The Neutral or Beneficial Effect on Water Quality Assessment Tool

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Paper:

INTRODUCTION

On 1 January 2015, the Sydney Catchment Authority (SCA) and State Water formed WaterNSW, a single organisation responsible for managing bulk water supply across the State. WaterNSW's area of operations includes the Sydney drinking water catchment (

Figure 1), which supplies drinking water to more than four and a half million people, and is overlapped by fifteen local government areas.

The neutral or beneficial effect test on water quality (NorBE) is a key component of the assessment and determination process established by State Environmental Planning Policy (Sydney Drinking Water Catchment) 2011 (the SEPP). The SEPP also provides a concurrence role for WaterNSW.

NorBE is satisfied if a development has no identifiable potential water quality impacts, or the impacts can be contained within the development site and contaminants prevented from reaching the drainage system, or any impacts can be transferred outside the site for treatment and disposal to the required standard.

Figure 1. The Sydney Drinking Water Catchment

A NorBE assessment must be completed for all development applications (DAs) submitted in the catchment, and consent cannot be granted by councils, as consent authorities, unless NorBE is satisfied.

WaterNSW recognised that councils did not have the resources, technical expertise or access to tools and models to undertake NorBE assessments. To ensure compliance with the SEPP and help deliver better water quality outcomes, WaterNSW has developed a highly innovative, web-based software application – the NorBE Assessment Tool. The NorBE Tool, accessible to both council staff and consultants operating in the catchment, enables consistent assessment across the catchment and reduces the number of routine DAs being referred to WaterNSW for assessment.

DISCUSSION

The NorBE Tool is a web-based software application that was custom-built for WaterNSW, with a GIS interface that allows the assessment of development site conditions, and stormwater and wastewater impacts. The Tool incorporates WaterNSW's wastewater effluent model for use in assessing development proposals in unsewered areas.

The development of the Tool was a highly innovative project, breaking new ground for WaterNSW, and arguably the state of NSW. There was no existing 'off the shelf' products that interfaced with WaterNSW's GIS, or performed the other required functions of NorBE and wastewater modelling.

Version 1 of the Tool was released in March 2011 for use by councils in the catchment. In February 2015 a substantial upgrade was released to allow broader access to, and use of, the Tool. The upgraded Tool enables councils to assess a broader range of the most common development types, as well as enabling consultants to complete their own NorBE assessments and lodge them with councils electronically in a secure environment. This increases the likelihood of high quality assessments being lodged that specifically address and achieve NorBE requirements, reducing the number of times councils and/or WaterNSW have to request further information in order to complete an assessment.

Different levels of user authorisations and stakeholder self-management have been incorporated, reflecting the management hierarchies of councils and consultancies, WaterNSW maintains control over the tools and data. WaterNSW can also view all assessments, regardless of the original author, but can only modify WaterNSW's own assessments. Using the different levels of user authorisations, NorBE assessments can be submitted for approval, approved by managers and the determination result recorded (ie consent refused or granted).

The NorBE Tool makes the NorBE assessment process less onerous for councils, providing a consistent approach across all councils in meeting the requirements of the SEPP. Councils can assess most common types of developments, including most alterations and additions, swimming pools, single dwellings and dual occupancies, and small urban and rural subdivisions. A Notice prepared under Clause 64 of the Environmental Planning and Assessment Regulation 2000 allows Councils who use the NorBE tool to assume concurrence for these development types, enabling council staff to undertake their own NorBE assessments.

Consultants can prepare NorBE assessments for lodging with council for any type of development. Councils can then certify the assessments for those development

types for which there is assumed concurrence, or forward them to WaterNSW for concurrence.

Using the NorBE Tool

The Tool guides the user through a number of screens depending on the nature of the proposal, recording the decision process for each development.

After entering lot information, which displays on the SIX Maps Viewer screen (Figure 2), the Pre-Assessment Checklist poses a series of generic questions to be asked at the start of each assessment. These questions help to focus the assessment on the nature of the proposal and the adequacy and completion of all water quality documentation accompanying the proposal.

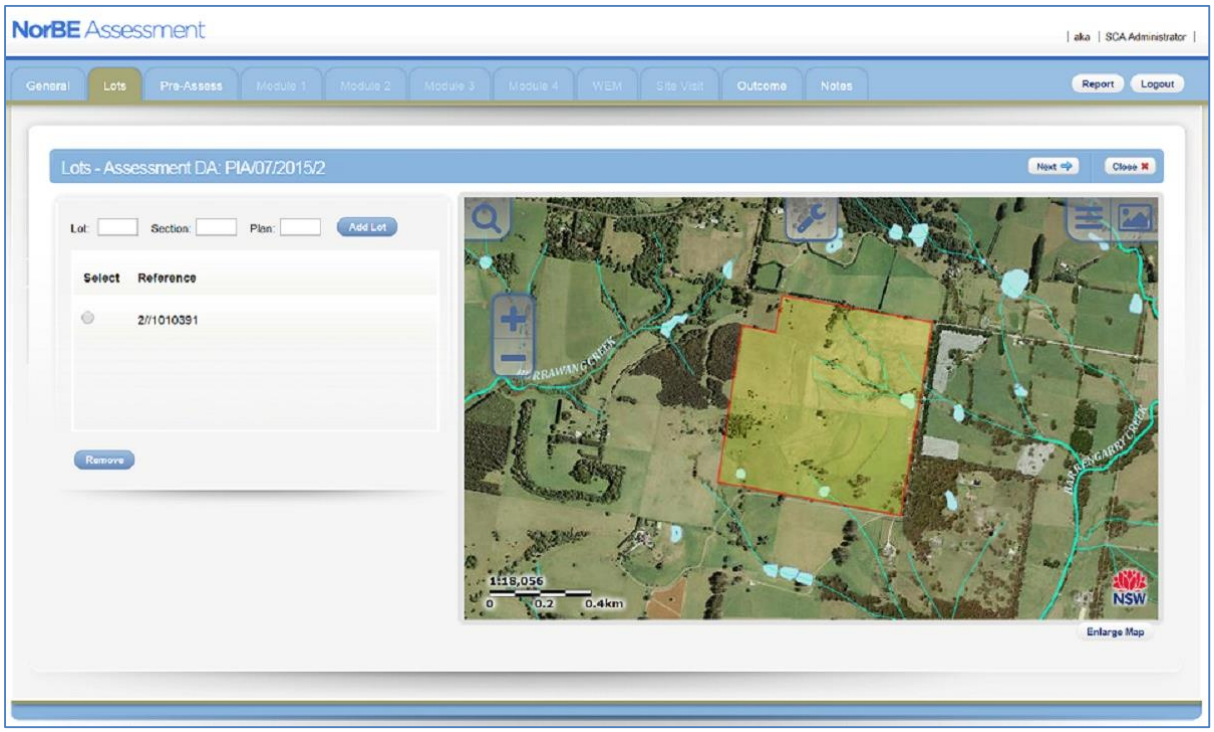

Figure 2. The Lots Screen Showing the GIS Interface

For a council user, the Tool will indicate immediately whether the proposal is one for which they can complete the NorBE assessment (a Module 1: small sewered development or Module 2: small unsewered development), or whether it needs to be referred to WaterNSW for concurrence (Module 3: large sewered subdivisions, Module 4: large unsewered subdivisions and Module 5: all other development). For consultants, the Tool will open the appropriate Module screen (1, 2, 3 or 4) for completion of the assessment.

A series of questions relevant to the development type are posed for each Module, with the most thorough assessment required for development types with the greatest potential risk to water quality. Help widgets have been added to assist the user answer questions, and a pop-up box appears when an outcome has been reached. The Tool saves the assessment each time the assessor clicks the 'Next' button to move between the screens to the next part of the assessment. It automatically generates conditions of consent according to the information entered by the user, for example conditions relating to erosion and sediment control measures. Notes can be added at any stage of the assessment.

The unsewered Modules of the Tool (2 and 4) include the wastewater effluent model (WEM) as part of the assessment. The WEM is a GIS-based effluent plume generation modelling tool to support the design of on-site wastewater systems, and the only one of its kind developed in Australia. It has been externally peer reviewed by industry experts and has attracted the interest of other councils and other natural resource management organisations. The WEM has been designed so that it can be used even by those without extensive background knowledge or technical expertise.

The WEM draws upon natural resource spatial data for model inputs and design calculations, modelling the direction and distance that three contaminants of concern (faecal coliforms, nitrogen and phosphorus) will travel beyond the edge of the effluent management area (EMA). This allows a visual interpretation and assessment of the potential impact of a development on water quality (Figure 3).

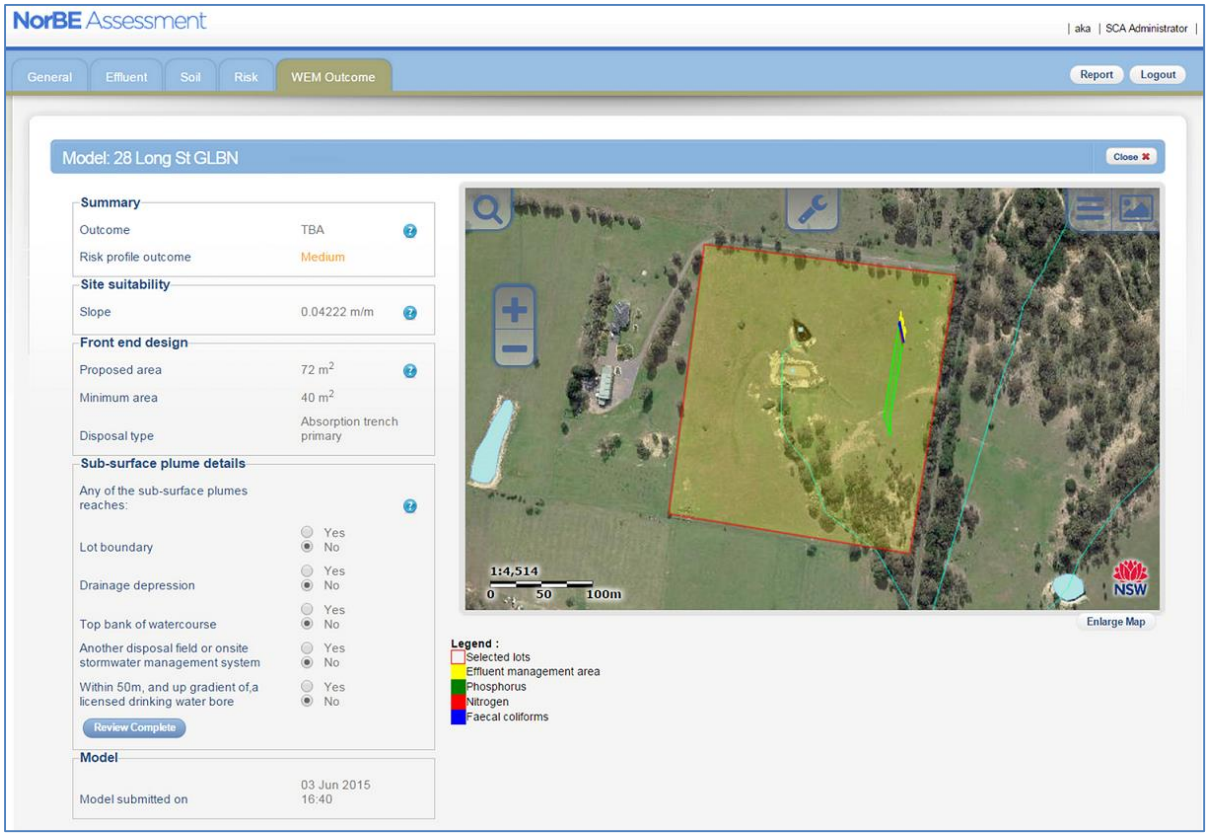

Figure 3. WEM Outcome Screen – Example of Effluent Plume Generation

The user is required to enter information (development type, effluent volumes, proposed wastewater and disposal system types and sizes, soils data and estimated risk) into four WEM screens that appear as 'tabs' across the top of the screen. The proposed EMA site is located by 'clicking' on the aerial photo – this generates system GIS data for that site and its possible suitability as a location for the EMA.

If the effluent plume is predicted to leave the site, or reach a watercourse then the proposed on-site system does **not** have a neutral or beneficial effect on water quality. Also, errors and system constraints are identified by the Tool, allowing the WEM to be used as a design tool, and ensuring consistency with Australian Standard 1547:2012 (Figure 4).

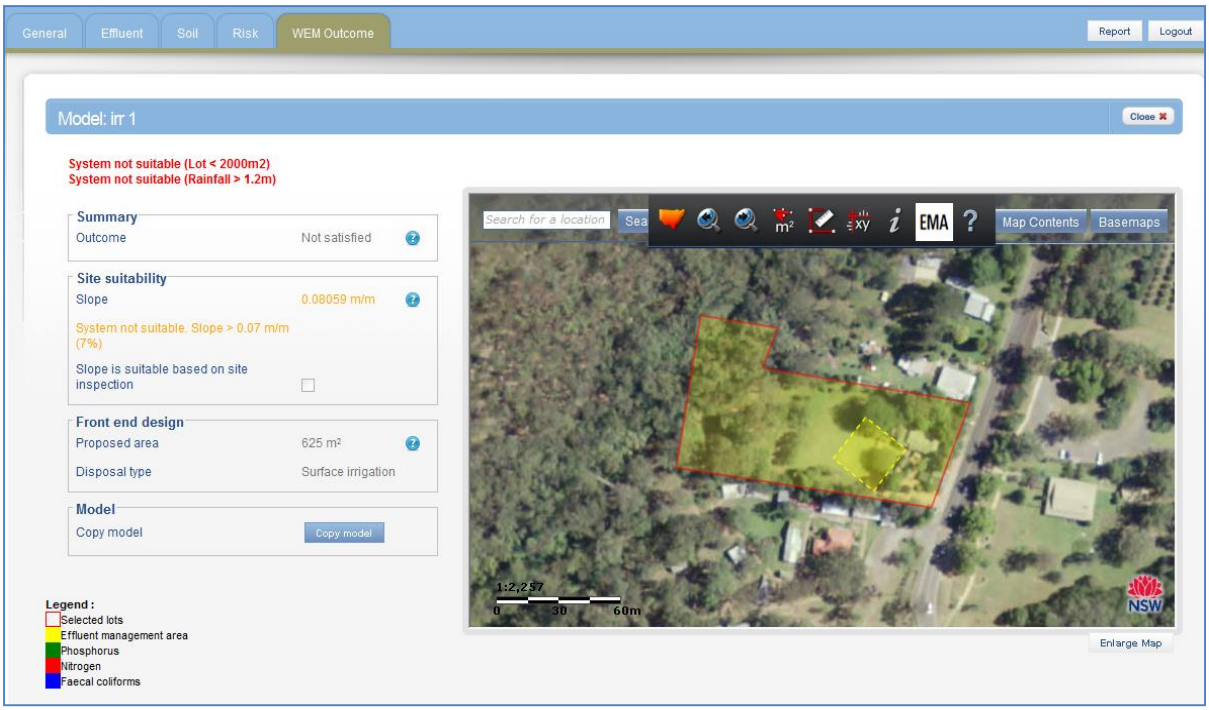

Figure 4. System constraints identified by Tool (red and orange text)

The proposed EMA site, or type of on-site system, can be altered in various scenarios to assess whether alternative proposals contain the effluent on-site. In this way, consultants can use the NorBE Tool as a design tool, ensuring that their proposal will have a neutral or beneficial effect on water quality before they submit it to council as part of the DA.

The first part of the NorBE assessment, including wastewater effluent modelling if relevant, is able to be completed as a desktop assessment. The last section requires a site visit. In completing the relevant 'tabs' for the assessment, the Tool leads to a particular action or generates a NorBE outcome, for example that NorBE is satisfied, and for councils, that consent may be issued on water quality grounds. Reports for individual assessments and determined applications can also be generated directly from the Tool.

The active involvement of key stakeholders was a key strength in the Tool's development, affording a high degree of scrutiny. Councils and consultants were involved in workshops during development, and participated in a comprehensive training and familiarisation program before 'go live' of both versions of the Tool. These programs provided the opportunity for further enhancements to be identified and incorporated in the final version. Council staff were also formally surveyed on their experiences in using Version 1 of the Tool and their feedback was used to inform the upgrade. All training and support is provided at no cost to councils or consultants.

The NorBE Assessment Guideline supports the implementation of the SEPP by providing clear direction on what a NorBE means and how to achieve it, and provides the decision-making framework for the NorBE Tool, ensuring transparency.

WaterNSW has also developed User Guides for both councils and consultants that provide step-by-step instructions on how to use the Tool. Screen shots are included to inform every stage of the assessment process, as well as providing hints for troubleshooting. All these documents are available to download from WaterNSW's

website, and through links provided in the NorBE Tool. Assistance is also available through WaterNSW's Help Desk link in the Tool.

In addition to the contracted developer, WaterNSW worked with the NSW Department of Planning and Environment in the development and review of the SEPP and the gazettal of the NorBE Guidelines. Land and Property Information provided the custodial spatial services through their SIX Maps Viewer. Contractors provided WEM development and support.

CONCLUSION

The NorBE Tool has been designed to be practical and simple, providing the flexibility to achieve the best outcomes for the protection of water quality. It reduces costs to the developer, the community, the consent authority and WaterNSW as well as providing consistency and transparency of process.

Use of the Tool has resulted in a marked decrease in the number of DAs being forwarded to WaterNSW for concurrence assessment (Figure 5), in turn resulting in reduced assessment times and costs for proponents, consultants and councils.

The development and implementation of the NorBE Tool and the WEM has helped reduce the risk of development occurring that will have a detrimental impact on water quality.

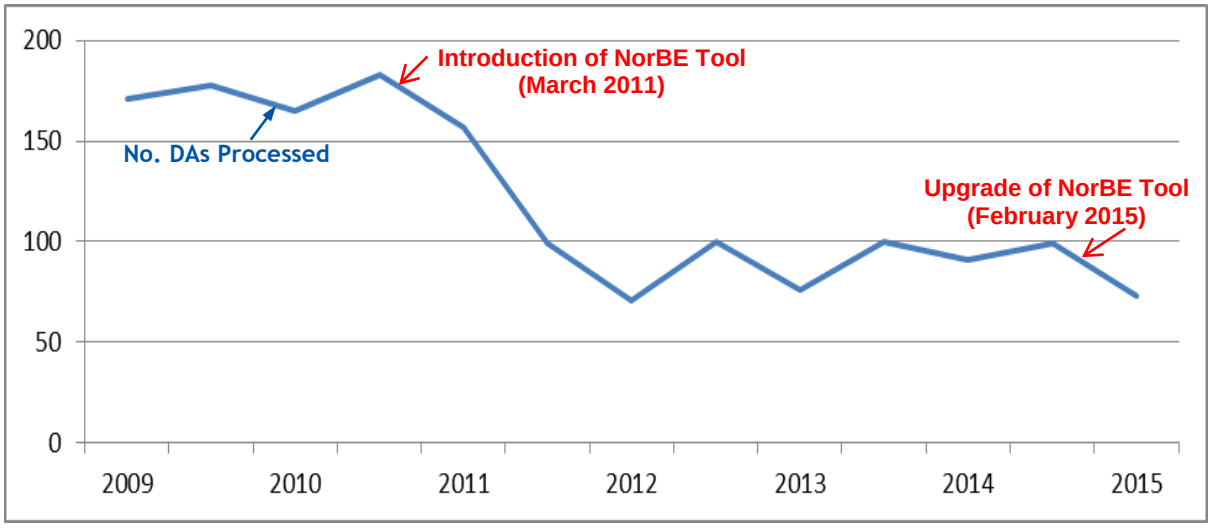

Figure 5. Reduction in DAs processed by WaterNSW (6 monthly)