

09 December 2020

To Pip Marshall, Environmental Officer, Infrastructure Assessment Branch

Copy to Neil McCarthy

From BORR IPT

Subject Response to DWER Memorandum, BORR Southern Section, Request for Advice

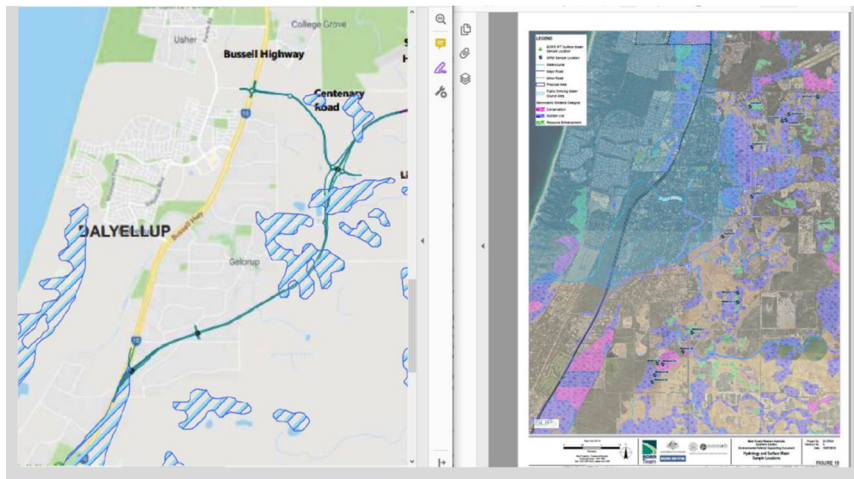
1. Introduction

This memo has been prepared in response to advice provided by the Department of Water and Environmental Regulation (DWER), regarding potential hydrologic impacts associated with the construction and operation of the Bunbury Outer Ring Road, Southern Section and their proposed mitigation (26 October 2020)

DWER provided comments on the Key Environmental Factor of Inland Waters in relation to Section 4.6 of the Bunbury Outer Ring Road (BORR) Southern Section Environmental Referral Supporting Document and Additional Information advertised for comment (BORR-02-RP-EN-0014_Rev 2_October 2020).

The following responses are provided.

ITEM NO.	EPA QUESTION	DWER COMMENT
1	Whether the issues relevant to your agency in the ARI Document have been addressed to a standard that enables the EPA to report on the proposal.	<p>Matters in relation to waterways, public drinking water supply areas and acid sulfate soils have been appropriately considered.</p> <p>In relation to the wetlands, which the proposal area overlaps or intersects, road construction can cause subsidence and/or heaving of underlying sediments. This risk is heightened if these sediments comprise peat, and it is suggested the risk may be significant if the thickness of peaty material is greater than approx. 1 m.</p> <p>Where peaty material of greater than approx. 1 m thickness occurs, this may result in a change to the hydrogeological and/or hydraulic conditions and an increased risk of localised flooding and inundation. These risks were realised during the construction of the Mitchell Freeway.</p> <p>The referral documentation does not characterise the materials underlying the wetlands. However, from a desk top assessment Image 1 has been produced to show alignment of possible risk areas with the wetlands that the proposal area overlaps or intersects.</p> <p>The left-hand side of this image identifies potential swamp and lacustrine deposits (comprising peat, peaty sand and clay), noting this should be used as a guide only. The right-hand side shows the location of wetlands, extracted from “Figure 10: Hydrology and Surface Water Sample Locations” of the referral documentation.</p> <p>Image 1: Possible swamp and lacustrine deposits (LHS) and wetlands that the proposal area overlaps or intersects (RHS)</p>

ITEM NO.	EPA QUESTION	DWER COMMENT
		

BORR IPT notes that DWER considers matters to waterways, public drinking water supply areas and acid sulphate soils are appropriately considered.

In regards to the matter of peaty material underlying wetlands, the following advice is provided.

An extensive preliminary geotechnical investigation has been carried out at selected locations along the proposed BORR alignment for the purpose of the preliminary Proposal design.

These geotechnical investigations, provide preliminary information for the BORR Southern Section. As part of the geotechnical investigation (inclusive of North and South), extensive portions of the proposed alignment were subject to the following investigations.

- A site walkover inspection was conducted where site access was granted
- One hundred and seventy-nine cone penetrometer tests (CPT) were conducted along proposed road alignments and at proposed underpass, bridge support (abutment or pier) and bridge approach embankment locations
- Eighty-four test pits were excavated along proposed road alignments and at proposed underpass and bridge support (abutment and pier) locations
- Eleven hand augers were bored across the BORR South footprint exclusively along proposed road alignments and at proposed bridge abutments
- A Dynamic Cone Penetrometer (DCP) or Perth Sand Penetrometer (PSP) test was completed adjacent to each hand auger and adjacent to most test pits
- Twenty-six Geotechnical boreholes were drilled at proposed bridge abutments
- Groundwater monitoring wells were installed adjacent to each geotechnical borehole
- A geophysical subsurface investigation comprising Ground Penetrator Radar (GPR) scanning was undertaken at two bridge sites in the BORR South: Yalinda Drive over BORR and the BORR-Bussell Highway Interchange.

Swamp deposit materials were intersected at test pit (TPC52) at the northern terminus of BORR South, near Centenary Road. The deposit was intersected from the underside of a Bassendean Sand layer (0.1 m) to 1.5 m depth. At this location the swamp deposit was a dark grey to mottled grey / pale brown sand from a depth of 0.1 to 1.2 m, and a pale grey mottled green silty sand from a depth of 1.2 to

1.5 m (collapsing). The relative density of the swamp deposit unit at TPC52 was inferred from DCP test results to be loose, becoming loose to medium dense from a depth of 1.1 m.

At the time of the site investigation some preferred sample locations could not be investigated due to restrictions of presence of native vegetation or land access. Evidence of the deposit near Centenary Road is indicative of the potential risk, but also better defines the potential extent of the risk.

Regardless, further site specific geotechnical and acid sulfate soil investigations will be required to be undertaken by the South West Gateway Alliance, based on the final construction footprint to identify potential swamp / lacustrine deposits and characterise soils underlying wetland areas. These investigations will inform the detailed design which will be required to consider increased risk of localised flooding and inundation, and any potential management measures required during the construction phase.

Information regarding prior geotechnical and acid sulphate soil investigations are included in the following reports:

- BORR IPT (2020) BORR Project Pavement Design and Geotechnical Interpretive Report (BORR-00-RP-GT-0004-February 2020), Unpublished report for Main Roads Western Australia.
- BORR IPT (2020) BORR Project Factual Geotechnical Investigation Report (BORR-00-RP-GT-0003-February 2020), Unpublished report for Main Roads Western Australia.
- BORR IPT (2020) BORR Southern Section Overarching Acid Sulfate Soil and Dewatering Management Plan (BORR-02-RP-EN-0018-May 2020), Unpublished report for Main Roads Western Australia.

ITEM NO.	EPA QUESTION	DWER COMMENT
2	If the proponent's mitigation and management measures are adequate to manage the potential impacts to Inland Waters so that hydrological regimes and quality of groundwater and surface water are maintained and that environmental values are protected.	The proponent's mitigation and management measures related to waterways, public drinking water supply areas and acid sulfate soils are considered appropriate. However, further investigation to identify actual risks associated with the potential settlement of materials underlying the wetland areas is recommended.

As noted above, extensive preliminary geotechnical investigation has been carried out at selected locations along the proposed BORR alignment for the purpose of the preliminary design. This has informed the basis and extent of potential risks requiring additional ground investigations during the detailed design.

Further site specific geotechnical and acid sulfate soil investigations will be required to be undertaken by the South West Gateway Alliance, based on the final construction footprint to characterise soils underlying wetland areas. These investigations will inform detailed design and any potential management measures required during the construction phase.

Information regarding prior geotechnical and acid sulphate soil investigations are included in the following reports:

- BORR IPT (2020) BORR Project Pavement Design and Geotechnical Interpretive Report (BORR-00-RP-GT-0004-February 2020), Unpublished report for Main Roads Western Australia.
- BORR IPT (2020) BORR Project Factual Geotechnical Investigation Report (BORR-00-RP-GT-0003-February 2020), Unpublished report for Main Roads Western Australia.
- BORR IPT (2020) BORR Southern Section Overarching Acid Sulfate Soil and Dewatering Management Plan (BORR-02-RP-EN-0018-May 2020), Unpublished report for Main Roads Western Australia.

ITEM NO.	EPA QUESTION	DWER COMMENT
3	Where the information is considered inadequate, please provide your advice on what is required together with your reasons.	The proponent should consider undertaking cone penetrometer work along the proposed route of the ring road and associated spur roads, both within the wetlands and other areas where potential swamp and lacustrine deposits may be found.

As noted above, extensive preliminary geotechnical investigation, including excavation of a series of test pits, boreholes and cone penetrometer tests (CPT), has been carried out at selected locations along the proposed BORR alignment for the purpose of the preliminary design.

One hundred and seventy-nine CPTs were conducted along proposed road alignments and at proposed underpass, footbridge, bridge support (abutment or pier) and bridge approach embankment locations over the entire extent of the BORR alignment in 2019.

The geotechnical investigations undertaken to date, provide preliminary information for the BORR Southern Section. Further geotechnical investigations will be required to be undertaken by the South West Gateway Alliance, based on the final construction footprint to confirm where potential swamp and lacustrine deposits may be found. These investigations will inform detailed design and any potential management measures required during the construction phase.

Information regarding CPTs is included in the following reports:

- BORR IPT (2020) BORR Project Pavement Design and Geotechnical Interpretive Report, February 2020, Unpublished report for Main Roads Western Australia.
- BORR IPT (2020) BORR Project Geotechnical Investigation Report, February 2020, Unpublished report for Main Roads Western Australia.

ITEM NO.	EPA QUESTION	DWER COMMENT
4	Provide any other information that the EPA may require for its assessment of this proposal.	The region has no further comments.

BORR IPT notes DWER's response to question 4.