Docket 6860
Exhibit DPS-VDH-5
33 Pages

POSITION PAPER ON ELECTRIC AND MAGNETIC POWER FREQUENCY FIELDS AND THE VELCO NORTHWEST VERMONT RELIABILITY PROJECT: REROUTE SUPPLEMENT

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MAY 20, 2004

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INTRODUCTION

This report is a supplement to the Vermont Department of Health ("VDH") Position Paper dated December 17, 2003 ("VDH Position Paper") to address VELCO's proposed modifications to the Northwest Vermont Reliability Project ("NRP") filed by VELCO on February 6, 2004, which are generally referred to throughout this report as the "Proposed Reroutes." This report supplements the section of the VDH Position Paper beginning on page 23 of that report and entitled *"Will the Projected Electric and Magnetic Power Frequency Fields Increase, Decrease or Stay the Same with the NRP?"* to include the new proposed transmission line corridors and changes in the pole structure configurations along the New Haven to Queen City corridor. Appendix C provides data obtained from VELCO and Appendix D provides the numerical results of the analysis. This report analyzes and provides conclusions relating to EMF and the VELCO Proposed Reroutes. The reader should read this report in conjunction with the VDH Position Paper and should refer to that report for the VDH analysis of the scientific reports and EMF guidelines applied in the analyses.

In summary, the projected electric and magnetic power frequency fields at the edge of the right of way ("ROW") and directly under the power line for average and maximum continuous load with the Proposed Reroutes are well below the health-based ICNIRP guidelines of 833 mG and 4.2 kV/m, respectively. The VDH concludes that modifications to the NRP Proposed Reroutes are not required for health reasons, but Vermont's policy of prudent avoidance to mitigate EMF exposure as identified in the Vermont Twenty Year Electric Plan (1994) should be continued.

WILL THE PROJECTED ELECTRIC AND MAGNETIC POWER FREQUENCY FIELDS INCREASE, DECREASE OR STAY THE SAME WITH THE PROPOSED NRP RE-ROUTES?

The VDH performed many calculations using an EXCEL format of the Bonneville Power Authority program provided by VELCO to derive existing and projected estimates of the electric and magnetic power frequency fields. Data was provided by VELCO and is listed in Appendix C. Data required for the calculations include: 1) continuous load ratings, 2) distance of the power line from the center of the ROW, 3) sag height of the power line, 4) number of conductors, 5) diameter of the conductor, 6) bundle diameter, 7) line to ground voltage, 8) phase angle, 9) existing and proposed average loading, and 10) existing and proposed maximum loading. The calculations use the maximum power line kV, the maximum sag (minimum height above the ground) and maximum line to ground voltage. The transmission line is modeled as a horizontal line at the actual or estimated sag height.

This report analyzes VELCO's Proposed Reroutes including both the transmission corridor reroutes and new EMF analyses of the New Haven to Queen City corridor due to changes to the pole structure configurations.

The ROW of the Proposed Reroutes from the New Haven Substation to the Queen City Substation ranges from 60 feet to 100 feet. In a couple locations the ROW is greater than 100 feet. Calculations were performed using a 40-foot ROW based on the distance of existing homes from the proposed power line.

Representative cross-sections for each corridor were determined by comparing the length of the segment, the distance of nearby residences, and the calculated magnetic and electric power frequency fields. Generally, cross-sections of longer length with residences in close proximity and higher field strengths were used. The cross-sections used are: Alt 1-1 for the Vergennes reroute, Alt 2-2 for the Little Chicago Road reroute, Alt 3-1 for the Shelburne reroute, Alt 4-1 for the Charlotte reroute, #8 for the New Haven to Vergennes corridor, #16 for the Vergennes to North Ferrisburg corridor, #18a for the North Ferrisburg to Charlotte corridor, #12 for the

Charlotte to Shelburne corridor, #16 for the Shelburne to Queen City – Pole 51 corridor, #22 for the Queen City – Pole 51 to Pole 58 corridor, #23A for the Queen City – Pole 58 to Pole 67 corridor, and #23C for the Queen City - Pole 67 to Queen City Substation corridor.

In circumstances where the power line is proposed to be placed on either side of the existing power line, the proposed power line is assumed to be placed in a position that is closest to the edge of the ROW and closest to existing residences according to the appropriate cross section provided in VELCO Exhibit DJB DPS6-1.

Using these parameters and assumptions the estimated existing and projected results are maximum possible values for the electric and magnetic power frequency fields. The results of these calculations are very conservative estimates and are not "real" or measured fields.

Comparison of the electric and magnetic power frequency fields calculated for this report indicate higher values than those in the VDH Position Paper because: 1) data provided from VELCO for this report was based on the absolute maximum sag at 100 degrees centigrade, instead of the data based on the maximum sag at peak current load in 2012 provided by VELCO and used in the VDH Position Paper, 2) the power lines are assumed here to be positioned as close to existing residences as allowed in the cross sections provided in VELCO Exhibit DJB DPS6-1 to provide an estimate of the highest expected value at the edge of the ROW, instead of in the center of the ROW as assumed in the VDH Position Paper; 3) the proposed distance of the power lines from the pole was increased to 5.5 feet, based on VELCO's Proposed Reroutes, from 5 feet used in VELCO's original proposal, and 4) cross section 12 was used to represent the entire New Haven to Queen City corridor in the VDH Position Paper versus using the appropriate cross section for each corridor in this report. As a result, the estimated electric and magnetic power frequency fields using these parameters are more likely to represent the highest actual fields along each corridor, so that the VDH can assure that the highest expected fields will not exceed the ICNIRP guidelines.

ELECTRIC AND MAGNETIC POWER FREQUENCY FIELDS AT AVERAGE LOADING AT THE EDGE OF THE RIGHT OF WAY (APPENDIX D, TABLES 2 & 4)

REROUTE CORRIDORS

The magnetic power frequency field along the Vergennes reroute corridor is projected to increase[1] with the Proposed Reroutes along the ROW for average loading from 22 mG in 2006 to 31 mG in 2012. The electric power frequency field is projected to be 1.15 kV/m in 2006 and will not change as the current changes or with time

The magnetic power frequency field along the Little Chicago Road reroute corridor is projected to increase with the Proposed Reroutes along the ROW for average loading from 18 mG in 2006 to 26 mG in 2012. The electric power frequency field is projected to be 1.15 kV/m in 2006 and will not change as the current changes or with time.

The magnetic power frequency field along the Shelburne reroute corridor is projected to increase with the Proposed Reroutes along the ROW for average loading from 14 mG in 2006 to 21 mG in 2012. The electric power frequency field is projected to be 1.15 kV/m in 2006 and will not change as the current changes or with time.

The magnetic power frequency field along the Charlotte reroute corridor is projected to increase with the Proposed Reroutes along the ROW for average loading from 17 mG in 2006 to 25 mG in 2012. The electric power frequency field is projected to be 1.15 kV/m in 2006 and will not change as the current changes or with time.

The magnetic power frequency field for average loading at the edge of the ROW is projected to increase with the Proposed Reroutes for the Vergennes, Little Chicago Road, Shelburne, and Charlotte reroute corridors between 2006 and 2012. The projected magnetic power frequency field for average loading at the edge of the ROW along the reroute corridors

[1] When the Proposed Reroute corridor is a new transmission corridor the concept of "increase" relates to the increase in electric or magnetic power frequency fields between the year of installation (2006) and 2012.

ranges from 21 to 31 mG and the average is approximately 26 mG in 2012. The projected magnetic power frequency fields at the edge of the ROW are approximately 6 and 30 times less than the Florida and ICNIRP guidelines, respectively, for public exposure. The projected electric power frequency fields at the edge of the ROW are approximately 1.5 and 3.5 times less than the Florida and ICNIRP guidelines, respectively.

ORIGINAL CORRIDORS - CHANGES TO POLE STRUCTURE CONFIGURATION

The magnetic power frequency field along the New Haven to Vergennes corridor is projected to increase with the Proposed Reroutes at the edge of the ROW for average loading from 3 mG in 2003 to 34 mG in 2006 and 47 mG in 2012. It is projected that if the existing 34.5 kV power line continues to be used the magnetic power frequency field will remain approximately the same in 2012 (3.8 mG). The proposed replacement of the 34.5 kV power line from Vergennes to the Queen City Substation by a 115 kV power line will allow more current to flow increasing the magnetic power frequency field. The electric power frequency field is projected to increase from 0.07 kV/m in 2003 to 2.05 kV/m in 2006 and will not change as the current changes or with time.

The magnetic power frequency field along the Vergennes to North Ferrisburg corridor is projected to increase with the Proposed Reroutes at the edge of the ROW for average loading from 11 mG in 2003 to 27 mG in 2006 and 39 mG in 2012. It is projected that if the existing 34.5 kV power line continues to be used the magnetic power frequency field will increase to 18 mG in 2012. The proposed replacement of the 34.5 kV power line from Vergennes to Queen City by a 115 kV power line will allow more current to flow increasing the magnetic power frequency field. The electric power frequency field is projected to increase from 0.29 kV/m in 2003 to 1.72 kV/m in 2006 and will not change as the current changes or with time.

The magnetic power frequency field along the North Ferrisburg to Charlotte corridor is projected to increase with the Proposed Reroutes at the edge of the ROW for average loading from 6.1 mG in 2003 to 25 mG in 2006 and 37 mG in 2012. It is projected that if the existing 34.5 kV power line continues to be used the magnetic power frequency field will increase to 12

mG in 2012. The proposed replacement of the 34.5 kV power line from Vergennes to the Queen City Substation by a 115 kV power line will allow more current to flow increasing the magnetic power frequency field. The electric power frequency field is projected to increase from 0.29 kV/m in 2003 to 1.72 kV/m in 2006 and will not change as the current changes or with time.

The magnetic power frequency field along the Charlotte to Shelburne corridor is projected to increase with the Proposed Reroutes at the edge of the ROW for average loading from 1.9 mG in 2003 to 21 mG in 2006 and 33 mG in 2012. It is projected that if the existing 34.5 kV power line continues to be used the magnetic power frequency field will remain approximately the same in 2012 (1.8 mG). The proposed replacement of the 34.5 kV power line from Vergennes to the Queen City Substation by a 115 kV power line will allow more current to flow through increasing the magnetic power frequency field. The electric power frequency field is projected to increase from 0.28 kV/m in 2003 to 2.05 kV/m in 2006 and will not change as the current changes or with time.

The magnetic power frequency field along the Shelburne to Queen City-Pole 51 corridor is projected to increase with the Proposed Reroutes at the edge of the ROW for average loading. It is projected to remain the same at 14 mG from 2003 to 2006 and then increase to 24 mG in 2012. It is projected the magnetic power frequency field will also remain approximately the same if the existing 34.5 kV power line continues to be used up through 2012 (16 mG). The electric power frequency field is projected to increase from 0.28 kV/min in 2003 to 1.72 kV/m in 2006 and will not change as the current changes or with time.

The magnetic power frequency field along the Queen City-Pole 51 to Pole 58 corridor is projected to decrease with the Proposed Reroutes at the edge of the ROW for average loading from 45 mG in 2003 to 20 mG in 2006 and increase to 22 mG in 2012. It is projected the magnetic power frequency field will be higher if the existing 34.5 kV power line from Vergennes to the Queen City Substation continues to be used up through 2012 (62 mG). The electric power frequency field is projected to decrease from 2.05 kV/min in 2003 to 1.17 kV/m in 2006 and will not change as the current changes or with time.

The magnetic power frequency field along the Queen City-Pole 58 to Pole 67 corridor is projected to decrease with the Proposed Reroutes at the edge of the ROW for average loading from 38 mG in 2003 to 28 mG in 2006 and increase to 31 mG in 2012. It is projected the magnetic power frequency field will be higher if the existing 34.5 kV power line from Vergennes to the Queen City Substation continues to be used up through 2012 (54 mG). The electric power frequency field is projected to increase from 1.17 kV/min in 2003 to 2.02 kV/m in 2006 and will not change as the current changes or with time.

The magnetic power frequency field along the Queen City-Pole 67 to the Queen City Substation corridor is projected to decrease with the Proposed Reroutes at the edge of the ROW for average loading from 37 mG in 2003 to 23 mG in 2006 and increase to 27 mG in 2012. It is projected the magnetic power frequency field will be higher if the existing 34.5 kV power line from Vergennes to the Queen City Substation continues to be used up through 2012 (53 mG). The electric power frequency field is projected to increase from 1.16 kV/min in 2003 to 2.12 kV/m in 2006 and will not change as the current changes or with time.

The magnetic power frequency field for average loading at the edge of the ROW is projected to increase with the Proposed Reroutes for the New Haven to Queen City – Pole 51 corridor between 2003 and 2012. The projected magnetic power frequency field for average loading at the edge of the ROW along the New Haven to Queen City – Pole 51 corridor ranges from 24 to 47 mG and the average is approximately 36 mG in 2012. There is a projected decrease with the NRP in the magnetic power frequency field for average loading at the edge of the ROW for the Queen City-Pole 51 to Queen City Substation corridor between 2003 and 2012. The projected magnetic power frequency field along the Queen City - Pole 51 to Queen City Substation corridor ranges from 22 to 31 mG and the average is approximately 27 mG in 2012. The projected magnetic power frequency fields at the edge of the ROW are approximately 3 and 30 times less than the Florida and ICNIRP guidelines, respectively. The projected electric power frequency fields at the edge of the ROW are approximately the same or less than the Florida guideline, and 2 times less than the ICNIRP guidelines.

CONCLUSION

The magnetic power frequency fields at the edge of the ROW for average loading with the NRP Proposed Reroutes are projected to be on the order of 3 times less than the Florida guideline of 150 mG, 30 times less than the ICNIRP guideline of 833 mG, and 300 times less than the IEEE guideline of 9,040 mG for public exposure. The electric power frequency fields at the edge of the ROW for average loading with the NRP Proposed Reroutes are projected to be less than or approximately the same as the Florida guideline of 2 kV/m, and 2 times less than the ICNIRP guideline of 4.2 kV/m and the IEEE guideline of 5 kV/m. This demonstrates that the projected maximum magnetic and electric power frequency fields for the NRP Proposed Reroutes are well below the health-based ICNIRP guidelines.

ELECTRIC & MAGNETIC POWER FREQUENCY FIELDS AT AVERAGE LOADING DIRECTLY UNDER THE POWER LINES (APPENDIX D, TABLES 1 & 4)

REROUTE CORRIDORS

The magnetic power frequency field along the Vergennes reroute corridor is projected to increase with the Proposed Reroutes for average loading directly under the power lines from 34 mG in 2006 to 47 mG in 2012. The electric power frequency field is projected to be 2.05 kV/m in 2006 and will not change as the current changes or with time.

The magnetic power frequency field along the Little Chicago Road reroute corridor is projected to increase with the Proposed Reroutes for average loading directly under the power lines from 28 mG in 2006 to 41 mG in 2012. The electric power frequency field is projected to be 2.05 kV/m in 2006 and will not change as the current changes or with time.

The magnetic power frequency field along the Shelburne reroute corridor is projected to increase with the Proposed Reroutes for average loading directly under the power lines from 21

mG in 2006 to 33 mG in 2012. The electric power frequency field is projected to be 2.05 kV/m in 2006 and will not change as the current changes or with time.

The magnetic power frequency field along the Charlotte reroute corridor is projected to increase with the Proposed Reroutes for average loading directly under the power lines from 26 mG in 2006 to 38 mG in 2012. The electric power frequency field is projected to be 2.05 kV/m in 2006 and will not change as the current changes or with time.

The magnetic power frequency field for average loading directly under the power line is projected to increase with the Proposed Reroutes for the Vergennes, Little Chicago Road, Shelburne, and Charlotte reroute corridors between 2006 and 2012. The projected magnetic power frequency field for average loading directly under the power along the re-routes ranges from 33 mG to 47 mG and the average is approximately 40 mG in 2012. The projected magnetic power frequency fields at the directly under the power line are approximately 4 and 20 times less than the Florida and ICNIRP guidelines, respectively, for public exposure. The projected electric power frequency fields directly under the power line are approximately the same as the Florida guideline and 2 times less than the ICNIRP guideline.

ORIGINAL CORRIDORS - CHANGES TO POLE STRUCTURE CONFIGURATION

The magnetic power frequency field along the New Haven to Vergennes corridor is projected to increase with the Proposed Reroutes from 10 mG in 2003 to 34 mG in 2006 and to 47 mG in 2012 for average loading directly under the power lines. It is projected that if the existing 34.5 kV power line continues to be used the magnetic power frequency field will be 13 mG in 2012. The proposed replacement of the 34.5 kV power line from Vergennes to the Queen City Substation by a 115 kV power line will allow more current to flow increasing the magnetic power frequency field. The electric power frequency field from the Proposed Reroutes is projected to increase from 0.16 kV/m to 2.05 kV/m and will not change as the current changes or with time.

The magnetic power frequency field along the Vergennes to North Ferrisburg corridor is projected to increase with the Proposed Reroutes from 14 mG in 2003 to 28 mG in 2006 and to 41 mG in 2012 for average loading directly under the power lines. It is projected that if the existing 34.5 kV power line from Vergennes to the Queen City Substation continues to be used the magnetic power frequency field will be 23 mG in 2012. The proposed replacement of the 34.5 kV power line by a 115 kV power line will allow more current to flow increasing the magnetic power frequency field. The electric power frequency field from the Proposed Reroutes is projected to increase from 0.29 kV/m to 2.05 kV/m and will not change as the current changes or with time.

The magnetic power frequency field along the North Ferrisburg to Charlotte corridor is projected to increase with the Proposed Reroutes from 7.6 mG in 2003 to 26 mG in 2006 and to 38 mG in 2012 for average loading directly under the power lines. It is projected that if the existing 34.5 kV power line continues to be used the magnetic power frequency field will be 15 mG in 2012. The proposed replacement of the 34.5 kV power line by a 115 kV power line from Vergennes to the Queen City Substation will allow more current to flow increasing the magnetic power frequency field. The electric power frequency field from the Proposed Reroutes is projected to increase from 0.29 kV/m to 2.05 kV/m and will not change as the current changes or with time.

The magnetic power frequency field along the Charlotte to Shelburne corridor is projected to increase with the Proposed Reroutes from 2.4 mG in 2003 to 21 mG in 2006 and to 33 mG in 2012 for average loading directly under the power lines. It is projected that if the existing 34.5 kV power line continues to be used the magnetic power frequency field will remain approximately the same in 2012 (2.2 mG). The proposed replacement of the 34.5 kV power line from Vergennes to the Queen City Substation by a 115 kV power line will allow more current to flow increasing the magnetic power frequency field. The electric power frequency field from the Proposed Reroutes is projected to increase from 0.28 kV/m to 2.05 kV/m and will not change as the current changes or with time.

The magnetic power frequency field along the Shelburne to Queen City-Pole 51 corridor is projected to decrease with the Proposed Reroutes from 18 mG in 2003 to 15 mG in 2006 and increase to 25 mG in 2012 for average loading directly under the power lines. It is projected the magnetic power frequency field will remain approximately the same if the existing 34.5 kV power line from Vergennes to the Queen City Substation continues to be used up through 2012 (19 mG). The electric power frequency field from the Proposed Reroutes is projected to increase from 0.28 kV/m to 2.05 kV/m and will not change as the current changes or with time.

The magnetic power frequency field along the Queen City-Pole 51 to Pole 58 corridor is projected to decrease with the Proposed Reroutes from 45 mG in 2003 to 25 mG in 2006 and increase to 28 mG in 2012 for average loading directly under the power lines. This is approximately 2 times less than the projected magnetic power frequency field of 62 mG if the existing 34.5 kV power line continues to be used up through 2012. The electric power frequency field from the Proposed Reroutes is projected to decrease from 2.05 kV/m to 1.61 kV/m and will not change as the current changes or with time.

The magnetic power frequency field along the Queen City-Pole 58 to Pole 67 corridor is projected to decrease with the Proposed Reroutes from 40 mG in 2003 to 28 mG in 2006 and increase to 31 mG in 2012 for average loading directly under the power lines. This is approximately 2 times less than the projected magnetic power frequency field of 57 mG if the existing 34.5 kV power line continues to be used up through 2012. The electric power frequency field from the Proposed Reroutes is projected to increase from 1.17 kV/m to 2.02 kV/m and will not change as the current changes or with time.

The magnetic power frequency field along the Queen City-Pole 67 to the Queen City Substation corridor is projected to decrease with the Proposed Reroutes from 39 mG in 2003 to 30 mG in 2006 and increase to 34 mG in 2012 for average loading directly under the power lines. This is approximately 2 times less than the projected magnetic power frequency field of 57 mG if the existing 34.5 kV power line continues to be used up through 2012. The electric power frequency field from the Proposed Reroutes is projected to increase from 1.16 kV/m to 2.12 kV/m and will not change as the current changes or with time.

The magnetic power frequency field for average loading directly under the power line is projected to increase with the Proposed Reroutes for the New Haven to Queen City – Pole 51 corridor between 2003 and 2012. There is a projected decrease with the NRP in the magnetic power frequency field for average loading directly under the power line for the Queen City-Pole 51 to Queen City Substation corridor between 2003 and 2012. The projected magnetic power frequency field for average loading directly under the power line ranges from 25 mG to 47 mG and the average is approximately 35 mG in 2012. The projected magnetic power frequency fields for average loading directly under the power line are approximately 3 and 20 times less than the Florida and ICNIRP guidelines, respectively. The projected electric power frequency fields for average loading directly under the power line are 4 times less than the Florida guideline and 2 times less than the ICNIRP guideline.

CONCLUSION

The magnetic power frequency fields with the NRP Proposed Reroutes for average loading directly under the power lines are projected to be on the order of 3 times less than the Florida guideline of 150 mG, 20 times less than the ICNIRP guideline of 833 mG and 250 times less than the IEEE guideline of 9,040 mG for public exposure, respectively. The electric power frequency fields directly under the power line for average or maximum loading with the NRP Proposed Reroutes are projected to be approximately 4 times less than the Florida guideline of 8 kV/m, and 2 times less than the ICNIRP and the IEEE guidelines of 4.2 kV/m and 5 kV/m, respectively. This demonstrates that the projected maximum magnetic and electric power frequency fields for the NRP Proposed Reroutes are well below the health-based ICNIRP guidelines.

MAGNETIC POWER FREQUENCY FIELDS AT MAXIMUM CONTINUOUS LOADING AT THE EDGE OF THE ROW (APPENDIX D, TABLE 3)

The maximum projected magnetic power frequency field along the Vergennes, Little Chicago Road, Shelburne, and Charlotte reroute corridors is 183 mG for the Proposed Reroutes for maximum continuous loading a the edge of the ROW. The projected magnetic power frequency field is approximately 4 times less than the ICNIRP guideline of 833 mG.

The maximum existing and projected magnetic power frequency fields along the New Haven to Vergennes corridor are 12 and 282 mG, respectively for the Proposed Reroutes for maximum continuous loading a the edge of the ROW. The maximum existing and projected magnetic power frequency fields along the Vergennes to North Ferrisburgh corridor are 96 and 274 mG, respectively for the Proposed Reroutes for maximum continuous loading a the edge of the ROW. The maximum existing and projected magnetic power frequency fields along the North Ferrisburgh to Charlotte corridor are 96 and 274 mG, respectively for the Proposed Reroutes for maximum continuous loading a the edge of the ROW. The maximum existing and projected magnetic power frequency fields along the Charlotte to Shelburne corridor are 75 and 282 mG, respectively for the Proposed Reroutes for maximum continuous loading a the edge of the ROW. The maximum existing and projected magnetic power frequency fields along the Shelburne to Queen City Pole 51 corridor are 75 and 274 mG, respectively for the Proposed Reroutes for maximum continuous loading a the edge of the ROW. The projected magnetic power frequency field at the edge of the ROW for maximum continuous loading is approximately 3 times less than the ICNIRP guideline.

The maximum existing and projected magnetic power frequency fields along the Queen City-Pole 51 to Queen City-Pole 58 corridor will increase from 176 mG and 189 mG, respectively, for maximum continuous loading at the edge of the ROW. The maximum existing and projected magnetic power frequency fields along the Queen City-Pole 58 to the Queen City – Pole 67 corridor will increase from 208 and 281 mG, respectively for maximum continuous loading at the edge of the ROW. The maximum existing and projected magnetic power frequency fields along the Queen City-Pole 67 to the Queen City Substation corridor will

increase from 204 and 286 mG, respectively for maximum continuous loading at the edge of the ROW. The projected magnetic power frequency field at the edge of the ROW for maximum continuous loading is approximately 3 times less than the ICNIRP guideline.

There is a projected increase with the Proposed Reroutes in the magnetic power frequency field for maximum continuous loading at the edge of the ROW for the New Haven to Queen City Substation corridor. The projected magnetic power frequency field for maximum continuous loading directly at the edge of the ROW ranges from 183 mG to 286 mG and the average is approximately 240 mG in 2012. The projected magnetic power frequency field at the edge of the ROW for maximum continuous loading is approximately 3 times less than the ICNIRP guideline.

CONCLUSION

The magnetic power frequency fields at the edge of the ROW with the NRP Proposed Reroutes for maximum continuous loading are projected to be approximately 3 times less than the ICNIRP guideline of 833 mG, and 30 times less than the IEEE guideline of 9,040 mG for public exposure. This demonstrates that the projected maximum magnetic power frequency fields at the edge of the ROW for the NRP Proposed Reroutes are well below the health-based ICNIRP guideline.

MAGNETIC POWER FREQUENCY FIELDS AT MAXIMUM CONTINUOUS LOADING DIRECTLY UNDER THE POWER LINE (APPENDIX D, TABLE 3)

The magnetic power frequency field for the Proposed Reroutes along the Vergennes, Little Chicago Road, Shelburne, and Charlotte reroute corridors is projected to be 282 mG for maximum loading directly under the power lines. The New Haven to Queen City Pole 51 corridor is projected to increase from an average of approximately 95 mG to 282 mG for maximum loading directly under the power lines. The magnetic power frequency field along the Queen City Pole 51 to Queen City Pole 58 corridor is projected to increase from 176 mG to 223 mG. The magnetic power frequency field along the Queen City Pole 58 to Pole 67 corridor is

projected to increase from 218 mG to 281 mG. The magnetic power frequency field along the Queen City Pole 67 to Queen City Substation corridor is projected to increase from 215 mG to 286 mG.

There is a projected increase with the Proposed Reroutes in the magnetic power frequency field for maximum continuous loading directly under the power line for the New Haven to Queen City Substation corridor. The projected magnetic power frequency field for maximum continuous loading directly under the power line ranges from 223 mG to 286 mG and the average is approximately 280 mG in 2012**.** The projected magnetic power frequency fields directly under the proposed power line for maximum continuous loading are approximately 3 and 30 times less than the ICNIRP and the IEEE guidelines for public exposure, respectively.

CONCLUSION

The magnetic power frequency fields with the NRP Proposed Reroutes for maximum loading directly under the power lines are expected to be on the order of 3 to 30 times less than the ICNIRP guideline of 833 mG and the IEEE guideline of 9,040 mG for public exposure, respectively. This demonstrates that the projected maximum magnetic power frequency fields directly under the power lines for the NRP Proposed Reroutes are well below the health-based ICNIRP guideline.

SUMMARY

In summary, the projected magnetic power frequency fields with the NRP Proposed Reroutes at the edge and in the ROW are less than the health-based ICNIRP guideline of 833 mG and the IEEE guideline of 9,040 mG for public exposure. The projected electric power frequency fields with the NRP Proposed Reroutes are less than the health-based ICNIRP guideline of 4.2 kV/m and the IEEE guideline of 5 kV/m at the edge of the ROW. This demonstrates that the projected electric and magnetic power frequency fields at the edge of the ROW and directly under the power line for the NRP reroute corridors and with proposed changes

in pole structure configuration along the New Haven to Queen City corridor are well below the health-based ICNIRP guidelines.

CONCLUSIONS FOR THE NRP PROPOSED REROUTES

The Vermont Department of Health concludes that the electric and magnetic power frequency field strength for the NRP Proposed Reroutes does not appear to be a public health hazard based on a review of the literature and on calculations with existing and projected current loads. In the absence of federal and state standards, the Vermont Department of Health applied the Florida (150 mG, 2 kV/m), ICNIRP (833 mG, 4.2 kV/m) and IEEE (9,040 mG, 5 kV/m) guidelines for electric and magnetic power frequency fields to its analysis of the NRP Proposed Reroutes.

The magnetic power frequency field for average loading at the edge of the ROW is projected to increase with the Proposed Reroutes along the Vergennes, Little Chicago Road, Shelburne, and Charlotte reroute corridors between 2006 and 2012 to less than 35 mG. This demonstrates that the projected magnetic power frequency fields at the edge of the ROW for the Proposed Reroutes are well below the health-based ICNIRP guideline of 833 mG.

The magnetic power frequency field for average loading at the edge of the ROW is projected to increase with the Proposed Reroutes along the New Haven to Queen City - Pole 51 corridor between 2003 and 2012. There is a projected decrease with the NRP in the magnetic power frequency field for the Queen City-Pole 51 to Queen City Substation corridor. The projected magnetic power frequency fields at the edge of the ROW are less than 50 mG. This demonstrates that the projected magnetic power frequency fields for average loading at the edge of the ROW for the Proposed Reroutes are well below the health-based ICNIRP guideline of 833 mG.

The magnetic power frequency field for average loading directly under the power line is projected to increase with the Proposed Reroutes along the Vergennes, Little Chicago Road,

Shelburne, and Charlotte reroute corridors between 2006 and 2012 to less than 50 mG. This demonstrates that the projected magnetic power frequency fields directly under the power line for the Proposed Reroutes are well below the health-based ICNIRP guideline of 833 mG.

The magnetic power frequency field for average loading directly under the power line is projected to increase with the Proposed Reroutes along the New Haven to Queen City - Pole 51 corridor between 2003 and 2012. There is a projected decrease with the Proposed Reroutes in the magnetic power frequency field for the Queen City-Pole 51 to Queen City Substation corridor between 2003 and 2012. The projected magnetic power frequency fields for average loading directly under the power lines are less than 50 mG. This demonstrates that the projected magnetic power frequency fields for average loading directly under the power line for the Proposed Reroutes are well below the health-based ICNIRP guideline of 833 mG.

The projected magnetic power frequency field for maximum continuous loading at the ROW edge for the Vergennes, Little Chicago Road, Shelburne, and Charlotte reroutes is 183 mG. This demonstrates that the projected maximum magnetic power frequency fields at the edge of the ROW for the Proposed Reroutes are well below the health-based ICNIRP guideline of 833 mG.

The magnetic power frequency field for maximum continuous load at the edge of the ROW is projected to increase with the Proposed Reroutes along the New Haven to Queen City Substation corridor. The average projected magnetic power frequency field at the edge of the ROW for maximum continuous load for the New Haven to Queen City Substation is approximately 270 mG. This demonstrates that the projected maximum magnetic power frequency fields at the edge of the ROW for the Proposed Reroutes are well below the health-based ICNIRP guideline of 833 mG.

The magnetic power frequency field for maximum continuous load directly under the power line is projected to increase with the Proposed Reroutes along the New Haven to Queen City Substation corridor. The projected magnetic power frequency field directly under the proposed power line for maximum continuous loading is approximately 280 mG for the reroute

and the New Haven to Queen City Substation corridors. This demonstrates that the projected maximum magnetic power frequency fields directly under the power line for the Proposed Reroutes are well below the health-based ICNIRP guideline of 833 mG.

The electric power frequency fields at the edge of the ROW are projected to increase with the Proposed Reroutes along the New Haven to Queen City – Pole 51 corridor, decrease along the Queen City - Pole 51 to Pole 58 corridor, and increase along the Queen City - Pole 58 to Queen City Substation corridor. The electric power frequency fields for the reroute and New Haven to Queen City Substation corridors (1.15 to 2.12 kV/m) are projected to be less than ro approximately the same as the Florida guideline of 2 kV/m at the edge of the ROW. This demonstrates that the projected electric power frequency fields at the edge of the ROW for the Proposed Reroutes are well below the health-based ICNIRP guideline of 4.2 kV/m.

The electric power frequency fields directly under the power line are projected to increase with the Proposed Reroutes along the New Haven to Queen City – Pole 51 corridor, decrease along the Queen City – Pole 51 to Pole 58 corridor, and increase along the Queen City – Pole 58 to Queen City Substation corridor. The electric power frequency fields for the reroute and New Haven to Queen City Substation corridors are projected to be less than the Florida guideline of 8 kV/m (1.61 to 2.12 kV/m). This demonstrates that the projected electric power frequency fields at the directly under the power line for the Proposed Reroutes are well below the health-based ICNIRP guideline of 4.2 kV/m.

In summary, the projected magnetic power frequency fields at the edge of the ROW and directly under the power line for average and maximum continuous load with the NRP Proposed Reroutes are less than the health-based ICNIRP guideline of 833 mG. The projected electric power frequency fields at the edge of the ROW and directly under the power line for average and maximum continuous load with the NRP Proposed Reroutes are less than the ICNIRP guideline of 4.2 kV/m. This demonstrates that the projected electric and magnetic power frequency fields for the NRP Proposed Reroutes are well below the health-based ICNIRP guidelines at the edge of the ROW and directly under the power line.

The Vermont Department of Health concludes that modifications to the NRP Proposed Reroutes are not required for health reasons, but Vermont's policy of prudent avoidance to mitigate EMF exposure as identified in the Vermont Twenty Year Electric Plan (1994) should be continued.

APPENDIX C

DATA FROM VELCO

Table 1. Proposed Electric & Magnetic Field Input Data

Alt 1-1, 2-2, 3-1, 4-1, Crosses 6, 15

This is the field input data for proposed 115kV line for the Vergennes, Little Chicago Road, Shelburne, and Charlotte reroutes, NH-V and V-NF corridors.

Bundle	x-feet	y-feet	n cond	Cond D	Bund D	l-n volt	phase
1	-5.5	37.2	1	1.345	18	69.72	0.00
2	5.5	28.7	1	1.345	18	69.72	240.00
3	-5.5	20.2	1	1.345	18	69.72	120.00

Alt 2-3

This is the field input data for proposed 115kV line for part of the Little Chicago Road reroute

Bundle	x-feet	y-feet	n cond	Cond D	Bund D	l-n volt	phase
1	-14	42.2	1	1.345	18	69.72	0.00
2	0	42.2	1	1.345	18	69.72	240.00
3	14	42.2	1	1.345	18	69.72	120.00

Cross 5

This is the field input data for proposed 115kV line for part of the NH-V corridor.

Bundle	x-feet	y-feet	n cond	Cond D	Bund D	l-n volt	phase
1	-76	29.6	1	1.108	18	69.72	0.00
2	-90	29.6	1	1.108	18	69.72	240.00
3	-104	29.6	1	1.108	18	69.72	120.00
4	-140.5	37.2	1	1.345	18	69.72	0.00
5	-129.5	28.7	1	1.345	18	69.72	240.00
6	-140.5	20.2	2	1.345	18	69.72	120.00

Cross 6A, 6B, 8, 9,10,12, 14, 18B, 19

This is the field input data for proposed 115kV line for parts of the NH-QC corridor.

Bundle	x-feet	y-feet	n cond	Cond D	Bund D	l-n volt	phase
1	-20.5	37.2	1	1.345	18	69.72	0.00
2	-9.5	28.7	1	1.345	18	69.72	240.00
3	-20.5	20.2	1	1.345	18	69.72	120.00

Cross 7, 16, 18A, 20

This is the field input data for proposed 115kV line for parts of the NH-QC corridor.

Bundle	x-feet	y-feet	n cond	Cond D	Bund D	l-n volt	phase
1	14.5	37.2	1	1.345	18	69.72	0.00
2	25.5	28.7	1	1.345	18	69.72	240.00
3	14.5	20.2	1	1.345	18	69.72	120.00

Cross 17

This is the field input data for proposed 115kV line for parts of the NH-QC corridor.

Bundle	x-feet	y-feet	n cond	Cond D	Bund D	l-n volt	phase
1	-14.5	37.2	1	1.345	18	69.72	0.00
2	-25.5	28.7	1	1.345	18	69.72	240.00
3	-14.5	20.2	1	1.345	18	69.72	120.00

Cross 21A

This is the field input data for proposed 115kV line for parts of the NH-QC corridor.

Bundle	x-feet	y-feet	n cond	Cond D	Bund D	l-n volt	phase
1	-7	37.2	1	1.345	18	69.72	0.00
2	-18	28.7	1	1.345	18	69.72	240.00
3	-7	20.2	1	1.345	18	69.72	120.00

Cross 23A

This is the field input data for proposed 115kV line for parts of the NH-QC corridor.

Bundle	x-feet	y-feet	n cond	Cond D	Bund D	l-n volt	phase
1	-30.25	29.6	1	1.108	18	69.72	0.00
2	-16.25	29.6	1	1.108	18	69.72	240.00
3	-2.25	29.6	1	1.108	18	69.72	120.00
4	61.75	37.2	1	1.345	18	69.72	0.00
5	50.75	28.7	1	1.345	18	69.72	240.00

6	61.75	20.2	1	1.345	18	69.72	120.00

Cross 23C

This is the field input data for proposed 115kV line for parts of the NH-QC corridor.

Bundle	x-feet	y-feet	n cond	Cond D	Bund D	l-n volt	phase
1	-30.25	29.6	1	1.108	18	69.72	0.00
2	-16.25	29.6	1	1.108	18	69.72	240.00
3	-2.25	29.6	1	1.108	18	69.72	120.00
4	71.75	45.4	1	1.345	18	69.72	0.00
5	60.75	36.9	1	1.345	18	69.72	240.00
6	71.75	28.4	1	1.345	18	69.72	120.00

Cross 25

This is the field input data for proposed 115kV line for parts of the NH-QC corridor.

Bundle	x-feet	y-feet	n cond	Cond D	Bund D	l-n volt	phase
1	6	29	1	1.345	18	69.72	0.00
2	20	29	1	1.345	18	69.72	240.00
3	34	29	1	1.345	18	69.72	120.00

Notes: *X-feet for the proposed structures are determined from the Cross Sections provided in Supplemental Testimony of David J. Boers, P.E. and the distance from the center of the structure provided in VELCO Exhibit DJB DPS6-1..

*Y-feet for the proposed structures are the “Y” 100 C feet from VELCO Exhibit DJB DPS6-1 (revised 26-Apr-04 by M. McCarty in e-mail from Jeff Carrara).

*N-cond, Bund-D, and L-n voltage for the proposed structures are provided in VELCO Exhibit DJB DPS6-1 and for existing structures from Prefiled Direct Testimony of Carla A. White and Lawrence G. Crist.

APPENDIX D

Table 1.

MAGNETIC POWER FREQUENCY FIELD STRENGTH AT AVERAGE LOADING DIRECTLY UNDER THE POWER LINE

(milliGauss)

	Existing Power Line				Proposed Power Line		
Corridor*	**2003**	**2006**	**2009**	**2012**	**2006**	**2009**	**2012**
Ver	NA**	NA	NA	NA	34	42	47
LCR	NA	NA	NA	NA	28	36	41
Shel	NA	NA	NA	NA	21	28	33
Char	NA	NA	NA	NA	26	33	38
NH – V	10	11	12	13	34	42	47
V – NF	14	19	21	23	28	36	41
NF – C	7.6	12	14	15	26	33	38
C – S	2.4	1	1.4	2.2	21	28	33
S – QC51	18	17	17	19	15	21	25
QC51 – 58	45	50	56	62	25	26	28
QC58 – 67	40	46	52	57	28	29	31
QC67 – QC	39	45	52	57	30	31	34

*Unless designated as a reroute, the corridor is as originally proposed

Ver = Vergennes reroute

LCR = Little Chicago Road reroute

Shel = Shelburne reroute

Char = Charlotte reroute

NH = New Haven substation

V = Vergennes substation

NF = North Ferrisburgh substation

C = Charlotte substation

S = Shelburne substation

QC51-58 = Queen City from poles 51 to 58

QC58-67 = Queen City from poles 58 to 67

QC67-QC = Queen City from pole 67 to substation

**NA = Not applicable

Table 2.

MAGNETIC POWER FREQUENCY FIELD STRENGTH AT AVERAGE LOADING ON THE EDGE OF THE RIGHT OF WAY*

(milliGauss)

	Existing Power Line				Proposed Power Line		
Corridor**	**2003**	**2006**	**2009**	**2012**	**2006**	**2009**	**2012**
Ver	NA***	NA	NA	NA	22	27	31
LCR	NA	NA	NA	NA	18	23	26
Shel	NA	NA	NA	NA	14	18	21
Char	NA	NA	NA	NA	17	21	25
NH – V	3	3.3	3.5	3.8	34	42	47
V – NF	11	15	17	18	27	35	39
NF – C	6.1	10	11	12	25	32	37
C – S	1.9	0.8	1.1	1.8	21	28	33
S – QC51	14	13	14	16	14	20	24
QC51 – 58	45	50	56	62	20	21	22
QC58 – 67	38	44	50	54	28	29	31
QC67 – QC	37	43	49	53	23	24	27

*40 foot ROW for all corridors

** Unless designated as a reroute, the corridor is as originally proposed
Ver = Vergennes reroute
LCR = Little Chicago Road reroute
Shel = Shelburne reroute
Char = Charlotte reroute
NH = New Haven substation
V = Vergennes substation
NF = North Ferrisburgh substation
C = Charlotte substation
S = Shelburne substation
QC51-58 = Queen City from poles 51 to 58
QC58-67 = Queen City from poles 58 to 67
QC67-QC = Queen City from pole 67 to substation
***NA = Not applicable

Table 3.

MAGNETIC POWER FREQUENCY FIELD STRENGTH AT MAXIMUM CONTINUOUS RATED LOAD DIRECTLY UNDER THE POWER LINE AND AT THE EDGE OF THE RIGHT OF WAY

(milliGauss)

	Existing Power Line		Proposed Power Line	
Corridor*	**Maximum**	**ROW Edge****	**Maximum**	**ROW Edge****
Ver	NA***	NA	282	183
LCR	NA	NA	282	183
Shel	NA	NA	282	183
Char	NA	NA	282	183
NH – V	41	12	282	282
V – NF	121	96	282	274
NF – C	121	96	282	274
C – S	94	75	282	282
S – QC51	94	75	282	274
QC51 – 58	176	176	223	189
QC58 – 67	218	208	281	281
QC67 – QC	215	204	286	286

* Unless designated as a reroute, the corridor is as originally proposed
Ver = Vergennes reroute
LCR = Little Chicago Road reroute
Shel = Shelburne reroute
Char = Charlotte reroute
NH = New Haven substation
V = Vergennes substation
NF = North Ferrisburgh substation
C = Charlotte substation
S = Shelburne substation
QC51-58 = Queen City from poles 51 to 58
QC58-67 = Queen City from poles 58 to 67
QC67-QC = Queen City from pole 67 to substation
**40 foot ROW for all corridors
***NA = Not applicable

Table 4.

ELECTRIC POWER FREQUENCY FIELD STRENGTH AT MAXIMUM OR AVERAGE CONTINUOUS RATED LOAD DIRECTLY UNDER THE POWER LINE AND AT THE EDGE OF THE RIGHT OF WAY

(kilovolt/meter)

	Existing Power Line		Proposed Power Line	
Corridor*	**Maximum**	**ROW Edge****	**Maximum**	**ROW Edge****
Ver	NA***	NA	2.05	1.15
LCR	NA	NA	2.05	1.15
Shel	NA	NA	2.05	1.15
Char	NA	NA	2.05	1.15
NH – V	0.16	0.07	2.05	2.05
V – NF	0.29	0.29	2.05	1.72
NF – C	0.29	0.29	2.05	1.72
C – S	0.28	0.28	2.05	2.05
S – QC51	0.28	0.28	2.05	1.72
QC51 – 58	2.05	2.05	1.61	1.17
QC58 – 67	1.17	1.17	2.02	2.02
QC67 – QC	1.16	1.16	2.12	2.12

* Unless designated as a reroute, the corridor is as originally proposed
Ver = Vergennes reroute
LCR = Little Chicago Road reroute
Shel = Shelburne reroute
Char = Charlotte reroute
NH = New Haven substation
V = Vergennes substation
NF = North Ferrisburgh substation
C = Charlotte substation
S = Shelburne substation
QC51-58 = Queen City from poles 51 to 58
QC58-67 = Queen City from poles 58 to 67
QC67-QC = Queen City from pole 67 to substation
**40 foot ROW for all corridors
***NA = Not applicable

Table 5.

DISTANCE FROM CENTER OF RIGHT OF WAY AT WHICH MAGNETIC POWER FREQUENCY FIELD HAS DROPPED TO 4 MILLIGAUSS

(feet)

	Existing Power Line				Proposed Power Line			
	2003		2012		2006		2012	
Corridor*	**West**	**East**	**West**	**East**	**West**	**East**	**West**	**East**
Ver	NA**	NA	NA	NA	66	56	78	68
LCR	NA	NA	NA	NA	60	50	72	62
Shel	NA	NA	NA	NA	50	42	65	55
Char	NA	NA	NA	NA	56	48	70	60
NH – V	40	40	50	50	81	41	92	52
V – NF	30	30	42	42	40	70	52	82
NF – C	19	19	32	32	36	68	50	80
C – S	all < 4 mG		all < 4 mG		65	27	80	40
S – QC51	36	36	37	37	20	53	35	67
QC51 – 58	32	58	50	81	60	72	70	77
QC58 – 67	87	106	106	109	95	95	101	110
QC67 – QC	87	163	106	165	78	123	85	136

* Unless designated as a reroute, the corridor is as originally proposed

Ver = Vergennes reroute

LCR = Little Chicago Road reroute

Shel = Shelburne reroute

Char = Charlotte reroute

NH = New Haven substation

V = Vergennes substation

NF = North Ferrisburgh substation

C = Charlotte substation

S = Shelburne substation

QC51-58 = Queen City from poles 51 to 58

QC58-67 = Queen City from poles 58 to 67

QC67-QC = Queen City from pole 67 to substation

**NA = Not applicable

Table 6.

MAGNETIC POWER FREQUENCY FIELD STRENGTH AT IDENTIFIED BUILDINGS NEAR THE RIGHT OF WAY AT AVERAGE LOADING

(milliGauss)

Corridor[1]	Near Pole # or Road	Distance[2] feet	Existing Power Line 2003	Existing Power Line 2012	Proposed Power Line 2006	Proposed Power Line 2012	
Ver							
	Monkton Rd	-50	NA[3]	NA	6.6	9.1	
	Monkton Rd	150	NA	NA	< 2	< 2	
	Middlebrook Rd	-50	NA	NA	6.6	9.1	
	Middlebrook Rd	300	NA	NA	< 2	< 2	
	Plank Rd	250	NA	NA	< 2	< 2	
	Route 7	-200	NA	NA	< 2	< 2	B[4]
	Meigs Rd	75	NA	NA	2.4	3.4	B
	Meigs Rd	50	NA	NA	4.9	6.7	B
	Meigs Rd	175	NA	NA	< 2	< 2	
	Meigs Rd	-75	NA	NA	3.2	4.4	B
LCR							
	391	-140	NA	NA	< 2	< 2	
	391	220	NA	NA	< 2	< 2	
Shel							
	173	150	NA	NA	< 2	< 2	
	NA	300	NA	NA	< 2	< 2	
	NA	-300	NA	NA	< 2	< 2	
Char							
	NA	-250	NA	NA	< 2	< 2	
	NA	250	NA	NA	< 2	< 2	
NH – V							
	63	50	3	3.8	3.1	4.3	B
	68	-50	3	3.8	12	16	
NF – C							
	264	50	< 2	2	7.7	12	
	264	-30	2.2	4.5	4.9	7.3	
	264	-500	< 2	< 2	< 2	< 2	

C – S	238	-25	< 2	< 2	4.9	7.5	
S - QC51	Bay Rd 128	160	< 2	< 2	< 2	< 2	
	Bay Rd 119	45	2.7	3.0	2.2	3.8	
	Bay Rd 117	20	16.9	18.2	5.4	9.4	
	Edward Dr	35	4.1	4.5	3.0	5.3	
	Mariners Cove	-115	< 2	< 2	< 2	< 2	
	Crown Rd	135	< 2	< 2	< 2	< 2	B
	Champlain Shores	35	4.1	4.5	3.0	5.3	
	Lakeview Dr	35	4.1	4.5	3.0	5.3	
	Hunters Way	60	< 2	< 2	< 2	2.5	
	Clearwater Circle	-145	< 2	< 2	< 2	< 2	
	Palmer Court	25	6.7	7.3	4.4	7.6	
	Wild Rose Circle	20	16.9	18.2	5.4	9.4	
	Windmill Bay Rd	-75	< 2	< 2	< 2	2.5	
	Penny Lane	15	11.3	12.2	5.4	9.4	
	Shelburne Bay Retirement	85	< 2	< 2	< 2	2.2	
	Pine Haven Shores Lane	-65	< 2	< 2	< 2	3.3	
		-115	< 2	< 2	< 2	< 2	
		-165	< 2	< 2	< 2	< 2	
	Pine Haven Shore	35	4.1	4.5	3.0	5.3	B
		215	< 2	< 2	< 2	< 2	
QC 51 - 58	Nesti Dr	50	15.1	20.5	7.5	8.2	B
		100	4.7	6.3	2.2	2.5	B
	South Beach Road	-60	10.2	13.0	4.0	5.2	
		-150	2.1	2.7	< 2	< 2	
	Bartlett Bay Rd	50	15.1	20.5	7.5	8.2	B
QC 58 - 67	Holmes Rd	115	2.2	2.4	2.4	3.4	B
		135	< 2	< 2	< 2	2.4	B
		-540	< 2	< 2	< 2	< 2	

	Fayette Rd	250	< 2	< 2	< 2	< 2	
QC 67 - QC	Hannaford Dr	585	< 2	< 2	< 2	< 2	B
	Maple Ave	-65	7.0	10.2	5.6	6.4	

[1] Unless designated as a reroute, the corridor is as originally proposed
Ver = Vergennes reroute
LCR = Little Chicago Road r-route
Shel = Shelburne reroute
Char = Charlotte reroute
NH = New Haven substation
V = Vergennes substation
NF = North Ferrisburgh substation
C = Charlotte substation
QC = Queen City substation
QC51-58 = Queen City from poles 51 to 58
QC58-67 = Queen City from poles 58 to 67
QC67-QC = Queen City from pole 67 to substation

[2]Distance is from center of ROW
[3]NA = Not applicable
[4]B = Business