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Saint Ignatius' College Riverview DA Stage 1
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Our ref: ELA2866/GW008

23rd October, 2015

Dear David,

Re: Ecological and Water Response to address condition 14 of the Secretary's Environmental Assessment Requirements (SEARs) for Saint Ignatius' College Staged Redevelopment of School Campus (SSD 7140)

Under Section 78A(8A) of the *Environmental Planning and Assessment Act* and Schedule 2 of the *Environmental Planning and Assessment Regulation 2000*, Saint Ignatius' College is required to address the Secretary's Environmental Assessment Requirements (SEARs) in a prepared environmental impact statement (EIS).

This memorandum specifically addresses the requirements of the SEARs' Condition 14, namely:

- Assess impacts on the Lane Cove River aquatic environment and riparian corridors potentially affected by the proposal, and outline any mitigation measures needed to manage impacts.
- Assess impacts on groundwater, including groundwater quality, quantity and connectivity.

The relevant policies and guidelines to consider include:

- NSW Aquifer Interference Policy (NOW, 2012)
- NSW State Rivers and Estuary Policy (1993)
- NSW Guidelines for Controlled Activities on Waterfront Land (DPI, 2012)

The following assessment has been prepared after reviewing the proposed Masterplan and supporting draft documents, and conducting a site inspection on 12 October 2015.

Aquatic and riparian impact assessment

The proposed development will occur inland of existing riparian and near-shore vegetation. Modifications to buildings will occur within the existing footprint, and where any vegetation removal is required (e.g. future ring road connection) this will not directly impact the riparian corridor. No development will occur within the estuary channel, and the proposed activities will not cause harm to marine vegetation, as it is defined under the NSW *Fisheries Management Act 1994* (saltmarsh, mangroves, seagrass and macroalgae). The proposal will not require dredging or reclamation of the estuary. No new drainage outlet structures will be built on 'waterfront land' as defined under the NSW *Water Management Act 2000* (WM Act) (Waterfront land includes the bed and bank of any river, lake or estuary and all land within 40 metres of the highest bank of the river, lake or estuary) (NSW DPI 2012a). No excavations or other works on 'waterfront land' that would otherwise trigger a Controlled Activity Approval from DPI Water under the WM Act is required.

The proposed development does not conflict with the objectives set in the NSW State Rivers and Estuary Policy (1993), which aim to manage the rivers and estuaries of NSW in ways which:

- Slow, halt or reverse the overall rate of degradation in the systems
- Ensure the long-term sustainability of their essential biophysical functions
- Maintain the beneficial use of these resources.

Further, the proposed development is not sited directly on land encompassed by the scope of the Policy, namely rivers, estuaries and the adjacent riverine plains. There will be no further loss of foreshore habitat and will not create a risk to bank instability.

Protection of the estuary and riparian lands will be offered in the form of best practise stormwater management. A Water Management Statement prepared for the St Ignatius College – Masterplan (Geoff Ninnes Fong & Partners, 1 Oct 2015) outlines the requirements set by Lane Cove Council and proposes the development will “*adopt a stormwater management strategy that maximises the use of runoff on site, reduces the peak flow discharge from the site and enhances the water quality leaving the site through the use of acceptable solutions and current industry practices*”. Proposed measures to mitigate post-development impacts relative to existing conditions are:

- Treatment train approach for new buildings
- New stormwater drainage network designed to cater for 20 year ARI event
- Collect and reuse roof runoff
- Installation of a Gross Pollutant Trap at the discharge point into the trunk main
- Investigate potential implementation of Water Sensitive Urban Design measures for stages 1 and 2A.

With implementation of a *stormwater management strategy*, direct, indirect and cumulative impacts to the aquatic and riparian ecosystems will be minimised.

Groundwater impact assessment

Summary

The proposed development will be entirely contained within the existing campus building footprint and as such will be developed on land above 30 m AHD. The primary aquifer in the area is the Hawkesbury Sandstone, which occurs within 2m of the ground surface and extends to an indeterminate depth greater than 30 m below the campus. Groundwater has been located in the north-east corner of the campus at a depth of 18 m, but yields were low and the water quality poor, hence there is no licensed groundwater use in this area.

Excavations for footings will be shallow and will not trigger assessment under the Aquifer Interference Policy (NSW DPI, 2012b). There is no intent for direct or indirect impacts to groundwater by the development.

Shallow, near-surface stormwater flow through discharges via springs to the south of the campus. This will not be impacted by development provided the proposed stormwater management plan is implemented and additional gross pollutant traps are developed, maintained and monitored for water quality.

Groundwater context

The principal instruments that govern equitable use of groundwater in NSW are the water sharing plans that are being progressively developed for rivers and groundwater systems across New South Wales following the introduction of the *NSW Water Management Act 2000*. These plans protect the health of our rivers and groundwater while also providing water users with perpetual access licences, equitable conditions, and increased opportunities to trade water through separation of land and water.

The relevant plan that covers groundwater around the study area is the *Water Sharing Plan for the Greater Metropolitan Region Groundwater Sources* (the plan) which covers 13 groundwater sources located on the east coast of NSW, covering an area of approximately 32,500 square kilometres, from Broken Bay in the north, to Shoalhaven Heads in the south, and Lithgow and Goulburn to the west. The region is bounded by the Hawkesbury River catchment to the north and west and the Shoalhaven River catchment to the south and south-west. The region also includes the groundwater of the Illawarra and metropolitan Sydney.

The provisions in the plan provide water to support the ecological processes and environmental needs of high priority Groundwater Dependent Ecosystems (GDEs) and rivers, and direct how the water available for extraction is to be shared. The plan also sets management rules for water access licenses, water allocation accounts, dealings in licenses and water allocations, water supply works approvals, and the extraction of water. The plan pertains to all water occurring naturally below the surface of the ground, all water contained within alluvial sediments below the surface of the land, all water contained within any coastal sands and all water contained within any porous rock aquifers and fractured rock aquifers that occur within the plan area. Waters not included within the plan are any surface waters within the plan area.

The plan provides for sharing water between the environment, town water supplies, landholders and commercial users. The volume of water available to meet all competing environmental and extractive needs varies on a yearly and daily basis, depending on the weather, recharge to aquifers, and river flows in the case of alluvium which is highly connected to surface water sources.

The NSW Aquifer Interference Policy 2012

In September 2012, the NSW Government released the NSW Aquifer Interference Policy (AIP) that considers the licensing and approval of aquifer interference activities (NSW DPI, 2012b). The Aquifer Interference Policy provides a coherent and constructive link between the requirements and expectations of both the *Environmental Planning and Assessment Act 1979* and the *Water Management Act 2000*. Cumulative impacts must explicitly be recognised and determined, either through monitoring, or numerical modelling, with expected impacts determined for the life of any activity and through to re-equilibration of any groundwater systems, which may be on the order of hundreds to thousands of years.

The NSW *Water Management Act 2000* defines an aquifer interference activity as that which involves any of the following:

- The penetration of an aquifer
- The interference with water in an aquifer

- The obstruction of the flow of water in an aquifer
- The taking of water from an aquifer in the course of carrying out mining or any other activity prescribed by the regulations
- The disposal of water taken from an aquifer in the course of carrying out mining or any other activity prescribed by the regulations

Provided the project can demonstrate that any groundwater impacts will cause minimal harm (as specified in the Act), there will be no need to invoke the Policy. The requirements of the Act should, however, be included in any Groundwater Management Strategy.

Saint Ignatius' College is grounded to the top of the Hawkesbury Sandstone, which locally constitutes the primary groundwater aquifer. This is a competent sandstone unit (e.g. Douglas Partners, 2008) and minimal excavations will be required (<2m). Hence there will be negligible penetration of the aquifer.

A registered bore (GW053747, licence # 10BL122120) is sighted in the north-east corner of the campus and was drilled in 1982 to a depth of 30.5 m. Hawkesbury Sandstone was encountered at 2.47 m and continued to the end of hole. Groundwater was intercepted at 18.9 m depth and the water level rose marginally to 18 m below ground level. Yield was low (0.6L/s) and the water was salty (B. Marsh, pers. comm. Saint Ignatius College, 12 Oct 2015), hence the bore was abandoned and the license cancelled. This site is at 34 m above water mark, thus the groundwater level sat at 16 m AHD.

During testing for proposed alterations and additions to the Riverview Rowing Shed (Jeffery and Katauskas, 2012), shallow bores were drilled near the shoreline on the southern end of the campus. A single bore penetrated water at a water level comparable to the low water mark of the estuary. This water was also salty and likely represents ingress from the estuary in to the Hawkesbury Sandstone exposed along the cliff face.

The redevelopment proposed here will occur within the existing site boundaries and at an elevation between 30 and 34 m above water mark. Therefore, the existing groundwater aquifer will not be impacted by the project and may be considered disconnected from the shallow water systems. Further, the groundwater in this area appears to be saline and unsuitable for use.

Notwithstanding, there is potential for recharge to the surficial sediments during rain events and this may penetrate to the Hawkesbury Sandstone aquifer. Discharge of stormwater via drains and the existence of a known spring (Tambourine Bay Well) to the south of the campus suggests local preferential flow remains near the surface, predominantly through the soil horizons. Significant iron staining is evident in this location, though the water has been previously (late 1800s) used as a local water source. This is considered a superficial feature maintained by rejected recharge travelling along the interface between the shallow sediments and the Hawkesbury Sandstone aquifer and not connected to the underlying Hawkesbury Sandstone aquifer.

The AIP states that any activity that results in a reduction in the groundwater resource pool of three megalitres (ML) per year or more, or at an instantaneous rate of greater than five litres per second will require a groundwater extraction and aquifer interference license. As there is no intent to remove or extract groundwater, directly or indirectly for the purposes of this project, licensing will not be required and disposal is not relevant.

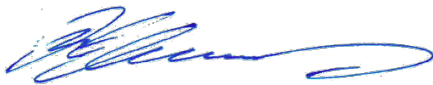
An assessment of environmental impacts would still be required, and minimal harm criteria thresholds determined, however, if the activity occurs within a Water Protection Zone (WPZ) or Limited Intrusion Zone (LIZ) or on Biophysical Strategic Agricultural Land (BSAL). As currently defined, the project does not intersect WPZ, LIZ nor BSAL.

Further, any activities with the potential to contaminate groundwater or result in unacceptable loss of storage or structural damage to an aquifer would also prompt a further assessment of impacts. The existing stormwater

management will be augmented and improved during the course of this development, with provision for additional gross pollutant traps being developed as part of the works. This would mitigate any potential impacts to the shallow water and mitigate against any contamination to these water sources.

The proposed development, as outlined in the Masterplan and supporting documents, is unlikely to have a significant impact on the Lane Cove River estuary, aquatic environments, riparian corridors, nor on groundwater quality, quantity and connectivity.

Yours sincerely,



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References

Douglas Partners, 2008. *Report on Geotechnical Investigation: St Ignatius Childcare Centre*

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NSW DPI, 2012b. *NSW Aquifer Interference Policy: NSW Government policy for the licensing and approval of aquifer interference activities, September 2012*. NSW Department of Primary Industries – Office of Water.

NSW Water Resources Council, 1993. *NSW State Rivers and Estuary Policy*. NSW Government.