

**STATE OF VERMONT  
PUBLIC UTILITY COMMISSION**

Investigation pursuant to 30 V.S.A. §§ 30 and )  
209 regarding the alleged failure of Vermont )  
Gas Systems, Inc. to comply with the certificate ) Case No. 17-3550-INV  
of public good in Docket 7970 by burying the )  
pipeline at less than required depth in New )  
Haven, Vermont )

Notice of Probable Violations of Vermont Gas )  
Systems, Inc. for certain aspects of the ) Case No. 18-0395-PET  
construction of the Addison natural gas pipeline )

**PREFILED DIRECT TESTIMONY  
OF BRIAN CONNAUGHTON ON BEHALF OF  
VERMONT ELECTRIC POWER COMPANY, INC.  
AND VERMONT TRANSCO LLC**

July 23, 2021

**Summary of Testimony**

In response to the Commission’s order of April 30, 2021, Mr. Connaughton’s testimony addresses why the Addison Natural Gas Pipeline (“ANGP”) as buried in the VELCO right-of-way (the “VELCO ROW”) in the Clay Plains swamp in New Haven, meets the HS-20+15% loading standard, after taking into the opinions of VELCO’s technical consultant, Kevin Bodenhamer of TRC. He also testifies concerning whether the ANGP limits VELCO’s future use of the VELCO ROW for additional electric transmission lines.

1 **Q1. Please state your name and occupation.**

2 A1. My name is Brian Connaughton. I am employed by Vermont Electric Power Company, Inc.  
3 and Vermont Transco LLC (together, “VELCO”) as the Director of Transmission Services.

4 **Q2. Please describe your educational and business background.**

5 A2. I hold a Bachelor’s Degree in Natural Resource Studies from the University of  
6 Massachusetts, Amherst as well as a Master’s Degree in Business Administration from the  
7 College of Saint Joseph, Rutland, Vermont. I have worked at VELCO for approximately  
8 fifteen years in several roles including Environmental Team Lead, Transmission Services  
9 Manager, and the Director of Transmission Services. Prior to my employment at VELCO, I  
10 worked at several environmental consulting firms. During this time, my roles included  
11 performing environmental assessments, environmental quality investigations, resource  
12 inventories and regulatory permitting to support the development of energy infrastructure  
13 projects in New England. A copy of my resume is provided as *Exhibit VELCO-BC-1*.

14 **Q3. Have you previously testified before the Public Utility Commission?**

15 A3. Yes, I have sponsored testimony to the Commission as part of the Southern Loop Project  
16 (Docket 7373) as well as part of the Saint Albans X61 Transformer Replacement Project  
17 (Docket 8085).

18 **Q4. What is the purpose of your testimony?**

19 A4. In the Commission’s Order of April 30, 2021 in this proceeding, it stated the following:

20 A key finding in the Liability Order is that the burial depth that Vermont Gas  
21 achieved in the VELCO right-of-way in New Haven has the potential to limit  
22 VELCO’s future use of its right-of-way for additional transmission lines. VELCO  
23 only recently sought party status in this case and therefore did not participate in the

1 evidentiary hearing. However, in its recent filing VELCO has now opined that the  
2 hearing officer's proposed findings on the burial-depth issue, and thus whether the  
3 applicable loading standard has been met, are incorrect. We believe that there would  
4 be value in hearing testimony from VELCO in this proceeding on why it believes the  
5 loading standard has been met.

6  
7 We believe it will be judicially efficient for VELCO to provide testimony as to  
8 whether the pipeline as buried in the swamp would, or would not, limit its future use  
9 of its right-of-way for additional transmission lines. If VELCO relies on the  
10 previously filed study to support its conclusions, then it must account for the flawed  
11 assumptions in the study identified by the hearing officer.

12  
13 In response to the Commission's order, VELCO requested TRC to perform a technical  
14 review of relevant information concerning whether the loading standard has been met,  
15 accounting for three specified "assumptions" in the May 25, 2016 engineering study  
16 prepared for Vermont Gas Systems, Inc. ("VGS") by Mott MacDonald (the "2016 MM  
17 Study"). VELCO asked TRC to consider the three assumptions in the 2016 MM Study that  
18 the Commission focused on in its order: (1) the diameter of the pipeline (12 inches versus 15  
19 inches); (2) the method of burial (trenching versus horizontal directional drilling); and (3) the  
20 density of the soil surrounding the pipeline. The testimony of Kevin Bodenhamer of TRC  
21 addresses the above issues.

22 My testimony takes into account the technical opinions of TRC, and addresses why  
23 the Addison Natural Gas Pipeline ("ANGP"), as buried in the VELCO right-of-way (the  
24 "VELCO ROW") in the Clay Plains swamp in New Haven (the "CP ROW"), meets the HS-  
25 20+15% loading standard. For that reason and others, I testify that the ANGP does not  
26 limit VELCO's future use of the VELCO ROW for additional electric transmission lines.

27

1 **Q5. First by way of background, please briefly describe the purpose and general terms of**  
2 **the Memorandum of Agreement between VGS and VELCO dated June 13, 2013 (the**  
3 **“MOA”), previously identified as Exhibit 16 to Exhibit VGS-JSH-2 in this**  
4 **proceeding.**

5 A5. The purpose of the June 2013 MOA was to document the agreement between VGS and  
6 VELCO pertaining to the co-location and crossing of the proposed ANGP within the  
7 VELCO rights-of-way (ROWs), including easements and lands owned in fee, associated with  
8 the VELCO transmission lines designated as the K21/K22/K24/K27/K43/K63/K64 and  
9 370 lines. The MOA includes provisions associated with employee, contractor and  
10 community safety considerations, the co-location license(s), the development of an  
11 Operating Agreement, VGS design adjustments to allow for a possible future use of the  
12 ROW for additional electric transmission line(s), VELCO’s review of VGS’s project plans,  
13 loading requirements, project coordination and oversight items, as well as terms pertaining  
14 to insurance and the treatment of information. The MOA was previously filed with the  
15 Commission as *Exhibit VELCO-PWL-2* in Docket 7970 and *Exhibit 16 to Exhibit VGS-*  
16 *JSH-2* in this proceeding.

17 **Q6. Paragraph 5 of the MOA states, “VGS will design the Project in VELCO’s ROW and**  
18 **access roads into VELCO’s ROW to meet an HS-20+15% standard which VGS plans**  
19 **to meet by using Class 3 pipe interred at a depth of 4 feet.” Please explain why this**  
20 **provision was developed and incorporated into the MOA.**

21 A6. Upon receiving the request from VGS to co-locate a natural gas pipeline within the  
22 transmission line corridors identified in A5 above, VELCO developed a Technical

1 Memorandum dated October 1, 2012 for the purpose of outlining the design, construction,  
2 and operation criteria that VELCO would require VGS to follow during the siting, layout,  
3 installation, and operation of the ANGP. The memorandum is being filed with my  
4 testimony as *Exhibit VELCO-BC-2*.

5 The requirements in the Technical Memorandum addressed, among other things, AC  
6 protection, transmission structure grounding, counterpoise, cathodic protection,  
7 transmission structure and foundation integrity and clearances, blasting, workspace and  
8 access roads for construction, and public and worker safety. A provision of the Technical  
9 Memorandum specifically applied to a loading integrity of HS-20, was later revised to include  
10 an adjustment of +15%, such that the buried ANGP would not preclude VELCO's safe  
11 movement of heavy construction equipment over the pipeline without additional  
12 precautions. This provision, as well as other items referred to in A5 above, were  
13 incorporated into the June 13, 2013 MOA to memorialize VELCO's requirements. The  
14 MOA was filed in Docket 7970 to ensure that it would be enforceable by the Commission  
15 should it issue a certificate of public good ("CPG") for the ANGP.

16 **Q7. Did VELCO enter into any other agreements with VGS concerning VGS's work in**  
17 **the VELCO ROW?**

18 A7. Yes, as per the MOA, VELCO and VGS entered into the VELCO/VGS Construction,  
19 Operation and Maintenance Agreement on July 24, 2015 (the "CO&M Agreement"). This  
20 agreement governs project construction and maintenance, including relocation and  
21 replacement activities taking place in or activity likely to impact the VELCO ROW or  
22 facilities. Provisions of this agreement include access notification requirements, safety

1 considerations, the HS 20+15% loading requirements, as well as project construction and  
2 maintenance items. The CO&M Agreement effective as of July 24, 2015, is attached hereto  
3 as *Exhibit VELCO-BC-3*.

4 VELCO has also executed licenses to co-locate the ANGP within the VELCO  
5 ROW associated with the transmission lines identified in A5 above, for each municipality  
6 that the ANGP crosses. The licenses set forth the general terms and conditions for the right  
7 to co-locate, operate, and maintain the gas pipeline within designated portions of VELCO's  
8 ROWs, provide access rights to certain areas within the VELCO ROWs in areas where VGS  
9 installed the ANGP adjacent to but outside of the VELCO ROWs, and provide  
10 maintenance and access rights in designated areas of the VELCO ROWs. The licenses also  
11 include specific sections of the June 13, 2013 MOA, for reference, including Section 3  
12 (VELCO Build-out); Section 5 (Loading); Section 6 (Line Clearances During Construction);  
13 Section 9 (Project Construction Review and Oversight); and Section 10 (VGS Personnel and  
14 Agents).

15 **Q8. Is the as-installed burial depth of the ANGP in VELCO's ROW sufficient to meet the**  
16 **HS-20+15% loading standard in the VELCO ROW? Why or why not?**

17 A8. As documented in the Technical Memorandum, the MOA, the CO&M Agreement, and the  
18 co-location licenses, VELCO required VGS to install the ANGP at a HS-20+15% loading  
19 rating so that the presence of the pipe would not preclude VELCO's movement of heavy  
20 construction equipment over the pipe. It is VELCO's understanding, based upon the  
21 information referenced in A9 below, that this loading standard has been achieved

1           irrespective of the fact that the pipeline was buried at depths less than 4 feet below the  
2           ground surface in a number of locations.

3   **Q9.   In reaching this conclusion, did VELCO rely on the May 25, 2016 engineering study**  
4   **by Mott MacDonald, LLC (the “2016 MM Study”), previously filed in this proceeding**  
5   **as Exhibit 18 to Exhibit VGS-JSH-2 at 3? Please explain.**

6   A9.   In September 2016, VGS informed VELCO of construction issues that limited the ability to  
7           achieve a burial depth of 4 feet in the CP ROW. Due to this issue, VGS requested that  
8           VELCO allow for the installation to be at a depth of less than four feet at eighteen (18)  
9           locations.

10                 In response, VELCO requested that an engineering analysis be performed to confirm  
11                 that the HS-20+15% loading factor would be met with the diminished burial depth. VGS  
12                 referenced the 2016 MM Study, which was relied upon as the basis for reaching the  
13                 conclusion that the less-than 4' burial of the gas pipeline would still meet the HS-20+15%  
14                 loading factor agreed upon in the MOA and CO&M agreements. In addition to the 2016  
15                 MM Study, VELCO also requested VGS: (1) document the specific areas where the pipe was  
16                 not installed at a depth of 4', (2) install yellow location markers over the pipeline in the  
17                 affected VELCO ROW (K43), and (3) to inspect the pipeline location on an annual basis for  
18                 two years to ensure that 3' of minimum cover is maintained which has occurred. VELCO  
19                 understands that the addition of replacement material would be performed as part of VGS's  
20                 routine inspection and maintenance program, if needed.

21                 In addition to the 2016 MM Study, VGS provided VELCO with a memorandum from  
22                 Mott MacDonald dated June 15, 2021 which included additional information pertaining to

1 the 2016 MM Study (the “2021 MM Memorandum”). The 2021 MM Memorandum  
2 confirmed the fundamental conclusion of the 2016 MM Study, i.e., that the HS-20+15%  
3 loading factor was met in the VELCO ROW, and which was relied upon by VELCO. See  
4 *Exhibit VELCO-BC-4*.

5 **Q10. The Commission requested that if VELCO did rely on the 2016 MM Study, that it**  
6 **account for three assumptions in the 2016 MM Study as you noted above. First, the**  
7 **Commission stated that the 2016 MM Study included a diameter of the ANGP (12.75**  
8 **inches) which did not consider the cement coating of the pipeline which increased**  
9 **the total diameter to approximately 15 inches. Does the fact that MM did not**  
10 **account for the cement coating on the pipe’s overall diameter for purposes of its**  
11 **loading analysis affect or alter VELCO’s conclusion that the ANGP met the HS-**  
12 **20+15% loading standard? Please explain.**

13 A10. As described in more detail in Mr. Bodenhamer’s testimony, the purpose of the cement  
14 coating is not to provide significant structural value, but rather is to add weight to the pipe.  
15 Based upon this information from Mr. Bodenhamer’s review, the omission of the cement  
16 coating on the pipe’s overall diameter does not affect VELCO’s conclusion that the HS-  
17 20+15% loading standard has been met.

18 **Q11. The second assumption in the 2016 MM Study that was called out by the**  
19 **Commission was the method of installation—open trench vs. horizontal direction**  
20 **drill. Does MM’s assumption concerning the installation method for purposes of its**  
21 **loading analysis affect or alter VELCO’s conclusion that the ANGP met the HS-**  
22 **20+15% loading standard? Please explain.**



1 A11. As described in more detail in Mr. Bodenhamer's testimony, open trench construction is a  
2 normal method of pipeline construction in wet areas and the calculations used by MM are  
3 utilized for all soil conditions. Based upon this information from Mr. Bodenhamer's review,  
4 the installation method does not affect VELCO's conclusion that the HS-20+15% loading  
5 standard has been met.

6 **Q12. The third assumption in the 2016 MM Study that was called out by the Commission**  
7 **was that the density of the soil surrounding the pipeline was a mix of swamp water**  
8 **and mud, rather than compacted soil. Does MM's soil density assumption affect or**  
9 **alter VELCO's conclusion that the ANGP met the HS-20+15% loading standard?**  
10 **Please explain.**

11 A12. As described in more detail in Mr. Bodenhamer's testimony, the soil density assumptions did  
12 not affect the accuracy of MM's conclusions. Based upon this information from Mr.  
13 Bodenhamer's review, MM's soil density assumption does not affect VELCO's conclusion  
14 that the HS-20+15% loading standard has been met.

15 **Q13. Based upon the 2016 MM Study, 2021 MM Memorandum, and TRC testimony, what**  
16 **is VELCO's conclusion as to whether the ANGP satisfies the HS-20+15% loading**  
17 **standard as required in the CO&M Agreement and MOA?**

18 A13. Based on the information provided by VGS, specifically, the 2016 MM Study and the 2021  
19 MM Memorandum as well as the recent review by Mr. Bodenhamer of TRC, VELCO  
20 believes that the HS-20+15% loading requirement for the ANGP has been met by VGS.

1 **Q14. What are the current uses by VELCO of the transmission line ROWs identified in A5**  
2 **above, and what are the potential future uses of the K43 Line ROW in the locations**  
3 **where the pipeline was installed at depths less than four feet below the ground**  
4 **surface?**

5 A14. The K21/K22/K24/K27/K43 and K64 ROWs contain 115kV transmission lines. The  
6 K21/K22/K24/K27 and K43 lines also have fiber optic cables affixed to the structures.  
7 The K63 and 370 ROW is used to accommodate both an 115kV and 345kV transmission  
8 line and fiber optic cable, running parallel to each other. The locations where the ANGP is  
9 buried at depths less than 4 feet are along VELCO's K43 ROW, which includes a 115kV  
10 transmission line. A potential future use of the K43 ROW, as contemplated in the MOA  
11 and the project design process, is an additional 345kV line located to the east of the existing  
12 K43 line in a potential ROW expansion area.

13 **Q15. As the Commission inquired, does the ANGP, as buried in the Clay Plains swamp,**  
14 **limit VELCO's future use of the VELCO ROW?**

15 A15. No. The Project does not limit VELCO's future use of the ROWs. With specificity to the  
16 K43 ROW where the pipeline was installed at depths less than 4 feet, the pipeline was  
17 installed along the *western* edge of the ROW, in order to preserve VELCO's ability to build, if  
18 necessary, additional infrastructure on the *opposite, eastern* side of the ROW. Future  
19 expansion in this area is further protected by VGS's obligation to provide for any necessary  
20 additional cathodic protection for the pipeline, AC mitigation, and grounding that could be  
21 necessary for potential future 345kV buildout, should that buildout occur. See Exhibit 16 to  
22 Exhibit VGS-JSH-2 Paragraph 3 of the MOA.

1 **Q16. Please discuss the safety considerations that VELCO considered for the ANGP to be**  
2 **located in the VELCO ROW, as reflected in the CO&M Agreement.**

3 A16. The CO&M Agreement contains several provisions to ensure the safety of workers and the  
4 general public for sections of the ANGP that are co-located within a VELCO ROW.  
5 Specifically, the CO&M agreement requires the performance of safety trainings, compliance  
6 with Electrical Safety Code, Occupational Safety and Health Administration (OSHA), and  
7 VELCO safety requirements, as well as measures to ensure the maintenance and use of  
8 proper grounding, AC mitigation, and cathodic protection systems. In addition, the CO&M  
9 Agreement requires that VGS maintains the HS-20+15% standard for the ANGP from the  
10 date of installation.

11 **Q17. Does that conclude your testimony at this time?**

12 A17. Yes, it does.