



Memorandum

25 April 2017

To: Patrick Crain, Poseidon Water Ref. No.: 11110796-02

From: Paul Hermann, Andrew Peek Tel: 949-585-5200

CC:

Subject: HBDP Outfall – Salinity Comments

1. Introduction

The purpose of this Technical Memorandum is to advise on the possible effects of adding brine from the proposed Huntington Beach Desalination Plant (HBDP) into the existing cooling water discharge pipeline at the Huntington Beach Generating Station (HBGS). The existing discharge pipeline for the HBGS is a 14 ft. diameter concrete pipe that was constructed in the early 1960's.

2. Comment

The introduction of brine to any concrete product would typically increase the rate of salt-related deterioration mechanisms in the concrete such as chloride induced rebar corrosion and salt-scaling. However, as the discharge pipe is continually submerged and is therefore not subjected to wet/dry conditions, the effects are not as pronounced when compared to the same situation in tidal (wet/dry) areas. In addition, the discharge pipeline was designed for service in seawater, which would have included provisions to mitigate chloride induced rebar corrosion. It has been GHD's experience that for various reasons related to cement chemistry and manufacture, concrete structures from the era when this discharge pipeline was designed and constructed often exhibit higher durability compared to their design life than structures built slightly later.

Recent assessment of the existing Encina Power Station outfall in Carlsbad, which was built at a similar time to the HBGS and operates in a similar service environment, showed this to be the case.

3. Conclusion

Poseidon has advised that it will contract with a licensed California structural or civil engineer to perform an inspection of the existing outfall pipe to determine the condition of the existing pipeline prior to designing and constructing the improvements and will therefore accommodate any relevant information into their design. Further, they advised that they will perform periodic inspections during the operating period for integrity and useful life updates. For this stage of the project, the initial condition assessment report is a suitable basis



from which to estimate the project service life of the existing pipeline with the increased salinity in the discharge. The periodic inspections would also provide the means to confirm that the service life estimates remain valid throughout the operating period.