

**STATE OF ILLINOIS**  
**ILLINOIS COMMERCE COMMISSION**

THE PEOPLES GAS LIGHT	:	
AND COKE COMPANY	:	
	:	No. 09-_____
Proposed General Increase	:	
In Rates For Gas Service	:	

Direct Testimony of  
**THOMAS L. PURACCHIO**  
Manager, Gas Storage  
Integrys Business Support, L.L.C.

On Behalf of  
The Peoples Gas Light and Coke Company

February 13, 2009

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1 **I. INTRODUCTION AND BACKGROUND**

2 **A. Identification of Witness**

3 Q. Please state your name and business address.

4 A. Thomas L. Puracchio. 230 County Road 2800 N. Fisher, Illinois 61843.

5 Q. By whom are you employed and in what capacity?

6 A. I am employed by Integrys Business Support, LLC (“IBS”) as Manager, Gas Storage. In  
7 that capacity, I am responsible for the operation of the Manlove Field Gas Storage  
8 Complex. The Manlove Field Gas Storage Complex includes Manlove Field, the  
9 underground natural gas storage field owned and operated by The Peoples Gas Light and  
10 Coke Company (“Peoples Gas”), and Peoples Gas’ Liquefied Natural Gas (“LNG”)  
11 Plant.

12 **B. Purpose of Testimony**

13 Q. What is the purpose of your direct testimony?

14 A. My testimony will describe the physical characteristics and operations of Manlove Field  
15 and Peoples Gas’ LNG Plant.

16 I will confirm that Peoples Gas’ rate base assets associated with Manlove Field  
17 and the LNG Plant, including assets added since the last general rate case, Illinois  
18 Commerce Commission (“ICC”) Docket Nos. 07-0241/07-0242 (cons.), are used and  
19 useful and were prudently acquired and placed into service at a reasonable cost.

20 I describe one major capital project related to Manlove Field, which is listed on  
21 Schedule F-4 of Peoples Gas’ initial filing. I also describe an adjustment to the working  
22 gas inventory at Manlove Field.

23           **C.     Summary of Conclusions**

24    Q.     Please summarize the conclusions of your direct testimony.

25    A.     I conclude that Peoples Gas' investment in Manlove Field and all related facilities is used  
26           and useful in the rendering of utility service to Peoples Gas' customers, and was  
27           prudently acquired and placed into service at a reasonable cost. I conclude, specifically,  
28           that the injections of cushion gas into the Manlove Field underground storage facility  
29           were used and useful in the rendering of utility service to Peoples Gas' customers and I  
30           conclude that Peoples Gas' LNG plant is used and useful and was prudently acquired and  
31           placed into service at a reasonable cost.

32                 I conclude that there are expected benefits related to the planned multi-year  
33           project to systematically replace the gas gathering system piping system at Manlove Field  
34           sufficient to warrant the inclusion of this planned investment in rate base. This project is  
35           expected to enhance the safety and reliability of the gas gathering system piping. It will  
36           be prudently added to Peoples Gas' assets, and to the extent included in rate base, it will  
37           be used and useful in providing utility service.

38                 I also conclude that the reclassification of 3.0 MMDth (million dekatherms) of  
39           inventory at Manlove Field from working gas to cushion gas is appropriate.

40           **D.     Itemized Attachments to Direct Testimony**

41    Q.     Are you sponsoring any attachments to your direct testimony?

42    A.     Yes, in addition to my direct testimony which has been labeled as Peoples Gas Exhibit  
43           TLP-1.0, I am sponsoring the following exhibits which I discuss later in my testimony:

- 44           •     Peoples Gas Exhibit TLP-1.1: A report from Smedvig Technologies titled "An  
45                 Alternative Method of Calculating Cushion Gas and Non-Recoverable Gas" dated  
46                 December 18, 1998.

- 47 • Peoples Gas Exhibit TLP-1.2: A report from Charles R. Connaughton P.E. PhD,  
48 titled "Supplement to the Manlove Field Trapped Gas Report" dated September  
49 30, 2005.
- 50 • Peoples Gas Exhibit TLP-1.3: A memo from Charles R. Connaughton dated  
51 March 17, 2007.
- 52 • Peoples Gas Exhibit TLP-1.4: A memo from Charles R. Connaughton dated May  
53 30, 2008.
- 54 • Peoples Gas Exhibit TLP-1.5: A report from MHA Petroleum Consultants  
55 detailing a reservoir simulation study dated November 17, 2006.
- 56 • Peoples Gas Exhibit TLP-1.6: An internal review of an assessment of the natural  
57 gas inventory in Manlove Field conducted by Schlumberger Data & Consulting  
58 Services, dated December 10, 2008.

59 **E. Background and Experience**

60 Q. Please summarize your educational background and experience.

61 A. I received a Bachelor of Science degree in Industrial Engineering from Bradley  
62 University in 1984. I have been employed by Peoples Gas since 1984. I was transferred  
63 to my current position in December 2001. My position became part of Integrys Business  
64 Support, LLC in 2008. Previous positions that I held with Peoples Gas include Gas  
65 Control Manager, Customer Service Manager (North Shore Gas Company), and engineer  
66 in various operational areas.

67 **II. MANLOVE FIELD**

68 **A. Description**

69 Q. What assets comprise Peoples Gas' Underground Storage Plant?

70 A. In Underground Storage Plant, Peoples Gas has one gas storage facility, Manlove Field,  
71 which is located in central Illinois.

72 Q. What is the purpose of a gas storage facility for a gas utility?

73 A. Gas utilities use storage facilities to maintain inventory to provide supply flexibility,  
74 improve the reliability of deliveries, and to mitigate the risk associated with seasonal  
75 price movements.

76 Q. Please describe the physical characteristics of Manlove Field.

77 A. At Manlove Field, natural gas is stored in the Mt. Simon sandstone formation at a depth  
78 of approximately 4,000 feet. The Mt. Simon formation is an aquifer and originally  
79 contained no gas or oil. The geology of this sandstone is very complex and  
80 non-homogeneous.

81 Q. Please explain what an aquifer field is and what distinguishes an aquifer field from other  
82 types of natural gas storage fields.

83 A. Aquifers are porous and permeable rock formations. The pores are saturated with water  
84 under pressure. To store gas, the native water must be displaced by injecting gas at a  
85 pressure higher than the original aquifer pressure.

86 Other types of underground storage used by utilities around the country include  
87 depleted oil and gas reservoirs, pinnacle reefs, and salt caverns. Peoples Gas does not  
88 have any of these types of storage.

89 Gas storage in an aquifer is inherently more complex than any of the other types  
90 of storage. Injecting gas in and withdrawing gas from an aquifer results in large  
91 proportions of the injected gas being trapped in the sandstone pores by the water. Large  
92 quantities of water can be produced along with the gas in aquifer storage and this is  
93 particularly true at Manlove Field. Understanding and managing water production in an  
94 aquifer field such as Manlove Field is vital to maximizing the usefulness of the aquifer.

95                   In aquifer storage, the working volume is dependent on gas inventory, aquifer  
96 strength, and operational practices. The working volumes of other types of storage are  
97 usually fixed or more readily controlled.

98 Q. Please describe how Peoples Gas typically operates Manlove Field.

99 A. Manlove Field is typically operated with one-cycle (consisting of a withdrawal period  
100 and an injection period) per year. The withdrawal period typically runs from the first or  
101 second week of December through the first or second week of March. A working gas  
102 target is established at the beginning of the injection season and adjusted as needed  
103 during the injection period. A withdrawal plan is established before the withdrawal  
104 period and adjusted as needed.

105 Q. In your opinion, do the amounts shown as Underground Storage Plant on Schedule B-5,  
106 page 2 of 2, column J, line 2 of Peoples Gas Exhibit (“Ex.”) JH-1.1, sponsored by John  
107 Hengtgen, comprising Manlove Field and all of its related facilities, represent facilities  
108 that were prudently acquired at a reasonable cost and are those facilities used and useful  
109 in Peoples Gas’ rendering of utility service?

110 A. Yes. In my opinion, the amounts represent properties that were prudently acquired at a  
111 reasonable cost and are used and useful.

112                   **B.     Cushion Gas**

113 Q. Please describe cushion gas and working gas.

114 A. In a gas storage facility such as Manlove Field, cushion gas (also sometimes referred to  
115 as “base gas”) is the volume of gas needed to maintain adequate pressure and  
116 deliverability rates throughout the withdrawal season. It is distinguished from the

117 working gas (also sometimes referred to as “top gas”), which is the volume of gas in  
118 addition to the volume of cushion gas. Working gas is the part of our inventory that is  
119 typically available to cycle in and out of storage, whereas cushion gas is simply needed to  
120 make the storage field function effectively.

121 Q. How is cushion gas created in the reservoir?

122 A. Gas in the Manlove Field reservoir is under pressure and tends to expand, radially  
123 invading new areas. As this occurs, some of the gas inevitably becomes trapped as  
124 cushion gas.

125 Q. Can the creation of cushion gas be prevented?

126 A. No, in an aquifer storage field such as Manlove Field, the creation of cushion gas cannot  
127 be prevented. It is a normal consequence of the operation of the storage field.

128 Q. Are particular gas injections identified as replacement cushion gas?

129 A. No. Our practice is to accumulate a percentage, currently 3.5%, of injections each day  
130 during the injection season and capitalize that amount as an approximation of the amount  
131 of cushion gas created by the reservoir.

132 Q. How much cushion gas did Peoples Gas capitalize since its last rate case?

133 A. From October 2006 through December 2008, Peoples Gas capitalized an additional  
134 2.77 MMDth of injections as cushion gas into Manlove Field, at a cost of \$22,850,471.

135 Q. Are there any reports or studies that support the amount of gas that Peoples Gas  
136 capitalizes as cushion gas?

137 A. Yes. Exhibit TLP-1.1 is a report from Smedvig Technologies titled “An Alternative  
138 Method of Calculating Cushion Gas and Non-Recoverable Gas,” dated December 18,  
139 1998. This report supports the method used to determine the split between recoverable  
140 and non-recoverable cushion gas. Exhibit TLP-1.2 is a report from Charles R.  
141 Connaughton P.E. PhD, titled “Supplement to the Manlove Field Gas Report” dated  
142 September 30, 2005. This report supports a cushion gas volume equivalent to 3.5% of  
143 injected quantities for 2006 injections. Exhibits TLP-1.3 and TLP-1.4 are memos, also  
144 from Charles R. Connaughton, stating that a cushion gas volume equivalent to 3.5% of  
145 injected quantities is appropriate for the 2007 and 2008 injection season, respectively.  
146 Finally, Exhibit TLP-1.5 details the results of a reservoir simulation study performed by  
147 MHA Petroleum. The study considered the effect of continuing to inject cushion gas at a  
148 rate of 3.5% of injections and concluded that that amount is adequate to maintain  
149 performance.

150 Q. In your opinion, is the additional cushion gas prudently acquired at reasonable cost and  
151 used and useful in Peoples Gas’ rendering of utility service?

152 A. Yes.

153 Q. Is any portion of the cushion gas in Manlove Field considered to be recoverable?

154 A. Yes. The recoverable portion is accounted for as Recoverable Natural Gas  
155 (Account 117).

156 Q. In your opinion, do the amounts shown as Recoverable Natural Gas (Account 117) on  
157 Schedule B-5, page 2 of 2, column J, line 11 of Peoples Gas Ex. JH-1.1, sponsored by  
158 Mr. Hengtgen, represent recoverable cushion gas that was prudently acquired at a

159 reasonable cost and is that recoverable cushion gas used and useful in Peoples Gas'  
160 rendering of utility service?

161 A. Yes.

162 **C. Test Year Rate Base Additions**

163 Q. Are there any planned rate base additions related to Manlove Field?

164 A. Yes, Peoples Gas is planning a Gathering System Pipe Replacement Project. This is a  
165 multi-year project to systematically begin replacement of the gas gathering piping system  
166 at Manlove Field.

167 Q. Will the investment in this project exceed \$3,100,000 by the end of the test year?

168 A. Yes. The project is therefore included on Schedule F-4 (attached to the testimony of  
169 Edward Doerk as Peoples Gas Ex. ED-1.1).

170 Q. Please describe the Gathering System Pipe Replacement Project.

171 A. The gas gathering system at Manlove Field consists of approximately 70 miles of  
172 predominantly 12-inch diameter steel piping that interconnects the 153  
173 injection/withdrawal wells with the compressor station. The scope of the project to  
174 replace the gas gathering system includes an engineering study to assess the existing  
175 system and the development of an optimized replacement plan. It is expected that the  
176 project will be completed over a ten year period beginning in 2009.

177 Q. What is the rationale for the project and what are the associated benefits?

178 A. The gas gathering system was installed in stages as underground storage at Manlove  
179 Field was developed with the oldest sections having been installed in 1966. Over time,  
180 many of the oldest sections have been replaced for various reasons, but, some of the

181 oldest sections do remain in service. In recent years, Peoples Gas has observed  
182 CO<sub>2</sub>-related and microbial-influenced corrosion in the gas gathering system. The system  
183 is not designed to accommodate pipeline pigs for either routine cleaning or internal  
184 inspection. For these reasons, Peoples Gas believes that a program to begin replacement  
185 of the system before it reaches the end of its useful life will enhance the safety and  
186 reliability of the system.

187 Q. Describe the project execution plan.

188 A. As mentioned earlier, Peoples Gas intends to first perform an engineering study to assess  
189 the existing system and develop an optimized replacement plan. A Request for  
190 Information (“RFI”) has been issued to several engineering firms. Peoples Gas will use  
191 the information obtained in response to the RFI to prepare a cost benefit analysis for the  
192 project, prepare a business case, and obtain approval from the Board of Directors. Once  
193 approval has been obtained, Peoples Gas plans to seek separate competitive bids for the  
194 engineering study and for the pipe replacement.

195 Q. What alternatives have been considered?

196 A. Peoples Gas could simply choose not to begin proactively replacing the gas gathering  
197 system and subsequently replace sections of pipe only as pipe failures occur. This clearly  
198 could have a negative impact on safety and reliability. Peoples Gas could also choose to  
199 forego the engineering study and begin replacing sections of pipe in-kind. This  
200 alternative would provide less benefit than first prioritizing the segments for replacement  
201 and optimizing the ultimate layout of the system.

202 Q. What is the expected cost of the Gathering System Pipe Replacement Project?

203 A. The total cost is expected to be \$60.8 million. This equates to approximately \$800,000  
204 per mile to replace 70 miles of pipeline, including the cost of the engineering study,  
205 spread over ten years and with inflation factors applied. In the first year, 2009, the  
206 expenditures are estimated to be \$5.6 million. The expected test year expenditure is  
207 \$5.7 million (\$800,000 per mile times 7 miles plus inflation) for the replacement of  
208 approximately 7 miles of pipeline. During the project, pipe installed each year will be  
209 placed into service each year, and will therefore be used and useful, each year. It is  
210 possible, as a result of the engineering study discussed above, that Peoples Gas will  
211 determine that a full replacement of the gas gathering system is not required and that only  
212 certain portions of the system need to be replaced at this time. In either event, full or  
213 partial replacement of the gathering system, the test year expenditures would be the same.

214 Q. Are there any reports, studies, forecasts, and documentation that support your view that  
215 this project will be prudent and used and useful in providing utility service?

216 A. The cost benefit analysis, and business case that will be developed in 2009 are expected  
217 to demonstrate that the project will be prudent and used and useful in providing utility  
218 service.

219 **D. Inventory Adjustment**

220 Q. Are you aware of any adjustments to the inventory of gas in storage at Manlove Field?

221 A. Yes, as a result of an assessment of the natural gas inventory in Manlove Field conducted  
222 by Schlumberger Data & Consulting Services (DCS), Peoples Gas reclassified  
223 3.0 MMDth from working gas to cushion gas in January 2009. Exhibit TLP-1.6 is an  
224 internal review, dated December 10, 2008, of the DCS assessment of inventory.

225 Q. What prompted Peoples Gas to request that DCS conduct the inventory assessment and  
226 what was its purpose?

227 A. The assessment was conducted to implement, in part, a recommendation made by The  
228 Liberty Consulting Group in the Gas Supply Management Audit on behalf of the Illinois  
229 Commerce Commission. The purpose of the DCS assessment included verifying the  
230 volumes of total inventory, working gas, and cushion gas in Manlove Field.

231 Q. What were the major conclusions?

232 A. As explained in Exhibit TLP-1.6, the DCS study concluded that the total inventory  
233 recorded by Peoples Gas for Manlove Field as of the end of the 2007 injection cycle is  
234 well within the +/- 10% range of uncertainty specified by DCS. Likewise, the study  
235 concluded that the amount of gas that is currently being cycled agrees very closely with  
236 the quantity of working gas determined by DCS.

237 Q. Based on the conclusions, are any inventory accounting adjustments necessary?

238 A. No adjustment to total inventory is needed. DCS developed a range of working gas with  
239 an upper limit of 38.7 MMDth as of the end of the 2007 injection cycle. Peoples Gas'  
240 records as of the end of the 2007 injection cycle indicate a total working gas quantity of  
241 41.7 MMDth. Therefore, the reclassification of 3.0 MMDth from working gas to cushion  
242 gas is appropriate. Ex. TLP-1.6 contains a recommendation that this reclassification be  
243 made.

244 **III. LIQUEFIED NATURAL GAS PLANT**

245 Q. Does Peoples Gas have Liquefied Natural Gas Plant in its rate base?

246 A. Yes. Peoples Gas owns a facility for liquefying, storing, and vaporizing LNG, located at  
247 the Manlove Field Gas Storage Complex. I refer to this facility as the LNG Plant. This  
248 facility is included in the test year rate base as Liquefied Natural Gas Plant, shown on  
249 Schedule B-5, page 2 of 2, column J, line 3 of Peoples Gas Ex. JH-1.1, sponsored by  
250 Mr. Hengtgen.

251 Q. Please describe Peoples Gas' LNG Plant.

252 A. The LNG Plant is comprised of a liquefaction system, a vaporization system, two large  
253 above-ground storage tanks, LNG pumps, and associated equipment. The facilities are  
254 designed to liquefy natural gas received from pipelines and store it in the tanks as LNG.  
255 When required, the LNG can be vaporized back into natural gas and injected into Peoples  
256 Gas' transmission system.

257 Q. What is the purpose of the LNG Plant?

258 A. Peoples Gas maintains the LNG Plant as a peaking facility, to meet its deliverability  
259 requirements at times of peak load, particularly in case of elevated loads late in the winter  
260 withdrawal season when deliverability from Manlove Field is relatively low.

261 Q. Was the LNG Plant prudently acquired at a reasonable cost, and does it continue to be  
262 used and useful in providing adequate, efficient, and reliable service to Peoples Gas'  
263 customers?

264 A. Yes.

265 Q. Does this conclude your direct testimony?

266 A. Yes, it does.