Dam Inspection Report and Action Plan

Project: 1075 Horseshoe Bend Road Torquay
Report No: AGTE20249-1

| Geotechnical | Environmental | Residential | Pavements Investigation & Design |
Adelaide, Ballarat, Brisbane, Dingley Village, Warrnambool

Prepared for:

The Dunes Torquay

21 October 2020

Contents

1. Introduction

Australian Geotechnical Testing (AGT) was engaged by The Dunes Torquay to undertake a further assessment and inspection for the existing farm dam at 1075 Horseshoe Bend Road Torquay VIC. This follows the report "AGTE20249 The Dunes Dam Torquay" presented on 9th October.

Further inspection was carried out on 15th October to identify any areas of the dam that needs immediate attention to ensure the safety of the dam during the current operation.

- Inlet and Outlet pipes around and inside embankment was inspected and the details is presented in Appendix A. All pipes are currently above the operating water level except the pipe from the flood sump immediately west of the dam.
- The pipe that was concluded to be the cause of leak, is part of Barwon Water's decommissioned treatment plant and is capped off following the leak incident. A meeting is organised with Barwon Water to discuss removal of the pipe.
- The water level at reservoir is to be operated at 12 mAHD. Fluctuations to RL12.5mAHD has been observed in the absence of depth marker and is prevented after the marker installation.
- Embankment surface is mostly visible for safety inspections. A small area at southeast corner where the Black Rock Treatment Plant inlet pipe are located requires clearance the vegetation.

2. Action Plan

2.1 Daily Inspections

Currently daily inspections are carried out by the dam operator onsite and the records are kept to the following repository:

https://ausgeotest.sharepoint.com/:f:/g/Engineering/projects/EhSCJ3FqXmRIgyN5zT3ROVUBZRTje36_oZj72XZmlGIZ5Q?e=JKUC0A

Water level marker is installed as shown in Figure 1. Due to safety reason installation is at 13 mAHD and the arrangement is being made to lower the reservoir water level and carry out the installation at RL12 mAHD.

The vegetation on the embankment is arranged to be cleared to ensure the embankment surface is visible. An assessment of trees on the embankment is required to ensure the root growth is stopped and will not create seepage path in the embankment.

The pipes installed inside the embankment are inspected regularly for any seepage and possibility of piping erosion.

2.2 Inspection by Dams Engineer

Currently weekly to fortnightly inspections are carried out by an experienced dams engineer from AGT assisting and assessing the results of daily inspection and completing the detailed inspection as part of the comprehensive safety review of the dam.

Figure 1 Water Level Marker

2.4 Comprehensive Safety Review of Dam

A comprehensive safety review of the dam is required and will be prepared based on the following:

- Incorporating the results of safety assessment carried out in 2017 by AGT.
- Carrying out additional fieldwork including:
  - Drilling of 6 boreholes to a maximum depth of 6m at the embankment toe to assess the dam foundation.
  - Carry out moisture test and Emerson classification (and pinhole if required) to identify potential for piping.
  - Installation of standpipe piezometers to identify seepage in the foundation and groundwater levels

- Immediate Risk due to Flooding Risk (Spillway Requirement): Figure 2 and 3 show elevation contour map and the estimated flood levels of the area. It can be seen in Figure 2 that the embankment is at least 5m above surrounding ground with relatively far distance from 1% AEP flood zone. This means the very low catchment size with embankment crest being above significant flood events. Therefore, the overtopping of embankment is unlikely. Nevertheless, this will be further assessed during the comprehensive safety review considering more significant flood levels over 1% AEP.

Figure 2 Elevation Contours around Dam Site

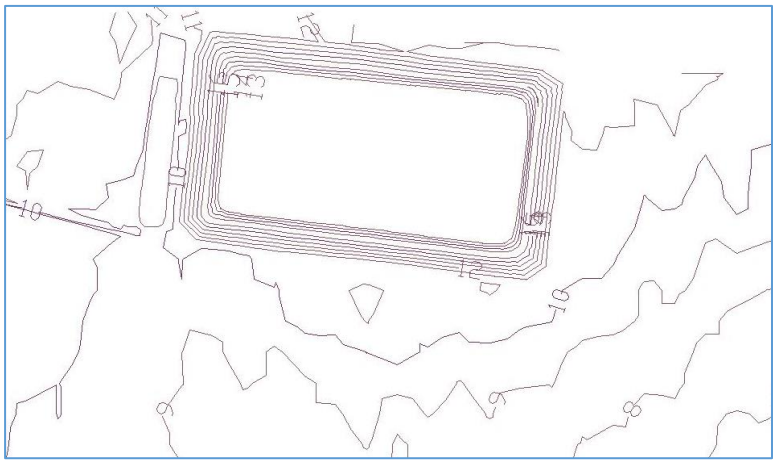
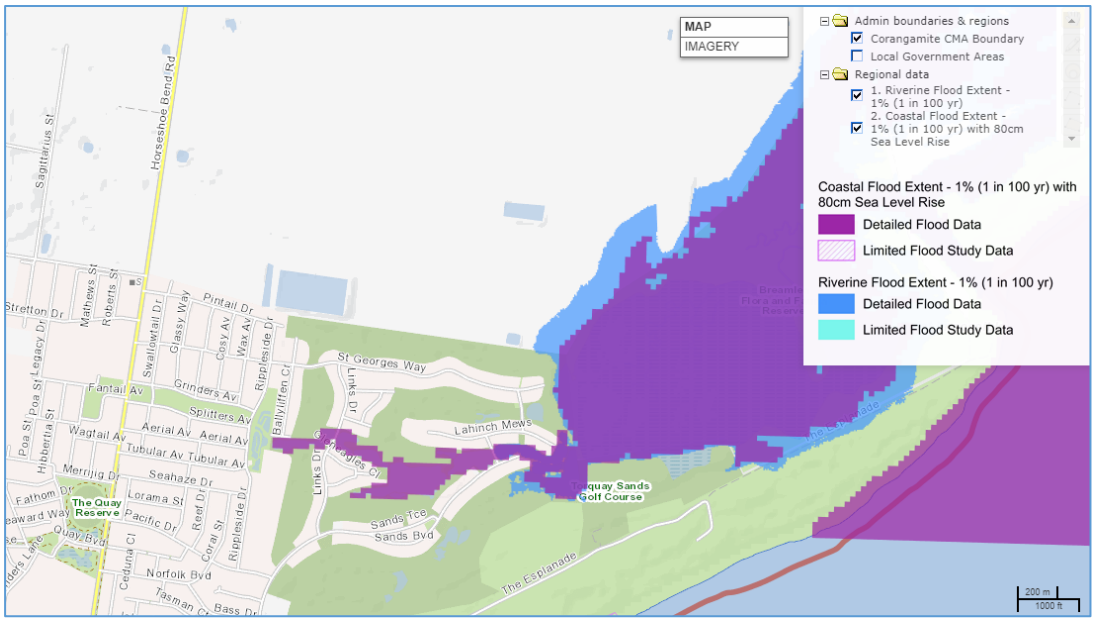


Figure 3 Flood Map of Area



2.5 Dam Safety Emergency Plan (DSEP) and Inundation Mapping

The studies are being currently undertaken to provide inundation mapping as part of requirement for DSEP. Consequently, the DSEP will bill prepared by 30th November 2020. An immediate need of safety management is control measures to maintain the reservoir water level at 12m AHD for interim operation of the dam. The mechanism and equipment to control this level will be finalised by 10th November 2020.

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Appendix A – Inspection of Pipe Works

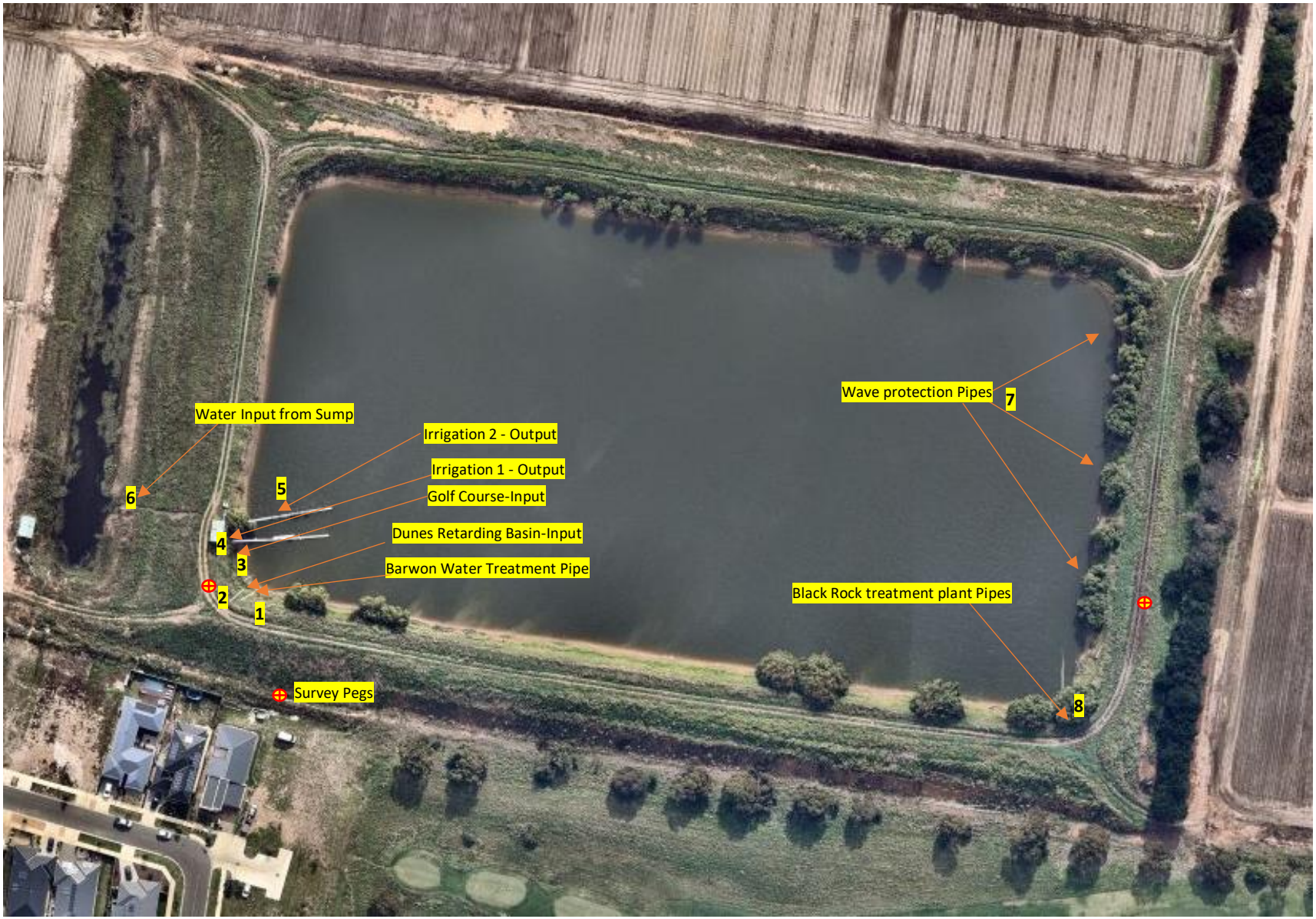
Water Input from Sump
Irrigation 2 - Output
Irrigation 1 - Output
Golf Course-Input
Dunes Retarding Basin-Input
Barwon Water Treatment Pipe
Wave protection Pipes
Black Rock treatment plant Pipes
Survey Pegs
1
2
3
4
5
6
7
8

Figure 1 Old Treatment Plant ran by Barron water. Plant decommissioned but pipe was not properly decommissioned. The pipe was submerged during the leak and was concluded to be the path for leak. The blue cap was installed after the leak incident.

Figure 2 The Dunes retarding basing. Input water to reservoir. Flowmeter Installed

Figure 3 Retarding basing, 500m away football field

Figure 4 Water Input from golf course flowmeter installed

Figure 5 Irrigation 1 - Water output - flowmeter not installed

Figure 6 AHD TBM 15.5m

Figure 7 Output to golf course Flowmeter installed

Figure 8 Irrigation 2 Flowmeter not installed

Figure 9 Water from Sump next to dam input to reservoir

Figure 10 Pressure Relief and Other Controls Next To Pump House On Crest

Figure 11 Irrigation 3 - Additional outlet for less flow volume

Figure 12 Northeast bank – Black Pipe for erosion reduction of Wave Action

Figure 13 TBM peg 16.6m – Southeast Corner

Figure 14 Input From Black Rock treatment plant Class C Water