



Office of the Hawkesbury-Nepean

#21

Major Projects Assessment
Department of Planning and Infrastructure
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SYDNEY NSW 2001

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17 November 2011

Attn. Kane Winwood

Dear Sir

Subject: Modification of Operating Conditions for Brooklyn Wastewater Treatment Plant

I am writing to you in relation to an application made by the Sydney Water Corporation (SWC) for a modification to the effluent quality limits defined in the Minister for Planning's Conditions of Approval for this development. Specifically, SWC is requesting a significant increase in the discharge limits for total nitrogen, total phosphorus and ammonia nitrogen. Thank-you for your extension of time within which the Office of the Hawkesbury-Nepean (OHN) is able to make its submission on this matter.

The OHN was established in March 2009 to improve the health of the Hawkesbury-Nepean river system, through:

- improved co-ordination and implementation of river management strategies;
- providing a single point of access for information on the river and its management;
- promoting more effective management of development adjacent to the River; and
- greater involvement of river users and stakeholders in river management.

The OHN therefore commends the Department of Planning and Infrastructure for its decision to release the Environmental Assessment (EA) for this proposal for public review.

As you are aware, the Hawkesbury estuary is a highly significant ecosystem that provides significant commercial, recreational and environmental values for local and regional communities. Many projects and initiatives implemented by State and local government organisations, and a multitude of 'on-the-ground' activities of community and industry groups have led to an overall improvement in the water quality of the Hawkesbury-Nepean River. In recent times, these have included the \$77.4 million Hawkesbury-Nepean River Recovery Program. One of the key aims of the Program is to reduce nutrient loads to improve the health of the river. Any proposal to increase nutrient loads to this waterway needs careful consideration to ensure that the benefits of significant investments in river health are protected.

This issue has also been brought to OHN's attention by concerned representatives of the commercial fisheries industry and the other stakeholders such as the recently established Hawkesbury Environmental Network (HEN).

The OHN has reviewed the EA report and associated modelling report, and has identified a number of matters requiring consideration, presented in Attachment 1 to this letter. Based on the available information further technical clarification is required to explain the implications of the proposal on the reported regular exceedance of oxidised nitrogen levels in the estuary.

Also, the modelling does not appear to have considered the water quality characteristics of the estuary into which the treated effluent is discharged, when predicting the impacts of the proposed modification. Whilst it is difficult for the OHN to quantify the significance of this point in terms of predicted outcomes associated with this proposal, we believe this matter requires clarification.

In light of the matters raised it is considered that the application would be strengthened by an assessment and more explicit reporting of the benefits and costs of alternative means of complying with the existing effluent criteria, such as the addition of a tertiary filter as already trialled at the WWTP.

Should you wish to discuss this matter please contact Shane Barter on 4729 8126.

Yours sincerely

A handwritten signature in black ink, appearing to read 'Maree Abood', written in a cursive style.

Maree Abood
Director

OFFICE OF THE HAWKESBURY-NEPEAN

Issues of concern relegating to Proposal to increase effluent discharge limits for Brooklyn Wastewater Treatment Plant (WTP)

Current levels of oxidised nitrogen in the Hawkesbury Estuary

The OHN believes that the EA's focus on a subset of the parameters for which limits are set in the Conditions of Approval leads to a failure to consider that levels of oxidised nitrogen (NOx) throughout the estuary currently exceed the relevant water quality objective at least 50 per cent of the time.

NOx is a critical nutrient when considering the potential for excessive algal growth in estuarine systems. Nitrogen is often identified as the nutrient that limits (and therefore controls) algal growth in estuarine waters, and NOx a good indicator of the level of nitrogen that is 'bioavailable' for such growth. A significant portion of nitrogen discharged from tertiary wastewater treatment plants is present as oxidised nitrogen (nitrates and nitrites).

Table 1 below presents a summary of water quality monitoring results collected by Hornsby Shire Council in the vicinity of the discharge point for the Brooklyn WTP. This data, published in Council's Annual Water Quality Monitoring Reports, indicates that the ANZECC Guideline value of 0.015 mg/L (or 15 ug/L) is exceeded at least 50 per cent of the time. These levels of exceedance are significant, with the 80th percentile values of 0.04 and 0.06 mg/L indicating concentrations (approximately) 3 to 4 times that required to meet the ANZECC trigger values¹.

Site	Oxidised Nitrogen Concentrations (mg/L)			
	2008-09		2009-10	
	50 th %ile	80 th %ile	50 th %ile	80 th %ile
103 – Mouth of Milsons Passage	0.03	0.06	0.02	0.04
104 – Hawkesbury River off Peat Island	0.03	0.05	0.02	0.04
107 – Hawkesbury River off Long Island	0.03	0.05	0.02	0.04
108 – Hawkesbury River off Dangar Island	0.02	0.04	0.02	0.03
106 – Mouth of Sandbrook Inlet	0.02	0.06	0.02	0.02
105 – Hawkesbury River Bridge near STP outlet	0.03	0.05	0.02	0.04

Table 1. Oxidised nitrogen concentrations in the Hawkesbury estuary (2008-2010)

Notes: 1. ANZECC trigger value is 0.015 mg/L. 2. Site 105 is located within initial dilution zone.

It is important to understand that the OHN does not contend that the elevated NOx levels in the estuary are, or have been, caused by the discharge from Brooklyn WTP. The OHN does believe, however, that the frequency of exceedance of ANZECC Guidelines (the measure adopted in SWC's EA to assess the impacts of different discharge scenarios), requires further consideration in Department of Planning and Infrastructure's assessment of this application.

Effluent plume modelling

The OHN queries the statement in the in Section 5.1.2 of the EA that the modelling considers only the "concentrations of nutrients in the river sourced from treated effluent from the WWTP". The modelling should incorporate the water quality characteristics (or profile) of the water into

¹ A frequency of compliance with ANZECC trigger values of 75-80 per cent is often interpreted as a good water quality outcome

which the effluent is discharged. If this is not considered, the predicted pollutant concentrations at the boundary of the initial dilution zone (or anywhere else) will be under-estimated.

This suggestion is strengthened by the fact that Figures 8 and 9 in the EA indicate zero pollutant levels occur at various distances from the discharge point, at those times when Brooklyn WWTP is not discharging. Consideration of the background level of these nutrients (from other sources) present at those times is important.

The OHN would recommend that due consideration of current or background water quality would constitute a basic requirement of best practice in dispersion modelling, and cumulative impact assessment as recommended in the Hawkesbury-Nepean River State of Joint Intent (endorsed by the NSW Government in 2001), and State Regional Environment Policy 20. The apparent decision not to incorporate this matter into the modelling results as presented in Figures 8 and 9 generates could generate some doubt regarding the claimed high frequency (~100%) of compliance with ANZECC Guidelines at the boundary of the initial dilution zone (and perhaps beyond).

The OHN requests that SWC clarify and justify its approach in regard to this aspect of its prediction of river outcomes associated with this proposal.

Assumed volumes of wastewater discharge

One of the reasons for improved predicted outcomes through the CORMIX modelling, as stated in Section 2.3 of the numerical modelling report, is that the actual effluent volume discharged is considerably less than that assumed in earlier modelling. Also noted in various sections of the EA that the current discharge volume of 0.25 ML/day is considerably less than the ultimate design average dry weather flow (ADWF) of 0.71 ML/day.

The OHN believes that the expected ultimate discharge volume should be used in the modelling. A small discharge volume will be better diluted upon discharge, compared to a (~ three times) larger discharge volume. The OHN requests that SWC clarify and justify any such assumption.