

PETITION FOR RULEMAKING

TO THE HONORABLE COMMISSION:

Pursuant to the provisions of Title 30 of the Texas Administrative Code Chapter 20, Ingleside on the Bay Coastal Watch Association (“IOBCWA”), Port Aransas Conservancy (“PAC”), and Hillcrest Residents Association (“HRA”) (collectively, “Petitioners”) submit this Petition for Adoption of a Rule (the “Petition”) to the Texas Commission on Environmental Quality (“TCEQ” or “Commission”), seeking adoption of rules that prescribe reasonable measures to minimize impingement and entrainment of aquatic life. Since September of 2015, the Commission has been required to adopt such rules pursuant to Texas Water Code § 18.003(h), and yet has failed to do so.

I. Introduction

Desalination of seawater is a water supply strategy currently under consideration at several locations in Texas. According to the Texas Water Development Board’s 2020 Biennial Report on Seawater and Brackish Groundwater Desalination in Texas, four regional water planning groups include 10 seawater desalination recommended water management strategies (projects).¹ At the same time, the water planning process has recognized the need to carefully consider the environmental impacts of seawater desalination projects, as the 2015 Coastal Bend Regional Water Plan acknowledged:

The potential environmental effects resulting from the construction of a desalination plant in the vicinity of Nueces Bay and/or Corpus Christi Bay will be sensitive to the siting of the plant and its appurtenances. Environmental analyses including impingement and entrainment will need to be considered as part of the intake evaluation.²

¹ Texas Water Development Board, “The Future of Desalination in Texas: 2020 Biennial Report on Seawater and Brackish Groundwater Desalination in Texas.” December 1, 2020, at 24.

² Regional Water Plan, p. 5D.9-8.

Surface water desalination facilities are not entirely limited to coastal locations, however. For example, the City of Abilene has a desalination facility which processes water from O.H. Ivie Reservoir.

The brine discharges from desalination plants, as well as the intake facilities for such plants, can have significant adverse environmental impacts.

The desalination process produces significant quantities of concentrated brine as a wastewater. In fact, of the water drawn into a typical reverse osmosis desalination plant, roughly two thirds is ultimately discharged from the facility as brine. Discharge of this wastewater creates areas of high salinity gradients in the receiving waters, which can be fatal to aquatic life. Water inherently moves to areas of higher salt concentration, so that aquatic life within areas of high salinity gradients – such as those created by brine discharges – will potentially have the water sucked out of their bodies, resulting in dehydration. This is particularly a risk with the larval stage of many aquatic species. The defouling agents contained in desalination discharges, as well as the metals potentially contained in desalination discharges, can also negatively impact wildlife in receiving waters.

In addition to the environmental impacts of wastewater discharges from desalination facilities, the intakes for such facilities can also have significant impacts. Impingement (the trapping of organisms against intake screens by the velocity and force of water flowing through them) and entrainment (the passage of smaller organisms through the intake screen into the process equipment) both can cause significant adverse impacts on aquatic life. Intakes may also have adverse environmental impacts as the result of associated construction activities, removal of habitat, and interference with aquatic travel patterns. Even if an animal is able to escape after

contact with an intake structure, the 24-hour survival rate after such contacts is low. Species entrained into the desalination process encounter tremendous salinity gradients and pressures that cause significant damage or fatality to the animal.

The environmental impact of cooling water intake structures has been addressed at the federal level within Section 316(b) of the Federal Clean Water Act (“CWA”), and regulations issued to implement that provision of the CWA.³ These regulations have been incorporated into the TCEQ regulations as applicable to Texas Pollutant Discharge Elimination System Permits.⁴ Those regulations establish minimum standards for cooling water intake structures, and provide for addressing the impact of such structures particularly when there are sport or commercial species of impingement or entrainment concern in the area of the intake.⁵ The same regulations contain specific requirements regarding the type of information to be provided for review of the intake structures, the monitoring to be performed, and the records to be maintained.⁶ In adopting regulations governing cooling water intakes, EPA noted that the effects of CWIS on aquatic habitats and biota in the waterbody do not occur in isolation from other ongoing physical, chemical, and biological stressors.⁷ Such stressors may include: Degraded water and sediment quality, low dissolved oxygen (DO) levels, eutrophication, fishing, channel or shoreline (habitat) modification (intake structure and other flood or storm controls), hydrologic regime changes and invasive species.

³ 40 C.F.R. Part 125, Subparts I & J.

⁴ 30 T.A.C. Chapter 308, Subchapter I.

⁵ 40 C.F.R. 125.84(b)(4)(iii) & (b)(5)(ii), incorporated into TCEQ Regulations for cooling water intake structures at 30 TAC 308.91(5).

⁶ 40 C.F.R. 125.84(c)(5), (c)(6) & (c)(7).

⁷ 79 Fed.Reg. 48300, 48318 (Aug. 15, 2014)(National Pollutant Discharge Elimination System—Final Regulations To Establish Requirements for Cooling Water Intake Structures at Existing Facilities and Amend Requirements at Phase I Facilities).

While the focus of intake structures at the federal level has been related to cooling water intakes, the Texas Legislature has recognized that the intake of water for desalination purposes also poses a potential risk to wildlife. House Bill 2031, passed in 2015 by the 84th Session of the Texas Legislature, addressed seawater desalination. Among other things, that bill required the Texas Parks and Wildlife Department (TPWD) with the Texas General Land Office (GLO) to jointly conduct a study to identify zones in the Gulf of Mexico that are appropriate for the diversion of marine seawater and a study to identify zones in the Gulf of Mexico that are appropriate for the discharge of waste resulting from the desalination of marine seawater, taking into account the need to protect marine organisms.⁸ TPWD and GLO completed this study September 1, 2018, designating offshore areas where diversion of marine seawater and discharge of desalination waste are appropriate.

TPWD and GLO also made recommendations as to the design of intake structures to address potential environmental impacts. As noted by TPWD and GLO, the use of directional drilling to install piping below the seabed and drawing water down through a sandy bottom will prevent impingement of marine organisms on intake screens and prevent entrainment of organisms through the intake screen.⁹

⁸ Tex. Water Code § 18.005(g).

⁹ TPWD/GLO Report at p. 2.

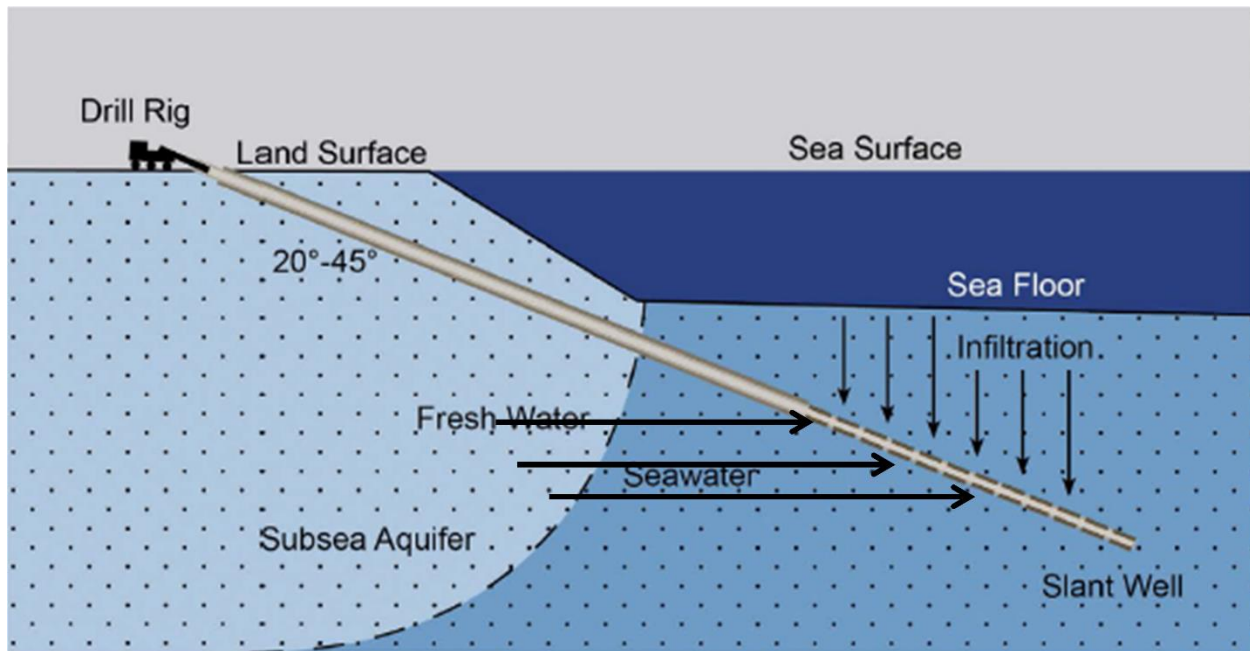


Figure 1: Slant Well Infiltration Intake¹⁰

Where feasible, this method would minimize both impingement and entrainment, and is used at some desalination plants. In that sense, this is analogous to closed-cycle cooling systems for steam-electric power plants, which are used as the regulatory benchmark in that context for minimization of impingement and entrainment impacts.¹¹

In situations where a subsurface intake is not feasible, other design measures are still available to reduce the risks of impingement and entrainment caused by an intake. Since the shallow area near the shore is, generally, the most biologically productive zone of a waterbody, the impingement and entrainment impacts are reduced by placing intakes further from the shoreline. Likewise, since most aquatic life are present within the upper reaches of the water column, placing the intakes at greater depth will tend to decrease the impingement and entrainment impacts. Limiting the flow-through velocity at the intake will also reduce the impacts, but will not

¹⁰ Missimer, Thomas & Maliva, Robert. (2017). Environmental issues in seawater reverse osmosis desalination: Intakes and outfalls. *Desalination*. Vol. 434, 15 May 2018.

¹¹ 40 C.F.R. 125.84(b)(1).

address the entrainment of organisms in fully passive developmental stages (such as larval stages of redfish on the Texas Coast). To address impingement, EPA has adopted a performance standard of 0.5 feet-per-second for intakes that are not located in sensitive environments,¹² in addition to capacity requirements which vary based upon the classification of the source water body.¹³ But the United States Fish and Wildlife Service has noted that not all important aquatic species are capable of swimming at sustained speeds above 0.5 fps, and so that performance standard is not sufficient at all locations,¹⁴ which has led the EPA to require site-specific consideration of enhanced protection when there are migratory and/or sport or commercial species of impingement or entrainment concern impacted by an intake.¹⁵

Beyond location, and reduction of velocity, certain design measures for the configuration of an intake can reduce impingement and entrainment. For example, TPWD and GLO recommended the following design measures to reduce the environmental impact of diversions for desalination facilities:

- intake structure design should adjust or adaptively manage with varying flows and water quality that may occur at the intake site;
- intake structures should be designed to reduce the flow velocity so that marine organisms may escape being drawn into the intake;
- screens or booms, or both, should be used to exclude organisms from the intake; and
- a site-specific study of conditions at proposed intake locations be conducted to identify marine organisms at risk from intake operations and to inform the design planning process.¹⁶

¹² 40 CFR 125.84(b)(2).

¹³ 40 C.F.R. 125.84(b)(3).

¹⁴ Final Biological Opinion re: United States Environmental Protection Agency's Issuance and Implementation of the Final Regulations § 316(b) of the Clean Water Act.

¹⁵ 40 C.F.R. 125.84(b)(4)(ii) & (b)(5)(ii).

¹⁶ TPWD/GLO Report at p. 2.

In light of these potential environmental impacts of seawater desalination intakes, and the availability of measures to reduce environmental impacts, HB 2031 required that, “[TCEQ] by rule shall prescribe reasonable measures to minimize impingement and entrainment.”¹⁷ This requirement is not limited to the expedited permitting program authorized by HB 2031. Prior to passage of HB 2031, TCEQ had adopted EPA’s regulations governing cooling water intake structures to address potential impingement and entrainment concerns for cooling water intakes,¹⁸ but TCEQ has not adopted regulations governing intakes at desalination facilities, as required by Chapter 18 of the Texas Water Code. This petition asks that TCEQ engage in that required rulemaking. Petitioners further propose that TCEQ adopt rules governing desalination intakes that are analogous to the regulations TCEQ has already adopted governing cooling water intake structures.

II. Petitioners’ Names and Addresses

IOBCWA is a Texas non-profit organization formed in 2019 by a group of concerned Ingleside on the Bay citizens who are taking action to mitigate negative effects on their bayfront community due to rising sea levels, larger and more frequent ship traffic, and rapid industrialization. IOBCWA engages with area industries, universities, and coastal communities. PAC is a Texas non-profit that works to foster a balance of conservation and economically sustainable uses for Port Aransas and its surrounding neighborhood and waterways while recognizing that the Port Aransas community and economy is dependent on tourism and fisheries within a healthy barrier island coastal ecosystem. Hillcrest Residents Association seeks to protect public health, safety, the environment, and the quality of life for residents in the Hillcrest

¹⁷ Tex. Water Code § 18.003(h).

¹⁸ 30 TAC § 308.91.

neighborhood and the immediately surrounding area near Corpus Christi Bay. The addresses of Petitioners are:

Ingleside on the Bay Coastal Watch Association 1018 Bayshore Drive Ingleside on the Bay, Texas 78362	Port Aransas Conservancy P.O. Box 422 Port Aransas, Texas 78373
Hillcrest Residents Association 2422 Summers St. Corpus Christi, Texas 78407	

For purposes of this Petition, IOBCWA, PAC and HRA may be contacted through Eric Allmon or Rick Lowerre at the contact information below:

Perales, Allmon & Ice
1206 San Antonio
Austin, Texas 78701
T: 512-469-6000
eallmon@txenvirolaw.com
rl@txenvirolaw.com

III. Brief Explanation of Proposed Rule

This Petition proposes that the Commission adopt a new 30 Tex. Admin. Code § 295.18, regarding the application requirements for a desalination intake, and § 295.60, setting forth measures to minimize impingement and entrainment at desalination facilities. The proposed rules are adapted from the federal rules governing cooling water intake structures, found at 40 C.F.R. § 125.84, and other federal rules referenced in that section, which have been incorporated into the TCEQ rules by reference at Chapter 308, Subchapter I. The proposed rules express a preference for attaining a reduction of impingement and entrainment to that equivalent to subsurface infiltration, much as the state and federal rules for cooling water intake structures establish that an intake flow equivalent to the use of a closed-cycle recirculating cooling water system is a

technological benchmark for minimizing the potential for impingement and entrainment.¹⁹ If such a process is infeasible, then, at a minimum, facilities must have an intake velocity of no greater than 0.5 fps, similar to the state and federal rule for cooling water intake structures. The further minimization of impingement and entrainment is required under circumstances similar to those set forth in state and federal rules for cooling water intakes, *i.e.* circumstances where information indicates that threatened or endangered species would be potentially impacted by the intakes, or that commercially or recreationally important species would be impacted by the intakes. In addition, the proposed rules specify that such particular attention is also to be given when an intake is proposed to be installed at a location that has not been designated as appropriate by the Texas Parks and Wildlife Department and the Texas General Land Office.

Consistent with the rules for cooling water intake structures, the proposed rules include requirements that specific information be provided within an application regarding source water physical data, intake structure data, and source water biological characterization data. This information is not currently explicitly required for desalination water rights applications, but is equally necessary to perform an evaluation to ensure that a facility reasonably minimizes the negative environmental impacts of impingement and entrainment.

As a minimum technical performance standard, the proposed rules establish that if subsurface intakes are infeasible, then each intake must be designed and constructed to have a maximum through-screen velocity of no greater than 0.5 fps, with particular intake flow capacity requirements equivalent to those for cooling water intake structures dependent upon the type of source water body to be used. Similar to the federal and state rules for cooling water intake

¹⁹ 40 CFR 125.84(b)(1), incorporated into the TCEQ Rules by reference at 30 TAC § 308.91(5).

structures, the proposed rules are not limited to only those intakes located withdrawing water for seawater purposes.

The proposed rules also provide for monitoring and record-keeping requirements equivalent to the requirements applicable under state and federal law to cooling water intake structures.

IV. Text of Proposed Rule

A full copy of the proposed rule is attached as Exhibit A and is incorporated by reference.

V. Statement of Commission's Authority

Texas Water Code §§ 5.102 and 5.103 authorize the Commission to adopt rules as necessary to carry out its powers and duties, which includes the authority to adopt rules to minimize impingement and entrainment of wildlife at seawater desalination facilities. Texas Water Code § 18.003(h) provides that the commission by rule shall prescribe reasonable measures to minimize impingement and entrainment. Accordingly, the Commission has both the authority and the duty to adopt the requested rules.

VI. Injury or Inequity Resulting from Failure to Adopt Rule

If the proposed rule is not enacted, the Commission will continue to lack consistent guidance for the determination of measures to be required to minimize impingement and entrainment of wildlife at desalination facilities. This will potentially result in the inconsistency of requirements for different facilities, and a variance in the requirements applicable to these facilities as opposed to the requirements applicable to facilities that intake cooling water. Adoption of the proposed rules creates a regulatory structure that treats intake structures for desalination facilities in a manner similar to the treatment of cooling water intake structures under 30 TAC Chapter 308, Subchapter I, thereby ensuring equivalent protectiveness. Structures permitted for

desalination uses may intake water that will ultimately be used for cooling water purposes, resulting in the intakes ultimately being subject to the requirements of 30 TAC Chapter 308, Subchapter I. The adoption of similar rules to govern desalination facilities ensures that appropriate measures will be able to be implemented when the facilities are initially being built, rather than risking a situation where the facilities are constructed prior to a consideration of what is required to properly meet the requirements for cooling water intake structures.

Additionally, a failure to adopt the requested rule would increase the likelihood that intakes for desalination facilities would result in harmful environmental impacts upon wildlife, with potentially devastating consequent economic impacts. For example, sensitive areas of the Corpus Christi Bay ecosystem contain an important combination of tidal flats, tidal marsh, mangroves, unvegetated shallows, and extensive seagrass beds that provide nurse, forage, and cover habitats for many species of fish and wildlife and is of biological, recreational and economic importance to the local communities. The fish that develop in these sensitive areas account for a high proportion of the angling trips taken to the Corpus Christi area, as well as a high proportion of the sport and commercial fish landed in the Corpus Christi area. Impacts upon these sensitive areas could be economically dramatic. Within the Corpus Christi area, nature tourism now accounts for 47 percent of all visitor trips.²⁰ Annual destination spending by nature-oriented visitors is estimated at \$674 million for 2012-13, which represents over 50 percent of overall visitor spending.²¹ The total economic impact of nature tourism, including both direct and secondary effects, is estimated at \$987 million in business revenues, \$549 million in value added activity and 12,914 jobs.²²

²⁰ Texas A&M University – Corpus Christi, “The Economic Significance of Tourism and Nature Tourism in Corpus Christi, 2014 Update”, March 2014, p. iv.

²¹ *Id.*

²² *Id.*

Oyster farming is a developing industry whose growth would be threatened by inadequate protection of environments impacted by desalination intake structures. In 2019, the Texas Legislature passed House Bill 1300 directing the Texas Parks and Wildlife Department to develop an off-bottom oyster mariculture program. Dr. Joe Fox, Chair of the Harte Research Institute for the Gulf of Mexico Studies of Texas A&M University has noted that this new industry would be intended to provide jobs to restore working waterfronts in Texas to areas damaged by Hurricane Harvey, as well as providing oysters to Texas retailers to offset a declining natural fishery. Oysters are sensitive to even small changes in their ecosystem,

Multiple desalination facilities are under consideration in the Corpus Christi Bay area, including facilities that would potentially impact sensitive areas for recreationally and commercially important species. Such economic activity and jobs would be placed at risk by inadequate protection of the ecological productivity of the Bay from the adverse impacts of desalination intakes. The proposed rules establish a framework for enhanced scrutiny of such areas where important sport and commercial fisheries would be impacted, thereby providing a step towards addressing these environmental and economic injuries.

VII. Conclusion

For the reasons set forth above, IOBCWA, PAC and HRA respectfully request that the Commission grant this Petition and initiate a rulemaking that is consistent with the rule proposed in Exhibit A.

Respectfully submitted,
/s/ Eric Allmon
Eric Allmon
State Bar No. 24031819
Richard Lowerre
State Bar No. 12632900
**PERALES, ALLMON &
ICE, P.C**
1206 San Antonio
Austin, Texas 78701
512-469-6000 (t)
512-482-9346 (f)