

5 February 2015

Ref: 3999639

Ms Karen Jones  
Director, Infrastructure Projects  
Development Assessment Systems and Approvals  
Department of Planning & Environment  
GPO Box 39  
SYDNEY NSW 2001

ATTN: Ms Ingrid Illias

Dear Ms Jones,

**RE: Response to NSW Office of Water submission on the Modifications to the CBD and SE Light Rail**

Transport for NSW (TfNSW) has received the NSW Office of Water (NOW) submission on the proposed CBD and SE Light Rail (CSELR) modifications. The submission is dated 19 December 2014 and was passed onto TfNSW by the Department of Planning and Environment on 4 February 2015.

The submission raises four distinct concerns regarding impacts to groundwater from the altered Anzac Parade tunnel construction methodology before confirming that NOW maintains its position that a fully sealed tunnel design is the preferred option for the protection and management of the Botany Sands Groundwater Source. The NOW concerns are highlighted below followed by the TfNSW response.

The submission has correctly noted that construction of the tunnel will be carried out via cut-and-cover construction methodology and would comprise a combination of bored piled and temporary sheet piled walls, with a cast-in-place roof slab. The tunnel floor would be cast in place once the spoil from the inside of the tunnel has been removed.

- 1. Assuming that the proposed underpass is a drained design, it appears that the tunnel would have a permanent groundwater "take" which would need to be pumped and managed. As this would occur in the already fully committed Botany Sands Groundwater Source, this presents a significant issue in relation to the management of the water source, unless the permanent water take is accounted for through trading, and subsequently retired.**

The result of a permanent groundwater "take" as a result of the tunnel construction and operation has not changed from the approved project. It was acknowledged in chapter 10.4 of the Environmental Impact Statement (EIS) that groundwater is expected to be encountered during the construction of the Moore Park tunnel and, therefore, dewatering would be required. Dewatering during construction of the CSELR would result in a localised drawdown of the water table, causing a change in groundwater flow direction. If

groundwater flow patterns are changed, water from further afield would be drawn towards the CSELR structure being constructed. The EIS identified the potential risks associated with the localised drawdown of the water table and specified safeguards that would be implemented to avoid or minimise these risks. The proposed modification in construction methodology will not result in increased risks to aquifer drawdown and the information provided in the approved project EIS is still relevant.

The Moore Park tunnel would be constructed through the Botany Sands aquifer using a tanked construction technique (where practicable) to reduce the volume of groundwater inflow, drawdown and settlement risk.

In accordance with condition of approval B68 and Environmental Management Measure H1, additional investigations will be undertaken during detailed design in consultation with NOW. Environmental Management Measure Z.6 also specifies that construction techniques would aim to reduce the volume of dewatering required at the deeper sections of the tunnel.

## **2. Structural damage to neighbouring buildings and infrastructure may occur as a result of dewatering in the area.**

The approved project EIS noted that a potential impact arising from the tunnel construction may include settlement as a result of aquifer drawdown. The EIS identified that “settlement could adversely impact neighbouring buildings and structures. Settlement was observed during the construction of the Eastern Distributor and may be of particular concern where the Botany Sands aquifer is intersected”.

As a result of this concern, management measures were included in the EIS to prevent potential impacts to neighbouring development. A dewatering system for excavations proposed in the Botany Sands aquifer would be developed. This could comprise the reinjection of groundwater back into the same aquifer to minimise the spatial extent of drawdown (and therefore settlement). Environmental Management Measure H2 included in the modifications submissions report re-states this commitment in relation to the construction of the tunnel. Additionally, a condition assessment of existing buildings and infrastructure would be undertaken to monitor the risk of settlement from groundwater drawdown.

Therefore there is no change to the potential impacts as a result of the changed construction methodology.

## **3. Noted that detailed investigations and predictions of water take required as part of the Conditions of Approval have not yet been undertaken.**

Modelling of potential groundwater inflow rates during the construction of the CSELR proposal was not undertaken as part of the EIS for the approved project nor the proposed modification. Groundwater modelling will be undertaken during the detailed design phase to estimate the potential groundwater inflow rates during construction and operation of the Moore Park tunnel and the potential impacts resulting from permanent interruption of groundwater flow, including the extent of the drawdown and the potential for settlement. This will include additional investigation/assessment of dewatering requirements for the construction of the Moore Park tunnel which would be undertaken in consultation with NOW.

Conditions of Approval B67 to B71 outline the requirements in relation to groundwater investigations. These conditions will be complied with throughout the project and will ensure impacts are identified and minimised. Additionally, management measures Z.1 and Z.2 contained in the modifications submissions report have been included to ensure compliance. These measures are as follows:

Z.1 – A construction groundwater management plan would be prepared prior to construction, and would detail the control measures that aim to minimise potential impacts to groundwater resources and receiving environments during construction. The purpose of the plan is to provide practical impact mitigation principles and measures for the design and construction of the proposal consistent with relevant legislation and standard guidelines.

Z.2 – The construction groundwater management plan would include details of a groundwater monitoring program, which would be implemented prior to construction to identify changes in groundwater quality and levels during the construction. The monitoring program would be developed in consultation with the NSW Office of Water.

**4. Requests confirmation that condition B67(e) is still applicable to the modified design. Condition B67(e) requires *details of measures to be implemented to ensure that post-construction groundwater inflows to the tunnel are eliminated or minimised.***

All conditions of approval previously issued will be applicable to the project modifications unless otherwise advised by the Department of Planning & Environment. Condition B67(e) will be complied with, with investigations undertaken during detailed design.

**NSW Office of Water asserts that it maintains its position that a fully sealed tunnel design is the preferable design for the protection and management of the Botany Sands Groundwater Source unless suitable allocation volumes can be purchased and retired.**

The final decision regarding whether the tunnel will be drained rather than sealed will be made during detailed design, once all necessary information is available. Environmental Management Measures are in place to ensure that groundwater is appropriately protected from undue impacts associated with construction and operation of the CSELR. These measures will be implemented throughout construction and operation. Any additional findings arising as a result of detailed studies would also be incorporated into the construction process as appropriate.

Yours sincerely,



Louise Sureda  
Principal Manager, Planning & Development

