Staff Report of Investigation
Case No. WR-2007-0216, *et al.*

Missouri American Water Company
Asbestos-Cement (AC) and Lead-Jointed Pipe Issue

Prepared By:
Jerry Scheible, P.E., and James A. Merciel, Jr. P.E.
Water & Sewer Department
Missouri Public Service Commission

November 6, 2007

Introduction and Background

On July 13, 2007, Alan Ratermann filed rebuttal testimony in the subject case on behalf of the Utility Workers Union of America, Local 335 (UWUA Local 335, or the Union). Mr. Ratermann is President of the UWUA Local 335 and, as stated in his testimony, a "lead person in the construction department at Missouri American Water Company." In his testimony, he states that his concern is for the health and well being of Missouri American Water Company (Company) crew workers during construction activities on, and the Company's customers receiving water service via, asbestos-cement (AC) water mains. He also expresses concern for the Company's customers receiving water service via water mains that are lead-jointed. He wants to ensure that "adequate funds from the requested rate increase are allocated to address these health and safety issues." Specifically, he argues that funding should be allocated for training of employees on safe procedures when working on asbestos containing materials, and for the implementation of a program for the removal and replacement of Company water mains containing the above mentioned materials.

AC pipe is made of asbestos fibers that reinforce a cement mixture. A "lead joint" refers to the joining of cast iron pipe sections using molten lead that is poured between the bell end of a pipe section and the spigot end of an adjoining pipe section, thereby forming a seal. Neither AC pipe nor cast iron pipe using lead joints have been used for new construction for some years, but these types of pipe remain in use in water systems around the country including in the Company's systems.

In response to Mr. Ratermann's testimony, James A. Merciel, Jr., Utility Regulatory Engineering Supervisor from the Water and Sewer Department of the Missouri Public Service Commission, Cindy Hebenstreit, Central Region Director of Environmental Management and Compliance for American Water Company, and Greg A. Weeks, General Manager of Network Operations for Missouri-American Water Company, each prepared surrebuttal testimony.

Water & Sewer Department Staff's (Staff) Findings

There are two aspects to this asbestos issue; (1) worker safety while working on AC pipe, and (2) consumer safety related to the possibility of asbestos contamination in the water supply and related to the use of lead-jointed pipe.

I. Worker Safety

The surrebuttal testimonies presented by the Company representatives state that the amount of AC pipe in the Company's system is "extremely limited," citing that less than 2% of the total pipe network in the St. Louis County system specifically is comprised of AC. Small amounts exist in the Company's other systems as well. The occurrence of repairs involving the cutting of AC pipe in the St. Louis County system since January of 2004 is reported to be less than one-half of one percent of the total repair work. The Company, in Mr. Week's testimony and in statements to the Staff while this report was being prepared, states that it provides on the job training for workers dealing with AC pipe through the oversight of experienced lead persons/supervisors who have been informed of the correct procedures by means of a training brochure produced by the American Water Works Association (AWWA), entitled "Work Practices for Asbestos-Cement Pipe."

According to Mr. Week's testimony, those practices were proven effective in July of 2007 when the Company hired John A. Jurgiel & Associates, Inc., an independent industrial hygiene and safety consultant, to perform air monitoring during an AC pipe cutting demonstration. On October 26, 2007, Staff received requested correspondence from the Company regarding a report of the testing data. The report, which includes an Analysis Report from QuanTEM Laboratories, LLC, is attached (Attachment 1) as a part of this Staff Report. The results indicate that the airborne asbestos during the cutting was below the Occupational Safety and Health Administration (OSHA) Permissible Exposure Limit of an eight (8) hour time weighted average of 0.1 fiber per cubic centimeter, and 1 fiber per cubic centimeter averaged over a 30 minute period. OSHA standards for air quality with respect to asbestos may be found in the Code of Federal Regulations, 29 CFR 1926.1101.

On October 23, 2007, Mr. Scheible spoke with Mr. Bob Clark, one of Missouri-American's crew supervisors, who is, in fact, Mr. Ratermann's supervisor. He stated that he believes that dealing with AC pipe is indeed rare, and that there is no issue with regard to the Company's crews' ability to properly work on such pipe. He further confirmed that the Company follows the guidelines established in the AWWA publication mentioned above when AC pipe is encountered.

II. Consumer Safety

Possible Asbestos Contamination

To protect the water consumers, the Company reports that after repair, mains are flushed before they are put back into service, to remove contaminants from the distribution system, "including any minimal amount of asbestos slurry from cutting an AC pipe during a repair." The Company hired E. M. Analytical, Inc. to voluntarily perform testing of the water for the presence of asbestos in 2001 and again in 2004. Samples were taken at a total of twelve locations throughout the system and no asbestos was evident above the minimum detection limit. Staff has reviewed a copy of the results. Asbestos content in drinking water is addressed in the Missouri Code of

State Regulations, 10 CSR 60-4.030, which establishes a maximum contaminant level of 7 million fibers per liter that are more than 10 microns in length.

Specific research has been conducted regarding the possible health affects of utilizing AC pipe in water supply systems. The Company cites a 2003 publication by the World Health Organization titled "Asbestos in Drinking-Water," which Mr. Scheible reviewed on-line. The publication concludes that "*Asbestos is introduced into water by the dissolution of asbestos-containing minerals and ores as well as from industrial effluents, atmospheric pollution and asbestos cement pipes in the distribution system. Exfoliation of asbestos from asbestos cement pipes is related to the aggressiveness of the water supply. Limited data indicate that exposure to airborne asbestos released from tap water during showers or humidification is negligible. Asbestos is a known human carcinogen by the inhalation route. Although well studied, there has been little convincing evidence of the carcinogenicity of ingested asbestos in epidemiological studies of populations with drinking-water supplies containing high concentrations of asbestos. Moreover, in extensive studies in animal species, asbestos has not consistently increased the incidence of tumors of the gastrointestinal tract. There is, therefore, no consistent evidence that ingested asbestos is hazardous to health, and thus it is concluded that there is no need to establish a health based guideline value for asbestos in drinking-water*."

Use of Lead-Jointed Pipe

The Company addresses Mr. Ratermann's concerns regarding the presence of lead-jointed pipe in the water distribution system by citing Missouri Revised Statute 640.120, which specifically allows the use of lead to repair lead-jointed pipe that has been in use since prior to 1989. Notably, what is commonly referred to as the Department of Natural Resources' (DNR's) "Lead and Copper Rule," found in the Code of State Regulations as 10 CSR 60-15.010, and which is mandated by United States Environmental Protection Agency by the federal Safe Drinking Water Act, addresses monitoring for lead (and copper) at customers' taps, and also addresses taking measures that result in water that is non-corrosive for the purpose of reducing lead and copper leaching into the water. The reason sampling is required to be taken at customers' taps, and the major reason for the existence of the Lead and Copper Rule, is because of the risk of increased concentration of lead and copper in water that sits overnight in residential and building plumbing, exposed for this extended period to customer service pipes sometimes made entirely of lead, lead-based solder used for joining plumbing pipe fittings in buildings, and copper commonly used for pipe inside buildings. The Lead and Copper Rule requires corrosion to be minimized because corrosive water could result in significant concentrations of lead and copper in building plumbing systems, after sitting for extended periods. If the water is corrosive, then the same risk of higher lead concentration exists in water being distributed due to lead-jointed pipe in the distribution system.

DNR performs, or requires the utilities to perform, routine testing of public water supply systems for contaminants, the results of which are published in an annual Consumer Confidence Report (CCR). Mr. Scheible was able to access the Company's St. Louis and St. Charles Counties CCRs from 2006, which include results from samples for lead taken in 2004 at customers' taps.

Fifty total water samples were taken and tested, none of which returned results above the fifteen (15) parts per billion action level of detection for lead.

III. Staff's Investigation of Concerns

On October 28, 2007, Mr. Scheible spoke to Jack Baker of the Missouri Department of Natural Resources (MDNR) St. Louis Regional Office, and inquired as to whether or not MDNR was aware of any evidence of drinking water provided by Missouri American being contaminated with either asbestos or lead. Mr. Baker confirmed that past MDNR required testing of the water showed no contamination and that, in conjunction with the non-corrosive properties of the water supplied by the Company in its service areas, asbestos and lead contamination is a "non-issue with DNR."

On October 30, 2007, Mr. Scheible called and spoke to Mr. Ratermann personally and in his capacity as President of the Union. When asked what information he bases his concerns of the possibility of asbestos or lead leaching into the water supply upon, he stated it is based upon general information gathered from technical reports as posted on the internet, and not on any actual data collected from the testing of the Company's water. He did, however, offer that his concerns about worker safety when performing maintenance on AC pipe are reinforced by a July 23, 2007 citation by OSHA to the Company's St. Charles County division for improper practices when working on AC pipe. On October 31, 2007, the Company confirmed to the Staff that it received the OSHA notice of violation, which was apparently issued because of the actions of an independent contractor working on Company facilities, not an actual Company employee. The Company stated that worker safety and training is being improved, and that the finalizing of details to resolve the matter is still in progress between the Company and the Union.

Water & Sewer Department Staff's Conclusions

Although Mr. Ratermann's concerns as expressed to the Public Service Commission and the Staff are noble in nature, there is no evidence that further efforts by the Public Service Commission are necessary. The safety of both customers and workers is important and the Staff will continue to monitor issues as discovered or brought to the Commission's attention. The Company, by evidence and statements from both it and Mr. Ratermann, is working with the Union and OSHA, in the context of a notice of violation, and is willing to implement improvements to its training and work procedures. It is evident to the Staff that the Company is conscientious of any potential health risks associated with AC and lead-jointed pipe, has been and is sampling the water in compliance with DNR water quality requirements, and DNR has no issue with the Company with regard to lead concentration, nor corrosion control. Mr. Ratermann does not cite any Company specific data that would suggest any potential contamination by the indicated substances, and Staff did not find any Company specific data during its investigation to indicate that there is a problem with lead or asbestos contamination. Therefore, the Staff concludes that additional funds need not be allocated per se in the subject rate case nor is there any need for further action with regard to these issues.

JOHN A. JURGIEL & ASSOCIATES, INC.

Industrial Hygiene & Safety Consultants *Since 1978*

July 17, 2007

Ms. Lynn McClenahan
Loss Control Manager, Operational Risk Management
Missouri American Water Company
727 Craig Road
St. Louis, MO 63141

Re: Air Monitoring for Asbestos
6 Edward Drive, St. Peters, MO

Dear Ms. McClenahan:

This letter will serve as our report for the asbestos air monitoring conducted at 6 Edward Drive in St. Peters, Missouri on July 13, 2007. Two area samples and two personal samples were collected during asbestos cement pipe cutting operations. This monitoring was conducted to establish an OSHA Negative Exposure Assessment (NEA).

In-progress air samples were collected during the asbestos cutting operation using low volume sampling pumps calibrated to 3 liters per minute. The collection media used for all samples was 25mm 0.8 micron MCE cassettes in open-face configuration. Samples were analyzed by Phase Contrast Microscopy at a laboratory accredited by the American Industrial Hygiene Association (AIHA). All the samples were below the laboratory Limit of Detection (LOD) of 0.0138 fibers per cubic centimeter (f/cc). The OSHA Permissible Exposure Limit (PEL) is 0.1 f/cc. The sample results are summarized in the following table. All field data is included in Table 1 attached to this report.

Sample Description	Results
Area, SE of Hole, at Ground Level	< LOD
Area, SW of Hole, at Ground Level	< LOD
Personal, Gretchen Benhardt, Cutting and Wetting	< LOD
Personal, Louis Rodriguez, Cutting and Wetting	< LOD
Field Blank	0 Fibers
Field Blank	0 Fibers

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Ms. Lynn McClenahan
Loss Control Manager, Operational Risk Management
Missouri American Water Company
July 17, 2007
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Please call if you have any questions or comments.

Sincerely,

Gregory K. Young
Project Manager

GKY/jah

JOHN A. JURGIEL & ASSOCIATES, INC.

Industrial Hygiene & Safety Consulting Since 1978

LABORATORY SUBMITTAL

CHAIN OF CUSTODY

Lab: QuanTem

Location:

Project: MO American Water

Sampled by: D. Young

Sample # / Media: 6 / PCM Cassettes

Turn Around Time: RUSH!

NUMBER	SAMPLE ID	DESCRIPTION	ANALYSIS TYPE	VOLUME
1	MW-1	Area	PCM	195 l
2	MW-2	↓		195 l
3	MW-3	Personal		195 l
4	MW-4	↓		192 l
5	MW-5	Field Blank		—
6	MW-6	↓		—
7				
8				
9				
10				
11				
12				
13				
14				
15				

Additional Comments:

Chain of Custody		Date / Time
Relinquished by	Greg Young	7/16/07 17:00
Received by	R Molina	7/17/07 9:15am
Relinquished by		
Received by		

1810 Craig Road, Suite 207 St. Louis, Missouri 63146 Phone (314) 878-6556 Fax: (314) 878-0297

TABLE 1
Asbestos Air Sampling Results
MO American Water
6 Edward Drive, St. Peters, MO
July 13, 2007

Sample Number	Time On	Time Off	Time (mins)	Location/Description	Flow Rate (lpm)	Volume (liters)	Results (f/cc)
MW-1	9:50 am	10:55 am	65	Area, SE of Hole, at Ground Level	3	195	< LOD
MW-2	9:50 am	10:55 am	65	Area, SW of Hole, at Ground Level	3	195	< LOD
MW-3	9:53 am	10:58 am	65	Personal, Gretchen Benhardt, Cutting and Wetting	3	195	< LOD
MW-4	9:54 am	10:58 am	64	Personal, Louis Rodriguez, Cutting and Wetting	3	192	< LOD
MW-5	--	--	--	Field Blank	--	--	0 Fibers
MW-6	--	--	--	Field Blank	--	--	0 Fibers

Note:
LOD = Limit Of Detection

JOHN A. JURGIEL & ASSOCIATES, INC.

1810 Craig Road, Suite 207   St. Louis, Missouri 63146   Phone: 314-878-8666   Fax: 314-878-0297

QUANTEM LABORATORIES
2033 Heritage Park Drive / Oklahoma City, OK 73120 / (405) 755-7272 / Fax (405) 755-2058

QuanTEM Laboratories, LLC
Phase Contrast Microscopy
Analysis Report

QuanTEM Lab No.: 152329
Date Received: July 17 2007
Received By: Rachel Mollerl
Date Analyzed: July 17, 2007
Analyzed By: Joe Melton
Methodology: NIOSH 7400
AIHA Lab Number: 101352

Client: Jurgiel & Associates, Inc.
Acct. No: B461

Project: Mo American Water
Project Location: N/A
Project Number: N/A

QuanTEM Sample ID	Client ID	Air Volume (Liters)	Fibers	Fields	Detection Limit (f/cc)	Fiber Concentration (f/cc)	95% LCL (f/cc)	95% UCL (f/cc)
1	MW-1	195	0	100	0.0138	Below D.L.	N/A	N/A
2	MW-2	195	1	100	0.0138	Below D.L.	N/A	N/A
3	MW-3	195	0.5	100	0.0138	Below D.L.	N/A	N/A
4	MW-4	192	2	100	0.0141	Below D.L.	N/A	N/A
5	MW-5	BLANK	0	100	N/A	N/A	N/A	N/A
6	MW-6	BLANK	0	100	N/A	N/A	N/A	N/A

J. Melton
Analyst

17-Jul-07
Date

Attachment 1 pg 5/5

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF MISSOURI

AFFIDAVIT OF JERRY SCHEIBLE

STATE OF MISSOURI)
) **SS**
COUNTY OF CALLAWAY)

CASE NO. WC-2007-0216, *et al.*

COMES NOW Jerry Scheible, being of lawful age, and on his oath states the following: (1) that he is a Utility Regulatory Engineer in the Missouri Public Service Commission's Water & Sewer Department; (2) that he participated in the preparation of the foregoing *Staff Report of Investigation*; (3) that he has knowledge of the information presented in the foregoing *Staff Report of Investigation*; and (4) that the information presented in the foregoing *Staff Report of Investigation* is true and correct to the best of his knowledge, information and belief.

Jerry Scheible

Subscribed and sworn to before me this 16th day of November 2007.

Notary Public

NOTARY PUBLIC NOTARY SEAL STATE OF MISSOURI

SUSAN L. SUNDERMEYER
My Commission Expires
September 21, 2010
Callaway County
Commission #06942086

My Commission Expires: 9-21-10

BEFORE THE PUBLIC SERVICE COMMISSION OF THE STATE OF MISSOURI

AFFIDAVIT OF JAMES A. MERCIEL, JR.

STATE OF MISSOURI)
) ss
COUNTY OF CALLAWAY)

Case No. WR-2007-0216

James A. Merciel, Jr., of lawful age, on his oath states: (1) that he is the Assistant Manager – Engineering in the Water and Sewer Department of the Missouri Public Service Commission; (2) that he participated in the preparation of the foregoing *STAFF REPORT OF INVESTIGATION* (Asbestos Cement Pipe and Lead Pipe); (3) that he has knowledge of the matters set forth in the foregoing *STAFF REPORT OF INVESTIGATION*; and (4) that the matters set forth in the foregoing *STAFF REPORT OF INVESTIGATION* are true and correct to the best of his knowledge, information and belief.

James A. Merciel, Jr., P.E.
Assistant Manager - Engineering
Water & Sewer Department
Utility Operations Division

Subscribed and sworn to before me this 6th day of November 2007.

Notary Public

NOTARY PUBLIC NOTARY SEAL STATE OF MISSOURI

SUSAN L. SUNDERMEYER
My Commission Expires
September 21, 2010
Callaway County
Commission #06942066