

## Section 20. BLASTING

### 20.1. INTRODUCTION

During construction, blasting will likely be required in some areas of the proposed Project to break up bedrock for development of roadways, leveling ground, and preparing turbine foundations. Any and all blasting will be performed by properly licensed and trained professionals who will handle, transport, store, and use all explosive materials according to the provisions for safety, notification, planning, and documentation set out in the blasting plan provided as Exhibit 20-1. Blasted bedrock, to the greatest feasible extent, will be broken down into a well-graded mixture according to specifications from the Maine Department of Transportation (MDOT) and used on-site as surface aggregate for crane paths and access roads, riprap, and embankment fills. Proposed site grades have been designed to balance cuts and fills to minimize the net import or export of blasted material.

### 20.2. SOILS

The Project area extends across an area approximately 12 miles from north to south and 6 miles from east to west. The site is primarily located in the Level IV Ecoregion “Downeast Coast,” with small portions of the western and northern areas extending into the “Eastern Maine-Southern New Brunswick Plains.” This section of Maine has a unique history of geologic and soil-forming processes which resulted in an interspersion of soil parent materials and phases of development. According to the NRCS Washington County soil survey, “The area consists of till-mantled, rolling to hilly uplands in the northern part, gently sloping valleys terminating in coastal lowlands in the southern part, and glaciofluvial outwash plains and deltas in the west central part. Glaciomarine or glaciolacustrine sediments cover the coastal valleys.”<sup>18</sup> The Project site can be characterized by both lodgment and melt-out glacial till, portions of which have a bouldery surface; which is interspersed with the large glaciofluvial-formed deltas, eskers, and outwash plains; silty clay marine sediments; and deep organic materials. Project planning has sited Project components to utilize the soils best suited for construction and long-term Project operation, to avoid unsuitable areas, and to minimize development within less suitable areas to unavoidable uses such as access roads or collector lines. Where appropriate, minor modifications will be made to improve site conditions.

Preliminary geotechnical investigations will be conducted to assess the potential for adverse effects of blasting on protected natural resources and structures or wells not controlled by the Applicant. Ground vibration, peak particle velocities, noise and air blast effects, and on-site and off-site ground and surface water quality and quantity will also be monitored and documented with impact minimized where possible.

### 20.3. BLASTING PLAN

The Applicant has provided a preliminary Blasting Plan in conformance with Title 38 M.R.S.A § 490-Z (14) as Exhibit 20-1.

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<sup>18</sup> David E. Wilkinson. *Soil Survey of Washington County Area, Maine*, (2008) p.1. Available online: [https://www.nrcs.usda.gov/Internet/FSE\\_MANUSCRIPTS/maine/washingtonME2008/Washington\\_southern.pdf](https://www.nrcs.usda.gov/Internet/FSE_MANUSCRIPTS/maine/washingtonME2008/Washington_southern.pdf)

## 20.4. ACID ROCK MITIGATION

The Project will be analyzed for potential acid rock drainage (ARD) as part of the preliminary geotechnical investigation for the Project. If acid rock is identified, soils will be amended to mitigate for pH levels in compliance with the mitigation techniques below.

These mitigation techniques are based on mitigation plans prepared for other recent wind projects in the State of Maine. Handling techniques and treatment methodologies are available for acid producing rock, including:

- Avoiding or minimizing the disturbance/excavation of acid producing rock;
- Disposing of the material above the water table;
- Controlling surface and groundwater to divert water away from acid-producing rock and management areas;
- Blending or alkaline addition to maintain the pH at near-neutral levels;
- Identifying potential borrow sites for cover material;
- Identifying potential borrow sites for the isolation or temporary storage of potential acid-producing material;
- Using low permeability and impermeable barriers to limit infiltration into the potentially acid-producing rock from rainwater or groundwater;
- Preparing a logistics plan including sources for alkaline material and locations for stockpiling of such material;
- Identifying monitoring methods and locations to evaluate the effectiveness of mitigation; and
- Preparing contingency plans should initial mitigation require modification.

The construction plan will be drafted to allow initial construction activities to commence while evaluations of ARD locations of concern are in progress. Any initial construction activities such as preliminary clearing and grubbing do not require cut and fill operations into bedrock.

Sources of crushed limestone and agricultural lime will be investigated to neutralize potential ARD producing rocks. Additionally, borrow areas will be identified on-site as a source of low permeability cover.



**EXHIBIT 20-1: PRELIMINARY BLASTING PLAN**



**APEX**  
CLEAN ENERGY

## **Downeast Wind, LLC**

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Preliminary Blasting Plan

October, 2020

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## 1.0 PROJECT DESCRIPTION

Downeast Wind (hereafter referred to as the Project) is a utility-scale wind farm project proposed by Downeast Wind, LLC (the Applicant), a wholly owned subsidiary of Apex Clean Energy. The Project, located in T18 MD BPP, T24 MD BPP, and the town of Columbia, includes the construction and operation of up to 30 wind turbines, access roads and collections lines, meteorological towers, an operations & maintenance building, construction laydown areas, a collection substation, and a point of interconnection substation in the town of Columbia, Washington County, Maine.

## 2.0 REQUIREMENTS FOR PROJECT

This is a preliminary plan. A Final Blasting Plan will be prepared by Apex and/or its BOP contractor to account for final design and geotechnical analysis. The Final Blasting Plan will meet all of the requirements set forth in this plan. Geotechnical borings will be conducted as determined necessary by a professional engineer to allow foundation design to be finalized for the turbine and substation locations, and possibly also the meteorological tower locations, depending on the selected site.

Although mechanical excavation with a pneumatic hammer or large ripper may be possible for bedrock encountered, particularly the upper few feet, in some cases blasting may be required. In such cases, blasting will likely generate less noise and take less time than the described alternatives. At the time of construction, the Applicant will determine where blasting may be needed, and the extent required, considering noise impacts, construction schedule and costs, the volume of rock encountered, the hardness of the rock encountered, required safety precautions, and other factors.

## 3.0 BLASTING OPERATIONS

Where blasting is deemed necessary, the final blasting plan will be submitted to MDEP in writing for approval. Blasting will be performed only after approval has been given by the construction manager for such operations and will comply with the following provisions, as well as other conditions established by the MDEP. Blasting operations will be performed by a blaster who is fully licensed and insured for the transportation, use, and handling of explosives in accordance with all applicable federal, state and local requirements. Blasting permits will be applied for, as required, from local authorities.

Any blasting operations will adhere to applicable statutes and regulations governing the use of explosives in the State of Maine. All pertinent safety regulations and standards will be applied as required for safety, security and other related details for any blasting deemed necessary. Additional applicable safety regulations include:

- Code of Federal Regulations A.T.F. Title 27.
- 38 M.R.S.A. § 490-Z (14)
- M.R.S.A. Title 25, Chapter 318
- Directive 495 standards of the National Fire Protection Association (NFPA)
- Occupation Safety and Health Administration (OSHA) standards, 29 CFR 1926.900 - 1926.914 and 1910.109

## 4.0 PRE-BLAST SURVEYS AND NOTIFICATIONS

Pre-blast surveys will be offered to all property owners with structures, wells, etc., within a 2,000 ft radius of the blast site. Landowners within that range who desire a survey will be appropriately notified. The results of those surveys will be documented via video, still photographs, and appropriate narration, or written reports.

Notification of blasting at the site will be published in newspapers and provided to all persons located within 1,000 feet of the blast site prior to the blasting schedule. The notification plan will be in writing and available for inspection by MDEP.

## 5.0 BLAST MONITORING

All blasts will be monitored by a representative who is properly trained in seismic monitoring equipment. There will be at least one seismograph in use at all times and monitoring equipment will be placed at the structure with closest proximity to the blast site.

## 6.0 SEQUENCE OF BLASTING

Blasting operations will be coordinated with all appropriate parties, including local emergency responders. Blasts will be developed to minimize ground vibrations and maximize protection to surrounding structures.

## 7.0 BLASTING PROCEDURES

### 7.1 Transportation

All vehicles/vessels transporting explosive materials will display all placards, lettering, and/or numbering required. Only authorized persons will transport and handle the explosives as designated by the authority of those licensed for this purpose. Vehicles transporting explosive materials will not be left unattended.

### 7.2 Storage

The secure storage of explosives will be in accordance with applicable requirements of the United States Bureau of Alcohol, Tobacco, and Firearms and Department of Labor. The storage area of all explosive materials will be located on the site at a location approved by the supervising blasting engineer of the blasting subcontractor. Caps or other detonating devices will not be stored with Class A explosives. An accurate running inventory of all explosives and blasting agents stored at the Project will be maintained: two copies will be maintained - one at the magazine (storage area) and one in the main Project construction office which will be at least 50 feet from the magazine. The designated storage site, explosive transporting vehicles, and areas where explosives are being used will be clearly marked and will display the required warning signs. A daily tally of all explosives delivered, used, and stored will be maintained at the main Project construction office.

### 7.3 Blasting Hours

Blasting will occur only in daylight hours between 7 AM and 7 PM. Blasting will not occur on holidays.

Blasting will not be conducted at times different from those announced in the blasting schedule except in the case of emergency situations, such as electrical storms or other events concerning public safety.

### 7.4 Access to Blasting Areas

Access to the blasting area will be regulated to prevent unauthorized entry before each blast and following the blast until it is determined that no unusual circumstances exist following the blast.

### 7.5 Coordination with Local Safety Officials

The Applicant and its contractors will work closely with local safety officials to apprise them of construction schedules, including blasting, and will coordinate with emergency facilities such as area hospitals and transportation services. Additional detail on emergency service coordination can be found in the Applicant's Emergency Action Plan. (Exhibit 27-1).

### 7.6 Drilling and Loading

All drill holes will be sufficiently large to freely allow for the insertion of the explosives. Drilling and loading operations will not be carried on in the same area. Drilling will be separated from loaded holes by at least the depth of the loaded hole but in no case less than 50 feet. The loading or loaded area will be kept free of any equipment, operations, or persons not essential to loading; no vehicle traffic will be permitted over loaded holes; the blast site will be guarded or barricaded and posted with danger signs to restrict unauthorized entry. No holes will be loaded except those to be fired in the next round of blasting; after loading, all remaining explosive materials and detonators will be immediately returned to an authorized magazine; no explosive materials or loaded holes will be left unattended at the blast site at any time. Cartridges will be primed only in the number required for a single round of blasting.

### 7.7 Firing

Adjacent property owners will be notified in advance of the commencement of construction by written notice. Such notice will describe construction operations sequences, including blasting, and will describe availability of updated construction schedules and provide contact information for concerns. Warning signs will be provided at points of access to blasting areas.

Blasting operations immediately adjacent to overhead power lines, meteorological towers, communications lines, utility services, or other structures will not be carried on until the operators and/or owners have been notified and measures for safe control have been taken.

Prior to the firing of a shot, all persons in the danger area will be warned of the blast and ordered to a safe distance from the area. Blasts will not be fired until it



is certain that every person has retreated to a safe distance and no one remains in a dangerous location. Prior to the firing of a shot, a competent flag person will be posted at all access points to danger areas.

Blasting machines will be tested prior to use and periodically thereafter as prescribed by the manufacturer. Blasting machines will be operated, maintained, and inspected as prescribed by the manufacturer.

All loading and firing will be directed and supervised by one designated person who is licensed to handle explosives. The contractor or its subcontractor will use sufficient stemming, matting, or natural protective cover to prevent fly rock from leaving property owned or under control of the permittee or operator or from entering protected natural resources or natural buffer strips. Crushed rock or other suitable material will be used for stemming when available. Native gravel, drill cuttings, or other material may be used for stemming if no other suitable material is available.

If a blast is to be initiated by detonating cord, the detonating cord will be covered by crushed rock or other suitable cover to reduce noise and concussion effects.

Blasted rock or boulders may be broken into a well-graded mixture of the size recommended by the geotechnical engineer, and utilized in the nearest appropriate location (e.g., access roads). Should blasting occur, the procedure will consist of implementing line control to full depth and then using controlled blasting techniques in one or more benches to create minimum breakage outside the line control but create maximum rock fragmentation within the target area. Prior to blasting, the applicable regulatory concerns/requirements will be met.

#### 7.8 Post-Blasting

Following blasting operations, no explosive materials will be abandoned. All refuse from explosive loading such as empty box paper and fiber packing will be burned at an approved location.

A record of each blast, including seismographic data, will be kept for at least one year from the date of the last blast by the general contractor, its subcontractor (if appropriate) and the Applicant, and will be available for inspection during normal business hours. The blast record will contain, at a minimum, the following data:

- Name of blasting company or blasting contractor;
- Location, date and time of blast;
- Name and signature of blaster;
- Type of material blasted;
- Number and spacing of holes and depth of burden or stemming;
- Diameter and depth of holes;
- Type of explosives used;
- Total amount of explosives used;
- Maximum amount of explosives used per delay period of 8 milliseconds or greater;
- Maximum number of holes per delay period of 8 milliseconds or greater;

- Method of firing and type of circuit;
- Direction and distance in feet to the nearest structure (both owned and not owned by the project developer);
- Weather conditions, including such factors as wind direction and cloud cover;
- Height or length of stemming;
- Numbers of mats or other forms of protection used;

At the completion of blasting, a post-blast survey will be conducted of the same facilities (structures, foundations, water supply wells, utilities, etc.) as documented during the pre-blast survey. Findings inconsistent with those reported during the pre-blast survey will immediately be provided to the contractor/subcontractor/applicant and will be documented in writing and photographs. Depending on the nature (and source) of the inconsistency, specific corrective actions will be developed in consultation with the affected party, and will set forth the method, procedures, and timing of implementation.

## 8.0 SECURITY AND WARNING WHISTLES

Warning and “all clear” signals will be sounded within an audible range of one-half mile from the blasting location. All applicable persons within the permit area will be notified through appropriate instructions and posted signs.

All blasting operations will use the following safety signals:

(1) WARNING SIGNAL - a one-minute series of long audible signals 5 minutes prior to blast signal;

(2) BLAST SIGNAL - a series of short audible signals 1 minute prior to the shot;

and

(3) ALL CLEAR SIGNAL - a prolonged audible signal following the inspection of blast area. Prior to blasting, necessary precautions for the protection of persons and adjoining property will be established. Such precautions will include the following:

- A blasting mat will be placed over the blasting surface when deemed necessary. The blasting mat will remain in place until all shots are fired in the blasting zone.
- Appropriate signs will be erected in the area of blasting activities.
- Notification of blasting at the site will be published in newspapers prior to the blasting schedule.
- A storm alert monitoring device will be used by the blasting contractor to detect any electrical build-up in the atmosphere at the blast area while using electrical caps.
- Special care will be taken with detonating cords and connectors to protect from the impact of falling rocks or other impeding objects.
- Vehicles equipped with radio transmitters and portable 2-way radios will not be permitted within 100 feet of blasting operations.

## 9.0 BLASTING PERSONNEL

Those responsible for explosives will be in compliance with applicable local, state, and federal laws and will also possess a Certificate of Competency or a license as required by state law.

There will be no smoking, open lights, or fire of any kind within 50 feet of any area where explosives are being handled. No source of ignition, except necessary means to light fuses or fire electric detonators, will be permitted in an area containing loaded holes. Containers of explosive materials will be opened only with non-sparking tools or instruments. Metal slitters may be used for opening fiberboard boxes, paper bags or plastic tubes. After loading of a blast is completed, all excess explosive materials and detonators will be removed to a safe location or returned at once to the storage area, observing the same rules as when being conveyed to the blasting area.

Operations involving the handling or use of explosive materials will be discontinued and personnel moved to a safe area during the approach or progress of a thunderstorm or dust storm; controls will be established to prevent accidental discharge of electric blasting caps from extraneous electricity.

## 10.0 LICENSES, PERMITS, AND RECORDS

All blasting operations will be performed by a blaster who is fully licensed and insured for the transportation, use, and handling of explosives. Records of individual blasts will comply with 38 M.S.R.A. § 490-Z (14)(L).

## 11.0 BLAST VIBRATION AND SOUND

Blasting operations in or adjacent to residences, buildings, structures, utilities, or other facilities will be carefully planned with full consideration for all forces and conditions involved. Blasting permits will be obtained as required by local authorities. Records of individual blasts will comply with 38 M.S.R.A. § 490-Z (14)(H).

Prior to blasting at each site, a pre-blast survey will be conducted as described in section 4.0, to inspect the blast area and adjacent areas within 2,000 ft.

The minimum amount of blasting material will be used to effectively fracture the competent rock for the excavation depth. Independent monitoring of vibration and air concussion levels will be carried out by the contractor during all blasting operations.

The maximum allowable air-blast at any inhabited building not owned or controlled by the developer may not exceed 128 decibels peak when measured by an instrument having a flat response (+ or - 3 decibels) over the range of 5 to 200 hertz.

The maximum allowable air-blast at an uninhabited building not owned or controlled by the developer may not exceed 128 decibels peak when measured by an instrument having a flat response (+ or - 3 decibels) over the range of 5 to 200 hertz. Depending on building use (or lack thereof), the allowable air-blast may increase to 140 decibels peak.