



OUT19/6907

Andy Nixey
Key Sites and Industry Assessments
Planning and Assessment Group
NSW Department of Planning, Industry and Environment

andy.nixey@planning.nsw.gov.au

Dear Mr Nixey

**Ivanhoe Estate Redevelopment – Stage 1 (SSD 8903)
EIS Exhibition**

I refer to your email of 22 May 2019 to the Department of Planning, Industry and Environment (DPIE) – Lands, Water and Department of Primary Industries (DPI) about the above matter.

The following advice for you to consider is from relevant branches of Lands & Water and DPI.

DPIE – Water and the NSW Natural Resources Access Regulator

- Works on waterfront land should be carried out in accordance with the Guidelines for Controlled Activities (2012) <https://www.industry.nsw.gov.au/water/licensing-trade/approvals/controlled-activities>.
- A Vegetation Management Plan/Rehabilitation Management Plan should be developed to identify the management of the riparian zones around Shrimptons Creek. This plan should be developed in consultation with the Natural Resources Access Regulator.
- Detailed advice about groundwater is provided in **Attachment A**.

Any further referrals to DPIE – Lands, Water and DPI can be sent by email to:
landuse.enquiries@dpi.nsw.gov.au.

Yours sincerely

Liz Rogers
Manager, Assessments
DPIE Water – Strategic Relations
8th August 2019

**Ivanhoe Estate (SSD 8903)
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- 1 An authorisation shall be obtained from the Natural Resources Access Regulator (NRAR) for the take of groundwater as part of the activity. Groundwater shall not be pumped or extracted for any purpose other than temporary dewatering during the period of construction at the site identified in the development application
- 2 Further investigations, as proposed by Douglas Partners in the geotechnical report, should be undertaken to verify the groundwater conditions on site. Currently methods for construction have been based on assumptions of the groundwater conditions and these assumptions should be verified:
 - a. **Selected cored boreholes in accessible areas** – to “ground-truth” the desk-top assessment and provide further information in areas where only limited data is available. These would preferably include:
 - i. Bores near the basement perimeter near Shrimptons Creek, to assess whether rock levels may preclude the need for cut-off walls for basement design and construction;
 - ii. Bores at the proposed bridge abutment, to assess foundation design and construction conditions.
 - iii. Bores at selected accessible locations through the site, likely in roadways and preferably in or near the proposed basement footprints, to provide greater confidence in the consistency of ground conditions across the site. A low test/borehole density is suggested due to current access issues, and further testing would be recommended to provide greater confidence for detailed design. If practical, greater density would be focussed in areas of earlier (“Stage 1”) development.
 - b. **Installation of standpipes and dataloggers** – at selected bores to allow for monitoring of groundwater levels. This will assist with responses to expected DPIE–Water requirements with regard to tanking and dewatering. It is noted that as groundwater levels do fluctuate over time, a longer period of monitoring with dataloggers is necessary.
 - c. **Rising head tests** – at each standpipe location, for preliminary assessment of groundwater inflow.
 - d. **Laboratory testing** – including petrographic testing of sandstone (to assess durability for use in rockfill), soil properties near Shrimptons Creek (to inform future scour assessment), soil and groundwater aggressivity (for structural design), groundwater chemistry (for preliminary assessment for disposal).
- 3 Remediation activities should be undertaken where hydrocarbons above the limit were detected. Additional monitoring bores should be installed for the specific purpose of determining whether the hydrocarbon contamination has leached into the aquifer.
- 4 If the investigations demonstrate that the take of groundwater is likely to exceed 3 ML then the appropriate licences and approvals should be sought through NRAR.
- 5 Following the groundwater investigations the likely impacts to surrounding groundwater users including the environment should be reported to NRAR.
- 6 The design and construction of each building must prevent any take or inflow of groundwater after the completion of construction by making any below-ground levels fully watertight for the anticipated life of each building.

- 7 Sufficient permanent drainage shall be provided beneath and around the outside of the watertight structure to ensure that natural groundwater flow is not impeded and:
 - a. any groundwater mounding at the edge of the structure shall be at a level not greater than 10 % above the level to which the water table might naturally rise in the location immediately prior to the construction of the structure; and
 - b. any elevated water table is more than 1.0 m below the natural ground surface existent at the location immediately prior to the construction of the structure; and
 - c. where the habitable, accessible or occupiable part of the structure (not being footings or foundations) is founded in bedrock or impermeable natural soil then the requirement to maintain groundwater flows beneath the structure is not applicable.
- 8 The methods and the materials used for construction shall be designed to account for the likely range of salinity and pollutants which may be dissolved in groundwater beneath the site.
- 9 Groundwater quality testing of samples taken from outside the footprint of the proposed construction, with the intent of ensuring that as far as possible the natural and contaminant hydrochemistry of the potential dewatered groundwater is understood, shall be conducted on a suitable number of samples and tested at a certified laboratory.
 - a. Details of the sampling locations and the protocol used, together with the test results accompanied by laboratory test certificates.
 - b. An assessment of results must be done by suitably qualified persons with the intent of identifying the presence of any contaminants and comparison of the data against accepted water quality objectives or criteria for the intended dewatering purpose.
 - c. In the event of adverse quality findings, the proponent must develop a plan to mitigate the impacts of the hydrochemistry on the dewatered groundwater.
- 10 The method of disposal of pumped water shall be nominated (i.e. reinjection, drainage to the stormwater system or discharge to sewer) and a copy of the written permission from the relevant controlling authority shall be provided in a report to be provided to NRAR with the application for the authorisation. The disposal of any contaminated pumped groundwater (sometimes called "tailwater") must comply with the provisions of the *Protection of the Environment Operations Act 1997* and any requirements of the relevant controlling authority.
- 11 Contaminated groundwater—i.e. constituent concentrations above appropriate National Environment Protection (Assessment of Site Contamination) Measure (NEPM 2013) thresholds—shall not be reinjected into any geological formation. The reinjection system design, if proposed, and treatment methods to remove contaminants shall be nominated and included in a report to be provided to NRAR with the application for the authorisation. The quality of any pumped water that is to be reinjected must be demonstrated to be compatible with, or improve, the intrinsic or ambient groundwater in the vicinity of the reinjection site.
- 12 Daily measurements of water levels from monitoring bores outside basement support walls, weekly measurements of groundwater and discharge water quality, and weekly measurements of pumped volumes shall be recorded by the proponent throughout the construction phase of the development and provided to NRAR in raw data form and in a completion report prior to building certification.

END ATTACHMENT A