below. The certificates of compliance confirm that WPL is lawfully able to undertake the ongoing conversion activities for the balance of the Estate, specifically the change in land use from plantation production forestry to animal farming or cropping, and the changes in land use from dry stock to dairy (milking platforms), in accordance with the

operative Waikato Regional Plan and the RMA until PC1 becomes operative.

49 WPL is applying for consents for the future conversion of the balance of the Estate now, under Rule 3.11.5.7, rather than waiting for PC1 to become operative. The rules in PC1 all have immediate legal effect as from notification.

Table 2: Future change in land use - Certificates of Compliance

Ref.	Consent number	Activity
A	AUTH136966.01.01	Change of land use from plantation production forestry to animal farming or cropping
B	AUTH136967.01.01	Change of land use from dry stock to dairy (milking platforms)

50 WPL also obtained certificates of compliance relating to the point-source discharges of farm effluent, and feed pad and standoff pad effluent, on to land, and the use of land for fertiliser and associated discharges. These are summarised in **Table 3** below and confirm that WPL is lawfully able to undertake these point-source discharges within the Estate.

Table 3: Point source discharges - Certificates of compliance

Ref.	Consent number	Activity
L	AUTH136982.01.01	The use of land for the discharge of farm dairy effluent onto land; and the discharge of farm dairy effluent onto land up to a total cumulative effluent loading rate of 150kg N/ha/year from all sources of applied nitrogen including fertilizer and irrigated farm effluent.
M	AUTH136983.01.01	The use of land for the discharge of feed pad and standoff pad effluent onto land; and the discharge of effluent onto land up to a total cumulative effluent loading rate of 150kg N/ha/year from all sources of applied nitrogen including fertilizer and irrigated farm effluent.
N	AUTH136984.01.01	The use of land for fertiliser application; and the discharge of fertiliser up to a total cumulative effluent loading rate of 150kg N/ha/year from all sources of applied nitrogen including fertiliser and irrigated farm effluent.

O	AUTH136985.01.01	The use of land for nitrogen application when sprayed onto [crops] and the discharge of nitrogen when sprayed onto land for [crops and associated maximum loading rates]
P	AUTH136986.01.01	The use of land for nitrogen application when sprayed onto land for grazed pasture; and the discharge of nitrogen when sprayed onto land for grazed pasture up to a maximum loading rate of 150kg N/ha/year.
Q	AUTH136987.01.01	The use of land for nitrogen application onto non-grazed land; and the discharge of nitrogen onto non-grazed land.

51 WPL also holds a certificate of compliance for future forestry activities, as well as other associated activities, within the Estate as described in **Table 4**.

Table 4: Forestry and associated activities – Certificates of Compliance

Ref.	Consent number	Activity
KA	AUTH136977.01.01	Use of land for plantation production forestry and ancillary grazing of animals or cropping
KB	AUTH137167.01.01	Use of land for roading and tracking, and any associated activities, including roading and tracking associated with the installation of bridges and culverts.
W	AUTH137159.01.01	The discharge of water into water, namely into any freshwater body on or abutting Wairakei Estate including the Waikato River.

52 WPL uses water to support the Estate's activities (including dairying), and particularly for stock and shed washdown purposes and pastoral irrigation. Despite relatively high rainfall on the elevated areas of the Estate, soil moisture deficits often occur due to lower rainfall and the free draining soils on the river valley. As a result, 974ha (or 13%) of the dairy platforms within the Estate are currently irrigated, primarily using central pivot irrigators.

53 WPL has authorised water takes from the Waikato River and five tributaries on the Estate (Pueto, Sexton, Paetataramoa, Ta Hau and Orakonui Streams) and from groundwater aquifers to support its existing activities and the future development of the Estate.

54 WPL has developed a "Water User Group" for cooperative water use and holds a consent from WRC for the take and use of surface water for stock water, shed wash down, and domestic purposes and pasture irrigation. The Water User Group water take consent is provided in **Table 5** below and surface water use consent is provided in **Table 6** below.

Table 5: Water User Group Consents (Take)

Consent number	Water course	Take location
AUTH139232.01.01	Waikato River	1882118 E 5722530 N [Earnslaw]
	Waikato River	1886916 E 5727239 N [Pinta]
	Waikato River	1882545 E 5722452 N [Sheffield]
	Waikato River	1879668 E 5371315 N [Resolution]
	Waikato River	1886917 E 5726339 N [Broadlands]
	Waikato River	1856084 E 5743842 N [Kereru]
	Waikato River	1862034 E 5744554 N [Tirohanga]
	Pueto Stream	1880020 E 5719125 N [Mayflower]
	Waikato River	1879669 E 5731315 N [Endurance]
	Waikato River	1885244 E 5733832 N [Renown]
	Waikato River	1882546 E 5722455 N [Sheffield]
	Pueto Stream	1882081 E 5722425 N [Earnslaw]
	Pueto Stream	1880067 E 5719184 N [Mayflower]
	Pueto Stream	1881130 E 5720166 N [Otago]
	Pueto Stream	1878590 E 5715686 N [Pueto]
	Pueto Stream	1879716 E 5710004 N [Tauhara]
	Sexton Stream	1881423 E 5713460 N [Sexton]
	Paetataramoa Stream	1883829 E 5716824 N [Paetataramoa]
	Te Hau Stream	1885791 E 5719555 N [Te Hau]
	Orakonui Stream	1870011 E 5729035 N [Discovery]

Table 6: Water User Group Consents (Use)

Consent number	Activity
AUTH19232.02.01	To use water from the Waikato River and Pueto Stream for irrigation purposes

55 WPL also holds all relevant permits to take and use groundwater from five bore sites within the Estate, as provided in **Table 7** below.

Table 7: WPL Groundwater Consent

Consent number	Bore	Take location
AUTH135201.01.01	Achilles	1879511 E 5727131 N
	Kaimanawa	1881828 E 5724919 N
	Broadlands	1887818 E 5726139 N
	Tram Road	1876157 E 5726053 N
	Raroa	1886983 E 5715748 N

56 WPL also holds a global consent for farming activities across the Estate. The consent provides for three activities relating to mitigation activities, farm services and maintenance, as provided in **Table 8** below.

Table 8: Global Farm Activities consent

Consent number	Activity Subtype	Activity Description
AUTH160164.02.01	Dam	Damming & Diversion within the Wairakei Estate, Reporoa
AUTH140164.01.01	Bed - structure	To construct bridges, culverts & erosion control structures within the Wairakei Estate, Reporoa
AUTH140164.03.01	Land - disturbance	To undertake earthworks related to vegetation clearance and tree felling not including plantation forestry in the Wairakei Estate, Reporoa

NATURAL RESOURCE AND LANDUSE SUITABILITY DECISIONS

57 Central to the development of the Estate, all farming activities, land uses, and associated diffuse discharges are undertaken in accordance with an adaptive management framework. The adaptive management approach is dynamic and informed by the relative changes in water quality parameters against the predicted outcomes.

58 Overall, WPL aims to optimise farm environmental performance and provide strategic direction for successful and sustainable business performance.

59 The Estate management incorporates a range of environmental and sustainability measures to ensure the effects of the farming operations on the environment are minimised and enable the Estate to be managed sustainability and for the benefit of future generations.

60 The Estate layout and operation has been carefully aligned to workable land areas based on suitability for farming land use or retirement.

61 The forestry areas on the land, including pine production forest and retired areas, ensures the Estate can achieve an appropriate balance between commercial outcomes and environmental sustainability.

62 The protection of these areas is central to the development of the Estate. All retired areas are essential for ecological and landscape protection, for example the riparian margins enhance ecology within water bodies and retired erosion prone areas safeguard slope stability.

63 To provide a consistent approach for land management across the Estate, WPL has developed five farm environmental planning protocols for the current and ongoing management of the Estate.

64 The protocols are established to set expectations of the farming practices across the Estate and are incorporated into the modelling to estimate effectiveness and performance. The protocols target risks (critical source areas) and focus actions. These cover riparian, high risk erosion prone land, gully protection, sediment controls and wetlands, as follows:

64.1 ***Protocol 1:*** Riparian boundary for waterbodies (includes rivers, streams and wetlands), set by uniform buffer of 15 metres from waterbodies (Note is measured as a mean for stream catchment)

64.2 ***Protocol 2:*** High Risk Erosion Prone Land will be avoided for all pastoral uses

64.3 ***Protocol 3:*** High Risk Erosion Prone Land Gully protection; 10 metre buffers around the (gully) top of the high risk erosion prone land areas

64.4 ***Protocol 4:*** Sediment Controls: where slope angle for the break line along gullies is greater than 4^{o}, sediment detention bunds are applied every 100 metres; and where the slope angle is greater than 10^{o} sediment detention bunds are

applied every 50m. The slope angles are set from analysis on current sediment bund installations and successful sediment controls

64.5 ***Protocol 5:*** Construct/ Enhance Wetlands where groundwater approaches surface levels and/or paddocks contain springs (are very wet year-round), or as determined by the MODFLOW model

65 **Table 9** shows the current minimum, average and maximum fenced setback adjacent to the waterbodies on the site. The (weighted) average minimum, average and maximum setback from the rivers and streams across the Estate is 22, 45 and 147 metres, respectively.

Table 9: Fenced setbacks (m) from the Estate waterbodies

Stream/ river name	Length (m)	Minimum setback (m)	Average setback (m)	Maximum setback (m)
Greens Gulch	2,209	27	35	70
Kaiwaimouku Stream	477	17	40	60
Kaiwhitiwhiti Stream	2,253	20	30	75
Kopaki Stream	427	10	20	40
Kourawaikapu Stream	1,959	10	25	50
Little Creek	590	25	40	75
Makawe Stream	674	60	80	110
Mangamingi Stream	2,151	20	45	140
Orakonui Stream	11,568	50	80	390
Otawheta Stream	3,057	18	40	190
Paetataramoa Stream	10,096	17	25	60
Parariki Stream	4,876	15	28	70

Pueto Stream	29,663	20	50	150
Sexton Creek	10,585	20	30	65
Taratahi Stream	1,701	12	25	95
Te Awataniwha Stream	1,620	13	40	85
Te Hau Stream	2,978	16	25	70
Te Hukui Stream	3,030	12	25	60
Waikotero Stream	2,077	15	35	60
Waipari Stream	848	20	35	70
Waiwhakarewaumu Stream	7,960	10	20	105
Waikato River (Broadlands)	2,634	23	52	130
Waikato River (Earnslaw/Duke)	4,226	23	75	180
Waikato River (Perseverance/Sheffield)	5,899	26	50	119
Waikato River (Pinta)	1,657	5	38	75
Waikato River (Renown to Endurance)	12,563	23	65	245
Weighted average		**22.0**	**45.2**	**147.0**
TOTAL	**127,778**			

66 The targeted average fenced setback along the Waikato River is 75 metres, with several areas exceeding 150 metres (see **Figure 5** below) and 15 metres on all of the streams within the Estate, exceeding the WRC requirements considerably.

67 In total, there is approximately 127.7 kilometres of streams and rivers running through the Estate (**Table 9**). All key riparian and wetland areas within the Estate have dedicated riparian management plans that have been prepared and implemented in association with the proposed Farm Environment Plan.

68 These areas are protected with over 423 kilometres of fencing (with a further 100 kilometres identified to follow). WPL has permanently retired 750ha of riparian areas with a further 500ha identified for future retirement.

Figure 5: Wide riparian buffers adjacent the Waikato River

69 The riparian margins are progressively planted with native species over time and kept pest and weed free; and variable setbacks between 10 and up to 390 metres are achieved from water bodies (depending on topography) in all livestock and pastoral farming areas on WPL (**Table 1**).

70 The current riparian vegetation and fences exclude stock from all water bodies and wetlands within the Estate adjacent to farm land, an example wetland system is shown in **Figure 6** below. WPL is fully compliant with Schedule 1, as shown in **Figure 7** below.

Figure 6: Stock Exclusion from water bodies

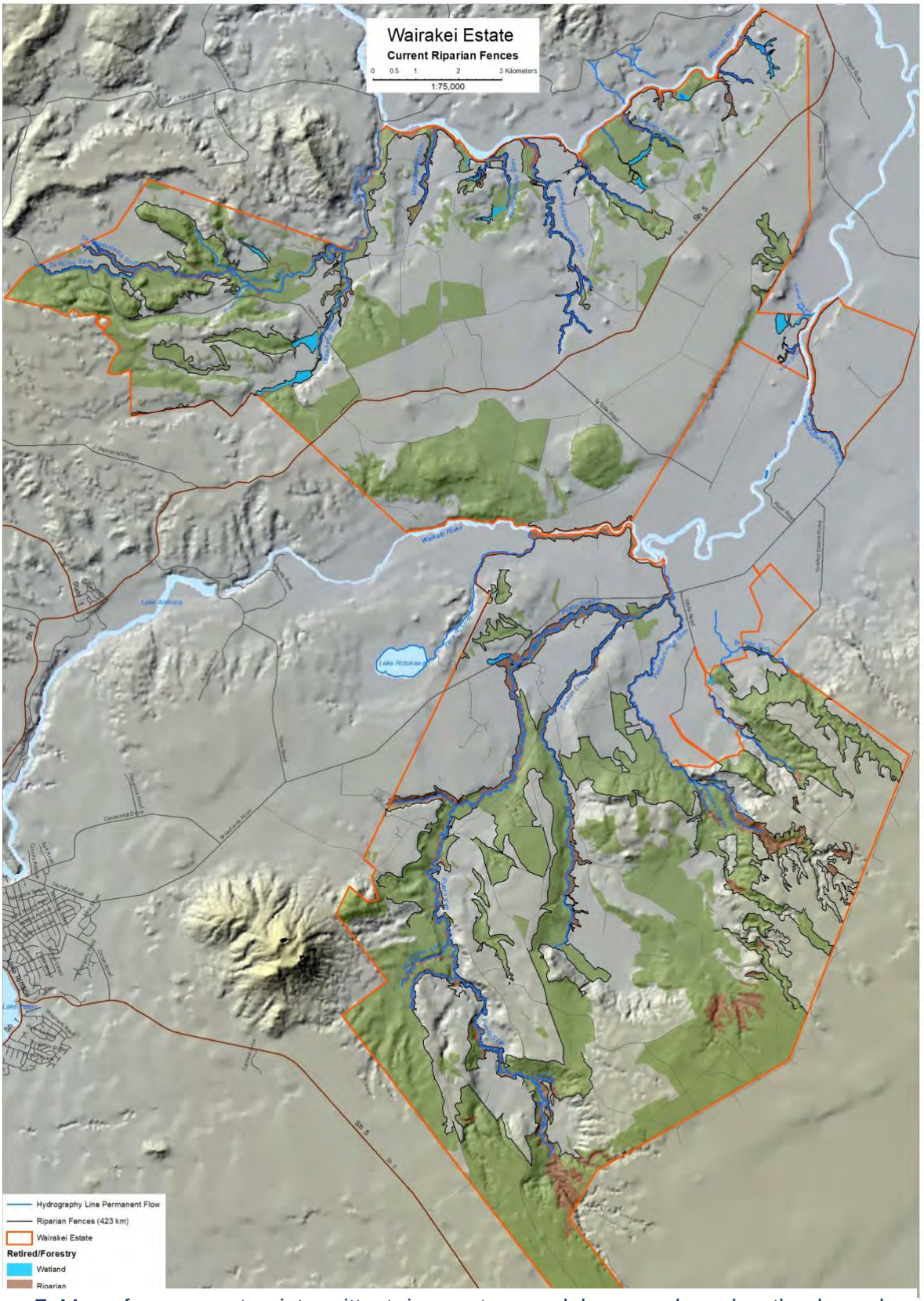

Figure 7: Map of permanent or intermittent rivers, streams, lakes, ponds and wetlands, and riparian vegetation and fences adjacent to waterways, within the Estate

DECISION PROCESS FOR THE CONSENT APPLICATION UNDER RULE 3.11.5.7

71 WPL has applied for land use consent under Rule 3.11.5.7 for the conversion of 1,300ha of planted production forest to dairy farming activities. The application relates to parts of the Estate leased by PAMU that have been converted to dairy farming activities by PAMU since 22 October 2016 in reliance on the COCs described above.

72 While not strictly necessary until PC1 becomes operative, WPL considered it appropriate (in line with its commitment to sustainability) to bring the land under regulation by PC1 sooner rather than later. The application is currently on hold with WRC under s 37 of the RMA.

MANAGING RISK THROUGH ADAPTIVE MANAGEMENT

73 WPL has invested considerable capital in the development of the Estate and is critically aware of the risks posed by having farm and land infrastructure ”stranded” if water quality continues to degrade in the sub-catchments where the Estate farms.

74 To manage this risk and to explore options for mitigations an adaptive management approach is adopted. This involves a constant process of learning by doing, monitoring freshwater attributes and investigating the performance of mitigations .

75 The adaptive management approach encourages the staged implementation of mitigations to be measured against the ongoing improvement of surface water and groundwater attributes.

76 WPL undertake monitoring at key sites on the Estate, these are compared with the Freshwater Objectives in Table 3.11-1.

77 In practice WPL has set internal targets and protocols for environmental mitigations (protocols 1 to 5 para 66) and performance across the Estate.

78 The following figures demonstrate how the Estate is applying the protocols to introduce mitigations – in response to feedback from monitoring, tenants, and the biophysical conditions which create critical source areas.

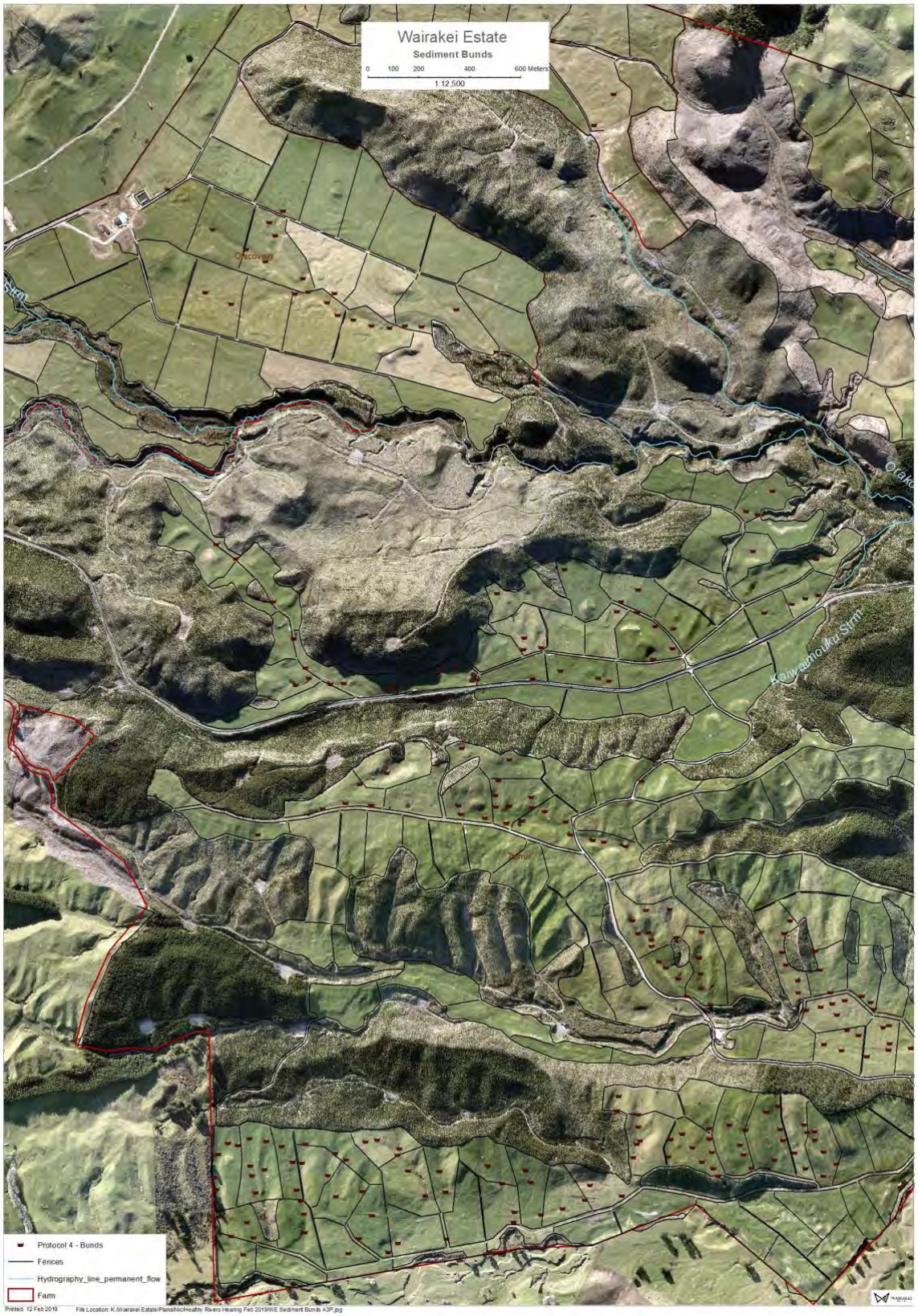

Figure 8 : Overlay of WPL's mitigation Protocol 4 (Bunds) installed at 2018

Figure 9 : Overlay of WPL's mitigation Protocols 2 and 3 (Erosion Prone Land and Gulley Protection)

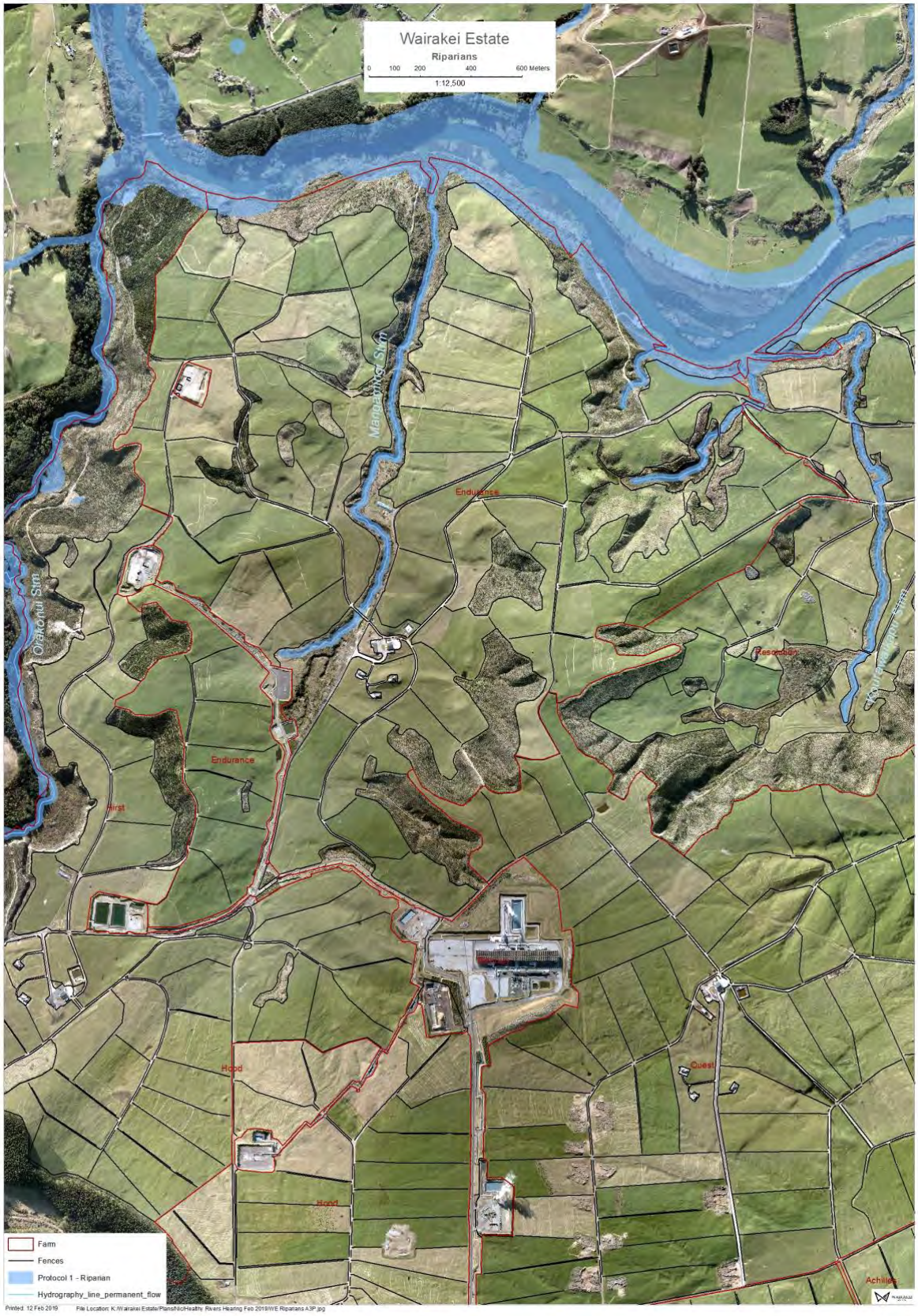

Figure 10 : Overlay of riparian margins under WPL's mitigation Protocol 1 (2018)

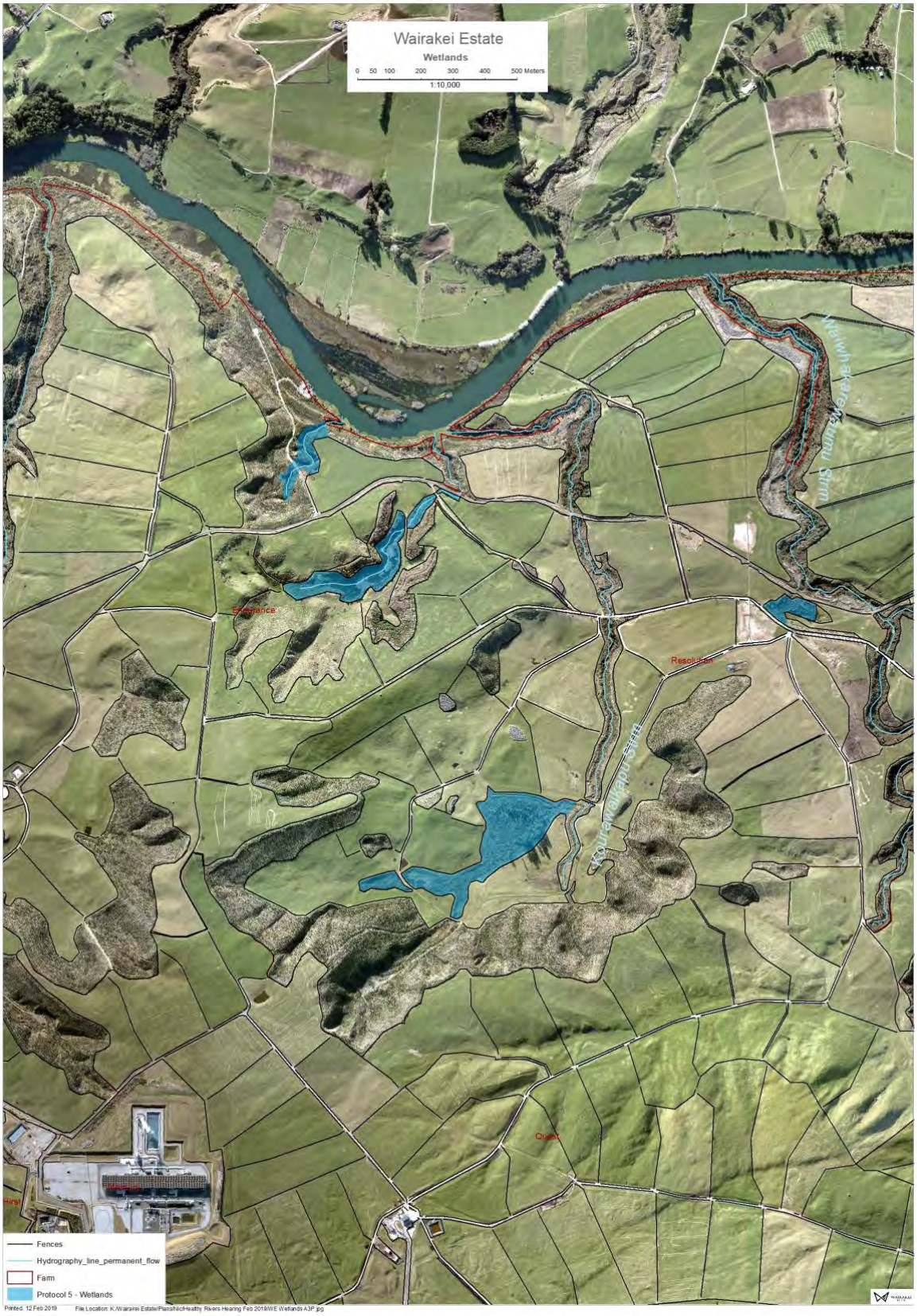

Figure 11 : Overlay of wetland areas under WPL's Protocol 5 (2018)

RESPONSES TO THE REPORTING OFFICERS SECTION 42A REPORT ON THE BLOCK ONE TOPICS

79 I agree with the observations from the s42A report that parts of the Waikato and Waipā Rivers are degraded, and that a revised management framework is needed to meet the NPS-FM and the Vision and Strategy.

80 I have read and considered the reporting Officers' recommendations in the section 42A report and make the following comments on the report from the perspective of WPL.

B1. Overall Direction for PC1 Analysis and Recommendations

81 I support the direction in submissions which allow for both steps to achieve the Freshwater Objectives NPS FM (**FWO**) sooner than the proposed timeframes and acknowledging the flexibility for sustainable farming in those catchments where the FWO's are already met.

82 In my view the plan provisions as proposed clearly prejudices those farmers who have acted in the interests of the environment and invested in sustainable systems.

B1.3.2 Sub-catchments vs Whole of Catchment View

83 WPL is a landowner who is investing in practical solutions to avoid, remedy and mitigate the effects of their particular land use. The scale of the Estate and the inter-relationships between farms and resource management means a sub-catchment-based approach is a practical reality.

84 At the Estate the annual farm planning is focused on the adaptive management cycle of environmental observations – mitigation actions – adjust behaviours – observe results.

85 The ability to control or act on the behaviours or decisions of others outside the immediate boundary of the Estate within a sub-catchment is negligible.

86 In common with other submitters WPL seeks opportunities to work with others to share mitigation practices and the science to achieve the Vision and Strategy within sub-catchment groups.

87 The guidance in PC1 for sub-catchment level mitigations is provided by the 75th percentile reduction for farms where the NRP is in the upper quartile. These farms are required to prepare a FEP under Rule 3.

88 The consequence for the Upper Waikato FMU is that 30% (and 50% in the Ruahuwai sub-catchment) of farms take no actions until 2026. This is because they are in Priority 3 (Table 3.11-2) catchments.

B2. Values and Uses

89 WPL has observed over the last 5 years increasing groundwater levels. These observations from well data collected across the Estate show a steady rise in the farm water table.

90 **Figure 12** below illustrates this trend for rising groundwater at the Broadlands Business units.

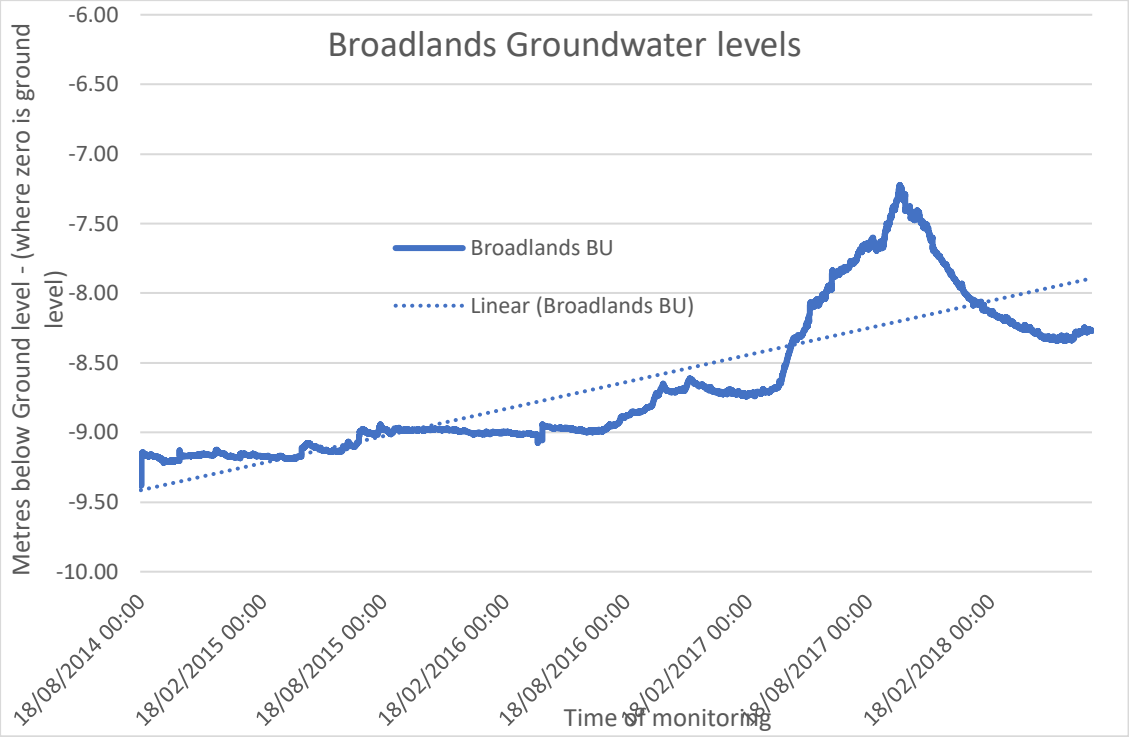

Figure 12: Groundwater monitoring at Estate

91 This has resulted in numerous springs, seeps and saturated paddock areas both across the Estate and in the Upper Waikato generally.

92 WPL's response to rising groundwater levels was to select an action appropriate to our internal mitigation protocols. This includes retiring as new wetland areas (see **Figure 7**) or replacing pasture depending on contour, slope, pasture conditions and management options.

93 I note that to date WPL has retired 94.3 Ha as wetlands.

B3.3.1 Economic Impact of PC1

94 WPL has undertaken a unique approach to land development and farming practices, seeking to provide a leading example of sustainable farming. This project has involved considerable expenditure on the science, farm systems, education and management of the resources across the Estate.

95 As such it is important that flexibility is retained in the plan for sub-catchments to proactively respond to the different FWO's and economic opportunities. This means that where the Vision and Strategy is achieved there is flexibility for parties to explore land use options.

96 WPL believes that landowners, enterprises and sub-catchment groups should be rewarded and incentivised to undertake mitigations and apply for consent as early as possible.

B4.3.3 Objective 3

97 The analysis and proposed wording for Objective 3 is incongruous with landowner farm practices and mitigations. WPL is a significant landowner in the Ruahuwai sub-catchment.

98 As described above many of the FWO in Table 3.11-1 are already achieved in the Ruahuwai sub-catchment, this means the focus is on "maintaining and improving" through farm practices and mitigations.

99 In practice this means maintaining diffuse discharges at pre-2016 levels by applying the mitigation protocols through an Adaptive Management cycle. WPL has focused their mitigation efforts on actions to influence water quality outcomes for bacteria, clarity and nutrients.

100 The Officers state at para 392 that:

> 'there is a need for all landowners to improve land use practices, regardless of whether their sub-catchment is meeting water quality limits, to ensure that the targets are achieved at a wider catchment scale.'

101 This assumption implies an ongoing requirement to spend money and take responsibility for the actions of other landowners and sub-catchments.

102 For example, the retirement of significant land areas for riparian protection won't occur if neighbouring properties don't agree to a similar approach. Similarly, the retirement of land in the Upper FMU where the FWO's are met is a cost to the local landowner and a benefit to down river landowners.

103 It is confusing as to why ongoing mitigation actions are required for a sub-catchment if the Vision and Strategy is already achieved. This situation creates significant uncertainty for resource managers and landowners throughout the catchment under PC1.

104 If provided for by PC1, the mitigation actions of a catchment collective are likely to focus on broad scale or sub-catchment scale mitigations, however these will still need to be matched to a FWO or a resource limit to attract investment from landowners.

105 I understand the Upper FMU ends at the Karapiro Tailrace, however the Table 3.11-1 provides for managing and meeting FWO's at a much finer scale. This is a practical application for resource management and matching the level of mitigation efforts with the difference between the desired state and the current state of water quality.

106 If there is an ongoing requirement to go beyond the desired states in the FWO Table 3.11-1, it implies landowners are subsidising others in the FMU.

B4.3.4 Objective 4

107 In the analysis and recommendations for Objective 4 the Officers have overlooked the importance of adaptive management for natural resource and catchment management.

108 WPL owns more than 80% of the land (property) within sub-catchment 74 (Pueto) in Table 3.11-2. As such the ability to form a sub-catchment approach to managing the Pueto sub-catchment is a practical option.

109 Adaptive Management explicitly provides landowner's with options to explore the effectiveness of mitigation choices where the environmental outcomes are uncertain. It also provides a mechanism for landowners to adjust the intensity of land use or shift the intensity of land use to reduce sub-catchment loads.

110 WPL has explored the opportunity to avoid degradation and improve water quality through investing in significant riparian areas to avoid surface water driven constituent runoff and adjusting farm planning to move intensive land use in groundwater recharge areas some distance from surface waterways.

111 The potential for this form of sub-catchment management i.e. farming intensification linked to nitrogen source risk, is explored in the evidence of Mr Williamson.

112 Further it could include a clause to focus on solutions to provide earlier progress towards the FWO's in a sub-catchment where iwi

and/or community interests are high such as a popular swimming reach. I personally swim in the Waikato River during summer (**Figure 13**) and support a focus on unique locations and habitats for flora and fauna.

Figure 13 :Waikato River at Wellington Street beach on Waitangi Day.

B5 FMU's, Sub-catchments and Tables 3.11-1 and 3.11-2

113 PC1 Table 3.11-2 contains 74 management units (sub-catchments) for landowners, resource managers and regulators to focus on relative to achieving the FWO's in Table 3.11-1. The results of cumulative efforts at a sub-catchment scale will deliver the outcome for the Vision and Strategy at an FMU scale.

114 The number and scale for each of the individual management units is critical for landowner participation, regulatory outcomes and efficient use of resources.

115 I agree with many other submitters that getting the scale (and number) of sub-catchments incorrect will constrain the ability to manage the land in a way that efficiently achieves the FWO's.

116 This occurs where a large sub-catchment like the "Ohakuri" sub-catchment 66 contains both geographically diverse landowners and biophysically different reaches within the sub-catchment.

117 The Waikato River forms the property boundary for the Estate in sub-catchment 66A for 12.56 km's. Along this reach the river is shallow (typically around 2-3 m deep), swift and follows a sinuous form of curves and turns. While below the Tutukau Bridge the river begins its impoundment behind the Ohakuri Dam and has significant tailrace effects from the dam, including reduced flow velocity, increased depth and increased weeds and the channel straightens out.

118 I believe that the spatial extents are largely a management tool and that data can be either collected during the operational period of the plan and/or predicted from modelling.

119 WPL has undertaken monitoring at Tutukau Bridge (66A site) previously and has discussed the possibility for extra monitoring with catchment partners: Mercury Energy, NIWA, Contact Energy and NTNK. The extra resources required to monitor at this location could be shared with members of a catchment group for the proposed sub-catchment.

B5.4.4.8. Other attributes and load limits

120 WPL has put considerable effort into exploring both methods and options to manage sub-catchments 66 (A and B), 72 and 73, within the finite resource limits proposed under PC1.

121 The NPS FM makes provision for Freshwater Objectives to define with attributes the values for a waterbody. The NPS FM also provides the options for limits and targets to efficiently manage resources and avoid over allocation which threatens achieving the FWO's.

122 For the Estate, resource limits will provide a discrete mechanism for determining the effectiveness of resource management decision making and avoiding degradation of the existing and future water quality.

123 I support Table 3.11-1 being amended to include a column for resource limits as loads for Total Nitrogen and Total Phosphorus. These two attributes will provide a "resource management budget" over a broad temporal range.

CONCLUSIONS

124 WPL is firmly committed to managing the Estate in a sustainable way. It welcomes PC1 as a timely response to the NPS-FM and the Vision and Strategy.

125 The Estate has invested considerable time and efforts to prepare a sustainable management framework for farming which will be resilient to changes in land use demands while meeting environmental outcomes. This approach has developed the five protocols highlighted in para 66 and produced the RDST discussed in **Appendix 1**.

126 To ensure the success of these efforts considerable attention is being given to PC1 to align with this overall philosophy.

127 I am concerned that without an appropriate definition for springs in the proposed plan it will be confusing for resource managers and farmers to make an informed land management decision for retiring and setting fences around springs if they are to be protected, or returned to pasture if they are ephemeral seeps.

128 I understand the Upper FMU ends at the Karapiro Tailrace, however the Table 3.11-1 provides for managing and meeting resource targets at a much finer scale. This is a practical application for resource management and matching the level of mitigation efforts with the difference between the desired state and the current state of water quality.

129 The proposed Objective 3 will be significantly improved if it includes both temporal (10 year) and spatial (sub-catchment) elements to provide guidance to landowners, resource managers and regulators alike.

130 I consider that benefits of greater participation in catchment management at the sub-catchment scale, will be achieved by providing for adaptive management solutions to be used at a sub-catchment level. This will have benefits both during the 10 year plan cycle and over the longer term of the Vision and Strategy.

131 I note from the evidence of Dr Neale that the FWO's in Table 3.11-1 have a poor match to the observed data. This is a concern for resource management on the Estate where the proposed FWO's in PC1 will define environmental performance and targets for mitigation actions.

132 WPL has been in farm operations since 2004 with most land conversions completed in 2016. The high risk or critical source areas have been either avoided, retired, or shifted to lower intensity land use.

133 The consequence of the PC1 provisions for the Estate and other landowners in the Upper FMU is that the attribute levels for the FWO's in Table 3.11-1 appear to include conservative numbers which bias the levels of mitigations required against the background levels of nutrients from the lake and geogenic sources.

134 In practice this means that a reduction in the TN and TP loads from the Upper FMU provide much of the "Vision and Strategy work" for the middle FMU's.

135 While the structure of the PC1 provisions considered in this Hearing Block are generally appropriate, the evidence from the WPL experts demonstrates that some significant changes are required – particularly in relation to key objectives and Table 3.11-1.

136 The analysis of the economic and science modelling in the Section 32 Report by the WPL experts also indicates that significant changes may also be required to the provisions that will be considered in the Block 2 Hearing Topics to ensure that the Objectives (particularly Objective 3) will actually be achieved.

Nicholas Conland

Wairakei Estate, Natural Resources

15 February 2019

APPENDIX 1 **DEVELOPMENT OF THE RUAHUWAI DECISION SUPPORT TOOL**

1 In 2015 I undertook a study for WPL to explore options for improving decision making for land development and mitigations across the Estate. This included the evaluation of a range of data collected from surface water, groundwater and farm systems.

2 The findings of this study concluded that longterm investment in farm assets, land use decisions and mitigations needed to be supported by a predictive tool or catchment calculator.

3 WPL agreed with the conclusion of the report and decided to commission the development of the decision support tool, that is now known as the Ruahuwai Decision Support Tool (RDST).

4 I engaged heavily with several parties in this project including:

4.1 Dr Roland Stenger (Lincoln Agritech Limited)

4.2 Dr Scott Wilson (Lincoln Agritech Limited)

4.3 Dr Andrew Holster (Independent)

4.4 Dr Andrew Herron (Jacobs)

4.5 Dr Phillip Jordan (HARC)

4.6 Dr Iris Vogeler (AgResearch)

4.7 Mr Williamson (WWLA)

4.8 Dr Ranvir Singh (Massey University)

4.9 Ms Alison Dewes (WaiOra/PAMU)

4.10 Waikato Regional Council

4.11 NIWA

5 The biophysical domain for the RDST was selected to account for influences up and down river from the Estate to allow external and internal influences to be understood and therefore inform reporting and decision making.

6 The result was the RDST architecture and modelling framework.

7 The name for the RDST was provided by Ngati Tahu-Ngati Whaoa (**NTNK**) Chairman Roger Pikia who recommended the historical

name for the geothermally influenced sub-catchment area of the upper Waikato.

8 Nga Rua-hu-wai o Tahu Matua - The boiling waters of Tahu Matua.

9 Geothermal activity is located in that catchment along the full stretch of the Waikato River and its Environs. The geothermal fields extend from Waiotapu - Rotokawa - Orakei Korako, and there are a number of pools and hot-spots along the river. The wai also depicts the freshwater as well as the geothermal.

10 The shortened version is Rua-hu-wai. It is normal for formal names to have a full version and then a shortened version which is: Rua-hu-wai.

11 The objective for the RDST was to allow the Estate to explore and understand the likely outcomes for land use options and to make informed mitigation decisions.

12 The RDST enables the landowners to optimise land value and utilisation through an adaptive management approach without compromising environmental outcomes and risking stranded assets.

13 The RDST was first used for an informed dialogue between tenants and the Estate and then later to assess the development options available under PC1.

14 The RDST development involved a vigorous review process both internally and externally.

15 The following external parties have provided significant feedback and review comments:

15.1 Dr Elliot/Dr Cooper – NIWA

15.2 Dr Snow – AgResearch

15.3 Dr Wilson/Dr Stenger – Lincoln AgriTech Limited

16 The RDST provides a unique insight into the biophysical functions between land use and the freshwater objectives sought in the proposed PC1.

17 The RDST will be described and discussed in the hearing Blocks 2 and 3.