

DOCKET NO.: 010503-WU - Application for increase in water rates for Seven Springs System in Pasco County by Aloha Utilities, Inc.

WITNESS: **Direct Testimony of Van Hoofnagle**, of the Department of Environmental Protection, Appearing on Behalf of Staff

DATE FILED: November 21, 2001

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FPSC-COMMISSION CLERK

1 | the implementation of the State and Federal Safe Drinking Water Acts.
2 | Specifically, we develop program guidance, policy, rules, provide training and
3 | public education, manage the state and federal budgets for the program, manage
4 | the entire drinking water database, generate reports, and occasionally manage
5 | special studies and projects.

6 | Q. Are you familiar with the Seven Springs water division of Aloha Utilities,
7 | Inc.?

8 | A. I am somewhat familiar with this area and its problems.

9 | Q. Are you familiar with the "black water" problem that some customers of the
10 | Seven Springs water division of Aloha Utilities, Inc., have experienced and
11 | are still experiencing?

12 | A. Yes, I have had significant involvement with this issue.

13 | Q. Has the black substance in what is known as "black water" experienced by
14 | some Aloha customers been analyzed?

15 | A. Yes

16 | Q. If so, what is it?

17 | A. The black material is the compound copper sulfide.

18 | Q. Is it possible to create copper sulfide without a source of copper?

19 | A. No, however, there are several factors necessary in the formation of Copper
20 | sulfide, including, an energy source (usually metal ions), time and
21 | temperature, the presence of sulfur reducing bacteria, and either sulfates or
22 | elemental sulfur.

23 | Q. Is the "black water" being formed in the customers' pipes after the meter?

24 | A. Yes, but the conditions above are found in both the customers' hot water
25 | heaters and the elemental sulfur or sulfates are introduced from the

1 distribution system.

2 Q. If the water at the meter meets all drinking standards does this formation
3 of "black water" after the meter constitute a violation of federal or state
4 drinking water standards?

5 A. No.

6 Q. Please explain how this "black water" is formed.

7 A. Briefly, it is suspected that black water is being formed by the sulfates
8 or sulfur reacting with metal ions and sulfur reducing bacteria in the hot
9 water tanks in the presence of warm temperatures (say about 120 to 130 degrees
10 F) and time. Hydrogen sulfide is formed and then reacts with copper in the
11 plumbing of the home to precipitate out copper sulfide (black water).

12 Q. Do you know of any other utilities that are experiencing or have
13 experienced "black water"?

14 A. Yes.

15 Q. Please list utility and county.

16 A. In discussions over the years with other DEP District Offices, utility
17 managers and Department of Health drinking water staff there have been
18 occurrences of black water problems in Volusia County, the Ft. Myers area
19 facilities, and Polk, Hillsborough, Pasco and Pinellas Counties. However, it
20 also appears that most of these events are episodic or have been resolved.

21 Q. Do you know of any other utilities that are experiencing or have
22 experienced copper corrosion problems due to hydrogen sulfide?

23 A. This is a tougher issue to identify exactly. There is presently a very
24 significant copper corrosion problem being encountered throughout the Central
25 Florida Corridor up into the City of Jacksonville. Since there are a number

1 | of different forms of copper corrosion types it remains unclear if they are
2 | solely due to hydrogen sulfide or due to other forms of corrosion.

3 | Q. Please list utility and county.

4 | A. I'm sorry, but I do not know them by utility name. My source of
5 | information of this phenomenon comes from meetings with the Plumbers and
6 | Contractors on the Building Code Task Force (or Committee) Meetings I attended
7 | several months to a year ago.

8 | Q. Did you participate in the Interagency Copper Pipe Corrosion Project?

9 | A. Yes.

10 | Q. Subsequent to this Interagency Project, has DEP taken any actions to try
11 | to prevent or alleviate the occurrence of "black water" or excessive copper
12 | corrosion?

13 | A. Yes.

14 | Q. Could you explain what actions have been taken and any rules that may be
15 | proposed?

16 | A. During the last regular Legislative Session (2001) The DEP worked with
17 | Legislators to craft a bill and revise statutory language that would authorize
18 | and empower the DEP to require any utility proposing to add new wells to do
19 | additional testing for selected water quality parameters to ensure that
20 | drinking water standards would not be violated at the customer's tap. Senate
21 | Bill 2030 was passed and placed into the Florida Law as Chapter 2001-270. As
22 | a result, Florida Statutes have been amended (Chapter 403.861(17)) and the
23 | Drinking Water Section is presently drafting rules to implement that statute.
24 | The draft rules will address some of the recommendations of the May 2001
25 | Interagency Copper Pipe Corrosion Project Final Report.

1 Q. Have there been any statutory changes?

2 A. Yes, as stated above and I have attached Chapter 403.861, F.S. to my
3 testimony as Exhibit VH-1

4 Q. Also, have there been any changes to the building codes?

5 A. Yes, as I understand it they will become effective on January 1, 2002,
6 although I am not familiar with those changes as they may affect this issue.

7 Q. Did the Interagency Copper Pipe Corrosion Project issue a Final Report
8 dated May 2001?

9 A. Yes. I have attached that report to my testimony as Exhibit VH-2.

10 Q. In your opinion what could Aloha Utilities do to eliminate the "black
11 water" problem?

12 A. While I cannot address the cost issues and any debate or calculation of
13 rates, there are a number of things the utility might study and implement to
14 reduce or eliminate over time the 'black water' problems now being
15 experienced. There is no panacea or guarantees due to the complex nature of
16 the water and corrosion chemistry and relatively unique specific conditions
17 that are found in their waters. However, aeration with pre and post pH
18 adjustment added with alkalinity control has proven the most effective in
19 other parts of Florida. Additionally there are emerging technologies that
20 lend themselves to addressing the future Disinfection Byproducts Rule as
21 well, such as the MIOX system; which I might add may to be a relatively cost
22 effective solution. Since the black water problems do not appear in all of
23 Aloha's service subareas, it is the DEP's belief at this time that a
24 centralized treatment system would not be cost effective. Future and on-going
25 engineering and cost studies need to identify technical solutions and their

1 | associated costs.
2 | Q. Do you have anything further to add?
3 | A. No, I do not.
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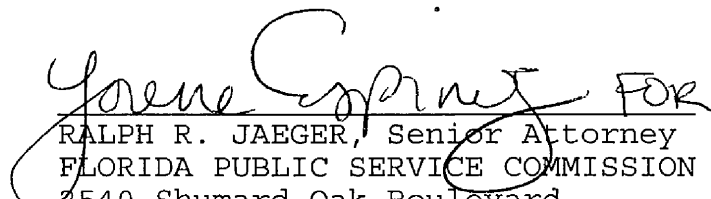
BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

In re: Application for increase
in water rates for Seven Springs
System in Pasco County by Aloha
Utilities, Inc.

DOCKET NO. 010503-WU
FILED: NOVEMBER 21, 2001

CERTIFICATE OF SERVICE

I HEREBY CERTIFY that true and correct copies of the Direct Testimony of Van Hoofnagle and the Direct Testimony of Jennie Lingo have been furnished to **Ms. Margaret Lytle**, 2379 Broad Street, Brooksville, Florida 34604-6899, via e-mail and regular U.S. Mail; to **Mr. Edward Wood**, 1043 Daleside Lane, New Port Richey, Florida 34655-4293; and **Steve Burgess, Esquire**, Office of Public Counsel, c/o The Florida Legislature, 111 W. Madison Street #812, Tallahassee, Florida 32399-1400, via regular U.S. Mail; and to **F. Marshall Deterding, Esquire**, Rose, Sundstrom & Bentley, LLP, 2548 Blainstone Pines Drive, Tallahassee, Florida 32301, via hand delivery, on this 21st day of November, 2001.


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403.861 Department; powers and duties.—The department shall have the power and the duty to carry out the provisions and purposes of this act and, for this purpose, to:

(1) Administer and enforce the provisions of this act and all rules and orders adopted, issued, or made effective hereunder.

(2) Enter into agreements, contracts, or cooperative arrangements, under such terms and conditions as it deems appropriate, with other local, state, federal, or interstate agencies; municipalities; political subdivisions; educational institutions; or other organizations or persons.

(3) Receive financial and technical assistance from the Federal Government and other public or private agencies.

(4) Participate in related programs conducted by federal agencies, other states, interstate agencies, or other public or private agencies or organizations.

(5) Establish adequate fiscal controls and accounting procedures to assure proper disbursement of, and accounting for, funds appropriated or otherwise provided for the purpose of carrying out provisions of this act.

(6) Delegate those responsibilities and duties deemed appropriate for the purpose of administering requirements of this act.

(7) Issue permits for constructing, altering, extending, or operating a public water system, based upon the size of the system, type of treatment provided by the system, or population served by the system. The department may issue a permit for a public water system based upon review of a preliminary design report or plans and specifications and a completed permit application form and other required information as set forth in department rule.

(8) Require a fee in an amount sufficient to cover the costs of viewing and acting upon any application for the construction and operation of a public water supply system and the costs of surveillance and other field services associated with any permit issued, but the amount in no case shall exceed \$7,500. The fee schedule shall be adopted by rule based on a sliding scale relating to the size, type of treatment, or population served by the system that is proposed by the applicant.

(9) Adopt rules pursuant to ss. 120.536(1) and 120.54 to implement the provisions of this act.

(10) Review and approve record drawings prior to allowing operation of any new, altered, or extended public water system for which a valid permit has been issued under subsection (7).

(11) Establish and maintain laboratories for radiological, microbiological, and chemical analyses of water samples from public water systems, if the department determines that an additional laboratory capability beyond that provided by the Department of Health is necessary.

(12) Plan, develop, and coordinate program activities for the management and implementation of the state primary and secondary drinking water regulations, including taking sanitary surveys.

(13) Collect and disseminate information and conduct educational and training programs relating to drinking water and public water systems.

(14) Conduct data management activities to maintain essential records needed for administration of the public water system supervision program and for submission to the administrator, including the maintenance of an inventory for all public water systems.

(15) Establish and collect fees for conducting state laboratory analyses as may be necessary, to be collected and used by either the department or the Department of Health in conducting its public water supply laboratory functions.

(16) Require suppliers of water to collect samples of water as required by state primary

drinking water regulations, to submit such samples to an appropriate laboratory for analysis, and to keep sampling records as required under the federal act and make such records available to the department upon request.

(17) Require suppliers of water to submit periodic operating reports and testing data which the department determines are reasonably necessary to ascertain the adequacy of water supply systems. The information may include raw water data to determine whether additional treatment will be required to ensure that water at the consumer's tap meets applicable drinking water standards and action levels.

(18) Issue such orders as may be necessary to effectuate the intent and purposes of this act.

(19) Assist state and local agencies in the determination and investigation of suspected waterborne disease outbreaks, including diseases associated with chemical contaminants.

(20) Encourage public involvement and participation in the planning and implementation of the state public water system supervisory plans.

History.—s. 12, ch. 77-337; s. 165, ch. 79-400; s. 46, ch. 86-186; s. 40, ch. 91-305; s. 107, ch. 98-200; s. 170, ch. 99-8; s. 6, ch. 2001-270.

EXHIBIT COVER PAGE

VH - 2
FINAL REPORT

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DATE FILED: November 21, 2001



**INTERAGENCY
COPPER PIPE CORROSION
PROJECT**

FINAL REPORT

MAY 2001

**INTERAGENCY COPPER PIPE CORROSION PROJECT
FINAL REPORT**

PRESENTED BY THE:

**Florida Department of Community Affairs,
Florida Department of Environmental Protection, and
Florida Public Service Commission,**

WITH ASSISTANCE FROM THE:

**Florida Association of Counties,
Florida Building Commission,
Florida Department of Health,
Florida Rural Water Association,
Pinellas County Utilities,
St. Johns River Water Management District, and
Southwest Florida Water Management District.**

INTERAGENCY COPPER PIPE CORROSION PROJECT FINAL REPORT

TABLE OF CONTENTS

EXECUTIVE SUMMARY	iv
I. INTRODUCTION AND PURPOSE	1
II. SUMMARY OF PREVIOUS SULFIDE WATER STUDIES	2
A. The Pasco County Black Water Study	2
B. The Sulfide-Induced Copper Corrosion Study	3
C. Florida Building Commission (f/k/a the Florida Board of Building Codes and Standards) Study	4
D. Summary	5
III. INTERAGENCY AND WORK GROUP MEETINGS	6
A. First Interagency Project Meeting - August 24, 2000	6
B. Work Group Meetings - September 2000	7
1. Sulfide Source Water Issues Work Group	7
2. Building Codes/ County Ordinances/ Education Work Group	8
C. Second Interagency Project Meeting - September 29, 2000	10
D. Work Group Meetings - October 2000	10
1. Sulfide Source Water Issues Work Group	10
2. Building Codes/ County Ordinances/ Education Work Group	11
3. Existing Corroded Copper Pipe Repair/Replacement and Education Work Group	12
E. Joint Work Group Meeting - November 2000	13
F. Third Interagency Project Meeting - November 17, 2000	13
G. Work Group Meetings - December 2000	14
1. Sulfide Source Water Issues Work Group	14
2. Building Codes/ County Ordinances/ Education Work Group	14

INTERAGENCY COPPER PIPE CORROSION PROJECT FINAL REPORT

TABLE OF CONTENTS (CONTINUED)

H.	Work Group Meeting - January 2001	15
1.	Existing Corroded Copper Pipe Repair/Replacement and Education Work Group	15
a.	Assistance for Homeowners with Existing Copper Pipe Corrosion	15
b.	Alternative Funding for Treatment	17
I.	Fourth Interagency Project Meeting - March 19, 2001	19
J.	Work Group Meetings - April 2001	20
1.	Joint Work Group	20
2.	Building Codes/ County Ordinances/ Education Work Group	21
IV.	RECOMMENDATIONS	23
A.	DEP Permitting Rules for New Wells	23
B.	Building Code Education and Amendments	24
C.	DEP Consumer Confidence Reports	25
D.	Manufacturer Product Information	27
E.	Legislation/Education on Home Water Conditioning Devices	27
F.	Assistance for Homeowners with Existing Copper Pipe Corrosion	28
G.	Alternative Funding for Treatment	28
H.	Consumer Education	29
I.	Monitoring	29
V.	CONCLUSION	31

INTERAGENCY COPPER PIPE CORROSION PROJECT FINAL REPORT

TABLE OF CONTENTS (CONTINUED)

VI.	ATTACHMENTS	37
A.	Acronym List	37
B.	List of Additional Project Participants	39
C.	Map of Cities Having Copper Corrosion Problems in Florida	40
D.	Guidelines for Sulfides in Potable Groundwater Sources	41
E.	Florida Senate Bill 1030	42
F.	Duval County Ordinance Banning Copper Pipe in New Construction	58

EXECUTIVE SUMMARY

The Interagency Copper Pipe Corrosion Project (Interagency Project or Project) was initiated in response to complaints of black water occurring in some customers' homes in Florida. Several years ago it came to our attention that some Floridians were experiencing problems with copper corrosion. The black water discussed in this report occurs when hydrogen sulfide in the source water reacts with copper pipes to create copper sulfide, a form of copper corrosion. This corrosion can result in gray to black water in the customers' homes, pin hole leaks, and eventually failure of the copper pipe. In many instances failure of copper pipe due to corrosion will result without evidence of discolored water. Further, the quality of the potable water as it enters the customers' homes is meeting all state and federal drinking water standards for health effects. Consequently, this is viewed as an aesthetic rather than a health problem.

In Florida, occurrences of hydrogen sulfide are predominantly found in coastal areas, and bordering the I-4 corridor. However, evidence indicates that the instances of black water are more isolated. While hydrogen sulfide appears to be a key factor leading to copper corrosion, other factors affect the level of corrosion that occurs. For example, pin hole leaks occur when there is also a significant level of oxygen in the water. It is important to recognize that discolored water can be caused by a variety of different factors, and corrosion can occur in other piping materials, such as iron pipe. However, for purposes of this report we are limiting the scope of our discussion to corrosion of copper pipe and the type of discolored water resulting from that corrosion.

While there have been several studies on this issue, a workable solution has not been implemented. Since the problem of copper corrosion is widespread, it was believed that the best approach to resolving the problem would be to obtain input from the whole array of entities affected by the problem, which have varying degrees of jurisdiction over this matter. Consequently, in August of 2000, the Florida Public Service Commission (PSC) initiated the Interagency Copper Pipe Corrosion Project with the Florida Department of Community Affairs (DCA) and the Florida Department of Environmental Protection (DEP). These agencies were joined by representatives from the Florida Association of Counties (FAC), Florida Building Commission (FBC), Florida Department of Health (DOH), Florida Rural Water Association (FRWA), Pinellas County Utilities (PCU), St. Johns River Water Management District (SJRWMD), Southwest Florida Water Management District (SWFWMD), and a number of other government agencies, associations, universities, and private businesses. The goal of the Interagency Project was to find a consolidated solution to sulfide-induced copper pipe corrosion. Although there is still work to be done in this area, we believe the actions undertaken by the Interagency Project will serve to diminish the occurrence of copper corrosion and black water problems in the future.

Through a series of Interagency and work group meetings, the Project participants have developed several recommendations which are designed to help avoid or mitigate copper pipe corrosion in the future, or address existing copper corrosion problems. The recommendations are broken down into nine categories as follows:

A. DEP Permitting Rules for New Wells

- ▶ Enact legislation giving DEP specific statutory authority to require additional testing of raw water for drinking water wells.
- ▶ Promulgate the additional rules needed to require each utility that applies for a new water plant permit to perform tests on all new wells to determine if that water system is at risk of developing copper pipe corrosion problems. The proposed guidelines for “Sulfides in Potable Groundwater Sources” should be incorporated into the new permitting rules. The rules should authorize DEP to place conditions on the utility’s water plant permit to ensure that any sulfide problem is resolved by the utility. Also, DEP should develop treatment cost information in conjunction with the rulemaking effort.
- ▶ If the DEP well testing rules are adopted, some form of notification should be developed to inform small utilities that the FRWA is available to provide assistance in conducting the well tests.
- ▶ If the DEP well testing rules are adopted, all five water management districts (WMDs) should be notified of the new rules, and some form of notification should be developed for the WMDs to provide to consumptive use permit applicants.

B. Building Code Education and Amendments

- ▶ Specific training regarding Florida’s copper corrosion problems should be included in the FBC’s Spring 2001 training on Florida’s new statewide building code.
- ▶ If other efforts to address copper corrosion problems fail, and it is determined that it is not cost effective for water utilities to improve the quality of the water for compatibility with water service pipes and water distribution pipes, local governments that believe stronger action is needed should consider approving amendments to the building code for their county.

C. DEP Consumer Confidence Reports

- ▶ Enact legislation and rule changes to modify the United States Environmental Protection Agency (EPA)/DEP-required Consumer Confidence Reports (CCRs) to include additional water chemistry information that is needed by the building community in order to assess the appropriateness of water piping materials for a particular region, and expand distribution of the CCRs to local government officials, building officials, and other members of the building community. The financial impact of requiring the additional information in the CCRs should be considered when changes to the CCRs are pursued through legislation or rulemaking.

D. Manufacturer Product Information

- ▶ Manufacturers of water pipe products should include information on or with their products that provides the conditions under which their products are suitable for use in conjunction with the quality of the water provided by the water purveyors.

E. Legislation/Education on Home Water Conditioning Devices

- ▶ The home water conditioning device industry should be required to place notification, such as a disclaimer, on their product to inform customers that the use of this product may contribute to corrosion of copper pipes in some areas of the state.
- ▶ If the home water conditioning device industry is not required to provide notification, other mechanisms to independently educate utility customers who are experiencing copper corrosion problems about the possible effect of home water conditioning devices on copper corrosion should be developed.

F. Assistance for Homeowners with Existing Copper Pipe Corrosion

- ▶ Local governments should consider establishment of a municipal service taxing unit (MSTU) or municipal service benefit unit (MSBU), pursuant to Section 125.01(q), Florida Statutes, to help finance plumbing retrofits in the affected homes.
- ▶ Local governments should consider working with local banks to secure low-interest rate loans for customers who need to finance plumbing retrofits in their homes.

G. Alternative Funding for Treatment

- ▶ Utilities that need financial assistance with treatment plant upgrades should contact the DEP to determine if they are eligible for funding through the State Revolving Fund (SRF), and if so, make the appropriate application to obtain funding.
- ▶ Enact legislation to modify the SRF rules to allow large, privately-owned utilities to be eligible for SRF assistance.
- ▶ Rural utilities that need financial assistance with treatment plant upgrades should also contact the United States Department of Agriculture Rural Development Office to determine if they are eligible for funding through that Office.

H. Consumer Education

- ▶ An educational brochure should be developed to inform consumers and the building community of copper corrosion problems and possible solutions. The brochure should be developed jointly by the American Waterworks Association (AWWA), DCA, DEP, DOH, FAC, FRWA, PSC, and Florida's five WMDs.

I. Monitoring

- ▶ The Interagency Project recommendations should be monitored for one year by the DCA, DEP, and PSC.
- ▶ After one year, a status report should be prepared and issued by the DCA, DEP, and PSC.

Some of these recommended actions are already under way and may be completed within the next few months. Others will require additional work. Some of the recommendations call for actions which are beyond the authority of most of the entities involved in the Project, but reflect options that could be considered and pursued by local governmental authorities.

Regarding the recommendations which have already been initiated, efforts are already under way to enact legislation during the 2001 Florida Legislative Session to give DEP the authority to require additional testing of raw water for drinking water wells. Systems found to be at risk would be required to ensure that the sulfide problem is addressed. Also, the new statewide building code is scheduled to go into effect on October 1, 2001. Through the prior efforts of the Florida Building Commission, which is a part of the Department of Community Affairs, the new code includes a provision to address the compatibility of piping material used in new homes with the local water supply. Steps are being taken to develop mechanisms to provide the building community with water quality and product compatibility information. Further, steps to develop a consumer education brochure have been initiated.

Florida's copper corrosion problem is a complex issue without an easy solution. However, we believe these recommendations will move our state in the right direction toward resolving these copper corrosion issues. The progress of the recommendations provided in this report will be monitored for at least one year, after which a status report will be issued jointly by the DCA, DEP, and PSC.

INTERAGENCY COPPER PIPE CORROSION PROJECT FINAL REPORT

I. INTRODUCTION AND PURPOSE

This Project was initiated in response to complaints of black water occurring in some customers' homes in Florida. The black water discussed in this report occurs when hydrogen sulfide in the source water reacts with copper pipes to create copper sulfide, a form of copper corrosion. This corrosion can result in gray to black water in the customers' homes, pin hole leaks, and eventually failure of the copper pipe. In many instances failure of copper pipe due to corrosion will result without evidence of discolored water. The quality of the water as it enters the customers' homes is meeting all state and federal drinking water standards for health effects. Consequently, this is viewed as an aesthetic rather than a health problem.

We are aware that hydrogen sulfide is present in the ground water in several areas of the state, notably along coastal areas, and bordering the I-4 corridor. Further it is known that water utilities in Duval, Nassau, Orange, Pasco, and Highlands Counties have experienced failure of copper pipes due to copper corrosion. In fact, Duval County passed an ordinance banning copper water pipes in new residential construction as a result of the copper pipe corrosion problems experienced in that County. It is important to note that discolored water can be caused by a variety of different factors, and corrosion can occur in other piping materials such as iron. However, for purposes of this report we are limiting the scope of our discussion to discolored water caused by corrosion of copper pipe.

While there have been several studies on this issue, a workable solution has not been implemented. Since the problem is widespread, it was believed that the best approach to resolving the problem would be to obtain input from the whole array of entities affected by the problem, which have varying degrees of jurisdiction over this matter. Consequently, in August of 2000, the Florida Public Service Commission (PSC) initiated an Interagency Copper Pipe Corrosion Project (Interagency Project or Project) with the Florida Department of Community Affairs (DCA) and the Florida Department of Environmental Protection (DEP). These agencies were joined by representatives from the Florida Association of Counties (FAC), Florida Building Commission (FBC), Florida Department of Health (DOH), Florida Rural Water Association (FRWA), Pinellas County Utilities (PCU), St. Johns River Water Management District (SJRWMD), Southwest Florida Water Management District (SWFWMD), and a number of other government agencies, associations, universities, and private businesses. The goal of the Interagency Project was to find a consolidated solution to sulfide-induced copper pipe corrosion. The following report presents a summary of previous sulfide water studies, a chronological summary of the Project meetings, and the final recommendation of the Project participants. Due to the number of acronyms used throughout this paper, an acronym list has been provided as Attachment A for easy reference. Also, a list of additional Project participants has been included as Attachment B.

II. SUMMARY OF PREVIOUS SULFIDE WATER STUDIES

Copper pipe corrosion is a very complex issue. Several studies have been conducted on this issue, but none yielded conclusive results. However, those studies have provided valuable insight into some of the causes of copper pipe corrosion. The Pasco County Black Water study, the Sulfide-Induced Copper Corrosion study, and a Florida Building Commission (f/k/a the Florida Board of Building Codes and Standards) study, provide relevant information regarding the black water problem. All three studies provide data supporting the argument that removal of copper piping is necessary to eliminate black water. However, the studies were conducted using water containing hydrogen sulfide. It can be presumed that if the hydrogen sulfide were removed from the water through treatment prior to the water entering the system, copper sulfide would not be formed. Also, removal of the hydrogen sulfide through treatment would diminish or eliminate the taste and odor resulting from hydrogen sulfide in the water. The following is a summary of those studies.

A. The Pasco County Black Water Study

This DEP-sponsored study focused on responding to customer complaints that water provided by a water utility in that area tasted and smelled poorly and contained a black sediment. Tests indicated that the offensive taste and odor were caused by hydrogen sulfide and the sediment in the black water was determined to be copper sulfide, a corrosion product formed by hydrogen sulfide and the copper in home plumbing.

Based on initial research findings, DEP concluded that the color and odor conditions are caused by sulfur reducing bacteria in hot water heaters. It is believed that the bacteria convert sulfur and sulfates in the water to hydrogen sulfide, which is the odor smelled by the occupants. The hydrogen sulfide in turn reacts with the copper in the home water distribution system to create copper sulfide---the black substance in the water.

DEP solicited the FRWA to conduct a study to determine if the water quality problem could be corrected from within the home by performing various water system tasks that were simple and inexpensive. Approaches considered were raising the water temperature in the water heaters, changing the sacrificial anode from magnesium to aluminum, and disinfecting the water heater and household piping. In some homes, the home water softener was disconnected to perform tests.

Thirty-five customers agreed to participate in the DEP-funded study. A licensed plumber performed the physical work, and a laboratory certified by DOH performed the analyses on the drinking water samples. The study concluded that the results are inconclusive and mixed. None of the remedies had a long lasting effect on the black water and odor problem.

In this study, presence or absence of home water conditioning devices seemed to have no effect on the generation of hydrogen sulfide and the subsequent reaction with copper pipe. The water conditioning units did not remove the orthophosphate added by the utility to inhibit copper corrosion.

The utility had been (and continues to be) concerned about the effect of the home water treatment units on the inhibitor.

It should be noted that the homes involved in this study were targeted as those with a significant black water problem, and were not a random sample. The problem did not exist at the point of connection, but rather manifested itself after water entered the homes with copper piping. Water entering the homes met all state requirements, contained no sediment, and had no odor. Due to the selection of homes involved in this study, the results could be skewed, resulting in the inconclusive findings of the study. Also, it should be noted that while this study found that the treatment units did not remove the orthophosphate, it is not generally agreed that this is always the case.

B. The Sulfide-Induced Copper Corrosion Study

This study was conducted by Sara Jacobs, a water quality intern at the Alameda County, California, Water District; Steve Reiber, Director of Water Research at HDR Engineering; and Marc Edwards, Associate Professor in the Department of Civil Engineering at Virginia Polytechnic Institute and State University. The goal of the study was to examine the effect of sulfides on copper piping and to identify remediation strategies.

Specific report findings included:

- ▶ In laboratory experiments using low-alkalinity drinking water at pH 6.5 and 9.2, addition of sulfides produced some of the highest corrosion rates ever recorded for copper. At these rates, which did not decrease with time, all the copper in a pipe of 1/16-in. (16-mm) wall thickness would completely disappear (corrode) in less than nine years at pH 6.5 and 18 years at pH 9.2.
- ▶ Sulfide-induced corrosion initiated in the laboratory proved difficult to stop.
- ▶ Although some utilities were able to successfully reduce 90th percentile copper concentrations and pitting corrosion problems with typical corrosion remediation strategies, others were not. Remediation strategies examined to address sulfide-induced copper corrosion included removal of sulfides from the water, chlorination, superchlorination, and deaeration.

The report concluded that sulfides can accelerate the corrosion of copper pipe and elevate concentrations of copper in drinking water. In addition, it found that remediation strategies are inconclusive. The study further acknowledged that utility case studies strongly support a relationship between sulfides and increased copper corrosion problems.

C. Florida Building Commission (f/k/a the Florida Board of Building Codes and Standards) Study

In 1997, the Florida Board of Building Codes and Standards (BBCS) joined the Copper Development Association (CDA) and the Building Construction Industry Advisory Committee (BCIAC) in commissioning a study to determine the cause of the copper corrosion problem in Florida and to identify solutions. The group contracted with the University of Florida (UF) to implement the study.

The group also established an Advisory Group which consisted of impacted parties to review the work of the UF researchers and to provide peer review. The Advisory Group consisted of individuals representing the state agencies (DEP, FBC, PSC), the copper industry, contractors, engineers, water purveyors and other interested parties. Some of the general conclusions drawn from the study are as follows:

- ▶ Even though copper is more noble than any of the other metals commonly used in water distribution systems, it can be attacked by corrosion under the following adverse conditions: (1) aggressive soft waters, (2) in systems where the water flow velocity is in excess of about 5 feet per second especially in forced-circulation hot water systems and (3) in water systems with deposits of dissolved minerals, high quantities of dissolved gases (e.g. carbon dioxide, hydrogen sulfide, oxygen), and high temperatures.
- ▶ Water quality plays a significant role in the corrosion process. The most significant factors are pH, alkalinity, inorganic carbonate, dissolved oxygen, excessive chlorine and higher temperatures. Other factors that play a part in the corrosion process include calcium, silicate, organic matter, ammonia, sulfides, chloride, phosphate and nitrate.
- ▶ The corrosion types found in Florida, based upon the opinions of the research participants, are pitting, general, galvanic and erosion corrosion.
- ▶ The Florida copper corrosion failures do not follow a general pattern in the State or within a city. For example, one would encounter a failure on one street in a subdivision and no problems on the next street within the same subdivision.
- ▶ Based upon the areas studied, the researchers ranked the following geographic regions with copper corrosion in order of severity, beginning with the most severe:

Orange and Seminole Counties
Polk and Osceola Counties
Hillsborough, Pinellas and Manatee Counties
Palm Beach and Martin Counties
Sarasota and Charlotte Counties
Broward and Dade Counties

Volusia and Flagler Counties
Duval and St. Johns Counties
Brevard County

Based upon the responses provided by plumbing contractors, building owners, building inspectors, and water providers, a map of Florida cities having copper corrosion problems was created. The map is shown as Attachment C.

Although the study produced valuable information pertaining to copper corrosion, it did not provide definitive conclusions regarding the cause or the solutions to the problem. However, the group did acknowledge that the preliminary findings from the study do recognize that, at least in certain geographic areas of the State, there is a corrosion concern in copper piping systems utilized to purvey potable water.

D. Summary

Although these studies provided limited conclusions about the causes of and solutions for copper pipe corrosion, they were useful in establishing a starting point for this Interagency Project. Generally, the three studies found there is a relationship between sulfides and copper pipe corrosion, and there are a variety of factors that can exacerbate the problem, including pH, mineral content, dissolved gases, water velocity, and water temperature.

III. INTERAGENCY AND WORK GROUP MEETINGS

The participants in the Interagency Project met either jointly or in separate work groups a total of 17 times between August 2000 and April 2001. Detailed minutes from the Interagency Project Meetings are available on the Florida Public Service Commission's website at http://www.floridapsc.com/industry/water_waste_water/pipecorrproj.html. The following is a chronological summary of those 17 meetings.

A. First Interagency Project Meeting - August 24, 2000

The initial Interagency Project meeting was held in Tallahassee on Thursday, August 24, 2000. The meeting was very well attended, with representatives from DEP, DCA, PSC, DOH, Office of Public Counsel, Nassau County Building Department, Pasco County, Orange County, SWFWMD, FAC, Florida League of Cities, the Governor's Office, the Florida Conflict Resolution Consortium, David W. Porter Engineering, and Rose, Sundstrom & Bentley Law Firm.

PSC Commissioner Lila Jaber began the meeting by welcoming participants and explaining the purpose of the meeting, which simply stated is to explore possible options to aid customers with existing copper pipe damage and prevent future copper pipe corrosion. The meeting included presentations by PSC staff on hydrogen sulfide corrosion problems. Additionally, a draft proposal for how the Interagency Project should be structured was presented. The initial proposals for project strategy, work groups, project time line, and a work group plan were approved as follows:

► Proposed Project Strategy

1. Initiate interagency effort and establish work groups
2. Identify the problems
3. Find solutions and design plans for implementation
4. Implement plans to obtain solutions

► Proposed Work Groups

1. Current copper pipe corrosion in homes
 - a. Work Group A - Repair or replace corroded copper pipes
2. Prevent copper pipe corrosion on a going-forward basis
 - a. Work Group B - Treatment and standards for removal of hydrogen sulfide
 - b. Work Group C - Building codes/ county ordinance/ public education

► Proposed Project Time Line

August 1, 2000 PSC initiation of plan to establish work group.

August 24, 2000 Initial meeting of state and local governmental agencies to discuss unresolved issues and develop a strategy to identify solutions.

September, 2000	Meeting with the work group and industry representatives to identify solutions and potential recommendations.
October, 2000	Meeting with the work group and industry representatives to identify recommended solutions and plan for implementation.
November, 2000	Meeting with the work group and industry representatives to finalize a plan for implementing solutions.
December, 2000	Meeting with the work group and industry representatives to review draft project report and implement plan to obtain solutions.

▪ **Proposed Work Group Plan**

1. Clearly identify the aspect of the problem that each work group is trying to resolve
2. Research and identify as many solutions as possible
3. Analyze each of the potential solutions to determine its feasibility
4. Develop conclusions and recommended solutions
5. Develop a plan to implement the recommended solutions
6. Prepare a report describing the research, analysis, conclusions, recommendations, and plan of implementation.

The participants suggested additional entities that should be invited to future meetings, then proceeded with a discussion regarding specific aspects of how the proposed work groups should be formed and resources/data that may be available to assist the work groups in their efforts. The meeting also included a general discussion of the hydrogen sulfide problem. The meeting concluded with an agreement on the part of the participants to move forward with the proposed work groups.

B. Work Group Meetings - September 2000

As discussed above, it was proposed at the first Interagency Meeting that several work groups be formed to focus on certain aspects of the Project. Two of those groups were formed in September. The following is a summary of the initial meetings held by each group.

1. Sulfide Source Water Issues Work Group

Following the first Interagency Meeting, representatives of DEP agreed to chair Work Group B of the initial proposal shown above. It was subsequently named the Sulfide Source Water Issues Work Group (Sulfide Group). This work group was comprised primarily of representatives from DEP, DOH, FRWA, PCU, and PSC, with participation by representatives from the University of Central Florida (UCF), Boyle Engineering, SWFWMD, and SJRWMD at subsequent meetings. The group held its first two meetings in Tallahassee on September 8 and 15, 2000.

The group's task was to explore possible water treatment options to remove hydrogen sulfide and possible revisions to DEP rules. At the first work group meeting, the participants decided to address the issue from a statewide perspective as opposed to concentrating on a specific area. The group discussed the location of the problem in the state and reviewed a map depicting groundwater monitoring well test data from DEP which showed similar results to data gathered in the lead and copper rule testing. Participants discussed three prior sulfide water studies and recognized flaws with each. The group also suggested addressing all sulfides. There is currently no DEP standard for sulfur, sulfides, or hydrogen sulfide. It was noted that the difficulty in setting a new "one size fits all" standard is that it may introduce additional costs to a lot of utilities unnecessarily. Participants also briefly discussed educational efforts.

At the second work group meeting the group decided to explore addressing the hydrogen sulfide problem through the DEP's permitting rules. The group discussed developing a recommendation to the DEP Rules Revision Technical Advisory Committee (TAC). For example, relatively inexpensive tests could be done in the field on new wells to measure for pH, alkalinity, dissolved oxygen, iron, turbidity, total sulfides, and hydrogen sulfide. These seven measurements could be put into a table and analyzed collectively to determine whether the well is at high risk for black water problems. If the well is found to be at high risk, chlorination alone might be ruled out as an option. It was suggested that it may be preferable to state that under certain circumstances, chlorination is not good enough and leave the solution up to the utility. Also, the utility could be required to provide certification that it has addressed the problem. A representative of PCU volunteered to draft guidelines for the proposed well tests.

2. Building Codes/ County Ordinances/ Education Work Group

Representatives of DCA agreed to chair Work Group C of the initial proposal. It was subsequently named the Building Codes/ County Ordinances/ Education Work Group (Building Codes Group), and was comprised primarily of representatives from the DCA and PSC, with participation by representatives from UF and FAC. The group held its first two meetings in Tallahassee on September 8 and 14, 2000.

The group's task was to explore new, or changes to existing, building codes or county ordinances regarding the type of material used for water pipes in affected areas. After Hurricane Andrew caused major damage in South Florida in August of 1992, the Governor's Study Commission on Building Codes and the DCA, studied ways in which to help protect Floridians from sustaining such damage during future hurricanes. The solution was a statewide building code. Currently, Florida operates under three or four different building codes with multiple local variations. The DCA and FBC have been working for the last few years to develop a new statewide building code. The new building code is based upon the existing and national building codes, and is proposed to be effective October 1, 2001.

At the first work group meeting, a representative of DCA presented the third draft of the new Florida Building Code-Volume II-Plumbing. A new provision in Chapter 6 of the code appears to address the copper pipe corrosion problem by putting the responsibility on the engineer and contractor to select the proper piping for homes based on the water supplied by the utility. If a contractor is shown not to be in compliance with the new building code, the contractor could be taken to court. Section 605.1 of this draft states:

605.1 Water compatibility. Water service pipe and water distribution pipe shall be resistant to corrosive action and degrading action from the potable water supplied by the water purveyor or individual water supply system.

It was explained that the building code does not discriminate against products and it is impractical to ban copper pipe in Florida as it appears to have no problems in most areas of the state. Since little more can be done within the code, it was advised that the group should consider working through the Plumbing TAC to the FBC on an educational program. The group could address general training for contractors/designers on the black water problem, as well as ways to comply with the new provision in Chapter 6 of the code in areas that are prone to the black water problem.

The group was also informed that changes to the building code can only be made by the FBC. However, local governments may amend the code if the amendments will make the code more stringent and are justified. The amendments must be approved by a county-wide review board, and must be re-evaluated periodically by the FBC. Such amendments do not have to be approved by the FBC, but can be appealed to the FBC by affected parties.

Discussion ensued regarding the predictability of the black water problem. The problem can show up within two weeks or after 40 years. Black water has been found in commercial applications as well as residential. Also, workmanship has been implicated as contributing to the problem, as have flux, aggressive water (dissolved minerals, organic matter, ammonia and sulfides in the water), and the velocity of the water. As discussed in Section II above, in 1997, the BBCS, CDA, and BCIAC commissioned a study on copper corrosion. A representative of UF gave a presentation on that study to the group, including a proposal to conduct a second, more-detailed study.

At the second work group meeting, the group focused on the proposed education program. The FBC has a budget to provide an educational program on the new building code. The group's proposed strategy is to tie into the FBC's program in order to educate builders, developers, and local governments about the copper pipe corrosion problem and how best to avoid corrosion in areas with high levels of hydrogen sulfide in the water. The group planned to work jointly with the FBC's Plumbing TAC on this approach. The work group planned to meet with the Plumbing TAC on October 16, 2000, to see if it was willing to work with the Interagency Project's Building Codes Group in this manner.

C. Second Interagency Project Meeting - September 29, 2000

The second Interagency Project meeting was held in Tallahassee on Friday, September 29, 2000. The meeting was attended by many of the participants who attended the first meeting, along with the addition of representatives from the SJRWMD, FRWA, CDA, and staff from the Legislative Committee on Intergovernmental Relations (LCIR). The meeting was opened with a brief overview of the project time line and work groups for the benefit of those who were unable to attend the first meeting, then reports were given on the activities to date of the work groups.

There was general agreement among the Project participants with the current strategies of each work group. Although it was noted that implementing new standards is not the easiest way to go, several participants voiced support for the approach of the Sulfide Group in that there could be cost savings in the long run by looking at the permitting aspect.

Also, some participants suggested that it might be helpful to conduct a survey to get a better idea of the location and magnitude of the problem. Several participants discussed the information they had already obtained regarding this problem. It was reported that county representatives indicated they are not receiving a lot of complaints. Those that have had the problem did something about it on the front end (i.e., treatment plant). It was reported that most utilities in the South district aerate, which is one means of removing hydrogen sulfide. Additionally, complaints received by DEP have been random, leading to an incremental approach.

A representative from the CDA stated that he had been tracking this concern for the past 7½ years. He agreed that utilities are putting programs in place to address this, and he added that other utilities experiencing problems can learn from them. He mentioned that the CDA is proactive in researching copper corrosion problems and that it was willing to help in any way possible. Several participants offered to help with the surveys if the group decided to go forward with that suggestion. The meeting ended with a discussion of options for helping customers with existing problems. It was suggested that funding might be available through a grant program.

D. Work Group Meetings - October 2000

In October, the Sulfide and Building Groups each held their third meeting. Also, Work Group A of the initial proposal was formed. A summary of each group's October meeting is shown below.

1. Sulfide Source Water Issues Work Group

The third meeting of the Sulfide Group was held on October 12, 2000, at the offices of Boyle Engineering in Orlando. The meeting was attended by the primary work group members, along with consultants from Boyle Engineering and UCF. The group further discussed its decision at the last meeting to develop a recommendation to the DEP Permitting Rules Revision TAC. The

recommendation would be for DEP to require a utility, upon applying for a new water plant permit with the addition of a new well(s), to perform relatively inexpensive tests to allow DEP to identify water systems at risk for potential copper corrosion problems. The tests would measure for pH, total sulfides, dissolved oxygen, alkalinity, turbidity, and iron. When source water total sulfides exceed 0.3 mg/l, the DEP could encourage treatment processes other than chemical oxidation with chlorine for the removal of total sulfides from potable water sources. The water plant permit would not be issued unless the utility ensured that the sulfide problem would be addressed.

The group discussed the appropriate threshold for application of these requirements, and agreed that systems serving less than 350 persons (100 customers or connections) should not be included. It was mentioned that the group's proposal would be discussed at an upcoming DEP TAC meeting.

Also, the U.S. Environmental Protection Agency (EPA) and DEP now require utilities to provide water quality information to customers in an annual Consumer Confidence Report (CCR). The group discussed the use of CCRs to report aesthetic problems with the water provided, such as the presence of hydrogen sulfide. However, it was noted that this may require statutory and/or rule changes.

2. Building Codes/ County Ordinances/ Education Work Group

The third meeting of the Building Codes Group was a meeting with the FBC's Plumbing TAC on October 16, 2000, in Orlando. The meeting was attended by representatives of the work group. The group's proposed strategy was to work in conjunction with the FBC to educate builders, developers, and local governments about the copper pipe corrosion problem and how best to avoid corrosion in areas with high levels of hydrogen sulfide in the water.

The TAC seemed amenable to the proposed educational aspect, but predominantly focused on how to enforce Section 605.1. The new provision in the code appears to address the copper pipe corrosion problem by putting the responsibility on the contractor to select the proper piping for homes based on the water supplied by the utility. Many of the members believed this provision would be difficult to enforce. They realized that it placed liability on builders to use materials "resistant to corrosion" depending on the water supplied by the utilities. However, they were concerned that builders had no criteria for making this determination.

Also, they were concerned about moving a customer away from one problem and into another. For example, if you eliminate the use of one material to respond to corrosion concerns, the alternate material may produce some other type of problem. Special attention should be paid to this aspect when determining which material is most suitable. They arrived at a recommendation to have manufacturers of each plumbing material (i.e., copper, chlorinated polyvinyl chloride (CPVC), etc.) provide to the "appropriate authority" criteria under which their product would be suitable. Then, utilities would be required by the "appropriate authority" to analyze the physical and chemical

properties of the water, possibly test the compatibility of the water with each material, and report to the building officials any information about products that would not be compatible with their water supply.

The TAC tabled the issue until after its ideas could be shared with the other work group members. The Chairman of the TAC emphasized that the new code says that contractors must ensure compatibility, and that without putting in place some type of criteria, the contractor would be on his own. Several participants suggested that without some sort of guidelines for the contractor, the new provision should be withdrawn altogether.

3. Existing Corroded Copper Pipe Repair/Replacement and Education Work Group

At the first Interagency Meeting it was proposed that a work group be formed to explore options to assist homeowners who are currently experiencing copper pipe corrosion in their homes. On October 23, 2000, representatives from the PSC, FAC, and an LCIR staff person met in Tallahassee to discuss possible options to assist those homeowners.

The group discussed options for educating homeowners about copper corrosion. The information could be provided at several different points of contact for homeowners, such as lending institutions, insurance companies, and real estate offices. Also, in terms of government agencies, information could be provided by local governments, DEP, DOH, FBC or the water management districts (WMDs) when applications for well permits are received.

Regarding possible sources of funding to assist customers with the cost of replacing corroded pipes, it was suggested that the group investigate the availability of funding through DCA's Community Development Block Grant Program (CDBG), DEP's State Revolving Fund (SRF), municipal service taxing units (MSTUs), or low-interest rate loans through banks. Another option is an appropriation by the Legislature to pay for plumbing retrofits. It could be established as a pilot program, and limited to a certain geographic region and time frame. If the pilot program were successful, the issue could be revisited by the Legislature in the future to assist additional customers. If full funding were not an option, the program could be designed to offer matching grants to assist customers with the cost of repiping their homes.

It was noted that in order to allocate funding to the problem, there is a need to determine the magnitude of the problem and cost to repair it. It has been reported that it typically costs around \$3,000 to completely repipe a home, but may cost as much as \$5,000 for large homes. The group further discussed the idea of doing a survey to assess how many Floridians might be affected by this problem. The group agreed to research some of the options discussed to see if they are viable solutions.

E. Joint Work Group Meeting - November 2000

As discussed above, the Building Codes Group met with the FBC Plumbing TAC on October 16, 2000, in Orlando. Based upon discussion at that meeting, the work group members believed both work groups should meet jointly to discuss the results of that meeting and determine the next action to be taken. Consequently, on November 3, 2000, the Sulfide and Building Codes Groups held a joint meeting in Tallahassee, to discuss the suggestions of the FBC Plumbing TAC.

The groups discussed the process that would be used if the Plumbing TAC decided to remove the new provision from the building code. The groups then discussed the concerns that were expressed at the Plumbing TAC meeting and ways in which those concerns could be resolved. One option that was discussed was the use of a database containing water quality and pipe information that could be accessed by contractors and plumbers to determine the suitability for certain building materials in a given area. However, because water chemistry may change from time to time, there would need to be a method in place for the periodic updating of the database. Further, a determination would need to be made regarding which organization would be responsible for the development and maintenance of the database.

Also, the possibility of including additional information in the DEP required CCRs was discussed. For example, if the water exceeds certain parameters, a simple statement regarding its corrosivity could possibly be added to the CCR without statutory or rule changes. However, more significant additions would require statutory and/or rule changes. There was general agreement that the work groups should continue to work with the manufacturers and utilities to establish a means of providing the necessary information to local building officials and contractors.

F. Third Interagency Project Meeting - November 17, 2000

The third Interagency Project meeting was held in Tallahassee on Friday, November 17, 2000. The meeting was attended by many of the participants from the prior two Interagency Project meetings, along with the addition of representatives from the FBC and Florida Association of Plumbing, Heating, and Cooling Contractors. After a brief introduction, reports were given regarding the activities of the work groups since the last Interagency Meeting.

There seemed to be agreement among the Project participants with the current strategies of each work group. As discussed above, at the second Interagency Meeting, the participants discussed conducting a survey to get a better idea of the location and magnitude of the problem. A draft survey was presented, and several suggestions were made which were subsequently incorporated into the survey. The group agreed that the survey would be sent to water providers in Florida.

A brief discussion was held regarding assistance for existing customers, after which the group reviewed a proposed outline for the Interagency Project's final report. The group agreed that the

report could be issued in the Spring of 2001, even though the DEP rulemaking and building code activities will still be in process

G. Work Group Meetings - December 2000

1. Sulfide Source Water Issues Work Group

The fourth meeting of the Sulfide Group was held on December 11, 2000, in Clearwater. The meeting was attended by the primary work group members, along with representatives from the SWFWMD and SJRWMD. As discussed above, the group planned to prepare guidelines for testing new wells. The resulting proposed guidelines for "Sulfides in Potable Groundwater Sources" were presented at the meeting. The DEP rulemaking to incorporate these changes will be in early Summer of 2001. DEP staff do not anticipate any difficulties in getting the proposed rule changes approved. The proposed guidelines are shown as Attachment D.

The group discussed public education and the possibility of using the WMDs to inform applicants as they apply for well drilling permits. It was agreed that there is a role for the WMDs in this process, and that it is important to notify the WMDs once the new rule is in place. The group also discussed the use of the CCR or a survey to convey the water quality information from local utilities to local building officials. No conclusions were reached in this meeting, and it was agreed further work needs to be done in this area.

Also, a discussion took place regarding home treatment unit concerns that were raised at the Building Codes Group meeting the previous day. Home water conditioning devices remove certain minerals from the water. In general, removal of some minerals causes the water to be more aggressive or corrosive. In some cases, utilities are able to address copper corrosion problems by adding compounds, referred to as inhibitors, to the water. Some professionals believe that in addition to making the water more aggressive, the point-of-entry home water conditioning devices installed in the customers' homes remove the inhibitors and disinfectants, such as chlorine, from the water before the water enters the customers' copper pipes, thus negating the effect of the inhibitors and disinfectants in the water system. In some areas, it is common practice to install the water conditioning devices when the home is built. Currently, these devices are not subject to regulation. Due to current concerns about the effect of these devices on copper corrosion, the group agreed that it is important to raise the issue that home water treatment devices are exempted from any state regulatory oversight, pursuant to Section 489.103(15), Florida Statutes.

2. Building Codes/ County Ordinances/ Education Work Group

The fourth meeting of the Building Codes Group was another meeting with the FBC Plumbing TAC on December 10, 2000, in Orlando. The meeting was attended by representatives of the work group. Representatives from the copper, CPVC, and PEX (cross linked polyethylene)

industries, and the Florida section of the American Waterworks Association (AWWA) attended the meeting as well. All three industries agreed to put in writing the conditions under which their product is suitable for use by the end of February 2001. There was still some uncertainty regarding how to require the utilities to report which water quality parameters exist in their water, which agency should require the information, and how often it should be updated.

H. Work Group Meetings - January 2001

1. Existing Corroded Copper Pipe Repair/Replacement and Education Work Group

A meeting was held on January 17, 2001, in Tallahassee, to further discuss options for assisting homeowners with existing copper pipe damage. The meeting was attended by representatives of the PSC and FAC. During November and December, a variety of options to aid customers with the financial burden of replacing corroded copper pipes were explored. Two viable options were identified, both of which would be implemented at the local government level. Additionally, two viable options for assisting water utilities with the costs of treatment plant upgrades were identified.

a. Assistance for Homeowners with Existing Copper Pipe Corrosion

The first option considered for assisting homeowners with existing copper pipe corrosion is establishment of a municipal service taxing unit (MSTU) or municipal service benefit unit (MSBU) by the local government. Florida's Constitution grants counties the authority to establish a funding source for municipal purposes. Specifically, Section 125.01(q), Florida Statutes, provides that counties may establish municipal service taxing units, commonly referred to as MSTUs, or municipal service benefit units (MSBUs). MSTUs and MSBUs are financing mechanisms to perform municipal functions in unincorporated areas of the county. The county appears to have a great deal of discretion in defining the boundaries of these units within the county. In fact, the units' boundaries may include all or part of a municipality if the governing body of that municipality consents.

There may be an opportunity for a county to establish an MSTU or MSBU which would include the area where customers are experiencing black water problems. Through creation of such a unit, the local government could help finance retrofits in the affected homes over time. The unit could be funded in several different ways. The distinction between an MSTU and MSBU appears to be in the way each is funded. MSTUs are typically funded through ad valorem property taxes, and MSBUs are funded through non ad valorem special assessments. However, they may also be funded through issuing bonds or through a DEP grant or loan program. The funding acquired through these options may have to be repaid in some manner. It would be at the discretion of the local government to determine how repayment would be made, but it could include partial payment by the customers, such as with a matching grant program.

The second option for assisting customers with existing copper pipe corrosion problems is low-interest guaranteed loans. Again, this would require action at the local government level. Local governments could work in coordination with private banks to provide low-interest loans to customers who need to finance the costs of repiping their homes due to copper corrosion. Although this option would not relieve the customers of the financial burden of repiping their homes, it would reduce the total cost.

In order to receive a below market interest rate, local governments could guarantee the loans against default. The default rate on similar loans is typically very low, approximately 2% or less. Therefore, a local government may need only secure approximately 2% or less of the total amount needed to repipe all the homes within its boundaries that are currently experiencing black water problems. The local government could raise the funds needed to cover defaults, or there may be some type of funding available to cover this small portion of the loans, as discussed below. For example, assume that a county has 500 customers that need to replace copper pipes. At an average cost of \$3,000 per home, the county would have to guarantee approximately \$30,000 to secure loans for those customers (500 customers x \$3,000 per repipe x 2%).

A representative of the work group contacted a local banking official to discuss the feasibility of this proposal. We were advised that such a proposal is feasible, and that the current market interest rate for this type of loan is approximately 12%. With the local government guaranteeing the loans, the interest rate could drop to the prime rate which is 8% or possibly even a point below the prime rate depending on the details of the proposal. With this proposal, customers would pay for the retrofit over time rather than paying approximately \$3,000 out-of-pocket at the time the pipes are replaced. Moreover, the customers would be paying an independent third party, the local bank, and not the water utility. Finally, with the guarantee against default by the local government, the customers would be repaying the loan at a lower interest rate than they could receive otherwise.¹

The Drinking Water State Revolving Fund (SRF), which is administered by DEP, provides low-interest loans and grants on a priority basis to water utilities for administration, design, and construction of public water utility facilities. Although it is doubtful that the SRF could be used for replacement of damaged pipes, we understand that there is a possibility that SRF monies could go to county governments for securing a portion of the low-interest loans against default. This money would ultimately have to be repaid to the SRF, but use of the SRF money would provide the county

¹ However, it was reported that a private utility contacted its bank representative a couple of years ago regarding the feasibility of funding for such improvements. The utility was told that the cost of such a program would outweigh its usefulness because home equity loans, on an individual basis, would carry a cost almost as low, if not lower, and would not require nearly the same level of startup costs. The more recently obtained information seems to indicate that low interest guaranteed loans are a feasible option. However, the earlier response serves to remind us that it is important to ensure that whatever option is pursued is in fact the lowest cost alternative for the customers in that region.

government with more time to arrange for payment of the defaults. There may be other sources of funds from the DEP, through programs other than the Drinking Water SRF.

A third option that was evaluated, but ruled out as a viable option, was the Community Development Block Grant (CDBG) Program. The CDBG Program, created by Congress in 1974, is a federal program that provides funding for housing and community development. The program, administered by the U.S. Department of Housing and Urban Development (HUD), consists of two components -- an entitlement program that provides funds directly to urban areas and a small cities program which funds rural community activities. The law allows states to administer the program on behalf of small local governments, or non-entitlement communities. States must also adhere to many of the stringent requirements imposed by HUD on entitlement communities, target low and moderate income persons (70% of the funds must be used for activities that benefit such persons), provide for citizen and public participation, and allow home ownership assistance as an eligible activity.

Non-entitlement cities, or cities who opt out of an urban entitlement program, with a population less than 50,000, and counties having a population less than 200,000, are eligible to apply for Small Cities CDBG grants. However, because under current regulations, the black water occurrence is viewed as an aesthetic concern rather than a health problem, customers who experience black water do not qualify for assistance under this program. Also, the Program requires that if any action is taken to repair a home, everything in the home must be brought up to code specifications. Consequently, even if this were an eligible activity, the cost and effort to assist the customers could extend well beyond that of simply replacing the copper pipes. If state and federal standards ever change such that the black water problem is deemed a health hazard, the use of CDBG grants in some areas could be re-evaluated.

After evaluating these options the group determined that the most feasible option of those explored was the proposal for local governments to work with private banks to assist customers in obtaining below market interest rate loans in order to finance the costs of repiping their homes. At the January 17, 2001 meeting, the local government funding option was discussed in detail with the FAC representative. He agreed to ask the members of his association for informal feedback on the local government funding proposal. The FAC representative has reported that the proposal has not received an enthusiastic response from the local governments.

b. Alternative Funding for Treatment

There are alternative water treatment methods available to utilities to remove hydrogen sulfide from water, including tray aeration, forced draft aeration and packed tower aeration. However, any modification made to a water treatment plant must be approved in advance by the local DEP office. Also, construction of these advanced treatment facilities is usually quite costly.

The costs of these improvements are typically borne by the customers in the form of a rate increase. Two viable options were identified which may help utilities offset the cost of treatment plant upgrades.

As discussed above, DEP administers the SRF which provides low-interest loans and grants on a priority basis to water utilities for administration, design, and construction of public water utility facilities. The program is funded by both state and federal governments. The priority system takes into account public health considerations, compliance with the Safe Drinking Water Act, or other enforceable requirements relating to drinking water systems. Other factors that influence priority are affordability, median household income of the population affected, and consolidation of small water systems.

Under federal requirements, SRF funds are available to all water systems, regardless of ownership. Section 403.8532, Florida Statutes, which authorizes the SRF, specifically limits funding to investor-owned systems serving less than 1,500 service connections in a single service area unless the project will result in the consolidation of two or more systems. This statutory limit makes investor-owned utilities with more than 1,500 service connections ineligible to receive funding from the SRF. However, publicly-owned, and smaller privately-owned utilities with black water problems may be eligible.

Approximately \$25 million is available for grant and low-interest loan funding each year. Each year 15% of the funds are reserved exclusively for small systems serving fewer than 10,000 persons. The low-interest loans are generally made with a 20 year repayment, at interest rates 40% below market rates. Also each year, 15% of the funds are available as grants to small, financially disadvantaged communities with a public health risk factor. Additionally, SRF funding may be available for construction of new water treatment facilities designed to address other future drinking water standards, but that would also serve to address copper corrosion problems on a prospective basis.

A second option that may be available to utilities in rural areas is funding through the U.S. Department of Agriculture's (USDA) Rural Development Office. Funding to improve water and wastewater systems is available for publicly-owned and not-for-profit community systems which are located in rural areas. In order to be considered a rural utility, the utility must either be located in a rural area of the county or in a city with a population of 10,000 people or less. Although privately-owned rural utilities are ineligible for direct assistance, they may become eligible if the utility is being sold to a public or non-profit entity. For example, if system upgrades are required as a condition of the sale of the utility to public or non-profit owners, the Rural Development Office may help finance the upgrades. Additional information regarding the Office of USDA Rural Development is available on its website at www.rurdev.usda.gov/fl.

I. Fourth Interagency Project Meeting - March 19, 2001

The fourth Interagency Project meeting was held in Tallahassee on Monday, March 19, 2001. The meeting was attended by many of the participants from the prior three Interagency Project meetings, along with the addition of representatives from the AWWA/City of Tallahassee, Camp Dresser & McKee, Inc., and Polk County Utilities. After a brief introduction, reports were given regarding the activities of the work groups since the last Interagency Meeting.

Prior to the meeting, a draft final report of the Interagency Project was distributed to the Project participants. A discussion was held regarding specific concerns and suggested changes to the report. Most of those suggestions have been incorporated into the body of this final report. Many of the suggestions simply involved clarification of certain points, and as such are not discussed in detail in this section. However, there were several concerns raised either during the meeting or in the weeks that followed which warrant further discussion.

Much of the discussion that has taken place in Project meetings has focused on copper pipe. However, it was noted that the other components of the plumbing system can be affected as well. Therefore, it is important to ensure that the entire plumbing system, not just the pipe, is compatible with the water supply.

Also, discussion of the black water problem typically centers around residential customers. However, copper corrosion has been experienced by multi-residential and commercial customers as well. Further, corrosion problems are not limited to citizens served by utilities. Corrosion problems have also been experienced by citizens served by private wells. Therefore, it is important that we not neglect to recognize the effect of copper corrosion problems on these consumers when addressing this issue.

Additionally, concerns were raised that removal of copper piping will not address all hydrogen sulfide issues. While removal of the copper piping will eliminate the copper sulfide corrosion products, taste and odor concerns due to excessive levels of hydrogen sulfide will not be eliminated. The only positive way to eliminate the taste and odor concerns is to take steps to significantly reduce the amount of hydrogen sulfide and elemental sulfur in the distributed water.

Although the proposed DEP tests for new wells will be relatively inexpensive, concern was raised that any additional treatment that is required as a result of those tests could be quite significant for some utilities. Also, there was some concern that a utility may be placed in the position of upgrading treatment facilities to address potential corrosion concerns for a new well even though it is not experiencing problems with its existing wells. In many cases, utilities can fall back on a DEP standard or requirement to support the need for certain plant upgrades. Because there is no standard linked to the proposed new well tests, there is some concern that it may be difficult for utilities to support the need for the upgrades when seeking rate relief to recover the costs of the upgrades. It was suggested that the PSC should consider making a recommendation to the Legislature for language that would allow recovery of those costs similar to Section 367.0817, Florida Statutes,

which allows recovery of all prudent costs of a reuse project. Also, it was suggested that the Project should include a recommendation regarding enacting legislation to help pay for plumbing retrofits.

One of the most repeated concerns throughout the course of this Project relates to the proposed mechanisms for providing the building community with the necessary information to determine appropriate piping materials in a given region. As discussed previously, the EPA and DEP require utilities to provide water quality information to customers in an annual Consumer Confidence Report (CCR). It has been proposed that the CCRs could be expanded to include finished water chemistry data that could be used by the building community to assess piping material compatibility. There is concern among several Project participants that the DEP-required CCRs are not the appropriate vehicle for providing utility water chemistry data to the building community. One concern is that this deviates from the original purpose of the CCRs, which is to provide utility customers with water quality data. Also, due to the many factors that affect corrosion, the legislation needed to provide any meaningful data to be included in the CCRs could be extremely complex and result in substantial cost to the utility customers. Further, there is concern that the testing needed on the part of the utilities and pipe manufacturers would be complicated, costly, and would need to be updated frequently.

Finally, some concerns were expressed that discolored water and pipe corrosion are not limited to copper pipe. Discolored water can be caused by a variety of different factors. Also, corrosion has been experienced with other piping materials, such as iron. The group generally agreed that while these statements are correct, the scope of this report should be limited to problems resulting from corrosion of copper pipe.

J. Work Group Meetings - April 2001

1. Joint Work Group

A limited joint meeting of the Sulfide, Building Codes, and Repair/Replacement/Education Groups was held on April 5, 2001, in Tallahassee. The meeting was attended by the work group chairmen, along with a few work group members. The groups discussed four topics: (1) next steps that are needed to carry out the recommendations in the report, (2) establishing a group to develop a copper corrosion educational brochure, (3) future monitoring of the progress of the recommendations, and (4) a follow-up survey by DEP to help quantify reported instances of copper pipe corrosion.

The groups discussed some specific actions that are needed in order to accomplish the Project recommendations, and which agencies should be responsible for taking those actions. (1) The next steps developed by the groups are discussed later in Section V. (2) The groups decided that development of an educational brochure should be listed as a separate recommendation in the report. The group determined that the PSC would take the lead on developing the brochure with participation requested from the AWWA, DCA, DEP, DOH, FAC, FRWA, and the water

management districts. (3) The group agreed that it would be appropriate to monitor the progress of the recommendations and provide a status report in approximately one year.

(4) The Project participants believed it would be helpful to conduct a survey to determine the magnitude of the black water problem. Although we have some indication of the general location where black water problems appear, we are not aware of the problem's magnitude. In an attempt to better quantify the problem, the Interagency Project mailed surveys to 651 water providers in Florida (serving 250 or more connections) to try to estimate the number of customers statewide who have experienced discolored water, pinhole leaks, or copper pipe failures attributed to hydrogen sulfide corrosion. Surveys were returned by 46 of the 651 utilities. Due to the limited number of responses received, we believe the survey results are inconclusive. However, it is interesting to note that the utilities that responded do not appear to have experienced black water problems.

Due to the limited response to the Interagency Project's survey, DEP offered to conduct an additional informal survey of the DEP District Offices and Health Departments to determine the approximate number of complaints of black water that are received at those offices each year. In April, 2001, DEP contacted its District Offices and Health Departments via e-mail to request this information. The survey responses showed that only isolated incidents of this phenomenon occurred. Deland had a problem about eight years ago, but it subsided after the utility upgraded its system and provided aeration. Daytona Beach had a problem at one apartment complex about seven years ago, which was traced to the water heaters. Sacrificial anodes were replaced and the problem was resolved.

The DEP's Northeast District had two complaints concerning black water last year, and the problem was linked to water heaters. About five years ago, a utility in Nassau County had a problem with black water in one subdivision due to corrosion of copper plumbing in some of the houses. When the copper piping was replaced with CPVC piping, the problem was resolved. DEP's Central District (Orlando) has received complaints of corrosion and leaking pipes, but no black coloration of the water. Finally, DEP's Southwest District reported that there have been some isolated incidents of black water in Pinellas, Polk and Hillsborough Counties.

2. Building Codes/ County Ordinances/ Education Work Group

The fifth meeting of the Building Codes Group was another meeting with the FBC Plumbing TAC on April 9, 2001, in Orlando. The meeting was attended by representatives of the work group. The TAC members discussed the draft final report of the Interagency Project.

As discussed previously, several TAC members expressed concerns about being able to enforce the new provisions in the building code related to ensuring compatibility of piping materials with the water supply. In an effort to address those concerns, the Project participants developed two recommendations which are designed to provide the necessary information to the building community. One recommendation is for the manufacturers of water pipe products to provide

information regarding the conditions under which their products are suitable for use. The other recommendation is to modify the DEP required CCRs to include utility water chemistry data which can be compared to the pipe specifications. The concept is that a building contractor could obtain the CCR for the utility that will be serving that area. The water chemistry data in the CCR would then be compared to the pipe information provided by the manufacturers. If the water chemistry falls within the ranges that are suitable for whichever type of piping material the builder chooses, then that material should be suitable for use within that area.

The concept is simple. Putting that concept into practice is not simple. There is concern over determining which water elements need to be compared. Water utilities are not required to test for some of the elements that might be needed in order to do a proper evaluation. As a result, in order for this concept to work, utilities must either voluntarily perform the tests or the rules must be changed to require the tests. Either way, additional testing may result in higher rates for utility customers. Also, there is some concern that this type of comparison will not address all of the various factors that might interact with each other in the water and adversely affect piping material.

Even if we can eliminate the concerns over which elements should be compared and how to achieve the testing of those elements, water chemistry fluctuates over time. The information provided by the utilities would represent a snapshot in time. Consequently, there is concern that even if the piping material and water are compatible at one point in time, they might not remain compatible in the future if the water chemistry changes.

Finally, concern has been expressed that the compatibility issue should not be limited to water piping material. There are other components within plumbing systems, such as fittings and valves, that are susceptible to corrosion. It is important to ensure that the entire plumbing system, not just the pipe, is compatible with the water provided by the water purveyor.

The TAC voted to recommend to the FBC that it approve the draft final report of the Interagency Project, with the understanding the certain changes requested by the TAC and FBC would be incorporated into the report. Additionally, the TAC voted to require that the manufacturers of water piping materials provide information regarding the conditions under which their products are suitable for use.

On April 11, 2001, the FBC approved the draft final report. However, the FBC tabled the issue regarding requiring the manufacturers to provide water compatibility data in order to allow its legal staff an opportunity to evaluate this option further. In the meantime, provision of this information by the water pipe manufacturers will continue to be on a voluntary basis.

IV. RECOMMENDATIONS

Each recommendation discussed below either serves to help avoid or mitigate copper pipe corrosion in the future, or assist with existing copper corrosion problems. Some of the recommendations are already under way and may be completed within the next few months. Others will require additional work. Some of the recommendations call for actions which are beyond the authority of most of the entities involved in this Project, but reflect options that could be considered and pursued by local governmental authorities. The following are the Interagency Project recommendations addressing Florida's copper pipe corrosion problems.

A. DEP Permitting Rules for New Wells

The Interagency Project recommends that the following actions should be taken:

- ▶ Enact legislation giving DEP specific statutory authority to require additional testing of raw water for drinking water wells.
- ▶ Promulgate the additional rules needed to require each utility that applies for a new water plant permit to perform tests on all new wells to determine if that water system is at risk of developing copper pipe corrosion problems. The proposed guidelines for "Sulfides in Potable Groundwater Sources" should be incorporated into the new permitting rules. The rules should authorize DEP to place conditions on the utility's water plant permit to ensure that any sulfide problem is resolved by the utility. Also, DEP should develop treatment cost information in conjunction with the rulemaking effort.
- ▶ If the DEP well testing rules are adopted, some form of notification should be developed to inform small utilities that the FRWA is available to provide assistance in conducting the well tests.
- ▶ If the DEP well testing rules are adopted, all five WMDs should be notified of the new rules, and some form of notification should be developed for the WMDs to provide to consumptive use permit applicants.

This recommendation is designed to help mitigate future copper pipe corrosion by focusing on source water testing and water treatment options to address the hydrogen sulfide content in new wells. Guidelines were developed to be used in determining the potential for distribution system impacts that occur as a result of inadequate removal of total sulfides from potable source water. The guidelines consist of parameters, including pH, alkalinity, hydrogen sulfide, dissolved oxygen, and total sulfides, which can be used to indicate wells which may be at risk of developing copper pipe corrosion problems. Those guidelines are shown as Attachment D.

In order to implement these guidelines, DEP would need specific statutory authority and its existing permitting rules would need to be revised. Consequently, Florida Senate Bill 1030 was introduced during the 2001 Florida Legislative Session to give DEP that specific authority. The bill was passed by the Senate on April 11, 2001, and the House of Representatives on May 3, 2001. The enrolled bill is shown as Attachment E.

If the guidelines are adopted, upon applying for a new water plant permit that incorporates a new well(s), a utility would be required to perform tests to allow DEP to identify whether the water system is at risk for potential copper pipe corrosion problems. Conditions could then be placed on the water plant permit to ensure that the sulfide problem is addressed by the utility. Identifying these high risk systems in the early stages will help mitigate copper pipe corrosion in the future, and may result in lower treatment costs in the long run because it will alert utilities to the need to install appropriate treatment methods initially rather than modifying an existing treatment plant after problems occur. The FRWA has offered to assist small water utilities in performing the well tests. Also, since the WMDs issue consumptive use permits for wells, the WMDs could be a vehicle for informing utilities that additional testing of raw water will be required at the time the well is drilled.

Additionally, concerns have been expressed regarding the costs of treatment plant upgrades that may result due to tests on new wells. DEP will be undertaking a study of these costs this summer as part of the rulemaking associated with this recommendation.

B. Building Code Education and Amendments

The Interagency Project recommends:

- ▶ Specific training regarding Florida's copper corrosion problems should be included in the FBC's Spring 2001 training on Florida's new statewide building code.
- ▶ If other efforts to address copper corrosion problems fail, and it is determined that it is not cost effective for water utilities to improve the quality of the water for compatibility with water service pipes and water distribution pipes, local governments that believe stronger action is needed should consider approving amendments to the building code for their county.

This recommendation is also designed to help mitigate future copper pipe corrosion. The new statewide building code, which is scheduled to go into effect on October 1, 2001, contains provisions which address compatibility of piping material with the local water supply. The FBC will be conducting statewide training on the new code in the Spring of 2001, to educate the building community about the new code requirements. This training could also be used to educate the building community about copper pipe corrosion and appropriate building materials to avoid potential black water problems. Addressing this issue during the training sessions will alert the building community to be more aware of this problem when choosing building materials. This

change in the building code, combined with a proactive educational effort, will help to reduce the incidence of copper pipe corrosion in future construction.

Even though the statewide building code does not ban copper piping, local governments may amend the code if the amendments will make the code requirements more stringent. For example, to address its copper corrosion problems, Duval County passed an ordinance banning copper water pipes in new residential construction after September 1, 1995. That ordinance is shown as Attachment F. Although Duval County's ordinance specifically addresses residential construction, again it is important to note that copper corrosion affects multi-residential and commercial customers as well. Amendments to the building code must be approved by a county-wide review board, and must be re-evaluated periodically by the FBC. The amendments do not have to be approved by FBC, but can be appealed to the FBC by affected parties.

Although we are recommending code amendments as an option, the Project participants believe this alternative should only be pursued after all other efforts to address copper corrosion concerns have failed. It is important to allow time for the new code provision and training efforts to work before pursuing more stringent requirements. Also, as discussed previously, there are other components within plumbing systems, such as fittings and valves, that are susceptible to corrosion. Even if certain piping materials are eliminated from plumbing systems, customers may still experience failure of other components within the plumbing system due to corrosion. Therefore, it is important to recognize that while this type of code amendment may help to reduce copper corrosion, it may not completely eliminate it. Also, it should be noted that failure to treat the water to remove excessive levels of hydrogen sulfide or elemental sulfur will not address taste and odor concerns.

C. DEP Consumer Confidence Reports

The Interagency Project recommends that the following action should be considered:

- ▶ Enact legislation and rule changes to modify the EPA/DEP required CCRs to include additional water chemistry information that is needed by the building community in order to assess the appropriateness of water piping materials for a particular region, and expand distribution of the CCRs to local government officials, building officials, and other members of the building community. The financial impact of requiring the additional information in the CCRs should be considered when changes to the CCRs are pursued through legislation or rulemaking.

This recommendation is designed to address future copper pipe corrosion. In order for engineers and contractors to comply with the new requirement in the building code, they must have a means of obtaining water quality and product compatibility information. By modifying the CCRs to include additional information which is needed by the building community, we would be creating a readily available and easily obtainable source for that information. Also, utilities could be required

to send a copy of the CCRs to local government officials, building officials, and other members of the building community at the time the CCRs are issued to the utilities' customers.

However, as discussed previously, depending on the magnitude of the changes to the CCRs, statutory and rule changes may be necessary. Utilities are required to provide the CCRs to consumers by July 1 of each year. Presently, only the water consumers, DEP, and PSC receive copies of utility CCRs. In the case of multi-residential customers, the CCR typically only goes to the apartment complex owner, not the individual tenants. However, in those instances, the CCR should contain a disclosure about any efforts the utility made to get the information to unbilled consumers. Requiring the utilities to provide the CCRs to local government officials, building officials, and other members of the building community would require a rule change.

Regarding the data shown in the CCRs, under the current rules utilities are only required to report detection or violations on primary contaminants. Further, secondary contaminants are not shown in the CCRs unless the utility experiences a violation on that standard. Currently, utilities are not required to test for or report data on many of the elements that would be needed to analyze pipe compatibility with a utility's finished water product. For example, utilities test finished water for pH once every three years, but they are not required to test for alkalinity, total sulfides, or dissolved oxygen. Therefore, rule changes are necessary to require this information. Also, it is important to note that requiring additional information in the CCRs regarding finished water will necessitate additional testing by the utility. If the cost of the additional testing is significant, it could result in higher service rates for customers. Therefore, the financial impact of requiring the additional information in the CCRs should be considered when changes to the CCRs are pursued through legislation or rulemaking.

A standard template is used by many utilities as a guideline for completing the CCRs. The time period for making changes to the template for the July 1, 2001 CCRs has passed. However, DEP anticipates that it will be changing the template by the end of 2001 or early 2002 for the July 1, 2002 CCRs. As an interim measure between the current requirements and future rulemaking, the template could be modified to include the desired information on a voluntary basis. Although not required, some utilities test for some of these elements, and it is believed those utilities may be willing to provide the data voluntarily. Further, DEP may initiate rulemaking in early 2002 to make other changes to the CCR which are not related to this topic, and may be able to address these changes at that time. Therefore, it is possible that the water chemistry data which is needed by the building community may be included in the CCRs by July 1, 2002.

Additionally, the DEP requires water utilities to submit Monthly Operating Reports (MOR) which contain chemical usage, water flow, and water testing data. As an alternative to modifying the CCRs, the DEP is exploring the use of December's expanded MOR as a place to put the finished water quality information needed by the building community. Under this scenario, provision of the information would be on a voluntary basis.

D. Manufacturer Product Information

The Interagency Project recommends that:

- ▶ Manufacturers of water pipe products should include information on or with their products that provides the conditions under which their products are suitable for use in conjunction with the quality of the water provided by the water purveyors.

This recommendation is also designed to mitigate future copper pipe corrosion. In addition to providing the building community with water chemistry information via the CCRs, they will also need specifications of the water piping products. The best source of information regarding the conditions under which certain building materials are suitable is the product manufacturers. Representatives from the copper, CPVC, and PEX industries agreed to put in writing the conditions under which their product is suitable for use. This information combined with the proposed modification to the CCRs would provide the building community with the necessary information to assess which pipe material is most suitable for that area. We believe it would be beneficial if the product manufacturers would include that information on or with their products. Some information with regard to the manufacturers has already been received, and is being reviewed by the FBC's Plumbing TAC.

E. Legislation/Education on Home Water Conditioning Devices

The Interagency Project recommends:

- ▶ The home water conditioning device industry should be required to place notification, such as a disclaimer, on their product to inform customers that the use of this product may contribute to corrosion of copper pipes in some areas of the state.
- ▶ If the home water conditioning device industry is not required to provide notification, other mechanisms to independently educate utility customers who are experiencing copper corrosion problems about the possible effect of home water conditioning devices on copper corrosion should be developed.

This recommendation is designed to address both existing and future copper pipe corrosion. As discussed previously, there is concern that point-of-entry home water conditioning devices may contribute to copper corrosion problems. Currently, these devices are exempt from Department of Business and Professional Regulation (DBPR) regulation pursuant to Section 489.103(15), Florida Statutes. The Interagency Project recommends that due to current concerns about the effect of these devices on copper pipe corrosion, some action to require this industry to educate the public on this issue should be considered.

F. Assistance for Homeowners with Existing Copper Pipe Corrosion

The Interagency Project recommends that:

- ▶ Local governments consider establishment of a MSTU or MSBU, pursuant to Section 125.01(q), Florida Statutes, to help finance plumbing retrofits in the affected homes.
- ▶ Local governments consider working with local banks to secure low-interest rate loans for customers who need to finance plumbing retrofits in their homes.

This recommendation is designed to address existing copper pipe corrosion problems. In addition to efforts to address the problem prospectively, a variety of options to aid customers with the financial burden of replacing corroded copper pipes were explored. As discussed previously, two viable options were identified, both of which would be implemented at the local government level. The first option is establishment of a municipal service taxing unit (MSTU) or municipal service benefit unit (MSBU), to finance plumbing retrofits for affected homeowners. The second option is low-interest guaranteed loans.

G. Alternative Funding for Treatment

The Interagency Project recommends that one or more of the following options be considered:

- ▶ Utilities that need financial assistance with treatment plant upgrades should contact the DEP to determine if they are eligible for funding through the SRF, and if so, make the appropriate application to obtain funding.
- ▶ Enact legislation to modify the SRF rules to allow large, privately-owned utilities to be eligible for SRF assistance.
- ▶ Rural utilities that need financial assistance with treatment plant upgrades should also contact the Office of USDA Rural Development to determine if they are eligible for funding through that Office.

This recommendation addresses existing and future copper pipe corrosion problems. As discussed previously, alternative water treatment methods are available to utilities to remove hydrogen sulfide from water, but construction of these advanced treatment facilities is usually quite costly. Further, the costs of these improvements are typically borne by the customers in the form of a rate increase. Two viable options that were identified which may help utilities offset the cost of treatment plant upgrades are the DEP administered SRF, and funding through the U.S. Department of Agriculture's (USDA) Rural Development Office. However, under current regulations, large investor-owned utilities are not eligible for funding through the SRF.

H. Consumer Education

The Interagency Project recommends that:

- ▶ An educational brochure should be developed to inform consumers and the building community of copper corrosion problems and possible solutions. The brochure should be developed jointly by the AWWA, DCA, DEP, DOH, FAC, FRWA, PSC, and Florida's five WMDs.

This recommendation addresses existing and future copper pipe corrosion problems. As discussed previously, the Project participants believe it would be helpful to develop a mechanism by which consumers and the building community can be informed of copper corrosion problems and possible solutions. Educational brochures have been used for many years as an easy and cost effective means of providing information to the public. Throughout the course of this Project, options for providing information to water customers through various agencies have been discussed. The Project participants believe that rather than having different agencies address only one aspect of copper corrosion, a more effective solution would be to jointly produce one brochure which covers all of the key components relating to copper corrosion. The brochure could then be distributed by a number of agencies which have contact with the general public and the building community.

I. Monitoring

The Interagency Project recommends:

- ▶ The Interagency Project recommendations should be monitored for one year by the DCA, DEP, and PSC.
- ▶ After one year, a status report should be prepared and issued by the DCA, DEP, and PSC.

Clearly this is a work in progress. As discussed previously, efforts are already under way to carry out several of the recommendations provided in this report. The Project participants believe it would be helpful to continue to monitor the progress of the recommendations for at least one year. Representatives from the DCA, DEP, and PSC have agreed to be responsible for monitoring the recommendations. Other Project participants may be called upon for their input from time to time, and meetings will be held periodically if needed.

Although the DCA, DEP, and PSC will work jointly to monitor the recommendations, each agency will have primary responsibility over certain recommendations. The DCA will monitor recommendations B (Building Code Education and Amendments) and D (Manufacturer Product Information). The DEP will monitor recommendations A (DEP Permitting Rules for New Wells),

C (DEP Consumer Confidence Reports), and portions of G (Alternative Funding for Treatment). The PSC will monitor recommendations E (Legislation/Education on Home Water Conditioning Devices), F (Assistance for Homeowners with Existing Copper Pipe Corrosion) in coordination with the FAC and FLC, portions of G (Alternative Funding for Treatment), and H (Consumer Education).

It is anticipated that some of these recommendations will be completed within the next year. However, some recommendations may take several years to complete. We will monitor the progress of efforts that are made to carry out these recommendations during the next year, and report on the status of each recommendation as it stands at that time. Specific actions that are needed in order to accomplish the Project recommendations and the agencies responsible for taking those actions are discussed in more detail in Section V.

The PSC will continue to coordinate meetings with the DCA, DEP, and other Project participants as needed, and will coordinate preparation and distribution of the status report. The status report will be provided to each person on the original distribution list for the Interagency Copper Pipe Corrosion Project Final Report, and will be posted on the PSC's website as discussed previously.

V. CONCLUSION

As noted throughout this report, Florida's copper corrosion problem is a complex issue without an easy solution. Although evidence indicates that instances of black water are more isolated, it is clear that copper corrosion is a significant problem in Florida. We believe that the new building code provision combined with an effective training program will help to reduce the incidence of copper pipe corrosion in future construction. Likewise, if the proposed DEP permitting rules for new well testing are adopted, we believe this will give us a significant lead on tackling potential copper corrosion problems before they occur. But these actions are only part of the solution. We believe the other recommendations regarding providing necessary information to contractors through utility CCRs and manufacturer product information are vital to the successful implementation of the new building code provision to address copper corrosion. Further, the possible effect of home water conditioning devices on copper corrosion cannot be ignored. At a minimum, mechanisms should be created to convey information on copper corrosion to homeowners. And finally, the cost to repair the damage this problem creates cannot be overlooked. As stated in the report, some funding assistance could be made available through MSTUs, MSBUs, or low-interest guaranteed loans.

As discussed previously, the work groups determined specific actions that are needed in order to accomplish the Project recommendations and which agencies should be responsible for taking those actions. Each recommendation is reiterated below, including the next steps that are needed and the agencies responsible:

A. DEP Permitting Rules for New Wells

- ▶ Enact legislation giving DEP specific statutory authority to require additional testing of raw water for drinking water wells.

Next Step: DEP will continue to monitor the progress of SB 1030 during the 2001 Legislative Session.

- ▶ Promulgate the additional rules needed to require each utility that applies for a new water plant permit to perform tests on all new wells to determine if that water system is at risk of developing copper pipe corrosion problems. The proposed guidelines for "Sulfides in Potable Groundwater Sources" should be incorporated into the new permitting rules. The rules should authorize DEP to place conditions on the utility's water plant permit to ensure that any sulfide problem is resolved by the utility. Also, DEP should develop treatment cost information in conjunction with the rulemaking effort.

Next Steps: If SB 1030 becomes law, DEP will pursue rulemaking in 2002, which entails:

1. drafting new rule language as described in the recommendation, and
2. identifying the costs associated with the new tests and subsequent treatment methods.

- ▶ If the DEP well testing rules are adopted, some form of notification should be developed to inform small utilities that the FRWA is available to provide assistance in conducting the well tests.

Next Step: If the DEP well testing rules are adopted, the FRWA should notify small water utilities of its availability to provide testing assistance through the Circuit Rider Program or some other mechanism that it deems appropriate.

- ▶ If the DEP well testing rules are adopted, all five WMDs should be notified of the new rules, and some form of notification should be developed for the WMDs to provide to consumptive use permit applicants.

Next Steps:

1. The WMDs should be included in DEP's rulemaking process.
2. If the DEP well testing rules are adopted, the WMDs should notify consumptive use or water use permit applicants of the new rule requirements.

B. Building Code Education and Amendments

- ▶ Specific training regarding Florida's copper corrosion problems should be included in the FBC's Spring 2001 training on Florida's new statewide building code.

Next Step: The training materials are currently being developed. The FBC Plumbing TAC's Chairman and staff are working together to incorporate in the Plumbing Transition Training the necessary language to implement this recommendation. It will include information on the new code provision, the efforts that are underway to develop mechanisms to provide pipe and water compatibility data to the building community, steps that can be taken to determine the most suitable piping material for a given region, and sources for additional information on copper corrosion. The training materials will be released in May, 2001. The DCA and FBC should continue to monitor the development of the training materials and subsequent training.

- ▶ If other efforts to address copper corrosion problems fail, and it is determined that it is not cost effective for water utilities to improve the quality of the water for compatibility with the water service pipes and water distribution pipes, local governments that believe stronger action is needed should consider approving amendments to the building code for their county.

Next Step: The FAC and FLC should provide information to local governments about the potential use of a building code amendment as an alternative to address copper pipe corrosion problems, but only as a last resort if other efforts fail.

C. DEP Consumer Confidence Reports

- ▶ Enact legislation and rule changes to modify the EPA/DEP required CCRs to include additional water chemistry information that is needed by the building community in order to assess the appropriateness of water piping materials for a particular region, and expand distribution of the CCRs to local government officials, building officials, and other members of the building community. The financial impact of requiring the additional information in the CCRs should be considered when changes to the CCRs are pursued through legislation or rulemaking.

Next Steps:

1. DEP will pursue changing the CCR template in late 2001 or early 2002, for the July 1, 2002 CCR issuance. The FRWA may assist with this process.
2. Regarding rule changes, DEP will pursue rulemaking in 2002, which entails drafting new rule language to require water utilities to include finished water chemistry information in the annual CCRs, and increase the distribution of the CCRs to local government officials, building officials, and other members of the building community.

D. Manufacturer Product Information

- ▶ Manufacturers of water pipe products should include information on or with their products that provides the conditions under which their products are suitable for use in conjunction with the quality of the water provided by the water purveyors.

Next Steps: The DCA and FBC will continue to work with the water pipe manufacturers to make this information available to the building community.

E. Legislation/Education on Home Water Conditioning Devices

- ▶ The home water conditioning device industry should be required to place notification, such as a disclaimer, on their product to inform customers that the use of this product may contribute to corrosion of copper pipes in some areas of the state.

Next Step: DBPR should determine what steps are needed to initiate this requirement, and if it is feasible.

- ▶ If the home water conditioning device industry is not required to provide notification, other mechanisms to independently educate utility customers who are experiencing copper corrosion problems about the possible effect of home water conditioning devices on copper corrosion should be developed.

Next Step: The Project participants responsible for developing the educational brochure recommended in Section IV. H. above should include this information in the brochure.

F. Assistance for Homeowners with Existing Copper Pipe Corrosion

- ▶ Local governments should consider establishment of a MSTU or MSBU, pursuant to Section 125.01(q), Florida Statutes, to help finance plumbing retrofits in the affected homes.
- Local governments should consider working with local banks to secure low-interest rate loans for customers who need to finance plumbing retrofits in their homes.

Next Step: The FAC and FLC should inform local governments of the Project's recommendations regarding MSTUs, MSBUs, and low interest guaranteed loans.

G. Alternative Funding for Treatment

- ▶ Utilities that need financial assistance with treatment plant upgrades should contact the DEP to determine if they are eligible for funding through the SRF, and if so, make the appropriate application to obtain funding.

Next Step: DEP, the Florida Section of the AWWA, and FRWA are the appropriate agencies to assist utilities with information on this topic.

- ▶ Enact legislation to modify the SRF rules to allow large, privately-owned utilities to be eligible for SRF assistance.

Next Step: DEP should pursue drafting legislation to modify the SRF for the 2002 Legislative Session.

- ▶ Rural utilities that need financial assistance with treatment plant upgrades should also contact the Office of USDA Rural Development to determine if they are eligible for funding through that Office.

Next Step: The Florida Section of the AWWA and FRWA should inform small utilities of the availability of assistance through the USDA Rural Development Program.

H. Consumer Education

- ▶ An educational brochure should be developed to inform consumers and the building community of copper corrosion problems and possible solutions. The brochure should be developed jointly by the AWWA, DCA, DEP, DOH, FAC, FRWA, PSC, and Florida's five WMDs.

Next Step: Efforts are already under way to develop an educational brochure. The PSC will coordinate with the other agencies to develop the brochure. Meetings will be held periodically as needed. The PSC will be responsible for publishing the brochure and coordinating with the other agencies to distribute the finished product to consumers and the building community.

I. Monitoring

- ▶ The Interagency Project recommendations should be monitored for one year by the DCA, DEP, and PSC.

Next Step: The DCA, DEP, and PSC will monitor the progress of the recommendations contained in this report. Other Project participants may be contacted for their input occasionally during the next year. Meetings will be held periodically if needed.

- ▶ After one year, a status report should be prepared and issued by the DCA, DEP, and PSC.

Next Step: The DCA, DEP, and PSC, with assistance from other Project participants as needed, will prepare and distribute a status report after one year.

In conclusion, we recognize that the concerns voiced throughout the course of this Project regarding many of the recommendations are valid concerns. We acknowledge that some of the recommendations will be difficult to accomplish and may in fact prove to be too complex. But to state it simply, we won't know if we don't try. Again, while evidence indicates that instances of

black water are more isolated, copper corrosion is a significant problem in Florida. We believe we have a responsibility to the citizens of Florida to pursue any options that may help to diminish the occurrence of copper corrosion and black water problems in the future. We believe the recommended actions will help mitigate the problems associated with copper pipe corrosion in the State of Florida.

INTERAGENCY COPPER PIPE CORROSION PROJECT

ACRONYM LIST

► **ACRONYMS FOR AGENCY NAMES**

AWWA - American Waterworks Association

BBCS - Florida Board of Building Codes and Standards

BCIAC - Building Construction Industry Advisory Committee

CDA - Copper Development Association

DBPR - Florida Department of Business and Professional Regulation

DCA - Florida Department of Community Affairs

DEP - Florida Department of Environmental Protection

DOH - Florida Department of Health

EPA - U. S. Environmental Protection Agency

FAC - Florida Association of Counties

FBC - Florida Building Commission

FRWA - Florida Rural Water Association

HUD - U. S. Department of Housing and Urban Development

LCIR - Legislative Committee on Intergovernmental Relations

PCU - Pinellas County Utilities

PSC - Florida Public Service Commission

SJRWMD - St. Johns River Water Management District

SWFWMD - Southwest Florida Water Management District

UCF - University of Central Florida

UF - University of Florida

ATTACHMENT A

INTERAGENCY COPPER PIPE CORROSION PROJECT

ACRONYM LIST (CONTINUED)

► **OTHER ACRONYMS**

CCR - Consumer Confidence Report (issued by utilities as required by EPA/DEP)

CDBG - Community Development Block Grant

CPVC - Chlorinated polyvinyl chloride pipe

MSBU - Municipal Service Benefit Unit

MSTU - Municipal Service Taxing Unit

PEX - Cross linked polyethylene pipe

SRF - State Revolving Fund

TAC - Technical Advisory Committee

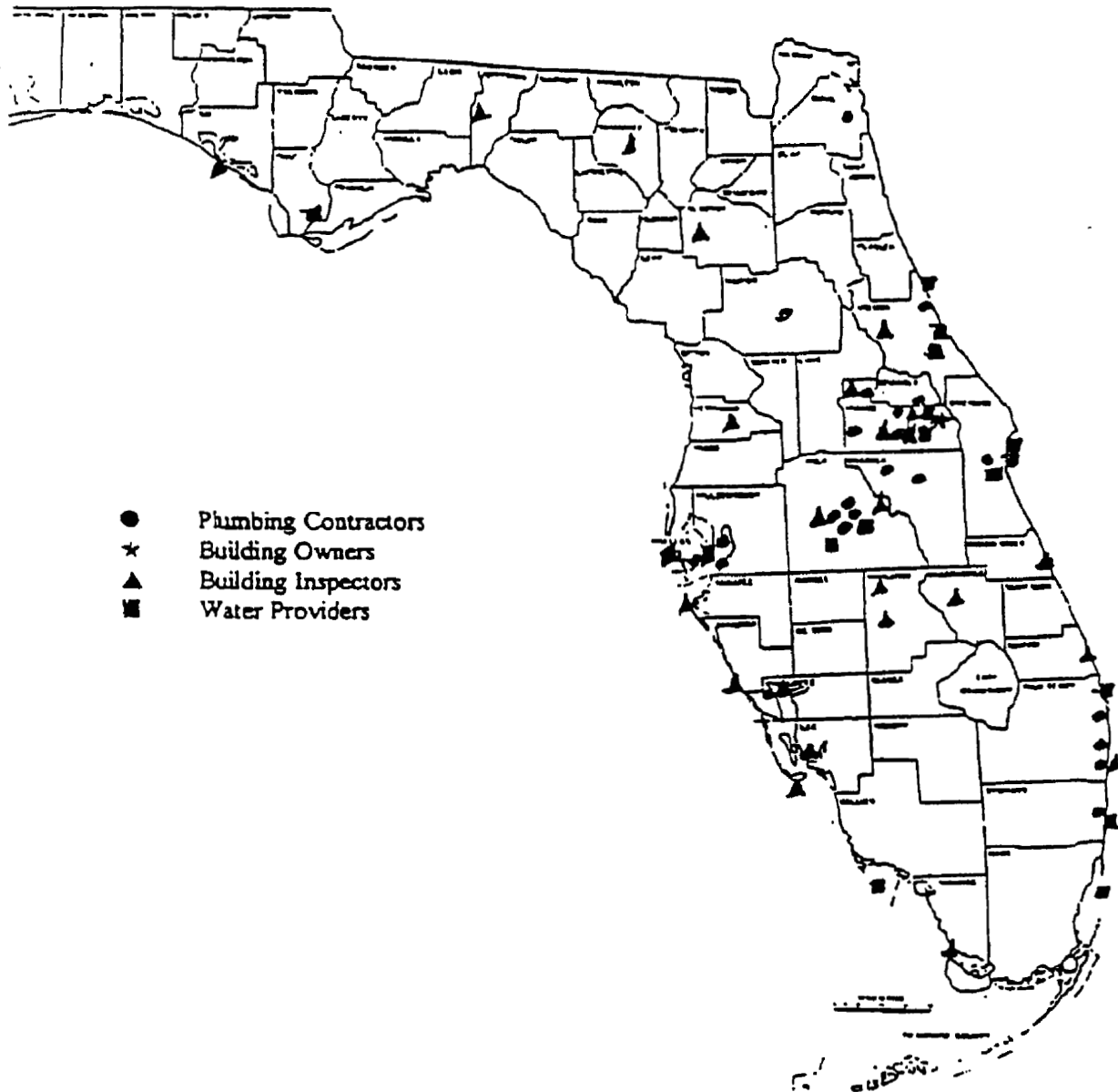
WMD - Water Management District

INTERAGENCY COPPER PIPE CORROSION PROJECT

LIST OF ADDITIONAL PROJECT PARTICIPANTS

Representatives from the following entities attended at least one Interagency or Work Group Meeting, and participated in the Project:

American Waterworks Association - Florida Section (AWWA)
B. F. Goodrich
Boyle Engineering
Camp Dresser & McKee Inc.
City of Tallahassee Utilities (*on behalf of AWWA*)
Copper Development Association (CDA)
David W. Porter Engineering (*on behalf of Aloha Utilities*)
Florida Association of Plumbing, Heating & Cooling Contractors
Florida Conflict Resolution Consortium
Florida League of Cities (FLC)
Florida Water Services Corporation
Governor's Office of Planning
Governor's State of Florida Office - Washington, D.C.
Legislative Committee on Intergovernmental Relations (LCIR)
Nassau County Building Department
Office of Public Counsel (OPC)
Orange County
Pasco County
Polk County Utilities
Rose, Sundstrom & Bentley (*on behalf of Aloha Utilities*)
University of Central Florida (UCF)
University of Florida



Respondents' Map of Cities Having Copper Corrosion Problems in Florida

Source: "Final Project Report"

State of Florida, Department of Community Affairs, and
University of Florida, M.E. Rinker, Sr., School of Building Construction

Sulfides in Potable Groundwater Sources

The following are suggested Guidelines that may be helpful in determining the potential for distribution system impacts that occur as a result of inadequate removal of Total S⁻ from potable water sources. The design of water treatment processes must be based upon sound engineering practice, source water quality, and finished water quality goals.

Monitoring for the following parameters would be required when a permit for potable use of a groundwater source is submitted: Total Sulfides, pH, Alkalinity, Dissolved Oxygen, Turbidity, and Total Dissolved Iron. These guidelines indicate the potential distribution system impacts of sulfides and a level of treatment that may reduce those impacts. The assumption is made that potable sources with less than 0.3 mg/l total sulfides would not result in a significant impact.

Potential for Impacts w/o Tot. S ⁻ Removal	Water Quality Ranges	Potential Treatment
Low	Tot. S ⁻ < 0.3 mg/l Dissolved Iron < 0.1 mg/l	Direct Chlorination ¹
Moderate	0.3 mg/l ≤ Tot. S ⁻ ≤ 0.6 mg/l @ pH ≤ 7.2 or 0.3 mg/l ≤ Tot. S ⁻ ≤ 0.6 mg/l @ pH > 7.2	Conventional aeration ² (max removal efficiency ~40-50%) Conventional Aeration ² with pH Adjustment ³
Significant	0.6 mg/l < Tot. S ⁻ ≤ 3.0 mg/l @ pH < 7.2 or 0.6 mg/l < Tot. S ⁻ ≤ 3.0 mg/l @ pH > 7.2	Forced draft aeration with pH adjustment (max removal efficiency ~ 90%) Forced draft aeration with pH Adjustment ³
Very Significant	Tot. S ⁻ > 3.0 mg/l	Packed tower aeration with pH adjustment ³ (max removal efficiency > 90%)

High alkalinity will make pH adjustment more costly, and use of another technology may be in order. High iron content raises concern if chlorination alone is used and significant D.O. exists in the source water. Filtration may be required to remove particulate iron prior to distribution.

¹Direct chlorination of S⁻ in water in the pH range normally found in potable sources produces elemental sulfur and increased turbidity. Finished water turbidity should not be more than 2 NTU greater than raw water turbidity.

²Increased dissolved oxygen entrained during aeration may increase corrosivity.

³Reduction of alkalinity during pH adjustment and high dissolved oxygen entrained during aeration may increase corrosivity. Corrosion control processes such as pH adjustment, alkalinity recovery, or use of inhibitors may be required. Treatment processes that preserve the natural alkalinity of the source water may enhance the stability of finished water.

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2001 Legislature

CS for SB 1030, 1st Engrossed

1
2 An act relating to water resources; amending s.
3 403.852, F.S.; redefining the terms "public
4 water system," "noncommunity water system,"
5 "nontransient noncommunity water system," and
6 "transient noncommunity water system"; amending
7 s. 403.853, F.S.; requiring the Department of
8 Environmental Protection to adopt primary and
9 secondary drinking water regulations for
10 nontransient noncommunity water systems and
11 transient noncommunity water systems; providing
12 that certified operators are not required for
13 certain transient noncommunity water systems;
14 amending s. 403.8532, F.S.; authorizing the
15 Department of Environmental Protection to make
16 loans to nonprofit transient noncommunity water
17 systems; amending s. 403.854, F.S.; requiring
18 the Department of Environmental Protection to
19 waive on a case-by-case basis certain
20 disinfection and operator requirements
21 applicable to transient noncommunity water
22 systems; amending s. 403.589, F.S.; providing
23 that it is a violation for failure to comply
24 with certain permit requirements; amending s.
25 403.861, F.S.; authorizing the Department of
26 Environmental Protection to issue permits for
27 altering or extending a public water system
28 based on the size of the system under certain
29 circumstances; requiring suppliers of water to
30 submit periodic operating reports and testing
31 data which may include certain raw water data;

1

CODING: Words ~~stricken~~ are deletions; words underlined are additions.

1 amending s. 403.865, F.S.; providing a
2 legislative finding that the operation of water
3 and wastewater treatment systems must be
4 operated by qualified personnel; amending s.
5 403.866, F.S.; redefining the terms "operator"
6 and "water distribution system"; amending s.
7 403.867, F.S.; requiring water distribution
8 system operators to be licensed; amending s.
9 403.871, F.S.; requiring the Department of
10 Environmental Protection to establish certain
11 fees sufficient to cover the entire cost of
12 administering ss. 403.865-403.876, F.S.,
13 relating to water and wastewater operator
14 certification; amending s. 403.872, F.S.;
15 requiring any person to be licensed as a water
16 distribution system operator to take the
17 licensure examination; amending s. 403.875,
18 F.S.; prohibiting any person from performing
19 the duties of an operator of a water
20 distribution system unless licensed; amending
21 s. 403.88, F.S.; requiring the Department of
22 Environmental Protection to classify water
23 treatment plants and water distribution systems
24 by size, complexity, and level of treatment
25 necessary to render the source water suitable
26 for its intended purpose; requiring the
27 Department of Environmental Protection to
28 establish the levels of certification and the
29 staffing requirements for water treatment
30 plant, water distribution system, and
31 wastewater treatment plant operators; providing

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1 a water treatment plant operator's license is
2 also valid as a water distribution system
3 license of the same classification or lower;
4 amending s. 403.1832, F.S.; conforming a
5 cross-reference; amending s. 403.1835, F.S.;
6 providing a definition of local governmental
7 agencies; amending s. 373.323, F.S.; providing
8 continuing education requirements for water
9 well contractors; authorizing water well
10 contractors to install and repair certain
11 equipment on water systems; amending s.
12 373.324, F.S.; providing continuing education
13 requirements for license renewal; repealing s.
14 403.1821, F.S., relating to the short title of
15 the "Florida Water Pollution Control and Sewage
16 Treatment Plant Grant Act"; repealing s.
17 403.1822, F.S., relating to definitions;
18 repealing s. 403.1823, F.S., relating to
19 rulemaking authority; repealing s. 403.1826,
20 F.S., relating to grants and requirements for
21 eligibility; repealing s. 403.1829, F.S.,
22 relating to funding project priorities;
23 providing an effective date.

24
25 Be It Enacted by the Legislature of the State of Florida:

26
27 Section 1. Subsections (2), (4), and (17) of section
28 403.852, Florida Statutes, are amended, and subsection (18) is
29 added to that section, to read:

30 403.852 Definitions; ss. 403.850-403.864.--As used in
31 ss. 403.850-403.864:

3

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- 1 (2) "Public water system" means a ~~community,~~
2 ~~nontransient noncommunity, or noncommunity~~ system for the
3 provision to the public of piped water for human consumption
4 through pipes or other constructed conveyances if, ~~provided~~
5 ~~that~~ such system has at least 15 service connections or
6 regularly serves at least 25 individuals daily at least 60
7 days out of the year. A public water system is either a
8 community water system or a noncommunity water system. The
9 term "public water system" includes:
- 10 (a) Any collection, treatment, storage, and
11 distribution facility or facilities under control of the
12 operator of such system and used primarily in connection with
13 such system.
- 14 (b) Any collection or pretreatment storage facility or
15 facilities not under control of the operator of such system
16 but used primarily in connection with such system.
- 17 (4) "Noncommunity water system" means a public water
18 system that for provision to the public of piped water for
19 ~~human consumption, which serves at least 25 individuals daily~~
20 ~~at least 60 days out of the year, but which is not a community~~
21 ~~water system, except that a water system for a wilderness~~
22 ~~educational camp is a noncommunity water system. A~~
23 noncommunity water system is either a nontransient
24 noncommunity water system or a transient noncommunity water
25 system.
- 26 (17) "Nontransient noncommunity water system" means a
27 noncommunity public water system ~~that is not a community water~~
28 ~~system and that~~ regularly serves at least 25 of the same
29 persons over 6 months per year.
- 30 (18) "Transient noncommunity water system" means a
31 noncommunity water system that has at least 15 service

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1 connections or regularly serves at least 25 persons daily at
2 least 60 days out of the year but that does not regularly
3 serve 25 or more of the same persons for more than 6 months
4 per year.

5 Section 2. Subsections (1) and (6) of section 403.853,
6 Florida Statutes, are amended to read:

7 403.853 Drinking water standards.--

8 (1) The department shall adopt and enforce:

9 (a)1. State primary drinking water regulations that
10 shall be no less stringent at any given time than the complete
11 interim or revised national primary drinking water regulations
12 in effect at such time; and

13 2. State secondary drinking water regulations
14 patterned after the national secondary drinking water
15 regulations.

16 (b) Primary and secondary drinking water regulations
17 for nontransient noncommunity water systems and transient
18 noncommunity water systems, which shall be no more stringent
19 than the corresponding national primary or secondary drinking
20 water regulations in effect at such time, except that
21 nontransient, noncommunity systems shall monitor and comply
22 with additional primary drinking water regulations as
23 determined by the department.

24 (6) Upon the request of the owner or operator of a
25 transient noncommunity water system serving businesses, other
26 than restaurants or other public food service establishments,
27 and using groundwater as a source of supply, the department,
28 or a local county health department designated by the
29 department, shall perform a sanitary survey of the facility.
30 Upon receipt of satisfactory survey results according to
31 department criteria, the department shall reduce the

5

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1 requirements of such owner or operator from monitoring and
2 reporting on a quarterly basis to performing these functions
3 on an annual basis. Any revised monitoring and reporting
4 schedule approved by the department under this subsection
5 shall apply until such time as a violation of applicable state
6 or federal primary drinking water standards is determined by
7 the system owner or operator, by the department, or by an
8 agency designated by the department, after a random or routine
9 sanitary survey. Certified operators are not required for
10 transient noncommunity water systems of the type and size
11 covered by this subsection. Any reports required of such
12 system shall be limited to the minimum as required by federal
13 law. When not contrary to the provisions of federal law, the
14 department may, upon request and by rule, waive additional
15 provisions of state drinking water regulations for such
16 systems.

17 Section 3. Subsection (3) of section 403.8532, Florida
18 Statutes, is amended to read:

19 403.8532 Drinking water state revolving loan fund;
20 use; rules.--

21 (3) The department is authorized to make loans to
22 community water systems, nonprofit transient noncommunity
23 water systems, and nonprofit nontransient noncommunity water
24 systems to assist them in planning, designing, and
25 constructing public water systems, unless such public water
26 systems are for-profit privately owned or investor-owned
27 systems that regularly serve 1,500 service connections or more
28 within a single certified or franchised area. However, a
29 for-profit privately owned or investor-owned public water
30 system that regularly serves 1,500 service connections or more
31 within a single certified or franchised area may qualify for a

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1 loan only if the proposed project will result in the
2 consolidation of two or more public water systems. The
3 department is authorized to provide loan guarantees, to
4 purchase loan insurance, and to refinance local debt through
5 the issue of new loans for projects approved by the
6 department. Public water systems are authorized to borrow
7 funds made available pursuant to this section and may pledge
8 any revenues or other adequate security available to them to
9 repay any funds borrowed. The department shall administer
10 loans so that amounts credited to the Drinking Water Revolving
11 Loan Trust Fund in any fiscal year are reserved for the
12 following purposes:

13 (a) At least 15 percent to qualifying small public
14 water systems.

15 (b) Up to 15 percent to qualifying financially
16 disadvantaged communities.

17 (c) However, if an insufficient number of the projects
18 for which funds are reserved under this paragraph have been
19 submitted to the department at the time the funding priority
20 list authorized under this section is adopted, the reservation
21 of these funds shall no longer apply. The department may
22 award the unreserved funds as otherwise provided in this
23 section.

24 Section 4. Subsections (4), (5), and (8) of section
25 403.854, Florida Statutes, are amended to read:

26 403.854 Variances, exemptions, and waivers.--

27 (4)(a) The department shall, except upon a showing of
28 good cause, waive on a case-by-case basis any disinfection
29 ~~chlorination~~ requirement applicable to transient noncommunity
30 water systems using ground water as a source of supply upon an
31 affirmative showing by the supplier of water that no hazard to

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1 health will result. This showing shall be based upon the
2 following:

- 3 1. The completion of a satisfactory sanitary survey;
- 4 2. The history of the quality of water provided by the
5 system and monthly monitoring tests for bacteriological
6 contamination;
- 7 3. Evaluation of the well and the site on which it is
8 located, including geology, depth of well, casing, grouting,
9 and other relevant factors which have an impact on the quality
10 of water supplied; and
- 11 4. The number of connections and size of the
12 distribution system.

13 (b) The department may as a condition of waiver
14 require a monitoring program of sufficient frequency to assure
15 that safe drinking water standards are being met.

16 (5) The department shall, except upon a showing of
17 good cause, waive on a case-by-case basis any requirement for
18 a certified operator for a transient ~~nontransient noncommunity~~
19 ~~or noncommunity water system using ground water as a source of~~
20 ~~supply having a design flow of less than 10,000 gallons per~~
21 ~~day~~ upon an affirmative showing by the supplier of water that
22 the system can be properly maintained without a certified
23 operator. The department shall consider:

- 24 (a) The results of a sanitary survey if deemed
25 necessary;
- 26 (b) The operation and maintenance records for the year
27 preceding an application for waiver;
- 28 (c) The adequacy of monitoring procedures for maximum
29 contaminant levels included in primary drinking water
30 regulations;

31

1 (d) The feasibility of the supplier of water becoming
2 a certified operator; and

3 (e) Any threat to public health that could result from
4 nonattendance of the system by a certified operator.

5 (8) Neither the department nor any of its employees
6 shall be held liable for money damages for any injury,
7 sickness, or death sustained by any person as a result of
8 drinking water from any transient noncommunity water system
9 granted a waiver under subsection (4) or subsection (5).

10 Section 5. Subsection (6) of section 403.859, Florida
11 Statutes, is amended to read:

12 403.859 Prohibited acts.--The following acts and the
13 causing thereof are prohibited and are violations of this act:

14 (6) Failure by a supplier of water to comply with the
15 requirements of a permit issued under s. 403.861(7) any
16 approved plans and specifications or condition to the approval
17 of plans and specifications issued by the department pursuant
18 to this act.

19 Section 6. Subsections (7), (10), and (17) of section
20 403.861, Florida Statutes, are amended to read:

21 403.861 Department; powers and duties.--The department
22 shall have the power and the duty to carry out the provisions
23 and purposes of this act and, for this purpose, to:

24 (7) Issue permits for constructing, altering,
25 extending, or operating a public water ~~supply~~ system, based
26 upon the size of the system, type of treatment provided by the
27 system, or population served by the system. The department may
28 issue a permit for a public water system based upon review of
29 a preliminary design report or plans and specifications and a
30 completed permit application form and other required
31 information as set forth in department rule.

1 (10) ~~Review~~ ~~Require department or county health~~
2 ~~department review and approve record drawings approval of~~
3 ~~complete plans and specifications prior to allowing the~~
4 ~~installation, operation, alteration, or extension of any new,~~
5 ~~altered, or extended public water system for which a valid~~
6 ~~permit has been issued under subsection (7).~~
7 (17) Require suppliers of water to submit periodic
8 operating reports and testing data which the department
9 determines are reasonably necessary to ascertain the adequacy
10 of water supply systems. The information may include raw water
11 data to determine whether additional treatment will be
12 required to ensure that water at the consumer's tap meets
13 applicable drinking water standards and action levels.
14 Section 7. Section 403.865, Florida Statutes, is
15 amended to read:
16 403.865 Water and wastewater facility personnel;
17 legislative purpose.--The Legislature finds that the threat to
18 the public health and the environment from the operation of
19 water and wastewater treatment plants and water distribution
20 systems mandates that qualified personnel operate these
21 facilities. It is the legislative intent that any person who
22 performs the duties of an operator and who falls below minimum
23 competency or who otherwise presents a danger to the public be
24 prohibited from operating a plant or system in this state.
25 Section 8. Subsections (3) and (5) of section 403.866,
26 Florida Statutes, are amended to read:
27 403.866 Definitions; ss. 403.865-403.876.--As used in
28 ss. 403.865-403.876, the term:
29 (3) "Operator" means any person, including the owner,
30 who is in onsite charge of the actual operation, supervision,
31 and maintenance of a water treatment plant, water distribution

1 system, or domestic wastewater treatment plant and includes
2 the person in onsite charge of a shift or period of operation
3 during any part of the day.

4 (5) "Water distribution system" means those components.
5 of a public water system used in conveying water for human
6 consumption from the water treatment plant to the consumer's
7 property, including pipes, tanks, pumps pipelines, conduits,
8 pumping stations, and all other constructed conveyances
9 structures, devices, appurtenances, and facilities used
10 specifically for such purpose.

11 Section 9. Section 403.867, Florida Statutes, is
12 amended to read:

13 403.867 License required.--A person may not perform
14 the duties of an operator of a water treatment plant, water
15 distribution system, or a domestic wastewater treatment plant
16 unless he or she holds a current operator's license issued by
17 the department.

18 Section 10. Section 403.871, Florida Statutes, is
19 amended to read:

20 403.871 Fees.--The department shall, by rule,
21 establish fees to be paid by persons seeking licensure or
22 license renewal to cover the entire cost to the department of
23 administering ss. 403.865-403.876, including, but not limited
24 to, the costs associated with for application review and
25 examination, reexamination, licensing and renewal, renewal of
26 an inactive license, reactivation of an inactive license,
27 recordmaking, and recordkeeping, and the costs of ensuring
28 compliance with ss. 403.865-403.876. The fees for license
29 application and license renewal shall be nonrefundable. The
30 department shall establish fees adequate to administer and
31 implement ss. 403.865-403.876.

1 (1) The application fee may not exceed \$100 and is not
2 refundable.

3 (2) The renewal fee may not exceed \$100 and is not
4 refundable.

5 (3) All fees collected under this section must be
6 deposited into the Water Quality Assurance Trust Fund. The
7 fees shall be used exclusively to implement the provisions of
8 ss. 403.865-403.876.

9 Section 11. Subsections (1) and (3) of section
10 403.872, Florida Statutes, are amended to read:

11 403.872 Requirements for licensure.--

12 (1) Any person desiring to be licensed as a water
13 treatment plant operator, a water distribution system
14 operator, or a domestic wastewater treatment plant operator
15 must apply to the department to take the licensure
16 examination.

17 (3) The department shall license as an operator any
18 applicant who has passed the examination and meets the other
19 criteria established under this section.

20 Section 12. Paragraphs (a), (b), and (f) of subsection
21 (1) of section 403.875, Florida Statutes, are amended to read:

22 403.875 Prohibitions; penalties.--

23 (1) A person may not:

24 (a) Perform the duties of an operator of a water
25 treatment plant, water distribution system, or domestic
26 wastewater treatment plant unless he or she is licensed under
27 ss. 403.865-403.876.

28 (b) Use the name or title "water treatment plant
29 operator," "water distribution system operator," or "domestic
30 wastewater treatment plant operator" or any other words,
31 letters, abbreviations, or insignia indicating or implying

1 that he or she is an operator, or otherwise holds himself or
2 herself out as an operator, unless the person is the holder of
3 a valid license issued under ss. 403.865-403.876.

4 (f) Employ unlicensed persons to perform the duties of
5 an operator of a water treatment or domestic wastewater
6 treatment plant or a water distribution system.

7 Section 13. Section 403.88, Florida Statutes, is
8 amended to read:

9 403.88 Classification of water and wastewater
10 treatment facilities and facility operators.--

11 (1) The department shall classify water treatment
12 plants, and wastewater treatment plants, and water
13 distribution systems by size, complexity, and level of
14 treatment necessary to render the wastewater or source water
15 suitable for its intended purpose in compliance with this
16 chapter and department rules.

17 (2) The department shall establish the levels of
18 certification and the staffing requirements for water
19 treatment plant, water distribution system, and wastewater
20 treatment plant operators certified under ss. 403.865-403.876
21 necessary to carry out subsection (1).

22 (3) A water treatment plant operator's license is also
23 valid as a water distribution system license of the same
24 classification or lower.

25 (4) ~~(3)~~ The department shall adopt rules necessary to
26 carry out this section.

27 Section 14. Subsection (1) of section 403.1832,
28 Florida Statutes, is amended to read:

29 403.1832 Department to accept federal aid; Grants and
30 Donations Trust Fund.--
31

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1 (1) The department is designated as the administrative
2 agency of the state to apply for and accept any funds or other
3 aid and to cooperate and enter into contracts and agreements
4 with the Federal Government relating to the planning, design,
5 construction, operation, maintenance, and enforcement
6 activities of the program to provide clean air and water and
7 pollution abatement of the air and waters of the state,
8 including solid waste management, hazardous waste management,
9 and ecosystem management and restoration, or to any other
10 related environmental purposes authorized by the Congress of
11 the United States. The department may, in the name of the
12 state, make such applications, sign such documents, give such
13 assurances, and do such other things as are necessary to
14 obtain such aid from or cooperate with the United States
15 Government or any agency thereof. The department may consent
16 to enter into contracts and agreements and cooperate with any
17 other state agency, local governmental agency, person, or
18 other state when it is necessary to carry out the provisions
19 of this section ~~ss. 403.1821-403.1832~~.

20 Section 15. Paragraph (a) of subsection (2) of section
21 403.1835, Florida Statutes, is amended to read:

22 403.1835 Water pollution control financial
23 assistance.--

24 (2) For the purposes of this section, the term:

25 (a) "Local governmental agencies" refers to any
26 municipality, county, district, or authority, or any agency
27 thereof, or a combination of two or more of the foregoing,
28 acting jointly in connection with a project having
29 jurisdiction over collection, transmission, treatment, or
30 disposal of sewage, industrial wastes, stormwater, or other
31 wastes and includes a district or authority the principal

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2001 Legislature

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1 responsibility of which is to provide airport, industrial or
2 research park, or port facilities to the public means local
3 governmental agencies as defined in s. 403.1022(3).

4 Section 16. Subsection (5) is amended and subsection
5 (10) is added to section 373.323, Florida Statutes, to read:

6 373.323 Licensure of water well contractors;
7 application, qualifications, and examinations; equipment
8 identification.--

9 (5) The water management district shall issue a water
10 well contracting license to any applicant who receives a
11 passing grade on the examination, has paid the initial
12 application fee, take and completes, to the satisfaction of
13 the department a minimum of 12 hours of approved coursework,
14 and has complied with the requirements of this section. A
15 passing grade on the examination shall be as established by
16 the department by rule. A license issued by any water
17 management district shall be valid in every water management
18 district in the state.

19 (10) Water well contractors licensed pursuant to this
20 section shall be authorized to install, repair and modify
21 pumps and tanks in accordance with the Florida Building Code,
22 chapter 29; Section 612 -- Well Pumps and Tanks Used for
23 Private Potable Water Systems. In addition, licensed water
24 well contractors shall be able to install pumps, tanks, and
25 water conditioning equipment for all water well systems.

26 Section 17. Section 373.324, Florida Statutes, is
27 amended to read:

28 373.324 License renewal.--

29 (1) A water well contractor shall submit an
30 application for renewal of a license to the water management
31 district which issued the license.

15

CODING: Words ~~stricken~~ are deletions; words underlined are additions.

1 (2) The water management district shall renew a
2 license upon receipt of the renewal application, proof of
3 completion of 12 classroom hours of continuing education for
4 each renewal cycle, and renewal fee.

5 (3) The department shall prescribe by rule the method
6 for renewal of license which shall include continuing
7 education requirements of not less than 12 classroom hours for
8 each renewal cycle.

9 (4)~~(3)~~ The department shall adopt rules establishing a
10 procedure for the biennial renewal of licenses, which shall be
11 adopted by each water management district.

12 (5)~~(4)~~ A license which is not renewed at the end of
13 the biennium prescribed by the department shall automatically
14 revert to inactive status. Such license may be reactivated
15 only if the licensee meets the qualifications for reactivation
16 in s. 373.325.

17 (6)~~(5)~~ At least 60 days prior to the automatic
18 reversion of a license to inactive status, the water
19 management district shall mail a notice of such reversion to
20 the last known address of the licensee.

21 Section 18. Sections 403.1821, 403.1822, 403.1823,
22 403.1826, and 403.1829, Florida Statutes, are repealed.

23 Section 19. This act shall take effect July 1, 2001.
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ORDINANCE CODE City of JACKSONVILLE, FLORIDA Codified through Ord. No. 2000-15-E, effective Jan. 13, 2000. (Supplement No. 1)

TITLE VIII CONSTRUCTION REGULATIONS AND BUILDING CODES*

Chapter 341 PLUMBING CODE*

PART 1. STATE LAW

Sec. 341.101. Adoption of Standard Plumbing Code.

Sec. 341.101. Adoption of Standard Plumbing Code.

Except as set forth herein, Chapters 1 through 17 and Appendixes (excepting Appendix H) of the Standard Plumbing Code 1994 Edition are hereby adopted as the Plumbing Code for the City of Jacksonville. The provisions of the Standard Plumbing Code shall apply to every plumbing installation, including alterations, repairs, replacement, equipment appliances, fixtures, fittings and appurtenances, and when connected to a water or sewerage system. The Plumbing Code is amended as follows:

- (a) Type M copper tubing shall not be allowed.
- (b) Copper tubing shall be prohibited in all new residential construction commencing after September 1, 1995.
- (c) Cut off valves for tubs and showers shall not be required.
- (d) Thermal expansion controls for hot water heaters shall not be required in residential construction.

(Ord. 83-591-400, § 1; Ord. 84-232-122, § 1; Ord. 85-568-374, § 1; Ord. 85-1201-663, § 12; Ord. 90-901-408, § 3; Ord. 93-545-302, § 4; Ord. 95-333-470, § 1; Ord. 98-673-E, § 10)