



Your Reference: 09\_0189  
Our Reference: DOC12/38941  
Our Contact: Mark Hanemann 9995 6845

Ms Belinda Scott  
Senior Planning Officer  
Infrastructure Projects  
Department of Planning  
GPO Box 39  
SYDNEY NSW 2001

Dear Ms Scott

I refer to your letter dated 4 September 2012 requesting the Environment Protection Authority (EPA) provide advice on the Environmental Assessment (EA) for *Water and Wastewater Servicing of the West Dapto Urban Release Area and Adjacent Growth Areas*.

The EPA has reviewed the EA and has identified a number of matters of concern in relation to the proposal, particularly in relation to:

- predicted exceedances of the licence limits currently in place for wet weather overflows from the Shellharbour sewerage system; and
- predicted significant exceedances of identified noise goals, even with noise mitigation measures in place.

Full details of the matters identified for consideration by the Department of Planning and Infrastructure when developing conditions of approval for the project are provided at **Attachment 1**.

If you have any queries in relation to this letter, please contact Mark Hanemann, Acting Head Metropolitan Infrastructure (Water) on 9995 6845 or [mark.hanemann@epa.nsw.gov.au](mailto:mark.hanemann@epa.nsw.gov.au)

Yours sincerely

A handwritten signature in black ink that reads 'Giselle Howard' followed by the date '29/10/12'.

**GISSELLE HOWARD**  
**Director Metropolitan**  
**Environment Protection Authority**

Encl. *Attachment 1 - EPA Comments on EA for Water and Wastewater Servicing of the West Dapto Urban Release Area and Adjacent Growth Areas*



**ATTACHMENT 1**  
**EPA COMMENTS ON EA FOR WATER AND WASTEWATER**  
**INFRASTRUCTURE IN THE WEST DAPTO URBAN RELEASE AREA**

**Waste water partial treatment, bypass and overflow events**

The EPA notes that hydraulic modelling of the proposed sewerage systems indicate that wet weather overflows from the Shellharbour system are predicted to exceed the limits currently in place for wet weather overflows in Sydney Water's environment protection licence.

In order to meet limits on wet weather overflows set by the EPA under the *Protection of the Environment Operations Act 1997*, Sydney Water is required to undertake improvements works in Wollongong, in the Bellambi and Port Kembla systems. These works are to be completed by June 2013 and the EPA expects that Sydney Water will comply with the wet weather overflow limits for those systems. The EPA considers that it is not acceptable for Sydney Water to design new sewerage networks that will result in breaches of current limits. The proponent should be required to address and mitigate any exceedances in the detailed design and planning stages.

The EPA notes that the primary disinfection units at Port Kembla Sewage Treatment Plant (STP) are expected to exceed the EPA's current limits after 2031. Additional bypasses of appropriate treatment processes, which are considered breaches of conditions of the environment protection licence for Port Kembla Waste Water Treatment Plant as a result of the additional sewage flows and infrastructure are not acceptable and should be considered more thoroughly through detailed design and planning stages of the proposed development.

**Marine water quality impacts through discharge through the deep ocean outfalls**

The EPA notes that Sydney Water does not anticipate to be undertaking any construction activities in the marine environment and that any marine water quality impacts will be through the increase in effluent discharged from the sewage treatment plants.

The EPA has undertaken a review of the modelling of the deep ocean outfalls at Port Kembla and Shellharbour STPs carried out by the proponent.

The modelling indicates that the Shellharbour outfall design does not enable good hydrodynamic mixing, as much of the initial momentum is lost in pits that existed in the original configuration of the outfall structure. The Environmental Assessment (EA) does not indicate whether this design was re-configured with the most recent augmentation of the plant. Sydney Water should confirm whether this is the case.

The EPA notes that average dry weather flows for Port Kembla and Shellharbour STPs are expected to increase from 43 and 14 ML/day to 62.2 and 22.2 ML/day respectively in 2048. These flows exceed the current outfall design capacities of 59 and 20ML/day.

Any increase in volume is likely to reduce near-field dilutions, increase the surface plume thickness and/or increase the dimensions of the plume.

Wollongong outfall has better dilution efficiency as the multi-port diffuser configuration utilises the discharge flow momentum at depth, allowing three-dimensional mixing as the plume rises to the surface during the near-field phase of flow. However, as the outfall approaches capacity in 2048, the relatively shallow nature of the site could mean that the increased flow volume could have serious implications for the mixing ability of the current outfall design.

The EA does not clearly define the mixing zone for these discharge plumes (i.e. hydrodynamic, density, temperature, effluent concentration or distance parameters), but alludes to the initial dilution phase as being defined by the salinity reaching 35.5 ( $\pm 0.25$  std dev). For an outfall, the majority of mixing occurs in the relatively controllable near-field zone where turbulent mixing is driven by the characteristics of the discharge (i.e. volume, velocity, density). Generally, initial mixing in a hydrodynamic sense refers to the discharge driven near-field where, if contaminants are not met at end of pipe, the discharge structure can be designed to maximise dilution in the near-field. The EPA generally expects that guideline criteria are met within the near-field zone where dilutions are relatively controllable.

It is not clear what modelling was undertaken by the proponent for effluent constituents. The EA states that modelling was not carried out for those constituents that met the guideline criteria; however the EPA notes that modelling (mixing zone/initial mixing modelling) was done. The proponent should clarify whether near-field or far-field modelling was carried out, as modelling undertaken by the EPA indicated that the initial mixing zones all lie in the far-field, well beyond the near-field.

Randomly selected effluent flow and effluent quality data were used in the modelling. The EPA considers this to be unusual, expecting scenarios should be run targeting mean, median, maximum, 75<sup>th</sup> percentile and 90<sup>th</sup> percentile conditions or choosing values that would be expected to produce a 'worst case scenario' outcome. A random selection may result in set of uncharacteristic starting conditions for the model. The EPA considers that the randomly chosen values driving the model should be presented in the context of how the outfall operates on a day-to-day basis.

The EA states that ammonia concentrations will not cause problems at Wollongong as the ammonia is converted to nitrogen as part of the treatment process. The EPA assumes that the EA is referring to N<sub>2</sub> gas and that there will be no ammonia residual in the effluent. If the ambient environment currently exceeds the guidelines, then any contribution of total nitrogen or ammonia will increase the concentration of ammonia in the coastal zone.

The EPA also notes some inaccuracies around the use of guideline criteria in the modelling results –

- ANZECC Aquatic Ecosystem Protection Trigger (2000) for ammonia (NH<sub>3</sub>) is 20µg/L not 500µg/L, as indicated in Table 6.4.
- The criteria for total suspended solids in the guidelines is 0.5mg/L however the EA uses 3mg/L (converted from a range of 0.5 – 10 NTU).

### **Impact on inland water quality**

The EA considers potential operational impacts of the proposal on inland waterways within the development areas, concluding that there will be only a relatively minor increase in nutrient and total suspended solids loads due to changes to proposed

wastewater overflow infrastructure, and that the increased loads from sewage overflows would not be significant. The EA indicates that this is because the contribution of contaminant loads from sewage is relatively small compared to current loads from urban stormwater runoff.

The EPA considers that some points in the EA should be expanded in order to support the above conclusion –

- Some measure of confidence should be provided around the modelled estimate of stormwater and wastewater loads of nutrients, faecal coliforms and total suspended solids.
- The proportion of stormwater and wastewater overflow load estimates for nutrients that are biologically available should be defined (e.g. ammonium, oxidised nitrogen and filterable reactive phosphorus). Wastewater is expected to have a higher proportion of biologically available nutrients.
- Information should be provided to support the notion that the assimilative capacity of the receiving environment is fairly resilient. The EPA considers it likely that impacts such as algal blooms and aquatic weeds would occur as a result of development in the West Dapto Urban Release Area and Adjacent Growth Areas; and
- The EA has not considered the combined contaminant loads of sewage overflows and stormwater inputs from the broader development proposal. The combined load impacts on the aquatic ecology should be considered for the WDURA and AGA.

### **Noise and vibration assessment**

The noise and vibration assessment indicates that operational noise criteria can be satisfied at all locations with the provision of appropriate noise mitigation measures during the design phase. Item 24 of the Statement of Commitments should clearly reflect this.

The EPA notes that the assessment predicts significant exceedances of Noise Management Levels of up to 40 dB and higher to the surrounding community due to airborne noise from construction works. Highly significant exceedances of the identified noise goals in particular are predicted, even with noise mitigation measures in place. A suite of noise and vibration mitigation and management measures are proposed in the EA to address the expected impacts. Prior to commencement of construction, a detailed Construction Noise and Vibration Management Plan should be developed and implemented by the proponent.

It should be clearly acknowledged, however, that the implementation of the Construction Noise and Vibration Management Plan will not, in many cases, be able to reduce the impacts from the works to a level that even approaches the relevant construction noise and vibration goals. The EPA considers that the paramount issues will be –

- effective communication with, and management responses to the concerns of, the affected community;
- the need for clear justification and prior approval to carry out any construction works outside the recommended standard hours defined in Section 2.2 of the Interim Construction Noise Guideline (ICNG);
- the early erection of temporary noise barriers; and
- the need to minimise any truck movements outside standard hours.

Construction activities should be limited to the recommended standard hours defined in Section 2.2 of the Interim Construction Noise Guideline (ICNG), and not be limited to 'daylight' hours as proposed in Table 34 and Table 36 of the noise and vibration assessment.

### **Contaminated sites**

The EPA agrees with Coffey's general assessment of the contamination status of the 12 identified sites in Table 3 of Appendix H of the environmental assessment.

The greatest impacts identified by Coffey are geotechnical considerations (land degradation and watercourse management) rather than soil, fill or groundwater contamination. The EPA generally agrees that "groundwater impacts are not anticipated to be great" and the overall assessment of significant environmental impacts are unlikely if the recommended management and mitigation measures are successfully implemented.

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