Pacific Environment Limited

Consulting • Technologies • Monitoring • Toxicology

20 July 2015

Samantha Wilson
Senior Consultant
Urbis
Tower 2, Level 23, Darling Park
201 Sussex Street, Sydney NSW 2000

Dear Samantha,

Re: 2 Figtree Drive (Site 53), Sydney Olympic Park – Odour Assessment

1 BACKGROUND

The NSW Department of Planning and Environment (DP&E) has captured a submission from the NSW Environment Protection Authority (EPA) within their Environmental Assessment Requirements for the proposed residential development of Site 53, Sydney Olympic Park (located at 2 Figtree Drive).

The EPA's submission requires the production of "*an Odour Impact Assessment detailing the likely impacts and any proposed management (including operational) and mitigation measures to protect the amenity of residents/visitors/employees from the nearby Homebush Liquid Waste Treatment Plant (LWTP)*".

Pacific Environment has previously produced an odour assessment relating to the proposed Carter Street Urban Activation Precinct (UAP) in Olympic Park, NSW (hereafter, 'the Carter Street Odour Assessment'). This proposed Carter Street UAP is located adjacent to the existing LWTP referred to by the EPA. As such, the Carter Street Odour Assessment[1] characterised the LWTP's potential odour impacts across the extent of the Sydney Olympic Park region. The Homebush Bay LWTP is operated by Transpacific Industries Pty Ltd (Transpacific).

It is understood that in February 2014 the EPA amended the licence for Transpacific requiring them to undertake an odour audit. As a result of the audit the EPA requested Transpacific implement various system improvements to reduce odours. These improvements included:

- Sealing identified leaks from Degrit Building and Process Tanks/Equipment to reduce fugitive emissions;
- Repairing corroded tank covers;
- Reinstating negative air condition in the Degrit Building which was found not to be operating effectively;
- Residue conveyor replacement for better air extraction;
- Deodorising misting system install above bins; and
- Air ducting added to receival tanks.

While the level of completion of the above upgrades is not known, it is considered that they would provide improvements to the odour amenity originally assessed within the Carter Street Odour Assessment.

[1] Report available at https://majorprojects.affinitylive.com/public/dfb09039a4b9463300a4d4370d83931a/11.%20Appendix%20I%20Odour%20Assessment.pdfd.pdf

2 LEGISLATIVE CONTEXT

2.1 Odour Impact Assessment Guidelines

Technical Guidelines – Assessment and Management of Odour in NSW

In November 2006 then NSW Department of Environment and Conservation (now NSW EPA) published technical guidelines for the assessment and management of odour. One of the key overlying principles adopted in the framework is planning to prevent and minimise odour impacts. This means that at the planning stage, planners, proponents and regulators should consider the compatibility of a proposal with current and likely future land uses.

Notwithstanding this, existing activities are required to undertake measures to minimise their odour impacts if land use conflicts arise once operational. The benchmark for an operational facility is whether odour is being prevented or minimised using best management practices and best available technology. Best management practice generally involves adopting particular operational procedures that minimise odour while retaining or improving production efficiency. The first step in developing an appropriate mitigation strategy is to consider the extent to which management practices can reduce odour. Where management practices fail to achieve the required odour reduction by themselves, the use of best available control technology should be considered.

Odour Impact Assessment Criteria

The EPA has developed odour goals and the way in which they should be applied with dispersion models to assess the likelihood of nuisance impact arising from the emission of odour.

There are two factors that need to be considered:

1. what "level of exposure" to odour is considered acceptable to meet current community standards in NSW and

2. how can dispersion models be used to determine if a source of odour meets the goals which are based on this acceptable level of exposure

The term "level of exposure" has been used to reflect the fact that odour impacts are determined by several factors the most important of which are:

- the **F**requency of the exposure
- the **I**ntensity of the odour
- the **D**uration of the odour episodes and
- the **O**ffensiveness of the odour (collectively called FIDO factor)

Whether or not an individual considers an odour to be a nuisance will depend on the FIDO factors outlined above and although it is possible to derive formulae for assessing odour annoyance in a community, the response of any individual to an odour is still relatively unpredictable. Therefore, odour goals need to take account of these factors.

The EPA Approved Methods include odour impact assessment criteria for ground-level concentrations (GLCs) for complex mixtures of odorous air pollutants. They have been refined by the EPA to take account of population density in the area.

Table 2.1 lists the NSW EPA's criteria to be exceeded not more than 1% of the time, for different population densities.

Table 2.1: Impact Assessment Criteria for the Assessment of Odorous air pollutants

Population of affected community	Impact Assessment Criteria for Complex Mixtures of Odorous Air Pollutants (OU, nose-response-time average, 99th percentile)
≤ ~2	7
~10	6
~30	5
~125	4
~500	3
Urban (2000) and/or schools and hospitals	2

The difference between odour criteria is based on considerations of risk of odour impact rather than differences in odour acceptability between urban and rural areas. For a given odour level there will be a wide range of responses in the population exposed to the odour. In a densely populated area there will therefore be a greater risk that some individuals within the community will find the odour unacceptable than in a sparsely populated area.

An odour impact assessment criterion of 7 OU would be acceptable to the average person, but as the number of exposed people increases, the probability of a more sensitive individual being exposed increases. The most stringent criterion of 2 OU is considered to be acceptable for the whole population. An odour criterion of 2 OU has been historically adopted for the Homebush Bay LWTP.

3 CARTER STREET ODOUR ASSESSMENT

The Carter Street Odour Assessment was prepared by Pacific Environment for the (then) NSW Department of Planning & Infrastructure (DP&I, now DP&E) in October 2013. The DPE propose to rezone the Carter Street Urban Activation Precinct (UAP) in Sydney Olympic Park to permit a range of uses including residential. As noted above, the proposed UAP is located adjacent to the existing LWTP.

The Carter Street Odour Assessment evaluated the existing and potential future odorous impacts associated with the LWTP on the proposed UAP, and beyond across the Olympic Park as a whole. Local land use, terrain and meteorology were considered in a quantitative odour impact assessment that was completed using the CALPUFF atmospheric dispersion model.

The Homebush Bay LWTP operates under Environment Protection Licence (EPL) 4560. Odorous emissions are controlled by the odour control furnace (OCF) and main thermal oil heater (MTOH). The OCF was installed in 2005 to replace the central thermal oxidiser and the residue processing plant thermal oxidiser. When the OCF is not operational, the carbon bed filter (S851) is used as backup control to treat odorous emissions along with the MTOH. In addition, previous odour investigations (**The Odour Unit; 2013**) indicate that odorous emissions are expected from the truck unloading bay and the residual bin.

To characterise the odour emissions from the LWTP when it is operating as normal and during worst case emissions, four scenarios were modelled, namely:

- Scenario 1 – Normal operations with the OCF operating (S851 not operating)
- Scenario 2 – Worst case operations with OCF operating (S851 not operating)
- Scenario 3 – Normal operations with S851 operating (OCF not operating)
- Scenario 4 – Worst case operations with S851 operating (OCF not operating)

3.1 Implications for future development at 2 Figtree Drive

Under Scenarios 1-3 described above, odour dispersion modelling predicts that the odour performance criterion of 2 OU does not extend to the proposed development site of 2 Figtree Drive.

Under Scenario 4 modelling, the 2 OU odour performance criterion is predicted to be experienced (however not exceeded) in the vicinity of the proposed development site at 2 Figtree Drive. The odour contours predicted for Scenarios 1 to 4 are reproduced in **Figure 3.1**, **Figure 3.2**, **Figure 3.3**, and **Figure 3.4** along with the location of the proposed development.

Figure 3.1: Predicted 99th percentile nose-response average ground level odour concentrations – Scenario 1

Figure 3.2: Predicted 99th percentile nose-response average ground level odour concentrations – Scenario 2

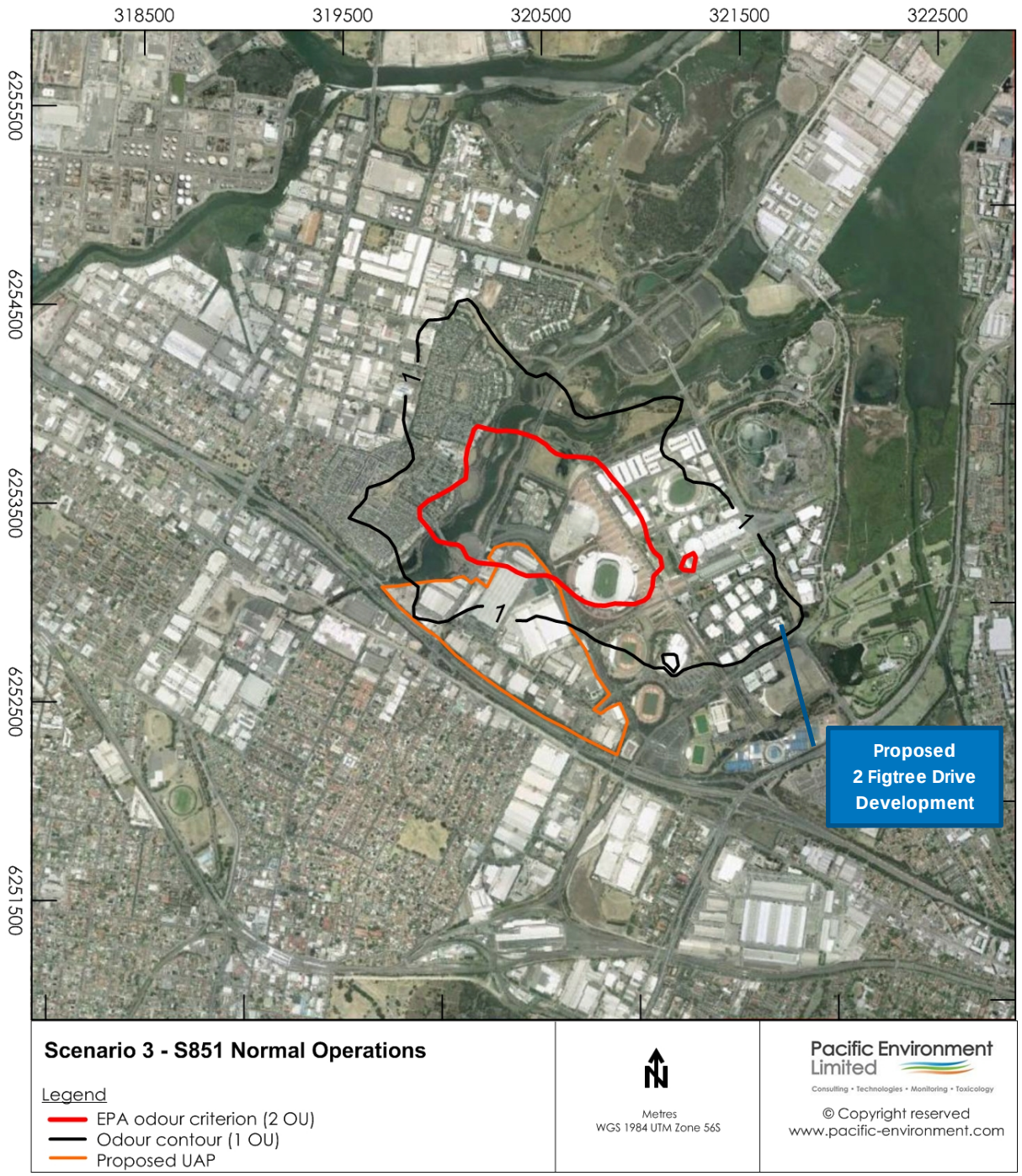

Figure 3.3: Predicted 99th percentile nose-response average ground level odour concentrations – Scenario 3

Figure 3.4: Predicted 99th percentile nose-response average ground level odour concentrations – Scenario 4

It is instructive to contextualise the outputs presented in **Figure 3.4**. The contour plots presented represent maximum predicted odour concentrations, under a 'worst-worst case' odour emission rates from the LWTP (failure of the primary odour control unit alongside worst-case observed odour emissions) combined with worst case meteorology in terms of odour dispersion. The likelihood of all these variables aligning as an operational reality is considered to be extremely low. Further, under such conditions, there would be odour impacts experienced across the majority of the Sydney Olympic Park, including all stadia, commercial and retail premises.

Further, it is noted that the EPA has required the LWTP to complete additional odour mitigation measures since the production of the Carter Street Odour Assessment. While the status of these improvements is not known, it is considered that any additional measures would reduce the 'worst-worst case' predictions (along with all other Scenario impacts).

Even under such 'worst-worst case' odour emissions / meteorology, the 2 OU odour performance criterion in the vicinity of the proposed development at 2, Figtree Drive is anticipated to be met (i.e. not exceeded).

4 CONCLUSION

A review of previous odour modelling of the existing LWTP and its potential to impact upon proposed development at 2, Figtree Drive, Sydney Olympic Park has been completed. Only under a 'worst-worst case' odour emission scenario is it anticipated that the 2 OU odour performance criterion is met (but not exceeded) in the vicinity of this development site. On this basis, it is considered that the risk of odour impacts from the LWTP under normal, and even upset, conditions is extremely low.

I trust that the above is adequate to evaluate likelihood of odour impacts of the LWTP upon the proposed development site. Do not hesitate to contact the undersigned if you would like any additional clarification.

Yours sincerely

Damon Roddis
Principal/General Manager (NSW)
Pacific Environment Limited

5 REFERENCES

NSW EPA (2005)
"Approved Methods for the Modelling and Assessment of Air Pollutants in NSW", August 2005

NSW EPA (2006)
"Assessment and management of odours from stationary sources in NSW", November 2006

Pacific Environment (2013)
"Carter Street Olympic Park – Odour Assessment", Final Report, 15 October 2013 available at: https://majorprojects.affinitylive.com/public/dfb09039a4b9463300a4d4370d83931a/11.%20Appendix%20I%20Odour%20Assessment.pdfd.pdf

The Odour Unit (2013)
"Technical Memorandum: Odour Dispersion Modelling Study of the Homebush Facility", January 2013. Prepared for Transpacific Industries Pty Ltd