

Additional Information to the Environmental Impact Statement



SECTION 4

Water Resources



4.0 Water Resources

4.1 Introduction

Existing surface water and groundwater values and the impacts of the Port Expansion Project (PEP) on these values are described in Chapter B.2 (Water Resources) of the Environmental Impact Statement (EIS). The Project area lies in marine waters offshore from the existing reclamation area in the vicinity of the mouth of Ross River and Ross Creek. Existing groundwater monitoring on the constructed eastern reclamation area adjacent to the Project area, indicates water levels are tidal influenced and the quality is saline. Groundwater quality is also slightly acidic, which is likely attributed to localised oxidisation around individual wells during diurnal tide surges.

This section provides information to address submissions received in response to the EIS relevant to water resources and the implications of the proposed revised design on these values. Key matters pertaining to water resources include:

- consideration of potential flood impacts on the future Townsville State Development Area as a result of the PEP
- consideration of revised water and sediment quality guidelines
- degradation of groundwater from potential acid sulfate soils (PASS).

The potential for PASS and subsequent potential for degradation of groundwater associated with the PEP is addressed in Section 6.2.5 of the Additional Information to the Environmental Impact Statement (AEIS).

4.2 Response to Submissions

4.2.1 Consideration of potential flood impacts on the future Townsville State Development Area as a result of the Project

The Department of Environment and Heritage Protection (DEHP) recommended the inclusion of a comprehensive flood study. A further submission from Department of Transport and Main Roads recommended that the Townsville State Development Area (TSDA) Development Scheme and associated flood study, be included in the assessment of flood impacts from the PEP. The Project area is located in marine waters adjacent to the existing reclamation area which lies on the northern side of the mouth of the Ross River, whilst the TSDA lies to the south of the Ross River.

The PEP flood impact study presented in Appendix G of the EIS considered the original Townsville Flood Hazard Study model. Flood modelling has since been revised to consider a straightening of the eastern revetment of the proposed reclamation to test the sensitivity of the PEP to the future development of the TSDA. This revised revetment was simulated to be continuous with the existing reclamation edge as illustrated in Figure 4.1. In lieu of the Department of Transport and Main Roads model, which was not available at the time of this revision, the inflow of the updated PEP modelling was doubled to account for future development of the TSDA. This was considered to be a conservative approach in assessing how significant flows from future developments via the Ross River could affect upstream flooding, given the limited detail currently available about future developments within the TSDA.

As a result the revised modelling demonstrated no change in impact to flood level, flow or inundation as a result of the revised design and future development of the TSDA. Mitigation measures provided in Section B.2.5 of the EIS and reiterated in Section 4.3.4.2 of the AEIS are considered adequate to effectively manage impacts on water resources.

4.2.2 Consideration of revised water and sediment quality guidelines

A submission from DEHP requested the following references be taken into consideration when assessing the impact of the Project on water resources:

- a review of nitrate toxicity to freshwater aquatic species (Hickey, Martin, & NIWA, 2009)
- revision of the ANZECC/ARMCANZ Sediment Quality Guidelines (Simpson, Batley, & Chariton, 2010)
- development of guidelines for ammonia in estuarine and marine water systems (Batley & Simpson, 2009).

The Project is located seaward and offshore from the existing reclamation area and will drain to the marine environment seaward of the mouth for both Ross Creek and Ross River. Water discharges, such as tailwater during construction and stormwater during operation, are predominantly limited to the marine environment.

Nitrate and ammonia trigger values used in the EIS assessment of impacts to freshwater environments are derived from the draft *Ross River Basin Environmental Values and Water Quality Objectives* (DEHP, 2012) and are considered more relevant and applicable to the PEP than the aforementioned guidelines. Impacts to freshwater systems, in the context of this guideline, are provided in Chapter B.2 (Water Resources) of the EIS. Impacts on freshwater water quality as a result of the PEP are expected to be minimal, due to the implementation of mitigation measures outlined in Section B.2.5 of the EIS.

Revision of the ANZECC/ARMCANZ Sediment Quality Guidelines (Simpson, Batley, & Chariton, 2010) and Development of guidelines for ammonia in estuarine and marine water systems (Batley & Simpson, 2009) were considered in the EIS, specifically these were used for development of Chapters B.4 (Marine Water Quality) and B.5 (Marine Sediment Quality) of the EIS. These references were omitted in the EIS and have been individually noted in the Errata List (Appendix C3) and Reference List (Appendix C4) of the AEIS.

4.3 Revised Environmental Impact Assessment

4.3.1 Legislation and policy

There are no legislation or policy changes applicable to the assessment of water resources values as they apply to the PEP, or the management of these values.

4.3.2 Design refinement

The project design has been revised as described in Section 2.0 of the AEIS. The design refinement process has resulted in an increased reclamation footprint to enable greater volumes of dredge material to be placed on land. The revised design has been considered in the flood modelling by extending the eastern revetment to run continuous to the existing reclamation revetment to identify any change in the extent, duration or frequency of flood events with the construction of the PEP.

4.3.3 Supporting studies

Flood modelling was reassessed to consider the revised PEP design and future development within the TSDA. Results of this remodelling are illustrated in Figure 4.1 to Figure 4.7.

4.3.4 Revised assessment

4.3.4.1 Impact assessment

Flood modelling was undertaken using a revised Developed Case Model to consider an extended eastern revetment design and future development of the TSDA, illustrated in Figure 4.1.

The revised modelling showed the impact of the PEP on the extent and intensity of storm surges is consistent with Appendix G of the EIS (refer Figure 4.2). There is no measurable change in the impact of the PEP on the extent or duration of a 50 year or 100 year flood event in the Townsville region as a result of the revised design (refer Figure 4.3 and Figure 4.4). The revised design does not change the expected impact of the PEP on the 100 year surge event (refer Figure 4.7). This would be expected given the distance seaward of the PEP from the mouth of both Ross Creek and Ross River.

Impacts of the Project on water resource values are consistent with Section B.2.5 of the EIS.



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Legend Project Area Townsville State Development Area Model Extent Water Depth (m) 0 - 1m 1 - 2m 2 - 3 3 - 4m 4 - 5m 5 - 10m > 10m Scale:1:70,000 (when printed at A4) 0.5 3 0 Kilometers PROJECT ID 60161996 LAST MODIFIED CFS 19-02-2016 60161996_PLN_162 Data Source: Noise Data - AECOM 2015 StreetPro © 2010 Pitney Bowes Software Pty Ltd Roads, Parks - © 2010 PSMA Australia Pty Ltd Base Image - ESRI 2012 AECOM does not warrant the accuracy or completeness of information displayed in this map and any person using it does so at their own risk. AECOM shall bear no responsibility or liability for any errors, faults, defects, or omissions in the information.

AFIS

Figure 4.2





XTENT OF MODE



EXTENT OF MODEL



4.3.4.2 Mitigation measures

Mitigation measures to reduce the impact on the Project water resources values are provided in Section B.2.5 of the EIS and outlined in the Construction Environmental Management Plan (Appendix B2) and the Operational Environmental Management Plan (Appendix B3).

4.3.5 Summary

Impacts of the Project on water resource values are consistent with Section B.2.5 of the EIS. Mitigation measures provided in Section B.2.5 of the EIS remain current for the revised design.

4.4 Conclusion

The PEP is expected to have a low impact on water resources on site or within the surrounding area during construction and operation. Whilst the Project reclamation footprint has been revised through the design refinement process, this has not altered the outcome of the assessment presented in the EIS. The mitigation measures identified in the EIS remain relevant given the scale and duration of the PEP construction.