

**STATE OF VERMONT
PUBLIC SERVICE BOARD**

DOCKET NO. 6860

Petitions of Vermont Electric Power Company)
Inc. (VELCO) and Green Mountain Power)
Corporation (GMP) for a certificate of public)
good, pursuant to 30 V.S.A. Section 248,)
authorizing VELCO to construct the so-called)
Northwest Reliability Project)

**PREFILED SURREBUTTAL TESTIMONY OF
CARLA A. WHITE
And
LAWRENCE G. CRIST**

**ON BEHALF OF
VERMONT DEPARTMENT OF PUBLIC SERVICE**

July 26, 2004

Summary: The purpose of Ms. White's and Mr. Crist's testimony is to address the rebuttal testimony of VCSE's witness Dulsky and the Towns' witness Emerson with respect to electric and magnetic fields.

Q1. Please state your name and business address.

A1. Carla A. White:

My name is Carla A. White. My business address is Radiological Health, Health Protection, Vermont Department of Health, 108 Cherry Street, PO Box 70, Burlington, VT 05402-0070.

Lawrence G. Crist:

My name is Lawrence G. Crist. My business address is Health Protection, Vermont Department of Health, 108 Cherry Street, PO Box 70, Burlington, VT 05402-0070.

Q2. By whom are you employed and in what capacity?

A2. Carla A. White:

I am employed by the Vermont Department of Health as a Senior Radiological Health Specialist.

Lawrence G. Crist:

I am employed by the Vermont Department of Health as Director of the Division of Health Protection.

Q3. Have you previously provided testimony in this case.

A3. Yes.

Q4. What is the purpose of your testimony?

A4. We have reviewed the rebuttal testimony of VCSE's witness Dulsky and the Towns' witness Emerson and provide this testimony to address those witnesses' statements and recommendations with respect to electric and magnetic fields.

Q5. Please refer to Dr. Dulsky's answer to Question 6 on page 3 of her testimony, and specifically to her statement that the Board should take all possible steps to minimize exposure to EMF until certainty of safety has been established. Please explain whether you agree or disagree with that statement.

A5. We disagree with this statement because it is virtually impossible to prove that there is an absolute certainty of safety from any type of activity. Because of the scientific uncertainty of the effect of power frequency EMF on human health, the policy of prudent avoidance is used to balance the actions of avoiding potential harm and the costs attached to these actions. Please refer to prefiled testimony of December 17, 2003 for a discussion of the Vermont Twenty Year Electric Plan (1994) Policy of Prudent Avoidance.

Q6. Please refer to Dr. Dulsky's answer to Question 7 on page 4 of her testimony, and specifically to her recommendation that chronic exposure to EMF should be limited to 3 to 4 mG. Please explain whether you agree or disagree with that recommendation.

A6. The VDH does not believe that it is appropriate at this time to establish a limit of 3 to 4mG for EMF emitted by overhead transmission power lines or underground cables for this project because:

1. data in the current body of literature is insufficient to establish a direct cause and effect relationship between EMF exposure and adverse health effects,
2. epidemiological studies do not show a consistent association between exposure to EMF and adverse health effects,
3. there is little evidence of the effect of power frequency EMF on cells, tissues or animals below 1000 mG, and
4. there is no known biological mechanism for how EMF would cause cancer.

It also should be noted:

1. the average home encompasses a range of EMF strengths from 0.1 to 4 mG,
2. no other States have instituted health based standards to EMFs from transmission lines,
3. Existing transmission lines along the proposed corridor emit EMFs in a range of 2 to 45 mG with average loading at the edge of the ROW and of 12 to 208 mG with maximum continuous loading at the edge of the ROW, with no evidence of adverse health effects, and
4. ICNIRP has established health-based EMF standards of 833mG.

Creation of a health-based standard for power frequency EMF of 3 to 4 mG is not justified at this time. If EMFs in excess of 3 to 4 mG were creating a health problem we would be seeing many more childhood leukemia cases than we are at the present time, which we are not as Mr. Crist testified in this proceeding on February 24, 2004. For an

average relative risk of 2.0, which has been calculated from epidemiological studies from exposure to EMF, we would expect to see 9 new cases of childhood leukemia per year in Vermont and we are not. We are seeing about 6 cases a year, which is less than that, and is fully consistent with the national average rate we would expect to see based on population. In addition, the scientific community continues to look aggressively for a connection between EMF and certain diseases, particularly childhood leukemia, but there is insufficient evidence to establish a direct cause and effect relationship between the EMFs and childhood leukemia.) The Vermont Department of Health concludes that the policy of prudent avoidance as delineated in the Vermont Twenty Year Electric Plan (1994) continues to be appropriate for evaluation of this project.

Q7. Please refer to the prefiled rebuttal testimony of Mr. Emerson, and in particular the concerns he expresses regarding EMFs. Please describe any steps you have taken to evaluate the potential exposure of the students at the Waldorf School in Charlotte to EMFs.

A7. The Vermont Department of Health (“VDH”) considered the issue of electric and magnetic power frequency fields (“EMF”) from the proposed overhead transmission line and underground transmission cable and their possible health effects on the students in the Waldorf High School in Charlotte very seriously. We surveyed the site on July 22, 2004. The strength of the magnetic power frequency field under the present overhead 34.5 kV power line was 2.5 mG compared to a background of approximately 1 mG away from the power line. We were given permission to survey the inside building and found the following EMF fields:

Background of approximately 1.5 mG in the middle of all rooms

Electric Panels in room behind reception area:

Background of 1.6 mG in the middle of the room

Large electric panel on left: 119 mG on contact and 32 mG at 1 foot away

Upper electric panel on right: 45 mG on contact

Lower electric panel on right: 119 mG on contact

Electric panel on wall to right: 11 mG on contact

Door facing the 34.5 kV power lines in the hand-work art room: 1.8 mG

Computer: 15 mG on contact and 2 mG at 2 feet away

Fluorescent overhead light fixture: Ranges from 2 mG to 39 mG on contact

Fine arts room closest to railroad: 1.5 mG

Refrigerator:

14 mG at front on contact

42 mG in back on contact

Water cooler: 28 mG on contact

These are all consistent with typical EMF strengths found in homes and for home appliances.

In addition, using the same methodology we have used throughout our analysis of this project, we calculated the projected EMFs within the school at the closest approach to the school from the existing 34.5 kV line (20 feet away), the original proposed route (160 feet away), the LandWorks Charlotte Alternative (18 to 23 feet away) and from a hypothetical underground transmission cable (18 feet away). The results of these calculations are contained in the table attached as Exhibit DPS-VDH-7.

Q8. Please explain whether VDH has formed an opinion on whether the location of a pole close to the Waldorf School as provided in the Landworks proposed route poses a health risk to the students.

A8. The VDH concludes that the projected magnetic power frequency fields for all alternatives at the closest approach to the school are less than the health-based ICNIRP guideline of 833 mG and therefore would not pose an adverse health risk. The expected EMF from the pole close to the school, as proposed by Landworks, would be expected to increase the EMF from the present levels that currently result from the existing transmission line. The present average EMF level in the Fine Arts room is 1.5 mG and is projected to increase to between 20 mG and 24 mG in 2012 at the wall closest to the railroad track. The EMF strength in the middle of the room will be less due to the increased distance away from the overhead transmission line. The VDH notes that this is 34 times less than the health based ICNIRP standard and is comparable to levels of exposure from computer monitor screens, refrigerator and water coolers used in the school as listed in A7 above. However, this level would not be expected in other areas of the building, due to increased distance from the proposed transmission line and from any metallic material in the walls. The projected EMFs as listed in DPS-VDH-7 are not of concern because these levels are typically encountered in every day life from indoor wiring, appliances, etc.

Q9. Please explain whether VDH has any concerns if the transmission line were buried on the east side of the Waldorf School.

A9. Most students attending the Waldorf School will need to cross over the underground transmission cable or under the overhead transmission line in order to get to

the school, on foot or by vehicle. If traveling by foot, based on the calculations in our Underground Supplement report, the EMF strength would vary from a minimum of 36 mG to 5,308 mG for an underground transmission cable and 38 mG to less than 282 mG for the overhead transmission line. On average the EMF from the underground transmission cable would be higher than the EMF from the overhead transmission line. The VDH concludes that the magnetic power frequency fields from an underground transmission cable may pose a public health hazard to students and some method of reducing the EMF or restricting use of that area would need to be employed, as discussed in our Underground Supplement.

Q10. Does this conclude your surrebuttal testimony?

A10. Yes.