The Black Nubble Wind Farm

Appendix 5.3: Transmission Line Construction Plan

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1.0 Transmission Line Construction Plan

The proposed 115 kV transmission line between Endless Energy's Electric Harvest Substation and the nearest utility substation will be a single circuit, H-Frame, wood pole configuration. The proposed 34.5 kV collector system transmission lines between the summit and the Electric Harvest Substation will be a single circuit, single wood pole configuration.

The width of the ROW will vary depending on the type of construction and whether the line is the sole occupant of the ROW or is shared with other facilities. For the 34.5 kV collector system, the width of the ROW will be 75'. For the 115 kV H-frame construction, the width will be 150' if it is the sole occupant. There is a portion where this line will run parallel to an existing corridor owned by Boralex. For this section, the width will be 75'. As the 115 kV transmission line approaches the utility substation (owned by Central Maine Power), it will be placed underground and follow existing ROW, either owned by MDOT (Maine Department of Transportation) or CMP.

The initial stage of transmission line construction will involve clearing the right-of-way (ROW) and installing a construction access road system. The development of the access road system will be executed with the goal of minimizing environmental impacts to the greatest extent possible. Access road systems will focus on employing existing roads wherever possible and will locate new roads to minimize crossing of wetlands and environmentally sensitive areas. The final design of the access road system will be performed once the design of the transmission line has been finalized.

The vast majority of the transmission line structures are expected to consist of wood poles. Poles will be delivered to each structure location by truck or skidder or possibly flown in by helicopter at the option of the contractor. In areas where access is suitable (e.g., level uplands near roads), trucks may be used. In areas with tougher access, skidders may be used to bring the poles to the proposed pole locations.

Wood pole installation will require the use of an excavator to dig the hole to the proper depth. Excavation may require grubbing an area of approximately 20 feet in radius, per pole. The grubbed area is

necessary for equipment to safely and efficiently dig and set the pole. The radii of disturbance will overlap for the two-poles on each H-frame structure. Angle structures will additionally require guy anchor placement, which may increase the area of disturbance around the pole location. Guy anchors generally consist of a 4' length of a wood timber buried about 5' deep.

The transmission lines have been designed to site poles outside of wetlands to the maximum extent possible, but engineering requirements may necessitate some pole placement in wetlands. In these cases, proper erosion controls will be used, grubbing will be kept to a minimum, and the disturbed areas will be restored to original contours in order to maintain the original drainage patterns.

Once a sufficient number of structures have been erected, the next stage on construction will be to install the conductors. This installation requires the use of special equipment called a "tensioner" and "puller" along with several stands to allow the conductor to be rolled off the reels. Conductor pullers and tensioners require a large, fairly level area for their setup. The pullers and tensioners are typically mounted on large, flat bed-type tractor-trailer rigs, and can weigh in excess of 80,000 pounds. They frequently also need to be anchored by large bulldozers. The location of this equipment varies with site conditions and is best left to the contractor to decide. There is significant flexibility in where this equipment will be placed. Typically, the placement of this equipment will be about a mile apart (the length of conductor that is on a single reel) where accessibility is good. Only in the most extreme circumstances will this equipment need to be placed where it may have an impact to environmental resources.

The stringing of conductor starts by first threading a continuous polypropylene line through all the blocks (hung on each of the structures to facilitate the stringing process). This is typically installed by someone walking the length of the line or using an ATV. The polypropylene line is then replaced with a steel pulling wire by pulling the polypropylene line back through the blocks with the steel wire connected at the end of the rope. The steel pull line is used to string the conductor in the same fashion that the steel pull wire was installed. The "puller" and "tensioner" work in conjunction with each other to keep the conductor up in the air and not to drag on the ground.

After the conductor is pulled and tensioned, it will be clipped into place by removing the blocks from each structure and installing the final insulator hardware. Crews that clip wire in typically do not use heavy equipment and will access poles on foot from the constructed access road. Impacts from these crews will be minimal.

Once the conductor is installed and the contractor has no need to traverse the ROW, final clean-up of the ROW will commence. Temporary roads will be removed as well as final restoration of the ROW.