Comments on Alden Technical Memorandum - Linear Diffuser Optimization and Design for Poseidon's Huntington Beach Desalination Plant, dated July 31, 2018, submitted as part of Appendix BBBBB:

- Page 6 discusses the calculation of D_m at different distances. The text states, "Unless the required dilution of 14.45 or more is obtained at the impact point, the distance to the boundary of the brine mixing zone (BMZ) (i.e. where the dilution is 14.45) is determined by linear interpolation of the dilution between the calculated distances to the impact point and the end of the near field." It should be clarified how the dilution is calculated at the end of the nearfield.

- Given the diagram in figure 1, it seems like the diffuser could be designed to be symmetrical (i.e. ports on either side). This *might* decrease the size of the BMZ slightly. However, Water Board staff acknowledges that there may other considerations for the asymmetrical design. However, those are not clearly discussed in the report.

- The Head Loss calculations (page 9) should be revised to evaluate a discharge rate of 62.5 MGD. This new analysis does not need to replace the current analysis (of 127 MGD) but can be a supplemental analysis. If it is the case that current analysis is applicable to the reduced discharge volume, a narrative discussion clarifying this should be included.

- There is a typo in Table 3 for S_{ta}. The table says "2.77," but the correct value from the model output is "3.68." The Q_e value (168 MGD) was correctly computed using 3.68 Q_e = 62.5 * (3.68 - 1) = 168 MGD. The typo in the table should be corrected.

- Only one port design run is shown in Table 3. The report should include a few iterations comparing different results that show the proposed design has the least deleterious volume and to the extent feasible the least areal BMZ.

- The water column depth at the location of the diffuser needs to be clarified. Poseidon's most recent submittal uses the smallest water column depth of the different values from previous documents, therefore analyses based on this calculation are likely the most conservative estimates and no change is required to the diffuser design. However, as noted, the depth of the water column at the proposed diffuser location has been inconsistently stated in different documents. Water Boards staff requests that these inconsistencies been addressed.
  1. State Lands Commissions Final SEIR states: "The ends of the HBGS intake and discharge pipelines are located at the seaward end of the 11.78-acre lease parcel (PRC 1980.1) at a depth of approximately **33 feet mean lower low water**," page 4-19. Page 4-39 states, "Water depth: 33 feet mean lower low water (location of intake pipeline end)." Finally, Figure 2-3 (page 2-6) states that, "WATER DEPTH: 21.91 FEET (or approximately 24.2 MLLW)."
  2. Poseidon's most recent dilution study, Appendix KKKK3, says "The existing discharge tower is located at latitude 33$_o$ 38' 19" N, longitude 117° 58' 57" W, approximately 1,500 ft (457 m) offshore from the mean lower-low water tide line at a depth of **27.9 ft (8.5 m)** below mean sea level (Figure 3)." I note that this depth is referring to "mean sea level" not MLLW which could make a difference. However, MLLW should be the most conservative and therefore should be a smaller number, if anything, than mean sea level.

3. Phil Roberts report states, “The port depths were taken as **27 ft** to account for the height of the risers above the seabed,” page 13. Roberts does reference Poseidon’s 27.9 ft (8.5 m) measurement throughout.
4. Poseidon’s most recent submittal for the revised diffuser states, “It should be noted that the existing water depth is **24.2 feet** below Mean Lower Low Water (MLLW)” page 2.
5. The NPDES permit for the Huntington Beach Generating Station sates, “Wastewaters generated at the Facility are discharged to the Pacific Ocean at Discharge Point No. 001. The outfall is located approximately 1,500 feet offshore at a depth of **25 feet**. The outfall does not possess a diffuser but terminates in a 21-foot diameter pipeline,” Page F-10 (or page 72).