SOAH DOCKET NO. 582-20-1895
TCEQ DOCKET NO. 2019-1156-IWD

IN THE MATTER OF THE	**§**	**BEFORE THE STATE OFFICE**
APPLICATION OF PORT OF	**§**	
CORPUS CHRISTI AUTHORITY OF	**§**	**OF**
NUECES COUNTY FOR TPDES	**§**	
PERMIT NO. WQ0005253000	**§**	**ADMINISTRATIVE HEARINGS**

PROPOSED FINDINGS OF FACT AND CONCLUSIONS OF LAW OF
PORT ARANSAS CONSERVANCY AND KINGS AND STEVES

I. PROPOSED FINDINGS OF FACT

Background

1. The Port of Corpus Christi Authority of Nueces County (Applicant or Port Authority) filed an application (Application) for a new Texas Pollutant Discharge Elimination System (TPDES) permit with TCEQ on March 7, 2018.

2. The Application requests authorization to discharge treated effluent into the Corpus Christi Ship Channel in Nueces County, Texas.

3. TCEQ's Executive Director (ED) declared the Application administratively complete on June 26, 2018.

4. The ED completed the technical review of the Application and prepared a draft permit (Draft Permit).

Notice and Jurisdiction

5. The Notice of Receipt of Application and Intent to Obtain Water Quality Permit (NORI) was published on July 25, 2018, in the *Aransas Pass Progress*, *Ingleside Index*, and *Corpus Christi Caller-Times*. The NORI was also published on July 26, 2018 in the *Port Aransas South Jetty*.

6. The Notice Application and Preliminary Decision (NAPD) was published on November 21, 2018, in the *Aransas Pass Progress* and *Ingleside Index*. The NAPD was also published on November 22, 2018 in the *Port Aransas South Jetty* and *Corpus Christi Caller-Times*.

7. Copies of the Application were placed in La Retama Central Library, Sinton Public Library, Ed and Hazel Richmond Public Library, and the Port Aransas City Hall.

8. A public meeting was held on April 8, 2019, at the Port Aransas Civic Center in Port Aransas, Texas.

9. The public comment period ended at the close of the public meeting.

10. TCEQ received public comments on the Application, and the ED prepared a Response to Comments, which was filed with the Chief Clerk on July 3, 2019.

11. On November 21, 2019, the Commission issued an interim order granting certain hearing requests, referring certain hearing requests to the State Office of Administrative Hearings (SOAH) for an affectedness determination, and denying certain hearing requests and requests for reconsideration, and referring the Application to SOAH for a contested evidentiary hearing on the following nine issues:

A. Whether the proposed discharge will adversely impact: the marine environment, aquatic life, and wildlife, including birds and endangered or threatened species, spawning eggs, or larval migration;

B. Whether the proposed discharge will adversely impact the health of the requesters and their families, including whether fish and other seafood will be safe for human consumption;

C. Whether the proposed discharge will adversely impact recreational activities, commercial fishing, or fisheries in Corpus Christi Bay and the ship channel;

D. Whether the Application, and representations contained therein, are complete and accurate;

E. Whether the Applicant substantially complied with applicable public notice requirements;

F. Whether the draft permit is consistent with the Texas Coastal Management Program's goals and policies;

G. Whether the modeling complies with applicable regulations to ensure the draft permit is protective of water quality, including utilizing accurate inputs;

H. Whether the Executive Director's antidegradation review was accurate; and

I. Whether the draft permit includes all appropriate and necessary requirements.

Proceedings at SOAH

12. The preliminary hearing was initially scheduled to be held in Port Aransas, Texas, on March 24, 2020, but due to the COVID-19 pandemic, was rescheduled and set to convene via Zoom videoconference.

13. Notice of the rescheduled preliminary hearing was mailed by TCEQ on May 28, 2020, and published by the Port Authority in the *Aransas Pass Progress* and *Corpus Christi Caller-Times* on June 3, 2020, and the *Port Aransas South Jetty* on June 4, 2020.

14. The preliminary hearing was held before Administrative Law Judges (ALJs) Rebecca S. Smith and Cassandra Quinn on July 9, 2020, via Zoom videoconference.

15. At the preliminary hearing, the ALJs determined that SOAH had jurisdiction, named parties, and admitted the administrative record into evidence for all purposes.

16. Before the evidentiary hearing, various named parties withdrew. The remaining parties are: the Port Authority; ED; TCEQ's Office of Public Interest Counsel (OPIC); Audubon Texas; Port Aransas Conservancy (PAC); the following individuals represented by counsel: James Harrison King, Tammy King, Edward Steves, and Sam Steves (collectively, represented protestants); and the following individuals representing themselves: Stacey Bartlett, Jo Ellen Krueger, Sarah Searight, Lisa Turcotte, Cara Denney, Aldo Dyer, and Mark Grosse.

17. An evidentiary hearing convened on November 4-6 and 9-10, 2020, via Zoom videoconference, with ALJs Rebecca S. Smith and Cassandra Quinn presiding. All parties participated at the hearing except for Ms. Denney, Mr. Dyer, and Mr. Grosse. The record closed on January 12, 2021, after the parties submitted written closing arguments and proposed findings of fact and conclusions of law.

18. On February 5, 2021, the ALJs issued a Proposal for Decision (PFD) recommending that the Application be denied.

19. On May 19, 2021, the Commission considered the ALJs' PFD during an open meeting and voted to remand the matter back to SOAH for additional proceedings.

20. The Commission issued an Interim Order on May 26, 2021, remanding the case to SOAH for the ALJs to "Apply the appropriate legal standard for non-numeric criteria found in 30 Texas Administrative Code § 307 .6(e)(1) for evaluating the impacts to aquatic organisms that move through a zone of initial dilution;" and take additional evidence on the following issues:

    A) Whether the proposed discharge will adversely impact: the marine environment, aquatic life, and wildlife, including birds and endangered or threatened species, spawning eggs, or larval migration;

    C) Whether the proposed discharge will adversely impact recreational activities, commercial fishing, or fisheries in Corpus Christi Bay and the ship channel;

    D) Whether the Application, and representations contained therein, are complete and accurate;

    G) Whether the modeling complies with applicable regulations to ensure the draft permit is protective of water quality, including utilizing accurate inputs;

    H) Whether the Executive Director's antidegradation review was accurate; and

    I) Whether the draft permit includes all appropriate and necessary requirements.

21. In its Interim Order on May 26, 2021, the Commission also ordered that a "30-day deadline is SET from the issuance of the Commission's Order for the Applicant to provide revised information to all parties including the depth of the channel, site-specific ambient velocity, and the depth of the diffuser."

22. The Applicant subsequently revised its Application to change the location of the discharge (outfall), to revise its proposed diffuser design, and to present additional modeling and data, among other things.

23. On November 10, 2021, the ALJs issued Order No. 16, adopting a procedural schedule on remand for this case.

24. The preliminary hearing on remand was held before ALJs Rebecca Smith and Cassandra Quinn on January 25, 2022, via Zoom videoconference.

25. The evidentiary hearing on remand convened on March 14-25, 2021, via Zoom videoconference, with ALJs Rebecca Smith and Cassandra Quinn presiding. The record closed on April 22, 2022, after the parties submitted written closing arguments and proposed findings of fact and conclusions of law.

Description of Proposed Facility and Discharge

26. The Port Authority seeks a wastewater discharge permit for a proposed marine seawater desalination plant (the Facility) to be located on Harbor Island in Nueces County, Texas.

27. Harbor Island is situated between the Texas coast and the barrier islands of San Jose Island and Mustang Island, at the mouth of the Aransas Pass inlet, which connects the Gulf of Mexico to Texas's bays and estuaries.

28. The Facility will pump seawater from the Gulf of Mexico and use reverse osmosis to produce potable water.

29. The proposed discharge is for treated effluent from the Facility, consisting primarily of the concentrated brine resulting from the desalination process.

30. If the Draft Permit is issued, the treated effluent will be discharged into the Corpus Christi Ship Channel approximately 229 feet off Harbor Island's shoreline. The outfall location is near the confluence of the Corpus Christi Ship Channel, Aransas Channel, Lydia Ann Channel, and Aransas Pass inlet.

31. The proposed discharge is to Segment 2481 (Corpus Christi Bay) of the Texas classified surface water segments.

32. The designated uses for Segment 2481 are primary contact recreation, exceptional aquatic life use, and oyster waters.

33. The Port Authority plans to use a diffuser at the discharge site to enhance mixing of the treated effluent with the ambient water.

Texas Surface Water Quality Standards

34. The TSWQS were developed to protect surface water quality in regards to human health, aquatic life, terrestrial life, and the environment.

35. The TSWQS designate uses for the state's surface waters, and establish narrative and numerical water quality standards to protect those uses.

36. The TCEQ has adopted standard procedures to implement the TSWQS, which are approved by the U.S. Environmental Protection Agency (EPA) and set forth in "Procedures to Implement the Texas Surface Water Quality Standards (RG 194)" (IPs).

37. The TSWQS and IPs are used to set permit limits for wastewater discharges.

38. The TSWQS establish "mixing zones" in the receiving water body, which are defined areas contiguous to the permitted discharge where the effluent mixes with the receiving waters. Acute toxicity to aquatic organisms is not allowed in a mixing zone, and chronic toxicity to aquatic organisms is not allowed beyond a mixing zone.

39. There are three applicable mixing zones: the zone of initial dilution (ZID), aquatic life mixing zone, and human health mixing zone.

40. For toxic substances where adequate toxicity information is available, the TSWQS establish numerical water quality standards for acute and chronic toxicity that apply at the mixing zone boundaries.

41. The TSWQS do not contain numerical criteria for salinity. However, concentrations and the relative ratios of dissolved minerals such as chloride, sulfate, and total dissolved solids must be maintained such that existing, designated, presumed, and attainable uses are not impaired.

42. Under the TSWQS, salinity gradients in estuaries must be maintained to support attainable estuarine-dependent aquatic life uses, and careful consideration must be given to all activities that may detrimentally affect salinity gradients.

Issue 1: The appropriate legal standard for non-numeric criteria found in 30 Texas Administrative Code § 307.6(e)(1) for evaluating the impacts to aquatic organisms that move through a zone of initial dilution.

43. The Port failed to meet its burden of proof to show that there will be no significant lethality to aquatic organisms that move through the Zone of Initial Dilution (ZID).

44. There will be significant lethality to aquatic organisms that move through the ZID.

45. Lethality of aquatic organisms that move through the ZID will be statistically and biologically meaningful and likely to result in a meaningful negative effect on the population.

Issue 2.A: Impact on the Marine Environment, Aquatic Life, and Wildlife

46. Aransas Pass is one of five major coastal passes connecting the Gulf of Mexico with Texas's bays and estuaries. The next closest inlets are Packery Channel, a very small channel over 20 miles to the south, and the channel at Port O'Connor over 80 miles to the north.

47. Aransas Pass is the main source of productivity (e.g., spawning, migrating, and feeding) and connectivity with the Gulf of Mexico for all the fish and invertebrate populations in the entire region.

48. The Gulf-bay connection created by the Aransas Pass inlet is necessary for the life cycle of certain estuarine-dependent marine species. The adults of these species typically live and spawn offshore, and their eggs and larvae drift in coastal currents until a portion of them arrive at the coast and are drawn into the inlet. From there, some of the larvae are carried on the flood tide into the estuary where they can develop into juveniles and sub-adults, before eventually returning to the ocean.

49. Because the inlet compounds and magnifies the marine life abundance, the impact of the proposed discharge will be disproportionately greater than what would occur in other areas with less densities and concentrations of marine life.

50. The desalination facility is located within the Redfish Bay State Scientific Area .

51. The outfall is located in an area designated as essential fish habitat for red drum (redfish) and shrimp under the Magnuson-Stevens Fishery Conservation and Management Act.

52. The Texas Parks and Wildlife Department and Texas General Land Office prepared a 2018 report that identifies zones in the Gulf of Mexico that are appropriate for the discharge of marine seawater desalination waste while taking into account the need to protect marine organisms (the Desalination Study).

53. The proposed discharge is located in an area that the Desalination Study does not identify for desalination activities. The Desalination Study does not preclude desalination activities in areas that have not been identified, but the exclusion of the proposed discharge site supports that it is a sensitive location.

54. High salinity or saline imbalances can be fatal to aquatic life, particularly early life stages, such as embryos and larvae.

55. There is a zone of passage for aquatic organisms around the ZID and mixing zones. However, early life stages of aquatic species cannot swim around the effluent plume and will enter the ZID and mixing zones, and thus, come into contact with the undiluted effluent.

56. While levels of salinity rise and fall, they do so over time, allowing time for acclimation by aquatic species that protects them.

57. Early life stages of aquatic species will be adversely affected by the sudden changes in salinity that will be associated with the proposed discharge.

58. The proposed discharge will likely result in significant loss of life and other adverse effects on early life stages of fin and shellfish, including their larvae, in the ZID.

59. If the area is degraded, fish will not go elsewhere to spawn, but instead will spawn less (or not at all), reduce their feeding, and ultimately reduce the carrying capacity of local fish populations.

60. The ambient salinity in the Corpus Christi Ship Channel naturally fluctuates between 15 ppt and 41 ppt.

61. The proposed discharge will result in salinity levels at the outfall as high as 69 ppt.

62. The record includes a reliable no-effects concentration for salinity of 35.0 ppt.

63. While the increase in salinity over the entire channel may be small, aquatic organisms will be exposed to salinity concentrations greater than 10% in the ZID and 7% in aquatic life mixing zones and up to 38% in the ZID and 28% in the aquatic life mixing zone.

64. Small increases in salinity can have adverse effects if the ambient salinity is already at the physiological limit for some species, or if a system is on the edge of collapse.

65. The Texas Parks and Wildlife Department filed comments in 2019 recommended that the permit include a limit on increases in salinity concentration at the aquatic life mixing zone of 5%

66. The Texas Parks and Wildlife Department was not consulted for its position recommendation on the new location, new diffuser or resulting impacts of the discharge on marine species resulting from the 2021 amended application.

67. The Application specified that the diffuser would be designed to achieve 10.7% or less effluent at the ZID boundary.

68. The Draft Permit's establishment of a maximum effluent percentage 14.6% at the ZID boundary was not set based on what is protective of aquatic life.

69. Because the TSWQS do not contain numeric criteria for salinity, the Draft Permit's requirement to test the effluent after the discharge commences and screen it against the TSWQS's water-quality-based effluent limits does not address the concerns about salinity.

70. Given the discharge location's pivotal role in the life cycle of estuarine-dependent species and the sensitivity of early life stages to salinity changes, waiting to identify the extent of salinity's adverse impacts until after the discharge commences is not sufficient.

71. The Draft Permit does not require testing of salinity impacts on appropriate subjects, such as 1-5 day old larval red drum.

72. The careful consideration required for evaluating the impacts of a discharge of salinity was not performed.

73. The proposed discharge will adversely impact the marine environment, aquatic life, and wildlife, including spawning eggs and larval migration.

74. The proposed discharge will adversely impact birds and endangered or threatened species.

75. The proposed discharge will not comply with the requirements of the Texas Surface Water Quality Standards (TSWQS) and the permit will not be protective of aquatic life.

76. The change in salinity in the Pass/Channel that will result from the proposed discharge will disrupt the spawning and migration patterns, adversely affecting numbers of species' ability to survive to reach and mature in the nursery area of the Corpus Christi Bay system.

77. The Port has chosen perhaps the most ecologically sensitive aquatic area on the Texas coast for its proposed discharge of concentrated brine.

78. The permit has the potential to have devastating and far-reaching consequences to the marine environment and aquatic life, both in the immediate area and beyond.

Issue 2.C: Impact on Recreational Activities, Commercial Fishing, and Fisheries

All findings adopted for Issue A also apply here, along with the following additional findings:

79. The Aransas Pass tidal inlet is a multi-species spawning site for the most economically valuable sportfishes in the region.

80. The productivity of local populations of sportfishes, including red drum, spotted seatrout, sheepshead, black drum and southern flounder, is directly linked to, and dependent upon, the reproductive activity that occurs in the Aransas Pass inlet.

81. The fisheries in the Corpus Christi Bay, Aransas Pass inlet, and Texas Gulf of Mexico support a multi-billion-dollar commercial fishing industry for finfish, crab, and shrimp.

82. The adverse impacts to the marine environment and aquatic life, including early life stages, is likely to disrupt fish reproduction in the area to such a degree that it will result in diminished fish populations in and around Corpus Christi Bay.

83. The adverse effects to fish populations will damage recreational and commercial fishing industries.

84. The proposed discharge will adversely impact recreational activities, commercial fishing, and fisheries in Corpus Christi Bay and the ship channel.

85. The predominant fish stocked by TPWD is Red Drum with 19 million red drum released

along the Texas coast in 2021.

86. The proposed discharge would negate much of the benefit of fish-stocking efforts of TPWD, which spends approximately $3.7 million annually on fish stocking along the Texas coast.

Issue 2.D: Accuracy and Completeness of the Application

87. The Application incorrectly identifies the depth of the channel at the outfall location.

88. The Port failed to provide a technical report in the Application pursuant to 30 TAC § 305.45(a)(8) prepared by either by a Texas licensed professional engineer, a Texas licensed professional geoscientist, or by a qualified person who is competent and experienced in the field to which the application relates and thoroughly familiar with the operation or project for which the application is made.

89. No one with the required license or expertise was identified in the Application or otherwise in the record as preparing the technical report.

90. No witness sponsored the Application or verified any of the facts in the Application.

91. No one with the Port or the consultant that prepared the Application testified at the hearing to support the opinions and facts provided in the Application.

92. The Port failed to provide accurate information in the Application pursuant to 30 TAC § 305.45 and .48 on the conditions in the receiving waters at the location of the outfall.

93. The Application provides general information on conditions in the Pass/Channel, i.e. the receiving waters. (S-APP 377), but failed to provide accurate information on the conditions in receiving waters needed for modeling and evaluation of impacts on water quality and the marine habitat as required by 30 TAC § 305.45(a)(8)(A) requiring information on the "systems used for or in connection with the disposal of waste, …"

94. The Application states the depth of the water at the outfall is 90 feet, but the evidence shows it to be about 65 feet.

95. The Port failed to provide accurate information in the Application on the conditions used in the modeling and the Port's interpretation of its modeling.

96. The Port failed to provide any information on its plans of phasing in operations that would alter the discharge rates in its Application.

97. The Port failed to provide information in its Application on its proposed pattern of discharge pursuant to 30 TAC § 305.45(a)(8)(B)(i).

98. The Application identifies only the average daily and maximum daily discharge rate of 95.6 and 110 mgd.

99. The Application did not reveal any specific Port's plans to operate at production rates that would reduce discharge rates below the average daily discharge rate.

100. The Application shows that lower production levels will reduce discharge rates, but not whether there will be a reduce the rate of dilution of the effluent below worst-case scenarios for the 95.6 mgd daily average discharge rate.

101. The Application failed to provide information about the effluent as required by 30 TAC § 305.45(a)(8)(B)(ii) which requires that the application include information on the chemicals or characteristics of the chemicals that can be expected to be in the discharge "described in enough detail to allow evaluation of the water and environmental quality considerations involved; …"

102. The Application identified other uses for chemicals, including chemical coagulation, that may be used and discharged in the effluent but did not identify the chemical(s), type(s) of chemical(s), or characteristics of the chemical(s) that may be used.

103. In its June 2020 agreement with the Port, the University of Texas, Marine Science Institute agreed to complete a report by January 2021 on such chemicals, types of chemicals or chemical characteristics (PAC-11, at 8), showing that the Port could have provided such information in its Application when first raised by TPWD in 2018.

104. The Port failed to provide the required data on the conditions at the outfall in its Application.

105. The Application does not include information on the conditions in the receiving waters at the location of the outfall, as required by 30 TAC § 305.47 (a)(8)(A) & (C), including the existence of an eddy or eddies previously identified by the Port.

106. The Application includes inconsistent information on the location of the outfall.

Issue 2.G: Modeling Analysis

107. The Cornell Mixing Zone (CORMIX) model is the most commonly used model to design diffusers and evaluate mixing near outfalls.

108. The TCEQ's IPs provide for the use of the CORMIX model when a diffuser can be used, and the TCEQ has developed a guidance manual for running the model titled "Mixing Analyses Using CORMIX" (CORMIX SOPs).

109. The ED uses the CORMIX model to predict the percentage of effluent present at the edge of each regulatory mixing zone, and then sets permit limits based on the highest predicted effluent percentages.

110. In running the model, the ED relied on information provided in the Application and the CORMIX SOPs.

Near Field Modeling

A. Summary

111. All parties agreed that the CORMIX model should be used to evaluate the mixing performance of the diffuser.

112. The predictions from the modeling must be considered in light of the local bathymetric and flow conditions that the CORMIX model could not evaluate as well as the limits on the accuracy of modeling results that the model identifies.[1]

113. The Executive Director and Port Authority did not use accurate inputs for their modeling.

114. The Executive Director and Port Authority did not properly consider the local bathymetric and flow conditions that the CORMIX model could not evaluate as well as the limits on the accuracy of modeling results that the model identifies.

115. Neither the modeling by the Executive Director nor that of the Port Authority ensures that the draft permit is protective of water quality.

116. The critical conditions identified with the modeling by the Executive Director for use in evaluating the impacts on water quality and the marine environment do not reflect the worst-case conditions for the change in salinity over ambient concentrations or the maximum concentrations that would occur as a result of the discharge.[2]

B. The Location of the Outfall

117. TCEQ's Report "Instructions for Complete the Industrial Waste Permit Application" requires that the location of the outfall be identified with the latitude and longitude and be specified in the Application to an accuracy of at least six decimal figures.[3]

118. The Application specifies the location of the outfall with its latitude and longitude.[4]

119. The depth of the outfall is identified in the Application and in related documents filed by the Port Authority as 65 feet.[5]

120. The modeling by the Executive Director and Port Authority incorrectly assumed 90 feet for the input needed for the depth of the channel bottom at the outfall location for their CORMIX modeling.[6]

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[1] Ex. PAC-51R at 10:1-15, 14:7-15:20 and 26:4- 31:12; Remand Tr. Vol. 1 at 201:14 – 202:7.

[2] Remand Tr. Vol. 9 at 2272:14-23; Ex. Kings-Steves-21R.

[3] Ex. ED-SG-7 at 27 of 122.

[4] Ex. AR-R 5 (Admin Record - Remand Tab J) at 00136.

[5] Ex. AR-R 4 (Admin Record – Remand Tab I) at 254 (Figure 1), Ex. APP-LT-1-R Rebuttal at 4-5; APP-CJ-1-R Rebuttal, pp. 2-3.

[6] Ex. AR-R 4 (Admin Record – Remand Tab I) at 248.

121. At the depth of 65 feet and the location identified by the latitude and longitude of the outfall, all or some of the 20 ports that make up the outfall from which the effluent is discharged are buried in the channel bottom and are not in the water.

122. At the depth of 65 feet and the location identified by the latitude and longitude figures in the Application, the outfall is within an underwater cove, with sides of the cove being the extensions of the points of land coming off Harbor Island to the east and west of the outfall.

123. At the depth of 65 feet and the location identified by the latitude and longitude of the outfall, the centerline of the plume will be below the depth of the sides of the cove for the majority of the tidal conditions when the plume reaches these sides.

124. At the depth of 65 feet and the location identified by the latitude and longitude of the outfall, the outfall is located on the side of and below the top of the 95-foot hole.

125. The Port Authority stated that it can move the outfall location away from the location identified in the Application with the latitude and longitude after a permit is issued.

126. The Port Authority has not identified any new location for the outfall that it might use.

127. The Port Authority has not identified any limit on the distance the outfall could be moved.

128. No modeling or evaluation of the mixing or impacts of the effluent were performed by the Executive Director or the Port Authority for any location other than the location defined in the Application with the latitude and longitude.

129. The modeling by the Executive Director and Port Authority incorrectly assumed 229 feet for the input needed for the DISTB, the distance from the discharge to the bank or shore, which is the distance to the shore measured at the water surface.

130. The Executive Director and Port Authority's method for determining the DISTB did not comply with the CORMIX User Manual, which defines the DISTB as:

> the average distance between the outfall location (or diffuser mid-point) and the shoreline. It is also specified as a cumulative ambient discharge divided by the product UA times HA.[7]

131. PAC used a range of DISTBs from zero to about 100 feet for its modeling to evaluate the potential for the dense effluent plume to fall and contact the channel bottom.[8]

132. PAC's modeling showed that for DISTBs of up to 45 feet the CORMIX model predicted that the plume would contact the bank and that normal mixing would be reduced.[9]

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[7] Ex. ED-5 Remand, at xx (Bates page 0022): Distance from Shore (DISTB).

[8] Ex. PAC-51R SS-5 (Excel) Rows 89 – 93, Ex. PAC-49R at 15:10-12.

[9] *Id.*

133. The reduction in mixing at DISTB OF 0 feet and 9 feet resulted in the % of effluent remaining at the boundary of the ZID as about 55%.[10]

134. The modeling by the Executive Director for the conditions modeled by PAC showed that percentage as 14.6%.[11]

C. Schematization with Model Inputs

135. The conservative module of the CORMIX model was primarily used by the Executive Director and the Port Authority.[12]

136. The conservative module of the CORMIX model requires schematization of the cross section of the channel at the location of the outfall with a flat channel bottom and a vertical wall representing one bank or boundary for the movement of the plume in the channel.[13]

137. The Executive Director used a schematization with a 90-foot channel bottom and the vertical wall with a DISTB distance to the outfall of 229 feet.[14]

138. The schematization by the Executive Director therefore assumes that the land that forms the sloping bank down to 90 feet is water which can be available for assisting with mixing.[15]

139. PAC used a schematization with a 70-foot channel bottom and a number of vertical walls set at DISTB distances to the outfall from 0 to about 100 feet.[16]

140. PAC's schematization was prepared in accordance with the approach in the CORMIX User Manual to represent proximity of the bank and the available water for mixing due to the location of the bank.[17]

141. PAC varied the DISTB for its schematizations to run sensitivity analyses that understand the potential interaction of the dense effluent plume as it falls and contacts the bank on or in which the discharge ports for the outfall have been located by the Application.[18]

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[10] *Id.*

[11] Ex. Kings-Steves-21R, Row 8.

[12] Ex. PAC-51R at 23:14-15.

[13] *Id.,* at 22:14-25.

[14] Ex. PAC-51R SS-8, Ex. PAC-49R at 14:3-5.

[15] *Id*.

[16] Ex. PAC-51R SS-5 (Excel), Rows 89 – 93, Ex. PAC-49R at 15:10-12.

[17] Ex. ED-5 Remand at 42-44 and 46.

[18] Ex. PAC-51R at 13:14-14:2, 23:14-23, 33:8-17.

142. The CORMIX User Manual explains that the CORMIX model can be used to evaluate mixing performance as a plume interacts with a boundary, such as the bank or sloping bottom of the channel, at the outfall location identified by the Application.[19]

143. PAC's sensitivity analysis for the range of DISTB inputs and the representative of the depth of the outfall demonstrated that the plume will contact or interact with the bank, the sloping bottom of the channel, before the plume reaches the boundary of the ZID or any other mixing zone for the faster velocities of the current in the ship channel.[20]

144. PAC's sensitivity analysis for the range of DISTB inputs and the representative depth of the outfall demonstrated that the modeling by the Executive Director and Port Authority overpredicted mixing and underpredicted the concentrations of salinity that would exist at the mixing zone boundaries and at 100 and 200 meters from the outfall.[21]

D. Proper Evaluation of the Results of the CORMIX Modeling

145. The path of the dense effluent plume that is predicted by the CORMIX modeling by the Executive Director for the higher channel velocities will fall below the top of sides of the cove when the plume reaches these sides to the east and the west of the outfall.[22]

146. The dense effluent plume cannot follow the straight-line path predicted by the CORMIX modeling by the Executive Director to the mixing zone boundaries for the majority of tidal conditions.[23]

147. At the higher channel velocities, the plume will contact or interact with the sides of the cove before the plume reaches the boundary of the ZID or any other mixing zone.[24]

148. At the higher channel velocities, once the plume will contact or interact with the sides of the cove, the mixing performance will be reduced below what the CORMIX model predicts.[25]

149. The CORMIX model predicts that the critical conditions or worst-case conditions for the mixing of the effluent occur at the faster velocities of the current in the ship channel.[26]

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[19] Ex. ED-5 Remand at v (Bates page 0007), 3rd paragraph; Ex. PAC-51R at 13:7-16.

[20] Ex. PAC-51R SS-8; Ex. PAC-51R at 8, 13:7-16, 14:Table 1, 33:8-17.

[21] *Id.*

[22] Ex. PAC-51R SS-7 at 11, 14; Ex. PAC-51R at 10:2-8.

[23] Ex. PAC-51R at 13:14-16 and 25:7-14.

[24] *Id.*

[25] Ex. PAC-51R at 10:11-15.

[26] Ex. PAC-51R at 35:5-14.

150. The CORMIX model also predicts that, the dense saline plume will fall into the 95-foot hole and fill it up.[27]

151. The CORMIX model cannot predict the % of effluent or concentration of salinity that will then be in the hole but provides a range with a high of 8 ppt above ambient.[28]

152. The CORMIX modeling by the Executive Director cannot provide reliable predictions of where the plume will contact the boundaries of the mixing zones.[29]

153. The CORMIX modeling by the Executive Director cannot provide reliable predictions of the percentage of effluent that will remain at the boundaries of the mixing zones as a result of the discharge.

154. The CORMIX modeling by the Executive Director cannot provide reliable predictions of the change in salinity over ambient that will result at the boundaries of the mixing zones from the discharge.

155. Neither the Executive Director nor the Port Authority attempted to evaluate the impact on mixing of these local bathymetric conditions with any quantitative method.

156. The CORMIX model also assumes uniform flow at and around the outfall, such that the flow of the receiving water in the channel is in the same direction and the same velocity above and below the outfall and to the left and right of the outfall.[30]

157. The CORMIX model cannot consider local non-uniform flow conditions, such as eddies and changes in current velocities at or in the area of the discharge.[31]

158. There are, at times, eddies at or near the outfall.[32]

159. The Corporate Representative for the Port Authority described an eddy that created the hole as common knowledge among personnel of the Port Authority.[33]

160. There are also times with non-uniform flow due to the fact that the velocities of the currents to the south of the outfall are twice the velocity of the currents to the north.[34]

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[27] Ex. PAC-51R at 26:4 – 28:12.

[28] *Id.,* at 28:7-12.

[29] Ex. PAC-51R at 20:3-12, and 40:16-26.

[30] Ex. PAC-49R at 26:16-23.

[31] *Id*.

[32] Ex. PAC-51R SS-4; Ex. PAC-44R, p. 23, l. 22 – p. 25, l. 4; Ex. PAC-53R BW-17.

[33] Ex. PAC-18 at 185:6-16.

[34] Ex. PAC-49R at 26:5-15.

161. The impact of these non-uniform flow conditions, eddies, and changes in velocities on mixing cannot be evaluated by the CORMIX model.[35]

162. Neither the Executive Director nor the Port Authority attempted to evaluate the impact on mixing of these local non-uniform flow conditions.

163. Also, the CORMIX User Manual as well as the session reports for the individual CORMIX modeling runs output state that, "whenever the model is applicable,"[36]

> The user must take note that HYDRODYNAMIC MODELING by any known technique is NOT AN EXACT SCIENCE. Extensive comparison with field and laboratory data has shown that the CORMIX predictions on dilutions and concentrations (with associated plume geometries) are reliable for the majority of cases and are accurate to within about +-50% (standard deviation).[37]

164. Neither the Port Authority's Application nor the Executive Director's modeling memorandums or reports provided the statement in the modeling outputs regarding the accuracy of the model.

165. Neither the Port Authority nor the Executive Director took into account the range of error reported by the CORMIX User Manual and session reports in evaluating the reliability of the predictions of mixing from their modeling.

E. The Brine Module

166. The CORMIX User Manual recommends that the Brine module in CORMIX be run for all brine discharges.[38]

167. All parties used the Brine module in their CORMIX modeling for their evaluation of the mixing performance of the diffuser for the Application as originally filed.[39]

168. The Executive Director did not use the Brine module for the evaluation of the mixing performance of the diffuser for the Amended Application.[40]

169. The Executive Director stated that the Brine module could not be used for the evaluation of the mixing performance of the diffuser for the Amended Application in the near field.

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[35] Ex. PAC-49R at 26:16-23.

[36] Ex. ED-5 Remand, p. 23 (Bates page 0051).

[37] *Id.,* and Ex. Kings-Steves-26R, p. 5.

[38] Ex. ED-5 Remand at 49; Remand Tr. Vol. 9 at 2334:25 – 2335:3.

[39] Remand Tr. Vol. 9 at 2337:5-8; Administrative Record – Tab D at S-Application 000353. The Port's original application said, "CORMIX analysis for brine discharge requires" . . . and then goes on the describe the set up for the brine option, inputs with slopes for the channel bottom.

[40] Remand Tr. Vol. 9 at 2337:5-8.

170. The Port Authority ran the Brine module.[41]

171. The Port Authority stated that the Brine module was not appropriate for the location.[42]

172. PAC used the Brine module and compared the results of the modeling with that module with the results of modeling with the conservative module.[43]

173. The Brine module predicts 7% worse mixing at the boundaries of the ZID and aquatic life mixing zones.[44]

Far Field Modeling

174. There will be bottom plumes with higher salinity concentrations than in the receiving waters of the channel for a mile from the outfall.[45]

175. The bottom plumes will flow into low spots in the channel as it moves across or parallel with the ship channel.[46]

176. The bottom plumes will have higher concentrations of salinity and lower dissolved oxygen levels than the ambient water above them.[47]

177. The Executive Director did not evaluate the impacts of these bottom plumes on water quality or marine species.

178. The CORMIX modeling accurately predicts bottom plumes with higher salinity concentrations than in the receiving waters of the channel.[48]

179. The SUNTANS modeling was performed for the Port Authority in 2019.[49]

180. The SUNTANS modeling assumed as its input that the effluent plume entering the far field would have 1% of the effluent remaining.[50]

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[41] Ex. APP-LT-5-R at 4, fn 4.

[42] *Id.*

[43] Ex. PAC-51R at 21:7-22:12.

[44] *Id.*

[45] Ex. PAC-51R, at 16:15-17 and 17:1-8.

[46] *Id.,* at 16:1-3, 17:1-8, 27:10-17 and 28:11-24.

[47] *Id*.

[48] *Id.*

[49] Ex. APP-JF-13.

[50] *Id*., p. 1.

181. The modeling by the Executive Director for the diffuser in the Amended Application predicts 8.9% of the effluent would remain at the boundary of the aquatic life mixing zone.[51]

182. The SUNTANS modeling was not run with the new Executive Director's predictions for mixing.[52]

183. The SUNTANS modeling predicts there will be no bottom plumes with higher salinity concentrations than in the receiving waters anywhere beyond the mixing zones.[53]

184. The SUNTANS modeling predicts no increase in salinity over time in the Corpus Christi Bay System.[54]

Issue 2.H: Antidegradation Requirements

185. The proposed discharge is to Segment 2481 (Corpus Christi Bay) of the Texas classified surface water segments.[55]

186. Segment 2481 has human use of "primary recreation" and aquatic life use of "exceptional" and "oyster water."[56]

187. Mr. Peter Schaefer authored the water quality standards memo (Adm. Rec., Tab J, pp. 101-102) and the "standards worksheet," i.e., the "Permit Review for Classified Waters by Standards Team," (Adm. Rec. Tab J, pp. 102-105).[57]

188. Mr. Schaefer relied on a "weight of evidence" analysis to conduct his antidegradation analysis, but, while EPA has guidance on the proper way to conduct such an analysis, the TCEQ agency has little guidance, and Mr. Schaefer did not explain what his weight of evidence methodology was.[58]

189. Mr. Schaefer does not know precisely what a salinity gradient is, or whether it is a function in part of the time over which a change in salinity occurs or, what the remaining assimilative capacity for salinity or salinity gradient of the waters near the discharge is.[59]

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[51] Administrative Record – Tab F, pp. ED-0052 – ED-0059.

[52] Ex. AR-R 4 (Admin Record – Remand Tab I) at 2.

[53] Ex. APP-JF-13, at 2-3.

[54] Ex. APP-JF-13, at 3.

[55] Ex. ED-PS-1R, p. 25:16-18.

[56] 30 TAC §307.10(1), Ex. ED-PS-1R, p. 28:2-5.

[57] Ex. ED-PS-1R, p. 35:14-25.

[58] Tr. Vol 9, p. 2350:14-18 and Tr. Vol. 9, p. 2358:16-24; EPA (2016), Weight-of-evidence in Ecological Assessment (EPA/100/R-16/001); and Tr. Vol. 9, p. 2359:13-20 and Tr. Vol. 9, pp. 2359:21 through p. 2363:10.

[59] Tr. Vol. 9, pp. 2349:5 through 2350:6, and Tr. Vol. 9, p. 2351:18-24 [also, Tr. Vol. 9, p. 2356:19-22], and Tr. Vol. 9, p. 2352:11-15.

190. Mr. Schaefer did not have a definition "de minimis" when he undertook the antidegradation analysis.[60]

191. Mr. Schaefer's conclusions as stated in his water quality standards memo and its worksheet and in his direct testimony depend in part on the underlying assumption that salinity concentrations on the bottom of the channel near the discharge point will not increase more than 1 ppt.[61] .

192. Mr. Schaefer's knowledge regarding the effluent percentage at the edge of the aquatic life mixing zone turns on the quality of the CORMIX data utilized by Ms. Cunningham.[62] .

193. Mr. Schaefer did not consider in his antidegradation analysis the CORMIX salinity concentrations projected by the modeling of Dr. Socolofsky or Dr. Osting, because he trusted the agency staff members to use the agency's established procedures and protocols, and he did not know that others, e.g., Socolofsky and Osting, would do that. Indeed, he discounted to "zero" the data from the opposing side.[63]

194. Mr. Schaefer relied in part in his antidegradation analysis on the estimate Dr. Furnans had developed for the worst-case ratio of (a) the salt discharged in a day to (b) the ambient-water salt passing the north-south plane through the discharge point in a day.[64] That estimate was based on an incorrect conversion from MGD to m^3/day that resulted a quantity of salt discharged in a day that was 1/10th the true amount.[65]

195. On balance, the agency's antidegradation analysis lacked (a) the methodological structure and (b) the explicit standards for fact-finding and (c) the reasoned evaluation of all available reliable and probative evidence necessary to ensure the issuance of the draft permit would be consistent with Tier 1 and Tier 2 antidegradation standards.

196. An antidegradation review is designed to ensure that a proposed discharge does not impair the uses or degrade the water quality of the receiving waters.

197. Tier 1 and Tier 2 antidegradation reviews are required due to the exceptional aquatic life use designation at the outfall location.

198. Following the TCEQ's procedural requirements for an antidegradation review is not sufficient on its own to ensure that the proposed discharge complies with the substantive

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[60] Tr. Vol. 9, p. 2384:9-11.

[61] Tr. Vol. 9, pp. 2357:20 through 2358:3.

[62] Tr. Vol. 9, pp. 2359:21 through 2360:8.

[63] Tr. Vol. 9, pp. 2360:25 through 2361:12 and Tr. Vol. 9, p. 2361:20-24.

[64] Ex. ED-PS-1R at 26:24-29; A.R., Tab J, p. 105.

[65] Exs. APP-JF-14 at 2 (relied upon by Mr. Schaefer) and APP-JF-3R at 2 (offered by Dr. Furnans on remand) and RG-415 (Surface Water Quality Monitoring Procedures, Appendix C, Conversion Table), 1 gallon equals 3.8 liters, and 1 cubic meter (i.e., 1000 liters) equals 263.2 gallons.

antidegradation standards.

199. The existence of a zone of passage for aquatic life around the mixing zone does not ensure that the designated uses and water quality of Segment 2481 (Corpus Christi Bay) will not be impaired.

200. No demonstration was made that degradation of water quality in the water body receiving the desalination effluent is necessary for important economic or social development.

201. The ED's antidegradation review does not demonstrate that the proposed discharge will maintain existing uses and not lower water quality by more than a de minimis amount.

202. The ED's antidegradation review did not ensure that salinity gradients in the estuary would be maintained.

Issue 2I: Draft Permit Requirements

203. The Draft Permit fails to specify daily maximum and daily average flow limits of 110 million gallons per day (MGD) and 95.6 MGD, respectively.

204. A number of permit conditions required by law are not included in the draft permit, including a description of the effluent, as required by Tex. Water Code § 26.029(a)(2) and 30 TAC §305.45(a)(8)(B)(ii), providing the chemical characteristics or limits on likely chemicals in the effluent because the ED did not require such information.

205. The Draft Permit fails to include a limit for salinity.

206. The Draft Permit fails to include effluent limits related to the HHMZ or the ALMZ.

Transcription Costs

207. Any party that wanted a copy of the transcript had to pay for their own copy.

208. Only the portion of the court reporter's fees attributable to the recording and transcription of the hearing should be subject to allocation.

209. Only the court reporter's hourly fee is a cost that is associated solely with the court reporter's preparation of the transcript of the hearing. These costs total $3,650.00 for the hearing on the merits, and $175.00 for the prehearing conference.

210. The only amount that should be subject to allocation among the parties is $3,825.00.

211. The transcript was required by SOAH's rules.

212. No party asserts that transcript costs should be allocated to Audubon or the self-represented protestants.

213. Transcript costs cannot be assessed against the Executive Director and OPIC because they are statutory parties who are precluded from appealing the decision of the Commission.

214. The Port Authority and the Executive Director requested the remand.

215. The Port Authority should bear the transcript costs associated with the remand, and no portion should be allocated.

II. PROPOSED CONCLUSIONS OF LAW

1. The Commission has jurisdiction over water quality and the issuance of TPDES permits. Tex. Water Code §§ 5.013, 26.003, 26.011, 26.027, and 26.028.

2. The Application was referred to SOAH under Texas Water Code § 5.556.

3. SOAH has jurisdiction to conduct a hearing and prepare a proposal for decision in contested cases referred by the Commission under Texas Government Code § 2003.047.

4. Notice of the Application and the hearing were properly provided to the public and to all parties. Tex. Water Code §§ 5.115, 26.022, 26.028; Tex. Gov't Code §§ 2001.051-.052; 30 Tex. Admin. Code ch. 39.

5. The Application is subject to Texas Government Code § 2003.047(i-1)-(i-3).

6. There must be no significant lethality to aquatic organisms that move through a ZID. 30 Tex. Admin. Code § 307.8(b)(2).

7. Water in the state must be maintained to preclude adverse toxic effects on aquatic life. 30 Tex. Admin. Code § 307.6(b)(4).

8. Surface waters must not be toxic to man from ingestion of water, consumption of aquatic organisms, or contact with the skin, or to terrestrial or aquatic life. 30 Tex. Admin. Code § 307.4(d).

9. Salinity gradients in estuaries must be maintained to support attainable estuarine-dependent aquatic life uses. 30 Tex. Admin. Code § 307.4(g)(3).

10. An attainable use is a use that can be reasonably achieved by a water body in accordance with its physical, biological, and chemical characteristics whether it is currently meeting that use or not. 30 Tex. Admin. Code § 307.3(a)(4).

11. Careful consideration must be given to all activities that may detrimentally affect salinity gradients. 30 Tex. Admin. Code § 307.4(g)(3).

12. The highest water quality sustained since November 28, 1975, defines baseline conditions for determinations of degradation. 30 Tex. Admin. Code § 307.5(c)(2)(B).

13. The ED's antidegradation review does not ensure compliance with the Tier 1 and Tier 2 antidegradation standards. 30 Tex. Admin. Code § 307.5(b).

14. The ED's modeling analysis of the proposed discharge is not sufficient to ensure the Draft Permit is protective of water quality.

15. The Draft Permit is not protective of water quality and the uses of the receiving waters under the applicable TSWQS. 30 Tex. Admin. Code ch. 307.

16. The Draft Permit does not include all appropriate and necessary requirements to protect the

marine environment, aquatic life, wildlife, recreational activities, commercial fishing, and fisheries.

17. No transcript costs may be assessed against the Executive Director or OPIC because the TCEQ's rules prohibit the assessment of any cost to a statutory party who is precluded by law from appealing any ruling, decision, or other act of the Commission. Tex. Water Code §§ 5.275, .356; 30 Tex. Admin. Code § 80.23(d)(2).

18. Factors to be considered in assessing transcript costs include: the party who requested the transcript; the financial ability of the party to pay the costs; the extent to which the party participated in the hearing; the relative benefits to the various parties of having a transcript; and any other factor which is relevant to a just and reasonable assessment of the costs. 30 Tex. Admin. Code § 80.23(d)(1).

19. Considering the factors in 30 Texas Administrative Code § 80.23(d)(1), no transcript costs should be assessed or allocated against any parties, but rather the parties should bear the transcript costs they have already paid themselves.

20. The appropriate legal standard for non-numeric criteria is found in 30 Texas Administrative Code § 307.6(e)(1) for evaluating the impacts to aquatic organisms that move through a zone of initial dilution (ZID).

21. The appropriate legal standard for non-numeric criteria is that acute total toxicity levels may be exceeded in a ZID, but there must be no significant lethality to aquatic organisms that move through a ZID.

22. The Texas Surface Water Quality Standards (TSWQS) do not define "significant lethality." Administrative rules, which have the same force as statutes, are construed in the same manner as statutes.[66] The rules of statutory construction require that a statute be interpreted in accordance with its plain meaning unless the language is ambiguous or the plain meaning leads to absurd results.[67] "The plain meaning of a word may be found in a simple dictionary."[68] Significant is defined as "having meaning" or "having or likely to have influence or effect; important."[69] This plain meaning is consistent with the use of the word "significant" throughout the TSWQS.[70]

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[66] *TPCIGA v. Morrison*, 212 S.W.3d 349, 353 (Tex. App—Austin, 2006, pet. denied).

[67] *Clark v. State*, Cause No. 10-18-00322-CR, 2020 Tex. App. LEXIS 9292, *5 (Tex. App.—Waco 2020, no pet.).

[68] *Id*.

[69] Merriam-Webster, Significant Definition & Meaning - Merriam-Webster, Mar. 30, 2022.

[70] "Significant" is used numerous times in the TSWQS in various contexts. *See e.g.*, 30 Tex. Admin. Code §§ 307.3(a)(41), (50), (51), (54), (56)-(58), (71) ("significant long-term human consumption"), 307.4(j)(2) ("significant risk of ingestion"), 307.6(d)(5)(E), (e)(2)(A) ("significant potential for exerting toxicity"), 307.9(b) ("significant areas of a water body").

Respectfully submitted,

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CERTIFICATE OF SERVICE

I certify that a copy of this document was served on all parties of record on this date, April 22, 2022, in accordance with the applicable service procedures.

/s/ Craig R. Bennett
Craig R. Bennett