



Port Isabel Seawater Desalination Facility

Frequently Asked Questions



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Laguna Madre Water District Seawater Desalination Project Frequently asked Questions:

Environmental Concerns:

How will desalination impact the local environment?

Desalination can have various environmental impacts, including intake of seawater affecting marine organisms, energy consumption, and disposal of brine concentrate back into the Port Isabel Channel. However, modern desalination technologies will minimize these impacts through advanced intake methods, energy-efficient processes, and responsible discharge practices.

What measures are in place to mitigate any potential environmental risks?

To mitigate environmental risks, comprehensive environmental impact assessments are underway prior to project implementation. Measures include utilizing intake screens to minimize harm to marine life, adopting energy-efficient technologies to reduce power consumption, and implementing brine disposal combined with existing and permitted domestic wastewater effluent that will yield a return flow that is comparable to existing receiving water that minimizes harm to marine ecosystems.

How does desalination compare to other water sourcing methods in terms of environmental impact?

Desalination generally has a higher environmental footprint compared to traditional water sourcing methods like surface water or groundwater extraction due to energy consumption and brine discharge. However, it can offer advantages in areas with limited freshwater resources or where traditional sources are depleted or contaminated. Efforts are continually made to improve desalination technologies and reduce environmental impact.

Effect on Marine Biology:

How will desalination affect marine life in the Port Isabel Ship Channel and surrounding areas?

Desalination can potentially impact marine life through intake of seawater for the desalination process and discharge of brine concentrate back into the ocean. Intake systems are designed to minimize harm to marine organisms,

and brine discharge is often diluted to reduce its impact. However, localized effects on marine ecosystems may still occur, which is why environmental impact assessments are being conducted to evaluate and mitigate these risks.

Are there studies or assessments available on the impact of desalination on marine biology?

Yes, there are numerous studies and assessments available that examine the impact of desalination on marine biology. These studies evaluate factors such as the effect of intake systems on marine organisms, changes in water chemistry due to brine discharge, and long-term ecological consequences. These assessments help inform the design and operation of desalination plants to minimize their impact on marine ecosystems. The District has authorized the preparation of a full Environmental Assessment (EA).

Impingement of Marine Life:

How will the desalination plant prevent or minimize the impingement of marine life?

The desalination plant employs various methods to prevent or minimize the impingement of marine life. One common approach is the use of intake screens or meshes that filter out larger marine organisms before they enter the plant. Additionally, the openings will be design at a low velocity to maintain low suction force and minimize the intake of marine life.

Are there technologies or strategies in place to address this issue?

Yes, there are several technologies and strategies employed to address the impingement of marine life. These may include:

- Fine mesh screens or intake structures designed to reduce the intake of marine organisms, and reducing the risk of organisms being drawn in.
- Environmental monitoring and adaptive management practices to assess and mitigate any unintended impacts on marine ecosystems.

Endangered Species:

What steps are being taken to protect endangered species in the area during and after desalination plant construction and operation?

The protection of endangered species is a priority during and after the construction and operation of the desalination plant. Steps have been taken to protect endangered species that include conducting thorough environmental impact assessments to identify potential risks to endangered species habitats and populations. Additionally, mitigation measures such as habitat restoration, relocation of sensitive species, and the implementation of exclusion zones may be implemented to minimize adverse effects.

Ongoing monitoring and collaboration with environmental agencies and conservation organizations are essential to ensure compliance with regulations and to adaptively manage any unforeseen impacts on endangered species in the area.

Discharge of Concentrate:

What is the plan for managing and disposing of the concentrate produced during the desalination process?

The management of concentrate, also known as brine, is an essential aspect of desalination plant operation. Typically, the concentrate is discharged back into the water body from which the seawater was extracted. The desalination plant's plan for managing concentrate involves diluting it with permitted wastewater effluent to reduce its salinity to match existing conditions, adhering to regulatory guidelines for discharge volumes and concentrations.

How will the discharge of concentrate back into the Port Isabel Ship Channel be regulated to minimize impact?

The discharge of concentrate back into the Port Isabel Ship Channel is regulated to minimize environmental impact. This will involve obtaining permits from the Texas Commission on Environmental Quality (TCEQ) that specify discharge limits for salinity, and other parameters. Additionally, monitoring programs may be implemented to assess the impact of concentrate discharge on water quality and marine ecosystems. The desalination plant may also incorporate technologies such as diffusers or mixing zones to ensure proper dilution and dispersion of the discharged concentrate, minimizing its impact on the surrounding environment.

Impact on Navigable Waterways:

Will the desalination project have any impact on the navigability of the Port Isabel Ship Channel?

The desalination project is designed to minimize impacts on the navigability of the Port Isabel Ship Channel. Comprehensive planning and environmental assessments are being conducted to evaluate potential impacts on maritime traffic. Measures are implemented to ensure that vessel navigation is not adversely affected by the presence or operation of the desalination plant.

What measures are in place to ensure that maritime traffic and navigation are not disrupted during the construction and operation of the desalination plant?

During both the construction and operation phases of the desalination plant, measures are implemented to minimize disruption to maritime traffic and navigation. These measures may include:

- Coordination with maritime authorities to schedule construction activities during low-traffic periods.
- Establishment of safety zones or navigational markers to delineate areas around the plant site.
- Implementation of traffic management plans to ensure safe passage of vessels through the channel.
- Continuous monitoring and communication with vessel operators to address any concerns or issues that may arise during construction or operation.

Water Security:

How does desalination contribute to water security for the Laguna Madre Water District?

Desalination contributes to water security for the Laguna Madre Water District by providing a reliable and diversified source of fresh water. Unlike traditional sources such as groundwater or surface water, which may be susceptible to depletion or contamination, desalination relies on abundant seawater as its feedstock. This reduces dependency on finite freshwater resources and helps ensure a consistent water supply, even during periods of drought or water scarcity.

What assurances are in place to ensure a reliable and sustainable water supply for the community?

Several assurances are in place to ensure a reliable and sustainable water supply for the community:

- **Infrastructure Investment:** The desalination plant is equipped with modern and efficient technologies to maximize water production and minimize operational disruptions.
- **Water Management Practices:** Comprehensive water management strategies are implemented to optimize water usage, reduce wastage, and ensure efficient distribution of water resources.
- **Monitoring and Maintenance:** Ongoing monitoring and maintenance programs are in place to detect and address any issues that may arise with the desalination plant or water distribution infrastructure.
- **Diversification of Water Sources:** In addition to desalination, the Laguna Madre Water District will utilize a combination of water sources, including surface water, water conservation and reclaimed water, to further enhance water security and resilience.
- **Regulatory Compliance:** The desalination plant operates in compliance with regulatory standards and permits to safeguard water quality and protect the environment, ensuring a sustainable water supply for the community. Together, these measures help ensure that the Laguna Madre

Water District has a reliable, sustainable, and resilient water supply to meet the needs of its residents and businesses.

Improved Drinking Water Quality:

How will desalinated water quality compare to other sources of drinking water available to the community?

Desalinated water typically surpasses the quality of many other sources of drinking water available to the community. Seawater, the feedstock for desalination, is naturally free from many contaminants found in freshwater sources such as rivers and lakes. Through the desalination process, impurities, salts, and minerals are removed, resulting in high-quality, purified water. Desalinated water often meets or exceeds regulatory standards for drinking water quality, providing residents with a reliable and safe source of potable water.

What improvements in water quality can residents expect from implementing desalination technology?

Implementing desalination technology can lead to significant improvements in water quality for residents:

- **Removal of Contaminants:** Desalination removes various contaminants, including salts, minerals, bacteria, and organic compounds, resulting in water that is clean, clear, and free from taste and odor issues. Desalination has been proven to remove emerging contaminants being regulated by the EPA, such as PFAS compounds.
- **Consistency:** Desalinated water quality remains consistent regardless of environmental conditions, ensuring residents have access to high-quality drinking water year-round.
- **Health Benefits:** High-quality drinking water provided by desalination can contribute to improved public health by reducing the risk of waterborne illnesses and contaminants associated with other water sources. Overall, residents can expect a noticeable improvement in water quality and reliability by implementing desalination technology, enhancing their overall drinking water experience and quality of life.

Capital Costs:

What are the estimated capital costs for implementing a desalination plant in the Port Isabel Ship Channel?

The estimated capital costs for implementing a desalination plant in the Port Isabel Ship Channel can vary depending on factors such as plant capacity, technology chosen, infrastructure requirements, and environmental considerations. Typically, desalination plants involve significant upfront investment due to the need for specialized equipment and infrastructure.

Detailed feasibility studies and engineering assessments are being conducted to determine the specific capital costs tailored to the project's scope and requirements.

How will these costs be funded?

The costs of implementing a desalination plant in the Port Isabel Ship Channel may be funded through various mechanisms, including:

- **Public Financing for Capital Costs:** Government entities such as local, state, or federal agencies may provide grants or loans to support desalination projects as part of water infrastructure investments. It is anticipated that capital funds will be obtained from the Texas Water Development Board and the US Bureau of Reclamation.
- **User Fees:** Water consumers in the Laguna Madre Water District may contribute to funding the desalination project through water user fees and rates for the operational cost.

Power Costs:

How much power will the desalination plant require to operate?

The power requirement of a desalination plant depends on various factors such as plant capacity, technology utilized, feedwater characteristics, and operational parameters. Generally, desalination plants consume significant amounts of electricity to power pumps, motors, and treatment processes. Advanced technologies such as reverse osmosis (RO) typically require less energy compared to thermal desalination methods like multi-stage flash (MSF) or multi-effect distillation (MED). Detailed engineering studies are underway to estimate the specific power requirements tailored to the desalination plant's design and operational needs. Innovative contracting with the power provider will investigate long term contracts, off-peak power and interruptible power rates and, alternative power sources

What is the anticipated cost of this power, and how does it compare to other water sourcing methods?

The anticipated cost of power for operating a desalination plant depends on factors such as electricity rates, energy efficiency measures, and plant efficiency. Desalination plants may incur significant operational costs related to energy consumption, which can vary depending on local energy prices and availability. Compared to other water sourcing methods such as groundwater pumping or surface water treatment, desalination typically has higher energy requirements and associated costs. However, advancements in desalination technology and energy management practices aim to reduce power consumption and overall operating costs, making desalination more competitive with traditional water sourcing methods, particularly in regions where freshwater resources are limited or contaminated. As part of the

ongoing Feasibility Study, the initial rates will be estimated to determine projected operational costs.

Impact on Water Rates:

How will the implementation of desalination affect water rates for residents and businesses in the Laguna Madre Water District?

The implementation of desalination may affect water rates for residents and businesses in the Laguna Madre Water District. Desalination projects involve significant capital investment and operational costs, which may necessitate adjustments to tax rates and user rates to cover these expenses. However, the extent of the impact on water rates depends on various factors such as the financing structure of the project, energy costs, water demand, and regulatory considerations. Measures may be taken to mitigate the impact on water rates, such as seeking funding through grants or loans, optimizing plant efficiency to reduce operating costs, and phasing in rate adjustments over time if needed.

Are there projections available on how desalination will influence water rates in the short and long term?

Projections on how desalination will influence water rates in the short and long term will be included in feasibility studies and financial analyses conducted as part of the project planning process. These projections take into account factors such as capital costs, operational expenses, revenue sources, and anticipated water demand. While specific projections may vary depending on project specifics and economic conditions, stakeholders often consider potential impacts on water affordability and affordability mechanisms to ensure equitable access to water for all residents and businesses in the Laguna Madre Water District.

Impact of Not Doing the Project:

What are the potential consequences of not implementing the desalination project for the Laguna Madre Water District and the local community?

Not implementing the desalination project could lead to several potential consequences for the Laguna Madre Water District and the local community, including:

- **Water Shortages:** Without a reliable and sustainable water supply from desalination, the Laguna Madre Water District may face water shortages, particularly during periods of drought or increased water demand.
- **Water Quality Concerns:** Relying solely on current water sources (Rio Grande) may pose risks to water quality, as these sources may be susceptible to contamination or depletion over time.

- **Economic Impacts:** Water shortages or quality issues could have adverse economic impacts on residents, businesses, and industries reliant on a consistent and high-quality water supply.
- **Environmental Concerns:** Increased pressure on existing water sources may lead to environmental degradation, habitat loss, and depletion of freshwater ecosystems. Overall, not implementing the desalination project could jeopardize water security, economic stability, and environmental sustainability for the Laguna Madre Water District and the local community.

How does the status quo or reliance on current water sources compare to the benefits offered by desalination in terms of water security and quality?

Reliance on current water sources may provide some level of water security and quality but may also present limitations and risks. Compared to desalination, which offers a reliable and diversified water supply, current Rio Grande is vulnerable to factors such as drought, contamination, and overexploitation. Desalination provides a sustainable solution to address these challenges by tapping into abundant seawater resources and producing high-quality drinking water through advanced treatment processes. Additionally, desalination offers greater control over water quality parameters, reducing reliance on fluctuating environmental conditions and potential contaminants. Overall, desalination offers significant benefits in terms of water security and quality compared to the status quo or reliance on current water sources.

Alternatives:

Are there any alternative solutions or technologies being considered besides desalination to address the water needs of the Laguna Madre Water District?

Yes, there may be alternative solutions or technologies being considered to address the water needs of the Laguna Madre Water District. Some potential alternatives include:

- **Water Conservation and Efficiency Measures:** Implementing water conservation programs and efficiency measures to reduce water demand and optimize water usage. This will always be a part of the District's plan.
- **Surface Water Management:** The District has a series of small to medium off-channel reservoirs that are used to mitigate short term water shortages but cannot be depended on for extended periods of time.
- **Reclaimed Water:** Treating and utilizing reclaimed water for potable and non-potable purposes such as irrigation.

How do these alternatives compare in terms of feasibility, cost-effectiveness, and environmental impact?

The feasibility, cost-effectiveness, and environmental impact of alternative solutions vary depending on factors such as local conditions, regulatory requirements, and stakeholder preferences. Some alternatives may be more feasible or cost-effective in the short term but may have limitations in terms of scalability, reliability, or environmental sustainability. Comparative assessments and feasibility studies are being conducted to evaluate the pros and cons of each alternative, considering factors such as:

- **Resource Availability:** Availability and reliability of water resources, including groundwater, surface water, and reclaimed water.
- **Infrastructure Requirements:** Investment costs, operational requirements, and infrastructure needs associated with implementing each alternative.
- **Environmental Considerations:** Potential environmental impacts, including habitat disturbance, water quality, and energy consumption.
- **Stakeholder Engagement:** Community preferences, regulatory considerations, and social acceptance of each alternative. Ultimately, the selection of the most suitable alternative(s) depends on a holistic assessment of these factors and alignment with the goals and priorities of the Laguna Madre Water District and the local community.

Impact on Nearby Residents:

Are there any potential impacts on nearby residents, such as noise, visual pollution, or increased traffic, resulting from the desalination project?

The desalination project may potentially have several impacts on nearby residents, including:

- **Noise:** Construction activities and operation of machinery at the desalination plant may generate noise, particularly during the construction phase.
- **Visual Pollution:** The presence of industrial infrastructure, such as treatment facilities will not be an issue as the plant will be located in an existing industrial area and adjacent to the existing water and wastewater treatment plant.
- **Increased Traffic:** Temporary transportation of materials and equipment to and from the project site may result in increased traffic on local roads during the construction phase. These potential impacts should be assessed and addressed through effective planning and mitigation measures to minimize adverse effects on nearby residents.

What steps are being taken to minimize any disruptions or inconveniences to residents living in the vicinity of the project site?

To minimize disruptions or inconveniences to nearby residents, several steps may be taken, including:

- **Noise Mitigation:** Implementing construction noise mitigation measures such as scheduling noisy activities during the daylight.
- **Traffic Management:** Developing traffic management plans to minimize congestion and ensure safe passage of vehicles during construction activities.
- **Community Engagement:** Engaging with nearby residents through community meetings, newsletters, and other communication channels to provide updates on project progress and address concerns or feedback.
- **Compliance with Regulations:** Ensuring compliance with relevant regulations and permit conditions related to noise levels, and traffic management. These measures aim to balance the needs of the project with the well-being and quality of life of nearby residents, fostering a positive relationship between the desalination project and the surrounding community.

Other Concerns:

How will desalination impact water quality in the local area?

Desalination can improve water quality in the local area by providing a source of high-quality, potable water. Unlike some traditional water sourcing methods that may rely on surface water susceptible to contamination or groundwater with high mineral content, desalination produces purified water from seawater, which is typically free from contaminants and impurities. As a result, desalination can contribute to improved drinking water quality and reliability for the community.

What benefits does desalination offer over other water sourcing methods for the Laguna Madre Water District?

Desalination offers several benefits over other water sourcing methods for the Laguna Madre Water District:

- **Water Security:** Desalination provides a reliable and sustainable source of water, reducing reliance on limited freshwater resources and diversifying the water supply portfolio.
- **Drought Resilience:** Desalination is less vulnerable to drought conditions compared to surface water or groundwater sources, which may be depleted during prolonged dry periods.

- **Quality Control:** Desalination produces high-quality drinking water that meets stringent regulatory standards, ensuring safe and consistent water supply for residents.
- **Environmental Sustainability:** Desalination can help alleviate pressure on freshwater ecosystems by reducing the need for freshwater extraction, particularly in coastal areas where freshwater resources are scarce or vulnerable to contamination. Overall, desalination offers a dependable and environmentally sustainable solution to meet the water needs of the Laguna Madre Water District, enhancing water security and quality for the community.