
SOUTH PRO MAITLAND LTD

Revised Nutrient Budget Summary Report for APP-20181917

South Pro Maitland Ltd-Proposed –V3



Prepared by Nouman Kyamanywa
Farm Environmental Consultant

60862598 - SOUTH PRO MAITLAND LTD

C/- L TAYLOR
188 WAICOLA ROAD
RD 1 OTAUTAU

January 15, 2019



Executive Summary

Grant Taylor, requested a nutrient budget to reflect the nutrient loss of the 205.7ha dairy farm located at 131 Garden Gully Road, Gore. The nutrient budget was to support an application for a resource consent to farm for South Pro Maitland Limited (APP-20181917).

The OVERSEER Nutrient Budget Review raised concerns in Paragraphs 37, 38 and 43 about whether or not there would be a shortfall in feed as a result of the increase in pasture production and decrease in N fertiliser inputs. The report indicated the need to bring in either more supplements or fertiliser, or a combination of both in order to cover the predicted shortfall in feed requirements.

A revised Nutrient Budget has therefore been prepared in response to the Information Request from Environment Southland that includes additional supplements amounting to 60 t DM in the Proposed Scenario. The only change to the Proposed Scenario has therefore been addition of 30 t of PKE and 30 t of Barley grain. This report summaries the difference between the Nutrient Budget of the Initial Proposal submitted for consent and the Revised Proposal Nutrient Budget. Modelling comparisons should be made between the five year Actual Nutrient Budgets and the Revised Proposal Nutrient Budget.

The revised N loss from the proposed system (Nutrient Budgets South Pro Maitland Ltd-Proposed –V3) has been estimated by OVERSEER® 6.3.0 as 9,839 kg N/year or **48 kg N/ha/year**. The addition of supplements has resulted in a further reduction in modelled N loss from the initial proposal. There has been no change in modelled P loss which remained at 199 kg P/year or 1.0 kg P/ha/year.

Review Summary

A snip shot from the OVERSEER Nutrient Budget Review is shown below.

Table 3a: Supplements imported and Harvested

	2013/2014	2014/2015	2015/2016	2016/2017	2017/2018	Proposed
Supplements Imported (tDM)	300	420	500	396	458	530
Supplements Imported (tDM/ha)	1.54	2.16	2.57	2.04	2.35	2.72
Effective Area (ha)	194.5	194.5	194.5	194.5	194.5	194.5
RSU/ha	5023	4584	4589	5022	5095	5536
N Fertiliser applied (kgN/ha)	174	233	265	278	371	246
Pasture Intake (tDM/ha)	12.7	10.9	10.2	11.4	11.1	12.4
Silage Harvested to storage (tDM)	0	300	69	51	69	69

7. The proposed Overseer model shows the pasture production for the last 5 seasons has averaged 11.3 tDM/ha and the proposed scenario is predicting 12.4 tDM/ha or 1.1 tDM increase in pasture production (see Table 3a above and Table 3b below). The average N used over the last 5 seasons has been 264 kgN/ha and the proposed is predicting using 248 kgN/ha or a 0.16tDM/ha decrease in potential pasture grown through a decrease in N proposed. The supplement used for the last 5 seasons has averaged 2.13 tDM/ha and the proposed is predicting using 2.72tDM/ha or 0.59 tDM/ha increase in supplement used. Based on this information, the proposed scenarios increase in pasture harvested has not been justified as there is a shortfall of 0.67 tDM/ha (assuming a 10:1 response). This will either mean an extra 130 tDM supplement imported or an extra 67 kgN/ha or a combination of both. This increase in N fertilizer used and or supplement imported will increase the N loss in the proposed scenario.

Table 3b: Comparison of actual and proposed feed availability

(tDM/ha)	Average last 5 season	Proposed	Difference
Pasture Intake	11.3	12.4	1.1
Supplements Imported	2.13	2.72	0.59
Pasture Growth from N fertilizer*	2.64	2.48	-0.16

*Pasture growth from N fertilizer have assumed an average 10:1 response

Figure 1: Snip shot from the OVERSEER Nutrient Budget Review

Amendments to Proposed Nutrient Budget V3

Table 1: Changes to Proposed supplements imported and fed

	Initial Proposal V2	Revised Proposal V3
Supplements Imported (tDM)	530	590
Supplements Imported (tDM/ha)	2.72	3.03
Effective Area (ha)	194.5	194.5
RSU/ha	5336	5336
N Fertiliser applied (kgN/ha)	246	246
Pasture Intake (tDM/ha)	12.4	12.1
Silage Harvested to storage (tDM)	69	69

Table 2: Comparison of actual and revised proposed feed availability

tDM/ha	Average last 5 years	Revised Proposal V3	Difference
Pasture Intake	11.3	12.1	0.76
Supplements Imported	2.13	3.03	0.90
Pasture Growth from fertiliser*	2.64	2.46	-0.18
Feed requirement shortfall (tDM/ha)			0.04

*Pasture growth from N fertiliser assumed at 10:1 response

The increase in supplements in the revised nutrient budget results in a reduction in estimated pasture intake from 12.4 to 12.1 t DM/ha. There has been no alteration in N fertiliser in the revised proposal, please note an error in the reviewed report Table 3b; Pasture growth from N fertiliser should be calculated as 2.46 rather than 2.48. The feed requirement shortfall from the revised Proposal results in a shortfall of 0.04 tDM/ha which is well within the modelling limitations of OVERSEER.

Nutrient loss predictions from OVERSEER are strongly linked to the volume and nitrogen concentrations of pasture and supplements eaten. Less pasture and more supplements are eaten in the Revised Proposal compared to the Initial Proposal. The additional supplements (30 t of PKE and 30 t of Barley grain fed in the shed) results in a lower nitrogen intake compared to pasture. The difference in dietary N intake therefore results in lower N loss from the Proposal V3.

Table 3: OVERSEER outputs

Overseer 6.3.0	Initial Proposal V2	Revised Proposal V3
N lost to water kg/ha/year	49	48
Total N lost kg/year	9,979	9,839
P lost kg/ha/year	1	1
Total P lost kg/year	199	199
Other sources – N	441	442
Other sources – P	87	86