

ONE PLAN AND OVERSEER VERSION CHANGE – Lynette Baish and Ian McNab

Nutrient budgets like Overseer are a useful tool to estimate nutrient requirements for production as well as the potential losses of nutrients to soil and water over and above the needs of the pasture or crop

OVERSEER was developed in the mid 1990's as a decision support tool, a mechanism to predict nutrient losses, compare farm management scenario's and in recent years has been increasingly relied on, rightly or wrongly, for regulation and compliance to inform decisions and the setting of conditions for resource consents. Like any model, OVERSEER has evolved through regular updates which incorporate new technologies and knowledge and which have enabled more sophisticated and flexible analysis. For instance, in July 2008 the model was upgraded to include a P runoff loss model, DCD's, additional feedpad, animal shelters and effluent management systems, wetlands and riparian strips.¹

Overseer version changes were initially perceived to be minor

All OVERSEER updates are subject to pre-release testing as part of the ongoing development of the model. According to evidence to the One Plan by Ledgard, "the magnitude of N and P losses may change with different versions but some reassurance is provided via pre-release testing showing excellent correlation between successive versions in recent years."² He continues, and concludes...

*"While OVERSEER upgrades may result in small differences in predicted nutrient losses between different versions, this is more than outweighed by the improved flexibility to model different farm systems and nutrient mitigation techniques. Although successive versions of OVERSEER provide increased sophistication, the required inputs remain common, easily obtained farm parameters or inputs with acceptable default values... OVERSEER is a long-term average model, and so it is appropriate for long-term planning and policy development."*³

In his 2009 evidence, Dr Ledgard had indicated that it would be important to consider the situation where future OVERSEER versions lead to a different estimate of N leaching that affect a farm's compliance with N loss limits, particularly where, on the basis of an earlier OVERSEER version, the farmer had committed to a capital intensive system which initially complied, but which subsequently proved to be non-complying.⁴ Given the 20 year timeframe envisaged to achieve One Plan N loss limits, it was inevitable that new versions might impact N loss predictions, however the preferred approach would generally be to consider compliance of the actual or proposed farm system using the new OVERSEER version.⁵

Yet the change from version 5.2.3 to 6.0 saw a dramatic increase in on-farm N-loss numbers

The major upgrade between versions 5.2.3 and 6.0, had a fundamental impact on predicted leaching levels with the introduction of a new drainage model. Dr Alec McKay has stated that in fact, we have, previous to recent upgrades, been underestimating nitrogen losses to land and water.⁶

¹ For more information on OVERSEER development see: <https://www.overseer.org.nz/overseer-explained/development-history>

² Section 42a Report of Dr Stewart Ledgard on behalf of Horizons Regional Council Concerning Water Quality [para 17]

³ Ibid [para 18]

⁴ Section 42a Report of Dr Stewart Ledgard on behalf of Horizons Regional Council Concerning Water Quality, p 24, [para k]

⁵ Ibid, pp 23-24

⁶ Dr Alec McKay, pers.comm.

What the courts said on the matter of Overseer version change

The Environment Court was asked to address the issue of Overseer versions however the matter was not argued at the hearing.⁷ The Environment Court rejected the argument that the overall framework for regulating intensive farming relied on a particular version of OVERSEER.⁸ Further, as stated in the Environment Courts decision, in the event that version changes do result in unintended outcomes for consent applicants, “there is the opportunity of the community to revisit objectives, policies and rules at any time in the future under the One Plan.”⁹

Included in the suite of appeals lodged against the Environment Court decision by Horticulture NZ, was an assertion that the Environment Court erred in law in respect of the decision to have a generic reference to OVERSEER rather than referring to a specific version.¹⁰ In its summary response to the Court, MWRC clarified the following:

- “OVERSEER input and output files may be submitted as part of a nutrient management plan (NMP).¹¹ An NMP is required as a performance condition, but OVERSEER input and output files need only be submitted if the OVERSEER model is used....No rule requires compliance with a particular version of OVERSEER as if it was a standard or requirement such that needs to be a document incorporated by reference. What is required for compliance is a nutrient management plan or... a nutrient budget.”¹²
- “MWRC accepts that in calculating the population size of existing dairy farmers that would be able to achieve the controlled activity standards the 5.4 version of OVERSEER was used and that population size for some targeted catchments may change with the newer version. The degree of change is unknown. All existing farmers will, however, have a pathway to obtain consent. Any refinements to the plan as a result that cannot be addressed by sensible administration of the plan can be addressed by a plan change if deemed necessary.”

The decision on appeal noted:

- “What is required, by way of performance condition in rr 13-1A to 13-1C, is a nutrient management plan prepared “in accordance with” the 2007 Code of Practice. The sufficiency and adequacy of that plan will be determined in accordance with the code. No particular version of OVERSEER need be used. Other models – such as SPASMO and APSIN – may be used for commercial vegetable growing, for instance. Nothing in this offends the Act.”¹³

It is apparent that the court did not anticipate version changes would drastically impact outcomes.

⁷ Maasen, John. WRC submission to HNZ: Appeal Question 9 – Referencing of OVERSEER: HNZ Submissions (para’s 100-106) JWM-030235-196-216-V4:YL. p 34

⁸ Ibid, p 34

⁹ Ibid, p 34

¹⁰ See para 7a of Notice of Appeal “Did the Environment Court correctly apply clauses 30-35 of Schedule 1 of the Act when it determined that it was open to the Council to have a generic reference to OVERSEER?”

¹¹ NMP as defined in One Plan Glossary.

¹² Maasen, John. WRC submission to HNZ: Question 9 – Referencing of OVERSEER: HNZ Submissions (para’s 100-106) JWM-030235-196-216-V4:Y., pp 33-34

¹³ HORTICULTURE NEW ZEALAND v MANAWATU-WANGANUI REGIONAL COUNCIL [2013] NZHC 2492 [24 September 2013]

The issue of dealing with version changes to OVERSEER is not confined to Horizons

According to OVERSEER guidance¹⁴, any standard or limit derived from OVERSEER modelling (whether in a plan or resource consent condition) must be updated when a new version of OVERSEER is released. Managing updates of OVERSEER is challenging, particularly when previous versions are no longer available for regulatory use once superseded.

Regional Councils have applied different approaches to this problem, from ECAN's Farm Portal, which operates as a proxy to OVERSEER, to the *Reference File Method* devised for the Bay of Plenty in relation to the Lake Rotorua Catchment Plan.¹⁵ These examples rely on a linkage to any external mechanism which functions to assimilate the version change into the nutrient management approach without recourse to a plan change to alter plan provisions. It should be noted that these mechanisms are currently subject to plan appeals and there is very little case law at this stage to provide any further guidance as to their utility.

Why should we continue to use OVERSEER to set limits when the model continues to be updated twice a year?

While Overseer was never meant to measure water quality it is the best tool for measuring what leaves the root zone, so it tells farmers and ourselves what is leaving the farm and whether or not management choices are reducing or increasing those losses. We still need some measure of what the farm is losing to determine if the environment is better or worse off, and due to the delay between root zone and surface water, we can't gauge impacts that from direct measures of surface and ground water quality because the nitrogen leaving the farm now, hasn't got there yet.

This means we still need Overseer to inform us and farmers if what they're doing on farm is making the environment better or worse. Overseer won't tell us what the levels of N and P in the water are, but it does tell us if the farmer is losing more or less than he was.

Changing Table 14.2 permissible N-loss numbers to match Overseer version 6.3 is the best option at this point to allow us to re-start the Intensive Land Use Consent application process.

The biggest issue facing us at present is the discrepancy between farm N-loss estimates in the current version of Overseer and the permissible N-loss limits in Table 14.2 due to the wide-ranging increase in N-leaching from farms with well-drained soils under high rainfall.

Future updates of Overseer nutrient budgeting will change farm N-loss depending on the farm system being practiced; but it is very unlikely that we will see the catchment-wide increases seen previously. Where version updates over initial years established the foundation components and sub-model functions of OVERSEER, future changes are likely to be "farm management"/ mitigation based enhancements.

According to Caroline Read, CEO of Overseer, changes are coming regarding the energy and cropping sub-models in Overseer.¹⁶ This will give more up-to-date estimates of N-leaching depending how farms

¹⁴ Freeman et al. *Using OVERSEER in regulation – Technical resources and guidance for the appropriate and consistent use of OVERSEER by regional councils* (August 2016).

¹⁵ For more information on ECAN and BoP approaches see Xkenjik, Milcah. *Keeping nutrient management regulation in step with OVERSEER version changes: A review of regional approaches*. (January 2018).

¹⁶ Read, Caroline. Pers. Comm.

are managed, and may increase N-loss from farms that use forage crops, but if it assumed that this is more accurate than current modelling, then it is important that farmers see this and use it to modify farm practice to reduce N-losses by changing farm cropping practices.

Using the most up-to-date Overseer model will also enable farmers to use the latest mitigation techniques such as plantain, as well as showing the more correct nitrogen losses from forage crops, and lead them to better crop management to reduce losses to waterways. Horizons will undertake a technical examination of the change implications for any future version update in relation to One Plan objectives to determine appropriate action as necessary in respect of the Plan.