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Resource Assessments Team
Department of Planning & Environment
Locked Bag 5022
Parramatta NSW 2124

Attention: Allison Sharp
Via Major Projects Planning Portal

Dear Ms Sharp

HOLCIM SALT ASH SAND OPERATIONS – SSD-9099356

Thank you for the opportunity to comment on the Environmental Impact Statement (EIS) in support of a state significant development application to expand sand extraction and processing operations at Holcim's Salt Ash sand quarry.

Hunter Water Corporation (Hunter Water) understands the proposal includes the following elements and represents a significant change to the existing quarrying operations undertaken at the site:

- using a combination of dry extraction and dredging methods to process up to 500,000 tonnes per annum of sand extracted from the site.
- processing of up to an additional 200,000 tonnes per annum of sand imported from other quarries.
- operation for up to 30 years.
- proposed backfilling of deep excavations to -28 metres AHD using suitable approved fill materials to assist batter stability.

The project area is located in the northern part of the Stockton Groundwater Source, to the immediate north and west of the North Stockton Catchment Area, a gazetted special area under the Hunter Water Act 1991, as shown in **Figure 1**.

Hunter Water is the regional water utility for the Lower Hunter and is primarily interested in the sustainable use of water resources and impacts on the Stockton aquifer (also referred to in the EIS as the Stockton sandbeds or the Stockton Groundwater Source), including impacts on both water quantity and water quality.

As a supporter of the United Nations Sustainable Development Goals, Hunter Water is also interested in how the proposal addresses sustainable land use and environmental management in and around the North Stockton Catchment Area.

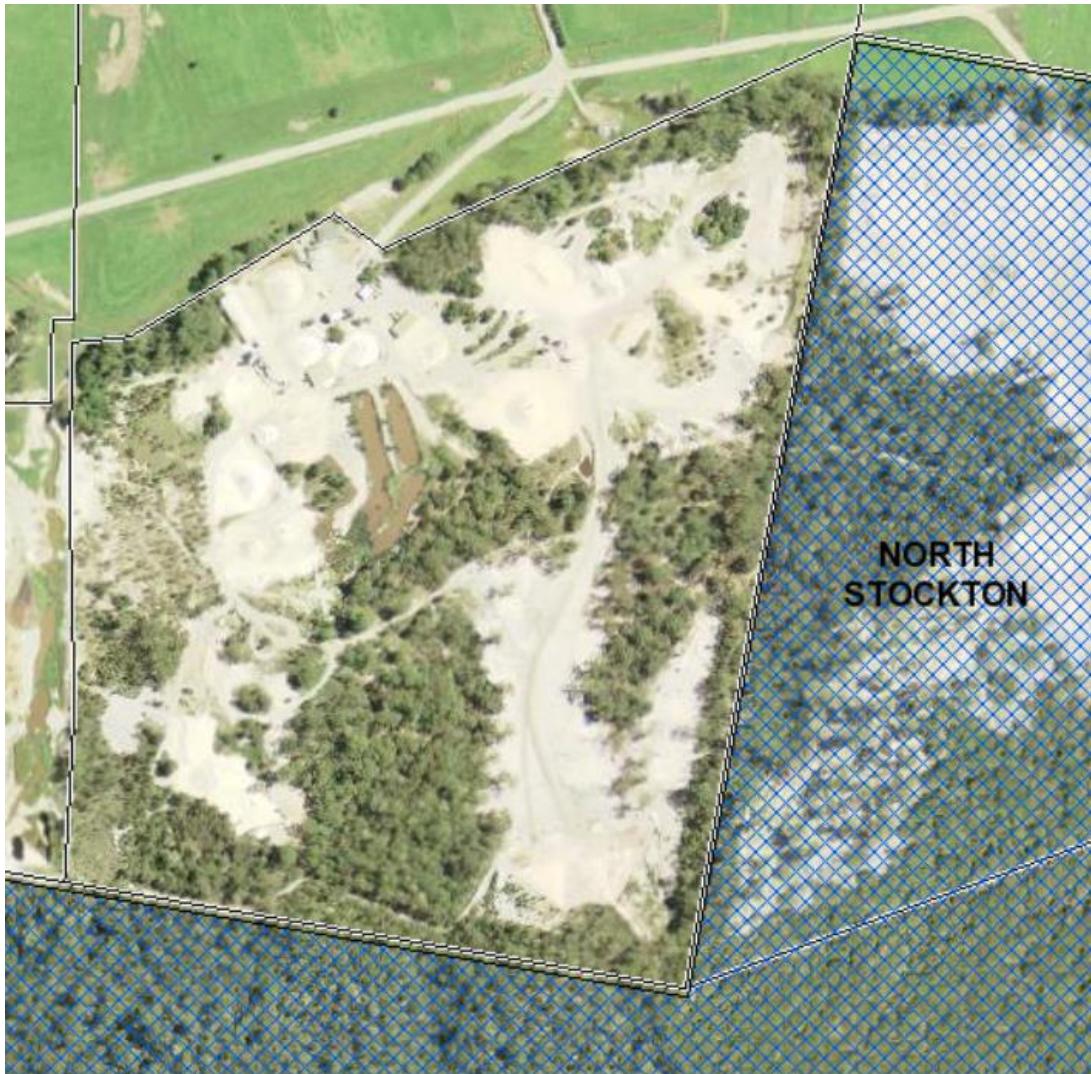


Figure 1: The project area location adjacent to the North Stockton Catchment Area

Aquifer Impacts

Hydrology

The EIS states that detailed hydrogeological investigations and groundwater modelling have been undertaken to assess the project's impacts on the Stockton aquifer. The detailed assessment is acknowledged and is considered to be adequate.

Notable results of the groundwater impact assessment of interest to Hunter Water are:

The extraction of groundwater by dredging operations and evaporation from the dredge pond cause an effective drawdown within the aquifer and movement of groundwater toward the dredge pond and/or a reduction in the northward groundwater flux from the site. ... The drawdown levels at the completion of Stage 7 are predicted to be up to 1 m in the site, and up to 0.2 m drawdown extending to a maximum of 1.1 km from the site.

Approximately 246 megalitres per year (ML/y) of baseflow will be lost during Stage 3, which would otherwise have drained into a network of surface drains and Tilligerry Creek. The loss of baseflow will present a minor impact as modelling confirms there is no impact to groundwater levels north of the quarry, where the groundwater gradient is different to that in the higher permeability sand units on the site. Most of the reduction in flux is to the surface drains, with only 4 ML/y reduction directly to Tilligerry Creek, which is tidal and controlled by a gate to minimise the tidal influence. As such, the change to environmental water availability to Tilligerry Creek will be minimal.

The worst case change to the groundwater regime during and post quarrying is assessed to have minimal impact on groundwater level in surrounding wells. The long-term change in the groundwater level is predicted to be in the order of 0.5 m at the site, and 0.15 m at the nearest Hunter Water wells. Groundwater modelling shows the decline in groundwater level during dredging and post quarry completion is <0.5 metres off site, and well within the 2 metre seasonal variation seen in historical monitoring data for the network of Hunter Water wells, and from wells on the quarry and nearby sand extraction operations.

Similarly, there will be no alteration of groundwater flow or gradient towards the wells. Evaluation of pumping scenarios for operation of the Hunter Water bores has shown that under full operation for an extended period, these wells do not extract water from the site and will not be affected by changed water quality conditions in the proposed dredge pond.

Under the worst case scenario (rehabilitation option 1 – open pond) the water balance assessment indicates the largest ultimate water loss as a result of the proposal would be as a result of evaporation from the dredge pond (404 ML/year). The ultimate peak demand at Stage 7 of the proposed operation is approximately 576 ML/year, which is stated to comprise approximately 3% of the available allocations from the Stockton Groundwater Source.

The EIS indicates the potential for adverse impacts from the proposal on flow regimes and standing levels of the aquifer will be minimal, thereby maintaining the integrity of the available water supply for Hunter Water in the North Stockton catchment area and Stockton groundwater source (SGS). Hunter Water acknowledges that the overall impact of the proposal on groundwater baseflow is relatively minor in the context of the regional groundwater flux. Licensing of the required additional water take is a matter for assessment by DPE Water and NRAR.

Hunter Water also acknowledges that the proposal will not have a significant impact on the Hunter Water emergency borefield in the Stockton aquifer, terrestrial groundwater dependent ecosystems around the site, or on aquatic ecosystems around Tilligerry Creek. Similarly, Hunter Water acknowledges that the proposal would not present a risk to saltwater intrusion into the Stockton aquifer or to the migration of existing PFAS contamination in the region.

Groundwater Water Quality

It is acknowledged in the EIS that the dredging and oxidation of pyritic sulphides (currently in situ sediment below the water table), as well as the dredge pond water itself through chemical oxidation of the water column, may result in acid generation and an increase the concentration of dissolved metals and other chemical compounds in the water. This is acknowledged in the EIS as the principal impact on water as a result of the proposal and is expected to be localised in the vicinity of the project area.

The EIS states the following regarding minimising the potential for the project to result in acidification and release of dissolved metals in the SGS as a result of the oxidation of pyritic sulfides (contained within in situ sediment below the water table) as a result of the proposed dredging activities:

To minimise the potential for the project to result in acidification and release of dissolved metals in the SGS, a management strategy has been formulated and includes evaluation of various options which could be applied during project operations (and after closure) to limit the potential for off-site migration of impacted groundwater and risk to downgradient groundwater users.

It is anticipated that one or a combination of management options will be capable of treating the potential risks to water quality for the SGS. The selection, design and

optimisation of treatment methods will require continued feasibility evaluation to quantify performance relative to the water quality objectives.

The EIS identifies the need for more information and further evaluation of the preferred management of water quality risks from the proposal. Hunter Water recommends that a higher level of confidence is required regarding the management of water quality risks prior to approval of any activities that may result in the realisation of these risks (ie. the proposed dredging). Hunter Water also recommends a precautionary approach be adopted regarding the risk of water quality impacts in the Stockton Groundwater Source and the management of potential long-term impacts after cessation of the quarry operations.

A groundwater management plan is proposed to be prepared for the project to describe the objectives and proposed types and locations of groundwater management and monitoring. The plan will also describe the monitoring observations which will trigger actions and the proposed action and/or mitigation should triggers be exceeded. Hunter Water agrees that a detailed groundwater management plan, and other associated plans, would be required for all aspects the proposal, should it be approved, to ensure monitoring is undertaken and the results reported to relevant stakeholder on a regular basis to maintain satisfactory oversight of the proposed activities.

Land Capability and Future Land use

The EIS describes the project area as having a low land capability in its current state. We note this land capability rating is related to agricultural productivity, as opposed to the site's natural condition and ecosystems that have evolved to exist on the land. Various options exist for future sustainable land uses on the land. The condition of the land may potentially be modified in association with gross site disturbing activities, such as the existing and proposed extractive industry, to facilitate such future land uses. Indeed, this would be the case if suitable fill materials were allowed to be imported to assist with batter stabilisation as it would result in a significant change to the characteristics of the land.

The proposal includes importing fill materials to assist with batter stabilisation and potentially to fill all or part of the void created by the proposed dredging activities. It is uncertain whether the void would be able to be filled entirely or partly, in which case an open water pond (rehabilitation option 1 in the EIS) with an invert level of -28m AHD would be created over the majority of the site as a consequence of the void. The proposition of removing a significant volume of one extractive resource from the site and replacing it with another suitable material, approved by regulation, is considered to be unrealistic based on acceptability criteria stated in the EIS and in the absence of evidence of its feasibility.

Inadequate information is provided in the EIS in relation to the long-term geotechnical stability and design requirements for batters up to 30 metres below the groundwater level in the proposed dredge pond, in the likely event that insufficient material is available for the proposed backfilling (ie. rehabilitation option 1 – open pond). The EIS states that *any failure of slopes are expected to occur progressively over a relatively slow timeframe (over several minutes to hours) rather than suddenly* although sudden failures of the slope may result and *it is therefore critical that regular monitoring is undertaken* throughout construction and operation of the project. It is unclear whether this risk may extend beyond the operating life of the proposed quarry. It is recommended that a much greater level of confidence around this issue is needed for adequate consideration of the proposal prior to its determination.

The remaining parts of the land (the perimeter buffer area) are proposed to be rehabilitated using native vegetation species on completion of quarrying activities. The methodology for native ecosystem rehabilitation is well established, although requires careful management for it to be successful. In that regard the description of this

rehabilitation approach in the EIS is generally acceptable, although at least two key aspects of the proposed quarrying operations would significantly influence that success; the management of topsoil resources and the management of proposed fill materials. Specifically, recovery and subsequent reuse of native topsoil are integral to the success of native ecosystem re-establishment and the use of introduced soil materials in areas where native species rehabilitation is generally inconsistent with the objective of re-establishing local ecological attributes. More details are required for these and other aspects described in the EIS to ensure the rehabilitation objectives (i.e. via anticipated performance standards and completion criteria) would be achieved by the proposed activities and to address other risks to rehabilitation success identified in the EIS. Information provided in the EIS requires substantial refinement to address this aspect of rehabilitation for the proposal.

Inadequate justification is provided for the establishment of an open water pond “for use as an ecotourism attraction and/or environmental conservation” as the final land use for some or the majority of the site and similarly for the completely back-filled option. Hunter Water recommends that greater certainty around the final landform and long-term land use at the site be provided prior to determining the application to assist consideration of the proposal. Hunter Water considers that establishing an open water pond on the majority of the site is inconsistent with surrounding land uses, would essentially sterilise the land from productive future use that is compatible with the surrounding area and, therefore, does not represent a sustainable long-term land use or comply with the objects of the Environmental Planning and Assessment Act 1979.

In contrast to the likely end use for the majority of the site as an open water pond, limiting extraction to above the groundwater table would likely facilitate a more productive land use outcome that would be consistent with the surrounding area and/or the current RU2 – *Rural Landscape* land zoning, without the identified risks. Such future land use would assist in conserving water in the adjacent and underlying aquifer, as well as benefitting from it.

Avoidance of risk is the preferred approach to risk mitigation. Accordingly, and on balance, Hunter Water recommends that sand extraction be limited to 0.7 metres above the predicted maximum groundwater elevation and a final rehabilitated landform no less than one metre above the predicted maximum groundwater elevation in order to protect the Stockton Groundwater Source and enable the subsequent establishment of sustainable land uses. This would be consistent with approvals for existing sand quarry operations in the area, for which these operating conditions have been imposed for the same reasons.

Importation of Fill and Contamination Risk

It is acknowledged that there is a relatively low likelihood of contamination at the site from either the existing or proposed quarrying activities. In Hunter Water’s experience the introduction of fill materials, even when certified as suitable under various resource recovery exemptions, can still result in the introduction of contaminants to a site despite the certification and associated management controls. This has occurred in the Tomago aquifer and elsewhere and the experience is that corrective action, while successful, can be both difficult and protracted to achieve.

Despite the best of intentions and the implementation of strict management protocols, the introduction of fill materials to a site presents a contamination risk that cannot be eliminated. The use of fill materials to assist batter stability below the water level, where the materials cannot be inspected or feasibly recovered once they are placed, presents an even higher risk. The recommended approach to avoid such risks is to design the activity to be undertaken in a manner that does not require imported fill materials to be used.

It would be useful to have more information on why it is necessary to import fill materials to assist with batter stability and an analysis of potentially available fill materials, sources and volumes to assist consideration of the proposal. It would also be useful to understand the design considerations for the proposed dredging activities without importing fill materials to assist batter stability, and associated resource recovery implications (both the reduction in the recoverable resource at the site and the redirection of approved materials from beneficial reuse elsewhere), which has not been considered in the EIS as an alternative approach.

Hunter Water recommends no importation of 'foreign' fill materials to aid in final landform batter stability in order to avoid the introduction of contamination risks and unnatural landscape and biophysical process at the site. Should the proposed dredging activities be approved it is recommended that they be designed and undertaken in a manner that allows natural landscape and biophysical processes to operate.

The EIS acknowledges that water quality in the aquifer may be impacted by potential hydrocarbon contamination in the event of a fuel or oil spill or leak from machinery used to extract the sand, particularly the proposed use of a diesel powered dredge. Should the proposed dredging activity be approved, this risk could be avoided by using an electrically powered dredge.

Environmental Management, Monitoring and Reporting

Apart from the matters described above, the proposed environmental management, monitoring and reporting measures described in the EIS are generally acceptable to Hunter Water.

The proposal represents a significant change to existing sand quarrying operations in the area and Hunter Water believes that careful consideration of the risks are warranted in determining the application. Thank you for the opportunity to review the EIS and provide comments.

A handwritten signature in black ink, appearing to read 'Greg McHarg', with a stylized flourish extending to the right.

Greg McHarg

Account Manager - Major Development