Update on impact analysis for the Essential Freshwater Package

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Security Level	In Confidence	MfE Priority:	Non-Urgent

	Action sought:	**Response by:**
To Hon David Parker, Minister for the Environment To Hon Damien O'Connor, Minister of Agriculture CC Hon Nanaia Mahuta, Associate Minister for the Environment	Noting only	N/A

Actions for Minister's Office Staff	**Return** the signed report to MfE.
Number of appendices and attachments n/a	Titles of appendices and attachments (ie separate attached documents):
Note any feedback on the quality of the report	

Ministry for the Environment contacts

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Update on impact analysis for the Essential Freshwater package

Key Messages

1. The purpose of this briefing is to update you on the impact analysis work for the *Essential Freshwater* package.
2. The impact assessment will deliver two main outputs:
    - analysis looking at key proposals, for instance the proposed nitrogen attribute
    - a summary describing the benefits and costs of the package, covering economic, social, cultural and environmental impacts.
3. We are working with expert suppliers to provide information on the benefits and costs of proposals by March 2020 with a focus on supporting ministerial decision making on key issues.

Background

4. The *Essential Freshwater* package sets out proposals and options to achieve the Government's agreed objectives of:
    - Stopping the further degradation of freshwater resources and starting to make immediate improvements so that water quality is materially improving within five years; and
    - Reversing the past damage to bring freshwater resources, waterways and ecosystems to a healthy state within a generation.
5. Ministers will be asked to make decisions on the package of options in the first half of 2020. To support these decisions, we have preliminary agreement with Treasury that we will produce a report under Section 32 of the Resource Management Act 1991 (the RMA) that will cover off all of what is required for the final RIA (instead of producing both documents).
6. To that end, the impact assessment work will aim to provide an indication of the scale of the social, economic and environmental benefits and costs of the package, focussing on the key policy areas.

Impact assessment project overview

7. By March 2020, MfE aims to produce a summary of findings focused on the impact of key proposals within the *Essential Freshwater* package. This will include the impacts on particular industries and regions. A more detailed evaluation as required under Section 32 will underpin this summary.
8. We are developing models to assess the environmental and economic impacts of the package, as well as commissioning work to assess the social impact and impact on Māori and councils. The *Essential Freshwater* impact assessment workstreams are set out in Table 1 below.

Environmental modelling

9. Environmental modelling is needed to inform the environmental, social, cultural, and economic effects of the *Essential Freshwater* package. While the environmental modelling results will be needed by other workstreams suppliers have been unable to commit to timeframes that would make this work.
10. MfE is scoping the development of a statistical environmental model as an in-house option

that may deliver results for use in other workstreams within the time available. This is a new approach focused on catchment scale analysis of the effectiveness and cost of known mitigation options to meet proposed bottom lines for nitrogen. MfE will ensure that the environmental model approach is appropriately peer reviewed. We may be able to include other bottom lines but will focus on Dissolved Inorganic Nitrogen (DIN) in the first instance.

11. Because the statistical environmental model is novel, we are also developing a parallel approach adapting an existing model from a supplier to look at the impact of the proposed DIN bottom line and the current periphyton attribute in the NOF. The outputs from this project could feed into further policy work on allocation.
12. The objective of the statistical environmental model is to show how much each catchment needs to reduce nitrogen loading; and the extent to which bottom lines can be met through either least-cost or most effective mitigations, or, alternatively, whether land-use change is needed.

Economic modelling

13. We are looking to develop models to assess the broad economic impact of the proposals, at an industry, regional, and national level. We are also considering how factors such as changing technology and economic productivity can be incorporated into the economic modelling.
14. For example, technological advancement and innovation could be modelled through moving less efficient producers up to higher levels of efficiency through adopting best practice farm processes.
15. We are considering how to assess the cost of inaction (i.e. the impacts on the environment, producers and social impacts produced by carrying forward the "status quo"). Each report produced will consider the impact of the status quo within its domain-focus.
16. Please note we are still in discussions with suppliers on how best these factors can be included in the economic modelling.

Social impact

17. We will also assess the social impact of the proposals, with a focus on employment impacts at the regional level.

Table 1. Overview status of MFE Essential Freshwater impact assessment projects

Domain and key questions	Project overview	Status
Environmental How much mitigation is needed to meet bottom lines for Dissolved Inorganic Nitrogen (DIN)? How effective are known mitigations and how much would it cost to meet the proposed	MfE is developing a statistical spatial model of catchment level water quality to assess the potential to mitigate pollutants by: - Mapping water quality, soil, and land use. - Regression analysis used to relate water quality measured to farm activity and soil type, and allocate to land use. - Pollution mitigation options applied to land areas to estimate decrease in pollution as a result of the various mitigations which will help to assess ability to meet bottom lines through mitigation or if land-use change needed. The mitigation options being used in this modelling include both existing and emerging mitigations and are based on research undertaken as part of the Our Land and Water	In development, initial results late November (for peer-review), final results end December

Domain and key questions	Project overview	Status
bottom lines for DIN?	National Science Challenge. To complete this work and link it to the economic workstream below some assumptions will need to be made about how Councils will implement the NPS-FM, particularly how the allowable nitrogen and phosphorus will be shared. Where possible these options will be captured by scenario analysis.	
	On a slightly longer timeframe, MfE and MPI are working to adapt an existing model developed by the contractor, to look at the impact of the proposed DIN attribute, and the current Periphyton attribute within the National Objectives Framework. This could later be built on for testing water and nutrient allocation policy options. Within this model we could look at different values for DIN, or an N exception regime because of macroinvertebrate community index (as raised by Taranaki Regional Council). The values to be looked at are yet to be decided.	Contracting supplier (Land Water People), final report due March 2020
	We are looking at whether the environmental benefits of the nitrogen bottom line can be estimated using the same base research as was used in the interim RIA to estimate the benefits of the sediment proposal.	Scoping
Economic What are the industry, regional and national costs to meet the bottom lines? What would it cost to meet the bottom lines if we continued under BAU for another decade?	Industry impact – developing methodology with supplier to undertake a microeconomic analysis of the economic impact of different pollution mitigation strategies on the structure, conduct and performance of the agricultural industries. We will focus on assessing: - the potential cost to primary producers of meeting the bottom lines - Whether some producers could be expected to cease trading, and in which sectors, how many and where they are located - Marginal effect of proposed bottom lines above the NPS 2017.	Contracting supplier (Sapere), final report due February 2020
	Regional & National impact – establishing options with providers. We will focus on assessing: - The potential economic impact on national and regional GDP of meeting the bottom lines - Which regions are most exposed, and how community economic wellbeing could be impacted (ie employment) - Marginal effect of proposed bottom lines above the NPS 2017.	Scoping with potential suppliers
	MPI is undertaking modelling of vegetable growing nitrogen mitigations to determine the impacts that the mitigations will likely have on in-stream N levels in the Whangamarie stream in Pukekohe and whether the proposed N-bottom line will be met.	Analysis underway (delivered December - March)
Social What are the social benefits and costs of the package?	MfE is assessing the positive and negative impacts on the wellbeing of local communities (eg, employment, health, community cohesion) based on existing case studies.	Contracting supplier (AgResearch), final report due February 2020
Māori	MfE is assessing the impacts on Māori, including individuals,	Contracting

Domain and key questions	Project overview	Status
What are the benefits and costs of the package to Māori?	whānau, hapū and iwi, Māori landowners, agribusiness and other businesses (eg, costs of engagement for iwi and hapū, impacts on the relationships of Māori to water and customary practices, impacts on under-developed land).	supplier (Poipoia Ltd), final report due February 2020
Councils Do regional councils have the capability and capacity to implement the package?	MfE is assessing the impact on Regional Councils and Unitary Authorities (cost of policy development, compliance, monitoring and enforcement; ability of councils to make the necessary changes).	Contracted to Castalia Ltd. Final report due mid-December

Specific analysis of the impacts of NES and s360 policies

18. Note that MPI and MfE are also undertaking and commissioning a number of studies on individual policies that build on the interim impact analysis. Analysis that MPI is currently undertaking and contracting is set out in the table below. Note that the below work is all expected to be delivered between December 2019 and March 2020.

Table 2. Studies on individual NES and s360 policies commissioned by MPI to build on the interim impact analysis.

Analysis area	What	Status
Stock exclusion	Hydrological modelling to identify where policy will apply and then quantifying the length of streams, rivers, and wetland that needs cattle, pigs and deer excluded. Quantifying amount of farm land included with 5m, and other potential, set-back requirements.	Contracting Supplier
	Estimating the current annual dry matter production that occurs in the areas by the 5m, and other potential, riparian setback.	Testing approach with supplier
	Using NIWA's CLUES model to estimate the water quality benefits of the proposed stock exclusion policy and a small number of variants. MPI worked with NIWA in this way with the previous stock exclusion policy proposals in 2016.	Contracting with supplier
	Testing an alternative to stock carrying capacity.	Analysis underway
Intensification controls	Identify the amount of exotic forest that is likely to be harvested over the period 2020 to 2025, to help quantify the opportunity costs associated with the NES intensification proposals.	Analysis underway
	Use agricultural production survey (APS) data to estimate the historic rate of land use changes that would be captured by the proposed NES intensification controls.	Results being peer reviewed
	Quantifying the historic rate of 'high risk land use changes'	Analysis partially-complete

NES controls on feedlots, sacrifice paddocks and stock holding areas	Quantify the amount of land captured by the proposed 50m set-back requirements.	Analysis underway
	Assess prevalence of stock-holding areas and, potentially, sacrifice paddocks as well as assessment of expected behaviour changes stemming from proposed regulations on stock-holding areas and feedlots.	Scoping
Wetlands	Using radiometric data, developing survey maps defining the extent of perennial, seasonally wet, and intermittent wetlands for Southland, Northland, West Coast, and Marlborough. Defining size, land cover, and other critical criteria for each wetland.	Contracting supplier
Winter Grazing	Develop an improved approach for determining environmental risk associated with winter grazing that includes not only slope but also other critical risk factors such as soil water permeability. Use this approach to develop a national risk map that is responsive to the various factors making up the risk assessment.	Contracting supplier

Other work

19. MfE has started scoping a piece of work looking at the co-benefits of policy interventions in water, climate change, resource management and biodiversity. We will provide you an update on this work separately.
20. MPI is exploring ways to upgrade their economic forecasting models to better account for the cumulative impacts of policies impacting the primary sector. There may be opportunities for MPI and MfE to collaborate in this space.
21. Many submitters to the *Essential Freshwater* consultation have produced impact analysis to inform their submissions. These submissions are currently being reviewed by MfE. MPI organised a workshop with primary sector and local government submitters on 14 November to discuss the results of their analysis. MPI received useful feedback on their impact analysis which is being followed up.
22. As part of their submission on the Essential Freshwater proposals, DairyNZ presented detailed economic modelling of the impacts of these proposals on the dairy industry and wider economy. We are talking to DairyNZ about addressing some of the issues with their analysis[1].

[1] MPI and MfE think that this work could usefully be enhanced to provide for an analysis of the effects on the package on the dairy industry. The original analysis contained a number of assumptions that we would examine and, importantly, did not use the implementation of the 2017 NPS as a baseline. However, we consider that working with DairyNZ will usefully allow a number of different scenarios and assumptions to be tested and will improve the usefulness of the analysis for Ministerial decision making.

Recommendations

23. We recommend that Ministers:

a. **Note** the current plan for improving on the impact assessment provided in the interim Regulatory Impact Assessment.

b. **Agree** to share this briefing with Essential Freshwater advisory groups.

Signatures

S9(2)(a)

Date

Date

Hon David Parker
Minister for the Environment **Date**

Hon Damien O'Connor
Minister of Agriculture **Date**