



State of Vermont

Agency of Natural Resources – Office of General Counsel
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Montpelier, VT 05620-3901

Agency of Natural Resources

Direct Tel.: 802-249-1720

April 14, 2017

Judith C. Whitney, Clerk
Vermont Public Service Board
112 State Street
Montpelier, VT 05620-2701

**Re: Docket No. 8791 - Vermont Gas Systems, Inc.
Investigation Regarding Harsh Sunflower Plants**

Dear Ms. Whitney:

The Agency supports the Department's recommended penalty of \$6,000.00 in this matter. The Agency recommends, and requests, that the \$6,000.00 be paid to the New England Wildflower Society to be utilized to further the seed collection and banking work funded in part by the Supplemental Environmental Project (SEP) approved as part of the Agency's separate enforcement action. A copy of the original SEP proposal is attached to this letter. The Agency has been informed by Vermont Gas Systems, Inc., that it agrees to this recommendation.

Please contact me if you should have any questions.

Respectfully submitted,
State of Vermont Agency of Natural Resources

By:  Donald J. Einhorn, Esq.

Copy: Service List

SEP Proposal – New England Wild Flower Society – 22 December 2016

1. Project Implementer

William Brumback, Conservation Director, New England Wild Flower Society, 180 Hemenway Rd., Framingham, MA 01701. bbrumback@newenglandwild.org 508-877-7630 x 3201.

2. Geographic Area to Benefit from the Project

State of Vermont with emphasis on the Champlain Valley.

3. Project Description and Budget

New England Wild Flower Society, the nation's oldest plant conservation organization requests \$10,828 to collect seeds from 15 globally or regionally rare plants in Vermont. The Society will process and permanently store these seeds as part of its multi-year initiative to bank seeds from over 2000 populations of more than 300 regionally rare species in New England. The project is the leading edge of a national effort to secure seeds from all the imperiled plant species in the United States and part of international efforts to bank seeds to preserve genetic diversity, restore degraded habitats, and potentially provide material for augmentations or introduction in the wild following declines or catastrophic loss.

Habitat destruction remains the major cause of plant decline, but scientific studies around the world have documented range shifts and species declines directly related to climate change and its signature alterations in temperature and precipitation. Given the current climate trajectory, scientists predict that 57 percent of the planet's plant species will lose more than half their range by 2080. In New England, as elsewhere, changes will be felt most dramatically in forests. In general, plant communities will come apart and reform in new combinations, related to their seed dispersal mechanisms, differing migration rates, and establishment success.

For the rarest native plants, already limited to a few populations in specialized habitats and threatened with extinction or with extirpation in parts of their range, the situation is critical. Preserving plants and their habits is the first step in conservation, but as a backup to their destruction in the wild, and as hedge against climate change, seed banking assures their survival as genetic material for potential reintroduction to the wild. For this reason, the Global Strategy for Plant Conservation, a key element of the international Convention on Biological Diversity (CBD), sets as one goal ensuring that by 2020, "at least 75% of threatened plants should be in *ex-situ* collections (growing collections and seed banks), preferably in the country of origin and at least 20% available for restoration and recovery programs." New England Wild Flower Society's seed bank (established 1982) is ideally placed to provide this conservation service.

The Seed Banking Solution

The Society intends to meet the CBD goal through an intensive effort to collect and preserve seeds of the rare plants of New England. As a national leader in plant conservation, New England Wild Flower Society has invested in the research and on-the-ground monitoring that enables us to assess the state of New England's rare flora. The recently published second edition of *Flora Conservanda* shows that **17 percent of the 2,300 native plant taxa in our region are either globally or regionally rare**. Of those 388 taxa, 62 are globally rare species. Also critical to conserve are the 326 regionally rare taxa. Vermont is home to 22 globally rare plants and 96 regionally rare plants. To prioritize collection of the most threatened rare plant populations for ex situ (off-site) conservation, the Society developed a set of peer-reviewed decision matrices.

The Seed Ark

A seed bank is a repository of carefully selected and prepared living plant seeds, packaged in airtight containers, and maintained at low temperature and humidity. For rare species, a sample of 1500 seeds is collected, sometimes over several years in order to avoid depleting the natural population. Seeds are cleaned either by hand or mechanically, and then gradually dried down to less than 20% relative humidity. They are then counted, sealed in airtight foil envelopes, and stored at -20° C. A subsample of at least 20 seeds is thawed and tested for viability by germinating them under controlled conditions. Testing is carried out initially to provide a baseline of viability, then repeated usually every five years thereafter to monitor changes in viability of frozen seeds. Seeds of rare species are held in perpetuity. As needed, seeds may be withdrawn and propagated for research or restoration. For most species, viability is expected to remain high for hundreds of years.

In the future, it seems likely that we will be assisting some species by either relocating them to appropriate habitats within newly developed climate envelopes or by constructing new populations from the seed bank. Some people are advocating moving plants now, well ahead of clear knowledge of the local impacts of climate change. But just because it is now possible to successfully grow a species further north does not mean that the climate or the habitat or the plant community will be suitable in the future. Recent models are beginning to predict where plants might naturally end up under different climate scenarios. Seed banking gives us the ability to time our interventions well and based on scientific evidence of changes in climate and habitat. We can then make the best decisions about augmenting populations at existing sites, reintroducing species to sites from which they have disappeared, or introducing them to new sites in the historic range or beyond.

Budget Information

Based on experience, each collection for the seed bank costs averages \$2500. Each collection averages 19 hours of staff time (volunteer time additional) for identifying populations for collection, determining ownership, contacting landowners for permission to collect, collecting seeds, and finally, cleaning counting, drying, and testing seeds before (and during) storage in

perpetuity in the seed bank. Additional expenses in the per collection cost include travel, supplies, and equipment for the seed facility. **The Society is asking for \$10,828 for staff time and travel expenses for collection of seed from 15 globally or regionally rare plant species in Vermont. It will assume the largest portion of expenses for processing and banking these species in perpetuity. Because seeds are not always produced each year in sufficient quantities to collect, the project will begin in June of 2017 and finish in December of 2018, allowing two years to collect from the proposed 15 plant species.**

4. Expected Project Benefits

The expected benefits are that seeds of species of Globally or Regionally rare plants will be collected and subsequently placed in a seed bank in perpetuity as a backup in case of the loss of populations in the wild. These seeds may be used for augmentation of existing populations, introduction of new sites for the taxon or for other restoration purposes as directed by the Vermont Natural Heritage Inventory.

5. Certification

The New England Wild Flower Society has proposed to collect the genetic diversity of the region's rare plants by 2020, but this SEP project is not the result of substantive planning prior to or during the enforcement action.

5B2. Reports:

New England Wild Flower Society will provide the Agency of Natural Resources (ANR) a final report by 31 Jan 2019. The report shall document the activities that occurred under this SEP including the following:

- A listing of the species that were collected along with the site name or location of the collected population(s);
- Rare Plant and/or Seed Collection Forms from visited populations;
- Updates on ownership, if any;
- Discussion of threats to the population, if any.

An interim report will be provided to ANR by Jan 31, 2018 documenting progress up until that time.