

**STAFF'S REPORT IN RESPONSE TO  
THE COMMISSION'S ORDER FOR STAFF TO CONTINUE ITS  
ANNUAL REPORTING TO THE COMMISSION IN  
CASE NO. GS-2008-0038**

**CONCERNING LACLEDE'S  
DIRECT- BURIED COPPER SERVICE LINE  
REPLACEMENT PROGRAM AND  
THE EFFECTIVENESS OF THE COMPANY'S LEAK SURVEY  
PROCEDURES AND INVESTIGATIONS**

**September 18, 2009**

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**Syllabus:**

This report discusses the ninth (9<sup>th</sup>) year of Laclede's ten (10) year direct-buried copper service line replacement program and also provides an overview of the prior years of the program. At the end of the ninth (9<sup>th</sup>) year of the program, Laclede has completed a total of 73,453 direct-buried copper service lines, which is approximately 95 percent (95%) of the beginning total of replacements. All of the direct-buried copper service lines in Pressure Region I (service lines that can operate above 35 psig) have been replaced or eliminated. Through the ninth (9<sup>th</sup>) year of the program, Laclede has averaged over 8,100 replacements each year, exceeding the original Agreement's annual replacement rate of 8,000 direct-buried copper service lines. Laclede's 2009 annual bar-hole leak survey over direct-buried copper service lines indicated a continued downward trend in the leak rate. Staff recommends that Laclede replace the remaining direct-buried copper service lines by the end of program year ten (10), which ends March 1, 2010, and continue making timely leak repairs.

**Background:**

On October 30, 1998, as a result of three natural gas incidents in Laclede Gas Company's operating area, the Commission issued an Order Establishing Case No. GO-99-155 for the purpose of receiving information relevant to the adequacy of Laclede Gas Company's (Laclede or Company) direct-buried copper service line replacement program and the effectiveness of the Company's leak survey procedures and investigations. The Staff investigated Laclede's replacement program and its leak survey procedures and reached an agreement with Laclede concerning a schedule for direct-buried soft copper service line replacement and the type and frequency of leak surveys. The Parties filed a Unanimous Stipulation and Agreement ("Agreement"), which was approved by the Commission in Case No. GO-99-155 on May 30, 2000.

As part of the Agreement, Laclede agreed to an annual replacement rate of 8,000 direct-buried copper service lines. In addition, Laclede agreed to submit annual reports to Staff detailing the number of these service line replacements completed, and further agreed to submit additional reports confirming the achievement of other milestones under the Agreement.

On August 1, 2003, Staff filed its Three-Year Summary Report in which Staff requested the Commission approve continuation of the requirements of the Agreement, with Staff reporting to the Commission annually. In its summary, Staff stated that the requirements of the Copper Service Line Replacement Program were meeting the overall goals of protecting the public, achieving a substantial number of replacements annually, using effective leak detection methods, and the timely eliminating discovered leaks. Staff verified that Laclede met or exceeded the guidelines of the Agreement and, more importantly, that the crucial goal of public safety was being maintained. The Commission issued its Report and Order in March 2004 adopting Staff's recommendation that the Commission continue the current requirements of the previously approved Stipulation and Agreement with annual reporting from Staff.

Since 2003, Staff has filed Annual Reports updating the status of Laclede's direct-buried copper service line replacement program and leak surveys. In each year's Annual Report, Staff stated that the Replacement Program was meeting the overall goals of protecting the public, achieving a substantial number of replacements annually, using effective leak detection methods, and timely eliminating discovered leaks. Each year Staff verified Laclede has met or exceeded the guidelines of the Agreement and that the crucial goal of public safety was being achieved.

On August 8, 2007, Laclede filed an application in this case (Case No. GS-2008-0038) requesting the Commission issue an Order revising replacement requirements set forth in Case No. GO-99-155.

In its Application, Laclede requested a reduction in the number of direct-buried soft copper service lines it was required to replace annually from 8,000 to 6,000 due to a significant reduction in the copper service line leak rate, increased integrity of the copper service lines remaining in service, and the increasing costs of replacing the remaining copper lines. In addition, to the costs, Laclede noted the remaining copper

service lines are scattered throughout high traffic areas or in locations where construction is difficult. Laclede further proposed to accelerate the replacement of those soft copper service lines that are located in Pressure Region I, so that all remaining lines in Pressure Region I would be replaced by the end of program year 9, which concluded in February 2009. In its Application, Laclede also noted this approach had been approved in the later stages of previous replacement programs.

On August 17, 2007, the Commission issued its Order directing Staff to file its recommendation in Case No. GS-2008-0038, no later than September 6, 2007. In compliance with the Order, on September 6, 2007, Staff filed its recommendation concerning Laclede's Application, suggesting the Commission issue an Order revising replacement requirements set forth in Case No. GO-99-155. In its recommendation, Staff indicated that Laclede's request is consistent with the goal of assuring public safety and Staff recommended the Commission set an accelerated replacement deadline of February 2009 (one year earlier than would have occurred in the original program) for all direct-buried soft copper service lines in Pressure Region I. Staff made this recommendation because Pressure Region I is the area in which the previous incidents occurred and this area has the greatest present potential for additional leaks. Staff suggested the Commission order Laclede to replace 7,000 soft copper service lines annually, continue annual bar-hole leak surveys and comply with the guidelines set forth in the original Stipulation and Agreement. Staff noted that the overall average annual replacement rate for the duration of the program would still be approximately 8,000 service line replacements if Laclede followed Staff's recommendations. Staff also recommended the Commission allow Laclede the right to seek additional modifications in 2008 upon completion of the next leak survey.

On September 13, 2007, Laclede filed its response to the Staff Recommendation. Laclede was willing to accept the modified replacement program terms set forth in Staff's Recommendation. Laclede reserved the right to renew its request for additional program modifications in 2008, upon completion of its next leak survey of direct-buried copper service lines.

On September 20, 2007, the Commission issued its Order: 1) directing Laclede to continue to meet all requirements of the Original Stipulation and Agreement; 2)

permitting Laclede to reduce the number of direct-buried soft copper service lines from 8,000 to 7,000 lines annually, beginning in February 2008; 3) establishing an accelerated replacement deadline for all direct-buried soft copper service lines in Pressure Region I of February 2009; 4) continuing its requirement for Staff to report to the Commission annually and, 5) if at any time the leakage rate increases or Staff determines that public safety is compromised, Staff shall immediately present this information to the Commission and recommend appropriate remedial action.

On September 11, 2008, Staff filed its Report summarizing data obtained through July 2008 during Staff's ongoing monitoring of the program's progress. In its Report, Staff addressed information relevant to the adequacy of Laclede's revised copper service line replacement program and discussed the effectiveness of the Company's leak surveys and investigations. Staff recommended that Laclede: 1) continue with the annual replacement rate of 7,000 direct-buried copper service lines; 2) continue with the accelerated replacement rate of direct-buried copper service lines in Pressure Region I to be completed by February 2009; 3) continue to conduct annual bar-hole leak surveys of direct-buried copper service lines; and 4) continue repairing Class 3 leaks in Pressure Region I within six (6) months of discovery and within one (1) year of discovery in Pressure Region II.

On September 30, 2008, the Commission issued its Order directing: 1) Laclede to continue to meet or exceed the revised replacement requirements as well as other requirements of the Unanimous Stipulation and Agreement; 2) Staff to report to the Commission annually; and 3) that Staff's next annual report be filed no later than September 1, 2009, unless otherwise ordered. On September 1, 2009, the Commission issued an Order Extending Time to File Staff's Annual Report until September 18, 2009.

### **Report Overview:**

This report summarizes data obtained through July 2009 during Staff's ongoing monitoring of the program's progress, addresses information relevant to the adequacy of Laclede's revised copper service line replacement program, and discusses the effectiveness of the Company's leak surveys and investigations. For purposes of this

report, Staff will touch upon the major points of Laclede's program. The program does appear to be yielding positive results.

#### **Staff Investigational/Annual Report:**

##### **1. Copper Service Line Replacements**

During program year nine (9) (twelve months ending March 1, 2009), Laclede completed a total of 7,718 direct-buried copper service line replacements (main-to-meter). During the first nine (9) years of the program, Laclede has completed a total of 73,453 direct-buried copper service line replacements, which represents approximately 95 percent (95%) of the program's beginning total qualifying service lines (76,966). All of the copper service lines have now been replaced or eliminated in Pressure Region I as required in the Commissions September 20, 2007 Order. Through the end of program year nine (9), Laclede has averaged 8,161 direct-buried copper service line replacements each year, which exceeds the original Agreement's requirement for annual replacement of 8,000 direct-buried copper service lines. The annual replacement rate was reduced to 7,000 copper service lines during the program year ending February 2008. Details regarding the copper line replacements from 1999 through March 1, 2008 can be found in the Summary of Prior Years Actions section of this report.

**Conclusion:** The annual replacement rate (i.e. approximately 10% annually), based upon priority, with increased frequencies of leak surveys, continues to be successful. The results of the replacement program are a substantial annual reduction in the number of direct-buried copper service lines in the system, especially with the completion of replacements in Pressure Region I, and a reduced leakage rate (through the first nine (9) years of the program) for the remaining lines to be replaced.

Staff recommends that, unless otherwise ordered by the Commission, Laclede replace the remaining direct-buried copper service lines (main-to-meter) by the end of program year ten (10), which ends March 1, 2010.

## **2. Bar-hole Leak Surveys**

Laclede conducted its 2009 bar-hole leak survey during the months of March through July 2009. Laclede personnel conducted a bar-hole leak survey over 49 direct-buried copper service lines in Pressure Region I and conducted a bar-hole leak survey over approximately 8,456 direct-buried copper service lines in Pressure Region II for a total of 8,505 direct-buried copper service lines bar-hole leak surveyed in 2009. No new leaks were found in Pressure Region I and thirty-eight new leaks were found in Pressure Region II for a total of thirty-eight new leaks found during the 2009 direct-buried copper service line bar-hole leak survey. The thirty-eight new leaks found during the 2009 bar-hole leak survey represents a 0.45 percent (0.45%) leak rate for the 2009 survey, which is a reduction from the leakage rate of 0.53% found during the 2008 survey. The leakage rate for new leaks discovered on copper service lines has decreased 87% since the beginning of the program.

**Conclusion:** Laclede conducts the annual direct-buried copper service line leak surveys during March through July of each year. Therefore, since the remaining copper service lines will be replaced by the end of program year ten (10), which ends March 1, 2010, this requirement is no longer necessary.

## **3. Leak Repairs**

By expediting the repair of all leaks found during a bar-hole leak survey prior to conducting the subsequent year's bar-hole leak survey, the Company continues to enhance the downward trend in the number of detected leaks found during subsequent annual bar-hole leak surveys. Class 1 and 2 leaks are repaired immediately, and, in accordance with the Agreement, Class 3 leaks (considered non-hazardous) detected during an annual bar-hole leak survey are required to be repaired within six (6) months of discovery in Pressure Region I and within one (1) year of discovery in Pressure Region II. Laclede continues to exceed the requirements in the Agreement by repairing Class 3 leaks in Pressure Region I within an average time of approximately one (1) month from discovery and within an average time of approximately six (6) months from discovery in Pressure Region II. The guideline in the Agreement exceeds MoPSC



minimum pipeline safety regulations that require Class 3 leaks to be monitored every six (6) months until repaired (within 5 years of discovery).

All locations of detected leaks, along with other historical information, are used in a prioritization model for identifying replacement areas in a consistent manner and prioritizing the scheduling of these areas for replacement. It is critical that any upward trends in new leaks on replacement program pipelines be identified promptly, as upward trends can point to the need to refocus efforts to meet the program's goals and objectives of proper prioritization of leak replacements.

**Conclusion:** Staff recommends that the requirements in the Agreement calling for Class 3 leaks in Pressure Region I to be repaired within six (6) months and Class 3 leaks in Pressure Region II to be repaired within one (1) year should be continued.

### **Recommendations:**

Staff recommends that the requirements contained in the Agreement, which are the three-point foundation of Laclede's current direct-buried copper service line replacement program, be continued.

- **Priority Replacements.** Replace the remaining direct-buried copper service lines (main-to-meter) by the end of program year ten (10), which ends March 1, 2010, unless otherwise ordered by the Commission.
- **Leak Surveys.** The remaining direct-buried copper service lines will be replaced by the end of program year ten (10), which ends March 1, 2009, this requirement is no longer necessary.
- **Timely Elimination of Discovered Leaks.** Class 3 leaks in Pressure Region II should be repaired within one (1) year. Since all direct-buried copper service lines in Pressure Region one (1) have been replaced or eliminated, this requirement is no longer necessary.

The program has been in place for over nine (9) years. A substantial number of Laclede's direct-buried soft copper services have been replaced or eliminated, with all of those in Pressure Region I being replaced or eliminated and over 84% replaced or eliminated in Pressure Region II. The leakage rate (calculated from annual bar-hole

surveys) for direct-buried soft copper service lines has steadily decreased over the last 9 years of the program.

Priority replacements, leak surveys, and timely elimination of discovered leaks must be considered together in order to achieve the purpose of the Agreement, which is protection of the public's safety, and each, must therefore, complement the other. At this time, Staff believes that the efforts of the parties in meeting the Agreement's requirements are achieving this purpose, and this is supported by the results discussed in the preceding report.

For the term of this program, Staff has and will continue to monitor the effectiveness of Laclede's direct-buried copper service line replacements and leak surveys. If at any time, Staff determines that the program requirements should be enhanced, it will immediately bring its concerns and recommendations to the Commission.

### **Summary of Prior Years Actions:**

#### **1. Copper Service Line Replacements**

Laclede replaced or eliminated a total of 66,123 direct-buried copper service lines during the first eight (8) years of the program, which represents approximately 86 percent (86%) of the program's beginning total qualifying lines (76,966). The Agreement requires Laclede to replace or renew 8,000 lines annually (revised to 7,000 during program year eight) and Laclede has exceeded the annual required rate of renewals. Laclede was permitted, under the terms of the Agreement's replacement requirements, to do partial replacement of certain copper service lines. However, during the beginning of the second year of the program, Laclede discovered efficiencies and benefits in conducting full main-to-meter replacements and since that time (including the second year of the program) has been replacing, main-to-meter, approximately 8,200 copper service lines each year. Staff, in the previous annual reports has recommended, unless otherwise ordered by the Commission, that Laclede continue to renew (main-to-meter replacement) a minimum of 8,000 direct-buried copper service lines annually (revised to 7,000 annually during program year eight).

## 2. Bar-hole Leak Surveys

Laclede successfully completed an annual bar-hole leak survey for each of the first eight (8) program years, with each survey completed by July 1<sup>st</sup> of each year. In 1999, Laclede first completed a bar-hole leak survey producing a 3.4 percent (3.4%) leak rate. Laclede's 2002 bar-hole leak survey, of approximately 60,000 direct-buried copper service lines, produced a leak rate of 1.1 percent (1.1%). The reduction in leak rate from 1999 to 2002 was approximately a 68 percent (68%) reduction in discovery of new leaks during annual bar-hole leak surveys. The following table summarizes all the prior annual bar-hole leak survey information for years 1999 through 2008.

### **SUMMARY OF PRIOR ANNUAL BAR-HOLE LEAK SURVEY INFORMATION**

<b>YEAR OF SURVEY</b> (Completed by July 1 of Year Shown)	<b>NUMBER OF SERVICE LINES SURVEYED</b>	<b>LEAK RATE</b>
1999	~77,000	3.40%
2002	~60,000	1.10%
2003	~52,000	1.06%
2004	44,624	0.92%
2005	37,557	0.76%
2006	30,772	0.65%
2007	23,046	0.65%
2008	16,076	0.53%

As reported in Staff's August 2003 Three-Year Summary Report, and Staff's 2004, 2005, 2006, 2007 and 2008 Annual Reports, results from bar-hole leak surveys have shown a continuing downward trend in the leak discovery rate (percentage) of new leaks discovered on copper service lines.

The Agreement mandates practices that provide for early leak detection on direct-buried copper service lines. Therefore, the Staff has recommended that, as it pertains to leak surveys, Laclede continue to perform an annual bar-hole leak survey. The Agreement specifically states that an annual bar-hole survey shall be conducted for the first three (3) program years. Because, at the time of Staff's Three-Year Summary Report, and 2004, 2005, 2006, 2007 and 2008 Annual Reports, no other testing method had been shown to be superior in the detection of sub-surface leaks than strategically

placing bar-holes over certain service line locations and conducting a leak survey, the Staff continued to recommend that the annual bar-hole leak surveys continue.

### **3. Leak Repairs**

All Class 1 and 2 leaks are repaired immediately. Otherwise, in accordance with the Agreement, leaks detected during an annual bar-hole leak survey are required to be repaired within six (6) months, or at the latest, within a year of discovery, depending on whether the leaks are located in Pressure Regions I (direct-buried copper service lines that can operate above 35 psig) or II (these same service lines operate below 35 psig). These leak repair requirements are more stringent than MoPSC Pipeline Safety Regulations, which generally require that Class 3 leaks, which are not considered to be a hazard, be monitored every six (6) months and repaired within five (5) years.

For the first three (3) years of the program, Laclede repaired most Class 3 leaks in Pressure Region I within an average time of three (3) to four (4) months after discovery, instead of the six (6) months allowed under the Agreement. During the fourth, fifth, sixth, seventh and eighth year of the program, Laclede repaired Class 3 leaks in Pressure Region I within an average time of three (3) months (down from the first three (3) years of the program). While the Agreement requires Class 3 leaks in Pressure Region II to be repaired within one (1) year of discovery, Laclede averaged seven (7) to nine (9) months for these repairs during the first three (3) years of the program. During the fourth, fifth, sixth, seventh and eighth year of the program, Laclede was repairing Class 3 leaks in Pressure Region II within an average time of seven (7) months (down from the first three (3) years of the program).

Making timely repairs prior to the subsequent bar-hole leak survey: (1) provides for more accurate studies of data; (2) facilitates determination of leak trends in leak totals; and (3) improves detection of differences in areas where corrosion may be more or less active. For these reasons, Staff recommended maintaining the timely repair requirements of six (6) months for Pressure Region I leaks, and one (1) year for Pressure Region II leaks, as stated in the Agreement.

**BEFORE THE PUBLIC SERVICE COMMISSION  
OF THE STATE OF MISSOURI**

In the Matter of the Verified Application of Laclede )  
Gas Company for an Order Establishing Replacement )  
Requirements for The Final Phase of its Soft Copper )  
Service Line Replacement Program Previously )  
Approved Pursuant to Case No. GO-99-155 )

Case No. GS-2008-0038

**AFFIDAVIT OF RICHARD A. FENNEL**

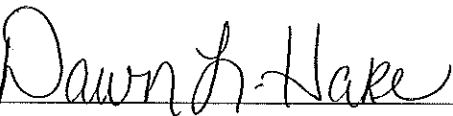
**STATE OF MISSOURI**     )  
                                      )  
**COUNTY OF COLE**        )

Richard A. Fennel, employee of the Missouri Public Service Commission, being of lawful age and after being duly sworn, states that he has participated in the preparation of the accompanying Staff Report and that the facts therein are true and correct to the best of his knowledge and belief.

  
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Richard A. Fennel

Subscribed and sworn to before me this 18<sup>th</sup> day of September, 2009.

  
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NOTARY PUBLIC

