Table of Contents

MONHEGAN CBAC REPORT

10/2/17

Recommendations and Rationale for Community Benefit Package and Agreement

Monhegan CBAC Report

RECOMMENDATIONS AND RATIONALE FOR COMMUNITY BENEFIT PACKAGE AND AGREEMENT

INTRODUCTION | EXECUTIVE SUMMARY

The Monhegan Community Benefits Advisory Committee ("CBAC") was established in July 2016 by Plantation vote to:

1. Aid in developing a community benefits agreement with Maine Aqua Ventus ("MAV"); and
2. Make recommendations to the Monhegan Board of Assessors on a specific community benefits package and associated agreement with MAV.

The purpose of this Report is therefore to provide CBAC's written recommendations to the Assessors on a community benefits package and associated agreement with MAV.

The concept of a community benefits package began with the Maine Public Utilities Commission ("Maine PUC") term sheet for the MAV Project[1], which requires MAV to either (i) provide electric energy to Monhegan Plantation Power District ("MPPD") and a fiber optic cable (the "Cable Option"); or (ii) provide an alternative community benefits package. Both are subject to a "commercially reasonable efforts" standard. Accordingly, discussions/negotiations with MAV focused upon developing term sheets for the Cable Option and an alternative "cash" option, referred to in this Report as the "Fund Option".

In sum, **CBAC recommends that Monhegan adopt the Fund Option, which provides significant monetary resources for Monhegan to sustainably address energy, telecommunication, and overall community needs.** The Fund Option is preferable to the Cable Option, which has less flexibility, more risk, and does not have the potential to address Monhegan's needs as well as the Fund Option. **In short, the Fund Option provides Monhegan with the best opportunity to sustain the island's environmental, economic, and social values on a long-term basis.**

Below is CBAC's summary evaluation of these two options:

Community Benefit Option	Total "Net" Economic Value[2]	Risk Profile
Cable Option	$3.95 million to $4.25 million[3]	Medium to High
Fund Option	$4.77 million to $6.27 million	Low-medium to Medium-high

Recommendation: Fund Option is the Preferred Community Benefit Package for Monhegan

[1] The MAV Project is a 12 MW offshore wind energy test site project near Monhegan Island. See Maine PUC Docket No. 2010-035 for more details.
[2] Excludes common essential terms to both the Cable Option and Fund Option described in Table 6 on page 6 of this Report.
[3] Based primarily upon estimated fuel savings to MPPD in The Financial Engineering Company Economic Report.

CBAC also prepared a Summary Comparison of the Final Term Sheets to analyze the similarities and differences between the Fund Option and Cable Option in relation to Monhegan Community Needs, highlighting why the Fund Option is preferred over the Cable Option. The Final Term Sheets for both the Cable Option and Fund Option are attached as Exhibit A. This Summary Comparison is set forth below.

Table 1 – Summary Comparison of Cable Option and Fund Option Based Upon Community Needs

Monhegan Community Need	Cable Option	Fund Option	Preferred Option
Sustainable energy	Provides sustainable energy only when MAV Project is operational and produces electricity; presents long-term sustainability challenges if mainland cable fails and is cost prohibitive to repair/replace	Provides upfront funding of at least $2.43 million and technical assistance for Monhegan to plan, design, and construct its own energy system that is not dependent on a mainland cable connection; provides additional funding for operations and maintenance; potential to provide multi-generational energy solutions	**Fund Option**
Affordable energy	Provides affordable energy only when MAV Project is operational and produces electricity; presents potential significant long-term costs and uncertainties owning a cable connection to the mainland	Provides upfront and ongoing funding to support capital expenditures for an island energy system and operation and maintenance costs	**Fund Option**
Reliable energy	Presents reliability issues interfacing with MPPD's power station; presents long-term reliability issues if mainland cable fails and is cost prohibitive to repair/replace	Allows Monhegan/MPPD to tailor its own energy system to promote reliable energy supplies and systems	**Fund Option**
Telecommunications	Highest speed broadband connection from island to mainland, but leaves on-island network costs with Monhegan; presents long-term reliability/sustainability issues if mainland cable fails and is cost prohibitive to repair/replace	Provides opportunity to meet or exceed current broadband speed standards (but not at highest speed); provides funding source for mainland connection and on-island network	**Fund Option**
Energy efficiency programs	UMaine collaboration for assistance; however, no potential revenues sources for support	UMaine collaboration with potential revenues sources for support	**Fund Option**
Other Monhegan Community Needs **(water source; fishing/lobstering diversification; transportation; affordable housing; health and wellness; solid waste & recycling; community farm; education; breakwater; job training; community center; municipal services; innate beauty/panoramic vistas; tourism)**	UMaine collaboration for assistance; however, no potential revenues sources to support	UMaine collaboration with potential revenues sources for support; provides additional separate municipal fund at $40,000 per year	**Fund Option**

Further details of CBAC's comparative evaluation of these two options are provided later in this report.

In making the Fund Option recommendation, CBAC performed extensive due diligence efforts to evaluate potential community benefits regarding the MAV Project. It conducted over 20 meetings from July 2016 until September 2017 that involved (1) development a community "framework outline" of values, assets, and needs of Monhegan to help identify potential types of benefits that best fit Monhegan; (2) technical and economic analyses in collaboration with technical/economic experts; and (3) negotiations with MAV representatives on specific potential community benefits with a focus on both the Cable Option and Fund Option.

Table 2 below identifies the various documents utilized by CBAC (in addition to its Summary Comparison above), which are also attached to this Report for ease of reference.

Table 2 – List of Documents, Studies, & Reports

DOCUMENT, STUDY, REPORT	EXHIBIT REFERENCE
MONHEGAN COMMUNITY BENEFITS ADVISORY COMMITTEE "FRAMEWORK OUTLINE"	Exhibit B
TILSON BROADBAND STUDY	Exhibit C
MEMO ON ESTIMATED CABLE AND INFRASTRUCTURE COSTS TO BRING GRID POWER TO MONHEGAN ISLAND, PREPARED BY LAWRENCE MOTT (FORMERLY OF THE WOOD GROUP/SGURRENERGY)	Exhibit D
ECONOMIC REVIEW OF THE MAINE AQUA VENTUS CABLE SUPPLY OPTION (MICHAEL HUBBARD OF THE FINANCIAL ENGINEERING COMPANY)	Exhibit E
LETTER RE: MONHEGAN ISLAND OPTIONS DATED 09/26/17, PREPARED BY LAWRENCE MOTT	Exhibit F

CBAC also worked off the prior and ongoing due diligence efforts of the Monhegan Energy Task Force ("METF"), which included reviews of the various studies and reports associated with the MAV Project. These studies/reports are listed in Exhibit G to this Report.

CBAC MEMBERS

The following table lists members of the CBAC.

Table 3 – List of CBAC Members

Tara Hire (Co-Chair)	**Jaye Morency (Co-Chair)**	**Chris Smith**
Willard "Billy" Boynton	**Winnie Murdock**	**Mott Feibusch**
Fred Faller	**Amy Zaref**	**Greg Rollins[4]**

[4] Mr. Rollins voluntarily resigned from CBAC after his term as a member of the Board of Assessors expired.

CBAC DUE DILIGENCE PART I | MONHEGAN VALUES & INVENTORY OF COMMUNITY NEEDS – THE "MONHEGAN FRAMEWORK OUTLINE"

CBAC prepared a Monhegan CBAC Framework Outline focused on values, assets, and needs of Monhegan. This due diligence task was completed to help CBAC in negotiations with MAV for two primary purposes: (1) to identify the types of benefits that align best with Monhegan's values and needs; and (2) to optimize these benefits through negotiations with MAV.

Details of the Monhegan CBAC Framework Outline are provided in Exhibit B of this Report. In sum, the Monhegan CBAC Framework Outline identified the following values arising out of its history, natural resources, economy, and island society, grouped in three core areas under the common theme of **sustainability**.

Table 4 – Monhegan Core Value Areas

CORE VALUE AREA	DESCRIPTION
ENVIRONMENTAL	Monhegan as a community has a history of undertaking and supporting projects to help ensure its natural resources and associated ecosystems are sustainably managed, utilized, and conserved; and the community continues to have a desire to be responsible stewards of land, sea, and air resources to sustain those vital resources. Although the CBAC's purpose and charge is not specifically focused on an environmental analysis of the MAV Project, as part of CBAC's development and negotiation of potential elements of a community benefits package, it is important to consider Monhegan's environmental values/guiding principles and to monitor the Department of Energy Environmental Assessment ("EA") review.
ECONOMIC	Constructive challenges for Monhegan include retention and diversification of fishing/lobstering, conservation of environmental values in balance with tourism and recreation, maintaining a vibrant artistic community, lowering energy costs, improving connectivity and telecommunications, and addressing other expenses, and providing new and expanded economic opportunities to sustain the island's economy as well as the seasonal and year-round population.
SOCIAL	A common goal of Monhegan is to maintain this social fabric and history of working together to find common solutions to sustain Monhegan as a seasonal and year-round island community. Support for education, community events, health care, community wellness, and communications/connectivity are among several areas that are important contributors to Monhegan's social values.

CBAC recognized that all three of the above values (environmental, economic, and social) are interdependent with each other and are important guiding principles to Monhegan's island community and culture, both now and in the future. All three require resources to sustain Monhegan. With these core value areas, CBAC set forth to negotiate terms of a community benefit agreement that would have the potential to provide a significant level of resources to support Monhegan in these efforts not only during the MAV Project timeframe but far into the future.

To help identify types of benefits to focus upon in negotiations, CBAC identified the following areas of community "needs" for Monhegan.

Table 5 – Monhegan Community "Needs"

COMMUNITY NEEDS	
Sustainable Energy	Health and Wellness
Affordable Energy	Solid Waste & Recycling Programs
Reliable Energy	Expanded Community Farm
Telecommunications	Education
Energy Efficiency Programs	Breakwater
Water Source	Job Training: New Skills
Fishing/Lobstering Diversification Opportunities	Community Center/Events
	Municipal services to Community
Transportation Town Dock/Boat Lines/USPO	Innate Beauty/Panoramic Vistas
Affordable Housing	Tourism

More detailed descriptions of these community needs are provided in the Monhegan CBAC Framework Outline, attached as Exhibit B.

CBAC DUE DILIGENCE PART II | TECHNICAL/ECONOMIC REVIEW

To assist CBAC, it engaged technical/economic expertise of Tilson on broadband issues, and on cable/economic issues it engaged The Financial Engineering Company and the Wood Group (formerly SgurrEnergy). This technical/economic assistance focused upon the following:

1. Tilson Broadband Study; An Evaluation of the Current Broadband Needs and Assets of Monhegan. Tilson prepared a Phase I report addressing broadband needs or gaps with proposed solutions including (i) a microwave link from Monhegan to the mainland analysis; (ii) an island fiber network; and (iii) an island wireless network. As noted above, this report is attached as Exhibit C.

2. Mott Cable Study and Mott Letter of September, 2017. Lawrence Mott (formerly of Wood Group/SgurrEnergy) conducted a review and evaluation of logistics, costs, benefits, and challenges with a cable (including the main subsea cable to the MAV Project and Monhegan cable spur off this main line under the Cable Option scenario). As noted, his reports are attached as Exhibit D and Exhibit F.

3. Hubbard (The Financial Engineering Company) Economic Review Study. The Financial Engineering Company conducted a review and evaluation of MAV's Cable Option to provide energy, and the estimated value of associated energy savings. As noted, this report is attached as Exhibit E.

Having completed CBAC's due diligence on Monhegan values, assets, and needs, and the technical and economic considerations of the Cable Option and Fund Option, CBAC proceeded to finalize negotiations with MAV. These negotiations resulted in two term sheets: one for the Cable Option, and a second for the Fund Option.

CBAC'S EVALUATION OF NEGOTIATED TERM SHEETS FOR THE CABLE OPTION & FUND OPTION

The essential terms of the negotiated Cable Option and Fund Option are summarized below.

Table 6 – Cable Option vs. Fund Option;
Common and Different Essential Terms

Common Essential Terms to both the Cable Option and Fund Option	
• University of Maine Collaboration/Support for Monhegan Projects, focused on Community Needs of Monhegan • Tuition Scholarships at UMaine; one full tuition scholarship every year to a Monhegan resident (with carry over provisions, provided there are no more than four student full-time equivalent scholarships in any given year) • Job Opportunities; Monhegan residents have first options to jobs created by MAV where applicants meet qualifications; provisions for reasonable training shall be provided if needed • UMaine and MAV shall not develop, construct, or operate any commercial grid-scale offshore wind project within 15 nautical miles of the boundaries of Monhegan • MAV shall undertake best efforts to meet FAA lighting requirements and mitigate lighting impacts, including but not limited to utilizing radar-induced lighting or similar technology that may be approved by the FAA • MAV shall undertake best efforts to "downshield" lighting associated with the turbines and turbine platforms	
Differences between Essential Terms of Cable Option and Fund Option	
Cable Option	Fund Option
• Cable with Electrical and Fiber Optic Capacities (i.e., Monhegan Spur constructed as part of the MAV Project connection to the mainland) • MAV provides or makes arrangements to provide MPPD with power generation up to 340 megawatts per year (at 1% per year increase) • Assignment of decommissioning fund at the end of the MAV Project, if legally permissible (estimated at approx. $500,000, but will be determined through MAV Project permitting)	• Initial payment to Monhegan of $100,00 by May 1, 2018 for island energy/broadband fund, provided the Maine PUC approves the power purchase agreement for MAV • UMaine provides direct technical assistance in supporting Monhegan's efforts to secure grant funding for fully functional broadband network • Upon the commercial operations date of the MAV Project, MAV shall pay Monhegan $2.33 million to a designated energy/broadband fund • Upon financial close of the MAV Project, MAV shall provide $100,000 to Monhegan to support

• Option to own cable at end of MAV Project Cable Reserve Fund in the amount of $500,000, if Monhegan elects to own cable at the end of the MAV Project	third-party expertise to design an alternative and/or supplemental power generation system and on-island broadband system • Starting on the first January following financial close of the MAV Project, MAV shall pay $40,000 per year to Monhegan to be used at the discretion of Monhegan (annual payments increase by 2.5% each year for the life of the MAV Project) • UMaine shall pay Monhegan 5% of gross licensing royalty revenues from projects utilizing UMaine VolturnUS technology (in waters of the East Coast/Gulf Coast of the U.S.), to be allocated at the discretion of Monhegan (5% payment obligation exists until patents expire or termination of royalty paying project, whichever is later) • MAV shall pay Monhegan 4% of gross revenues generated by the MAV Project from any renewable energy credit sales to the Monhegan Energy/Broadband Fund, subject to a $50,000 annual cap for the first 10 years of the MAV Project

Details on both separate term sheets are provided in Exhibit A to this Report.

CBAC analyzed the above negotiated term sheets considering (1) Monhegan values, assets, and needs; (2) economic value; and (3) risk profile. CBAC's analysis resulted in the following summary evaluation:

Community Benefit Option	Total "Net" Economic Value[5]	Risk Profile
Cable Option	$3.95 million to $4.25 million[6]	Medium to High
Fund Option	$4.77 million to $6.27 million	Low-medium to Medium-high

In short, CBAC's assessment is that the Fund Option provides greater economic value to Monhegan, presents less risk to Monhegan vs. the Cable Option, and provides Monhegan with more flexibility to meet its energy, telecommunication, and overall community needs. A more detailed analysis of these options is set forth below.

[5] Excludes common essential terms to both the Cable Option and Fund Option described above in Table 6.
[6] Based upon estimated fuel savings to MPPD in The Financial Engineering Company Economic Report at 3% and 4% discount rates (the mid-range discount rates listed in this Economic Report).

Cable Option Considerations

The Cable Option would provide Monhegan with a "link" to both the MAV Project and the mainland. A summary breakdown of estimated economic values of the Cable Option is provided below:

- Cable/Fuel savings[7]: $ 2,800,000 to $ 3,100,000
- Cable reserve fund: $ 500,000
- Transfer of decommissioning fund: ~$500,000
- Broadband mainland connections[8]: $ 150,000
- **Total (expressed as a range): $ 3,950,000 to $ 4,250,000**

The Cable Option benefits are primarily two-fold: (1) it provides MPPD with power generation, up to 340 megawatts per year (which covers the historical annual power demand of Monhegan); and (2) it provides a fiber broadband connection to the mainland.

These two features help address Monhegan's energy and broadband needs. However, through CBAC's due diligence, it identified the following considerations that presented potential drawbacks of the Cable Option:

- Monhegan's energy and telecommunication needs would be dependent upon the success of the MAV Project (both initially and long-term), leaving Monhegan with less control on addressing these community needs
- For long-term sustainability beyond the life of the MAV Project, if Monhegan or MPPD exercised an option to own the cable there are numerous uncertainties regarding cable costs and liabilities, and whether those would be cost prohibitive (without a cable post-MAV Project Monhegan would likely face many of the same energy and broadband challenges it has today)
- Cable management and maintenance is based on the MAV Project continuing to be viable, with the potential that MPPD may be required to operate the cable (in the case of the MAV project failing and/or MPPD or Monhegan exercising an option to own the cable). This is a large responsibility for the Island, with potential high operating cost per energy delivered or household as well as a new burden of management time/outside services to be engaged.
- There is still a lack of certainty regarding the mainland connection point and island cable and connect routes
- Cable installation impacts, such as hauling the cable into near shore waters, work at the land interface, and the island route to MPPD facilities will require excavation and winching equipment landed on island, excavation conducted and buried and surface infrastructure installed as overhead is not considered an option. This presents additional environmental concerns as to on-island disruption to habitat, vegetation, and aesthetics.
- Risk that MAV turbine-provided energy is not matched to Monhegan's power demand cycles and backup generation of the current MPPD turbines (e.g., cannot provide seamless backup); this is an electricity reliability risk issue
- Risk of MAV failure, early termination of Project, and post-MAV Project present a risk on having *sufficient* Reserve and Decommissioning funds
- No funding for an on-island broadband distribution network; only fiber connection if cable is provided.

[7] Based upon The Financial Engineering Company's Economic Report.

[8] Based on a "replacement" substitute cost estimate of a microwave link from the Island to the mainland. See Tilson Broadband Report.

- Energy cost (to buy power from the grid in the event of no MAV Project) will fluctuate and require management and long-term commitments to obtain reasonable costing via a portfolio of supply options. Low cost, long-term packages present a significant challenge with the small amounts of power required. This will further impact the potential supply of low cost energy.
- No money available toward other municipal challenges
- No guaranteed access to low-cost energy beyond MAV Project electricity; Monhegan/MPPD would likely need to undertake efforts with both the Federal Energy Regulatory Commission ("FERC") and the Maine PUC to get access to mainland energy for purchase
- Cable insurance underwriting while available now and as part of the MAV Project is not a given in the volatile insurance market and may have less viable terms when written for the Plantation or MPPD only at some distant future date. Other examples that may be referenced are not comparable:
    1. The Fox Islands undersea cable is insured along with all of the Coop utility assets, is insured as an electric Coop, has a high deductible amount, transmits an order of magnitude greater amount of electricity/value and can be easily managed by the critical mass of Coop staff.
    2. The Block Island cable serves a large population, transmits a high value of electricity, is managed by a critical mass of staff, had political, regulatory, legislative and monetary support. The Block Island utility was out of air quality compliance (with its diesel generators). Additionally, National Grid owns and operates the cable serving the Island (while the wind project owns the cable to the wind farm).

These drawbacks collectively present a higher risk to Monhegan to provide resources to support long-term sustainability of its energy and telecommunication needs. It also requires Monhegan to plan and tailor its on-island energy and telecommunication networks to MAV's, which may not be in the best alignment with Monhegan's values and needs. Finally, the Cable Option presents an inevitable "sunset" date. After that sunset date, a significant failure of the cable could occur. Even assuming insurance (costly and difficult to obtain for the reasons stated in the Mott Letter), it would be cost prohibitive to fix or replace, leaving Monhegan with similar energy and telecommunication challenges it faces today.

Fund Option Considerations

The Fund Option contains features that CBAC finds more attractive. This option not only addresses energy and telecommunication needs, but also addresses other island needs by providing funding and support beyond collaboration with UMaine. A summary breakdown of the estimated economic values of the Fund Option is provided below:

- Upfront payment into energy and broadband fund: $ 2,330,000
- Municipal payment[9]: $ 800,000
- Upfront broadband cap contribution: $ 100,000
- Grant funded broadband: $ 340,000
- Technical support: $ 100,000
- 5% Royalties on UMaine Technology: $ 600,000 to $ 2,100,000
- 4% Renewable Energy Credits (RECs): $ 500,000
- **Total (expressed as a range): $ 4,770,000 to $6,270,000**

[9] $800,000 represents an approximate present value of the municipal payments at $40,000 per year for 20 years. Applying a 2.5% annual escalator, the municipal payments to Monhegan total approximately $1.02 million over 20 years.

Collectively, this provides more holistic community benefits based on Monhegan's needs, and allows the Island to tailor implementing projects to its specific needs and values – i.e., retaining the long-held independence and self-reliance of Monhegan.

Below are highlights of the attractive features of the Fund Option:

- As noted, maintains energy independence – leaving Monhegan's sense of independence and self-reliance intact
- MPPD recent turbine upgrade remains fully utilized
- Once MAV Project achieves commercial operations, Monhegan will be *fully funded ($2.33M)* to maximize future energy technology improvements as they become available to lead to a sustainable independent energy program
- Upfront funding to initiate island energy/broadband upgrade ($100K), which is not contingent on project financing
- UMaine support and expertise to obtain full broadband funding for microwave upgrades and high performance distribution ($340K), which is not contingent on project financing. Grants will allow entire island broadband upgrade and long term independence.
- MAV operations will not affect daily life on Monhegan (other than the visual)
- MAV success leads to significant potential upside for Monhegan. ($600K - $2.1M as a potential estimated range for UMaine royalties, and potentially up to $500,000 in renewable energy credits (RECs) revenue).
- MAV Project long-term failure would have little effect on Monhegan
- The municipal payment of $40,000/year (increased at 2.5% per year) can be used at the community's discretion providing needed funds toward our many challenges, including but not limited to fire prevention and preparedness, wharf maintenance and upgrades, and community planning for sustainability

CBAC does note that there are also potential drawbacks of the Fund Option. However, when compared to the drawbacks of the Cable Option, CBAC views these as less risky and more manageable by Monhegan. These include:

- With no physical cable connection, there will be no fiber broadband connection to the mainland, presenting a limitation on the overall broadband connection speeds Monhegan can obtain. Although a fiber broadband connection would not exist, based on current technology and Monhegan's foreseeable broadband needs an upgraded microwave connection to the mainland (as identified in the Tilson Report) can provide Monhegan with significantly improved broadband that meets or exceeds current industry standards. It also leaves open opportunities for Monhegan to utilize any future technological advancements in microwave or similar technology.
- Significant organization, planning, and collaboration will be required by Monhegan community members to plan, design, and implement projects to address energy, telecommunication, and overall community needs. Because of Monhegan's history and culture, CBAC views this as a constructive challenge similar to other historical issues where the Island came together to address Island needs. In short, although much more work will be required, this work allows Monhegan to make decisions on what energy, telecommunication, and overall community projects are the best fit for Monhegan.

CBAC'S RECOMMENDATIONS

Based on the above, CBAC makes the following recommendations to the Board of Assessors:

1. Present the Fund Option Community Benefit Package/Agreement for adoption by the voters of Monhegan at a Special Town Meeting. Recommended warrant article language is provided in Exhibit H.

2. At the same Special Town meeting, request that CBAC, or a similar committee, remain in place (or be established) to monitor and provide advisory assistance to the Board of Assessors in implementing a Fund Option Community Benefit Package/Agreement. Recommended warrant article language is provided in Exhibit I.

3. Forward this Report and Request that the Board of Trustees of MPPD vote to endorse the Fund Option as a Community Benefit Package; and, upon review, approve a Community Benefit Agreement for the Fund Option. The possible forms of motions for consideration by the MPPD Board of Trustees are attached as Exhibit J.

We thank the Board of Assessors and Community of Monhegan for its engagement and support of CBAC's efforts, and look forward to continuing the Island's efforts to promote long-term sustainability.

Respectfully submitted this 2nd day of October, 2017.

/s/Tara Hire
Tara Hire

/s/ Jaye Morency
Jaye Morency

/s/Chris Smith
Chris Smith

/s/Willard Boynton
Willard Boynton

/s/Winnie Murdock
Winnie Murdock

/s/Fred Faller
Fred Faller

/s/Mott Feibusch
Mott Feibusch

/s/Amy Zaref
Amy Zaref

EXHIBIT A

MAV and CBAC Negotiated Term Sheet (9/22/2017) Summarizing 9/20/2017 Negotiation

Option A: "Cable" Community Benefit Package

Term	Benefit Amount/Requirement/Conditions
University of Maine Collaboration/Support for Monhegan Projects	• CBAC appreciates and finds the framework of this component of an overall Community Benefit Package to be acceptable, so long as it is part of a separate legally enforceable agreement between Monhegan Plantation and the University of Maine that sets forth a work plan for Monhegan and the University of Maine to establish and foster growth of this partnership and implement projects on and relating to Monhegan such as those identified in the Monhegan CBAC Framework Outline
Tuition Scholarship at UMaine	• One full tuition scholarship every year is offered to a Monhegan resident (as defined) that meets the acceptance criteria for the University of Maine on the basis of 120 credit hours whether 4 years (more or less) • Tuition scholarships may be carried over, provided there are no more than four student full-time equivalent scholarships any academic year (i.e. more than 4 if some at part-time)
Cable with Electrical and Fiber Optic Capacities	• MAV shall provide an electric cable capable of transmitting 300 kilowatts of power with separate fiber optic capacity installed to and upon Monhegan • Construction of the above infrastructure shall be commenced and completed during construction of the MAV Project • Materials, equipment, and construction of the above infrastructure (so-called Monhegan spur) shall be performed in accordance with same qualifications, terms, and conditions as the materials, equipment, and construction of the overall MAV Project and cable/fiber optic connections
Electric Energy Provision	• MAV shall provide or make arrangements to provide MPPD with electric energy for the entire duration of the contract term of the MPUC PPA, without charge to MPPD, in an annual amount not to exceed 340 megawatt hours, escalating at one percent per year and a maximum demand of 300 KW for the Monhegan spur • Electric energy may be sourced from the MAV Project • The ability to use the cable to deliver power from the mainland will be subject to securing a successful FERC ruling that allows the cable to be operated as a transmission facility.

	• MPUC approvals, as necessary, shall be obtained by appropriate parties; MAV agrees to undertake best efforts with appropriate parties (e.g., CMP, MPPD) to obtain any necessary MPUC approvals; MAV will cover all reasonable costs borne by MPPD to secure any necessary MPUC approvals • MAV representatives will undertake best efforts to work with Monhegan representatives to locate and design the interconnection consistent with the annual and maximum demands cited above, which shall also include provisions to avoid, minimize, or otherwise address aesthetic impacts from interconnection infrastructure (e.g., fish house covering concrete boxes) • MAV shall pay all commercially reasonable costs and installation of all interconnection to fulfill this commitment, which shall be performed in accordance with same qualifications, terms, and conditions of the materials, equipment, and construction of the overall MAV Project • MAV shall pay all costs associated with route design, permitting, and construction to the MPPD power station to the point of interconnection • Monhegan Plantation and/or MPPD will acquire, as necessary, property rights for the onshore cable to connect to the MPPD Power Station in accordance with applicable electrical and safety codes; MAV will pay all reasonable costs associated with acquisition and/or transactional costs associated with the above described property rights • MAV will bear the risk of loss for all of the above cable infrastructure until transfer of ownership • MAV will transfer ownership of the above shoreside assets to MPPD at COD • MPPD will be responsible for the O&M for shoreside assets • MAV will provide technical training, as needed, regarding the O&M associated with the interface between onshore assets and MAV Project assets
Option to Own Cable	• MAV will enter into a Option Agreement with Monhegan and/or MPPD to transfer ownership of the cable from the mainland to Monhegan at no cost and free and clear of any debt or encumbrances • MAV agrees to provide Monhegan and MPPD with at least 12 months notice prior to decommissioning the MAV Project

Cable Reserve Fund; Decommissioning Fund	• MAV shall establish a Cable Reserve Fund for the benefit of MPPD, which shall be available to MPPD at least 12 months prior to termination whether at 20 years or before 20 years • MAV shall contribute $500,000 into a Cable Reserve fund at least 12 months prior to termination whether at 20 years or before 20 years • If Monhegan and/or MPPD elects to exercise the Cable Option, then MAV shall transfer or assign the Cable Reserve Fund • MAV shall transfer or assign all portions of the MAV Project decommissioning funds necessary for decommissioning of the cable if legally permissible
Fiber Optic Cable	• MAV will pay for and install a fiber optic cable to Monhegan Island in conjunction with the electrical cable interconnection • The fiber optic cable shall be installed at a mutually agreeable location consistent with the co-located or separate electrical cable and Monhegan's broadband needs • MAV will bear the risk of loss until transfer of the fiber optic cable infrastructure • MAV will transfer ownership of the fiber optic cable infrastructure to Monhegan, MPPD, or other designated entity upon COD of the MAV Project
Jobs Opportunity	• Monhegan residents will have first options to jobs created by MAV where the applicants meet the qualifications for the positions (e.g., construction and deployment, monitoring, and O&M operations jobs • Provisions for reasonable training shall be provided if needed
Miscellaneous	• UMaine and MAV shall not develop, construct, or operate any commercial grid-scale offshore wind energy project within 15 nautical miles of the boundaries of Monhegan • MAV shall undertake best efforts to meet FAA lighting requirements and mitigate lighting impacts, including but not limited to utilizing radar-induced lighting or similar technology that may be approved by the FAA • MAV shall ensure coloration of the turbine platforms do not go beyond minimum requirements imposed by Coast Guard regulations or any other applicable laws or regulations • MAV shall undertake best efforts to "downshield" lighting associated with the turbines and turbine platforms

Permit Transfers; Joint Application for Cable Spur	• Upon election by Monhegan to accept cable after project termination, MAV agrees that it will transfer all permits necessary for operation of the cable beyond life of project • If required, MPPD and MAV agree to be joint applicants for the cable spur on Monhegan
Memorandum of Understanding	• MAV, Monhegan, and MPPD agree to adopt a memorandum of understanding or similar document describing the "Cable" Community Benefit Package, excluding only the first two terms regarding University of Maine collaboration and full tuition scholarships

Option B: "Energy/Broadband Fund" Community Benefit Package

Term	Benefit Amount/Requirement/Conditions
University of Maine Collaboration/Support for Monhegan Projects	• CBAC appreciates and finds the framework of this component of an overall Community Benefit Package to be acceptable, so long as it is part of a separate legally enforceable agreement between Monhegan Plantation and the University of Maine that sets forth a work plan for Monhegan and the University of Maine to establish and foster growth of this partnership and implement projects on and relating to Monhegan such as those identified in the Monhegan CBAC Framework Outline
Tuition Scholarship at UMaine	• One full tuition scholarship every year is offered to a Monhegan resident (as defined) that meets the acceptance criteria for the University of Maine on the basis of 120 credit hours whether 4 years (more or less) • Tuition scholarships may be carried over, provided there are no more than four student full-time equivelant scholarships any academic year (i.e. more than 4 if some at part-time)
Initial Energy/Broadband Capital Contribution	• One time capital commitment of $100,000 designated for island energy/broadband infrastructure capital fundcommitted by May 1, 2018, and funded as required to implement grant work when awarded, provided that the MPUC PPA has been approved prior to May 1, 2018. With the consent of Monhegan, MPPD shall determine the amount to allocate towards energy; with consent of MPPD, Monhegan shall determine the amount to allocate towards broadband improvements/investments
Grant-Funded Broadband Project	• UMaine agrees to provide direct technical assistance in supporting Monhegan's efforts to secure grant funding for a fully functional broadband network (note: initial estimates up to $440,000 in value based on the Tilson Plan)
Energy/Broadband Fund Initial Capital Contribution	• Upon COD of the MAV Project, MAV shall contribute $2.33 million to a designated energy/broadband fund for the benefit of Monhegan and MPPD. This MAV contribution shall be paid upfront within thirty (30) days of closing on overall MAV project financing • With the consent of Monhegan, MPPD shall determine the amount to allocate towards energy; with consent of MPPD, Monhegan shall determine the amount to allocate towards broadband improvements/investments
Energy/Broadband Fund	• MAV shall provide $100,000 to support third-party expertise

Technical Support	to design an alternative and/or supplemental power generation system, as well as third-party expertise to provide an engineered design of an on-island broadband system • Such third-party resources shall be available to Monhegan after financial close of the MAV Project • Third-party expertise may be part of a turnkey-package EPC deal, design-build, or other project development/construction/financing arrangement selected by Monhegan and MPPD
Municipal Support	• $40,000 annual payment (starting on the first January following financial close of the MAV project., unless financial close occurs in January upon which the first annual payment shall be due within 15 calendar days) for the life of the project) • Municipal support funds shall be allocated/invested at the discretion of Monhegan • Annual payments are subject to a 2.5% escalator
Royalties on University of Maine Technology Gross Revenues	University of Maine shall contribute 5% of gross licensing royalty revenues received by the University of Maine, from projects utilizing UMaine VolturnUS technology, with the geographical restriction on waters of the East Coast and Gulf Coast of the United States of America • Royalty payment obligation continues until patents expire (which shall include all extensions, renewals, and/or modifications) or the termination of a royalty paying project or projects , whichever is later, provided that royalty payments shall continue even after a project is terminated if the University of Maine continues to receive royalties. • Royalties will be divided at the discretion of Monhegan
Royalty on Renewable Energy Credit Gross Revenues	• MAV shall contribute 4% of gross revenues generated by the Project from any renewable energy credit sales to the Energy/Broadband Fund, subject to a $50,000 annual cap for the first 10 years of the project.
Jobs Opportunity	• Monhegan residents will have first options to jobs created by MAV where the applicants meet the qualifications for the positions (e.g., construction and deployment, monitoring, and O&M operations jobs • Provisions for reasonable training shall be provided if needed
Miscellaneous	• UMaine and MAV shall not develop, construct, or operate any commercial grid-scale offshore wind energy project within 15 nautical miles of the boundaries of Monhegan

	• MAV shall undertake best efforts to meet FAA lighting requirements and mitigate lighting impacts, including but not limited to utilizing radar-induced lighting or similar technology that may be approved by the FAA • MAV shall ensure coloration of the turbine platforms do not go beyond minimum requirements imposed by Coast Guard regulations or any other applicable laws or regulations • MAV shall undertake best efforts to "downshield" lighting associated with the turbines and turbine platforms
Memorandum of Understanding	• MAV, Monhegan, and MPPD agree to adopt a memorandum of understanding or similar document describing the "Energy/Broadband Fund" Community Benefit Package, excluding only the first two terms regarding University of Maine collaboration and full tuition scholarships

EXHIBIT B - MONHEGAN COMMUNITY BENEFITS ADVISORY COMMITTEE "FRAMEWORK OUTLINE"

INTRODUCTION

Purpose Statement. The purpose of this framework outline is to identify values and guiding principles to support the Community Benefit Advisory Committee's ["CBAC"] efforts to:

(1) Conduct due diligence in evaluating potential community benefits regarding the MAV Project;

(2) Engage in negotiations with MAV to develop an optimal community benefits package for Monhegan that promotes environmental, social, and economic sustainability; and

(3) Make recommendations to the Monhegan Board of Assessors on a specific community benefits package and associated agreement with MAV.

Schedule; Community Assets & Needs. This framework outline also sets forth a Schedule for CBAC meetings, and provides an initial list of Community Assets and Community Needs to help guide CBAC in negotiating a community benefits agreement with MAV.

Community Input. As a guiding document for conducting due diligence, evaluating potential benefits, engaging in negotiations, and making recommendations, CBAC will: (1) publish this framework outline for public review and consideration; and (2) conduct a community meeting to receive public input in-order to complete a final framework outline document. This community meeting is detailed in the schedule set forth below.

OUTLINE WITH SCHEDULE AND INITIAL INVENTORY OF COMMUNITY ASSETS & NEEDS

I. Authority and Charge of CBAC

The CBAC was created by Plantation vote in July 2016 to:

- "Aid in developing a community benefits agreement with Maine Aqua Ventus"; and
- "is charged with providing the Assessors with recommendations for obtaining the necessary professionals to negotiate a community benefits agreement; to oversee the development of the benefit document; [and] to give a progress report at the monthly Assessors' meeting."

Article 2, Plantation Warrant (July 26, 2016).

As stated in the Warrant, any "community benefits agreement will be approved by the Assessors once the authority to enter into the agreement is granted to them by the voters at a Town Meeting." *Article 2, Plantation Warrant (July 26, 2016)*.

II. Monhegan Values in the Context of Developing a Community Benefits Package and Associated Agreement

Monhegan values arising out of its history, natural resources, economy, and island society can be grouped into three core areas under the common theme of sustainability:

A. Environmental.

i. Monhegan as a community has a history of undertaking and supporting projects to help ensure its natural resources and associated ecosystems are sustainably managed, utilized, and conserved; and the community continues to have a desire to be responsible stewards of land, sea, and air resources to sustain those vital resources.
   1. *Land Conservation.* A large portion of the island remains undeveloped providing environmental benefits (e.g., wildlife habitat) and multiple-use recreational opportunities (e.g., extensive trail network for residents, non-residents, and visitors to use and enjoy).
   2. *Sea Conservation/Management.* There is a designated Monhegan Lobster Conservation Area focused on sustainable lobster fishing.
   3. *Air Emission Mitigation/Conservation.* The island's diesel power generation station was relocated away from the island's water source, and recently completed a significant upgrade (4 new diesel micro-turbines) to reduce environmental air emissions and increase energy efficiency. This facility also includes the installation of a solar PV system, and future plans are underway to utilize the excess heat from the turbines for use by the Museum.
   4. These represent only a few examples of the many efforts and projects that Monhegan has undertaken to help promote environmental sustainability through responsible stewardship of land, sea, and air resources.

ii. Although the CBAC's purpose and charge is not specifically focused on an environmental analysis of the MAV Project, as part of CBAC's development and negotiation of potential elements of a community benefits package, it is important to consider Monhegan's environmental values/guiding principles and to monitor the Department of Energy's Assessment review.

B. Economic. Monhegan's economy historically and currently centers on fishing/lobstering, tourism, and the arts, which have provided a solid economic base to support the island. Retaining this economic base, as well as providing new opportunities and growth in these economic areas and in new economic areas compatible with Monhegan, is on on-going effort that requires continuous investment in both human resources and economic development efforts to sustain Monhegan and its people. Constructive challenges for Monhegan include retention and diversification of fishing/lobstering, conservation of environmental values in balance with tourism and recreation, maintaining a vibrant artistic community, lowering energy and other cost-of-living expenses (e.g., affordable housing), and providing new and expanded economic opportunities to sustain the island economy as well as the seasonal and year-round population.

C. Social. Monhegan has a unique social fabric consisting of a tightly knit community that has a history of community support, respect, and the ability to "come together" to address community challenges and opportunities. These aspects, in combination with Monhegan's environmental and economic history, help form a culture unique to Monhegan. A common goal of Monhegan is to maintain this social fabric and history of working together to find common solutions to sustain Monhegan as a seasonal and year-round island community. Support for education, community events, health care, community wellness, communications/connectivity, are among several areas that are important contributors to Monhegan's social values.

Summary Point

All three of the above values (i.e., environmental, economic, and social) are interdependent with each other and important guiding principles to Monhegan's island community and culture, both now and in the future. All three require resources to sustain Monhegan. A community benefit agreement has the potential to provide a significant level of resources to support Monhegan in these efforts not only during the project timeframe but far into the future.

III. Monhegan's Recent Due Diligence Efforts

Monhegan established the Monhegan Energy Task Force ["METF"] to review the MAV Project, gather information on the Project, and make that information available to the public. Studies and reports made available through METF's review include:

I. Environmental Studies and Reports
   a. Monhegan Fall 2015 UMaine LiDAR Buoy Deployment, prepared by UMaine Advanced Structures & Composites Center
   b. Acoustic Modeling for Aqua Ventus I off Monhegan Island, ME, prepared by Pacific Northwest National Laboratory (Oct. 2013)
   c. Acoustic Bat Surveys on Monhegan Island in 2009, 2010, and 2011, prepared by Stantec Consulting Services, Inc. (Jan. 2012)
   d. Visual Observations for Birds, Turtles, and Marine Mammals at the University of Maine Test Site near Monhegan, Maine, prepared by Lubird Kennedy Environmental Services (April-June 2013)
   e. Two-year baseline characterization of benthic and emersal assemblages inside the University of Maine deepwater wind test sites off Monhegan Island, Maine, prepared by UMaine (March 2013)

II. Economic/Technical Studies and Reports
   a. Economic Impacts of the New England Aqua Ventus (Phases I and II) Offshore Wind Power Program in Maine, prepared by UMaine School of Economics (April 30, 2013)
   b. Potential Tourism Impacts of an Offshore Wind Farm Near Monhegan Island, prepared by UMaine (June 2016)
   c. Visual Modeling for Aqua Ventus I off Monhegan Island, ME
   d. Draft Outline of Provision of Power vs. Alternative Benefit
   e. The NEAV Cable Option: Analysis of Potential Fuel Savings and Emissions Reductions for Monhegan, prepared by Island Institute
   f. Review of Matinicus Plantation Electric Company and Monhegan Plantation Power District, prepared by The Financial Engineering Company (Feb. 1, 2016)
   g. MPPD Usage Summary Reports
   h. Summaries of Questions and Answers regarding the Project and Potential Community Benefits
   i. New England Aqua Ventus I – Project Update, December 2016

In addition to the above studies and reports, METF has conducted community outreach by holding community meetings and providing periodic public updates on developments of the MAV Project.

[See Following Pages for Schedule and Initial Inventory of Community Assets & Needs]

III. CBAC Anticipated Schedule/Public Process

Table 1 - Meeting Schedule

Meeting Number	Date	Meeting Summary/Anticipated Subject Matter
1	Dec. 13, 2016	Attend Community Meeting regarding Project Update
2	Jan. 19, 2017	Initial meeting with legal counsel to discuss schedule and approach to development and negotiation of community benefits
3	Feb. 9, 2017	Discuss working draft community benefit framework outline; inventory of community assets and needs; strategic considerations for negotiating a community benefit package;
4	Feb. 23, 2017	Review inventory of community assets and needs, and then release Framework Outline for public input at March 9 Community Meeting
5	March 9, 2017	Community Meeting Update – CBAC provides and obtains public input on Framework Outline; CBAC incorporates public input to complete inventory of community assets and needs and Framework Outline; Formulate request for a detailed proposal from MAV
6	March 23, 2017	Final approval of Framework Outline and request for detailed proposal from MAV
7	April 6, 2017	Review/analyze information and proposal from MAV; continue to discuss/negotiation potential community benefit terms and conditions with MAV and formulate a response to MAV; review/prepare draft recommendations regarding a community benefit package and associated agreement (post/publish draft recommendations including detailed terms and conditions)
8	April 20, 2017	Review updated draft recommendations regarding a community benefit package and associated agreement Adopt; Review/prepare questions and clarifications.
9	May 4, 2017	Review estimates by experts, Tilson (internet), Sgurr and Hubbard (electricity interconnect)
10	May 16, 2017, 2017	Plan a community meeting. Prepare a counterproposal.
11	May 30, 2017	Possible date for community meeting.
		The committee plans to meet every two weeks until our task is completed.

IV. CBAC Due Diligence Efforts: Initial Inventory of Community Assets

Table 2 – Initial Inventory of Community Assets

Fishing/ Monhegan Lobster Conservation Area - Protected lobster area via Maine state law. Provides an economic asset to the island fishermen that is the economic core to a year-round working community. Without this the island would be like others - based solely on tourism.
Natural Resources - Aside from fishing, Monhegan has few natural resources that can, on their own, be tapped economically but the trails, beauty and bird migration resources are at the core of the tourist economy. The conservation/protection of natural resources is key to sustaining the vital tourist season.
Water source - The Monhegan aquifer, the "Meadow", is a key resource. Essential to the existence of the summer community and the economy.
Town Dock/Boatline/USPO- With only one dock on the island, it is the lifeblood of the island and the centerpiece of community commerce. The dock is an asset that must be maintained to support a viable year-round boatline service and therefore the US Post Office's vital link to the mainland.
Power Transmission & Distribution - Without distribution, power generation is irrelevant. The grid covers the populated portion of the island. An asset that must be maintained and upgraded. Currently electric power is perceived by many as self-sufficient. There is a strong feeling among residents that Monhegan Island move toward self-sufficient, economical, and sustainable electric power generation.
Hospitality & Other Local Businesses – Several hotels, apartments and cottages are able to support tourism while galleries, the brewery, and shops add to the attraction of an island visit and hence all support the island economy.
Multi-Generational Property Owners – Owners and families keep returning and passing on the community to next generations which automatically sustains summer population.
Arts Community – Internationally known. The reason for many summer visitors to come to the island for longer stretches of time. Workshops attract potential future residents.
Trails - Owned and maintained by the Monhegan Associates Inc. Fully 2/3rds of the island is conservation land. Hiking and scenic walks provide visitors and tourists with a main attraction. Maintaining the trails is an important part of sustaining their beauty.
Land Conservation Areas - In the 1950's, Theodore Edison, recognizing the unique beauty of Monhegan, founded the Monhegan Associates Incorporated. Monhegan Associates has slowly purchased and inherited most of the land outside the village. With a strong charter to "protect the wild lands" the Associates have kept these lands wild but accessible to the public. The result of about 3/4 of the coastline of the island, including the entirety of the eastern and most majestic portions, is a development-free area left in its natural state.
Power Generation – MPPD has recently upgraded to a state of the art diesel power generation system. Generation costs are high but the recent upgrade electricity is a huge asset to the island without which there would not be a viable economy.

School – An asset required to attract year-round family living to the island. While the student count is low and variable from year to year, its very existence is key. The school building also serves as one of the central meeting places for larger groups of people and a functional town community center. The school is well supported by the community in the form of tax dollars and volunteering.
Museum - The cultural centerpiece of the island. The iconic lighthouse creates the "image" of Monhegan. The museum is nationally known and contains an outstanding historical collection of all aspects of island life. It operates as the cultural center for art and history of Monhegan Island including the art history of Monhegan's long line of artists.
Library - The library is a well-supported mini-cultural center and state of the art library. It is an asset utilized heavily by both summer and year-round residents alike.
Breakwater – Provides protected access to the harbor and protects the fishing fleet. Tax dollars and grants provide ongoing maintenance, rebuilding, and additions to the structure.
Roads – The community prefers to not pave the roads. Monhegan is mostly a walking community.
Fire Department – All volunteer and Town funded. A necessity that is often overlooked.
Church – Community space for worship, celebration, meeting place, music, and host for non-profit benefit events. The space is also used by the Island Farm Project for Farmer's Market.
Innate Beauty/Scenic Panoramas - The vistas on the trails and east side cliffs.
Quiet & Light – No modern roads/vehicles/equipment makes for a quiet island. The "light" is an artist's dream which has drawn many famous people to the island.
Bird Sanctuary - A migratory stop over. Drives additional tourism.
Telephone and Internet Service – Fairpoint Communications owns, operates, and maintains telephone service and internet service on Monhegan. They use microwave technology to do this. They are obligated by the PUC to provide this service and are not able to revoke it. If residents asked for the microwave towers to be removed, it would be a challenge to get this service back. RedZone Wireless has technology on-island providing internet service and VoIP service. Both Fairpoint and RedZone are limited by the technology available on-island at this time.
Year-round community – Although closer to 30 than the census number of 65, the year-round community keeps the municipality functioning and all of the assets of the island maintained. The year-round residents are the ones that hold town government positions, including for solid waste, roads, fire department, wharf, school, tax assessors, registrar of voters, tax collector, treasurer, financial planning. Year-round residents make decisions and plans for the assets and needs of the island.
Seasonal community – Invaluable to non-profits, they take positions as leaders and board members, organize fundraising events, spend money on-island, pay taxes, broadens the skills and knowledge base of the community.
Quality of Life – Quality of life on Monhegan is great; every day we are surrounded by nature and are in-tune with the weather in a way that people inshore don't need to be. We are active because

our livelihoods are often manual labor, but also because we have access to 13 miles of hiking trails. A simple life is possible here but requires hard-work. See needs:
Independence – Monhegan has a strong tradition of independence, which provides a strong foundation for establishing and promoting sustainability efforts.

V. CBAC Due Diligence Efforts: Initial Inventory of Community Needs

Table 3 – Initial Inventory of Community Needs

Sustainable Energy – MPPD has recently upgraded to a state-of-the-art diesel power generation system. While state-of-the-art, the system is nonetheless diesel and not "sustainable" or "renewable". The environment is still being damaged by this diesel system albeit at a lesser rate. This "need" extends beyond a limited timeframe and must continue beyond any research project timeframe. If economically feasible long-term, it is desirable to keep our own power company supported and integrate renewable energies that can be harnessed on-island.
Reliable Energy – Monhegan has a highly variable seasonally driven energy consumption pattern which strains reliability. In addition, reliability is also tied to the distribution system. The need is for a flexible (dealing with peak season demand) and reliable (backed up source) energy source. Given the constraint of the current plant capacity and assuming incoming wind loads would be higher, some transformer upgrades will be required, along with the equipment necessary for their placement, to fully benefit from new energy sourcing. Longer term, should the island begin to grow, further upgrades to the distribution lines may be needed. Resources are needed to implement upgrades. Trained people to maintain, operate and upgrade the current systems will be needed on-island and off-island.
Affordable Energy – Current generation and distribution costs are extremely high ($.70/Kwh). A sustainable supply of free energy would cut the final cost roughly in half. While still way above the average in Maine, this would be a significant reduction in cost to island living and conducting business. In order for the community to attract new residents and grow, however, there must be a plan/assurance/predictability to the *long-term* access to affordable energy much as mainland residents are able to assume.
Telecommunications –The current microwave telecommunication service is extremely unreliable and bandwidth deficient. A more robust (i.e. bandwidth - both incoming and backhaul) and *reliable* source of telecommunications connection to the mainland is greatly needed. Adequate consistent fiber optics will not only benefit the business community but also education, health and wellness, safety, and overall communications. The cost of this additional service will be higher than current costs. Given the small inhabited area on Monhegan and an existing and adequate radio Wi-Fi system that is already in place, a joint service provider and research sponsor partnership to offer municipal Wi-Fi to all islanders could be a cost-effective solution.
Energy Efficiency Programs – New programs to conserve energy (like the light bulb program) and the resources to implement them would go a long way towards keeping energy use under control. Research projects in this area would be a great long term benefit to the island.

Water source – Water quality from the aquifer (the Meadow) is very poor. Discoloration is high and overall quality is low. In 2016, the Meadow was stretched to its very limits but did make it through the season. Engineering and planning is needed for our water company. Specifically, understanding how much water is available, and how much we can draw without salt water intrusion, color and flavor to maintain a clean water system. We are also concerned about a 100-year storm that will cause extreme flooding and affect the aquifer.

Fishing/Lobstering Diversification Opportunities – Monhegan has the official capacity for 17 lobster boats with only 8 currently active. Resources are needed to explore other fishing opportunities (farms, aquaculture etc.) that may add to the lobsterman's current work and/or attract new fishing community members from the mainland. Testing for PSP is needed for aquaculture opportunities. This is a core competency that needs to turn positive for Monhegan to be a viable island.

Transportation - Town Dock/Boat line/USPO – The winter ferry service is much reduced and it is this ferry service functions primarily as the US Post Office delivery boat in the winter. The service is expensive for year-round residents and freight deliver is costly as well. The boat line needs to be economically viable in order that the island not lose this important winter service. The Town Dock needs a new hydraulic ramp for freight delivery and ongoing general maintenance is costly. Oil and Propane supply – and consistent delivery – is also another "need" tied to the ferry service reliability.

(Note - Boatline security: Possible state subsidies, diversified winter income, look into changing county to Knox if we are able to tap into more services there.)

Affordable Housing – The single most important reason new families do not settle on Monhegan. The actual *lack* of housing is first then the cost of that housing if it is available. MISCA provides some good assistance in this area but is resource constrained. The lack of buildable land is also a problem. Transitional housing is needed so people can try out Monhegan before investing in a house.

Health and Wellness – There are no health services on the island. Improvements could come from better winter ferry service and from improved fiber optics – telemedicine. In addition, Monhegan could be part of studies regarding the effects of turbines located 2.5 miles from an inhabited space. In addition, students in health fields could come to Monhegan for clinics.

Solid Waste/recycling Programs – New programs and the resources to implement them would help to keep the island clean and sustainable

Expanded community farm – Community greenhouse would help to jump start the season. UMaine Agriculture department could help for the community farm to grow a commodity crop in addition to seasonal fruits and vegetables.

Education – Needs enrichment programs for grades K-12 and financial assistance for high school students. Students at UMaine create programs to be implemented with the students at Monhegan

School, especially STEM subjects. Possible scholarship to UMaine for Monhegan residents.
Breakwater – Research and funding into effects of extending and/or widening. A safer harbor helps the fishermen and protects the dock.
Job Training; **New skills** – Good telecommunications will be invaluable here, in conjunction with diversified job opportunities for fishermen and tourism professionals. Summer income for fishermen, winter income for tourism professionals are critical areas. Examples include, but are not limited to, job training to fulfill jobs that can be performed by islanders from the island for the MAV project, as well as home based career training and job finding opportunities and job creation.
Community Center/**Events** – Should be planned for shoulder seasons to attract more tourists. Any events planned by UMaine should be planned before mid-June and after September. Plan to eat, drink, and sleep on the island.
Municipality – Town planning, budgeting, grant writing, possible town manager position.
Year-round community members – A primary need is more year-round residents. People who want to work hard, work in community and lead a 'simple-life' are needed. Attracting like-minded, hardworking, conscientious people is a need. As above, housing and economic opportunities for those people goes hand-in-hand.
Innate beauty/**panoramic vistas –** For any future projects, height and location limitations should be addressed early and well prior to a commercial project being proposed.
Tourism – Public toilets, municipal planning for large influx of seasonal visitors i.e. emergency evacuation, drought conditions, wear and tear on assets, fire department and emergency rescue services are some of Monhegan's needs to support a vibrant and sustainable tourism industry.

EXHIBIT C

Monhegan Island

Broadband Consulting – Phase 1

Submitted to:
Monhegan Community Benefits Advisory Committee ("CBAC")

Prepared by:
Tilson
245 Commercial Street, Suite 203
Portland, ME 04101
Phone: 207-591-6427
E-mail: broadband@tilsontech.com

Table of Contents

Introduction

Monhegan Island engaged Tilson to provide consulting work to support the further development of broadband options on the island. Tilson conducted a microwave link analysis, point to multi-point wireless broadband analysis, developed a wireless network cost estimate, as well as refreshed the costs of a fiber-to-the-premise (FTTP) network previously produced for the Island Institute.

The below table is a summary budget of the proposed wireless network. A portion of the construction costs are unknown at this time and will require quotes from contractors able to perform the construction. As a placeholder, Tilson has provided a range of the costs for each item based on industry norms. A detailed breakdown of the costs can be found in the "Wireless Network Cost Estimate" section of this report.

Table 1:Wireless Network Summary Budget

Item	Low	High
Construction and Pathing	$56,000	$65,000
Microwave Backhaul & Point-to-Multi-point	$45,280	$45,280
Supporting Equipment for New Builds & Cabinets	$35,484	$35,484
	$136,764	**$145,764**

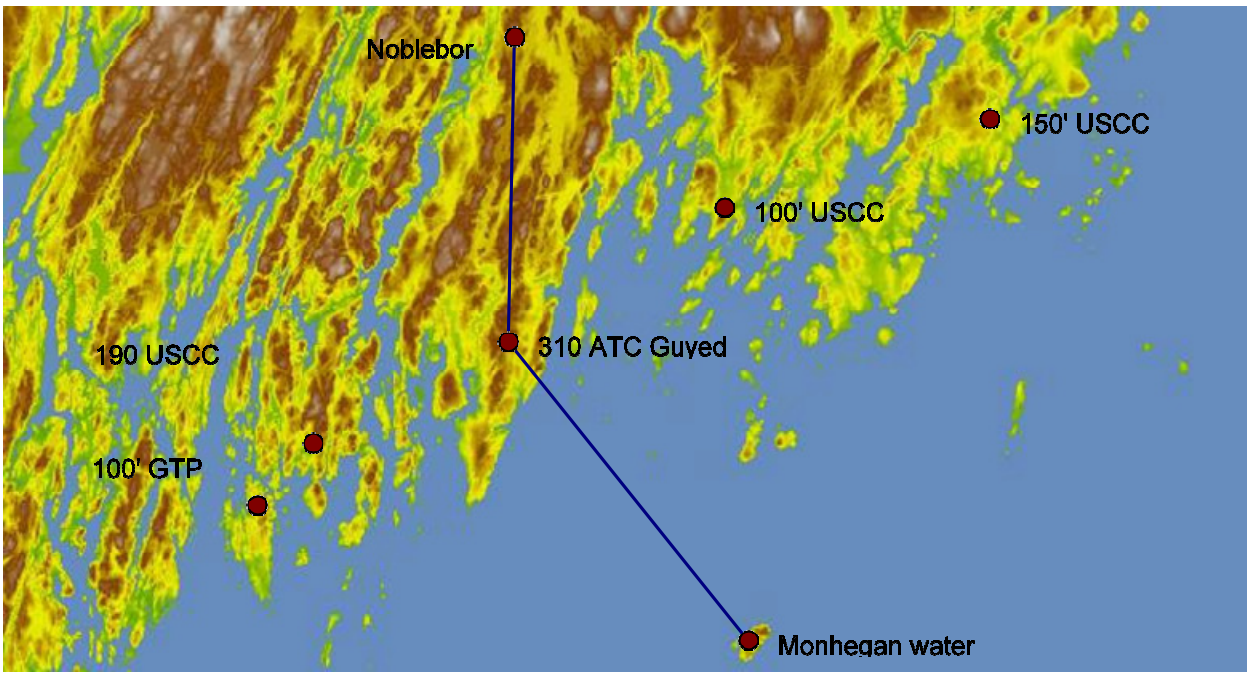
As for the FTTP network, the total cost to deploy is $438,225. A detailed breakdown of the costs can be found in the "Fiber-to-the-Premise (FTTP) Cost Refresh" section of this report.

Microwave Link Analysis

Following an analysis of potential plausible routes, Tilson has evaluated microwave link routes from the island to the mainland, and recommends a 700 megabit per second microwave backhaul link. The backhaul link has been designed in a two-hop approach, to keep the link lengths to a minimum. The shorter lengths allow for maximum throughput speeds and increased network reliability.

Tilson proposes utilizing DragonWave Harmony Enhanced 11GHz microwave radios. See Appendix A for the Harmony Enhanced datasheet. These radios will be mounted directly on the towers and will be powered by 48 volts of DC power, and connected to the existing fiber network via hybrid-fiber coaxial cable. Figure 1 illustrates the route of the two microwave hops from Nobleboro on the mainland to Monhegan island.

Figure 1: Monhegan Island Two-hop Microwave Backhaul Link



Site 1 – Nobleboro

Site 1 is a 190-foot lattice tower located in Nobleboro, ME. It is situated well for the main microwave link to ATC's tower (site 2), and is in close proximity to the existing fiber. An antenna height of 140 feet has been assumed available at this tower, and this assumption was used in the path analysis.

Site 2 – American Tower Corporation Tower

Site 2 is a 310-foot guyed tower owned by American Tower Corporation (ATC). Its location provides optimal Line of Sight (LoS) to both Monhegan Island and Nobleboro. The ATC tower's proximity to both allows for use of the 11Ghz radios providing both high bandwidth and reliability. Antenna heights of 254 feet and 165 feet are assumed available at this tower, and this assumption was used in the path analysis.

Site 3 – Monhegan Water Tank

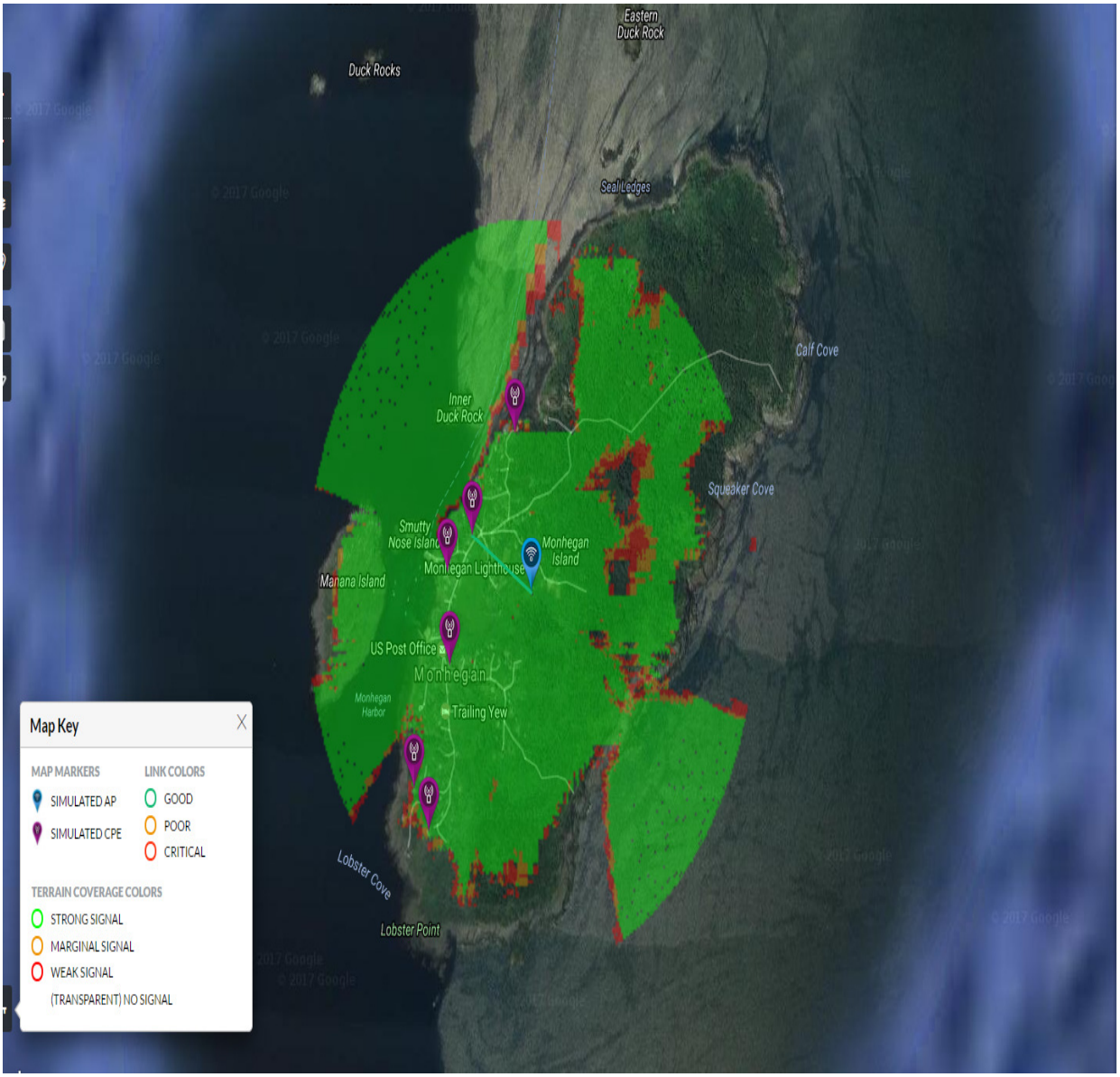
Site 3 is a water tank on Monhegan Island, and is approximately 60 feet high. Its location provides optimal LoS to greater than 95% of the premises on the island. Antenna heights of 50 feet for both the backhaul and the wireless access points are assumed available, and this assumption is used in the path analysis.

Point to Multi-Point Wireless Broadband Network

Tilson proposes using Ubiquiti Networks for the point to multi-point wireless broadband network. Ubiquiti products offer a quality consumer grade product with acceptable data throughputs at a reasonable price. Tilson has designed a 3-sector access point system using three Rocket Prism 5GHz radio base stations feeding individual 120-degree sector antennas. See Appendix B for the Rocket Prism 5GHz datasheet.

An Ubiquiti Nanobeam Customer Provided Equipment (CPE) will be mounted at or above 16 feet at each user location. See Appendix C for the NanoBeam datasheet. The CPE will be powered and cabled to the users' internal network using shielded CAT6A cable. Figure 2 contains the RF signal heat map from a simulated access point and simulated CPEs.

Figure 2: Monhegan Simulated RF Signal Heat Map



Technology Specifications

Tilson approached several Original Equipment Manufacturers (OEMs) and ultimately selected DragonWave for the microwave backhaul link and Ubiquiti Networks for the point to multi-point wireless broadband network. The below tables show the reliability metrics for the microwave backhaul link, the access points and the CPEs.

Table 2: Microwave Backhaul Link Reliability Metrics

Link Path	Modulation	Throughput	Radio	Annual Uptime Percentage	Annual Downtime Percentage	Annual Downtime in Minutes
1	2048-QAM	717 Mbps	HEMC 11 GHz	99.9959%	0.004%	22
2	2048-QAM	717 Mbps	HEMC 11 GHz	99.9925%	0.007%	37

Table 3: Access Point Reliability Metrics

Access Point	Modulation	Throughput	Radio	Annual Uptime Percentage	Annual Downtime Percentage	Annual Downtime in Minutes
1	256-QAM	500 Mbps	Rocket Prism 5GHz	99.999%	0.001%	5
2	256-QAM	500 Mbps	Rocket Prism 5GHz	99.999%	0.001%	5
3	256-QAM	500 Mbps	Rocket Prism 5GHz	99.999%	0.001%	5

Table 4: CPE Reliability Metrics

CPE	Modulation	Throughput	Radio	Annual Uptime Percentage	Annual Downtime Percentage	Annual Downtime in Minutes
1	256-QAM	53 Mbps	Nanobeam	99.999%	0.001%	5
2	256-QAM	53 Mbps	Nanobeam	99.999%	0.001%	5
3	256-QAM	60 Mbps	Nanobeam	99.999%	0.001%	5
4	256-QAM	57 Mbps	Nanobeam	99.999%	0.001%	5
5	256-QAM	60 Mbps	Nanobeam	99.999%	0.001%	5
6	256-QAM	60 Mbps	Nanobeam	99.999%	0.001%	5

Wireless Broadband Network Cost Estimate

The total cost of the proposed wireless broadband network ranges from $136,764 to $145,764. Deducting the cost range of $129,114 to $138,114 to deploy the microwave backhaul link that would be required whether the island is served wirelessly or via FTTP, this brings the total cost of the point to multi-point wireless network to equal $7,650. The costs associated with the FTTP network can be found in the next section.

An additional cost associated with provisioning Monhegan's broadband network (wireless or fiber) is the equipment installation at the customer premises. Costs ranging from $200 to $400 should be anticipated for this portion of the network.

The following tables provide the bill of materials for each component of the proposed network. As previously stated, a portion of the construction costs are currently unknown and will require quotes from contractors able to perform the construction.

Table 5: Construction & Pathing Bill of Materials

Construction & Pathing				
Item	**Quantity**	**Unit Cost**	**Cost Low**	**Cost High**
Nobleboro - Construction	1	TBD	$12,000	$15,000
ATC - Construction	1	TBD	$17,000	$20,000
Water Tank - Construction	1	TBD	$17,000	$20,000
Structural	3	TBD	$3,500	$5,500
FCC Frequency Survey & License	3	$1,763.67	$5,291	$5,291
			$54,791	**$65,000**

Table 6: Microwave Backhaul & Point-to-Multi-point Bill of Materials

Microwave Backhaul & Point-to-Multi-point			
Item	**Quantity**	**Unit Cost**	**Total Cost**
Dragon Wave Harmony Enhanced MC 11 Band1 High	2	$4,750	$9,500
Dragon Wave Harmony Enhanced MC 11 Band1 Low	2	$4,750	$9,500
800mbps upgrade license Key	4	$1,775	$7,100
Harmony Enhanced Dual carrier key.	4	$500	$2,000
4' High Performance ValuLine Microwave Dish	3	$2,630	$7,890
6' High Performance ValuLine Microwave Dish	1	$4,640	$4,640
Ubiquiti: 5GHz airMAX 120° Sector 19dB	3	$200	$600
Ubiquiti: 5GHz Rocket ac Gen2 Prism US	3	$350	$1,050
Ubiquiti: 5GHz NanoBeam ac Gen2 CPE 19dBi US	20	$150	$3,000
			$45,280

Table 7: Supporting Equipment Bill of Materials

Supporting Equipment			
Item	**Quantity**	**Unit Cost**	**Total Cost**
Westell Boxer 10 Cabinet	3	$8,000	$24,000
Battery Cabinet	3	$500	$1,500
Marathon M12V90FT	24	$281	$6,744
H-frames	3	$1,000	$3,000
14 Awg Dc Power Cabling	800	$0.30	$240
			$35,484

Fiber-to-the-Premise (FTTP) Cost Refresh

Tilson's detailed cost estimate included all the design, application, materials and labor costs associated with the fiber to the curb network.[1] Relying on Monhegan Power District to supply data on existing aerial routes, the percentage of aerial route miles and underground route miles are 32% and 68%, respectively. The estimate also assumes that all fiber drops are built at once, rather than on-demand. An island premium of 10% on materials, and 20% on labor was added to Tilson's standard estimates, and is reflected in the numbers below.

Table 8: Monhegan FTTP Capital Estimate

Project Miles	2.5
Aerial Miles	0.8
Poles	24
Premise Count	186
Application and Make Ready	$8,905.30
Materials	$72,967.21
Labor	$246,264.30
Engineering	$16,417.62
Margin/Profit (20%)	$69,713.52
Service Provider Tax (6% of Labor & Engineering)	$19,943.73
Sales Tax (5.5% of Materials)	$4,013.20
Total	$438,224.87
Per Premise Cost	$2,356.05

FTTP Planning Considerations

It should be noted that the unforeseen expenses associated with ledge work are far less expensive via aerial construction. In areas with ledge, a core drill can bore an 18 – 22" wide and six-foot deep hole for a pole set with higher predictability than conduit construction.

Also, it is worth holding discussions with the Monhegan Power District on their intent to perform capital upgrades to their network. If they are, cost sharing measures can be taken to extend pole lines from the poles that are already existing. This allows the electric utility to increase their service reliability with sound poles while FTTP reaches more parts of the island.

[1] Tilson's detailed cost estimate is based on the known cost of the network components of its high-level fiber design, plus estimates for labor costs, engineering and margin. A firm estimate is obtained when a project is put out to bid. Projects can be separated into engineering design and build, or put out to bid as a combined design/build.

Appendix A: DragonWave Harmony Enhanced Datasheet

DragonWave

HARMONY ENHANCED^{MC}

HIGH POWER MULTI CARRIER PACKET MICROWAVE

DELIVERING THE LOWEST COST PER BIT OVER MICROWAVE

This high capacity packet microwave builds upon the Harmony Enhanced family by delivering a multi-carrier channel system thereby doubling the capacity available in a single ODU. Because the radio and modem are integrated into a single highly compact outdoor unit, Harmony Enhanced^{MC} is a zero footprint solution – eliminating rack congestion and minimizing collocation space. The Ultra High Power increases the overall system gain and allows for deployment of smaller dishes, higher order modulations, or increased link availability.

Equipped with DragonWave's Bandwidth Accelerator+ technology, the Harmony Enhanced^{MC} achieves the highest degree of spectral efficiency (through 4096 QAM, 4 x 4 MIMO and wider channels), delivering more capacity per channel with a longer reach than any other all-outdoor microwave system. Harmony Enhanced^{MC} delivers industry leading capacities up to 4Gbps in a single radio and 8Gbps in a single channel with MIMO or a single antenna with XPIC.

With unmatched capacity and system gain, simple installation and operation, as well as sophisticated remote management capability, the Harmony Enhanced^{MC} delivers significant lifecycle cost savings for service providers and enterprises alike.

This innovative, carrier-grade packet microwave solution operates in licensed or unlicensed spectrum from 6 to 42 GHz.

SOLUTION HIGHLIGHTS

- Zero footprint, fully integrated all-outdoor unit
- Ultra high power radio option with up to 35dBm of transmit power
- 4 x 4 MIMO ready hardware supporting up to 8 Gbps capacity with DragonWave's Bandwidth Accelerator+
- Single Radio XPIC configuration
- Wide channel support up to 112 MHz
- Up to 4096QAM modulation support
- Service aware Hitless Automatic Adaptive Modulation (HAAM)
- SyncE support and 1588v2 Transparent Clock
- Pay-as-you-grow with automatic remote scalability
- Multi-port capability including an integrated 10Gb Ethernet port
- Comprehensive Ethernet OAM support (802.3ah, 802.1ag, Y.1731) and MEF services
- Advanced QoS support with 8 levels of prioritization
- Comprehensive management and provisioning with NetViewer NMS
- Intuitive EMS with Linkview
- Lowest total cost of ownership solution
- SDN Ready

KEY APPLICATIONS

- Mobile Backhaul
- Leased Line Replacement
- Last Mile Fiber Extension
- Private and Enterprise Networks

Appendix B: Rocket Prism 5 GHz airMAX ac Radio Base Station Datasheet

DATASHEET

rocket PRISM AC GEN2

Overview

Ubiquiti Networks has designed airMAX ac radios with high performance and ease of installation in mind. The Rocket®Prism 5AC Gen 2 features both airMAX ac and airPrism technologies for maximum wireless performance in high-density areas.

Pair the Rocket Prism 5AC Gen 2 with airMAX ac antennas for optimal performance:

- **PtP backhaul** RocketDish™ ac Antenna
- **PtMP links** airMAX ac Sector

Worldwide 5 GHz Coverage

Deploy the Rocket Prism 5AC Gen 2 anywhere in the world. It delivers complete coverage of the 5 GHz spectrum with a single radio. The Rocket Prism 5AC Gen 2 allows for flexibility in configuring channel bandwidths (subject to local country regulations).

Software

airOS 8

airOS® 8 is the revolutionary operating system for Ubiquiti® airMAX ac products.

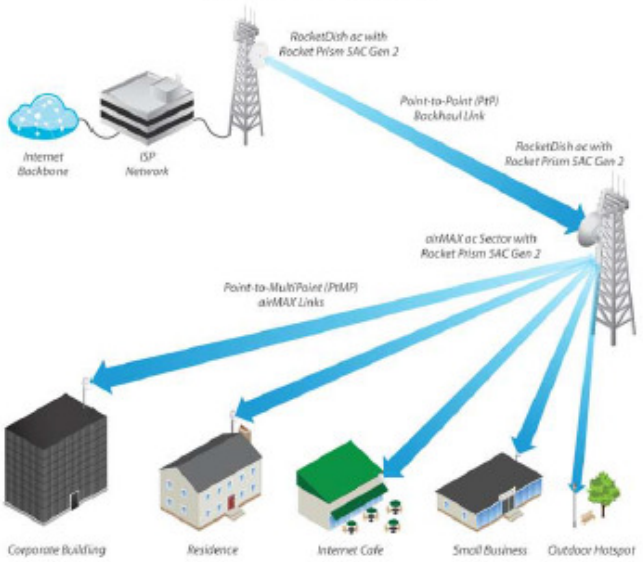
Powerful Wireless Features

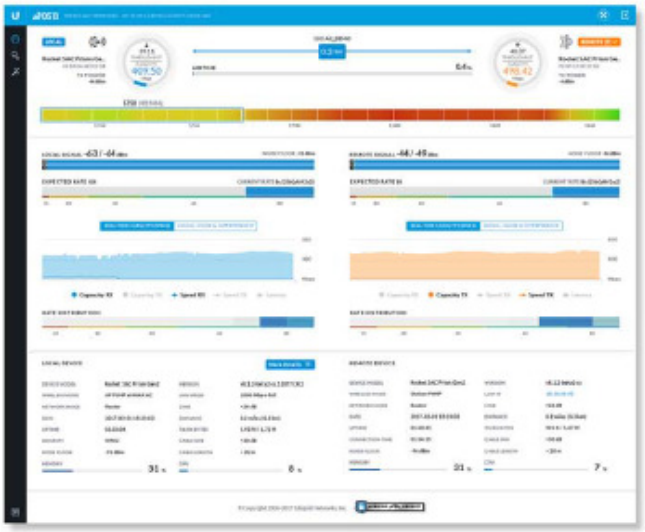
- Access Point PtMP airMAX Mixed Mode
- airMAX ac Protocol Support
- Long-Range Point-to-Point (PtP) Link Mode
- Selectable Channel Width
  - PtP: 10/20/30/40/50/60/80 MHz
  - PtMP: 10/20/30/40 MHz
- Automatic Channel Selection
- Transmit Power Control: Automatic/Manual
- Automatic Distance Selection (ACK Timing)
- Strongest WPA2 Security

Usability Enhancements

- airMagic® Channel Selection Tool
- Redesigned User Interface
- Dynamic Configuration Changes
- Instant Input Validation
- HTML5 Technology
- Optimization for Mobile Devices
- Detailed Device Statistics
- Comprehensive Array of Diagnostic Tools, including RF Diagnostics and airView® Spectrum Analyzer

Application Example





Advanced RF Analytics

airMAX ac devices feature a multi-radio architecture to power a revolutionary RF analytics engine.

An independent processor on the PCBA powers a second, dedicated radio, which persistently analyzes the full 5 GHz spectrum and every received symbol to provide you with the most advanced RF analytics in the industry.

Data from the spectrum analysis and RF performance monitoring is displayed on the *Main* tab and airView Spectrum Analyzer.

Real-Time Reporting

airOS 8 displays the following RF information:

- Persistent RF Error Vector Magnitude (EVM) constellation diagrams
- Signal, Noise, and Interference (SNI) diagrams
- Carrier to Interference-plus-Noise Ratio (CINR) histograms

Spectral Analysis

airView allows you to identify noise signatures and plan your networks to minimize noise interference. airView performs the following functions:

- Constantly monitors environmental noise
- Collects energy data points in real-time spectral views
- Helps optimize channel selection, network design, and wireless performance

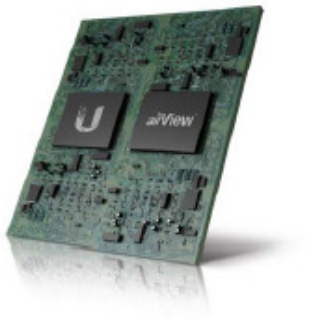
airView runs in the background without disabling the wireless link, so there is no disruption to the network.

In airView, there are three spectral views, each of which represents different data.

- **Waterfall** Aggregate energy collected for each frequency
- **Waveform** Aggregate energy collected
- **Ambient Noise Level** Background noise energy shown as a function of frequency

airView provides powerful spectrum analyzer functionality, eliminating the need to rent or purchase additional equipment for conducting site surveys.

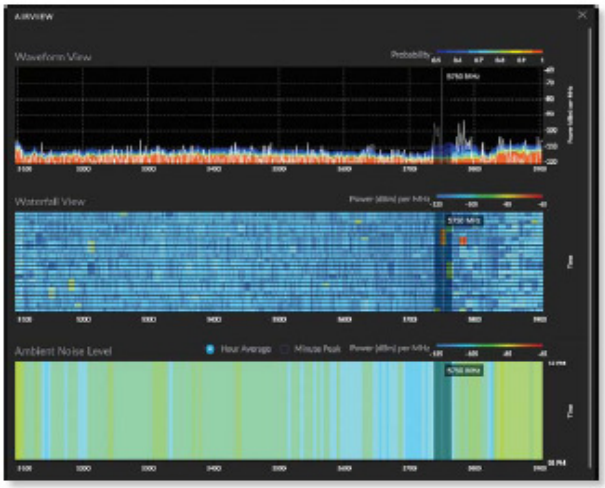
Multi-Radio Architecture



Constellation Diagram

SNI Diagram and CINR Histogram

Dedicated Spectral Analysis



DATASHEET

rocket PRISM AC GEN2

Technology

airMAX ac

Unlike standard Wi-Fi protocol, Ubiquiti's Time Division Multiple Access (TDMA) airMAX ac protocol allows each client to send and receive data using pre-designated time slots scheduled by an intelligent AP controller.

This time slot method eliminates hidden node collisions and maximizes airtime efficiency, so airMAX ac technology provides performance improvements in latency, noise immunity, scalability, and throughput compared to other outdoor systems in its class.

Intelligent QoS Priority assigned to voice/video for seamless streaming.

Scalability High capacity and scalability.

Long Distance Capable of high-speed, carrier-class links.

Superior Performance

The next-generation airMAX ac technology boosts the advantages of our proprietary TDMA protocol.

Ubiquiti's airMAX engine with custom IC dramatically improves TDMA latency and network scalability. The custom silicon provides hardware acceleration capabilities to the airMAX scheduler, to support the high data rates and dense modulation used in airMAX ac technology.

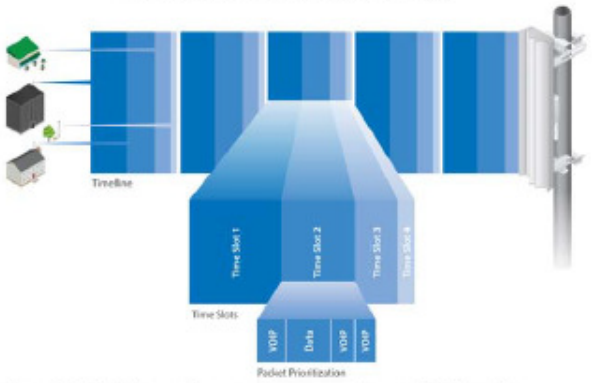
Throughput Breakthrough

airMAX ac supports high data rates, which require dense modulation: 256QAM – a significant increase from 64QAM, which is used in airMAX.

With their use of proprietary airMAX ac technology, airMAX ac products supports up to 500+ Mbps* (maximum 80 MHz channel width) real TCP/IP throughput – up to triple the throughput of standard airMAX products.

* Up to 330+ Mbps (maximum 40 MHz channel width) for PtMP links.

airMAX ac TDMA Technology



Up to 100 airMAX ac stations can be connected to an airMAX ac Sector; four airMAX ac stations are shown to illustrate the general concept.

airMAX ac Network Scalability

Superior Throughput Performance

Technology

airPRISM

To enhance airMAX ac performance, Ubiquiti Networks introduces our patented airPrism technology, which is featured on the Rocket Prism 5AC Gen 2, model RP-5AC-Gen2.

Improves SNR

High data rates require a high Signal-to-Noise Ratio (SNR), which is challenging to achieve, especially in noisy, high-density areas.

Integrated into Ubiquiti's custom silicon, airPrism technology creates a high SNR by isolating signals within the operating channel and rejecting interference using specialized circuitry, the High-Selectivity Receiver (HSR).

Removes Interference

Depending on the product model and operating mode, available channel widths may include 10, 20, 30, 40, 50, 60, and/or 80 MHz.

Theoretically APs operate on different channels; however, because of the wider channel bandwidths, there can be overlap in spectrum usage.

airPrism technology removes up to an additional 30+ dB of adjacent channel interference through the active filtering design, so an airMAX ac AP with airPrism technology can provide significantly greater performance than a typical AP.

Facilitates AP Co-Location

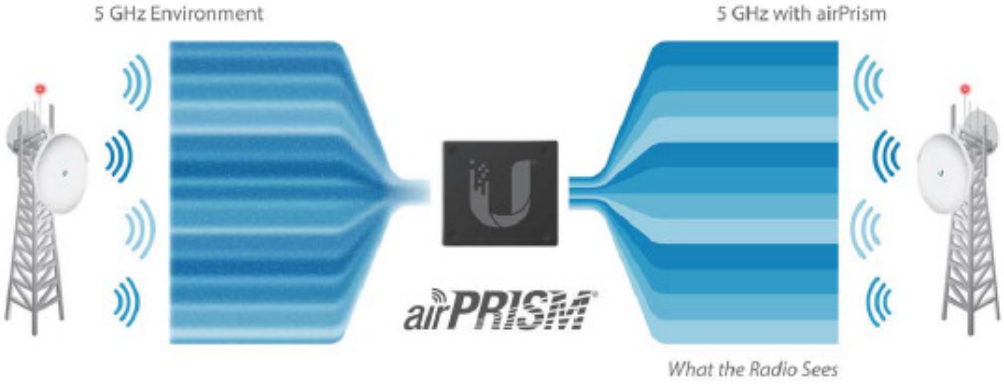
Co-location is vital in many scenarios. For example, a WISP may have limited tower space, so it must co-locate all APs within that allotted footprint. Shielding and other means can lessen interference but may be impractical.

By deploying airMAX ac APs with airPrism technology, you can co-locate APs and enhance the overall performance of your wireless network.

Number of APs	Channel Width
4	80 MHz*
8	40 MHz
16	20 MHz

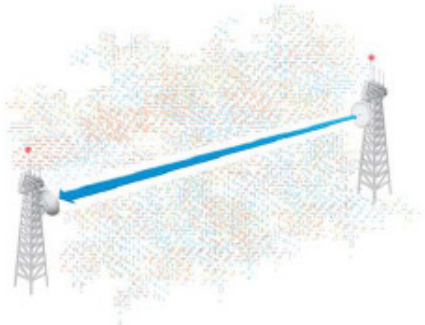
* PtP only

Active Radio Frequency Filtering



What the Radio Sees

Improved Latency and Noise Immunity



UMobile App

The RocketPrism 5AC Gen 2 integrates a separate Wi-Fi radio for fast and easy setup using your mobile device.

Accessing airOS via Wi-Fi

The U®Mobile App provides instant accessibility to the airOS configuration interface and can be downloaded from the App Store (iOS) or Google Play™ (Android). UMobile allows you to set up, configure, and manage the Rocket Prism 5AC Gen 2 and offers various configuration options once you're connected or logged in.

rocket PRISM AC GEN2

The Rocket Prism 5AC Gen 2 is designed to deliver maximum spectral efficiency and up to 500+ Mbps Real TCP/IP throughput.

Features

5 GHz Frequency Band With plenty of available spectrum, this unlicensed band works well for long-distance links. The Rocket Prism 5AC Gen 2 features full-band 5 GHz coverage and maximizes output power for the US market, meeting strict OOBE requirements.

airView Use the real-time spectrum analyzer so you can identify noise signatures and design your wireless links to minimize noise interference.

High Performance To take full advantage of its design and capabilities, deploy the Rocket Prism 5AC Gen 2 for PtP or PtMP links in high RF noise environments.

airPrism Sector Antenna You can mount three Rocket Prism 5AC Gen 2 radios on the airPrism 5 GHz 3x30° HD Sector Antenna, model AP-5AC-90-HD, for PtMP links. Each Rocket radio corresponds with a specific 30° beamwidth and independently transmits and receives.

Dedicated Management Radio Access the airOS configuration interface instantly through the UMobile app to set up and manage your Rocket 5AC Prism Gen 2.

Robust Die Cast Aluminum Casing Helps protect the Rocket Prism 5AC Gen 2 against electromagnetic interference.

GPS for Superior Co-Location Performance Precise GPS frame synchronization enable co-located Rocket Prism 5AC Gen 2 radios to transmit and receive data without interfering with each other, allowing for better frequency reuse and increased network stability.

Improved Surge Protection The Rocket Prism 5AC Gen 2 utilizes the latest ESD protection to help protect against power surges.

Gigabit Ethernet Delivers high throughput over its wired connection.

Plug and Play Every airMAX antenna has a built-in Rocket mount, so no tools are needed to install the Rocket Prism 5AC Gen 2. (airMAX ac antennas are recommended for optimal performance.)

Specifications

RP-5AC-Gen2		
Dimensions	88 x 40 x 230 mm (3.47 x 1.58 x 9.06")	
Weight	400 g (14.11 oz)	
Networking Interface	(1) 10/100/1000 Ethernet Port	
RF Connectors	(2) RP-SMA (Waterproof), (1) GPS* (Waterproof)	
LEDs	(4) Signal Strength, GPS*, Power, LAN	
Enclosure	Die-Cast Aluminum with White Powder Coating	
Max. Power Consumption	9.5W	
Power Supply	24V, 1A Gigabit PoE Adapter (Included)	
Power Method	Passive PoE (Pairs 4, 5+; 7, 8 Return)	
Processor Specs	Atheros MIPS 74Kc	
Memory	128 MB DDR2 SDRAM	
Supported Voltage Range	18-26VDC	
Signal Strength LEDs	Software-Adjustable to Correspond to Custom RSSI Levels	
Channel Sizes	PtP Mode	PtMP Mode
	10/20/30/40/50/60/80 MHz	10/20/30/40 MHz
ESD/EMP Protection	± 24 kV Contact / Air for Ethernet	
Operating Temperature	-40 to 80° C (-40 to 176° F)	
Operating Humidity	5 to 95% Noncondensing	
RoHS Compliance	Yes	
Shock and Vibration	ETSI300-019-1.4	
Modes	Access Point, Station	
Services	Web Server, SNMP, SSH Server, Telnet , Ping Watchdog, DHCP, NAT, Bridging, Routing	
Utilities	Antenna Alignment Tool, Discovery Utility, Site Survey, Ping, Traceroute, Speed Test	
Distance Adjustment	Dynamic Ack and Ackless Mode	
Power Adjustment	Software Adjustable UI or CLI	
Security	WPA2 AES Only	
QoS	Supports Packet Level Classification WMM and User Customer Level: High/Medium/Low	
Statistical Reporting	Up Time, Packet Errors, Data Rates, Wireless Distance, Ethernet Link Rate	
Other	Remote Reset Support, Software Enabled/Disabled, VLAN Support, 256QAM, GPS*, TX Filter	
Ubiquiti Specific Features	30/50/60 MHz Channels, airMAX ac Mode, Traffic Shaping with Burst Support, Discovery Protocol, Frequency Band Offset, Ackless Mode	
Certifications	CE, FCC, IC	

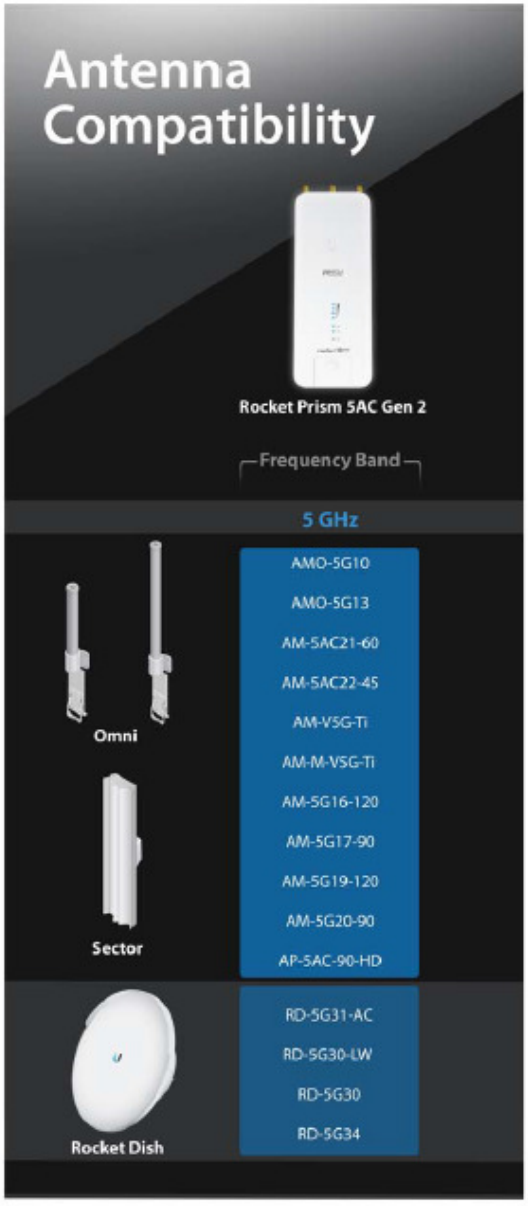
* Reserved for future use

RP-5AC-Gen2 Operating Frequency					
Operating Frequency	Worldwide	USA			
	2412 – 2472 MHz	2412 – 2462 MHz			
	5150 – 5875 MHz	USA: U-NII-1	USA: U-NII-2A	USA: U-NII-2C	USA: U-NII-3
		5150 - 5250 MHz	5250 - 5350 MHz	5470 - 5725 MHz	5725 - 5850 MHz

RP-5AC-Gen2 Output Power: 28 dBm							
TX Power Specifications				RX Power Specifications			
Modulation	Data Rate	Avg. TX	Tolerance	Modulation	Data Rate	Sensitivity	Tolerance
airMAX ac	1x BPSK (½)	28 dBm	± 2 dB	airMAX ac	1x BPSK (½)	-96 dBm	± 2 dB
	2x QPSK (½)	28 dBm	± 2 dB		2x QPSK (½)	-95 dBm	± 2 dB
	2x QPSK (¾)	28 dBm	± 2 dB		2x QPSK (¾)	-92 dBm	± 2 dB
	4x 16QAM (½)	28 dBm	± 2 dB		4x 16QAM (½)	-90 dBm	± 2 dB
	4x 16QAM (¾)	28 dBm	± 2 dB		4x 16QAM (¾)	-86 dBm	± 2 dB
	6x 64QAM (⅔)	28 dBm	± 2 dB		6x 64QAM (⅔)	-83 dBm	± 2 dB
	6x 64QAM (¾)	27 dBm	± 2 dB		6x 64QAM (¾)	-77 dBm	± 2 dB
	6x 64QAM (⅚)	26 dBm	± 2 dB		6x 64QAM (⅚)	-74 dBm	± 2 dB
	8x 256QAM (¾)	24 dBm	± 2 dB		8x 256QAM (¾)	-69 dBm	± 2 dB
	8x 256QAM (⅚)	22 dBm	± 2 dB		8x 256QAM (⅚)	-65 dBm	± 2 dB

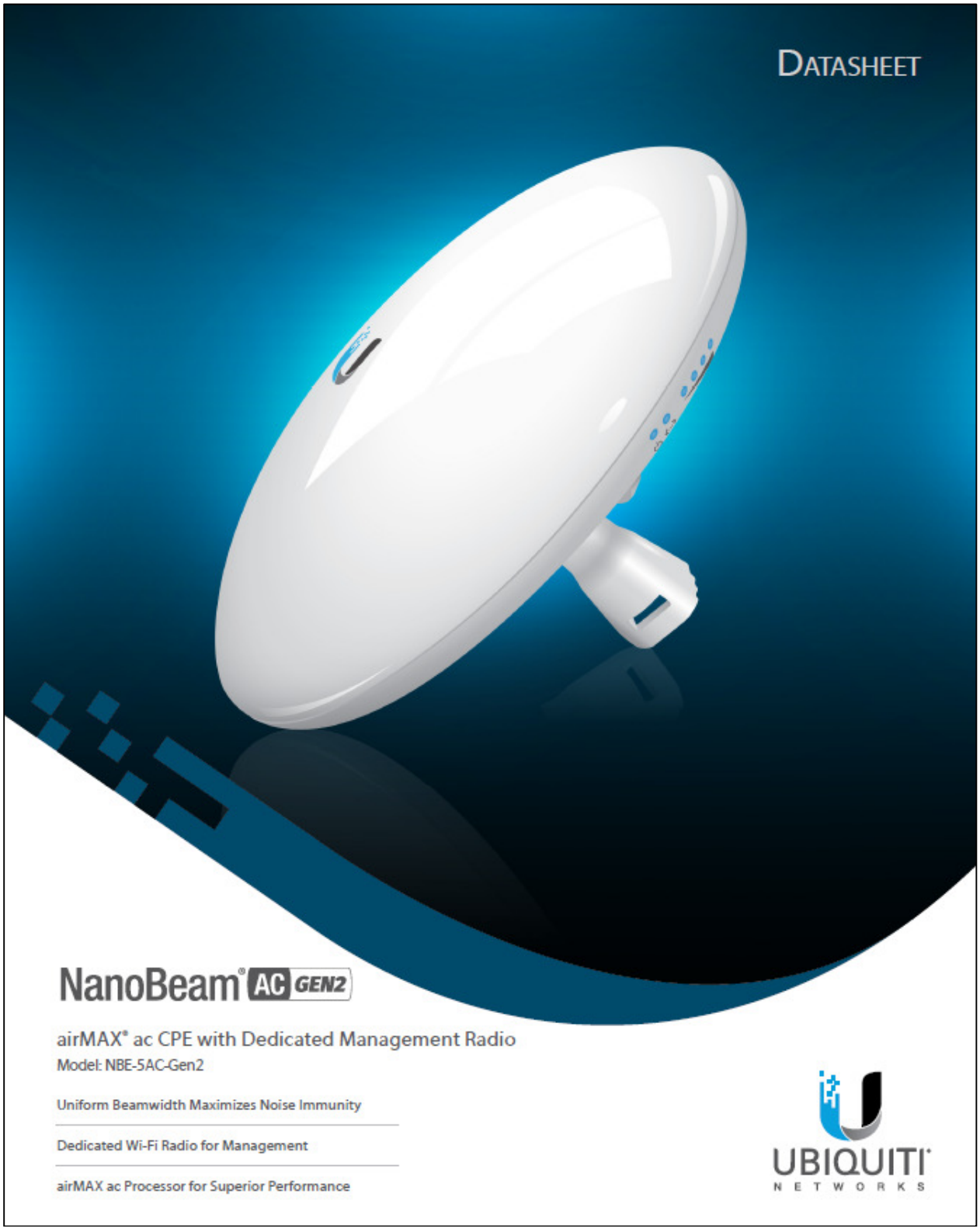
Plug and Play Integration

Rocket radios and airMAX antennas have been designed to seamlessly work together. Every airMAX antenna has a built-in Rocket mount, so installation requires no special tools.



www.ubnt.com

Appendix C: NanoBeam GEN2 airMAX ac CPE



Overview

Ubiquiti Networks launches the latest generation of airMAX® CPE (Customer Premises Equipment), the NanoBeam® 5AC Gen 2.

Improved Noise Immunity

The NanoBeam 5AC Gen 2 directs RF energy in a tighter beamwidth. With the focus in one direction, the NanoBeam 5AC Gen 2 blocks or spatially filters out noise, so noise immunity is improved. This feature is especially important in an area crowded with other RF signals of the same or similar frequency.

Integrated Design

The radio and antenna are combined to create a more efficient and compact CPE. The NanoBeam 5AC Gen 2 gets maximum gain out of the smallest footprint.

Providing high performance and an innovative form factor, the NanoBeam 5AC Gen 2 is versatile and cost-effective to deploy.

Software

airOS® 8 is the revolutionary operating system for Ubiquiti® airMAX ac products.

Powerful Wireless Features

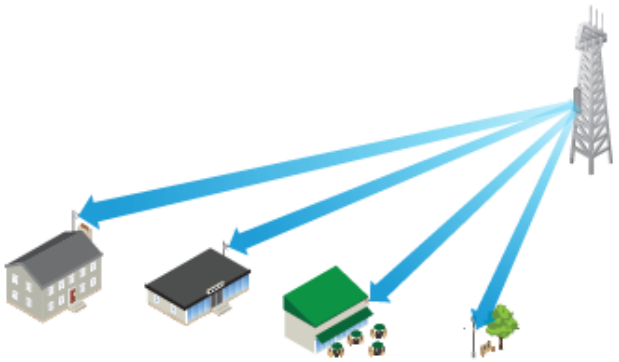
- Access Point PtMP airMAX Mixed Mode
- airMAX ac Protocol Support
- Long-Range Point-to-Point (PtP) Link Mode
- Selectable Channel Width
  - PtP: 10/20/30/40/50/60/80 MHz
  - PtMP: 10/20/30/40 MHz
- Automatic Channel Selection
- Transmit Power Control: Automatic/Manual
- Automatic Distance Selection (ACK Timing)
- Strongest WPA2 Security

Usability Enhancements

- airMagic® Channel Selection Tool
- Redesigned User Interface
- Dynamic Configuration Changes
- Instant Input Validation
- HTML5 Technology
- Optimization for Mobile Devices
- Detailed Device Statistics
- Comprehensive Array of Diagnostic Tools, including RF Diagnostics and airView® Spectrum Analyzer

Application Examples

PtMP Client Links

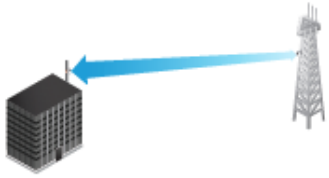


The NanoBeam 5AC Gen 2 used as a CPE device for each client in an airMAX PtMP network.

Wireless Client

The NanoBeam 5AC Gen 2 as a powerful wireless client.

PtP Link



Use a NanoBeam 5AC Gen 2 on each side of a PtP link.

Advanced RF Analytics

airMAX ac devices feature a multi-radio architecture to power a revolutionary RF analytics engine.

An independent processor on the PCBA powers a second, dedicated radio, which persistently analyzes the full 5 GHz spectrum and every received symbol to provide you with the most advanced RF analytics in the industry.

Real-Time Reporting

airOS 8 displays the following RF information:

- Persistent RF Error Vector Magnitude (EVM) constellation diagrams
- Signal, Noise, and Interference (SNI) diagrams
- Carrier to Interference-plus-Noise Ratio (CINR) histograms

Spectral Analysis

airView allows you to identify noise signatures and plan your networks to minimize noise interference. airView performs the following functions:

- Constantly monitors environmental noise
- Collects energy data points in real-time spectral views
- Helps optimize channel selection, network design, and wireless performance

airView runs in the background without disabling the wireless link, so there is no disruption to the network.

In airView, there are three spectral views, each of which represents different data: waveform, waterfall, and ambient noise level.

airView provides powerful spectrum analyzer functionality, eliminating the need to rent or purchase additional equipment for conducting site surveys.

UMobile App

The NanoBeam 5AC Gen 2 integrates a separate Wi-Fi radio for fast and easy setup using your mobile device.

Accessing airOS via Wi-Fi

The U®Mobile App provides instant accessibility to the airOS configuration interface and can be downloaded from the App Store (iOS) or Google Play™ (Android). UMobile allows you to set up, configure, and manage the NanoBeam 5AC Gen 2 and offers various configuration options once you're connected or logged in.

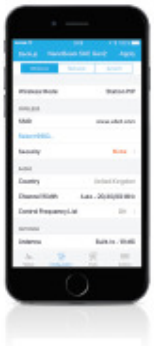
Multi-Radio Architecture

Constellation Diagrams

SNI Diagram and CINR Histogram

Dedicated Spectral Analysis

UMobile Configuration Screen



Technology

airMAX ac

Unlike standard Wi-Fi protocol, Ubiquiti's Time Division Multiple Access (TDMA) airMAX protocol allows each client to send and receive data using pre-designated time slots scheduled by an intelligent AP controller.

This time slot method eliminates hidden node collisions and maximizes airtime efficiency, so airMAX technology provides performance improvements in latency, noise immunity, scalability, and throughput compared to other outdoor systems in its class.

Intelligent QoS Priority assigned to voice/video for seamless streaming.

Scalability High capacity and scalability.

Long Distance Capable of high-speed, carrier-class links.

Superior Performance

The next-generation airMAX ac technology boosts the advantages of our proprietary TDMA protocol.

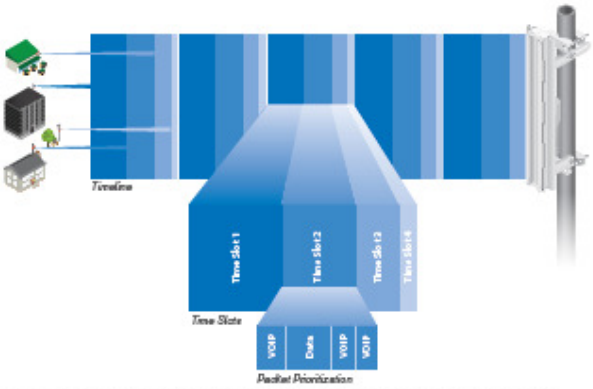
Ubiquiti's airMAX engine with custom IC dramatically improves TDMA latency and network scalability. The custom silicon provides hardware acceleration capabilities to the airMAX scheduler, to support the high data rates and dense modulation used in airMAX ac technology.

Throughput Breakthrough

airMAX ac supports high data rates, which require dense modulation: 256QAM – a significant increase from 64QAM, which is used in airMAX.

With their use of proprietary airMAX ac technology, airMAX ac products supports up to 450+ Mbps real TCP/IP throughput – up to triple the throughput of standard airMAX products.

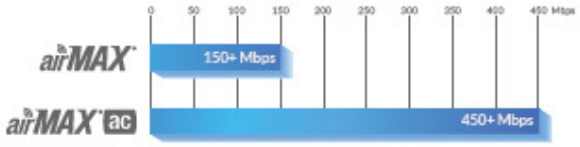
airMAX ac TDMA Technology



Up to 100 airMAX ac stations can be connected to an airMAX ac Sector; four airMAX ac stations are shown to illustrate the general concept.

airMAX Network Scalability

Superior Throughput Performance



Hardware Overview

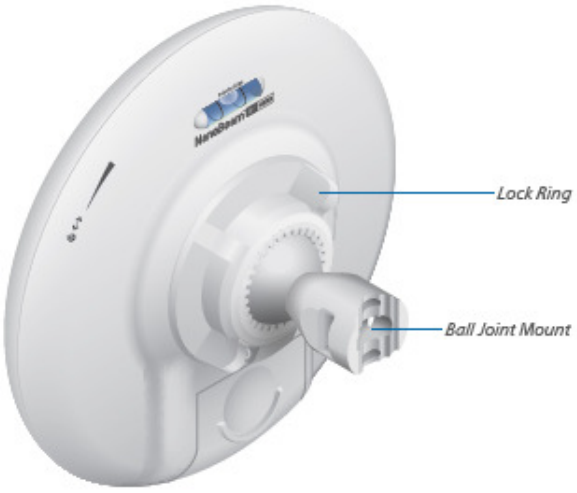
The NanoBeam 5AC Gen 2 features airMAX ac technology and enhanced protection against ESD events.

Ease of Installation

- **Quick Installation** No fasteners are required for pole-mounting, and a single wall fastener (not included) is required for wall-mounting.
- **Convenient Alignment** The NanoBeam 5AC Gen 2 pivots on its ball joint 3-axis mount for easy aiming.

Innovative Mechanical Design

- **Efficient Footprint** The radio and antenna are combined into a single body that takes up minimal space. The form factor features the highest gain for its size.
- **Aesthetics** The NanoBeam 5AC Gen 2 is small enough to blend discreetly into the background at a customer's location.
- **Versatile Mounting** The NanoBeam 5AC Gen 2 can be mounted in almost any position needed for line of sight.



Mounting Accessories

NanoBeam® Wall Mount Kit

Model: NBE-WMK

A wall mount kit is available as an optional accessory to enhance stability for wall-mounting.

NanoBeam® Window Mount

Model: NBE-19-WM

A suction cup mount is available as an optional accessory to mount the NanoBeam 5AC Gen 2 on a window.

IsoBeam Accessory

IsoBeam™

Model: ISO-BEAM-19

An RF isolator shield is available as an optional accessory to enhance signal isolation.

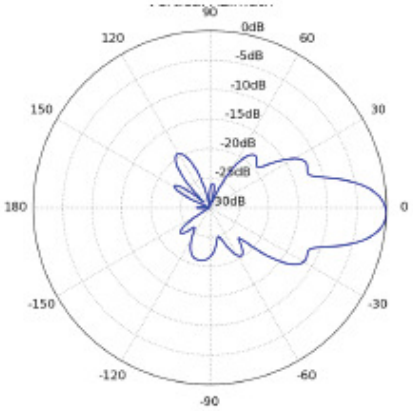
Specifications

NBE-5AC-Gen2		
Dimensions (Mount Included)	189 x 189 x 125 mm (7.44 x 7.44 x 4.92")	
Weight (Mount Included)	0.530 kg (1.17 lb)	
Power Supply	24V, 0.5A Gigabit PoE Adapter (Included)	
Max. Power Consumption	8.5W	
Gain	19 dBi	
Networking Interface	(1) 10/100/1000 Ethernet Port Wi-Fi for Management	
Processor Specs	Atheros MIPS 74Kc, 720 MHz	
Memory	128 MB DDR2, 8 MB Flash	
LEDs	Power, Ethernet, (4) Signal Strength	
Signal Strength LEDs	Software-Adjustable to Correspond to Custom RSSI Levels	
Max. VSWR	1.5:1	
Channel Sizes	PtP Mode	PtMP Mode
	10/20/30/40/50/60/80 MHz	10/20/30/40 MHz
Polarization	Dual Linear	
Enclosure	Outdoor UV Stabilized Plastic	
Mounting	Pole-Mount (Kit Included), Wall-Mount	
Wind Loading	45.4 N @ 200 km/h (10.2 lbf @ 125 mph)	
Wind Survivability	200 km/h (125 mph)	
ESD/EMP Protection	Air: ± 24 kV, Contact: ± 24 kV	
Operating Temperature	-40 to 80° C (-40 to 176° F)	
Operating Humidity	5 to 95% Noncondensing	
Certifications	CE, FCC, IC	
RoHS Compliance	Yes	
Salt Fog Test	IEC 68-2-11 (ASTM B117), Equivalent: MIL-STD-810 G Method 509.5	
Vibration Test	IEC 68-2-6	
Temperature Shock Test	IEC 68-2-14	
UV Test	IEC 68-2-5 at 40° C (104° F), Equivalent: ETS 300 019-1-4	
Wind-Driven Rain Test	ETS 300 019-1-4, Equivalent: MIL-STD-810 G Method 506.5	

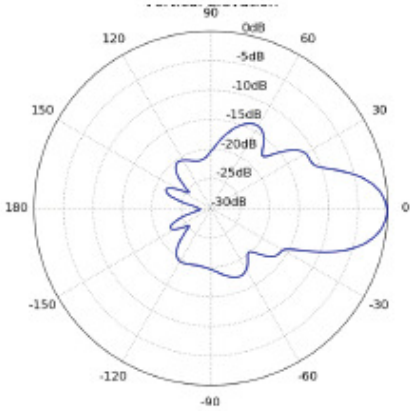
NBE-5AC-Gen2 Operating Frequency					
Operating Frequency	Worldwide	USA			
	2412 - 2472 MHz	2412 - 2462 MHz			
	5150 - 5875 MHz	USA: U-NII-1	USA: U-NII-2A	USA: U-NII-2C	USA: U-NII-3
		5150 - 5250 MHz	5250 - 5350 MHz	5470 - 5725 MHz	5725 - 5850 MHz

NBE-5AC-Gen2 Output Power: 25 dBm							
TX Power Specifications				RX Power Specifications			
Modulation	Data Rate	Avg. TX	Tolerance	Modulation	Data Rate	Sensitivity	Tolerance
airMAX ac	1x BPSK (½)	25 dBm	± 2 dB	airMAX ac	1x BPSK (½)	-96 dBm	± 2 dB
	2x QPSK (½)	25 dBm	± 2 dB		2x QPSK (½)	-95 dBm	± 2 dB
	2x QPSK (¾)	25 dBm	± 2 dB		2x QPSK (¾)	-92 dBm	± 2 dB
	4x 16QAM (½)	25 dBm	± 2 dB		4x 16QAM (½)	-90 dBm	± 2 dB
	4x 16QAM (¾)	25 dBm	± 2 dB		4x 16QAM (¾)	-86 dBm	± 2 dB
	6x 64QAM (⅔)	24 dBm	± 2 dB		6x 64QAM (⅔)	-83 dBm	± 2 dB
	6x 64QAM (¾)	23 dBm	± 2 dB		6x 64QAM (¾)	-77 dBm	± 2 dB
	6x 64QAM (⅚)	22 dBm	± 2 dB		6x 64QAM (⅚)	-74 dBm	± 2 dB
	8x 256QAM (¾)	21 dBm	± 2 dB		8x 256QAM (¾)	-69 dBm	± 2 dB
	8x 256QAM (⅚)	20 dBm	± 2 dB		8x 256QAM (⅚)	-65 dBm	± 2 dB

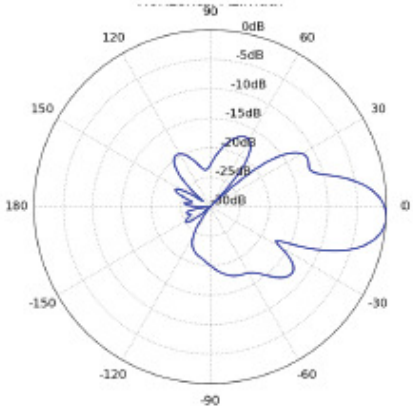
Vertical Azimuth



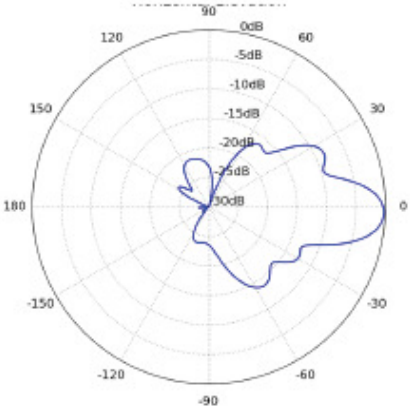
Vertical Elevation



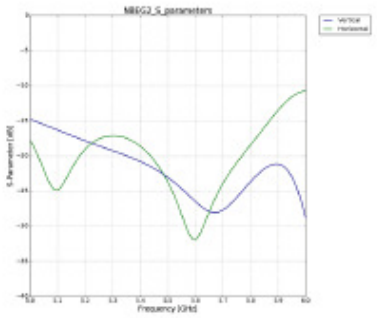
Horizontal Azimuth



Horizontal Elevation



Return Loss



Specifications are subject to change. Ubiquiti products are sold with a limited warranty described at: www.ubnt.com/support/warranty

www.ubnt.com

AJNB031317

EXHIBIT D

Wood Group
350 Commercial St
Portland, Maine 04101

(207) 699 5592
www.woodgroup.com

(Formerly known as SgurrEnergy and dba as SgurrEnergy Inc.)

Monhegan Island Plantation Power District
Monhegan Island, Maine

Re: Maine Aqua Ventus Community Benefit Technical Review: DRAFT

Memo on estimated cable and infrastructure costs to bring grid power to Monhegan Island

Wood Group clean energy (rebranded from SgurrEnergy) is pleased to provide the following information, cost basis and summary per our April 28, 2017 proposal to support the Monhegan Island Plantation (Plantation) as it evaluates the community benefits payments.

Scope:

Determine estimated costs for the Maine AquaVentus Project (MAV) to design and install a power cable interconnect into the island distribution system. The effort also includes discussion of the value of the power from this cable.

Overview:

Design:

The MAV project design (via the benefits option) includes electric power and energy supply to the island. This would be accomplished by landing the mainland project export cable on Monhegan and then continuing to the WTGs (Wind Turbines) therefore two cables on island in and out. Less likely but possible is a have a branch cable land on island from an underwater splice or hub connection from the export cable (these are new to the wind industry, being used by Hywind/Statoil in Scotland not unheard of and may be in the MAV WTGs design plan. The island cable would terminate at a small switchyard/cable interface near shore and change to a smaller more suitable cable and run to the Plantation plant via conduit/trenched into the rock where it would have proper utility grade switchgear and operate as if it were another generator set. There may be a consideration to run the underwater cable all the way to the plant as shore side space for an interface yard is a premium (see below comments in Cable and Route).

The cable would supply power to the island as long as it was energized at the mainland POI (Point of Interconnect) the electricity would flow from the WTGs or the mainland or both. The power quality while good, would have inherent fluctuations, and have the output characteristics and mode changes evident of the WTGs on the island grid. This may require power conditioning at the Plantation plant, such as a Statcom, or maybe battery/inverter package which would smooth power and provide a short period of supply to bring a Capstone unit online.

Cable and Route:

The cable would be single - three phase, 34.5kv and rated for the project with glass fiber for communications. The mainland POI would be an area with transmission capacity or easily upgraded capacity, land available for the POI, have good water cable landing options, and a suitable route to Monhegan, which needs to avoid areas too shallow for the installation vessel to traverse (although some can be done at high tide). We could assume this is Port Clyde area or possibly western side of Muscongus Bay. The bottom conditions are varied and difficult with rock, gravel, sand, mud and shallow/active areas requiring armour protection. We can assume there may be a cable crossing or two and we know the route is varied, has limited mud where the cable is easily jetted in to safe depth (3’ – 8’)

The Monhegan island landing will be costly as it is mostly rock, limited points to come ashore. Approaching and at shore the cable will require armouring and will certainly need mattressing (where a concrete blanket is poured over the cable - think of a concrete mattress).
A route to the plant may be difficult to configure and if the undersea cable were (on the off chance) run to the plant and back; the onshore portion may require special design as the cable is specified for underwater/seabed immersion cooling and will heat up during maximum WTG output. The summer air conditions may require the cable(s) to be in a concrete conduit or other design. For reference, we would assume the undersea cable alone to be ~5" outside diameter, whereas a standard armoured cable from the shore side interface to the plant may be 2" diameter.

In summary, the added scope of running a cable to the island versus directly to the WTGs is a very small portion of the total export cable total cost, but adds several complexities;

- To the design, it reduces reliability of the export cable,
- Adds minimally defined and additional off and onshore costs to MAV installation contracts
- During the installation effort; interface between several contractors (off and onshore) scheduling; which may impact the entire project schedule if weather delays during install of the Monhegan portion disrupt the entire cable laying effort and,
- To operations; whereby energization disruptions now include a community rather than WTGs alone, reporting may be required, along with metering/accounting as well as the above-mentioned power quality which is not required for the WTG export cable alone.
- Financiers of the Project will consider the cable/supply to Monhegan a risk.

These soft or currently undefined costs are not quantified here, but are part of the overall value discussion for MAV as they quantify the costs to implement the cable/power benefit option and its alternates.

Costing:

We have compiled a cost estimate for the added cost to design, procure, install, commission a cable running to Monhegan. This is only the added cost for MAV to conduct this scope instead of running the export cable directly to the WTGs. We have not looked into operational/administrative cost, we assume the Monhegan Plantation is well versed in public/private power generation/supply issues.

The below costs are based on our access to multiple European and Asian cabling and install bids over the past ten years, our seven years as owners engineer for Cape Wind and current work with several BOEM leasehold bidders and Deepwater Wind's Block Island project in the USA.
We have considered project management, planning, mobilization, civil works scopes in the many projects we review as our daily work as a technical advisor during due diligence
We are also locals, have sailed in and out of the area and familiar with Monhegan, islands, isolated grids, the power plant, distribution, and its rock.

The assumptions provide guidance to the overall scopes. We provide this as an estimate and have specifically not broken out details as we do not have enough data to do so. The costing exercise is based on review of what we know on the MAV project, looking through a variety of bids, scope definitions we have access to (primarily in Europe), several discussions amongst our colleagues in Europe as well as our new colleagues in Wood Group subsea and offshore oil infrastructure install groups.

Assumptions:
Offshore

- The cable will not reroute significantly versus the direct WTG route, therefore no significant cost to overall undersea cable quantity nor main route install.
- The drop to the island will require 400- 1400' of undersea cable
- We assume it will be a direct roundtrip run of undersea cable to a shore side interface and not an underwater splice/hub.
- We assume mattressing will be required to the island approach

- Labor and installation vessel time for the island drop will add approximately three days and be a major part of the cost as it positions to send cable ashore, determines end point, cuts, prepares and restarts run on to the WTGs.
- The cable install vessel may need to come from Europe. This is based on the likely supply of the cable sourced from Europe.
- Local/American flagged vessels will be required for support, landings on shore.
- That only a portion of the costs will be fixed/contractor risk and therefore exposed to overruns, additional scope, contingency

Total Offshore: $1.4m +25%/- 10%

Onshore

- PM and expert labor: design, manage: shore side interface, cable run to Plantation, switchgear, power quality, community interface, permitting, impact studies (sea to land interface)
- Mobilize and implement on island facilities: shore side interface, cable pulling, handling equipment, improvements to landing, site modifications, land purchase?; for shore side (assume 20' x 30'), cable routing, conduit/trenching
- Terminating cable, modifications to the power plant yard and routing to existing panel room
- Island switchgear, metering, communications terminations (not considering communications distribution)
- Power quality gear
- Operational efforts; administrative (one time during implementation and 4 months post commissioning, determining any additional post construction monitoring)

Total Onshore: $600k +20%/-10%

Value of Power:

We propose the value of the energy provided to the Plantation depends on who:

- The current LCOE for the Plantation
- The PPA (Power Purchase Agreement) for MAV

They may not be far off currently, but would assume the 350 MWH/year has a higher value to the Plantation.

We are available to discuss our findings and offer updates to this draft based on new information.

Wood Group looks forward to working further with the Plantation and Monhegan island community.

4.17.11124.USA.RPT.001 DRAFT A2

	Name	Job Title	Signature
Prepared by:	Lawrence H. Mott	Regional Director, Americas	
Reviewed by:	Tony Giustino	Director, Advisory Services, Americas	
Date of issue:	21 June 2017		

Contact: Lawrence H. Mott Lawrence.mott@SgurrEnergy.com 207 699 2095/ 802 279 3768

the Financial Engineering Company 235 Rockland Street, Rockport, Maine 04856

www.FinancialEngineeringCo.com

Phone: (907) 522-3351; (207) 593-9131
Fax: (907) 344-1843; (207) 593-9053

August 9, 2017

Monhegan Plantation
PO Box 322
Monhegan, Maine 04852

Economic Review of the Maine Aqua Ventus Cable Supply Option *(Public Report)*

INTRODUCTION

As part of the development of the proposed wind turbine facility to be located near Monhegan Island, the developer, Maine Aqua Ventus ("MAV") has provided the residents and businesses of Monhegan Island with two options. Each of these two options are described in greater detail below, but in general are: 1) free power to be delivered over 20 years or 2) a monetary payment.

To assist in its selection process, the Monhegan Plantation has commissioned several studies to investigate the risks and merits of the two options. This report provides an economic valuation of the free power in the first option that can then be compared to any alternative options advanced by MAV.

OPTIONS

The two options advanced by MAV are as follows.

A. *Cable Option*. An electric cable would be installed by MAV and terminated at the Monhegan Plantation Power District's ("MPPD") power plant. Electric power would then be provided to MPPD at no cost for the duration of the MPUC Power Purchase Agreement. Delivery of power is subject to an annual limit of 340,000 kilowatt-hours escalating at 1 percent per year and a maximum delivery rate of 300 kilowatts. After the project is decommissioned, Monhegan would have the right to acquire the cable at no charge. In addition to the electric cable, MAV would also install a fiber optic cable to Monhegan Island.

B. *Alternative Option*. The second option would likely involve a cash alternative as part of a negotiated agreement.

It is important to remember that the Cable Option does not represent free power to each residence or business. Rather, power is delivered free of charge to MPPD; who, in turn, will then deliver it through the system in the same manner as now. The rates charged by MPPD would represent its cost of operating and maintaining the distribution system, costs of administration, and other costs.

Although the proposals are still meant to be somewhat general at this time, there are several items of note.

With the Cable Option, the point of metering the energy is not specified. It could be at the point of delivery where it interconnects with MPPD's existing system or at the mainland terminus of the cable. If the meter is at the MPPD system, then the delivery limitations would not be subject to the losses in the submarine cable.

METHODOLOGY OF ANALYSIS AND ASSUMPTIONS

In very simplistic terms, Monhegan is faced with the choice of receiving free power or being paid to continue with its own power generation. The question then becomes what would it cost to continue with its own power generation. If the projected cost is greater than any payments in Option B, then Option A (the cable option) should be selected since the Option B payment is less than the value of the power.

To project the cost of continued power generation for 20 or more years, several assumptions must be made regarding power requirements, fuel prices, and several other influencing factors. Accordingly, the analysis includes the use of alternative assumptions in some areas to evaluate the sensitivity of the results.

The following assumptions were used in the analysis.

1. The project is assumed to have a Commercial Operation Date of January 2020.
2. Power requirements (summarized in Line 9, Attachment 1)
    a. MPPD power requirements, including losses, are assumed to be 326,400 kilowatt-hours/year in 2020 with a system peak demand of 120 kilowatts. This is equal to the estimated peak and energy requirements for 2017; which, in turn, is based on partial year load data provided by MPPD and historical sales.
    b. Power requirements are assumed to increase at 0.5 percent per year after 2020 for both cases (cable option and continued self-generation). The cable option offers free power to MPPD, and the lower delivery rates at the meter might result in a higher growth rate. However, a payment included with continued self-generation in Option B could be used to decrease delivery rates at the meter.
    c. Based on these assumptions, MPPD's power requirements are less than limitations set forth in the cable option. Therefore, all power requirements are assumed to be provided for from power delivered by MAV.

3. Generating efficiency is assumed to be 10 kilowatt-hours (generated)/gallon.
4. Cost of Generating Fuel (summarized in Lines 13 – 15, Attachment 1)
    a. The cost of generating fuel is assumed to average $3.00/gallon in 2017
    b. The cost of generating fuel is assumed to escalate at the same rate as that projected for Distillate Fuel Oil – Commercial in the US Energy Information Administration 2017 Annual Energy Outlook.
5. MPPD intends to enter into a nine-year maintenance agreement for the microturbines at a cost of $29,000/year for parts only. Labor for a Capstone technician is $150/hour plus travel and incidentals.
    a. It is assumed that at the end of nine years (mid 2026), the cost for parts increases at the assumed inflation rate of 2.5 percent/year.
    b. Outside labor is assumed to be two person-days/year plus $500 for expenses.
    c. Labor is assumed to increase at 2.5 percent/year from 2017.
    d. MPPD labor costs are assumed to not change significantly between the two options.

The projected value of the Cable Option summarized in the next section can provide a benchmark from which to evaluate any alternative options that are advanced.

RESULTS

Based on the assumptions previously listed, the projected costs of continued self-generation (representing the value of the Cable Option) are provided in Table 1. The projection is summarized on a: 1) nominal basis where the benefits over the 20-year study period are simply totaled and 2) a net present value basis using several different discount rates. The net present value comparison recognizes the time-value of money where a dollar today is worth more to a person than a dollar a year from (ignoring the effects of inflation) since the person can invest the money and gain from it. Reinvestment rates are presently quite low, especially on a risk-adjusted basis.

The results in Table 1 show that if MPPD continued to generate with the microturbines, the cost of fuel, operations, and maintenance over a 20-year period totals approximately $4.4 million. This represents the projected amount saved with the Cable Option.

Table 1
Summary of Results – Cable Option[1]

Discount Rate	Cable Option
Nominal	$ 4,370,694
2%	$ 3,490,659
3%	$ 3,139,493
4%	$ 2,835,341
5%	$ 2,570,981

SENSITIVITY ANALYSIS

The results summarized in the preceding table provide the projected value of the Cable Option. These projections, however, are based on a number of assumptions regarding future events, and the value would change with alternative assumptions.

Factors that might be considered include the following.

Fuel. Fuel prices are, in the long-term, one of the most unpredictable inputs to the model. The US Energy Information Administration publishes an annual long-term forecast of energy prices, and the forecast has continually shifted lower since the 2012 forecast. Lower fuel costs would decrease the value of the Cable Option.

Future Loads. The results summarized in the previous section are based in part on MPPD being able to secure all power requirements through the Cable Option. If actual loads in the future are less than that assumed, the value of the Cable Option would decrease. Higher loads would increase the value of the Cable Option, but the increase would be limited by peak delivery rates and annual energy limits specified in the proposed Cable Option.

Alternative Sources of Energy. The value of the Cable Option was projected based on continued use of the microturbines. If other forms of energy generation, such as solar photovoltaic ("PV") installations or MPPD's own wind generation, were implemented at some point in the future, this could reduce the projected value of the Cable Option. Any analysis of alternative energy production must also take into account the cost of implementing the new facilities.

[1] An alternative case was investigated where the turbines are assumed to be replaced at the end of 20 years at a cost of $1.8 million. If these replacement costs were included, the Cable Option benefits would increase to $6.2 million in nominal dollars, $4.7 million for a 2% discount rate, $4.1 million for a 3% discount rate, $3.7 million for a 4% discount rate, and $3.2 million for a 5% discount rate.

OTHER ISSUES

The preceding analysis is based on agreements being in force and infrastructure operational for the full 20 years. If MAV ceases operations or the cable fails during that 20 years, the benefits of the Cable Option can quickly erode.

For power to be delivered to Monhegan, MAV must find a power supplier for the periods of time that the wind project cannot provide sufficient energy. That power supplier will require compensation, and MAV will enter into a power sales/power supply agreement that sets forth the conditions of power supply, price that MAV must pay, and other terms. Typically, these agreements are for periods of time ranging in months to 5 – 7 years. Beyond that, suppliers are reluctant to lock in prices for the duration of the contract. These agreements also have performance clauses where either party must post certain financial guarantees if either's credit rating is less than some defined threshold.

One might expect that MAV will have to post this guarantee either through cash, a Letter of Credit, a guaranty provided by a third party, or some other method.

The duration of the contract for power supply and the performance clauses are of great importance of Monhegan. The longer the duration of the contract and the stronger the performance clauses will help reduce the risk of the Cable Option.

Failure of the Cable is also a source of risk. Even if MAV is an operating entity, it may not be in their financial interests to repair the cable. It is noted that Fox Islands Electric Cooperative installed a buried cable in 2005, and there have been no failures as of this time.

CONCLUSIONS

Based on the proposed terms of the two options presented by MAV and the assumptions listed herein, the Cable Option has a projected value ranging from $2.6 – 4.4 million depending on the discount rate used. Alternative assumptions would decrease or increase the value.

The Cable Option includes risks that are associated with the 20-year economic viability of MAV as well as the 20-year operational life of the submarine cable. There are ways to reduce these risks, but some risk will always remain with the Cable Option.

If the Cable Option is selected and the project successfully implemented, the cost of power delivered to the residents and businesses of Monhegan will be significantly reduced. MPPD could implement a modest surcharge during the time of free power to build up a capital reserve over the 20-year period. At the end of the contract term, the capital reserve could then help MPPD take advantage of generating technologies available at that time with minimal rate increases. Presumably, those generating technologies will be improved from that available today.

ATTACHMENT 1

BASE CASE PROJECTIONS

		Source		2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
							1	2	3	4	5	6	7	8	9
	Cable Option														
	Maximum Energy (MWh)	*Proposal*					340	343	347	350	354	357	361	365	368
	Maximum Demand (kW)	*Proposal*					300	300	300	300	300	300	300	300	300
	Load Factor	*L. 5 x 1,000 / L. 6 / 8,760*					12.94%	13.07%	13.20%	13.33%	13.46%	13.60%	13.73%	13.87%	14.01%
	Annual Load (MWh)	*Present Load tab*	*0.5%*				326.4	328.0	329.7	331.3	333.0	334.6	336.3	338.0	339.7
	Generating Efficiency (kWh/gal)	*MPPD*					10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
	Fuel														
	Cost Data														
	Assumed Escalation Index	*2017 EIA*			Cmrcl Distillate FO	Cmrcl Distillate FO	Cmrcl Distillate FO	Cmrcl Distillate FO	Cmrcl Distillate FO	Cmrcl Distillate FO	Cmrcl Distillate FO	Cmrcl Distillate FO	Cmrcl Distillate FO	Cmrcl Distillate FO	Cmrcl Distillate FO
	Index Value	*2017 EIA*		16.57	18.53	19.80	20.56	21.14	21.79	22.65	23.46	24.64	25.64	26.54	27.21
	Cost ($/gallon)	*L. 15 x Pct Incr L. 14*		3.00	3.35	3.58	3.72	3.83	3.95	4.10	4.25	4.46	4.64	4.80	4.93
	Usage (gallons)	*L. 9 x 1,000 / L. 10*					32,640	32,803	32,967	33,132	33,298	33,464	33,632	33,800	33,969
	Cost ($)	*L. 15 x L. 16*					$ 121,445	$ 125,518	$ 130,059	$ 135,843	$ 141,421	$ 149,277	$ 156,081	$ 162,370	$ 167,308
	Maintenance ($/year)														
	Parts														
	Escalation				0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.5%	2.5%	2.5%
	Cost	*L. 21 x (1+ L. 20)*		29,000	29,000	29,000	29,000	29,000	29,000	29,000	29,000	29,000	29,363	30,097	30,849
	Labor														
	Escalation				2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%
	Cost			2,900	2,973	3,047	3,123	3,201	3,281	3,363	3,447	3,533	3,578	3,667	3,759
	Cost of Turbine Replacement														
	Total Cost of Generation	*Σ Lines 17, 21, 24, 25*					153,568	157,719	162,340	168,206	173,868	181,811	189,021	196,134	201,916

	Option 1 Value	
	Sum of Annual	$ 4,370,694
	NPV @ 2%	$ 3,490,659
	NPV @ 3%	$ 3,139,493
	NPV @ 4%	$ 2,835,341
	NPV @ 5%	$ 2,570,981

		Source	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039
			10	11	12	13	14	15	16	17	18	19	20
	Cable Option												
	Maximum Energy (MWh)	*Proposal*	372	376	379	383	387	391	395	399	403	407	411
	Maximum Demand (kW)	*Proposal*	300	300	300	300	300	300	300	300	300	300	300
	Load Factor	*L. 5 x 1,000 / L. 6 / 8,760*	14.15%	14.29%	14.43%	14.58%	14.72%	14.87%	15.02%	15.17%	15.32%	15.48%	15.63%
	Annual Load (MWh)	*Present Load tab* *0.5%*	341.4	343.1	344.8	346.5	348.3	350.0	351.8	353.5	355.3	357.1	358.8
	Generating Efficiency (kWh/gal)	*MPPD*	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
	Fuel												
	Cost Data												
	Assumed Escalation Index	*2017 EIA*	Cmrcl Distillate FO	Cmrcl Distillate FO	Cmrcl Distillate FO	Cmrcl Distillate FO	Cmrcl Distillate FO	Cmrcl Distillate FO	Cmrcl Distillate FO	Cmrcl Distillate FO	Cmrcl Distillate FO	Cmrcl Distillate FO	Cmrcl Distillate FO
	Index Value	*2017 EIA*	28.17	29.42	30.59	31.87	32.49	33.57	34.46	35.87	36.61	37.48	38.72
	Cost ($/gallon)	*L. 15 x Pct Incr L. 14*	5.10	5.32	5.54	5.77	5.88	6.08	6.24	6.49	6.63	6.78	7.01
	Usage (gallons)	*L. 9 x 1,000 / L. 10*	34,139	34,309	34,481	34,653	34,826	35,001	35,176	35,351	35,528	35,706	35,884
	Cost ($)	*L. 15 x L. 16*	$ 174,095	$ 182,694	$ 190,936	$ 199,901	$ 204,844	$ 212,683	$ 219,387	$ 229,531	$ 235,446	$ 242,245	$ 251,529
	Maintenance ($/year)												
	Parts												
	Escalation		2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%
	Cost	*L. 21 x (1+ L. 20)*	31,620	32,411	33,221	34,051	34,903	35,775	36,670	37,586	38,526	39,489	40,477
	Labor												
	Escalation		2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%
	Cost		3,853	3,949	4,048	4,149	4,253	4,359	4,468	4,580	4,694	4,811	4,932
	Cost of Turbine Replacement												-
	Total Cost of Generation	*Σ Lines 17, 21, 24, 25*	209,567	219,053	228,204	238,101	243,999	252,817	260,525	271,697	278,666	286,545	296,938

	Option 1 Value	
	Sum of Annual	$ 4,370,694
	NPV @ 2%	$ 3,490,659
	NPV @ 3%	$ 3,139,493
	NPV @ 4%	$ 2,835,341
	NPV @ 5%	$ 2,570,981

Lawrence H. Mott

75 Elizabeth St, Peaks Island, Maine 04108 (802) 279 -3768

September 25, 2017

CBAC c/o Eaton Peabody

Monhegan Island, Maine

Memo on Monhegan Island options per the MAV Community Benefits Agreement

Committee,

As one of the third-party consultants for CBAC focused on the cable install costing, impacts and supply considerations this memo is intended to support the committee by highlighting several points of the two options.

The MAV project is developing cutting edge technology in a nascent offshore wind energy market in North America because of this the Project may not be realized, or may remain a pilot.

Cable Option;

The cable option overall has remained a viable direction for the island based on the intent of MAV to develop and operate a commercial project, this would offer the island a suitable power supply source, with commercial oversight and ongoing management. The cable would also offer glass fiber for broadband capacity.

While the cable option is based on a viable MAV project, choosing the cable option also must consider the cable without an operating MAV project.

The cable option has a variety of issues:

- Cable management and maintenance is based on the MAV project continuing to be viable, with the potential that the Power Plantation may be required to operate it (in the case of the MAV project failing) a large responsibility for the Island, with high operating cost per energy delivered or household as well as a new burden of management time/outside services to be engaged.
- Cable insurance underwriting while available now and as part of the MAV project is not a given in the volatile insurance market and may have less viable terms when written for the Plantation only. Other examples that may be referenced are not comparable;
    - The Fox Islands undersea cable is insured along with all of the Coop utility assets, is insured as an electric Coop, has a high deductible amount, transmits an order of magnitude greater amount of electricity/value and can be easily managed by the critical mass of Coop staff.
    - The Block Island cable serves a large population, transmits a high value of electricity, is managed by a critical mass of staff, had political, regulatory, legislative and monetary

support. The Block island utility was out of air quality compliance (with its diesel generators). Additionally, National grid owns and operates the cable serving the island (while the wind project owns the cable to the wind farm).

- Cable infrastructure for the Project (cable, substation components, design and control) is not meant to be a power supply for the small island loads and would require several modifications, not be efficient with the larger Project required components operating at low loads.
- Cable status and definition may require changes, including FERC transmission review in the event of it being a supply cable to the Plantation rather than the Project's generation/supply cable. Combined with this, the leases, Right of Ways on the shore based infrastructure may have to be renegotiated/transferred to the Power Plantation, therefore a potential maintenance and cost burden.
- Cable installation impacts; hauling the cable into near shore waters, work at the land interface, and the island route to the Power Plantation's facilities will require excavation and winching equipment landed on island, excavation conducted and buried and surface infrastructure installed as overhead is not considered an option.
- Energy cost (to buy power from the grid in the event of no MAV Project) will fluctuate and require management, long-term commitments to obtain reasonable costing via a portfolio of supply options. Low cost, long term packages a significant challenge with the small amounts of power required. This will further impact the supply of low cost energy.
- Impacts to current power producing equipment; The power plant would become a standby facility and likely require engine generators, switchgear designed as standby gear. The recently installed microturbines are meant to be run all the time (base load) they have a longer start -up period (~seven minutes versus ~45 seconds for a standard reciprocating unit). The Power Plantation should assume that the microturbines would need to be swapped out or possibly a short-term battery storage system installed to supply the load during the start-up cycle. Longer term an additional reciprocating unit(s) would be required as the microturbines will not suffice during repetitive on/off cycles and long idle periods between outages. All of the above may not meet a peak load scenario whereby the island load is potentially 250kW and an outage occurs; this would require larger genset(s) or a load shedding/brownout strategy, which in turn requires the distribution system to be designed to split the load in a workable fashion. While the island may not ever see 250kW, other island and isolated grids have seen significant load growth after implementing transmission/cables and slightly lower costs.
- Another item would be fuel management of a standby facility; the fuel supply must be managed so it remains clean, no bacteria buildup from sitting. With a smaller quantity, more active storage of the limited fuel consumed. It must be said that the expansion of a renewable energy component, battery storage in lieu of the cable would also require changes to the power plant's existing equipment.
- Fuel supply will still be required for island needs beyond the power plant. Home heating, trucks, boats. The cable will reduce diesel demand, but not negate the need for reliable fuel supply.
- Standby requirements may be more like base load operations in the event of a cable failure whereby a special equipment and or vessel is required to conduct the work. it could be assumed the island's power plant would need to operate for a month or two while the equipment is scheduled, repairs made. Major cable failures are not likely with the install specification called for in the current design but; shore side interface events on the mainland or island, shallow water interface areas are probable.
- Cable failure would also take the glass fiber out, therefore no broadband connectivity. The Island would need to consider what back-up is in place if per above, the cable was down for an extended period.

In summary, the cable while offering a known set of benefits must be taken in full context, must be considered in light of the MAV Project not available to operate it, offer the ongoing benefits of an operational project.

Cash Option:

The cash option offers funding potential beyond the similar supply equation offered from the cable proposal. The cash option opens a multitude of paths for the Power Plantation and more importantly the entire Island. The underlying fact that the island may then self-determine, create its own method of power generation, would be independent from MAV or the unknowns of the mainland grid supply and its volatility.

The cash option offers funds to develop solutions, can add to, enhance the power system and implement a solid broadband service via proven methods (such as microwave which is used in many rural and arctic areas for high speed connections). This offers the ability to implement technology when it suits the island and allows consideration of the island energy and communication needs as a whole. One may also assume the opportunities for more exciting elements in these technologies and systems which involve younger islanders, are more interactive than a cable alone. The obvious choice to implement this is investment in renewable technologies such as a larger photovoltaic system, efficiency, and storage technologies, the latest microwave and network distribution solutions.

The current plant capability with its CHP (combined heat and power) effort can be completed to improve efficiency. The power plant design criteria of a newly designed system would allow the existing plant configuration to be improved upon, provide most of the peak summer period with renewables covering the rest of the year. This could be further expanded based on economics as the storage, control and renewable technology space continues to undergo rapid advancement. Batteries are still expensive (on a life cycle basis), but are now being installed with good economics and getting better. Solar PV has come down dramatically and the balance of plant systems (inverters/controls/smart grid) offer excellent integration with conventional generators and batteries to offer utility grade, high capacity power supply.

The cash option offers funding potential beyond the similar supply equation offered from the cable proposal and most importantly offers the idea of a generational period solution and funding mechanism rather than twenty or so years.

Best Regards,

EXHIBIT G

LIST OF METF REPORT DOCUMENTS

Monhegan established the Monhegan Energy Task Force ["METF"] to review the MAV Project, gather information on the Project, and make that information available to the public. Studies and reports made available through METF's review include:

I. Environmental Studies and Reports
   a. Monhegan Fall 2015 UMaine LiDAR Buoy Deployment, prepared by UMaine Advanced Structures & Composites Center
   b. Acoustic Modeling for Aqua Ventus I off Monhegan Island, ME, prepared by Pacific Northwest National Laboratory (Oct. 2013)
   c. Acoustic Bat Surveys on Monhegan Island in 2009, 2010, and 2011, prepared by Stantec Consulting Services, Inc. (Jan. 2012)
   d. Visual Observations for Birds, Turtles, and Marine Mammals at the University of Maine Test Site near Monhegan, Maine, prepared by Lubird Kennedy Environmental Services (April-June 2013)
   e. Two-year baseline characterization of benthic and emersal assemblages inside the University of Maine deepwater wind test sites off Monhegan Island, Maine, prepared by UMaine (March 2013)

II. Economic/Technical Studies and Reports
   a. Economic Impacts of the New England Aqua Ventus (Phases I and II) Offshore Wind Power Program in Maine, prepared by UMaine School of Economics (April 30, 2013)
   b. Potential Tourism Impacts of an Offshore Wind Farm Near Monhegan Island, prepared by UMaine (June 2016)
   c. Visual Modeling for Aqua Ventus I off Monhegan Island, ME
   d. Draft Outline of Provision of Power vs. Alternative Benefit
   e. The NEAV Cable Option: Analysis of Potential Fuel Savings and Emissions Reductions for Monhegan, prepared by Island Institute
   f. Review of Matinicus Plantation Electric Company and Monhegan Plantation Power District, prepared by The Financial Engineering Company (Feb. 1, 2016)
   g. MPPD Usage Summary Reports
   h. Summaries of Questions and Answers regarding the Project and Potential Community Benefits
   i. New England Aqua Ventus I – Project Update, December 2016

In addition to the above studies and reports, METF has conducted community outreach by holding community meetings and providing periodic public updates on developments of the MAV Project.

EXHIBIT H

Warrant Article regarding "Fund Option" community benefit package
and associated Community Benefit Agreement

To see if the voters of Monhegan approve the "Fund Option" community benefit package as detailed in the Final Community Benefits Advisory Committee ("CBAC") Report to the Assessors dated October 2, 2017, and authorize the Assessors to sign a Community Benefit Agreement(s) on behalf of Monhegan Plantation consistent with the Fund Option and in substantial conformance to the Community Benefit Agreement(s) attached to this Warrant.

A copy of the Final CBAC Report to the Assessors dated October 2, 2017, and a copy of the form of a Community Benefit Agreement(s) are on file at the municipal office and made available at the Post Office, L. Brackett & Son, Monhegan Energy Task Force (METF) Facebook page, METF newsletter, and www.monheganplantation.com.

EXHIBIT I

Warrant Article regarding Advisory Assistance to Assessors concerning Fund Option Community Benefit Package and Agreement

To see if the voters of Monhegan will authorize and direct the Community Benefits Advisory Committee to monitor and provide advisory assistance to the Board of Assessors in implementing a Fund Option Community Benefit Package and Agreement.

EXHIBIT J

Possible forms of Motions for MPPD trustees regarding Fund Option Community Benefit Package and Agreement.

1. *[At MPPD's October 4, 2017 meeting]* Motion to endorse the "Fund Option" community benefit package as detailed in the Final Community Benefits Advisory Committee ("CBAC") Report to the Assessors dated October 2, 2017.

2. *[At a future meeting of the MPPD Trustees when the form of the Community Benefit Agreement is available]* Motion to authorize the Board of Trustees to sign a Community Benefit Agreement(s) on behalf of MPPD consistent with the Fund Option described in the Final Community Benefits Advisory Committee ("CBAC") Report dated October 2, 2017, and in substantial conformance to the Community Benefit Agreement(s) attached to the record of this vote.