Goodman
Level 17
60 Castlereagh Street
SYDNEY NSW 2000

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3 February 2016

**Attention:** Mr Richard Mawer
Senior Project Manager

Dear Richard,

**Re: Orica Southlands Industrial Estate Project Approval 060191**
**Review of Turning Head Hydraulic Modelling Assessment**

## 1. Background

Orica Australia has developed an industrial estate known as "Southlands" at Banksmeadow near Botany Bay. The land is located in the lower part of the Springvale and Floodvale Drains catchments. The site is flood liable and final hydraulic flood modelling using as-constructed survey was undertaken to confirm acceptable flood impacts to satisfy requirements of the Project Approval. This was confirmed in WMAwater's letter of 16th October 2015 to Ms Emma Barnet, Environmental Planning Office, Department of Planning and Environment (DoP).

Goodman are constructing buildings on the site and the fire brigade has requested a turning head be installed in the north east corner of the carpark and this may affect the flood levels and thus the Project Approval requirements.

Ms Fiona Gibson (DoP Planner Regional Assessments) advised (email of 8th January 2016) that *"given the complexities of the flooding issues associated with the redevelopment of the site, the Department requests that a peer review of the flooding information submitted in support of the proposal be provided. The peer review should advise whether:*
*1. the height of the proposed turning circle is sufficient to provide access for the fire brigade during flood events;*
*2. the off-site flood level increases would be acceptable (including consideration of any cumulative flood level increases); and*
*3. the proposal would still comply with the requirements of Condition 10 in Schedule 3 of the Approval regarding flood validation."*

WMAwater undertook this peer review role previously for the DoP and was engaged by Goodman in January 2016 to undertake the peer review as requested by the DoP.

**WMAwater Pty Ltd** **ABN 14 600 315 053**

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Aurecon (letter of 29th January 2016) was commissioned by Goodman to assess the feasibility of this turning head modification and determine whether there would be any change to the approved flood impacts. WMAwater has relied on the information provided by Aurecon for this peer review. WMAwater note that there are minor differences between the results provided by Hyder for our October 2015 review and those currently provided by Aurecon. A satisfactory explanation has been provided by Aurecon and relates to different hydraulic model versions and presentation of results.

## 2. Schedule 3 Condition 10

Schedule 3 Condition 10 (below) required several matters regarding flooding to be addressed as part of the approval.

*10. The Proponent shall commission and pay the full cost of a Hydraulic Modelling Flood Validation Assessment Report to confirm that the 'as constructed' Stage 1 compensatory flood storage works have been undertaken in accordance with the principles outlined in Orica Southlands Remediation and Development Project Hydraulic Modelling Report and Response to Exhibition Submissions/Comments – (Report Ref: 204617, 29th November 2010, Revision 3 by Aurecon) as amended by the addendum letter report titled Southlands – Detailed Design 2D Flood Re-Modelling – Addendum Advice Regarding Variation to Compensatory Flood Basin Design and Impact (Prepared by Aurecon, dated 22 February 2013), and that the flood impact is no greater than indicated in Figures D9a, D10a and D11a of the addendum report (Appendix 6). The assessment must:*

*a) be conducted by a suitably qualified, experienced and independent expert whose appointment has been endorsed by the Director-General;*

*b) be submitted to the Director-General and Council within 6 weeks of the completion of the flood mitigation works and prior to the construction of any warehouse units;*

*c) include a detailed survey from a Registered Surveyor on all key structures and areas including final surface levels wither side of Springvale Drain Flow Control Structure and any other location affecting the discharge of flood water from the Orica flood detention basin to Nant Street, Coal Pier Road, McPherson Street or the downstream reaches of Springvale or Floodvale Drains;*

*d) provide easy to read figures indicating any differences between the results provided on Figures D9a, D10a and D11a of the Aurecon 2013 addendum report;*

*e) determine whether the 'as constructed' Stage 1 works have been undertaken in accordance with the design principles outlined in the Aurecon 2010 report and Aurecon 2013 addendum report and comply with the requirements in this approval; and if necessary; and*

*f) recommend and prioritise measures to be undertaken in the event that the assessment shows that the flood impact exceeds that shown on Figures D9a, D10a and D11a of the Aurecon 2013 addendum report and that the works as executed are not in accordance with this approval.*

## 3. Outcomes of WMAwater's Review

*1. Is the height of the proposed turning circle sufficient to provide access for the fire brigade during flood events?*

The turning head is below the 1% AEP flood level however the proposed height is acceptable for the following reasons:

- raising the level will cause unacceptable increases in flood level;
- the probability of a coincident fire and flood is very rare;
- flood depth warning signs will be provided and the fire service can make an informed decision regarding access should they attend during a flood.

2. *Are the off-site flood level increases acceptable (including consideration of any cumulative flood level increases)?*

Yes. A summary of our review is as follows.

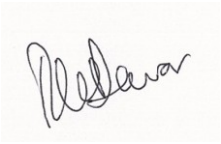
- Changes in flood impacts within the subject site itself can be ignored. These have occurred due to modifications to the earthworks from the design and by themselves only affect the site owners;
- The small changes in flood level above those already approved are within the tolerance of the construction methods, survey and hydraulic modelling and can be ignored;
- The isolated increases in flood impact typically occur in all flood impact assessments using computer models. These are termed numerical instabilities and are not reflective of the general impacts in the local area. For this reason they can be ignored.

3. *Does the proposal still comply with the requirements of Condition 10 in Schedule 3 of the Approval regarding flood validation?*

Yes, taking into account the above comments, the "as constructed plus turning head" flood impacts are no greater than the nominated design flood impacts and Schedule 3 Condition 10 has been satisfied. Field survey of the constructed turning head should be undertaken and provided to satisfy Condition 10 c).

Should you have any questions or require further clarification regarding the above please do not hesitate to contact the undersigned.

Yours Sincerely,
**WMAwater**



R W Dewar
**Director**