

State of Florida



Public Service Commission

CAPITAL CIRCLE OFFICE CENTER • 2540 SHUMARD OAK BOULEVARD
TALLAHASSEE, FLORIDA 32399-0850

-M-E-M-O-R-A-N-D-U-M-

DATE: April 3, 2008
TO: Ann Cole, Commission Clerk, Office of Commission Clerk
FROM: Jennifer Brubaker, Attorney Supervisor, Office of General Counsel *JSB*
RE: Docket Number 060122-WU - Joint petition for approval of stipulation on procedure with Office of Public Counsel, and application for limited proceeding increase in water rates in Pasco County, by Aloha Utilities, Inc.

Docket Number 060606-WS - Progress reports on implementation of Anion Exchange in Pasco County, filed by Aloha Utilities, Inc. pursuant to Order PSC-06-0270-AS-WU.

Please place a copy of the attached document in the files of both the above-referenced dockets.
Thank you.

JSB/tfw

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TALLAHASSEE, FLORIDA 32399-0850

-M-E-M-O-R-A-N-D-U-M-

DATE: March 26, 2008

TO: Matthew M. Carter II, Chairman
Lisa Polak Edgar, Commissioner
Katrina J. McMurrin, Commissioner
Nancy Argenziano, Commissioner
Nathan A. Skop, Commissioner

FROM: Mary Andrews Bane, Executive Director *MAB*
Michael G. Cooke, General Counsel *Michael G. Cooke*

RE: Aloha Utilities, Inc. - Response to Commissioner Edgar's February 29 Memorandum

On February 20, 2008, Commissioner Edgar requested staff to provide information on three issues regarding various Aloha Utilities, Inc., matters. Specifically, she requested information on: (1) a timeline and milestones for implementation of the physical interconnection that is needed so the company can receive bulk water from Pasco County, (2) circumstances surrounding the postponement of a February 14, 2008, visit by representatives of the Office of Public Counsel ("OPC") to company facilities and (3) staff's review of Aloha's compliance with the March 9, 2006, settlement agreement among the Office of Public Counsel, Aloha, and customer representatives. This memorandum provides staff's response.

Interconnection with Pasco County

With regard to the pending interconnection with Pasco County, Attachment 1 shows the current milestones necessary to complete the interconnection project and the parties responsible for the completion of each milestone. The attachment includes the expected completion dates for key actions that need to occur, as well as the actual completion dates for those actions and a number of related events that have occurred to date. The currently projected final completion date for the project, as reflected in Attachment 1, is August 2008.

The interconnection is necessary to resolve overpumping of Aloha's wells, a situation that has been the subject of enforcement by the Southwest Florida Water Management District ("SWFWMD"). While there were no established deadlines for completion of the physical interconnection itself, the company's November 26, 2007, SWFWMD permit required the company to file by October 1, 2007, a limited rate proceeding with the Commission to secure the rates needed to construct the interconnection project and to purchase bulk water from the county. In addition, discussions among the parties that occurred between approximately June and November 2007 focused on a draft implementation schedule for completion of the interconnection project by approximately February 2008. In accordance with the SWFWMD permit, the company filed the rate request with the Commission on September 28, 2007. The

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Commission considered the rate request at its February 12, 2008, Agenda Conference and issued a proposed agency action order on March 3, 2008 (Order No. PSC-08-0137-PAA-WU).

Consistent with the company's filing of the limited rate proceeding, and in an effort to meet the projected February 2008 date for completion of the interconnection point, Aloha submitted its design documents and draft Florida Department of Environmental Protection ("FDEP") permit application to Pasco County for review on November 7, 2007. The permit application must be submitted as a joint application by Aloha and Pasco County for processing by FDEP. The subsequent record of communication between Aloha and Pasco County indicates that Aloha timely responded to requests by Pasco County for additional information relating to the design and draft permit application. The delays that have occurred to date are attributable to the timing of Pasco County's responses to Aloha. As of today, Pasco County has not given final approval to the permit application.

Additional developments have occurred since the limited rate proceeding was conducted on February 12, 2008, that might impact the currently projected completion date. Specifically, a petition filed by four customers of the Executive Committee for Better Water Now protesting the Commission's proposed agency action order addressing the interconnection with Pasco County, Order No. PSC-08-0137-PAA-WU, was received on March 24, 2008. The OPC and Aloha also filed protests on March 24, 2008. In addition, on March 14, 2008, the Florida Governmental Utility Authority ("FGUA")¹ filed a "Suggestion of Abatement"² in the interconnection docket. Although filed in the interconnection docket, the Suggestion of Abatement on its face appears to address primarily the Anion Exchange construction project proceedings which are the subject of a separate docket. FGUA is not a party to either docket and has not sought to intervene. Staff have attempted to contact FGUA's attorney to obtain clarification regarding the filing, and have spoken with the OPC and the company regarding it. It is unknown at this time, however, what ultimate impact the Suggestion for Abatement and protests of the Commission's interconnection order might have on the interconnection timetable.

Facilities Site Visit

OPC had requested an opportunity to visit Aloha's water facilities with its consulting engineer to "inspect Aloha's water facilities, discover necessary information to permit the evaluation of the anion exchange/brine disposal problem, and inspect facilities associated with the bulk purchase of water."³ In addition to verifying construction and determining availability of space for future construction, OPC also indicated it contemplated using information gathered at the site visit so that it could evaluate additional solutions to the brine disposal issues raised by the anion exchange project. Some of the solutions being considered by OPC might have the effect of changing the previously agreed upon location of the interconnection point.

¹ FGUA is an interlocal entity created pursuant to Chapter 163, Florida Statutes ("F.S."), by political subdivisions of the State, such as various counties. The Commission previously has approved, as a matter of right, transfers to FGUA of investor-owned water and wastewater utilities, determining that FGUA is a "governmental authority" for purposes of Section 367.021(7), F.S. Order No. PSC-03-1284-FOF-WS, *In re: Joint Application for acknowledgement of sale of land and facilities of Florida Water Services Corporation in Lee County to Florida Governmental Utility Authority, and for cancellation of Certificate Nos. 3-6-W and 255-S*; but, see also, dissent by Commissioner Davidson, concluding that FGUA is not a "governmental authority" under Chapter 367, F.S.

² A "suggestion" is not a pleading contemplated by the Florida Administrative Procedures Act, the Uniform Rules, or any Commission rule or statute.

³ Letter dated February 25, 2008, from Stephen C. Reilly, Associate Public Counsel.

In response to OPC's request, a site visit had been planned for Thursday, February 14, 2008. Aloha intended that its anion exchange project engineer, David Porter, would give the tour.

On the morning of February 13th, Steve Reilly, Associate Public Counsel, called Aloha's counsel to confirm the tour. Shortly thereafter, Mr. Reilly left his office for a meeting in New Port Richey.

Mr. Porter's wife had apparently been admitted to the hospital earlier in the week, on February 11th, and her condition on Wednesday the 13th was such that Mr. Porter did not feel able to give the site tour.

On February 13th, at 11:58 a.m., and again at 3:06 p.m., Aloha notified Steve Reilly via email that the visit would need to be rescheduled. (Aloha indicated that the parties regularly communicated with each other via email.) Mr. Reilly stated that he received notification at approximately 3:30 p.m. on the 13th.

Aloha explained that it did not offer another employee to replace Mr. Porter and give the site visit because the facilities are not yet constructed, and Mr. Porter's knowledge as to the future placement and design of the anion exchange facilities remains the primary value of the tour.

Aloha rescheduled the site visit for February 20th, and Commission staff engineer Richard Redemann was able to tour the facilities. Mr. Reilly stated that he was unable to attend the February 20th visit due to his work schedule; he did not send other OPC staff in his place.

On March 14th, the parties met with Commission staff to discuss plans for OPC's site visit. Based on email confirmations sent on March 19th, the site visit is now scheduled to take place on March 27 at 10 a.m. It is unclear if this visit will be affected by the recently filed protests in the limited proceeding rate case but, to staff's knowledge, it still is scheduled to occur.

Anion Exchange Implementation Schedule

Staff has been monitoring the progress of implementation of the Anion Exchange ("AE") system since the order adopting the settlement was issued. In our review, we have analyzed the facts surrounding the current delays to determine the party or entity responsible. Attachment 2 provides a timeline showing the major events and those responsible for the delays.

From the effective date of the AE implementation schedule contained in the settlement agreement (June 27, 2006) until April 11, 2007, Aloha was working with Pasco County to finalize several issues: (1) the amount of water that could be purchased from Pasco County, (2) the flow rate at which water would be received from the county, (3) when Pasco County would be able to supply the water, and (4) the interconnection points at which the water would be delivered. This information was needed to determine whether and how reductions in pumping the company's wells would occur so that relative contributions of water from the County and the wells could be known. Final design of the AE system was contingent upon knowing how much

water from the wells needed to be treated. Record information demonstrates that the company pursued obtaining this information from the county and that the information was not provided by Pasco County until April 11, 2007. Hence, although the schedule in the AE settlement agreement contemplated completion of design by the end of December 2006, the information needed to complete the final design of the system was not obtained until April 11, 2007.

Once the information on bulk water supply was given to Aloha by Pasco County, it was forwarded to Dr. Levine⁴ for completion of a report on the development and final design of the AE process. It was expected that this final design phase of the project could be completed relatively soon after Dr. Levine had received the bulk water supply information. Further delays, however, were caused by the departure of Dr. Levine in December of 2006 from the University of South Florida. Aloha did not formally inform the Commission of this problem and the resulting impact on the project until September 5, 2007. Based upon correspondence dated June 22, 2007, from the company to the University of South Florida obtained by staff, it appears that Aloha made several attempts to obtain the final report in June of 2007. Staff believes that the Commission and parties should have been informed of this issue by at least June of 2007, when it became clear that the report was not going to be received. A draft report from Dr. Levine was not received until October 5, 2007. The final report was not received until November 15, 2007. The delay in obtaining Dr. Levine's report delayed the anion project by approximately three months.

While Dr. Levine's report was needed to finalize the design of the AE treatment system, additional information was needed to complete permitting of the project. An additional consultant, Dr. Gomberg, a groundwater hydrologist, was hired by Aloha to analyze the potential impacts of brine on groundwater, plants, and soils in areas where reuse water (which would contain the brine waste from the AE treatment plants) is to be applied. Dr. Levine's October 5, 2007, draft report was given to Dr. Gomberg upon receipt by Aloha. Dr. Gomberg completed his analysis and submitted a report on October 14, 2007. The report concluded that blending the brine with reuse water might not be an appropriate method of disposal due to high levels of sodium and chlorides. The brine disposal issue has resulted in further delays in the anion project as the least expensive method for brine disposal is being researched.

At this time, Aloha is researching seven alternatives for brine disposal. The seven methods are listed below and a more complete discussion of each alternative is included in Attachment 4:

1. Dispose of all AE wastes directly into the sanitary sewer system.
2. Truck all AE wastes off site.
3. Truck a portion of the AE wastes off-site and discharge a portion to the sanitary sewer system.
4. Reduce the discharge of home-owner water softener wastes to sanitary sewer systems, truck a portion of the AE wastes off-site and discharge a portion to the sanitary sewer system.

⁴ Aloha had retained, by a contract with the University of South Florida, the services of Dr. Audrey Levine to design the AE system. The contract by its terms expired June 30, 2007, unless the parties extended the term by mutual agreement.

5. Initially construct the AE water plant upgrades at only selected sites and discharge the wastes to the sanitary sewer system and/or truck them off site. When operating experience is obtained (with both the introduction of Pasco County bulk water into the water distribution system and the initial AE plants have been placed into service) determine if the remainder of the AE plants continue to be required.
6. Apply for and obtain FDEP groundwater quality exemption, variances and/or waivers for chlorides and total dissolved solids from the FDEP and utilize potassium chloride as the regenerate to allow discharge of the wastes to the sanitary sewer system.
7. Identify and construct brine treatment facilities that will allow for the reuse of the sodium chloride and thus the quantity of the wastes that will be generated and must be disposed of.

The AE project is currently at a standstill until a solution is found for the disposal of the brine. The brine disposal problem was not anticipated in the original 24 month timeline. The parties to the settlement and staff plan to meet again after OPC's engineer has completed his site visit. At that time, staff may be able to offer a clearer picture as to the possibilities for the brine disposal.

Attachment 3 shows the additional actions necessary to complete the anion project, the responsible parties, and a revised timeline if the brine disposal problem is resolved by July 1, 2008.

Aloha Utilities, Inc.
Timeline for Pasco County Interconnection

	<u>Events</u>	<u>Estimated Completion Date</u>	<u>Actual Completion Date</u>	<u>Persons/Entities Responsible for Completion</u>
1.	Design Interconnection Station	October 2007	October 2007	Porter and Aloha Staff
2.	Aloha submits documents, signed and sealed drawings, Engineering Report and FDEP permit application to Pasco County for approval.	November 7, 2007	November 7, 2007	Ernsberger, Porter and Aloha Staff
3.	Water Use permit signed requiring purchase of Pasco County Water by April 11, 2008	November 26, 2007	November 26, 2007	SWFWMD
4.	Pasco County responds to documents filed by Aloha on November 7, 2007 with 13 areas that need to be addressed before Pasco can execute the FDEP Permit Application.		December 6, 2007	Pasco County
5.	Aloha provides information requested by Pasco County on December 18, 2007		December 18, 2007	Ernsberger (company engineer), Porter and Aloha Staff
6.	Letter from Ernsberger to Pasco County requesting a response to the 12/18/07 letter.		January 15, 2008	
7.	Letter from Wharton, representing Aloha, to Pasco County requesting a response to the 12/18/07 letter.		January 22, 2008	
8.	Pasco County informs Ernsberger, by phone, that all the concerns mentioned in Pasco's 12/6/07 letter were satisfactorily answered in Mr. Ernsberger's 12/18/07 response. Aloha needs to submit a complete drawing of the interconnection.		February 4, 2008	Pasco County
9.	Ernsberger to file complete plan with Pasco the week of 2/19/08.	February 19, 2008	February 19, 2008	Ernsberger

10.	Locate and Purchase/Lease Real Estate	February 2008	Pending	Porter, Aloha Staff and Pasco County Mosquito Control Board
11.	Pasco/FIDEP Permit Review and Approval	March 2008	Pending	Porter, Pasco County and FDEP
	Florida Governmental Utility Authority files Suggestion of Abatement		March 14, 2008	
	Executive Committee For Better Water Now files a protest of the Commission's PAA Order on the Interconnection with Pasco County.		March 24, 2008	
	OPC files Petition on Proposed Commission's PAA Order on the Interconnection with Pasco County.		March 24, 2008	
	Aloha files Petition on Proposed Commission's PAA Order on the Interconnection with Pasco County.		March 24, 2008	
12.	Booster Station Bid/Award	April 2008		Porter and Aloha Staff
13.	Obtain Pasco DRD/Building Permits	May 2008		Porter, Aloha Staff and Pasco County
14.	Construct/Start Up Booster Station	August 2008		General Contractor, Aloha Staff, Porter and Pasco County

**Timeline of Relevant Events
Aloha Anion Exchange (AE) Construction Project**

Settlement Agreement Approved	April 5, 2006
Contract signed with University of South Florida for Dr. Levine to conduct study to design the appropriate anion facilities for Aloha wells. Study calls for report no later than June 2007.	May 12, 2006
24 month timeframe begins with Pasco County Ordinance requiring Aloha to install forced draft aeration facilities being repealed.	June 27, 2006
Letter from Aloha to Pasco County confirming that Pasco will send information regarding flow rates and pressure at the two interconnection points by August 4, 2006.	July 28, 2006
1st quarterly progress report , Aloha states that project is delayed 90 days because of Pasco Counties failure to provide necessary definitive information.	October 2, 2006
Dr. Levine leaves the University of South Florida to work with the US Environmental Protection Agency.	December, 2006
2nd quarterly progress report , Aloha reports that County still has not provided all necessary information but may be able to work around the problem such that a 90 day delay still seemed reasonable.	January 10, 2007
3rd quarterly progress report , Aloha estimated that the overall anion exchange water treatment project has been delayed by at least 180 days due to certain bulk water issues remaining unresolved with the County.	April 4, 2007
Letter from the County providing the necessary information requested by Aloha's letters.	April 11, 2007
4th quarterly progress report , Aloha states that the County provided the necessary data and the project completion date has been revised accordingly to February 18, 2009. The project is now delayed approximately 9 1/2 months	July 3, 2007
Letter from Aloha to Michael Cooke formally informing all parties that delays have now occurred due to the failure to receive Dr. Levine's report.	September 5, 2007
5th quarterly progress report , Aloha reports that a number of tasks have been delayed due to not receiving Dr. Levine's report. Aloha states that the project delays caused by the failure to receive Dr. Levine's report is totally outside Aloha's control.	October 3, 2007
Dr. Levine's draft report which concentrated on AE waste generation and disposal was received by Aloha.	October 5, 2007
Dr. Gomberg's report was received by Aloha. Dr. Gomberg is Aloha's hydrogeologist who was hired to analyze the potential impacts to groundwater, plants and soils in areas where reuse water is applied which contains the brine waste from the AE treatment plants.	October 14, 2007
Dr. Levine's final report received providing detailed information concerning Dr. Levine's work in total was received by Aloha.	November 15, 2007

6th quarterly progress report , Aloha states that there will be further delays due to the results of Dr. Gomberg's report. The progress report also lists the different AE brine disposal methods being reviewed. Aloha states that a new completion date can not be determined until the brine issue is resolved.	January 7, 2008
Florida Governmental Utility Authority files Suggestion of Abatement Executive Committee For Better Water Now files a protest of the Commission's PAA Order on the Interconnection with Pasco County.	March 14, 2008 March 24, 2008
OPC files a protest of the Commission's PAA Order on the Interconnection with Pasco County.	March 24, 2008
Aloha files a protest of the Commission's PAA Order on the Interconnection with Pasco County.	March 24, 2008
OPC's Engineer's site visit of Aloha's facilities.	March 27, 2008

Estimated Schedule as of March 7, 2008

<u>Anion Exchange Project Tasks</u>	<u>Phase</u>	<u>Per Utility's 7/2/2007 Timeline</u>	<u>Aloha's Revised Timeline</u>	<u>Individual(s) Responsible</u>
Receive Pasco County Bulk water Data	Design	4/11/2007	4/11/2007	A/D/E/L/R
Redefine WTP Treatment Requirements	Design	5/14/2007	7/1/08*	A/D/E/L/R/V
Redefine Project Design Parameters	Design	5/14/2007	7/1/08*	A/D/E/L/V
Update Tasks List and Schedule	Design	7/2/2007	3/7/2008*	A/D/E/L
Submit Updated Schedule to PSC	Design	7/2/2007	3/7/2008*	A/D/E/L
Prepare WWTP Permit Modification Application	Permitting	8/21/2007	7/31/08*	A/D/E/L
Submit WWTP Permit Application Review and Approval	Permitting	8/21/2007	7/31/08*	A/D/E/L/R/V
FDEP Permit Application Review and Approval	Permitting	9/21/2007	9/1/08*	R
Complete Updates to AE Permit Level Design Docs.	Permitting	9/30/2007	9/15/08*	A/D/E/L/V
Complete FDEP AE Permit Application	Permitting	9/30/2007	9/15/08*	A/D/E/L/V
Submit AE Permit Application Review and Approval	Permitting	9/30/2007	9/15/08*	A/D/E/L/V
FDEP AE Permit Application Review and Approval	Permitting	10/21/2007	10/20/08*	R
Preparation of Bid Packages	Bidding	11/21/2007	11/21/08*	A/D/E/L
Award Construction Contracts	Bidding/Award	1/7/2008	1/7/09*	A/D/E/L/V
Obtain DRD and Building Permits from Pasco County	Construction	2/14/2008	2/16/09*	A/D/E/L/R
AE Construction and Start-up	Construction	2/18/2009	2/22/10*	A/D/E/L/V/R
All AE Plants On-line		2/18/2009	2/22/10*	A/D/E/L/V/R

- Notes:
1. Updated schedule dates shown herein assume (as directed by PSC staff) that all AE waste disposal issues will be resolved on or before July 1, 2008. *The estimated schedule dates shown will change if this assumption is not correct.
 2. Updated schedule assumes that previous project concept, design objectives and implementation assumptions continue to be correct and no major deviations will be necessary. *The estimated schedule dates shown will change if these assumptions are not correct.
 3. A = Aloha staff and management; D = David W. Porter, P.E., E = Other engineering services; C = Contractors, R = Regulatory Agencies; E = Equipment Vendors, L = Legal Support

**Aloha Utilities, Inc.
Seven Springs Water System
Anion Exchange Implementation Project**

Identification of AE Waste Disposal Alternative Strategies

Overview

As part of the work being completed to implement the use of anion exchange (AE) to remove hydrogen sulfide at five of Aloha's water plants, various pilot testing work was undertaken by the University of South Florida (USF) to determine the quantity and characteristics of the various waste streams that would be generated under various conditions.

USF submitted a final waste generation report to Aloha on October 5, 2007. Included in this report (which has been previously submitted to the PSC staff) were estimates of the changes in the quality of the reuse water produced at Aloha's existing wastewater treatment plant (WWTP) should the AE wastes be discharged to the sanitary sewer system for disposal. [Note: Disposal of the AE wastes to the sanitary sewer system was but one of the alternative means of disposal of these wastes which has been discussed at various PSC/OPC/Customer/AUI project negotiation, project development and evaluation and progress meetings since the inception of the project. However, being the least cost alternative previously identified, it has been the alternative chosen first for evaluation by USF and Aloha.]

Subsequently, USF submitted its master project report to Aloha in final form on November 15, 2007. This report provided not only information on AE waste generation and disposal (as was contained in the earlier USF waste generation report), but also provided detailed pilot plant research data and final design recommendations for the various AE process units. A copy of this report was provided to PSC and OPC previously.

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Dr. David N. Gomberg, P.G., a groundwater hydrologist, was retained by Aloha to review the USF report and to evaluate the technical feasibility of disposing of the AE wastewater into the sanitary sewer system based on criteria provided in the Florida Department of Environmental Protection rules (62-610.865 and others) and his extensive experience in the development and operation of wastewater reuse systems. Once USF submitted its report to Aloha, Dr. Gomberg was able to undertake his analysis of the data provided in the USF report and complete his report. On October 14, 2007 Dr. Gomberg submitted his report to Aloha which detailed his analysis of the potential impacts to groundwater, plants and soils which may be experienced if the AE wastes were to be discharged to the sanitary sewer system resulting in the changes in reuse water quality (as projected in the USF report). A copy of this report has been provided to PSC and OPC previously.

Dr. Gomberg's report identified issues associated with long-term application of the reuse water after incorporation of the AE wastes raw wastewater stream that could potentially negatively impact groundwater quality, plants and soil conditions in the reuse water storage and application areas. As stated in Dr. Gomberg's report, it is very difficult to predict the magnitude of any potential impacts, however, the indicators were sufficient to warrant caution and concern.

These potential impacts have caused Aloha and its consultants to believe that disposal of the AE wastes to the sanitary sewer system in the quantities evaluated thus far is unwise. There is also sufficient uncertainty that it appears that Aloha may not be in a position to be able to make the certifications needed to apply for the necessary FDEP wastewater plant permit modifications.

This Technical Memo has been prepared to present the alternatives identified and to provide a framework from which the parties (PSC/OPC/Customers/AUI) can work to continue evaluation of the AE waste disposal options and select the most cost effective, technically feasible, time responsive option for final development and implementation.

AE Waste Disposal Alternatives Identified

The identified AE waste disposal alternatives are listed briefly below and discussed on the following pages:

1. Dispose of all AE wastes directly into the sanitary sewer system.
2. Truck all AE wastes off-site.
3. Truck a portion of the AE wastes off-site and discharge a portion to the sanitary sewer system.
4. Reduce the discharge of home-owner water softener wastes to sanitary sewer system and truck a portion of the AE wastes off-site and discharge a portion to the sanitary sewer system.
5. Initially construct the AE water plant upgrades at only selected sites and discharge the wastes to the sanitary sewer system and/or truck them off-site. When operating experience is obtained (with both the introduction of Pasco County bulk water into the water distribution system and the initial AE plants which have been placed into service) determine if the remainder of the AE plants continue to be required to solve the previously identified water quality issues and if so how the wastes can be disposed of.
6. Apply for and obtain FDEP groundwater quality exemptions, variances and/or waivers for chlorides and total dissolved solids (TDS) from the FDEP and utilize potassium chloride as the regenerate (to reduce sodium emissions) to allow discharge of the wastes to the sanitary sewer system.
7. Identify and construct brine treatment facilities that will allow for the reuse of the sodium chloride and thus reduce the quantity of wastes that will be generated and must be disposed of.

Discussion of Each Waste Disposal Alternative

Alternative 1 – Dispose of all AE Wastes to Sanitary Sewer System

This waste disposal alternative, if implemented, would likely be the least cost alternative provided no adverse impacts to groundwater, plants and soils in the reuse application areas materialized. Should these adverse impacts occur, this alternative might then become the highest cost alternative due to loss of treated wastewater disposal capacity (loss of reuse system use), regulatory actions and sanctions, and a number of other related repercussions.

As stated in Dr. Gomberg's report, this alternative poses the potential to raise the sodium, chloride and TDS concentrations in the groundwater located in the reuse storage and spray areas above FDEP mandated limits. In addition, the reuse water sodium, chloride and TDS concentrations would be increased to levels which would have the potential to create soil clogging and negatively affect certain plants. Again, this is discussed in Dr. Gomberg's report. Aloha and its consultants have determined that this alternative raises concerns.

Readers are directed to the USF reports and Dr. Gomberg's reports for detailed information related to the estimated quantities of AE wastes to be generated, the resulting reuse water quality changes projected and a detailed discussion of the potential impacts of those reuse water quality changes.

Alternative 2 – Truck All AE Wastes Off-Site

This waste disposal alternative, if implemented, is likely one of the higher costly alternatives. However, this alternative would also pose no risk of possible impacts to groundwater, plants and soils in the reuse water storage and application areas. Since this alternative would not require the discharge of any AE wastes to the sanitary sewer system, no wastewater plant permit modification would be required, thereby decreasing the time for project completion going forward.

Aloha contacted Pasco County representatives to determine if they had facilities to accept AE wastes and were told that they did not. Therefore, another means of transporting that disposing of the AE wastes had to be identified.

Aloha has identified one waste disposal company that has expressed interest in contracting for the transport and disposal of the AE wastes. Aloha's staff and its engineering consultant met with a representative of this company to discuss the project in detail and to provide him with an analysis of the AE wastes (which were provided in the USF) report. After reviewing the waste characteristics with the disposal facility where this firm has transported wastes of this type previously (The City of Tampa Wastewater Treatment System) the plant management rejected this waste stating that they have no additional capacity to accept this type of waste at their facility. Therefore, the contractor will need to deliver the Aloha AE wastes to Industrial Wastewater Services in Jacksonville, Florida for disposal, which is the closest facility that can accept these wastes.

The current best estimate of the cost of transporting the AE wastes, as provided by the waste disposal company, is approximately \$0.55/gallon (the current cost on December 20, 2007) providing a minimum of 6,000 gallons of waste (a full tanker truck load) were transported each day.

The estimated quantity of heavy salt bearing wastes to be generated on an annual average daily basis from all five water plant AE systems is approximately 6,000 gallons per day. Please note that these values are based on pilot testing experience only and may differ from that actually experienced with the full-size units when they become operational and operation is optimized. The actual quantity of wastes generated may vary, either more or less, depending on a number of factors such as the actual quantity of salt required for backwash the actual quantity of finished water produced at each plant and actual run-times experienced before regeneration is required as discussed in the USF and Gomberg reports.

Therefore, the estimated cost per day to truck the waste from all five plants on an annual average daily basis based on the USF projected waste generation rates is \$3,300/day or approximately \$1.2M/year.

Should this option be selected, additional waste transport and disposal companies must be identified so that the contract for service can be bid to minimize costs and to insure that there were back-up sources of service. A bid specification package would need to be developed, potential contractors identified and contacted, a pre-bid information meeting held with all potential bidders, bids taken and evaluated, bid award made and contracts prepared and executed prior to starting up the AE units.

Alternative 3 – Truck A Portion of the AE Wastes Off-Site and Discharge a Portion to the Sanitary Sewer System

This waste disposal alternative is essentially a combination of the first two alternatives. Its selection would result in more operating cost than Alternative 1 (assuming no adverse affects on groundwater, plants and soils occurred) but less than Alternative 2. The technical feasibility of this alternative and its cost would depend on the ratio of the waste quantity discharged to the sanitary sewer system to that trucked off-site. The determination of that ratio will require additional study by Dr. Gomberg, Aloha's engineering consultants and management.

Additional discussions with the FDEP related to wastewater plant permit modifications (specifically increased groundwater monitoring and response protocol implementation) will be required if this alternative is selected. These additional monitoring and response protocols will provide the necessary "reasonable assurance" to Aloha's management and the FDEP that this alternative will not result in groundwater, plant or soil impacts that could not be identified and rectified prior to operational and/or regulatory sanctions. In essence, increased (or new) monitoring systems would need to be constructed and placed into service to identify potential problems that could not be reversed (by increasing trucking of AE wastes) prior to the development negative impacts to Aloha, the customers utilizing its reuse water, the groundwater quality, etc.

Aloha and its consultants would need to conduct additional studies and possibly conduct predictive groundwater modeling to allow for the development of increased chloride, sodium and TDS concentration targets for the reuse water. Aloha would base these target concentrations largely on the experience of Dr. Gomberg and his additional analysis of the conditions that are representative where the reuse water is currently stored and applied. These values would then allow Aloha to determine the ratio of waste discharged to the sewer system to that trucked. This in turn would determine the estimated cost for off-site trucking of the wastes.

As an example, if the wastes from Plants 8 and 9 were trucked and the wastes from Plants 2, Mitchell, and 6 were discharged to the sanitary sewer system, the resulting reuse water concentrations for sodium would be 217 mg/L and chloride 361 mg/L (based on the values in the USF report for annual average daily flow rates) which are substantially lower than the values estimated for these constituents when all plants discharge to the sanitary sewer system (sodium of 292 mg/L and chloride of 479 mg/L). However, even the reduced values are substantially greater than the Maximum Contaminant Level (MCL) for these constituents allowed by FDEP rule in groundwater (sodium of 160 mg/L and chloride of 250 mg/L). The question that must be answered to determine if this level of reduction in concentration is acceptable so as not to create negative impacts in the future. The answer to this question is quite complicated and not easily quantified since many factors (such as natural groundwater flow and dilution characteristics, rainfall quantities, etc.) which is why additional analysis by Aloha and its consultants will need to be undertaken if this option is chosen for possible implementation. However, for this example, let us assume that this reduction in sodium and chloride concentrations is acceptable, then the estimated quantity of wastes to be trucked off-site is reduced to 2,600 gallons/day which would have an annual cost of approximately \$1,447/day or \$0.53M/year. It is important to note that in order to continue to obtain the "full load" price of \$0.55/gallon, the wastes at Plants 2, Mitchell and 6 would need to be stored such that a full truck load of waste (6,000 gallons) can be removed from the sites each time wastes are picked up. This will require a possible increase in the brine waste storage tank size at these plants.

As stated in the discussion for Alternative 3 above, the actual quantity of wastes generated may vary, either more or less, depending on a number of factors. These factors include: 1) the actual quantity of salt required for backwash, 2) the actual quantity of finished water produced at each plant, 3) the actual AE vessel run-times experienced before regeneration is required among others. Any variation in the actual quantities of waste generated will affect the allowable ratio of waste discharged to that trucked off-site and therefore will affect the costs associated with this alternative. Also, as stated earlier, the example above is just that, an example and may not be representative of the actual allowable ratio of waste discharged to that trucked. The determination of which will require additional analysis, consideration by Aloha and its consultants and discussions with the FDEP permitting staff.

Alternative 4 – Reduce the Discharge of Home-Owner Water Softener Wastes to Sanitary Sewer System and Truck a Portion of the AE Wastes Off-Site

This waste disposal alternative is essentially a variation of Alternative 3 and if selected for implementation the same level of study and discussions with FDEP would be required.

Since the concentration of sodium and chloride in Aloha's drinking water is quite low and the quantity of groundwater infiltration in the sanitary sewer system is quite low, it is likely that a large portion of the chloride and chloride found in the reuse water can be attributed to the discharge of home-owner water softener waste into the sanitary sewer system. Therefore, if these wastes were to no longer be discharged to the sanitary sewer system, the background concentration of sodium, chloride and TDS in the reuse water would be reduced. This in turn would allow more AE waste to be discharged to the sanitary sewer system and less to be trucked off-site reducing the associated costs.

The extent to which the home-owner softener wastes could be prevented from being discharged to the sanitary sewer system would dictate the increase in the allowable level of AE wastes could be discharged to the sanitary sewer system and the net reduction in the quantity and cost of trucking AE waste off-site.

Logistically, it may be very difficult, if not impossible, to develop a workable plan that would result in existing home owners no longer discharging their softener wastes to the sanitary sewers, therefore, although this alternative is attractive from a cost standpoint, it may take extensive time to accomplish or may be found to be realistically unworkable.

Alternative 5 – Initially Construct the AE Water Plant Upgrades at Only Selected Sites.

This waste disposal alternative is essentially a variation of the others. The major difference is that instead of constructing all the AE plants concurrently, only selected plants (most likely Plants 8 and 9) would be constructed initially. Once these plants were placed into service the combined effect of the addition of Pasco County bulk water, the reduction in the quantity of water produced by Aloha's own plants and the addition of the AE systems at Plants 8 and 9 would be evaluated over time to determine if these changes to the water system alleviates the water quality issues reported by some of Aloha's customers. If the water quality concerns are alleviated, then the other plants would not be retrofitted to add the AE process units, and therefore, would not generate any wastes requiring disposal.

If only the wastes from Plants 8 and 9 were discharged to the sanitary sewer system, the concentration of sodium and chloride in the reuse water is estimated to be 236 mg/L and 393 mg/L respectively. These values may still be greater than desirable and a portion of the wastes may have to be trucked off-site as with other options. In addition, the additional studies and coordination with the FDEP (described for Alternative 3 above) would be required to determine the allowable quantity of waste that could be discharged to the sanitary sewer and the level of additional groundwater monitoring that would be required.

If this alternative were to be selected it generates an additional concern not directly related to the waste disposal issues. The AE systems remove hydrogen sulfide from the raw water at the water plants prior to primary disinfection with free chlorine and secondary disinfection with chloramines. The removal of this hydrogen sulfide is beneficial to the primary and secondary disinfection process. The control of chloramination process is much more difficult when hydrogen sulfide is present. The recently completed chloramination systems at the water plants were designed with intent that pretreatment for hydrogen sulfide removal would be installed

once the proper method to do so was selected (the selection process was underway when the design work for the chloramination systems was underway but it was not completed).

Alternative 6 – Apply For and Obtain FDEP Groundwater Quality Exemptions, Variances and/or Waivers

FDEP rules (62-520.500, 62-520.520, etc.) provide for means of applying for exemptions, waivers and/or variances to its groundwater standards under certain specific conditions. If such exemptions, waivers and/or variances could be obtained to allow for higher levels of chloride and TDS in the ground water in the reuse spray areas, it may be possible to modify the basic design of the AE systems to utilize potassium chlorine as a regenerate solution instead of sodium chloride which would reduce the concentration of sodium to acceptable levels. This may allow more of the AE wastes to be discharged to the sanitary sewer system resulting in potentially reduced trucking costs.

Additional discussions with the FDEP related to wastewater plant permit modifications (specifically increased groundwater monitoring and response protocol implementation) will be required if this alternative is selected. These additional monitoring and response protocols will provide the necessary “reasonable assurance” to Aloha’s management and the FDEP that this alternative will not result in groundwater, plant or soil impacts that could not be identified and rectified prior to operational and/or regulatory sanctions. In essence, increased (or new) monitoring systems would need to be constructed and placed into service to identify potential problems that could not be reversed (by increasing trucking of AE wastes) prior to the development negative impacts to Aloha, the customers utilizing its reuse water, the groundwater quality, etc.

However, there are three major regulatory related problems which render the implementation of this alternative highly unlikely. FDEP stated at a recent meeting attended by PSC, OPC, customers and Aloha, that the granting of such exemptions, waivers and/or variances is extremely rare, that the time involved to obtain them is generally more than 18 months, that since Aloha’s spray fields are located near potable water well fields it is very likely that any

exemption, waiver and/or variance would be protested by third parties and that it is unlikely that the Department would grant such rule exemption, waiver and/or variance requests.

In addition, the costs associated with the substitution of potassium chloride for sodium chloride would be substantial. The brine make up facilities design would have to be changed to accommodate the potassium chloride since potassium chloride storage and handling practices are much different than those used for sodium chloride. In addition, the cost of potassium chloride is approximately double that of sodium chloride. The labor requirements for handling potassium chloride is also substantially greater than that for sodium chloride.

It should be emphasized that obtaining a waiver, variance or exemption of the FDEP groundwater rules in and of itself may not completely remove any potential negative impacts to soils and plants.

Alternative 7 – Identify and Construct Brine Treatment Facilities That Will Allow for the Reuse of the Sodium Chloride

It may be technically possible to develop a method to recover the sodium chloride (salt) from the brine wastes and reuse it resulting in a reduction in the quantity of wastes that would need to be disposed of.

The development of new technology, or the adaptation of existing technology, to accomplish this salt reuse may take considerable study and therefore, time. In addition, it may be found that even if the proper technology can be identified, the associated financial costs may be high.

Other Factors to Consider

As was stated in the USF report and the Gomberg report, the estimated changes in reuse water quality presented in the two reports were based on conservative assumptions. The salt quantity needed for regeneration of the AE vessels has been assumed to be 6 pounds per cubic foot of resin. This is the minimum salt loading rate that the manufacturer will allow and still provide a process guarantee. However, the USF pilot plant data suggests that a lower rate (4 pounds per cubic foot) may be sufficient. Once the AE units are placed into service and their operation

optimized, if it is found that the lower salt loading rate is feasible than the generation of waste at the AE plant(s) where this lower value is usable will be reduced as well. This will result in a lesser quantity of sodium and chloride that will be contained in the waste generated allowing more of the waste to be discharged to the sanitary sewer system. Therefore, this may result in a reduction in the quantity of waste that must be disposed of by trucking off-site with a possible *corresponding reduction in cost*.

We have spoken with the AE equipment manufacturer about the possibility of reducing the quantity of water that would be needed for each regeneration (by utilizing more automated sensors and controls) thus lessening the quantity of waste generated that must be trucked off-site. The manufacturer is looking into this possibility and if it is found to be technically possible, the associated costs will need to be evaluated.

The background sodium and chloride values utilized to calculate the estimated quality of the reuse water in the USF report were conservative values. Given the potential serious repercussions associated with under estimating the impacts of the AE waste on the reuse water quality this was the proper course of action to take. However, once the AE units are in operation in the field, it may be found that actual values may be slightly lower than the values predicted. Even though slight, the cost of trucking the wastes off-site would be reduced if this were found to be the case.

Recommendation

I recommend that Aloha, PSC, OPC and the customer representatives review this document and collectively chose which alternative(s) presented here will receive the additional study necessary to determine a proper course of action which will allow the AE implementation project to move forward.