Executive Summary

This analysis has been prepared as part of a land use consent application to increase the number of dairy cows on Woldwide One Limited (WOL) and Woldwide Two Limited (WTL), while increasing the number of cows wintered off paddock in animal housing and removing the in paddock winter grazing of both mature mixed age cows and young stock. The overall objectives of the changes are to remove on-paddock winter grazing from the property, which has a high environmental impact and can negatively impact cow condition, and improve farm profitability by grazing additional dairy cows on the land previously used for winter grazing and silage production.

The properties are located in the Heddon Bush area of Southland and are comprised of 502ha of land currently comprised of two dairy platforms and a support block. The farm is predominately flat and sits within the Central Plains (77%) and Oxidising (23%) Physiographic Zones.

The nutrient budgets have been developed using Overseer 6.3.1 and the "Overseer Best Practice Data Input Standards, March 2018". Four pre-expansion nutrient budgets (2013/14 – 2016/17) and a proposed post-expansion nutrient budget have been completed to inform the land use consent application to increase dairy cow numbers.

Modelled results from the 5 scenarios are presented below:

	13/14*	14/15	15/16	16/17	Average
Total N Loss (kg)	19055	23016	19112	20723	20477
N Loss/ha (kg)	40 (15)	46	38	41	41
Total P Loss (kg)	345	374	362	357	360
P Loss/ha (kg)	0.7 (0.2)	0.7	0.7	0.7	0.7
Pasture Grown Kg/DM/ha/yr (Dairy Platforms)	15,003	15,483	15,089	15,909	15,371

*See Section 7.1 & 10.1 for the makeup of these results

	Proposed Dairy Unit
Total N Loss (kg)	20262
N Loss/ha (kg)	40
Total P Loss (kg)	357
P loss/ha (kg)	0.7
Pasture Grown Kg/DM/ha/yr	15,544

Using Overseer, combined nutrient budgets have been developed for WOL, WTL and the Support Block, comparing the nutrient loss of the pre-expansion farm systems against the proposed farm system. Overseer has predicted that the nitrogen and phosphorus loss will decrease

Key drivers for the reduction in nitrogen loss are:

- Removal of winter and summer crop
- Removal of cows wintered outside on crop or grass
- Expansion of the size and use of the wintering barn facilities
- More efficient use of nitrogen fertiliser

Key drivers for the reduction in phosphorus loss are:

- Decrease in winter crop area
- Maintaining Olsen P at a target level of 30
- Expansion in the size and use of the wintering barn facilities (less wintering)

A supplementary section has been added to this report outlining the current and proposed nutrient budgets for the Horner Block (HB). The HB is a 160ha piece of land to the south west of WOL that is used for producing silage (cut and carry). HB receives wintering barn slurry from WOL, WTL and Woldwide 3 Limited and is deemed form part of the same landholding as WOL and WTL under the pSWLP.

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1.0 Farm Goals (Abe De Wolde)

Sustainability (environmental, economic and social) has been at the core of all we do at Woldwide Farming group. To us these principles flow out of a desire to be good stewards and they are all interlinked as shown in the picture below. (Please feel free to visit our website www.woldwide.nz to read the full story)

We were the first to build free stall barns in Southland to reduce outside crop wintering and we were the first (and only) ones to feed fresh grass to our cows in winter to reduce silage making losses and runoff. In 2013 we were supreme winners of the 2013 Southland Ballance Farm Environment Awards.

Ever since we came to New Zealand we have been trying to improve the sustainability of our farms with a long decision-making horizon and an innovative mind-set.

The proposed changes to the farms will enable us to take the next step on this journey; this plan will enable us to reduce fodder beet wintering further and we will be able to use our support land for fresh grass harvesting in winter rather than having to winter graze 1000 head of young stock on our lighter, high N loss soils. The utilisation of cow housing enables nutrients to be contained over winter and used to grow more grass and produce more food when the soil temperature rises and grass starts to grow again in the spring.

2.0 Proposal Overview

This analysis has been prepared as part of a proposal to increase the number of dairy cows on Woldwide One Limited (WOL) and Woldwide Two Limited (WTL), while increasing the number of cows wintered off paddock in animal housing and removing the in paddock winter grazing of both mature mixed age cows and young stock. The overall objectives of the changes are to remove on-paddock winter grazing from the property, which has a high environmental impact and can negatively impact cow condition, and improve farm profitability by grazing additional dairy cows on the land previously used for winter grazing and silage production.

The current effective land area of WOL and WTL is 388ha with total consented cow numbers of 1340. It is proposed to increase the land area of WOL and WTL to 502ha (479ha effective) by utilising the areas currently known as SH96 and Marcel Block to the north of WTL. In order to effectively utilise this land as part of the dairy platform it is proposed to increase total cow numbers by 160 to 1500.

At an operational level the property is currently split into two separate dairy farms and a support block (SH96 & Marcel). The dairy farms have individual discharge permits associated with them and the SH96 and Marcel Blocks have land use consent for dairying farming of cows that was granted in October 2017. Single land use, discharge and waters consent are being applied for to cover the overall expansion of both properties. This provides operational flexibility for the applicant and also allows a holistic assessment of environmental effects and proposed mitigations to be carried out.

Modelling has been carried out using Overseer Version 6.3.1 based on the property as a whole, however at a block level the pre-expansion budgets are broken down into the three farming enterprises to reflect the different fertiliser, feed and cropping regimes. The proposed budget does not individualise the farming enterprises as the entire property will be run as a dairy platform with WOL and WTL having the same size wintering facilities and similar land areas. The pre-expansion average losses have been derived by modelling the actual lawful use of the land (not consented maximums) from August 2013 through to July 2017 and comparing those losses to the proposed long term use of the land going forward.

Evidence of milk production has been obtained from Fonterra Co-Operative Group Ltd; fertiliser information from Ravensdown and Ballance (unless indicated otherwise); and cow numbers, concentrates fed and silage eaten and made on the dairy platforms from Agri-Business Consultants Ltd. Information has also been sort and provided directly from the property owner, Mr De Wolde.

Modelling pertaining to the Horner Block (HB), which is not directly related to WOL or WTL and is not proposed to be converted to dairy use has been included in a supplementary section to this report. Under the pSWLP, Environment Southland originally advised the Horner Block formed part of the landholding connected to WOL and WTL and therefore any farming activities on that land would need to be authorised by a land use consent. A legal opinion provided to the Council in October 2018 reversed this decision, however the HB supplementary section is still included for reference.

3.0 Property Overview

The 502ha of land is located across three soil types (farm scale soil mapping provided by Scandrett Rural Ltd – Appendix 1) comprised of Drummond (~348ha), Braxton (~105ha) and Glenelg (~49ha) soils. The farm is predominately flat and sits within the Central Plains (77%) and Oxidising (23%) Physiographic Zones (PZ).

The predominant risk to water quality within the PZ located on the property are contaminant losses (predominately nitrogen) to underlying groundwater. Within the Oxidising Zone this occurs via the movement of nutrient laden soil water during the late autumn and winter drainage period, into underlying aquifers. Within the Central Plains PZ the clay rich soils have shrink and swell properties, thus in dry conditions they are prone to cracking, which allows contaminants to bypass the soil

matrix and move into underlying aquifers or into subsurface drains and subsequently into surface water. This can occur if dairy effluent is not well managed or during the first rainfall events following dry conditions. During wetter conditions Braxton soils are also prone to losses to surface water via artificial drainage due to their poor drainage characteristics (swelling) when wet.

Key infrastructure on the property, which has been included as a mitigation for nutrient loss within the Overseer modelling are the farms two effluent storage ponds, which allow for the deferred irrigation of farm dairy and wintering barn effluent; the use of low depth irrigation and the two 625 stall wintering barns (currently 900 stalls available across both WOL and WTL).

4.0 Key Applicable Regulations

The Decisions Version of the Proposed Southland Water and Land Plan (pSWLP) was notified by Environment Southland on the 4th April 2018.

Policy direction for the expansion of an existing dairy farm is provided for under Policy 5 (Central Plains), Policy 10 (Oxidising) and Policy 16 (Farming activities that affect water quality), of the pSWLP.

Policies 5 and 10 both require decision makers to generally not grant resource consents for additional dairy farming of cows where contaminant losses will increase as a result of the proposed activity. These policies also require the implementation of good management practices to manage the adverse effects on water quality and for these to be considered when assessing resource consent applications or developing farm environment plans.

Policy 16 in its current form requires the following:

- In the interim period, prior to the development of freshwater objectives under the Fresh Water Management Unit Process, applications to further intensify existing dairy farming of cows will generally not be granted where:
    - (i) The adverse effects, including cumulatively, on ground and surface water cannot be avoided or mitigated; or
    - (ii) Existing water quality is already degraded to the point of being over allocated; or
    - (iii) Water quality does not met the Appendix E Water Quality Standards or bed sediments do not meet the Appendix C ANZECC sediment guidelines.

Rule 20(d)(ii) of the pSWLP seek to give effect to these policies by requiring an assessment that shows that the annual amount of nitrogen, phosphorus, sediment and microbiological contaminants discharged from the landholding will be no greater than that which was lawfully discharged annually on average for the five years prior to the application being made. If this can be shown then the proposed expanded dairy farm is a restricted discretionary activity.

Rule 20(e) applies if the criteria above cannot be met, resulting in the proposed expanded dairy farm being a discretionary activity. The consent application will need to show how Policies 5, 10 and 16 will be given effect to.

Pre-expansion Overseer modelling has only been able to be carried out for 4 of the years prior to this application being made as data is not yet available for 2017/18 and pre 2013/14 a significant area of the land subject to the proposed expansion was not under the control of Woldwide farms. On this basis the land use consent for the expanded dairy farm is a discretionary activity under Rule 20(e).

Despite being a discretionary activity the Overseer modelling presented in this report shows that total modelled nitrogen and phosphorus losses from the increase in cow numbers are fully mitigated and met the aims of Policy 16. There is no modelled increase in total nitrogen or phosphorus losses compared to the pre-expansion 4 year average losses.

5.0 Overseer Version and Protocols

The nutrient budgets have been developed using Overseer 6.3.1 and the "Overseer Best Practice Data Input Standards, March 2018". No deviations have been made from the protocol.

Overseer Assumptions

- Long term annual average model - the model uses annual average input and produces annual average outputs
- Near equilibrium conditions -model assumes that that the farm is at a state where there is minimal change each year
- Actual and reasonable inputs - it is assumed that input data is reasonable and a reflection of the actual farm system. If any parameter changes, it is assumed that all other parameters affected will also be changed.
- Good management practices are followed - Overseer assumes the property is managed is line with accepted industry good management practice.

6.0 Overseer Limitations

Key limitations of the Overseer model are:

- Overseer does not predict transformations, attenuation or dilution of nutrients between the root zone or farm boundary and the eventual receiving water body.
- Overseer uses long term average climate data and therefore doesn't account for climatic extremes.
- Overseer does not calculate the impacts of a conversion process, rather it predicts the long-term annual average nutrient budgets for the changed land use.
- Overseer is not spatially explicit beyond the level of defined blocks

- Not all management practices or activities that have an impact on nutrient losses are captured in the Overseer model

Further information on Overseer can be found in the following reports:

Technical Description of OVERSEER for Regional Councils, September 2015

Review of the phosphorus loss submodel in OVERSEER®, September 2016

7.0 Pre-Expansion Land Use

Four pre-expansion nutrient budgets have been produced covering the period from August 2013 to July 2017. An overview of each of the pre-expansion files is provided below with full details of the inputs used contained within Section 9.

All files have the following common input factors:

a) Dairy Platform Soil Test Results – Soil test result from 2016 have been used across all pre-expansion files. This represents a mid-point for the four files. Due to the annual fluctuations in soil test results and the fact WOL and WTL generally have higher Olsen P levels (reflected in the 2016 tests) this was deemed to be appropriate and avoided the complexity of multiple blocks having to be created to reflect different soil test results from different paddocks each year.

b) Support Block/Crop Soil Tests –Only sporadic soil test data is available for the support block so Overseer default values have been used. These default values provided a good representation of the fertility goals that were trying to be achieved on the support block.

c) Wintering Barn Use – The wintering barn is used from May – August in each of the pre-expansion files. In May the hours the barn is used for has been limited to 12 to reflect cows are generally only in the barn for half of May. In August, 1 hour of outside grazing has been entered to reflect some cows may periodically go outside if conditions are suitable. In June and July 900 cows are housed inside with numbers gradually falling over August as cows start springing.

d) Calving Date – A mean calving date of the 20th August and a drying off date of 15th June has been used for the pre-expansion files. This reflects the typical calving and drying off pattern over this time period.

e) Tile Drains – On Drummond and Glenelg soils there are minimal tile drains and thus no tile drainage has been included in the model for these soil types. For the Braxton soils an estimate of 30% tile drainage has been used.

f) Wintering Barn Slurry –52m^3 of slurry per hectare has been used for the pre-expansion modelling of the silage areas that receive barn slurry. Barn slurry has been entered as exported in the wintering pad tab and is re-imported as a fertiliser at a block level. It was applied in three

applications (17.3m^3/ha/application) and had the following nutrient classification, as outlined in the 2011 AgResearch report: Characterising dairy manures and slurries – Case Study 15.

Nitrogen = 3.2kg
Phosphorus = 0.8kg
Potassium = 4.4kg
Sulphur = 0.4kg
(Per 1000L of slurry)

g) Support Block = SH96 & Marcel Blocks

7.1 <u>August 2013 – June 2014</u>

In the 2013/14 season the farming enterprises occupied a smaller land area than what is under the control of Woldwide Group from 2014/15 onwards. The total farm size was 464ha (441ha effective) with WOL occupying 155ha and WTL 202ha. Peak cow numbers were 496 on WOL and 632 on WTL. On the support block to the north of WTL, Barley was sown with a tetraploid annual ryegrass on 26ha of land. This was harvested into cereal silage in late January with an additional cut of grass silage taken in April. Approximately 750 R1's grazed this area (along with the grass silage blocks)

over winter. In addition to the Barley, 14ha of swedes were grown and used to winter 420 mixed age cows. The remaining 43.5ha of the support block was used for silage production (~15T/DM/ha), spreading of wintering barn/dairy effluent and the winter grazing of R1's on grass.

Milk production for the season was 250281kg/MS from WOL and 341434kg/MS from WTL, or an average of 524kg/MS/cow across the two properties. In order to achieve this level of production cows were fed 644kg silage per cow (not including in the wintering barn) as well as molasses, barley and palm kernel in the dairy shed (see Section 9.3 for quantities). The wintering barns were used from May through to August (900 cows) with an additional 1000T of silage fed in these facilities over this time period.

Fertiliser during the 13/14 season was purchased from Ravensdown and fertiliser inputs into Overseer have been based on fertiliser purchase records and spreading/fertiliser information provided directly from Ravensdown for the 30ha of the support block that forms part of WTL from 2014/15 onwards. Fertiliser for the pasture component of the summer turnip crop is based on WTL Non-Effluent (Drum_4a.1) block, which is the largest block the turnips rotate through. This methodology is also used for summer turnip crops in modelling of future years. In addition to the Ravensdown fertiliser inputs for the support block "cut and carry silage/young stock winter grazing" this area also received three applications of wintering barn effluent (17m^3/ha/application).

In order to account for the additional 38ha that is not part of the Woldwide Group in 2013/14 but is included from 2014/15 onwards and is part of the area subject to the land use consent for expanded dairying, a conservative nitrogen loss figure of 15kg/ha/yr has been used for this area of land (represents an average nitrogen loss figure from a sheep farm on lighter soils). For phosphorus, 0.2kg/ha/yr has been used as a conservative loss to water figure (including phosphorus losses from other sources). These are accounted for separately in the table below (Est 38ha).

	13/14 Land Area	Est 38ha	Total	13/14 per ha	Est 38ha per ha
Nitrogen Loss (kg/N)	18485	570	19055	40	15
Phosphorus Loss (Kg/P)	337	8	345	0.7	0.2
Pasture Production (Dairy Platform – kg/DM)				15003	

7.2 August 2014 – June 2015

In the 2014/15 season an additional 38ha of support land was purchased to bring the overall size of the properties to 502ha. WTL expanded to take over 30ha of the support block, which resulted in WTL increasing in size from 202ha to 232ha. In addition to this, peak cow numbers on WTL increased from 632 in 2013/14 to 727. No changes were made to the area covered by WOL nor did any significant change in cow numbers occur (495 peak milked). On the support block to the north of WTL, Kale was grown on 30ha of land and facilitated the wintering of approximately 640 mixed age cows over June and July. In addition to the Kale, 10ha of fodder beet was grown and used to winter 430 mixed age cows. The remaining 51ha of the support block was used for silage production (~15T/DM/ha), spreading of wintering barn/dairy effluent and the winter grazing of approximately 875 R1's on grass.

Milk production for the season was 246072kg/MS from WOL and 372124kg/MS from WTL, or an average of 506kg/MS/cow across the two properties. In order to achieve this level of production cows were fed 487kg silage per cow (not including in the wintering barn) as well as molasses, barley and palm kernel in the dairy shed (see Section 9.3 for quantities). The wintering barns were used from May through to August (900 cows) with an additional 1000T of silage fed in these facilities over this time period.

Fertiliser during the 14/15 season was sourced from Balance Agri Nutrients and was applied according to the fertiliser plan produced by Latoya Grant (Balance Fertiliser Rep). Fertiliser records for the Kale crop were not available and thus standard recommendations have been used (based on information published by Ravensdown). Fertiliser inputs for the support block "cut and carry silage/young stock winter grazing" were not available and have been based on the 15/16 fertiliser records for the same land use. This area also received three applications of wintering barn effluent ($17m^3$/ha/application). Fodder beet fertiliser recommendations are based on the Balance fertiliser recommendations for fodder beet on Woldwide Three.

	Total	**Per/ha**
Nitrogen Loss (kg/N)	23016	46
Phosphorus Loss (Kg/P)	374	0.7
Pasture Production (Dairy Platform – kg/DM)		15483

7.3 August 2015 – June 2016

In the 2015/16 season no changes were made to the overall size of the properties (502ha) or the land area occupied by WTL or WOL. Peak cow numbers on WOL increased by ten cows to 505 but numbers on WTL decreased by 19 to 708 cows compared to the in 2014/15 season. On the support block to the north of WTL, fodder beet was grown on 22ha of land and facilitated the wintering of approximately 1100 mixed age cows over June and July. The remaining 69ha of the support block was used for silage production (~15T/DM/ha), spreading of wintering barn/dairy effluent and the winter grazing of approximately 745 R1's on grass.

Milk production for the season was 265277kg/MS from WOL and 361346kg/MS from WTL, or an average of 517kg/MS/cow across the two properties. In order to achieve this level of production cows were fed 510kg silage per cow (not including in the wintering barn) as well as molasses, barley and palm kernel in the dairy shed (see Section 9.3 for quantities). The wintering barns were used from May through to August (900 cows) with an additional 950T of silage fed in these facilities over this time period.

Fertiliser during the 15/16 season was sourced from Ravensdown and fertiliser inputs into Overseer have been based on fertiliser purchase records with reference to the fertiliser plan for the 15/16 season. Fodder beet is spread over two separate soil types and fertiliser use is based on the records for Marcel paddocks 2-5 where the majority of the crop was grown (SH96 paddock 6 where the rest of the fodder beet was grown had an almost identical fertiliser record). Fertiliser inputs for the

support block "cut and carry silage/young stock winter grazing" have been based on the 15/16 fertiliser records for this area from Ravensdown and also received three applications of wintering barn effluent (17m^3/ha/application).

	Total	Per/ha
Nitrogen Loss (kg/N)	19112	38
Phosphorus Loss (Kg/P)	362	0.7
Pasture Production (Dairy Platform – kg/DM)		15089

7.4 August 2016 – June 2017

In the 2016/17 season no changes were made to the overall size of the properties (502ha) or the land area occupied by WTL or WOL. Peak cow numbers on WOL decreased by seven cows to 497 and numbers on WTL increased by one to 709 cows compared to the in 2015/16 season. Summer Turnips stopped being grown on the property for the first time. On the support block to the north of WTL, fodder beet was grown on 22.5ha of land and facilitated the wintering of approximately 1130 mixed age cows over June and July. The remaining 68.5ha of the support block was used for silage production (~17T/DM/ha) and the spreading of wintering barn/dairy effluent. No winter grazing of young stock occurred off the silage blocks as fresh grass was cut in winter and feed directly in the wintering barn (entered as additional silage within Overseer).

Milk production for the season was 287774kg/MS from WOL and 387618kg/MS from WTL, or an average of 560kg/MS/cow across the two properties. In order to achieve this level of production cows were fed 710kg silage per cow (not including in the wintering barn) as well as molasses, barley and palm kernel in the dairy shed (see Section 9.3 for quantities). The wintering barns were used from May through to August (900 cows) with an additional 1000T of silage fed in these facilities over this time period.

Fertiliser during the 16/17 season was sourced from Ravensdown and fertiliser inputs into Overseer have been based on fertiliser purchase records with reference to the fertiliser plan for the 16/17 season. Fodder beet is spread over two separate soil types and fertiliser use is based on the records for Marcel paddocks 2-5 where the majority of the crop was grown (SH96 paddock 6 where the rest of the fodder beet was grown had an almost identical fertiliser record). Fertiliser inputs for the support block "cut and carry silage blocks" have been based on the 16/17 fertiliser records for this area from Ravensdown and also received three applications of wintering barn effluent ($17m^3$/ha/application).

It should be noted that the SH96 "cut and carry silage block" paddocks 2 and 3 (10ha) didn't receive the last two fertiliser applications unlike the rest of the block. This was deemed minor in the overall modelling scenario and didn't justify the complexity of adding another block to the Overseer file.

	Total	**Per/ha**
Nitrogen Loss (kg/N)	20723	41
Phosphorus Loss (Kg/P)	357	0.7
Pasture Production (Dairy Platform – kg/DM)		15909

8.0 Proposed Land Use

In the proposed scenario there are no changes to the overall size of the property (502ha) but the dairy platform (incorporating WOL and WTL) is expanded to cover the entire property (support land removed). Peak cow numbers are increased to 1500 cows (currently consented for 1340) to make use of the additional land being brought into the dairy platforms. A key change/mitigation in the proposed scenario is the removal of all in paddock winter grazing and the expansion of the wintering barn facilities to accommodate 1250 cows (currently 900).

Milk production is based on an average of 560kg/MS/cow or 840000kg/MS/yr. In order to achieve this level of production cows are fed 700kg silage per cow (not including in the wintering barn) as well as molasses, barley and palm kernel in the dairy shed (see Section 9.3 for quantities). The use of the wintering barns will be extended and used to a varying degree from May through to September. During this period, 1400T of silage is proposed be fed in these facilities.

Fertiliser usage is based on the 16/17 season fertiliser records sourced from Ravensdown with some modifications to account for a single application of barn effluent on 185ha of Drummond soil and additional phosphorus fertiliser to ensure Olsen P levels can be maintained at 30. In addition to this, a slight reduction in nitrogen fertiliser usage (when compared to average usage in the pre expansion nutrient budgets) has been made to better align with pasture production being achieved and the expanded use of farm dairy effluent.

Soil test results have been based on maintaining an Olsen P levels of 30, which is the long term goal objective and reflects a level where near maximum pasture production is achieved.

Tile drainage on Drummond and Glenelg soils is minimal and thus no tile drainage has been included in the model for these soil types. For the Braxton soils an estimate of 30% tile drainage has been used.

	Total	**Per/ha**
Nitrogen Loss (kg/N)	20262	40
Phosphorus Loss (Kg/P)	357	0.7
Pasture Production (Dairy Platform – kg/DM)		15544

9.0 Modelling Inputs

To construct the nutrient budgets the following input data has been used;

9.1 *Blocks*

The farm has been split into the following pastoral (effluent and non-effluent), fodder crops (rotating), crop blocks and cut and carry blocks:

Block Name	Soil Type	13/14	14/15	15/16	16/17	Proposed
WOL Effluent	Drum_2a.1	30	30	30	30	
WOL Non Effluent	Brax_4a.1	47.5	47.5	47.5	47.5	
WOL Non Effluent	Drum_2a.1	78.4	78.4	78.4	78.4	
WTL Effluent	Drum_2a.1	45	45	45	45	
WTL Non Effluent	Brax_4a.1	53	53	53	53	
WTL Non Effluent	Drum_2a.1	104	134	134	134	
Effluent Block	Drum_2a.1					120
Non-Effluent	Brax_4a.1					100.5
Non-Effluent	Drum_2a.1					25.4
Non-Effluent	Glene_4a.1					48
Barn Slurry	Drum_2a.1					185
Swedes	Drum_2a.1	2				
Swedes	Glene_4a.1	12				
Barley + Silage + WGYS	Drum_2a.1	19				
Barley + Silage + WGYS	Glene_4a.1	7				
Silage + WGYS + Barn Eff	Drum_2a.1	31.5	21.5			
Silage + WGYS + Barn Eff	Glene_4a.1	12	29.2			
SH 96 Silage+WGYS+Barn Eff	Drum_2a.1			28		
SH 96 Silage+WGYS+Barn Eff	Glene_4a.1			12		
Marcel Silage+WGYS+Barn Eff	Drum_2a.1			11		
Marcel Silage+WGYS+Barn Eff	Glene_4a.1			18		
SH96 Cut & Carry	Drum_2a.1				28	
SH96 Cut & Carry	Glene_4a.1				12	
Marcel Cut & Carry	Drum_2a.1				11	
Marcel Cut & Carry	Glene_4a.1				17.5	
Fodder Beet	Drum_2a.1		10	4	4	
Fodder Beet	Glene_4a.1			18	18.5	
Kale	Drum_2a.1		11.4			
Kale	Glene_4a.1		18.5			
Effective Farm Area		**441.4**	**478.5**	**478.9**	**478.9**	**478.9**
Non productive		22.6	23.5	23.1	23.1	23.1
Total Farm Area		**464**	**502**	**502**	**502**	**502**
Summer Turnips	Rotating	15.8	14	14.5		

- Soil areas were obtained from soils mapping provided by Dairy Green Ltd (refer to Appendix 1).
- Soil settings were obtained from SMap for all soil types.

9.2 *Climate Data*

- Location setting = Southland
- Climate station tool used for block climate data
  - 1002mm of rainfall
  - 9.8°C mean annual temperature
  - 731-1450mm daily rainfall pattern. Low variation.
  - 711mm mean annual PET

9.3 *Farm System Inputs*

Description	**13/14**	**14/15**	**15/16**	**16/17**	**Proposed**
Milk Solids Production	591,715 kg/MS	618,196 kg/MS	626,623 kg/MS	675,392 kg/MS	840,000 kg/MS
Median Calving Date	20th August	20th August	20th August	20th August	20th August
Drying Off Date	15th June	15th June	15th June	15th June	15th June
Cows on Farm (Generated from Peak Cow Numbers)	Friesian July – 900 Aug – 1189 Sep – 1128 Oct – 1128 Nov – 1128 Dec – 1128 Jan – 1060 Feb – 1060 Mar – 1060 Apr – 981 May – 913 Jun – 900 11 Bulls Dec-Feb	Friesian July – 900 Aug – 1285 Sep – 1222 Oct – 1222 Nov – 1222 Dec – 1222 Jan – 1149 Feb – 1149 Mar – 1149 Apr – 1063 May – 990 Jun – 900 12 Bulls Dec-Feb	Friesian July – 900 Aug – 1281 Sep – 1213 Oct – 1213 Nov – 1213 Dec – 1213 Jan – 1140 Feb – 1140 Mar – 1140 Apr – 1055 May – 982 Jun – 900 12 Bulls Dec-Feb	Friesian July – 900 Aug – 1249 Sep – 1206 Oct – 1206 Nov – 1206 Dec – 1206 Jan – 1174 Feb – 1174 Mar – 1174 Apr – 1049 May – 977 Jun – 900 12 Bulls Dec-Feb	Friesian July – 1250 Aug – 1500 Sep – 1500 Oct – 1500 Nov – 1500 Dec – 1500 Jan – 1410 Feb – 1410 Mar – 1410 Apr – 1305 May – 1215 Jun – 1250 15 Bulls Dec-Feb
Milking Shed Feeding	August to May	August to May	August to May	August to May	August to May
Dairy Replacements	Calves Aug – 88 Sep – 248 Oct – 248 R1's Jun – 750 Jul - 750	Calves Aug – 95 Sep – 269 Oct – 269 R1's Jun – 551 Jul - 551	Calves Aug – 95 Sep – 267 Oct – 267 R1's Jun – 745 Jul - 745	Calves Aug – 98 Sep – 275 Oct – 275 R1's Jun – 0 Jul - 0	Calves Aug – 220 Sep – 417 Oct – 417 R1's Jun – 0 Jul - 0
Dairy Cow Wintering	Mixed Age Jun – 420	Mixed Age Jun – 1070	Mixed Age Jun – 1100	Mixed Age Jun – 1130	Mixed Age Jun – 0

Description	13/14	14/15	15/16	16/17	Proposed
	Jul - 420	Jul - 1070	Jul - 1100	Jul - 1130	Jul – 0
Wintering Barn	Mth/Cows/Hr May - 900 - 12 Jun – 900 - 24 Jul – 900 – 24 Aug –535 – 23 Effluent – All Exported *(imported as a fertiliser at block level)*	Mth/Cows/Hr May - 900 - 12 Jun – 900 - 24 Jul – 900 – 24 Aug –578 – 23 Effluent – All Exported *(imported as a fertiliser at block level)*	Mth/Cows/Hr May - 900 - 12 Jun – 900 - 24 Jul – 900 – 24 Aug –576 – 23 Effluent – All Exported *(imported as a fertiliser at block level)*	Mth/Cows/Hr May - 900 - 12 Jun – 900 - 24 Jul – 900 – 24 Aug –562 – 23 Effluent – All Exported *(imported as a fertiliser at block level)*	Mth/Cows/Hr May- 1250-14 Jun -1250 - 24 Jul -1250 – 24 Aug -750 – 23 Sep -150 - 24 Effluent – All Exported *(imported as a fertiliser at block level)*
Crop Area & Inputs	14ha Swedes 13T/DM/ha Conventional Cultivation November 270kg/ha Cropmaster 15 at sowing 160kg/ha Urea – Jan Grazed 24 hrs day Jun & Jul by mixed age cows. 15.8ha Sum Turnips 9T/DM/ha Conventional Cultivation November 240kg/ha Cropmaster DAP at sowing 100kg/ha Urea – Dec 100kg/ha Urea – Apr for pasture renewal	29.9ha Kale 12T/DM/ha Conventional Cultivation November 450kg/ha Superten & 70kg/ha Urea at sowing. 150kg/ha Urea – Dec 100kg/ha Urea – Feb 250kg/ha Pot Super – Oct for Pasture Renewal. Grazed 24 hrs day Jun & Jul by mixed age cows. 10ha Fodder Beet 25T/DM/ha Conventional Cultivation October 400kg /ha Cropzeal 16N at sowing 200kg/ha	22ha Fodder Beet 25T/DM/ha Conventional Cultivation October 160kg/ha Ammo36, 280 kg/ha Super, 120kg/ha Cropmaster15 & 150kg/ha Pot Chloride at sowing. 250kg/ha Pot Super – Sep for Pasture Renewal. Grazed 24hrs day by mixed age cows. 14.5ha Sum Turnips 8T/DM/ha 240kg/ha DAP at sowing 100kg/ha Urea – Nov 250kg/ha Pot Super – Oct for Pasture Renewal.	22.5ha Fodder Beet 25T/DM/ha Conventional Cultivation October 425kg/ha Cropmaster 15, 110kg/ha Pot Chloride at sowing. 160kg/ha Urea & 75kg/ha Pot Chloride – Dec 250kg/ha Pot Super – Sep for Pasture Renewal. Grazed 24hrs day by mixed age cows.	None

Description	13/14	14/15	15/16	16/17	Proposed
	Grazed 2hrs day Feb & Mar by dairy cows	Sustain 20K – Dec 100kg/ha Sustain 20K – Feb 250kg/ha Pot Super – Sep for Pasture Renewal. Grazed 24hrs day Jun & Jul by mixed age cows <u>14ha Sum Turnips</u> Conventional Cultivation October 250kg/ha Cropzeal Boron Boost at sowing 150kg/ha Urea – Nov 250kg/ha Pot Super – Mar for Pasture Renewal. Grazed 2hrs day Jan & Feb by dairy cows.	Grazed 2hrs day Jan & Feb by dairy cows		
Silage/Barley Blocks & Inputs	<u>Barley+Silage + WGYS – 26ha</u> Barley under sown with annual ryegrass in October 251kg/N/ha, 101kg/P/ha & 139kg/K/ha	<u>Silage+WGYS+ Barn Eff – 50.7ha</u> 406kg/N/ha, 34kg/P/ha & 125kg/K/ha applied as fertiliser 166kg/N/ha, 42kg/P/ha & 228kg/K/ha applied as	<u>SH96 Silage + WGYS+ Barn Eff – 40ha</u> 406kg/N/ha, 34kg/P/ha & 125kg/K/ha applied as fertiliser 166kg/N/ha, 42kg/P/ha & 228kg/K/ha applied as	<u>SH96 Silage + WGYS+ Barn Eff – 40ha</u> 258kg/N/ha, 53kg/P/ha & 64kg/K/ha applied as fertiliser 166kg/N/ha, 42kg/P/ha & 228kg/K/ha applied as	<u>None</u>

Description	13/14	14/15	15/16	16/17	Proposed
	applied as fertiliser 8T/ha of Cereal Silage & 5T/ha grass silage. All grass winter grazing Jun & Jul with R1's <u>Silage+WGYS+ Barn Eff - 43.5ha</u> 304kg/N/ha, 59kg/P/ha & 228kg/K/ha applied as fertiliser. 166kg/N/ha, 42kg/P/ha and 228kg/K/ha applied as wintering barn effluent. 15T/ha grass silage cut. All grass winter grazing Jun & Jul with R1's	wintering barn effluent. 15T/ha grass silage cut. All grass winter grazing Jun & Jul with R1's	wintering barn effluent. 15T/ha grass silage cut All grass winter grazing with Jun & Jul R1's <u>Marcel Silage+ WGYS + Barn Eff – 29ha</u> 267kg/N/ha, 70kg/P/ha & 142kg/K/ha applied as fertiliser 166kg/N/ha, 42kg/P/ha & 228kg/K/ha applied as wintering barn effluent. 15T/ha grass silage cut All grass winter grazing Jun & Jul with R1's	wintering barn effluent. 17T/ha grass silage cut <u>Marcel Silage+ Barn Eff – 28.5ha</u> 440kg/N/ha, 89kg/P/ha & 167kg/K/ha applied as fertiliser 166kg/N/ha, 43kg/P/ha & 235kg/K/ha applied as wintering barn effluent. 17T/ha grass silage cut	
Supplements	<u>Utilised (DM)</u> 830T Barley Grain, 233T Molasses & 425T PKE fed in dairy shed 726T Silage (fed on dairy platform paddocks)	<u>Utilised (DM)</u> 845T Barley Grain, 148T Molasses & 524T PKE fed in dairy shed 595T Silage (fed on dairy platform paddocks)	<u>Utilised (DM)</u> 1092T Barley Grain, 92T Molasses & 600T PKE fed in dairy shed 619T Silage (fed on dairy platform paddocks)	<u>Utilised (DM)</u> 953T Barley Grain, 129T Molasses & 580T PKE fed in dairy shed 818T Silage (fed on dairy platform paddocks)	<u>Utilised (DM)</u> 1120T Barley Grain, 208T Molasses & 765T PKE fed in dairy shed 1000T Silage (fed on dairy platform paddocks)

Description	13/14	14/15	15/16	16/17	Proposed
	1000T Silage fed in wintering barn 168T Baleage fed on Swede Crop <u>Made on Farm (DM)</u> 51T Silage – to storage.	1000T Silage fed in wintering barn 300T Baleage fed on Kale & Fodder Beet Crop	950T Silage fed in wintering barn 240T Baleage fed on Fodder Beet Crop <u>Made on Farm (DM)</u> 77T Silage – to storage.	1000T Silage fed in wintering barn 252T Baleage fed on Fodder Beet Crop <u>Made on Farm (DM)</u> 38T Silage – to storage.	1400T Silage fed in wintering barn
Fertiliser	<u>WOL Effluent</u> 97kg/N/ha (split Aug-Mar) 25kg/P/ha 0kg/K/ha <u>WOL Non-Effluent</u> 189kg/N/ha (split Aug-Apr) 37kg/P/ha 18kg/K/ha <u>WTL Effluent</u> 147kg/N/ha (split Aug-Mar) 26kg/P/ha 0kg/K/ha <u>WTL Non-Effluent</u> 239kg/N/ha (split Aug-Apr) 39kg/P/ha 20kg/K/ha	<u>WOL Effluent</u> 140kg/N/ha (split Aug-Apr) 30kg/P/ha 0kg/K/ha <u>WOL Non-Effluent</u> 225kg/N/ha (split Aug-May) 46kg/P/ha 45kg/K/ha <u>WTL Effluent</u> 168kg/N/ha (split Aug-Apr) 30kg/P/ha 0kg/K/ha <u>WTL Non-Effluent</u> 225kg/N/ha (split Aug-May) 44kg/P/ha 30kg/K/ha	<u>WOL Effluent</u> 165kg/N/ha (split Aug-Mar) 32kg/P/ha 0kg/K/ha <u>WOL Non-Effluent</u> 203kg/N/ha (split Aug-Mar) 32kg/P/ha 24kg/K/ha <u>WTL Effluent</u> 156kg/N/ha (split Aug-Mar) 12kg/P/ha 0kg/K/ha <u>WTL Non-Effluent</u> 237kg/N/ha (split Aug-Mar) 19kg/P/ha 15kg/K/ha	<u>WOL Effluent</u> 165kg/N/ha (split Aug-Feb) 19kg/P/ha 0kg/K/ha <u>WOL Non-Effluent</u> 236kg/N/ha (split Aug-Apr) 20kg/P/ha 26kg/K/ha <u>WTL Effluent</u> 147kg/N/ha (split Aug-Mar) 14kg/P/ha 0kg/K/ha <u>WTL Non-Effluent</u> 241kg/N/ha (split Aug-Apr) 14kg/P/ha 0kg/K/ha	<u>Effluent</u> 139kg/N/ha (split Aug – Mar) 25kg/P/ha 0kg/K/ha <u>Non-Effluent</u> 209kg/N/ha (split Aug-Apr) 34kg/P/ha 28kg/K/ha <u>Barn Slurry</u> 173kg/N/ha (split Aug-Apr) 22kg/P/ha 0kg/K/ha 35kg/N/ha 9kg/P/ha 48kg/K/ha Applied as wintering barn effluent.
Effluent	Holding Pond Effluent applied at <12mm	Holding Pond Effluent applied at <12mm	Holding Pond Effluent applied at <12mm	Holding Pond Effluent applied at <12mm	Holding Pond Effluent applied at <12mm

Description	13/14	14/15	15/16	16/17	Proposed
	Wintering barn & pond solids exported as these are partly applied on land not covered in this nutrient budget. Where barn/pond effluent is applied on the support block this has been added under the fertiliser tab.	*Wintering barn & pond solids exported as these are partly applied on land not covered in this nutrient budget. Where barn/pond effluent is applied on the support block this has been added under the fertiliser tab.*	*Wintering barn & pond solids exported as these are partly applied on land not covered in this nutrient budget. Where barn/pond effluent is applied on the support block this has been added under the fertiliser tab.*	*Wintering barn & pond solids exported as these are partly applied on land not covered in this nutrient budget. Where barn/pond effluent is applied on the support block this has been added under the fertiliser tab.*	*Wintering barn & pond solids exported as these are partly applied on land not covered in this nutrient budget. Where barn/pond effluent is applied on the barn slurry block this has been added under the fertiliser tab.*

10.0 Modelling Results

10.1 *Pre-Expansion Results*

	13/14*	14/15	15/16	16/17	Average
Total N Loss (kg)	19055	23016	19112	20723	20477
N Loss/ha (kg)	40 (15)	46	38	41	41
N Concentration in Drainage (ppm)	7.3 - 12.9 (Pastoral) 16.4 - 27.1 (Crops) 5.9 – 12.5 (Silage/WGYS)	9.9 – 15.7 (Pastoral) 13.5 - 17.6 (Crops) 5.9 – 9.5 (Silage/WGYS)	7.3 – 14.3 (Pastoral) 13.1 - 18.8 (Crops) 4.0 – 9.8 (Silage/WGYS)	8.5 – 15.3 (Pastoral) 18.0 - 23.8 (Crops) 2.9 – 7.5 (Silage)	
Total P Loss (kg)	345	374	362	357	360
P Loss/ha (kg)	0.7 (0.2)	0.7	0.7	0.7	0.7
Pasture Grown Kg/DM/ha/yr (Dairy Platforms)	15,003	15,483	15,089	15,909	15,371

* 13/14 results include an estimate of losses from the 38ha of land that wasn't part of Woldwide Farms in 2013/14 but forms part of the property from 14/15 onwards and is part of the expanded dairy farming application. A conservative estimate of 15kg/N/ha and 0.2kg/P/ha has been used to estimate total losses – See Section 7.1 for further details.

***10.2** Post Expansion Results*

	Proposed Dairy Unit
Total N Loss (kg)	20262
N Loss/ha (kg)	40
N Concentration in Drainage (ppm)	Pastoral – 7.8 to 17.2 ppm
Total P Loss (kg)	356
P loss/ha (kg)	0.7
Pasture Grown Kg/DM/ha/yr	15,391

11.0 Modelling Conclusions

Using Overseer, combined nutrient budgets have been developed for WOL, WTL and the Support Block, comparing the nutrient loss of the pre-expansion farm systems against the proposed farm system. Overseer has predicted that the nitrogen and phosphorus loss will decrease

Key drivers for the reduction in nitrogen loss are:

- Removal of winter and summer crop
- Removal of cows wintered outside on crop or grass
- Expansion of the size and use of the wintering barn facilities
- More efficient use of nitrogen fertiliser

Key drivers for the reduction in phosphorus loss are:

- Decrease in winter crop area
- Maintaining Olsen P at a target level of 30
- Expansion in the size and use of the wintering barn facilities (less wintering)

12.0 Supplementary Report – Horner Block

The Horner Block (HB) is a 160ha piece of land located to the south west of WOL. It forms part of Woldwide Farms Ltd, which is a transport, contracting, concentrate purchasing and silage production company. Wintering barn slurry is taken from WOL, WTL and Woldwide Three Ltd for the cost of the nutrients it contains and is subsequently spread on designated areas of the HB as partial fulfilment of the fertiliser requirements of the cut and carry operation. Approximately 17T/DM/ha of silage is produced off the HB, which is subsequently purchased by the dairy farms in the Woldwide Group and other customers.

Due to the definition of "landholding" in the pSWLP, Environment Southland originally concluded that the HB is part of the same landholding as WOL and WTL and therefore needs to form part of the farming land use consent application activated by the increase in cow numbers on WOL and WTL. A subsequent legal opinion (October 2018) reversed this decision, however this supplementary report has still be included for reference.

The effective area of land associated with WOL and WTL barn slurry is approximately 97ha with an additional 56.5ha associated with Woldwide Three Ltd. Over the last 5 years the HB has been used for the production of cut and carry silage and the wintering of mixed age cows and young stock on grass and a range of crops. Accurate records of the crop areas and cow numbers are not available thus a current nutrient budget has been produced based on 2017-18 cut and carry operation.

The current nutrient budget represents a conservative approach to modelling the existing nitrogen and phosphorus losses on the HB. If a five year annual average was used (as outlined in Rule 20(d) of the pSWLP) winter grazing activities would also be captured, resulting in higher average nitrogen and phosphorus losses compared to a straight cut and carry operation.

Fertiliser inputs into the current nutrient budget are based on purchase records from Ravensdown for the 2017-18 season. In addition to the fertiliser purchased from Ravensdown, three applications of wintering barn slurry (17.3m^3/ha/application) were applied across the HB.

Fertiliser inputs into the proposed nutrient budget are also based on the 2017-18 purchase records from Ravensdown but a proportion of the purchased fertiliser has been replaced by wintering barn slurry on the WOL and WTL section of the HB. Five applications of wintering barn slurry are proposed to be applied (15.2m^3/ha/application) totalling 7372m^3.

Soil test results have been based on maintaining an Olsen P levels of 30, which is the long term goal objective and reflects a level where near maximum pasture production is achieved.

	Total Current	**Total Proposed**	**Per/ha Current**	**Per/ha Proposed**
Nitrogen Loss (kg/N)	3126	3092	20	19
Phosphorus Loss (Kg/P)	24	23	0.1	0.1
Pasture Production (kg/DM)	17000		17000	

12.1 *Modelling Inputs – Horner Block*

To construct the nutrient budgets the following input data has been used;

12.1.1 Blocks

The HB has been split into the following cut and carry blocks:

Block Name	**Soil Type**	**Current**	**Proposed**
Horner WW1&2	Brax_4a.1	62	62
Horner WW1&2	Drum_2a.1	30	30
Horner WW1&2	Waiau_3a.1	5	5
Horner WW3	Brax_4a.1	13	13
Horner WW3	Drum_2a.1	25	25
Horner WW3	Glene_4a.1	4	4
Horner WW3	Waiau_3a.1	14.5	14.5
Effective Farm Area		**153.5**	**153.5**
Non productive		6.5	6.5
Total Farm Area		**160**	**160**

- Soil areas were obtained from Smap/Environment Southland.
- Soil settings were obtained from SMap for all soil types.

12.1.2 Climate Data

- Location setting = Southland
- Climate station tool used for block climate data

- 1002mm of rainfall
- 9.8°C mean annual temperature
- 731-1450mm daily rainfall pattern. Low variation.
- 711mm mean annual PET

12.1.3 Farm System Inputs

Description	Current	Proposed
Cut & Carry Block Inputs	Grass Silage – 153.5ha 17T/ha grass silage cut (DM) 293kg/N/ha, 21kg/P/ha & 68kg/K/ha applied as fertiliser 166kg/N/ha, 42kg/P/ha and 228kg/K/ha applied as wintering barn effluent.	Grass Silage – 97ha (WOL & WTL Slurry Area) 17T/ha grass silage cut (DM) 207kg/N/ha, 10kg/P/ha & 0kg/K/ha applied as fertiliser 243kg/N/ha, 61kg/P/ha and 334kg/K/ha applied as wintering barn effluent. Grass Silage – 56.5ha (Woldwide Three Ltd Slurry Area) 17T/ha grass silage cut (DM) 293kg/N/ha, 21kg/P/ha & 68kg/K/ha applied as fertiliser 166kg/N/ha, 42kg/P/ha and 228kg/K/ha applied as wintering barn effluent.

Appendix 1 – Soil Survey/Farm Map

APPENDIX

Woldwide One Soils

The following photographs and comments refer to various paddocks across Woldwide One using paddock numbers provided on a farm plan as at January 2017.

Holes were dug on the 7 February 2017 to check the depth of topsoil, stone content and drainage properties. The topsoil and subsoil were checked for texture using field methods and for the drainage properties mottling was taken as an indication of impeded drainage.

The profile at each site was compared to the Topoclimate South soil map to determine if the soils were true to type as described in the Topoclimate soil information sheets.

It was found the Topoclimate maps were not particularly accurate with soil profiles generally better than stated. In places the soils were an intergrade between two types. The Braxton and Pukemutu soils are less extensive than shown.

Prior to Topoclimate maps being produced most of the block were depicted as being of the Drummond soil type in DSIR Soil Bureau Bulletin 27. Makarewa soils were shown to cover the west end of the farm. Makarewa soils are inherently poorly drained. Topoclimate has redefined the area covered by the Makarewa type as being a Braxton or Pukemutu soil type, both of which are poorly drained. Topoclimate has also extended the area of poorly drained soil to cover approximately 90% of Woldwide One.
I believe shallow to moderately deep Drummond soils cover much of the area shown as the Braxton type, other than for the west end of the block.

WOLDWIDE ONE

Paddock 23

Topoclimate suggests a Glenelg soil type for this area. However, there was no stone in the topsoil and there was a well developed subsoil. The subsoil was free draining with no mottling to the bottom of the subsoil level at 0.5 m. This profile is more characteristic of a Drummond soil type. The sample site was on a broad ridge. The paddock had recently been cultivated and the profile was reported as being uniform to plough depth across it, i.e. no stones in the topsoil.

Paddock 24

Topoclimate suggests a Glenelg soil type for this paddock. There was 250 mm depth of soil to stone. The profile was better than a typical Glenelg soil which has stone throughout all horizons. The south west corner where this hole was dug is the lightest part of the paddock.

Paddock 21

Topoclimate suggests Braxton and Pukemutu soil types cover this area. The profile was 250 mm depth of topsoil, no mottles present, well structured, overlying a heavier textured subsoil. There were some mottles present in the subsoil and no stone with 0.5 m of the surface. This profile is tending towards the Braxton soil type. The sample site was in a slight hollow and would be expected to have a wetter profile compared to the higher adjoining ground.

Paddock 7

Topoclimate suggests Braxton and Pukemutu soil types cover this area. The topsoil depth was 200 mm, overlying a 50 mm thick intergrade layer overlying a heavy and mottled subsoil. This profile showed poorer drainage than the profile in paddock 21 and is more characteristic of a Braxton soil type.

Woldwide One Ltd

1354 Hundred Line Rd, Dunearn 9783

LEGEND

Quarry/Gravel Pit	Shed
Creak/Duck Ponds	Public Road
Trees	Slurry Pit
Flood Bank	Tanker Track
Pilones/Powerline	Cow Yards
Effluent Paddocks	Waste Area
Houses	Bridge/Culvert
Water Bore	HNSO Chemical Storage
Under Pass	Fuel Tank
OFFAL Pit	Water Trough

Appendix 2 – Nutrient Budgets & Block Reports

Woldwide 1,2 & SH96/Marcel

Cain Duncan
Fonterra

Client reference:

Farm name: Woldwide 1,2 & 96 13/14 (2013-14)

Farm Nutrient Budget - Whole farm

	N	P	K	S	Ca	Mg	Na
	(kg/ha/yr)						
Nutrients added							
Fertiliser, lime & other	217	45	55	45	82	0	1
Rain/clover N fixation	62	0	2	5	3	6	26
Irrigation	0	0	0	0	0	0	0
Supplements imported	62	13	42	10	8	7	3
Nutrients removed							
As products	97	16	23	5	21	2	7
Exported effluent	56	8	53	6	14	5	3
As supplements and defoliation	45	6	32	3	7	2	1
To atmospheric	77	0	0	0	0	0	0
To water	40	0.7	18	61	75	4	15
Change in internal pools							
Plant material	-66	-9	-61	-7	-15	-6	-5
Organic pool	78	12	5	-10	1	1	0
Inorganic mineral	0	5	-16	0	5	-3	-4
Inorganic soil pool	13	18	45	0	-16	8	12

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Woldwide 1,2 & SH96/Marcel

Cain Duncan
Fonterra

Client reference:

Farm name: Woldwide 1,2 & 96 13/14 (2013-14)

Block Nitrogen

Block name	Total N lost (kg N/yr)	N lost to water (kg N/ha/yr)	N in drainage * (ppm)	N surplus (kg N/ha/yr)	Added N ** (kg N/ha/yr)
WOL Effluent (Drum_2a.1) ##	1260	44	**11.8**	271	253
WOL Non Effluent (Brax_4a.1) ##	1139	25	7.3	184	189
WOL Non Effluent (Drum_2a.1) ##	2660	36	9.6	190	189
WTL Effluent (Drum_2a.1) ##	2074	48	**12.9**	289	304
WTL Non Effluent (Brax_4a.1) ##	1456	29	8.4	202	239
WTL Non Effluent (Drum_2a.1) ##	4070	41	11.1	209	239
Swedes (Drum_2a.1)	162	81	**19.6**	266	173
Swedes (Glen_4a.1)	1434	120	**27.1**	264	173
Barley + Silage +WGYS (Drum_4a.1)	885	47	10.2	-56	251
Summer Turnips	1133	72	**16.4**	156	222
Silage + WG YS + Barn Eff (Drum_2a.1)	689	22	5.9	127	470
Silage + WG YS + Barn Eff (Glene_4a.1)	501	42	10.1	141	470
Barley + Silage +WGYS (Glene_4a.1)	408	58	**12.5**	-55	251
Other farm sources	611				
Whole farm	18483	40			
Less N removed in wetlands	0				
Farm output	18483	40			

* Estimated N concentration in drainage water at the bottom of the root zone. Maximum recommended level for drinking water is 11.3 ppm (note that this is not an environmental water quality standard).

** Sum of fertiliser and external factory effluent inputs.

N/A: N in drainage not calculated for easy and steep pastoral blocks, or for tree and shrubs, riparian, wetland or house blocks.

Has a fodder crop rotating though, results for pastoral block component only

Woldwide 1,2 & SH96/Marcel

Cain Duncan
Fonterra

Client reference:

Farm name: Woldwide 1,2 & 96 13/14 (2013-14)

Block Phosphorus

Block name	Total P lost (kg P/yr)	P lost (kg P/ha/yr)	P loss categories		
			Soil	Fertiliser	Effluent
WOL Effluent (Drum_2a.1) ##	7	0.2	Low	Low	Low
WOL Non Effluent (Brax_4a.1) ##	28	0.6	Low	Medium	n/a
WOL Non Effluent (Drum_2a.1) ##	16	0.2	Low	Low	n/a
WTL Effluent (Drum_2a.1) ##	10	0.2	Low	Low	Low
WTL Non Effluent (Brax_4a.1) ##	29	0.6	Low	Medium	n/a
WTL Non Effluent (Drum_2a.1) ##	21	0.2	Low	Low	n/a
Swedes (Drum_2a.1)	1	0.3	n/a	n/a	n/a
Swedes (Glen_4a.1)	3	0.2	n/a	n/a	n/a
Barley + Silage +WGYS (Drum_4a.1)	5	0.3	n/a	n/a	n/a
Summer Turnips	5	0.3	n/a	n/a	n/a
Silage + WG YS + Barn Eff (Drum_2a.1)	6	0.2	Low	Low	n/a
Silage + WG YS + Barn Eff (Glene_4a.1)	2	0.1	Low	Low	n/a
Barley + Silage +WGYS (Glene_4a.1)	1	0.2	n/a	n/a	n/a
Other farm sources	204				
Whole farm	337	0.7			

Has a fodder crop rotating though, results for pastoral block component only

Woldwide 1,2 & SH96/Marcel

Cain Duncan
Fonterra

Client reference:

Farm name: Woldwide 1,2 & 96 14/15 (2014-15)

Farm Nutrient Budget - Whole farm

	N	P	K	S	Ca	Mg	Na
	(kg/ha/yr)						
Nutrients added							
Fertiliser, lime & other	232	45	61	62	95	0	1
Rain/clover N fixation	62	0	2	5	3	6	26
Irrigation	0	0	0	0	0	0	0
Supplements imported	65	13	40	10	7	7	3
Nutrients removed							
As products	94	16	23	5	21	2	6
Exported effluent	55	8	51	6	13	5	3
As supplements	44	4	31	3	8	2	1
To atmospheric	79	0	0	0	0	0	0
To water	46	0.7	18	75	79	4	15
Change in internal pools							
Plant material	-78	-10	-78	-5	-17	-7	-5
Organic pool	105	13	5	-9	1	1	0
Inorganic mineral	0	5	-15	0	-2	-3	-4
Inorganic soil pool	13	21	69	0	2	9	13

Version 6.3.1, on 2019-03-18 01:58:26

Woldwide 1,2 & SH96/Marcel

Cain Duncan
Fonterra

Client reference:

Farm name: Woldwide 1,2 & 96 14/15 (2014-15)

Block Nitrogen

Block name	Total N lost (kg N/yr)	N lost to water (kg N/ha/yr)	N in drainage * (ppm)	N surplus (kg N/ha/yr)	Added N ** (kg N/ha/yr)
WOL Effluent (Drum_2a.1) ##	1534	53	**14.2**	300	311
WOL Non Effluent (Brax_4a.1) ##	1563	34	9.9	205	225
WOL Non Effluent (Drum_2a.1) ##	3481	46	**12.5**	211	225
WTL Effluent (Drum_2a.1) ##	2547	59	**15.7**	309	339
WTL Non Effluent (Brax_4a.1) ##	1744	34	9.9	205	225
WTL Non Effluent (Drum_2a.1) ##	5949	46	**12.5**	211	225
Kale (Drum_2a.1)	683	60	**13.5**	219	147
Kale (Glen_4a.1)	1529	83	**17.6**	219	147
Fodder Beet (Drum_2a.1)	704	70	**16.4**	181	142
Summer Turnips	990	71	**16.0**	123	191
Silage + WG YS + Barn Eff (Drum_2a.1)	471	22	5.9	146	572
Silage + WG YS + Barn Eff (Glene_4a.1)	1144	39	9.5	156	572
Other farm sources	678				
Whole farm	23016	46			
Less N removed in wetlands	0				
Farm output	23016	46			

* Estimated N concentration in drainage water at the bottom of the root zone. Maximum recommended level for drinking water is 11.3 ppm (note that this is not an environmental water quality standard).

** Sum of fertiliser and external factory effluent inputs.

N/A: N in drainage not calculated for easy and steep pastoral blocks, or for tree and shrubs, riparian, wetland or house blocks.

Has a fodder crop rotating though, results for pastoral block component only

Version 6.3.1, on 2019-03-18 01:58:54

Woldwide 1,2 & SH96/Marcel

Cain Duncan
Fonterra

Client reference:

Farm name: Woldwide 1,2 & 96 14/15 (2014-15)

Block Phosphorus

Block name	Total P lost (kg P/yr)	P lost (kg P/ha/yr)	P loss categories		
			Soil	Fertiliser	Effluent
WOL Effluent (Drum_2a.1) ##	7	0.2	Low	Low	Low
WOL Non Effluent (Brax_4a.1) ##	28	0.6	Low	Medium	n/a
WOL Non Effluent (Drum_2a.1) ##	17	0.2	Low	Low	n/a
WTL Effluent (Drum_2a.1) ##	13	0.3	Low	Low	Low
WTL Non Effluent (Brax_4a.1) ##	29	0.6	Low	Medium	n/a
WTL Non Effluent (Drum_2a.1) ##	27	0.2	Low	Low	n/a
Kale (Drum_2a.1)	4	0.3	n/a	n/a	n/a
Kale (Glen_4a.1)	4	0.2	n/a	n/a	n/a
Fodder Beet (Drum_2a.1)	4	0.4	n/a	n/a	n/a
Summer Turnips	5	0.3	n/a	n/a	n/a
Silage + WG YS + Barn Eff (Drum_2a.1)	3	0.1	Low	Low	n/a
Silage + WG YS + Barn Eff (Glene_4a.1)	3	0.1	Low	Low	n/a
Other farm sources	230				
Whole farm	374	0.7			

Has a fodder crop rotating though, results for pastoral block component only

Woldwide 1,2 & SH96/Marcel

Cain Duncan
Fonterra

Client reference:

Farm name: Woldwide 1,2 & 96 15/16 (2015/16)

Farm Nutrient Budget - Whole farm

	N	P	K	S	Ca	Mg	Na
	(kg/ha/yr)						
Nutrients added							
Fertiliser, lime & other	235	34	66	41	54	2	1
Rain/clover N fixation	58	0	2	5	3	6	26
Irrigation	0	0	0	0	0	0	0
Supplements imported	75	16	38	10	6	7	3
Nutrients removed							
As products	96	16	23	5	21	2	7
Exported effluent	55	8	50	6	13	5	3
As supplements	59	6	43	4	10	3	2
To atmospheric	77	0	0	0	0	0	0
To water	38	0.7	17	54	72	4	15
Change in internal pools							
Plant material	-73	-9	-69	-6	-15	-6	-4
Organic pool	106	14	5	-8	1	1	0
Inorganic mineral	0	5	-20	0	-2	-3	-4
Inorganic soil pool	11	9	58	0	-37	10	11

Version 6.3.1, on 2019-03-18 02:01:46

Woldwide 1,2 & SH96/Marcel

Cain Duncan
Fonterra

Client reference:

Farm name: Woldwide 1,2 & 96 15/16 (2015/16)

Block Nitrogen

Block name	Total N lost (kg N/yr)	N lost to water (kg N/ha/yr)	N in drainage * (ppm)	N surplus (kg N/ha/yr)	Added N ** (kg N/ha/yr)
WOL Effluent (Drum_2a.1) ##	1541	53	**14.3**	306	337
WOL Non Effluent (Brax_4a.1) ##	1144	25	7.3	194	203
WOL Non Effluent (Drum_2a.1) ##	2785	37	10.0	201	203
WTL Effluent (Drum_2a.1) ##	2271	52	**14.1**	299	328
WTL Non Effluent (Brax_4a.1) ##	1305	26	7.5	201	237
WTL Non Effluent (Drum_2a.1) ##	4853	38	10.2	207	237
Fodder Beet (Glen_4a.1)	1553	86	**18.8**	155	75
Fodder Beet (Drum_2a.1)	226	56	**13.1**	155	75
Summer Turnips	979	68	**15.3**	83	134
SH 96 Silage + WG YS + Barn Eff (Drum	624	22	6.0	148	572
SH 96 Silage + WG YS + Barn Eff (Glen	487	41	9.8	158	572
Marcel Silage + WG YS + Barn Eff (Drum	161	15	4.0	97	433
Marcel Silage + WG YS + Barn Eff (Glen	522	29	7.0	105	433
Other farm sources	661				
Whole farm	19112	38			
Less N removed in wetlands	0				
Farm output	19112	38			

* Estimated N concentration in drainage water at the bottom of the root zone. Maximum recommended level for drinking water is 11.3 ppm (note that this is not an environmental water quality standard).

** Sum of fertiliser and external factory effluent inputs.

N/A: N in drainage not calculated for easy and steep pastoral blocks, or for tree and shrubs, riparian, wetland or house blocks.

Has a fodder crop rotating though, results for pastoral block component only

Version 6.3.1, on 2019-03-18 02:02:23

Woldwide 1,2 & SH96/Marcel

Cain Duncan
Fonterra

Client reference:

Farm name: Woldwide 1,2 & 96 15/16 (2015/16)

Block Phosphorus

Block name	Total P lost (kg P/yr)	P lost (kg P/ha/yr)	P loss categories		
			Soil	Fertiliser	Effluent
WOL Effluent (Drum_2a.1) ##	7	0.2	Low	Low	Low
WOL Non Effluent (Brax_4a.1) ##	27	0.6	Low	Medium	n/a
WOL Non Effluent (Drum_2a.1) ##	16	0.2	Low	Low	n/a
WTL Effluent (Drum_2a.1) ##	12	0.3	Low	Low	Low
WTL Non Effluent (Brax_4a.1) ##	26	0.5	Low	Low	n/a
WTL Non Effluent (Drum_2a.1) ##	25	0.2	Low	Low	n/a
Fodder Beet (Glen_4a.1)	5	0.3	n/a	n/a	n/a
Fodder Beet (Drum_2a.1)	2	0.4	n/a	n/a	n/a
Summer Turnips	5	0.3	n/a	n/a	n/a
SH 96 Silage + WG YS + Barn Eff (Drum	4	0.1	Low	Low	n/a
SH 96 Silage + WG YS + Barn Eff (Glene	1	0.1	Low	Low	n/a
Marcel Silage + WG YS + Barn Eff (Drur	2	0.2	Low	Low	n/a
Marcel Silage + WG YS + Barn Eff (Glen	2	0.1	Low	Low	n/a
Other farm sources	227				
Whole farm	362	0.7			

Has a fodder crop rotating though, results for pastoral block component only

Woldwide 1,2 & SH96/Marcel

Cain Duncan
Fonterra

Client reference:

Farm name: Woldwide 1,2 & 96 16/17 (2016/17)

Farm Nutrient Budget - Whole farm

	N	P	K	S	Ca	Mg	Na
	(kg/ha/yr)						
Nutrients added							
Fertiliser, lime & other	246	30	59	36	32	5	2
Rain/clover N fixation	57	0	2	5	3	6	26
Irrigation	0	0	0	0	0	0	0
Supplements imported	70	15	39	10	7	7	3
Nutrients removed							
As products	103	17	25	6	23	2	7
Exported effluent	56	9	52	6	13	5	3
As supplements	60	7	50	5	12	3	3
To atmospheric	81	0	0	0	0	0	0
To water	41	0.7	18	52	79	3	15
Change in internal pools							
Plant material	-85	-11	-70	-8	-18	-6	-5
Organic pool	117	15	5	-10	1	1	0
Inorganic mineral	0	6	-22	0	-2	-3	-4
Inorganic soil pool	0	2	43	0	-67	12	13

Version 6.3.1, on 2019-03-18 02:04:03

Woldwide 1,2 & SH96/Marcel

Cain Duncan
Fonterra

Client reference:

Farm name: Woldwide 1,2 & 96 16/17 (2016/17)

Block Nitrogen

Block name	Total N lost (kg N/yr)	N lost to water (kg N/ha/yr)	N in drainage * (ppm)	N surplus (kg N/ha/yr)	Added N ** (kg N/ha/yr)
WOL Effluent (Drum_2a.1)	1710	57	**15.3**	308	342
WOL Non Effluent (Brax_4a.1)	1385	29	8.5	206	236
WOL Non Effluent (Drum_2a.1)	3323	42	**11.5**	213	236
WTL Effluent (Drum_2a.1)	2463	55	**14.7**	301	324
WTL Non Effluent (Brax_4a.1)	1601	30	8.8	206	241
WTL Non Effluent (Drum_2a.1)	5903	44	**11.9**	213	241
Fodder Beet (Glen_4a.1)	2022	109	**23.8**	221	137
Fodder Beet (Drum_2a.1)	307	77	**18.0**	221	137
SH96 Cut&Carry (Glen_4a.1)	144	12	2.9	70	424
SH96 Cut&Carry (Drum_2a.1)	329	12	3.2	69	424
Marcel Cut&Carry (Glen_4a.1)	518	30	7.1	145	606
Marcel Cut&Carry (Drum_2a.1)	306	28	7.5	157	606
Other farm sources	713				
Whole farm	20723	41			
Less N removed in wetlands	0				
Farm output	20723	41			

* Estimated N concentration in drainage water at the bottom of the root zone. Maximum recommended level for drinking water is 11.3 ppm (note that this is not an environmental water quality standard).

** Sum of fertiliser and external factory effluent inputs.

N/A: N in drainage not calculated for easy and steep pastoral blocks, or for tree and shrubs, riparian, wetland or house blocks.

Version 6.3.1, on 2019-03-18 02:04:30

Woldwide 1,2 & SH96/Marcel

Cain Duncan
Fonterra

Client reference:

Farm name: Woldwide 1,2 & 96 16/17 (2016/17)

Block Phosphorus

Block name	Total P lost (kg P/yr)	P lost (kg P/ha/yr)	P loss categories		
			Soil	Fertiliser	Effluent
WOL Effluent (Drum_2a.1)	7	0.2	Low	Low	Low
WOL Non Effluent (Brax_4a.1)	25	0.5	Low	Low	n/a
WOL Non Effluent (Drum_2a.1)	14	0.2	Low	Low	n/a
WTL Effluent (Drum_2a.1)	12	0.3	Low	Low	Low
WTL Non Effluent (Brax_4a.1)	25	0.5	Low	Low	n/a
WTL Non Effluent (Drum_2a.1)	23	0.2	Low	Low	n/a
Fodder Beet (Glen_4a.1)	5	0.3	n/a	n/a	n/a
Fodder Beet (Drum_2a.1)	2	0.4	n/a	n/a	n/a
SH96 Cut&Carry (Glen_4a.1)	1	0.1	n/a	n/a	n/a
SH96 Cut&Carry (Drum_2a.1)	3	0.1	n/a	n/a	n/a
Marcel Cut&Carry (Glen_4a.1)	2	0.1	n/a	n/a	n/a
Marcel Cut&Carry (Drum_2a.1)	2	0.2	n/a	n/a	n/a
Other farm sources	237				
Whole farm	357	0.7			

Version 6.3.1, on 2019-03-18 03:38:41

Abe De Wolde
Cain Duncan
Fonterra

WW1 & WW2 Proposed

Client reference:

Farm name: Woldwide 1&2 Proposed (Mitigations & Slurry) (Future)

Farm Nutrient Budget - Whole farm

	N	P	K	S	Ca	Mg	Na
	(kg/ha/yr)						
Nutrients added							
Fertiliser, lime & other	182	29	27	68	58	2	0
Rain/clover N fixation	80	0	2	5	3	6	26
Irrigation	0	0	0	0	0	0	0
Supplements imported	200	27	147	21	27	16	9
Nutrients removed							
As products	125	21	30	7	27	3	9
Exported effluent	76	9	71	7	15	7	3
As supplements	0	0	0	0	0	0	0
To atmospheric	88	0	0	0	0	0	0
To water	40	0.7	12	84	51	4	15
Change in internal pools							
Plant material	0	0	0	0	0	0	0
Organic pool	134	14	18	-4	3	2	1
Inorganic mineral	0	4	-16	0	-2	-3	-4
Inorganic soil pool	0	8	62	0	-6	11	12

Version 6.3.1, on 2019-03-18 03:41:21

Abe De Wolde

WW1 & WW2 Proposed

Client reference:

Farm name: Woldwide 1&2 Proposed (Mitigations & Slurry) (Future)

Cain Duncan

Fonterra

Block Nitrogen

Block name	Total N lost (kg N/yr)	N lost to water (kg N/ha/yr)	N in drainage * (ppm)	N surplus (kg N/ha/yr)	Added N ** (kg N/ha/yr)
Effluent Blocks (Drum_2a.1)	5388	45	**12.0**	262	271
Non Effluent (Brax_4a.1)	2674	27	7.8	186	209
Non-Effluent (Drum_2a.1)	956	38	10.2	192	209
Non-Effluent (Glen_4a.1)	3429	71	**17.2**	207	209
Barn Slurry (Drum_2a.1)	6987	38	10.2	196	208
Other farm sources	828				
Whole farm	20262	40			
Less N removed in wetlands	0				
Farm output	20262	40			

* Estimated N concentration in drainage water at the bottom of the root zone. Maximum recommended level for drinking water is 11.3 ppm (note that this is not an environmental water quality standard).

** Sum of fertiliser and external factory effluent inputs.

N/A: N in drainage not calculated for easy and steep pastoral blocks, or for tree and shrubs, riparian, wetland or house blocks.

Version 6.3.1, on 2019-03-18 03:41:53

Abe De Wolde
WW1 & WW2 Proposed
Client reference:
Farm name: Woldwide 1&2 Proposed (Mitigations & Slurry) (Future)

Cain Duncan
Fonterra

Block Phosphorus

Block name	Total P lost (kg P/yr)	P lost (kg P/ha/yr)	P loss categories		
			Soil	Fertiliser	Effluent
Effluent Blocks (Drum_2a.1)	22	0.2	Low	Low	Low
Non Effluent (Brax_4a.1)	44	0.4	Low	Low	n/a
Non-Effluent (Drum_2a.1)	4	0.1	Low	Low	n/a
Non-Effluent (Glen_4a.1)	5	0.1	Low	Low	n/a
Barn Slurry (Drum_2a.1)	26	0.1	Low	Low	n/a
Other farm sources	256				
Whole farm	357	0.7			

Woldwide Farms Ltd
Horner Block
Client reference:
Farm name: Horner Block -Current (Current)

Cain Duncan
Fonterra

Farm Nutrient Budget - Whole farm

	N	P	K	S	Ca	Mg	Na
	(kg/ha/yr)						
Nutrients added							
Fertiliser, lime & other	441	60	284	47	528	5	0
Rain/clover N fixation	46	0	2	5	3	6	26
Irrigation	0	0	0	0	0	0	0
Supplements imported	0	0	0	0	0	0	0
Nutrients removed							
As products	0	0	0	0	0	0	0
Exported effluent	0	0	0	0	0	0	0
As supplements	413	44	343	34	86	22	18
To atmospheric	20	0	0	0	0	0	0
To water	20	0.1	10	40	58	5	14
Change in internal pools							
Plant material	0	0	0	0	0	0	0
Organic pool	34	17	0	-22	0	0	0
Inorganic mineral	0	3	-27	0	171	-2	-5
Inorganic soil pool	0	-5	-40	0	215	-14	-1

Version 6.3.1, on 2019-03-18 03:44:59

Woldwide Farms Ltd
Horner Block
Client reference:
Farm name: Horner Block -Current (Current)

Cain Duncan
Fonterra

Block Nitrogen

Block name	Total N lost (kg N/yr)	N lost to water (kg N/ha/yr)	N in drainage * (ppm)	N surplus (kg N/ha/yr)	Added N ** (kg N/ha/yr)
Horner WW1&2 (Brax_4a.1)	987	16	4.7	73	459
Horner WW1&2 (Drum_2a.1)	714	24	6.5	78	459
Horner WW1&2 (Waiau_3a.1)	130	26	6.5	86	459
Horner WW3 (Brax_4a.1)	207	16	4.7	73	459
Horner WW3 (Drum_2a.1)	595	24	6.5	78	459
Horner WW3 (Glene_4a.1)	102	25	6.2	80	459
Horner WW3 (Waiau_3a.1)	378	26	6.5	86	459
Other farm sources	14				
Whole farm	3126	20			
Less N removed in wetlands	0				
Farm output	3126	20			

* Estimated N concentration in drainage water at the bottom of the root zone. Maximum recommended level for drinking water is 11.3 ppm (note that this is not an environmental water quality standard).

** Sum of fertiliser and external factory effluent inputs.

N/A: N in drainage not calculated for easy and steep pastoral blocks, or for tree and shrubs, riparian, wetland or house blocks.

Version 6.3.1, on 2019-03-18 03:45:36

Woldwide Farms Ltd
Horner Block
Client reference:
Farm name: Horner Block -Current (Current)

Cain Duncan
Fonterra

Block Phosphorus

Block name	Total P lost (kg P/yr)	P lost (kg P/ha/yr)	P loss categories		
			Soil	Fertiliser	Effluent
Horner WW1&2 (Brax_4a.1)	11	0.2	n/a	n/a	n/a
Horner WW1&2 (Drum_2a.1)	2	0.1	n/a	n/a	n/a
Horner WW1&2 (Waiau_3a.1)	1	0.2	n/a	n/a	n/a
Horner WW3 (Brax_4a.1)	2	0.2	n/a	n/a	n/a
Horner WW3 (Drum_2a.1)	2	0.1	n/a	n/a	n/a
Horner WW3 (Glene_4a.1)	0	0.1	n/a	n/a	n/a
Horner WW3 (Waiau_3a.1)	3	0.2	n/a	n/a	n/a
Other farm sources	1				
Whole farm	24	0.1			

Woldwide Farms Ltd
Horner Block
Client reference:
Farm name: Horner Block - Proposed (Proposed)

Cain Duncan
Fonterra

Farm Nutrient Budget - Whole farm

	N	P	K	S	Ca	Mg	Na
	(kg/ha/yr)						
Nutrients added							
Fertiliser, lime & other	435	65	307	45	528	5	0
Rain/clover N fixation	45	0	2	5	3	6	26
Irrigation	0	0	0	0	0	0	0
Supplements imported	0	0	0	0	0	0	0
Nutrients removed							
As products	0	0	0	0	0	0	0
Exported effluent	0	0	0	0	0	0	0
As supplements	406	44	332	33	86	23	18
To atmospheric	16	0	0	0	0	0	0
To water	19	0.1	8	39	58	5	14
Change in internal pools							
Plant material	0	0	0	0	0	0	0
Organic pool	38	17	0	-22	0	0	0
Inorganic mineral	0	3	-23	0	171	-2	-5
Inorganic soil pool	0	1	-7	0	215	-15	-1

Woldwide Farms Ltd
Horner Block
Client reference:
Farm name: Horner Block - Proposed (Proposed)

Cain Duncan
Fonterra

Block Nitrogen

Block name	Total N lost (kg N/yr)	N lost to water (kg N/ha/yr)	N in drainage * (ppm)	N surplus (kg N/ha/yr)	Added N ** (kg N/ha/yr)
Horner WW1&2 (Brax_4a.1)	1005	16	4.7	74	450
Horner WW1&2 (Drum_2a.1)	662	22	6.0	78	450
Horner WW1&2 (Waiau_3a.1)	131	26	6.5	85	450
Horner WW3 (Brax_4a.1)	207	16	4.7	73	459
Horner WW3 (Drum_2a.1)	595	24	6.5	78	459
Horner WW3 (Glene_4a.1)	102	25	6.2	80	459
Horner WW3 (Waiau_3a.1)	378	26	6.5	86	459
Other farm sources	14				
Whole farm	3092	19			
Less N removed in wetlands	0				
Farm output	3092	19			

* Estimated N concentration in drainage water at the bottom of the root zone. Maximum recommended level for drinking water is 11.3 ppm (note that this is not an environmental water quality standard).

** Sum of fertiliser and external factory effluent inputs.

N/A: N in drainage not calculated for easy and steep pastoral blocks, or for tree and shrubs, riparian, wetland or house blocks.

Version 6.3.1, on 2019-03-18 03:47:25

Woldwide Farms Ltd
Horner Block
Client reference:
Farm name: Horner Block - Proposed (Proposed)

Cain Duncan
Fonterra

Block Phosphorus

Block name	Total P lost (kg P/yr)	P lost (kg P/ha/yr)	P loss categories		
			Soil	Fertiliser	Effluent
Horner WW1&2 (Brax_4a.1)	10	0.2	n/a	n/a	n/a
Horner WW1&2 (Drum_2a.1)	2	0.1	n/a	n/a	n/a
Horner WW1&2 (Waiau_3a.1)	1	0.2	n/a	n/a	n/a
Horner WW3 (Brax_4a.1)	2	0.2	n/a	n/a	n/a
Horner WW3 (Drum_2a.1)	2	0.1	n/a	n/a	n/a
Horner WW3 (Glene_4a.1)	0	0.1	n/a	n/a	n/a
Horner WW3 (Waiau_3a.1)	3	0.2	n/a	n/a	n/a
Other farm sources	1				
Whole farm	23	0.1			

Appendix 3 – Nutrient Budget Evidence

Agri - Business Consultants
Annual Reviews

2013/14 Farm Review

Woldwide Group

	Average	Top Farm	WWF1	WWF 2	WWF3	Mayfiled
Final Production (kgMS)	13333212	325649	250281	341434	506021	427164
Effective Milking Area (ha)	9450.86	187.5	155	202	286	253
Stock Numbers/Weights						
Cows Wintered	29940	693	525	664	982	813
Cows at Peak	28619	673	496	632	950	794
Change Winter-Peak (%)	4.4%	2.9%	5.5%	4.8%	3.3%	2.3%
SR Wintered	3.17	3.7	3.4	3.3	3.4	3.2
SR at Peak	3.03	3.6	3.20	3.13	3.32	3.14
June 2012 Weights	474	480.0	540.0	540.0	510.0	520.0
LW/ha	1436	1722.9	1728.0	1689.5	1694.1	1631.9
KgMS/KGLW	0.98	1.01	0.93	1.00	1.04	1.03
KgLW/TDM Consumed	85.7	83.2	103.3	99.0	92.7	87.4
Herd BW	102.9	102.0	118.0	115.0	131.0	123.0
Production						
KgMS/ha	1411	1737	1615	1690	1769	1688
KgMS/cows at peak	466	484	505	540	533	538
KgMS/cow wintered	445	470	477	514	515	525
Mating						
Empties	2973	58	56	73	66	65
Empty % of peak numbers	10.5%	8.6%	11.3%	11.6%	6.9%	8.2%
Mating Interval (Weeks)	11.3	11.4	12	11.6	11.3	11.6
Wasteage - Loss + empties	14.3%	11.3%	16.2%	15.8%	10.0%	10.3%
Feed						
Silage at start	5343873	88160	142320	175780	174700	102700
+ silage bought	15777449	248420	655000	792000	1100000	205000
+ silage made	3174770	39380	15620	35420	53240	70400
- silage at end	15609412	115980	498292	591372	872232	147000
= silage fed	8686680	259980	314648	411828	455708	231100
Silage fed per cow	304	386	634	652	480	291
Silage per KgMS	0.7	0.8	1.3	1.2	0.9	0.5
Nitrogen Applied (kgN/ha)	179	200	151.6	175.2	158.7	194.2
Nitrogen Response @ 10:1	16963455	375000	234980	353904	453882	491326
Concentrates Bought						
Molasis t	1640	27.4	108	125	171	135.5
Barley	6258	319.5	340	490	891	449.6
Palm Kern t	7733	0	164	261	363	340.5
Concentrates fed per cow	546	434	1044	1179	1276	995
Concentrates per KgMS	1.17	0.90	2.07	2.18	2.40	1.85
Total Bought Milking Feed kgDM	38106535	848345	1035988	1440042	2015410	1371861
Total Bought Feed /cow	1332	1261	2089	2279	2121	1728
Total Bought Feed/kgMS	2.9	2.6	4.1	4.2	4.0	3.2
Feed Required For Milk Production @ 12kgDM/kgMS	159998544	3907788	3003372	4097208	6072252	5125968
Feed Required For Drystock	949590	0	0	0	0	0
Less Bought In Feed	38106535	848345	1035988	1440042	2015410	1371861
Leaves Pasture Utilised	122841599	3059443	1967384	2657166	4056842	3754107
Utilised Pasture/ha	**12998**	**16317**	**12693**	**13154**	**14185**	**14838**
Utilised Pasture/kgMS	9.21	9.39	7.86	7.78	8.02	8.79

Financial Analysis/hectare							
Income	Milk @ $8.40/kgMS	$11,934.66	$14,589.08	$13,563.62	$14,198.25	$14,862.16	$14,182.52
	Adj. for cull cows @ $1000	-$0.42	$114.08	-$62.61	-$48.36	$149.79	$128.86
	Total	$11,934.24	$14,703.16	$13,501.01	$14,149.88	$15,011.94	$14,311.38
Variable Feed Costs							
Silage	Bought Off @ 32c	$536.92	$423.97	$1,352.26	$1,254.65	$1,230.77	$259.29
	Made On @ 10c	$33.04	$21.00	$10.08	$17.53	$18.62	$27.83
	Fed Out @ 5c	$47.38	$69.33	$101.50	$101.94	$79.67	$45.67
	Change in inventory	-$339.41	-$47.48	-$734.91	-$658.36	-$780.46	-$56.03
Concentrates @ ?c		$572.07	$865.90	$1,572.05	$1,712.31	$2,026.98	$1,385.88
Nitrogen @ 17c		$313.28	$390.00	$257.72	$297.84	$269.79	$330.14
Less feed fed to drystock @ 16c		-$14.53	$0.00	$0.00	$0.00	$0.00	$0.00
Total Feed Costs		$1,148.74	$1,722.73	$2,558.70	$2,725.91	$2,845.37	$1,992.78
Net Margin		**$10,785.50**	**$12,980.43**	**$10,942.31**	**$11,423.97**	**$12,166.57**	**$12,318.60**

2014/15 Farm Review

	Average	Top Farm	WWF1	WWF 2	WWF3	Mayfiled
Final Production (kgMS)	5224056	312099	246072	372124	472332	402148
Effective Milking Area (ha)	3887.28	225.5	155	232	286	253
Stock Numbers/Weights						
Cows Wintered	12467	726	525	760	1000	810
Cows at Peak	11856	700	495	727	962	780
Change Winter-Peak (%)	4.9%	3.6%	5.7%	4.3%	3.8%	3.7%
SR Wintered	3.21	3.2	3.4	3.3	3.5	3.2
SR at Peak	3.05	3.1	3.19	3.13	3.36	3.08
June 2015 Weights	488	520.0	540.0	540.0	520.0	520.0
LW/ha	1487	1614.2	1724.5	1692.2	1749.1	1603.2
KgMS/KGLW	0.90	0.86	0.92	0.95	0.94	0.99
KgLW/TDM Consumed	99.0	93.7	104.6	103.5	101.0	95.0
Herd BW	105.6	109.0	99.0	99.0	110.0	111.0
Production						
KgMS/ha	1344	1384	1588	1604	1652	1590
KgMS/cows at peak	441	446	497	512	491	516
KgMS/cow wintered	419	430	469	490	472	496
Mating						
Empties	1172	83	51	72	75	56
Empty % of peak numbers	9.9%	11.9%	10.3%	9.9%	7.8%	7.2%
Mating Interval (Weeks)	11.0	10.9	11.6	11.6	11.4	11
Wasteage - Loss + empties	14.3%	15.0%	15.4%	13.8%	11.3%	10.6%
Feed						
Silage at start	2893650	130400	142320	199000	266000	146500
+ silage bought	5131040	205000	572000	724000	750000	251000
+ silage made	426730	15250	0	0	0	0
- silage at end	4090750	159210	526000	516000	607000	151000
= silage fed	4360670	191440	188320	407000	409000	246500
Silage fed per cow	368	273	380	560	425	316
Silage per KgMS	0.8	0.6	0.8	1.1	0.9	0.6
Nitrogen Applied (kgN/ha)	187	196.5	183.9	179.4	180.55	173
Nitrogen Response @ 10:1	7279890	443107.5	285045	416208	516373	437690
Concentrates Bought						
Molasis t	591	117	50.16	98.12	68.98	25.02
Barley	3187	0	333.43	511.29	658.41	527.62
Palm Kern t	4134	36.7	251.94	272.38	408.86	407.32
Concentrates fed per cow	667	173	1107	1036	1018	1069
Concentrates per KgMS	1.51	0.39	2.23	2.02	2.07	2.07
Total Bought Milking Feed kgDM	19126450	724827.5	1021146.5	1576536.5	1904730.5	1518020
Total Bought Feed /cow	1613	1035	2063	2169	1980	1946
Total Bought Feed/kgMS	3.7	2.3	4.1	4.2	4.0	3.8
Feed Required For Milk Production @ 12kgDM/kgMS	62688672	3745188	2952864	4465488	5667984	4825776
Feed Required For Drystock	0	0	0	0	0	0
Less Bought In Feed	19126450	724827.5	1021146.5	1576536.5	1904730.5	1518020
Leaves Pasture Utilised	43562222	3020360.5	1931717.5	2888951.5	3763253.5	3307756
Utilised Pasture/ha	**11206**	**13394**	**12463**	**12452**	**13158**	**13074**
Utilised Pasture/kgMS	8.34	9.68	7.85	7.76	7.97	8.23
Financial Analysis/hectare						
Income Milk @ $4.40/kgMS	$6,022.52	$6,089.74	$7,144.03	$7,217.92	$7,431.80	$7,152.83
Adj. for cull cows @ $1000	-$6.02	-$22.92	-$38.17	$15.92	$104.96	$117.96
Total	$6,016.51	$6,066.81	$7,105.86	$7,233.84	$7,536.75	$7,270.79
Variable Feed Costs						
Silage Bought Off @ 32c	$435.48	$290.91	$1,180.90	$998.62	$839.16	$317.47
Made On @ 10c	$10.59	$6.76	$0.00	$0.00	$0.00	$0.00
Fed Out @ 5c	$56.14	$42.45	$60.75	$87.72	$71.50	$48.72
Change in inventory	-$110.10	-$40.88	-$792.11	-$437.24	-$381.54	-$5.69
Concentrates @ ?c	$732.33	$235.58	$1,613.43	$1,545.75	$1,597.98	$1,493.43
Nitrogen @ 17c	$318.37	$334.05	$312.63	$304.98	$306.94	$294.10
Less feed fed to drystock @ 16c	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Total Feed Costs	$1,442.81	$868.87	$2,375.60	$2,499.83	$2,434.04	$2,148.02
Net Margin	**$4,573.70**	**$5,197.95**	**$4,730.26**	**$4,734.02**	**$5,102.71**	**$5,122.77**

2015/16 Farm Review

Woldewide Farms

	Average	Top Farm	WWF1	WWF 2	WWF3	WWF4	WWF5
Final Production (kgMS)	15594890	323306	265277	361346	462933	374617	231267
Effective Milking Area (ha)	12125.59	224	155	232	286	253	164
Stock Numbers/Weights							
Cows Wintered	38866	723	525	756	976	800	527
Cows at Peak	36737	704	505	708	957	757	500
Change Winter-Peak (%)	5.5%	2.6%	3.8%	6.3%	1.9%	5.4%	5.1%
SR Wintered	3.2	3.2	3.4	3.3	3.4	3.2	3.2
SR at Peak	3.03	3.1	3.26	3.05	3.35	2.99	3.0
June 2015 Weights	469.3	520.0	560.0	550.0	525.0	540.0	530.0
LW/ha	1421.7	1634.3	1791.9	1678.4	1756.7	1615.7	1615.9
KgMS/KGLW	0.90	0.88	0.96	0.93	0.92	0.92	0.87
KgLW/TDM Consumed	93.1	84.9	106.3	109.0	107.6	99.4	92.2
Herd BW	108.9	116.0	95.0	96.0	108.0	115.0	87.0
Production							
KgMS/ha	1286	1443	1711	1558	1619	1481	1410
KgMS/cows at peak	425	459	525	510	484	495	463
KgMS/cow wintered	401	447	505	478	474	468	439
Mating							
Empties	4489	109	69	102	84	93	104
Empty % of peak numbers	12.5%	15.5%	13.7%	14.4%	8.8%	12.3%	20.8%
Mating Interval (Weeks)	10.4	10	11.6	11.6	11.4	11	9.7
Wasteage - Loss + empties	17.0%	17.7%	17.0%	19.8%	10.6%	17.0%	24.9%
Feed							
Silage at start	7713240	69840	171000	100000	84000	75000	150000
+ silage bought	16438599	705780	585000	808000	995000	138000	167750
+ silage made	4065620	103000	11730	64860	79120	148000	223560
- silage at end	16806289	845680	508730	613000	800000	265000	470430
= silage fed	11411170	32940	259000	359860	358120	96000	70880
Silage fed per cow	311	47	513	508	374	127	142
Silage per KgMS	0.7	0.1	1.0	1.0	0.8	0.3	0.3
Nitrogen Applied (kgN/ha)	199.1	197.7	211.6	227.8	201.7	233.4	226.4
Nitrogen Response @ 10:1	24145058.6	442848	327980	528498	576882	590502	371296
Concentrates Bought							
Molasis t	862.14	55	24.5	67	0	27	50
Barley	4507.68	0	408.58	683.39	957.8	625.98	405.47
Palm Kern t	12375	132.9	295.58	304.3	504.76	434	167.6
Concentrates fed per cow	483	228	1251	1278	1325	1246	1066
Concentrates per KgMS	1.14	0.50	2.38	2.50	2.74	2.52	2.30
Total Bought Milking Feed kgDM	49235448.6	430648	1195210	1663637.5	2045156	1333435	528045.5
Total Bought Feed /cow	1340	612	2367	2350	2137	1761	1056
Total Bought Feed/kgMS	3.2	1.3	4.5	4.6	4.4	3.6	2.3
Feed Required For Milk Production @ 12kgDM/kgMS	187138680	3879672	3183324	4336152	5555196	4495404	2775204
Feed Required For Drystock	994100	0	0	0	0	0	0
Less Bought In Feed	49235448.6	430648	1195210	1663637.5	2045156	1333435	528045.5
Leaves Pasture Utilised	138897331	3449024	1988114	2672514.5	3510040	3161969	2247158.5
Utilised Pasture/ha	**11455**	**15397**	**12827**	**11519**	**12273**	**12498**	**13702**
Utilised Pasture/kgMS	8.91	10.67	7.49	7.40	7.58	8.44	9.72

Financial Analysis/hectare								
Income	Milk @ $3.90/kgMS		$5,120.67	$5,628.99	$6,674.71	$6,074.35	$6,312.72	$5,774.73	$5,499.64
	Adj. for cull cows @ $1000		-$4.36	-$17.46	$7.14	-$87.27	$225.57	$5.16	-$247.26
	Total		$5,116.31	$5,611.53	$6,681.85	$5,987.08	$6,538.29	$5,779.89	$5,252.38
Variable Feed Costs									
	Silage	Bought Off @ 30c	$413.43	$945.24	$1,132.26	$1,044.83	$1,043.71	$163.64	$306.86
		Made On @ 12c	$38.99	$55.18	$9.08	$33.55	$33.20	$70.20	$163.58
		Fed Out @ 5c	$48.33	$7.35	$83.55	$77.56	$62.61	$18.97	$21.61
		Change in inventory	-$235.62	-$1,108.34	-$697.25	-$707.59	-$801.12	-$240.32	-$625.23
	Concentrates @ 7c		$448.12	$230.91	$1,760.24	$1,817.35	$2,007.09	$1,619.16	$1,530.32
	Nitrogen @ 15.2c		$302.67	$300.50	$321.63	$346.26	$306.58	$354.77	$344.13
	Less feed fed to drystock @ 16c		-$15.83	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
	Total Feed Costs		$1,000.09	$430.84	$2,609.51	$2,611.95	$2,652.06	$1,986.42	$1,741.27
Net Margin			**$4,116.21**	**$5,180.69**	**$4,072.34**	**$3,375.13**	**$3,886.23**	**$3,793.47**	**$3,511.12**

2016/17 Farm Review

Woldewide Farms

	Average	Top Farm	WWF1	WWF 2	WWF3	WWF4	WWF5	Average
Final Production (kgMS)	18518916	239300	287774	387618	499695	432338	267414	1874839
	0							
Effective Milking Area (ha)	13615.02	138.5	155	232	286	253	170	1096
	0							
Stock Numbers/Weights	0							
Cows Wintered	42716	433	517	752	966	803	539	3577
Cows at Peak	40842	428	497	709	931	775	526	3438
Change Winter-Peak (%)	4.4%	1.2%	3.9%	5.7%	3.6%	3.5%	2.4%	3.9%
SR Wintered	3.1	3.1	3.3	3.2	3.4	3.2	3.2	3.3
SR at Peak	3.00	3.1	3.21	3.06	3.26	3.09	3.1	3.1
June 2017 Weights	476.4	530.0	550.0	550.0	525.0	540.0	530.0	539.0
LW/ha	1429.1	1637.8	1763.5	1680.8	1709.0	1654.2	1639.9	1690.8
KgMS/KGLW	0.95	1.05	1.05	0.99	1.02	1.03	0.96	1.01
KgLW/TDM Consumed	88.9	82.9	98.4	103.3	99.5	94.7	101.5	99.1
Herd BW	68.8		46.0	38.0	55.0	70.0	36.0	49.0
Production	83.3		51	54	70	88	42	61.0
KgMS/ha	1360	1728	1857	1671	1747	1709	1573	1711
KgMS/cows at peak	453	559	579	547	537	558	508	545
KgMS/cow wintered	434	553	557	515	517	538	496	524
Mating								
Empties	5435	52	66	110	78	82	68	404
Empty % of peak numbers	13.4%	12.1%	13.3%	15.5%	8.4%	10.6%	12.9%	11.8%
Mating Interval (Weeks)	10.5	10	12.4	12.4	12.4	12.4	12.4	12.4
Wasteage - Loss + empties	17.1%	13.2%	16.6%	20.3%	11.7%	13.7%	15.0%	15.2%
Feed								
Silage at start	11643549	90850	90000	150000	293000	265000	150000	948000
+ silage bought	15938955	69000	618600	859200	1161400	276000	392700	3307900
+ silage made	5458844	80040	0	38200	0	15000	0	53200
- silage at end	18534761	133400	390000	510000	900000	151000	275000	2226000
= silage fed	14406587	106490	318600	537400	554400	405000	267700	2083100
Silage fed per cow	353	249	641	758	595	523	509	606
Silage per KgMS	0.8	0.4	1.1	1.4	1.1	0.9	1.0	1.1
Nitrogen Applied (kgN/ha)	198.3	197	202	209	203	203	190	201.4
Nitrogen Response @ 10:1	27003713	272845	313100	484880	580580	513590	323000	2207344
Concentrates Bought								
Molasis t	1003.98	0	25	104	20	24	47	220
Barley	6202.52	326	419	534	576	579	398	2606
Palm Kernt	11707	172	252	328	567	362	154	1663
Concentrates fed per cow	463	1009	1211	1167	1181	1079	974	1128
Concentrates per KgMS	1.02	1.80	2.09	2.13	2.20	1.93	1.92	2.07
Total Bought Milking Feed kgDM	54864786	551155	1233400	1772980	2234880	1724540	1102850	8060844
Total Bought Feed /cow	1343	1521	2482	2501	2401	2225	2097	2345
Total Bought Feed/kgMS	3.0	2.7	4.3	4.6	4.5	4.0	4.1	4.3
Feed Required For Milk Production @ 12kgDM/kgMS	222226992	2871600	3453288	4651416	5996340	5188056	3208968	22498068
Feed Required For Drystock	619300	0	0	0	0	0	0	0
Less Bought In Feed	54864786	551155	1233400	1772980	2234880	1724540	1102850	8060844
Leaves Pasture Utilised	167981506	2320445	2219888	2878436	3761460	3463516	2106118	14437224
Utilised Pasture/ha	12338	16032	14322	12407	13152	13690	12389	13173
Utilised Pasture/kgMS	9.07	9.28	7.71	7.43	7.53	8.01	7.88	7.70

Financial Analysis/hectare								
Income	Milk @ $6.15/kgMS	$8,510.04	$10,625.96	$11,418.13	$10,275.22	$10,745.19	$10,509.40	$9,674.09	$10,520.31
	Adj. for cull cows @ $1000	$0.44	$123.39	$15.89	-$104.86	$182.83	$108.30	$66.04	$63.00
	Total	$8,510.49	$10,749.34	$11,434.02	$10,170.36	$10,928.02	$10,617.70	$9,740.13	$10,583.31
Variable Feed Costs									
Silage	Bought Off @ 30c	$373.41	$149.46	$1,197.29	$1,111.03	$1,218.25	$327.27	$693.00	$905.45
	Made On @ 12c	$45.48	$69.35	$0.00	$19.76	$0.00	$7.11	$0.00	$5.82
	Fed Out @ 5c	$54.31	$38.44	$102.77	$115.82	$96.92	$80.04	$78.74	$95.03
	Change in inventory	-$172.00	-$98.31	-$819.35	-$496.55	-$679.16	$144.19	-$235.29	-$373.14
Concentrates @ ?c		$397.27	$1,179.75	$1,454.23	$1,349.81	$1,373.76	$1,229.32	$1,192.63	$1,318.63
Nitrogen @ 15.2c		$287.59	$285.65	$292.90	$303.05	$294.35	$294.35	$275.50	$292.03
Less feed fed to drystock @ 16c		-$6.60	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Total Feed Costs		$979.45	$1,824.34	$2,427.84	$2,402.92	$2,304.12	$2,082.28	$2,004.57	$2,243.83
Net Margin		**$7,531.04**	**$9,125.01**	**$9,006.18**	**$7,767.44**	**$8,623.90**	**$8,535.41**	**$7,735.56**	**$8,339.48**

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2013/2014

Name	2013/2014	Reference Period Status	Past
Farm	32650		

Farm Metrics

Total Hectares	170	Dairy Hectares	155
Peak Cows		KgMS	250,281
Supplementary Feed Used		Cows Grazed Off Farm	
Fodder Crops Grown		Nitrogen Fertiliser Used	
Supplied Days	246		

Milk Quality

Average SCC		Grade Free Award Eligibility	
Demerit Days		Achievement Award Eligibility	
Demerit Points			

Submission Details

Submission Source		Sustainable Dairy Records	
		Submission Type	

System Information

Created By	integration, 11/03/2016 5:44 AM	Last Modified By	integration, 29/06/2018 5:11 PM

Farm Season History

29/06/2018 10:21 AM

User **integration**
Action **Changed Average**

13/04/2018 7:44 PM

User **integration**
Action **Changed**

2/09/2016 1:34 PM

User **integration**
Action **Changed**

11/03/2016 5:44 AM

User **integration**
Action **Created.**

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2013/2014

Name	2013/2014	Reference Period Status	Past
Farm	32651		

Farm Metrics

Total Hectares	205	Dairy Hectares	202
Peak Cows		KgMS	341,434
Supplementary Feed Used		Cows Grazed Off Farm	
Fodder Crops Grown		Nitrogen Fertiliser Used	
Supplied Days	299		

Milk Quality

Average SCC		Grade Free Award Eligibility	
Demerit Days		Achievement Award Eligibility	
Demerit Points			

Submission Details

Submission Source		Sustainable Dairy Records	
		Submission Type	

System Information

Created By	integration, 11/03/2016 5:43 AM	Last Modified By	integration, 1/08/2018 11:45 AM

Farm Season History

29/06/2018 10:21 AM

User **integration**
Action **Changed Average SCC from**

13/04/2018 7:44 PM

User **integration**
Action **Changed**

2/09/2016 1:34 PM

User **integration**
Action **Changed**

11/03/2016 5:43 AM

User **integration**
Action **Created.**

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2014/2015

Name	2014/2015	Reference Period Status	Past
Farm	32650		

Farm Metrics

Total Hectares	170	Dairy Hectares	155
Peak Cows		KgMS	246,071
Supplementary Feed Used		Cows Grazed Off Farm	
Fodder Crops Grown		Nitrogen Fertiliser Used	
Supplied Days	256		

Milk Quality

Average SCC		Grade Free Award Eligibility	
Demerit Days		Achievement Award Eligibility	
Demerit Points			

Submission Details

Submission Source		Sustainable Dairy Records	
		Submission Type	

System Information

Created By	integration, 11/03/2016 5:44 AM	Last Modified By	integration, 29/06/2018 5:11 PM

Farm Season History

13/04/2018 4:57 PM

User **integration**
Action

2/09/2016 1:29 PM

User **integration**
Action **Changed**

11/03/2016 5:44 AM

User **integration**
Action **Created.**

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2014/2015

Name	2014/2015	Reference Period Status	Past
Farm	32651		

Farm Metrics

Total Hectares	235	Dairy Hectares	232
Peak Cows		KgMS	372,124
Supplementary Feed Used		Cows Grazed Off Farm	
Fodder Crops Grown		Nitrogen Fertiliser Used	
Supplied Days	257		

Milk Quality

Average SCC		Grade Free Award Eligibility	
Demerit Days		Achievement Award Eligibility	
Demerit Points			

Submission Details

Submission Source		Sustainable Dairy Records	
		Submission Type	

System Information

Created By	integration, 11/03/2016 5:43 AM	Last Modified By	integration, 1/08/2018 11:45 AM

Farm Season History

13/04/2018 4:57 PM

User **integration**
Action **Changed**

2/09/2016 1:29 PM

User **integration**
Action **Changed**

11/03/2016 5:43 AM

User **integration**
Action **Created.**

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2015/2016

Name	2015/2016	Reference Period Status	Past
Farm	32650		

Farm Metrics

Total Hectares	170	Dairy Hectares	155
Peak Cows		KgMS	265.277
Supplementary Feed Used		Cows Grazed Off Farm	
Fodder Crops Grown		Nitrogen Fertiliser Used	
Supplied Days	264		

Milk Quality

Average SCC		Grade Free Award Eligibility	
Demerit Days		Achievement Award Eligibility	
Demerit Points			

Submission Details

Submission Source		Sustainable Dairy Records	
		Submission Type	

System Information

Created By	integration, 11/03/2016 5:44 AM	Last Modified By	integration, 29/06/2018 5:11 PM

Farm Season History

13/04/2018 1:45 PM

User **integration**
Action **Changed**

2/09/2016 12:45 PM

User **integration**
Action **Changed**

10/06/2016 3:35 PM

User **integration**
Action **Changed**

11/03/2016 5:44 AM

User **integration**
Action **Created.**

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2015/2016

Name	2015/2016	Reference Period Status	Past
Farm	32651		

Farm Metrics

Total Hectares	235	Dairy Hectares	232
Peak Cows		KgMS	361,346
Supplementary Feed Used		Cows Grazed Off Farm	
Fodder Crops Grown		Nitrogen Fertiliser Used	
Supplied Days	261		

Milk Quality

Average SCC		Grade Free Award Eligibility	
Demerit Days		Achievement Award Eligibility	
Demerit Points			

Submission Details

Submission Source		Sustainable Dairy Records	
		Submission Type	

System Information

Created By	integration, 11/03/2016 5:43 AM	Last Modified By	integration, 1/08/2018 11:45 AM

Farm Season History

13/04/2018 1:45 PM

User **integration**
Action **Changed**

2/09/2016 12:45 PM

User **integration**
Action **Changed**

6/06/2016 7:07 PM

User **integration**
Action **Changed**

11/03/2016 5:43 AM

User **integration**
Action **Created.**

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2016/2017

Name	2016/2017	Reference Period Status	Past
Farm	32650		

Farm Metrics

Total Hectares	170	Dairy Hectares	155
Peak Cows		KgMS	287,773
Supplementary Feed Used		Cows Grazed Off Farm	
Fodder Crops Grown		Nitrogen Fertiliser Used	
Supplied Days	273		

Milk Quality

Average SCC		Grade Free Award Eligibility	
Demerit Days		Achievement Award Eligibility	
Demerit Points			

Submission Details

Submission Source		Sustainable Dairy Records	
		Submission Type	

System Information

Created By	integration, 11/03/2016 5:44 AM	Last Modified By	integration, 29/06/2018 5:11 PM

Farm Season History

13/04/2018 10:27 AM

User **integration**
Action **Changed**

6/06/2017 1:08 PM

User **integration**
Action **Changed**

8/08/2016 12:35 PM

User **Rika West**
Action **Changed**

11/03/2016 5:44 AM

User **integration**
Action **Created.**

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2016/2017

Name	2016/2017	Reference Period Status	Past
Farm	32651		

Farm Metrics

Total Hectares	235	Dairy Hectares	232
Peak Cows		KgMS	387.617
Supplementary Feed Used		Cows Grazed Off Farm	
Fodder Crops Grown		Nitrogen Fertiliser Used	
Supplied Days	271		

Milk Quality

Average SCC		Grade Free Award Eligibility	
Demerit Days		Achievement Award Eligibility	
Demerit Points			

Submission Details

Submission Source		Sustainable Dairy Records	
		Submission Type	

System Information

Created By	integration, 11/03/2016 5:43 AM	Last Modified By	integration, 1/08/2018 11:45 AM

Farm Season History

13/04/2018 10:27 AM

User **integration**
Action **Changed**

6/06/2017 1:08 PM

User **integration**
Action **Changed**

9/11/2016 8:52 AM

User **integration**
Action **Changed**

11/03/2016 5:43 AM

User **integration**
Action **Created.**

			Year	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	Total
60848385 DE WOLDE GROUP HOLDING ACCOUNT				**34.622**	**59.803**	**44.586**	**67.289**	**65.693**	**287.691**	**19.161**	**40.050**	**19.400**	**5.830**	**644.125**
60842384 WOLDWIDE ONE LTD - DE WOLDE A & J J	0001110	SODIUM MOLYBDATE BAGS 25KG	2015-16			0.015								**0.015**
	0001210	BORATE 46 GRANULAR	2013-14						0.090					**0.090**
			2015-16				0.083							**0.083**
	0002510	SELENIUM SELPRILL DOUBLE 2%SE	2013-14	0.076										**0.076**
			2015-16		0.040	0.035			0.006					**0.081**
			2016-17					0.006		0.003				**0.009**
			2017-18		0.092									**0.092**
	0300000	AGLIME	2013-14				3.005		55.824	1.360				**60.189**
			2017-18						59.559					**59.559**
	1000000	SUPERPHOSPHATE BULK	2013-14	22.547			3.005							**25.552**
			2015-16		12.024	10.330	12.246	7.457	5.887					**47.944**
			2016-17					12.516	18.607	2.633				**33.756**
			2017-18					5.893	79.069					**84.762**
	1890000	SULPHUR SUPER 30 BULK	2013-14						8.676					**8.676**
	2000000	POTASSIUM CHLORIDE GRAN BULK	2013-14						4.338					**4.338**
			2015-16				3.394	1.864	0.655					**5.913**
			2016-17					2.158	4.017	0.293				**6.468**
			2017-18					0.633	7.454					**8.087**
	3000000	CROPMASTER DAP BULK	2013-14						13.792	0.085				**13.877**
			2015-16				1.583							**1.583**
	4000000	GRANULAR AMMONIUM SULP BULK	2016-17		7.120									**7.120**
			2017-18		8.733									**8.733**
	4050000	PASTORAL AMMONIUM SULPHATE	2013-14						2.335	0.255				**2.590**
	4300000	UREA BULK	2013-14	11.999		6.000	7.120	4.650	3.100		7.870	7.460	3.350	**51.549**
			2015-16		8.016	18.106	2.730	3.370	5.743	6.850	5.850			**50.665**
			2016-17		10.680	7.200	5.890	8.530		7.682	6.260	6.440		**52.482**
			2017-18		13.098	2.900	22.630	12.875			20.070	5.500	2.480	**79.553**
	4340000	FLEXI-N	2015-16				5.803	3.500						**9.303**
			2016-17					2.441	6.626					**9.067**
			2017-18						11.913					**11.913**
	Total			**34.622**	**59.803**	**44.586**	**67.289**	**65.693**	**287.691**	**19.161**	**40.050**	**19.400**	**5.830**	**644.125**

Parent	Parent Total		2013-14	2015-16	2016-17	2017-18	Total
60848385	DE WOLDE GROUP HOLDING ACCOUNT		166.937	115.587	108.902	252.699	644.125
	0001110	SODIUM MOLYBDATE BAGS 25KG		0.015			0.015
	0001210	BORATE 46 GRANULAR	0.090	0.083			0.173
	0002510	SELENIUM SELPRILL DOUBLE 2%SE	0.076	0.081	0.009	0.092	0.258
	0300000	AGLIME	60.189			59.559	119.748
	1000000	SUPERPHOSPHATE BULK	25.552	47.944	33.756	84.762	192.014
	1890000	SULPHUR SUPER 30 BULK	8.676				8.676
	2000000	POTASSIUM CHLORIDE GRAN BULK	4.338	5.913	6.468	8.087	24.806
	3000000	CROPMASTER DAP BULK	13.877	1.583			15.460
	4000000	GRANULAR AMMONIUM SULP BULK			7.120	8.733	15.853
	4050000	PASTORAL AMMONIUM SULPHATE	2.590				2.590
	4300000	UREA BULK	51.549	50.665	52.482	79.553	234.249
	4340000	FLEXI-N		9.303	9.067	11.913	30.283
	Total		166.937	115.587	108.902	252.699	644.125

			Year	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	Total
60848385 DE WOLDE GROUP HOLDING ACCOUNT				**45.612**	**90.677**	**43.282**	**79.720**	**68.036**	**337.372**	**50.340**	**58.900**	**28.660**	**6.250**	**808.849**
60842385 WOLDWIDE TWO LTD - DE WOLDE A & J J	0001110	SODIUM MOLYBDATE BAGS 25KG	2015-16			0.022								**0.022**
	0001210	BORATE 46 GRANULAR	2013-14						0.135					**0.135**
			2015-16				0.100							**0.100**
	0002510	SELENIUM SELPRILL DOUBLE 2%SE	2013-14	0.100										**0.100**
			2015-16		0.080	0.015			0.007					**0.102**
			2016-17					0.003						**0.003**
			2017-18		0.103									**0.103**
	0300000	AGLIME	2013-14				4.365		73.545					**77.910**
			2017-18						44.745	1.323				**46.068**
	1000000	SUPERPHOSPHATE BULK	2013-14	29.657			4.365							**34.022**
			2015-16		23.731	4.503	1.520	7.720	6.925					**44.399**
			2016-17					8.788	26.858					**35.646**
			2017-18					5.198	82.230	1.387				**88.815**
	1890000	SULPHUR SUPER 30 BULK	2013-14						12.215					**12.215**
	2000000	POTASSIUM CHLORIDE GRAN BULK	2013-14						6.108					**6.108**
			2015-16				3.330	1.430	0.769					**5.529**
			2016-17					1.555	6.381					**7.936**
			2017-18					0.578	13.609	10.345				**24.532**
	3000000	CROPMASTER DAP BULK	2013-14						19.100					**19.100**
			2015-16				1.900							**1.900**
	4000000	GRANULAR AMMONIUM SULP BULK	2015-16				3.774	3.666	1.050					**8.490**
			2016-17		10.597									**10.597**
			2017-18		9.780									**9.780**
	4050000	PASTORAL AMMONIUM SULPHATE	2013-14						2.341					**2.341**
	4300000	UREA BULK	2013-14	15.855		8.000	10.250	6.260	4.150		12.470	8.380	5.010	**70.375**
			2015-16		15.821	16.122	11.766	6.969	12.789	13.200	12.060	2.000		**90.727**
			2016-17		15.895	10.520	13.670	9.365	2.310	11.380	10.970	9.650		**83.760**
			2017-18		14.670	4.100	20.180	12.035		12.440	23.400	8.630	1.240	**96.695**
	4340000	FLEXI-N	2015-16				4.500	2.680						**7.180**
			2016-17					1.789	8.721					**10.510**
			2017-18						13.384	0.265				**13.649**
	Total			**45.612**	**90.677**	**43.282**	**79.720**	**68.036**	**337.372**	**50.340**	**58.900**	**28.660**	**6.250**	**808.849**

Parent	Parent Total		2013-14	2015-16	2016-17	2017-18	Total
60848385	DE WOLDE GROUP HOLDING ACCOUNT		**222.306**	**158.449**	**148.452**	**279.642**	**808.849**
	0001110	SODIUM MOLYBDATE BAGS 25KG		0.022			**0.022**
	0001210	BORATE 46 GRANULAR	0.135	0.100			**0.235**
	0002510	SELENIUM SELPRILL DOUBLE 2%SE	0.100	0.102	0.003	0.103	**0.308**
	0300000	AGLIME	77.910			46.068	**123.978**
	1000000	SUPERPHOSPHATE BULK	34.022	44.399	35.646	88.815	**202.882**
	1890000	SULPHUR SUPER 30 BULK	12.215				**12.215**
	2000000	POTASSIUM CHLORIDE GRAN BULK	6.108	5.529	7.936	24.532	**44.105**
	3000000	CROPMASTER DAP BULK	19.100	1.900			**21.000**
	4000000	GRANULAR AMMONIUM SULP BULK		8.490	10.597	9.780	**28.867**
	4050000	PASTORAL AMMONIUM SULPHATE	2.341				**2.341**
	4300000	UREA BULK	70.375	90.727	83.760	96.695	**341.557**
	4340000	FLEXI-N		7.180	10.510	13.649	**31.339**
	Total		**222.306**	**158.449**	**148.452**	**279.642**	**808.849**

Ballance agri-nutrients

Prepared for (customer): WOLDWIDE ONE LTD (Cust No: 3100992)
Property: Woldwide One Ltd (Prop No: 4077982)
Recommendation: WW 1 Annual 2014/15 **Representative:** Latoya Grant
Date: 07/07/2014 **Phone:** 027 434-4423

Having considered all available data relevant to your property Ballance Agri-Nutrients recommends the following fertiliser to be applied

Block: Non-Effluent **Area (Ha): 113** **Usage: Dairy**

Application	Kg/Ha	Product	N	P	K	S	Mg	Ca	Na	% of Mix	Kg/T	$/Tonne (Prod)	Total $ (Prod)	Crt/Sprd ($/T)	$/Ha	Total $
			(Kg nutrient / ha)													
14/15 WW 1 Spring N & P - Non eff		**Merchant:** PGG Wrightson Otautau **Store:** Winton Consignment Store								**Delivery Date:** **Carrier:** **Spreader:**						
	150.000	Superten								70						
	65.000	Nrich Urea								30						
Tot App Rate/Ha:	**215.000**	**Total tonnes:** **24.295**	30	14	0	16	0	33	0	**100**		$404.67	$9,831.46	$0.00	$87.00	$9,831.46
14/15 WW 1 Nov - Maint. Non eff		**Merchant:** PGG Wrightson Otautau **Store:** Winton Consignment Store								**Delivery Date:** **Carrier:** **Spreader:**						
	450.000	Superten 10K								100						
	1.000	Selenium									2.22					
Tot App Rate/Ha:	**451.000**	**Total tonnes:** **50.963**	0	32	45	38	0	79	0	**100**		$411.82	$20,987.58	$0.00	$185.73	$20,987.58
14/15 WW 1 Seasonal N - Non Eff		**Merchant:** PGG Wrightson Otautau **Store:** Winton Consignment Store								**Delivery Date:** **Carrier:** **Spreader:**						
	430.000	SustaiN								100						
Tot App Rate/Ha:	**430.000**	**Total tonnes:** **48.590**	197	0	0	0	0	0	0	**100**		$666.00	$32,360.94	$0.00	$286.38	$32,360.94
		Block Analysis:	227	46	45	54	0	112	0	123.848 tonnes			$63,180.18			$63,179.98
		Maintenance:	0	0	0	0	0	0	0							

Block: Effluent Area (Ha): 36 Usage: Dairy

Application	Kg/Ha	Product	N	P	K	S	Mg	Ca	Na	% of Mix	Kg/T	$/Tonne (Prod)	Total $ (Prod)	Crt/Sprd ($/T)	$/Ha	Total $
			(Kg nutrient / ha)													
14/15 WW1 Spring N - Eff		**Merchant:** PGG Wrightson Otautau **Store:** Winton Consignment Store								**Delivery Date:** **Carrier:** **Spreader:**						
	150.000	Superten								70						
	65.000	Nrich Urea								30						
Tot App Rate/Ha:	**215.000**	**Total tonnes:** 7.740	30	14	0	16	0	33	0	100		$404.67	$3,132.15	$0.00	$87.00	$3,132.15
14/15 WW1 Nov Maint - Eff		**Merchant:** PGG Wrightson Otautau **Store:** Winton Consignment Store								**Delivery Date:** **Carrier:** **Spreader:**						
	200.000	Sulphurgain 20S								100						
	1.000	Selenium									4.98					
Tot App Rate/Ha:	**201.000**	**Total tonnes:** 7.236	0	16	0	40	0	40	0	100		$373.29	$2,701.13	$0.00	$75.03	$2,701.13
14/15 WW1 Seasonal N - Eff		**Merchant:** PGG Wrightson Otautau **Store:** Winton Consignment Store								**Delivery Date:** **Carrier:** **Spreader:**						
	250.000	SustaiN								100						
Tot App Rate/Ha:	**250.000**	**Total tonnes:** 9.000	115	0	0	0	0	0	0	100		$666.00	$5,994.00	$0.00	$166.50	$5,994.00
		Block Analysis:	145	30	0	56	0	73	0	23.976 tonnes			$11,827.33			$11,827.27
		Maintenance:	0	0	0	0	0	0	0							

Block: Turnips Area (Ha): 10 Usage:

Application	Kg/Ha	Product	N	P	K	S	Mg	Ca	Na	% of Mix	Kg/T	$/Tonne (Prod)	Total $ (Prod)	Crt/Sprd ($/T)	$/Ha	Total $
			(Kg nutrient / ha)													
2014/15 WW1 Turnips at sowing		**Merchant:** PGG Wrightson Otautau **Store:** Winton Consignment Store								Delivery Date: Carrier: Spreader:						
	250.000	Cropzeal Boron Boost								100						
	1.000	Selenium									3.98					
Tot App Rate/Ha:	**251.000**	**Total tonnes: 2.510**	41	49	0	0	0	0	0	**100**		$917.66	$2,303.33	$0.00	$230.33	$2,303.33
2014/15 WW1 Turnip side dressing		**Merchant:** PGG Wrightson Otautau **Store:** Winton Consignment Store								Delivery Date: Carrier: Spreader:						
	150.000	SustaiN								100						
Tot App Rate/Ha:	**150.000**	**Total tonnes: 1.500**	69	0	0	0	0	0	0	**100**		$666.00	$999.00	$0.00	$99.90	$999.00
		Block Analysis:	110	49	0	0	0	0	0	4.010 tonnes			$3,302.32			$3,302.33
		Maintenance:	0	0	0	0	0	0	0							

Recommendation Totals:	**151.83 tonnes**	**$78,309.83**	**$78,309.58**

This is a fertiliser recommendation, not a quote. The prices shown are indicative only, and are exclusive of GST. On acceptance of a recommendation a sales order confirmation will be issued; this will show pricing on the day of issue. Fertiliser prices are subject to change; customers will be invoiced based on prices ruling on day of delivery

Our technical advice is given in good faith but without warranty. The application and use of products is beyond our control and we therefore do not warrant pasture, plant or crop performance to any specific level. In making recommendations we rely on information provided to us by the customer and/or third parties such as commercial analytical services. As an animal health precaution, do not allow livestock to graze pasture until fertiliser has disappeared from foliage. Mixes containing nitrogen can become unstable and should be applied either separately or immediately upon delivery. Please refer to the Fertiliser Codes of Practice with respect to both third party and environmental risk effects.

Stock fluoride poisoning (fluorosis) can occur following application of phosphate (P) fertilisers.

To minimise the risk of fluorosis, Ballance recommends that:

- Following application of P-fertiliser, pastures should not be grazed until at least 25 mm of rainfall has occurred, or sufficient time has elapsed so that no fertiliser residues are evident on the leaves of the pasture
- P-fertiliser application should be staggered so that there is feed available to stock at all times that is not contaminated with fertiliser residues

Should you choose to disregard the above principals, the fertiliser application practice you undertake is done so at your own risk. Managing P-fertiliser applications based on the following principals will reduce the risk of fluorosis, however, Ballance does not recommend application outside of the conditions outlined above.

- Application of P-fertilisers containing lower levels of fluoride will reduce the risk of fluorosis. For example, RPR and Superphosphate have higher fluoride levels than DAP and Triple super.
- Well-granulated fertiliser products are less likely to adhere to plant leaves
- Avoid applying P-fertilisers when the pasture is damp (e.g. on a morning dew)
- Low application rates (<200 kg/ha) will reduce the risk of fluorosis
- Defer P-fertiliser applications away from early spring when stock have high feed demand and are under stress, and where pasture covers are low.

Lime to go on Non-effluent only at 400kg/ha.

Ballance Agri-Nutrients

Prepared for (customer): WOLDWIDE TWO LTD (Cust No. 3100989)
Property: Woldwide Two Ltd (Prop No: 4077987)
Recommendation: WW 2 Annual 2014/15 **Representative:** Latoya Grant
Date: 07/07/2014 **Phone:** 027 434-4423

Having considered all available data relevant to your property Ballance Agri-Nutrients recommends the following fertiliser to be applied.

Block: Non-Effluent **Area (Ha): 207** **Usage: Dairy**

Application	Kg/Ha	Product	N	P	K	S	Mg	Ca	Na	% of Mix	Kg/T	$/Tonne (Prod)	Total $ (Prod)	Crt/Sprd ($/T)	$/Ha	Total $
			(Kg nutrient / ha)													
14/15 WW 2 Spring N and P - Non eff		**Merchant:** PGG Wrightson Otautau **Store:** Winton Consignment Store								Delivery Date: Carrier: Spreader:						
	150.000	Superten								70						
	65.000	Nrich Urea								30						
Tot App Rate/Ha:	**215.000**	**Total tonnes:** 44.505	30	14	0	16	0	33	0	**100**		$404.67	$18,009.84	$0.00	$87.00	$18,009.84
14/15 WW 2 Nov - Maint - Non eff		**Merchant:** PGG Wrightson Otautau **Store:** Winton Consignment Store								Delivery Date: Carrier: Spreader:						
	350.000	Sulphurgain 15S								85						
	60.000	Muriate Of Potash								15						
Tot App Rate/Ha:	**410.000**	**Total tonnes:** 84.870	0	30	30	52	0	74	0	**100**		$390.17	$33,113.73	$0.00	$159.97	$33,113.73
14/15 WW 2 Seasonal N - Non eff		**Merchant:** PGG Wrightson Otautau **Store:** Winton Consignment Store								Delivery Date: Carrier: Spreader:						
	430.000	SustaiN								100						
Tot App Rate/Ha:	**430.000**	**Total tonnes:** 89.010	197	0	0	0	0	0	0	**100**		$666.00	$59,280.66	$0.00	$286.38	$59,280.66
		Block Analysis:	227	44	30	68	0	107	0	218.385 tonnes			$110,404.40			$110,404.23
		Maintenance:	0	0	0	0	0	0	0							

Block: Effluent Area (Ha): 26 Usage: D

Application	Kg/Ha	Product	N	P	K	S	Mg	Ca	Na	% of Mix	Kg/T	$/Tonne (Prod)	Total $ (Prod)	Crt/Sprd ($/T)	$/Ha	Total $
			(Kg nutrient / ha)													
14/15 WW 2 Spring N & P - Eff		**Merchant:** PGG Wrightson Otautau **Store:** Winton Consignment Store								Delivery Date: Carrier: Spreader:						
	150.000	Superten								70						
	65.000	Nrich Urea								30						
Tot App Rate/Ha:	**215.000**	**Total tonnes:** 5.590	30	14	0	16	0	33	0	**100**		$404.67	$2,262.11	$0.00	$87.00	$2,262.11
14/15 WW 2 Nov - Maint - Eff		**Merchant:** PGG Wrightson Otautau **Store:** Winton Consignment Store								Delivery Date: Carrier: Spreader:						
	200.000	Sulphurgain 20S								100						
	1.000	Selenium									4.98					
Tot App Rate/Ha:	**201.000**	**Total tonnes:** 5.226	0	16	0	40	0	40	0	**100**		$373.29	$1,950.81	$0.00	$75.03	$1,950.81
14/15 WW 2 Seasonal N - Eff		**Merchant:** PGG Wrightson Otautau **Store:** Winton Consignment Store								Delivery Date: Carrier: Spreader:						
	300.000	SustaiN								100						
Tot App Rate/Ha:	**300.000**	**Total tonnes:** 7.800	138	0	0	0	0	0	0	**100**		$666.00	$5,194.80	$0.00	$199.80	$5,194.80
		Block Analysis:	168	30	0	56	0	73	0	18.616 tonnes			$9,407.76			$9,407.72
		Maintenance:	0	0	0	0	0	0	0							

Block: Turnips Area (Ha): 10 Usage:

Application	Kg/Ha	Product	N	P	K	S	Mg	Ca	Na	% of Mix	Kg/T	$/Tonne (Prod)	Total $ (Prod)	Crt/Sprd ($/T)	$/Ha	Total $
			(Kg nutrient / ha)													
14/15 WW 2 Turnips - At sowing		**Merchant:** PGG Wrightson Otautau **Store:** Winton Consignment Store								Delivery Date: Carrier: Spreader:						
	250.000	Cropzeal Boron Boost								100						
	1.000	Selenium									3.98					
Tot App Rate/Ha:	**251.000**	**Total tonnes:** 2.510	41	49	0	0	0	0	0	100		$917.66	$2,303.33	$0.00	$230.33	$2,303.33
14/15 WW 2 Turnips - Side		**Merchant:** PGG Wrightson Otautau **Store:** Winton Consignment Store								Delivery Date: Carrier: Spreader:						
	150.000	SustaiN								100						
Tot App Rate/Ha:	**150.000**	**Total tonnes:** 1.500	69	0	0	0	0	0	0	100		$666.00	$999.00	$0.00	$99.90	$999.00
		Block Analysis:	110	49	0	0	0	0	0	4.010 tonnes			$3,302.32			$3,302.33
		Maintenance:	0	0	0	0	0	0	0							

Recommendation Totals:	**241.01 tonnes**	**$123,114.48**	**$123,114.28**

This is a fertiliser recommendation, not a quote. The prices shown are indicative only, and are exclusive of GST. On acceptance of a recommendation a sales order confirmation will be issued; this will show pricing on the day of issue. Fertiliser prices are subject to change; customers will be invoiced based on prices ruling on day of delivery

Our technical advice is given in good faith but without warranty. The application and use of products is beyond our control and we therefore do not warrant pasture, plant or crop performance to any specific level. In making recommendations we rely on information provided to us by the customer and/or third parties such as commercial analytical services. As an animal health precaution, do not allow livestock to graze pasture until fertiliser has disappeared from foliage. Mixes containing nitrogen can become unstable and should be applied either separately or immediately upon delivery. Please refer to the Fertiliser Codes of Practice with respect to both third party and environmental risk effects

Stock fluoride poisoning (fluorosis) can occur following application of phosphate (P) fertilisers.

To minimise the risk of fluorosis, Ballance recommends that

- Following application of P-fertiliser, pastures should not be grazed until at least 25 mm of rainfall has occurred, or sufficient time has elapsed so that no fertiliser residues are evident on the leaves of the pasture
- P-fertiliser application should be staggered so that there is feed available to stock at all times that is not contaminated with fertiliser residues

Should you choose to disregard the above principals, the fertiliser application practice you undertake is done so at your own risk. Managing P-fertiliser applications based on the following principals will reduce the risk of fluorosis, however, Ballance does not recommend application outside of the conditions outlined above

- Application of P-fertilisers containing lower levels of fluoride will reduce the risk of fluorosis. For example, RPR and Superphosphate have higher fluoride levels than DAP and Triple super.
- Well-granulated fertiliser products are less likely to adhere to plant leaves
- Avoid applying P-fertilisers when the pasture is damp (e.g. on a morning dew)
- Low application rates (<200 kg/ha) will reduce the risk of fluorosis
- Defer P-fertiliser applications away from early spring when stock have high feed demand and are under stress, and where pasture covers are low

Lime on Non-Effluent area only at 400kg/ha.

Block: Fodder Beet Wintering 3 Area (Ha): 3 Usage:

Application	Kg/Ha	Product	N	P	K	S	Mg	Ca	Na	% of Mix	Kg	$/Tonne (Prod)	Total $ (Prod)	Crt/Sprd ($/T)	$/Ha	Total $
			(Kg nutrient / ha)													
Base Dressing		**Merchant:** PGG Wrightson Otautau **Store:** Winton Consignment Store								**Delivery Date:** **Carrier:** **Spreader:**						
	400.000	Cropzeal 16N								76						
	100.000	Agriculture Coarse Salt 1200kg								19						
	25.000	Boron 15%									47.62					
Tot App Rate/Ha:	**525.000**	**Total tonnes: 1.575**	62	32	40	38	0	0	39	**95**		**$726.52**	**$1,144.27**	**$0.00**	**$381.42**	**$1,144.27**
Side Dressing - Jan		**Merchant:** PGG Wrightson Otautau **Store:** Winton Consignment Store								**Delivery Date:** **Carrier:** **Spreader:**						
	200.000	SustaiN 20K								100						
Tot App Rate/Ha:	**200.000**	**Total tonnes: 0.600**	55	0	40	0	0	0	0	**100**		**$706.00**	**$423.60**	**$0.00**	**$141.20**	**$423.60**
Side Dressing - Mar		**Merchant:** PGG Wrightson Otautau **Store:** Winton Consignment Store								**Delivery Date:** **Carrier:** **Spreader:**						
	100.000	SustaiN								100						
Tot App Rate/Ha:	**100.000**	**Total tonnes: 0.300**	46	0	0	0	0	0	0	**100**		**$684.00**	**$205.20**	**$0.00**	**$68.40**	**$205.20**
		Block Analysis:	**163**	**32**	**80**	**38**	**0**	**0**	**39**	**2.475 tonnes**			**$1,773.07**			**$1,773.07**
		Maintenance:	**0**	**0**	**0**	**0**	**0**	**0**	**0**							

Recommendation Totals:	**268.18 tonnes**	**$139,650.23**	**$139,650.19**

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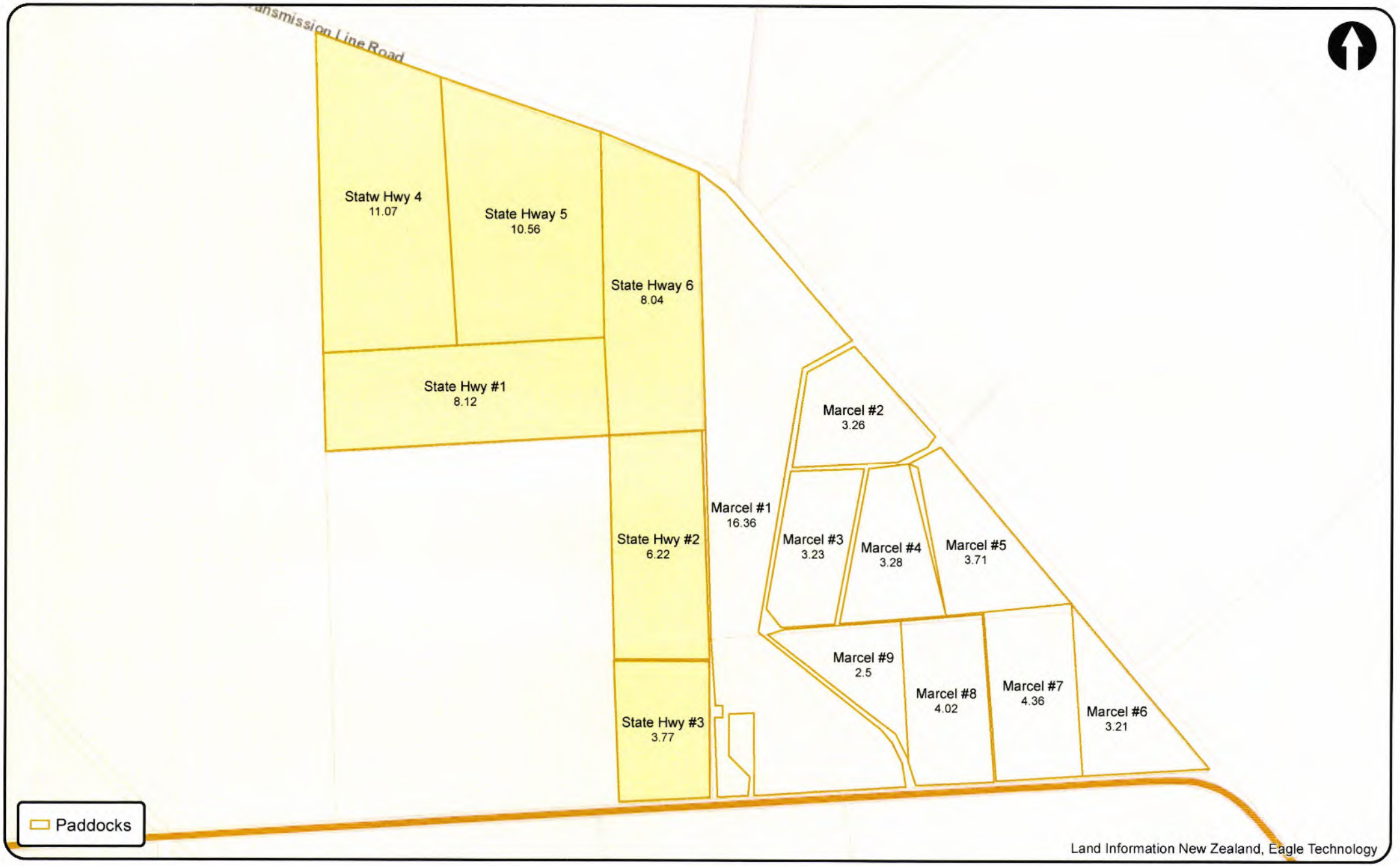
- Defer P-fertiliser applications away from early spring when stock have high feed demand and are under stress, and where pasture covers are low

Maintenance Lime should be applied to the Non-effluent area only at 400kg/ha.



My Ravensdown Smart Maps
www.myravensdown.co.nz
Note: Areas are in hectares

SH96 map

0 55 110 220 330 440 Metres

ravensdown

28 May 2018

Nutrient summary report

WOLDWIDE FARM LTD - 60842383

Query range : 01 Jun 2013 to 28 May 2018

Name	Date	Area (ha)	Product	Rate (kg/ha or l/ha)	N kg/ha	P kg/ha	K kg/ha	S kg/ha	Ca kg/ha	Mg kg/ha
State Hway 5	01/04/2014	10.1	Urea	89	41	-	-	-	-	-
	02/09/2014	10.2	Non-Ravensdown product *	538	-	-	-	-	-	-
	18/09/2014	10.2	BAN-Urea	110	50	-	-	-	-	-
	29/10/2014	10.2	BAN-Urea	161	74	-	-	-	-	-
	30/12/2014	10.1	BAN-HIGH ANALYSIS *	213	-	-	-	-	-	-
	18/02/2015	10.2	NON-RAVENSDOWN PRODUCT *	108	-	-	-	-	-	-
	04/04/2015	10.2	BAN-Urea	80	37	-	-	-	-	-
	02/09/2015	10.1	Ammo 36 + Sel	150	53	-	-	14	-	-
	23/09/2015	10.1	Urea	156	72	-	-	-	-	-
	22/10/2015	9.9	POST SILAGE	377	71	9	51	11	20	9
	17/11/2015	10.1	UREA	79	36	-	-	-	-	-
	10/12/2015	10.1	CUT 2 DRESSING	670	66	9	51	11	131	8
	02/02/2016	10.2	UREA	160	74	-	-	-	-	-
	24/03/2016	10	20 POT SUP FLEXI-N	291	33	15	21	19	34	4
	31/08/2016	9.8	UREA	70	32	-	-	-	-	-
	18/10/2016	10	Marcel Post 1st cut	375	100	21	32	14	-	-
	07/12/2016	0.5	Marcel post 2nd Cut	315	76	20	30	13	-	-
	09/12/2016	10	SH96/Horner 2nd Post Cut	214	33	12	-	15	27	4

	30/01/2017	9.7	Gladfield Post 3rd Cut	240	49	22	33	1	-	-
	21/03/2017	9.8	Urea	106	49	-	-	-	-	-
	Area weighted total				**831**	**84**	**179**	**81**	**202**	**24**
State Hway 6	01/04/2014	7.4	Urea	90	41	-	-	-	-	-
	02/09/2014	7.7	Non-Ravensdown product *	543	-	-	-	-	-	-
	18/09/2014	7.8	BAN-Urea	112	52	-	-	-	-	-
	29/10/2014	7.6	BAN-Urea	158	73	-	-	-	-	-
	30/12/2014	7.6	BAN-HIGH ANALYSIS *	213	-	-	-	-	-	-
	18/02/2015	7.6	NON-RAVENSDOWN PRODUCT *	109	-	-	-	-	-	-
	04/04/2015	7.6	BAN-Urea	80	37	-	-	-	-	-
	27/10/2015	7.5	FODDER BEET	1336	-	24	-	29	438	-
	29/10/2015	7.7	FODDERBEET STARTER	682	17	12	70	9	-	-
	25/10/2016	7.7	WINTON FB BASE MIX 2016	614	62	39	92	34	-	1
	06/12/2016	7.7	4 - 6 WEEK DRESSING	252	75	-	38	-	-	-
	02/11/2017	7.8	WINTON FB BASE MIX 2017	632	64	40	95	35	-	1
	02/11/2017	7.5	AGLIME	1057	-	-	-	-	380	-
	Area weighted total				**402**	**110**	**284**	**102**	**765**	**2**
State Hwy #1	01/04/2014	7.8	Urea	88	41	-	-	-	-	-
	02/09/2014	7.9	Non-Ravensdown product *	511	-	-	-	-	-	-
	18/09/2014	8	BAN-Urea	101	47	-	-	-	-	-
	29/10/2014	8	BAN-Urea	158	73	-	-	-	-	-

	30/12/2014	7.9	BAN-HIGH ANALYSIS *	206	-	-	-	-	-	-
	18/02/2015	8	NON-RAVENSDOWN PRODUCT *	102	-	-	-	-	-	-
	04/04/2015	8	BAN-Urea	76	35	-	-	-	-	-
	02/09/2015	7.5	Ammo 36 + Sel	145	52	-	-	14	-	-
	23/09/2015	7.8	Urea	149	69	-	-	-	-	-
	22/10/2015	7.5	POST SILAGE	390	74	10	53	12	21	9
	17/11/2015	7.9	UREA	81	37	-	-	-	-	-
	10/12/2015	8	CUT 2 DRESSING	682	67	9	52	11	133	8
	02/02/2016	7.9	UREA	165	76	-	-	-	-	-
	24/03/2016	7.9	20 POT SUP FLEXI-N	284	32	15	21	18	33	4
	31/08/2016	7.9	UREA	70	32	-	-	-	-	-
	18/10/2016	7.8	Marcel Post 1st cut	368	98	21	31	13	-	-
	09/12/2016	7.9	SH96/Horner 2nd Post Cut	216	33	12	-	15	27	4
	30/01/2017	7.9	Gladfield Post 3rd Cut	224	46	20	30	1	-	-
	21/03/2017	7.9	Urea	103	48	-	-	-	-	-
	Area weighted total				**827**	**84**	**179**	**81**	**209**	**25**
State Hwy #2	05/08/2013	5.5	SMIX	302	62	15	-	18	34	-
	23/10/2013	6.1	Other Product *	1427	-	-	-	-	-	-
	23/10/2013	6.1	Other Product *	1427	-	-	-	-	-	-
	20/11/2013	6.1	Urea	320	147	-	-	-	-	-
	01/04/2014	6	EX BARLEY S.H.96	727	49	43	69	53	96	-
	18/09/2014	6.1	BAN-Urea	85	39	-	-	-	-	-
	05/11/2014	5.8	BAN-High Analysis *	657	-	-	-	-	-	-
	31/08/2016	5.7	UREA	70	32	-	-	-	-	-

	18/10/2016	6	Marcel Post 1st cut	354	94	20	30	13	-	-
	09/12/2016	5.9	SH96/Horner 2nd Post Cut	218	34	12	-	15	27	4
	Area weighted total				**438**	**86**	**96**	**94**	**149**	**4**
State Hwy #3	30/07/2013	3.5	Urea	132	61	-	-	-	-	-
	23/10/2013	3.6	Other Product *	1457	-	-	-	-	-	-
	23/10/2013	3.6	Other Product *	1457	-	-	-	-	-	-
	20/11/2013	3.5	Urea	331	152	-	-	-	-	-
	01/04/2014	3.5	EX BARLEY S.H.96	759	51	45	73	55	100	-
	18/09/2014	3.6	BAN-Urea	86	40	-	-	-	-	-
	05/11/2014	3.3	BAN-High Analysis *	676	-	-	-	-	-	-
	31/08/2016	3.2	UREA	73	33	-	-	-	-	-
	18/10/2016	3.2	Marcel Post 1st cut	426	113	24	36	16	-	-
	09/12/2016	3.2	SH96/Horner 2nd Post Cut	224	35	13	-	15	28	4
	Area weighted total				**439**	**73**	**98**	**78**	**117**	**4**
Statw Hwy 4	01/04/2014	10.6	Urea	86	40	-	-	-	-	-
	02/09/2014	10.7	Non-Ravensdown product *	512	-	-	-	-	-	-
	18/09/2014	10.8	BAN-Urea	103	48	-	-	-	-	-
	29/10/2014	10.9	BAN-Urea	155	71	-	-	-	-	-
	30/12/2014	10.8	BAN-HIGH ANALYSIS *	206	-	-	-	-	-	-
	18/02/2015	10.9	NON-RAVENSDOWN PRODUCT *	108	-	-	-	-	-	-
	04/04/2015	10.9	BAN-Urea	80	37	-	-	-	-	-
	02/09/2015	10.8	Ammo 36 + Sel	148	53	-	-	14	-	-
	23/09/2015	10.9	Urea	148	68	-	-	-	-	-
	22/10/2015	10.7	POST SILAGE	399	75	10	54	12	22	9

	17/11/2015	10.9	UREA	78	36	-	-	-	-	-
	10/12/2015	10.9	CUT 2 DRESSING	665	65	9	51	11	130	8
	02/02/2016	10.9	UREA	159	73	-	-	-	-	-
	24/03/2016	10.8	20 POT SUP FLEXI-N	275	31	14	20	18	32	4
	31/08/2016	10.7	UREA	66	30	-	-	-	-	-
	18/10/2016	10.9	Marcel Post 1st cut	361	96	20	31	13	-	-
	09/12/2016	10.8	SH96/Horner 2nd Post Cut	201	31	11	-	14	25	4
	30/01/2017	10.9	Gladfield Post 3rd Cut	240	49	22	33	1	-	-
	21/03/2017	10.9	Urea	101	47	-	-	-	-	-
	Area weighted total				**833**	**85**	**184**	**81**	**205**	**25**
Weighted average rate based on applied areas and rates for selected areas					**677**	**88**	**181**	**86**	**285**	**17**

Note: Total and average rates assume product applications cover effective area of paddock(s) selected.
This is dependent on positional accuracy of paddock boundaries
* The product that you have created, is missing nutrient values. This will affect any averages or totals in the Nutrient summary. Please go to the event concerned and add the nutrient values to the appropriate product.

Nutrient summary report

WOLDWIDE FARM LTD - 60842383

Query range : 01 Jun 2013 to 29 May 2018

Name	Date	Area (ha)	Product	Rate (kg/ha or l/ha)	N kg/ha	P kg/ha	K kg/ha	S kg/ha	Ca kg/ha	Mg kg/ha
Marcel #1	09/10/2013	15.5	Ag Lime *	1121	-	-	-	-	-	-
	21/10/2013	15.7	BARLEY STARTER	422	51	57	68	3	-	-
	20/11/2013	15.2	Urea	326	150	-	-	-	-	-
	01/04/2014	14.9	EX BARLEY S.H.96	746	50	44	71	54	99	-
	02/09/2014	15.5	Non-Ravensdown product *	566	-	-	-	-	-	-
	18/09/2014	15.6	BAN-Urea	109	50	-	-	-	-	-
	05/11/2014	14.9	BAN-High Analysis *	689	-	-	-	-	-	-
	14/10/2015	15.1	Cropmaster 15	402	60	40	40	31	-	-
	17/11/2015	15.3	UREA	230	106	-	-	-	-	-
	02/02/2016	15.2	UREA + 50% POT SUPER	492	75	15	82	18	33	-
	24/03/2016	15.7	20 POT SUP FLEXI-N	299	34	16	22	19	35	4
	19/08/2016	15.4	MARCEL	341	78	22	33	17	-	-
	30/08/2016	15	Urea/Potash	219	69	-	35	-	-	-
	18/10/2016	15.8	Marcel Post 1st cut	421	112	24	36	15	-	-
	07/12/2016	15.7	Marcel post 2nd Cut	367	89	23	35	15	-	-
	30/01/2017	15.5	Gladfield Post 3rd Cut	254	52	23	35	1	-	-
	21/03/2017	15.7	Urea	108	50	-	-	-	-	-
	27/09/2017	14.5	CROPMASTER DAP BULK	166	29	33	-	2	-	-

	02/11/2017	6.3	WINTON FB BASE MIX 2017	651	65	42	98	36	-	1
	02/11/2017	6.2	AGLIME	1063	-	-	-	-	383	-
	Area weighted total				**1019**	**295**	**466**	**178**	**299**	**4**
Marcel #2	05/08/2013	2.9	SMIX	291	59	15	-	18	32	-
	18/10/2013	3	MARCEL 1ST CUT	559	103	20	56	25	45	-
	09/12/2013	3.2	MARCEL POST 2ND CUT	452	124	23	56	1	-	-
	23/01/2014	3.1	POST 3RD CUT	632	67	33	61	40	73	-
	17/03/2014	3	Urea	72	33	-	-	-	-	-
	02/09/2014	3.1	Non-Ravensdown product *	560	-	-	-	-	-	-
	18/09/2014	3.1	BAN-Urea	112	51	-	-	-	-	-
	29/10/2014	3.1	Ban-Urea	272	125	-	-	-	-	-
	30/12/2014	3.2	BAN-HIGH ANALYSIS *	229	-	-	-	-	-	-
	18/02/2015	3.1	NON-RAVENSDOWN PRODUCT *	110	-	-	-	-	-	-
	04/04/2015	3.1	BAN-Urea	84	39	-	-	-	-	-
	01/10/2015	2.7	jzw - AMM SE	152	54	-	-	15	-	-
	27/10/2015	3.1	FODDER BEET	1319	-	24	-	29	432	-
	29/10/2015	3.1	FODDERBEET STARTER	716	18	12	73	9	-	-
	25/10/2016	3.1	WINTON FB BASE MIX 2016	642	65	41	97	35	-	1
	06/12/2016	3.2	4 - 6 WEEK DRESSING	256	77	-	39	-	-	-
	30/04/2018	3.1	UREA BULK	78	36	-	-	-	-	-
	Area weighted total				**801**	**158**	**366**	**160**	**545**	**1**
Marcel #3	05/08/2013	3	SMIX	281	57	14	-	17	31	-

	18/10/2013	3	MARCEL 1ST CUT	541	99	19	54	24	43	-
	09/12/2013	3.2	MARCEL POST 2ND CUT	486	133	24	61	1	-	-
	23/01/2014	3.1	POST 3RD CUT	625	66	32	60	40	72	-
	17/03/2014	3.1	Urea	80	37	-	-	-	-	-
	02/09/2014	3.1	Non-Ravensdown product *	570	-	-	-	-	-	-
	18/09/2014	3	BAN-Urea	110	50	-	-	-	-	-
	29/10/2014	3.1	Ban-Urea	276	127	-	-	-	-	-
	30/12/2014	3.2	BAN-HIGH ANALYSIS *	243	-	-	-	-	-	-
	18/02/2015	3.1	NON-RAVENSDOWN PRODUCT *	105	-	-	-	-	-	-
	04/04/2015	3.1	BAN-Urea	91	42	-	-	-	-	-
	01/10/2015	3.1	jzw - AMM SE	169	60	-	-	16	-	-
	27/10/2015	3.1	FODDER BEET	1328	-	24	-	29	436	-
	29/10/2015	3.1	FODDERBEET STARTER	684	17	12	70	9	-	-
	25/10/2016	3.1	WINTON FB BASE MIX 2016	675	68	43	102	37	-	1
	06/12/2016	3.2	4 - 6 WEEK DRESSING	259	78	-	39	-	-	-
	30/04/2018	3.1	UREA BULK	78	36	-	-	-	-	-
	Area weighted total				**836**	**163**	**374**	**166**	**558**	**1**
Marcel #4	05/08/2013	3.2	SMIX	306	63	15	-	19	34	-
	18/10/2013	3.1	MARCEL 1ST CUT	563	103	20	56	25	45	-
	09/12/2013	3.3	MARCEL POST 2ND CUT	490	134	24	61	1	-	-
	23/01/2014	3.2	POST 3RD CUT	649	69	34	62	41	75	-
	17/03/2014	3.2	Urea	73	34	-	-	-	-	-

	02/09/2014	3.2	Non-Ravensdown product *	558	-	-	-	-	-	-
	18/09/2014	3.2	BAN-Urea	119	55	-	-	-	-	-
	29/10/2014	3.2	Ban-Urea	304	140	-	-	-	-	-
	30/12/2014	3.2	BAN-HIGH ANALYSIS *	227	-	-	-	-	-	-
	18/02/2015	3	NON-RAVENSDOWN PRODUCT *	122	-	-	-	-	-	-
	04/04/2015	3	BAN-Urea	94	43	-	-	-	-	-
	01/10/2015	2.8	jzw - AMM SE	168	60	-	-	16	-	-
	27/10/2015	3.2	FODDER BEET	1451	-	26	-	32	476	-
	29/10/2015	3.2	FODDERBEET STARTER	706	18	12	72	9	-	-
	25/10/2016	3.3	WINTON FB BASE MIX 2016	675	68	43	102	37	-	1
	06/12/2016	3.3	4 - 6 WEEK DRESSING	260	78	-	40	-	-	-
	30/04/2018	3.2	UREA BULK	75	35	-	-	-	-	-
	Area weighted total				**871**	**172**	**387**	**175**	**615**	**1**
Marcel #5	05/08/2013	3.4	SMIX	305	62	15	-	19	34	-
	18/10/2013	3.4	MARCEL 1ST CUT	595	109	21	59	26	48	-
	09/12/2013	3.5	MARCEL POST 2ND CUT	467	128	23	58	1	-	-
	23/01/2014	3.6	POST 3RD CUT	678	72	35	65	43	78	-
	17/03/2014	3.4	Urea	75	34	-	-	-	-	-
	02/09/2014	3.6	Non-Ravensdown product *	591	-	-	-	-	-	-
	18/09/2014	3.5	BAN-Urea	112	51	-	-	-	-	-
	29/10/2014	3.4	Ban-Urea	293	135	-	-	-	-	-

	30/12/2014	3.4	BAN-HIGH ANALYSIS *	232	-	-	-	-	-	-
	18/02/2015	3.4	NON-RAVENSDOWN PRODUCT *	110	-	-	-	-	-	-
	04/04/2015	3.5	BAN-Urea	82	38	-	-	-	-	-
	01/10/2015	3.4	jzw - AMM SE	150	53	-	-	14	-	-
	27/10/2015	3.4	FODDER BEET	1307	-	24	-	29	429	-
	29/10/2015	3.5	FODDERBEET STARTER	745	19	13	76	10	-	-
	25/10/2016	3.5	WINTON FB BASE MIX 2016	630	63	40	95	34	-	1
	06/12/2016	3.5	4 - 6 WEEK DRESSING	241	72	-	37	-	-	-
	30/04/2018	3.5	UREA BULK	78	36	-	-	-	-	-
	Area weighted total				**811**	**160**	**366**	**164**	**538**	**1**
Marcel #6	05/08/2013	2.9	SMIX	303	62	15	-	18	34	-
	06/11/2013	2.8	Cropmaster 15	273	41	27	27	21	-	-
	10/01/2014	3	Urea	169	78	-	-	-	-	-
	03/12/2014	3	Non-Ravensdown product *	332	-	-	-	-	-	-
	06/01/2015	3	BAN-Urea	201	92	-	-	-	-	-
	14/10/2015	3.1	Cropmaster 15	410	61	41	41	32	-	-
	17/11/2015	3.1	UREA	218	100	-	-	-	-	-
	02/02/2016	3.1	UREA + 50% POT SUPER	485	74	15	81	18	32	-
	24/03/2016	3	20 POT SUP FLEXI-N	294	33	15	21	19	34	4
	19/08/2016	2.9	MARCEL	344	79	22	33	17	-	-
	30/08/2016	2.9	Urea/Potash	203	64	-	32	-	-	-
	18/10/2016	3.1	Marcel Post 1st cut	448	119	25	38	16	-	-

	07/12/2016	3	Marcel post 2nd Cut	357	86	23	34	15	-	-
	30/01/2017	3	Gladfield Post 3rd Cut	237	49	22	32	1	-	-
	21/03/2017	3	Urea	106	49	-	-	-	-	-
	27/09/2017	2.9	CROPMASTER DAP BULK	158	28	32	-	2	-	-
	Area weighted total				**951**	**220**	**319**	**148**	**94**	**4**
Marcel #7	05/08/2013	4.2	SMIX	274	56	14	-	17	30	-
	06/11/2013	3.9	Cropmaster 15	249	38	25	25	19	-	-
	10/01/2014	4.1	Urea	149	68	-	-	-	-	-
	03/12/2014	4.1	Non-Ravensdown product *	304	-	-	-	-	-	-
	06/01/2015	4	BAN-Urea	149	69	-	-	-	-	-
	14/10/2015	4.2	Cropmaster 15	374	56	37	37	29	-	-
	17/11/2015	4.1	UREA	208	96	-	-	-	-	-
	02/02/2016	4.2	UREA + 50% POT SUPER	464	71	14	77	17	31	-
	24/03/2016	4.1	20 POT SUP FLEXI-N	288	32	15	21	18	33	4
	19/08/2016	4.1	MARCEL	332	76	21	32	16	-	-
	30/08/2016	4.1	Urea/Potash	199	63	-	31	-	-	-
	18/10/2016	4.1	Marcel Post 1st cut	394	105	22	33	14	-	-
	07/12/2016	4.1	Marcel post 2nd Cut	328	79	21	31	14	-	-
	30/01/2017	4.1	Gladfield Post 3rd Cut	236	49	21	32	1	-	-
	21/03/2017	4.1	Urea	103	47	-	-	-	-	-
	27/09/2017	4	CROPMASTER DAP BULK	165	29	33	-	2	-	-
	Area weighted total				**879**	**210**	**303**	**139**	**90**	**4**
Marcel #8	05/08/2013	3.8	SMIX	277	56	14	-	17	31	-

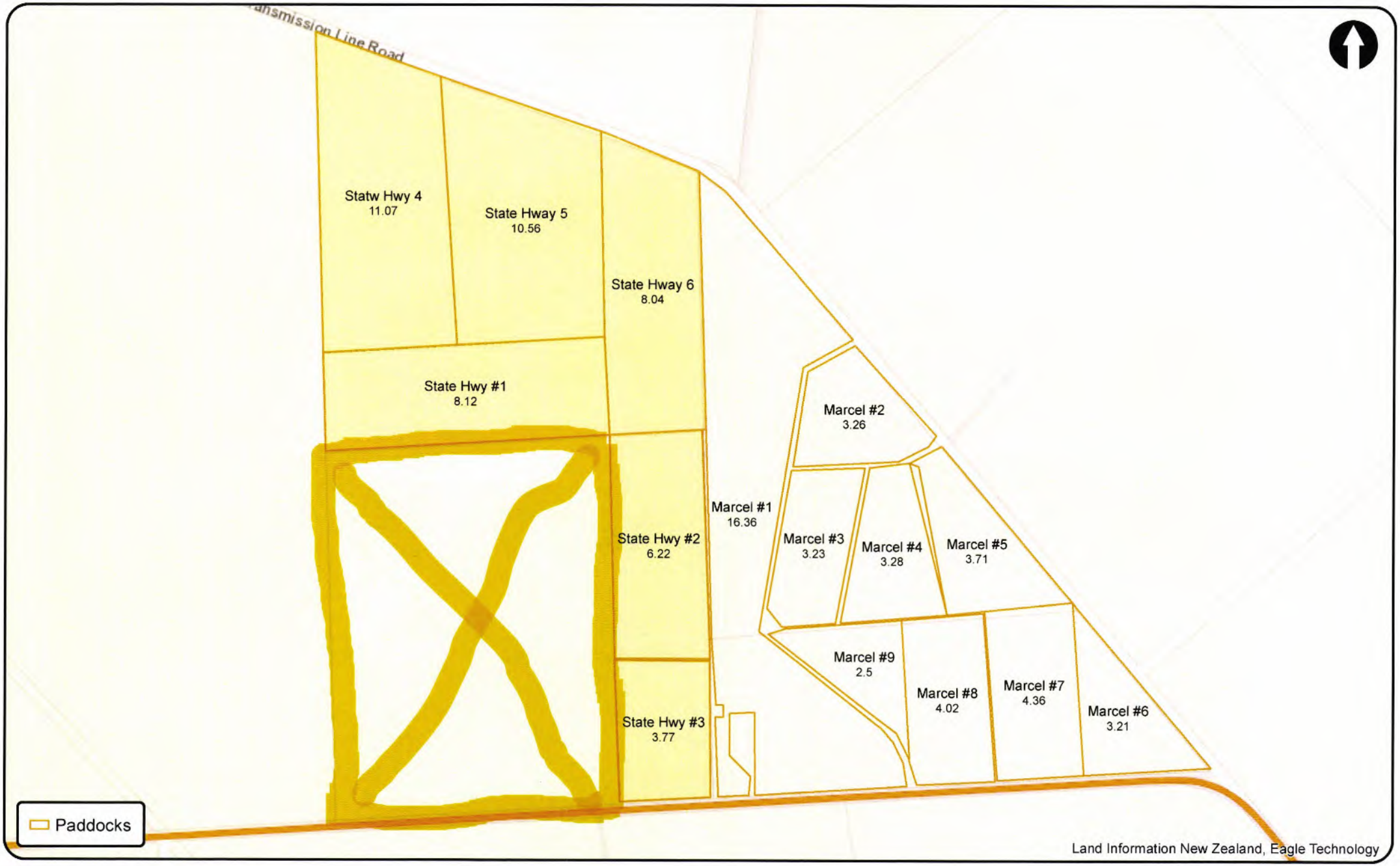
	06/11/2013	3.6	Cropmaster 15	265	40	26	26	20	-	-
	10/01/2014	3.8	Urea	158	73	-	-	-	-	-
	03/12/2014	3.8	Non-Ravensdown product *	321	-	-	-	-	-	-
	06/01/2015	3.8	BAN-Urea	157	72	-	-	-	-	-
	14/10/2015	3.9	Cropmaster 15	381	57	38	38	29	-	-
	17/11/2015	3.9	UREA	210	97	-	-	-	-	-
	02/02/2016	3.9	UREA + 50% POT SUPER	469	72	14	78	17	31	-
	24/03/2016	3.8	20 POT SUP FLEXI-N	293	33	15	21	19	34	4
	19/08/2016	3.8	MARCEL	328	75	21	32	16	-	-
	30/08/2016	3.8	Urea/Potash	206	65	-	32	-	-	-
	18/10/2016	3.9	Marcel Post 1st cut	386	103	22	33	14	-	-
	18/10/2016	0.3	Marcel Post 1st cut	355	95	20	30	13	-	-
	07/12/2016	3.9	Marcel post 2nd Cut	336	81	21	32	14	-	-
	30/01/2017	3.9	Gladfield Post 3rd Cut	240	49	22	33	1	-	-
	21/03/2017	3.9	Urea	106	49	-	-	-	-	-
	27/09/2017	3.7	CROPMASTER DAP BULK	174	31	35	-	2	-	-
	Area weighted total				**920**	**219**	**315**	**144**	**92**	**4**
Marcel #9	05/08/2013	2.2	SMIX	292	60	15	-	18	32	-
	06/11/2013	2.2	Cropmaster 15	293	44	29	29	23	-	-
	10/01/2014	2.3	Urea	169	78	-	-	-	-	-
	03/12/2014	2.3	Non-Ravensdown product *	358	-	-	-	-	-	-
	06/01/2015	2.3	BAN-Urea	186	85	-	-	-	-	-
	14/10/2015	2.3	Cropmaster 15	390	58	39	39	30	-	-
	17/11/2015	2.3	UREA	219	101	-	-	-	-	-

	02/02/2016	2.3	UREA + 50% POT SUPER	493	76	15	82	18	33	-
	24/03/2016	2.2	20 POT SUP FLEXI-N	320	36	17	23	20	37	5
	19/08/2016	2.2	MARCEL	334	77	21	32	17	-	-
	30/08/2016	2.2	Urea/Potash	229	72	-	36	-	-	-
	18/10/2016	2.1	Marcel Post 1st cut	435	116	25	37	16	-	-
	18/10/2016	0.5	Marcel Post 1st cut	402	107	23	34	15	-	-
	07/12/2016	2.3	Marcel post 2nd Cut	354	85	22	34	15	-	-
	30/01/2017	2.3	Gladfield Post 3rd Cut	263	54	24	36	1	-	-
	21/03/2017	2.3	Urea	115	53	-	-	-	-	-
	27/09/2017	1.7	CROPMASTER DAP BULK	165	29	33	-	2	-	-
	30/04/2018	0.3	UREA BULK	76	35	-	-	-	-	-
	Area weighted total				**940**	**214**	**322**	**146**	**93**	**4**
Weighted average rate based on applied areas and rates for selected areas					**928**	**229**	**389**	**163**	**314**	**3**

Note: Total and average rates assume product applications cover effective area of paddock(s) selected.

This is dependent on positional accuracy of paddock boundaries

* The product that you have created, is missing nutrient values. This will affect any averages or totals in the Nutrient summary. Please go to the event concerned and add the nutrient values to the appropriate product.



My Ravensdown Smart Maps
www.myravensdown.co.nz
Note: Areas are in hectares

SH96 map

0 55 110 220 330 440 Metres

ravensdown

28 May 2018

Cain Duncan

From: Kieran Anderson <Kieran.Anderson@ravensdown.co.nz>
Sent: Thursday, 14 June 2018 11:39 a.m.
To: Cain Duncan
Cc: Abe de Wolde
Subject: Woldwide farms fertiliser - 2013/14 season
Attachments: Parent Customer Sale Summary (7).xlsx

Gday Cain
Attached is report of fertiliser applied in the 2013/14 season under Woldwide farms which this block (X on map) was under then.
I have highlighted the fertiliser dispatched to the SH96 block which Abe confirmed this area was part of. This part (X) of the SH96 block was bang on 30ha. The numbers highlighted in orange are orders that correspond to 30ha orders (apart from the first order 17.3T). Mixes are as below. I am asking our spreading guys to look back into the archives of the spreading info to confirm these for me.
August mix 17.31T - Spread rate 270kg/ha area 64 ha – this mix would have gone across majority of SH96 block.

- 150kg/ha Superphosphate
- 120kg/ha Urea

October mix 11.5T - Spread rate 380kg/ha area 30ha – (the other 24T order on this month was at spread rate 500kg/ha – 48ha, so again the rest of the SH96 block)

- Urea 180kg/ha
- DAP 80kg/ha
- Potassium Chloride 100kg/ha

December mix 50.03T – spread rate 860kg/ha

- Lime 500kg/ha
- Urea 180kg/ha
- DAP 80kg/ha
- Potassium Chloride 100kg/ha

January mix 11.11T – Spread rate 370kg/ha

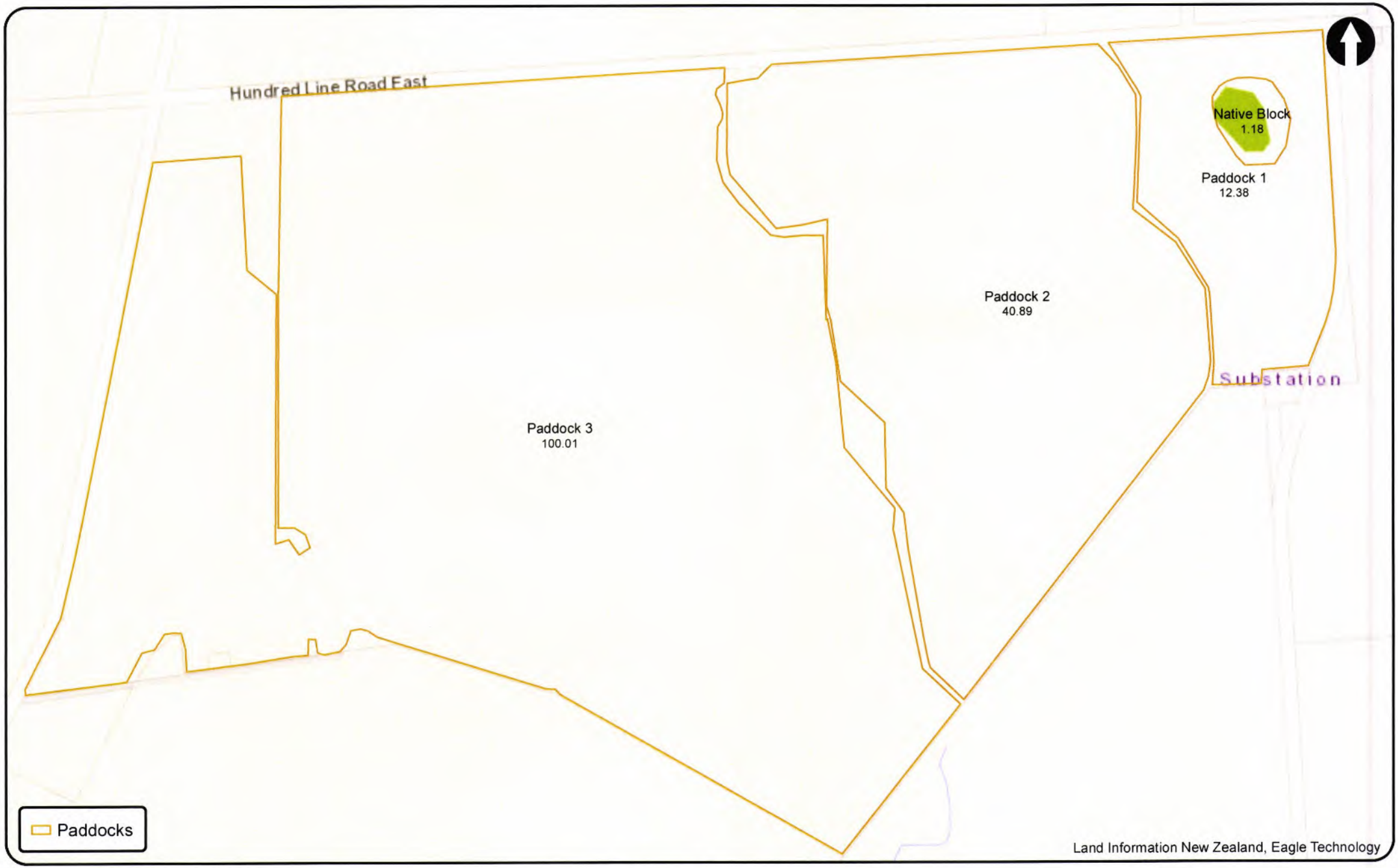
- Superphosphate 150kg/ha
- Urea 120kg/ha
- Potassium Chloride 100kg/ha

Hopefully this makes sense. Any questions let me know.

Cheers Kieran

Parent Customer Sale Transactions

	customer	Item #	Item Description	UOM	2013/14 Quantity Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	Total
TOTAL	**60848385**	**DE WOLDE GROUP HOLDING ACCOUNT**			**1**	**52**	**6**	**102**	**18**	**56**	**25**	**13**	**15**	**31**	**319**
Parent	**60848385**	**DE WOLDE GROUP HOLDING ACCOUNT**			**1**	**52**	**6**	**102**	**18**	**56**	**25**	**13**	**15**	**31**	**319**
	60842383	WOLDWIDE FARM LTD - DE WOLDE A & J J			1	52	6	102	18	56	25	13	15	31	319
		0001930	SODIUM CHLORIDE G22 COARSE SI	MT			1.20								1.20
		3004600	CROPMASTER DAP BORATE 46 BULK	MT					3.60	0.60					4.20
		4300000	UREA BULK	MT	0.50		4.30		14.52		2.61		14.81	4.45	41.19
		9343953	tzd - HORNER BLOCK	MT		34.67									34.67
		9343954	tzd - STATE HIGHWAY 96	MT		17.31									17.31
		9351967	SH96 Post 1st cut + Selinium	MT				24.01							24.01
		9352418	Barley Starter	MT				14.51							14.51
		9353255	SH96 Post 1st cut + Selinium	MT				11.50							11.50
		9353256	Post 1st Cut + Se	MT				41.12							41.12
		9353266	Marcel post 1st cut + Se	MT				7.00							7.00
		9353948	Barley Starter	MT				3.71							3.71
		9362544	Marcel Post 2nd Cut	MT						5.60					5.60
		9362546	Post 2nd Cut	MT						50.03					50.03
		9367391	SH96 Post 3rd Cut	MT							11.11				11.11
		9367406	Marcel Pasture - Post 3rd Cut	MT							7.33				7.33
		9367681	JXR - turnip mix pdk 8	MT							3.90				3.90
		9369651	EX WHOLE CROP FEB 2014	MT								13.29			13.29
		9374524	UNDER SOWN HORNERS CROP	MT										9.15	9.15
		9374532	EX BARLEY S.H.96	MT										17.71	17.71



My Ravensdown Smart Maps
www.myravensdown.co.nz
Note: Areas are in hectares

Woldwide Horner Block

0 45 90 180 270 360 Metres

ravensdown

26 July 2018

Nutrient summary report

WOLDWIDE FARM LTD - 60842383

Query range : 01 Jun 2016 to 26 Jul 2018

Name	Date	Area (ha)	Product	Rate (kg/ha or l/ha)	N kg/ha	P kg/ha	K kg/ha	S kg/ha	Ca kg/ha	Mg kg/ha
Paddock 1	18/08/2016	10.5	HORNER BLOCK	286	81	23	-	18	-	-
	31/08/2016	10.5	UREA	73	34	-	-	-	-	-
	11/10/2016	10.8	super / urea	408	70	23	-	28	51	-
	11/10/2016	10.9	Ag Lime	1069	-	-	-	-	385	-
	09/12/2016	10.4	SH96/Horner 2nd Post Cut	231	36	13	-	16	29	5
	31/01/2017	10.5	Gladfield Post 3rd Cut	241	50	22	33	1	-	-
	23/03/2017	10.7	UREA BULK	108	50	-	-	-	-	-
	15/08/2017	9.9	AMMO36 + SE	167	59	-	-	16	-	-
	07/09/2017	10.5	UREA BULK	108	50	-	-	-	-	-
	26/10/2017	8.8	Ag Lime	1545	-	-	-	-	556	-
	31/10/2017	10.5	POST DRESS CUT	387	103	22	33	14	-	-
	15/12/2017	10.6	GLadfield post 2nd Cut	336	81	21	32	13	-	-
	15/01/2018	10.3	UREA / SOA / KCL	217	61	-	27	12	-	-
	06/03/2018	10.6	POST HARVEST MIX	328	80	22	44	1	-	-
	09/04/2018	10.9	UREA BULK	118	54	-	-	-	-	-
	Area weighted total				**687**	**124**	**143**	**101**	**802**	**4**
Paddock 2	18/08/2016	39.2	HORNER BLOCK	271	77	22	-	17	-	-
	31/08/2016	38.7	UREA	71	32	-	-	-	-	-
	11/10/2016	39.7	super / urea	377	65	21	-	26	47	-

	12/10/2016	35.9	AGLIME	1045	-	-	-	-	376	-
	09/12/2016	38.9	SH96/Horner 2nd Post Cut	212	33	12	-	15	27	4
	31/01/2017	38.7	Gladfield Post 3rd Cut	234	48	21	32	1	-	-
	23/03/2017	39.8	UREA BULK	104	48	-	-	-	-	-
	15/08/2017	38	AMMO36 + SE	164	59	-	-	16	-	-
	07/09/2017	39.3	UREA BULK	106	49	-	-	-	-	-
	26/10/2017	3.2	AGLIME	1594	-	-	-	-	574	-
	26/10/2017	16.3	Ag Lime	1587	-	-	-	-	571	-
	26/10/2017	18.8	Ag Lime	1565	-	-	-	-	563	-
	15/01/2018	38.8	UREA / SOA / KCL	210	59	-	26	12	-	-
	06/03/2018	39.8	POST HARVEST MIX	312	76	21	42	1	-	-
	06/03/2018	0.1	POST HARVEST MIX	327	79	22	44	1	-	-
	10/04/2018	39.9	UREA BULK	107	49	-	-	-	-	-
	Area weighted total				**571**	**93**	**96**	**83**	**932**	**4**
Paddock 3	18/08/2016	95.1	HORNER BLOCK	268	76	21	-	16	-	-
	31/08/2016	96.2	UREA	70	32	-	-	-	-	-
	07/10/2016	46.4	SH96/Horner 1st Post Cut	379	59	21	-	26	47	7
	07/10/2016	49.2	SH96/Horner 1st Post Cut	395	61	22	-	27	49	8
	07/10/2016	38.5	Ag Lime	1027	-	-	-	-	370	-
	11/10/2016	18.6	Ag Lime	1060	-	-	-	-	382	-
	09/12/2016	96.2	SH96/Horner 2nd Post Cut	215	33	12	-	15	27	4
	31/01/2017	27.7	Gladfield Post 3rd Cut	228	47	21	31	1	-	-

	31/01/2017	67.2	Gladfield Post 3rd Cut	241	50	22	33	1	-	-
	23/03/2017	98.2	UREA BULK	105	48	-	-	-	-	-
	15/08/2017	37.6	AMMO36 + SE	159	57	-	-	15	-	-
	15/08/2017	57.9	AMMO36 + SE	160	57	-	-	15	-	-
	07/09/2017	97.7	UREA BULK	105	48	-	-	-	-	-
	26/10/2017	97.9	AGLIME	1564	-	-	-	-	563	-
	31/10/2017	3.3	POST DRESS CUT	378	101	21	32	14	-	-
	29/11/2017	93.2	SUL FLE POT	433	54	23	16	40	52	7
	15/12/2017	3.5	GLadfield post 2nd Cut	338	82	21	32	13	-	-
	15/01/2018	18.5	UREA / SOA / KCL	205	57	-	26	12	-	-
	15/01/2018	78.7	UREA / SOA / KCL	209	59	-	26	12	-	-
	06/03/2018	11	POST HARVEST MIX	306	74	20	41	1	-	-
	06/03/2018	87.1	POST HARVEST MIX	316	77	21	42	1	-	-
	09/04/2018	27.2	UREA BULK	107	49	-	-	-	-	-
	09/04/2018	37.7	UREA BULK	110	50	-	-	-	-	-
	09/04/2018	19.8	UREA BULK	109	50	-	-	-	-	-
	10/04/2018	8.6	UREA BULK	101	46	-	-	-	-	-
	Area weighted total				**623**	**117**	**115**	**122**	**885**	**18**
Weighted average rate based on applied areas and rates for selected areas					**614**	**111**	**112**	**110**	**891**	**13**

Note: Total and average rates assume product applications cover effective area of paddock(s) selected.
This is dependent on positional accuracy of paddock boundaries