STATE OF VERMONT
PUBLIC SERVICE BOARD

Petition of Vermont Gas Systems, Inc., requesting a Certificate of Public Good pursuant to 30 V.S.A. § 248, authorizing the construction of the "Addison Rutland Natural Gas Project Phase 2 (ARNGP Phase 2)" to extend natural gas transmission facilities in Franklin and Addison Counties, for service to the Ticonderoga mill in New York, and construction of two Community Gate Stations for distribution service in the towns of Cornwall and Shoreham, Vermont	)))))))))	Public Service Board Docket No. 8180

PREFILED TESTIMONY OF SCOTT DARLING

On Behalf of the Vermont Agency of Natural Resources,
Fish and Wildlife Department

Summary of Testimony

Mr. Darling is a Wildlife Biologist with the Vermont Department of Fish and Wildlife. The purpose of his testimony is to review the potential impacts of the proposed project on Vermont's state and federally endangered bats, to make recommendations to minimize any impacts from the project, and to propose a course of further evaluation of potential impacts and necessary responses where warranted.

Q1. Please state your name, place of employment, and your current position with the Department.

A1. Scott Darling, wildlife biologist for the Vermont Fish and Wildlife Department and stationed at the Rutland office. My current title is Wildlife Management Program Manager.

Q2. Please provide a description of your educational background.

A2. I have a B.S. in Wildlife Biology from the University of Vermont and an M.S. in Administration from St. Michael's College. I have been a certified wildlife biologist by the Wildlife Society since 1987. My resume is attached.

Q3. Have you previously provided testimony to the Public Service Board?

A3. Yes, I provided testimony on behalf of the Department regarding Dockets 6860, 6911, 7156, 7250, 7508, and 7628. The latter dockets were proposals for wind energy facilities in East Haven, Sheffield, Lowell, and Georgia, Vermont.

Q4. Please describe your experience and training regarding bats.

A4. My training and experience with bats has been extensive since 2001. As a result of my work on bats, Vermont is one of the leading states with bat population inventory and management. Since the onset of white-nose syndrome (WNS), a highly infectious fungal disease that has devastated bat populations throughout the eastern United States, Vermont has been a leader in bat population monitoring, research, and conservation strategies to save bats from this crisis.

I have worked closely with other bat biologists from the U.S. Fish and Wildlife Service, other state fish and wildlife agencies, and universities. I am an active participant in the Northeast Bat Working Group, an organization of state, federal, and university bat biologists focusing on bat conservation and management issues in the Northeast. I have also been appointed to numerous national committees including the U.S. Department of Interior's Wind Turbine Guidelines Advisory Committee, the technical committee of the Bat-Wind Energy Cooperative, and the Steering Committee for the National WNS Plan.

My responsibilities for the conservation of Vermont's nine bat species require me to develop and implement the state's bat conservation and recovery plan. A significant element of the state's bat conservation and management program is to conduct numerous field surveys and research projects. In the past several years, field surveys have included bat hibernacula (i.e., caves and mines) surveys, summer mist-netting and acoustic surveys, and fall swarming surveys to inventory and monitor bat species composition or

monitor population indices. Research work has focused primarily on the Indiana bat (*Myotis sodalis*) and includes capture and radio telemetry to study spring emergence and migration, maternity colony habitat, and summer foraging habitat of this federally endangered species.

Q5. Do you have a role in assessing Vermont's bat populations and their habitat for the Department of Fish and Wildlife?

A5. One of my roles as the state's bat biologist is to apply my expertise in evaluating Vermont's bat populations, designing research projects to further our understanding of these populations, and developing and implementing conservation and management programs to maintain bat populations. One of these programs includes evaluating land use and management activities for their impacts to bat populations and, where appropriate, providing the DFW with an assessment of the impacts of these activities in preparation for specific regulatory procedures (e.g., Vermont endangered species permits, Act 250 permits applications, Section 248 proceedings). I prepare both forest management guidelines and habitat mitigation guidelines for the Indiana bat and the northern long-eared bat, the latter is newly designated as state endangered due to WNS and now proposed for federal listing as well.

Q6. What is the purpose of your testimony in this proceeding?

A6. To provide the Agency's review of the potential impacts of the proposed project on Vermont's state and federally endangered bats, to make recommendations to minimize any impacts from the project, and to propose a course of further evaluation of potential impacts and necessary responses where warranted. The Indiana bat is the species of greatest focus for this project because of its abundance and distribution within the project area. In addition, the same measures needed to protect the Indiana bat will also greatly apply to the state-endangered northern long-eared bat.

Q7. Have you reviewed the Petitioner's prefiled direct testimony, in particular the testimony of Jeff Nelson and the report by Gilman & Briggs Environmental regarding rare, threatened, and endangered species, Appendix 4 to Exhibit Petitioner JAN-2?

A7. Yes, I have. I also participated in two project site tours and one personal visit to select ownerships within the project site.

Q8. Have you reviewed the Petitioner's responses to ANR's Information Requests?

A8. Yes, I have.

Q9. Please describe the other background work you have conducted in order to assist you in the review of the petitioner's proposed project?

A9. Since 2001, I have conducted numerous inventory and research work on Indiana bats within the Champlain Valley of Vermont. During that time, I have documented no fewer than 10 Indiana bat maternity colonies ranging in size from 30 to 310 bats. These studies typically involved the use of radio telemetry to locate roost trees, document maternity colony size, and home range and foraging habitat use.

I have also reviewed U.S. Fish and Wildlife Service guidance on survey procedures for determining presence/absence of Indiana bats as well as the draft interim guidance for northern long-eared bats. These documents provide insights into national standards and expectations for surveying for presence or absence of these species.

Finally, as I mentioned earlier, I have worked with Art Gilman on the Phase I project and conducted two field tours and two meetings with Mr. Gilman to discuss survey protocols and learn of his field inventory findings.

Q10. Can you provide an overview of Vermont's bat species?

A10. First of all, it is important to understand the life history of Vermont's bat species in assessing the potential impacts of a landscape-scale development project on Vermont's bats. There are nine species of bats found in Vermont. In general, six of the species hibernate in caves or mines during the winter and then emerge in the spring to migrate to their summer range. There, females congregate together in maternity colonies in habitats suitable for the species. Big brown bats and little brown bats are most often found in buildings, although they periodically roost in dead and dying trees as well. Species such as the Indiana bat and the northern long-eared bat primarily roost in trees. The last two hibernating bat species – the small-footed bat and the tri-colored bat – roost in rock cliffs and solitarily in the branches of live trees, respectively. In summary, land use activities that convert forested habitat may have its greatest impacts on Indiana bats and northern long-eared bats.

The remaining three bat species are considered long-distance migrants in that they migrate out of the Northeast in late summer and early fall and spend the winter months in the southeastern United States or further south (Fleming and Eby 2003). They then return to Vermont and the Northeast in late spring.

Q11. Can you describe the maternity colony habitat of the Indiana bat?

A11. Since the earliest work on Indiana bats in 2001, all of the summer maternity colonies have been found below 1000 feet in elevation in the Chaplain Valley from Hinesburg south to Orwell. The Champlain Valley offers the warmest temperatures and the greatest number of wetlands in the state, providing some of the highest insect populations for foraging. It is interesting to note that Vermont's remaining little brown bat populations are also now primarily restricted to the Champlain Valley.

Indiana bats establish maternity colonies in either live shagbark hickories or black locust trees, or in dead and dying trees of numerous species. The bats roost under loose (i.e., exfoliating) bark in the trees during the day, using the solar radiation on the bole of the tree to warm themselves and their pups after their birth. Each colony uses approximately 10-15 different roost trees ranging in diameter from 8 to well over 50 inches during the reproductive period, congregating in the larger (> 18 inches in diameter), select "primary" roost tree just before and during the birth of the pups.

Besides the requirement of available roost trees, Indiana bats must have access to forested habitat for feeding on insect prey. Radio telemetry research in Vermont shows that Indiana bats range as far as 2.5-2.75 miles from their roost trees in search of insects each night. While Indiana bats are a species of the mixed agricultural lands, they forage primarily along the forest edges or within forested habitat. Consequently, access to forested habitat as far away as 2.5 miles is an important requirement for this species.

During foraging forays, Indiana bats may use hedgerows as narrow as 25 feet wide at the canopy to move between forest patches, avoiding flight in open fields in order to avoid predation.

Q12. Can you describe the status of Vermont's populations of Indiana bats?

A12. While all six hibernating bat populations are susceptible to WNS, the degree of impact on bat species has varied widely. In the Northeast, northern long-eared bats have experienced declines estimated at 98%, little browns at 91%, tri-colored bats at 75%, and Indiana bats at 72% (Turner et al. 2011). Data collected specifically in Vermont are consistent with the findings across the region with the exception of Indiana bats.

Inexplicably, Indiana bat survey counts conducted at the one New York mine at which Vermont's Indiana bat colonies hibernate have actually increased in number since the onset of WNS. As a result, Vermont continues to host the densest populations of Indiana bats across the species range, making the Champlain Valley a critical region to the future of the species.

Prior to WNS, I estimated that there were 30 or more Indiana bat maternity colonies within the Champlain Valley with the average Indiana bat colony size determined to be 118 females (note: average colony size across the species range is 50-80 females). It is currently unclear if

the increase in Indiana bats in the Champlain Valley has resulted in larger colony sizes or, instead, more colonies within the valley.

Q13. Now let's discuss the potential impact of the project on endangered bats. Please describe the concerns the Agency has with regard to the project's impacts on the necessary habitat for bats.

A13. Concerns about the potential effects of the Vermont Gas – Phase II project on critical bat habitat include two impacts – the clearing of potential roost trees and the conversion of forested habitat into a linear opening that fragments bat foraging habitat. The Phase II project passes through the most suitable Indiana bat habitat in the Northeast and the densest populations of this species across its range.

The clearing of potential roost trees has two possible implications for both the Indiana bat and the northern long-eared bat. First, the felling of potential roost trees during the maternity colony season (April through September) risks killing the bats roosting under the bark. The potential for direct mortality should a tree be cut while a colony roosts in its bole is a risk of a direct taking of any listed bat. Second, the loss of quality roost trees, particularly the primary trees, even if felled during the hibernation season, may impact overall colony success. The first threat is most easily resolved by felling all potential

roost trees during the hibernating season (October 1-March 31). The second impact is best addressed by avoiding any roost trees used by Indiana bats.

The conversion of forested habitat with a linear opening risks permanent fragmentation of foraging habitat. A critical need of insectivorous bats is access to a wide variety of habitats that produce a wide variety of insects at different times of the season. Forests, wetlands, lakes, and rivers and streams cumulatively provide a rich source of both terrestrial and aquatic insects needed to support maternity colonies raising their young in such a short period of time.

Q14. Have you reviewed the survey methodology provided by Gilman & Briggs Environmental in their report on rare, threatened, and endangered species?

A14. Yes, I have.

Q15. What is your overall evaluation of the results of these surveys and the data provided?

A15. Surveying for potential roost trees on projects such as this that covers an extensive area is particularly challenging. First, 5.4 miles of proposed corridor have not yet been evaluated

for potential roost trees. As a result, it is impossible to determine the level of impact on endangered bats without first knowing the potential conflicts between the planned route and the existing habitat conditions.

Second, the numerous changes in the proposed route likely shifted the 300 foot zone and possible direct impacts to potential roost trees. Keeping up with the locations of potential roost trees relative to the project location has been problematic.

Third, thoroughly surveying the forested portions of the line is not easily conducted, and potential roost trees may be missed, especially when evaluating a 300 foot swath.

On June 4, 2014, I met with Art Gilman to review the latest route and each of the identified potential roost trees that he has located. He was able to identify those trees that may potentially be impacted by the project, each requiring additional survey work or flagging to assure that such trees would not be removed during construction. Of course, he has yet to identify any potential roost trees on land ownerships that could not yet be surveyed.

Q16. What comments do you have on the survey methodology?

A16. The Gilman & Briggs report states that potential roost trees of 10 inches in diameter for shagbark hickories and 16 inches in diameter for all other tree species were identified during the survey process. Yet, in October, 2013, I was given a table of some 80 potential roost trees that included elm and green ash trees with less than 16 inches in diameter. Recent conversations with the consultants indicated that higher quality potential roost trees less than 16 inches in diameter were, in fact, also identified for further evaluation.

Q17. What are your recommendations for protecting bat roost trees that have been identified in the survey?

A17. I recommend that all potential roost trees equal to or greater than 12 inches diameter that are also proposed for cutting be surveyed for bat use.

Any potential roost trees that are found to have northern long-eared bats or Indiana bats are to be protected, even if it requires re-routing the corridor.

In addition, I recommend that all potential roost trees not proposed for felling, but adjacent to any of the project's construction areas (e.g., access routes, the corridor itself) be flagged so that personnel associated with the construction can clearly determine that such trees should be retained.

Q18. Do you have a recommended survey protocol for determining whether one of the above potential roost trees is currently used by bats?

A18. Yes, Art Gilman has requested such a protocol, and I developed a survey protocol based upon my review of our historical Indiana bat data and the latest U.S. Fish and Wildlife Service guidelines on surveying for Indiana bats and northern long-eared bats. This protocol requires conducting five nights of acoustic monitoring throughout the entire evening and, if necessary, three nights of emergence surveys to further assess any tree exhibiting acoustic bat activity. The combination of these two techniques should assure the detection of any use by endangered bats of a potential roost tree. The emergence count survey requirement is identical to that proposed by Art Gilman. The acoustic component of the survey is a more efficient method to detect bat activity, including any bat emergence well after dark and any bat use the following dawn. On June 4, I provided this survey protocol to Art Gilman for his review.

Q19. Briefly, how are acoustic bat surveys conducted, and how does one identify bat species that are detected?

A19. Acoustic surveys employ equipment known as bat detectors to record high frequency sounds, including the echolocation calls of bats. Sounds are picked up on a microphone on the bat detector and recorded digitally onto a memory card. The recorded bat calls can be used to draw conclusions about the level of bat activity or the presence of particular bat species at a given site. In order to determine the latter, using special software, these high frequency sounds are visually displayed for either qualitative or quantitative analysis

of the call characteristics to determine the bat species. Unfortunately, some of the calls, particularly of the *Myotis* genus, cannot easily be distinguished from each other. The significance of this shortcoming has decreased recently as all four of Vermont's *Myotis* species are now state listed.

Q20. Has Vermont Gas indicated when they would be performing those surveys?

A20. I have only communicated with the consultant on the survey protocol, but he has indicated that his firm would be conducting such surveys. The survey methodology requires that such surveys be conducted during the months of June and July. If the surveys cannot be conducted during that time frame, then the trees must be avoided by the project. If Vermont Gas does not conduct the surveys, then the only means by which the project can avoid impacts to the endangered Indiana and northern long-eared bats is by routing the project so that all potential roost trees are avoided.

Q21. Can you explain the process you conducted in your evaluation of the project's impacts to bat foraging habitat?

A21. I simply evaluated the proposed project route against the landscape cover to locate sites where forest patches would be divided by the insertion of a pipeline corridor. Those

patches cut off from all other nearby access via hedgerows, forested corridors, or other forest patches were identified and submitted to the Petitioner. In all, 22 sites were initially identified through my evaluation.

An ensuing site visit with the Petitioner's consultants identified sites where an appropriate vegetation management plan associated with the corridor maintenance could be applied to reduce the width of openings within the forest patch, corridor, or hedgerow to no more than 20 feet. A cross-section showing the proposed vegetative management plan has yet to be provided by the Petitioner. I must still review the final proposed project location to then identify those sites where a vegetative management strategy is to be applied.

Q22. Will the proposed vegetative management plan address all of the sites where foraging habitat will be fragmented by the Project?

A22. No, there is one location at mile marker 3.2 where the project corridor is running parallel to an existing 80-foot wide Green Mountain Power (GMP) transmission line. The project clearing will initially widen the transmission line opening an additional 25 feet. I have recommended that no additional clearing take place beyond the GMP right-of-way. If the pipeline cannot be routed within the GMP transmission line, mitigation must be provided. Mitigation opportunities include establishing a low, woody vegetated corridor across the

transmission line similar to that which has been done at other locations in Vermont, or off-site mitigation for bat foraging habitat. To date, there has been no resolution on this matter. The Petitioner suggested I contact Green Mountain Power to work toward a solution. Given that Vermont Gas is proposing to fragment this foraging habitat with its pipeline project, I did not consider it ANR's responsibility to coordinate an avoidance alternative with GMP.

Q23. Can you summarize what remaining steps need to be taken in order to make a determination on the impacts of this project on the state and federally endangered bats?

A23. In order to make a determination, the Petitioner's consultants need to complete the field inventory of potential roost trees, including on the lands not yet surveyed, review each one with a Vermont Fish and Wildlife Department expert, where appropriate, conduct surveys for bat utilization, and then develop a plan to avoid impacts to each and every tree found to be used by state listed bats.

In addition, the Petitioner needs to provide specific details such as a cross-section of the proposed vegetative management plan for the sites identified. Included in this is a proposal to address the expansion of the transmission line located at mile marker 3.2 discussed above.

Q24. Until the steps you have outlined have occurred, can Petitioner demonstrate that the Project will not destroy or imperil state and federally endangered bats?

A24. No.

Q25. Does this conclude your testimony at this time?

A25. Yes.