

Meeting Summary

DATE: September 9, 2011

FROM: Jerry M. Salsano

TO: Coquina Coast Representatives (via email only)

CC: Staff and Interested Parties (via email only)

SUBJ: Coquina Coast Seawater Desalination Alternative Water Supply Project Siting Area Meeting Summary, August 17, 2011 R1

Purpose

Conduct business as required to accomplish the Coquina Coast Seawater Desalination Alternative Water Supply Project PDR. The meeting agenda is at Attachment 2.

Action Items

Person/Agency	ACTION ITEM(s)	Due/Status
SJRWMD	Seek STAG funds for Phase 2 of the project at this time, with the option to pursue funds for subsequent design or construction phases. Note: The STAG program was eliminated by Congress in the most recent funding measure that was signed into law in early CY 2011. SJRWMD will continue to pursue available grants as and when they become available.	Ongoing
Suppliers	Examine how conservation is treated on Supplier websites and consider increasing the prominence of that process.	Ongoing
Partners	Review MOA to determine latitude for amending Phase 2A to accomplish desired goals	ASAP
Pirnie/Arcadis	Respond to Dr. Peter Anderson's question regarding effect on beach wells that presence, absence or variability of Coquina layer will have	ASAP
Pirnie/Arcadis	Include comparative costs for partners in the final report.	ASAP
Pirnie/Arcadis	Add notes to all cost estimate pages that the numbers shown do not reflect any outside funding.	ASAP
Pirnie/Arcadis	Include in the cost section write up that the costs are the cost to make and transmit water and do not readily translate to the rates that each utility will charge to their customers because they do not include administrative costs of governance and/or the ameliorating effect of blending by each utility.	ASAP
Pirnie/Arcadis	Cost Summary Slide and Table in report—note that the distances on the bottom are from shore to plant, not from shore to intake or discharge structures.	ASAP
SJC/Pirnie/Arcadis	Coordinate to assure that the demand values for the SJC system be vetted to address the complexity that the Ponte Vedra system and the SJRWMD WSP.	ASAP
SJRWMD/SJC	Coordinate to assure the CUP and project demand numbers are correct in the next draft of the final report.	ASAP

Note: The author prepared this work product from notes taken during the meeting or teleconference. The work product is not intended to be verbatim text of the conversations, but a summary of the important points covered. If an addressee finds that an error in fact was made please contact the author and corrections will be made with a revised version circulated.

Person/Agency	ACTION ITEM(s)	Due/Status
Pirnie/Arcadis/ Taurant/Palm Coast	Assure all invoicing for Phase 2A is final and submitted no later than the final date established by SJRWMD for end of FY funding. This date is presumed to be 10/15/11, but may change.	10/15/11
Partners	During review of Phase 2A Report, compare the original scope to the deliverable to assure that report adequately addresses that scope.	8/12/11 TBD
Suppliers	Evaluate Phase 2A scope and MOA—determine what, if any, additional work will be accomplished under Phase 2A and the transition period and how long the transition period will be.	7/13/11 8/17/11 TBD
Partners/Pirnie/ Arcadis	Assure Phase 2B includes sufficient hours for legal support relative to eligibility for existing nationwide permits and to evaluate Federal decisions in order to avoid significant unnecessary permitting costs.	TBD
Pirnie/Arcadis	Follow up with SJRWMD to determine CUP requirements to substantiate the need for water from this project.	TBD
Pirnie/Arcadis	During treatment plant site selection assure that proximity of highest ranked beach well site(s) is considered.	TDB
Pirnie/Arcadis/ SKM	Provide partners common operating pressure data on recent RO plants.	TBD
Pirnie/Arcadis/ SKM	Integrate transmission system phasing into the phase costs, recognizing that governance might determine that phasing be altered with some partners taking water earlier than planned to make the project affordable.	TBD
Suppliers	Consider Stan Niego (SJRWMD) suggestion that a strategy could be employed to take out options on multiple tracts early in the process to mitigate the potential for speculation. The MOA could be modified to allow such for the benefit of the Suppliers.	TBD
Suppliers	Take action as and when appropriate to publicly notice site options in order to minimize/avoid land speculation.	TBD
Team	Assure that corrosivity testing (coupon testing) is included as part of the pilot plant testing.	TBD

Welcome and Introductions

The meeting started at 9:05. Richard Adams, Chairman, Palm Coast, welcomed the attendees, shown at Attachment 1.

Public Comments—none.

Plan for Public Meeting

Michelle Robinson, Dialogue, noted that the public meeting is tonight, August 17, 2011, at Whitney Laboratory Auditorium, with the open house scheduled to begin at 6:00 and the presentations at 6:30. The wetland presentation will not be provided but the team will cover all other topics originally planned. Ms. Robinson also noted that the team added a web page that focuses on siting data and that 3 more Twitter followers were added in the last month.

Pilot Plan Comments and Discussion

Sean Chaparro lead the discussion noting comments from FDEP regarding the potential requirement to monitor for *Cryptosporidium*, and that once the plant is constructed there would be increased monitoring required for lead and copper. He also noted that once the project moves into the next phase the pilot plan will be refined to reflect more precise siting. Keith Riger,

DeLand, asked if there would be corrosivity testing. The consultant team noted that such testing was not originally planned but that it could be added during scope revision and negotiations.

ACTION ITEM

Final Siting Report

Mr. Chaparro led this discussion noting that the final report was delivered July 29, 2011. He highlighted the following elements of the siting evaluation process:

- Evaluation criteria development
- Weighting scenario development
- Partner scoring of site areas
- Sub-area selection from highest ranked sites

Partner scoring was used to rank the areas. The team then focused on the top five areas and selected 14 sub areas within those five. These 14 sub-areas will be the focus going forward for consideration for plant siting. This process included a preliminary real estate assessment.

Bathymetric Survey Results

Mr. Chaparro also covered these results noting that the coastal depth survey was performed during week of 7/12/11.

- Determine ocean depths to identify lengths of intake/ discharge pipes
- Single-beam electronic sounding & GPS used to map topography
- Data collected for 7 miles (north to south) at intervals ~ 1 mile apart and extending 10 miles offshore to depth of ~70 ft.

Preliminary results:

- Confirmed favorable locations and lengths of pipelines consistent with identified site sub-areas
- Intake pipeline can be located ~ 3.0 miles from shoreline (60-ft water depth)
- Discharge pipe can be located ~ 1 mile from shoreline (40-ft water depth)

These results were very close to the available data the team used preliminarily but resulted in slightly shorter distances off-shore to reach necessary depths.

Dr. Peter Anderson, Whitney Lab, asked if there was a requirement that the discharge be located in deeper water than the intake. The team explained that this is not a regulatory requirement but that the deeper water for the intake was driven by protection of ocean vessels.

There followed discussion of regulatory requirements and jurisdiction with a recognition that FDEP and SJRWMD have jurisdiction to 3 miles, with [EPA](#) supplanting FDEP beyond 3 miles to the Continental Shelf. There is no CUP jurisdiction or CUP required beyond 3 miles.

Phase 2A Report Draft 1 discussion

Scott Shannon, Malcolm Pirnie, facilitated the discussion for the Draft 1 report distributed July 29, 2011, noting that comments were originally due by August 12, 2011. A number of partners submitted comments but the consultant team will accept additional comments if they are forthcoming but not later than non on August 22, 2011 to provide adequate time to complete draft 2, due to be distributed by August 26, 2011.

Referring to the following table contained in the draft document and the presentation, Glenn Forrest, SJRWMD, noted that it appears as though St. Johns County's (SJC's) main CUP data is not included in the pertinent table in the document. Mr. Shannon asked that Mr. Forrest coordinate with SJC and the team to assure the numbers are correct in the next draft. **ACTION ITEM**

	Estimated AADD Water Demand (MGD)								
	2010	2015	2020	2025	2030	2035	2040	2045	2050
Palm Coast	0.0	0.0	4.0	6.0	9.0	12	15	18	21
Leesburg	0.0	0.0	0.0	1	3.5	4.0	4.0	4.0	4.0
St. Johns County	0.0	0.0	0.0	2.3	4.8	6.9	9.1	11.9	14.8
City of DeLand	0.0	0.5	4.1	7.2	7.8	8.3	8.8	9.0	9.2
TOTAL	0.0	0.5	8.1	16.5	25.1	31.3	36.9	43.0	49.1

Someone suggested that the team assure that readers understand that transmission system phasing is integrated into the phase costs. Neal Shinkre, SJC, noted that governance might determine that phasing be altered with some partners taking water earlier than planned to make the project affordable. **ACTION ITEM**

Mr. Riger observed the “too early” expected construction completion date for Phase 1 of the transmission system. The team discussed and recognized that recent developments will likely impact timing and will change from 2015 to 2020. The Consultant will confirm that costs were based on escalation to 2020. **ACTION ITEM**

Mr. Chaparro led the intake discussion, noting that the project could employ either a screened ocean intake or radial collector wells. It is likely that a combined intake/discharge tunnel would be used from the plant to a transition structure to avoid sensitive coastal resources.

Conduit	Plant production (MGD)	Conduit Capacity (MGD)	Conduit Diameter (in)
Intake	50	120	84
	25	60	60
Discharge	50	70	66
	25	35	48

Preliminary investigation results do support the use of radial collector beach wells. Additional testing will be necessary in the next phase to confirm potential capacity. When asked about the length of the radial arms, the team confirmed it would be in the range of 100 feet

Mr. Chaparro further covered the methods and results of the marine ecological survey, which can be reviewed in Attachment 3. The reader should note that the conclusions reflected here and in the report are all based on desktop surveys. Field work will follow in the next phase with refined decisions if appropriate.

The next topic covered was the hydrodynamic study, planned for Phase 2B.

- Hydrodynamic studies to be completed in Phase 2B
- Identify suitable locations for intake/discharge
- Study to include:
 - Hydrodynamic data collection and analysis (current, salinity, temperature, water level, wind, etc.)
 - 18 months data collection at 2 to 5 sites—cover range of meteorological and hydrodynamic conditions
 - Hydrodynamic model simulation
 - Dilution/Mixing study
 - Sediment study
- Anticipated 24-month study

The proposed work does include both nearfield and farfield modeling with an anticipated data collection duration of 18 months and total duration of 24 months. No modeling was done in Phases 1 or 2A.

Regarding proposed geotechnical investigations.

- Geotechnical investigations in Phase 2B
- Identify geotechnical conditions—affect intake/ discharge tunnel design and costs
- Investigations to include:
 - 4 to 6 geotechnical borings at depths of about 100-ft
 - Split spoon samples at 5-ft intervals (2.5-ft intervals at certain depths)
 - Soil lab testing
- Items to be evaluated:
 - Stratigraphy
 - Soil properties (grain size, Atterburg limits)
 - Permeability
 - Strength
 - Hardness
 - Stiffness

Not included in previous letter reports or technical memoranda are the topics of power supply and renewal energy.

Potential Sources of Conventional Power

- 115 kV Bunnell – Matanzas line (east of I-95 & north of Royal Palms Parkway)
 - Nearest for locations close to coast

- Heavily loaded
- 240 kV Bunnell line (west of intersection of I-95 and US-1 & north to Royal Palms Parkway)
 - Adequate capacity
 - 3 to 9 miles from site areas
 - High power transmission costs

Renewable Energy Options Considered

- Solar Power
- Wind Power
- Bloombox Device
- Waste to Energy

Reduced Energy Processes/Equipment

- High efficiency pumps/motors and VFDs
- Energy recovery devices
- Centrifugal
- Turbine based
- Isobaric

At this point Mr. Shannon reviewed the estimated costs of the various types of potential configurations and components. These estimates can be reviewed at Attachment 3. Mr. Salsano cautioned the attendees that the various treatment cost option tables do not include transmission costs. Ray Sharp, Leesburg, asked that the team compare costs among partners to reveal the differences. **ACTION ITEM**

Regarding the Cost Summary Slide the team noted that the distances on the bottom are from shore to plant, not from shore to intake or discharge structures. Make this clear in the final slide. **ACTION ITEM**

Mr. Shinkre requested that all cost estimates contain a note that the numbers shown do not reflect any outside funding. **ACTION ITEM**

Further, Mr. Shinkre requested that the report note in the cost section that the costs are the cost to make and transmit water and do not readily translate to the rates that each utility will charge to their customers because they do not include administrative costs of governance and or the ameliorating effect of blending by each utility. **ACTION ITEM**

Still further, Mr. Shinkre asked that the consultant team work him to assure that the demand values for their system be vetted to address the complexity that the Ponte Vedra system and the SJRWMD WSP. **ACTION ITEM**

Work and Deliverable Schedule

- Draft 1 Phase 2A Report comments due – 8/12/11
- Public Meeting – 8/17/11
- Final Pilot Study Plan– 8/26/11 (to be submitted w/ Draft 2 Phase 2A report as appendix)
- Draft 2 Phase 2 A Report – 8/26/11
- Teleconference to review Draft 2 Phase 2A – 9/14/11
- Draft 2 Phase 2 A Report comments due – 9/16/11

- Final Phase 2A Report – 9/30/11

Phase 2A and Transition discussion (including MOA applicability)

Mr. Adams noted the current plan to delay implementation of Phase 2B. The team discussed remaining 2A work, transition and those allowance and additive tasks not authorized.

Brian Matthews, Palm Coast, asked if the MOA needs to be amended to finalize anything or deal with the changed timelines. Mr. Forrest stated that he would review. **ACTION ITEM**

Mr. Shinkre noted that MOA suspension is an option rather than termination.

Milestones—Jerry Salsano, Taurant, committed to providing to the Partners a set of draft revised milestones for partner input and approval for incorporation into the MOA by administrative change.

Regarding MOA expiration, Mr. Salsano read an excerpt from the MOA that indicates it does not expire until all milestones are complete.

Mr. Adams made it clear that discussion on disposition of remaining Phase 2A funds would not begin until after September 30. **ACTION ITEM**

Regarding what actions might be undertaken during the extended transition period there was consideration given to routine communication among potential partners (including past and potential new) to periodically assess demand projection changes and interest in resuming the project. This communication could also be used to comport with special conditions requirements of the Palm Coast CUP.

Confirm agenda for next meeting

Next Business Teleconference—September 14, 2011, 9:00 a.m.

<i>Review Draft 2 based on Draft 1 comments (Pirnie).....</i>	<i>15 minutes</i>
<i>MOA changes discussion (Chair).</i>	<i>30 minutes</i>
<i>Review public meeting outcome (Dialogue)</i>	<i>15 minutes</i>
<i>Review web/Twitter input (Dialogue)</i>	<i>15 minutes</i>
<i>Review list of work product and deliverables</i>	<i>15 minutes</i>
<i>that should be preserved (Pirnie/Chair)</i>	

Member Comments—none.

Public comments

Kermit Prime—did Pirnie get live data from Marineland wells? Yes.

Adjourn Meeting—11:00 a.m.

Attachments

1. Teleconference Participant List and Appointee Attendance List
2. Agenda
3. Slides (contained only in PDF version of this summary)

Business Meeting Attendance List			
Name	Affiliation		
Richard Adams	City of Palm Coast	Brian Matthews	Palm Coast
Peter Anderson	Whitney Lab, UF	Greg Peugh	QK4
Ed Balchon	Malcolm Pirnie/Arcadis	Kermit Prime	Prime Solutions, LLC
Bob Cadle	Hazen and Sawyer, P.C.	Keith Riger	City of DeLand
Sean Chaparro	Malcolm Pirnie/Arcadis	Michelle Robinson	Malcolm Pirnie-Dialogue
Charles Ericksen	Palm Coast	Jerry Salsano	Taurant Consulting, Inc.
Frank Fernandez	News-Journal	Ray Sharp	City of Leesburg
Glenn Forrest	SJRWMD	Neal Shinkre	St. Johns County Utilities
Ying Lee	Palm Coast (CPH)	Nimisha Vyas	Avant Century
John Mampe	Hammock CCC		

COQUINA COAST SEAWATER DESALINATION ALTERNATIVE WATER SUPPLY PROJECT																						
Phase 2A Business Meeting Appointee Attendance																						
Meeting (M) / Teleconference (T)	Phase 2A												Transition									
	T	M	T	M	T	M	T	M	M	T	M	T										
	11-Aug-10	8-Sep-10	20-Oct-10	8-Dec-10	19-Jan-11	23-Mar-11	20-Apr-11	11-May-11	8-Jun-11	20-Jul-11	17-Aug-11	14-Sep-11	TBD	TBD	TBD	TBD						
Suppliers																						
City of Leesburg	★	★	★	★	★	★	★	★	★	★	★	★										
City of Palm Coast	★	★	★	★	★	★	★	★	★	★	★	★										
Ex Officio Members																						
City of DeLand	★	★		★	★	★	★	★	x	★	★											
St. Johns County	★	★	★	★	★		★	★	★		★											
<table border="0"> <tr> <td>★</td> <td>Appointed member(s) present</td> </tr> <tr> <td></td> <td>Appointed member(s) not present</td> </tr> <tr> <td>x</td> <td>Appointed member(s) not present, with advance notice</td> </tr> </table>																	★	Appointed member(s) present		Appointed member(s) not present	x	Appointed member(s) not present, with advance notice
★	Appointed member(s) present																					
	Appointed member(s) not present																					
x	Appointed member(s) not present, with advance notice																					



Business Meeting Agenda

Wednesday, August 17, 2011, 9:00 a.m. – 11:50 p.m.

City of Palm Coast Community Center
305 Palm Coast Parkway NE, Palm Coast, FL 32135

<u>ITEM</u>	<u>WHO</u>	<u>START</u>
• Welcome and introductions	Chair	9:00
• Public comments	Chair	9:05
• Plan for Public meeting	Pirnie	9:10
• Pilot Plan Comments Discussion	Pirnie	9:20
• Final Siting Report	Pirnie	9:35
• Bathymetric Survey Results	Pirnie	9:50
• Phase 2A Report Draft 1 discussion	Pirnie	10:05
• Phase 2A and Transition discussion	Chair	11:05
(including MOA applicability)		
• Confirm agenda for next meeting(s)/ next tasks	Chair	11:35
• Member comments	Chair	11:45
• Adjourn business meeting	Chair	11:50



Coquina Coast
seawater desalination project

Public Meeting Planning

Coquina Coast Seawater Desalination Project
Business Meeting
August 17, 2011



Coquina Coast
seawater desalination project

Pilot Study Plan Update

Coquina Coast Seawater Desalination Project
Business Meeting
August 17, 2011



Coquina Coast
seawater desalination project

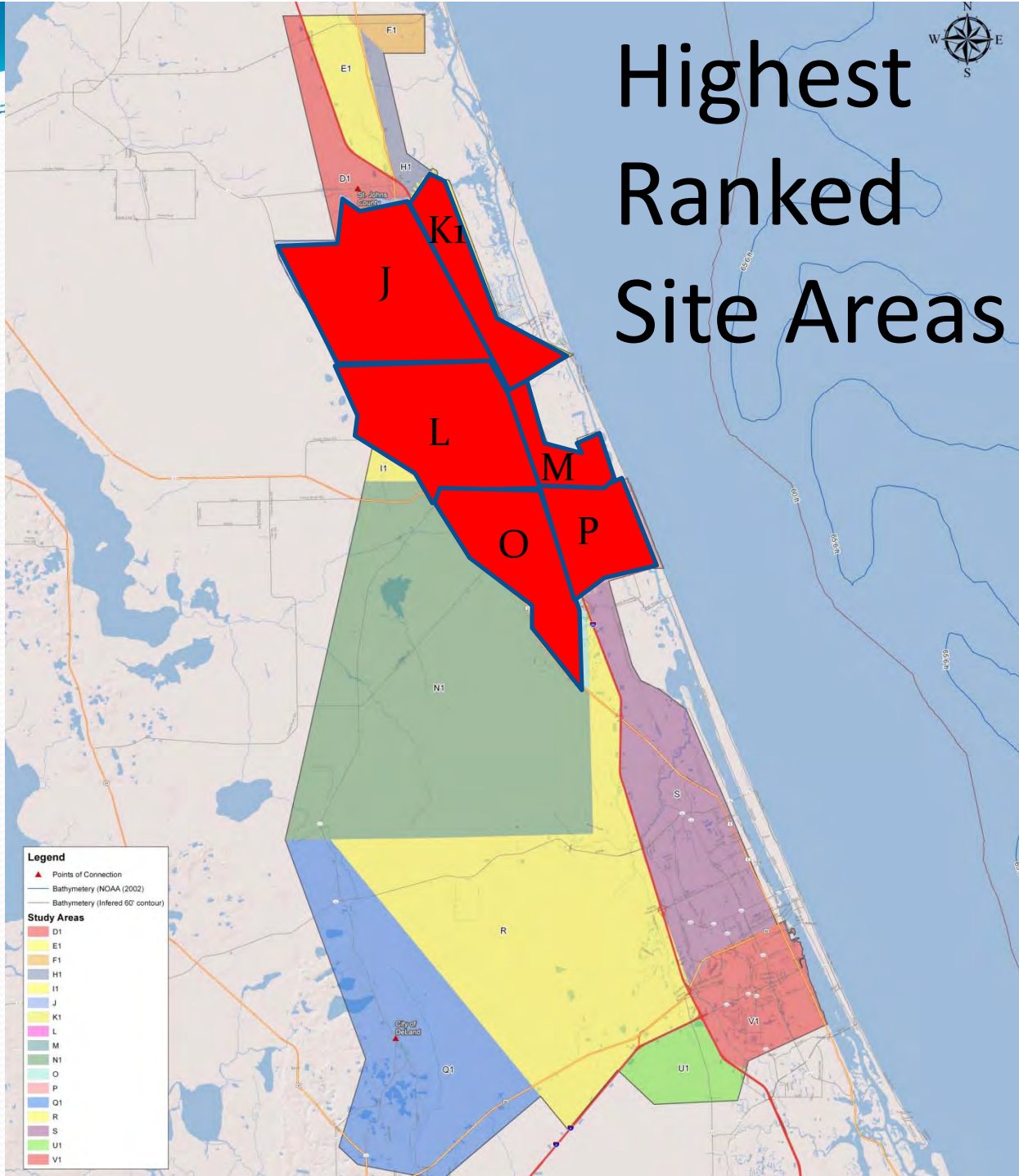
Final Siting Evaluation Report

Coquina Coast Seawater Desalination Project
Business Meeting
August 17, 2011

Final Siting Evaluation Report

- 💧 Final report submitted July 29, 2011
- 💧 Siting evaluation process
 - 💧 Evaluation criteria development
 - 💧 Weighting scenario development
 - 💧 Partner scoring of site areas
 - 💧 Sub-area selection from highest ranked sites

Highest Ranked Site Areas



Coquina Coast
Water desalination project



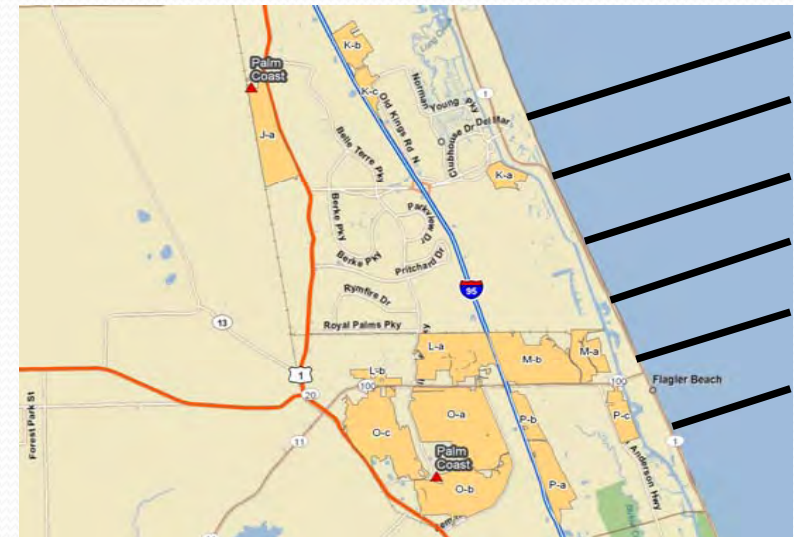
Coquina Coast
seawater desalination project

Bathymetric Survey Results

Coquina Coast Seawater Desalination Project
Business Meeting
August 17, 2011

What was done?

- ◆ Survey completed week of 7/12/2011
- ◆ Determine ocean depths → identify lengths of intake/discharge pipes
- ◆ Single-beam electronic sounding & GPS used to map topography
- ◆ Data collected for 7 miles (north to south) at intervals ~ 1 mile apart and extending 10 miles offshore to depth of ~70 ft.



Preliminary Results

- ✔ Confirmed favorable locations and lengths of pipelines → consistent with identified site sub-areas
- ✔ Intake pipeline can be located ~ 3.0 miles from shoreline (60-ft water depth)
- ✔ Discharge pipe can be located ~ 1 mile from shoreline (40-ft water depth)



Coquina Coast
seawater desalination project

Phase 2A Draft 1 Report

Coquina Coast Seawater Desalination Project
Business Meeting
August 17, 2011

Phase 2A Report TOC

- ES. Executive Summary
 - 1. Introduction
 - 2. Demand and WQ Requirements
 - 3. Treatment Process and Product Transmission
 - 4. Intake and Concentrate Disposal
 - 5. Siting Evaluation
 - 6. Power Supply and Renewable Energy Assessment
 - 7. Permitting Requirements
 - 8. Cost Estimates
 - 9. Funding Initiative Plan Update
 - 10. Summary and Recommendations

Phase 2A Report TOC

- ES. Executive Summary
- 1. Introduction
- 2. Demand and WQ Requirements
- 3. Treatment Process and Product Transmission
- 4. Intake and Concentrate Disposal
- 5. Siting Evaluation
- 6. Power Supply and Renewable Energy Assessment
- 7. Permitting Requirements
- 8. Cost Estimates
- 9. Funding Initiative Plan Update
- 10. Summary and Recommendations

Demand and WQ Requirements

- Updated water need projections through 2050

	Estimated AADD Water Demand (MGD)								
	2010	2015	2020	2025	2030	2035	2040	2045	2050
Palm Coast	0.0	0.0	4.0	6.0	9.0	12	15	18	21
Leesburg	0.0	0.0	0.0	1	3.5	4.0	4.0	4.0	4.0
St. Johns County	0.0	0.0	0.0	2.3	4.8	6.9	9.1	11.9	14.8
City of DeLand	0.0	0.5	4.1	7.2	7.8	8.3	8.8	9.0	9.2
TOTAL	0.0	0.5	8.1	16.5	25.1	31.3	36.9	43.0	49.1

Demand and WQ Requirements

- 2030 projected water supply requirements (with potential conservation reduction)

	Potential Conservation Reduction (MGD)	AADD w/o Additional Conservation (MGD)	AADD w/ Additional Conservation (MGD)
Palm Coast	1.62*	9.00	7.38
Leesburg	1.04**	3.54	2.50
St. Johns County	2.50**	4.80	2.30
DeLand	1.95*	7.80	5.85
TOTAL	7.11	25.14	18.03

* Based on SJRWMD pilot study

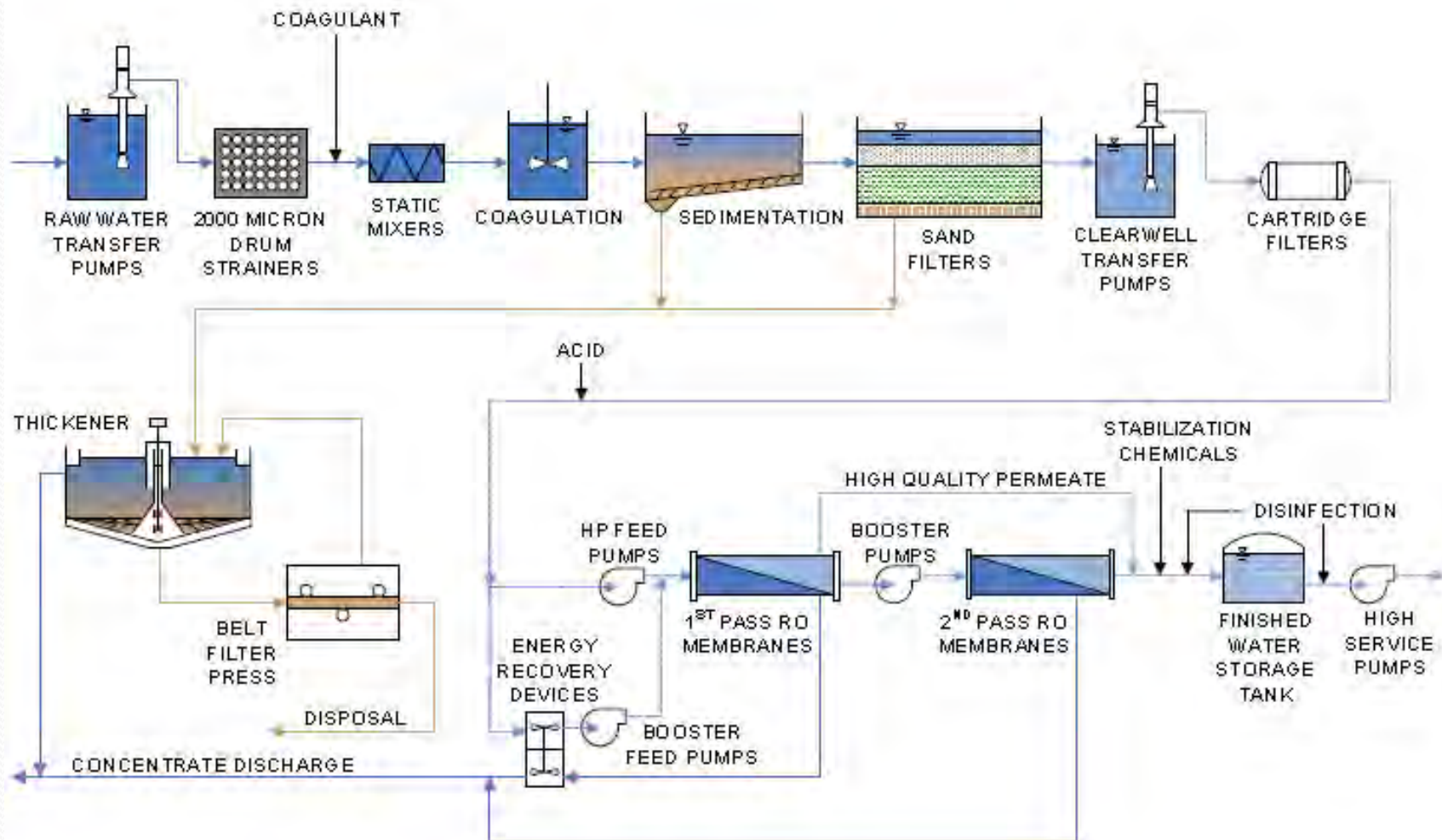
** Based on Partner estimates

Demand and WQ Requirements

- 💧 Project capacities considered for Phase 2A
 - 💧 10 MGD (2020) - 25 MGD (2030) with Suppliers only
 - 💧 25 MGD (2020) to 50 MGD (2030) with Suppliers and Ex-Officio members
- 💧 Finished WQ requirements same as Phase 1 recommendations.

Treatment Process

- Similar pretreatment, RO, stabilization, storage, pumping, requirements from Phase 1



Transmission System

- Hydraulic modeling of transmission system to establish:
 - Transmission main requirements and placement
 - Booster pump stations
- Transmission main and booster station requirements established for 25 MGD and 50 MGD capacities.

Transmission System

ID	Transmission Main POC	Diameter (inches)		Length (linear ft)
		50 MGD capacity	25 MGD capacity	
A	Transmission main from plant	54	36	18,300
B	Transmission main header	36	36	49,200
C	Palm Coast 1	24	16	2,500
D	St. Johns County	24	24	28,200
E	Palm Coast 2	24	16	21,400
F	Transmission main header	30	30	93,500
G	DeLand	30	24	33,900
H	Leesburg	24	24	356,000
TOTAL				603,200 (114 miles)

Transmission System



Transmission System

💧 Potential transmission system phasing

Phase	Transmission System Segment	Supply to	Implementation Year
Phase 1	A, B, C, E, F, and G	DeLand and Palm Coast	2020
Phase 2	D and H	St Johns County Leesburg	2025

💧 Pump stations

Segment	50 MGD Capacity	25 MGD Capacity	Year
F	9,200 gpm (175' TDH)	7,900 gpm (88' TDH)	2030
H	3,800 gpm (140' TDH)	2,500 gpm (182' TDH)	2035
D	10,300 gpm (100' TDH)	--	2045

Intake and Concentrate Disposal

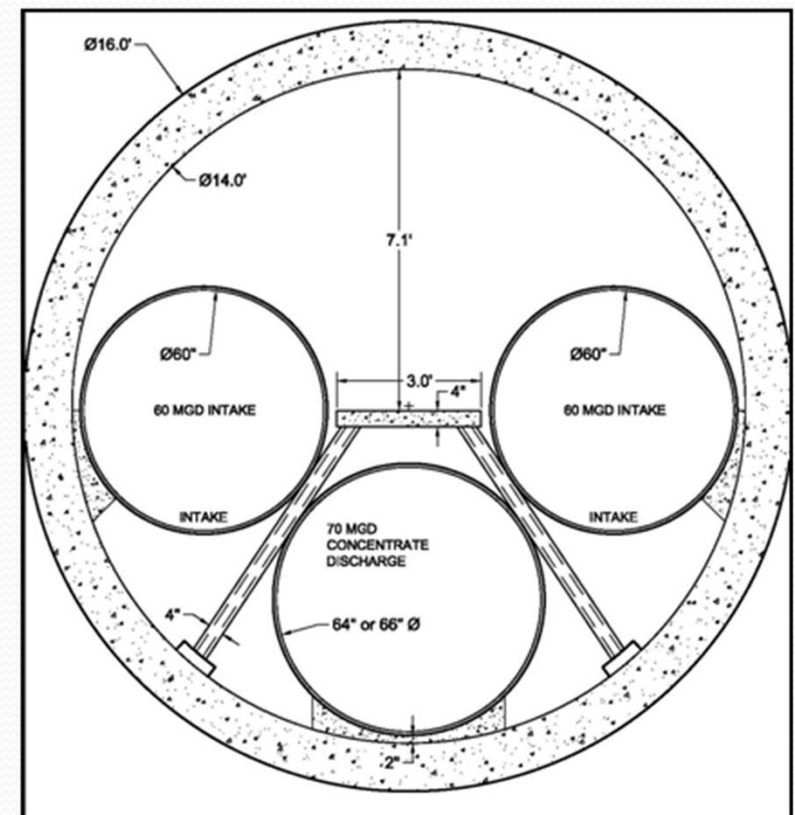
- Intake options considered based on Phase 1 assessment
 - Screened ocean intake
 - Radial collector beach wells
- Dispersion fields considered for concentrate disposal based on Phase 1

Tunnel and Pipeline Intake/Discharge

Components:

- ◆ Tunnel from plant to transition structure (avoid sensitive coastal resources)
- ◆ Near surface pipelines to screened intake and discharge diffusers

- ◆ Considered separate intake/discharge pipelines and combined intake/discharge tunnel

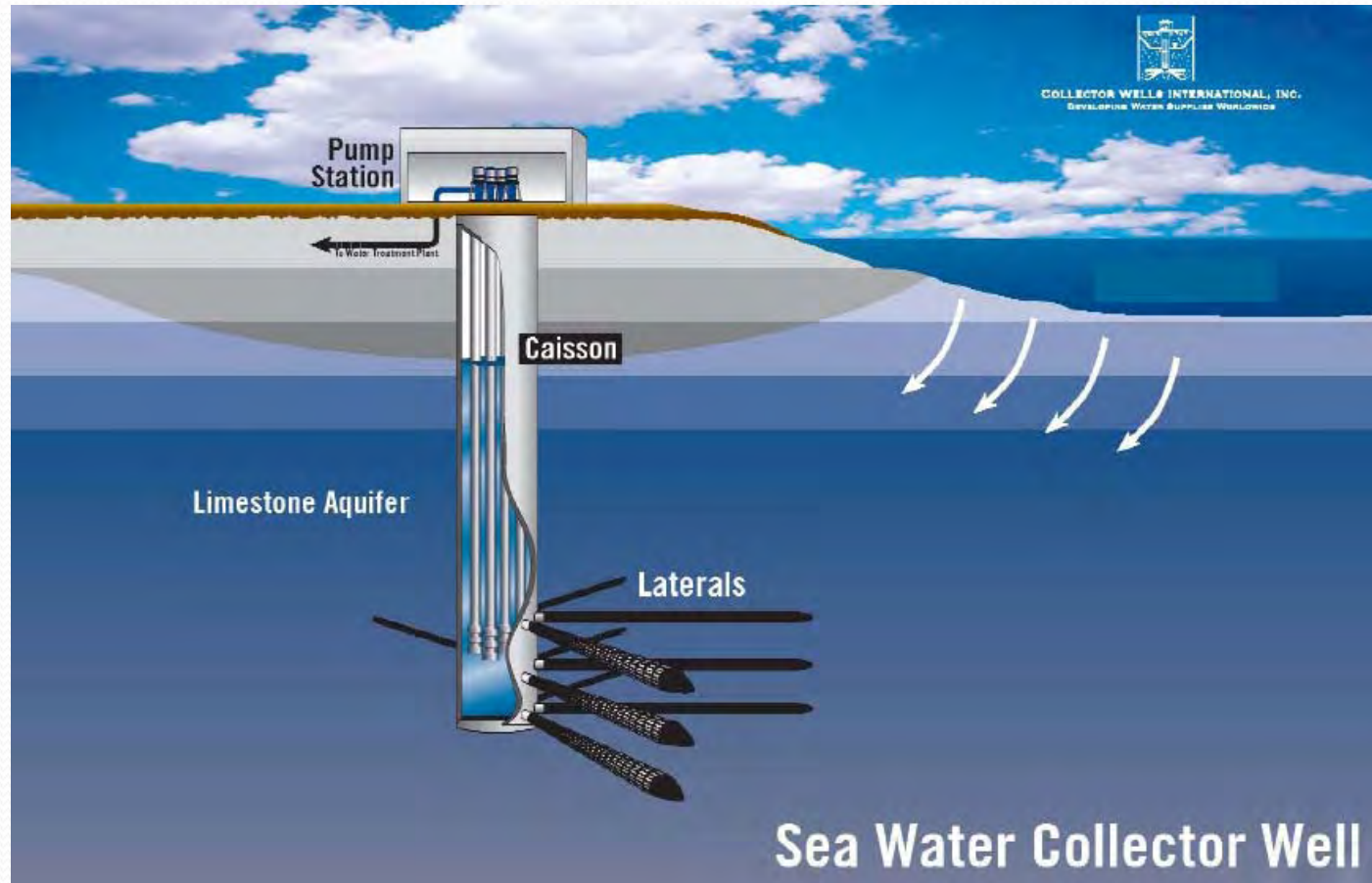


Tunnel and Pipeline Intake/Discharge

Conduit	Plant production (MGD)	Conduit Capacity (MGD)	Conduit Diameter (in)
Intake	50	120	84
	25	60	60
Discharge	50	70	66
	25	35	48

Conduit sizing based on 42% RO system recovery

Radial Collector Beach Wells



- 💧 Preliminary hydrogeological testing confirmed feasibility of beach wells
- 💧 Additional testing recommended for Phase 2B to confirm yield

Preliminary Field Studies and Investigations

- 💧 Bathymetry Survey
- 💧 Marine Ecological Study
- 💧 Siting Ecological Survey
- 💧 Hydrodynamic Study Plan
- 💧 Geotechnical Investigation Plan

Marine Ecological Survey

- Preliminary biological inventory of marine life
 - Identify species of concern in area that may be harmed by concentrate discharge
 - Inventory developed from nine databases
- Criteria used:
 - At least one stage of organism life cycle in at least one database
 - Marine species in aquatic existence (i.e. birds excluded)
 - Exclude obligate brackish water species

Marine Ecological Survey

💧 Identified 1,045 unique species in area

Threatened species

- Florida Rainbow (bivalve mollusc)
- Loggerhead Turtle

Proposed for ESA listing

- Atlantic Sturgeon*
- Largetooth Sawfish
- Loggerhead Turtle

Species of concern

- Atlantic Sturgeon
- Blueback Herring
- Common Snook
- Mangrove Rivulus
- Opossum Pipefish
- Saltmarsh Topminnow
- Sand Tiger Shark
- Calico Grouper

Endangered Species

- Bottlenose Dolphin
- Goliath Grouper
- Green Turtle
- Hawksbill Turtle
- Humpback Whale
- Kemp's Ridley Turtle
- Leatherback Turtle
- Manatee
- North Atlantic Right Whale
- Shortnose Sturgeon
- Smalltooth Sawfish

* Unlikely to survive in hyper-saline environments

Siting Ecological Survey

- 💧 Preliminary ecological survey of site sub-areas
- 💧 Identified species protected under state and federal endangered species act in Flagler County
 - 💧 Plants and lichens
 - 💧 Fish and amphibians
 - 💧 Reptiles
 - 💧 Birds
 - 💧 Mammals

Siting Ecological Survey

Habitat	Species	Site Sub-Areas
Wetlands (hydric or wet flatwoods)	<ul style="list-style-type: none"> • Lake side sunflower • Celestial Lilly 	O-b, O-c, L-a, L-b
Wetlands with rookeries	<ul style="list-style-type: none"> • Wood stork • Brown pelican • Little blue heron • Snowy egret • Tricolored heron • White ibis 	All sites have potential for a rookery to be present; however, no known rookeries in any site sub-areas
Freshwater marshes	<ul style="list-style-type: none"> • Florida Sandhill Crane • Limpkin 	All site sub-areas

Siting Ecological Survey

Habitat	Species	Site Sub-Areas
Upland sandy scrub areas	<ul style="list-style-type: none"> • Gopher tortoise • Eastern Indigo Snake • Gopher frog • Florida Scrub-Jay • Coastal vervain • Atlantic Coast Florida Lantana • Nodding Pinweed • Florida Mountain-mint 	K-a, M-a, M-b, O-b, P-a, P-c. But any upland area may contain similar conditions suitable for these species
Upland forested areas	<ul style="list-style-type: none"> • Florida black bear • Florida mouse • Sherman's fox squirrel 	All site sub-areas

Hydrodynamic Study Plan

- 💧 Hydrodynamic studies to be completed in Phase 2B
- 💧 Identify suitable locations for intake/discharge
- 💧 Study to include:
 - 💧 Hydrodynamic data collection and analysis (current, salinity, temperature, water level, wind, etc)
 - 💧 18 months data collection at 2 to 5 sites → cover range of meteorological and hydrodynamic conditions
 - 💧 Hydrodynamic model simulation
 - 💧 Dilution/Mixing study
 - 💧 Sediment study
- 💧 Anticipated 24-month study

Geotechnical Investigations Plan

- 💧 Geotechnical investigations in Phase 2B
- 💧 Identify geotechnical conditions → affect intake/discharge tunnel design and costs
- 💧 Investigations to include:
 - 💧 4 to 6 geotechnical borings at depths of about 100-ft
 - 💧 Split spoon samples at 5-ft intervals (2.5-ft intervals at certain depths)
 - 💧 Soil lab testing
- 💧 Items to be evaluated:
 - 💧 Stratigraphy, soil properties (grain size, Atterburg limits), permeability, strength, hardness, stiffness

Power Supply & Renewable Energy

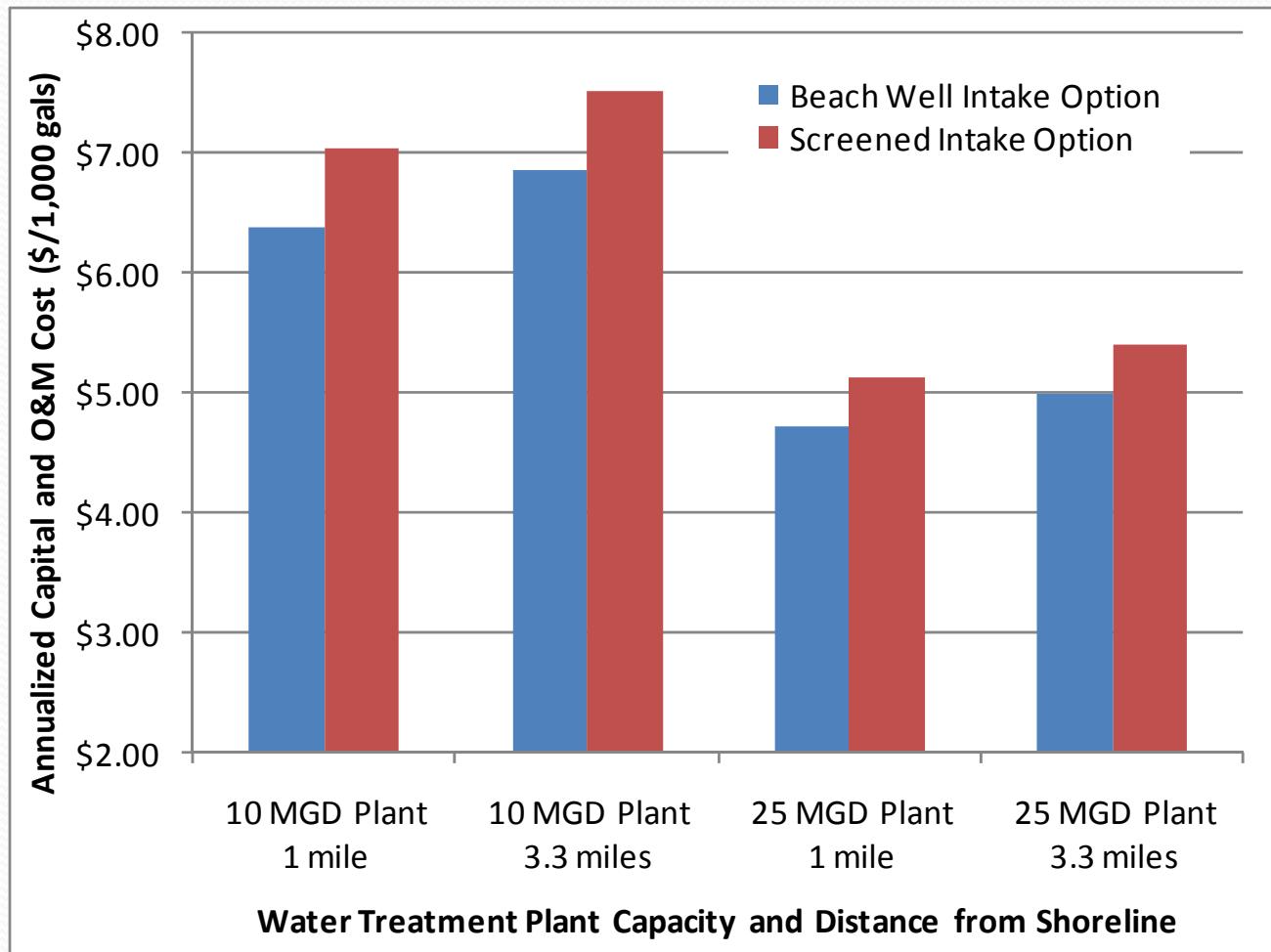
💧 Potential Sources of Conventional Power

- 💧 115 kV Bunnell – Matanzas line (east of I-95 & north of Royal Palms Parkway)
 - 💧 Nearest for locations close to coast
 - 💧 Heavily loaded
- 💧 240 kV Bunnell line (west of intersection of I-95 and US-1 & north to Royal Palms Parkway)
 - 💧 Adequate capacity
 - 💧 3 to 9 miles from site areas
 - 💧 High power transmission costs

Power Supply & Renewable Energy

- 💧 Renewable Energy Options Considered
 - 💧 Solar Power
 - 💧 Wind Power
 - 💧 Bloombox Device
 - 💧 Waste to Energy
- 💧 Reduced Energy Processes/Equipment
 - 💧 High efficiency pumps/motors and VFDs
 - 💧 Energy recovery devices
 - 💧 Centrifugal
 - 💧 Turbine based
 - 💧 Isobaric

Cost Summary



*Annualized cost does not include transmission costs



Estimated Costs – Beach Wells

Parameter	Beach Well Intake (10 MGD Plant)	Beach Well Intake (25 MGD Plant)
Intake Well System	\$19,918,000	\$42,456,000
Intake/Discharge Tunnel	\$58,542,000	\$67,313,000
Pipelines in Tunnel	\$17,347,000	\$30,583,000
Offshore Discharge Pipeline	\$956,000	\$1,441,000
Transition and Terminal Structures	\$12,110,000	\$12,790,000
Onshore Intake Pipeline	\$13,140,000	\$17,973,000
Onshore Discharge Pipeline	\$10,245,000	\$14,512,000
Treatment Plant	\$85,500,000	\$163,320,000
Total Capital Cost	\$217,730,000	\$350,390,000
Annualized Capital Cost	\$16,920,000	\$27,230,000
Annual Treatment O&M Costs	\$7,580,000	\$17,225,000
Annual Intake/Discharge O&M Costs	\$540,000	\$1,045,000
Total Annual Costs	\$25,040,000	\$45,500,000
Total Supply Cost per 1,000 gals	\$6.86	\$4.99

*Total supply cost does not include transmission costs

Estimated Costs – Intake Pipeline

Parameter	Combination Tunnel (10 MGD Plant)	Combination Tunnel (25 MGD Plant)
Intake/Discharge Tunnel	\$58,542,000	\$67,313,000
Pipes in Tunnel	\$21,758,000	\$38,892,000
Offshore Intake Pipeline	\$38,869,000	\$60,061,000
Offshore Discharge Pipeline	\$956,000	\$1,441,000
Transition and Terminal Structures	\$7,560,000	\$8,490,000
Onshore Intake Pipeline	\$13,140,000	\$13,140,000
Onshore Discharge Pipeline	\$10,245,000	\$10,245,000
Treatment Plant	\$97,906,000	\$191,899,000
Total Capital Cost	\$248,980,000	\$400,580,000
Annualized Capital Cost	\$19,350,000	\$31,130,000
Annual Treatment O&M Costs	\$7,880,000	\$17,935,000
Annual Intake/Discharge O&M Costs	\$169,000	\$205,500
Total Annual Costs	\$27,400,000	\$49,270,000
Total Supply Cost per 1,000 gals	\$7.51	\$5.40

*Total supply cost does not include transmission costs



Estimated Costs – Transmission

25 MGD Buildout Capacity		
Parameter	Stages 1 & 2 (2020 onward)	Stages 1, 2 & 3 (2025 onward)
Design Capacity	16.8 MGD	25.0 MGD
Transmission Mains	\$92,110,000	\$216,230,000
Booster Pump Stations	\$0	\$3,740,000
<i>Total Capital Cost</i>	<i>\$92,110,000</i>	<i>\$219,970,000</i>
Annualized Capital Cost	\$7,157,000	\$17,092,000
Annual O&M Costs	\$41,000	\$248,000
Total Annual Costs	\$7,198,000	\$17,340,000
<i>Average Cost per 1,000 gals</i>	\$1.17	\$1.89
50 MGD Buildout Capacity		
Parameter	Stages 1 & 2 (2020 onward)	Stages 1, 2 & 3 (2025 onward)
Design Capacity (MGD)	30.2	49.0
Transmission Mains	\$107,720,000	\$235,750,000
Booster Pump Stations	\$2,350,000	\$6,680,000
<i>Total Capital Cost</i>	<i>\$110,070,000</i>	<i>\$242,430,000</i>
Annualized Capital Cost	\$8,552,000	\$18,837,000
Annual O&M Costs	\$292,000	\$681,000
Total Annual Costs	\$8,844,000	\$19,518,000
<i>Average Cost per 1,000 gals</i>	\$ 0.80	\$1.09

*Costs for “Stages 1,2 & 3”, represent total transmission costs and include costs from “Stages 1&2”





Coquina Coast
seawater desalination project

Phase 2A and Transition Discussion

Coquina Coast Seawater Desalination Project
Business Meeting
August 17, 2011



Coquina Coast
seawater desalination project

Deliverables and Schedule Review

Coquina Coast Seawater Desalination Project
Business Meeting
August 17, 2011

Upcoming Project Activity

- 💧 Draft 1 Phase 2A Report comments due – 8/12/11
- 💧 Public Meeting – 8/17/11
- 💧 Final Pilot Study Plan– 8/26/11 (*to be submitted w/ Draft 2 Phase 2A report as appendix*)
- 💧 Draft 2 Phase 2 A Report – 8/26/11
- 💧 Teleconference to review Draft 2 Phase 2A – 9/14/11
- 💧 Draft 2 Phase 2 A Report comments due – 9/16/11
- 💧 Final Phase 2A Report – 9/30/11