FLORIDA PUBLIC SERVICE COMMISSION
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M E M O R A N D U M

OCTOBER 23, 1997

TO: DIRECTOR, DIVISION OF RECORDS AND REPORTING

FROM: DIVISION OF WATER AND WASTEWATER (MCROY, STARLING, CROUCH, CHASE, VON FOSSEN)
DIVISION OF LEGAL SERVICES (JAEGER)

RE: DOCKET NO. 960545-WS - INVESTIGATION OF UTILITY RATES OF ALOHA UTILITIES, INC.
COUNTY: PASCO

AGENDA: NOVEMBER 4, 1997 - REGULAR AGENDA - POST HEARING DECISION PARTIES MAY PARTICIPATE (ISSUE 1 IS PROPOSED AGENCY ACTION).

CRITICAL DATES: NONE

SPECIAL INSTRUCTIONS: NONE

FILE LOCATION: I:\PSC\WAW\WP\960545B.RCM
R:\PSC\WAS\123\ALOHA.WK4 - ATTACHMENTS 5 & 6

CASE BACKGROUND

Aloha Utilities, Inc. (Aloha or Utility), is a class A water and wastewater utility located in Pasco County. The Utility consists of two distinct service areas -- Aloha Gardens and Seven Springs. As of December 31, 1996, Aloha was serving 8,474 ERCs in its Seven Springs service area.

On April 30, 1996, Mr. James Goldberg, President of the Wyndtree Master Community Association, filed a petition, signed by 262 customers within Aloha's Seven Springs service area, requesting that the Commission investigate the utility's rates and water quality. The petition and request were assigned Docket 960545-WS.

For the purposes of hearing, Docket 960545-WS was consolidated with Docket 950615-SU (Aloha's reuse case). The hearing was held on September 9-10, 1996 in New Port Richey, and concluded on October 28, 1996 in Tallahassee. Customer testimony about quality of service was taken on September 9, 1997. Both customer testimony sessions were attended by over 500 customers, fifty-six of whom

provided testimony which included the following quality of service problems: black water, pressure, odor, and customer service related problems. The customers also provided many samples of discolored black water.

After evaluation of the evidence taken during the hearing, the Commission rendered its final decision by Order No. PSC-97-0280-FOF-WS (Final Order), issued on March 12, 1997. The Commission determined that the quality of service provided by Aloha's water system was unsatisfactory. Since the evidence indicated that the water quality problems were related to the presence of hydrogen sulfide in Aloha's source water and the cost of treatment might be expensive, the Commission ordered that Aloha prepare a report which evaluated the costs and efficiencies of several different treatment options for the removal of hydrogen sulfide from its source water.

On March 27, 1997, Aloha filed its Motion for Reconsideration. On April 8, 1997, the Office of Public Counsel (OPC) filed its Response and Cross-Motion. Aloha filed its timely Response to Cross-Motion for Reconsideration on April 21, 1997. Also, on April 16, 1997, Aloha filed a Motion for Stay of Order No. PSC-97-0280-FOF-WS. By Order No. PSC-97-0549-FOF-WS, issued May 13, 1997, the Commission denied Aloha's Petition for Reconsideration on the finding that the quality of service was unsatisfactory. By Order No. PSC-97-0658-FOF-SU, issued on June 9, 1997, the Commission denied Aloha's Petition for Reconsideration and granted OPC's cross-motion for reconsideration with regard to the reuse docket. That Order also recognized that a stay of the refund requirements of the Final Order was in effect pending the determination on reconsideration. The refund was included as a credit in the September bill.

On June 12, 1997, Aloha filed its report with the Commission, recommending that it be allowed to continue adjusting the corrosion inhibitor dosage level in an ongoing effort to eliminate the black water problem. Aloha also recommended that if hydrogen sulfide treatment facilities are required, then the option of constructing three central water treatment plants which utilize Packed Tower Aeration should be approved. Aloha has estimated that construction and operation of these plants would increase customer rates by 398%.

This recommendation addresses what actions the Commission should require Aloha to take to improve the quality of its water service.

DISCUSSION OF ISSUES

ISSUE 1: What action should the Commission require Aloha to take to improve the quality of its water service?

RECOMMENDATION: Aloha should be required to immediately begin planning for the installation of treatment facilities to increase the water's pH. Aloha should be required to notify all customers who are experiencing problems with black water that this is an indication that their copper pipes are deteriorating and that the only quick solution for both eliminating the black water and preventing a copper pipe failure is to repipe their homes with CPVC. Aloha should also be required to inform all builders and plumbers within the local area of the problems which its customers who have copper plumbing have experienced. Staff further recommends that Aloha should survey each of its customers to determine if they are willing to pay for new treatment facilities that are not required by any current DEP or EPA rule and which will increase their water rates. This survey should also attempt to determine how many customers are currently experiencing problems with black water. The survey should be approved by staff prior to being sent to the customers. Aloha should also be put on notice that a courteous response to customer concerns is expected and the Commission will specifically explore this issue in future proceedings. (MCROY, STARLING, VON FOSSEN, CHASE)

STAFF ANALYSIS: Since Docket No. 960545-WS was combined with the hearing for Docket No. 950615-SU, staff did not have the benefit of being able to directly communicate with Aloha representatives and its customers about the black water problem between the beginning of the hearing and June 12, 1997 (when Aloha filed its engineering report). Since then, staff has met with the Utility and many of its customers. Staff has also stayed in close contact with DEP representatives. Many letters have been prepared by the various parties involved in this case. A copy of some of the correspondence which is discussed in this recommendation is provided in Attachment 1.

Staff has divided its analysis into two sections. The first section presents Additional Background Information and Facts about Aloha's quality of service. The second section presents an Analysis of Each Quality of Service Problem. As noted in the Commission's Final Order, many customers who are not experiencing black water problems have expressed dissatisfaction with the water's pressure and odor as well as customer service related problems. Staff believes that each of these quality of service problems should be discussed separately and has divided them into

the following categories: A. Black Water, B. Odor and Pressure Problems, and C. Customer Relations and Service Issues.

I. Additional Background Information and Facts

By Order PSC-95-1605-FOF-SU, issued on December 28, 1995 (the Proposed Agency Action (PAA) order which was subsequently protested), the Commission initially determined that Aloha's quality of service was satisfactory. The emergence of the black water problem in Wyndtree and Chelsea was the principle change in circumstances between the PAA order and the September, 1996 hearing, and was a major factor in the Commission's subsequent finding that Aloha's quality of service was unsatisfactory.

After the first customer meeting on August 9, 1995, it was apparent to staff that many customers were dissatisfied with Aloha's quality of service. Therefore, staff included in its PAA recommendation a discussion about the quality of service problems which the customers described at the August, 1995 customer meeting in New Port Richey. Approximately 200 customers attended this meeting and eight of the eighteen customers who testified offered complaints about poor water quality. The customer complaints included low water pressure, odor, discoloration, corrosive water, and water so hard it can destroy clothes unless a softener is added. No customers from Chelsea or Wyndtree testified about black water or provided any black water samples at this meeting. The lack of complaints about black water at this earlier meeting is not surprising, however, since most of the customers from Wyndtree and Chelsea who are experiencing black water problems have told staff that the discoloration appeared shortly after wells eight and nine were placed into service in December, 1995.

In its PAA recommendation, staff explained that the odor and various discoloration complaints which were received could be traced to the hydrogen sulfide, magnesium, manganese, and iron which are commonly found in Florida's groundwater supply. Staff noted that the cost of providing additional treatment to remove these substances would be expensive and would increase the customer's monthly charges. Staff also stated that it is possible that the level of odor and discoloration was more tolerable than the monthly price increase. Staff suggested that the utility would be well served if it surveyed its customers to determine if they would be willing to accept the present conditions in lieu of increased water rates. Staff is not aware of any attempt by Aloha to follow through with staff's suggestion that it conduct a survey which would have given the customers an opportunity to indicate

whether or not they would be willing to pay higher rates for better water quality.

Beginning in January, 1996, the Florida Department of Environment Protection (DEP) started to receive complaints about black water from Aloha customers within the Chelsea and Wyndtree areas of Aloha's Seven Springs water system. There are 436 homes in the Wyndtree area and 144 homes in Chelsea and it is staff's understanding that each of these homes has copper plumbing. Staff has observed black water coming out of the hot water side of the bathroom tubs and sinks and most of the customers have told staff that the black discoloration is worse on the hot water side. However, both in conversations with staff and through their testimony at the formal hearing, customers have indicated that the black water is sometimes observed on the cold water side. Many customers have also told staff that their clothes have been stained when washed in hot water. Unless the customer has been away from their home for an extended time, the water will usually become clear within two minutes. Even after the water clears, however, a black residue will remain in the tub which can only be removed by physically scrubbing it out.

Some customers in Wyndtree have told staff that the black water problem occurs frequently. Other customers within Wyndtree have told staff that they have never experienced a problem with black water. Several customers have told staff that, in response to a black water complaint, Aloha will come out and drain the home's hot water heater and flush the lines. The customers have indicated that this procedure works temporarily, but the problem will eventually recur.

Aloha has informed staff that during the past year, it has received black water complaints from 144 customers within Wyndtree and 44 customers within Chelsea. Representative Fasano has provided the Commission with copies of numerous letters by which Aloha is informed of customers who have complained to his office about black and/or "smelly" water. Since it is reasonable to assume that some customers have simply stopped complaining to Aloha about the discolored water, staff believes that the 188 customers who have complained to Aloha during the past year only indicates the minimum number of customers who are experiencing the black water problem. Staff believes that the number of homes in Wyndtree and Chelsea which are currently experiencing discolored black water problems is between 200-300, but cannot at this time provide a more specific estimate. As is discussed later in this issue, staff recommends that the utility should be required to survey its

customers in an effort to provide a better estimate of how many customers are experiencing problems with black water.

In response to the black water complaints, the DEP collected and analyzed samples of the black water from 16 homes within Chelsea and Wyndtree in March, 1996. The DEP's analysis indicated that the black substance was copper sulfide. Aloha and the DEP have each tested the water from wells 8 and 9 and the copper level in both of these wells was below detectable limits. Since Aloha's transmission and distribution system does not contain any copper, the copper sulfide must be formed by a reaction of sulfides with the copper plumbing inside of the customer's home.

As is the case for most of Florida's groundwater supply, hydrogen sulfide is present in Aloha's raw water. Sulfide is one of several different species of sulfur which can exist in water, depending upon the water's pH (a measure of the water's acidity or alkalinity). Currently, Aloha is converting (oxidizing) all of the sulfides which are present in its raw water supply into a sulfate by chlorinating the water. Sulfate is a form of sulfur which does not have a strong, unpleasant odor and does not react with copper piping to form copper sulfide. Aloha states that hydrogen sulfide has been successfully removed by chlorination at countless numbers of water facilities for decades. Many utilities under the Commission's jurisdiction also convert sulfides to sulfates by chlorination. Many other utilities in Florida, however, have also installed tray aerators to remove some of the sulfide from the water. Since this type of treatment typically removes only 50% of the sulfides, chlorination is then needed to oxidize the remaining sulfides.

Unfortunately, the sulfate can be converted back into a sulfide by sulfur reducing bacteria which are commonly found in small numbers in most water. Aloha's engineer has stated that this is the only mechanism by which the sulfates can be converted back into a sulfide after the water leaves the plant. Since these sulfur reducing bacteria thrive in very warm areas, such as the hot water heater, the number of bacteria is usually not sufficient enough to create hydrogen sulfide in cold moving water. However, if the water temperature is hot and/or the water is stagnant, such as in seldom used guest bathroom plumbing, the number of bacteria can be increased to very high numbers. When large numbers of sulfur reducing bacteria are present, relatively large quantities of sulfate can be converted back to sulfide which can then react with the copper plumbing and form copper sulfide. Sulfides can also form within a water system's transmission and distribution system. Staff is not aware of any evidence, however, which proves

that hydrogen sulfide is present within Aloha's transmission and distribution system.

Aloha could increase the level of chlorine in the system in an effort to better control the sulfur reducing bacteria population within the customer's home. The problem with increasing the chlorine concentration is that more trihalomethanes will also be formed. Trihalomethanes are formed by a reaction of chlorine with natural organics found in the water and are considered by DEP to be a primary contaminant. Aloha's engineer has told staff that Aloha had to lower its chlorine dosage rate in September, 1995 in order to keep the trihalomethane levels below the maximum contaminant level. Therefore, staff believes that increasing the concentration of chlorine in the water is not an option which Aloha can pursue and still remain in compliance with DEP's trihalomethane regulation. In fact, staff believes that the black water problem is more likely related to this change in Aloha's operation (lowering the chlorine levels) than was the placement of wells 8 and 9 into service in December, 1995.

Aloha has stated that the extensive use of home treatment units in the area has contributed to the overall problem of discolored water. The home treatment units can exacerbate the problem by removing chlorine from the water, thereby increasing the probability that the bacteria will multiply within the home and convert more sulfate to sulfide. The effectiveness of the corrosion inhibitor which Aloha has been adding to the system is also limited by the fact that some home treatment units may not allow the inhibitor to pass through them. The home treatment units also remove hardness and other minerals present in the water delivered to the home. When these minerals are removed from the water, the water becomes more aggressive and the rate of copper corrosion will increase. EPA's Lead and Copper rule states that it is inappropriate to sample for water quality results at any site which follows a home treatment unit, including the hot water heater. Through this rule, the EPA has recognized that home treatment units can alter the water's chemistry and make the water more corrosive. Therefore, no water utility in the state is required by DEP or EPA to provide water which will not react with copper piping after passing through a hot water heater or a home treatment unit.

Between July 24-26, 1997, staff contacted many customers within the Wyndtree and Chelsea service areas and found that the customers in this area continue to experience problems with black water. The customers have also informed staff that the black water problem has not improved since the hearing. Staff observed black

water coming out of the bathtub hot water faucets of 7 homes within Chelsea and Wyndtree. Two of these homes did not have any point-of-entry home treatment units. Staff has also contacted several customers who have experienced problems with discolored black water in the nearby Trinity, Woodgate, and Riviera subdivisions. Staff also observed as water was flushed from five fire hydrants in the Wyndtree and Chelsea subdivisions and did not notice any hydrogen sulfide odors or black water coming from any of these hydrants.

On August 26, 1997, staff received a copy of a master's thesis titled "Sulfide-Induced Corrosion of Copper in Drinking Water" from a representative of the Copper Development Association. This thesis was prepared by Sara Jacobs who was directed by Assistant Professor Marc Edwards at the University of Colorado. Staff believes that this thesis provides unbiased and relevant information about the black water problems similar to those being experienced in Chelsea and Wyndtree and has provided a copy to each of the parties involved in this case. One of the conclusions of the thesis is that once sulfide-induced corrosion problems are initiated, they are very difficult to stop. In Ms. Jacobs experiments, removing sulfides from the raw water, adding chlorine, and de-aerating water were not effective in mitigating the problem within a few weeks or months. The only effective treatment was physically removing the copper sulfide film by scouring the inside of the copper pipe. Several statements from this thesis which staff believes are relevant to the black water problem at Aloha are provided in Attachment 2.

Although staff believes that the question of how the black water (copper sulfide) is formed within the home has been satisfactorily explained, the question of why some homes experience the black water problem while other homes in the same neighborhood have never experienced the problem is perplexing. Aloha's engineer believes that, in addition to the homes having copper plumbing, the following conditions are generally present in the homes of affected customers:

1. The customer was not a large user of hot water or the home included a rather large capacity hot water tank.

2. An in-home water treatment unit (water conditioner) was present.

3. The customer's home was rather large and there were back bathrooms that received little use.

Staff has contacted, however, a home which has a family of five and does not have a home treatment unit, yet continues to experience problems with black water. At this time, staff is not aware of any explanation for why this customer continues to have a problem with black water. Staff is also aware of a home in Wyndtree where the customer has a point of entry home treatment unit and does not often use the back bathroom, yet has not experienced the black water problem.

Staff has been informed by DEP district staff in Tampa that it has not received complaints about black water from any other water utilities within Pasco County. Pasco County Utilities has stated that it has not received black water complaints. Staff has reviewed the customer complaint files from other PSC regulated utilities within Pasco County and found that the PSC has not received any complaints about black water for these service areas. A 1992 published study by Pinellas County (which is adjacent to Aloha's southern service area) and the University of Central Florida reported that customers of the Pinellas water system have experienced problems with black water.

Beginning in May of 1996, Aloha attempted to eliminate the discoloration problem by adding a corrosion inhibitor to the water. This treatment was required since DEP rules mandate that Aloha begin corrosion control treatment after it failed its first round of copper testing. Staff notes that DEP had to refer Aloha to the EPA in an effort to force Aloha to begin Lead and Copper sampling (EPA had primacy over Lead and Copper testing at the time). The three corrosion control treatments which are discussed in the Lead and Copper rule are alkalinity and pH adjustment, calcium hardness adjustment, and corrosion inhibitors. The corrosion inhibitor works by first stripping away the scale on the copper pipe inside of the customer's home and then laying a protective coating on the inner walls of the copper pipe. PH adjustment is also a common corrosion control measure and requires the addition of a chemical (lime, soda ash, and caustic soda are commonly used) to raise the water's pH. Increasing the water's pH reduces copper corrosion by allowing more calcium carbonate to form a protective scale on copper pipes. In October, 1996, the DEP stated that the effectiveness of Aloha's corrosion control program has yet to be demonstrated as this is a slow process and requires time.

In a July 24, 1997 letter to an Aloha customer, DEP noted that the black water problems developed after the construction and placement into service of wells 8 and 9 in the Wyndtree and Chelsea area during December, 1995. DEP also restated its position that Aloha continues to remain in compliance with all of its rules and

regulations, except for the Lead and Copper rule. Aloha did fail its first round of copper testing (sampled at the customer's tap) but remains in compliance with the rule since it began adding a corrosion inhibitor to the system. Aloha recently completed its second round of Lead and Copper sampling and is required to collect another round of samples before January, 1998. Aloha has stated, in its September "Water News" newsletter, that the copper level in these samples was 1.6 mg/L, the copper action level is 1.3 mg/l.

In a July 10, 1997 letter to Representative Fasano, DEP stated that it was going to convene a panel of experts to review Aloha's black water problem. The panel met, via telephone conference, on August 29, 1997. Although PSC staff has not yet received any written recommendations from this panel, DEP district staff have verbally informed staff that the panel indicated that pH adjustment could improve the situation.

Even though staff is not aware of any black water problems with other utilities in Pasco County, problems associated with copper corrosion have also been experienced by other water systems within the state. In some instances, copper corrosion causes discolored, black water. In many cases, the copper pipes fail and have to be replaced. As stated earlier, some customers of the Pinellas County water system have experienced black water problems. Staff has also been informed that some customers within Temple Terrace have experienced black water problems. One of the PSC's regulated utilities (Florida Public Utilities in Fernandina Beach) experienced problems with black water in two of its subdivisions in 1988. This utility addressed the black water problem by increasing the water's pH, keeping the customers informed about its efforts to fix the problem, and eventually making a commitment to its customers to replace failed copper piping.

On March 7, 1997, the Commission informed the Department of Community Affairs (DCA) of the copper corrosion problem (black water) which Aloha has experienced despite the fact that Aloha is in compliance with DEP's rules and regulations. The DCA is the state agency responsible for setting state building codes. Currently, the University of Florida has been contracted to investigate and provide recommendations to the DCA concerning the copper water tube corrosion problems which are being experienced in many of Florida's drinking water systems. In conjunction with the UF study, the DCA helped organize several meetings throughout the state in an effort to obtain more information about copper pipe failures. Staff has attended several of these meetings and learned that many homeowners, particularly in the Orlando area, have had to replace their copper plumbing at an average cost of $3,000.

One indication of the scope of the copper corrosion problem is the fact that 532 of the 2,102 community water systems in Florida failed their initial round of copper testing. Another indication is the fact that the Duval County Commission, in response to numerous complaints about copper pipe failures, passed an ordinance in 1995, prohibiting the use of copper piping in new residential construction within Duval County.

On September 15, 1997, Aloha's customers received a newsletter from Aloha informing them that the Commission is considering requiring that Aloha construct facilities which will increase their rates. The customers were encouraged to inform the Commission about whether they believe additional water treatment is necessary. A copy of this newsletter is provided at the end of Attachment 1. The Commission's Division of Consumer Affairs began tracking the number of customers who called the Commission after this newsletter was distributed. As of this date, the Commission has received 77 calls about Aloha. Thirty-six of these customers stated that the water quality was satisfactory and no improvements were needed. Twenty of those who called stated that the water quality was unsatisfactory.

Since September 15, 1997, 99 customers have written the Commission a letter to express their opinion about this case. Twenty-seven of these customers indicated that the water quality was satisfactory; twenty indicated that the water quality was unsatisfactory. Forty-seven of these customers indicated that Aloha should be allowed to continue adding the corrosion inhibitor. Four customers indicated that Aloha should be required to build additional water treatment facilities.

II. Analysis of Each Quality of Service Problem

As stated earlier, staff has divided each of the quality of service problems into three categories: A. Discolored Black water, B. Odor and Pressure Problems, and C. Customer Relations and Service Issues. Each of these categories are discussed below.

A. Black Water

Staff believes that there are five main options which are available to reduce or eliminate the formation of black water.

1. Continue adding the corrosion inhibitor and varying the dosage rates.

2. Construct water treatment facilities which remove hydrogen sulfide.

3. Cease pumping water from wells 8 and 9.

4. Increase the water's pH.

5. Change the plumbing inside of the home from copper to a material (CPVC) which will not react with the water.

In the discussion which follows, staff describes each option as well as the advantages, disadvantages, and estimated cost of each option. Attachment 3 briefly summarizes these advantages, disadvantages, and costs.

Option 1: Continue the addition of the corrosion inhibitor

In April, 1996, Aloha began adding a corrosion inhibitor to the system. Addition of the corrosion inhibitor was required because the utility failed its first round of copper sampling. The corrosion inhibitor works by first stripping the unwanted copper sulfide scale (this scale is not the protective calcium carbonate scale) from the customer's copper piping and then coating the inside of the pipe. Aloha continues to maintain that continued injection of this chemical could eventually eliminate or reduce the black water problem in homes which do not have home treatment units. Between April, 1996 and May, 1997 Aloha spent $38,000 for the corrosion inhibitor, representing an annual expense of $35,000.

Aloha states that it has conducted tests which prove that the corrosion inhibitor has reduced the copper levels inside of several customer's homes and has also reduced the number of discolored water complaints by one third. Aloha adds that additional fine tuning of the system must continue in order to further reduce the copper levels. None of the homes which Aloha included in this second round of copper testing, however, were located in either Wyndtree or Chelsea. These homes were excluded since they do not meet the EPA's criteria for the selection of homes in which to collect water samples for Lead and Copper testing. This criteria states that the homes which are sampled must have used lead solder inside the home and/or have lead service lines.

DEP and EPA rules require that Aloha continue adding the corrosion inhibitor to the system. The principle advantages of continuing to implement only this option is that it is inexpensive and the treatment facilities are already in place. It has been more than a year since the utility began adding the corrosion

inhibitor to the system, however, and the customers have told staff that the problem has not improved. The presence of home treatment units may be part of the problem, but staff is aware of several homes which do not have home treatments yet still continue to have recurring problems with black water.

Option 2: Construct Water Treatment Facilities to Remove Hydrogen Sulfide

Aloha evaluated several treatment alternatives for the removal of hydrogen sulfide from the water. Aloha recommends that if treatment for hydrogen sulfide is required, then the construction of three central water treatment plants with Packed Tower Aeration (PTA) facilities is the treatment alternative which should be approved. Aloha selected the Packed Tower treatment process since it can remove 95% of the hydrogen sulfide which is present in Aloha's raw water supply compared to the 50% removal efficiency of tray aerators. Since small amounts of hydrogen sulfide can cause black water problems, Aloha recommended that tray aeration would not be a suitable treatment to eliminate black water. Aloha estimates that construction of PTA at three plants will increase a customer's water bill for 6,000 gallons from $14.74 to $58.75 or 3.98 times the current rate. A detailed breakdown of the capital costs associated with Aloha's proposal is provided in Attachment 4.

Aloha has also proposed the construction of other facilities in addition to the PTA treatment process. This includes the addition of 2,000,000 gallons of storage and pumping facilities, the use of ozone as the primary disinfectant instead of chlorine, auxiliary power generators for each plant, new supply wells, relocation of two existing wells, and modifications to the transmission and distribution system which will improve system pressure during peak demand periods. The cost of these facilities is also provided in Attachment 4.

Even though the three plants will supply adequate capacity for projected customer growth through 2015, Aloha's calculation of a 398% rate increase does not include any used and useful adjustments. Staff has calculated that application of a 70% used and useful adjustment to Aloha's treatment facilities would lower the rates of customers who use 6,000 gallons of water from the utility's estimate of $58.75 per month to $53.37 (which would still be a 362% rate increase over the current $14.74 per month charge for 6,000 gallons). The 70% used and useful percentage is only a estimate and is entirely based upon demands which Aloha has provided in its engineering report, not the actual flow data which the Commission typically uses in a rate proceeding. Aloha could

request approval of an AFPI charge which would allow it to recover the carrying costs associated with non-used and useful plant from future connections. Aloha's impact charges for new customers would also have to be increased.

Staff believes that Aloha might avoid any used and useful adjustments for its treatment facilities by constructing only the Mitchell Road plant and the Wyndtree plant. Staff has calculated, using Aloha's estimates, that the construction and operation of only these two plants would increase the monthly bill for 6,000 gallons of water from $14.74 to $48.90 (a 332% rate increase). Staff's calculations are provided in Attachment 5.

The chemical expense associated with the Packed Tower Aeration treatment process is significant. Before the water enters the aerator, chemicals must be added to lower the water's pH; after the water leaves the aerator, additional chemicals are then needed to stabilize the water's alkalinity and recarbonate the water. Aloha has estimated that the yearly chemical expense for three treatment plants would be $2,076,890. This chemical expense could be reduced but the hydrogen sulfide removal efficiency would also be lowered. Another significant expense associated with this process is for labor.

To specifically address the black water problem in the Wyndtree and Chelsea areas, staff believes that construction of only the Wyndtree plant will reduce the amount of sulfur which is entering the Wyndtree area. Staff believes that lowering the sulfur levels will eventually decrease the amount of copper sulfide which is formed in the home. The Jacobs thesis does indicate, however, that construction of hydrogen sulfide treatment facilities will not reduce the elevated rate of copper corrosion in homes which have previously experienced the black water problem (even though the formation of the black corrosion by-product should be significantly reduced or eliminated). The only remedial action which Jacobs found was effective in reducing the copper corrosion rates was physically removing the black film, which is impractical for home plumbing.

Aloha's engineer believes that the construction of any one of the proposed facilities, without the other two, will not have any beneficial effect on the resolution of the various water quality concerns. Aloha's engineer argues that, since the Seven Springs water transmission and distribution system is a looped system, the benefits of removing the hydrogen sulfide by one plant would be negated by the intermixing of the highly treated water from the older facilities. Since the Wyndtree and Chelsea subdivisions are

much closer to the Wyndtree plant than the Mitchell Road plant, staff believes that the amount of lesser treated water which would reach Chelsea and Wyndtree is insignificant. Staff has estimated that constructing this one plant could increase Aloha's water bill for 6,000 gallons from $14.74 to $31.74 (a 215% rate increase).

Aloha's engineer has also repeatedly expressed his concern that construction of the Packed Tower Aeration (PTA) facilities will not eliminate the black water problems. As support for this position, Aloha has referenced the Sara Jacobs thesis. Staff has discussed Aloha's problem with Professor Edwards who indicated that, in his opinion, treatment which lowers the amount of sulfur in the system should eventually reduce the amount of corrosion by-product (black water). Professor Edwards indicated, however, that it would take at least a year before the problem would improve.

Mr. Porter has also noted that the PTA treatment process will significantly increase the dissolved oxygen level of the water. Research has been done which indicates that a higher dissolved oxygen level in the water will result in a higher rate of copper corrosion. Jacob's research indicates that, for sulfide induced copper corrosion, the presence or absence of oxygen was more important than the dissolved oxygen concentration.

Aloha has submitted a project schedule which indicates that the three plants would be completed by September, 2000. One of the first tasks of the project would involve the construction of a pilot plant at a cost of $340,000. Staff emphasizes that this pilot plant would only allow Aloha to provide more accurate cost estimates and determine whether de-gasification and corrosion control chemicals will be needed. This pilot plant would not provide water to any of Aloha's customers. Representative Fasano indicated, in a August 1, 1997 letter to staff, that he favored proceeding with the construction of a pilot plant.

Option 3: Stop pumping water from wells eight and nine

The number of black water complaints dramatically increased shortly after wells 8 and 9 were placed into service in December, 1995. Given this fact, it appears reasonable to assume that the black water problem may be eliminated if these wells were shut down.

If Aloha were ordered to stop pumping from wells 8 and 9, then the utility would be forced to purchase water from Pasco County through the existing 6" Pasco County interconnect. This interconnect can deliver water at the rate of 1,800 gallons per

minute and serves as Aloha's emergency water source. Since wells 8 and 9 are each permitted to produce an average of 500,000 gallons of water per day and the Pasco County bulk water rate as of October, 1997 will be $1.99 per thousand gallons, staff estimates that Aloha could incur an annual purchased water expense of $725,000 to supplement the water which would no longer be pumped from wells 8 and 9.

Aloha believes that this option will not eliminate the black water problem since the average amount of sulfates present in Pasco County's water is 25 mg/l, compared to the 17 mg/l sulfate concentration produced by well number 9 and the 8 mg/l produced by well number 8. Since we are trying to reduce or eliminate the copper sulfide by reducing the amount of sulfate which is present in the system, staff agrees that it would not be logical to replace wells 8 and 9 with a water source which has more sulfates. As was discussed earlier, staff believes that the black water problem could also be related to the fact that chlorine levels were lowered in September, 1995 in an effort to reduce the formation of trihalomethanes.

Staff is also concerned that shutting down wells 8 and 9 may result in pressure problems in the southern part of Aloha's territory (the area surrounding Wyndtree) since wells 8 and 9 are the only sources of water in this area. These wells were originally constructed to improve the pressure in the Wyndtree and Chelsea areas.

Option 4: Adjustment of the pH

PH adjustment is a corrosion control treatment which has been successfully utilized throughout the country and is one of the EPA approved treatments for corrosion control. The Pinellas County water system, which Aloha has modeled its Packed Tower Treatment process after, uses pH adjustment and corrosion inhibitors to control corrosion. Pasco County uses pH adjustment to control corrosion. Florida Public Utilities in Fernandina Beach is a FPSC regulated utility which also utilizes pH adjustment to control corrosion. The panel of experts which DEP convened indicated that pH adjustment is a treatment option which should be considered. Sara Jacobs also observed that the amount of corrosion by-products (black water) was reduced at a higher pH.

Aloha's engineer has told staff that it would be difficult for Aloha to begin pH adjustment since Aloha's water is supplied from up to eight different water sources and each source would need to be similarly adjusted. Mr. Porter stated that once the water left

the plant it would be difficult for the utility to keep the pH stable in the transmission and distribution system. Mr. Porter also stated that the chemicals which would be needed for pH are dangerous and difficult to handle. Mr. Porter also stated that the cost of pH adjustment would be significant but he would need additional time to provide staff an estimate of the cost.

Staff realizes that the chemicals used for pH adjustment will be difficult to handle, but does not believe that this is sufficient reason to exclude this treatment from consideration. Staff has discussed pH adjustment with a representative from Florida Public Utilities who indicated that this type of treatment is not expensive. Staff believes that the capital costs for this treatment option would be a small amount for chemical feed equipment and some additional safety equipment. The primary expense, as is the case for the corrosion inhibitor, would be the chemical cost.

Option 5: Replumb with CPVC the homes of customers who are experiencing black water problems

Since copper sulfide is created when the copper piping inside the home reacts with sulfides which are present in the water, the removal of one of the elements that form the compound will eliminate the problem. CPVC is a plumbing material which will not react with any sulfides which may pass through it. Therefore, staff is convinced that replacing the copper pipes with CPVC will eliminate the problem with black discolored water. Staff has learned that the average cost of replumbing a home with CPVC is $3,000. Homes which are larger, such as those found in Wyndtree and Chelsea, would cost more to replumb.

This option will also eliminate the black water problem in homes which have home treatment units. Since the copper plumbing within a home can usually be replaced in approximately two days, this option will eliminate the problem quicker than any of the other options. The primary limitation of this option is that it will not eliminate the hydrogen sulfide odor which is present in these homes. Another disadvantage of this option is the significant expense to the individual homeowner.

Aloha has stated that new homes in the Trinity area are being constructed with CPVC. Staff is not aware of any black water complaints from homes in the Trinity subdivision (adjacent to Wyndtree) which have CPVC plumbing. Staff recommends that Aloha should take whatever action is necessary to ensure that builders and plumbers in its service area are aware of the problems which

many of its customers have experienced with copper plumbing. Staff recommends that Aloha should include language in future developer agreements which notifies the developer that homes with copper plumbing have experienced problems with black water (copper sulfide) and encourages the developer to use CPVC instead of copper.

BF Goodrich, a manufacturer of CPVC, agreed to pay for the cost of replacing with CPVC the copper piping of a customer in Wyndtree who is experiencing the black water problem. If, as expected, this is successful in eliminating the black water in this home, then customers will have a proven option which will quickly eliminate the problem in their home. The CPVC was installed on September 29, 1997, and the customer has told staff that no black water has been observed since the CPVC was installed. The customer believes and staff agrees that more time (six months) is required before any claim can be made that replacing the copper plumbing with CPVC has permanently eliminated the black water problem inside the home.

Conclusion

Since the copper sulfide is forming on the customer's side of the meter and the water meets federal and state drinking water standards, Aloha has taken the position that it is not responsible for the black water problem. Staff believes that Aloha does have an obligation, however, to provide additional treatment to correct the black water problem if it is economically feasible and there is a reasonable expectation that the treatment will help reduce or eliminate the problem.

Aloha recommends that it be allowed to address this problem by continuing to add only the corrosion inhibitor. Since the Lead and Copper rule requires that Aloha continue adding the corrosion inhibitor to the system, the question of whether this option should be continued is moot. Aloha still believes that this option will eventually reduce the formation of copper sulfide inside the homes of customer's who do not have home treatment units. Since many customers (including some who do not have home treatment units) are still experiencing the copper sulfide problem over a year after the introduction of the corrosion inhibitor, staff is not convinced that this treatment approach will be effective in eliminating the black water problem.

The option of constructing three treatment plants to remove hydrogen sulfide (ensuring that no intermixing of lesser treated water) is expensive (a $4,203,143 increase over present annual

revenues) and staff estimates that (after adjusting for used and useful considerations) the water rates for all 8,000 of Aloha's Seven Springs water customers would still increase by 332%. Aloha also estimates that no treatment facilities will be placed into service before September, 2000. As stated earlier, staff believes that after these facilities are placed into service it will take at least another year before the situation improves. Therefore, implementation of this option would not reduce or eliminate the black water problem before 2001. The research which staff has reviewed also indicates that even if the black discoloration is eliminated or reduced by construction of the hydrogen sulfide treatment facilities, the elevated rate of copper corrosion in homes which have experienced this black water problem will not be reduced. Since the cost of this option is high, the time lag before any improvement would be provided is four years, and the rate of copper corrosion will not be reduced, staff does not believe that it is appropriate to require that Aloha build three PTA treatment facilities to specifically address the black water problem.

Since the cost of building and operating three plants is significant, staff also evaluated the option of building only one plant near Wyndtree. Staff has calculated that construction of only the Wyndtree plant would increase the water rates for all 8,000 of Aloha's customers by 215% (a $1,849,352 increase in annual revenues). As stated earlier, staff disagrees with Aloha's contention that construction of only one plant in Wyndtree would not improve the black water problem. Staff would agree, however, that customers in the northern end of Aloha's service area would receive little of the higher treated water from the Wyndtree plant. Therefore, if only one plant was constructed many customers would be paying higher rates for no improvement in their water quality. Based on this concern as well as those raised in the prior paragraph, staff does not recommend that Aloha be required to construct only one hydrogen sulfide treatment facility near Wyndtree in an effort to eliminate the black water problem.

Staff also does not recommend that Aloha be ordered to stop pumping water from wells 8 and 9. As discussed earlier, the sulfate level in Pasco County's water is higher than that which is currently found in wells 8 or 9. Staff agrees with Aloha that replacing wells 8 and 9 with a source of water which has more sulfates will not eliminate the black water problem. Since these wells were originally placed into service to improve pressure in the Wyndtree area and the Pasco County interconnect is located several miles north of Wyndtree, staff is very concerned about the possible reduction in water pressure.

Staff recommends that Aloha should be required to immediately begin planning for pH adjustment. The Jacobs study indicates that pH adjustment could reduce the amount of discoloration which is being experienced by the customers. Staff has been informed by DEP staff that its panel of experts believe that pH adjustment is an option which could improve the problem. Although staff does not, at this time, have a specific estimate for the cost of this option, staff believes that the cost would be comparable to the corrosion inhibitor.

Staff believes that for those customers who continue to experience severe, recurring incidents of black water, repiping their home with CPVC is the best available option to quickly eliminate the formation of copper sulfide. As discussed in Issue 2, however, staff does not believe that it would be appropriate to require that Aloha pay for replumbing homes which have black water. Therefore, the homeowner would have to pay for the replumbing expense.

While it may appear unfair to take the position that the individual customer will have to incur the replumbing expense, staff believes that it would be equally unfair to require that Aloha build treatment facilities which, depending upon the option selected, would double or triple the rates of all 8,000 of Aloha's current customers in an attempt to specifically address the problem of discolored black water in 200-300 homes. Also, the presence of copper sulfide is an indication of a severe copper corrosion problem inside the home which will eventually cause the copper pipes to fail. Even though staff is not aware of any copper pipe failures in the Wyndtree area, Jacobs calculated that the pipes could begin to fail in as little as eight years after the initial appearance of the copper sulfide. Therefore, it is likely that this replumbing expense will be incurred whether hydrogen sulfide treatment is constructed or not.

In formulating its recommendation that replacing the copper pipes with CPVC is the most economical and quickest option for eliminating the black water problem, staff is not suggesting that any party is responsible for the problem. That is a question which is the jurisdiction of the courts. Staff is attempting to inform the customers of the only option which will quickly eliminate this unfortunate problem and also prevent a copper pipe failure from causing damage to their home in the future. Staff is also not stating that any treatment option should be excluded from consideration. In fact, staff has recommended that Aloha should be required to begin adjusting the pH adjustment in an attempt to reduce the level of discoloration. Staff is not aware, however, of

any remediation techniques (economical or not) which will effectively reduce to acceptable levels the elevated copper corrosion rate in homes which have experienced black water problems.

B. Odor and Pressure Problems

Many customers have complained about the odor of the water as well as the water pressure. Staff believes that Aloha's proposal to construct three central water treatment plants with PTA and ozonation facilities will significantly improve the water's odor and taste. The additional 2,000,000 gallons of storage and transmission and distribution system modifications will allow Aloha to maintain higher system pressures during peak demand periods. None of these facilities, which could increase the rates by up to 398%, are required by any current DEP or EPA regulation.

Staff believes that a cheaper treatment option is available which will remove 50% of the sulfur from the water and should also improve the odor and pressure problems. This option consists of constructing the three central plants with simple tray aerators on top of each storage tank, instead of PTA and ozonation treatment facilities. This option not only has a lower capital cost, but also has lower operation and maintenance costs than the option which Aloha has recommended. Staff has estimated that this option could increase the rates by 178%.

Aloha's engineer has expressed his concern to staff that simple tray aeration would increase the water's dissolved oxygen level and could result in even more discoloration problems in other areas of Aloha's service territory. Staff notes, however, that many systems under the Commission's jurisdiction have successfully implemented this type of treatment yet have not experienced serious discoloration problems.

Staff still believes that the level of odor and discoloration may be more tolerable to a majority of the customers than the estimated 398% monthly price increase which would result from constructing the PTA and ozonation facilities or even the 178% increase of the cheaper simple tray aerator alternative which staff has already discussed. Since none of these facilities are required by any government mandate and will significantly increase Aloha's rates, staff recommends that Aloha should be required to survey its customers and attempt to find out if the customers are willing to pay higher rates for better water quality and how much of a rate increase would be tolerable to the customers. Staff also recommends that this survey should attempt to determine how many

customers in the Wyndtree, Chelsea, Riviera, Oldgate, Trinity, and Woodgate subdivisions are experiencing problems with black discolored water. Staff further recommends that the survey should be approved by staff before being sent to the customers.

C. Customer Relations and Service Issues

As discussed in this recommendation, customers have legitimate concerns over the quality of water and the impact it has had on their homes and lives. Aggravating this situation is the poor attitude of Aloha's employees as described by customers at the hearing. (TR 110, 129, 354, 375, 391, 412) They believe that Aloha is not interested in improving the water quality and only pay lip service to their repeated complaints. (TR 411) Customers also testified that Aloha's representatives acted like they were the only ones who were complaining about water quality problems. (TR 143, 148, 395)

Fifty-seven customers presented testimony about Aloha's quality of service. Several of the customers who testified represented various customer groups and spoke for a number of people. It is obvious that the customers are dissatisfied with the quality of water which Aloha is providing, have been unhappy with the water for several years, and do not trust the utility. Eleven customers cited instances of what they perceived to be rude treatment by utility personnel.

In addition to the numerous complaints which were received at the customer meetings, Aloha's customers have written the Commission several hundred letters which have been placed into the docket file.

Conclusion

Staff believes that Aloha has been operating under the assumption that the water quality problems are not as serious as the customers would have the Commission believe. The customers do not appear to trust Aloha and believe that the utility is not interested in improving the water quality. The utility did not help the situation when it refused to allow a consultant, hired by the customers, access to Aloha's raw water supply so that independent tests could be done. (EXH 6) This attitude is to a large degree responsible for the poor relationship the utility has with its customers. Staff realizes that the customers are frustrated with Aloha's persistent water quality problems and, absent a solution to water quality problems, utility

representatives will be perceived as the enemy by many customers.

Presently, Aloha has a full time employee whose responsibility is to handle customer complaints. Additionally, it has in place a complaint tracking system and based upon discussions with individual customers, appears to respond to complaints in a timely manner. While customer testimony has indicated instances of discourteous treatment to some customers, it is difficult at this time to isolate specific problems for corrective action due to the overriding impact of the water quality problems. As noted herein, addressing and correcting the water quality problems will require a commitment by utility management. Absent such commitment, utility personnel who deal directly with customers can only treat the symptoms of the recurring problem which can only add to the deteriorating relationship between customers and utility personnel.

At this time we believe that the water quality problem is the "black cloud" which is dominating customer relations. Absent a solution to this problem, we believe any Commission ordered corrective action to Aloha's present complaint handing procedures would be fruitless at this time. However, we believe Aloha should be put on notice that a courteous response to customer concerns is expected and we will specifically explore this issue in future proceedings.

One step which Aloha could take to improve customer relations would be to pay the up-front cost of replacing the plumbing within the home of customer's experiencing black water problems and who cannot or are unwilling to pay the entire cost at one time. Aloha could then add the replumbing cost to the monthly bill, allowing the customer to spread the expense over a longer time period. If Aloha agreed to do this, then staff believes that, in a future water rate proceeding, it would be appropriate to allow Aloha to recover all of the carrying costs associated with this replumbing expense from all of the customers. As is discussed in Issue 2, however, staff has acknowledged that the Commission does not have the authority to require that Aloha take this action.

ISSUE 2: Should the Commission require Aloha Utilities, Inc., to replace any piping or plumbing on the customer's side of the meter?

RECOMMENDATION: No, the Commission lacks the statutory authority to require such action because the Commission's jurisdiction appears to end at the customer side of the meter. (CROUCH, JAEGER)

STAFF ANALYSIS: Staff believes that the quickest, cheapest, and most certain solution for the copper sulfide problem is the replumbing of each individual house with CPVC pipe. However, staff does not believe that the Commission has the authority to order the utility to take such action.

Section 367.121(1)(d), Florida Statutes, states that the Commission shall have power to require repairs, improvements, additions, and extensions to any facility. However, Commission Rule 25-30.231, Florida Administrative Code, provides in pertinent part:

> Each utility, unless specifically relieved in any case by the commission from such obligation, shall operate and maintain in safe, efficient and proper condition all of the facilities and equipment used in connection with . . . the distribution, regulation, measurement and delivery of water service to the customer up to and including the point of delivery into the piping owned by the customer. (Emphasis supplied)

This rule recognizes that neither the utility nor the Commission has authority over nor can be responsible for what sort of plumbing a customer or builder may choose to use. This is up to the builder and the local building codes. Staff does note that Duval County, where there is also a problem with hydrogen sulfide in the water, has banned, by ordinance, the use of copper piping in plumbing. However, Pasco County, like many other counties, has not. The utility cannot control the type of plumbing chosen by a developer/builder. Also, the type of plumbing is not controlled by tariff and is not covered by Section 367.011, Florida Statutes, and within the purview of this Commission.

The Commission is a creature of statute and must look entirely to the statute for its authority. A reasonable doubt as to a power must be resolved against exercise thereof. Florida Bridge Co. v. Bevis, 363 So. 2d 799 (Fla. 1978). Section 367.121, Florida Statutes, sets forth the powers of the Commission. Staff has

reviewed that section and can find no provision which would either allow the Commission to order replacement of private plumbing or assess damages. Therefore, even if the Commission were to find that Aloha was at fault in delivering water that damaged the pipes of the customers, staff does not believe that the Commission has either the power to assess damages or to order the replacement of private property. (See also, Southern Bell Telephone and Telegraph Co. v. Mobile America Corporation, Inc., 291 So. 2d 199, 202 (Fla. 1974)).

Staff does note that the Commission has required utilities, when making repairs to its property in an easement, to leave the area much as it found it. Also, there has been some question about the placement of back-flow preventer devices and the responsibility of the utility (See Docket No. 910963-WS). In that docket, the Commission found that it was up to the customer to retain a certified technician to perform inspections and maintenance of back-flow preventer devices. However, staff is not aware of any cases where the Commission has ever required a water or wastewater utility to make repairs inside a home.

For electric utilities, Commission rules require that the utility is only responsible for wiring up to the point of delivery (usually the meter) and the customer is responsible for all facilities on their side of the point of delivery. One exception to this rule is for conservation programs where inside wiring is necessary. For telephone utilities, Commission rules require that the utility is only responsible for network wiring up to the point of demarcation as defined by Commission Rule 25-4.0345(1)(b), Florida Administrative Code.

Based on the above, staff does not believe that the Commission has the authority to order Aloha to replace the plumbing or piping on the customer's side of the meter.

EXH 27

SEP 30 1996
Department of Environmental Protection
SOUTHWEST DISTRICT

Florida House of Representatives

MIKE FASANO
REPRESENTATIVE, DISTRICT 45

8217 Massachusetts Avenue
New Port Richey, FL 34653
813-848-6585

316 House Office Building
Tallahassee, FL 32399-1300
904-488-8128

September 27, 1996

Dr. Richard Garrity, Director of District Management
Florida Department of Environmental Protection
3804 Coconut Palm Drive
Tampa, FL 33619

Dear Dr. Garrity:

As you know, the Public Service Commission held a series of public hearings regarding Aloha Utilities in Pasco County earlier this month. At these hearings hundreds of Aloha Utilities customers came out to express their displeasure at the poor quality of water and service they receive from that utility. In addition to the scores of residents who spoke to the Commission, dozens of samples of dirty, black, and smelly water were presented.

An employee of the Department of Environmental Protection testified before the Commission that the water tests completed on Aloha's product consistently meet state standards. The same employee declined an invitation to drink from the water samples offered as exhibits. It is a great concern to me that such poor quality water is being served to customers of Aloha Utilities, while reportedly meeting state guidelines. Aloha Utilities has consistently maintained the posture that the dirty water is a result of customer pipes and hot water heaters. I believe that the public hearings clearly demonstrated that the problem originates from the utility and not the customers' homes. I respectfully request that your Department conduct spot checks on Aloha Utilities' water without giving the utility any advance warning.

I would greatly appreciate your consideration of this request. As always, if there is ever anything I can do for you please do not hesitate to call on me.

Yours truly,

Mike

Mike Fasano
State Representative, District 45

MF/gg

cc: Presidents of Seven Springs Service Area Community Associations

COMMITTEES: Education · Finance & Taxation · Governmental Operations · Insurance · Regulated Industries

EXH 28

Department of Environmental Protection

Lawton Chiles
Governor

Southwest District
3804 Coconut Palm Drive
Tampa, Florida 33619

Virginia B. Wetherell
Secretary

October 14, 1996

Mike Fasano, State Representative, District 54
8217 Massachusetts Ave.
New Port Richey, FL 34653

Re: Water Quality Issues - Aloha Utilities, Inc.

Dear Mr. Fasano:

Thank you for bringing your concerns to my attention.

The Drinking Water staff of the Southwest District office have been involved in water quality complaints (water discoloration) for the above mentioned utility since January of this year. We have since, on an unprecedented effort to help in the solution of this problem, appeared at different forums including the Public Service Commissions meeting, collected and analyzed samples, coordinated with other entities like the West Coast Regional Water Supply Authority laboratory personnel and consulted with in-house staff as well as outside consultants and industry representatives.

To this point, the result of this investigation indicates that the utility is in compliance with all water quality standards in our rules and regulations except for copper. Additionally, there is no indication of a health risk associated with this discoloration, however, it is aesthetically unpleasant. The utility has initiated a corrosion control program, which consists of the addition of a corrosion inhibitor in their distribution system, to reduce copper concentration below the rule's action level. The effectiveness of this program has yet to be demonstrated as this is a slow process and requires time. By initiating this program, the utility is considered to be in compliance with our rules and regulations. The only reason the Department's employee declined to drink the water samples offered as exibits was because of their unknown orgins (i.e. hot water heater, toilet bowl, etc.).

In an extra effort to help we are planning to gather additional information and schedule meetings with the utility on a continuous basis until the problem cease to exist. These meetings will explore every possible alternative and solution to the problems. Hence, we cannot honor your request to conduct spot checks without utility notification.

Please rest assure that like you, we believe that the safety, health and welfare of the residents in our state is of the utmost importance. If you have any questions or need additional information, please call me at (813) 744-6100, ext. 352.

Sincerely,

Richard D. Garrity, Ph.D.
Directory of District Management

RDG/prr

cc: Michael S. Hickey, P.E.

FROM 08.12.1997 14:38

David W. Porter, P.E., C.O.
Water/Wastewater System Consultant

Regulatory Assistance, Troubleshooting, Permitting, Contract Operation, Rehabilitation and System Design

November 12, 1996

Mr. Gerald B. Foster
Department of Environmental Protection
Southwest District
3804 Coconut Palm Drive
Tampa, Florida 33619

Re: Aloha Utilities, Inc.
Seven Springs and Aloha Gardens Water Systems
PWS ID #6512214 and PWS ID #6510050
Corrosion Control Implementation

Dear Gerald,

Thank you for meeting with Steve Watford and me one week ago last Friday to discuss the above referenced project. As we discussed during that meeting, I have prepared this letter to outline the procedure which my client, Aloha Utilities, Inc., plans to follow to comply with the Department's lead and copper rules.

At our meeting we related to you that ever since we implemented the corrosion inhibitor chemical addition we have frequently changed the rate at which we have dosed the inhibitor chemical in an attempt to relieve the discolored water problem that is being experienced in a small localized area within our service area. Consequently, we can not consider the corrosion control system to be optimized at this time. In fact, the technical director of the manufacturer of the corrosion inhibitor chemical, Mr. Bill Mersch of Stiles-Kem, has recently stated that we may need to further fine-tune the dosage of the chemical to further reduce the severity of the discolored water problem. Mr. Mersch plans to meet with us on December 4, 1996 to review the data, tour the system and further provide us with fine-tuning assistance.

As we discussed, and you agreed, we are not in a position at this time to submit WQP or lead and copper tap samples for your approval and your determination of optimum conditions as we feel that if we were to sample today, the inhibitor dosage values that we report may be higher than those that we will be able to apply in the future and still control the discolored water problem. After we have completed fine tuning the corrosion inhibitor dosage we hope to be in a position to be start compliance testing. Presently, we plan to begin WQP entry point testing in January 1997 and WQP tap and first round lead and copper tap sampling in June 1997.

Another problem that we related to you during our meeting Friday was that we have recently learned that many of the lead and copper tap sampling sites identified in our approved sampling plan may have home water treatment systems that are materially effecting the corrosion inhibitor chemical's efficacy. We agreed that we would preform a survey to determine which test sites had these home treatment units and that we would remove these sites from our sampling plan. If the number of units removed from the plan is great enough to reduce the number below the number required, we will select new sites and provide you with an update to the plan.

PCHD//Foster_11-6-96 WPD//pcs//via fax & U.S.

[illegible] Road • Suite 210 • Orange Park, FL 32073 • Phone: 904-269-6773 • Fax: 904-269-3667 • Pager: 904-645-2048 • E-Mail: potomac@jaxinternet.com

END

Hopefully, we will be able to complete our two six month WQP and lead and copper tap sampling monitoring periods before the January 1998 deadline by which we were to have these tasks accomplished.

Gerald, thank you for the help and guidance you have provided to my client and me during this project. If you have any questions, please call me.

Sincerely,

David W. Porter, P.E., C.O.
Water/Wastewater System Consultant

cc: Mr. Stephen Watford, V.P./AUI

David W. Porter, P.E., C.O.
Water/Wastewater System Consultant

Regulatory Assistance, Troubleshooting, Permitting, Contract Operation, Rehabilitation and System Design

February 17, 1997

Florida Public Service Commission
2540 Shumard Oak Boulevard
Tallahassee, Florida 32399-0873
Attn: John M. Starling

Re: Aloha Utilities, Inc.
Seven Springs Water and Wastewater System
FPSC Docket Numbers 950615-SU and 960545-WS

Dear John,

I have reviewed the Staff Recommendation for the above-referenced docket which calls for a report, based on my testimony at hearing, evaluating alternative methods of treatment to remove additional hydrogen sulphide (H_2S). I would like to outline the scope of this report, given the limited time frame allowed for its completion, discussed at the hearing and in the Recommendation.

As I stated at hearing, I believe that retrofitting each of the existing Seven Springs water facilities to include additional H_2S reduction process units will prove to be costly and not prudent. Assuming USEPA and FDEP rule changes as expected, the ultimate consolidation of the treatment facilities into one or two major plants will be the most cost effective solution. Consolidation is already a part of the Utility's long term water system plans. A complete engineering analysis and master plan of the Seven Springs Water System would take significantly longer than 90 days. However, I believe that even the limited scope report called for by the Staff Recommendation should address this consolidated approach on a preliminary basis and point the way to a long term solution; not just a quick fix attempt. After this preliminary report has been prepared, the Commission and the customers should have a better indication of the degree of system modifications and the associated "round dollar" costs that will be required remove additional H_2S. The report will also provide an explanation of the impacts of recommended improvements on other aspects of the water chemistry; the pros and cons of H_2S removal; and what should be done, if anything, beyond the corrosion control program currently underway.

Because of the limited time frame allowed, this report will only include a limited analysis of the upgrade requirements for the Seven Springs Water System and provide "ball-park" cost estimates to allow for narrowing down the options available. Afterward, detailed analysis of the most feasible option can be undertaken. No detailed engineering study; facility design; land requirement determination and cost estimates for same; distribution system modification analysis, design or cost estimates; can be completed within the time allowed.

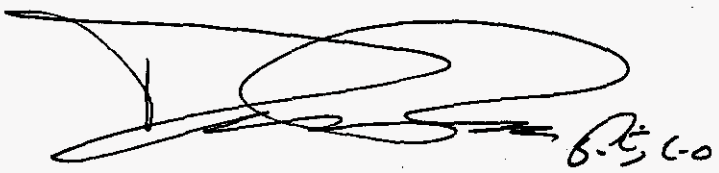
PCHD//Starling_60 day report//proj/via fax and U.S.

357 Wells Road • Suite 226 • Orange Park, FL 32073 • Phone: 904-269-6773 • Fax: 904-269-3667 • Pager: 904-645-2048 • E-Mail: porterpe@southeast.net

I am concerned that the intent of the Recommendation was beyond what I have described above. If I am correct, then I will have a problem completing the report within 90 days, and I ask that you please advise me and Aloha as soon as possible.

If you have any questions, please call me; I will be happy to discuss this issue with you in more detail.

Sincerely,



David W. Porter, P.E., C.O.
Water/Wastewater System Consultant

cc: Mr. Steve Watford, V.P./AUI
Mr. John Jenkins, Esq./RS&B
Mr. Robert Nixon, CPA/CJN&W

STATE OF FLORIDA

JULIA L. JOHNSON
CHAIRMAN

CAPITAL CIRCLE OFFICE CENTER
2540 Shumard Oak Boulevard
Tallahassee, FL 32399-0854
(904) 413-6044

Public Service Commission

March 7, 1997

James Murley, Secretary
Department of Community Affairs
2555 Shumard Oak Boulevard
Tallahassee, Florida 32399

Dear Mr. Murley:

The Florida Public Service Commission is responsible for the economic regulation of privately owned water and wastewater utilities for 38 counties within the State of Florida. Often, as a part of our regulatory process, we hold customer hearings in the utility's service territory to receive input from the customers on the quality of service which the utility provides. Recently, we held one of these customer meetings in Pasco County for Aloha Utilities, Inc. During the course of this hearing, we received several complaints about water leaks within the homes of customers who have copper plumbing. For example, one customer had to replace his copper plumbing with Chlorinated Polyvinyl Chloride (CPVC) piping at a cost of approximately $5,000. Also, many of Aloha's customers complained about black water which is coming out of their water taps. The Department of Environmental Protection investigated this problem and determined that the black substance is copper sulfide. The copper sulfide gives the water a black appearance as well as leaving a residue in the customer's bathtubs, sinks, and toilets. The copper sulfide is created when the sulfides which are present in the water react with copper in the customer's plumbing. Even though Aloha's water meets State and Federal drinking water standards for sulfides as well as primary and secondary contaminants, copper sulfide is forming and copper pipes are leaking within the homes of many of Aloha's customers.

This copper corrosion problem appears to be more prevalent in water systems which use a Reverse Osmosis treatment process or have high levels of hydrogen sulfide in the groundwater supply and the number of complaints which we have received is escalating. When the customers are informed that the damage to their copper piping might be caused by corrosive water, they believe that the utility should be held responsible and should pay for any repairs or damages. The typical utility response is that the builder used the wrong material or improper construction techniques and that the utility should not be held liable for any repairs or damages within the home. Our rules state that the utility is only responsible for the water system up to the meter and we do not have any authority to require that the utility replace the customer's plumbing.

Since your agency is responsible for setting minimum standards for building construction, including the materials used for plumbing within residential homes, we believe that you should be made aware of this apparent growing problem. If you decide to further investigate this issue, our staff will be willing to provide any assistance you may require. Our contact person for this issue is Mr. John Starling at 413-6952.

Sincerely,

Julia Johnson
Chairman

cc: Richard Dixon

ALOHA UTILITIES, INC.
2514 Aloha Place
Holiday, Florida 34691
(813) 937-4275

June 13, 1997

The Honorable Mike Fasano
State Representative, District 45
8217 Massachusetts Avenue
New Port Richey, FL 34653

Dear Mr. Fasano:

I am in receipt of the several letters which you have sent to me, from May 27th through June 4th. Each of the letters list between one and four customers who have complained to you about "black smelly water" or "brackish smelly water" received from Aloha Utilities, Inc.

We, at Aloha Utilities, are very much concerned with the quality of water service provided to our customers and ensuring that they receive the highest quality of water service possible. In order to do this, we must be able to communicate directly with those customers when they have a problem with their service so that we can get all of the pertinent information concerning the nature of their complaints. We have told you, several times in the past, that in order for us to properly respond to these customers, we must have information directly provided to the Utility. This is necessary so that we can properly evaluate their concerns and provide them with a response and correct their problem if possible.

Only five of the fifteen customers you have listed in your letters have contacted us about a problem with their water quality this year. Three of those five customers, contacted us the same day they contacted you, and those calls were the only calls we received from them this year concerning their water quality. Six customers from your list have never contacted us for any sort of complaint since establishing service with us years ago. As such, we are having difficulty understanding why customers of the Utility Company are calling or writing their complaints to you about Aloha's service without even contacting the Utility directly.

We have undertaken to contact each of the fifteen customers listed in your letters on our own to try and obtain the facts and circumstances surrounding their problems and address those problems. When speaking with the customers, many have told us that they were instructed, by a newsletter or their Association's leaders, not to contact the Utility but to contact you instead. Your acting as a "go-between" is not serving the interest of those customers in getting their problems resolved satisfactorily or expeditiously. Therefore, from this point forward, we request that you instruct any customers who contact your office to contact the Utility directly, either in writing or by phone and we will help them to address their problems. We cannot continue to have Utility complaints handled through your office. If the customers wish to contact you at the same time they contact the Utility, that is their prerogative. However, we cannot handle complaints in this matter on a continuing basis. Thank you for your prompt attention to this problem. If you have any questions in this regard, please let me know.

Sincerely,

ALOHA UTILITIES, INC.

Stephen G. Watford
Vice President

SGW/ck

Cc: Dr. Richard Garrity, Department of Environmental Protection
Dr. Marc Yacht, Pasco County Health Department
Ralph Jaegar, Public Service Commission

Letters/97gencor-Fasano 6/13

Department of Environmental Protection

Lawton Chiles
Governor

Southwest District
3804 Coconut Palm Drive
Tampa, Florida 33619

Virginia B. Wetherell
Secretary

July 8, 1997

Kenneth J. Swann,
Environmental Health Director
7623 Little Road - Suite 100-B
New Port Richey, FL. 34654

Re: Letter of 6/25/97,
Aloha Utilities - Water Quality

Dear Mr. Swann:

The Department is in receipt of the above referenced letter, and will be responding to Mr. Wood accordingly.

We would also like to thank you for your efforts in coordinating with the Department on this issue. Regarding which, you advised myself and Pedro Rivera, P.E. by phone on April 16, 1997 that your agency was initiating an investigation into the black water issue at the subject utility. You indicated you considered the copper sulfate content in consumers water to be unacceptable as it was considered a "skin irritant" by your agency. You advised us you had taken 2 water samples from customers taps which were discolored and having them tested for bacteriological and copper sulfate content, and submit them to the state Health Officer for comment. We are in receipt of the bacteriological analysis. We would appreciate the status of your investigation into this matter. We are also very interested in what the State Health Officer comments are regarding the water quality.

If you have any questions or need additional information in this matter, please do not hesitate to contact me at (813) 744-6100 ext. 314.

Respectfully,

W.C. Dunn
Environmental Supervisor II
Drinking Water Section

WCD/scr

Department of Environmental Protection

Lawton Chiles
Governor

Marjory Stoneman Douglas Building
3900 Commonwealth Boulevard
Tallahassee, Florida 32399-3000

Virginia B. Wetherell
Secretary

July 10, 1997

Honorable Mike Fasano
Representative, District 45
8217 Massachusetts Avenue
New Port Richey, Florida 34653-3111

Dear Representative Fasano:

The Department's Southwest District has previously investigated customers' complaints of dirty, smelly water provided by Aloha Utilities. It appears this problem developed after the placement of wells eight and nine into service in the Seven Springs area.

In March, 1996, the Department initiated a study of 16 homes in the most affected areas. It was concluded that the problem was a result of the combination of elemental sulfur in the water and its reaction in water heaters. It was also concluded that the heavy use of home treatment units in the area contributed to the overall problem of discolored water.

Additional sampling conducted October 29, 1996 of water at sites requested by you and of raw water from wells eight and nine, showed no water quality standards were exceeded, except copper. The copper is currently being addressed by the corrosion control program initiated by Aloha Utilities in accordance with the Department's Control of Lead and Copper rule.

We agree that the complainants' water is not aesthetically pleasing; however, the lack of water quality violations has prevented the Department from taking formal action. In light of this, The District Office has initiated the process for a secondary water quality standards review, specifically for odor, color, and elemental sulfur.

The Public Service Commission (PSC) has issued an order, number PSC-97-0280-FOF-WS, Section VI, to Aloha Utilities to develop a treatment plan to resolve the issue of discolored water. That plan was submitted by Aloha to the PSC on June 10, 1997. We understand the PSC is scheduled to act on the plan by September 29, 1997.

The Department's technical staff is available to assist the PSC in any way. The Department will also expedite issuance of any permits that may be required, if the PSC orders implementation of the plan.

The Department's Southwest District Office, in cooperation with our Division of Water Facilities, is also planning a "panel of experts" review of the problem to include another site visit. If you have additional questions or concerns or need further information about the timetable for this review, please contact Dr. Richard Garrity, Director of District Management for the Department's Southwest District Office, by mail at 3804 Coconut Palm Drive, Tampa, Florida 33619-8318 or by phone at (813) 744-6100, extension 352.

Sincerely,

Virginia B. Wetherell
Secretary

VBW/wd

cc: Richard Garrity, Ph.D., DEP-SWD

Florida House of Representatives

Mike Fasano
Representative, 45th District
Majority Whip

Reply to:
☒ 8217 Massachusetts Avenue
New Port Richey, FL 34653-3111
(813) 848-5885
☐ 323 The Capitol
Tallahassee, FL 32399-1300
(904) 488-8528

Committees
Vice Chair, Community Colleges & Career Prep
Finance & Taxation
Governmental Operations
Regulated Services

July 17, 1997

The Honorable Virginia Wetherell
Florida Department of Environmental Protection
3900 Commonwealth Boulevard
Tallahassee, FL 32399-3000

Dear Secretary Wetherell:

Thank you very much for your recent letter regarding the ongoing problems with Aloha Utilities. I appreciate your willingness to convene a panel of water experts to look at this shameful situation. I am looking forward to working with the panel to address the continuing problems my constituents are having with this utility.

In your letter you mention the lack of water quality violations that have prevented you for taking formal action against Aloha Utilities. I am more than willing to file legislation that will tighten up the water quality standards in Florida so that water that looks and smells like the product Aloha Utilities produces will no longer be considered "acceptable." I would greatly appreciate it if you and your staff would make a recommendation to me regarding legislation that would give you the authority to address this very important health and safety issue.

Thank you in advance for your assistance in suggesting legislation that will protect Florida's water consumers. As always, if there is ever anything I can do for you please do not hesitate to call on me.

Yours truly,

Mike

Mike Fasano
State Representative, District 45

MF/gg

cc: Presidents of Seven Springs Service Delivery Area Homeowner Associations

Department of Environmental Protection

Lawton Chiles
Governor

Southwest District
3804 Coconut Palm Drive
Tampa, Florida 33619

Virginia B. Wetherell
Secretary

July 24, 1997

Mr. & Mrs. Ed O. Wood
1043 Daleside Lane
New Port Richey, Florida 34655

Re: Aloha Utilities Complaint

Dear Mr. & Mrs. Wood:

This is in response to your June 17, 1997, inquiry. We would like to let you know the Southwest District has previously investigated complaints related to the subject.

It appears the problems developed after construction and placement into service of wells number's 8 and 9 in the Seven Springs service area. In response to complaints from the customers in the service area, the Department initiated in March 1996 a study of 16 homes in the most affected areas. Our conclusions were the problem was a combination of elemental sulfur in the water and it's reaction in water heaters. We also concluded that the use of home treatment units, which were heavily utilized in the area also contributed to the overall problem of discolored water.

Additional sampling conducted October 29, 1997 at sites requested by Representative Mike Fasano, as well as raw water from wells 8 and 9, showed no water quality standards exceeded, except copper. The copper is currently being addressed by the corrosion control program initiated by the utility, in accordance with the Department's Lead and Copper rule.

We concur some residents in the area have water that is not aesthetically pleasing, however, the lack of water quality violations has prevented the Department from taking formal action. In light of this, the District Office has initiated the process for a secondary water quality standards review, specifically for odor, color, and elemental sulfur.

In the meantime, the Public Service Commission has issued order # PSC-97-0280-FOF-WS, Section VI to Aloha Utilities to develop a treatment plan to resolve the issue of discolored water. That plan was submitted by Aloha to the Commission on June 10, 1997. We understand the Commission is scheduled to act on the plan by September 29, 1997.

Our Southwest District Office in cooperation with our Division of Water Facilities is also planning a "panel of experts" review of the problem including another site visit.

The Department will also expedite issuance of any permits that may be required, if the P.S.C. orders implementation of the Plan.

Please feel free to contact Pete Screnock, at (813) 744-6100 ext. 462 if you have additional questions or concerns.

Sincerely,

Richard D. Garrity, Ph. D.
Director of District Management
Southwest District

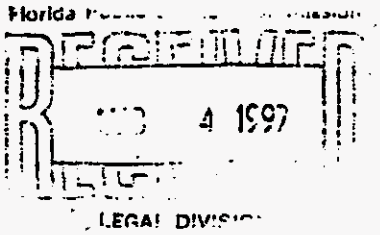
RDG/wdp

Florida House of Representatives

Mike Fasano
Representative, 45th District
Majority Whip

Reply to:
■ 8217 Massachusetts Avenue
New Port Richey, FL 34653-3111
(813) 848-5885
□ 323 The Capitol
Tallahassee, FL 32399-1300
(904) 488-8528

Committees
Vice Chair, Community Colleges & Career Prep
Finance & Taxation
Governmental Operations
Regulated Services



August 1, 1997

Ralph Jaeger, Senior Attorney
Public Service Commission
2540 Shumard Oak Blvd.
Tallahassee, FL 32399-0850

Dear Mr. Jaeger:

Thank you for coordinating the conference call this morning regarding the developing staff recommendation in the matter of Aloha Utilities' ongoing water quality problems. I appreciate your interest in receiving input from all parties concerned.

I am writing to reiterate my own personal opinion that the idea of building a pilot plant to service specifically the Wyndtree, Chelsea Place, Trinity and surrounding areas is the best option thus far discussed. While I understand that this approach will be costly, I believe that it can be accomplished at no cost to existing customers. One of the issues discussed during the recent rate case was the fact that Aloha's impact fees are far below comparable impact fees charged by Pasco County. If Aloha would raise its impact fees to match Pasco County's, the utility would raise the needed dollars after the construction of about two hundred new homes (given the rough estimates discussed by the PSC staff). By taking out a bond on that future construction, Aloha will be able to begin building its pilot plant fairly quickly.

I hope you will take this idea into consideration as you develop your recommendation. Once again, thank you for including me in the discussion today. As always, if there is ever anything I can do for you please do not hesitate to call on me.

Yours truly,

Mike Fasano
State Representative, District 45

MF/gg

cc: Harold McLean, Office of Public Counsel

David W. Porter, P.E., C.O.
Water/Wastewater System Consultant

Regulatory Assistance, Troubleshooting, Permitting, Contract Operation, Rehabilitation and System Design

August 20, 1997

Florida Public Service Commission
2540 Shumard Oak Boulevard
Tallahassee, Florida 32399-0873
Attn: John M. Starling

RECEIVED
AUG 22 1997
Florida Public Service Commission
Division of Water and Wastewater

Re: Aloha Utilities, Inc.
Seven Springs Water and Wastewater System
FPSC Docket Numbers 950615-SU and 960545-WS

Dear John,

Per our meeting last week, I have prepared this letter to seek your direction regarding a proposal for a study to determine the capital and operating costs associated with interconnecting Aloha's water system with that of Pasco County.

As I brought to your attention during our meeting, there are a number of issues that may make interconnection with the County undesirable, and also clearly make such an interconnection ill-suited to resolve existing water quality complaints. They include:

1. The retail price charged by Aloha for treated water in the Seven Springs system is presently $1.27/1000 gallons, the County currently charges utilities approximately $2.15/1000 gallons for bulk rate service. The costs for transmission, distribution, billing and administration by Aloha would have to be added on to any charges from the County to calculate an appropriate rate to be charged to the customers. Substantial capital expenditures will have to be incurred to interconnect the two systems, and the County will no doubt charge the Utility a substantial connection fee for the amount of demand paced on the County system either through an up-front capital charge or through a surcharge. The cost of abandonment of Aloha's existing water supply and treatment facilities would also have to be taken into account. These factors combine to indicate a several fold increase in the cost for water service from Aloha to its customers if an interconnection with Pasco County occurs. This increase in cost will be realized before any additional treatment costs, outlined in paragraphs 2 and 3 below, are considered.
2. All of the infrastructure improvements proposed in our report would still be required if Aloha were to interconnect to the County with the possible exception of the new water wells. However, it is possible that the County would need to add additional wells to make up the capacity utilized by Aloha. If the additional wells were needed the County would most likely look to Aloha for funding their construction.
3. All the scientific evidence to date demonstrates (and I believe that the Staff now agrees) that the "black" water residue found in a small number of customer's water is caused by the interaction of water containing naturally occurring sulfate (converted to sulfide in the customer's homes) and copper pipe in their homes. It is very clear to us that an interconnection with Pasco County will increase, rather than lessen, the occurrence of this copper sulfide in customer's homes. The County water supplied in the area contains up to 2.5 times more sulfate than Aloha's water does. Therefore, if there is any hope of reducing the black residue problem through this interconnection, any water obtained from the County would need to be treated to the same level proposed in our report.

1657 Wells Road • Suite 226 • Orange Park, FL 32073 • Phone: 904-269-6773 • Fax: 904-269-3667 • Pager: 904-645-2048 • E-Mail: porterpe@southeast.net

Since the water supplied to Aloha from the County would have already had the naturally occurring sulfide converted to sulfate at the County's water plant, an additional treatment stage that would convert sulfate back to sulfide (which could then be removed by high rate aeration) would have to be added to our process train.

In addition, since the level of sulfate (and therefore the converted sulfide) in the County's water is up to 2.5 times greater than Aloha's water, the process units proposed in our report would have to be increased in size to accommodate the higher sulfide levels, substantially increasing the costs of the treatment units and the proposed new facilities overall.

These additional treatment steps would most likely increase the projected capital and operating costs substantially over those contained in our report prepared and submitted to the PSC a few months ago.

4. Previous discussions between Aloha management and its engineers and the FDEP have led Aloha to conclude that the County does not have the capacity available to serve Aloha (at average day, max day, peak hour and fire flow capacities). In addition, the costs associated with the physical connection to the County's water system may be high since a very high flow rate will be required (6,254 GPM to meet the 1998 estimated peak hour flow demands). The County's water storage and high service pumping system may have to be modified substantially to allow the County to supply the water at the flow rates required to service Aloha's customers.
5. It is doubtful that the County could obtain the necessary South West Florida Water Management District (SWFWMD) Water Use Permits to construct new wells should they be required. In fact, SWFWMD is not granting Water Use Permits for new sources to anyone in the Water Use Caution Area in which both Aloha and the County reside.

Just the items listed above make it very clear that an interconnection to the County's water system will cost more than the plant modification costs projected in our report. In fact, I do not see any way that such costs will not be **substantially more** than any of the options originally proposed by Aloha in its report.

If you wish to consider requiring Aloha to prepare a study analyzing the feasibility of interconnecting with the County, including projecting capital costs and the anticipated rates for same, please be advised that the time to complete such a study would be approximately 90 days and will cost between $45,000 and $60,000. This will require an analysis of greater complexity than that required to complete the report filed in June.

I trust that this letter provides sufficient information to demonstrate to the Commission that an interconnection with the County is not feasible and that a detailed study in not warranted, nor should the costs of such a study be borne by Aloha's customers, who are ultimately responsible for all such costs.

Also, in your letter you requested that Aloha determine anticipated rates associated with the construction of one new water facility to serve the Wyndtree area. As I related to you during our meeting, it is my opinion that the construction of any one of the proposed facilities, without the other two, will not have any beneficial effect on the resolution of the various water quality concerns. The Seven Springs Water System is a looped system (as required by good engineering practice) and, therefore, if only one plant were to be constructed, intermixing of the highly treated water from the new plant and the lesser treated water from the older facilities will occur, negating the benefits of the new facility.

If you have any questions, please call me; I will be happy to discuss these issues with you in more detail.

Sincerely,

David W. Porter, P.E., C.O.
Water/Wastewater System Consultant

cc: Mr. Steve Watford, V.P./AUI
Mr. Marty Deterding, Esq./RS&B
Mr. John Jenkins, Esq./RS&B
Mr. Robert Nixon, CPA/CJN&W

PASCO COUNTY, FLORIDA

DADE CITY (352) 521-4274
LAND O' LAKES (813) 996-7341
NEW PORT RICHEY (813) 847-8145
Fax (813) 847-8064

UTILITIES SERVICES BRANCH
PUB. WKS./UTILITIES BLDG.,S-205
7530 LITTLE ROAD
NEW PORT RICHEY, FL 34654

August 28, 1997

The Honorable Mike Fasano
Representative, District 45
Florida House of Representatives
8217 Massachusetts Avenue
New Port Richey, Florida 34653-3111

Dear Representative Fasano:

In reply to your correspondence of August 20, 1997, we offer the following answers to your questions regarding copper piping and "black water" conditions in drinking water occurring in Aloha Utilities drinking water.

The most likely cause of "black water" conditions being experienced by customers of Aloha Utilities is the high concentration of naturally occurring hydrogen sulfide (H2S) in the source water. The presence of the H2S combined with the addition of the chemical orthopolyphosphate to control lead and copper levels in compliance with State and Federal regulations may be promoting conditions favorable for the development of "black water".

The orthopolyphosphate is added to promote coating of copper piping and reduce the presence of lead and copper levels in the domestic drinking water.

Unfortunately, the source water contains hydrogen sulfide in sufficient quantities that the addition of chlorine disinfection produces elemental sulphur which, combined with the presence of the orthopolyphosphate and the addition of heat in water heaters causes chemical reduction and results in the development of "black water" (copper sulfate) conditions. Based on the information available at this time, this is the most logical explanation for the "black water" conditions.

The difference between Pasco County Utilities and Aloha Utilities' water is that our source waters have lower natural occurring levels of H2S and our alternative methods of treatment. For the West Pasco system we employ "air-stripping" to reduce already low H2S levels. In addition, our lead and copper control employs sodium hydroxide versus orthopolyphosphate. As a result, we have not experienced "black water" problems.

I hope this information and discussion is sufficient to meet your immediate requirements. I would be happy to discuss this or other matters at your convenience. Feel free to contact me.

Sincerely,

Douglas S. Bramlett,
Asst. County Administrator
(Utilities Services)

DSB/RJT/fd

cc: Ralph Jaeger, Fla. Public Service Commission, Tallahassee, FL
Pasco County Board of County Commissioners
John J. Gallagher, County Administrator

Department of Environmental Protection

Lawton Chiles
Governor

Southwest District
3804 Coconut Palm Drive
Tampa, Florida 33619

Virginia B. Wetherell
Secretary

August 29, 1997

Mr. Jim Goldberg
Water Committee Chairman
Wyndtree Master Association
1251 Trafalgar Drive
New Port Richey, FL 34655

Re: Letter of July 28, 1997 to
The Honorable Virginia B. Wetherell

Dear Mr. Goldberg:

I have been asked by Secretary Wetherell to respond to your recent letter.

We are continuing to investigate the black water issue with the intention to bring it to resolution. Our investigation has included both water reactions in the public water supply system and the private plumbing systems including home treatment devices.

Specifically, the well water is essentially copper free, lead free and passes through non-metallic (PVC) water mains, thus there is copper and lead free water being served to the customers. The water quality standards for copper and lead are 1.0 and 0.015 mg/l respectively. Only the lead standard is health related.

Also, the Manual of Small Public Water Supply Systems, EPA 570/9-91-003 has a section on Household Water Treatment. It states, "... softening may add sodium to the drinking water. Softening only the hot water, leaving the cold drinking water untreated, will avoid this problem. Softening may also make the water more corrosive, and possibly increase the levels of metals like lead and copper in the water. Occasional "flushing" of water at the tap will help solve the second problem."

The October 29, 1996 informational sampling referred to in our letter of July 10, 1997 is consistent with the above EPA statement. The "cold" untreated water sample collected at 7633 Albocor Drive showed a copper content of 0.418 milligrams per liter (mg/l). The "cold" homeowner treated (softener) water sample collected at 1251 Trafalgar Drive was 8.810 mg/l.

Our letter of July 10, 1997 referred to these samples and the associated two "hot" water samples exceeding the water quality standard of 1.0 mg/l for copper. By regulation this standard only applies to the finished water provided to the distribution system. As stated earlier the finished water is essentially copper and lead free and thus fully meets the standard.

As part of our investigation we are reviewing the article "Water Discoloration, Cause and Fix" in detail. This week we are conferring with professionals from two major counties, our headquarters and our local district office. All have extensive experience with public water supplies. The county officials have addressed copper corrosion problems for their entire service areas and the others have implemented the lead and copper rule statewide.

We are also participating on a statewide panel which is addressing copper corrosion on a statewide basis. We are there to contribute from our experience and to learn from the experience of others.

We will follow your recommendation for unannounced visits as practical. Scheduling visits to witness flushing and getting access to secured water utility facilities needs some degree of coordination.

For further clarification or voicing of concerns please feel free to contact WIC. Dunn at the above listed address or by phone at 813/744-6100, ext. 314.

Very truly yours,

Richard D. Garrity, Ph.D.
Director of District Management
Southwest District

RDG/wdr

cc: Virginia B. Wetherell

David W. Porter, P.E., C.O.
Water/Wastewater System Consultant

Regulatory Assistance, Troubleshooting, Permitting, Contract Operation, Rehabilitation and System Design

September 11, 1997

Florida Public Service Commission
2540 Shumard Oak Boulevard
Tallahassee, Florida 32399-0873
Attn: John M. Starling

Re: Aloha Utilities, Inc.
Seven Springs Water System
FPSC Docket Number 960545-WS

Dear John,

Enclosed please find a copy of a letter I prepared in response to Doug Bramlett's letter in which he presented certain opinions regarding issues of importance to the above referenced Docket.

It is my opinion that Doug's opinions are totally without merit and that there is no scientific basis for his statements. My letter addresses these major items:

1. The concentration of hydrogen sulfide found in Aloha's source water is not abnormally high as compared to other waters found in the surrounding area. In fact, Aloha's source water contains less hydrogen sulfide than the County's according to the available data which is attached.
2. The oxidation of hydrogen sulfide, utilizing chlorine as the oxidant, does not create appreciable quantities of elemental sulfur...sulfate is produced.
3. Partially aerating hydrogen sulfide bearing waters allows the remaining hydrogen sulfide to be oxidized with oxygen as the electron acceptor which creates elemental sulfur.
4. Sulfur reducing bacteria require a source of electrons to facilitate the sulfate to sulfide reduction reaction.
5. The concentration of sulfate in Aloha's finished water is approximately 10 mg/L. Pasco County's reported sulfate concentration for the finished water produced at its Little Road Water Treatment Plant is 24.49 mg/L.
6. In accordance with their corrosion control plan, Aloha recently completed a first draw customer tap sampling event. This event was the first completed after installation of Aloha's corrosion inhibitor system. The 90th percentile copper concentration observed was 1.55 mg/L. Pasco County also recently completed a similar sampling event. It was also their first such event after the installation of their pH control system. Pasco County's 90th percentile copper concentration observed was 1.99 mg/L. Therefore, Aloha's corrosion control program is more effective than the Pasco County's in reducing the concentration of copper found in the water of customer's homes, which is the goal of the corrosion control programs.

As you know, Aloha Utilities, Inc. is Pasco County's largest competitor. I can only speculate as to the motives that led Mr. Bramlett to offer his opinions which are clearly unsupported by the facts and have no scientific basis.

PCHD// Starling_Bramlett//proj/via hand

857 Wells Road • Suite 226 • Orange Park, FL 32073 • Phone: 904-269-6773 • Fax: 904-269-3667 • Pager: 904-645-2048 • E-Mail: porterpe@southeast.net

John, I know that I have not told you anything new here. The facts haven't changed. However, I had no choice but to respond to yet another attempt by someone to offer incorrect opinions in this matter that could become part of the record.

If you have any questions, please call me.

Sincerely,

David W. Porter, P.E., C.O.
Water/Wastewater System Consultant

cc: Mr. Steve Watford, Pres./AUI
Mr. Marty Deterding, Esq./RS&B
Mr. John Jenkins, Esq./RS&B

David W. Porter, P.E., C.O.
Water/Wastewater System Consultant

Regulatory Assistance, Troubleshooting, Permitting, Contract Operation, Rehabilitation and System Design

September 11, 1997

Pasco County
Utilities Services Branch
Public Works/Utilities Building, S-205
New Port Richey, FL 34654
Attn: Mr. Douglas S. Bramlett, Assistant County Administrator

Re: Aloha Utilities, Inc./Seven Springs Water System

Dear Mr. Bramlett:

Last Friday I received a copy of a letter that you wrote to Representative Mike Fasano in which you gave your opinion regarding the cause of "black water" problems that are being experienced by a small number of Aloha's customers located in an isolated section of Aloha's south western service area. Because you expressed opinions concerning Aloha's water system and provided a comparison between Aloha's corrosion control program and that of Pasco County, I believe your letter requires a response. There has been considerable debate and on-going litigation concerning this issue to date. To the extent that you have chosen to express your opinion on these volatile issues I must, on behalf of my client Aloha Utilities, Inc. point out that your letter is wrought with inaccuracies. We therefore request that you immediately issue a retraction, or at the very least a statement that your opinions were in error.

I must start out by telling you that when I read your letter I was astounded. Many of your statements contradicted not only my understanding of water process engineering and water chemistry, but also the specific findings of the numerous treatises and articles which I have researched on this subject over the last several years. I have prepared this letter in hopes that you can clarify your comments to show me the basis, if any, for the specific points your raised which I otherwise believe to be without foundation.

First of all, you state that the source of black water is the "high concentration of naturally occurring hydrogen sulfide (H_2S) in the source water." The source water in question does not contain "high" concentrations of hydrogen sulfide. Since we, like all water utilities (including Pasco County) are not required to submit hydrogen sulfide monitoring data for our source water to FDEP, I would like to know how you concluded that Aloha's source water contains "high" levels of hydrogen sulfide. In fact, the information we have concerning sulfate concentrations in Pasco County's finished water, shown later in this letter, leads us to believe that the County's source water may be higher in hydrogen sulfide then that of Aloha.

Aloha provides proper, and generally accepted, treatment for the control of hydrogen sulfide at its well sites. Chlorine oxidation of hydrogen sulfide is provided at each well site. This method is very successful as the water entering the distribution system does not contain any measurable quantity of hydrogen sulfide. All hydrogen sulfide is oxidized to sulfate. The chemical equation related to this reaction is well know and well understood. This process has been utilized at countless numbers of water facilities for controlling hydrogen sulfide for decades. The equation follows:

$$H_2S + 4Cl_2 + 4H_2O = H_2SO_4 + 8HCl$$

Please note that no elemental sulfur is produced in this reaction...only the sulfate form of sulfur remains.

97 Wells Road • Suite 226 • Orange Park, FL 32073 • Phone: 904-269-6773 • Fax: 904-269-3667 • Pager: 904-645-2048 • E-Mail: porterpe@southeast.net

You state that in your system, you utilize air stripping to remove a portion of the hydrogen sulfide. Air stripping at the pH normally found in raw waters is not very efficient in removing hydrogen sulfide. A large portion of the sulfide is not in the gaseous state at pH 7 or above and can not, therefore, be removed by air stripping. In fact only 64% of the total hydrogen sulfide is in the gaseous state at this pH. Therefore, even if your air stripper was 100% efficient in removing the hydrogen sulfide that is in the gaseous state (which it is not), over 35% of the hydrogen sulfide would not be removed and would pass though the air stripping unit. Your water would still contain a substantial portion of the of hydrogen sulfide originally present. What you may not be aware of is the fact that air stripping adds substantial quantities of oxygen to the water which causes the water to become very corrosive. In addition, the elevated oxygen levels can cause the oxidation of the remaining hydrogen sulfide to elemental sulfur as shown in the following reaction:

$$2\,H_2S + O_2 = 2H_2O + 2S_{(s)}$$

Therefore, it is more likely that facilities utilizing simple air stripping will produce elemental sulfur than will facilities utilizing chemical oxidation. The main problems associated with converting hydrogen sulfide to elemental sulfur are related to finished water turbidity increases and the negative effects that increased water turbidity produce (like lower disinfection efficiency, increased chance for bacterial contamination and growths in the distribution system, etc.).

One of the statements that you made is plainly contrary to all literature on the subject of black water development of which I am aware. Did you really mean to say that "the addition of chlorine disinfection produces elemental sulfur which, combined with the presence of the orthopolyphosphate and the addition of heat in the water heaters causes chemical reduction and results in the development of "black water" (copper sulfate) conditions." There are a number of inaccuracies in this statement. First, chemical oxidation of hydrogen sulfide with chlorine does not produce any appreciable quantities of elemental sulfur as shown in the chemical equation presented on page one of this letter. Next, it is not possible to combine sulfur and orthopolyphospate under any conditions to get copper sulfate... a source of copper is required. Please see the attached letter from the manufacturer of the orthopolyphosphate inhibitor Aloha utilizes confirming this fact.

After Aloha's water is treated at its well sites, there is no appreciable quantity of hydrogen sulfide present in the finished water... it has been converted to sulfate. The level of sulfate in Aloha's water meets all state and federal standards... as you may know the federal standard is presently 250 mg/L for sulfate. Aloha's water typically has a sulfate concentration of about 10 mg/L. Interestingly, Aloha's sulfate concentration is less than half of that produced at the County's treatment system. In fact your 1996 water quality testing data, as submitted to the FDEP and attached here, shows that your West Pasco Water System produces water with sulfates that range from a low of 12.44 mg/L to a high of 47.8 mg/L. Your main facility, the Little Road Water Treatment Plant, which is I believe the facility with the air stripping units, produces water with a sulfate concentration of 24.49 mg/L which is approximately two and one half times greater than that shown for the Aloha system.

After the water enters the homes of our customer's, in most cases, this sulfate causes no problems. However, in a small number of homes, the sulfate is converted back to sulfide in the homeowners hot water system by sulfate reducing bacteria as shown in the following equation:

$$SO_4^{2-} + 8H^+ + 6e^- \rightarrow H_2S + 2H_2O + 2OH^-$$

The equation shows several important facts. First, free electrons are required for this reaction to proceed. The source of these elections has frequently been found to be from the placement of a sacrificial anode in the hot water tank. The anode's purpose is to extend the life of the tank by corroding before the tank. However, corrosion, which is the loss of electrons, provides the free electrons needed to allow the reduction reaction to proceed. Frequently, changing out the anode will correct this problem (as recommended in American Water Works Association publications). Secondly, the quantity of hydrogen sulfide produced in this reaction, assuming that there are a sufficient number of organisms and time so as not to rate limit the reaction, is directly proportional to the quantity of sulfate present in the water. Since the water produced by the County contains far greater quantities of sulfate than that produced by Aloha, one would speculate that your customer's should be experiencing a much higher incidence of the black water problem if your analysis of the source of the problem is correct. There are many other sources of electrons that could cause this problem. One of these is the improper grounding of home electrical systems to the water piping, causing current to flow through the copper piping, which causes the release of electrons into the water. This reaction is very complicated and a great number of papers and books have been written on the subject.

Are you also aware that FDEP has determined that the black substance you talk about is largely composed of copper **sulfide** not copper **sulfate**? There is quite a large difference between the two. We believe that since the black particles found in the water have been shown to be copper sulfide, the more likely mechanism for the development of the particles is that, in certain homes, sulfate is reduced to sulfide by sulfur reducing bacteria. This sulfide then combines with copper, leached from the customer's piping as part of the natural process of copper pipe corrosion. This combination of copper and sulfide yields copper sulfide.

The source of the copper needed to form copper sulfide comes from the customer's home copper water piping system. Copper pipe corrodes with time under all water conditions, however, recent research has shown that water containing naturally occurring sulfides accelerates this process. Copper water piping corrosion is a major problem in Florida, so much so that a panel of experts has been assembled (of which I am a member) by State of Florida Department of Community Affairs working with the University of Florida to address this problem and to make recommendations to building officials and others state-wide that may lessen this problem. Due to information gained from this group to date, Mr. Watford, President of Aloha Utilities, Inc. sent a letter to Mr. Gallagher recommending that he look into the problem and suggested that the County may want to develop an information sheet to be provided to builders that would instruct the builder's that they should carefully consider all the facts before they chose the material of construction to be used in water piping system. It has come to our attention that a number of Florida communities have considered banning the use of copper piping for residential water system use. In fact, Duval county banned its use two years ago. If copper piping were not used, it would be impossible for copper sulfide to form.

Your statement that the orthopolyphosphate in some way enhances the generation of the black water particles is totally false. In fact, the opposite is true. Orthopolyphosphate corrosion inhibitor blend addition to water systems is a recognized effective technology to control copper corrosion. The great majority of water systems in Florida with raw water characteristics similar to Aloha's are using this technology successfully. In fact nearby Pinellas and Hillsborough Counties are utilizing the same inhibitor chemical that Aloha uses. Pinellas County and Aloha share the same water source as Pasco County. Again I refer you to the inhibitor manufacturer's letter attached for additional information on this matter.

Since Aloha began adding the inhibitor, the concentration of copper found in first-draw tap samples has fallen dramatically to 1.55 mg/L at the 90th percentile level. Aloha expects to find that with their second round of post treatment sampling, scheduled for later this year, that Aloha's first-draw tap sample test results will yield a copper concentration below the 1.3 mg/L action level. Pasco County has chosen to utilize pH adjustment as your corrosion control method. According to my telephone discussion with Gerald Foster of the FDEP, the County's first round, post treatment, first-draw tap sample test results showed 1.99 mg/L copper at the 90th percentile. Therefore, your copper concentration value is 28% higher than Aloha's. Your chosen corrosion control method is not performing as well as that chosen by Aloha. Your statement indicating that your use of pH control rather than inhibitor addition was a factor that explained why your customer's do not experience this black water problem is contrary to your own reported test results. In fact, since the concentration of copper in the water is directly related to the formation of copper sulfide, the incidence of black water must logically be more pronounced in your system than Aloha's.

The fact that the County's water contains more sulfate and that the tap samples of water at your customer's homes contains more copper leads me to believe that there is a good chance that there are customer's in your system that are experiencing the black water problem and that either they have not spoken out or you are not reporting this fact in your letter. I would think that it would be a good idea for the County to survey its customers to determine if the problem is being experienced so that the appropriate action can be taken.

What sets Aloha's problem off from the other systems that are experiencing this problem across the State (and there are many such systems) is that Aloha is receiving a great deal of attention from Representative Fasano that the others are not. Aloha is making every effort to assist its customers that are experiencing this problem through its corrosion control program.

Doug, I hope that this letter provides you with the data needed for you to determine that your letter to Representative Fasano needs to be retracted or substantially clarified and corrected.

Thank you in advance for whatever information you can provide me to explain the discrepancies I have indicated. If you have any questions, please call me.

Sincerely,

David W. Porter, P.E., C.O.
Water/Wastewater System Consultant

Cc: Steve Watford, President/AUI
Marty Deterding, Esq./RS&B
John Jenkins, Esq./RS&B
Representative Mike Fasano
Ralph Jaeger/FPSC
John J. Gallagher/Pasco County Administrator
Pasco County Board of County Commissioners

MET PRO CORPORATION **Stiles-Kem Division**

1570 LAKESIDE DRIVE • WAUKEGAN, IL 60085-8309 • (847) 689-1100 • FAX (847) 689-0289

David W. Porter, P.E., C.O.
1857 Wells Road, Suite 210
Orange Park, Fl. 32073

September 8, 1997

Dear Dave:

In reference to our discussion this morning regarding the issue of "black water", I feel that it is essential that everyone understand the chemistry we apply through the use of our *blended phosphate treatment programs*. We have always explained our technology to all interested parties hoping that a better understanding of this technology will continue to provide for the great success we have enjoyed throughout the country for over 40 years.

Our discussion centered on the use of phosphates (specifically orthophosphate) in Florida waters. As you are well aware, we treat a significant number of communities throughout the State of Florida. "Black water" problems have never been linked to the use of phosphates, rather it is often understood that the use of *blended phosphates* can alleviate these types of problems.

Phosphate + hydrogen sulfide + heat does not cause "black water" (copper sulfate). You as well as several other colleagues, have studied this "black water" phenomena for some period of time. In our previous discussions, I feel that you have a good solid understanding of our treatment approach and can appreciate the fact that our programs deal with lowering lead/copper levels as well as sequestering iron, manganese and hardness within supply waters. This has been demonstrated at Aloha Utilities, Pinellas County and Hillsborough County.

Our reputation throughout the country as well as within the water treatment community remains excellent. We pride ourselves on the method of application of these treatment programs and the benefits we provide to the people across the country. If anyone is interested in learning more about our treatment programs, please have them contact us directly.

As always, we thank you for your interest in maintaining high drinking water standards. Feel free to contact us if the need arises.

Sincerely:

William F. Mersch

William F. Mersch

cc: Mr. Keith Chance

NSF

Water News

Aloha Utilities, Inc. *September, 1997*

IMPORTANT

See page 2 for important information regarding upcoming Public Service Commission action that could increase your utility rates substantially!

THIS NEWSLETTER HAS BEEN DEVELOPED TO INFORM YOU OF THE ACTIVITIES THAT ALOHA UTILITIES IS UNDERTAKING TO PROVIDE YOU WITH HIGH QUALITY WATER AND WASTEWATER UTILITY SERVICES.

ALOHA UTILITIES WELCOMES ANY COMMENTS YOU MAY HAVE CONCERNING THIS NEWSLETTER; SEND COMMENTS TO:

NEWSLETTER EDITOR
2514 ALOHA PLACE
HOLIDAY, FL 34691

Corrosion Control Program, Great Progress Made!

As you may recall, in our last "Water News," we discussed a new corrosion control program that we were implementing to assist you in minimizing the natural corrosion of the copper water pipes in your home. Utilities around the country have undertaken this program, in part, as a result of rule changes made by the United States Environmental Protection Agency (U.S.E.P.A).

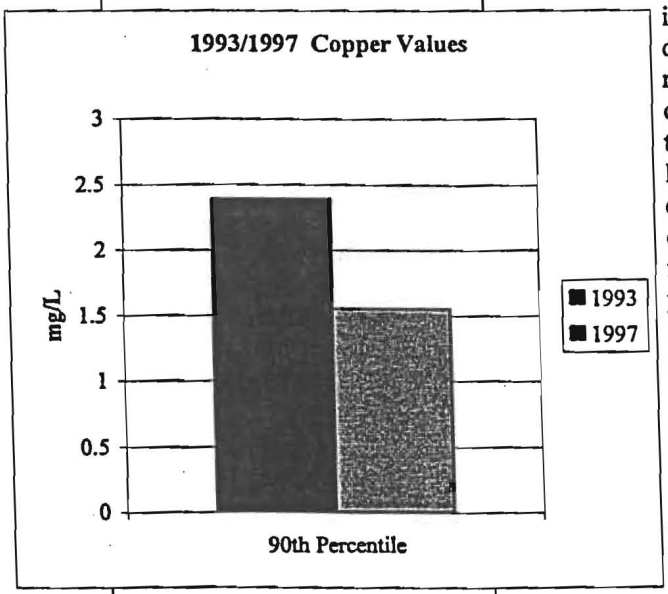
The U.S.E.P.A. made these rule changes based on their research into a nationwide problem concerning the effect on water quality from home copper water piping. U.S.E.P.A. determined that drinking water frequently contained dissolved copper as home copper water piping aged and corroded.

In late April 1996 we began adding a corrosion inhibitor to the water that we produce. This inhibitor cleans the piping and then places a microscopic protective barrier on the inner walls of the pipe. This barrier acts to prevent the water carried from actually coming into contact with the copper pipe. Like all things in life, nothing is perfect. This barrier is not 100% effective and some corrosion will still take place, however, at greatly reduced overall levels.

Since we began the addition of the inhibitor chemical, we have been working with the inhibitor manufacturer, our engineer and the Florida Department of Environmental Protection (who oversees this program for the U.S.E.P.A.) to fine-tune the process to obtain maximum benefit from the corrosion control program.

Recently, we completed the first round of water testing in a group of 60 customer's homes to determine how the program is proceeding.

We are very pleased with the outcome of the testing. To date in-home water copper levels have been reduced by approximately 35%. The chart below shows before and after in-home water copper levels found at the statistical 90th percentile (a value that is reported to the FDEP) for the 60 homes sampled. The bars show dramatic improvement indicating that the rate of copper corrosion (and therefore the level of copper dissolved in your drinking water from the pipes in your home) has also decreased dramatically.



Further fine tuning is ongoing. In approximately six months we will perform water testing in the test homes again. We feel confident that we will soon be able to report to you that even greater reductions in the rate of copper corrosion has been achieved.

Water Concerns May Trigger Sharp Rate Increase!

The PSC Staff is expected to issue their recommendations to the Commissioners on water quality issues on September 25th. We will send out an updated "Water News" immediately after the official Staff recommendation has been issued. Listed below are the alternatives expected to be considered by the Commissioners for your water rates on October 7, 1997:

1. Continue current corrosion control program to resolve isolated problems and continue to seek other solutions to these isolated problems. This is the option recommended by Aloha and its engineer.
   Est. Annual Cost: $75,000
   Estimated increase in ALL water rates: 5% (a current $30 per month bill will become $31.50 per month).
2. Construction of new water treatment plant to provide service to Chelsea and Wyndtree subdivisions and others in the southern service area separate from all other customers.
   Est. Annual Cost: $1,600,000
   Estimated increase in ALL water rates: 100% (a current $30 per month bill will become $60.00 per month).
3. Construction of water treatment plants for sulfur removal for Aloha's entire service area.
   Est. Annual Cost: $4,800,000
   Estimated increase in ALL water rates: 300% (a current $30 per month bill will become $120.00 per month).

Let your choice be known! Failure to inform the PSC of your preference just increases the chance that you will have alternatives 2 or 3 chosen for you. If you believe that the majority of customers of Aloha who are satisfied with the quality of water they are receiving should not pay for substantial improvements to the system at this time you must act now! Make your voice heard by calling the PSC at 1-800-342-3552 or writing the Commission at the address listed at the end of this page. Reference Aloha Utilities, Inc., PSC Docket Number 960545-WS when you contact PSC to voice your concern. All comments must be received before September 25th. The earlier the better.

In the last "Water News" we told you about a problem that was occurring in one small section of our service area.

Starting in January of 1996 we began receiving a relatively small number of complaints of water discoloration from customers living in the Wyndtree and Chelsea Place subdivisions. We expended considerable resources investigating the cause of the problem. It was not uncommon to find one customer experiencing the problem and the neighbors immediately next door completely unaffected. In addition, in each and every instance, the water entering the affected customer's home was clear and clean and exhibited no discoloration. These two facts led us to conclude that the discoloration was most likely occurring after the water entered the home.

With the help of the Florida Department of Environmental Protection (FDEP) we determined the cause of the problem. The FDEP lab identified the black substance in the water as copper sulfide. Copper sulfide forms when the copper piping in the home corrodes causing copper to be dissolved into the water. This dissolved copper then combines with sulfide (generated in the hot water system of the home when sulfur reducing bacteria break down naturally occurring sulfur compounds) to form copper sulfide. It is important to note that our water contains no copper or sulfide when it enters your home.

The formation of copper sulfide should be minimized and the discolored water problem should be greatly reduced if the leaching of copper into the water from the home piping can be controlled.

We began adding a corrosion inhibitor to the water in late April 1996 to minimize copper corrosion and leaching. To date, the program has been very successful (see related story on Page 1). As we continue to add the corrosion inhibitor chemical, the concentration of copper in the water of the affected homes will continue to reduce.

This discolored water issue has been the subject of a great deal of media attention, spearheaded by Representative Fasano, over the last year or so. If one were to believe the media, every customer of our utility is experiencing the water discoloration problem. We know that this is not the case as the actual number of complaints that we have received regarding this issue represent less than 200 customers out of the 8,200 customers we serve in the Seven Springs Water System service area. We state this not to minimize or make light of the problem being experienced by those that are affected, however, it is important to keep the actual magnitude of the problem in focus. **What Representative Fasano and the news media have not told our customers is that the cost of any actions taken in hopes of correcting the problem will ultimately be**

Water Concerns May Trigger Sharp Rate Increase! Continued

borne by ALL customers whether they are experiencing the problem or not.

At a public hearing held last year in a wastewater related rate proceeding, a relatively small, but vocal and well orchestrated group of customers, convinced the Florida Public Service Commission (PSC) that the water discoloration problem and general dissatisfaction with water quality was much larger and wider spread than we believe either actually is. At that hearing, FDEP experts testified that Aloha was in full compliance with all State and Federal water statutes. Nevertheless, the PSC Staff recommended to the Commissioners that a study be performed to determine the options for improving overall water quality primarily for the purposes of addressing the discoloration problem. The PSC required us to study methods of removing sulfide from our raw water which, in the view of our consulting engineer, will not resolve the discoloration problem for those customer's now experiencing it. Based on the most recent information available from the water industry nationwide and from university researchers who have recently concluded studies in this area, simply reducing the level of sulfur in the water would have no beneficial effect on those customers currently effected by the discoloration problem.

As a result of the PSC order requiring the Utility to complete this study on sulfur removal, the Utility filed an extensive and costly study on June 10, 1997. It took three months to complete this study and it has now been reviewed by the PSC Staff for approximately the same length of time. The cost of the study in consulting engineering fees alone was over $50,000. That cost will ultimately be born by the Utility rate payers. Based on the fact that the Utility was already meeting all State and Federal standards for water quality we felt that no further water quality improvements other than continuing the current corrosion control program were necessary and we still stand by that conclusion.

The Commission is currently considering several alternatives, most of which if ordered by the Commission, will result in substantial expenditures of monies by Aloha Utilities in an attempt to improve water quality. **Whatever monies are required by the Commission to be spent for this purpose will ultimately have to be paid for by ALL customers through substantial increases in rates.** While the Utility anticipates that at some point in time improvements will have to be made to centralize water treatment and meet anticipated future environmental regulatory requirements, we do not believe immediate changes currently being considered by the PSC are necessary or in the best interest of the customers at this time and any one of them will most definitely require a substantial and immediate increase in rates.

Please review the alternatives that are expected to be considered as outlined on Page 2 of this newsletter prior to September 25th, and contact the PSC at their "800" number as listed or in writing at:

Division of Records and Reporting
Florida Public Service Commission
2540 Shumard Oak Boulevard
Tallahassee, Florida 32399-0850
1-800-342-3552

Reference Aloha Utilities, Inc., PSC Docket Number 960545-WS when you contact PSC to voice your concern.

The more people who call or write the PSC, the more likely it is that your positions will be heard and considered. If you believe that water quality improvements (beyond that required by law) are worth the cost, let the PSC know. But a vote for improvements with no rate increase is not an option that the PSC can legally consider. Let your voice be heard.

Selected Quotes from the Jacobs Study

1. Copper metal is widely used in plumbing systems throughout the world because it is economical, resistant to corrosion, and easy to install. However, copper corrosion, whether manifested as uniform or pitting type corrosion, remains a significant problem worldwide. (p. 1)

2. Based on experiences compiled in this work, it seems that adverse effects from sulfides are not confined to copper corrosion in the laboratory. Utilities and homeowners should be alerted to a greater likelihood of copper corrosion problems whenever sulfides are present. (p. 55)

3. While higher corrosion rates are expected to affect the lifetime of uniformly corroding pipes, increased copper by-product release and pitting failure are two potential problems of even greater short-term concern to utilities and homeowners. (p. 31)

4. For a uniformly corroding pipe of 1/16" (0.16 cm) wall thickness, it would take about 100 years to completely corrode through the pipe at pH 6.5 without sulfides. In contrast, at the same pH with sulfides it would take only 8 years to completely corrode through a pipe of equal thickness. In fact, these estimates are probably overly optimistic given the likelihood of non-uniform corrosion, but the calculations clearly demonstrate the potential dangers to home plumbing longevity. (p. 32)

5. Previous research has demonstrated corrosion-accelerating effects of sulfides on copper in natural and synthetic sea water, pure water, and air. These effects are evident almost immediately after exposure to sulfide and have been initiated at concentrations as low as 0.007 mg/l. (p. 1)

6. In the absence of sulfides, a passivating copper oxide scale develops on copper pipes which is often composed of Cu_2O. However, when sulfides are present, a thick, black, poorly adherent scale forms which is composed primarily of Cu_2S, although CuS, Cu_2O, and non-stoichiometric copper sulfide species such as $Cu_{1.8}S$ have also been reported. (p. 2)

7. While extensive research has been conducted on the effects of sulfides on copper corrosion in sea water, there have been surprisingly few studies regarding sulfide-induced copper corrosion in drinking water. (p. 2)

8. In sum, sulfur-induced corrosion appears to be a result of the exposure of copper to oxygen and sulfides and not to their resulting oxidation products. (p. 4)

9. The weight loss of the coupons exposed to sulfides was 20 times that of the coupons that

had not been exposed to sulfides at a given pH. Although the electrochemical corrosion rate measurements are similar for coupons exposed to sulfides at low and high pH, the weight loss of the coupons exposed to sulfides at pH 6.5 was about twice that of the coupons at pH 9.2. (p. 17)

10. A thick (about 0.4 mm) black scale was present on the coupons exposed to sulfides at both pH 6.5 and 9.2. (p. 18)

11. However, this research suggests that once sulfide scales are present, the elevated corrosion rates are not diminished by low oxygen concentrations which are obtainable by nitrogen gas sparging for 1 hour. (p. 27)

12. Several remediation strategies were investigated, including removal of soluble sulfides from the water, chlorination, super-chlorination, and de-aeration. Another possible remediation strategy, physical removal of the scale, was shown to be effective in the preceding chapter; however, this strategy is not likely to be practical in home plumbing. (p. 36)

13. Thus, neither chlorination nor super-chlorination are completely effective remediation strategies for sulfide-induced copper corrosion over relatively short time periods, although some benefits may be observed at the higher pH. (p. 40)

14. These results suggest that the presence or absence of oxygen may be more important than changes in oxygen concentration. (p. 41)

15. For utilities that have oxygenated source waters, any increase in oxygen concentration due to aeration in an attempt to remove sulfides would not likely increase corrosion problems. However, utilities with source waters containing sulfides might have lower ambient oxygen concentrations than were achieved in this work. At these utilities, aeration might initiate a severe sulfide-induce corrosion attack which had been previously suppressed by the absence of oxygen. Additional research is needed on the interplay between oxygen and sulfide-induced copper corrosion in drinking water, as well as on effective remediation strategies. (p. 42)

16. In a case study which must remain confidential for legal reasons, an anonymous utility with sulfides in their raw water received vehement consumer complaints due to occurrence of high concentrations of black particulates at-the-tap. When copper pipe sections from the affected homes were examined, there was a thick coating of soft "mushy" black scale present. The black scale and particles were identified as cupric sulfide... Interestingly, this utility was removing sulfides to below detection levels (<0.2 mg/L) by aeration. (p. 43)

17. The utility (Orlando Utilities Commission) receives about 8 or 9 copper related complaints every month including blue water, pitting failure, and metallic taste complaints.

Based on pipe loop testing, the utility determined that pH adjustment to a target of pH 8.0 would be the most cost effective and least disruptive treatment to mitigate corrosion by-product release. (p. 44)

18. However, some similar trends were observed in the laboratory phase of the investigation such as a significant reduction in by-product release at higher pH in the presence of sulfides. (p. 46)

19. The study conclude that "Where a biofilm containing SRB is established, no remedial action is likely to be effective. In severely hit hospitals, complete replacement of the hot water system would be indicated." (p. 48)

20. Considering the extremely deleterious effects of sulfides on copper corrosion identified in this work, potential impacts of sulfides should be considered whenever copper corrosion problems are encountered. (p. 52)

COMPARISON OF OPTIONS FOR ELIMINATING BLACK WATER

OPTION	ADVANTAGES	DISADVANTAGES	ESTIMATED COST
1. Corrosion Inhibitor	Inexpensive. Already in operation.	After 17 months the inhibitor has not yet eliminated the black water problem in many homes. Home treatment units may not allow the inhibitor to pass through them.	Additional expense of $32,647 per year.
2. Construct central water treatment facilities	Will improve the water's taste and odor. Adds needed storage. Improved pressure throughout the system.	Expensive. Will not reduce elevated corrosion rates. Will take several years before the black water problem is reduce or eliminated.	Depending upon whether one, two, or three wtps are constructed the rates will increase by 398%, 331%, or 215%.
3. Stop pumping from wells 8 and/or 9	Easy to implement (no time lag).	Possible reduction of pressure in the southern area. Need to restart Lead and Copper Testing since Aloha would have a new water source. Unknown whether it will help.	It will cost $725,000 to purchase water from Pasco County to replace that which can not be pumped from both of these wells.
4. Increase the pH	Nationally accepted method for corrosion control.	Difficult to balance the pH since Aloha has seven different water sources.	Capital cost should be low. Staff believes the chemical expense would be comparable to the corrosion inhibitor expense.
5. Repipe the home with CPVC.	Takes approximately two days to repipe the home. Will work in homes which have home treatment. Will prevent any future damage to the home from a copper pipe failure.	Inconvenience to the customer.	Cost has been reported to be approximately $3,000 per home but will be more in larger homes. There will be no recurring annual O&M expense for the utility.

Water Treatment Plant Estimated Construction Costs

Description	Mitchell Road (Modify plant)	Wyndtree WTP (New Plant)	Industrial WTP (New Plant)	Total
Chemical Storage and feed equipment	$243,350	$281,030	$281,030	$805,410
Unit Process Equipment				
Packed Tower H2S Stripper	$230,790	$252,770	$252,770	$736,330
Off-Gas pre-striper	$28,260	$62,800	$39,250	$130,310
Off-gas Carbon Contactor	$157,000	$204,100	$204,100	$565,200
Ozone Disinfection Unit	$142,870	$142,870	$142,870	$428,610
Transfer treated water	$110,685	$110,685	$110,685	$332,055
Ground Storage Tank	$0	$279,460	$279,460	$558,920
Compound Loop Chlorination	$8,635	$45,530	$45,530	$99,695
Chlorine Room Scrubber	$4,239	$42,390	$42,390	$89,019
High Service Pumping	$0	$299,870	$299,870	$599,740
Electrical Generator	$54,950	$54,950	$54,950	$164,850
Flow Meters and Recorders	$7,379	$21,980	$21,980	$51,339
Pressure Relief Valve Assembly	$13,659	$13,659	$13,659	$40,977
SCADA system	$36,895	$36,895	$36,895	$110,685
Concrete Slabs/Bldg mods	$64,370	$105,190	$105,190	$274,750
Operations bldg	$0	$31,400	$31,400	$62,800
Yard Piping	$25,277	$50,397	$54,950	$130,624
Subtotal	$1,128,359	$2,035,976	$2,016,979	$5,181,314
Sitework (4%)	$45,134	$81,439	$80,679	$207,253
Electrical (10%)	$112,836	$203,598	$201,698	$518,131
Contingencies (15%)	$192,949	$348,152	$344,903	$886,005
Land	$30,000	$30,000	$30,000	$90,000
Subtotal	$1,509,279	$2,699,165	$2,674,259	$6,882,703
Well Improvement (1998)				$811,572
T&D Mods (1998)				$1,095,939
Totals				$8,790,213
Engineering & Permitting				$1,424,000
Total				$10,214,213

	Construction of Three wtp's (Aloha's Estimate)	Three wtp's with Used and Useful Adjustment (70%) (Staff's Estimate)	Construction of Two wtp's (Staff's Estimate)	Construction of One wtp (Staff's Estimate)	Three WTP's With Ground Storage and Tray Aeration (Staff's Estimate)
Ground Storage and Tray Aeration Only					$3,083,536
Mitchell Road WTP (modify existing plant)	$1,509,279	$1,509,279	$1,509,279	$0	0
Wyndtree WTP (new for wells 8&9)	$2,699,165	$2,699,165	$2,699,165	$2,699,165	0
Industrial WTP (new for wells 1,2,3)	$2,674,259	$2,674,259	$0	$0	0
Well Modifications	$811,572	$811,572	$811,572	$811,572	$811,572
WTP Subtotal	$7,694,275	$7,694,275	$5,020,015	$3,510,737	$3,895,108
T&D system modifications (1998)	$1,095,939	$1,095,939	$721,939	$721,939	$1,095,939
T&D system modifications (2013)	$0	$0	$0	$0	$0
T&D Subtotal	$1,095,939	$1,095,939	$721,939	$721,939	$1,095,939
Subtotal	$8,790,214	$8,790,214	$5,741,954	$4,232,676	$4,991,047
Engineering	$1,424,000	$1,424,000	$1,250,000	$1,000,000	$500,000
Total Capital Investment	$10,214,214	$10,214,214	$6,991,954	$5,232,676	$5,491,047
Composite Depreciation Rate	4.094%	4.094%	4.094%	4.094%	4.094%
Depreciation expense	$418,130	$292,691	$286,223	$214,205	$224,782
Taxes Other Than Income (Property Taxes)	$223,089	$156,162	$152,711	$114,287	$119,930
Income Taxes					
Net Add. investment	$9,796,084	$6,857,259	$6,705,731	$5,018,470	$5,266,265
Weighted Cost of Equity	4.01%	4.01%	4.01%	4.01%	4.01%
Net Income generated by addtl. investment	$392,823	$274,976	$268,900	$201,241	$211,177
Divide by income tax expansion factor	1.6032998	1.6032998	1.6032998	1.6032998	1.6032998
Pre-tax income	$629,813	$440,869	$431,127	$322,649	$338,580
Less: Net income per above	($392,823)	($274,976)	($268,900)	($201,241)	($211,177)
Additional income tax provision required	$236,990	$165,893	$162,227	$121,408	$127,403
Additional required rate of return	$1,023,691	$725,759	$700,749	$524,430	$550,325
Revenue Impact Calculation					
Increased O&M expense	$2,671,372	$2,671,372	$2,246,082	$791,800	$180,000
Depreciation	$418,130	$292,691	$286,223	$214,205	$224,782
Taxes other than income taxes	$223,089	$156,162	$152,711	$114,287	$119,930
Income Taxes	$236,990	$165,893	$162,227	$121,408	$127,403
Total estimated additional operating expenses	$3,549,581	$3,286,118	$2,847,244	$1,241,701	$652,115
Additional required rate of return	$1,023,691	$725,759	$700,749	$524,430	$550,325
Total Additional costs and rate of return	$4,573,272	$4,011,877	$3,547,993	$1,766,131	$1,202,440
Divide by RAF	0.955	0.955	0.955	0.955	0.955
Total additional revenue required	$4,788,766	$4,200,919	$3,715,176	$1,849,352	$1,259,099
Divide by Annualized revenue	$1,603,086	$1,603,086	$1,603,086	$1,603,086	$1,603,086
Percentage increase in revenue and rates	298.72%	262.05%	231.75%	115.36%	78.54%

REQUIRED RATES

Base Facility Charge (Monthly)	Present Rates	Construction of Three wtp's (Aloha's Estimate)	Three wtp's with Used and Useful Adjustment (70%) (Staff Estimate)	Construction of Two wtp's (Staff Estimate)	Construction of One wtp (Staff Estimate)	Three wtp's With Ground Storage and Tray Aeration (Staff Estimate)
5/8" X 3/4"	$7.12	$28.39	$25.78	$23.62	$15.33	$12.71
1"	$18.94	$75.52	$68.57	$62.83	$40.79	$33.82
1 1/2"	$35.52	$141.63	$128.60	$117.84	$76.50	$63.42
2"	$57.24	$228.23	$207.24	$189.89	$123.27	$102.20
3"	$113.73	$453.46	$411.76	$377.30	$244.93	$203.06
6"	$275.27	$1,097.56	$996.62	$913.21	$592.83	$491.47
8"	$562.36	$2,242.24	$2,036.04	$1,865.64	$1,211.11	$1,004.05
Gallonage Charge (per 1,000 gallons)	$1.27	$5.06	$4.60	$4.21	$2.74	$2.27
Bill at 3,000 gallons	$10.93	$43.57	$39.57	$36.26	$23.54	$19.51
Bill at 6,000 gallons	$14.74	$58.75	$53.37	$48.90	$31.74	$26.32
Bill at 10,000 gallons	$19.82	$78.99	$71.76	$65.75	$42.68	$35.39