

Attachment 7.

**Appendix A - Updated Description of Premises**

*Introduction*

The Town of Nantucket seeks to purchase a solar photovoltaic (PV) system at one or more building(s) at the Surfside Waste Water Treatment Plant (WWTP), and to lease PV systems through an Energy Services Contract at additional municipally-owned sites. The Cadmus Group created 10 preliminary solar photovoltaic (PV) array designs for the WWTP and municipal sites of interest throughout Nantucket. The designs illustrate configuration and electricity production potential based on information collected during a site visit on May 6, 2019, publicly available satellite images, and additional information provided by the Town.

The estimated system capacities and annual productions are listed below, and preliminary site designs are included thereafter. In their proposals, Respondents shall also provide specific details about how they will utilize currently available incentives.

Site Name	Address	System Capacities (kW DC)	Estimated Annual Productions (kWh)
Fire Station	4 Fairgrounds Road Nantucket, MA	248.4	324,700
Airport	14 Airport Road, Nantucket, MA	1,180	1,328,000
High School/Middle School	11 Surfside Road, Nantucket, MA	227.2	285,400
Elementary School	30 Surfside Road, Nantucket, MA	200.9	248,100
Surfside Wastewater Treatment Plant Single	81 South Shore Road, Nantucket, MA	40.8	53,330
Surfside Waste Water Treatment Plant – Full Site	81 South Shore Road, Nantucket, MA	107.1	135,500
Wannacomet Water Company	1 Milestone Road, Nantucket, MA	3350	4,494,000
Wannacomet Water Company Building	1 Milestone Road, Nantucket, MA	23.8	27,180
MRF and C&D Building Landfill**	188 Madaket Rd, Nantucket, MA 02554	320.6	378,000
DPW Garage Landfill	188 Madaket Rd, Nantucket, MA 02554	84.2	106,600
<i>Total*</i>		5,818	7,169,280

*\* The total excludes the WWTP Single Building amounts, which is included in the WWTP full site total, and Wannacomet Water Company Building, which is a secondary and smaller option to the Water Company ground mounted system.*

*\*\*Based on Developer feedback, an additional building, the Composter Facility “Filter Building,” has been added as available for consideration, but is not included in this preliminary site design and system capacity estimates. The facility data for the “Filter Building,” including utility data and roof age, is included in the Facilities Data summary in Attachment 2, and the building is identified in the section for the MRF and C&D Building, below.*

*Preliminary Design and Technical Feasibility*

*Fire Station/Public Safety Facility (4 Fairgrounds Rd.)*

The Fire Station is oriented such that only the roof on the backside, which faces southeast, is suitable for solar. The parking lots in the southeast section of the parcel is also suitable for potential solar PV parking canopy array development, shown in the lower right hand of the picture below. This preliminary analysis estimates that the Fire Station, Public Safety Facility, and parking canopy can support PV arrays of approximately 248.4 kW DC. An array of this capacity would generate 324,700 kWh annually.

**Conceptual Design**



DC Capacity (kW)	248.4
AC Capacity (kW)	216.5
No. Modules	552
Module	LG360Q1C-A5
Inverter	Sunny Tripower 2400
Est. Annual Solar Production (kWh)	324,700

*Nantucket Memorial Airport (14 Airport Rd.)*

Several buildings at the Nantucket Memorial Airport are suitable for solar. This preliminary analysis estimates that the Airport can support PV arrays of approximately 1,180 kW DC. An array of this capacity would generate 1,328,000 kWh annually. There is an opportunity to develop ground mounted solar as well, but there are FAA regulations on development near runways and usually requires a buffer zone around the runway. If the Town is also interested in pursuing this option, it may benefit from direct consultation with the FAA to determine what is feasible.

**Conceptual Design**

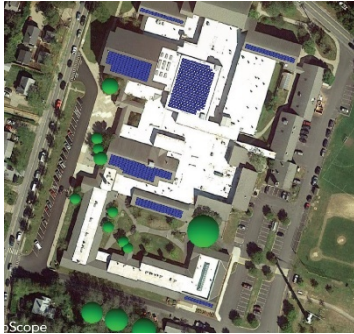


DC Capacity (kW)	1,180
AC Capacity (kW)	962.4
No. Modules	3,695
PV Module	REC Solar, REC280TP (280W)
Inverter	Sunny Tripower 2400
Est. Annual Solar Production (kWh)	1,328,000

## *Nantucket High School/Middle School (10 Surfside Rd.)*

The roof on this facility features many different levels, which limits the useable surface area for solar. However, there are several angled roofs that are situated well to capture sunlight. This analysis estimates that the High School/Middle School Building site can support PV arrays of approximately 227.2 kW DC. The arrays across the building would generate approximately 285,400 kWh annually.

### Conceptual Design



DC Capacity (kW)	227.2
AC Capacity (kW)	192.5
No. Modules	710
PV Module	Trina Solar, TSM-PD14 320W
Inverter	Sunny Tripower 24000
Est. Annual Solar Production (kWh)	285,400

## *Nantucket Elementary School (30 Surfside Rd.)*

The Nantucket Elementary school has several areas of its roof well situated for solar. However, some of these locations are visible from the road, which may be an issue for getting a “Certificate of Appropriateness” from the Nantucket Historic District Commission (HDC). This analysis modeled all viable locations to show the maximum benefit available. It is estimated that the Nantucket Elementary School can support PV arrays of approximately 200.9 kW DC. An array of this capacity would generate 248,100 kWh annually.

### Conceptual Design



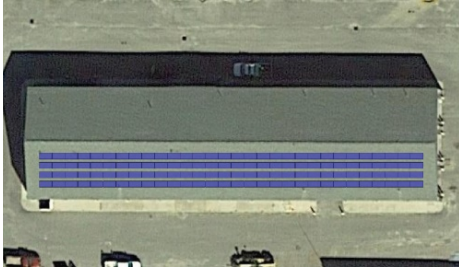
DC Capacity (kW)	200.9
AC Capacity (kW)	147.8
No. Modules	591
PV Module	SolarWorld, Sunmodule XL SW 340
Inverter	MICRO-0.25-I-OUTD-US-208 (ABB)
Est. Annual Solar Production (kWh)	248,100

## *Surfside Waste Water Treatment Plant - Single Building (81 South Shore Rd.)*

The Town of Nantucket intends to purchase an array directly at the Surfside WWTP using awarded grant funding. Based on preferences of the Town outlined in their RFQ, this analysis modeled both the large single building at the WWTP, as well as all viable buildings on site. Both designs are included below. For

the single WWTP building, this analysis estimates that the building can support a PV array of approximately 40.8 kW DC. An array of this capacity would generate 53,330 kWh annually.

### Conceptual Design



DC Capacity (kW)	40.8
AC Capacity (kW)	50
No. Modules	120
PV Module	SolarWorld, Sunmodule XL SW 340
Inverter	PVI 50TL (Solectria)
Est. Annual Solar Production (kWh)	53,330

### *Surfside Waste Water Treatment Plant – Full Site (81 South Shore Rd.)*

The entire Surfside WWTP site has several buildings with roof areas considered viable for solar. This preliminary analysis estimates that the buildings at the WWTP site can support PV arrays of approximately 107.1 kW DC. This is inclusive of the capacity modeled in the single building scenario. An array of this capacity would generate 135,500 kWh annually.

### Conceptual Design



DC Capacity (kW)	107.1
AC Capacity (kW)	100
No. Modules	315
PV Module	SolarWorld, Sunmodule XL SW 340
Inverter	PVI 50TL (Solectria)
Est. Annual Solar Production (kWh)	135,500

### *Wannacomet Water Company (1 Milestone Rd.; “Wyers Valley”)*

The Wannacomet Water Company appears to have a large amount of space that can be redeveloped, however, the existence of wells onsite combined with a state policy that places a protective “no disturbance” radius around wells limits the actual area available.<sup>1</sup> Accounting for those limitations, this analysis estimates that the Wannacomet Water Company can support ground-mounted PV arrays of

<sup>1</sup> DEP Policy # BRP 2011-1, updated April 18, 2018.

approximately 3,350 kW DC. An array of this capacity would generate 4,494,000 kWh annually. This array is designed to include a setback from the bike path so there could still be a greenway for bikers.

### Conceptual Design



DC Capacity (kW)	3,350
AC Capacity (kW)	2,430
No. Modules	9,704
PV Module	Canadian Solar, CS6U 345W
Inverter	MICRO-0.25-I-OUTD-US-208 (ABB)
Est. Annual Solar Production (kWh)	4,494,000

### *Wannacomet Water Company Building (1 Milestone Rd.)*

This analysis also includes a design for a roof-mounted PV system on the Water Company Garage. This analysis estimates that the Wannacomet Water Company Building can support building mounted PV arrays of approximately 23.8 kW DC. An array of this capacity would generate 27,180 kWh annually.

### Conceptual Design



DC Capacity (kW)	23.8
AC Capacity (kW)	20.0
No. Modules	70
PV Module	SolarWorld, Sunmodule XL SW 340
Inverter	PVI 50TL (Solectria)
Est. Annual Solar Production (kWh)	27,180



*MRF and C&D Buildings (188 Madaket Rd.)*

The MRF and C&D Buildings at the Landfill are both viable for solar development. This analysis estimates that the MRF and C&D Buildings can support PV arrays of approximately 320.6 kW DC. An array of this capacity would generate 378,000 kWh annually.

**Conceptual Design**



DC Capacity (kW)	320.6
AC Capacity (kW)	264.7
No. Modules	1,002
PV Module	Trina Solar, TSM-PD14 320W
Inverter	Sunny Tripower 24000
Est. Annual Solar Production (kWh)	378,000

*\*\* The building outlined with Red Box in the image above is the “Filter Building” that has been added for consideration in the RFP. The corresponding utility data and roof age is included in Attachment 2.*

*DPW Garage (188 Madaket Rd.)*

The DPW garage at the Landfill is viable for solar development. This analysis estimates that the DPW garage can support PV arrays of approximately 84.2 kW DC. An array of this capacity would generate 106,600 kWh annually.

**Conceptual Design**



DC Capacity (kW)	84.2
AC Capacity (kW)	72.2
No. Modules	234
PV Module	LG360Q1C-A5
Inverter	Sunny Tripower 2400
Est. Annual Solar Production (kWh)	106,600