Project Plan: Economic Impacts of Rotorua N reduction

Prepared by	***30 September 2014*** ***File ref:***
Summary	The costs of different approaches to reducing nitrogen losses in the Rotorua catchment will be assessed in terms of: • Relative impacts of different allocation options • On-farm impacts on profit and revenue • District impacts on GDP, growth and employment.
Background	The proposed Regional Policy Statement (RPS) has set a nitrogen limit for Lake Rotorua of 435 tN/y. To achieve this, the estimated total reduction is 320 tN/y with about 270 tN/y expected from the rural/pastoral sector. Of this 270 tN/y, the current framework proposes that 140 tonnes of N reduction is allocated to farmers. Six allocation options for how this reduction is distributed are to be analysed. The options under consideration are: 1. Flat rate sector averages of 35kg/ha/yr for dairy and 13/kg/ha/yr for drystock 2. Sector averages adjusted for the influence of rainfall and soil type (i.e. with higher leaching allowances for leakier soils and higher rainfall, but with the same sector averages as for 1). 3. A flat percentage clawback from "Rule 11" nitrogen benchmarks, with final allowances fixed within the ranges of 30-40kg/ha/yr for dairy farming and 10-20kg/ha/yr for drystock. 4. A flat percentage clawback from "Rule 11" nitrogen benchmarks, with final allowances fixed within the range of 10-40kg/ha/yr for all farms. 5. A natural capital approach based on LUC classes (Land Use Capability Survey Handbook Version 3.0) where more allocation is provided to the better land classes (I, II, III….) and less to the less elite land classes (…..VI, VII VIII) 6. Equal allocation on a kgN/ha basis with a split between pastoral and very steep land. It is likely that individual farm benchmarks will be tradable in order to increase the flexibility of the regulation and reduce overall cost.
Objective	To assess the impacts of the different allocation options under consideration. This will include: • Total economic impact across the catchment • Economic impacts on different farm system types

	• Likely land use across the catchment once rules are imposed • Likely farm management scenarios once rules are imposed Given that trading is proposed, it will be important to assess the impact of different levels of trading inefficiency (for example if 15% or 30% of allowances are retained despite the opportunity for advantageous transactions).
Outputs	First, a catchment model will need to be developed in order to determine the impacts on farm profitability and the impact of trading on the total economic cost. This involves four key steps. 1. Develop representative pastoral farm system types: • Use rainfall and soil maps to inform discussions with local agricultural consultants and other people and establish distinct zones that we may distinguish as being relatively similar for modelling purposes. • Construct hypothetical representative farms (drystock and dairy) for each zone. This may consist of multiple types of one enterprise for each zone, if one type of agriculture is particularly dominant or disparate in that zone. Expert judgement will be tested against other data (for example, the Beef & Lamb and DairyNZ economic surveys and prior studies in the catchment). 2. Establish a modelling protocol for pastoral farming: • Ask local consultants to establish a modelling protocol, alongside key DairyNZ staff (Alvaro Romera and Pierre Beukes), that they will utilise to prioritise mitigation actions when they decide how the hypothetical producers will respond to required reductions in N leaching. • Get this modelling protocol peer-reviewed and agreed by key stakeholders. 3. Determine relationships between profit and leaching: • Use local consultants to utilise the modelling protocol in OVERSEER and FARMAX to identify cost and leaching implications of the different mitigation scenarios for each representative farm system type. This will provide a set of relationships between profit and leaching. • Work with Scion to access data for forestry profitability. This will include all forestry species and management regimes appropriate for Rotorua. 4. A DairyNZ contractor will use the outputs of pastoral farming modelling (step 3 above), available data on forestry economics and BOPRC catchment data to develop a Rotorua Catchment bio-economic model. This model will then be used to test the six allocation approaches outlined above in the Background. These six allocation approaches will be examined under four potential policy scenarios:

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Mitigation at farm level, with no potential for trading of nitrogen discharge allowances
Trading with no transactions costs
Trading with 15% of allowances retained (i.e. 15% of potentially advantageous transactions do not take place)
Trading with 30% of allowances retained

Second, a report will be developed for farm-level impacts based on this catchment modelling analysis showing:

Total economic impact across the catchment (in terms of profit and revenue)
Economic impacts on different farm system type
Likely land use across the catchment once new rules are imposed
Likely farm management scenarios once new rules are imposed

Third, aspects outside the catchment model will be assessed:

Implications of changes in profit for debt servicing
Likely changes in farm equity
Implications for lifestyle blocks
Other scenarios such as Transferable Development Rights, milking sheep and mānuka, depending on data availability.

Fourth, the on-farm catchment impacts will then be used to drive district-level analysis showing the economic impacts on employment, revenue and opportunity costs (etc.).
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<tr><td>Scope Includes</td><td>

On-farm impacts for land in the Rotorua catchment.
Off-farm impacts on GDP and employment.

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<tr><td>Scope Excludes</td><td>

Lake modelling
Cultural impact assessment
Social impact assessment

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<tr><td>Risks and mitigation</td><td colspan="2">
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<tr><th>Risk</th><th>Mitigation</th></tr>
<tr><td>Timeframe too tight</td><td>Ensure adequate resourcing from outset, maximise use of existing datasets and knowledge, develop some parts of project in tandem, ensure brief but frequent communication between all parties.</td></tr>
<tr><td>Lack of farmer cooperation</td><td>Collective members are positive about this project and the Committee and Coordinator will liaise directly with individual farmers to manage concerns as they arise. Results will be presented on a per hectare basis to maintain anonymity.</td></tr>
<tr><td>Incorrect mitigation levels and/or costs</td><td>Industry standard software, assumptions and data will be used by local agronomic experts</td></tr>
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	Inadequate resourcing	Maintain clear project management oversight with reporting to identify pending workflow. Identify industry funding and maximise use of existing work.
Success criteria	• The relationship between N limits and profit and capital value is understood for a range of Rotorua farm systems • The distributional impacts of different allocation options are understood for a range of Rotorua farm systems • The total economic costs are understood for different allocation options • Farmers have good information to engage with allocation options • BOPRC has good information on which to base its decisions • Public understand potential impacts of options consulted on • Final report delivered to BoPRC on time • Improved engagement between farmers and BoPRC	

Milestones	**Stage**	**What**	**Who**	**When (2014)**
1	Set up	Agree scope and distribution of costs.	STAG Subcom.	July
2	Catchment model 1	Establish rainfall and soil zones	Alastair	July
3	Catchment model 1	Establish representative farm system types.	BOPRC contractor A/ Alvaro/Graeme/ B&L expert	Mid-August
4	Catchment model 2	Develop modelling protocol.	BOPRC contractor A/ Alvaro/Graeme/ B&L expert/ farmers	End of August
5	Catchment model 3	Develop scion forestry data	Scion	Data due 1 October
6	Catchment model 3	Model profit/leaching relationships	BOPRC contractor B	Data due 1 October

7	Catchment model 4	Build optimisation model using data from 2-4.	Alvaro	17 October
8	Draft on-farm report	Use catchment model to write report on on-farm impacts. First draft delivered for feedback and review.	Alvaro	7 November
9	Peer review	Stakeholders peer review report and agree content	All	21 November
10	Report back to STAG	Report catchment modelling results to STAG to support comparison of allocation options.		28 November
11	Draft district impact report	Use on-farm catchment analysis to support district impacts report (e.g. input-output or CGE).	BOPRC contractor C	December/January/February
12	Report back to STAG	Report back on full district economic analysis	BOPRC contractor C	February
13	Final reports	Incorporate peer review feedback and finalise reports for s.32	BOPRC contractor C/ BOPRC	March

Project Team and Coordination	The project manager is The project sponsor is Not charged: Charged:
Project Linkages	• Reference and leverage off data and findings from three local SFF projects: Lake Rotorua Collective; Lake Okaro; and Project Rerewhakaaitu • The RPS, 10 Year Plan, Regional Water and Land Plan and Rotorua District Plan • Rotorua-Rotoiti Action Plan and more recent STAG direction on nitrogen allocation

Budget	**Contractor**	**Hours**	**$/hour**	**Cost (ex gst)**

Project Approval	**Project approved …… (signed)**			
Project Completion	**Completed …… (signed)** **Date**……			