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Memorandum

Date: 30 April 2025

To: Regina Flugge and Alan Kerr, Leichhardt

From: Isabelle Hemmings, M.A.Sc., P.Eng. (ON, BC); Geosyntec Consultants International, Inc.

Subject: **AU424013 Peer Review – Hydraulic Model Report for Eramurra Salt Project**

INTRODUCTION

Geosyntec Consultants International, Inc. (Geosyntec) was retained by Leichhardt Salt Pty Ltd to conduct a peer review of the HEC-RAS model outputs. The model was constructed to evaluate the Eramurra Salt Project facility in the western Pilbara region of Western Australia. The HEC-RAS model was constructed by Surface Water Solutions. The report (**Eramurra Salt Project Hydrologic Assessment for Scenario 7.2.1** dated March 2025, prepared by Krey Price, Surface Water Solutions Document Number SWS-2025_GS-001/0 Rev 0 28 March 2025), figures, and response to comments were provided for review. Overall, the reporting and documented model construction are well presented and provide the necessary information for reviews. References are well documented, and procedures followed are clearly outlined. Figures are overall clearly presented and provide satisfactory evidence of model results. No major issues were found, and the minor comments are documented in the following section.

REVIEW COMMENTS

The two-dimensional (2D) model construction details were compared to the figures provided to document the results and compared to Australian standards of hydrology and hydraulic modelling. Cell size was appropriate for the data provided, size of the modelled domain and was adjusted to provide more resolutions of areas of interest and/or large topographic differences such as near the bunds proposed for the salt flats. Changes in cell sizing was done gradually to avoid stability issues. The model should be updated once the design is refined in future design stages to reflect the actual topographic changes due to the development of the ponds.

The model included up to date representations of the proposed conditions on site. It is noted that the bunds around the salt flats continue to be vertical walls; however, in the absence of more detailed design information, this is considered conservative in evaluating the changes in flood depths and is appropriate for this level of design.

Manning's n roughness coefficients selected were appropriate for the conditions on site.

The model was run in the rain on grid mode, which is also appropriate for the site. When making comparisons between scenarios, differences greater than 10 cm are recommended to be considered as a substantial change to account for the nuances of rain on grid analysis. This recommendation was reflected in the figures for the final document.

The analysis included climate change, as requested in the comments received from both the Western Australia Environmental Protection Authority (EPA) and, Department of Climate Change, Energy, the Environment and Water (DCCEEW) provided in response to the project Environmental Review Document (ERD), and in accordance with the latest guidance from Geoscience Australia – Australian Rainfall and Runoff (ARR). Scenarios selected for the climate change analysis were appropriately conservative for the design stage. As the regional effects were the focus of the study at this time, using a standardized uplift factor for all design events is conservative and appropriate. As the design is advanced, the climate change analysis should be revised to provide a more detailed analysis under climate change scenarios. Climate change scenarios in the future should focus on both local effects and regional effects, noting that the temporal patterns will be different for each analysis.

The analysis also included standard, un-escalated rainfall analyses, and were done in accordance with the ARR recommendations.

CONCLUSIONS

Overall, the hydraulic assessment of the Eramurra Salt Flats project was well presented, thoughtfully documented, and followed the necessary guidelines for hydraulic assessment in Australia. Limitations and caveats regarding the results are thoroughly documented and are acceptable given the conceptual design stage of the works.

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