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December 28, 1994

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Mr. David L. Rauch
Executive Secretary
Missouri Public Service Commission
P. O. Box 360
Jefferson City, MO 65102

RE: Case No. GO-91-277

Dear Mr. Rauch:

Enclosed for filing in the above-captioned case is an original and fourteen (14) conformed copies of **Staff's Supplemental Information Regarding Staff's Recommendations To Approve Missouri Gas Energy's (MGE) New Replacement And Protection Plan.**

Bob Leonberger, Assistant Manager, Energy Department Gas Safety will be available at the on-the-record conference scheduled for 1:30 p.m. on December 29, 1994, in the above-referenced case to address the Staff's attached Supplemental Information and additional questions of the Commission or other parties. In the Staff's desire to expedite the hearing process to the extent possible, the attached Supplemental Information is presented so that it will be available to the Commission, MGE, and other parties prior to the hearing.

This filing has been mailed or hand-delivered this date to all counsel of record.

Thank you for your attention to this matter.

Sincerely,

William M. Shansey
William M. Shansey
Assistant General Counsel

314-751-8702

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Enclosure
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Service List for Case No. GO-91-277

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**SUPPLEMENTAL INFORMATION REGARDING STAFF'S RECOMMENDATION
TO APPROVE MGE'S NEW REPLACEMENT AND PROTECTION PLAN IN CASE
NUMBER GO-91-277**

When the current replacement program was developed by the Company (Company refers to MGE and its predecessors), the Company nor the Staff knew exactly what we were getting into, since a large-scale replacement program had never been undertaken by either party. Unfortunately, at the time the Company did not fully utilize the experience, knowledge and expertise of their operations personnel that were subsequently given the task of carrying out the approved program. Hence, when the program was implemented, the lack of operational input quickly became clear. At first admittedly, the selection of cast iron for replacement was not too difficult a task, since there were plenty of obvious candidates for replacement. These were located throughout the system and the initial replacement activity quickly reduced the amount of these obvious replacement candidates. Basically, eliminating the existing leaks and leaks that were found. The Company now has a continuing surveillance program and enhanced leakage survey programs to better identify areas of potential hazard. At this point in the replacement program there is a need to replace the most potentially hazardous pipe first and in a prioritized manner, but accomplish this task in a smarter manner. The Company and the Staff believe that this will be better accomplished by the proposed modified program for cast iron mains.

I believe it is important to put MGE's replacement program for cast iron mains in perspective. The Company averaged less than six (6) miles of cast iron main replacements annually in the three (3) years preceding the Commission's approval of the Company's replacement program in October, 1992. In calendar year 1994 alone, the Company is scheduled to replace 39 miles of cast iron mains. In addition in the following six (6) years (1995-2000) the cast iron main replacements are scheduled to be greater than 35 miles annually, which is more than 5% of the 661 miles of cast iron in their system at the end of CY 1993. The Commission approved program increased replacements by six-fold. The magnitude of the increase in replacements is important to note. In 1992, 1993, and 1994, MGE replaced a cumulative total of approximately 76 miles of cast iron main. That amount represents approximately 11% of the total miles of cast iron main that was in their system at the end of CY 1991. The proposed modification is not seeking to reduce the total amount of cast iron that is replaced annually, only to modify what has been found to be a restrictive replacement required by categories. The original approach identified categories of cast iron main with the most leakage and fracture history and developed a program to replace those categories in a piecemeal fashion. Having replaced most of the worst pipe identified in the last three years and with the experience and knowledge those years have given MGE, a more systematic approach was developed that replaces the highest priority in a smarter manner with no detriment to public safety.

The original program was based primarily on the concept that certain sizes of cast iron pipe, such as 4-inch and smaller diameter, has a greater incidence of leakage, and that pipe in certain areas may pose more potential for hazard. These basic concepts are essentially correct. That does not mean, however, that all of the 4-inch pipe or pipe in specified areas is bad or even the most

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potentially hazardous pipe in the system. Taken to an extreme, by continuing with the present replacement categories of 4-inch for example, the Company may be required to replace 4-inch diameter cast iron main to meet the mileage quotas contained in the categories that may have few or no leaks, when other larger diameter cast iron pipe, that may actually present a greater hazard, is scheduled for replacement in subsequent years. What the approved program failed to recognize was that after the program was in effect for a few years, the worst pipe in the 4-inch category has been eliminated and there may actually be 6-inch diameter cast iron pipe that from a safety perspective should be replaced before 4-inch diameter cast iron that is not as great a hazard, but it must be replaced due to the imposition of the categories in the approved plan. MGE is still recognizing the potential for hazard for the smaller diameter pipe and other factors that are listed categories and have included those items as part of their evaluation and analysis.

The logistics of the distribution systems in the larger areas do not lend themselves to replacements of a specific size category only. A distribution system is a grid system and is typically constructed of varying sizes of piping. As an example, a 6-inch cast iron pipeline may be the primary feed into an area with smaller 4-inch piping used as laterals off of the 6-inch header. If the Company is held to the categories in the current program, the quota for the 4-inch diameter is higher, so the 4-inch would need to be replaced to meet the required total. The remaining 6-inch diameter cast iron main would be reconnected to the new 4-inch and left until subsequent years since it may not have a specific category designation. Then, the old 6-inch cast iron that was reconnected to the new polyethylene (PE) a few years previously will now have to be re-excavated and replaced and reconnected to the new 4-inch. The whole point is the replacements have to be made and there is duplication of excavation and the need to connect the new replaced pipe to old existing pipe that will be removed within a short time. An additional economic draw-back of this approach is that the required connection of the new PE to the old cast iron is expensive and will be removed and discarded when the larger pipe is replaced in just a few years. Further, a concern that is addressed in the Commission's regulations is damage or disturbance of cast iron by nearby excavations. If a 4-inch section is removed and the connecting 6-inch is left for replacement at a later date, the soil around the remaining 6-inch cast iron has been disturbed, which increases the potential for fractures.

Fractures and leakage on cast iron pipe usually occurs in geographic areas and is based on a multitude of factors, such as; corrosive soil, quality of original installation, presence of expansive clays, presence of fill, presence of ground moisture, location of pavement, presence of heavy traffic, etc. The Company tracks the location of breaks, corrosion leaks, main condition reports, and other data that can readily identify the rather specific clusters where the problems are occurring. As those cast iron replacement candidate areas are identified, the service line replacement and unprotected steel main replacements/protection are also considered and projects can be undertaken in those geographic areas that require attention and all the required replacements made at one time. The savings realized from this "global" approach are obvious and will result in more replacements being made for less cost, in a more systematic manner with less disruption to the public and most importantly, with no detriment to public safety. The Staff recommended that MGE be required to monitor and report leaks in the current categories, so if the proposed program for some reason does not produce as expected, the Staff will be able to

evaluate the information. If the desired results are not being realized, the Staff would recommend that the program be modified.

The Staff does not believe safety is being compromised by the modified replacement program submitted by MGE. The modified program discusses removing the worst first on a prioritized basis. The approach is a more "global" to identify the areas where the worst facilities are located and remove them all. The approach recognizes that there is also an unprotected steel service line/yard line program and an unprotected steel main replacement cathodic protection program and treats that as a total package rather than separate entities. In that way the mains identified as needing replacement, both unprotected steel and cast iron, can be replaced together in an area at the same time without having to connect new piping to existing piping that may need to be replaced in a few years. In the same manner, without considering the replacement of mains with the service lines, cast iron mains may be replaced and old, unprotected steel service lines reconnected to the new PE main. When the service line connection at the main is exposed, replacement of the service line can typically be accomplished by inserting a smaller size PE pipe inside the existing service line and making the connection at the building. The Company would not be required to return to the same area and replace the service lines at a later date, which causes increased expense for the same replacement and causes double or triple the aggravation for the public in the vicinity of the replacement.

There are other operational advantages to the approach. First, the distribution system is evaluated to determine where flow problems (bottlenecks) may exist on the system due to growth in certain areas. If such areas are identified in an area selected for replacement activities, the pressure can be increased in the area or larger size piping can be installed to meet the demand. If replacements are made on a piecemeal, categorized basis increasing the size of the pipe in a specific section may not help the need for increased flow. It is common in the natural gas industry to increase the pressure of the older, lower pressure systems when replaced. Therefore, an entire area would have to be replaced at once to accomplish this so that the pressure to be raised in the entire area at the same time and all the needed main and service line replacements are made to accommodate the change in operational pressures. There is a distinct advantage in increasing the pressure above the present lower pressure systems. The pipe sizes can be reduced and the existing pipe can be left in place and a smaller size pipe "inserted" into it. This reduces the requirement to make an excavation for the entire length of the replacement and reduces the size, and consequently the cost, of both the materials and the excavation. If the replacements are done in pieces and not by area, the pressures can not be as readily increased and the pipe must be replaced "size-for-size" and an excavation must be made for the entire length and not inserted into the old pipe, increasing the cost for material and excavation.

The timing of the request for modification of the replacement program may make it appear that MGE acquired the Company at the first of the year and decided to modify the replacement program, which they had agreed in the stipulation and agreement for the sale to follow. In fact Gas Service personnel contacted Staff in mid-1993, prior to discussions about a possible sale, and discussed the short-comings of continuing to follow the approved replacement schedule. The Staff's reaction was simple. We wanted the most potentially hazardous pipe removed from the

system first and as quickly as possible. If following that basic guideline did not achieve the categories of replacement contained in the approved program, then the Company would have to modify the current approved program's requirements. The Company's scheduling for CY 1994 occurred in mid to late 1993 and the Company and the Staff were going to see how the actual projects selected for replacement matched the required program schedule. Then, late in 1993 and early 1994, the activities connected with the sale of the Company and movement of personnel to Western Resources, caused the issue to not be addressed until later in 1994. In mid-1994, further discussions with MGE occurred to modify their replacement program.

The categories in the current cast iron replacement program are restrictive and may not actually accomplish what the rule requires (namely to replace those sections of cast iron that represent the greatest potential for hazard). Further, the categories do not recognize the logistics of a distribution system, is not cost effective to implement, and may in fact create additional problems for the integrity of the remaining cast iron pipe that will then be replaced at a later date. On page 3 of the Commission's October 13, 1992, *Order Approving Amended Revised Cast Iron Main And Unprotected Steel Main Replacement Program*, and repeated in the Commission's December 2, 1994, *Order Concerning Motion to Modify* - the purpose for the replacement program is clearly stated, "The overriding purpose of the gas safety replacement program is to insure that the most potentially hazardous lines are inspected, repaired and replaced in a timely a fashion as is feasible for Gas Service." The Staff believes that the Modified Program submitted by MGE accomplishes the purpose as stated by the Commission. The distribution system (mains and service lines) are evaluated and the facilities with the greatest potential for hazard are selected for replacement. With the approach detailed in the Modified Program, those replacements not only are prioritized for safety, but the actual replacements are made in a manner that achieves the goal stated in the Orders, and in the most cost effective, efficient, and timely manner possible.

The Staff does not believe that the Modification of MGE's program as a "sudden apparent abandonment by MGE and the Staff of the prioritization schedule.". In fact, the facilities in the categories are listed as priorities in the evaluation process of the Company that focuses on public safety. The Staff believes the Modified Program proposed with the monitoring safeguards recommended by the Staff in its memorandum, is a better prioritization schedule that will "...insure that the most potentially hazardous lines are inspected, repaired and replaced in as timely a fashion as is feasible...", as was the desire of the Commission. The Staff recommends that the Commission approve MGE's Modified Program as detailed in the Staff's November 21, 1994 Memorandum.