2025-2026

Water Sustainability & Conservation in Cape May

Columbia University: School of Professional Studies & The Climate School

Summarized Final Client Reports
Prepared by the Cape May City Environmental Commission

School of Professional Studies

Phase One: Water Efficiency & Sustainability

1 Circularity

2 Desalination Operations

3 Demand

4 Finance

CIRCULARITY

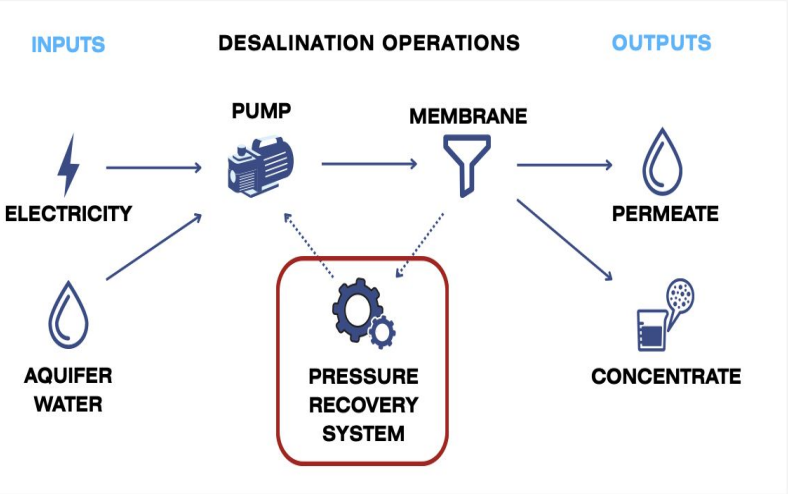
SOLUTION: MONETIZE WASTE

	Salt	Minerals	Landscaping
VALUE	$165 PER TON (POST EVAPORATION)	HIGHLY VARIABLE	DEMAND OFFSET OF 1 MILLION GALLONS PER YEAR
FORM	EVAPORATED	OFTEN EVAPORATED	LIQUID
IMPLEMENTATION EASE	LOW	LOW	HIGH
POTENTIAL BUYERS	HAVEN Salt Company LLC; The SALT Depot	Albemarle®	CITY OF CAPE MAY NEW JERSEY

Best use case: Irrigating city land with concentrate

DESALINATION

PROBLEM SUMMARY



DESALINATION

FINANCIAL PAYBACK ANALYSIS

METRIC	CALCULATION APPROACH	MODELED ESTIMATE
Upfront Cost	**Number of devices (#)** multiplied by **device cost ($)**	$195,000
Annual Cost Savings	**Reduction in electricity usage (kWh)** multiplied by **electricity cost ($/kWh)**	$15-30,000
Lifetime Cost Savings	**Cumulative cost savings over 30 years ($)** minus **upfront cost ($)**	$450,000
Payback period	**Upfront cost ($)** divided by **annual cost savings ($/y)**	11 years

FINANCE

CAPACITY & COST ASSESSMENT

PROPOSED SOLAR CAPACITY EXPANSION FOR DESALINATION OPERATIONS

Illustrative mapping of 133kW solar system

Proposal summary

- Propose to add significant capacity to existing solar array using Helioscope software
- Projected annual savings of ~$40,000 to reduce operating costs
- Payback period of 5 to 6 years over the 30 year asset life

ONSITE SOLAR COULD REDUCE ANNUAL COSTS BY $40K

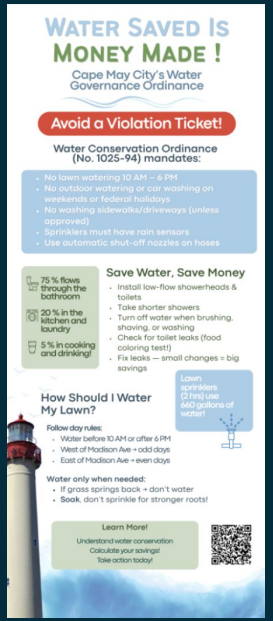
DEMAND

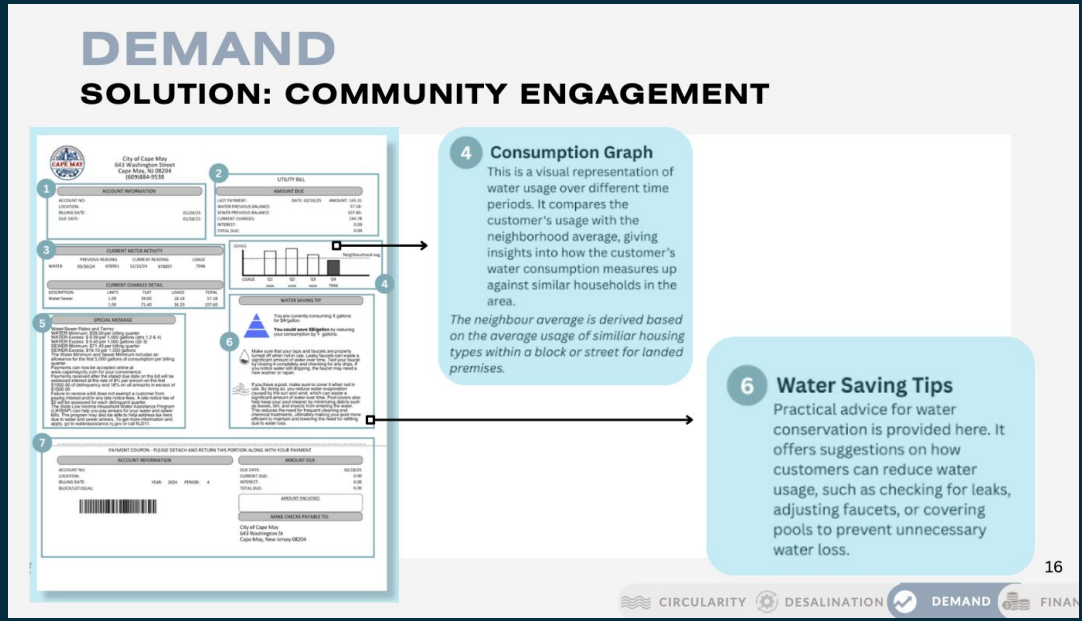
WATER CONSERVATION PROPOSAL

Rate structure — current vs. proposed

For illustrative purposes only.

Component	Current ($/1,000 gal)	Proposed ($/1,000 gal)	Change
Water tariff	$9.09	$10.50	+$1.41
Water Conservation Tax (WCT)	—	$1.575	+$1.575
Sewer / Waterborne Tax	$18.10	$20.00	+$1.90
Total	$27.19	$32.075	+$4.885





DEMAND

COST BENEFIT ANALYSIS

TOTAL UPFRONT COST
(ONE TIME $)

~$150,000

LIFETIME CONSERVATION
(GALLONS/LIFETIME)

46,000,000+

CONSERVATION COST
($/GALLON)

$0.003

COST SAVINGS TO HOTELS
($/HOTEL)

$15,000-50,000

COST-EFFECTIVE SOLUTION TO PROMOTE WATER CONSERVATION AND SUPPORT TOURISM INDUSTRY

DEMAND

COST BENEFIT ANALYSIS: CITY VIEW

ILLUSTRATIVE IMPACT OF REBATE PROGRAM ON CAPE MAY CITY

Program Scale		Rebate		Total Costs to Cape May ($)			Impact Analysis	
	(#)	($)	(%)	Program administration	Rebate payments	Total costs	Lifetime water savings (g)	Cost per water saved ($/g)
Showerhead	910	$15	*50%*	$5,000	$13,650	$18,650	26,572,000	$0.001
Toilet	960	$140	*70%*	$5,000	$134,400	$139,400	19,622,400	$0.007
Total				**$10,000**	**$148,050**	**$158,050**	**46,194,400**	**$0.003**

COST-EFFECTIVE SOLUTION TO PROMOTE WATER CONSERVATION AND SUPPORT TOURISM INDUSTRY

The Climate School

Phase Two: Water Conservation & Community Engagement

1

Story Map & Media Assets

2

Financial Analysis

3

Community Workshop

4

Public Art Campaign

Story Map & Media Assets

CAPE MAY'S WATER STORY MAP: A LIVING RESOURCE

What

ArcGIS StoryMaps is a web-based content-creation and communication tool that allows you to share maps, apps, and multimedia in the context of a narrative.

Why

Interactive storytelling: An interactive narrative, accessible via mobile devices. Viewers can engage and connect with the material in a way that elicits awareness and action.

How

Scan QR code to see the storymap in action!

MARKETING DELIVERABLE: *TABLE TENTS*

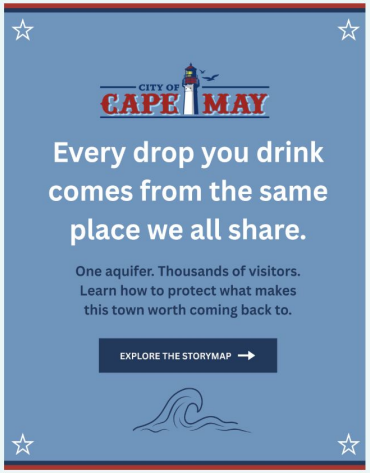
- **Where:** restaurant tables around town.
- **Why:**
  a. **Capitalize on spaces** where people are already waiting and looking for things to do
  b. **Peak curiosity** Cape May and its history & current reality, especially for **tourists and seasonal visitors**.
  c. Cape May logo promotes **credibility** and **trust**

MARKETING DELIVERABLE: *SOCIAL MEDIA POST*

Elements from Research:

- **Attachment-based** emotional appeal over fear and data
- Emotionality tied to **place identity**

Caption: "*Cape May's freshwater comes from a single shared aquifer. Every summer, all visitors and locals draw from the same source. The more we understand it, the better we protect what makes this town worth coming back to. We built a StoryMap to show you how it works and what you can do. Link in bio.*"



MARKETING DELIVERABLE: *BROCHURE*

- Provide in key tourist sites & partner businesses

MARKETING DELIVERABLE: *ENGAGING BUSINESSES*

Subject: Partnership Opportunity: Water Conservation Storymap x [Business Name]

Hi [Name],

I'm reaching out to you on behalf of the Cape May Environmental Commission. We're launching a new GIS Water Conservation storymap in [Month], aiming to engage Cape May residents, tourists, and businesses in our town's mission to preserve our water supply. The storymap will feature prominent water conservation locales, including the desalination plant and a new public art installation we are piloting. The goal is to make water conservation part of the fabric of experiencing our town, especially for tourists and seasonal visitors.

We are inviting a select group of local partners to help promote this by hosting promotional materials (e.g. table tents, flyers, and brochures), and we'd love for you to be a part of this initiative. In return, I'd be happy to feature [Business Name] in our storymap as a business supporting our town's water conservation mission.

Would you be open to a quick call this week to discuss this? We can also share samples of the promotional materials.

Sincerely,
[Your Name]
[Title], Cape May Environmental Commission

Tier 1: Hotels & Trolley Tours
The Chalfonte Hotel
The Inn of Cape May
AirBNB & VRBO
Cape May Trolley Tours

Tier 2: Restaurants
Mayer's Tavern
The Cricket Club
Mad Batter Restaurant & Bar
Ocean 7
The Lobster House

Tier 3: Shops
GIVENS
Bath Time

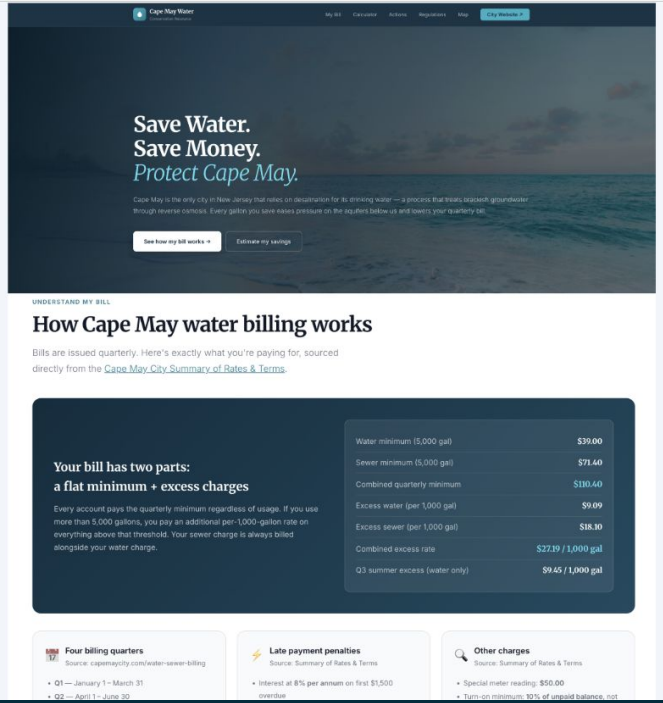
Financial Analysis: Tiered Pricing & Rebate Program

Webpage

Function: Estimate savings & enable decision-making
Role: Conversion platform

Key Design

- Interactive savings calculator
- Mobile-friendly responsive design
- Clear, detailed explanation of program benefits



FOR CAPE MAY RESIDENTS

WHAT YOU NEED TO KNOW ABOUT WATER REFORM

UNDERSTANDING HIGHER WATER BILLS, REBATE ACCESS, AND HOUSEHOLD SAVINGS

Based on 2024 actual usage · Affordable Housing Properties

ANNUAL BILL INCREASE	TOTAL REBATES AVAILABLE	ANNUAL SAVINGS IF UPGRADED
+17.3%	$15,500	$49,056
Across 3 affordable housing properties	Showerhead + toilet upgrades across all units	Bill reduction from efficient fixtures, per year

▸ RATE STRUCTURE: WHAT CHANGES

COMPONENT	CURRENT ($/1,000 GAL)	PROPOSED ($/1,000 GAL)	CHANGE
Water tariff	$9.09	$10.50	+$1.41
Water Conservation Tax	—	$1.575	+$1.575 (new)
Sewer / Wastewater	$18.10	$20.00	+$1.90
TOTAL per 1,000 gal	**$27.19**	**$32.075**	+$4.885 (+18%)

HOW WATER REFORM AFFECTS RESIDENTS

Cape May's proposed water pricing reform is designed to promote long-term sustainability by encouraging more efficient water use. For residents, the projected increase in water rates will result in higher bills; however, the availability of low-flow fixture rebates creates an opportunity to offset these costs through reduced consumption.

THE MAIN BARRIER: ACCESS AND UPFRONT COSTS

In theory, the savings generated from installing efficient fixtures—such as low-flow toilets and showerheads—can fully offset the expected increase in water bills for many households. However, the primary barrier for residents is not the effectiveness of these upgrades, but the ability to access them. Upfront costs associated with purchasing and installing new fixtures may prevent many households, particularly those in affordable housing or on fixed incomes, from participating in the program.

WHY ACCESSIBLE REBATES AND AFFORDABILITY MATTER

This highlights the importance of program design. Ensuring that rebates are easy to access—or automatically applied—and that upfront costs are minimized or covered is essential to achieving equitable outcomes. Without these measures, the benefits of conservation may not reach the households that need them most.

Ultimately, water pricing reform can be both effective and fair, but only if affordability and access are prioritized. With the right support mechanisms in place, residents can reduce their water bills while contributing to the City's long-term sustainability goals.

FOR CAPE MAY RESTAURANTS

WHAT YOU NEED TO KNOW ABOUT WATER REFORM

UNDERSTANDING MODERATE BILL INCREASES AND LIMITED COST OFFSET

Based on 2024 actual usage data · 7 Cape May Restaurants

AVG. ANNUAL INCREASE	RATE CHANGE	MAX TOILET REBATE
+17%	$27→$32	$560
$2,100–$6,640 more per year per venue	Per 1,000 gallons · +$4.89 (+18%)	Up to $140/toilet · 4 toilets max in model

▸ SEASONAL USAGE PATTERN (ALL 7 RESTAURANTS, 2024)

Summer (Q3) accounts for **37% of annual usage** — the highest-cost quarter under tiered pricing. Higher summer bills arrive precisely when cash flow is most stretched for peak-season operations.

PROJECTED BILL INCREASES FOR RESTAURANTS

Under Cape May's proposed tiered water pricing structure, restaurants are expected to see moderate increases in annual water bills as rates rise to reflect the true cost of water use and support conservation goals. While the introduction of a low-flow fixture rebate program provides an opportunity to reduce water consumption and offset some of these costs, the financial impact for restaurants differs from that of larger commercial users.

WHY REBATES MAY NOT FULLY CLOSE THE GAP

Our analysis indicates that while efficiency upgrades can generate meaningful savings, they are unlikely to fully offset the projected increase in water bills for most restaurants. This creates a financial gap that may be particularly challenging during peak operating periods, such as the summer season when water usage and costs are highest.

WHY ADDITIONAL SUPPORT MAY BE NEEDED

As a result, while the rebate program is a critical component of the policy, it may not be sufficient on its own. Additional measures—such as phased rate increases, flexible payment options, or targeted outreach, could help ease the transition. For restaurant owners, early participation in the rebate program and incremental efficiency improvements can still reduce overall costs and improve long-term resilience, even if they do not completely eliminate the impact of higher rates.

FOR CAPE MAY HOTELS

WHAT YOU NEED TO KNOW ABOUT WATER REFORM

UNDERSTANDING HIGHER WATER BILLS AND CONSERVATION INCENTIVES

Based on 2024 actual usage data · Top 10 Cape May Hotels

AVG. BILL INCREASE	TOTAL REBATE AVAILABLE	SAVINGS AFTER REBATES
+17.2%	$139K	$828K
~$20,000–$42,000/yr per large hotel	Across top 10 hotels, upfront cash	Annual bill savings if all fixtures upgraded

▸ RATE STRUCTURE: WHAT CHANGES

COMPONENT	CURRENT ($/1,000 GAL)	PROPOSED ($/1,000 GAL)	CHANGE
Water tariff	$9.09	$10.50	+$1.41
Water Conservation Tax (WCT)	—	$1.575	+$1.575
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TOTAL per 1,000 gal	**$27.19**	**$32.075**	+$4.885 (+18%)

PROJECTED BILL INCREASES FOR HOTELS

Cape May's proposed water pricing reform is expected to increase annual water bills for large commercial users, particularly hotels, due to the introduction of a tiered rate structure that includes a water tariff, a Water Conservation Tax, and a higher wastewater charge. Based on 2024 usage data, bills for the city's largest hotels are projected to rise by approximately 18% on average, with the largest properties seeing the greatest absolute increases due to their high water consumption.

HOW HOTELS CAN OFFSET THESE COSTS

However, the analysis shows that hotels are uniquely positioned to offset and potentially exceed as these increased costs through participation in the City's low-flow fixture rebate program. By upgrading to more efficient showerheads and toilets, hotels can significantly reduce water usage while receiving upfront rebates that improve cash flow. Across the top ten hotel users, efficiency upgrades could generate substantial annual savings that grow over time, with payback periods often occurring within a single season.

WHY EARLY ACTION MAKES FINANCIAL SENSE

Importantly, this positions water conservation not as a regulatory burden, but as a financially beneficial strategy. The combination of upfront rebates and ongoing cost reductions aligns the City's sustainability goals with hotel operators' business interests. As a result, early adoption of efficiency measures offers hotels the opportunity to reduce operating costs while contributing to long-term water resource management.

Community Workshop

Time	Minutes	Topic	Speaker Notes
9:00 AM	15	Sign-in, refreshments, and filling out sticky notes	Encourage people to answer the question: "Why are you here?" Have one of the organizers walk around and collect sticky notes and put them on a board (whiteboard) at the front of the room.
9:15 AM	30	Introductions from speakers and sticky note activity	Have each speaker/facilitator introduce themselves and their expertise. Read out each sticky note and organize them on the board by overall topic/theme/subject. Make sure to address topics as they come up, and ensure the participants that you will try to cover all of the questions and topics mentioned in the notes. ***You will not be able to answer all of the however***
9:45 AM	15	Presentation	Quick presentation on the water issue (saltwater intrusion into the aquifer, higher pumping rates during peak months lead to overpumping, the desalination plant is outdated, and the city lost federal funding to revamp it) and the tiered water pricing and rebate program.
10:00 AM	10	Questions	Take a few questions from the crowd, but emphasize that we are about to break out into small groups to discuss the topics further.
10:10 AM	15	Small-group breakout	Ask the participants: Do you have any concerns? Do you see barriers to the adoption of the tiered water pricing/rebate program? Is there anything that is not clear to you or that you need more information on? Ask the groups to ID their top item for each question asked.
10:25 AM	20	Round robin to hear feedback from the residents. Go around each group and ask for their top answer for each question that we previously asked.	Facilitator scribes. Collect the questions. Make sure you cross-reference the topics with the sticky notes to cover as much ground as possible. *Make a disclaimer that we are not going to be able to answer all of the questions tonight
10:45 AM	15	Next steps and fill out post-workshop surveys	Thank everyone for coming, and have the speakers hand out the post-workshop surveys. Ask everyone to return the filled-out ones to the table in the lobby.
11:00 AM		Conclusion	

CITY OF CAPE MAY

Dear Cape May Resident,

Cape May is facing a severe water **crisis**. Due to rising sea levels, saltwater is creeping into our aquifers, threatening our supply of fresh, clean, and safe drinking water. This contamination has forced the abandonment of **hundreds** of public and private wells, increasing our long-term reliance on the desalination plant. The desalination plant, located on the west end of Sunset Boulevard, will need **significant** upgrades to accommodate increased capacity resulting from well closures. Experts estimate that the desalination plant's capacity will need to increase by 50% to meet water demand.

The City of Cape May is proposing a tiered water-pricing and rebate program to help curb water use, but we want **your** input!

If you are interested in learning more about the problem and proposed solution, Cape May City Officials and the Environmental Commission Team will host a **Cape May WaterSmart Workshop from 9 am to 11 am on Saturday, [redacted] 2026.** The two-hour workshop will include:

- Free breakfast
- Information session
- Group discussions with your local representatives, friends, neighbors, employees, and employers
- Q&A with city officials and aquifer quality experts
- Childcare

Please check **YES** or **NO** below to indicate your interest in attending this event. A postaged return envelope has been enclosed for your convenience. Please drop this form in your mailbox as soon as possible, or return it to the front desk of the Cape May Public Library.

☐ **YES**
☐ **NO**

Thank you for taking the time to fill out this form. Additional information about the event will be released once we have received surveys. We hope to see you there!

Public Art Campaign

Why Public Art?

Making Cape May's water crisis visible, relatable, and actionable

Public Art

Reaches non-traditional audiences: Tourists & seasonal visitors encounter it passively

Emotion-first: Creates visceral connection to an invisible water system before data

Place-specific: Cape May's identity makes public space a stage for shared storytelling

Durable presence: Physical installations work 24/7 without a media budget

VS

Traditional Outreach

Requires active opt-in: Brochures and reports only reach already-interested residents

Data-heavy: Technical framing creates distance rather than urgency for the public

Generic: One-size-fits-all messaging struggles to resonate in seasonal communities

Temporary reach: Campaigns end and awareness fades without reinforcement

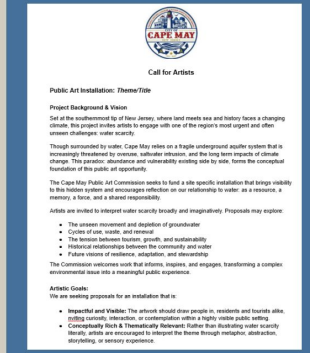
Requests for Proposal:

Artists are invited to submit a proposal, to include:

- Project Background & Vision
- Artistic Goals
- Budget
- Eligibility
- Submission Requirements

Proposals may explore:

- The unseen movement and depletion of groundwater
- Cycles of use, waste, and renewal
- The tension between tourism, growth, and sustainability
- Historical relationships between the community and water
- Future visions of resilience, adaptation, and stewardship



Call for Artists

Public Art Installation: *Theme/Title*

Project Background & Vision

Set at the southernmost tip of New Jersey, where land meets sea and history faces a changing climate, this project invites artists to engage with one of the region's most urgent and often unseen challenges: water scarcity.

Though surrounded by water, Cape May relies on a fragile underground aquifer system that is increasingly threatened by overuse, saltwater intrusion, and the long term impacts of climate change. This paradox: abundance and vulnerability existing side by side, forms the conceptual foundation of this public art opportunity.

The Cape May Public Art Commission seeks to fund a site specific installation that brings visibility to this hidden system and encourages reflection on our relationship to water: as a resource, a memory, a force, and a shared responsibility.

Artists are invited to interpret water scarcity broadly and imaginatively. Proposals may explore:

- The unseen movement and depletion of groundwater
- Cycles of use, waste, and renewal
- The tension between tourism, growth, and sustainability
- Historical relationships between the community and water
- Future visions of resilience, adaptation, and stewardship

The Commission welcomes work that informs, inspires, and engages, transforming a complex environmental issue into a meaningful public experience.

Artistic Goals:
We are seeking proposals for an installation that is:

- **Impactful and Visible:** The artwork should draw people in, residents and tourists alike, inviting curiosity, interaction, or contemplation within a highly visible public setting.
- **Conceptually Rich & Thematically Relevant:** Rather than illustrating water scarcity literally, artists are encouraged to interpret the theme through metaphor, abstraction, storytelling, or sensory experience.