ORIGINAL

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

DOCKET NO. 960545-WS

WATER QUALITY INVESTIGATION OF ALOHA UTILITIES, INC

REBUTTAL TESTIMONY OF DAVID W. PORTER, P.E., C.O.

Q. Please state your name and professional address.

A. David W. Porter, P.E., C.O., Water/Wastewater System Consulting Engineer, 3197 Ryans Court, Green Cove Springs, Florida, 32043.

Q. Have you previously provided testimony in this proceeding?

A. Yes. I prefiled direct testimony.

Q. What is the purpose of this rebuttal testimony?

A. I wish to respond to a number of statements made, and issues raised, by Mr. Ted L. Biddy, P.E. in this testimony.

Q. What are your qualifications relative to this case?

A. I hold a BSCE degree from the University of Massachusetts where the emphasis of my studies was in water and wastewater treatment technology. I have 27 years experience in the operation, management, design, construction and troubleshooting water and wastewater facilities. During that time, I have been employed as a treatment plant operator and administrator, a design engineer, principal engineer, vice president and general manager of a large engineering firm that specialized in the design of water and wastewater facilities worldwide, principal engineer for a multinational water and wastewater equipment manufacturing firm that provides state-

of-the-art equipment for high purity water systems worldwide. I served as on-site research engineer and head of a pilot testing team that developed a two stage ozone water treatment system for total trihalomethane reduction in drinking water which won a national award from the American Consulting Engineers Council. For 14 years I taught water and wastewater treatment technology as an adjunct instructor at community colleges, universities and State sponsored short schools. I have authored numerous technical papers and trade magazine articles related to treatment facility design, troubleshooting, operation and management. I have served as the chairman of the American Water Works Association's Pipeline Rehabilitation Standards Committee and have served on numerous technical advisory committees for the Water Environmental Federation, the American Water Works Association and governmental regulatory agencies such as the Florida Department of Environmental Regulation. I was appointed to and served on a Florida Department of Community Development task force that studied copper piping corrosion problems throughout the State of Florida and investigated possible causes and solutions. I am an A Class Licensed Plant Operator in the State of Florida, a Grad VII Licensed Plant Operator in the Commonwealth of Massachusetts, a Registered Professional Engineer in the States of Florida and Virginia.

Q. What are your professional affiliations related to this case?

A. I am a member of the American Water Works Association, the Water Environment Federation and the Florida Water and Wastewater Operators Association.

Q. Have you reviewed the direct testimony of Mr. Ted L. Biddy, P.E. concerning this case?

A. Yes.

Q. What are your comments concerning your review of Mr. Biddy's testimony as it relates to his impressions of the adequacy of the water facilities upgrade study report?

A. In his testimony, Mr. Biddy stated that he reviewed my report "Water Facilities Upgrade Study Report" completed as directed by the Commission in its March 12, 1997 Order. Mr. Biddy stated that it was his opinion "that the report did not adequately address the Commission's Order in that the report did not attempt to isolate the problem area(s) and then study ways to upgrade the water quality at the problem area(s) but that the study included extensive new water treatment, storage, and pumping facilities for all nine existing well sites." Mr. Biddy's statement is seriously in error. The report fully addressed the Commission's Order which specifically required that the report study two methods for removal of hydrogen sulfide (H_2S) from Aloha's water. The first method was tray aeration and the second was packed tower aeration. Further, the report was to evaluate whether treatment at each present well site would be technically

feasible and cost effective or whether centralized treatment of the water would be more desirable from both a long term technical feasibility and cost effectiveness point of view. The report took into account the changing Federal Environmental Protection Agency (EPA) and Florida Department of Environmental Protection (DEP) regulations which must be considered in any upgrade of a water facility. Mr. Biddy states that my Alternate 2 - Centralized Water Facilities "includes new and expanded facilities for this utility's needs through the year 2015 and beyond." Mr. Biddy further states "this broad brush approach would obviously be good for the utility but in no way solves the problem in a cost effective manner." Mr. Biddy goes on to state that he believes that "the study should have concentrated a study into the cause and cure of the water quality problems at the southwest portion of the service area served by well nos. 8 and 9 where most of the water quality complaints have come from." The statements by Mr. Biddy indicate that he did not understand that two years of investigation into the cause(s) of the water quality complaints had already been completed when the Commission ordered that the study be undertaken. During that proceeding two year period, a number of studies and investigations were made to locate the source of the water quality complaints. Many different groups participated in these investigations such as the DEP, Commission staff and Aloha's engineers. In

addition, a detailed study of copper water piping corrosion and copper sulfide generation was completed by the University of Colorado. Since it was first published as a graduate school thesis, it has been subjected to extensive peer review and analysis by other experts and has now been published in the July 1998 *Journal of the American Waterworks Association*, the most recognized journal on water treatment in this country. The Commission staff and Aloha's Engineer had both provided information to the Commission regarding this study which showed that copper sulfide related black water problems were not uncommon in many locations throughout the United States. The Colorado report also showed that simply reducing the sulfide concentrations of the water did not have a great effect on the reduction of black water formation in those systems already experiencing the problem. The report also showed that the concentration of sulfide would need to be reduced to very low levels (almost to 0) for any reduction in the experience of copper sulfide related black water problem would be realized in homes presently experiencing the problem. Knowing this, the Commission staff concluded that reducing the sulfide concentration of Aloha's water would more than likely have no measurable effect on the incidence of black water complaints from those customers already experiencing the problem. The Commission staff also stated that the only known method for completely controlling the black water problem

would be to replace the copper piping in the customer's homes with CPVC piping. Therefore, the Commission's purpose for ordering the completion of the study was to address odor and taste complaints that some customer's had voiced...not to specifically address the black water problem. The report fully addressed the Commission's Order and correctly took into account any upgrades that would be required by FDEP in permitting the construction of any new facilities. What Mr. Biddy apparently fails to understand is that the FDEP will require Aloha to address any new requirements that have come into effect since Aloha's facilities were constructed many years ago in any proposed facility upgrades. The report was reviewed by the FDEP prior to its release to insure that the data presented in the report was an accurate representation of what the FDEP would require of Aloha if it submitted permit application for facility upgrades. Mr. Biddy consciously ignored the extensive studies of the black water problem that had taken place prior to the Commission's Order; the requirements of the FDEP regarding upgrading existing water facilities; the University of Colorado findings which later became the American Waterworks Association article; previous Commission Staff findings and Recommendations; upcoming EPA rule changes; and the purpose of the study before he prepared his testimony. In his deposition, Mr. Biddy after repeated questioning made it very clear that he had ignored all

previous evidence on the issue of the black water and hydrogen sulfide in what he claimed was an attempt to remain "neutral" and to base his analysis solely on his own testing and review. In effect what he has done is to have kept himself ignorant of the over four years of data accumulated by various entities as outlined above and to ensure that his opinion is based upon only a very small amount of the total evidence available on the subject. As such, he has ensured that his analysis is incomplete, and therefore, his conclusions are based on only a very small percentage of all the evidence available, thereby making his conclusions at the very least suspect, if not totally invalid.

Q. Do you have any comments regarding Mr. Biddy's interpretation of the laboratory results he obtained from samples of Aloha's raw and finished water?

A. Yes I do. Mr. Biddy stated that the water testing results were "remarkable for their lack of detection of sulfides and sulfates." He then goes on to state that "the tests for odor from the raw and finished water of all the wells except for well no. 6 have Threshold Order [odor] Numbers (TON) in excess of the Florida DEP Secondary Drinking Water Standard of 3." Mr. Biddy also prepared a Memorandum to File after his field sampling trip to Aloha's well sites. In his memo he repeatedly made statements such as "some hydrogen sulfide odor was obvious at the raw water tap" and "both wells has a strong

hydrogen sulfide odor and taste in the finished water." Mr. Biddy's statements contradict each other as there is no possibility that the raw and finished water could both exhibit a strong hydrogen sulfide smell and not contain any hydrogen sulfide. Obviously, Mr. Biddy was not correct when he reported hydrogen sulfide smell at the wells or there is an error with his laboratory data.

Q. Are you aware that Mr. Biddy stated in his testimony that Aloha or others unknown super-chlorinated both the raw well water and the finished water prior to his laboratory collecting samples on August 4, 1999?

A. Yes.

Q. Do you have any comments to make about Mr. Biddy's assertions regarding the super-chlorination of the wells and finished water?

A. Yes I do. In his testimony, Mr. Biddy states that he based his assumption that the wells were super-chlorinated from a laboratory report he received showing a Threshold Odor Number (TON) for certain samples that were 16 units. He further states that his laboratory informed him that the odor was a "very strong chlorine odor." However, there is no notation on the laboratory's records that indicated that any chlorine odor was identified whatsoever. In fact, Mr. Biddy's very detailed filed trip memorandum makes no reference to chlorine odor in the water whatsoever. This is quite remarkable. Super

chlorinated water would exhibit an almost bleach like odor that would be quite noticeable at the sample points where the water comes into contact with the air. In addition, if the water had been super-chlorinated as Mr. Biddy states, it would have been impossible to detect hydrogen sulfide in the water at the sample site as chlorine quickly oxidizes hydrogen sulfide to sulfate which would not exhibit the characteristic rotten egg smell associated with hydrogen sulfide. Any reasonable person can easily tell the difference between rotten egg (hydrogen sulfide) and super-chlorinated (bleach) smelling water. I can only conclude that Mr. Biddy correctly identified hydrogen sulfide in the water at the well sites and ignored this fact when reaching his conclusions. A copy of Mr. Biddy's Memo to File is attached to my testimony as **Exhibit "DWP-1"**. There has been absolutely no evidence submitted by Mr. Biddy that supports his contention that the raw water was super-chlorinated, even the lab results say nothing about chlorination of raw water. I find it incredible that Mr. Biddy can conclude that super-chlorination of both the raw and treated water occurred, when such a conclusion is not only contrary to all the other evidence over the years (other than a very strained interpretation of one set of laboratory results), they are contrary to his own contemporaneous observations.

Q. Were you present during the August 4, 1999 water sampling

event?

A. Yes.

Q. Please tell me of your perceptions regarding the water quality on that date.

A. I was personally present at each site where samples were extracted. At each site, the raw water did exhibit the odor of hydrogen sulfide; typical of what Aloha, the FDEP, the FPSC staff and many others have found in the past and typical of all other utilities in the area and much of the rest of Florida. The finished water from each location exhibited no excessive hydrogen sulfide odor and did exhibit a mild chlorine odor typical of chlorinated finished water. The water in all cases was clear and palatable. I drank finished water from each of the well sites and found it to be of good quality. It is important to note that chlorine smell and taste at the point where the finished water is produced is not uncommon at any water facility utilizing chlorination for disinfection. This is because the chlorine concentration of the finished water is at its greatest point where the water leaves the water plant site and it enters the distribution system. FDEP rules require that the chlorine added at the water plant site be great enough to enable the water to contain a residual amount of chlorine at the furthest reaches of the water distribution system. This residual chlorine serves to protect those customers on the ends of the

distribution system. This residual chlorine serves to protect those customers on the ends of the distribution system. However, Aloha at no time super-chlorinates its finished water as reported by Mr. Biddy. While at the sites on August 4, 1999 not one person, lab sampling technicians, Commission staff, Mr. Biddy, Public Counsel's office staff, commented that a chlorine odor was detected. In fact, several persons were seen either drinking or otherwise tasting the water. Mr. Biddy in his memorandum states that he tasted the water, however, he did not report the chlorine odor or taste. Mr. Biddy's charges that Aloha or some unknown person super-chlorinated the wells and/or finished water is totally without merit.

Q. Are you familiar with the rate at which the well pump operates at Well No. 1?

A. Yes, if the pump is rated at 1,000 gallons per minute.

Q. If we assumed that you wanted to super-chlorinate Well No. 1, how much chlorine would you need to add to the well itself for the finished water to continuously contain the 50 mg/L chlorine concentrations speculated by Mr. Biddy?

A. The well would need to be dosed at almost one half pound of pure chlorine for each 1,000 gallons of water pumped from the well for the finished water to contain 50 mg/L. Since the well is pumping about 1,000 gallons each minute, about one half pound of pure chlorine would have to be added to the

water as it was pumped from the well each minute. Pure chlorine is not able to be fed directly into the well water. Typically, the chlorine would be added as a liquid solution known as sodium hypochlorite which contains about 1 pound of pure chlorine per gallon of solution. Therefore, about one half gallon of sodium hypochlorite solution would need to be continuously added each minute to the water as it is pumped from the well to maintain a 50 mg/L concentration of chlorine in the finished water. This is a large quantity of chlorine solution that would require a large storage tank of hypochlorinate to be located at the well site and a pump connected to the water well capable of pumping one half gallon of the solution each minute. This pump and its discharge piping connecting it from the solution tank to the well would be very noticeable in a small well house and would not be easily missed by anyone inspecting the well house as Mr. Biddy did. In fact, the sampling teams were present for approximately 45 minutes or more at each sampling site during the day of the sampling event. During that time alone, over 20 gallons of chlorine solution would have had to be added directly to the well for the water sampled to contain 50 mg/L of chlorine as Mr. Biddy contends. Since no chlorine storage tank and feed pump was seen by Mr. Biddy according to his Memorandum to File concerning his visit, the chlorine solution would have had to be added directly to the well by hand

through a 2" diameter well inspection port opening located on the top of the well which was in plain site of all those who attended the event. I am sure that even Mr. Biddy would have seen someone pouring 20 gallon jugs of chlorine solution down the well in front of his nose.

Q. Would it not be possible to super-chlorinate the well the night before Mr. Biddy visited the site and have the well water show super-chlorinated levels the next morning?

A. Not if the well was used throughout the night. You have to remember, Mr. Biddy contends that all but one of the wells he visited were super-chlorinated. Therefore, it would not be possible for all of Aloha's wells to lie dormant for an entire night; the system would have run out of water very quickly and a large number of pressure and supply complaints would have been received. Which they were not. Therefore, it is safe to assume that Aloha's wells were operating throughout the night. Therefore, of the wells Mr. Biddy claims were super-chlorinated would have had to have the sodium hypochlorite storage and feed equipment similar to that I described for Well No. 1. The only difference would be that the pumping rate of the solution pumps would be less from wells which pumps at a lower rate than Well No. 1. For instance, Wells 8 and 9 pump at the rate of 500 gallons of water per minute. Therefore, the rate at which chlorine solution would need to be pumped into the well at these sites would be approximately

one quarter of a gallon per minute. This is still a substantial quantity of chlorine solution to be pumped and the chlorine storage tanks and pumps would be very noticeable. The important point to remember here is that as long as any of the wells are in use, chlorine solution would need to be pumped to the well continuously for the water leaving the well to show chlorine concentrations of 50 mg/L.

Q. Would it not be possible to super-chlorinate the aquifer the day before Mr. Biddy's visit so that no chlorine solution would need to be added the day of the sampling?

A. There is no possible way to super-chlorinate the aquifer itself. First, it would violate FDEP rules to do so. One would actually be contaminating the aquifer to super-chlorinate it. There would also be no physical way to super-chlorinate enough water surrounding the well to be of any possible consequence. One would need to super-chlorinate a large zone of the water around the well bore hole opening to accomplish what would be needed to allow the water pumped from the well the next day to contain 50 mg/L of chlorine, since the well would have been used all night at 1,000 gallons each minute and since the well pulls water from a zone 360 degrees around the bore hole. As an example of the quantity of chlorine solution that might be needed, for each 1 million gallons of aquifer water to be super-chlorinated, about 3,800 gallons of chlorine solution would be needed. Since Well No.

1 pumps about 1.4 million gallons of water each day, over
2 5,000 gallons of chlorine solution would be needed to super-
3 chlorinate just the water pumped by Well No. 1 in only one
4 day. But as I stated before, since there is no way to make a
5 well pump only water from a small part of the aquifer, the
6 amount of aquifer water that would actually need to be treated
7 to ensure that the water to be pumped by the well the next day
8 would be super-chlorinated would need to be much greater.
9 Therefore, even if there was a way to get the chlorine
10 solution to the aquifer (which there is no way to accomplish
11 this without a great deal of equipment and effort that would
12 take a great deal of time and expense) the amount of chlorine
13 solution needed would be huge, in my opinion at least 10,000
14 gallons or more. In my opinion, it would be technically
15 impossible to super-chlorinate the aquifer the day before Mr.
16 Biddy visited the wells.
17 Q. Based on all you have said here, do you think it is
18 technically feasible to super-chlorinate the wells in such a
19 way that an experienced and competent expert could have not
20 noticed?
21 A. Absolutely not. For the wells to have been super-chlorinated
22 and for an expert to visit the wells and not see or smell
23 obvious evidence of its is unthinkable.
24 Q. Can you think of any benefit that Aloha would receive from
25 super-chlorinating its wells and finished water prior to Mr.

Biddy conducting his sampling?

A. I cannot conceive any benefit that Aloha would receive from super chlorinating its wells and finished water prior to Mr. Biddy's sampling event. The only person who could possibly benefit is someone who is not concerned with finding the facts in this case, but rather with obscuring the facts by focusing on one errant set of results that do not agree with any of the other evidence accumulated over the years. Certainly Aloha has the least to gain from such tampering. Aloha has repeatedly stated, for over four years, that its raw water contains hydrogen sulfide and that its finished water contains sulfate and small quantities of residual hydrogen sulfide. Numerous lab reports, completed over many years attest to Aloha statements. The FDEP has independently sampled and tested Aloha's water and found the same. The FPSC staff, and indeed the Commissioners, have inspected Aloha's wells and found the same. What Aloha could possibly gain by trying to produce conditions that would be vastly different than ever seen before is beyond me; I have no clue.

Q. During the August 4, 1999 sampling event, did Aloha retain a separate independent laboratory to extract samples of raw and finished water from each site where Mr. Biddy extracted samples? If yes, why and what were the results?

A. Yes. Those samples taken by an independent lab, Short Environmental Laboratories, and were taken within 2 or 3

minutes of those taken by Mr. Biddy's lab at each of the same locations. Neither Aloha's engineer, employees, or representatives ever took the samples, touched the samples, handled the samples after they were taken, transported them to the lab, or tested them. Complete Chain of Custody records exist for such samples showing that they were retained solely by the testing labs, employees and agents. The testing results produced by the second laboratory were totally consistent with what had been reported by Aloha, the FDEP and FPSC staff for many years. The results were totally inconsistent with the testing results produced by Mr. Biddy's laboratory.

Q. On October 6, 1999 another water sampling and testing round was undertaken by the Public Service Commission staff. Are you familiar with that event and the testing results produced by their laboratory? If so, please comment.

A. yes I was present during that sampling event and have reviewed the laboratory results produced by the FPSC's laboratory. The laboratory testing results produced by FPSC's laboratory were totally consistent with what had been reported by Aloha, the FDEP and FPSC staff for many years. The results were totally inconsistent with the testing results produced by Mr. Biddy's laboratory.

Q. Did Aloha arrange for comparison testing to be undertaken at the October 6, 1999 sampling event? If so, what were the

results of that testing?

A. Aloha did arrange for an independent laboratory to collect comparison samples and provide testing of those samples. The laboratory testing results produced by the independent laboratory were totally consistent with what had been reported by Aloha, the FDEP And FPSC staff for many years. The results were totally inconsistent with the testing results produced by Mr. Biddy's laboratory.

Q. Mr. Porter, can you summarize your thoughts concerning all the sampling and testing data we have discussed here?

A. I have prepared a table which shows all the recent testing data in comparison format; that table is attached to my testimony as **Exhibit "DWP-4"**. As can be easily seen from the table, all laboratory testing results produced by each independent laboratory was totally consistent with what had been reported by Aloha, the FDEP and FPSC staff for many years with the exception of the results of Mr. Biddy's laboratory which were totally inconsistent with the testing results produced by all other laboratories.

Q. What can you conclude from this comparison of laboratory results?

A. That Mr. Biddy's data is seriously flawed and cannot be trusted and therefore, Mr. Biddy's statements and conclusions regarding the quality of Aloha's water must be likewise flawed and incorrect. In fact, the discrepancy between Mr. Biddy's

observations regarding odors he detected at the site (hydrogen sulfide) and later statements regarding excessive chlorine are totally at odds with each other and I can only conclude that Mr. Biddy's entire testimony cannot be trusted for accuracy or reliability.

Q. Have you any opinions as to how Mr. Biddy's laboratory data could be so inaccurate? If so please comment.

A. Yes I do. Careful, thoroughly accurate preparation of the Chain of Custody documents (which describe the entire sampling and testing process from the collection of the sample, to preservation of the sample, to transport of the sample to the laboratory, to testing of the sample at the laboratory, to documenting the results of the testing) are of paramount importance and are used to determine if testing results can be trusted and are valid for use in scientific evaluations and legal proceedings. I have reviewed the Chain of Custody documents prepared by Mr. Biddy's laboratory for the August 4, 1999 sampling event. Those documents do not indicate that the samples for sulfide were properly preserved prior to their shipment to the laboratory for analysis. The EPA and FDEP have standard preservation procedures that must be followed for a sample to be considered valid. There is no evidence that these procedures were followed and, therefore, it must be assumed that they were not preserved as required. Because of lack of proper preservation of the samples, Mr. Biddy's data

is not valid and must be discarded. Attached to my testimony is a letter from Short Environmental Laboratories that documents that the failure to utilize proper FDEP/EPA required sample preservation methods can indeed cause serious testing errors. At my request, Mr. Cummings at Short Environmental Laboratories took some well water samples that contained sulfides and held them for the same period of time that Mr. Biddy's lab held his samples before testing for sulfide. In fact, Short Environmental Laboratories found that 90% of the actual sulfide concentration can be lost before testing if the sample was not preserved properly at the time of sampling. This 90% loss of sulfide in the sample appears to be the major reason that Mr. Biddy's test results show lack of expected sulfide. The reason that sulfide was not found in his samples has nothing to do with super-chlorination of the samples, but due to improper sample preservation by Mr. Biddy's laboratory. A copy of the Short Environmental Laboratory letter is attached as **Exhibit "DWP-3"**.

Q. Based on your testimony regarding the reliability of Mr. Biddy's data and the inconsistency in his observations, what can you conclude regarding his claim that Aloha or unknown others super-chlorinated that wells?

A. The entire body of data collected by Mr. Biddy is highly suspect and in my opinion not suitable for use under any circumstances. The inconsistencies between Mr. Biddy's own

observations regarding "obvious" and "strong" hydrogen sulfide odors and tastes at the well sites and his later interpretation of laboratory results regarding the presence of strong chlorine odor also make Mr. Biddy's testimony highly suspect. It is my opinion that Mr. Biddy's statements accusing Aloha or other unknown persons of super-chlorinating the wells prior to his sampling event are wholly inconsistent with the data and are false.

Q. Mr. Porter, are you familiar with Mr. Biddy's claim that the presence of chlorine in a sample of Aloha's water that had sat in the laboratory for three weeks proves his assertion that Aloha's water was super-chlorinated on the day of sampling? If so, Please comment.

A. Mr. Biddy's statement again is totally incorrect. In fact, the presence of chlorine (at 1.4 mg/L as reported by Mr. Biddy) in a standing sample only proves that Aloha's water is of high quality and that Aloha's addition of chlorine to oxidize hydrogen sulfide to sulfate at the well sites is highly effective. You see when chlorine, a strong oxidizer, is added to water, it reacts with reducing agents, such as hydrogen sulfide, very rapidly. In the process of oxidizing the reducing agents, some of the chlorine is used up. This amount of used chlorine is known as chlorine demand. After the chlorine demand is satisfied, the remaining chlorine in the water is known as Free Available Chlorine. It is this

Free Available Chlorine that is largely responsible for killing pathogenic (disease causing) organisms that may be present in the water. This level of Free Available Chlorine must be great enough to protect the water as it travels to the customers' homes through the distribution piping. Should a cross-connection between a drinking water source and a non-drinking water source (such as an irrigation system) occur, it is the Free Available Chlorine that will kill any pathogenic organisms in the non-drinking water source; protecting the customers from disease. As you can see then, some level of Free Available Chlorine is not only desirable, but necessary. In fact the FDEP rules require that Free Available Chlorine be present in the water at the farthest ends of the distribution system where the water may be as old as several weeks, depending on the rate of use of the water in that area. Finding Free Available Chlorine concentrations in the water samples taken right at the treatment plant of 1.4 mg/L after two or three weeks indicates that Aloha is doing its job and that the water is of high quality. Further evidence of this fact is that neither Mr. Biddy or his laboratory field technician noted high levels of chlorine in the water at any of the homes he visited on August 5, 1999. Those homes are very close to a water plant and not on an end of a dead-end line. Had the finished water distributed to the customers been super-chlorinated the day before (at a concentration of

25 to 50 mg/L according to Mr. Biddy in his deposition), the water at the customers' homes would have had a very strong bleach smell which it did not. Also, not one complaint from any customer was received on August 4 or 5, 1999 concerning bleach smelling water. Mr. Biddy is wholly incorrect in his assumptions and a great deal of additional factors and evidence proves it clearly. Attached are the field notes from the lab technician hired by Mr. Biddy as **Exhibit "DWP-2."**

Q. Mr. Porter, you were present at all the sampling sites visited during the August 4, 1999 sampling event. Are you aware of any directions given to any Aloha staff member by Aloha management to super-chlorinate the wells?

A. No, not at all.

Q. Have you any knowledge of anyone super-chlorinating the wells?

A. No, not at all.

Q. Did you super-chlorinate the wells?

A. No, I did not.

Q. Are you familiar with a claim in Mr. Biddy's testimony that he visited six customers' homes on August 5, 1999 for the purpose of observing the quality of their water and obtaining samples for laboratory analysis? If so, please comment.

A. Yes I am. Mr. Biddy reports to have visited six homes on August 5, 1999. Unfortunately, Aloha was not notified of these visits and therefore, I did not attend these visits. Mr. Biddy states in his testimony that at one of the homes,

that of Mr. Coogan, he observed black water. He further states that he found high copper concentrations in the black water in the Coogan residence. However, he states that he tested the water for sulfide and found none. He concludes that since he found black water and no sulfide that the claim by Aloha that the black substance is copper sulfide is incorrect. This assumption by Mr. Biddy is flawed and totally incorrect. I reviewed the Chain of Custody documents provided by Mr. Biddy's laboratory for the water samples extracted at Mr. Coogan's home. The chain of custody forms do not indicate that proper preservation methods were applied to the samples collected and therefore, as with the well samples, invalidates the samples and tests conducted thereon. In addition, Mr. Biddy's laboratory reported that the testing method used to determine what level of sulfide was present was EPA Method 376.2. This method specifically excludes its use for detecting sulfide when it is combined with copper to produce copper sulfide. Mr. Biddy has based his assumption that the black residue found in Mr. Coogan's water cannot be copper sulfide on his laboratory data which does not show the presence of sulfide in the water. His assumption is inherently false because the testing method used by his laboratory specifically excludes measuring sulfide in the form of copper sulfide. His assertion is ridiculous. It is my opinion that Mr. Biddy's statements illustrate his total lack

of knowledge regarding the testing methods chosen, their interpretation, the requirements for proper sample collection and preservation, the mechanism of formation of copper sulfide and the basic engineering and chemical principals underlying this entire issue. The presence of high copper concentrations in Mr. Coogan's water in his home, coupled with Mr. Biddy's own laboratory data that shows that there is no copper in the water entering Mr. Coogan's home, should have indicated to him that Aloha's claims were valid. It is important to keep in mind here that the determination that the black substance in the black water was originally determined by the FDEP and its laboratories and not Aloha. Since that time, independent verification of FDEP determinations has been repeated numerous times by independent labs and various agencies. Also, a major peer reviewed research paper has been written and published on this subject (fully discussing the formation of copper sulfide in home copper piping systems) by researchers at the University of Colorado and published in the *American Waterworks Association Journal*. A copy of this paper was attached to Mr. Watford's direct testimony filed earlier in this case. Also, a Florida Department of Community Affairs study has been completed, overseen by a select committee (on which I and members of the Public Service Commission staff were members) that fully investigated this copper corrosion problem. It is my opinion that Mr. Biddy was either not aware

of these studies, or chose not to consider them when he made his assertions. It is also important to note that Mr. Biddy stated in a sworn deposition taken on October 18, 1999 that he saw evidence of black water in all the homes he visited. However, at that deposition, he was asked if he actually saw any black water running from any of the faucets from the remaining five homes (other than Mr. Coogan's home), and he reported in deposition that he did not. In addition, Mr. Biddy was asked to comment on the notes of his laboratory technician who collected the water samples at each home in which the technician stated that the water was odor free, clear and colorless at each home, including the water entering Mr. Coogan's home. The laboratory technician's field notes are attached as **Exhibit "DWP-2"** His response was that his observations and that of his own laboratory technician were frequently not in agreement. Again, there appears to be a major inconsistency in Mr. Biddy's observations and those of others who made observations at the same location and time, even his own independent lab, and his own memo to the file regarding his visit. Again, it is my opinion that these inconsistencies cast serious doubt on the accuracy of Mr. Biddy's entire testimony.

Q. Are you familiar with statements made by Mr. Biddy concerning elevated copper levels found in the water in Mr. Coogan's home? If yes, please comment.

A. Yes, I am. It is important to note that the laboratory data submitted with Mr. Biddy's testimony show that none of his samples were taken at the meter, which is the point of connection where Aloha's water is delivered to Mr. Coogan. The ERA and FDEP rules require that all water samples used for judging compliance with EPA and FDEP Secondary Contaminant rules be taken at or before the point of connection with the customer's home water system. The Commission's own rules also designate the point of connection (the meter) as the point where Aloha's responsibility for the quality of their water ends. The rules of the EPA, the FDEP and FPSC establishing that a utility should not be responsible for water quality after it enters a customer's home where it can be contaminated in any number of ways, all beyond the control of the utility, it is reasonable and correct. Therefore, all of Mr. Biddy's statements regarding whether Aloha's water met FDEP Secondary Contaminant regulations based on his samples taken at any point other then than the point of connection are meaningless and must be disregarded. Regarding Mr. Biddy's comments related to the EPA and FDEP Lead and Copper Rule, again all of his samples were not valid for use in determining whether Aloha's water complied with the rule or not. This is because Mr. Coogan has installed a home water treatment unit which changes the chemical character of the water as it enters his home. The EPA and FDEP rules are specific in that any home

with a home water treatment unit cannot be used to evaluate whether a water utility is complying with the Lead and Copper rule. The EPA and FDEP excluded homes with in-home water treatment units from eligibility for use as testing sites because they were well aware that these homes were likely to experience water quality problems, of the type now reported by Mr. Coogan, for which the utility had no responsibility and could exercise no control. Therefore, any comments made by Mr. Biddy regarding Aloha's compliance with EPA and FDEP's Lead and Copper rules are meaningless and must be disregarded. Actually, Mr. Biddy's testimony only further illustrates what the FDEP, Aloha consultants, FPSC staff, University of Colorado studies and others have stated previously; that the black substance found in some customers' homes is composed of copper sulfide which is formed in the customer's home itself. Further evidence of this fact is that one customer (Mr. Vento) had very pronounced problems with black water; however, after he re-piped his home with CPVC and removed all copper piping, his black water problem totally disappeared. Had there been some other cause for the black water problem replacing the copper with CPVC would not have totally resolved the problem. Any competent environmental engineer that specializes in water treatment should be aware of the EPA and FDEP rule requirements that I have stated here. Since Mr. Biddy claims to be a water engineering expert, I can only conclude that his

statements regarding the concentrations of copper found in Mr. Coogan's water and Aloha's compliance with EPA and FDEP rules were made only to case an unrealistic, totally inappropriate and unfair doubt on Aloha's claim that its water meets all EPA and FDEP rule requirements. If this was not Mr. Biddy's intention, then his lack of knowledge regarding the rules is appalling and causes me to seriously doubt his claim to be an expert regarding water system engineering and permitting.

Q. Do you have any opinion as to why Mr. Coogan's home is experiencing the black water problem? If so, please comment.

A. Mr. Coogan has installed a home water treatment unit in his home. This unit modifies the character of the water substantially from the water as was supplied by Aloha. One of the changes that is made to the water is to reduce the hardness of the water, especially the calcium hardness of the water. Aloha adds a copper corrosion inhibitor to its water. This inhibitor, primarily a phosphate compound, bonds with calcium to form a coating on the inside of the copper piping to protect it. Mr. Coogan's in-home water treatment unit removes the calcium needed to allow Aloha's inhibitor to function and therefore, places his own piping at risk. Commission Staff, FDEP Staff and I have stated this these facts in previous hearings concerning this case. Why Mr. Biddy apparently chose to neglect this fact in formulating his opinions I do not know.

Q. Can you comment on Mr. Biddy's statements in his testimony regarding use of a pressure filter for hydrogen sulfide removal as an alternative to the aeration methods discussed in your report?

A. Yes, I can. This is where I find the most compelling evidence that Mr. Biddy's testimony is seriously flawed overall. Hydrogen sulfide is a gas and as such is not a solid or particle. It is a basic rudimentary engineering fact that filters are used to remove solid particles by a straining a action; filters cannot remove a gas as it passes through the filter media and is not able to be strained out. During his deposition, Mr. Biddy was shown a section of FDEP Rule 62-555 which lists reference documents that must be utilized when an engineer designs a water treatment system. Mr. Biddy was then shown the three references listed in the FDEP rule that deal with water treatment facility design. In all three documents Mr. Biddy was shown passages that specifically stated that aeration was typically utilized for the removal of hydrogen sulfide and the filters were used to remove solids and particles in all three references. Nowhere in any of the references was there any documentation that filters could be used for hydrogen sulfide removal directly as contemplated by Mr. Biddy in his testimony deposition. Mr. Biddy was asked to explain this discrepancy and only stated that the use of pressure filters for hydrogen sulfide removal was common. Mr.

Biddy was asked if he ever designed a facility using pressure filters for direct hydrogen removal. He stated no. He was asked if he was aware of any facilities in Florida utilizing pressure filters for direct hydrogen sulfide removal. He stated no. Mr. Biddy was asked if he was aware of any pressure filter installations for the direct removal of hydrogen sulfide had ever been permitted by the FDEP in the State of Florida. He said no. It is my opinion that Mr. Biddy is not knowledgeable in the design of water facilities for the removal of hydrogen sulfide and that his testimony is highly flawed and should be disregarded. Also, as I stated earlier, it is my opinion that Mr. Biddy's testimony regarding the use of pressure filters as the only upgrade to Aloha's water system was highly flawed because it did not take into consideration FDEP and EPA existing rules, much less rule changes recently implemented or soon to be implemented, water use patterns that effect water quality after it leaves the water plants and therefore requires a change, is storage and distribution methods, overall water quality issues that must be addressed before FDEP permits can be obtained, etc. In general, it is my opinion that Mr. Biddy's statements regarding the suitability of various treatment system modifications are highly flawed and should not be relied upon.

Q. Would you care to summarize your opinion of Mr. Biddy's study into this matter and his testimony in general? If so, please

do so.

A. As I have pointed out, it is my opinion that Mr. Biddy's investigation was highly flawed due to his apparent lack of knowledge and understanding of the issues, the selection of laboratory methods used to measure sulfide, his apparent lack of understanding of FDEP design requirements as they pertain to use of aeration versus filtration technology for direct removal of hydrogen sulfide (a gas, not a solid), his stated intentional disregard for previous data collected by others such as Aloha itself, the FDEP and FPSC staff and the Florida Rural Water Association, and the large number of inconsistencies in his perceptions regarding odor and the presence of black water and his later comments and those of his laboratory technician who extracted samples. It is my opinion that Mr. Biddy's testimony is totally without merit and should not be relied upon in any way. It is my opinion that Mr. Biddy's statements are unsupported by any significant facts and are totally false regarding his claim that Aloha or some unknown person super-chlorinated the wells and finished water to "rig" the tests during his visit on August 4, 1999 and a great deal of evidence clearly shows this.

Q. Have you represented Aloha Utilities throughout this water quality investigation proceeding on engineering matters?

A. Yes, I have. I have been the engineer primarily responsible for Aloha's response to this investigation as it involves

engineering issues.

Q. Have you prepared an analysis of the costs incurred by the utility for engineering fees relative to this issue and this case?

A. Yes.

Q. What are the total engineering costs to date?

A. The total engineering costs incurred to date, including fees and costs, is $66,213.01 through the end of September. We estimate approximately $31,130 additional dollars will be incurred to completion of this case for a total of $97,343.01 in engineering fees expected to be incurred before this case is finalized. I have summarized the actual and estimated engineering costs to complete as **Exhibit "DWP-5"**.

Q. Do you have any thing else to add?

A. Not at this time.

TED L. BIDDY, P.E., P.L.S.

2308 Clara Kee Boulevard
Tallahassee, Florida 32303
Phone: (850)536-0928
Mobile: (850)508-2738
Fax: (850)536-0938
E-mailTedBiddy@msn.com

CIVIL, STRUCTURAL and FORENSIC ENGINEERING, INVESTIGATIONS, STUDIES, REPORTS

MEMORANDUM

Docket No. 960545-WS
David W. Porter
Exhibit DWP-1
Memo to File

August 9, 1999

To: Aloha Utilities, Inc. File
Docket No. 960545-WS

From: Ted L. Biddy

CC: Harold Mclean

Re: Investigation trip of August 4 & 5, 1999

Harold Mclean and I traveled to the Aloha Utilities Water Service Area Located Southeast of New Port Richey on Wednesday, August 4, 1999 for purposes of inspecting and testing of the potable water system. We met with the following at 9:30 AM at the 7-11 store at the intersection of S.R. 54 and Little Road.

Marshall Deterding, Attorney for Aloha Utilities
Stephen Watford, Aloha Utilities
David Porter, P.E., Engineer for Aloha Utilities
Ralph Jaeger, Attorney, PSC
Bob Crouch, P.E., PSC
Marty Walker, Technician, Savannah Laboratories
Technician, Aloha's Testing Lab

Together, the entire group traveled to Well No. 1 to start the water sampling. Our subcontractor Savannah Laboratories and the Aloha Utilities Lab man obtained raw and finished water samples for testing at Well No 1 and later at Well Nos. 3, 6, 8 & 9.

Well no. 1 is located in a mobile home park off Highway 54 East. The well is located in an approximate 120 ft. by 75 ft fenced enclosure which also contains a maintenance building. The well is a 1000 gpm vertical turbine pump well with a 10,000 gallon hydropneumatic tank. A polyphosphate/orthophosphate feed pump and chemical tank were present which is a part of Aloha's corrosion control chemical treatment. A gas chlorinator with chlorine cylinders was also At this well in a separate room of the concrete block building. The corrosion control feed pump and tank and the chlorination facilities were typical at all well sites visited.

The Utility personnel stated that Aloha has an easement only extending 5 feet out from their well building, tank and piping. The balance of the area inside the enclosed fence was said to belong to the mobile home park homeowner's association.

The lab technicians took their samples from both the raw and finished water taps. The raw water tap was located inside the building at the discharge side of the pump while the finished water sample was taken from a tap at the discharge piping of the hydropneumatic tank. These sampling points were typical at all wells sampled. Some hydrogen sulfide odor was obvious at the raw water tap.

The group then traveled to Well No. 6 which is located in the Heritage Lake Subdivision on a lot with residences existing on most lots. Again, the Aloha personnel stated that they only had an easement extending for 5 feet outside their facilities. The area inside the fence line measured approximately 55 feet by 45 feet. Well No. 6 is a 450 gpm vertical turbine pump well with a 5,000 gallon hydropneumatic tank. Again, the raw water sample had a hydrogen sulfide odor. The lab technicians took their samples and we moved on to Well No. 3.

Well No. 3 is located off Little Road south of S. R. 54 and is a 200 gpm vertical turbine pump well with a 5,000 gallon hydropneumatic tank. The well site is adjacent to private ownership and is said to consist only of an easement extending 5 feet from the facilities. Here again, there was a hydrogen sulfide odor in the raw water. The lab technicians obtained their samples from the raw and finished water and the group moved on to Well Nos. 8 & 9.

Well Nos. 8 & 9 are in close proximity to each other and are located on Aloha owned sites off Mitchell Blvd near the southwest corner of the service area. These two wells were developed by Aloha and put in service in December, 1995 nearly 4 years ago and are identical in characteristics with 500 gpm vertical turbine pumps and 10,000 gallon hydropneumatic tanks. Reportedly, when these two wells were put in service, the flow in the transmission line in the area was reversed. These two wells serve the Chelsa, Wyndtree, Wyndgate subdivisions and surrounding areas where most of the customer complaints concerning water quality have come from.

The Aloha personnel furnished plats of the property parcels included for Wells 8 & 9. The parcel for Well No. 8 is 0.39 acres and the parcel for Well No. 9 is 0.25 acres. Both parcels have adequate area for any expanded treatment facilities which might be added.

The raw water sampling from Well Nos. 8 & 9 was completed in similar fashion as the previous wells. However, both of these wells had a strong hydrogen sulfide odor and taste in the finished water.

After completion of the sampling from wells 1, 3, 6, 8 & 9, the lab technicians left the area to return to their labs. Savannah Labs will give us the reports within 14 days.

At the completion of well sampling, Bob Crouch and Ralph Jaeger returned to Tallahassee. Before leaving, Bob Crouch stated that he would have a plot made of all the previous water quality complaints upon a map of the area to verify the locations of the complaints in relation to the well locations.

Harold and I then spent the balance of the day in visiting the local representative's office and in obtaining names and addresses of Aloha customers who we would visit on Thursday, August 5th.

On Thursday, August 5, 1999, after a visit with the local area State Legislator (Mike Pasada), Harold and I met Marty Walker of Savannah Labs at the Aloha Water Service area for purposes of visiting a number of the Aloha customers and taking water samples at the homes for testing. Together we visited with six customers in the area. We obtained one cold water sample from within the house, one hot water sample from within the house and one cold water sample from a

yard hose bibb located between the house and the meter. These sampling points were consistent at all homes visited. The specific homes visited were as follows:

- St. Arno residence at 6809 Willets Dr.- Has 1 year old 40 gallon hot water heater. Has noticed water problem for about last 5 years. Has had water purifying unit for last 7-8 years (water softener unit using salt pellets.

- Yanna residence at 7437 Cheltenham Court- Water quality problem started about 3 years ago, black water problem throughout including in toilet when flushed, has Kenmore Water softener using Morton System Salt Saver pellets, Also has water purifying unit under kitchen sink. He flushes hot water heater regularly. Still has problem. Both cold and hot water from kitchen faucet has hydrogen sulfide odor. Toilet tank has accumulation of black particles in bottom of tank.

- Davis residence at 2727 Cypress Hollow- Has had black water problem over last 4 to 5 years, has had Kenmore water softener unit for last 16 years, had pinhole leak occur in copper line in July, 1999.

- Strauder Residence at 2528 Bymwood Drive- Has black water problem but no copper piping except for two short lines at hot water heater, Mr. Strauder showed us black residue in sprinklers and in sink stoppers. Has no water softener. Has mostly PVC lines. Purchases water for drinking from commercial sources. Wife has only one kidney. Well No. 1 feeds this area.

- Coogan Residence at 1430 Davenport- very bad black water from cold and hot water faucets. Tub of water ran which was very black. Extensive residue left in tub after draining. Samples of black water taken from kitchen faucets. Outside hose bibb water sample very grey.

- Oko Residence at 1202 Middlesex Drive- Has noticed problem for last 6 years or "since the new well was connected". Black residue in toilet tank. Browish, yellow residue on sides of toilet tank. Has water softener.

Harold and I completed the work in late afternoon and were able to make the 5:30 P.M. flight back from Tampa. Pictures taken at all well sites and residences tested are being developed. Savannah labs to have test reports complete by 8/18/99.

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Docket No. 960545-WS
David W. Porter
Exhibit DWP-2
Lab Tech Notes

GRAB AND COMPOSITE FIELD SAMPLING DATA

Client: FL-DPC

Site Name: Cold-6809 willets/mr. St. Arno

Location: N.P.R.

Date Sampled: 8/5/99 Time Sampled: 1015

Type of Sample: Water: ✓ Soil: ___ Sludge: ___

Type of Sampling: Grab: ✓ Composite: ___ Other: ___

SITE MAP:

			Calibration	Date/Time	QC
pH	8.38		7.00/4.00 units	8-5-99 1092S	6.98
Cond.	501	umhos/cm	0 (C)	/	26.9
WT	27.9	oc	1413 (umhos/cm)	/	1415
D.O.		mg/L		/	

NOTES:

Color: none Odor: none Appear: clear

Sampled by: MW

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EXHIBIT
DWP-2

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GRAB AND COMPOSITE FIELD SAMPLING DATA

Client: F.L.-OPC

Site Name: Hot 6809 Willets / Mr. S. Arno

Location: N.P.R.

Date Sampled: 8/5/99 Time Sampled: ~~1018~~ ~~1018~~

Type of Sample: Water: ✓ Soil: ____ Sludge: ____

Type of Sampling: Grab: ✓ Composite: ____ Other: ____

SITE MAP:

			Calibration	Date/Time	QC
pH	8.04		____ units	____/____	____
Cond.	542	umhos/cm	____ (C)	____/____	____
WT	48.8	oc	____ (umhos/cm)	____/____	____
D.O.	____	mg/L			

See Cal/BOD Wallets

NOTES:

Color: none Odor: none Appear: clear

Sampled by: MW

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GRAB AND COMPOSITE FIELD SAMPLING DATA

Client: F.L. - D.P.C.

Site Name: Outside - 6809 Willets / Mr. St. Bruno

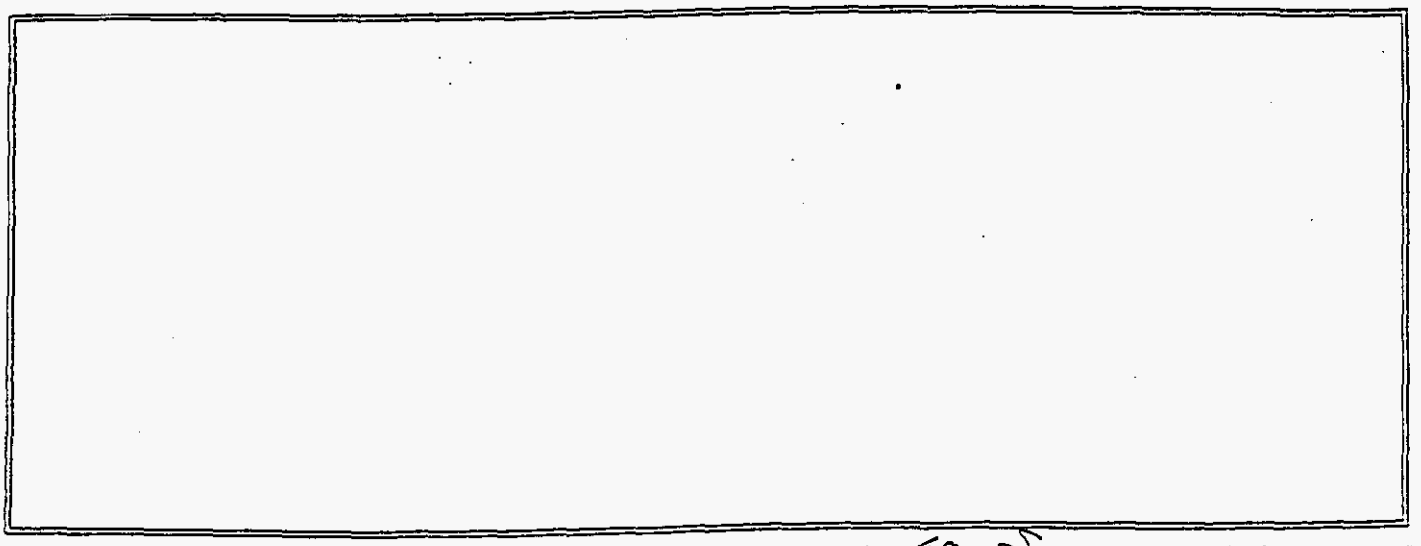
Location: _____

Date Sampled: 8/5/99 Time Sampled: 1032

Type of Sample: Water: ~ Soil: ___ Sludge: ___

Type of Sampling: Grab: ~ Composite: ___ Other: ___

SITE MAP:



			Calibration	Date/Time	QC
pH	7.18		6809 Willets - See - Cal		
Cond.	421	umhos/cm	units	/	
WT	30.3	oc	(C)	/	
D.O.		mg/L	(umhos/cm)	/	

NOTES:

Color: none Odor: none Appear: clear

Sampled by: MW

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GRAB AND COMPOSITE FIELD SAMPLING DATA

Client: F.L. - O.P.C.

Site Name: Cold - 7437 Cheltam / Mr. Hanna

Location: N.P.R.

Date Sampled: 8/5/99 Time Sampled: 1102

Type of Sample: Water: ✓ Soil: ____ Sludge: ____

Type of Sampling: Grab: ✓ Composite: ____ Other: ____

SITE MAP:

			Calibration	Date/Time	QC
pH	7.65		Cold 2a		
Cond.	745	umhos/cm	____ units	____/____	____
WT	27.7	oc	____ (C)	____/____	____
D.O.	____	mg/L	____ (umhos/cm)	____/____	____

NOTES:

Color: none Odor: none Appear: clear

Sampled by: RW

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GRAB AND COMPOSITE FIELD SAMPLING DATA

Client: F.L.- D.P.C.

Site Name: Hat-7437 Cheltam / Mt Hanna

Location: N.P.R.

Date Sampled: 8/5/99 Time Sampled: 1105

Type of Sample: Water: V Soil: ___ Sludge: ___

Type of Sampling: Grab: V Composite: ___ Other: ___

SITE MAP:

pH	7.72		Calibration	Date/Time	QC
Cond.	524	umhos/cm	See Cal-log Sheet	___/___	___
WT	46.1	oc	___(C)	___/___	___
D.O.	___	mg/L	___(umhos/cm)	___/___	___

NOTES:

Color: none Odor: none Appear: clear

Sampled by: MW

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GRAB AND COMPOSITE FIELD SAMPLING DATA

Client: F.L.-D.P.C.

Site Name: Outside 7437 Chelsea

Location: N.P.R.

Date Sampled: 8/5/99 Time Sampled: 1122

Type of Sample: Water: ✓ Soil: ___ Sludge: ___

Type of Sampling: Grab: ✓ Composite: ___ Other: ___

SITE MAP:

			Calibration	Date/Time	QC
pH	7.49		Cal-See 6809 Watts units	___/___	___
Cond.	493	umhos/cm	___ (C)	___/___	___
WT	28.0	oc	___ (umhos/cm)	___/___	___
D.O.	___	mg/L			

NOTES:

Color: none Odor: none Appear: clear

Sampled by: MW

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GRAB AND COMPOSITE FIELD SAMPLING DATA

Client: F.L. - D.P.C.

Site Name: Cold - 2727 Cypress Hollow / Mr. Davis

Location: N.P.R.

Date Sampled: 8/5/99 Time Sampled: 1228

Type of Sample: Water: ✓ Soil: ___ Sludge: ___

Type of Sampling: Grab: ✓ Composite: ___ Other: ___

SITE MAP:

			Calibration	Date/Time	QC
pH	7.98		See Cold-Boguille		
Cond.	478	umhos/cm	___ units	___/___	___
WT	25.7	oc	___ (C)	___/___	___
D.O.	___	mg/L	___ (umhos/cm)	___/___	___

NOTES:

Color: none Odor: none Appear: clear

Sampled by: MW

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GRAB AND COMPOSITE FIELD SAMPLING DATA

Client: F.L. - D.E.C.

Site Name: Haf-2727 Cypress Hollow / Mr. Davis

Location: N.P.R.

Date Sampled: 8/5/99 Time Sampled: 1232

Type of Sample: Water: ✓ Soil: ____ Sludge: ____

Type of Sampling: Grab: ✓ Composite: ____ Other: ____

SITE MAP:

			Calibration	Date/Time	QC
pH	7.84		____ units	____/____	____
Cond.	492	umhos/cm	____ (C)	____/____	____
WT	42.8	oc	____ (umhos/cm)	____/____	____
D.O.	____	mg/L			

NOTES:

Color: none Odor: none Appear: clear

Sampled by: MW

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GRAB AND COMPOSITE FIELD SAMPLING DATA

Client: F.L. - D.P.C.

Site Name: Outside - 2727 Cypress Bottom Dr. Davis

Location: N.P.L.

Date Sampled: 8/5/99 Time Sampled: 1244

Type of Sample: Water: ✓ Soil: ___ Sludge: ___

Type of Sampling: Grab: ✓ Composite: ___ Other: ___

SITE MAP:

pH	7.78		Calibration	Date/Time	QC
Cond.	480	umhos/cm	___ units	___/___	___
WT	24.9	oc	___ (C)	___/___	___
D.O.	___	mg/L	___ (umhos/cm)	___/___	___

NOTES: Color: none Odor: none Appear: clear

Sampled by: MW

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GRAB AND COMPOSITE FIELD SAMPLING DATA

Client: F.L.-D.P.C.

Site Name: Cold - 2528 Brynwood / Mr. Stauder

Location: N.P.R.

Date Sampled: 8/5/99 Time Sampled: 1308

Type of Sample: Water: ✓ Soil: ____ Sludge: ____

Type of Sampling: Grab: ✓ Composite: ____ Other: ____

SITE MAP:

			Calibration	Date/Time	QC
pH	7.89		See Cal. Log Book		
Cond.	487	umhos/cm	____ units	____/____	____
WT	28.3	oc	____ (C)	____/____	____
D.O.	____	mg/L	____ (umhos/cm)	____/____	____

NOTES:

Color: none Odor: none Appear: clear

Sampled by: MW

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GRAB AND COMPOSITE FIELD SAMPLING DATA

Client: FL. O.P.C.

Site Name: Nat-2528 Brynwood/Mr. Stouder

Location: N.P.R.

Date Sampled: 8/5/99 Time Sampled: 1312

Type of Sample: Water: ✓ Soil: ___ Sludge: ___

Type of Sampling: Grab: ✓ Composite: ___ Other: ___

SITE MAP:

			Calibration	Date/Time	QC
pH	7.91		Cold. See 6809 Willet units	___/___	___
Cond.	473	umhos/cm	___ (C)	___/___	___
WT	45.1	oc	___ (umhos/cm)	___/___	___
D.O.	___	mg/L			

NOTES:

Color: none Odor: none Appear: clear

Sampled by: MW

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GRAB AND COMPOSITE FIELD SAMPLING DATA

Client: F.L. - D.E.C.

Site Name: Outside - 2528 Brynwood / Mr. Stouder

Location: N. P. R.

Date Sampled: 8/5/99 Time Sampled: 1324

Type of Sample: Water: ✓ Soil: ___ Sludge: ___

Type of Sampling: Grab: ✓ Composite: ___ Other: ___

SITE MAP:

			Calibration	Date/Time	QC
pH	7.76		___ units	___/___	___
Cond.	483	umhos/cm	___ (C)	___/___	___
WT	29.0	oc	___ (umhos/cm)	___/___	___
D.O.	___	mg/L			

NOTES:

Color: none Odor: none Appear: clear

Sampled by: MW

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GRAB AND COMPOSITE FIELD SAMPLING DATA

Client: F.L. - D.P.C.

Site Name: Hot - 1430 Davenport/Mr. Coogan

Location: N.P.R.

Date Sampled: 8/5/99 Time Sampled: 1346

Type of Sample: Water: ✓ Soil: ___ Sludge: ___

Type of Sampling: Grab: ✓ Composite: ___ Other: ___

SITE MAP:

			Calibration	Date/Time	QC
pH	7.30		See Cals. Log sheets		
Cond.	5-42	umhos/cm	units	___/___	
WT	41.5	oc	(C)	___/___	
D.O.		mg/L	(umhos/cm)	___/___	

NOTES:

Color: Dark grey Odor: yes Appear: turbid, with heavy suspended solids

Sampled by: MW

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GRAB AND COMPOSITE FIELD SAMPLING DATA

Client: F.L. - D.P.C.

Site Name: Cold - 1430 Davenport / Mr. Coogan

Location: N.P.R.

Date Sampled: 8 / 5 / 99 Time Sampled: 1350

Type of Sample: Water: ✓ Soil: ____ Sludge: ____

Type of Sampling: Grab: ✓ Composite: ____ Other: ____

SITE MAP:

pH	7.27		Calibrati~~Cold~~ See Cold-6809 Wilbur	Date/Time	QC
Cond.	524	umhos/cm	____ units	____/____	____
WT	29.4	oc	____ (C)	____/____	____
D.O.	____	mg/L	____ (umhos/cm)	____/____	____

NOTES:

Color: grey Odor: yes Appear: slight turbidity

Sampled by: MW

C:\WP51\FORMS\GRABCOMP

SL SAVANNAH LABORATORIES
& ENVIRONMENTAL SERVICES, INC.

6712 Benjamin Road • Suite 100 • Tampa, FL 33634 • (813) 885-7427 • Fax (813) 885-7049

GRAB AND COMPOSITE FIELD SAMPLING DATA

Client: F.L. - D.P.C.

Site Name: Outside - 1430 Davenport / Mr. Coogan

Location: N.P.L.

Date Sampled: 8/5/99 Time Sampled: 1412

Type of Sample: Water: ✓ Soil: ____ Sludge: ____

Type of Sampling: Grab: ✓ Composite: ____ Other: ____

SITE MAP:

			Calibration	Date/Time	QC
pH	7.23		See Cal-6825 Wtbk		
Cond.	525	umhos/cm	____ units	____/____	____
WT	28.2	oc	____ (C)	____/____	____
D.O.	____	mg/L	____ (umhos/cm)	____/____	____

NOTES:

Color: none Odor: none Appear: clear

Sampled by: MW

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SAVANNAH LABORATORIES
& ENVIRONMENTAL SERVICES, INC.

6712 Benjamin Road • Suite 100 • Tampa, FL 33634 • (813) 885-7427 • Fax (813) 885-7049

GRAB AND COMPOSITE FIELD SAMPLING DATA

Client: F.L. - D.E.P.

Site Name: Hot-1212 Middleton/Mr. Oko

Location: N.P.R.

Date Sampled: 8/5/99 Time Sampled: 1435

Type of Sample: Water: ✓ Soil: ___ Sludge: ___

Type of Sampling: Grab: ✓ Composite: ___ Other: ___

SITE MAP:

pH	7.20		Calibration	Date/Time	QC
Cond.	522	umhos/cm	___ units	___/___	___
WT	34.2	oc	___ (C)	___/___	___
D.O.	___	mg/L	___ (umhos/cm)	___/___	___

Cal-6809 Willets

NOTES:

Color: none Odor: none Appear: clear

Sampled by: MW

C:\WP51\FORMS\GRABCOMP

SAVANNAH LABORATORIES
& ENVIRONMENTAL SERVICES, INC.

6712 Benjamin Road • Suite 100 • Tampa, FL 33634 • (813) 885-7427 • Fax (813) 885-7049

GRAB AND COMPOSITE FIELD SAMPLING DATA

Client: F.L.-D.P.C.

Site Name: Cold - 1212 Middlesex/ Moto

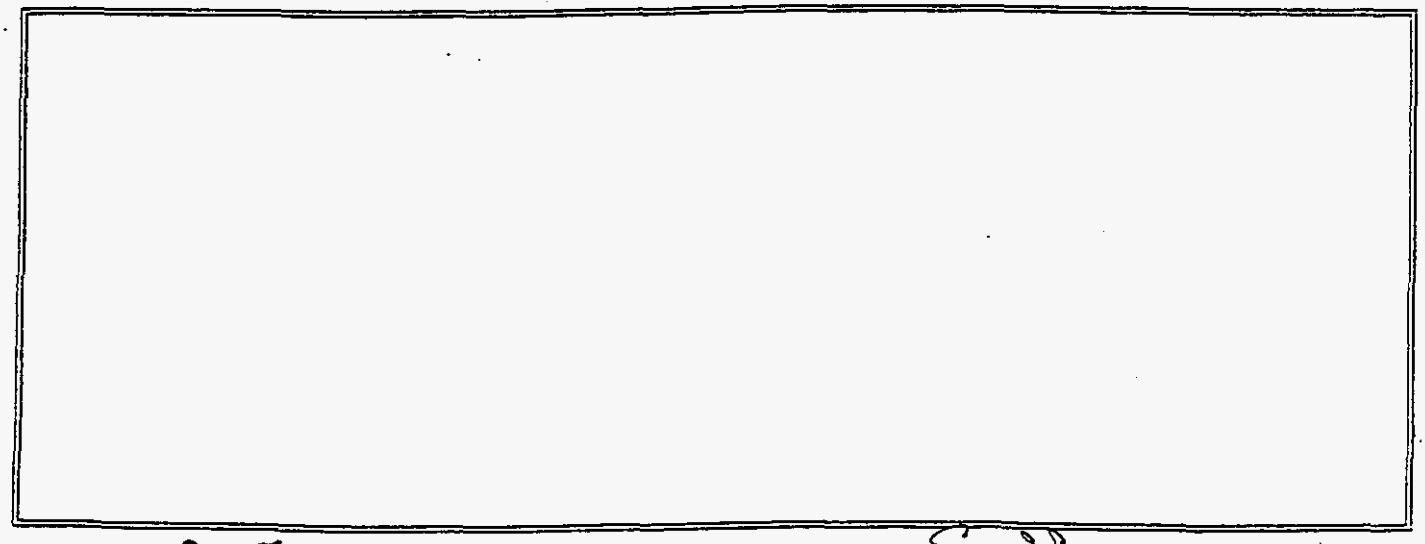
Location: N. P. R.

Date Sampled: 8/5/99 Time Sampled: 1428

Type of Sample: Water: ~ Soil: ___ Sludge: ___

Type of Sampling: Grab: ~ Composite: ___ Other: ___

SITE MAP:



			Calibration	Date/Time	QC
pH	7.17		___ units	___/___	~
Cond.	476	umhos/cm	___ (C)	___/___	___
WT	28.7	oc	___ (umhos/cm)	___/___	___
D.O.	___	mg/L			

See Cal-6809 Cal-6810

NOTES:

Color: none Odor: none Appear.: clear

Sampled by: MW

C:\WPSI\FORMS\GRABCOMP

SAVANNAH LABORATORIES
& ENVIRONMENTAL SERVICES, INC.

6712 Benjamin Road • Suite 100 • Tampa, FL 33634 • (813) 885-7427 • Fax (813) 885-7049

GRAB AND COMPOSITE FIELD SAMPLING DATA

Client: F.L. - D.P.C.

Site Name: Outside - 1212 Middlesex / Mr. Oko

Location: N.P.R.

Date Sampled: 8/5/99 Time Sampled: 1450

Type of Sample: Water: ✓ Soil: ____ Sludge: ____

Type of Sampling: Grab: ✓ Composite: ____ Other: ____

SITE MAP:

pH	7.17		Calibration	Date/Time	QC
Cond.	472	umhos/cm	____ units	____/____	____
WT	31.6	oc	____ (C)	____/____	____
D.O.	____	mg/L	____ (umhos/cm)	____/____	____

Cold - See 4809 attached

NOTES:

Color: none Odor: none Appear: clear

Sampled by: MW

C:\WPSI\FORMS\GRABCOMP

SHORT ENVIRONMENTAL LABORATORIES, INC.
10405 US 27 South
Sebring, Florida 33870
1-800-833-4022 HRS# E85344 & E85458, FDEP QAP# 880516 (941) 655-4022

10-28-99

For: Attn: Steve Watford
Aloha Utilities, Inc.
2514 Aloha Place
Holiday, FL 34691

Dear Mr. Watford:

As one of Aloha's consulting laboratories, we reviewd with interest the results of the sulfide analyses submitted by our laboratory and the laboratory hired by the Office of Public Counsel. The positive results of our analyses did not surprise as one can smell sulfide at the sample sites. The laboratory representing the Office of Public Counsel, however, reported finding no sulfide in any of the samples. While we are confidont our results are indeed accurate, further consideration seemed appropriate.

We noticed during our review of the results that the other laboratory did not document preserving their samples with zinc acetate plus pH adjustment to greater than 9 with sodium hydroxide. While this is an important requirement as documented in DEP's standard operating procedures (40 CFR Part 136 Table II enclosed), we were curious how well sulfide samples would replicate using preserved and unpreserved portions.

Our facility receives its water from a public water system with high levels of sulfide in the source water (2 wells). We sampled each well with containers preserved properly and with containers woth no preservative. After holding each set of samples for 6 days, the preserved samples read 4.38 mg/l and 3.67 respectively. The unpreserved samples read 0.18 mg/l and 0.27 respectively. As you can see, loss of sulfide was in the 90% range.

It is our opinion that this may be the reason for such a drastic discrepancy in the two sets of analytical data.

If you have any questions please cntact me.

Enclosure

Sincerely,

Bruce Cummings
Laboratory Director

EXHIBIT
DWP-3

WELL #1 - RAW

Parameter	Samples Taken - 10/06/99 Short Environmental Labs	Samples Taken - 10/06/99 Southern Analytical Labs	Samples Taken - 08/04/99 Short Environmental Labs	Samples Taken - 08/04/99 Savannah Labs
Sulfide	0.18 mg/L	0.49 mg/L	0.56 mg/L	<0.10 mg/L
Sulfate	1.0u[1]	0.20 mg/L	1.0u mg/L	<5.0 mg/L
Copper	0.02 mg/L	0.01u mg/L	0.01u mg/L	<0.020 mg/L
pH	7.46 S.U.	7.1 S.U.	7.13 S.U.	7.2 S.U.
Total Chlorine Residual	<0.01 mg/L	0.01u mg/L	--	--
Free Chlorine Residual	<0.01 mg/L	0.01u mg/L	--	--
Color	--	--	11. PCU	25. PCU
Odor	--	--	0. TON	4. TON
Total Hardness	--	–	235. mg/L	220. mg/L
Conductivity	452. umho/cm	453. umho/cm	471. umho/cm	--
Temperature	24.5 °C	27.1 °C	24.9 °C	--

WELL #1 - TREATED

Parameter	Samples Taken - 10/06/99 Short Environmental Labs	Samples Taken - 10/06/99 Southern Analytical Labs	Samples Taken - 08/04/99 Short Environmental Labs	Samples Taken - 08/04/99 Savannah Labs
Sulfide	0.15 mg/L	0.1u mg/L	0.35 mg/L	<0.10 mg/L
Sulfate	1.0u mg/L	0.73 mg/L	1.0u mg/L	<5.0 mg/L
Copper	0.01u mg/L	0.01u mg/L	0.01u mg/L	<0.020 mg/L
pH	7.36 S.U.	7.8 S.U.	7.19 S.U.	7.2 S.U.
Total Chlorine Residual	2.0 mg/L	2.0 mg/L	--	--
Free Chlorine Residual	1.3 mg/L	1.3 mg/L	--	--
Color	--	--	10. PCU	10. PCU
Odor	--	--	0. TON	16. TON
Total Hardness	--	--	235. mg/L	220. mg/L
Conductivity	449. umho/cm	431. umho/cm	475. umho/cm	--
Temperature	24.2 °C	26.9 °C	25.0 °C	--

[1] u - Parameter was analyzed for but not detected

EXHIBIT
DWP-4

WELL #3 - RAW

	Samples Taken - 10/06/99		Samples Taken - 08/04/99	
Parameter	**Short Environmental Labs**	**Southern Analytical Labs**	**Short Environmental Labs**	**Savannah Labs**
Sulfide	1.95 mg/L	1.4 mg/L	2.8 mg/L	<0.10 mg/L
Sulfate	11. mg/L	9.4 mg/L	11. mg/L	<5.0 mg/L
Copper	0.01u mg/L	0.01u mg/L	0.01u mg/L	<0.020 mg/L
pH	7.63 S.U.	7.1 S.U.	7.67 S.U.	7.6 S.U.
Total Chlorine Residual	<0.01 mg/L	0.01u mg/L	--	--
Free Chlorine Residual	<0.01 mg/L	0.01u mg/L	--	--
Color	--	--	10. PCU	15. PCU
Odor	--	--	7. TON	4. TON
Total Hardness	--	--	190. mg/L	190. mg/L
Conductivity	383. umho/cm	390. umho/cm	384. umho/cm	--
Temperature	24.8 °C	25.4 °C	25.6 °C	--

WELL #3 - TREATED

	Samples Taken - 10/06/99		Samples Taken - 08/04/99	
Parameter	**Short Environmental Labs**	**Southern Analytical Labs**	**Short Environmental Labs**	**Savannah Labs**
Sulfide	0.27 mg/L	0.38 mg/L	0.71 mg/L	<0.10 mg/L
Sulfate	7.6 mg/L	11. mg/L	4.6 mg/L	<5.0 mg/L
Copper	0.01u mg/L	0.01u mg/L	0.01u mg/L	<0.020 mg/L
pH	7.17 S.U.	7.0 S.U.	7.09 S.U.	7.2 S.U.
Total Chlorine Residual	2.0 mg/L	1.6 mg/L	--	--
Free Chlorine Residual	1.3 mg/L	1.5 mg/L	--	--
Color	--	--	5. PCU	5. PCU
Odor	--	--	0. TON	16. TON
Total Hardness	--	--	193. mg/L	190. mg/L
Conductivity	379. umho/cm	375. umho/cm	397. umho/cm	--
Temperature	24.9 °C	25.4 °C	25.4 °C	--

WELL #6 - RAW

	Samples Taken - 10/06/99		Samples Taken - 08/04/99	
Parameter	**Short Environmental Labs**	**Southern Analytical Labs**	**Short Environmental Labs**	**Savannah Labs**
Sulfide	1.80 mg/L	1.5 mg/L	2.1 mg/L	<0.10 mg/L
Sulfate	6. mg/L	4.9 mg/L	5.7 mg/L	<5.0 mg/L
Copper	0.01u mg/L	0.01u mg/L	0.01u mg/L	<0.020 mg/L
pH	7.60 S.U.	6.9 S.U.	7.45 S.U.	7.6 S.U.
Total Chlorine Residual	<0.01 mg/L	0.01u mg/L	--	--
Free Chlorine Residual	<0.01 mg/L	0.01u mg/L	--	--
Color	--	--	10. PCU	20. PCU
Odor	--	--	1. TON	2. TON
Total Hardness	--	--	184. mg/L	180. mg/L
Conductivity	392. umho/cm	381. umho/cm	384. umho/cm	--
Temperature	24.1 °C	26.5 °C	24.6 °C	--

WELL #6 - TREATED

	Samples Taken - 10/06/99		Samples Taken - 08/04/99	
Parameter	**Short Environmental Labs**	**Southern Analytical Labs**	**Short Environmental Labs**	**Savannah Labs**
Sulfide	0.15 mg/L	0.1u mg/L	0.81 mg/L	<0.10 mg/L
Sulfate	3.4 mg/L	6.5 mg/L	7.4 mg/L	<5.0 mg/L
Copper	0.01u mg/L	0.01u mg/L	0.03 mg/L	<0.020 mg/L
pH	7.10 S.U.	7.2 S.U.	7.21 S.U.	7.2 S.U.
Total Chlorine Residual	3.8 mg/L	4.0 mg/L	--	--
Free Chlorine Residual	3.6 mg/L	4.0 mg/L	--	--
Color	--	--	10. PCU	10. PCU
Odor	--	--	0. TON	2. TON
Total Hardness	--	--	188. mg/L	180. mg/L
Conductivity	373. umho/cm	175. umho/cm	392. umho/cm	--
Temperature	24.1 °C	26.1 °C	24.5 °C	--

WELL #8- RAW

	Samples Taken - 10/06/99		Samples Taken - 08/04/99	
Parameter	**Short Environmental Labs**	**Southern Analytical Labs**	**Short Environmental Labs**	**Savannah Labs**
Sulfide	1.09 mg/L	1.8 mg/L	2.6 mg/L	<0.10 mg/L
Sulfate	7.1 mg/L	5.7 mg/L	6.4 mg/L	<5.0 mg/L
Copper	0.84 mg/L	0.01u mg/L	0.01u mg/L	<0.020 mg/L
pH	7.65 S.U.	7.7 S.U.	7.51 S.U.	7.6 S.U.
Total Chlorine Residual	<0.01 mg/L	0.01u mg/L	--	--
Free Chlorine Residual	<0.01 mg/L	0.01u mg/L	--	--
Color	--	--	10. PCU	20. PCU
Odor	--	--	0. TON	4. TON
Total Hardness	--	--	221. mg/L	210. mg/L
Conductivity	476. umho/cm	389. umho/cm	443. umho/cm	--
Temperature	25.3 °C	27.8 °C	25.4 °C	--

WELL #8 - TREATED

	Samples Taken - 10/06/99		Samples Taken - 08/04/99	
Parameter	**Short Environmental Labs**	**Southern Analytical Labs**	**Short Environmental Labs**	**Savannah Labs**
Sulfide	0.27 mg/L	0.34 mg/L	0.41 mg/L	<0.10 mg/L
Sulfate	2.0 mg/L	8.2 mg/L	1.0u mg/L	<5.0 mg/L
Copper	0.01u mg/L	0.01u mg/L	0.01u mg/L	<0.020 mg/L
pH	7.36 S.U.	7.7 S.U.	7.13 S.U.	7.2 S.U.
Total Chlorine Residual	3.0 mg/L	3.8 mg/L	--	--
Free Chlorine Residual	2.0 mg/L	3.0 mg/L	--	--
Color	--	--	10. PCU	10. PCU
Odor	--	--	0. TON	4. TON
Total Hardness	--	--	220. mg/L	210. mg/L
Conductivity	481. umho/cm	189. umho/cm	461. umho/cm	--
Temperature	24.9 °C	28.3 °C	25.4 °C	--

WELL #9- RAW

	Samples Taken - 10/06/99		Samples Taken - 08/04/99	
Parameter	**Short Environmental Labs**	**Southern Analytical Labs**	**Short Environmental Labs**	**Savannah Labs**
Sulfide	2.90 mg/L	2.6 mg/L	4.5 mg/L	<0.10 mg/L
Sulfate	1.0u mg/L	7.5 mg/L	1.0u mg/L	<5.0 mg/L
Copper	0.01u mg/L	0.01u mg/L	0.01u mg/L	<0.020 mg/L
pH	8.29 S.U.	7.8 S.U.	7.65 S.U.	7.7 S.U.
Total Chlorine Residual	<0.01 mg/L	0.01u mg/L	--	--
Free Chlorine Residual	<0.01 mg/L	0.01u mg/L	--	--
Color	--	--	10. PCU	20. PCU
Odor	--	--	4. TON	4. TON
Total Hardness	--	--	216. mg/L	210. mg/L
Conductivity	432. umho/cm	395. umho/cm	442. umho/cm	--
Temperature	25.8 °C	28.2 °C	25.8 °C	--

WELL #9 - TREATED

	Samples Taken - 10/06/99		Samples Taken - 08/04/99	
Parameter	**Short Environmental Labs**	**Southern Analytical Labs**	**Short Environmental Labs**	**Savannah Labs**
Sulfide	0.41 mg/L	0.1u mg/L	0.35 mg/L	<0.10 mg/L
Sulfate	9.1 mg/L	11. mg/L	8.0u mg/L	<5.0 mg/L
Copper	0.02 mg/L	0.01u mg/L	0.07 mg/L	0.046 mg/L
pH	7.14 S.U.	7.6 S.U.	6.95 S.U.	7.1 S.U.
Total Chlorine Residual	3.8 mg/L	3.0 mg/L	--	--
Free Chlorine Residual	3.2 mg/L	1.4 mg/L	--	--
Color	--	--	4. PCU	5. PCU
Odor	--	--	0. TON	16. TON
Total Hardness	--	--	216. mg/L	210. mg/L
Conductivity	440. umho/cm	393. umho/cm	467. umho/cm	--
Temperature	25.2 °C	27.9 °C	25.7 °C	--

ENGINEERING COSTS
SCHEDULE SINCE THE OCTOBER 1996 HEARING
ALOHA UTILITIES, INC.
Docket No. 960545-WS
11/01/96-10/01/99

Water Quality Issue

Invoice Number	Invoice Date	Fees	Costs	Total
0149	12/03/96	$ 75.00	$ 0.00	$ 75.00
0159	02/02/97	750.00	0.00	750.00
0166	03/01/97	1,012.50	0.00	1,012.50
0167	03/01/97	825.00	0.00	825.00
0175	03/29/97	112.50	0.00	112.50
0176	03/29/97	1,950.00	0.00	1,950.00
0184	05/01/97	7,387.50	367.09	7,754.59
0188	06/01/97	14,212.50	854.61	15,067.11
0196	08/03/97	1,950.00	63.55	2,013.55
0201	09/01/97	4,012.50	262.04	4,274.54
0209	10/03/97	5,400.00	270.50	5,670.50
0213	11/02/97	525.00	0.00	525.00
0219	11/20/97	4,875.00	349.33	5,224.33
0227	01/04/98	450.00	0.00	450.00
0238	02/02/98	1,387.50	0.00	1,387.50
0245	03/02/98	5,325.00	218.86	5,543.86
0253	04/03/98	637.50	0.00	637.50
0260	05/03/98	764.15	0.00	764.15
0269	05/30/98	1,557.00	0.00	1,557.00
0272	06/29/98	1,350.75	0.00	1,350.75
0277	07/31/98	3,672.44	0.00	3,672.44
0282	09/01/98	519.30	0.00	519.30
0304	12/04/98	112.50	0.00	112.50
0313	01/04/99	1,513.39	0.00	1,513.39
0319	02/02/99	150.00	0.00	150.00
0334	03/03/99	262.50	0.00	262.50
0345	03/28/99	150.00	0.00	150.00
0380	08/02/99	900.00	0.00	900.00
0385	09/06/99	1,275.00	0.00	1,275.00
0392	10/03/99	712.50	0.00	712.50
Total		63,827.03	2,385.98	66,213.01

aloha\17\2porter.sch

INVOICE

Mr. Stephen Watford, President
Aloha Utilities, Inc.
2514 Aloha Place
Holiday, FL 34691

Date: February 2, 1998
Invoice No.: 0238

Job No.: AUI-010-5-S
Job Name: Florida PSC Rate Case Assistance
Period: January 3, 1998 – January 30, 1998

INVOICE FOR PROFESSIONAL SERVICES

PROFESSIONAL SERVICES THIS PERIOD:	$1,387.50
TOTAL INVOICED TO DATE:	$43,325.00
TOTAL DUE THIS INVOICE:	$1,387.50

Thank you for the opportunity to provide these services. Please see job detail report attached for complete documentation concerning the work completed this job cost period.

David W. Porter, P.E., C.O.

PCHD//AUI-010-5-S_Invoice 2-2-98.DOC//Proj/via US

2

INVOICE

Mr. Stephen Watford, President
Aloha Utilities, Inc.
2514 Aloha Place
Holiday, FL 34691

Date: March 2, 1998
Invoice No.: 0245

Job No.: AUI-010-5-S
Job Name: Florida PSC Rate Case Assistance
Period: January 31, 1998 – February 27, 1998

INVOICE FOR PROFESSIONAL SERVICES

PROFESSIONAL SERVICES THIS PERIOD:	$5,543.86
TOTAL INVOICED TO DATE:	$48,868.86
TOTAL DUE THIS INVOICE:	$5,543.86

Thank you for the opportunity to provide these services. Please see job detail report attached for complete documentation concerning the work completed this job cost period.

David W. Porter, P.E., C.O.

PCHD//AUI-010-5-S_Invoice 3-2-98.DOC//Proj/via US

INVOICE

Mr. Stephen Watford, President
Aloha Utilities, Inc.
2514 Aloha Place
Holiday, FL 34691

Date: April 3, 1998
Invoice No.: 0253

Job No.: AUI-010-5-S
Job Name: Florida PSC Rate Case Assistance
Period: February 28, 1998 – March 27, 1998

INVOICE FOR PROFESSIONAL SERVICES

PROFESSIONAL SERVICES THIS PERIOD:	$637.50
TOTAL INVOICED TO DATE:	$49,506.36
TOTAL DUE THIS INVOICE:	$637.50

Thank you for the opportunity to provide these services. Please see job detail report attached for complete documentation concerning the work completed this job cost period.

David W. Porter, P.E., C.O.

PCHD//AUI-010-5-S_Invoice 4-3-98.DOC//Proj/via US

INVOICE

Mr. Stephen Watford, President
Aloha Utilities, Inc.
2514 Aloha Place
Holiday, FL 34691

Date: May 3, 1998
Invoice No.: 0260

Job No.: AUI-010-5-S
Job Name: Florida PSC Rate Case Assistance
Period: March 28, 1998 – May 1, 1998

INVOICE FOR PROFESSIONAL SERVICES

PROFESSIONAL SERVICES THIS PERIOD:	$764.15
TOTAL INVOICED TO DATE:	$50,270.51
TOTAL DUE THIS INVOICE:	$764.15

Thank you for the opportunity to provide these services. Please see job detail report attached for complete documentation concerning the work completed this job cost period.

David W. Porter, P.E., C.O.

PCHD//AUI-010-5-S_Invoice 5-3-98.DOC//Proj/via US

INVOICE

Mr. Stephen Watford, President
Aloha Utilities, Inc.
2514 Aloha Place
Holiday, FL 34691

Date: May 30, 1998
Invoice No.: 0269

Job No.: AUI-010-5-S
Job Name: Florida PSC Rate Case Assistance
Period: May 2, 1998 – May 29, 1998

INVOICE FOR PROFESSIONAL SERVICES

PROFESSIONAL SERVICES THIS PERIOD:	$1,557.00
TOTAL INVOICED TO DATE:	$51,063.36
TOTAL DUE THIS INVOICE:	$1,557.00

Thank you for the opportunity to provide these services. Please see job detail report attached for complete documentation concerning the work completed this job cost period.

David W. Porter, P.E., C.O.

PCHD//AUI-010-5-S_Invoice 5-30-98.DOC//Proj/via US

6

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

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

INVOICE

PAID
7/14/98
VP

Mr. Stephen Watford, President
Aloha Utilities, Inc.
2514 Aloha Place
Holiday, FL 34691

Date June 29, 1998
Invoice No.: 0272

Job No.: AUI-010-5-S
Job Name: Florida PSC Rate Case Assistance
Period: May 30, 1998 – June 26, 1998

INVOICE FOR PROFESSIONAL SERVICES

PROFESSIONAL SERVICES THIS PERIOD:	$1,350.75
TOTAL INVOICED TO DATE:	$52,414.11
TOTAL DUE THIS INVOICE:	$1,350.75

Thank you for the opportunity to provide these services. Please see job detail report attached for complete documentation concerning the work completed this job cost period.

David W. Porter, P.E., C.O.

PCHD//AUI-010-5-S_Invoice 6-29-98.DOC//Proj/via US

7

1867 Wells Road • Suite 226 • Orange Park, FL 32073 • Phone: 904-269-6773 • Fax: 904-269-3667 • Mobile: 904-710-6773 • E-Mail: porterpe@southeast.net

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

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

PAID
8/18/98 VP

INVOICE

Mr. Stephen Watford, President
Aloha Utilities, Inc.
2514 Aloha Place
Holiday, FL 34691

Date July 31, 1998
Invoice No.: 0277

Job No.: AUI-010-5-S
Job Name: Florida PSC Rate Case Assistance
Period: June 27, 1998 – July 31, 1998

INVOICE FOR PROFESSIONAL SERVICES

PROFESSIONAL SERVICES THIS PERIOD:	$3,672.44
TOTAL INVOICED TO DATE:	$56,086.55
TOTAL DUE THIS INVOICE:	$3,672.44

Thank you for the opportunity to provide these services. Please see job detail report attached for complete documentation concerning the work completed this job cost period.

David W. Porter, P.E., C.O.

PCHD//AUI-010-5-S_Invoice 7-31-98.DOC//Proj/via US

Road • Suite 226 • Orange Park, FL 32073 • Phone: 904-269-6773 • Fax: 904-269-3967 • Mobile: 904-710-6773 • E-Mail: porterpe@southeast.net

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

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

PAID 9/4/98 DWP

INVOICE

Mr. Stephen Watford, President
Aloha Utilities, Inc.
2514 Aloha Place
Holiday, FL 34691

Date September 1, 1998
Invoice No.: 0282

Job No.: AUI-010-5-S
Job Name: Florida PSC Rate Case Assistance
Period: August 1, 1998 – August 28, 1998

INVOICE FOR PROFESSIONAL SERVICES

PROFESSIONAL SERVICES THIS PERIOD:	$519.30
TOTAL INVOICED TO DATE:	$56,605.85
TOTAL DUE THIS INVOICE:	$519.30

Thank you for the opportunity to provide these services. Please see job detail report attached for complete documentation concerning the work completed this job cost period.

David W. Porter, P.E., C.O.

PCIID//AUI-010-5-S_Invoice 9-1-98.DOC//Proj/via US

1657 Wells Road • Suite 226 • Orange Park, FL 32073 • Phone: 904-269-6773 • Fax: 904-269-3667 • Mobile: 904-710-6773 • E-Mail: porterpe@mindspring.com

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

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

INVOICE

PAID
1/2/99 DP

Mr. Stephen Watford, President
Aloha Utilities, Inc.
2514 Aloha Place
Holiday, FL 34691

Date December 4, 1998
Invoice No.: 0304

Job No.: AUI-010-5-S
Job Name: Florida PSC Rate Case Assistance
Period: October 31, 1998 – November 27, 1998

INVOICE FOR PROFESSIONAL SERVICES

PROFESSIONAL SERVICES THIS PERIOD:	$112.50
TOTAL INVOICED TO DATE:	$56,718.35
TOTAL DUE THIS INVOICE:	$112.50

Thank you for the opportunity to provide these services. Please see job detail report attached for complete documentation concerning the work completed this job cost period.

David W. Porter, P.E., C.O.

PCHD//AUI-010-5-S_Invoice 12-4-98.DOC//Proj/via US

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Road • Suite 226 • Orange Park, FL 32073 • Phone: 904-269-6773 • Fax: 904-269-3667 • Mobile: 904-710-6773 • E-Mail: porterpe@southeast.net

[redacted]vid W. Porter, P.E., C.O.
[redacted]/Wastewater System Consultant

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

PAID
1/13/99 DWP

INVOICE

Mr. Stephen Watford, President
Aloha Utilities, Inc.
2514 Aloha Place
Holiday, FL 34691

Date January 4, 1999
Invoice No.: 0313

Job No.: AUI-010-5-S
Job Name: Florida PSC Rate Case Assistance
Period: November 28, 1998 – January 1, 1999

INVOICE FOR PROFESSIONAL SERVICES

PROFESSIONAL SERVICES THIS PERIOD:	$1,513.39
TOTAL INVOICED TO DATE:	$58,231.74
TOTAL DUE THIS INVOICE:	$1,513.39

Thank you for the opportunity to provide these services. Please see job detail report attached for complete documentation concerning the work completed this job cost period.

David W. Porter, P.E., C.O.

PCHD\AUI-010-5-S_Invoice 1-4-99.DOC//Proj/via US

7 Ryans Court • Green Cove Springs, FL 32043 • Phone: 904-291-2744 • Fax: 904-291-7769 • Mobile: 904-710-6773 • E-Mail: porterpe@southeast.net

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

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

PAID
2/12/99 DWP

INVOICE

Mr. Stephen Watford, President
Aloha Utilities, Inc.
2514 Aloha Place
Holiday, FL 34691

Date February 2, 1999
Invoice No.: 0319

Job No.: AUI-010-5-S
Job Name: Florida PSC Rate Case Assistance
Period: January 2, 1999 – January 29, 1999

INVOICE FOR PROFESSIONAL SERVICES

PROFESSIONAL SERVICES THIS PERIOD:	$150.00
TOTAL INVOICED TO DATE:	$58,381.74
TOTAL DUE THIS INVOICE:	$150.00

Thank you for the opportunity to provide these services. Please see job detail report attached for complete documentation concerning the work completed this job cost period.

David W. Porter, P.E., C.O.

PCHD//AUI-010-5-S_Invoice 2-2-99.DOC//Proj/via US

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

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

INVOICE

PAID
dp 3/20/99

Mr. Stephen Watford, President
Aloha Utilities, Inc.
2514 Aloha Place
Holiday, FL 34691

Date March 3, 1999
Invoice No.: 0334

Job No.: AUI-010-5-S
Job Name: Florida PSC Rate Case Assistance
Period: January 30, 1999 – February 26, 1999

INVOICE FOR PROFESSIONAL SERVICES

PROFESSIONAL SERVICES THIS PERIOD:	$262.50
TOTAL INVOICED TO DATE:	$58,644.24
TOTAL DUE THIS INVOICE:	$262.50

Thank you for the opportunity to provide these services. Please see job detail report attached for complete documentation concerning the work completed this job cost period.

David W. Porter, P.E., C.O.

PCHD//AUI-010-5-S_Invoice 3-3-99.DOC//Proj/via Express US

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3197 Ryans Court • Green Cove Springs, FL 32043 • Phone: 904-291-2744 • Fax: 904-291-7769 • Mobile: 904-710-6773 • E-Mail: porterpe@southeast.net

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

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

INVOICE

PAID vp 4/15/99

Mr. Stephen Watford, President
Aloha Utilities, Inc.
2514 Aloha Place
Holiday, FL 34691

Date March 28, 1999
Invoice No.: 0345

Job No.: AUI-010-5-S
Job Name: Florida PSC Rate Case Assistance
Period: February 27, 1999 – March 26, 1999

INVOICE FOR PROFESSIONAL SERVICES

PROFESSIONAL SERVICES THIS PERIOD:	$150.00
TOTAL INVOICED TO DATE:	$58,794.24
TOTAL DUE THIS INVOICE:	$150.00

Thank you for the opportunity to provide these services. Please see job detail report attached for complete documentation concerning the work completed this job cost period.

David W. Porter, P.E., C.O.

PCHD//AUI-010-5-S_Invoice 3-28-99.DOC//Proj/via US

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3197 Ryans Court • Green Cove Springs, FL 32043 • Phone: 904-291-2744 • Fax: 904-291-7769 • Cell Phone: 904-710-6773 • E-Mail: porterpe@southeast.net

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

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

INVOICE

PAID
8/14/99 VP

Mr. Stephen Watford, President
Aloha Utilities, Inc.
2514 Aloha Place
Holiday, FL 34691

Date: August 2, 1999
Invoice No.: 0380

Job No.: AUI-017-5-S
Job Name: FPSC Water Quality Hearing
Period: June 26, 1999 – July 30, 1999

INVOICE FOR PROFESSIONAL SERVICES

PROFESSIONAL SERVICES THIS PERIOD:	$900.00
TOTAL INVOICED TO DATE:	$900.00
TOTAL DUE THIS INVOICE:	$900.00

Thank you for the opportunity to provide these services. Please see job detail report attached for complete documentation concerning the work completed this job cost period.

David W. Porter, P.E., C.O.

PCHD//AUI-016-2-R_Invoice 8-2-99.DOC//Proj/via Hand

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1197 Ruane Court • Green Cove Springs, FL 32043 • Phone: 904-291-2744 • Fax: 904-291-7769 • Cell Phone: 904-710-5773 • E-Mail: porterpe@southeast.net

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

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

INVOICE

Mr. Stephen Watford, President
Aloha Utilities, Inc.
2514 Aloha Place
Holiday, FL 34691

Date: ~~August 2, 1999~~ SEP 6, 1999
Invoice No.: 0385

PAID
VP 9/7/99

Job No.: AUI-017-5-S
Job Name: FPSC Water Quality Hearing
Period: July 31, 1999 – August 27, 1999

INVOICE FOR PROFESSIONAL SERVICES

PROFESSIONAL SERVICES THIS PERIOD:	$1,275.00
TOTAL INVOICED TO DATE:	$2,175.00
TOTAL DUE THIS INVOICE:	$1,275.00

Thank you for the opportunity to provide these services. Please see job detail report attached for complete documentation concerning the work completed this job cost period.

David W. Porter, P.E., C.O.

PCHD//AUI-016-2-R_Invoice 8-2-99.DOC//Proj/via US Express

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

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

INVOICE

PAID
VP 10/14/99

Mr. Stephen Watford, President
Aloha Utilities, Inc.
2514 Aloha Place
Holiday, FL 34691

Date: October 3, 1999
Invoice No.: 0392

Job No.: AUI-017-5-S
Job Name: FPSC Water Quality Hearing
Period: August 28, 1999 – October 1, 1999

INVOICE FOR PROFESSIONAL SERVICES

PROFESSIONAL SERVICES THIS PERIOD:	$712.50
TOTAL INVOICED TO DATE:	$2,887.50
TOTAL DUE THIS INVOICE:	$712.50

Thank you for the opportunity to provide these services. Please see job detail report attached for complete documentation concerning the work completed this job cost period.

David W. Porter, P.E., C.O.

PCHD//AUI-016-2-R_Invoice 10-3-99.DOC//Proj/via Airborne

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ALOHA UTILITIES, INC.
PSC Docket No. 960545-WS
Water Quality Investigation of Aloha Utilities, Inc.
Estimated Engineering Services Estimate to Complete

October 1999 - Incurred but Unbilled

Travel to and participate in second round of testing of wells, meetings prior to and after testing; telephone conference with representatives of lab; work on discovery responses; work on preparation for deposition of Biddy; meetings with lawyers re: depositions with Biddy; attend deposition with Biddy; discussions with lawyers re: outcome of deposition and exhibits; work on preparation of testimony and exhibits; discussions and revisions of same; finalization of same for submission.

92 hours at $75/hour

November 1999

Preparation for deposition; review of various documents in preparation for hearing; prepare for and attend deposition to be taken by OPC.

48 hours at $75/hour

December 1999

Travel to and final preparation for hearing in Pasco County; meetings with lawyers and client; attendance at hearing; preparation after hearing for next day; attendance at second day of hearing; preparation of late-filed exhibits; discussions with attorney and client re: preparation of same; review of transcript.

118 hours at $75/hour

January 1999 through April 1999

Assist in preparation of review of transcript and exhibits; assist in preparation of brief; review of final brief; review of OPC brief; review of staff recommendation; various conversations concerning the staff recommendation and analysis and any concerns re: same; post agenda discussions with attorneys and client; review final order and discussions re: same.

104 hours at $80/hour

Fees	Costs	Total
$27,670	$3,460	$31,130

Total Estimated to Complete: $31,130