



State of Vermont

ANR Planning & Legal Affairs Division

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Agency of Natural Resources

October 21, 2011

BY email and U.S. Mail

Susan Hudson, Clerk

Vermont Public Service Board

Drawer 20, 112 State Street

Montpelier, VT 05620-2701

Docket No. 7508: Kingdom Community Wind

Dear Mrs. Hudson:

The Vermont Agency of Natural Resources ("ANR") provides the following Comments on the proposed **Decommissioning** Plan filed by Georgia Mountain Community Wind ("Georgia"), pursuant to Condition 11 of the Certificate of Public Good.

ANR also notifies the Board and the other parties that Georgia's authorization to construct under the NPDES construction stormwater general **permit has** expired. Georgia **had** authorization under the permit 3-9020, but the authorization term was limited to two years **and** the authorization period has passed. Georgia has submitted a request for authorization for the project under the NPDES construction general permit 3-9020. A Notice of Intent will likely be issued and published for public comment sometime next week. ANR will alert the **Board** and the other parties when a new authorization has issued.

ANR Comments to _____ s Proposed **Decommissioning** Plan

The sufficiency of the Decommissioning Plan must be evaluated against its intended purpose as established by the Public Service Board ("**Board**") in its Decision and Order of June 11, 2010. **The** Board found that upon decommissioning, the project site will be restored to preconstruction conditions.¹ The Board **found** that the goal of decommissioning is to "ensure that the Project site returns to its pre-construction condition and reestablishes a stable forest community after the generation facility ceases to be used for commercial production"² To guarantee that the Decommissioning Plan achieves this purpose, the Board imposed the requirement that the Decommissioning Plan should be adequately

¹ Docket 7508, Decision and Order, at 84, finding 273 (June 11, 2010).

² Id. at finding 274.

funded and that the sufficiency of that funding could be determined only **after** Georgia provides a detailed study on the costs of decommissioning including restoration of the summit **area**.³

Georgia's proposed Decommissioning Plan, unfortunately, is inadequate to return the site to its **preconstruction conditions**. Contrary to the requirement for detail, the **Plan** fails to incorporate specificity in the needed ecological restoration measures to be implemented. Accordingly, the Decommissioning Plan should be revised to reflect the following recommendations of Eric **Sorenson**.⁴

To accomplish the requirements of decommissioning established by the Board, the decommissioning **and restoration** plan should include specific details on the following elements:

1. The Decommissioning Plan should include a purpose and goal statement that reflects the Purpose **identified** by the Board to **return** the Project site "to its **pre-construction** condition and reestablishes a stable forest community after the generation facility ceases to be used for commercial **production**." Finding 274.

The proposed Purpose section ignores this requirement and merely states that the site should be returned to an appropriate condition.

2. Removal of the wind project infrastructure. Although the Decommissioning Plan contains **reference** to removal of **the** turbines and associated components, there is no detail regarding treatment of the road. The following section identifies recommended approaches for addressing the road infrastructure.⁵

³ Id, at finding 275.

⁴ Eric Sorenson, **community** ecologist for the Agency of Natural Resources, testified at the technical hearings, *inter alia*, on the need for site restoration.

⁵ Condition 11 also requires "a detailed estimate of the projected decommissioning costs along with certification that the cost estimate was prepared by a **person(s)** with appropriate **knowledge** and experience in wind generation projects and cost estimating."

The proposed plan lacks the requisite certification. It contains a general and vague reference that the estimate was prepared "by individuals familiar with the work and experienced in their respective fields." What are the respective fields of the preparers? Who actually prepared the Plan? When was the Plan prepared? Has the Plan been reviewed by Cianbro or anyone else in the past 19 months.

There appears to be some uncertainty and confusion regarding the date of the decommissioning estimate, Exhibit A, The second page of Exhibit A lists the date of the letter as January 25,2010. The first page provides a preparation date of January 25,2011. The proposed decommissioning plan was filed on October 11, 2011. The Decommissioning Plan, however, states that the Plan indicates the cost in 2011 dollars. Have there been changes in the industry, materials, resources, or inflation **from** the time the plan was prepared (January 25,2010 or January 25,2011)? The certification of the plan should identify any changes to the estimates from the time the plan was initially prepared.

3. Site preparation, including deep-ripping or other method to break up the compacted soils of the turbine pads, roads, side-slopes, and **stormwater** features and return these areas as closely as possible to the pre-construction contours and soil depths. Areas that have re-vegetated naturally over the life of the wind project and have young forest communities present may not need to be **included** in the site preparation work, as long as they meet re-vegetation standards and are free of invasive species.
4. **Reestablishment** of organic material on all of the re-contoured surfaces should utilize a mixture of organic compost and wood mulch from a source free of invasive species seeds and propagules. Organic material should be applied at a depth of 4 to **8** inches. The proposed decommissioning plan suggests using topsoil that has been stockpiled since construction of the project for this purpose. This approach may not be practical. The topsoil removed during construction would be better used on new **road** and turbine pad sideslopes to encourage re-vegetation, rather than saving it for decades to be used for decommissioning. Stockpiled topsoil will lose organic matter content over time (oxidation) and many seeds and other propagules in the soil will die if they are buried for many years.
5. Re-vegetation of all the re-contoured and exposed soil portion of the decommissioned site is critical to establishing a stable forest community and for reducing the spread of invasive plant species, especially in the Champlain Valley where these species are so prevalent. Specific methods for establishing vegetative cover should be decided at the time of decommissioning so that they can be based on current climate conditions and site conditions. The selection of such vegetative cover should be made with the consultation of ANR staff. Establishment of woody plants will be critical for the success of the decommissioning and restoration **plan**. Planting of tree species should occur on all of the decommissioned and re-contoured site with a density of 200 stems per acre or more. Tree species to plant should be decided at the time of decommissioning, should be based on consultation with ANR, and should reflect **the** species present in adjacent natural communities. The tree species will most likely include Northern Red Oak (*Quercus rubra*), Sugar Maple (*Acer saccharum*), American Beech (*Fagus grandifolia*), Hop Hornbeam (*Ostrya virginiana*), and White Pine (*Pinus strobus*).

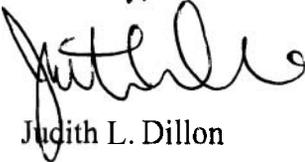
The proposed decommissioning plan contains a seeding proposal, The Board required that the area be reforested. Reseeding will **not return** the area to its preconstruction condition. If at the time of decommissioning, seeding of exposed soil is determined to be appropriate as part of the **revegetation** plan, seeding should be accomplished with seeds of native plant species and determined at the time of decommissioning.

6. Post-decommissioning re-vegetation monitoring and remedial action should be specified. Monitoring and remedial action should occur for five years following decommissioning and should establish 75% survival of tree species plantings as the standard for remedial action. The **75%** standard could include natural establishment of native tree species in the decommissioned area. Tree species density below the **75%** threshold (150 stems per acre) within any of the five years following decommissioning should result in additional plantings.

7. Invasive species monitoring and control plan should be conducted for 5 years following decommissioning and should be consistent with the post-construction **invasive** species monitoring and control plan (May 13,2011) approved by the PSB.

Attached is an example of a decommissioning plan that has been approved by the **PSB** that could be used as a **model** for incorporating the above elements.

Thank you for the opportunity to comment on the Decommissioning Plan. Please contact the undersigned if you have **any** questions regarding the ANR comments.

Sincerely,

Judith L. Dillon

Enclosure
Cc: Service List

Amended Kingdom Community Wind Decommissioning Plan

Description of Changes Relating to GMP-ANR Stipulation

June, 2011

GMP-ANR Stipulation

Condition 4 of the *Stipulation Between Green Mountain Power and the Vermont Agency of Natural Resources Regarding Mitigation for Impacts to Benr Habitat, State Significant Natural Communities and from Habitat Fragmentation* (hereafter Stipulation) requires that Green Mountain Power (GMP) amend the Decommissioning Plan (Ex. Pet-CP-6) to include a Site Restoration Plan. The revisions are described in this Attachment **A**. It should be noted that the final determination of appropriate vegetation shall be made at the time of decommissioning to account for changes in the climate and any advancements in ecosystem restoration which may occur between the present day and the time of **decommissioning** (Conditions 4.4 & 4.8 of the Stipulation), whereupon the precise footprint and methods of restoration activities and the recommendations for vegetation may be revised from what is described herein subject to mutually agreement between the Agency of Natural Resources (ANR) and GMP. It should also be noted that the decommissioning approaches described herein strive to minimize disturbance to undisturbed areas or disturbed areas that have naturalized subsequent to construction. As such, it is the intent of this plan that no blasting activities will be carried out as part of the decommissioning process.

Site Restoration Plan

Site Preparation

Per Conditions 4.1 and 4.3 of the Stipulation, the area of decommissioning is defined as the turbine pads, the crane path, the portion of the access road that lies within **Parcel 4** Ridgeline Easement Area, and the ridgeline stormwater management system, This area of decommissioning (except the stormwater management system) will be **deep-ripped/scarified** to loosen the compacted surfaces. The exact limits of restoration and width of the **deep ripping/scarification** will depend on the degree to which natural regeneration has encroached on the road surfaces and the footprint of the equipment used to decommission the site. Any reduction in the area of restoration from what is specified in Condition 4.1 of the Stipulation will be based on ANR approval and will be based on the degree to **which** natural regeneration has occurred on areas disturbed during project construction.

A bulldozer equipped with a **ripper/scarifier** set to a depth of approximately 18 inches (+/- 3) will be used to break up the compacted surfaces within **the** Area. The bulldozer blade will be used to establish random and undulating microtopography in the scarified layer and in stormwater conveyance systems (**e.g.**, ditches and berms) contiguous to the scarified road surfaces, contouring the site (also called microtopography) to provide surface features for plant colonization and habitat variability (**details** on the decommissioning of **stormwater** infrastructure are included in a later section of this Plan).

The amount of achievable relief for microtopography will be directly related to the depth of the fill material at that location. For example, in areas of where the roadbed was constructed within a cut zone, the depth of fill may only be on the order of 18 inches. In areas of fill, it may be measured in feet. As a general guideline, the maximum relief between **the** crest and trough of the constructed undulations of the microtopography should not exceed 50% of the depth of fill and should not exceed 4 ft in the vertical. The slopes of the larger undulations should not exceed a 5:1 slope (horizontal : vertical) along the axis of the road so that equipment **ingress/egress** for revegetation activities and future remedial actions remains unhindered. The pattern of constructed microtopography will be established across the entire site (crane road, turbine pads, and access road on the Parcel 4 Ridgeline Easement).

Condition 4.2 requires CMP to establish organic material on the recontoured surface. The surface will be prepared for revegetation through the utilization of a combination of organic compost and wood mulch, both obtained from locally available sources where possible, which will be combined to create a compost mixture to be applied to the re-contoured areas treated under this plan. All reasonable efforts shall be taken to limit the possibility of noxious species being introduced to the project area as a result of the importation of materials. The compost material shall have a minimum content of 20% organic compost and a maximum content of 80% wood mulch. The compost mixture will be applied at a thickness of 4 to 8 inches. The maximum thickness of application will not exceed 12 inches. It is understood that the determination of appropriate vegetation shall be made at the time of decommissioning.

The application of the organic compost and wood mulch to re-graded access roads, crane paths, turbine pads, and ditches contiguous to the road surfaces within the Area will be accomplished using excavators and dump trucks and/or high-volume precision blowers or other appropriate equipment. The **mixture** of

compost and wood mulch is non-erodible. The details of the revegetation plan shall be made at the time of decommissioning.

Site Preparation on Non-Landowner Ridgeline Properties

In accordance with Condition 4.10 of the Stipulation, GMP agrees to work in good faith with ANR at the time of decommissioning to employ more aggressive site preparation measures (i.e., creating topographic variability of a more complex nature) for the developed areas of the ridge line that are not included in the Parcel 4 easement area. The goal of these restoration enhancements is to prudently facilitate the return of the ridgeline to natural and undeveloped conditions. Because there are no conservation easements covering these areas, the goal of the restoration enhancements is also to make future ridgeline development less likely.

Planting Plan

Condition 4.4 in the Stipulation requires GMP to revegetate the areas disturbed after decommissioning. An assessment of climate change at the time of decommissioning will determine specific methods, and appropriate vegetation to be used in each of the areas. It is anticipated that the results of post-construction monitoring will provide valuable insight into the performance of the plant species and methods described in the *Kingdom Community Wind Farm Construction Revegetation Plan, June, 2011*. Until such time that the approach to site restoration can be modified based on these future conditions and studies, the following planting plan is provided as a guideline, based on current conditions. The final decommissioning planting plan will be reviewed and approved by ANR.

Woody Plant Establishment

Though most of the tree species in the surrounding forest propagate via wind dispersed seeds, site restoration activities will include the installation of woody plants in plots +/- 100 feet in width at strategic locations, currently estimated to be not more than 8 locations (approximately every ½ mile along the ridgeline) to accelerate reforestation and promote habitat connectivity in wetland and riparian corridors and ridgeline saddles. Woody species that are native to the site, elevation, and habitat will be selected. The specific species and the type of stock to be installed (e.g., bare root whip, tubelings, containerized) will be determined at a future date in advance of decommissioning and based on site conditions and observations such as how individual tree species fare at naturally recruitment on areas of

thin soil. The preliminary approach considered at this time is to install woody vegetation at a density of 200 stems per acre. The timing of and methods for tree planting activities are contingent upon the selection of desirable tree species and the size of the plant stock. In general, planting will occur only following snowmelt in the spring.

Ridgeline Success Plan

The approach to revegetating the turbine pads, the crane path, and the portion of the access road that lies within the Parcel 4 Ridgeline Easement Area is subject to an assessment of ecological conditions at the time of decommissioning and mutual agreement between GMP and ANR. Approaches may include the use of seeding for grasses that may enhance the process of additional soil formation and resulting in conditions that are amenable for natural regeneration of trees, as well as the installation of woody plant material. Accordingly, the performance criteria for the revegetation approaches will be developed at the time of decommissioning in accordance with Condition 4.5 of the Stipulation. Should the decommissioning plan include the installation of woody plants, current guidance would have them installed at a density of 200 stems per acre and would require that an average stem count of **150 live stems/acre** will be maintained throughout the monitoring period (the equivalent of 75% survival). Live stems enumerated during sampling will include those that are planted as well as volunteers, meaning that replanting will not be required if the rate of natural regeneration offsets the mortality of planted stems. This target live stem density is subject to revision based on the findings of monitoring during the construction and post-construction period as described in Kingdom Community Wind Farm *Construction Revegetation Plan, June, 2011* as well as the results of any other studies conducted in the vicinity over the **lifespan** of the project.

Post-Decommissioning Revegetation Monitoring Plan

Condition 4.5 of the Stipulation requires GMP to monitor revegetation effort following decommissioning. The success of the revegetation effort will be determined via direct observations of plant establishment each year for five years following decommissioning. The approach to sampling and the size and number of sampling **plots** will be dependent on the revegetation approaches that are mutually agreed upon by GMP and ANR at the time of decommissioning. However, sampling plot size will likely remain the standard 400 m² (4,306 ft², or roughly 1/10th of an acre) and likely consist of rectangles measuring 20 m by 20 m (or narrower for restricted sites) located **within** the restored surfaces. The proposed **frequency** of

sampling plots will be one plot per acre, but will at a minimum include one plot for each turbine pad and multiple plots along the roads. Plot length and width will be adjusted accordingly to fit narrower crane road and access. The location of plot centers along the crane path and access road will not be equally spaced but rather chosen at random using random number tables keyed to road stationing. However, sufficient plots will be specifically located within woody planting zones so as to track the progress of planted stock. The locations of the random plots may vary from year to year so as to characterize conditions throughout the project corridor or they may be fixed so that performance at specific locations can be monitored through time. Final plot locations and plot size will be mutually agreed to between GMP and ANR in advance of monitoring.

Within each sampling plot, all species (herbs, shrubs, and trees) will be identified and the percent cover of each species will be estimated and recorded. Both seeded and recruited plants will be identified. In addition, the number and species of planted and naturally regenerating woody stems within the sampling plot will also be enumerated. From the center point of the sample plots, photo-documentation will be conducted for each cardinal direction. The coordinates of the center point of each sampling plot will be captured via **GPS** to facilitate its reoccupation should the ANR require spatially fixed sampling plots or annual monitoring.

Remedial Actions

GMP agrees to pursue remedial actions, as necessary, based on **the** Planting Plan and the performance criteria to be established for the Ridgeline Success Plan at the time of decommissioning. Remedial actions may involve reseeding and/or replanting areas that fail to meet to-be-established performance criteria. The Post-Decommissioning Revegetation Monitoring Plan discussed in the preceding section will allow for remedial actions to be targeted at those areas where regeneration and/or planting fails to meet established performance criteria by evaluating results on a plot-by-plot basis. For example, should the stem count for woody species fall below the threshold of 150 live **stems/acre** (the equivalent of 75% survival), replanting will be necessary. However, as the number and size of test sites for woody revegetation are subject to future agreement between **GMP** and ANR, remedial actions or their triggers cannot be defined at this point.

Duration of Monitoring and Remediation

Site monitoring and remediation will be carried out in the manner described above for a period of five consecutive growing seasons following decommissioning, with Year 1 being the first growing season after that during which the revegetation efforts (e.g., seed application and/or woody plants installation) are completed. Sampling, other field observations, and photo-documentation will be completed by September 1 of each required monitoring year. If at the end of Year 5 it is determined that the performance criteria as established in the Ridgeline Success Plan have been met, GMP will be released from any further requirements with respect to monitoring or remediation. If at the end of Year 5 it is determined that portions of the decommissioned areas are failing to meet performance criteria, CMP agrees to continue pursuing remedial measures on those particular areas to address the shortcomings until such time that annual monitoring determines that the performance criteria have been met. Annual monitoring and remedial measures pursued after Year 5 will be restricted to those areas that fail to meet performance criteria as opposed to site-wide monitoring. All monitoring will be curtailed once 5 years of success, as defined herein and by future ANR approval, have been achieved, pursuant to Section 4.5 of the Stipulation,

Invasive Species Monitoring and Control Plan

Study Area

As required by Condition 4.6 of the Stipulation, GMP will be tasked with monitoring all the decommissioned areas for invasive species and controlling any invasive species that become established. Monitoring and control of invasive species will be carried out simultaneously with the fieldwork required for the Post-Decommissioning Revegetation Monitoring Plan as described below via a pedestrian survey.

The Vermont Agency of Agriculture Quarantine Rule (VAAFQ, 2002) or other guidelines in place at the time of decommissioning will be used to **identify** those species known to be invasive and noxious species in Vermont. Any species included on the quarantine rule (or subsequent guidance) occurring within the decommissioning area will be identified and quantified by stem counts or percent areal cover (whichever is appropriate). The locations of the occurrences of invasive species will be noted using a **recreational-grade GPS**. For those invasive species that form large colonies or where individual plants of a species are broadly disseminated over a large area, a polygon of the colony location will be mapped using GPS units capable of sub-meter accuracy,

The means of monitoring invasive species will be by field personnel performing a reconnaissance-level survey to identify occurrences of invasive species across the entire decommissioning area. Field personnel will perform a pedestrian survey along the edge of both sides of the former access road, crane paths, turbine pads, and stormwater management facilities for their full extent and look for occurrences of invasive species within the entire area of decommissioning. Field personnel will also survey 100 feet into the adjoining forest for any occurrences of invasive species.

The presence of any invasive species will be recorded by field notes and GPS locations during the pedestrian survey. Where invasive species occur in close proximity to the forest edge, field personnel will survey 100 feet into the forest to determine if the species has migrated into previously undisturbed areas.

Individual plants or small groupings of plants will be noted and located using GPS. Any individual or small grouping of invasive plants identified during the course of the monitoring process will be removed by manual extraction and disposed of **offsite**. GMP will control larger colonies by manual removal when possible or using approved herbicides in strict accordance with State regulations for handling and application. Application of herbicides will be performed by State-certified pesticide applicators only. No application of herbicides will be carried out within 50 feet of wetlands or streams without prior consultation with ANR.

GMP must monitor and control the decommissioned areas for invasive species for a minimum period of five years and not to exceed 10 years, with Year 1 being the first full growing season following the completion of decommissioning revegetation activities. Should invasive species monitoring determine that no invasive plants are present within the study area during the final three consecutive growing seasons of this five-year period (Years 3, 4, and 5), ANR will release GMP from further monitoring obligations. Monitoring activities will continue until there are three consecutive years with no invasive species detected over the entire area of decommissioning. However, GMP will not be required to perform any further invasive species monitoring or management beyond year 10. The possibility of release from invasive species monitoring and control will be evaluated upon review of each year's annual report (see following section).

Monitoring and control for invasive species will be carried out simultaneously with the sampling, field observations, and photo-documentation required of the Post-Decommissioning Revegetation Monitoring Plan as described above and will be completed by September 1 of each year in which monitoring is required.

Annual Reporting

Annual reports presenting an analysis of the monitoring results for revegetation activities and for invasive species will be submitted to the ANR no later than **31** December of the monitoring year or as specified by any forthcoming permit. The annual report will be concise in scope and contain information arranged in the following manner. In the event that GMP is released from the requirement to monitor either the revegetation effort or for invasive species, that component of the annual report will be omitted from delivery. The final content of the Annual Report is subject to change based on the final decommissioning plan that is to be developed at a later date.

- Introduction:
 - a review of the goals and objectives of the monitoring efforts; and
 - a summary of any maintenance or remedial measures that occurred over the preceding year.
- Methods
 - a brief description of the field methodology employed to collect data.
- Results
 - map occurrences of all invasive species identified and report on how each occurrence was controlled during that year;
 - maps of plot locations, photographic stations, and occurrences of invasive species;
 - a summary of the results for herbaceous species, installed woody plants, and recruited vegetation for the entire area of decommissioning, based on both plot data and any future means of site monitoring to be determined in the future;
 - a description of any remedial action taken that year pertaining to revegetation; and
 - a summary of the results of invasive species monitoring and control.
- Invasive Species Assessment and Management Recommendations

- Assessment of Threat: a brief summary will be included discussing the distribution and density of identified species within the project area. This analysis will consider species abundance, identification of possible vectors for species introduction, and whether or not that vector is controllable.
- Management of Invasive Species: the methods employed for invasive species control carried out during the preceding year will be discussed, as will the results of herbicide application on any identified and treated colonies. Any invasive species colonies observed within wetland areas or in close proximity to streams that cannot be controlled by mechanical extraction will be discussed, as will potential methods of future control.
- Future Activities
 - proposed remedial measures to be employed.
- Appendices:
 - tabular results of invasive species occurrences and control by location (including geographic coordinates) for the entire area of decommissioning;
 - tabular results by plot, including geographic coordinates;
 - field notes for observed invasive species; and
 - site photographs annotated with site number / location.

Ridgeline Stormwater Management System & Stream Culvert Decommissioning

In accordance with Condition 4.3 of the Stipulation, GMP has evaluated the proposed project site plans with respect to the potential for:

- a) Removal of certain stream culverts to **improve/restore** aquatic connectivity upon decommissioning, and;
- b) Removal or modification of certain operational phase stormwater management infrastructure (e.g., basins and level spreaders) to provide for long-term water quality protection and restoration.

The overall goal of these approaches is to maintain natural hydrology and plant communities to the greatest extent practicable, while minimizing new site disturbance and/or the removal of native vegetation. As such, no blasting would occur in the implementation of any stormwater decommissioning efforts. The proposed approaches to decommissioning stormwater management features are consistent with guidance provided by the U.S. Fish and Wildlife Service (USFWS) Wind Turbine Guidelines Advisory Committee, regarding decommissioning recommendations to the Secretary of the Interior, dated March 4, 2010 (pages 65 and 66). The following sections summarize the results of this evaluation of the proposed structures.

Since the previous draft of this stormwater decommissioning plan was completed (February 23, 2011), the site plans have changed appreciably and proposed impacts to stream features have been further diminished. In addition, GMP has gained a better understanding of the logistical issues and obligations with respect to site decommissioning. For these two reasons, some of the proposed approaches described below differ from those included in the earlier draft of the stormwater decommissioning plan.

Decommissioning Stream Crossings

The final plan set (dated May 17, 2011) has been evaluated to determine if there are any stream crossings or other impacts along the ridgeline that should be modified or removed at decommissioning and that could:

- a) be accomplished without disturbing previously undisturbed areas and by avoiding potential secondary impacts;
- b) provide an ecological benefit by restoring natural connectivity; and
- c) allow for continued site access for post-decommissioning site monitoring for the purposes of both the Ridgeline Success Plan and the Invasive Species Monitoring Plan, and for implementation of remedial actions (if required).

There are a total of fifteen (15) channel segments where permanent or temporary impacts would occur from construction along the ridgeline. These are located on Sheets C108 through C117 of the final plan set dated May 17, 2011. Of the channel impact segments, thirteen (13) do not have associated culvert

crossings to be removed since the proposed impacts are primarily to channel upper-limits which will be filled, or impacts are only temporary, during **construction** of the project. Only two (2) stream crossings are potential candidates for removal: Culvert CV-C1 at stream **2009-SC-15A** (Sheet C-111); and the **rock sandwich** at stream **2009-SC-C15** (Sheet C-111).

Though the earlier draft of the stormwater decommissioning plan recommended these features be removed, it has been determined subsequently that these features should remain. This is because removal of these features would preclude access to the revegetated areas for the purposes of **monitoring** and carrying out any necessary remedial activities. As proposed by the final design plans, Culvert CV-C1 is proposed to be countersunk 10 inches below ground surface at construction and have a rock-lined waterway within the pipe to match existing grade in the **stream** channel at both the upstream and downstream ends. This substrate will approximate **natural** cobble conditions within **the** pipe and facilitate **organism** passage. Accordingly, stream impacts have now been mitigated to the extent feasible by the construction design. Also, **the** road embankment at both the culvert location and that of the rock sandwich will have revegetated by **the** time of decommissioning. Removal of these features would entail re-disturbing these revegetated slopes.

Decommissioning Stormwater Management Systems

An evaluation was also performed of the potential removal or modification of stormwater infrastructure that is associated with collecting and treating stormwater runoff from impervious surfaces along the project's ridgeline, specifically stormwater basins and level spreaders. For purposes of this evaluation, it was assumed that the impervious surfaces located along the project's ridgeline (which include the a portion of the access road in Parcel 4, the crane paths, turbine pads, and roadside ditches), would be reverted to a pervious condition during decommissioning as presented in the preceding section entitled "Site Restoration Plan." Based on this assumption, it is anticipated that these previously impervious surfaces would transition to pervious surfaces, thereby allowing precipitation to infiltrate and dissipate. In the absence of these impervious surfaces, no discharge of stormwater **runoff from** impervious surfaces would be occurring, and the stormwater management systems (**e.g.**, conveyances, level **spreaders**, and basins) would no longer be needed. The following **is a** list of recommendations that address decommissioning of these stormwater management features.

Conveyances

In addition to the roadside ditches (decommissioned per the preceding "Site Preparation Plan"), other stormwater conveyances consist of rock-lined channels leading from these ditches to wet ponds and stormwater pipes leading from the ponds to stormwater **outfalls**. The footprint of the rock-lined channels is generally small (as compared to a typical stormwater basin). Therefore, given the close proximity of existing vegetation, it is anticipated that over time, existing seed stock from the surrounding vegetation would regenerate these channels, resulting in restored ecology and connectivity to the adjacent forested lands. To avoid disturbances to surfaces that have revegetated over the time between project construction and decommissioning, buried stormwater piping will be left in **situ** rather than being excavated and removed. Additional detail regarding potential modifications to these pipes is included under the discussion for decommissioning stormwater basins below.

Level Spreaders

As a stormwater management approach that, by design, has minimal impact on its surroundings, it is recommended that level spreaders remain in place with no additional alteration. As discussed above with respect to rock-lined channels, the footprint of a level spreader is generally small and is designed to function in combination with a vegetated buffer. Therefore, given the close proximity of existing **vegetation**, it is anticipated that over time, existing seed stock from the surrounding vegetation would regenerate the **small** area of the level spreaders.

Stormwater Basins

The stormwater management system associated with the project largely consists of level spreaders for managing and treating stormwater runoff. However, in order to fully comply with applicable criteria of the Vermont Stormwater Management Manual (VSMM), the overall stormwater management plan also includes sixteen (16) conventional stormwater basins (WP-A through WP-Q, with no WP-P). Fourteen (14) stormwater basins are to be located along the ridgeline with the remaining two (2) to be located along the access road. These latter two basins would not be modified as part of this plan, as it is anticipated that the impervious surface associated with the access road would remain in place following decommissioning and that the stormwater management system associated with this portion of the project would be the responsibility of the landowner. The evaluation of the potential for the decommissioning of the fourteen (14) ridgeline **basins** was performed with the following goals in mind:

1. maximizing opportunity for restoring vegetated areas while also considering safety and long term water quality protection factors; and
2. maximizing opportunity for creating high elevation wetland resource areas while also considering feasibility.

The proposed approaches to restoring stormwater basins are described below. It should be noted that all basins are to be excavated below ground surface and the excavated material will be largely redistributed to other areas of the site for use as fill for road embankments, turbine pads, **etc.** during construction of the project. As such, little native material will remain available to fill in these excavated features. In all cases, the stormwater pipes and outlet structures associated with these basins would be plugged and cut off at a depth of roughly 12 inches below the proposed grade.

1. In instances of shallow basin excavation where fill will be placed above existing ground surface to create the micropool, these represent opportunities to backfill the basin with the berm. **The** berm that separates the **forebay** from the micropool can also be knocked down and redistributed within the basin. Subsequently, revegetation efforts could proceed in a manner consistent with the approaches described earlier in this document with respect to road surfaces, turbine pads, and roadside ditches. Based on a preliminary assessment, basins falling into this category include wet ponds WP-K, WP-M, and WP-Q.
2. Where no fill material is present adjacent to the basin and the depth of basin excavation is less than eight feet, the basin could be backfilled in part with off-site materials (no **onsite** material is assumed to be available beyond the minor amounts described in point **#1** above or without additional site disturbance for mining). The basin could be filled in part with rock material and/or earth and capped with soil or a combination of organic materials such as wood chips, compost, etc. Depending on the landscape setting of the basin, these may be amenable to restoration as described earlier in this document with respect to road surfaces, turbine pads, and roadside ditches. Alternately, they could be restored as high elevation wetlands. Preliminarily, it is anticipated that this treatment method would apply to WP-A, WP-C, WP-D, WP-I, WP-J, WP-

L, WP-N, and WP-O. The approach to develop wetland features would be outlined in a "High Elevation Wetland Creation Plan," which would be developed at the time of decommissioning.

3. Where no fill material is present adjacent to the basin and the depth of excavation is greater than eight feet (e.g., wet ponds WP-B, WP-E, and WP-F), restoration of the excavated rock pool via refilling with rock or earth would involve excessive and costly material transport, and the potential for significant new earth disturbance. In these cases, plugging the outlet structure and piping is recommended. Given the depth of cut into bedrock it is anticipated that the basin would then backfill with native groundwater, creating a ponded feature not unlike an abandoned quarry prospect, which are commonly found in Vermont.

Plans to be Developed at Decommissioning

Based on an evaluation of potential stormwater basin restoration approaches, the following is a recommended list of actions and plans that would be necessary for moving the proposed approaches forward. Like the plans for revegetation of the crane path, turbine pads, and portions of the access road, these plans would be developed at the time of decommissioning.

1. GMP and ANR will assess conditions at the time decommissioning to determine the feasibility of the various proposed approaches to stormwater basin restoration, including factors such as degree of natural regeneration within and adjacent to the basin and the species present, the hydrologic regime manifested in the area around the basin (e.g., evidence of groundwater discharge), the environmental and financial impacts of the restoration approach (e.g., the cost of trucking fill materials to the site), and post-restoration safety considerations.
2. Prepare a "Stormwater Basin Deconstruction Plan" that involves but is not limited to activities such as:
 - a. installation of Erosion Prevention and Sediment Control (EPSC) measures;
 - b. basin dewatering;
 - c. modification of basin infrastructure (e.g., plugging and cutting of outlet structures and pipes); and
 - d. requirements for re-grading and stabilization.

3. Prepare a "High Elevation Wetland Creation Plan" that includes but is not limited to:
 - a. establishing appropriate microtopography (as needed);
 - b. details on the depth and placement of topsoil or other organic-rich planting medium;
 - c. a planting plan that is comprised of native trees, shrubs, and grasses that are native to the region and appropriate for high elevation wetland conditions; and
 - d. developing appropriate performance criteria based on the planting plan (it is anticipated that the approach to invasive species monitoring and control and annual reporting would be consistent with the approaches presented in the preceding sections).

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