

**BEFORE THE**  
**PENNSYLVANIA PUBLIC UTILITY COMMISSION**

<b>IN RE: APPLICATION OF TRANS-ALLEGHENY</b>	<b>:</b>	
<b>INTERSTATE LINE COMPANY FOR</b>	<b>:</b>	
<b>(I) A CERTIFICATE OF PUBLIC CONVENIENCE</b>	<b>:</b>	
<b>TO OFFER, RENDER, FURNISH AND/OR</b>	<b>:</b>	
<b>SUPPLY TRANSMISSION SERVICE IN THE</b>	<b>:</b>	
<b>COMMONWEALTH OF PENNSYLVANIA;</b>	<b>:</b>	
<b>(II) AUTHORIZATION AND CERTIFICATION</b>	<b>:</b>	
<b>TO LOCATE, CONSTRUCT, OPERATE AND</b>	<b>:</b>	<b>Docket No. A-110172</b>
<b>MAINTAIN CERTAIN HIGH VOLTAGE ELECTRIC</b>	<b>:</b>	<b>A-110172F0002</b>
<b>TRANSMISSION LINES AND RELATED ELECTRIC</b>	<b>:</b>	<b>A-110172F0003</b>
<b>SUBSTATION FACILITIES; (III) AUTHORITY</b>	<b>:</b>	<b>A-110172F0004</b>
<b>TO EXERCISE THE POWER OF EMINENT</b>	<b>:</b>	<b>G-000721229</b>
<b>DOMAIN FOR THE CONSTRUCTION AND</b>	<b>:</b>	
<b>INSTALLATION OF AERIAL ELECTRIC</b>	<b>:</b>	
<b>TRANSMISSION FACILITIES ALONG THE</b>	<b>:</b>	
<b>PROPOSED TRANSMISSION LINE ROUTES</b>	<b>:</b>	
<b>IN PENNSYLVANIA; (IV) APPROVAL OF AN</b>	<b>:</b>	
<b>EXEMPTION FROM MUNICIPAL ZONING</b>	<b>:</b>	
<b>REGULATION WITH RESPECT TO THE</b>	<b>:</b>	
<b>CONSTRUCTION OF BUILDINGS; AND</b>	<b>:</b>	
<b>(V) APPROVAL OF CERTAIN RELATED</b>	<b>:</b>	
<b>AFFILIATED INTEREST ARRANGEMENTS</b>	<b>:</b>	

**REBUTTAL TESTIMONY OF**  
**JOHN R. BODENSCHATZ, P.E.**

**Re: Potential Gas Facility Mitigation Measures**

**December 10, 2007**

REBUTTAL TESTIMONY OF JOHN R. BODENSCHATZ, P.E.

1 Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

2 A. My name is John R. Bodenschatz. My business address is 800 Cabin Hill Drive,  
3 Greensburg, Pennsylvania 15601-1689.

4

5 Q. HAVE YOU PREVIOUSLY SUBMITTED DIRECT TESTIMONY IN THIS  
6 PROCEEDING ON BEHALF OF TRANS-ALLEGHENY INTERSTATE LINE  
7 COMPANY (“TrAILCo”)?

8 A. Yes.

9

10 Q. PLEASE DESCRIBE THE PURPOSE OF YOUR REBUTTAL TESTIMONY.

11 A. My rebuttal testimony addresses (i) the recommendations contained in the direct  
12 testimonies of Columbia Gas of Pennsylvania, Inc. and Columbia Gas  
13 Transportation Corporation (individually and collectively, “Columbia”) witnesses  
14 Richard W. Burke and Michael D. Spencer; (ii) the misconceptions about the  
15 average tower heights for the 500 kV portion of TrAIL; (iii) how TrAILCo and  
16 Allegheny Power intend to handle the possible impacts of subsidence associated  
17 with prior underground mining activities along portions of the proposed TrAIL  
18 route; and (iv) some public input testimony regarding the safety issues of gas  
19 pipelines and high voltage electric power lines like TrAIL operating in close  
20 proximity to each other.

1 Q. WILL THE USE OF VARIOUS TERMS IN YOUR REBUTTAL TESTIMONY  
2 BE CONSISTENT WITH THE DEFINITIONS ASSIGNED TO THOSE TERMS  
3 IN THE TABLE OF NOMENCLATURE ATTACHED TO TRAILCO  
4 WITNESS FLITMAN'S DIRECT TESTIMONY AS TRAILCO EXHIBIT DEF-  
5 1?

6 A. Yes. In addition, I may define other terms in my rebuttal testimony.  
7

8 RESPONSE TO COLUMBIA GAS WITNESSES

9 Q. PLEASE SUMMARIZE THE COLUMBIA WITNESSES' RECOMMENDATIONS.

10 A. Both Columbia witnesses describe their concerns with potential impacts of TrAIL  
11 on Columbia's gas distribution or transmission facilities either by way of "direct  
12 physical conflict" or the potential for "interference" with Columbia's facilities  
13 from potential corrosion associated with electric currents. Columbia witness  
14 Burke recommends that the Commission require TrAILCo to submit detailed  
15 engineering studies that will enable Columbia to determine the extent to which the  
16 TrAIL route adversely affects Columbia's facilities, along with a specific plan to  
17 mitigate any such effects. Columbia witness Spencer recommends that any  
18 specific authority issued by the Commission that approves the TrAIL project or  
19 TrAILCo's ability to exercise eminent domain should be specifically conditioned  
20 upon TrAILCo's agreement to adhere to an acceptable plan to mitigate or  
21 eliminate all identified issues created by the proximity of TrAIL project facilities  
22 in proximity to Columbia's gas transmission pipelines.

23

1 Q. PLEASE SUMMARIZE ALLEGHENY POWER’S PRACTICE WHEN A NEW  
2 ELECTRIC TRANSMISSION FACILITY IS PROPOSED TO BE  
3 CONSTRUCTED IN CLOSE PROXIMITY TO AN EXISTING NATURAL GAS  
4 PIPELINE AND INDICATE WHETHER TRAILCO WILL ADOPT THIS  
5 PRACTICE.

6 A. Allegheny Power’s past and current practice is to investigate and determine the  
7 need for any alternating current (“AC”) or direct current (“DC”) mitigation  
8 measures, which I will refer to generally as an AC/DC Mitigation Plan, for any  
9 existing natural gas pipeline facilities that may come into close proximity with a  
10 planned Allegheny Power transmission line. It has been Allegheny Power’s  
11 practice to address any need for an AC/DC Mitigation Plan as soon as the location  
12 of any existing natural gas facilities is identified in close proximity to a planned  
13 electric facility during the detailed design process for that new electric  
14 transmission line. TrAILCo has adopted and will continue this same practice with  
15 respect to TrAIL.

16  
17 Q. HAS TRAILCO PREPARED ANY AC/DC MITIGATION PLAN FOR THE  
18 TRAIL PROJECT AT THIS TIME?

19 A. No. TrAILCo has not identified any specific needs for AC or DC mitigation  
20 measures at this time because the final routing and design for the TrAIL Project is  
21 in an early stage and has not yet been completed. For example, the detailed  
22 ground survey of the entire proposed TrAIL route is still in progress. Among the  
23 primary purposes of this detailed survey will be the identification of marked

1 existing natural gas and any other utility facilities that may run parallel to or be  
2 crossed by the final TrAIL route. Once any such facilities are identified, TrAILCo  
3 will work with their owners to determine whether TrAIL will affect those facilities  
4 and, if so, how to best mitigate any such effects. Where jointly determined to be  
5 necessary, the final result of this dialogue would be an agreed AC/DC Mitigation  
6 Plan that would be developed during TrAILCo's detailed engineering and design  
7 process for TrAIL. Again, this is precisely the approach that has been followed by  
8 Allegheny Power and implemented successfully for similar electric projects. To  
9 my knowledge, Allegheny Power has never failed to reach a mutually agreeable  
10 approach with an existing gas pipeline owner for mitigating the effects of a new  
11 electric transmission line on that existing pipeline.

12

13 Q. WHAT ARE TYPICAL AC OR DC MITIGATION MEASURES?

14 A. Typical AC or DC mitigation measures include facilities that are retrofitted onto  
15 existing natural gas pipelines or above-ground facilities. For in-ground gas  
16 facilities, these measures can include cathodic isolation to protect natural gas  
17 pipelines from ground fault currents or sacrificial magnesium or zinc anode systems  
18 with a bentonite backfill to protect against corrosion of the existing gas pipeline.  
19 For above-ground facilities, equipment such as zinc ribbon spiral systems to protect  
20 pipeline employees and other third parties from the effects of induced electrostatic  
21 charge on above-ground pipeline facilities have been installed on existing natural  
22 gas or other utility facilities during past transmission line projects initiated by  
23 Allegheny Power.

1 Q. HOW WOULD TRAILCO IDENTIFY AND DETERMINE ANY AC OR DC  
2 MITIGATION MEASURES THAT MAY BE REQUIRED FOR THE TRAIL  
3 PROJECT?

4 A. For the purposes of this answer, I will assume that an existing Columbia gas  
5 pipeline would be identified as running in parallel with a segment of the final  
6 TrAIL route. In such an instance, TrAILCo would work expeditiously with  
7 Columbia to jointly determine whether the operation of TrAIL will necessitate any  
8 mitigation measures on the Columbia facilities. As has been the past practice,  
9 either Columbia or its independent consultant would prepare an electrical effects  
10 study, develop a recommended AC/DC Mitigation Plan if the electrical effects  
11 study warrants it, and provide cost estimates for installing any necessary  
12 mitigation measures on the existing gas facilities. The objective of this study  
13 process would be to establish an agreement between TrAILCo and Columbia  
14 regarding the need for any mitigation measures and the estimated cost to install  
15 them.

16  
17 Q. UNDER THE HYPOTHETICAL SITUATION YOU JUST DESCRIBED, WHO  
18 WOULD PAY FOR THE COSTS OF THE STUDIES AND THE RESULTING  
19 INSTALLATION OF ANY MITIGATION MEASURES?

20 A. Consistent with current Allegheny Power practices, TrAILCo and Columbia would  
21 reach an agreement on the costs for the studies and any mitigation measures.  
22 Assuming such an agreement, TrAILCo would reimburse Columbia for its actual  
23 reasonable costs for developing, or having an outside consultant prepare, the

1 studies that determine the need for any mitigation measures. TrAILCo would also  
2 reimburse Columbia for the actual reasonable costs for installing any necessary  
3 mitigation measures.

4

5 Q. WHAT WOULD BE THE PROTOCOL IF THE FINAL LOCATION OF TRAIL  
6 REQUIRES THE RELOCATION OF ANY EXISTING NATURAL GAS  
7 PIPELINE OR OTHER UTILITY FACILITIES?

8 A. If the final TrAIL route parallels or crosses over existing natural gas pipelines or  
9 other utility facilities, from our experience it is extremely unlikely that the  
10 relocation of existing utility facilities would be required. For example, TrAILCo  
11 would make every effort during the final engineering and design process to avoid  
12 the relocation of an existing natural gas pipeline or other utility facility. It would  
13 be far less disruptive to the existing utility facility and far more cost-effective for  
14 TrAILCo to adjust the final placement of a tower structure during the design phase  
15 so as to avoid requiring the relocation of an existing utility facility. In the unlikely  
16 event of relocation, however, TrAILCo would negotiate a mutually acceptable  
17 agreement with the owner of the existing facility regarding the proper protocol for  
18 relocating the existing facility, including developing procedures and designs for  
19 the relocation and a related cost estimate. Subject to such an agreement, TrAILCo  
20 would reimburse the existing facility owner for the reasonable actual costs for  
21 relocating the facilities.

1 Q. SHOULD THE RECOMMENDATIONS OF COLUMBIA'S WITNESSES BE  
2 ADOPTED BY THE COMMISSION IN THIS PROCEEDING?

3 A. No. There are three primary reasons why the Commission should not adopt these  
4 recommendations. First, the recommendations are unnecessary and, to the extent  
5 Columbia requests that TrAILCo be required to adhere to a specific mitigation  
6 plan that is acceptable to both Columbia and the Commission, such  
7 recommendations could needlessly interfere with and deprive TrAILCo and the  
8 existing utility facility owners the flexibility necessary to effectively address the  
9 differing circumstances that will likely be presented in the field. Second, the  
10 process TrAILCo intends to follow if existing natural gas or other utility facilities  
11 are identified in close proximity to TrAIL during the ground survey and the  
12 detailed design and engineering for the project, is precisely the same one that  
13 Columbia witness Spencer describes as his requested action at page 11 of his  
14 direct testimony, and is, in fact, the process that has been followed in similar  
15 situations with other utilities, including Columbia. Third, to my knowledge,  
16 Allegheny Power has never failed to reach a mutually agreeable approach with an  
17 existing gas pipeline owner to mitigate the effects of a new electric transmission  
18 line on an existing pipeline. TrAILCo has no reason to believe it will be unable  
19 to do so in connection with the final TrAIL route. It is therefore unnecessary for  
20 the Commission to condition any final authority to site the TrAIL project as  
21 requested by Columbia.

1 AVERAGE TOWER HEIGHT ISSUES

2 Q. OCA WITNESS LANZALOTTA STATES AT PAGE 21 OF HIS DIRECT  
3 TESTIMONY THAT THE PREXY 500 KV LINE WOULD BE 160 FEET  
4 HIGH, WHILE 138 KV LINES ON THE ALLEGHENY POWER SYSTEM  
5 ARE TYPICALLY LESS THAN 60 FEET. ECC WITNESS LOEHR  
6 SIMILARLY OBSRVES THAT THE 500 KV TOWERS STRUCTURES FOR  
7 TRAIL WILL BE 160 FEET TALL. DO YOU AGREE WITH THEIR  
8 STATEMENTS OR CONCLUSIONS?

9 A. No, I do not agree. First, Mr. Lanzalotta overstates the typical height of the tower  
10 structures planned for the 500 kV segments of TrAIL, as well as ECC witness  
11 Loehr, who similarly states that the 500 kV structures would be 160 feet tall. In  
12 fact, this value is 35 feet taller than the average 500 kV lattice tower structure  
13 proposed for TrAIL. I previously testified at page 11 of my direct testimony,  
14 TrAILCo Statement No. 7, that the average height of all 500 kV tower structures  
15 over the entire length of TrAIL is anticipated to be approximately 125 feet. It is  
16 still our expectation that the average height of all 500 kV tower structures for  
17 TrAIL will be approximately 125 feet. Figures 1 through 5 of TrAILCo Exhibit  
18 JRB-2 to my direct testimony graphically depict typical 500 kV lattice towers  
19 with a typical height range of 72 to 177 feet above ground. Next, OCA witness  
20 Lanzalotta incorrectly assumes that the tower structure for a 138 kV line -  
21 described as typically 60 feet in height - would apply to his proposal to follow the  
22 paths of existing 138 kV rights-of-way and add new conductors to existing towers  
23 where possible. In fact, double circuit 138 kV tower structures would be much

1 taller. As Figures 11 and 12 of TrAILCo Exhibit JRB-2 indicate, the tubular steel  
2 towers planned for the double circuit segments of TrAIL's 138 kV lines will be in  
3 the range of 110 feet tall. To support their contentions that 138 kV lines would be  
4 less intrusive, both witnesses have incorrectly overstated the typical tower  
5 structure height planned for the 500 kV segments of TrAIL, and Mr. Lanzalotta  
6 understates the 138 kV tower structure heights that would apply to his proposal.

7  
8 SUBSIDENCE ISSUES

9 Q. A NUMBER OF WITNESSES AT THE PUBLIC INPUT HEARINGS  
10 TESTIFIED ABOUT PREVIOUS MINING ACTIVITIES IN  
11 SOUTHWESTERN PENNSYLVANIA AND THEIR POSSIBLE IMPACT ON  
12 TRAIL. IF ENCOUNTERED ALONG THE PREFERRED LINE ROUTE, WILL  
13 EXISTING DEEP MINES IN SOUTHWESTERN PENNSYLVANIA POSE A  
14 RISK TO THE STABILITY OF THE PROPOSED TRANSMISSION  
15 STRUCTURES?

16 A. No. A proper design and maintenance plan will virtually eliminate any risk  
17 associated with deep mine activities that may be encountered along the preferred  
18 TrAIL route. Allegheny Power's Transmission Maintenance Group has  
19 effectively dealt with mining activities under its rights-of-way throughout its  
20 service territory in Pennsylvania, as well as along transmission line rights-of-way  
21 in West Virginia and Maryland. Specifically, Allegheny Power has successfully  
22 managed the affects of subsidence from long wall mining activities underneath  
23 existing 500 kV lines in Pennsylvania, and expects to do the same with respect to

1 TrAIL. While some minor damage may occur due to subsidence, repairs are  
2 made before it would threaten the stability of the structure or the operation of the  
3 line. Allegheny Power's experience and demonstrated success in planning for and  
4 identifying issues with regard to subsidence will be equally applied to TrAIL.

5  
6 Q. PLEASE ELABORATE ON THE ACTIONS TRAILCO WILL TAKE TO  
7 MINIMIZE THE EXPOSURE OF TOWER STRUCTURES TO SUBSIDENCE-  
8 RELATED INSTABILITY.

9 A. Any existing or proposed deep mines along the preferred TrAIL route can be  
10 addressed with a number of design and engineering tools. First, a complete  
11 geotechnical analysis of the entire preferred line route is in progress and existing  
12 mined areas will be identified. Any deep mines identified will be further assessed  
13 according to a number of factors, including the overall depth of the mine and the  
14 ground cover over it, the size of the void represented by the mined area, the type  
15 of mining that was carried out, and the extent of underground support that has  
16 been left by the operator. Even where the line route passes over a deep mined  
17 area, it may not pose a problem if the amount and type of existing cover over the  
18 mined area is stable, the underground void area is not extensive, or if an adequate  
19 amount of support has been left in place. A proactive approach that will be  
20 available to TrAILCo, if necessary, would be to purchase and install sufficient  
21 coal support under the location of a tower structure. In those instances where this  
22 approach is feasible and can be carried out, it provides the benefit of removing  
23 any potential risk associated with ongoing or future mining activities.

1 Q. ARE THERE SPECIFIC ENGINEERING AND DESIGN APPROACHES  
2 THAT CAN MITIGATE THE RISK OF SUBSIDENCE-RELATED  
3 INSTABILITY?

4 A. Yes. When an area that has been mined is identified as a potential subsidence  
5 area, several engineering and design options are available to TrAILCo to address  
6 and minimize this concern. Of course, the easiest solution is considered first,  
7 which is to strive to avoid the placement of tower structures over an area of  
8 concern. Where it cannot be avoided, a typical design response could be the use  
9 of a “spread,” or wider, footing for the tower structure in order to distribute the  
10 structure load over a larger area. This serves to reduce the pressure applied by the  
11 foundation on the underlying soil and subsidence-exposed area. Foundation  
12 structures known as “Micropile” foundations may also be used to transfer the  
13 structure loads through the mined void area, thereby eliminating the possibility of  
14 foundation settlement if subsidence does occur at ground level. Another approach  
15 could be “grout,” or fill in, the void area under the structure foundation, which  
16 then provides a foundational support to the overburden above the void area. This  
17 practice in most cases eliminates the possibility of subsidence and can allow the  
18 use of standard foundations.

1 SAFETY ISSUES BETWEEN GAS PIPELINES AND TRAIL

2 Q. WOULD YOU ADDRESS CONCERNS THAT WERE RAISED AT THE  
3 PUBLIC INPUT HEARINGS, AND DURING SITE VISITS REGARDING THE  
4 POSSIBLE AFFECTS OF TRAIL ON NATURAL GAS PIPELINES THAT  
5 MAY ALREADY EXIST ALONG THE TRAIL RIGHT-OF-WAY?

6 A. Yes. At least one property owner – George Goroncy – described his concerns by  
7 referring to an existing Equitable Gas pipeline on his property. He claimed that  
8 this pipeline would be corroded by TRAIL-related voltages or currents. He also  
9 expressed concerns about whether any leaks from his residential gas metering  
10 equipment could be ignited by a “static spark or charge” from TrAIL. Mr.  
11 Goroncy further claimed that the existing gas pipeline on his property is  
12 approximately 300 feet from the proposed TrAIL right-of-way.

13  
14 As the Columbia Gas witnesses indicate in their direct testimonies, current  
15 mitigation procedures for steel gas lines that will be adjacent to or crossed by a  
16 new electric transmission line are readily available and are completely effective as  
17 a deterrent to any corrosive effects on those steel lines. As I have stated  
18 previously, TrAILCo will cooperate with the owner of any existing gas or other  
19 utility facility that may be crossed by TrAIL or situated in close proximity to it to  
20 determine if any mitigation is necessary and, if so, to reimburse the facility owner  
21 its reasonable costs for installing mitigation measures.

1 Mr. Goroncy's concerns about the effects of a possible static charge are addressed  
2 in my direct testimony, TrAILCo Exhibit JRB-1, page 2, where I indicate that  
3 TrAIL will conform to the National Electric Safety Code's 5 mA criteria in Rules  
4 232 C.1.c and 232 D.3.c. These rules reflect the maximum allowable induced  
5 current for TrAIL's right-of-way. Induced current at the 300 foot distance that  
6 was described for the residential gas metering facilities would be extremely low,  
7 if not undetectable. Consequently, static charge is not likely to be an issue for Mr.  
8 Goroncy's residential gas facilities. Moreover, I presume those gas facilities have  
9 been properly grounded in accordance with the applicable safety codes, which  
10 provide further protection from any static discharge that might occur from any  
11 other source.

12

13 Q. DOES THIS CONCLUDE YOUR REBUTTAL TESTIMONY?

14 A. Yes, it does. However, I reserve the right to file such additional testimony or  
15 exhibits as may be necessary or appropriate.