Town of West Newbury
Select Board
Monday, August 7, 2023 @ 5:30pm

381 Main Street, Town Office Building
www.wnewbury.org

AGENDA

Executive Session: *5:30pm in 1910 Building, 381 Main Street: Town Manager's office*

- MGL Ch. 30A §21(a) 6: To consider the purchase, exchange, lease or value of real property if the chair declares that an open meeting may have a detrimental effect on the negotiating position of the public body *(Church St);*
- MGL Ch. 30A §21(a) 3: To discuss strategy with respect to collective bargaining or litigation if an open meeting may have a detrimental effect on the bargaining or litigating position of the public body and the chair so declares *(potential wage claim)*;
- MGL Ch. 30A §21(a) 7: To comply with, or act under the authority of, any general or special law or federal grant-in-aid requirements *(Elliot Fund)*.

The Board may take a brief recess between the Executive Session and the Open Session beginning at 7 PM.

Open Session: *7:00pm by in-person attendance or remote participation (instructions below)*

Announcements:

- This meeting is being broadcast on local cable TV and recorded for rebroadcast on the local cable channels and on the internet. Meeting also accessible by remote participation; instructions below.
- West Newbury is a Purple Heart Community, and August 7, 2023 is Purple Heart Day
- 2023 Summer Bandstand Concert Series – Thursdays at 6:30pm – list of performers located on Town website
- Upcoming Planning Board meeting (Aug. 15th) regarding MBTA Communities planning process
- Fall Special Town Meeting warrant to close on Tuesday, Sept. 5th. Proposed warrant articles due to be submitted to Town Clerk's office no later than Thursday, August 31st! Blank article request forms posted online and available on request.
- Call for volunteers! FY24 positions on Boards/Commissions/Committees. See www.wnewbury.org/volunteer
- Reminder to subscribe for emailed Town agendas/news/announcements at www.wnewbury.org/subscribe

Regular Business

A. Request for Special Event permit (cont'd from 7/10/23), Harborside Half Marathon and 5K – Nov. 12, 2023 from 9am-1pm – *Loco Sports*
B. Request for appointment
    a. Conservation Commission Associate member, Haley McCraven
    b. Community Preservation Committee members
    c. Finance Committee, Ann O'Sullivan
    d. Select Board representative for the Investment Policy Committee
    e. Determine term of appointment for Alejandra Chandler, Conservation Commission
C. Presentation from Invasive Species Interns
D. Select Board review of Committees' charge / function
    a. Conservation Commission
    b. Community Preservation Committee
E. Cont'd Board discussion of Ash Street management, incl. updates on recent meetings/site visit with MA Div. of Fisheries & Wildlife
F. Discussion of potential to join Northeastern Massachusetts Law Enforcement Council (NEMLEC) – *Police Chief Dwyer*
G. Discussion of potential Municipal Vulnerability Preparedness (MVP) Action Grant
H. Request from Essex County Greenbelt for authorization to conduct fundraising activities and install temporary sign at Pipestave/Mill Pond in support of proposed Sawmill Brook land acquisition
I. Review of draft Memorandum of Understanding with Board of Water Commissioners re use of ARPA funds for Church/Prospect water main replacement project
J. Public Hearing to consider proposed amendment to Personnel Policy Sec. 5.7: Jury Duty
K. Review of draft Solar Feasibility Study
L. Discussion of Select Board/Town Manager Goals / Priorities for FY24
M. Review of CPA Affordable Housing Trust Grant Agreement
N. Meeting minutes: July 10, 2023

Town Manager Updates

O. Progress update regarding Tata & Howard water hydraulic plan/capital plan/rate study
P. Working documents, Water financial analysis/trends
Q. Town Planner report, August
R. Subsidized Housing Inventory 2023 Update
S. Updates on other ongoing/active projects/initiatives
T. Follow up meeting assignment; placing items for future agendas

Addendum to Meeting Notice regarding Remote Participation

Public participation in this meeting of the West Newbury Select Board will be available via remote participation. For this meeting, members of the public who wish to listen to the meeting may do so in the following manner:

Zoom Meeting
Phone: (646) 558 8656
Meeting ID: 811 8513 8534
Passcode: 818220
Join at: https://us06web.zoom.us/j/81185138534?pwd=Tk1YdnBFUmRlV2piYW1JRzl6VUhaUT09

Every effort will be made to ensure that the public can adequately access the proceedings in real time, via technological means. In the event that we are unable to do so, despite best efforts, we will post on the West Newbury website an audio or video recording of proceedings as soon as practicable after the meeting.

Military Order
of the
Purple Heart

TOWN OF WEST NEWBURY, MA
PROCLAMATION
PURPLE HEART COMMUNITY

WHEREAS, the people of West Newbury, MA have great admiration and the utmost gratitude for all the citizens of our community who have selflessly served in the Armed Forces that has been vital in maintaining the freedom and the way of life enjoyed by our citizens; and

WHEREAS, citizens of our community have been killed in action while serving in the Armed Forces and have been posthumously awarded the Purple Heart for their ultimate sacrifice; and

WHEREAS, citizens of our community have been awarded the Purple Heart for their bodily sacrifice of being wounded by the hand of the enemy while engaged in combat; and

WHEREAS, the Purple Heart is the oldest American military decoration and was created as The Badge of Military Merit, made of purple cloth in the shape of a heart with the word "Merit" sewn upon it, on August 7, 1782 in Newburgh, New York by General George Washington, then reestablished as the Purple Heart on February 22nd, 1932 by General Douglas MacArthur; and

WHEREAS, the heritage it represents is sacred to those who know the price paid to wear the Purple Heart; and

WHEREAS, August 7th is nationally recognized as Purple Heart Day; and

NOW, THEREFORE BE IT PROCLAIMED, We the West Newbury Select Board hereby proclaim West Newbury, Massachusetts, a Purple Heart Community, honoring the service and sacrifice of those from our community who were awarded the Purple Heart while serving in our Nations wars; and

ALSO, BE IT PROCLAIMED, That West Newbury, Massachusetts will recognize August 7th annually as Purple Heart Day, and urge our citizens and organizations to display the American Flag as well as other public expressions of recognition and appreciation of our Purple Heart recipients.

David Archibald, Select Board Chair

Richard Parker, Select Board Vice Chair

Wendy Reed, Select Board Clerk

West Newbury Summer Concert Series

Every Thursday June 22nd-Aug 24th 6:30-8:00pm

RAIN OR SHINE

June 22nd Thomas Machine Works Band

June 29th The Coalboilers Band

July 6th Marjorie Senet and The Broken Home Boys

July 13th Professor Louie and The Crowmatix

July 20th The Nephrock! Allstars

July 27th Freevolt

Aug 3rd Jittery Jack and Amy Griffin

Aug 10th Liz Frame and The Kickers

Aug 17th Live Dead

Aug 24th Merrimack Valley Concert Band

Location: Town Bandstand

381 Main Street, W. Newbury, MA 01985 (behind the Annex Building)

Food and Beverages available for purchase – Rain Shows in Annex Building

ALL SHOWS ARE FREE!

For more information visit www.wnewbury.org

Town Manager

From: Town Clerk
Sent: Wednesday, July 26, 2023 3:08 PM
To: Assistant Clerk
Cc: Selectboard; Wendy Reed; Rick Parker; Chris Wile
Subject: Date / time set for Warrant closing, and for Special Town Meeting
Attachments: Article request form template.xlsx; Article request form template.pdf

The Select Board has set the date/time for fall Special Town Meeting (STM) as Monday, **October 23rd at 7pm**, to be held in the Annex.

The Select Board expects to vote to close the STM Warrant at its meeting on **Tuesday, September 5th**. Town departments, Boards, Commissions, and Committees are being asked to let the Town Clerk's Office know what if any proposed articles may be anticipated for the Fall STM.

The Board has requested that any/all proposed warrant articles be received in the Town Clerks' office no later than close of business **Thursday, August 31st**, including any/all relevant backup, so that these materials can be included in the Board's meeting packet for their meeting on September 5th.

Article Request Forms
Due to there being newer members on the Finance Committee, **Article Request Forms will be expected for all proposed Town Meeting Articles**, even for recurring articles. Article Request Forms may include supporting documentation (basis of estimates, etc.).

Please let us know if you need any assistance,

James RW Blatchford
Town Clerk
Town of West Newbury
Phone 978-363-1100 X 110
Mobile 978-891-0039
www.WNewbury.org

Town of West Newbury
Special Event Permit

Welcome and Instructions:

It is the goal of the Town of West Newbury to work with event managers and organizers to help ensure that the events taking place in our community are both safe and successful, while minimizing the impact on our residents and businesses. We hope that you find the instructions set forth in this manual helpful in planning and preparing to carry out your special event.

Please review the instructions, and rules and regulations governing special events. Complete the Special Event Application Form and submit it to the Town of West Newbury, Town Clerk's Office, 381 Main Street, West Newbury, MA 01985.

Fulfilling the Guidelines for Special Events does not guarantee event approval. The Town of West Newbury reserves full discretion to approve, to disapprove or to limit any type of special event. If you have any questions, please contact the Town Clerk's Office at Townclerk@wnewbury.org or (978) 363-1100 ext. 110.

Guidelines for Special Events

A **special event** is any activity that occurs upon public or private property that affects the ordinary use of parks, playgrounds, fields, buildings, public streets, rights-of-way or sidewalks. Special Events may include festivals, fairs, concerts, holiday celebrations, parades, athletic tournaments, road or bicycle races, etc.

Individuals or organizations wishing to hold events on public property, or on private property but which may have an impact on public property such as (but not limited to) roads and Town parks, within the Town limits must obtain a Special Event Permit from the Town of West Newbury. Event sponsors must submit a substantially complete application at a minimum of 60 (sixty) days before the event. If the application is submitted less than 60 days before the event, the applicant must pay a $100 administrative fee or has the option of changing the date. The administrative fee applies to all for profit and nonprofit persons or organizations. The Town reserves the right to deny any application which it determines may create an undue burden on the Town's public safety departments and an undue nuisance to the Town and neighbors to the potential event.

Permit Posting: Special event permits shall be posted at greeting areas or main entrances at events. Event organizers and managers are reminded that they may be asked by Town staff to show proof of permit during the event.

Hours: Event activities are prohibited before 9:00 AM and after 10:00 PM in residential areas or such other hours as the Select Board set forth. Loudspeakers, amplified music, bullhorn or public address systems during event hours are strictly regulated and must be specifically approved as a part of the permit. The Select Board reserves the right to require other time restrictions depending on the type of event requested and the impact it may have on the Town and the abutting neighborhood(s).

Alcohol: Alcohol is prohibited on all Town of West Newbury public property, including buildings, parks, playgrounds, fields, etc. without the written consent of the Select Board. A one-day liquor license may be granted, at the sole discretion of the Select Board. In order to apply for a One Day Permit, applicants must provide a Certificate of Insurance, with the Town of West Newbury named as an Additional Insured, in the minimum amount of $1,000,000 for each Occurrence and $2,000,000 General Aggregate for both General Liability and Liquor Liability, as a precondition for obtaining permits. For events larger than 250 people, applicants must also provide an Umbrella Coverage that would sit over both the General Liability and Liquor Liability. The Certificate of Insurance must include all coverage deemed necessary for the event, as specified by the Town of West Newbury and Town Manager, including an indemnification and hold harmless clause. This Certificate must be submitted to the Town Clerk's Office no later than ten (10) business days before the event. Special Event Permits will not be issued without submission of a Certificate of Insurance.

Restrooms/Trash/Cleanup: The Town of West Newbury may require event organizers to provide temporary toilet facilities. Temporary toilet facilities must be cleaned daily. Trash and recycling must be disposed of in their designated containers. Daily trash pickup and disposal by the permit holder is required. The applicant must clean the right-of-way or public property of all rubbish and debris, returning it to its pre-event condition at the conclusion of the event. The event organizer may be required to arrange with the Department of Public Works for trash pickup and disposal, and to pay all costs associated with the aforementioned requirement. If the permit holder fails to clean up debris and trash within the specified period, cleanup will be arranged by the Town and all costs will be charged to the permit holder.

Traffic & Parking: Parking is permitted in designated areas only. The Police and Fire Departments require that all entries, exits and fire lanes be maintained. The Police Department reserves the right to require that detail officers be hired at the expense of the permit holder where deemed necessary by the Chief of Police.

Signs: Permits are required for temporary signs. No signs may be affixed to trees, buildings, or street fixtures.

Smoking: Smoking is not permitted in or on any public facility or on school grounds. "Smoking" includes carrying or having in one's possession a lighted or heated cigarette, cigar, or pipe, or a lighted or heated tobacco or plant product intended for human consumption through inhalation whether natural or synthetic in any manner or in any form. "Smoking" includes the use of an electronic smoking or "vaping" device.

Fireworks: Fireworks are not permitted without the prior approval of the West Newbury Select Board and West Newbury Fire Department.

Tents: Tents require an inspection and permit from the Town of West Newbury Health, Building, and Fire Departments. Such structures require a flame-resistant certificate issued by an acceptable testing laboratory, and a site plan indicating a fire lane accessing the tent or trailer, a fire extinguisher on-site, and acknowledgement that no smoking, fireworks, or open flames will be permitted in or near the tent.

Security/Traffic Control: Events may require the hiring of police officers to provide for security and/or traffic control.

Police Detail: For indoor functions, a minimum of one police detail officer is required for up to one hundred guests. For indoor functions with greater than one hundred guests, a minimum of two police detail officers are required. For outdoor functions, a minimum of two police detail officers are required for every one hundred guests. Special Event Permit holders must contact the West Newbury Police Department at 978-363-1213 to coordinate detail officers at least ten (10) days prior to the event. All details must be paid for in advance of the event. At the sole discretion of the Chief of Police, the police department may require additional officers on site depending on the type of event, the location and other particulars.

Fire Watch Detail: For indoor functions where there are no working sprinklers, a fire watch detail is required. The fire chief will determine how many fire fighters will be required depending on the location and size of the event.

First Aid and Medical: Events may require provisions for first aid and medical personnel, including but not limited to Town of West Newbury Fire Department and/or the town's ambulance service. To be determined by the fire department prior to issuance of a Special Event Permit.

Enforcement: Town of West Newbury Police, Fire, or other staff so designated by the Select Board may require that a resident, event employee or participant leave any park or public facility for violation of rules and regulations, and/or for violation of conditions applied by the Select Board in their issuance of a Special Event Permit.

Insurance: All applicants must provide a Certificate of Insurance, with the Town of West Newbury named as an Additional Insured, in the minimum amount of $1,000,000 for each Occurrence and $2,000,000 General Aggregate for commercial general liability as a precondition for obtaining permits. The Certificate of

Insurance must include all coverage deemed necessary for the event, as specified by the Town of West Newbury and Town Manager, including an indemnification and hold harmless clause in a form acceptable to Town Counsel. This Certificate and verification of Worker's Compensation Coverage must be submitted to the Town Manager's Office no later than ten (10) business days before the event. Special Event Permits will not be issued without submission of a Certificate of Insurance.

Additional Permitting and Cost Requirements: Depending upon the Special Event, additional permits may be required by Town of West Newbury Departments. These may include, but are not limited to, permits for temporary food preparation, athletic field use, field lighting, merchandise sales, raffle licenses, and indoor space needs. The organizers of the event are responsible for obtaining any additional permits or licenses and are responsible for any additional costs incurred by the Town of West Newbury as determined by representatives of each Town Department before the issuance of the Special Event Permit.

Special Event Application

Organization or Group Loco Sports, LLC & Ventures Endurance

Person Making Reservation Evan Dolecki

Mailing Address [redacted]

Phone [redacted] e-mail [redacted]

Event Date: 11/12/2023 Start Time 9:00 AM End Time 1:00 PM

Reason for Event 9th Annual Harborside Half Marathon & 5K to promote a healthy lifestyle and active living. Our charity for the 2023 event is Debbie's Treasure Chest.

Number of attendees 900

Check Appropriate Block:

_____Resident ___✓___Non-resident

_____ Fund Raising Group _____Non-Profit _____Commercial _____Other

Submit your application (with all maps, diagrams and attachments as required).

Provide a Schedule of Events along with a Sketch Plan which addresses:

1. The location of the event on the property see attached
2. For road or walk race, a detailed map of the route see attached
3. Features and attractions see attached
4. Participant circulation see attached
5. Proposed parking including how you will handle overflow parking see attached
6. Any proposed road closures see attached

7. Location of trash receptacles and dumpsters
see attached

8. Location of temporary toilet facilities
see attached

9. Accessible routes for the disabled or mobility impaired
see attached

10. Locations, size and number of any tents, trailers or temporary structures
see attached

11. Location, size, and description of any signage or banners
see attached

12. If food will be served or sold at the event, you must contact the West Newbury Board of Health to discuss Food and Beverage regulations before you submit your application. If required, your food permit must be submitted before final approval of the Special Event.
No food will be served or sold at the event in West Newbury

13. If Police Details and/or Firefighters/EMTs will be required, contact the West Newbury Police Department and West Newbury Fire Department to secure services. Only Police Officers may direct traffic on town streets. Evidence that Police and/or Fire Personnel have been secured must be presented before the approval of the final Special Event Permit.
Police and EMS has been contacted to secure detail for this event

14. Provide a Certificate of Insurance to the Town Manager's Office no later than ten (10) business days before the event. Final Special Event Permits will not be issued without submission of a Certificate of Insurance see attached

Name: Evan Dolecki Event: 9th Annual Harborside Half Marathon & 5K Sunday, November 12th, 2023

I/we agree and hold harmless and/or indemnify the said Town of West Newbury against any and all claims or liabilities for personal injury or property damage arising out of use of said property. If the application is submitted less than 60 days before the event, the applicant must pay a $100 administrative fee or has the option of changing the date. The administrative fee applies to all for profit and nonprofit persons or organizations.

Evan Dolecki 05/09/2023

Individual/Authorized Signature for Group Date

Chief of Police's Signature: Michael Dwyer Date: 07/14/23

Requests and comments:

No comments. Detail locations look good. Contact the PD at 978-363-1212 a week prior to confirm event and additional needs.

Fire Chief's Signature: Michael Dwyer Date: 07/14/23

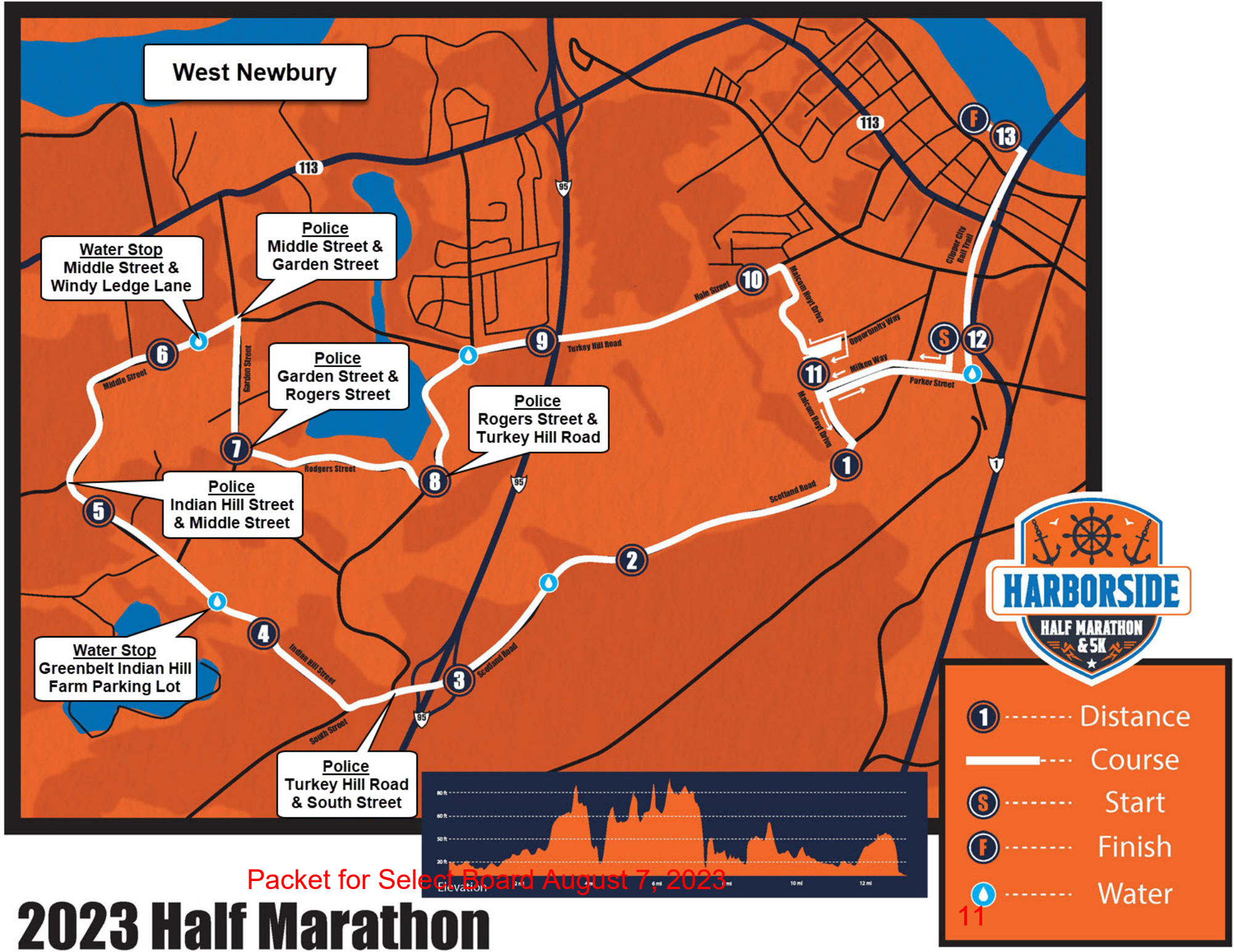
Requests and comments:

No comments or requirements. Contact above number for EMS support if needed.

Approval granted if signed here by Select Board: Date: _____

_____ _____ _____

Requests and comments:



2023 Half Marathon

Ventures Endurance & Loco Sports West Newbury Special Event Permit

Location of the event on property - The Harborside Half Marathon & 5K road race starts and finishes in the City of Newburyport, MA. Approximately 5 miles of the route will take place in the Town of West Newbury. All EMS & Police services necessary within the town will be addressed with both departments. No food will be served along the route and the event organizer has provided the specified certificate of insurance attached to this application.

Map of Route - A copy of the course has been attached to this application. South Street, Indian Hill Street, Middle Street, Garden Street, Rogers Street, and Turkey Hill Road will be used by runners in the Town of West Newbury.

Features & Attractions – There will be no features or attractions in the Town of West Newbury for this event.

Participant Circulation – Participants will follow the course through the Town of West Newbury. All road crossings and turns will have directional arrows and course marshals. Police will be hired for major intersections.

Police Details -- West Newbury Police Locations

1. Turkey Hill Road & South Street
2. Indian Hill Street & Middle Street
3. Middle Street & Garden Street
4. Garden Street & Rogers Street
5. Rogers Street & Turkey Hill Road

Participant Parking – All participant parking will take place in the City of Newburyport. No parking will be needed in West Newbury.

Road Closures - No road closures will be needed for this event. There may be slight traffic delays of up to 10 minutes during the heaviest runner traffic along the route.

Water Stop Locations – There will be two water stops in West Newbury in the following locations

1. Greenbelt Indian Hill Farm Parking Lot on Indian Hill Street
2. Intersection of Windy Ledge Lane and Middle Street

Trash receptacles and Dumpsters – The water stop crew will manage all used cups from runners. All water stops will have 3 trash cans at them. The crew will also monitor and clean the roadway post-event. We will have a course sweep team travelling the route after all runners have passed through picking up any miscellaneous trash.

Temporary Toilet Facilities – Two portable toilet units will be placed at each of the water stops in the Town of West Newbury. There are two water stops in West Newbury.

Units will be dropped off on Friday, November 10th and picked up on Monday, November 13th.

Accessible Routes for the Disables – This event will not require any accessible routes for the disabled as it takes placed on roads and a paved rail trail.

Tents, Trailers, or Temporary Structures – There will be no tents, trailers, or temporary structures needed in the Town of West Newbury for this event.

Signage or Banners – Public announcement (18” x 24”) signs including impact timeframe will be installed on the route early in the week before the event and removed immediately following the event. Directional arrows, mile marker a-frames, and as needed runner instruction signs will be installed on race morning and removed immediately following the event.

CERTIFICATE OF LIABILITY INSURANCE

DATE(MM/DD/YYYY)
03/02/2023

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must have ADDITIONAL INSURED provisions or be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER
Aon Risk Services Northeast, Inc.
New York NY Office
One Liberty Plaza
165 Broadway, Suite 3201
New York NY 10006 USA

CONTACT NAME:
PHONE (A/C. No. Ext): (866) 283-7122 **FAX (A/C. No.):** (800) 363-0105
E-MAIL ADDRESS:

INSURER(S) AFFORDING COVERAGE		NAIC #
INSURER A:	Everest National Insurance Co	10120
INSURER B:		
INSURER C:		
INSURER D:		
INSURER E:		
INSURER F:		

INSURED
Ventures Endurance Events, LLC
85 Devonshire St.
9th Floor
Boston MA 02109 USA

COVERAGES **CERTIFICATE NUMBER:** 570098108343 **REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

Limits shown are as requested

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
A	X **COMMERCIAL GENERAL LIABILITY** CLAIMS-MADE / X OCCUR X Liquor Liability GEN'L AGGREGATE LIMIT APPLIES PER: X POLICY / PRO-JECT / LOC OTHER:			SI8GL01746231	02/25/2023	02/25/2024	EACH OCCURRENCE	$1,000,000
							DAMAGE TO RENTED PREMISES (Ea occurrence)	$100,000
							MED EXP (Any one person)	Excluded
							PERSONAL & ADV INJURY	$1,000,000
							GENERAL AGGREGATE	$2,000,000
							PRODUCTS - COMP/OP AGG	$1,000,000
	AUTOMOBILE LIABILITY ANY AUTO OWNED AUTOS ONLY / SCHEDULED AUTOS HIRED AUTOS ONLY / NON-OWNED AUTOS ONLY						COMBINED SINGLE LIMIT (Ea accident)	
							BODILY INJURY (Per person)	
							BODILY INJURY (Per accident)	
							PROPERTY DAMAGE (Per accident)	
	UMBRELLA LIAB / OCCUR **EXCESS LIAB** / CLAIMS-MADE DED / RETENTION						EACH OCCURRENCE	
							AGGREGATE	
	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY Y / N ANY PROPRIETOR / PARTNER / EXECUTIVE OFFICER/MEMBER EXCLUDED? N / A **(Mandatory in NH)** If yes, describe under DESCRIPTION OF OPERATIONS below						PER STATUTE / OTH-ER	
							E.L. EACH ACCIDENT	
							E.L. DISEASE-EA EMPLOYEE	
							E.L. DISEASE-POLICY LIMIT	

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

RE: Harborside Half Marathon & 5K. Town of West Newbury is included as Additional Insured in accordance with the policy provisions of the General Liability policy.

CERTIFICATE HOLDER

Town of West Newbury
381 Main Street
West Newbury MA 01985 USA

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE

Aon Risk Services Northeast Inc.

Holder Identifier :

Certificate No : 570098108343

Town of West Newbury
Application for Appointment

For additional information please call 978-363-1100, ext. 115.

The Town appreciates your interest in serving. Please complete this form and return it to : Board of Selectmen, 381 Main Street, West Newbury, MA 01985 or email to: selectboard@wnewbury.org

Name: Haley McCraven

Address: [redacted]

e-mail: [redacted]

Mobile phone: [redacted] Home phone: N/A

Board(s) or committee(s) you are interested in volunteering on:

The Conservation Commission (Associate position)

Current or past committees served on: None for the town of West Newbury, but I have served on the Board of Directors for the Junior League of Boston (2014-2016, 2021 - 2022)

Relevant skills, expertise and education: With an MBA from Northeastern coupled with skills gained from my role as a management consultant at PwC, I possess a strong foundation in strategic planning, resource management and organizational leadership. My passion for protecting our wild spaces fuels my determination to contribute to the Conservation Commission. Having served on various committees and Boards in other organizations, I have honed my ability to collaborate effectively with diverse teams, driving them towards a common goal while ensuring efficient decision-making processes. Together, my educational background, expertise and commitment make me well suited to make a significant and positive impact on the Conservation Commission.

All board or committee vacancies will be filled by citizens deemed most qualified to serve in a particular capacity. I also understand that in the event that I am appointed to a position, my activities will be governed by the Massachusetts Conflict of Interest Law, Open Meeting Law, Public Records Law, the Bylaws of The Town of West Newbury and all other applicable federal, state and local laws or regulations.

Signature: Haley McCraven Date: July 17, 2023

Board/Committee

Appointing Authority

Date of Appointment Sworn in

Request for Select Board appointment to the Community Preservation Committee
FY 2024

Applicant	**Board, Committee or Commission**
John Haley	Conservation Commission
Robert Janes	Historical Commission
Gary Bill	Housing Authority
Patricia Reeser	Open Space Committee
Wendy Willis	Parks and Recreation Commission
Tim Cronin	Planning Board
Wendy Reed	Select Board

Bc

Town of West Newbury
Application for Appointment

For additional information please call 978-363-1100, ext. 115.

The Town appreciates your interest in serving. Please complete this form and return it to : Board of Selectmen, 381 Main Street, West Newbury, MA 01985 or email to: selectboard@wnewbury.org

Name: Ann O'Sullivan

Address [redacted]

e-mail: [redacted]

Mobile phone: [redacted] Home phone: [redacted]

Board(s) or committee(s) you are interested in volunteering on:

Finance Committee

Current or past committees served on: SelectBoard, CPC, Housing Production Plan wkg group

Relevant skills, expertise and education: CPA, past treasurer of several nonprofits in West Newbury, long time resident, Bachelor of Science in Accountancy from Bentley

All board or committee vacancies will be filled by citizens deemed most qualified to serve in a particular capacity. I also understand that in the event that I am appointed to a position, my activities will be governed by the Massachusetts Conflict of Interest Law, Open Meeting Law, Public Records Law, the Bylaws of The Town of West Newbury and all other applicable federal, state and local laws or regulations.

Signature: Ann O'Sullivan Date: 7/31/2023

Board/Committee

Appointing Authority

Date of Appointment Sworn in

Da

Town of West Newbury

Select Board

selectboard@wnewbury.org

Volunteer Boards, Commissions and Committees (BCC) are an integral part of the Town of West Newbury's organization. Although their origins range from proposals from interested residents to town meeting approved bylaws, members are appointed by the Select Board/Town Manager and serve specified terms prior to being considered for reappointment. As appointed entities, the work of these BCC is expected to be consistent with current and long-term priorities of the Town. In order to facilitate this, the Select Board will periodically review the size, terms, objectives, and accomplishments of all appointed BCC and provide direction and/or identify changes necessary to better reflect Town needs and operations. Each BCC will be asked to participate in this process by completing the attached questionnaire and returning it to the Select Board for discussion in a public meeting.

Appointed Boards, Commissions and Committees

- Affordable Housing Trust
- Board of Fire Engineers
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- Cultural Council
- Energy & Sustainability Committee
- Finance Committee
- Harbor Committee
- Historic District Commission
- Historical Commission
- Investment Policy Committee
- Mill Pond Committee
- Open Space Committee
- Personnel Advisory Committee
- River Access Committee
- Tree Committee
- Whittier School Committee
- Zoning Board of Appeals

July 2023

Please complete the following. Note that the size of the answer space will expand as information is entered. Also review the attached forms maintained by the Town Clerk's Office and note changes.

Name of BCC	Conservation Commission
Current Membership with Officers noted	1. Margaret (Molly) Hawkins – Chair 2. George Preble – Vice Chair 3. David Parrott – Clerk, Rep to OSC 4. John Haley – Rep to SCPC 5. Alejandra Chandler – Member 6. Associate Member – Vacant
Length of Terms	3 years
Meeting Schedule	First and third Mondays, additional meetings as needed
Location of Meetings	2nd Floor hearing room
Responsibility for Posting Meeting Agenda	Michelle Greene, Conservation Agent
Responsibility for Taking Meeting Minutes	Elisa Grammer – Volunteer, David Parrott, Michelle Greene
Responsibility for Updating Website	Michelle Greene
Town Staff Liaison/Support (if any)	Michelle Greene
BCC Charge (Review attached excerpt from the 2023 BCC Charge document and note any differences with your objectives)	The MA Conservation Commission Act, MGL Ch. 40, Sec. 8C, was enacted in 1957 giving communities the option to establish conservation commissions to act as advocates for the natural environment, prepare appropriate conservation plans, and manage conservation lands and the legislation was later amended to broaden Commission powers. In 1972 the Wetlands Protection Act (the Act), MGL Ch. 131, Sec. 40, was enacted and charged Conservation Commissions with the regulatory responsibilities to implement the Act. MACC has interpreted the Acts related to Conservation Commissions and created a list of their responsibilities /charges: 1. **Establishment and Purpose.** A city or town which accepts this section may establish a conservation commission, hereinafter called the commission, for the promotion and development of the natural resources and for the protection of watershed resources of said city or town. 2. **Research, Coordination and Education.** Such commission shall conduct researches into its local land areas and shall seek to coordinate the activities of unofficial bodies organized for similar purposes, and may advertise, prepare, print and distribute books, maps, charts, plans and pamphlets which in its judgment it deems necessary for its work.

BCC Charge (continued)	3. **Conservation and Passive Recreation Plan.** Among such plans may be a conservation and passive outdoor recreation plan which shall be, as far as possible, consistent with the town master plan and with any regional plans relating to the area. The commission may, from time to time, amend such plan. Such plan shall show open areas including marsh land, swamps and other wetlands, and shall show which areas are subject to restrictions or wetland *zoning* provisions and any other matters which may be shown on a plan index under section thirty-three of chapter one hundred and eighty-four. Acquisitions of interests in and under this section and other municipal open lands shall be shown thereon as well as lands owned by other entities kept open through any legal requirement. Such plan shall show other areas which public necessity requires to be retained for conservation and passive recreation use. 4. **Records.** It shall keep accurate records of its meetings and actions and shall file an annual report which shall be printed in the case of towns in the annual town report. 5. **Staff and Consultants.** The commission may appoint a director, clerks, consultants and other employees, and may contract for materials and services within available funds insofar as the same are not supplied by other departments. 6. **Size.** The commission shall consist of not less than three or more than seven members. 7. **Appointing Authority.** In cities the members shall be appointed by the mayor, subject to the provisions of the city charter, except that in cities having or operating under a Plan D or Plan E form of city charter, said appointments shall be by the city manager, subject to the provisions of the charter; and in towns they shall be appointed by the board of selectmen, excepting towns having a manager form of government, in which towns appointments shall be made by the town manager, subject to the approval of the board of selectmen. 8. **Terms.** When a commission is first established, the terms of the members shall be for one, two or three years, and so arranged that the terms of approximately one third of the members will expire each year, and their successors shall be appointed for terms of three years each. 9. **Removal and Vacancy.** Any member of a commission so appointed may, after a public *hearing*, if requested, be removed for cause by the appointing authority. A vacancy occurring otherwise than by expiration of a term shall in a city or town be filled for the unexpired term in the same manner as an original appointment.

BCC Charge (continued)	10. **Gifts.** Said commission may receive gifts, bequests or devises of personal property or interests in real property of the kinds mentioned below in the name of the city or town, subject to the approval of the city council in a city or of the board of selectmen in a town. 11. **Land Purchase.** It may purchase interests in such land with sums available to it. If insufficient funds are available or other reasons so require, a city council or a town meeting may raise or transfer funds so that the commission may acquire in the name of the city or town by option, purchase, lease or otherwise the fee in such land or water rights, *conservation restrictions*, *easements* or other contractual rights including conveyances on conditions or with limitations or reversions, as may be necessary to acquire, maintain, improve, protect, limit the future use of or otherwise conserve and properly utilize open spaces in land and water areas within its city or town, and it shall manage and control the same. 12. **Eminent Domain.** For the purposes of this section a city or town may, upon the written request of the commission, take by eminent domain under chapter seventy-nine, the fee or any lesser interest in any land or waters located in such city or town, provided such taking has first been approved by a two-thirds vote of the city council or a two-thirds vote of an annual or special town meeting, which land and waters shall thereupon be under the *jurisdiction* and control of the commission. 13. **Eminent Domain. *Damages*.** Upon a like vote, a city or town may expend monies in the fund, if any, established under the provisions of this section for the purpose of paying, in whole or in part, any damages for which such city or town may be liable by reason of any such taking. 14. **Rules and Regulations.** The commission may adopt rules and regulations governing the use of land and waters under its control, and prescribe penalties, not exceeding a *fine* of one hundred dollars, for any violation thereof. 15. **Mosquito Control and Public Access.** No action taken under this section shall affect the powers and duties of the state reclamation board or any mosquito control or other project operating under or authorized by chapter two hundred and fifty-two, or restrict any established public access. 16. **Eminent Domain and Farmland.** Lands used for farming or agriculture, as defined in section one A of chapter one hundred and twenty-eight, shall not be taken by eminent domain under the authority of this section. 17. **New Agriculture Rules.** Prior to the adoption of any rule or regulation which seeks to further regulate matters

BCC Charge (continued)	established by section forty of chapter one hundred and thirty-one or regulations authorized thereunder relative to agricultural or aquacultural practice, the commission shall, no later than seven days prior to the commission's *public hearing* on the adoption of said rules and regulations, give notice of the said proposed rules and regulations to the farmland advisory board established pursuant to section forty of chapter one hundred and thirty-one. 18. **Conservation Fund.** A city or town may appropriate money in any year to a conservation fund of which the treasurer shall be the custodian. He may deposit or invest the proceeds of said fund in savings banks, trust companies incorporated under the laws of the Commonwealth, banking companies incorporated under the laws of the commonwealth which are members of the Federal Deposit Insurance Corporation, or national banks, or invest it in paid up shares and accounts of and in cooperative banks or in shares of savings and loan associations or in shares of federal savings and loan associations doing business in the commonwealth, and any income therefrom shall be credited to the fund. Money in said fund may be expended by said commission for any purpose authorized by this section; provided, however, that no expenditure for a taking by eminent domain shall be made unless such expenditure has been approved in accordance with this section.
Accomplishments ~~since the last Evaluation~~ Over the Last Year	• Coordinate with Essex County Greenbelt Association (ECGA) to begin the process to acquire the Sawmill Brook / Austin property conservation land; • Monitor mitigation efforts at 87 Main Street and PRSD, two sites with major erosion and sedimentation issues; • Work at Cherry Hill Conservation land to manage invasive plants (interns, 2 work days held with a 3rd scheduled, prescribed burn, permitting to chemically manage invasives); • Hire for and oversee 2nd year of invasive plant internship • More work of Land Agent than what has been done previously and greater communication/outreach about this work; • Eagle Scout candidate trail work at Riverbend trails; • Increased communication and collaboration with other BCCs and town departments; • Outreach on the Act (WPA 101) to Sage Center
Priorities for the Next Year	• Local wetlands protection Bylaw and Regulations for Spring 2024 town meeting;

	• Hire 2 seasonal land stewards with expanded responsibilities from just invasive plant mapping and management; • Continue to increase sharing/outreach to the community on Conservation / Land Agent initiatives
Two Year Priorities	• Dial in management and stewardship of town land; • Improve access to town owned land; • Mass Trails grant for trail creation and improvement; • Work on the OSRP (expires 2025)
Five Year Priorities	• Maintain efficient operations
How can the Select Board/Town Manager better support the work of this BCC?	• Share the feedback the SB/TM receives from residents / community with Commission when it is raised to the SB/TM – will allow the Commission to create better practices and policies if possible or provide valuable education/outreach; • Help with "public relations" of the Conservation Commission, i.e. less public jokes/negative comments about the Commission – how can we expect the community/departments/other BCCs to want to work with the Commission if it does not appear the Town takes the Commission and the work it does as serious, relevant, or valuable; • Ensure that Conservation, either through the Commission or Agent, is brought into land use discussions early to help explain/point out wetlands permitting considerations. This helps avoid unexpected permitting delays or conditions later in a project's process; • Create opportunities for the Commission/Agent to engage with other town depts./BCCs to educate on the WPA and the role of the Commission.
Are there other BCC whose work overlaps with yours?	• CPC – ConCom required to have seat on the CPC, ConCom review of projects/proposals, shared interests in land acquisitions; • OSC – ConCom rep on OSC, shared interests in land acquisitions, shared interests in access and management of town owned land; • River Access Committee – Involves areas regulated under WPA (200' out from mean annual high water, bank, priority habitat of rare and endangered species; land under water; floodplain); • Harbor Committee – Installation of docks and moorings involve areas regulated under WPA (200' out from mean annual high water, bank, priority habitat of rare and endangered species; land under water; floodplain), many docks and moorings have perpetual conditions for protection of rare and endangered species habitat;

	• Planning Board – Review of projects and changes to projects in wetland resource areas • Board of Health (septic & stormwater) – Review of septic permits to determine if ConCom permitting is needed for work in wetland resource areas; review SW filings and permits for work in wetland resource areas / impacts to wetlands / compliance with issued permits; • Tree Committee – Permitting if tree removal is within a wetland resource area, shared interest in trees on town owned land; • Mill Pond Committee – Management plan requires permitting through ConCom and review with ConCom with regards to work in wetlands or in Mill Pond, trees in the pond review committee has ConCom representation, ConCom vote needed (along with others) to amend management plan; • Climate Change Resiliency Committee – Shared interest in town owned lands; brought article for funding the first invasive plant internship under Conservation Agent supervision to Town Meeting
Is there other input you wish to provide?	N/A
Completed by	Michelle Greene after discussion with Conservation Commission on 7/27/203
Date	7/31/2023

Conservation Commission

Composition: 5 members and one alternate member, appointed

Date of Creation: March 12, 1960

MGL Reference: M.G.L. Ch. 40, Sec. 8C (MA Conservation Commission Act), M.G.L. Ch. 131, Sec. 40 (Wetlands Protection Act), M.G.L. Ch. 44B, Sec. 5 (establishes CPC members, requires 1 ConCom member), and Amendment to Article 97 to the MA Constitution (requires unanimous vote from ConCom before a municipality may dispose of Article 97 land)

Bylaw Reference: Town Bylaws Title XV

Other Reference: 310 CMR 10:00

Other Reference: Mill Pond / Pipestave Hill Management Plan

Charge:

[Adopted at the adjourned Annual Town Meeting May 11, 1988, approved by the Attorney General July 28, 1988, and posted according to law August 29, 1988.] That the Town of West Newbury adopts the provisions of M.G.L., CH.131, Sec. 40 and 310 CMR 10:00 as the West

Newbury Wetlands Protection By-Law. The Conservation Commission may adopt regulations and fees for permits for work within an area subject to the state wetlands protections act and regulations, in addition to the $25.00 fee for Notices of Intent charged under M.G.L. c.131, sec. 40. Town, county, state and federal projects are exempt from any fees imposed under this By-Law. Any fees imposed under this By-Law will be refunded if a project is denied by the West Newbury Conservation Commission. Permits are valid for three (3) years, as provided under state law. Any determination or decision resulting from the administrative appellate process set forth in M.G.L. c. 131, sec. 40 and 310 CMR 10:05 (7) and/or judicial appeals of the determination or decision of that administrative process pursuant to M.G.L. c.30A will be adopted by the West Newbury Conservation Commission as the Commission's determination or decision under this By-Law after the exhaustion of all the appellate remedies described above. ***West Newbury Bylaws Chapter XV***

Mission Statement:
The Conservation Commission is responsible for overseeing and implementing the state's Wetlands Protection Act and Regulations.

Wetlands and their bordering lands are valuable to the community. Among other values they protect the public drinking supply, store flood water and prevent storm damage, filter pollutants and slow erosion, and provide wildlife habitat. Buffer zones extending 100 feet from the edge of wetlands and resource areas extending 200 feet from the edges of rivers and perennial streams are protected for these purposes. The Wetlands Protection Act (G.L. Ch. 131 sec. 40) (“the Act”) was enacted in 1972 and regulations under the Act (310 CMR 10.00) were first enacted in 1974. They recognize the values provided by wetlands and their buffer zones and give local Conservation Commissions responsibility for implementation. Despite these efforts, more than half of the original wetlands on the continental United States have been lost to commercial, agricultural and residential development and 1,250 acres have been lost in Massachusetts between 1991 and 2005.

Db

Town of West Newbury

Select Board

selectboard@wnewbury.org

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July 2023

Board, Commission, Committee Review

Please complete the following. Note that the size of the answer space will expand as information is entered. Also review the attached forms maintained by the Town Clerk's Office and note changes.

Name of BCC	Community Preservation Committee
Current Membership with Officers noted	1. Wendy Reed, Select Board - Chair 2. Tim Cronin, Planning Board - Vice Chair 3. John Haley, Conservation Commission 4. Patricia Reeser, Open Space Committee 5. Robert Janes, Historical Commission 6. Gary Bill, Housing Authority 7. Wendy Willis, Parks and Recreation Commission
Length of Terms	1 Year
Meeting Schedule	Third Thursday of each month, 6:00 p.m.
Location of Meetings	First Floor Hearing Room. Once the Second Floor Hearing Room is Zoom ready, would prefer to meet there.
Responsibility for Posting Meeting Agenda	CPC Admin Assistant
Responsibility for Taking Meeting Minutes	CPC Admin Assistant
Responsibility for Updating Website	CPC Admin Assistant
Town Staff Liaison/Support (if any)	CPC Admin Assistant
BCC Charge (Review attached excerpt from the 2023 BCC Charge document and note any differences with your objectives)	What's listed in the attachment Is the text of the bylaw. We would state our Charge to be: The CPC is charged with studying the Town's needs, goals, and resources with respect to Community Housing, Historical Preservation and Open Space and Recreation pursuant to the Community Preservation Act. The CPC reviews applications for project eligibility and funding and makes recommendations at Town Meeting for the allocation and expenditure of CPA funds.
Accomplishments in the past year	1. Overhauled and updated the CP Plan 2. Consolidated and streamlined application forms 3. Reviewed and recommended the following projects: a. Almshouse Cemetery Scan b. Transfer of Community Housing funds to Affordable Housing Trust 4. Jointly prepared Grant Agreement with Affordable Housing Trust
Priorities for the Next Year	1. Hold annual public hearing required by CPA and update CP Plan accordingly 2. Evaluate options for improving flexibility of applications involving Chapter 61 land purchases

Two Year Priorities	1. Advocate for maintaining funding level at 3% and maximize award of state funds 2. Publish report from AHT on use of CPA funds
Five Year Priorities	
How can the Select Board/Town Manager better support the work of this BCC?	The Town Manager already keeps the CPC apprised of upcoming projects and potential applications. This is helpful in managing the application process and timeline.
Are there other BCC whose work overlaps with yours?	Other BCCs are represented on the CPC and their work is reflected by member's input.
Is there other input you wish to provide?	The role of procurement requirements in the project application process is still unclear. In order to get accurate cost estimates, development of scope and some contact with vendors is necessary. A better defined process and support from the DPW staff would be helpful for applicants as well as the CPC.
Completed by	Wendy Reed with CPC input at the July meeting
Date	July 20, 2023

Community Preservation Committee

Composition: 7 members, appointed

Date of Creation: April 30, 2007

MGL Reference: M.G.L. Ch. 44B

Bylaw Reference: Town Bylaws, Title XXXVI

Charge:

Sec. 1 Establishment a) There is hereby established a Community Preservation Committee, consisting of seven (7) voting members pursuant to MGL Chapter 44B. The composition of the committee, the appointing authority, specific roles, and the term of office for the committee members shall be as follows: b) One member of the Board of Selectmen or their designee, as designated by a majority vote of the entire current membership of the Board of Selectmen for a term of one year and thereafter until a duly appointed successor is named. c) One member of the Open Space Committee as designated by a majority vote of the entire current membership of the Open Space Committee for a term of one year and thereafter until a duly appointed successor is named. 62 d) One member of the Conservation Commission as designated by a majority vote of the entire current membership of the Conservation Commission for a term of one year and thereafter until a duly appointed successor is named. e) One member of the Planning Board as designated by a majority vote by a majority vote of the entire current membership of the Planning Board for a term of one year and thereafter until a duly appointed successor is named. f) One member of the Historical Commission as designated by a majority vote of the entire current membership of the Historical Commission for an initial term of one year and thereafter until a duly appointed successor is named. g) One member of the Parks and Recreation Commission as designated by a majority vote of the entire current membership of the Parks and Recreation Commission for an initial term of one year and thereafter until a duly appointed successor is named. h) One member of the West Newbury Housing Authority as designated by a majority vote of the entire current membership of the Housing Authority for a term of one year and thereafter until a duly appointed successor is named. i) The Town Manager or designee shall serve Ex Officio. j) Each member of the Committee shall serve for the term as set forth above, or until the person no longer serves in the Community Preservation Committee position or on the board or committee as set forth above, whichever is earlier. Any committee shall designate a replacement at its next meeting should a vacancy occur. k) Should any of the Commissions, Boards, Councils or Committees who have appointment authority under this Section be no longer in existence for whatever reason, the absent appointment authority for that Commission, Board, Council, or Committee shall be assumed by the Board of Selectmen, who may appoint a replacement member from the community at-large. l) Any member of the Committee may be removed for cause by their respective authority after hearing. m) The Committee shall elect a Chairman, Vice Chairman, and a Secretary annually from its membership. Sec. 2. Duties a) The Community Preservation Committee shall hold one or more public hearings annually to provide information and solicit written proposals consistent with the Community Preservation Act, as adopted, from Town committees and boards, as 63 well as unaffiliated citizens or groups (ad hoc committees). Notice of the hearing, or hearings, shall be posted publicly in accordance with the

Open Meeting Law, M.G.L Chapter 30A. §20 and published for each of the two weeks preceding a hearing in a newspaper of general circulation in the town as required by M.G.L. chapter 44B. §3(b) (1). b) Additionally the Committee shall meet any number of times in meetings posted in accordance with Open Meeting Law to consult with existing municipal boards, standing committees, or ad hoc committees including, but not limited to, the Conservation Commission, the Historical Commission, the Planning Board, the Board of Parks and Recreation Commissioners, the Housing Authority, the Open Space Committee, the Board of Water Commissioners, and the Workforce Housing Trust or persons acting in those capacities or performing like duties, to determine the needs, possibilities, and resources of the Town regarding community preservation possibilities and resources or to act on submitted proposals. All completed proposals, as determined by the committee, submitted to the Committee shall be voted upon and ranked for possible recommendation to the Town at Town Meeting. A written report of all votes and summary of findings shall be presented at said Town Meeting. c) The Community Preservation Committee shall make recommendations to the legislative body (Town Meeting) for the acquisition, creation and preservation of open space; for the acquisition, preservation, rehabilitation and restoration of historic resources; for the acquisition, creation, and preservation of land for recreational use; for the acquisition, creation, and preservation of land for natural resources including agriculture, forestry, and conservation purposes; for the acquisition, creation, preservation and support of community housing; and for the rehabilitation or restoration of open space, land for recreational use, and community housing that is acquired or created as provided in this section. With respect to community housing, the Community Preservation Committee shall recommend, wherever possible, the reuse of existing buildings or construction of new buildings on previously developed sites. d) The Community Preservation Committee may include in its recommendation to the legislative body (Town Meeting) a recommendation to set aside for later spending funds for specific purposes that are consistent with community preservation but for which sufficient revenues are not then available in the Community Preservation Fund to accomplish that specific purpose or to set aside for later spending funds for general purposes that are consistent with community preservation. e) In every fiscal year, the Community Preservation Committee must recommend either that the Town legislative body (Town Meeting) spend, or set aside for later spending, not less than thirty (30) percent of the annual revenues in the Community Preservation Fund consistent with the provisions in M.G.L. Chapter 44B. 64 f) The Community Preservation Committee shall consult with the Finance Committee at a meeting prior to voting recommendations. Sec. 3 Requirement for a quorum and cost estimates The Community Preservation Committee shall comply with the provisions of the Open Meeting Law, M.G.L. Ch. 39, §23B. The committee shall not meet or conduct business without the presence of a majority of the members of the Community Preservation Committee, which shall constitute a quorum. The Community Preservation Committee shall approve its actions by majority vote of members present. Sec. 4. Amendments This bylaw may be amended from time to time by a majority vote of the Town Meeting consistent with the provisions of M.G.L. c. 44B. Sec. 5. Severability In case any section, paragraph, or part of this bylaw is, for any reason, declared invalid or unconstitutional by any court, every other section, paragraph, or part shall continue in full force and effect. Sec. 6. Effective Date Following Town Meeting approval, this bylaw shall take effect immediately upon approval by the Attorney General of the Commonwealth, and after all requirements of the M.G.L. c. 40, §32 have been met. Each appointing authority shall have sixty (60) days after approval by the Attorney General to make their initial appointments. If any appointing authority shall fail to make appointments as provided

in this bylaw, the Board of Selectmen shall send notice of such failure to the appointing authority. ***West Newbury Bylaws, Chapter XXXVI, §1-6***

Ash Street Update

At the July 10, 2023 Select Board meeting the following items were identified as needing further information before taking action on speeding issues associated with vehicles using the unpaved section of Ash Street:

- **MVPC Traffic Calming Measures** - a response from Patrick Reed, the Transportation Program Manager at MVPC, was received and is attached. In summary, he noted that the ruts in the road seem to act as natural speed bumps and that installed speed bumps might also be effective. Their location and construction details would need to be identified by a PE. He also noted that the transition from 35 mph on the paved entrances to 20 mph on the gravel section is abrupt and measures to reduce speed on these sections might be effective. Again, a traffic engineer would need to evaluate and make recommendations on these. MVPC does not currently have the resources to provide these services.
- **Mass Fish and Wildlife** - a remote meeting and site walk were conducted with representatives of Mass FW. Their primary focus is on protection of endangered/protected species such as Blanding's Turtles. There could be state money available for roadway work if it can be established that these species are present and being impacted by traffic through the area. As Blanding's turtles are being considered for listing as a federally endangered species, federal money may also become available for this work in the future. They have asked our Conservation Agent to conduct weekly surveys documenting roadkill which began on July 14th and they are also targeting spring 2024 to conduct a turtle study to support further consideration of habitat protection in this area. Given that there are limited opportunities for wildlife to pass under the road (there are three eight inch culverts close to the midpoint of the unpaved section which often are clogged and typically do not have headway), the use of barriers to direct wildlife to a crossing area would not be recommended.
- **Road Closure** - Mass FW representatives, as well as their District Office, favor at least seasonal closure of the road in the spring when Blanding's turtles are most likely to be actively crossing the roadway. This was discussed with our Police-Fire Chief at the site walk. He is strongly against closure of any duration given the need for emergency vehicle access from the Newbury and Georgetown side of town. The increased traffic on other roads that would result if this road was closed should also be considered. The closest detour to get to Route 95 from West Newbury would go around the Indian Hill Reservoir which frequently has flocks of geese in the roadway. A deer was also recently struck by a vehicle on this road and had to be euthanized.
- **Signs and Enforcement** - There are currently weight limit signs at the nearest cross street in either direction although there are many reports of vehicles exceeding this limit passing through this area. There are also 20 mph speed limit /Wildlife Crossing at either end of the unpaved section. The Police Department is working with the DPW to determine if additional signage is warranted and to make sure that vegetation around existing signs is trimmed back to insure good visibility. Mass FW noted that they have not found new or increased signage to be effective in reducing wildlife roadkill. The Police Chief has also provided a quote (attached) for purchase of a radar trailer which would display the speed of oncoming vehicles, as well as store data about number of vehicles passing, their speed and time of day. The possibility of using

ARPA funds for this has been raised given the ability to use it at other locations in town. Finally, the Police Department is in the process of contacting the most common navigation apps and requesting that this route be removed from their database.

- **Cost of Maintaining Gravel Road** - The practice over the last four to five years has been to regrade the road whenever the surface begins to show ruts. This typically follows heavy rain and the water overtopping the road from north to south. The work usually takes a half day and requires three to five truck loads of gravel, two operators and a backhoe. The cost in 2022 averaged $1,015 per regrading and it was completed eight times. To date in 2023 the road has been regraded five times. At the site visit with Mass FW, the DPW Highway Superintendent agreed to hold off on further regrading pending tonight's discussion. Less frequent regrading would save money and could make the road surface less conducive to speeding.

Notably, there are no single or simple solutions here. Wildlife protection, pedestrian/cycling safety, water quality and habitat protection, and public safety have all been identified as reasons to take action. The requirements needed to support each of these priorities are not the same, however, and may actually be in conflict.

From: Patrick Reed <preed@mvpc.org>
Sent: Wednesday, June 28, 2023 10:44:40 AM
To: Wendy Reed <wreed@wnewbury.org>
Cc: Jonah Williams <jwilliams@mvpc.org>; Town Manager <townmanager@wnewbury.org>
Subject: RE: Traffic calming in West Newbury

Good morning, Ms. Reed

Many apologies for the delayed reply on our end. It took us a bit to get out to look at this location. I'm sorry we couldn't do this before your select board meeting—we're currently in the midst of a very busy federal certification season.

When in the field, we did see some moderate speeding here for vehicles that *could* traverse at the natural surface area more quickly (mostly pickup trucks). The typical passenger vehicles we observed traveled at appropriate speeds simply because of the potholes that are there today. It's not particularly popular to say this, but road condition does have an impact on vehicular speed and the potholes do function as a speed control mechanism.

Question on our end:

- Is the natural surface segment town-owned or Fish and Wildlife owned? If the latter it may be worth coordinating with Fish and Wildlife.
- Do you plow/maintain this segment in the winter?

You could consider adding speed controlling measures such as humps/bumps as gateway elements, or, depending on road control and selected product, on the natural surface portion. These would need to be reflective based on the lack of streetlighting. You'd also need to put up MUTCD-compliant reflective signage as well to warn folks about the treatment. If you end up installing something like a series of reflective rubber humps on the natural surface portion, you might need to think about the length of the install spike/maintaining its position over time as there's probably a bit more give than the typical install on asphalt.

Vehicles can attain higher speeds prior to the natural surface portion of the roadway (the adjacent segments are relatively straight shots, paved, host lower volumes). That's part of the challenge here because the drop to 20mph from 35mph is relatively sudden. Controlling speeds further upstream and downstream would be beneficial to think about.

Here are some tools in the speed control toolkit. Please note the links I'm sending are more urban treatments. These aren't meant to be rubber-stamped applications for this context, but more so concepts you can think about. You'd have to engage an engineer to design these items for a curbless section without streetlights—very different from what you see in the diagrams.

- Pinchpoints: https://nacto.org/publication/urban-street-design-guide/street-design-elements/curb-extensions/pinchpoint/
- Road narrowing/gateway narrowing: https://nacto.org/publication/urban-street-design-guide/street-design-elements/curb-extensions/gateway/

In the paved segments on either side of the road, there's a lot of space with intermittent volumes so the road doesn't feel very tight. The tighter the road feels and the more you can control the channelization of vehicles, the slower vehicles will travel. You could consider a series of raised, reflective rumbles on the shoulder to narrow the road down prior to the natural surface segment. If you were to do this (or any gateway control) it would make sense to paint the centerlines on the paved portion of the roadway on either side of the natural surface area. With larger vehicles being the main cause of speeding (at least during our anecdotal observations) any raised treatment used would need to be continuous enough to have a real impact.

We don't have a PE on staff unfortunately, so anything we suggest/produce would need a look from a PE for comment/endorsement prior to installation.

Hope this helps—please keep us posted if you have any questions.

Thank you,

Patrick

Patrick Reed, AICP

Transportation Program Manager

Merrimack Valley Planning Commission
160 Main Street, Haverhill, MA 01830

Office: 978.374.0519 x15
MVPC.org

MPH Industries, Inc.
316 East 9th Street
Owensboro KY 42303
Phone: 888-689-9222
Fax: 270-685-6288

Date: 6/29/2023
Expires: 8/28/2023
Reference:
Terms: NET 30 DAYS

Sales Person: Melanie Clark
Phone: 888-689-9222
Fax: 270-685-6288
Email:

QUOTE: 37370

Quote To:	Ship To:
WEST NEWBURY POLICE DEPT. 401 MAIN ST WEST NEWBURY MA 01985 USA Phone: (978)363-1213 Fax: Email: Customer #: 19851	WEST NEWBURY POLICE DEPT. 401 MAIN ST WEST NEWBURY, MA 01985 USA Phone #: (978)363-1213 Fax #: Email: Ship Via: Best Way GND

USD

Line	Part	Description	Rev
1	SCOUT-BAS	Street Scout trailer with two12in-digit speed display and Slow Down message,tuning fork	-

Sales Kit

Kit Components

Kit Seq.	Part Number	Description	Qty Per	
1.001	903389	FORK,TUNING,35MPH K	1	EA
1.002	991207	TRAILER ASSY,STREET	1	EA
1.003	910854	PALLET,SHIPPING,STRE	1	EA
1.004	990856A	DISPLAY ASSY,12"	1	EA
1.005	910828	RADAR,DRU3 W/CABLE	1	EA
1.006	910961	CHRGR,BATT,12V,35A,3	1	EA
1.007	910922	SUPPORT,TRAILER,SHIP	1	EA

Quantity 1 EA Unit Price 4,738.00 Ext Price: 4,738.00

Line	Part	Description	Rev
9	951720	BATT ASSY,GROUP 24	ND

Quantity 1 EA Unit Price 307.81 Ext Price: 307.81

Line	Part	Description	Rev
10	951720	ADDITIONAL BATTERY	ND

Quantity 1 EA Unit Price 307.81 Ext Price: 307.81

Line	Part	Description	Rev
11	951719	50 WATT SOLAR PANEL	ND

Quantity 1 EA Unit Price 269.91 Ext Price: 269.91

Line	Part	Description	Rev
12	951770	SPEEDVIEW TRAFFIC DATA COLLECTION	-

Quantity 1 EA Unit Price Ext Price:

Line	Part	Description	Rev
13	951783G01	BLUETOOTH	ND

Quantity 1 EA Unit Price 150.00 Ext Price: 150.00

Line	Part	Description	Rev
14	951459RB	STROBE KIT	ND

Quantity 1 EA Unit Price 731.88 Ext Price: 731.88

Line	Part	Description	Rev
15	951716	CHANGEABLE SPEED LIMIT SIGN ASSEMBLY	ND

Quantity 1 EA Unit Price 486.08 Ext Price: 486.08

MPH Industries, Inc.
316 East 9th Street
Owensboro KY 42303
Phone: 888-689-9222
Fax: 270-685-6288

Date: 6/29/2023
Expires: 8/28/2023
Reference:
Terms: NET 30 DAYS

Sales Person: Melanie Clark
Phone: 888-689-9222
Fax: 270-685-6288
Email:

QUOTE: 37370

Line	Part	Description	Rev
16	909742	12V/24HR TIMER	ND

Quantity 1 EA **Unit Price** 106.56 **Ext Price:** 106.56

Line	Part	Description	Rev
17	550004	$0 Shipping per contract	

Quantity 1 EA **Unit Price** **Ext Price:**

Total: 7,098.05

Plus shipping and any applicable taxes

Thank you for an opportunity to quote.

MPH®

"You're On Our Radar"

StreetScout™ Trailer

POLICE RADAR • POLICE LASERS • SURVEY LASERS • SPEED SIGNS

The **StreetScout™** - the newest addition to the MPH line of speed trailers offers an economical, lightweight, easy-to-deploy speed control trailer, designed for use in cities, suburban and rural applications. The StreetScout has all of the quality, features and reliability of our larger trailers with everything it needs and nothing that it doesn't.

Compact, yet highly visible
When in use with a MUTCD-compliant speed sign, the trailer stands at 6 ft. Before towing, the sign quickly folds down to reduce wind resistance. Two 12-inch LED digits are easily viewable to greater than 600 feet in direct line-of-sight. With the overspeed and optional flashing strobes, StreetScout will alert drivers to reduce their speed.

Because it works
Numerous studies have shown that MPH speed trailers are effective in reducing speeds of drivers, without requiring an officer to be present. Contact us today and let us show you how easy it is to begin controlling traffic speeds in your work zones, school zones, city streets and neighborhoods.

Features	Benefits
Compact, lightweight design	Compact design allows for use in nearly any city or rural application. At only 400 lbs., this unit is easy to tow and deploy by one person in most cases.
Easy to program	Easy-to-follow operator instructions with each unit. Need more help? Check out our Youtube channel for a series of informative videos.
Same proprietary radar technology used by Law Enforcement	Factory programmed to target only approaching traffic.
Durable, trouble-free construction	Welded 11 gauge steel with square tubing. Durable powder-coated finish.
High visibility	Two 12-inch digits with choice of amber or red super-bright, wide-angle LEDs. Viewable at over 600 ft. Optional over-speed flashing strobes will grab the attention and slow speeding drivers.
Built-in battery charger with optional solar panel	Easily recharge batteries from outside locked battery storage box. Extend battery life and operation times with solar panel power assist.
Tamper-resistant	All electronics enclosed inside locked compartments.
Warranty	Two-year (parts & labor) warranty on electronics, one-year warranty on the trailer body.

WWW.MPHINDUSTRIES.COM • 888.689.9222 • INFO@MPHINDUSTRIES.COM

MPH® INDUSTRIES

StreetScout™ Trailer

Specifications

StreetScout Specifications

• Overall dimensions:	52"W x 90"L (incl. tongue) 52"W x 48"L (w/o tongue)
• Overall height:	6 ft. (with sign deployed)
• Overall height:	48" (sign folded for towing)
• Weight:	400 lbs.
• Frame dimensions:	48"W x 48"L
• Frame material:	11 ga., 2" sq. steel tubing
• Coating:	Rust-resistant undercoat with graffiti-resistant powder-coated topcoat.
• Tires & wheels:	8" wheels / 4.8-8 tires, locking lug nuts
• Suspension:	Leaf springs
• Wiring:	Concealed in frame
• Tongue:	2" ball, removable for added security
• Utility (battery) box:	13"H x 14.25"L x 37.5"W
• Jacks:	4 stabilizer jacks

Power

• Battery:	One 12V deep-cycle battery
• Charger:	Built-in 12V battery charger (easy access plug connection outside utility box)

Display

• Display enclosure:	19.5"H x 21.5"W x 5.5"L
• Access door:	Water-proof, opens from front with one locking handle
• Display window:	Tough, vandal-resistant Lexan™
• Speed digits:	Two 12" digits
• Display type:	Super-bright, wide-angle LEDs
• Viewing distance:	Greater than 600 ft.
• Brightness:	Full brightness in day, automatically dims for twilight use to extend battery life
• Battery status:	Viewable from outside trailer
• Stealth mode:	For covert traffic studies

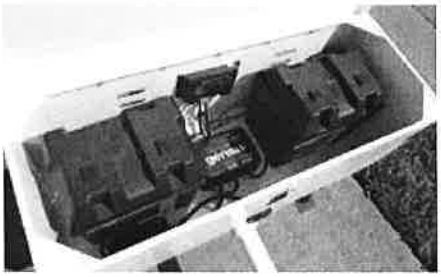
Radar

• Radar type:	Directional K band radar
• Range:	1,000 ft. for typical vehicles
• Compliance:	Complies with FCC Part 15 (no license required)
• Operating Temp:	-22° to +160°F

Options / Accessories

- **Strobe kit:** Highly visible flashers activate when overspeed setting is reached.
- **Traffic computer:** Stores speed and traffic volume data and generates reports and graphs.
- **Speed limit sign**
- **Battery options:** One additional 12V battery
- **Solar battery assist:** 20W or 50W panel
- **24/7 Timer**
- **Interior cabinet light**
- **Bluetooth® enabled communication**

MPH Industries, Inc.
316 East 9th Street
Owensboro, KY 42303
www.mphindustries.com
info@mphindustries.com
888-689-9222



STALKER radar
applied concepts, inc.

QUOTE #2075571

855 E. Collins Blvd
Richardson, TX 75081
Phone: 972-398-3780
Fax: 972-398-3781

National Toll Free: 1-800- STALKER

Inside Sales Partner: Diane Satoren, +1-972-801-4843, diane@stalkerradar.com

Reg Sales Mgr: Dan Doyle, 972-398-3780, dand@stalkerradar.com

Date: 06/27/23

Effective From : 06/27/2023 **Valid Through:** 09/25/2023 Lead Time: 60 working days

Bill To: **Customer ID:** 029842
West Newbury Police Dept
401 Main St Accounts Payable
West Newbury, MA 01985-1111

Ship To: *UPS Freight LTL (4-6 Days)*
West Newbury Police Dept
401 Main St Chief Michael Dwyer
West Newbury, MA 01985-1111

Grp	Qty	Package	Description	Wrnty/Mo	Price	Ext Price
1	1	821-1000-00	Stalker SAM Trailer	24	$10,900.00	$10,900.00

Ln	Qty	Part Number	Description	Price	Ext Price
1	1	015-2532-59	[253259] SAM Trailer with Top Display		$0.00
2	1	200-1229-01	[414155] Traffic Stats Sensor, 2 Comm Ports		$0.00
3	1	015-5345-00	[274714] SAM Trailer Solar Panel		$0.00
4	1	015-2328-62	[232862] Red LED Light Bar-SAM/SAM-R		$0.00
5	1	015-2354-40	[235440] Blue LED Light Bar-SAM/SAM-R		$0.00
6	1	015-5603-00	[275565] Trailer Wheel Lock		$0.00
7	1	200-1173-00	Traffic Analyst App, Thumb Drive, Manual		$0.00
8	1	200-1448-00	SAM/SAM-R Trailer User Manual Kit w/USB Cable		$0.00
9	1	006-0569-00	Certificate of Accuracy, Speed Sensor II		$0.00
10	1	060-1000-24	24-Month Warranty		$0.00
11	1	600-0022-01	SAM Trailer		$0.00
				Group Total	$10,900.00

Product	$10,900.00	Sub-Total:	$10,900.00
Discount	$0.00	Sales Tax 0%	$0.00
		Shipping & Handling:	$0.00
Payment Terms: Net 30 days		**Total: USD**	**$10,900.00**

State Contract # SP20-RadarLidar-X66

001

This Quote or Purchase Order is subject in all respects to the Terms and Conditions detailed at the back of this document. These Terms and Conditions contain limitations of liability, waivers of liability even for our own negligence, and indemnification provisions, all of which may affect your rights. Please review these Terms and Conditions carefully before proceeding.

Stalker SAM | Speed Awareness Monitor

Stalker's SAM trailers are powered by Precision Solar Controls and feature Stalker speed measurement accuracy in a rugged, dependable trailer platform.

- Optional Solar Panels
- 18" Amber LED characters - legible at up to 1000 ft.
- 4D Deep-cycle battery - provides over 18 days of operation and longer time between charges
- Stalker K-Band Doppler Radar
- New Optional Programmable LED Violator Alert
- Optional Integrated Statistics Package
- Hand-held controller

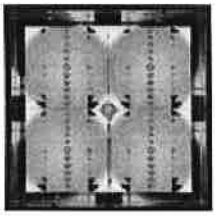
Programmable LED Violator Alert (Optional)

BUY AMERICAN ACT STALKER COMPLIANT

StalkerRadar.com

STALKER® **Power to Enforce.**

LED Lamp Matrix and Pulse Modulation



At the heart of the Stalker SAM is Precision Solar Control's LED Lamp Matrix and LED Pulse Width Modulation. The LED Lamp Matrix concentrates and focuses the LEDs' light, allowing the motorist to see the sign at a greater distance and, thus, act on the speed warning quicker.

LED Pulse Width Modulation significantly increases the time between battery charges and powers the LEDs so that they remain at a consistent brightness throughout the battery's discharge cycle.

Stalker K-Band Radar

The speed measurement component is pure Stalker - accurate and durable. Stalker's Stationary Speed Sensor II radar has greater range, sensitivity, and tracking when compared to competitive signs' radar.

4D Deep-cycle 12-volt battery Provides over 18 days of continuous operation yielding longer operational time between battery charges.

Graffiti-resistant paint

The finish keeps the trailer looking clean and neat for a professional department image, while its all steel construction provides a sturdy platform and reduces damage sustained in the field.

Dedicated hand-held controller

Complete programming and diagnostic functions in the palm of your hand.

Four stabilizing/leveling jacks

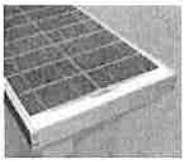
aid in proper placement and stability while allowing one officer to position the SAM on nearly any type of terrain.

Retractable/Removable tongue

Options:

Top-mounted solar panel

The panels recharges a day's worth of battery use with only 2.5 hours of sunlight allowing for "infinite" field operation.



New Programmable LED Violator Alert

High powered LED Violator Alert flashes to warn motorists when they have exceeded a pre-set speed. Three (3) different user-programmable settings and choice of blue/red or white/white.

Integrated statistical package

gathers valuable traffic data for improved grant writing support and verification of the sign's impact on traffic speeds.

STALKER SAM

Specifications:

TRAILER	
Width	64" (1.63m)
Length	116" (2.95m) tongue in travel position 57 ½" (1.5m) tongue in display position
Height	91" (2.31m)
Weight	700 lbs. (317.5kg)
Main Frame	2" x 4" x .120" Steel Tubing

DISPLAY CABINET	
Material Thickness	.156" ABS Plastic
Width	36" (.91m)
Height	25 ½" (.65m)
Depth	5 ¼" (.13m)
Lexan Window Thickness	.125"
Cabinet Temperature Delta	±20°

ENERGY SOURCE	
Battery Bank	4D Deep-Cycle Battery 18 days @ 78°F (25°C)

RADAR - STALKER STATIONARY SPEED SENSOR II - 24.125 GHz	
Detection Distance	Up to 1,200' (365 m)
Beam Width	30° x 32°

Accessories:

Coupler Lock

Wheel Jack

Wheel Lock

StalkerRadar.com

STALKER®

Power to Enforce.

applied concepts, inc.
855 East Collins Blvd. ■ Richardson, Texas 75081
972.398.3780 ■ Fax 972.398.3781

MANAGEMENT SYSTEMS CERTIFIED TO ISO 9001:2008 STALKER

006-0455-00 Rev F

800-STALKER

F

NEMLEC:

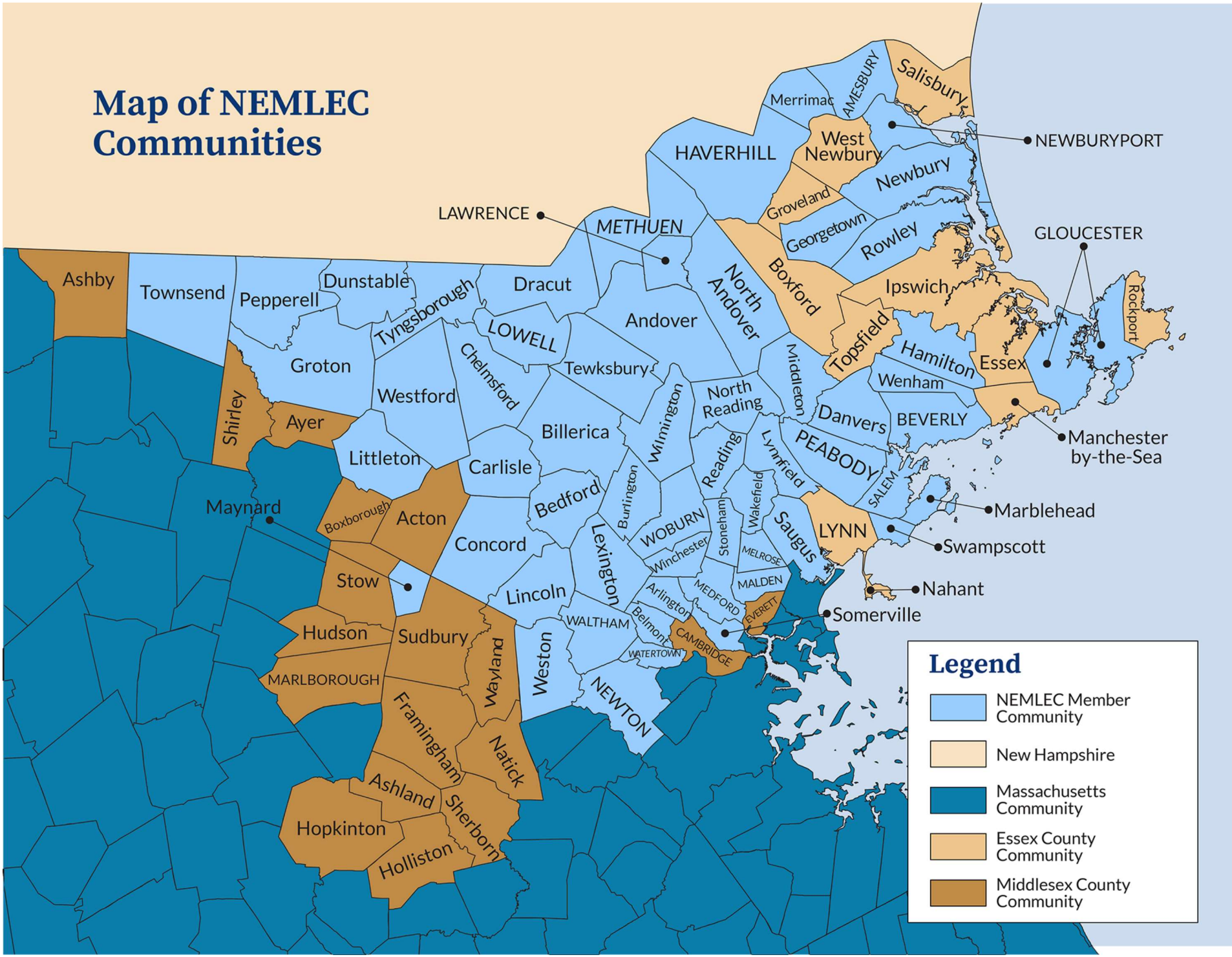
The Northeastern Massachusetts Law Enforcement Council

Assisting local law enforcement for over 50 years.

What we do: What is a Law Enforcement Council?

Simply stated, a law enforcement council coordinates a collaborative partnership of police agencies in a region that share knowledge, resources and personnel for the benefit of public safety.

There are over 18,000 law enforcement agencies in the United States. Approximately 85% have less than 24 sworn police officers. Agencies must efficiently manage the resources they have to provide public safety services in their communities, and most often provide patrol, 911 response, and criminal investigations. The ability to provide specialized services, such as electronic media assistance , search & rescue, and school safety may be limited. NEMLEC partnerships make many additional services available. By coordinating the sharing of police personnel, NEMLEC offers member police departments access to added resources on a moment's notice. This allows one agency, if they request aid, to increase its resources temporarily in response to an emergency or large event. NEMLEC's member agencies are committed to sharing assets and ensuring that communities are prepared for unplanned special occurrences.


Map of NEMLEC Communities
LAWRENCE
METHUEN
HAVERHILL
Merrimac
AMESBURY
Salisbury
NEWBURYPORT
West Newbury
Newbury
Groveland
Georgetown
Rowley
GLOUCESTER
Rockport
Ipswich
Boxford
North Andover
Andover
Topsfield
Hamilton
Essex
Wenham
Middleton
Danvers
BEVERLY
Manchester by-the-Sea
PEABODY
SALEM
Marblehead
Swampscott
LYNN
Nahant
Somerville
Saugus
Lynnfield
Wakefield
Reading
North Reading
Wilmington
Burlington
Stoneham
WOBURN
Winchester
MELROSE
MALDEN
MEDFORD
EVERETT
Arlington
Belmont
CAMBRIDGE
WATERTOWN
WALTHAM
Lexington
Weston
NEWTON
Wayland
Framingham
Natick
Sherborn
Holliston
Hopkinton
Ashland
MARLBOROUGH
Hudson
Sudbury
Stow
Maynard
Boxborough
Acton
Concord
Lincoln
Bedford
Billerica
Carlisle
Littleton
Chelmsford
LOWELL
Tewksbury
Dracut
Dunstable
Tyngsborough
Pepperell
Townsend
Ashby
Shirley
Ayer
Groton
Westford
Legend
NEMLEC Member Community
New Hampshire
Massachusetts Community
Essex County Community
Middlesex County Community

List of member agencies

Amesbury
Andover
Arlington
Bedford
Belmont
Beverly
Billerica
Burlington
Carlisle
Chelmsford
Concord
Danvers
Dracut
Dunstable
Essex
County SD
Georgetown
Gloucester
Groton
Hamilton
Haverhill
Lawrence
Lexington
Lincoln
Littleton
Lowell
Lynnfield
Malden
Marblehead
Maynard
Medford
Melrose
Merrimac
Methuen
Middlesex
County SD
Middleton
Newbury
Newburyport
Newton
North
Andover
North
Reading
Peabody
Pepperell
Reading
Rowley
Salem
Saugus
Somerville
Stoneham
Swampscott
Tewksbury
Townsend
Tyngsborough
Wakefield
Waltham
Watertown
Wenham
Westford
Weston
Wilmington
Winchester
Woburn

Memorandum

TO: West Newbury Select Board

FROM: Christine Wallace, P.E., DPW Program & Project Manager

DATE: August 3, 2023

RE: River Road Climate Change Resiliency FY24 MVP Action Grant Status

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This memo provides a status update on the Town's application for the River Road Climate Change Resiliency Study for the MVP FY24 Action Grant round. The application was submitted on May 4, 2023 for a request of $150,000 (plus the $50,000 Town match) with the project having a completion by the end of FY25.

- On July 27, 2023, we were notified by the MVP Program that they only have funding through the FY24 year, and they have asked us to revise the scope and resubmit it to them.

- Town Manager Angus Jennings and I met remotely with Michelle Rowden from the MVP Program on July 28 and she advised on potential scope changes/reductions. She also requested that we include accounting for anticipated staff and volunteer time, even though we already met the requirement of the 25% match with the $50,000 Town Meeting allocation. She did say the Town would be welcome to submit another application next year for FY25 based on results from the FY24 study, and she said it is very common for communities to get subsequent grant awards once they get started with the MVP program.

- Elisa Grammer, Rick Parker, and I met remotely on August 3 with Leila Pike and Mike Sebulis of GEI and Gayle Bowness from the Gulf of Maine Research Institute (GMRI), to work through the details of a revised scope and what would be a reasonable effort for all parties involved. Initial discussions determined:

    - CCRC volunteer time – Number of events will be reduced with the new scope and allows for more flexibility and not be locked into specific events.
    - Library staff time – Same as above
    - GEI time – Their original scope was planned for an FY24 completion of the analysis, so they feel they will be able to complete their full analysis in that time frame. There were some added public events that will need to be removed or consolidated. Their goal is to focus on a baseline for existing conditions and vulnerability analysis.

- Gulf of Maine Institute time – They will need to consolidate some of their events or change them to virtual to manage the shortened time frame. By finishing in June 2024, some of the nice weather events planned for summer and fall of 2024 will need to be adjusted. Their goal is to provide an educational overview of climate change, help residents interpret the work GEI is doing, and gather feedback from residents of what they have witnessed on River Road.
- Project Manager time – Will not be affected by the new scope other than I will have to track additional in-kind time with the monthly progress reports.
- Overall the group felt with a revised scope, we could still get the same technical analysis, a more concise public outreach approach, and still produce a quality product that will be the first step in analyzing existing conditions for River Road and begin the public education process in West Newbury. Some of the consultant's costs would go down as a result, but some would go up to meet a tighter time frame. Both GEI and GMRI have discussed work loads with their staff and have determined the work will be feasible to complete by FY24. If there is an issue with lump sum costs, we discussed the possibility of contracting with GEI a time and materials contract to better track their expenses.

- Next steps:
  - Continue to work through details of the scope changes and costs involved with the consultants and volunteers
  - Town Manager Angus Jennings to discuss project status with Select Board on August 7
  - Meet again with Michelle Rowden week of August 7 to review revised scope
  - Resubmit revised scope and costs early the week of August 14

From: Vanessa Johnson-Hall <vkjohnson@ecga.org>
Sent: Monday, July 17, 2023 12:05 PM
To: Town Manager <townmanager@wnewbury.org>
Cc: Cathy Lanois <ccl@ecga.org>
Subject: Greenbelt Fundraising for Sawmill

H

Hi Angus,

Greenbelt is starting to ramp up the public portion of our fundraising campaign for the Sawmill Brook Conservation Project. Could Greenbelt have a table with informational materials about the campaign at some Town events, such as the Thursday night concerts or soccer games at Pipestave? Also, would we be able to put up a temporary sign near the Mill Pond kiosk at the property?

I'm copying Cathy Lanois, our Director of Development.

Thank you,
Vanessa

--

Vanessa Johnson-Hall

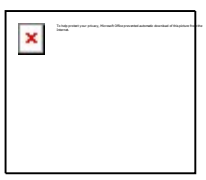
Director, Land Conservation Division
Greenbelt | Essex County's Land Trust

82 Eastern Avenue

MAIL TO: P.O. Box 1026

Essex, MA 01929
vkjohnson@ecga.org
Office: (978) 768-7241 **x116**

ecga.org



Town of West Newbury Select Board
381 Main Street
West Newbury, MA 01985

August 2, 2023

Dear Members of the Select Board,

At your July 24, 2023 Select Board meeting, Vanessa Johnson Hall from Greenbelt asked permission to fundraise for the Sawmill Brook Conservation Project on property that is owned by the Town of West Newbury. That fundraising effort would include posting temporary signs on Town property and raising awareness at community events. Therefore, on behalf of Greenbelt, I am submitting the following requests for your review at your August 7, 2023 meeting to:

1. place a temporary sign at the following locations:
   #1 the Pipestave Hill kiosk near the recycling area
   #2 the lower field parking area for Mill Pond kiosk
   #3 the building at Mill Pond kiosk
   #4 and #5 next to two of the trail connections leading from Mill Pond to the Sawmill Brook Conservation Project land

   We request that the signs be in place from August 19 until November 1. If that's not possible, we request that they be in place from August 19 to September 2, 2023, and again from September 17 to October 1, 2023. Greenbelt will take responsibility for placing and removing the temporary signs.

   Attached please find a draft of the sign. The size is 11" x 17". They will be laminated to protect them from rain.

2. have Greenbelt staff and community members manage an informational table at the Town's Thursday Night Concert Series on August 17 and 24. We will have a 6-foot table with a map of the project and flyers to hand out.

Thank you for your consideration of these requests. I plan to attend your August 7 meeting via zoom to answer any questions. If you have questions before then, please don't hesitate to email me at ccl@ecga.org.

Kind regards,

Cathy Lanois
Director of Development and Community Engagement

att

Be Part of West Newbury's Open Space Legacy

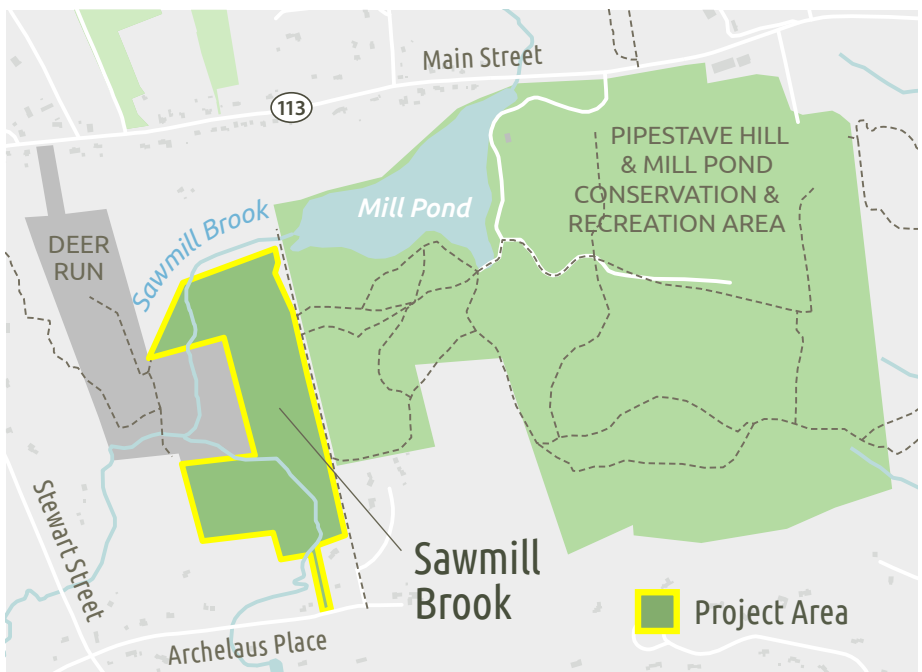
Help add 32 acres to Mill Pond and Pipestave Hill

A WEST NEWBURY AND GREENBELT PARTNERSHIP EFFORT

Thanks for your vote to support this project with CPA funds!
But there's more to do...
Help raise the remaining $130,000 needed to preserve this parcel.

DONATE TODAY TO FOREVER PROTECT:

- 32 acres that West Newbury will own
- Trails extending from Mill Pond & Pipestave Hill
- Important wildlife habitat
- Climate-resilient wetlands and forests
- Local water quality



LEARN MORE
ecga.org/sawmillbrook

DONATE NOW!

Questions?
ccl@ecga.org

Thank you!

Greenbelt
Essex County's Land Trust

Executive Assistant

From: Jon Gregory <jgregory@tataandhoward.com>
Sent: Monday, July 31, 2023 10:57 AM
To: Town Manager; Steven Daunais
Cc: Water Superintendent; Town Accountant; Selectboard
Subject: RE: T&H invoicing for Church/Prospect work

Good morning, Angus,

Thank you for your email. We understand the Town's situation with funding.

We will discontinue further work on the Church Street and Prospect Street Water Main project until the written agreement between the Select Board and BOWC is in place. In the meantime, we will prepare a separate engineering agreement with the BOWC for work to be funded from ARPA. We are working with our accounting dept. to determine the best means to document the change from Amendment No. 3 to a new engineering agreement for the work associated with ARPA funds since a portion of that work has already been invoiced to the Town. We will keep the Town informed as to how to best resolve the paperwork situation.

Thank you.

Jon Gregory, P.E. (MA)
Vice President

TATA & HOWARD

10 Riverside Drive, Suite 104
Lakeville, MA 02347
D: (508) 386-9339
C: (774) 254-3523

From: Town Manager <townmanager@wnewbury.org>
Sent: Friday, July 28, 2023 6:04 PM
To: Jon Gregory <jgregory@tataandhoward.com>; Steven Daunais <sdaunais@tataandhoward.com>
Cc: Water Superintendent <water.superintendent@wnewbury.org>; Town Accountant <townaccountant@wnewbury.org>; Selectboard <selectboard@wnewbury.org>
Subject: T&H invoicing for Church/Prospect work

Jon/Steve,
I wanted to reach out re contracting/invoicing for the portion of Church/Prospect Street work to be funded from ARPA. Earlier this week, we received your July 10 invoice #17 with a portion of the invoice ($1,324.00) payable from Water Dept funds and a portion of the invoice ($3,150.00) coded to hit the ARPA funds. Next week, we will put through payment for the portion of invoice #17 payable from Water Dept funds, but will hold the portion of the invoice payable from ARPA funds for the time being.

While the Select Board did approve use of the ARPA funds for this purpose, their vote was specifically contingent on a written agreement between the Select Board and the Board of Water Commissioners, in accordance with advice from Town Counsel and from our ARPA consultant. A written agreement is not yet in place.

The attached contract and amendments were provided to my office yesterday. The BOWC Chair signed Amendment #3 to your contract, but did so without notice to nor consultation with my office/Select Board, and it does not appear that this was reviewed by the full BOWC prior to the Chair's signature on May 23rd. (And, the amendment only bears 1 signature, whereas the Board is only authorized to act as a Board, not by one member). Further, none of the contract amendments had been placed on file with the Town Accountant, which is a requirement of state law.

Until we have a written agreement between the Select Board and BOWC regarding use of the ARPA funds, we do not want T&H to spend further time toward the preparation of bid documents for Church/Prospect. To ensure a clean paper trail for our ARPA record-keeping and reporting, we'd like to see a separate agreement for work to be funded from ARPA, as distinct from work already under contract for this project.

At its next meeting on Aug 7th, the Select Board will be asked to approve a MOU with the BOWC documenting the procedures for expenditure of these funds. A draft MOU will be shared with the BOWC next week, then will be sent to the BOWC for their approval coming out of the 8/7 Select Board meeting.

I met with Mark earlier today to talk this over. As long as the BOWC is able to schedule a meeting relatively soon after the Select Board's Aug 7th meeting, I expect we'd be able to put through the remainder of the invoice #17 for payment in the first half of August, and also at that time to authorize continued work on the project. In the meantime, I know your office has its hands full with the water rate study, so we don't expect any short-term delay in the Church/Prospect work to cause any disruption to that project's overall timeline.

Thanks,
Angus

Angus Jennings, Town Manager
Town of West Newbury
Town Office Building
381 Main Street
West Newbury, MA 01985
(978) 363-1100 x111
townmanager@wnewbury.org

Ivria G. Fried
T: 617.804.2427
40 Grove Street, Suite 190
Wellesley, MA 02482
ifried@miyares-harrington.com

February 10, 2023

Via email
West Newbury Select Board
381 Main Street
West Newbury, MA 01985

Re: ARPA Funds

Dear Select Board:

You have asked what tools, if any, may be available to the Select Board to ensure that American Rescue Plan Act of 2021 (ARPA) funds are used in compliance with the Act. As you are aware, ARPA is the federal government's economic stimulus bill to speed up the nation's recovery from the economic and health effects of the COVID 19 public health emergency. Under ARPA, Massachusetts communities received federal aid to respond to these public health and economic impacts. However, such funds may only be used for eligible purposes. The making of "necessary investments in water, sewer, or broadband infrastructure" is an eligible purpose. *See,* Department of the Treasury's Final Rule, 31 CFR Part 35 RIN 1505-AC77. There are two ways to ensure that funds are appropriately used: (1) Select Board project review prior to awarding the grant; and (2) Execution of a Grant Agreement or Memorandum of Understanding relative to the use of such funds.

First, the Select Board must vote to appropriate all ARPA funds. Thus, the Select Board should review funding requests to ensure that the proposed project is eligible under the Treasury's Final Rule. A blanket award to a grantee for "allowed" purposes is discouraged.

Second, the Select Board may execute a Grant Agreement or MOU with the entity receiving the funds to ensure that the Board has sufficient oversight and control over the funds. If grantee fails to use the funds as provided in the Grant Agreement or MOU, the Select Board could seek repayment. In my opinion, a Grant Agreement or MOU should include provisions that:

- Incorporate by reference any federal rules that apply to the grant award.
- Require open and direct communication with grantees.
- Require regular and thorough reporting from grantees relating to expenditures.

- Tie grant disbursements to deliverables, milestones or other reportable actions when possible.
- Obligate the grantee to track and maintain records of all grant-related documents, including communications, receipts and invoices.
- Include a right-to-audit clause. A right-to-audit clause allows a jurisdiction to request documents and engage in an active review process.
- Establish attainable program goals and targets, and understand which expenditures are allowable under federal law.

I have attached two sample agreements: one under ARPA and one under Coronavirus Aid, Relief, and Economic Security Act. While both agreements were with private parties, the agreements could be amended to incorporate a situation where the recipient is a town department or public body. Please let me know if you have any questions or concerns.

Sincerely,

Ivria Glass Fried

THIS MEMORANDUM OF UNDERSTANDING ("MOU") is made as of this ___day of August, 2023, by and between the West Newbury Board of Water Commissioners, an elected public body with an address 381 Main Street, West Newbury, Massachusetts 01985 (hereinafter referred to as the "Recipient"), and the Town of West Newbury (the "Town"), with an address of 381 Main Street, West Newbury, Massachusetts 01985, acting through its Select Board (collectively, the "Parties").

RECITALS

WHEREAS, the American Rescue Plan Act ("ARPA") provides for the use of funds to make necessary investments in water, sewer, or broadband infrastructure as noted in the Department of the Treasury's Final Rule, 31 CFR Part 35 RIN 1505-AC77; and

WHEREAS on March 13, 2023, the Town of West Newbury Select Board approved the use of a portion of the Town's ARPA funds to purchase water mains for the Church and Prospect Street Water Main Replacement (the "Project"); and

WHEREAS the purpose of this project is to replace aging and deteriorating water mains on Church and Prospect Streets; and

WHEREAS, the Recipient submitted an application for ARPA funding to support the Project to replace water mains located at Church Street and Prospect Street, West Newbury, MA; and

WHEREAS, the Town has reviewed the Recipient's application and has determined that the proposed project is consistent with the terms of ARPA and the Project, and has elected to award funding to the Recipient on condition that such funding be used exclusively for the purposes described below, and in a manner consistent with the terms and conditions contained herein.

NOW, THEREFORE, in consideration of the mutual promises contained herein, the Parties agree as follows:

1. The Project. The Recipient agrees that all funds provided for herein shall be used exclusively for the work described in **EXHIBIT A** (the "Project").

2. Reporting. The Recipient agrees to track and maintain records of all fund-related documents, including communications, receipts and invoices, and will provide regular and thorough reporting relating to expenditures.

3. Award. Subject to the terms of this MOU, the Town agrees to award the Recipient the amount of up to $625,000 from the Town's ARPA funds, with funds to be disbursed to Recipient upon submission of receipts for eligible expenses associated with the Project.

4. Additional Funding. The Recipient shall ensure that adequate funding is in place to complete the Project. In the event that the funds alone are for any reason insufficient to complete the Project, the Recipient will obtain or have available other funds sufficient in the aggregate to ensure completion of the Project.

5. Contracts. The Town will have signing authority on all contracts necessary for the completion of the Project.

6. Right to Audit. The Town shall have the right to request documents and engage in an active review process of all Project related documents.

7. Term. This MOU shall remain in effect until the Recipient has completed the Project and the Town has disbursed final payment of the grant awards.

8. Return of Funds.

   a. If the Town determines that the Recipient has failed to use all funds on the Project as required by this MOU, or has otherwise defaulted under its obligations under this MOU, it shall send the Recipient written notice to that effect. Upon delivery of said notice, the Recipient shall immediately reimburse the Town in whole or in part, as the Town may determine. The Town may take such steps as are necessary, including legal action, to recover said funds if not timely reimbursed.

   b. In the event that a court of competent jurisdiction issues a final, binding, conclusive Judgment that the grant of funds as described by this MOU violates the law, then the Recipient shall be liable to repay to the Town the entire amount of funding provided under this MOU, and the Town shall take such steps as are necessary, including legal action, to recover said funds.

   c. In the event the Town is required to take legal action under this MOU, the Recipient shall be liable for all of the Town's costs expended for the enforcement of this MOU, including but not limited to reasonable attorney's fees and court costs.

9. Notice. Any and all notices, or other communications required or permitted under this MOU, shall be in writing and delivered in hand to the parties hereto at the following addresses:

If to the Recipient:

Board of Water Commissioners
Town of West Newbury
381 Main Street
West Newbury, MA 01985

If to the Town:

Select Board c/o Town Manager
Town of West Newbury
381 Main Street
West Newbury, MA 01985

10. No Liability of Town. By making this award, the Town does not accept any liability whatsoever for any acts, omissions or errors associated with the Project. Nothing in this MOU shall be construed to render the Town or any elected or appointed official or employee of the Town, or their successors in office, personally liable for any obligation under this MOU. Recipient agrees to indemnify and defend the Town from all claims, suits or demands, costs and expenses, including attorney's fees, resulting from implementation of the Project or this MOU.

11. Severability. If any term or condition of this MOU or any application thereof shall to any extent be held invalid, illegal or unenforceable by a court of competent jurisdiction, the validity, legality, and enforceability of the remaining terms and conditions of this MOU shall not be deemed affected thereby.

12. Governing Law and Consent to Venue. This MOU shall be construed under, and governed by, the laws of the Commonwealth of Massachusetts. The Recipient agrees that any litigation arising in connection with this MOU shall be conducted exclusively in Newburyport District Court or in the Essex County Superior Court, both of which are located in the County of Essex, Commonwealth of Massachusetts. This choice of venue is intended to be mandatory and not permissive in nature. The parties to this MOU further agree to waive their rights to a jury trial.

13. Entire MOU: This MOU constitutes the entire agreement between the parties hereto, and may be amended only in writing executed by both the Town of West Newbury and the Recipient. Signatory below acknowledges and avers that he/she has the authority to execute this MOU on behalf of the Recipient.

IN WITNESS HEREOF, the parties hereto have caused this MOU to be duly executed this ____ day of August 2023

Board of Water Commissioners

_____
By: Robert Janes
Its: Chairperson
Duly authorized: By ___ vote of Board of Water Commissioners on _____, 2023

Town of West Newbury

_____
Angus Jennings, Town Manager
Duly authorized: By ___ vote of Select Board on _____, 2023

Town of West Newbury
SLFRF - state and local fiscal recovery funds ARPA
Project Request Form

Please complete this form and attach any additional paperwork to support your request.

Date:	3/3/2023
Project Name:	Church and Prospect Street Water Main Project
Project ID: (accounting use only)	
Expense Category:	ARPA or Water Department Stabilization and Free Cash
Description of Project: Water main pipe replacement on Church and Prospect Street. The original plan was to start the water main replacement in FY 2024. The BOWC'S decided that it would be best to purchase the water main in CY 2023 after the pipe company informed the department that there would be a 30-week lead time before we would see a delivery. Other municipalities have successfully followed the same process with the backlog of the supply chains. The plan is to borrow funds for the water main project and ask for approval of the installation cost (estimated to be $2M+) at the FY 2025 Town Meeting. By purchasing the water main in CY 2023 the water main replacement project would be able to move forward once approved at next year's Town Meeting. If we don't purchase the water main in CY 2023 and wait until CY 2024 the project would need to be pushed off for an additional year. **Please Note:** The BOWC would like to receive approval to use ARPA funds to purchase the water main this year. We plan to present eight articles at Town Meeting totaling $853,276. That would leave $0.51 in Stabilization and $255,686 Free Cash. If the Select Board would be willing to appropriate $625,000 out of ARPA funds for the water main purchase this year the Water Department would be more comfortable having the additional funds to pay the loan payments starting in FY 2025 (water rate increase required). That loan will be in the ballpark of $2M-$2.5M at this point. If the ARPA funds are not available this year the Water Department would deplete most of their available funds. We are not sure what the ARPA funds are allowed to be used for. We did put a 10% contingency on the water main cost for any cost increases in the future.	
Estimated Project cost	**water main=$625,000.** The total project including the $625,000 for the water main at this time is around 3M.
Status of completion:	The Water main project should be completed by the end of CY 2024 If the water main is purchased in CY 2023.
Which FY will these expenses occur:	FY 2024

Dept head approval/Date MARCH 3, 2023

BOS approval/Date

J

Town Manager

From: Executive Assistant
Sent: Thursday, July 20, 2023 8:45 AM
To: Assistant Assessor; Assistant Clerk; Brian Richard; Building Inspector; Christian Kuhn; COA; Community Preservation Committee; Conservation; Corinn Flaherty; DPW Admin; DPW Director; DPW Projects; Electrical Inspector; Executive Assistant; Finance Assistant; Jane Krafton; Joan Croteau; John Savage; Lee Ann Delp; Meals On Wheels; Michael Dwyer; Paul Sevigny; Planning Admin; Stan Kulacz; Town Accountant; Town Clerk; Town Manager; Town Planner; Town Treasurer; Water Superintendent; WNWater
Subject: Proposed amendment of Personnel Policy
Attachments: proposed_amendment_jury_duty - for hearing on 8-7-23.pdf

Hello,

On July 10, 2023, the Select Board proposed an amendment to the Personnel Policy relating to jury duty leave. (The complete Personnel Policy is online here).
Any proposed new, amended or revised policies shall be posted for a period of at least ten days after being proposed by the Select Board, during which time comments, information and questions regarding any proposed policy may be provided to the Select Board. A public hearing shall be held following the ten-day posting period. The Board will open public hearings on the proposed amendment on Monday, August 7 at/after 7pm. A copy of the public hearing notice is attached and hard copies will be posted within the Town Offices Building.

Comments, information and questions from all interested parties may be sent to the Town Manager (townmanager@wnewbury.org) in advance or may be provided at the hearing. All interested parties are encouraged to submit comments/questions, and/or to attend the hearing.

Thank you,

Rebecca Ambra, Executive Assistant
Office of the Town Manager
Town of West Newbury
381 Main Street
West Newbury, MA 01985
978-363-1100 x115
Exec.Assistant@wnewbury.org

Town of West Newbury
Select Board

381 Main Street, West Newbury, MA 01985 | 978-363-1100, Ext. 115
selectboard@wnewbury.org

Public Hearing Notice
Amendment to the Personnel Policy
Monday, August 7, 2023 @ 7pm

On July 10, 2023, the Select Board proposed an amendment to the Personnel Policy. Any proposed new, amended or revised policies shall be posted for a period of at least ten days after being proposed by the Select Board, during which time comments, information and questions regarding any proposed policy may be provided to the Select Board. A public hearing shall be held following the ten-day posting period.

A public hearing will be held by the Select Board on the following proposed revision to Sec. 5.7 of the Personnel Policy, the Jury Duty Policy (proposed deletions in ~~strikethrough~~ and proposed additions in double underlined):

Current:

5.7 *Jury Duty leave*

Employees shall be granted leave when called for jury duty and shall be paid their regular wages for the first ~~three~~ five days, or part thereof, of jury service. Employees will be paid the difference between their regular wages and the amount paid by the court, provided employees present evidence of compensation received from the court to the Town Accountant. Employees are required to report for work while on jury service if released before the end of the regular work day.

Comments, information and questions from all interested parties may be sent to the Town Manager in advance (townmanager@wnewbury.org), or may be provided at the hearing. All interested parties are encouraged to attend.

B2Q Associates
100 Burtt Rd. Suite 212
Andover, MA 01810
(978) 208 – 0609
www.b2qassociates.com

July 14, 2023
Mr. Angus Jennings
Town Manager
Town of West Newbury
381 Main Street
West Newbury, MA 01985

RE: Solar Site Feasibility Screening Study Report

Dear Angus,

B2Q is pleased to provide this report summarizing our findings from this solar site feasibility screening study for the Town of West Newbury.

INTRODUCTION

B2Q was engaged by the Town of West Newbury to complete a screening study to review the potential to implement solar photovoltaic (PV) systems at seven potential locations, which were selected by the Town prior to commencing the study. We understand that the Town is interested in exploring the opportunity to expand their portfolio of solar PV systems in support of their goals to reduce their contribution to greenhouse gases and to provide renewable energy resources for the Town and its residents. As such, the primary goals of this screening assessment were to perform an initial, high-level engineering review of the technical and economic feasibility of installing solar PV system(s) at the seven (7) potential locations. The Town has two existing solar PV systems: the Main Street Solar Project (owned by 3rd party) and a ground-mount array at the DPW (owned by the Town). The Town has also been exploring the feasibility of a microgrid at the Municipal Campus, which is outside the scope of this study.

Solar PV panels convert sunlight into electricity. Strings of multiple PV panels form a PV array which are connected to one or more inverters to allow for the conversion of DC power to AC power. Electricity can be used by the customer to power building loads, or, in some cases, exported directly to the utility electric grid. If a solar PV system is qualified for net metering by the utility, then excess generation can be exported to the grid. Net meters can register both solar PV energy generated at the site and utility grid energy consumed by the site. The customer is billed only for the net energy, which is the energy generated less the energy consumed.

Solar PV arrays are commonly mounted in several different configurations, such as roof-mounted, ground-mounted, and canopy-mounted. Canopy-mounted arrays are often placed over parking lots to function as a carport, as well. Solar PV arrays are generally mounted at a fixed tilt angle, but solar tracking systems are available to allow the panels to rotate, either on a single-axis or dual-axis, to dynamically track the position of the sun throughout the day. Fixed tilt, ground-mounted arrays are generally the cheapest option, while carport canopy arrays are typically the most expensive.

EXECUTIVE SUMMARY

The table below summarizes the preliminary screening results and potential solar PV system characteristics for each location. Refer to subsequent sections of the report for more details on the high-level technical and economic screening reviews for each location.

Table 1: Executive Summary Table.

Location		Mounting	Preliminary Solar PV System Size	Estimated Annual Solar PV Production	Estimated SMART Incentive Rate	Estimated Direct Ownership Economics				Estimated PPA	
						Order of Magnitude Construction Cost Estimate	Estimated Year 1 Net Cash Flow	Estimated 20-Year Net Present Value	Estimated Discounted Payback Period	Estimated Year 1 Net Cash Flow	Estimated 20-Year Net Present Value
-	-	-	kW AC	kWh	$/kWh	$	$	$	year	$	$
1.1	Housing Authority	Rooftop	133	170,400	-	$514,500	$70,518	$475,892	5	$53,089	$628,394
1.1	Housing Authority	Ground	33	49,837	-	$111,000	$21,366	$176,081	3	$16,999	$201,768
1.2	1910 Building	Parking Canopy	240	339,605	$0.017	$1,890,000	$144,706	$388,187	12	$58,094	$670,971
1.3	Public Safety Complex	Parking Canopy	30	49,617	$0.057	$266,000	$23,047	$84,549	10	$6,465	$75,970
1.4	Burnham Field	Parking Canopy	120	177,014	$0.017	$945,000	$75,208	$228,183	12	$29,960	$345,889
1.5	DPW & Pipestave Recreation	Rooftop	33	44,149	-	$129,500	$18,119	$124,219	5	$13,584	$160,767
1.5	DPW & Pipestave Recreation	Ground	12	19,881	$0.013	$42,000	$8,563	$72,067	3	$6,288	$74,862
1.5	DPW & Pipestave Recreation	Parking Canopy	480	774,705	-	$4,165,000	$315,880	$833,494	13	$144,054	$1,654,214
1.6	Page School	Ground	250	391,187	-	$810,000	$79,715	$371,546	8	$45,073	$524,583
1.7	North Dunn Field	Ground	300	480,886	-	$993,000	$196,768	$1,642,714	3	$154,166	$1,828,675
1.7	South Dunn Field	Ground	938	1,505,731	-	$3,300,000	$614,967	$4,992,348	3	$482,718	$5,725,875

KEY RESULTS & CONCLUSIONS

The following conclusions can be drawn from the executive summary table above:

1. Direct Ownership vs. 3rd Party Power Purchase Agreement (PPA): For each of the eleven potential solar PV systems considered across the seven locations, the screening and preliminary economic review indicate that a PPA would result in a higher 20-year net present value for the Town, compared to the Town directly purchasing and owning the system. The one exception to this conclusion is Location 1.3 Public Safety Complex canopy PV system, which indicates that the 20-year net present value would be slightly higher for the direct ownership path. This anomaly may be tied to the estimated SMART incentive, which is estimated to be higher than the other canopy PV systems considered in this study due to the G-2 utility rate structure used at this facility.

   Note that these conclusions are subject to change if the actual PPA offered by potential project developers is higher than the assumed PPA rates used in this study. We recommend the Town evaluate the potential procurement options to decide which is the preferred path, then solicit preliminary PPA proposals for review from developers, if 3rd party ownership is determined to be the preferred option. See the Key Assumptions & Methodology section later in this report for the assumed PPA and cost rates used in this screening study.

2. Incentives and Revenue Streams: Canopy solar PV systems at Location 1.2, 1.3, and 1.4 may be eligible to receive SMART incentives, largely due to the compensation rate adders for canopy systems, based on information published by the DOER. Solar PV systems under 25 kW AC, including the ground system considered at Location 1.5, may potentially be eligible for SMART incentives, as well. Rooftop, canopy, and ground systems over 25 kW AC are likely not eligible for SMART incentives. Additionally, behind the meter systems may be eligible to participate in other market programs, such as passive real-time demand response. We recommend the Town discuss the preliminary system concepts with applicable program representatives during the next phase of study/design, once the Town has prioritized which systems they are most interested in pursuing further.

   Federal investment tax credits (ITC) of up to 30% may be available to the Town in a direct ownership path through the Elective Pay option, or to a 3rd party project developer through the Transferability option, based on information published by the US IRS.

The matrix below summarizes the general favorable and unfavorable characteristics of each of the seven locations observed during this screening, to be considered by the Town while considering each site's compatibility for the installation of solar PV systems.

Table 2: Solar PV System Compatibility Summary.

Location	Favorable	Unfavorable
1.1 Housing Authority	• Physical space availability on roof and ground • Building interconnection phase = 3 phase • Solar PV could potentially be asset in future Municipal Campus microgrid	• Building interconnection voltage = 120/208V • Building electric infrastructure upgrades may be necessary to interconnect solar • SMART incentives unlikely
1.2 1910 Building	• Physical space availability over parking lot • Building interconnection phase = 3 phase • Solar PV could potentially be asset in future Municipal Campus microgrid • SMART incentives may be available due to canopy adder	• Building interconnection voltage = 120/208V
1.3 Public Safety Complex	• Building interconnection phase = 3 phase • Solar PV could potentially be asset in future Municipal Campus microgrid • SMART incentives may be available due to canopy adder	• Building interconnection voltage = 120/208V • Limited parking area space • High construction cost due to canopy steel and structures for small system size
1.4 Burnham Field	• Physical space availability over parking lot • Solar PV could be asset in potential future Municipal Campus microgrid • SMART incentives may be available due to canopy adder	• Building interconnection voltage and phase unknown • Small amount of local load
1.5 DPW & Pipestave Recreation	• Some amount of physical space availability on salt shed roof and ground	• Building interconnection voltage = 120/240V at DPW • Building interconnection phase = 1 phase at DPW • Small amount of local load at DPW

	• SMART incentives may be available for ground solar at DPW, if system is < 25 kW AC	• No existing local load at Pipestave Recreation • SMART incentives unlikely for rooftop solar at DPW • SMART incentives may not be available for canopy PV, due to lack of local loads • Salt shed structure may not be rated to support additional roof loads
1.6 Page School	• Physical space availability in unused field behind the school • Building interconnection phase = 3 phase • Large existing local load	• Building interconnection voltage = 120/208V • SMART incentives unlikely
1.7 Dunn Property	• Large amount of unused space	• No existing local load • No 3-phase utility power on Chase St. • SMART incentives may not be available, due to lack of local loads

Some additional general conclusions that can be drawn from this screening include:

- Building Interconnection Voltage and Phase: Most commercially available solar PV inverters output power at 480V, 3-phase. Each of the buildings considered in this study currently receives 208V, 3-phase power from the utility. Therefore, the solar PV systems may require a transformer to step-down the voltage to 208V between the inverter and the buildings' switchboard or panel. This is not necessarily a technical hurdle but could result in additional costs and should be investigated in more detail. Additionally, the DPW receives 240V, 1-phase power from the utility. Generally, the size of commercially available solar PV inverters outputting 1-phase power is limited, which may limit the size of potential behind the meter solar PV systems at Location 1.5. This could be studied further in the next phase of study and/or design, if the Town is interested in pursuing behind the meter solar PV at this site further.
- Building Interconnection Feasibility: The main switchboard or distribution panel in the buildings at Location 1.2, 1.3, and 1.6 were observed to have spare and/or blank positions, which potentially could be utilized to interconnect behind the meter solar PV systems. This should be studied further, and the interconnection strategy should be confirmed in the next phase of study and/or design.

KEY ASSUMPTIONS & METHODOLOGY

While reviewing the tables on the previous pages, please note the following:

1. The assumed direct ownership cost rates and 3rd party ownership PPA rates used in this study are shown in the table below. Assumed rates are based on industry-standard cost estimating guides, past experience, and industry metrics.

Table 3: Cost assumptions.

Cost Assumptions				
	Direct Ownership			PPA
Solar PV Type	Assumed Construction Cost Rate	Assumed Annual O&M Cost Rate	Assumed Utility Interconnection Cost Rate	Assumed 3rd Party PPA Rate
-	$/W DC	$/kW DC	$/W DC	$/kWh
Ground	$3.00	$18.00	$0.10	$0.10
Rooftop	$3.50		$0.10	$0.12
Canopy	$7.00		$0.10	$0.23

2. Estimated SMART program incentive rates were estimated using the "2023 SMART-BTM-Value-of-Energy-Workbook" tool, published by the Massachusetts Department of Energy Resources (DOER), for base compensation rates and applicable compensation rate adders[1]. Note that the estimated incentive rates are subject to change and are anticipated to decrease in 2024.
3. The estimated economics for both the direct ownership and 3rd party Power Purchase Agreement (PPA) options assume that the Town would be eligible to receive net metering credits from National Grid, either as direct credits on the site's utility bill or as remote net metering credits towards another site's utility bill.
4. The estimated economics for the direct ownership option assumes that the Town would be eligible to receive a federal Investment Tax Credit (ITC) through the Elective Pay program. Based on available guidance published to date, we assumed the Town could receive a one-time, direct payment equal to 30% of the total project cost. Elective pay participants could be eligible for the 6% base rate, plus up to a 24% bonus for meeting the program's prevailing wage and apprenticeship requirements. The actual bonus amount will vary depending on the year the project is built and the project's ability to meet the program's domestic content requirements. Projects built in 2024 or beyond could be penalized if the domestic content requirements are not met.
5. The estimated economics are based on a 20-year life cycle cost analysis (LCCA) assuming a 7% discount rate, 0.5% annual electric utility rate escalation, 2% annual PPA escalation, and 1% annual solar PV production degradation.

[1] https://www.mass.gov/info-details/solar-massachusetts-renewable-target-smart-program

B2Q and the Town of West Newbury conducted a walkthrough of each location together on 5/11/2023 to observe the sites, discuss potential panel locations and configurations, and discuss potential electrical interconnection locations at a high-level. Electrical drawings were not available at the time of this report, therefore the information presented in this report is based on site observations and discussions with Town staff, only. Historical monthly electric utility data was provided by National Grid from January 2019 through March 2023.

Based on the Town's feedback, B2Q focused on one or more potential solar PV system configurations for each location. B2Q developed preliminary models for each system using HelioScope, an online solar energy modeling and simulation software, to screen one potential configuration for each location/system type and to demonstrate equipment layouts, system sizes, and predicted annual energy production for each. Physical obstructions and shading caused by these obstructions (i.e., trees, buildings, rooftop equipment) were considered in each model. The HelioScope reports can be found in Appendix A.

DISCLAIMERS

The preliminary budgetary opinions of probable construction costs are based on industry-standard cost estimating guides, past experience, and industry metrics, estimated on a $/W DC basis, which varies based on if the system is ground-mounted, roof-mounted, or a canopy carport. The opinions of probable cost presented in this report are a high-level view of the potential costs, intended to be estimates within +/- 30% of actual costs, and are not reflective of what would be produced by a detailed economic feasibility analysis.

Incentive estimates provided in this report, including federal investment tax credit (ITC) and Solar Massachusetts Renewable Target (SMART) incentives, are preliminary estimates based on information published online by sources such as the U.S. Department of Energy and the Massachusetts DOER. B2Q referenced the Value of Energy and Incentive Calculator for Behind-the-Meter facilities, which was developed by the DOER to provide customers with a practical tool to estimate the value of potential SMART incentives. B2Q has no control over the decisions of government agencies to provide incentives or tax credits. Since incentives and tax credits are entirely at the discretion of the government agency, B2Q does not expressly or implicitly warrant or represent that incentives or tax credits will be awarded. B2Q recommends coordinating with government agencies during subsequent study and design phases.

Net metering credit estimates provided in this report are preliminary estimates based on information published by National Grid in the Net Metering Provision M.D.P.U. No. 1331. B2Q has no control over the decisions of utility companies to provide net metering agreements or credits. Since net metering is entirely at the discretion of the utility, B2Q does not expressly or implicitly warrant or represent that net metering will be awarded. B2Q recommends coordinating with the utility during subsequent study and design phases to discuss current net metering allocations and caps.

Power purchase agreement (PPA) rate estimates assumed in this study are preliminary estimates made based on past experience, industry metrics, and information on existing PPA rates provided by the Town. B2Q has no control over the decisions of potential 3rd party project developers

related to rate structures. Since PPAs are entirely at the discretion of the project developer, B2Q does not expressly or implicitly warrant or represent that PPAs will be awarded.

Interconnection related cost estimates provided in this report are preliminary estimates based on past experience and information published by the utilities, estimated on a $/W DC basis. B2Q has no control over the decisions of utility companies to provide an interconnection service agreement (ISA) or the related costs of interconnection. Since ISAs and related costs are entirely at the discretion of the utility, B2Q does not expressly or implicitly warrant or represent that an ISA will be awarded. B2Q recommends coordinating with the utility and initiating the ISA pre application process during subsequent study and design phases.

The Large Scale Ground Mounted Solar Photovoltaic Installations (LGSPI) map, indicating the utility's potential 3-phase capacity to host solar PV installations, was provided by West Newbury for B2Q to reference during this study. B2Q assumes that the information provided on this map is accurate, and B2Q does not expressly or implicitly warrant or represent that the utility has adequate capacity or that the utility will approve interconnection. Distributed generation interconnection feasibility and requirements are solely determined by the utility company, and B2Q recommends coordinating with the utility during subsequent study and design phases.

RECOMMENDED NEXT STEPS

In summary, further planning and detailed engineering review are necessary in preparation for the next phases of design and construction of new solar PV systems. The recommended next steps are as follows:

- Internal review of screening report by Town stakeholders
- Present findings to additional Town stakeholders at joint Selectboard and Energy and Sustainability Committee meeting
- Town to prioritize select locations and solar PV system types to move forward to the next phase of study and design
- Town to consider their preferred project ownership path – Town-owned or 3rd party-owned with PPA and lease

We would be happy to meet with you to discuss any questions or comments you have on the above information. Thank you for the opportunity to work with you on this effort.

Sincerely,

Thomas Banks

Tom Banks, PE
Project Engineer
B2Q Associates

1.1 HOUSING AUTHORITY

EXISTING CONDITIONS

The Housing Authority is located on Parcel R14-6A, which is owned by the West Newbury Housing Authority, not the Town of West Newbury. The Annex, also located on Parcel R14-6A, is leased to the Town of West Newbury by the Housing Authority. The Annex and its electric loads are not included in the scope of this study.

Table 4: Location 1.1 existing electric service.

1.1 Housing Authority					
Electric Utility			Main Electric Service		
Account #	Meter #	Rate	Amps	Voltage	Phase
65732-60005	54239760	G1	800	120/208V	3

The Housing Authority's, and the 1910 Building's and Annex's, existing electrical service is provided via a National Grid 13.2 kV grid-Y /7.62 kV primary – 208 V Y / 120 V secondary service, pad mount utility transformer located by the 1910 Building's front parking lot to the east of the building. The building's main service entry gear is located at ground level in an electric/boiler room. The existing service entrance switchboard is 800A, 3 phase, 4 wire, 208Y/120VAC. The existing main distribution panel does not appear to have available spare positions. Based on field observations, it appears that the Annex is served by the same electric service, but has its own distribution panels, which are sub-metered.

The Large Scale Ground Mounted Solar Photovoltaic Installations (LGSPI) map provided by West Newbury indicates the National Grid primary feeder in the immediate vicinity of the building along Main Street may have sufficient 3-phase capacity to host a solar PV installation.

The graph below shows the building's historical monthly electricity use. Estimates of monthly use were made as required to account for billing or metering errors. Monthly electricity use is relatively consistent from month to month, with a slight increase during the summer months. No usage was reported from June 2022 to August 2022, which may be attributed to a meter error. Based on conversations with town representatives, the electric data shown below is for the Housing Authority, only, and the Annex has a separate electric utility account.

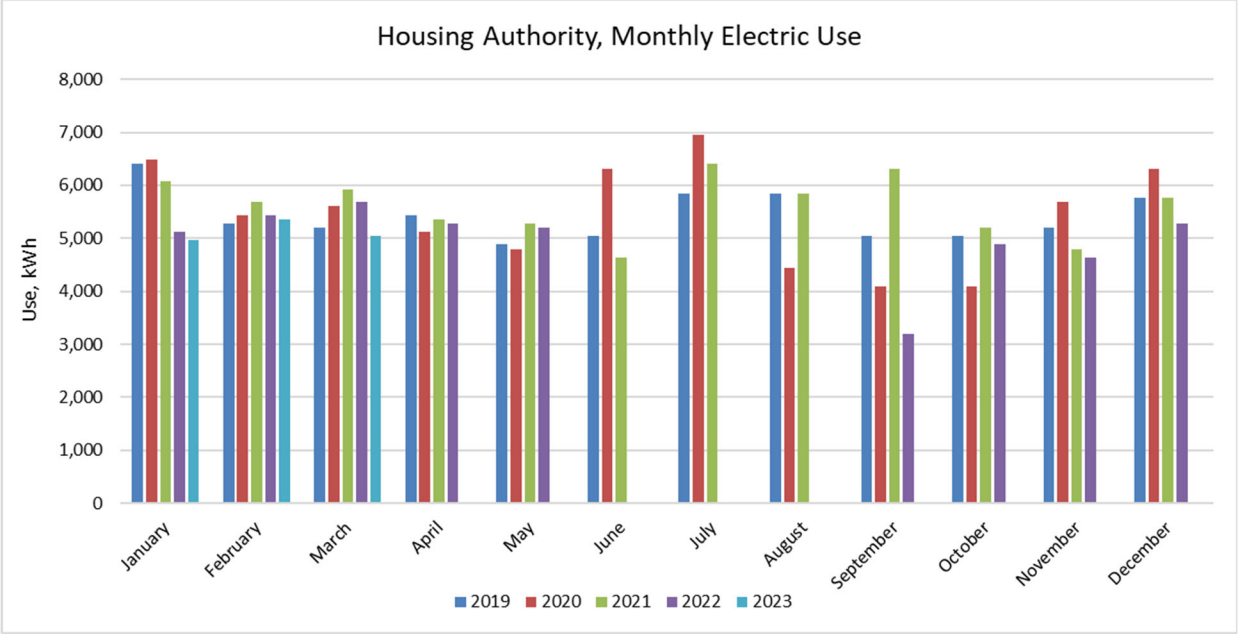


Figure 1: Location 1.1 monthly electricity use.

SOLAR PV REVIEW

TECHNICAL SCREENING

Rooftop solar PV and ground-mount solar PV systems were considered in this screening study. The small parking lot to the west of the building was not considered for canopy parking lot solar PV in this study due to its size limitations and the availability of rooftop and ground space at this site. Based on conversations with town staff, the roof was replaced roughly 7 years ago. It is recommended to engage a licensed professional structural engineer to assess the condition and suitability of the roof to support a roof-mounted solar PV systems as part of a future phase of study and/or design.

The preliminary screening results, including AC nameplate power, monthly and annual electricity generation, and panel layouts, for the rooftop and ground-mount solar PV systems are shown in the tables and figures below. The rooftop system was modeled at a 5° tilt angle and an azimuth angle parallel to the lengthwise roof edge. The ground-mount system was modeled at a 30° tilt angle and an azimuth angle of 180°, which is south-facing.

Table 5: Location 1.1 Solar PV Screening Summary.

1.1 Housing Authority			
Location	Mounting	Preliminary Inverter AC Nameplate kW	Estimated Annual Energy Generation kWh
Building	Rooftop	133	170,400
Open Space	Ground	33	49,837

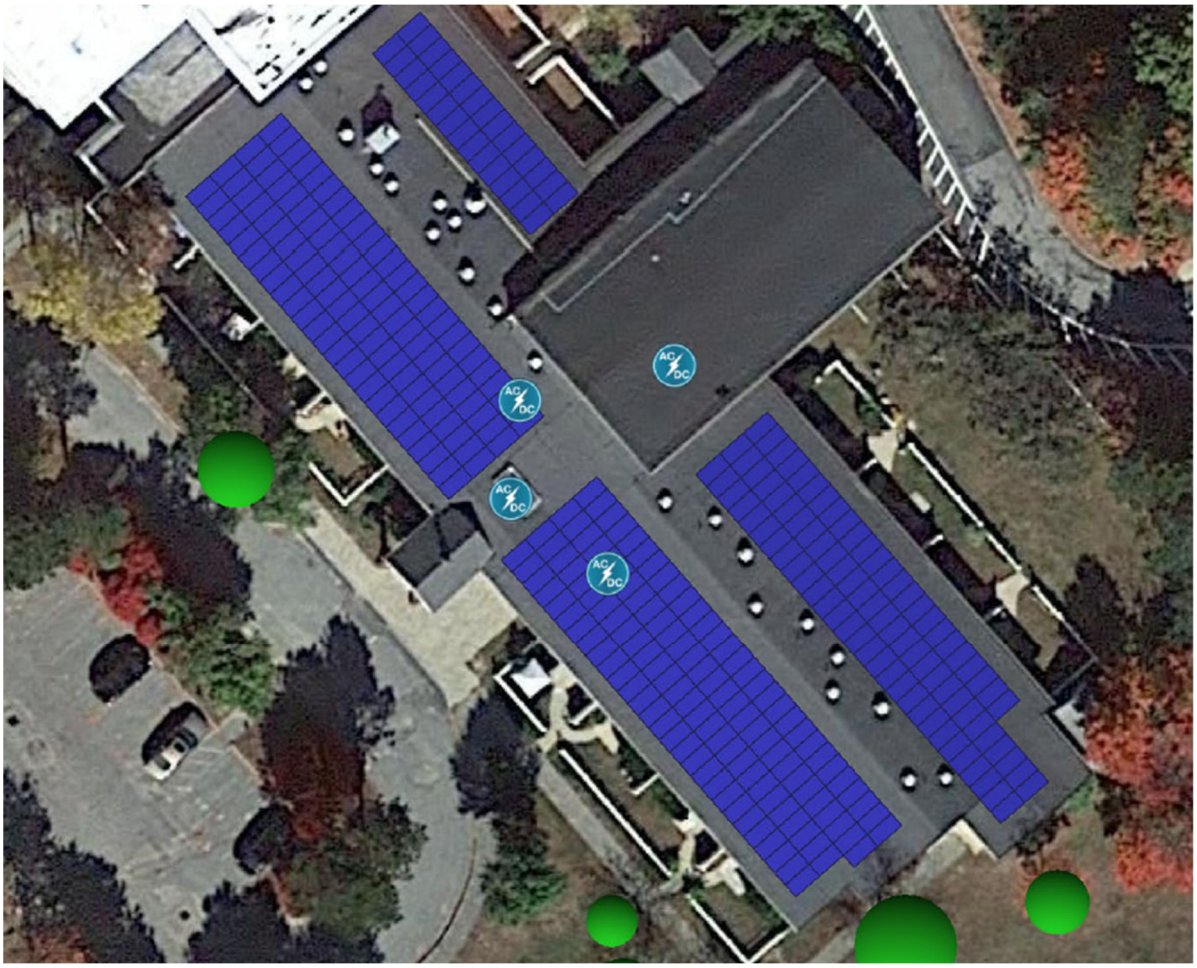


Figure 2: Location 1.1 Panel Layout – Rooftop.

Table 6: Location 1.1 Monthly Energy Generation – Rooftop.

1.1 Housing Authority - Roof	
Month	Predicted Solar PV Generation
January	7,428
February	10,283
March	15,860
April	17,742
May	20,116
June	19,895
July	21,535
August	18,540
September	15,151
October	10,798
November	7,387
December	5,665
Total	**170,400**

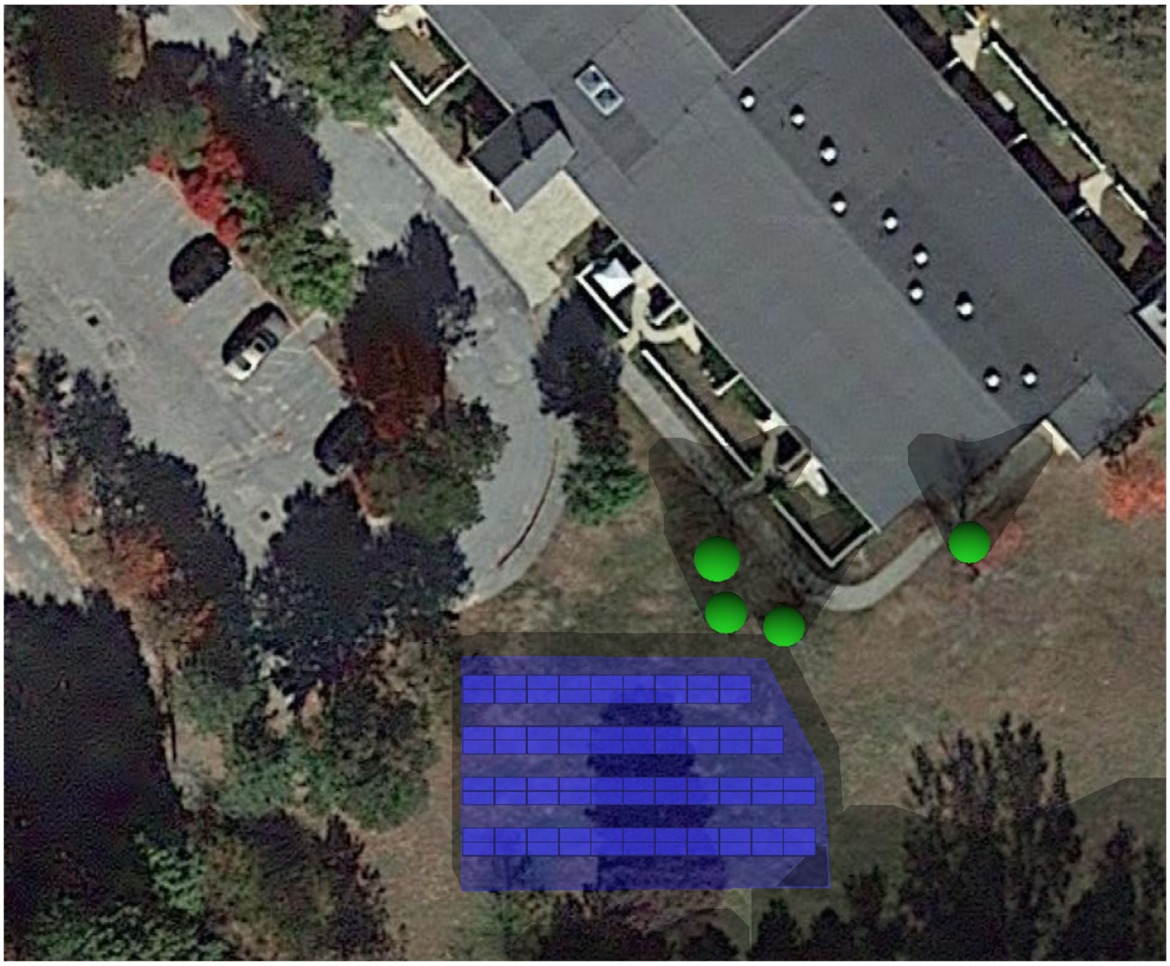


Figure 3: Location 1.1 Panel Layout – Ground-Mount.

Table 7: Location 1.1 Monthly Energy Generation – Ground-Mount.

1.1 Housing Authority - Ground	
Month	Predicted Solar PV Generation
January	2,420
February	3,572
March	5,201
April	5,043
May	5,263
June	4,994
July	5,584
August	5,163
September	4,742
October	3,745
November	2,388
December	1,722
Total	**49,837**

ECONOMIC SCREENING

The high level opinions of probable cost and incentives, and the preliminary life cycle cost analysis for the system(s) considered at this location are summarized in the table below.

Table 8: Location 1.1 Preliminary Economic Summary.

Mounting	Estimated SMART Incentive Rate	Estimated Direct Ownership Economics				Estimated PPA	
		Order of Magnitude Construction Cost Estimate	Estimated Year 1 Net Cash Flow	Estimated 20-Year Net Present Value	Estimated Discounted Payback Period	Estimated Year 1 Net Cash Flow	Estimated 20-Year Net Present Value
-	$/kWh	$	$	$	year	$	$
Rooftop	-	$514,500	$70,518	$475,892	5	$53,089	$628,394
Ground	-	$111,000	$21,366	$176,081	3	$16,999	$201,768

The potential SMART incentive rates were estimated based on the following information gathered from the "2023 SMART-BTM-Value-of-Energy-Workbook":

Rooftop System:

- G-1 Rate Class, Net-Metered Value of Energy = $0.21144
- Greater than 25 kW AC to 250 kW AC, Block 10 Base Compensation Rate = $0.16847/kWh
- Building Mounted Solar Tariff Generation Unit, Compensation Rate Adder = $0.0192/kWh
- Base Compensation Rate + Compensation Rate Adder – Value of Energy = **Estimated SMART Incentive = $0.00/kWh**

Ground-Mount System:

- G-1 Rate Class, Net-Metered Value of Energy = $0.21144
- Greater than 25 kW AC to 250 kW AC, Block 10 Base Compensation Rate = $0.16847/kWh
- No Compensation Rate Adders
- Base Compensation Rate + Compensation Rate Adder – Value of Energy = **Estimated SMART Incentive = $0.00/kWh**

1.2 1910 Building

Existing Conditions

The 1910 Building is located on Parcel R14-6, which is owned by the Town of West Newbury. The front parking lot is located on the same parcel, while the back parking lot, located to the southeast, is located on Parcel 14-4A, which is also owned by the Town of West Newbury.

Table 9: Location 1.2 existing electric service.

1.2 1910 Building					
Electric Utility			Main Electric Service		
Account #	Meter #	Rate	Amps	Voltage	Phase
53271-88004	25140301	G1	800	120/208V	3

The 1910 Building's, and the Housing Authority's and Annex's, existing electrical service is provided via a National Grid 13.2 kV grid-Y /7.62 kV primary – 208 V Y / 120 V secondary service, pad mount utility transformer located by the 1910 Building's front parking lot to the east of the building. The building's main service entry gear is located in the basement in an electric room. The existing service entrance switchboard is 800A, 3 phase, 4 wire, 208Y/120VAC. The existing main distribution panel appears to have available spare positions.

The LGSPI map provided by West Newbury indicates the National Grid primary feeder in the immediate vicinity of the building along Main Street may have sufficient 3-phase capacity to host a solar PV installation.

The graph below shows the building's historical monthly electricity use. Estimates of monthly use were made as required to account for billing or metering errors. Monthly electricity use is relatively consistent from month to month, with a slight increase during the summer months.

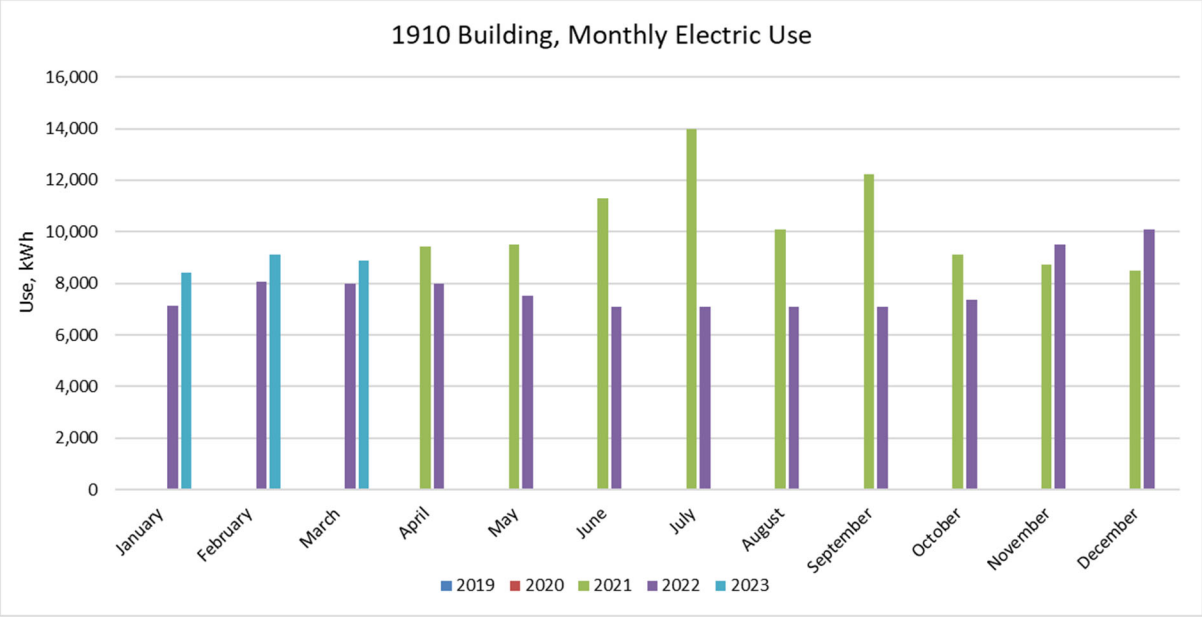


Figure 4: Location 1.2 monthly electricity use.

SOLAR PV REVIEW

TECHNICAL SCREENING

A canopy parking lot solar PV system over the back parking lot was considered in this screening study. The front parking lot was not considered due to aesthetic concerns related to its proximity to Main Street. Rooftop solar PV and ground-mount solar PV were not considered in this study due to the limited space availability. It is recommended to engage a licensed geotechnical engineer to assess the condition and suitability of the subsurface conditions to support canopy solar PV systems as part of a future phase of study and/or design.

The preliminary screening results, including AC nameplate power, monthly and annual electricity generation, and panel layouts, for the canopy parking solar PV system are shown in the tables and figure below. The canopy parking lot solar PV system was modeled at a 7° tilt angle and an azimuth angle to match the direction of the parking spaces.

Table 10: Location 1.2 Solar PV Screening Summary.

1.2 1910 Building			
Location	Mounting	Preliminary Inverter AC Nameplate kW	Estimated Annual Energy Generation kWh
Parking Lot	Canopy	240	339,605

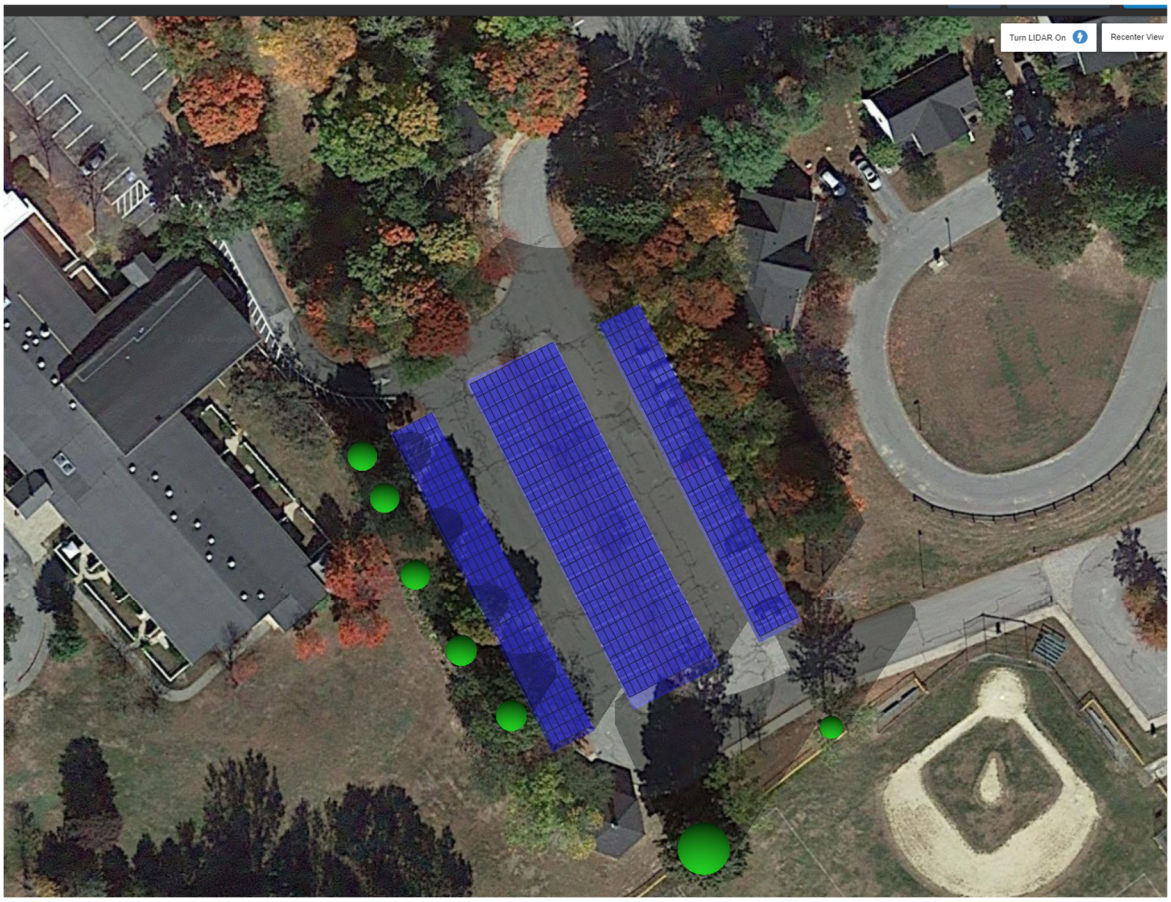


Figure 5: Location 1.2 Panel Layout – Canopy Parking.

Table 11: Location 1.2 Monthly Energy Generation – Canopy Parking.

1.2 1910 Building - Parking Canopy	
Month	Predicted Solar PV Generation
January	15,356
February	20,647
March	31,497
April	34,961
May	39,892
June	39,287
July	42,713
August	36,889
September	30,104
October	21,500
November	15,009
December	11,750
Total	**339,605**

ECONOMIC SCREENING

The high level opinions of probable cost and incentives and the preliminary life cycle cost analysis for the system(s) considered at this location are summarized in the table below.

Table 12: Location 1.2 Preliminary Economic Summary.

Mounting	Estimated SMART Incentive Rate	Estimated Direct Ownership Economics				Estimated PPA	
		Order of Magnitude Construction Cost Estimate	Estimated Year 1 Net Cash Flow	Estimated 20-Year Net Present Value	Estimated Discounted Payback Period	Estimated Year 1 Net Cash Flow	Estimated 20-Year Net Present Value
-	$/kWh	$	$	$	year	$	$
Parking Canopy	$0.017	$1,890,000	$144,706	$388,187	12	$58,094	$670,971

The potential SMART incentive rate was estimated based on the following information gathered from the "2023 SMART-BTM-Value-of-Energy-Workbook":

Canopy Carport System:

- G-1 Rate Class, Net-Metered Value of Energy = $0.21144
- Greater than 25 kW AC to 250 kW AC, Block 10 Base Compensation Rate = $0.16847/kWh
- Canopy Solar Tariff Generation Unit, Compensation Rate Adder = $0.06/kWh
- Base Compensation Rate + Compensation Rate Adder – Value of Energy = **Estimated SMART Incentive = $0.017/kWh**

1.3 PUBLIC SAFETY COMPLEX

EXISTING CONDITIONS

The Public Safety Complex, home to the police and fire station, is located on Parcel R14-3, which is owned by the Town of West Newbury.

Table 13: Location 1.3 existing electric service.

1.3 Public Safety Building					
Electric Utility			Main Electric Service		
Account #	Meter #	Rate	Amps	Voltage	Phase
15932-97003	25056615	G2	1200	120/208V	3

The Public Safety Complex's existing electrical service is provided via a National Grid primary to secondary service, pad mount utility transformer located to the east of the building. The transformer nameplate did not provide the size of the transformer. The building's main service entry gear is located in an electric room on the first floor. The existing service entrance switchboard is 1200A, 3 phase, 4 wire, 208Y/120VAC. The existing main distribution panel appears to have two spare, 100A positions.

The LGSPI map provided by West Newbury indicates the National Grid primary feeder in the immediate vicinity of the building along Main Street may have sufficient 3-phase capacity to host a solar PV installation.

The graph below shows the building's historical monthly electricity use. Monthly electricity use is typically highest in the winter and summer months. Monthly usage in January through March 2023 is noticeably lower than previous years, which may be attributed to energy conservation efforts or changes in building occupancy.

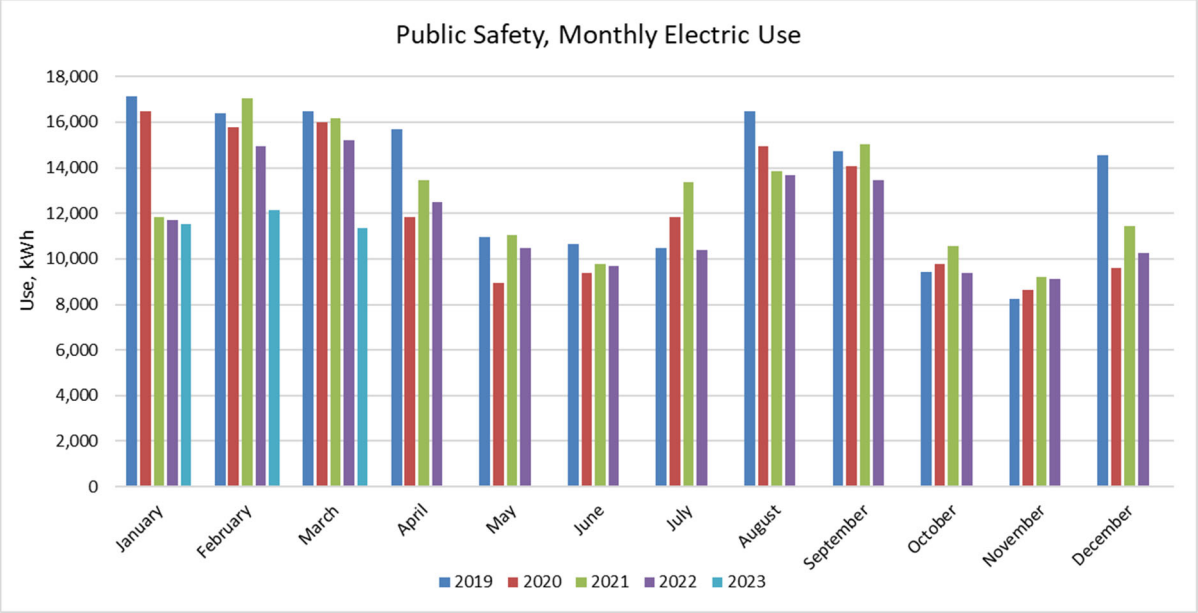


Figure 6: Location 1.3 monthly electricity use.

SOLAR PV REVIEW

TECHNICAL SCREENING

A canopy parking lot solar PV system over the parking lot to the south of the building was considered in this screening study. The spaces closest to the building were not included due to their proximity to the building. Rooftop solar PV and ground-mount solar PV were not considered in this study due to the limited space availability. It is recommended to engage a licensed geotechnical engineer to assess the condition and suitability of the subsurface conditions to support canopy solar PV systems as part of a future phase of study and/or design.

The preliminary screening results, including AC nameplate power, monthly and annual electricity generation, and panel layouts, for the canopy parking solar PV system are shown in the tables and figure below. The canopy parking lot solar PV system was modeled at a 7° tilt angle and an azimuth angle to match the direction of the parking spaces.

Table 14: Location 1.3 Solar PV Screening Summary.

1.3 Public Safety Complex			
Location	Mounting	Preliminary Inverter AC Nameplate kW	Estimated Annual Energy Generation kWh
Parking Lot	Canopy	30	49,617

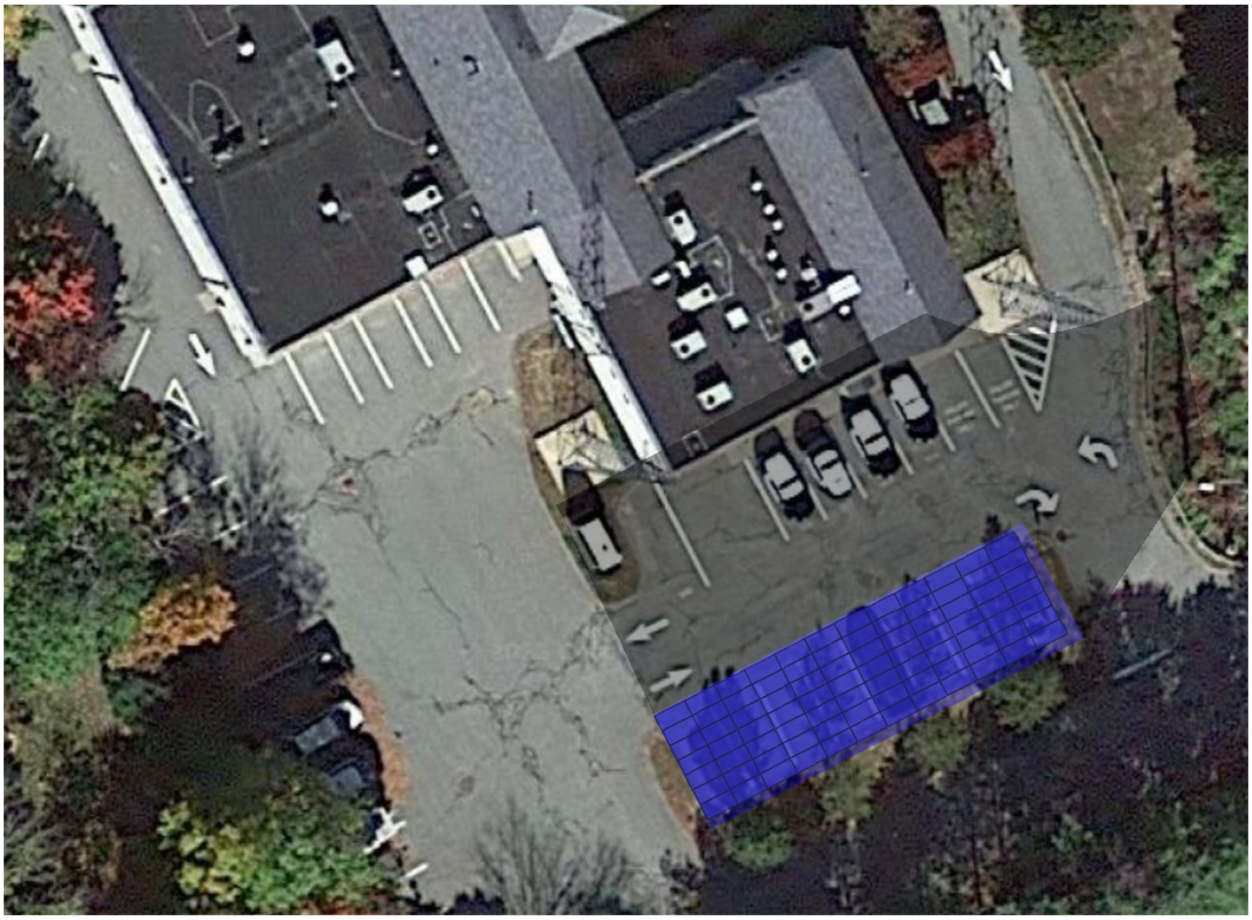


Figure 7: Location 1.3 Panel Layout – Canopy Parking.

Table 15: Location 1.3 Monthly Energy Generation – Canopy Parking.

1.3 Public Safety Complex - Parking Canopy	
Month	Predicted Solar PV Generation
January	2,431
February	3,142
March	4,644
April	5,050
May	5,608
June	5,541
July	6,086
August	5,282
September	4,415
October	3,258
November	2,291
December	1,869
Total	**49,617**

ECONOMIC SCREENING

The high level opinions of probable cost and incentives and the preliminary life cycle cost analysis for the system(s) considered at this location are summarized in the table below.

Table 16: Location 1.3 Preliminary Economic Summary.

Mounting	Estimated SMART Incentive Rate	Estimated Direct Ownership Economics				Estimated PPA	
		Order of Magnitude Construction Cost Estimate	Estimated Year 1 Net Cash Flow	Estimated 20-Year Net Present Value	Estimated Discounted Payback Period	Estimated Year 1 Net Cash Flow	Estimated 20-Year Net Present Value
-	$/kWh	$	$	$	year	$	$
Parking Canopy	$0.057	$266,000	$23,047	$84,549	10	$6,465	$75,970

The potential SMART incentive rate was estimated based on the following information gathered from the "2023 SMART-BTM-Value-of-Energy-Workbook":

Canopy Carport System:

- G-2 NEMA Rate Class, Net-Metered Value of Energy = $0.17173
- Greater than 25 kW AC to 250 kW AC, Block 10 Base Compensation Rate = $0.16847/kWh
- Canopy Solar Tariff Generation Unit, Compensation Rate Adder = $0.06/kWh
- Base Compensation Rate + Compensation Rate Adder – Value of Energy = **Estimated SMART Incentive = $0.057/kWh**

1.4 Burnham Field

Existing Conditions

Burnham Field, also known as Bachelor Street Field, and its parking lot is located on Parcel R14-3B, which is owned by the Town of West Newbury.

Table 17: Location 1.4 existing electric service.

1.4 Burnham Field					
Electric Utility			Main Electric Service		
Account #	Meter #	Rate	Amps	Voltage	Phase
50510-96019	93336179	G1	N/A	N/A	N/A

There is a small building at Burnham Field referred to as the snack shack. The snack shack was locked during the site walkthrough; therefore, the characteristics of the main service entry gear were unknown at the time of this report.

The LGSPI map provided by West Newbury indicates the National Grid primary feeder in the immediate vicinity of the building along Bachelor Street may have sufficient 3-phase capacity to host a solar PV installation.

The graph below shows the snack shack's historical monthly electricity use. Monthly electricity is relatively consistent from year to year. The building uses less than 2,000 kWh of electricity per year. Monthly usage increases during the summer months, likely correlating to more frequent use of the ball fields.

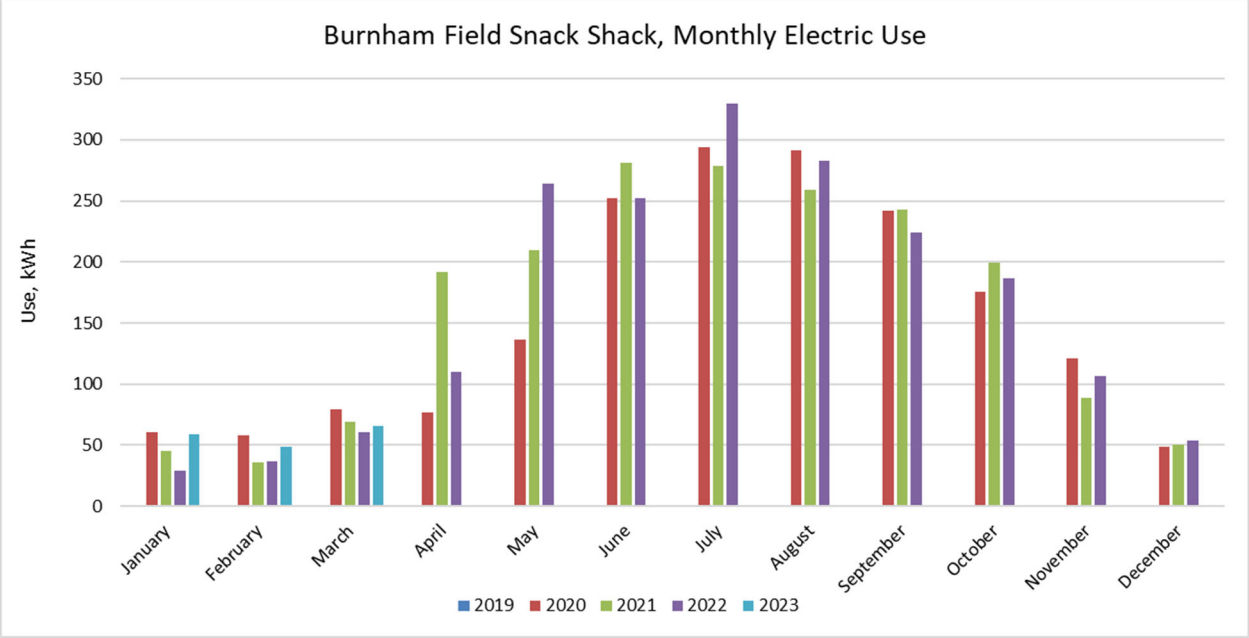


Figure 8: Location 1.4 monthly electricity use.

SOLAR PV REVIEW

TECHNICAL SCREENING

A canopy parking lot solar PV system over the parking lot was considered in this screening study. Rooftop solar PV and ground-mount solar PV were not considered in this study due to the limited space availability and town preferences. It is recommended to engage a licensed geotechnical engineer to assess the condition and suitability of the subsurface conditions to support canopy solar PV systems as part of a future phase of study and/or design.

The preliminary screening results, including AC nameplate power, monthly and annual electricity generation, and panel layouts, for the canopy parking solar PV system are shown in the tables and figure below. The canopy parking lot solar PV system was modeled at a 7° tilt angle and an azimuth angle to match the direction of the parking spaces.

Table 18: Location 1.4 Solar PV Screening Summary.

1.4 Burnham Field			
Location	Mounting	Preliminary Inverter AC Nameplate kW	Estimated Annual Energy Generation kWh
Parking Lot	Canopy	120	177,014

Figure 9: Location 1.4 Panel Layout – Canopy Parking.

Table 19: Location 1.4 Monthly Energy Generation – Canopy Parking.

1.4 Burnham Field - Parking Canopy	
Month	Predicted Solar PV Generation
January	8,680
February	11,211
March	16,563
April	18,106
May	20,138
June	19,757
July	21,615
August	18,779
September	15,710
October	11,601
November	8,184
December	6,670
Total	**177,014**

ECONOMIC SCREENING

The high level opinions of probable cost and incentives and the preliminary life cycle cost analysis for the system(s) considered at this location are summarized in the table below.

Table 20: Location 1.4 Preliminary Economic Summary.

Mounting	Estimated SMART Incentive Rate	Estimated Direct Ownership Economics				Estimated PPA	
		Order of Magnitude Construction Cost Estimate	Estimated Year 1 Net Cash Flow	Estimated 20-Year Net Present Value	Estimated Discounted Payback Period	Estimated Year 1 Net Cash Flow	Estimated 20-Year Net Present Value
-	$/kWh	$	$	$	year	$	$
Parking Canopy	$0.017	$945,000	$75,208	$228,183	12	$29,960	$345,889

The potential SMART incentive rate was estimated based on the following information gathered from the "2023 SMART-BTM-Value-of-Energy-Workbook":

Canopy Carport System:

- G-1 Rate Class, Net-Metered Value of Energy = $0.21144
- Greater than 25 kW AC to 250 kW AC, Block 10 Base Compensation Rate = $0.16847/kWh
- Canopy Solar Tariff Generation Unit, Compensation Rate Adder = $0.06/kWh
- Base Compensation Rate + Compensation Rate Adder – Value of Energy = **Estimated SMART Incentive = $0.017/kWh**

1.5 DPW Garage & Pipestave Recreation Area

Existing Conditions

The Department of Public Works (DPW) Garage, and salt shed, is located on Parcel R22-3, which is owned by the Town of West Newbury. This 200+ acre parcel of land is also home to the Pipestave Recreation Area, which is part of the greater Mill Pond Recreation Area. The recreation area includes a horseback riding ring, ball fields, and trails. The parcel is considered to be a high conservation priority area by the Town.

Table 21: Location 1.5 existing electric service.

1.5 DPW Garage					
Electric Utility			Main Electric Service (each, qty. 2)		
Account #	Meter #	Rate	Amps	Voltage	Phase
13106-14004	12470672	G1	200	120/240V	1

The DPW's existing electrical service is provided by National Grid. The utility transformer was not observed during the walkthrough. The building's main service entry gear is located on the building's east-facing exterior wall. The building has (2) 200A, 1-phase, 3 wire, 120/240VAC distribution panels located in the electric room inside on the first floor. The building's service is provided by two sources: National Grid's utility electric service and a customer-owned, ground-mount solar PV system. There is a net meter located on the building's east-facing exterior wall, as well. The existing solar PV system is designed for approximately 3.4 kW DC based on the panel nameplate ratings observed in the field. DC power is converted to AC power via a Solectria inverter located beneath the array. An inverter nameplate was not observed during the walkthrough to confirm the AC power rating.

The LGSPI map provided by West Newbury indicates the National Grid primary feeder in the immediate vicinity of the building along Main Street may have sufficient 3-phase capacity to host a solar PV installation.

The graph below shows the building's historical monthly electricity use. Note that the usage data shown below is assumed to be the building's net metered utility electricity use and does not include the electricity use from the solar PV system generation. Monthly electricity use is somewhat inconsistent and is typically highest in February and September.

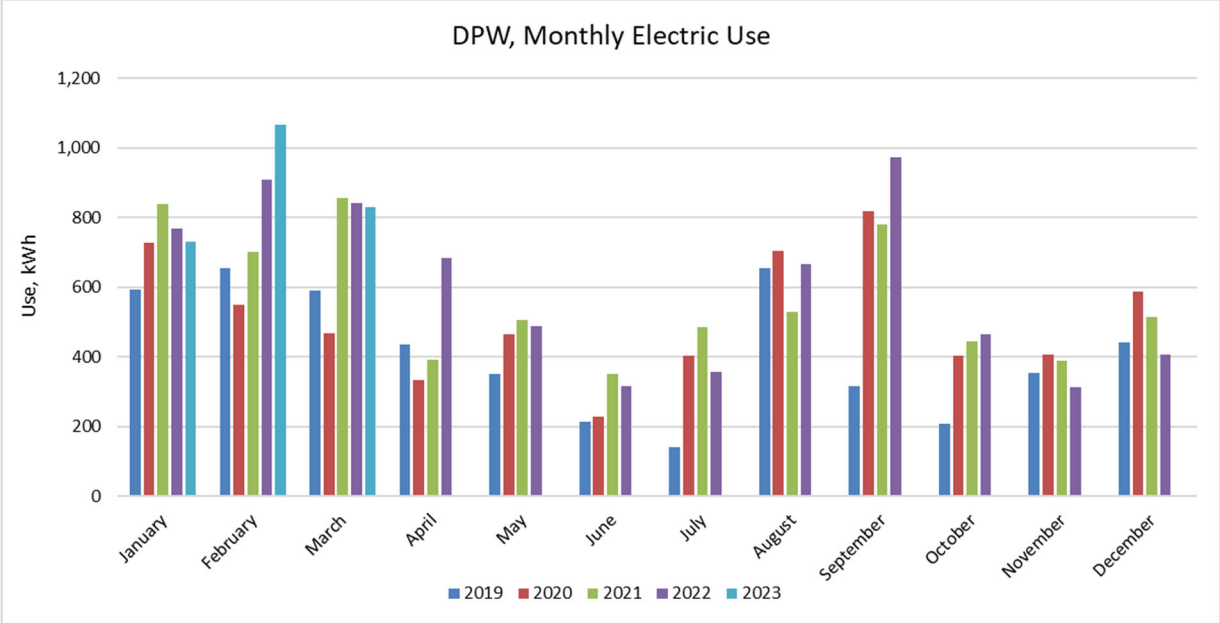


Figure 10: Location 1.5 monthly electricity use.

SOLAR PV REVIEW

TECHNICAL SCREENING

Rooftop solar PV on the salt shed and ground-mount solar PV systems were considered in this screening study at the DPW Garage. Rooftop solar PV on the garage itself was not considered in this study due to the town's concerns with the condition of the roof. It is recommended to engage a licensed professional structural engineer to assess the condition and suitability of the salt shed roof to support a roof-mounted solar PV systems as part of a future phase of study and/or design. The salt shed's structure may not be rated to support additional roof loads. Additionally, large-span canopy parking lot solar PV was considered by the Pipestave Recreation Area. It is recommended to engage a licensed geotechnical engineer to assess the condition and suitability of the subsurface conditions to support canopy solar PV systems as part of a future phase of study and/or design.

The preliminary screening results, including AC nameplate power, monthly and annual electricity generation, and panel layouts, for the solar PV systems are shown in the tables and figures below. The rooftop system was modeled at a 12° tilt angle on the lower section and a 20° tilt angle on the upper section, to match the estimated roof pitch, and an azimuth angle parallel to the lengthwise roof edge. The ground-mount system was modeled at a 30° tilt angle and an azimuth angle of 180°, which is south-facing. The canopy parking lot solar PV system was modeled at a 7° tilt angle and an azimuth angle to match the direction of the parking spaces.

Another potential option the Town may wish to consider in the future is the potential to replace, and potentially upsize, the existing ground-mount system at the site, instead of installing a second, new system. The Evergreen panels observed in the field are each rated for 210 W DC.

Panel technology has since advanced, with more efficient panels rated for 300 – 400 W DC available.

Table 22: Location 1.5 Solar PV Screening Summary.

1.5 DPW Garage / Pipestave Recreation Area			
Location	Mounting	Preliminary Inverter AC Nameplate kW	Estimated Annual Energy Generation kWh
Salt Shed	Rooftop	33	44,149
Open Space	Ground	12	19,881
Parking Lot	Canopy	480	774,705

Figure 11: Location 1.5 Panel Layout – Rooftop.

Table 23: Location 1.5 Monthly Energy Generation – Rooftop.

1.5 DPW Garage - Salt Shed Roof	
Month	Predicted Solar PV Generation
January	2,577
February	3,064
March	4,180
April	4,307
May	4,658
June	4,573
July	4,996
August	4,452
September	3,897
October	3,099
November	2,337
December	2,009
Total	**44,149**

Figure 12: Location 1.5 Panel Layout – Ground-Mount.

Table 24: Location 1.5 Monthly Energy Generation – Ground-Mount.

1.5 DPW Garage - Ground	
Month	Predicted Solar PV Generation
January	1,309
February	1,477
March	1,904
April	1,851
May	1,969
June	1,904
July	2,112
August	1,943
September	1,772
October	1,467
November	1,153
December	1,020
Total	**19,881**

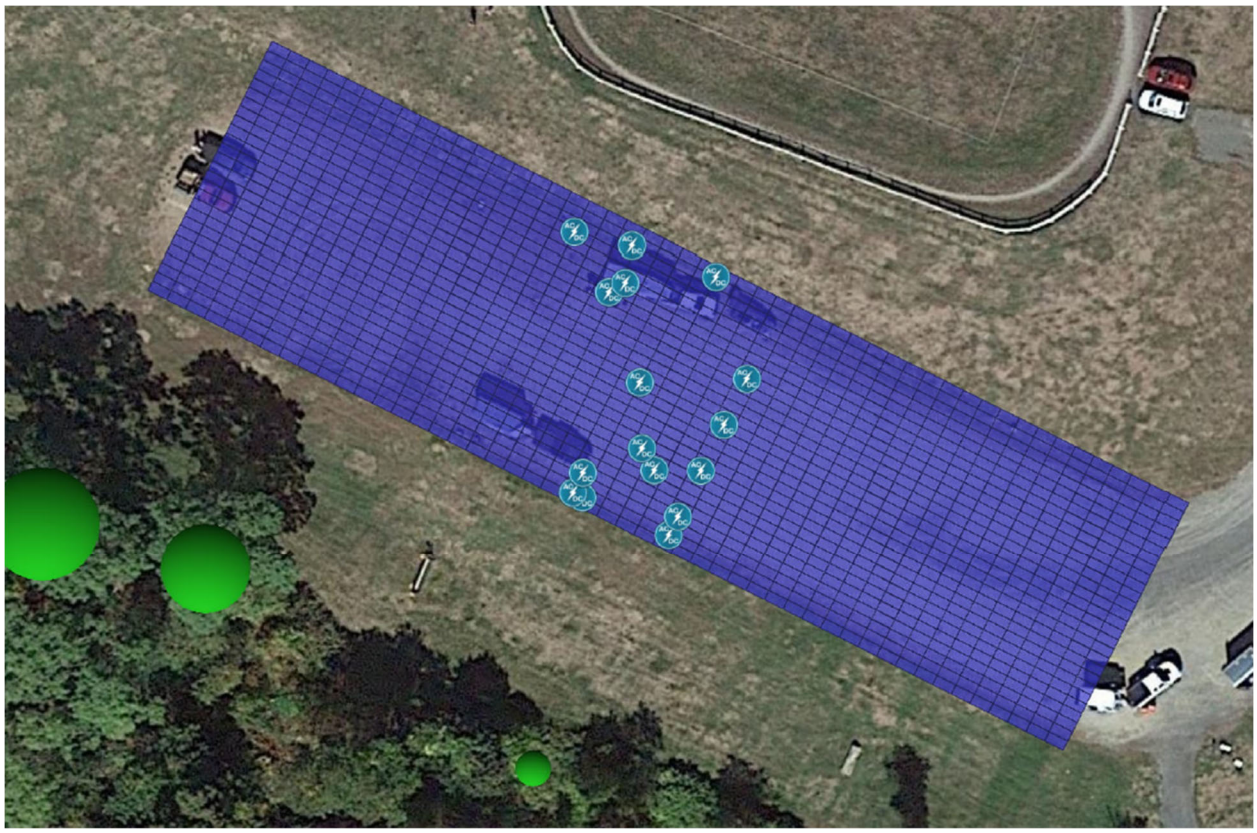


Figure 13: Location 1.5 Panel Layout – Canopy Parking.

Table 25: Location 1.5 Monthly Energy Generation – Canopy Parking.

1.5 Pipestave Recreation - Parking Canopy	
Month	Predicted Solar PV Generation
January	37,498
February	48,894
March	72,692
April	78,681
May	88,308
June	86,928
July	94,969
August	82,711
September	68,935
October	50,484
November	35,827
December	28,778
Total	**774,705**

ECONOMIC SCREENING

The high level opinions of probable cost and incentives and the preliminary life cycle cost analysis for the system(s) considered at this location are summarized in the table below.

Table 26: Location 1.5 Preliminary Economic Summary.

Mounting	Estimated SMART Incentive Rate	Estimated Direct Ownership Economics				Estimated PPA	
		Order of Magnitude Construction Cost Estimate	Estimated Year 1 Net Cash Flow	Estimated 20-Year Net Present Value	Estimated Discounted Payback Period	Estimated Year 1 Net Cash Flow	Estimated 20-Year Net Present Value
-	$/kWh	$	$	$	year	$	$
Rooftop	-	$129,500	$18,119	$124,219	5	$13,584	$160,767
Ground	$0.013	$42,000	$8,563	$72,067	3	$6,288	$74,862
Parking Canopy	-	$4,165,000	$315,880	$833,494	13	$144,054	$1,654,214

The potential SMART incentive rates were estimated based on the following information gathered from the "2023 SMART-BTM-Value-of-Energy-Workbook":

<u>Rooftop System:</u>

- G-1 Rate Class, Net-Metered Value of Energy = $0.21144
- Greater than 25 kW AC to 250 kW AC, Block 10 Base Compensation Rate = $0.16847/kWh
- Building Mounted Solar Tariff Generation Unit, Compensation Rate Adder = $0.0192/kWh
- Base Compensation Rate + Compensation Rate Adder – Value of Energy = **Estimated SMART Incentive = $0.00/kWh**

Ground-Mount System:

- G-1 Rate Class, Net-Metered Value of Energy = $0.21144
- Less than or equal to 25 kW AC, Block 10 Base Compensation Rate = $0.22463/kWh
- No Compensation Rate Adders
- Base Compensation Rate + Compensation Rate Adder – Value of Energy = **Estimated SMART Incentive = $0.013/kWh**

Canopy Carport System:

The SMART program offers an Alternative On-Bill Credit for systems interconnected as standalone systems, not serving on-site loads behind-the-meter. Based on information published on the DOER's website, Alternative On-Bill Credits are only available for systems that are unable to receive net metering credits. This screening study assumes that net metering will be available, and therefore assumes that SMART program incentives will not be offered for any standalone systems.

1.6 PAGE SCHOOL

EXISTING CONDITIONS

The Dr. John C Page School, also known as the Page School, is an elementary school located on Parcel R23-23, which is owned by the Town of West Newbury. The 120+ acre parcel is considered to be a high conservation priority area by the Town and is adjacent to the Riverbend Conservation Area, which is on Parcel R25-17 and R25-20.

Table 27: Location 1.6 existing electric service.

1.6 Page School					
Electric Utility			Main Electric Service		
Account #	Meter #	Rate	Amps	Voltage	Phase
35062-33006	25140352	G2	4000	120/208	3

The Page School's existing electrical service is provided via a National Grid 13.2 kV grid-Y /7.62 kV primary – 208 V Y / 120 V secondary service, pad mount utility transformer located in front of the building. The building's main service entry gear is located at ground level in an electric room. The existing service entrance switchboard is 4000A, 3 phase, 4 wire, 208Y/120VAC. The existing main distribution panel has two 400A spare positions, as well as several blank positions.

The LGSPI map provided by West Newbury indicates the National Grid primary feeder in the immediate vicinity of the building along Main Street may have sufficient 3-phase capacity to host a solar PV installation.

The Main Street Solar Project is located on the same property as the Page School but is not associated with nor interconnected with the school. The solar PV system is a ground-mount system owned and operated by a 3rd party. Electricity generated by the system is used by other municipal buildings via virtual net metering.

The graph below shows the building's historical monthly electricity use. Monthly electricity use is relatively consistent each month, which the exception of 2020. Lower usage in 2020 is likely attributed to reduced occupancy from the COVID-19 pandemic.

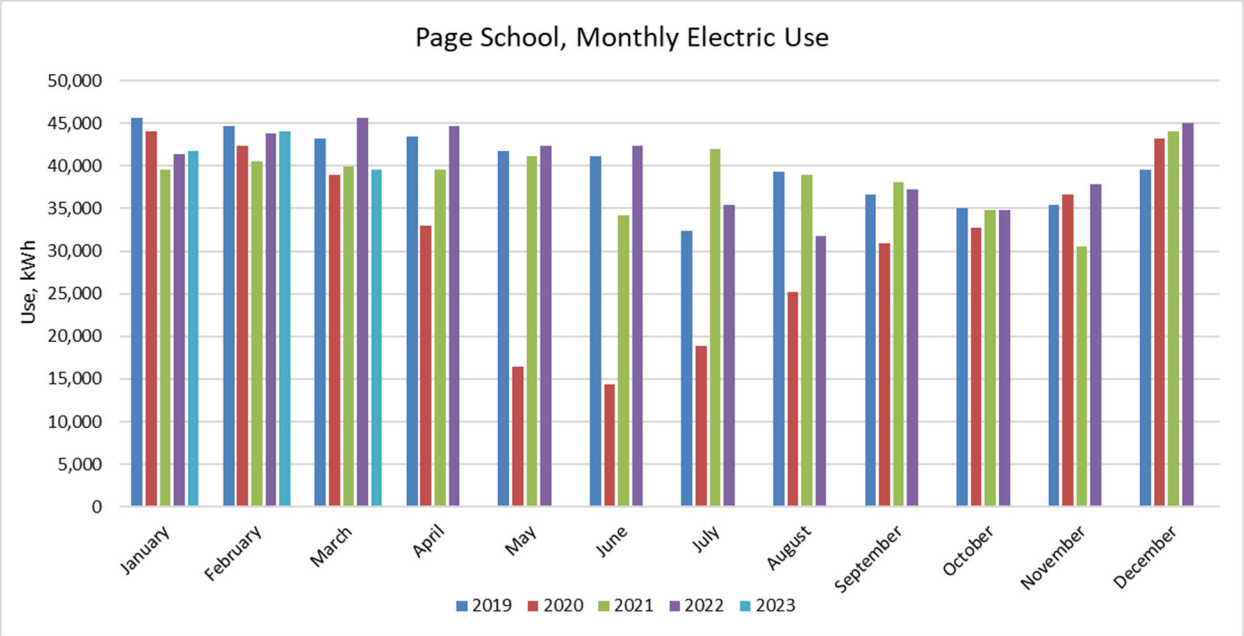


Figure 14: Location 1.6 monthly electricity use.

SOLAR PV REVIEW

TECHNICAL SCREENING

A ground-mount solar PV system in the open land behind the school was considered in this screening study. Rooftop solar PV and canopy parking lot solar PV were not considered in this primarily due to town preferences.

The preliminary screening results, including AC nameplate power, monthly and annual electricity generation, and panel layouts, for the ground-mount solar PV system are shown in the tables and figure below. The ground-mount systems were modeled at a 30° tilt angle and an azimuth angle of 180°, which is south-facing.

Table 28: Location 1.6 Solar PV Screening Summary.

1.6 Page School			
Location	Mounting	Preliminary Inverter AC Nameplate kW	Estimated Annual Energy Generation kWh
Open Space	Ground	250	391,187

Figure 15: Location 1.6 Panel Layout – Ground-Mount.

Table 29: Location 1.6 Monthly Energy Generation – Ground-Mount.

1.6 Page School - Ground	
Month	Predicted Solar PV Generation
January	24,534
February	29,178
March	38,699
April	37,541
May	39,226
June	37,279
July	41,542
August	38,367
September	35,171
October	28,974
November	22,112
December	18,564
Total	**391,187**

ECONOMIC SCREENING

The high level opinions of probable cost and incentives and the preliminary life cycle cost analysis for the system(s) considered at this location are summarized in the table below.

Table 30: Location 1.6 Preliminary Economic Summary.

Mounting	Estimated SMART Incentive Rate	Estimated Direct Ownership Economics				Estimated PPA	
		Order of Magnitude Construction Cost Estimate	Estimated Year 1 Net Cash Flow	Estimated 20-Year Net Present Value	Estimated Discounted Payback Period	Estimated Year 1 Net Cash Flow	Estimated 20-Year Net Present Value
-	$/kWh	$	$	$	year	$	$
Ground	-	$810,000	$79,715	$371,546	8	$45,073	$524,583

The potential SMART incentive rate was estimated based on the following information gathered from the "2023 SMART-BTM-Value-of-Energy-Workbook":

Ground-Mount System:

- G-2 NEMA Rate Class, Net-Metered Value of Energy = $0.17173
- Greater than 25 kW AC to 250 kW AC, Block 10 Base Compensation Rate = $0.16847/kWh
- No Compensation Rate Adders
- Base Compensation Rate + Compensation Rate Adder – Value of Energy = **Estimated SMART Incentive = $0.00/kWh**

1.7 DUNN PROPERTY

EXISTING CONDITIONS

The Dunn Property, consisting of the North, Central, and South Dunn Fields, is located on Parcel R26-19, which is owned by the Town of West Newbury. The 70+ acre parcel is considered to be a high conservation priority area by the Town.

There are not any existing local electrical services or loads located at the fields.

The LGSPI map provided by West Newbury indicates the National Grid primary feeder in the immediate vicinity of the property along Chase Street does not have any 3-phase service or capacity. Based on measurement estimates acquired from Google Earth, the North Dunn Field appears to be within the 1000-foot boundary of 3-phase utility infrastructure on Main Street. However, the South Dunn Field is outside of the 1000-foot boundary. Further review would be required to determine if solar PV systems at the Dunn Property could be interconnected to existing utility infrastructure on Main Street, or the scope of potential utility infrastructure upgrades on Chase Street to upgrade to 3-phase power.

SOLAR PV REVIEW

TECHNICAL SCREENING

Ground-mount solar PV systems in the open land in the North and South Dunn Fields were considered in this screening study.

The preliminary screening results, including AC nameplate power, monthly and annual electricity generation, and panel layouts, for the ground-mount solar PV systems are shown in the tables and figures below. The ground-mount systems were modeled at a 30° tilt angle and an azimuth angle of 180°, which is south-facing.

Table 31: Location 1.7 Solar PV Screening Summary.

1.7 Dunn Property			
Location	Mounting	Preliminary Inverter AC Nameplate kW	Estimated Annual Energy Generation kWh
North Field	Ground	300	480,886
South Field	Ground	938	1,505,731

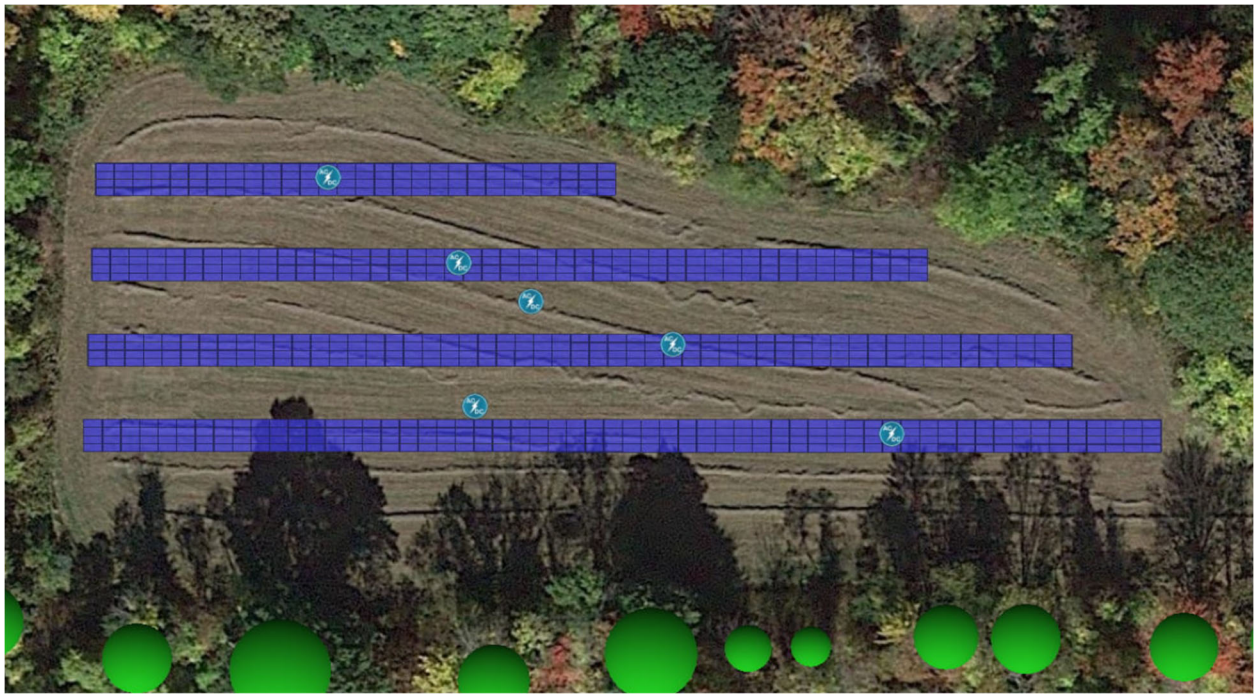


Figure 16: Location 1.7 Panel Layout – North Field.

Table 32: Location 1.7 Monthly Energy Generation – North Field.

1.7 Dunn Property - North Field	
Month	Predicted Solar PV Generation
January	30,813
February	35,831
March	47,279
April	45,883
May	47,998
June	45,638
July	50,836
August	46,946
September	43,031
October	35,489
November	27,374
December	23,768
Total	**480,886**

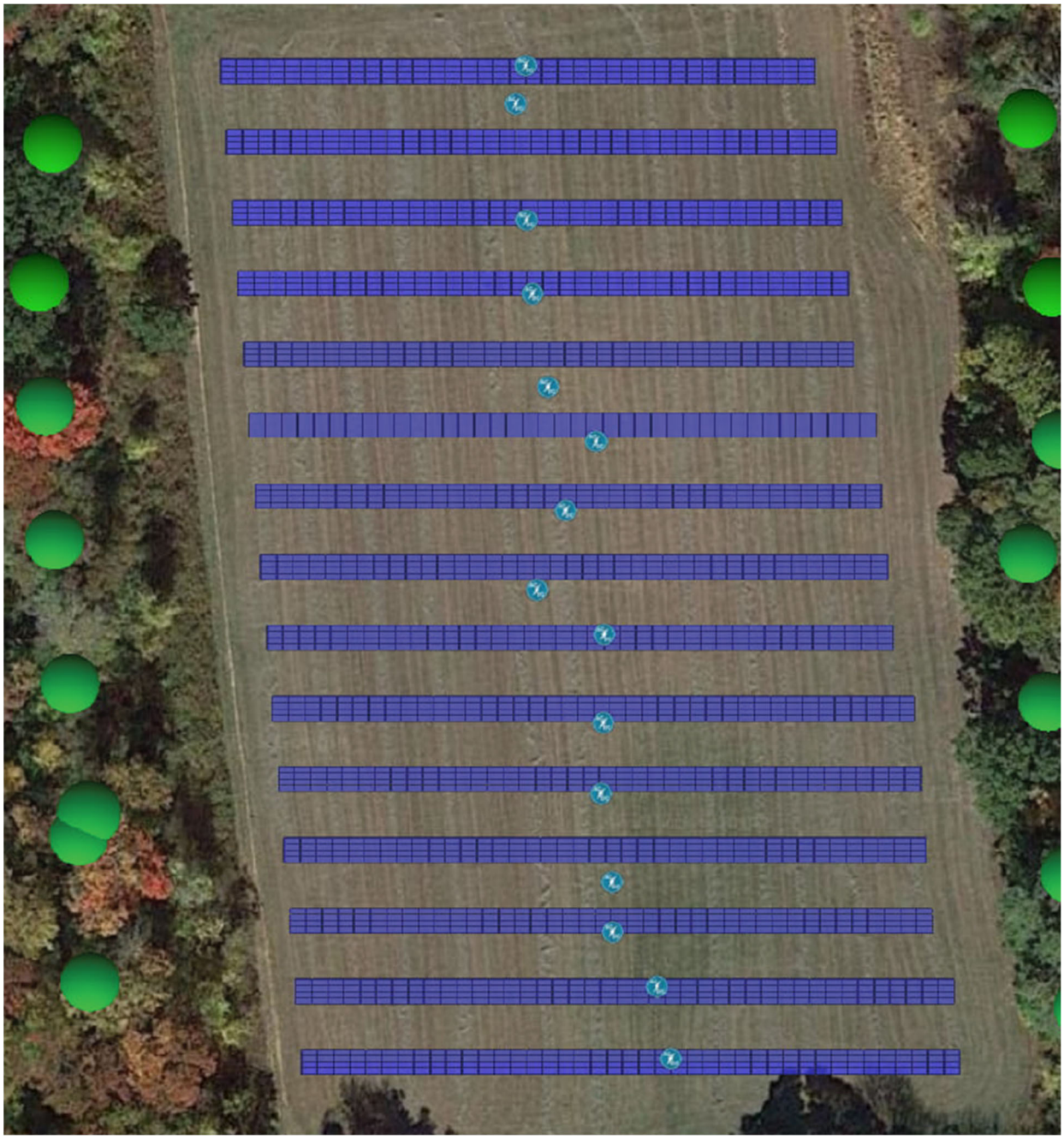


Figure 17: Location 1.7 Panel Layout – South Field.

Table 33: Location 1.7 Monthly Energy Generation – South Field.

1.7 Dunn Property - South Field	
Month	Predicted Solar PV Generation
January	100,805
February	118,664
March	151,585
April	141,379
May	143,883
June	134,861
July	151,436
August	143,618
September	136,599
October	116,864
November	90,556
December	75,481
Total	**1,505,731**

ECONOMIC SCREENING

The high level opinions of probable cost and incentives and the preliminary life cycle cost analysis for the system(s) considered at this location are summarized in the table below.

Table 34: Location 1.7 Preliminary Economic Summary.

Mounting	Estimated SMART Incentive Rate	Estimated Direct Ownership Economics				Estimated PPA	
		Order of Magnitude Construction Cost Estimate	Estimated Year 1 Net Cash Flow	Estimated 20-Year Net Present Value	Estimated Discounted Payback Period	Estimated Year 1 Net Cash Flow	Estimated 20-Year Net Present Value
-	$/kWh	$	$	$	year	$	$
Ground	-	$993,000	$196,768	$1,642,714	3	$154,166	$1,828,675
Ground	-	$3,300,000	$614,967	$4,992,348	3	$482,718	$5,725,875

The SMART program offers an Alternative On-Bill Credit for systems interconnected as standalone systems, not serving on-site loads behind-the-meter. Based on information published on the DOER's website, Alternative On-Bill Credits are only available for systems that are unable to receive net metering credits. This screening study assumes that net metering will be available, and therefore assumes that SMART program incentives will not be offered for any standalone systems.

OTHER SCREENING FACTORS

SOLAR TRACKING SYSTEMS

The purpose of solar tracking systems is to change the position of the solar panels based on the position of the sun to maximize output. Solar tracking systems are most commonly seen on ground-mounted solar PV systems, rather than rooftop or carport, due to the increased size and weight. Manual tracking systems need to be manually adjusted by the owner's personnel, which could be done seasonally. Active tracking systems automatically change position based on the position of the sun using motors or hydraulic systems. There are generally two types of solar tracking systems: single-axis and dual-axis. Single-axis tracking systems move from east to west, while dual-axis systems also move from north to south. Solar tracking systems can increase output in the range of 20-40%. However, including a solar tracking system will increase not only the upfront installation costs, but also the annual operations and maintenance cost. The SMART program offers a compensation rate adder of $0.01/kWh for eligible solar PV systems with solar trackers.

The list below summarizes the locations where ground-mount systems were screened, which could be potentially paired with a solar tracking system:

- 1.1 Housing Authority
- 1.5 DPW Garage
- 1.6 Page School
- 1.7 Dunn Property, North and South Dunn Fields

It is recommended to complete further design and cost-benefit analysis in the next phase of study, if West Newbury is interested in exploring solar tracking systems at these locations further.

COMMUNITY SOLAR

Installing a community solar project in West Newbury would create the opportunity for local residents and business owners to share the benefits of solar power. Community solar projects are generally large-scale PV systems, in the range of 0.5 MW up to 20 MW. Community solar programs in Massachusetts typically utilize the virtual net metering bill crediting system. On average, most National Grid community solar subscribers in Massachusetts can save 5-10% on their annual electricity costs[3]. If the installer is pursuing incentives from the SMART program, they could be eligible for up to a $0.03064/kWh compensation rate adder for community shared solar projects.

The list below suggests two locations screened in this study, which the Town may want to consider discussing potential community solar eligibility with National Grid during future phases of study and design. These locations are larger-scale PV systems with no local loads to serve, so they may be viable candidates for community solar projects.

- 1.5 Pipestave Recreation, Parking Lot

[3] https://www.energysage.com/local-data/community-solar/ma/national-grid/

- 1.7 Dunn Property, South Dunn Field

BATTERY ENERGY STORAGE SYSTEMS

Battery energy storage system (BESS) is an electrochemical energy storage device that allows energy to be stored for extended durations and be released as needed or directed by the owner. The BESS is bi-directional, allowing it to be charged as a load on the electric system and discharged as a source of electric energy. The BESS can be charged by the utility grid, or via any combination of on-site distributed energy resources (DERs), such as solar PV systems. The BESS stores this charged energy until it is needed, then releases it onto the electrical distribution system as required. The most common electrochemical technology used today is lithium-ion batteries. Other types of electrochemical energy storage include lead acid, sodium sulfur, sodium nickel chloride, and flow batteries. A technical datasheet for an example lithium-ion BESS is attached in Appendix B. This example battery is rated for 125 kW and 2, 4, or 6 hours of storage.

The BESS can be used for several applications, including demand response, peak shaving, off-grid resiliency, and frequency regulation. Customers can enroll their BESS in demand response programs, such as National Grid's Connected Solutions Daily Dispatch program, which offers incentives of $200 per average kW reduction each season. The Daily Dispatch season is June through September, with most events occurring in July and August. There are typically 30 to 60 events per year, each lasting 2-3 hours.

Customers can also utilize their BESS as a power source, when grid power is unavailable, to power standby loads in a building. Common commercial-scale battery storage duration times typically range from 1-6 hours, depending on the customers energy resilience goals. Further, the BESS would provide a reference voltage during a grid outage, which would allow any co-located solar PV systems to generate electricity to power the standby loads or to recharge the battery, while sunlight is available.

Battery energy storage systems could be procured directly by the Town or through a PPA by a 3rd party provider. Batteries may be eligible for the federal ITC, either as a standalone asset or when paired with solar PV, based on available information published online by the US Department of Energy. Further, pairing a BESS with a solar PV system could increase the potential SMART incentive rate through the energy storage compensation adder.

The list below summarizes the locations where behind-the-meter solar PV systems were considered, which could potentially be paired with a BESS:

- 1.1 Housing Authority
  - During the walkthrough, the Town mentioned that Housing Authority stakeholders are interested in implementing off-grid capable DERs to maintain safe, comfortable conditions for residents during extended grid power outages. The Town may want to further consider a BESS at this location during future phases of study and design.
- 1.2 1910 Building
- 1.3 Public Safety Complex

    - The Town may be interested in further improving the energy resiliency of the Public Safety Complex, home to both the police and fire station. There is an existing on-site diesel generator to provide standby power during a grid outage event, but the Town may want to further consider adding a BESS at this location during future phases of study and design.
- 1.5 DPW Garage
- 1.6 Page School

As a next step, we recommend that the Town discuss their energy resilience goals amongst its stakeholders to determine the level of interest in considering battery energy storage at one, or more, of the sites listed above.

RESILIENCY

Solar PV systems are not energy resilient as a standalone asset, and therefore cannot generate electricity if grid power is not available, if it is in the only on-site DER. Solar PV systems require a reference voltage from another source, such as the utility grid or an on-site BESS. If a solar PV system is co-located with a BESS, then the solar PV system could generate electricity to power building loads or to charge the battery, while sunlight is available. The list in the section includes locations which may be favorable for solar PV systems paired with a BESS, as discussed above.

Sites which may have multiple DERs, such as solar PV, BESS, wind, and/or fossil fuel generators, could explore integrating all these assets together to operate as a microgrid. Additional programming and controls, including a system supervisory controller, also known as a microgrid controller, would be required to control each of the assets during both normal, grid-tied mode and resilient, off-gird mode. During normal operations, the solar PV could generate electricity to power building loads, the BESS could discharge to reduce the building's peak demand or participate in demand response events, and the generator would be off. During off-grid operations, the solar PV could generate electricity during the day to meet standby building loads, while the battery either discharges and "trims" to meet the remaining loads, or charges from excess solar PV generation. At night, when the solar PV is unavailable, the battery could discharge to meet standby loads, until it reaches a predetermined minimum state of charge, then the generator could run, as needed. Adding solar PV and battery energy storage to a building that has an existing standby generator could allow the customer to not only reduce their dependence on fuel deliveries during a potential emergency, but also meet their building loads with renewable electricity, instead of fossil fuels.

Some microgrids are configured to serve one building, while others are tied to several buildings. The Town has been exploring the feasibility of implementing a community microgrid at the "Municipal Campus," which includes the 1910 Building, the Annex, the Housing Authority, and the Public Safety Complex (Locations 1.1, 1.2, and 1.3), which was studied in feasibility study completed by another consultant in 2018. If the Town is interested in pursing a community microgrid further, we recommend commencing a more detailed feasibility study to explore how the solar PV systems screened in this study could be paired with existing, or new, diesel generators and new battery energy storage systems to provide resilient power to the Municipal Campus during grid-outage events.

1.1 Housing Authority Ground West Newbury 381 Main St, West Newbury, MA 01985, USA

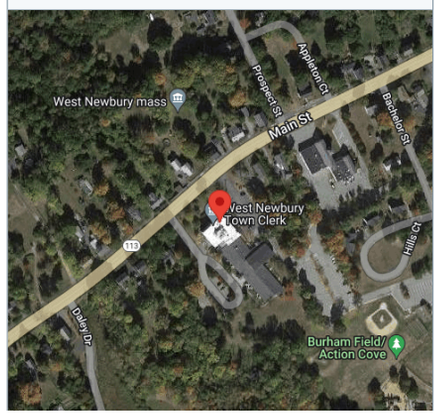
Project Details

Address	381 Main St, West Newbury, MA 01985, USA
Owner	Gabrielle Cole
Last Modified	Gabrielle Cole a minute ago
Location	(42.80050330000001, -70.9892665) (GMT -5)
Profile	Default Commercial

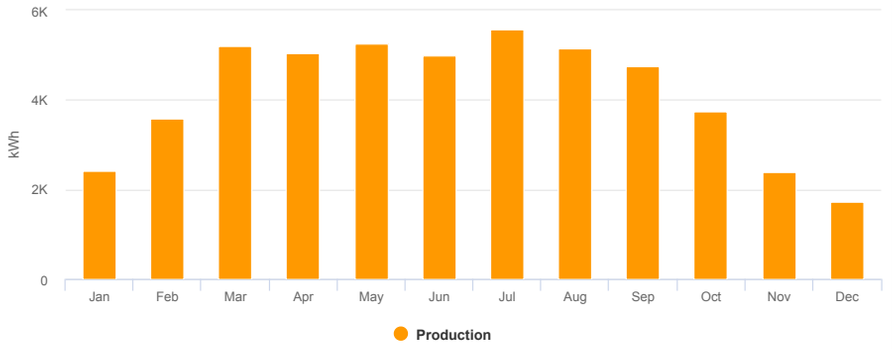
System Metrics

Design	1.1 Housing Authority Ground
Module DC Nameplate	36.9 kW
Inverter AC Nameplate	33.3 kW Load Ratio: 1.11
Annual Production	49.8 MWh
Performance Ratio	79.2%
kWh/kWp	1,350.6
Weather Dataset	TMY, 10km grid (42.85,-70.95), NREL (prospector)
Simulator Version	670ad8e266-60b9f88dc3-7fd752c342-6de52fe339

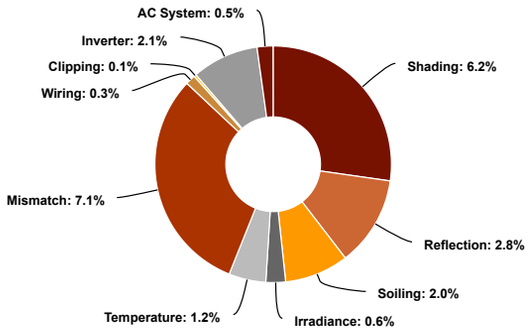
Project Location



Production



System Loss



Annual Production

	Description	Output	% Delta
Irradiance (kWh/m²)	Annual Global Horizontal Irradiance	1,427.4	-
	POA Irradiance	1,704.7	19.4%
	Shaded Irradiance	1,598.7	-6.2%
	Irradiance After Reflection	1,553.8	-2.8%
	Irradiance After Soiling	1,522.7	-2.0%
	Total Collector Irradiance	**1,522.6**	**-0.0%**
Energy (kWh)	Nameplate	56,241.0	-
	Output at Irradiance Levels	55,897.3	-0.6%
	Output at Cell Temperature Derate	55,249.7	-1.2%
	Output After Mismatch	51,352.1	-7.1%
	Optimal DC Output	51,191.1	-0.3%
	Constrained DC Output	51,153.9	-0.1%
	Inverter Output	50,087.6	-2.1%
	Energy to Grid	**49,837.1**	**-0.5%**

Temperature Metrics	
Avg. Operating Ambient Temp	11.9°C
Avg. Operating Cell Temp	20.0°C

Simulation Metrics	
Operating Hours	4,669
Solved Hours	4,669
Pending Hours	-
Error Hours	-

Condition Set

Description	Condition Set 1
Weather Dataset	TMY10km grid (42.85,-70.95)NREL(prospector) (download)
Solar Angle Location	Meteo Lat/Lng
Transposition Model	Perez Model
Temperature Model	Sandia Model

Temperature Model Parameters

Rack Type	a	b	Temperature Delta
Fixed Tilt	-3.56	-0.08	3.0°C
Flush Mount	-2.81	-0.05	0.0°C
East-West	-3.56	-0.08	3.0°C
Carport	-3.56	-0.08	3.0°C

Soiling (%)

J	F	M	A	M	J	J	A	S	O	N	D
2	2	2	2	2	2	2	2	2	2	2	2

Irradiation Variance	5.0%
Cell Temperature Spread	4.0°C
Module Binning Range	-2.5% to 2.5%
AC System Derate	0.50%

Component Characterizations

Type	Component	Characterization
Module	LG450S2W-U6 (1000V) (LG)	Spec Sheet Characterization,PAN
Inverter	Sunny Tripower_Core1 33-US-41 (SMA)	Default Characterization

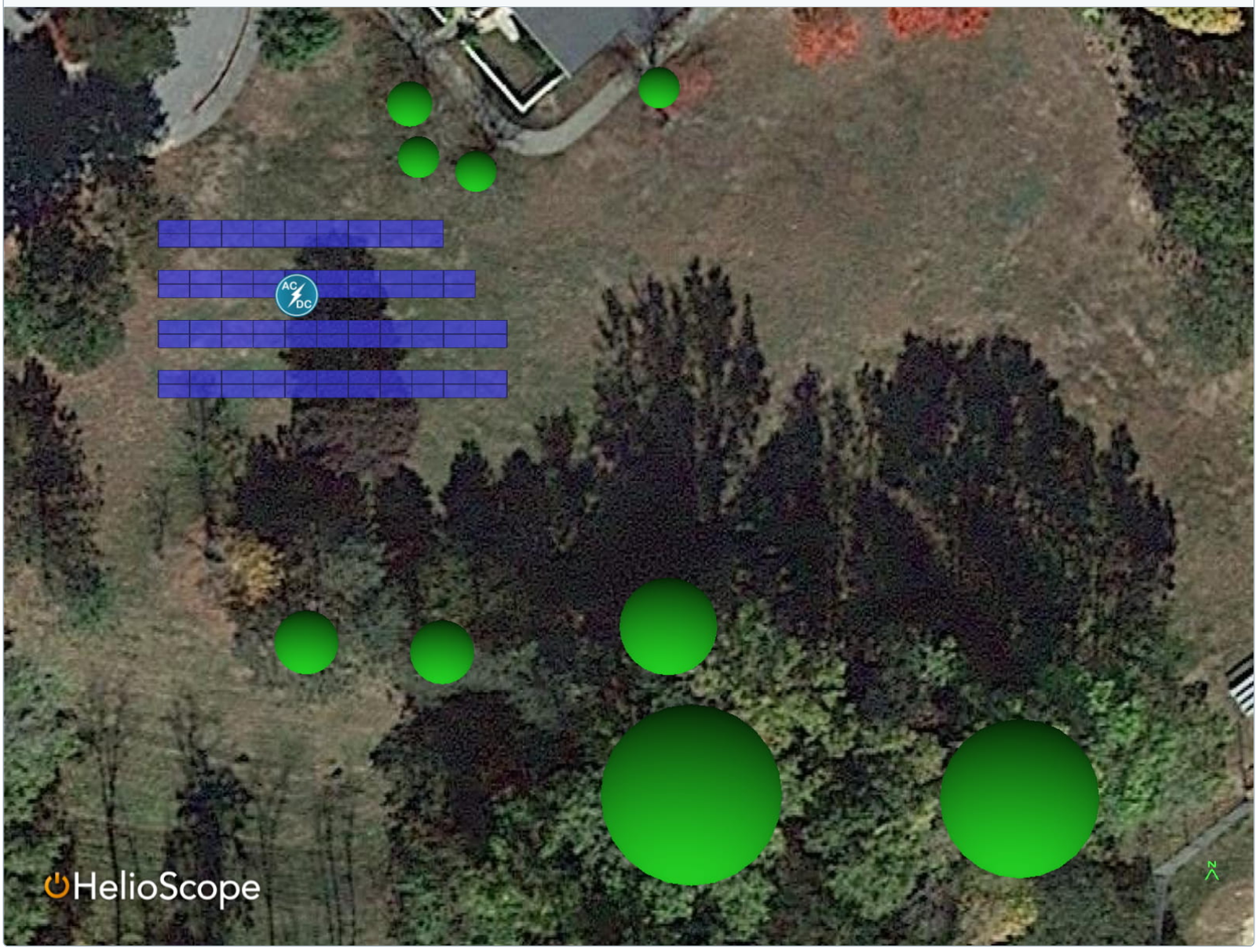
Design BOM

Component	Type	Quantity
2 input Combiners	Combiners	1
3 input Combiners	Combiners	1
12 AWG (Copper)	Home Runs	2
Sunny Tripower_Core1 33-US-41	Inverters	1
LG450S2W-U6 (1000V)	Modules	82
10 AWG (Copper)	Strings	5

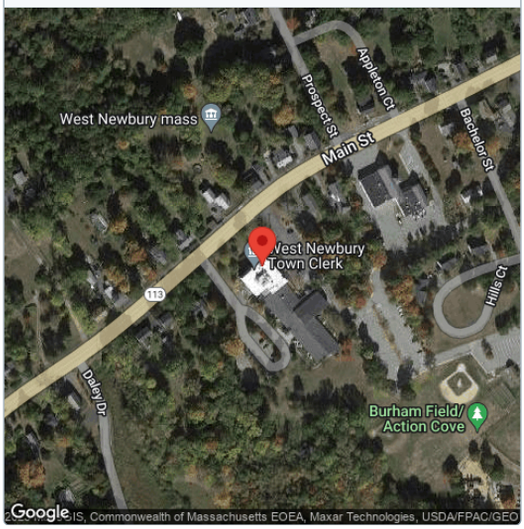
Monthly Shading

Month	GHI (kWh/m^2)	POA (kWh/m^2)	Shaded (kWh/m^2)	Nameplate (kWh)	Grid (kWh)
January	60.4	105.1	86.5	3,042.2	2,420.2
February	81.1	119.6	110.2	3,879.0	3,572.2
March	125.9	160.6	155.6	5,479.1	5,200.6
April	146.3	161.4	155.9	5,488.4	5,042.6
May	169.5	172.3	165.6	5,820.5	5,262.5
June	171.2	167.5	160.4	5,624.8	4,993.9
July	188.3	188.2	181.2	6,367.3	5,584.4
August	160.2	172.7	166.6	5,862.4	5,163.4
September	128.4	155.6	150.8	5,311.2	4,741.9
October	89.4	125.1	118.7	4,183.6	3,745.1
November	60.3	94.8	82.0	2,885.6	2,388.1
December	46.4	81.9	65.3	2,296.8	1,722.3

Design Render



Project Location



Design Wiring Zone

Description	Combiner Poles	String Size	Stringing Strategy
Wiring Zone	12	4 - 17	Along Racking

Field Segments

Description	Racking	Orientation	Tilt	Azimuth	Intrarow Spacing	Frame Size	Frames	Modules	Power
Field Segment 1	Fixed Tilt	Landscape (Horizontal)	30°	180°	5.0 ft	2x1	41	82	36.90 kW

1.1 Housing Authority Rooftop West Newbury 381 Main St, West Newbury, MA 01985, USA

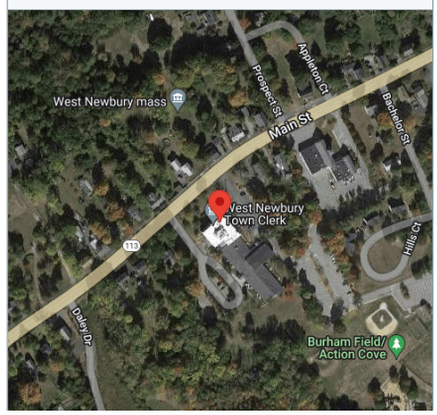
Project Details

Address	381 Main St, West Newbury, MA 01985, USA
Owner	Gabrielle Cole
Last Modified	Gabrielle Cole a few seconds ago
Location	(42.80050330000001, -70.9892665) (GMT -5)
Profile	Default Commercial

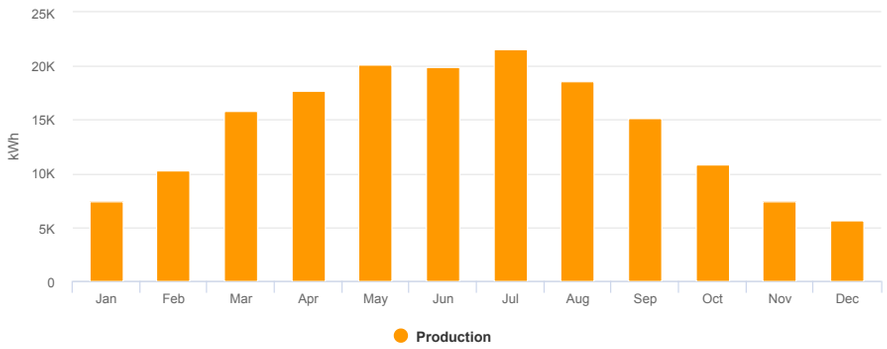
System Metrics

Design	1.1 Housing Authority Rooftop
Module DC Nameplate	146.7 kW
Inverter AC Nameplate	133.2 kW Load Ratio: 1.10
Annual Production	170.4 MWh
Performance Ratio	80.6%
kWh/kWp	1,161.6
Weather Dataset	TMY, 10km grid (42.85,-70.95), NREL (prospector)
Simulator Version	e0419dc019-dcabad097e-4d5d0f02fa-0e176ffd8f

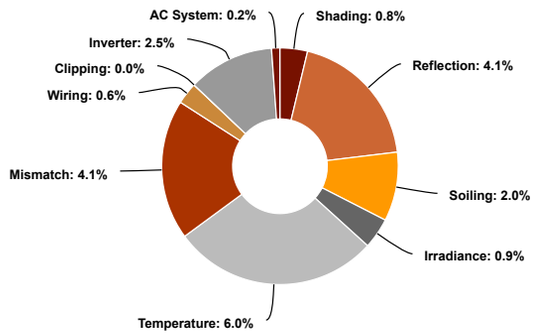
Project Location



Production



System Loss



Annual Production

	Description	Output	% Delta
Irradiance (kWh/m²)	Annual Global Horizontal Irradiance	1,427.4	-
	POA Irradiance	1,440.4	0.9%
	Shaded Irradiance	1,429.0	-0.8%
	Irradiance After Reflection	1,370.4	-4.1%
	Irradiance After Soiling	1,343.0	-2.0%
	Total Collector Irradiance	**1,343.0**	**0.0%**
Energy (kWh)	Nameplate	197,209.7	-
	Output at Irradiance Levels	195,456.6	-0.9%
	Output at Cell Temperature Derate	183,778.0	-6.0%
	Output After Mismatch	176,302.5	-4.1%
	Optimal DC Output	175,193.7	-0.6%
	Constrained DC Output	175,191.7	-0.0%
	Inverter Output	170,812.0	-2.5%
	Energy to Grid	**170,400.0**	**-0.2%**

Temperature Metrics	
Avg. Operating Ambient Temp	11.9°C
Avg. Operating Cell Temp	26.6°C

Simulation Metrics	
Operating Hours	4,669
Solved Hours	4,669
Pending Hours	-
Error Hours	-

Condition Set

Description	Condition Set 1
Weather Dataset	TMY10km grid (42.85,-70.95)NREL(prospector) (download)
Solar Angle Location	Meteo Lat/Lng
Transposition Model	Perez Model
Temperature Model	Sandia Model

Temperature Model Parameters

Rack Type	a	b	Temperature Delta
Fixed Tilt	-3.56	-0.08	3.0°C
Flush Mount	-2.81	-0.05	0.0°C
East-West	-3.56	-0.08	3.0°C
Carport	-3.56	-0.08	3.0°C

Soiling (%)

J	F	M	A	M	J	J	A	S	O	N	D
2	2	2	2	2	2	2	2	2	2	2	2

Irradiation Variance	5.0%
Cell Temperature Spread	4.0°C
Module Binning Range	-2.5% to 2.5%
AC System Derate	0.50%

Component Characterizations

Type	Component	Characterization
Module	LG450S2W-U6 (1000V) (LG)	Spec Sheet Characterization,PAN
Module	LG450S2W-U6 (1000V) (LG)	Spec Sheet Characterization,PAN
Inverter	Sunny Tripower CORE1 33-US (SMA)	Spec Sheet

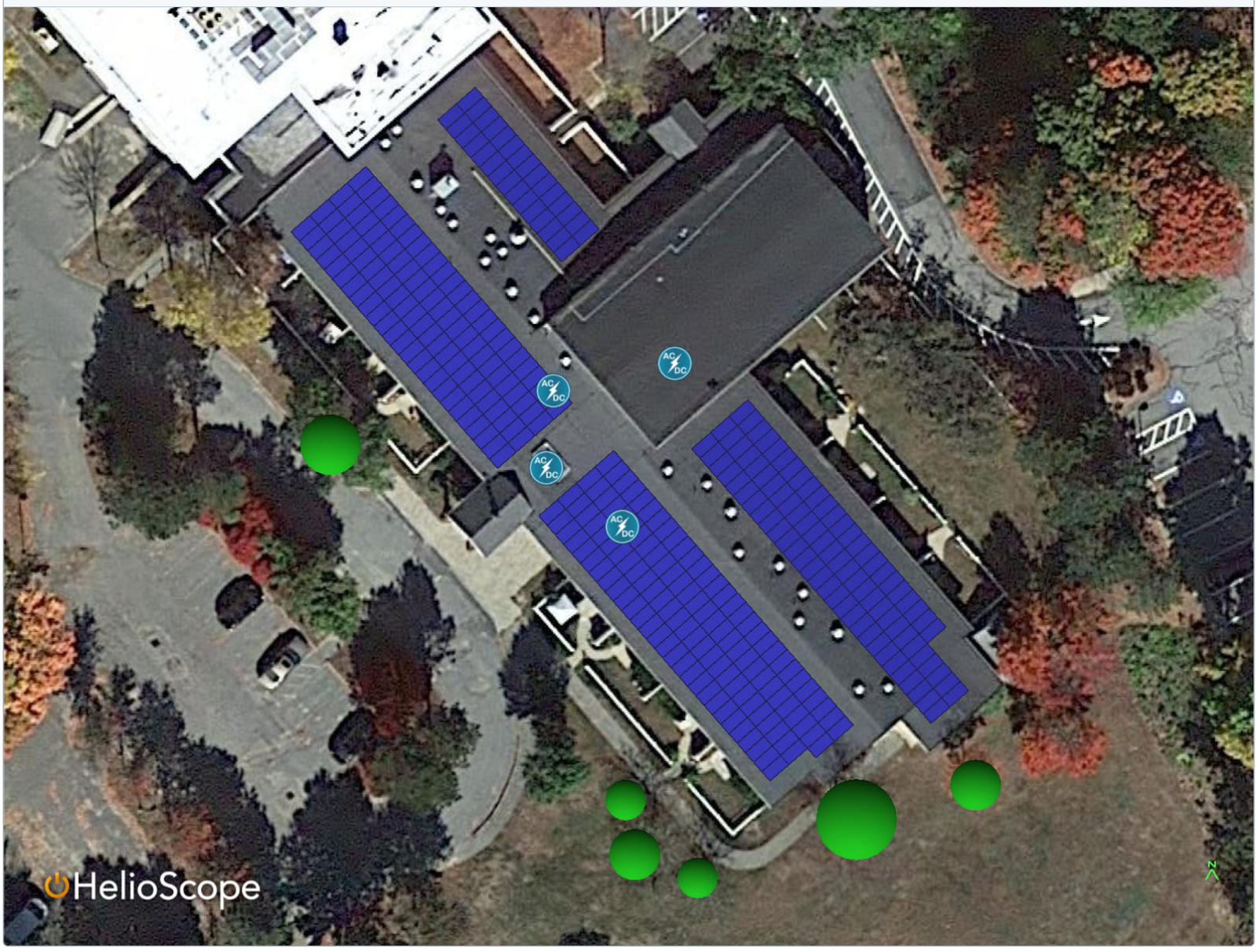
Design BOM

Component	Type	Quantity
1/0 AWG (Aluminum)	AC Home Runs	4
2 input Combiners	Combiners	4
3 input Combiners	Combiners	4
12 AWG (Copper)	Home Runs	8
Sunny Tripower CORE1 33-US	Inverters	4
LG450S2W-U6 (1000V)	Modules	326
10 AWG (Copper)	Strings	20

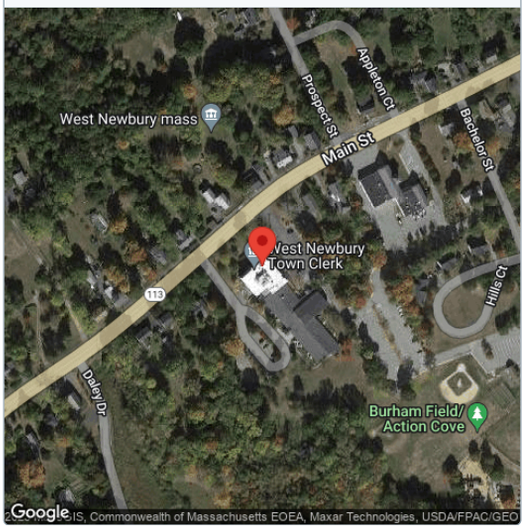
Monthly Shading

Month	GHI (kWh/m^2)	POA (kWh/m^2)	Shaded (kWh/m^2)	Nameplate (kWh)	Grid (kWh)
January	60.4	61.9	60.4	8,070.1	7,428.0
February	81.1	82.6	81.5	11,078.0	10,283.3
March	125.9	127.4	126.6	17,418.7	15,859.5
April	146.3	147.0	146.2	20,304.5	17,741.5
May	169.5	170.0	169.2	23,570.4	20,116.2
June	171.2	171.6	170.7	23,770.5	19,895.4
July	188.3	188.8	187.9	26,199.0	21,535.0
August	160.2	161.1	160.3	22,289.1	18,539.7
September	128.4	129.7	129.0	17,819.9	15,150.6
October	89.4	90.8	89.9	12,288.1	10,798.3
November	60.3	61.7	60.7	8,195.4	7,387.3
December	46.4	47.7	46.5	6,206.0	5,665.2

Design Render



Project Location



Design Wiring Zone

Description	Combiner Poles	String Size	Stringing Strategy
Wiring Zone	12	9 - 17	Along Racking

Field Segments

Description	Racking	Orientation	Tilt	Azimuth	Intrarow Spacing	Frame Size	Frames	Modules	Power
Field Segment 1	Flush Mount	Portrait (Vertical)	5°	228.892°	0.0 ft	1x1	214	214	96.30 kW
Field Segment 2	Flush Mount	Portrait (Vertical)	5°	48.895°	0.0 ft	1x1	112	112	50.40 kW

1.2 1910 Building Parking Lot West Newbury 381 Main St, West Newbury, MA 01985, USA

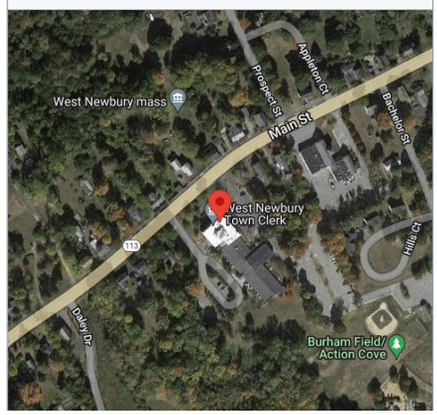
Project Details

Address	381 Main St, West Newbury, MA 01985, USA
Owner	Gabrielle Cole
Last Modified	Gabrielle Cole a few seconds ago
Location	(42.80050330000001, -70.9892665) (GMT -5)
Profile	Default Commercial

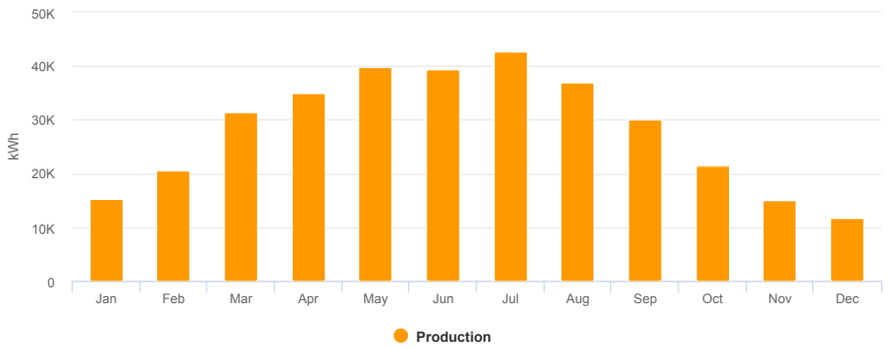
System Metrics

Design	1.2 1910 Building Parking Lot
Module DC Nameplate	270.0 kW
Inverter AC Nameplate	240.0 kW Load Ratio: 1.13
Annual Production	339.6 MWh
Performance Ratio	85.8%
kWh/kWp	1,257.8
Weather Dataset	TMY, 10km grid (42.85,-70.95), NREL (prospector)
Simulator Version	e0419dc019-dcabad097e-4d5d0f02fa-0e176ffd8f

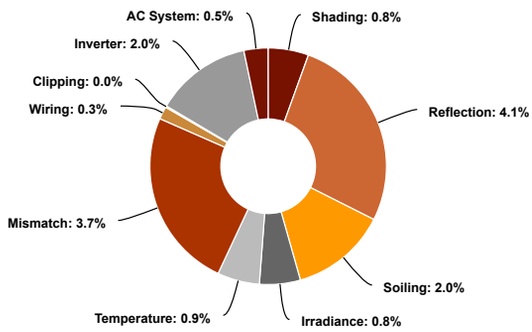
Project Location



Production



System Loss



Annual Production

	Description	Output	% Delta
Irradiance (kWh/m²)	Annual Global Horizontal Irradiance	1,427.4	-
	POA Irradiance	1,465.7	2.7%
	Shaded Irradiance	1,453.4	-0.8%
	Irradiance After Reflection	1,394.0	-4.1%
	Irradiance After Soiling	1,366.2	-2.0%
	Total Collector Irradiance	**1,366.1**	**-0.0%**
Energy (kWh)	Nameplate	369,202.0	-
	Output at Irradiance Levels	366,072.8	-0.8%
	Output at Cell Temperature Derate	362,871.9	-0.9%
	Output After Mismatch	349,304.0	-3.7%
	Optimal DC Output	348,389.9	-0.3%
	Constrained DC Output	348,277.4	-0.0%
	Inverter Output	341,311.8	-2.0%
	Energy to Grid	**339,605.3**	**-0.5%**

Temperature Metrics	
Avg. Operating Ambient Temp	11.9°C
Avg. Operating Cell Temp	19.2°C

Simulation Metrics	
Operating Hours	4,669
Solved Hours	4,669
Pending Hours	-
Error Hours	-

Condition Set

Description	Condition Set 1
Weather Dataset	TMY10km grid (42.85,-70.95)NREL(prospector) (download)
Solar Angle Location	Meteo Lat/Lng
Transposition Model	Perez Model
Temperature Model	Sandia Model

Temperature Model Parameters

Rack Type	a	b	Temperature Delta
Fixed Tilt	-3.56	-0.08	3.0°C
Flush Mount	-2.81	-0.05	0.0°C
East-West	-3.56	-0.08	3.0°C
Carport	-3.56	-0.08	3.0°C

Soiling (%)

J	F	M	A	M	J	J	A	S	O	N	D
2	2	2	2	2	2	2	2	2	2	2	2

Irradiation Variance	5.0%
Cell Temperature Spread	4.0°C
Module Binning Range	-2.5% to 2.5%
AC System Derate	0.50%

Component Characterizations

Type	Component	Characterization
Module	LG450S2W-U6 (1000V) (LG)	Spec Sheet Characterization,PAN
Module	LG450S2W-U6 (1000V) (LG)	Spec Sheet Characterization,PAN
Module	LG450S2W-U6 (1000V) (LG)	Spec Sheet Characterization,PAN
Inverter	Sunny Tripower X 30-US (SMA)	Spec Sheet

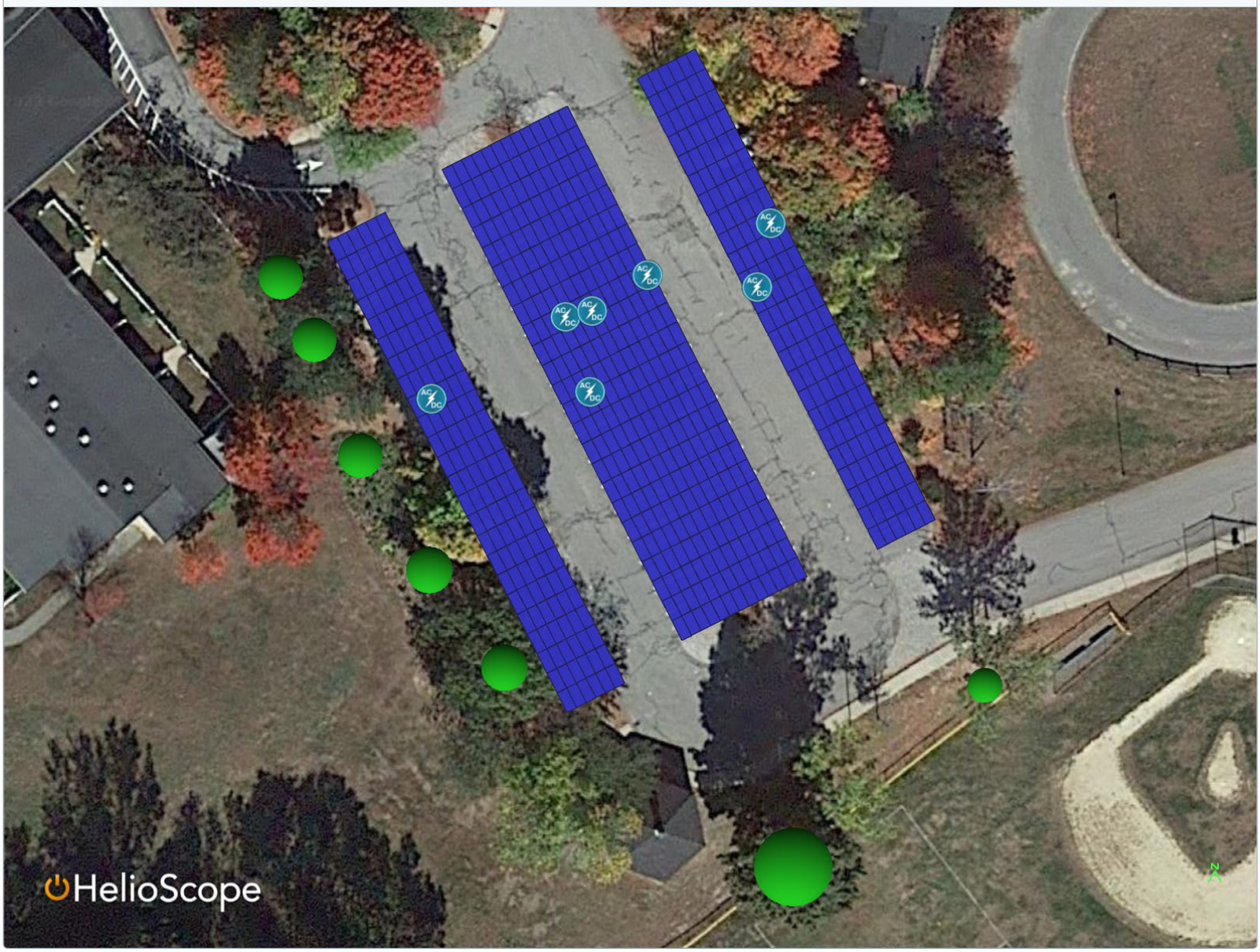
Design BOM

Component	Type	Quantity
Sunny Tripower X 30-US	Inverters	8
LG450S2W-U6 (1000V)	Modules	600
10 AWG (Copper)	Strings	40

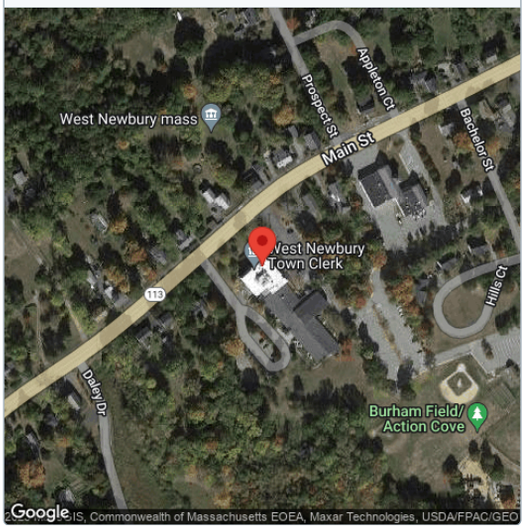
Monthly Shading

Month	GHI (kWh/m^2)	POA (kWh/m^2)	Shaded (kWh/m^2)	Nameplate (kWh)	Grid (kWh)
January	60.4	65.4	64.2	15,858.4	15,355.9
February	81.1	85.8	84.6	21,196.9	20,646.5
March	125.9	130.7	129.5	32,832.2	31,496.9
April	146.3	147.7	146.8	37,506.8	34,961.4
May	169.5	171.1	170.1	43,580.4	39,892.4
June	171.2	172.0	171.1	43,776.4	39,287.2
July	188.3	189.2	188.2	48,242.4	42,712.5
August	160.2	162.9	162.0	41,439.1	36,889.1
September	128.4	132.2	131.2	33,356.7	30,104.0
October	89.4	93.3	92.3	23,272.1	21,499.8
November	60.3	64.9	63.9	15,930.7	15,009.4
December	46.4	50.3	49.5	12,210.0	11,750.2

Design Render



Project Location



Design Wiring Zone

Description	Combiner Poles	String Size	Stringing Strategy
Wiring Zone	-	13 - 17	Along Racking

Field Segments

Description	Racking	Orientation	Tilt	Azimuth	Intrarow Spacing	Frame Size	Frames	Modules	Power
Field Segment 1	Carport	Landscape (Horizontal)	7°	242.992°	0.0 ft	1x1	312	312	140.40 kW
Field Segment 2	Carport	Landscape (Horizontal)	7°	242.992°	0.0 ft	1x1	144	144	64.80 kW
Field Segment 3	Carport	Landscape (Horizontal)	7°	242.992°	0.0 ft	1x1	144	144	64.80 kW

1.3 Public Safety Parking Lot West Newbury 381 Main St, West Newbury, MA 01985, USA

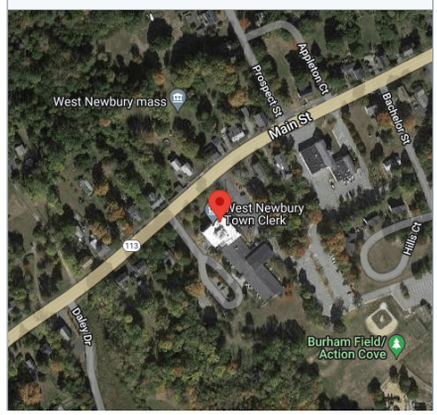
Project Details

Address	381 Main St, West Newbury, MA 01985, USA
Owner	Gabrielle Cole
Last Modified	Gabrielle Cole a few seconds ago
Location	(42.80050330000001, -70.9892665) (GMT -5)
Profile	Default Commercial

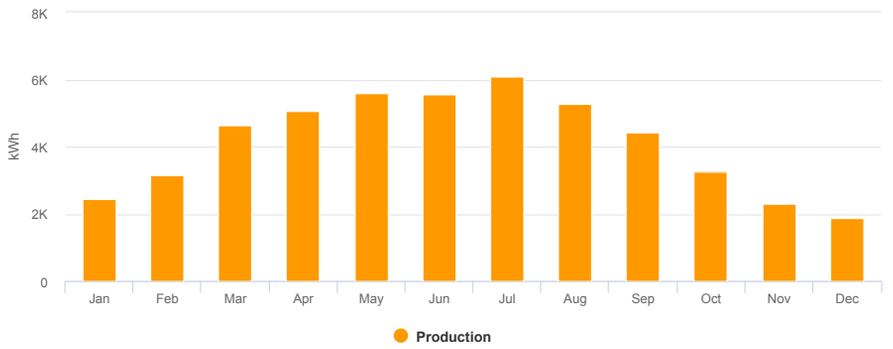
System Metrics

Design	1.3 Public Safety Parking Lot
Module DC Nameplate	37.8 kW
Inverter AC Nameplate	30.0 kW Load Ratio: 1.26
Annual Production	49.6 MWh
Performance Ratio	86.8%
kWh/kWp	1,312.6
Weather Dataset	TMY, 10km grid (42.85,-70.95), NREL (prospector)
Simulator Version	e0419dc019-dcabad097e-4d5d0f02fa-0e176ffd8f

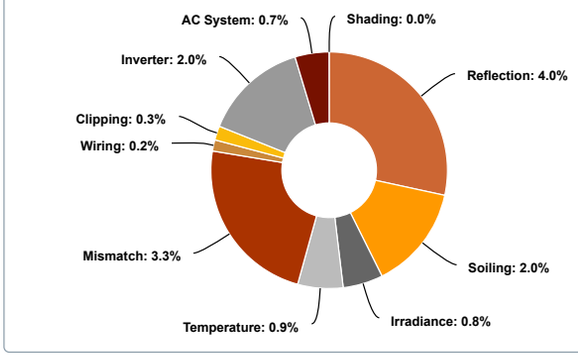
Project Location



Production



System Loss



Annual Production

	Description	Output	% Delta
Irradiance (kWh/m²)	Annual Global Horizontal Irradiance	1,427.4	-
	POA Irradiance	1,512.0	5.9%
	Shaded Irradiance	1,512.0	-0.0%
	Irradiance After Reflection	1,451.7	-4.0%
	Irradiance After Soiling	1,422.7	-2.0%
	Total Collector Irradiance	**1,422.7**	**0.0%**
Energy (kWh)	Nameplate	53,827.1	-
	Output at Irradiance Levels	53,413.4	-0.8%
	Output at Cell Temperature Derate	52,948.6	-0.9%
	Output After Mismatch	51,213.9	-3.3%
	Optimal DC Output	51,104.0	-0.2%
	Constrained DC Output	50,964.7	-0.3%
	Inverter Output	49,942.7	-2.0%
	Energy to Grid	**49,616.2**	**-0.7%**

Temperature Metrics	
Avg. Operating Ambient Temp	11.9°C
Avg. Operating Cell Temp	19.5°C

Simulation Metrics	
Operating Hours	4,669
Solved Hours	4,669
Pending Hours	-
Error Hours	-

Condition Set

Description	Condition Set 1
Weather Dataset	TMY10km grid (42.85,-70.95)NREL(prospector) (download)
Solar Angle Location	Meteo Lat/Lng
Transposition Model	Perez Model
Temperature Model	Sandia Model

Temperature Model Parameters

Rack Type	a	b	Temperature Delta
Fixed Tilt	-3.56	-0.08	3.0°C
Flush Mount	-2.81	-0.05	0.0°C
East-West	-3.56	-0.08	3.0°C
Carport	-3.56	-0.08	3.0°C

Soiling (%)

J	F	M	A	M	J	J	A	S	O	N	D
2	2	2	2	2	2	2	2	2	2	2	2

Irradiation Variance	5.0%
Cell Temperature Spread	4.0°C
Module Binning Range	-2.5% to 2.5%
AC System Derate	0.50%

Component Characterizations

Type	Component	Characterization
Module	LG450S2W-U6 (1000V) (LG)	Spec Sheet Characterization,PAN
Inverter	Sunny Tripower X 30-US (SMA)	Spec Sheet

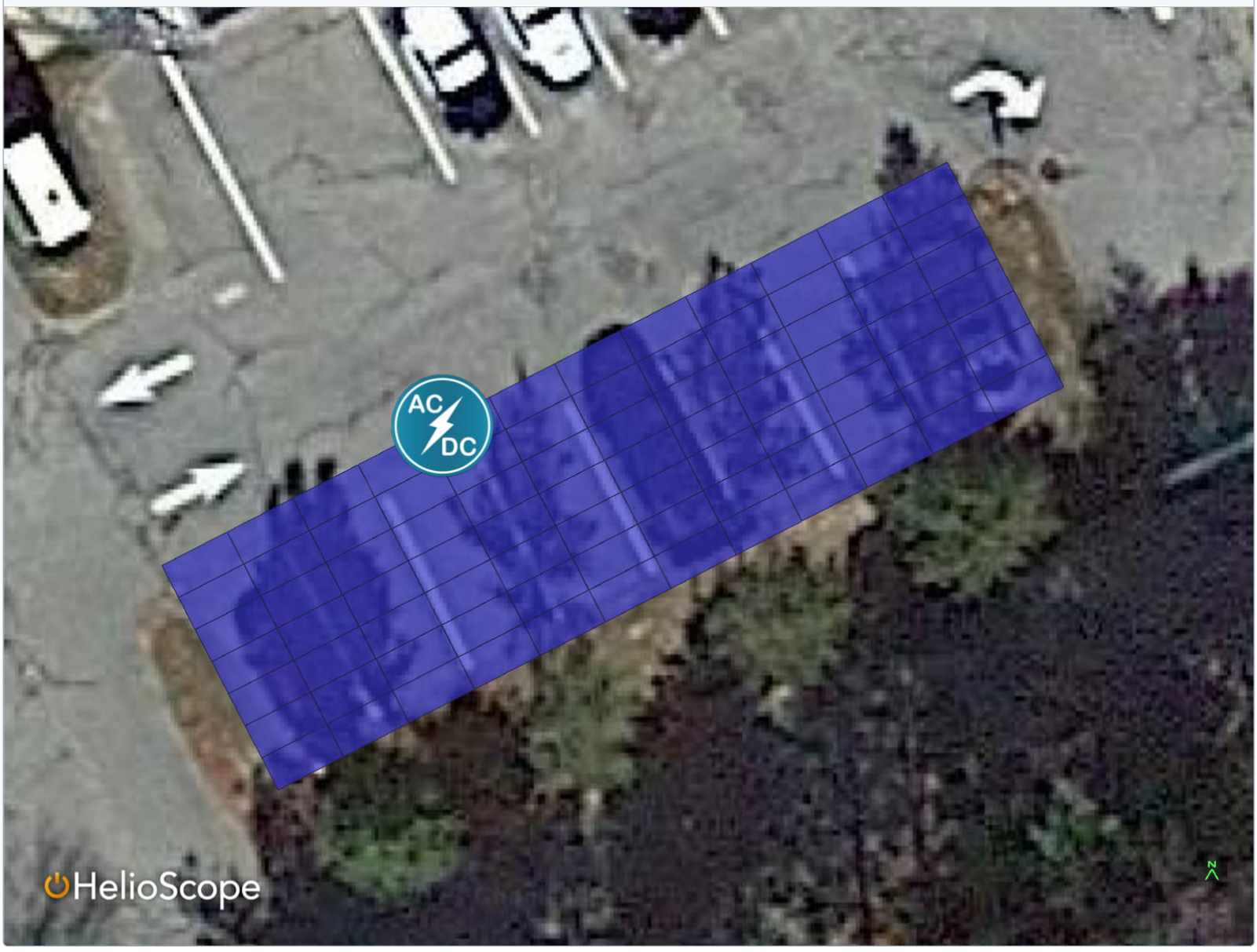
Design BOM

Component	Type	Quantity
1/0 AWG (Aluminum)	AC Home Runs	1
Sunny Tripower X 30-US	Inverters	1
LG450S2W-U6 (1000V)	Modules	84
10 AWG (Copper)	Strings	6

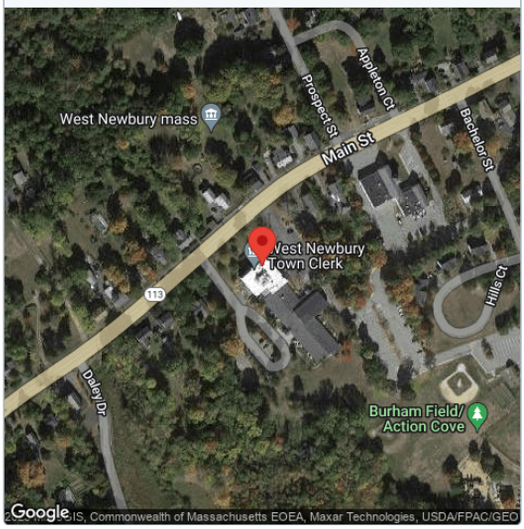
Monthly Shading

Month	GHI (kWh/m^2)	POA (kWh/m^2)	Shaded (kWh/m^2)	Nameplate (kWh)	Grid (kWh)
January	60.4	71.0	71.0	2,468.1	2,431.1
February	81.1	90.8	90.7	3,193.0	3,141.9
March	125.9	135.4	135.4	4,814.7	4,643.9
April	146.3	152.7	152.7	5,465.5	5,050.3
May	169.5	172.8	172.8	6,195.6	5,608.1
June	171.2	173.2	173.2	6,203.3	5,540.5
July	188.3	191.7	191.7	6,879.8	6,085.6
August	160.2	165.5	165.5	5,926.4	5,281.5
September	128.4	136.6	136.6	4,871.0	4,414.7
October	89.4	98.9	98.9	3,500.6	3,258.2
November	60.3	68.5	68.5	2,397.5	2,291.3
December	46.4	55.0	55.0	1,911.6	1,869.1

Design Render



Project Location



Design Wiring Zone

Description	Combiner Poles	String Size	Stringing Strategy
Wiring Zone	-	13 - 17	Along Racking

Field Segments

Description	Racking	Orientation	Tilt	Azimuth	Intrarow Spacing	Frame Size	Frames	Modules	Power
Field Segment 1	Carport	Landscape (Horizontal)	7°	152.834°	0.0 ft	1x1	84	84	37.80 kW

1.4 Burnham Field Parking Lot West Newbury 381 Main St, West Newbury, MA 01985, USA

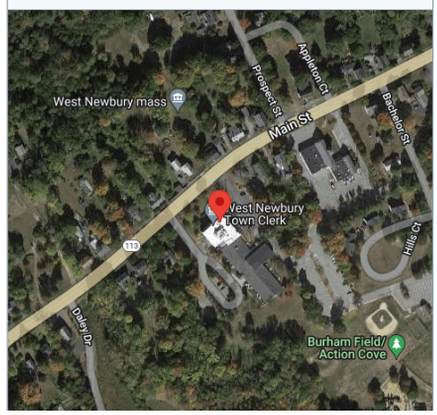
Project Details

Address	381 Main St, West Newbury, MA 01985, USA
Owner	Gabrielle Cole
Last Modified	Gabrielle Cole a few seconds ago
Location	(42.80050330000001, -70.9892665) (GMT -5)
Profile	Default Commercial

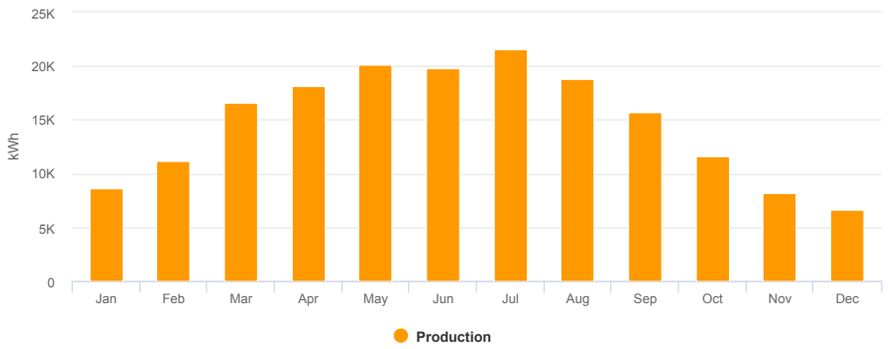
System Metrics

Design	1.4 Burnham Field Parking Lot
Module DC Nameplate	134.6 kW
Inverter AC Nameplate	120.0 kW Load Ratio: 1.12
Annual Production	177.0 MWh
Performance Ratio	86.7%
kWh/kWp	1,315.6
Weather Dataset	TMY, 10km grid (42.85,-70.95), NREL (prospector)
Simulator Version	e0419dc019-dcabad097e-4d5d0f02fa-0e176ffd8f

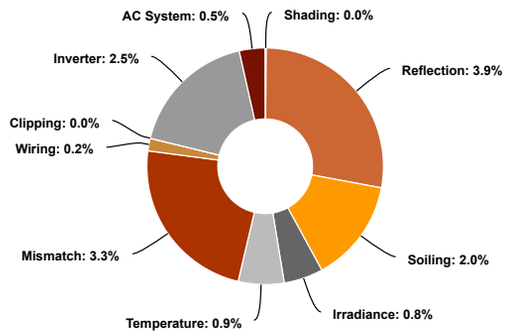
Project Location



Production



System Loss



Annual Production

	Description	Output	% Delta
Irradiance (kWh/m²)	Annual Global Horizontal Irradiance	1,427.4	-
	POA Irradiance	1,517.3	6.3%
	Shaded Irradiance	1,517.0	-0.0%
	Irradiance After Reflection	1,457.3	-3.9%
	Irradiance After Soiling	1,428.1	-2.0%
	Total Collector Irradiance	**1,428.1**	**-0.0%**
Energy (kWh)	Nameplate	192,338.7	-
	Output at Irradiance Levels	190,877.1	-0.8%
	Output at Cell Temperature Derate	189,187.7	-0.9%
	Output After Mismatch	182,914.5	-3.3%
	Optimal DC Output	182,469.3	-0.2%
	Constrained DC Output	182,465.9	-0.0%
	Inverter Output	177,904.2	-2.5%
	Energy to Grid	**177,014.7**	**-0.5%**

Temperature Metrics	
Avg. Operating Ambient Temp	11.9°C
Avg. Operating Cell Temp	19.5°C

Simulation Metrics	
Operating Hours	4,669
Solved Hours	4,669
Pending Hours	-
Error Hours	-

Condition Set

Description	Condition Set 1
Weather Dataset	TMY10km grid (42.85,-70.95)NREL(prospector) (download)
Solar Angle Location	Meteo Lat/Lng
Transposition Model	Perez Model
Temperature Model	Sandia Model

Temperature Model Parameters

Rack Type	a	b	Temperature Delta
Fixed Tilt	-3.56	-0.08	3.0°C
Flush Mount	-2.81	-0.05	0.0°C
East-West	-3.56	-0.08	3.0°C
Carport	-3.56	-0.08	3.0°C

Soiling (%)

J	F	M	A	M	J	J	A	S	O	N	D
2	2	2	2	2	2	2	2	2	2	2	2

Irradiation Variance	5.0%
Cell Temperature Spread	4.0°C
Module Binning Range	-2.5% to 2.5%
AC System Derate	0.50%

Component Characterizations

Type	Component	Characterization
Module	LG450S2W-U6 (1000V) (LG)	Spec Sheet Characterization,PAN
Inverter	Sunny Tripower X 20-US (SMA)	Spec Sheet

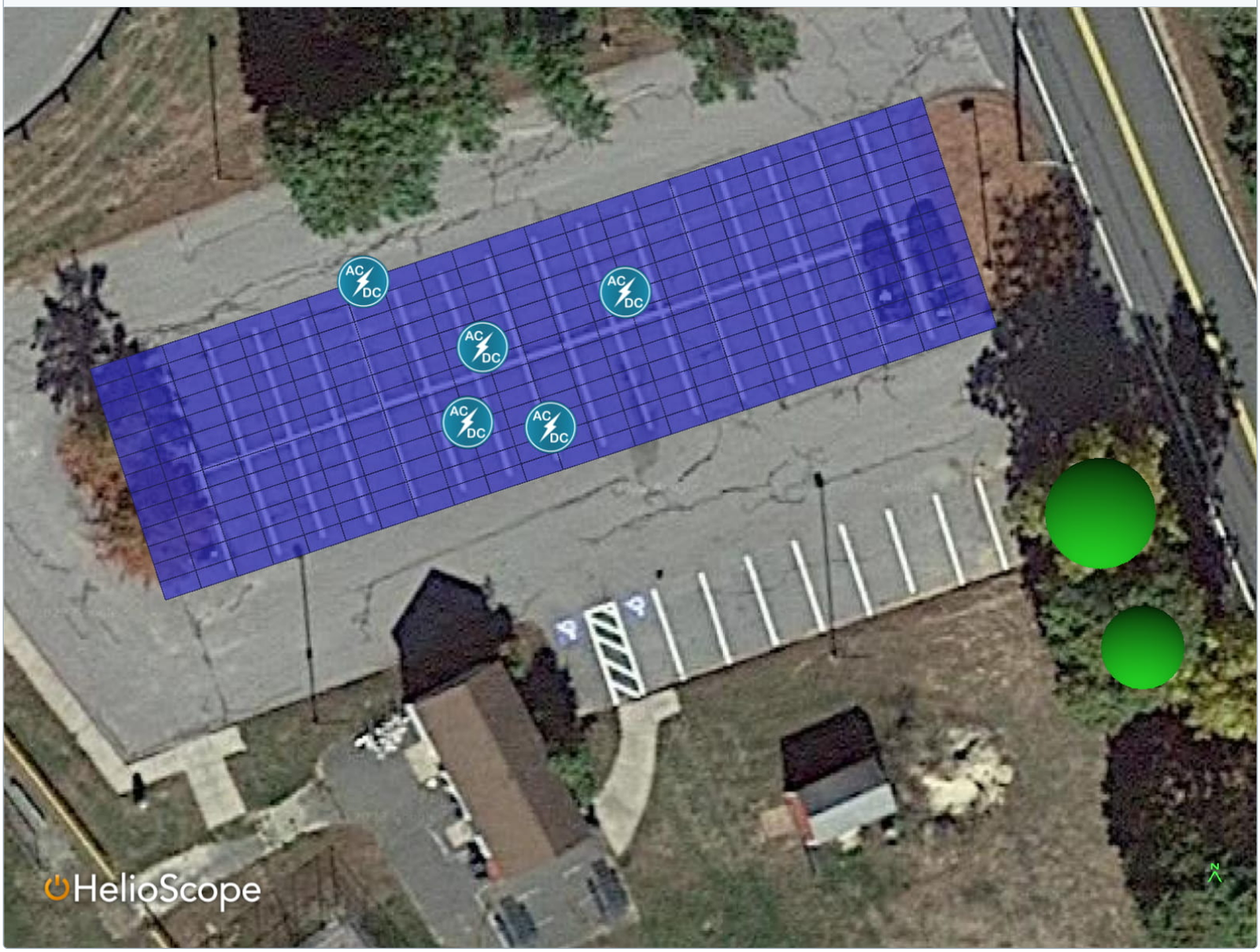
Design BOM

Component	Type	Quantity
Sunny Tripower X 20-US	Inverters	6
LG450S2W-U6 (1000V)	Modules	299
10 AWG (Copper)	Strings	18

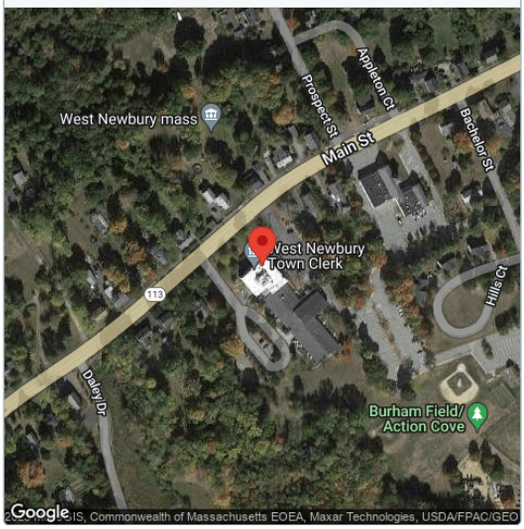
Monthly Shading

Month	GHI (kWh/m^2)	POA (kWh/m^2)	Shaded (kWh/m^2)	Nameplate (kWh)	Grid (kWh)
January	60.4	71.7	71.6	8,876.4	8,679.7
February	81.1	91.4	91.4	11,454.6	11,211.4
March	125.9	136.1	136.1	17,229.5	16,563.4
April	146.3	152.9	152.9	19,483.0	18,105.7
May	169.5	173.0	173.0	22,092.0	20,138.0
June	171.2	173.3	173.3	22,101.6	19,757.2
July	188.3	191.8	191.8	24,509.8	21,614.9
August	160.2	165.9	165.9	21,152.7	18,778.9
September	128.4	137.1	137.1	17,411.3	15,710.0
October	89.4	99.4	99.4	12,531.6	11,601.1
November	60.3	69.1	69.1	8,622.3	8,184.3
December	46.4	55.5	55.5	6,874.0	6,670.1

Design Render



Project Location



Design Wiring Zone

Description	Combiner Poles	String Size	Stringing Strategy
Wiring Zone	-	9 - 17	Along Racking

Field Segments

Description	Racking	Orientation	Tilt	Azimuth	Intrarow Spacing	Frame Size	Frames	Modules	Power
Field Segment 1	Carport	Landscape (Horizontal)	7°	161.859°	0.0 ft	1x1	299	299	134.55 kW

1.5 DPW Ground Mount West Newbury 381 Main St, West Newbury, MA 01985, USA

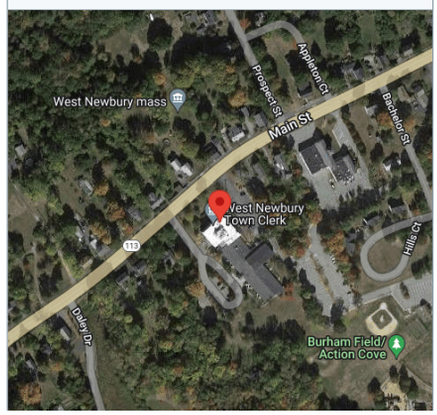
Project Details

Address	381 Main St, West Newbury, MA 01985, USA
Owner	Gabrielle Cole
Last Modified	Gabrielle Cole a few seconds ago
Location	(42.80050330000001, -70.9892665) (GMT -5)
Profile	Default Commercial

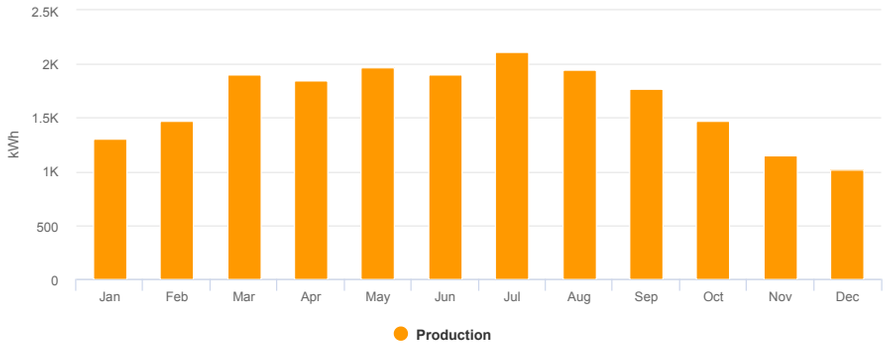
System Metrics

Design	1.5 DPW Ground Mount
Module DC Nameplate	14.4 kW
Inverter AC Nameplate	12.0 kW Load Ratio: 1.20
Annual Production	19.9 MWh
Performance Ratio	81.0%
kWh/kWp	1,380.5
Weather Dataset	TMY, 10km grid (42.85,-70.95), NREL (prospector)
Simulator Version	e0419dc019-dcabad097e-4d5d0f02fa-0e176ffd8f

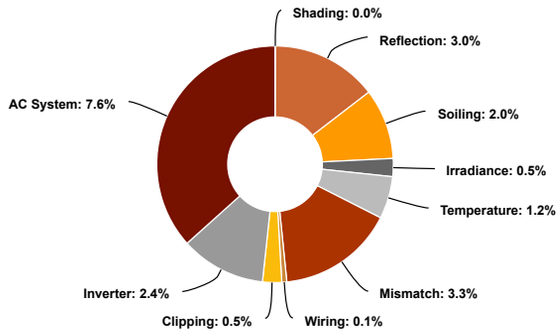
Project Location



Production



System Loss



Annual Production

	Description	Output	% Delta
Irradiance (kWh/m²)	Annual Global Horizontal Irradiance	1,427.4	-
	POA Irradiance	1,704.7	19.4%
	Shaded Irradiance	1,704.5	-0.0%
	Irradiance After Reflection	1,653.3	-3.0%
	Irradiance After Soiling	1,620.2	-2.0%
	Total Collector Irradiance	**1,620.2**	**0.0%**
Energy (kWh)	Nameplate	23,353.5	-
	Output at Irradiance Levels	23,233.8	-0.5%
	Output at Cell Temperature Derate	22,955.3	-1.2%
	Output After Mismatch	22,197.1	-3.3%
	Optimal DC Output	22,165.3	-0.1%
	Constrained DC Output	22,045.7	-0.5%
	Inverter Output	21,513.7	-2.4%
	Energy to Grid	**19,879.4**	**-7.6%**

Temperature Metrics	
Avg. Operating Ambient Temp	11.9°C
Avg. Operating Cell Temp	20.5°C

Simulation Metrics	
Operating Hours	4,669
Solved Hours	4,669
Pending Hours	-
Error Hours	-

Condition Set

Description	Condition Set 1
Weather Dataset	TMY10km grid (42.85,-70.95)NREL(prospector) (download)
Solar Angle Location	Meteo Lat/Lng
Transposition Model	Perez Model
Temperature Model	Sandia Model

Temperature Model Parameters

Rack Type	a	b	Temperature Delta
Fixed Tilt	-3.56	-0.08	3.0°C
Flush Mount	-2.81	-0.05	0.0°C
East-West	-3.56	-0.08	3.0°C
Carport	-3.56	-0.08	3.0°C

Soiling (%)

J	F	M	A	M	J	J	A	S	O	N	D
2	2	2	2	2	2	2	2	2	2	2	2

Irradiation Variance	5.0%
Cell Temperature Spread	4.0°C
Module Binning Range	-2.5% to 2.5%
AC System Derate	0.50%

Component Characterizations

Type	Component	Characterization
Module	LG450S2W-U6 (1000V) (LG)	Spec Sheet Characterization,PAN
Module	LG450S2W-U6 (1000V) (LG)	Spec Sheet Characterization,PAN
Inverter	Sunny Tripower X 12 (415V) (SMA Solar Technology)	Spec Sheet

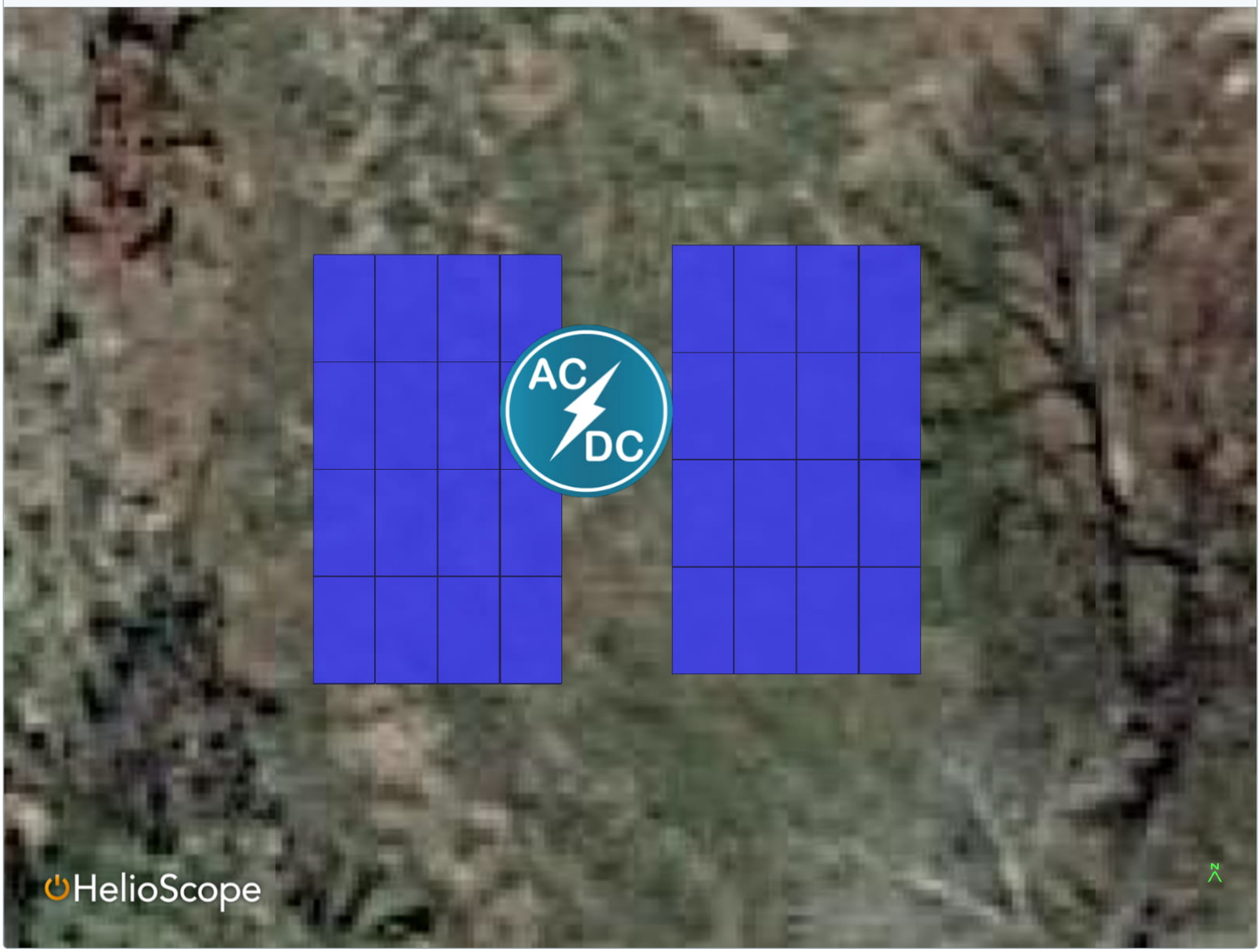
Design BOM

Component	Type	Quantity
1/0 AWG (Aluminum)	AC Home Runs	1
2 input Combiners	Combiners	1
Sunny Tripower X 12 (415V)	Inverters	1
LG450S2W-U6 (1000V)	Modules	32
10 AWG (Copper)	Strings	2

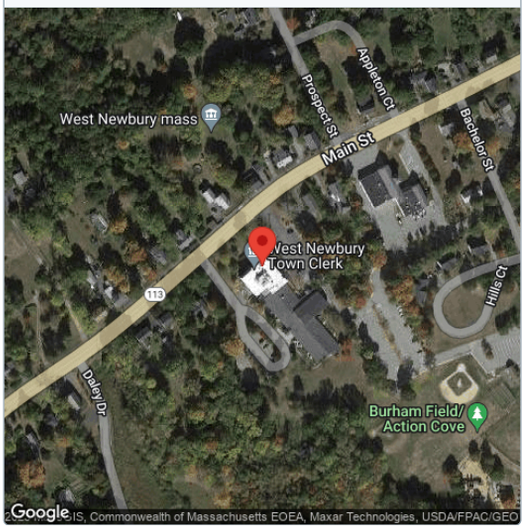
Monthly Shading

Month	GHI (kWh/m^2)	POA (kWh/m^2)	Shaded (kWh/m^2)	Nameplate (kWh)	Grid (kWh)
January	60.4	105.1	105.0	1,438.7	1,309.0
February	81.1	119.6	119.5	1,638.2	1,476.6
March	125.9	160.6	160.5	2,202.4	1,903.9
April	146.3	161.4	161.4	2,212.6	1,851.1
May	169.5	172.3	172.3	2,358.1	1,968.9
June	171.2	167.5	167.4	2,286.4	1,904.1
July	188.3	188.2	188.2	2,576.2	2,111.5
August	160.2	172.7	172.7	2,366.9	1,942.7
September	128.4	155.6	155.6	2,135.3	1,771.6
October	89.4	125.1	125.1	1,717.1	1,466.8
November	60.3	94.8	94.7	1,298.7	1,153.1
December	46.4	81.9	81.9	1,122.8	1,020.2

Design Render



Project Location



Design Wiring Zone

Description	Combiner Poles	String Size	Stringing Strategy
Wiring Zone	12	6 - 17	Along Racking

Field Segments

Description	Racking	Orientation	Tilt	Azimuth	Intrarow Spacing	Frame Size	Frames	Modules	Power
Field Segment 1	Carport	Portrait (Vertical)	30°	180°	0.0 ft	1x1	16	16	7.20 kW
Field Segment 1 (copy)	Carport	Portrait (Vertical)	30°	180°	0.0 ft	1x1	16	16	7.20 kW

1.5 DPW Salt Shed Roof West Newbury 381 Main St, West Newbury, MA 01985, USA

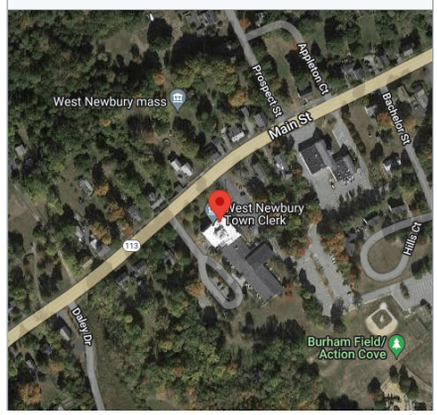
Project Details

Address	381 Main St, West Newbury, MA 01985, USA
Owner	Gabrielle Cole
Last Modified	Gabrielle Cole a few seconds ago
Location	(42.80050330000001, -70.9892665) (GMT -5)
Profile	Default Commercial

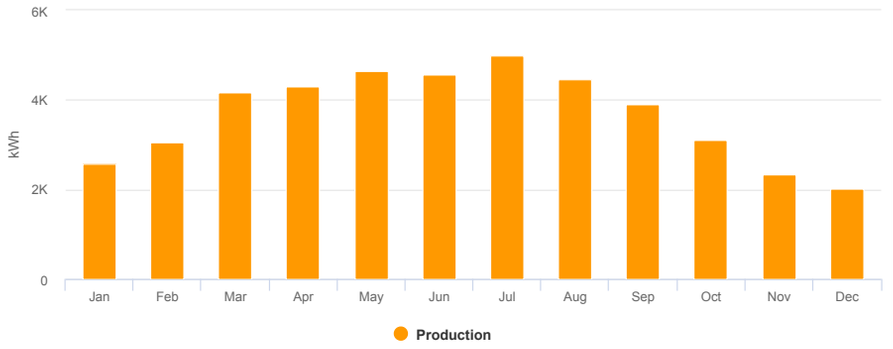
System Metrics

Design	1.5 DPW Salt Shed Roof
Module DC Nameplate	36.9 kW
Inverter AC Nameplate	33.3 kW Load Ratio: 1.11
Annual Production	44.1 MWh
Performance Ratio	74.2%
kWh/kWp	1,196.5
Weather Dataset	TMY, 10km grid (42.85,-70.95), NREL (prospector)
Simulator Version	e0419dc019-dcabad097e-4d5d0f02fa-0e176ffd8f

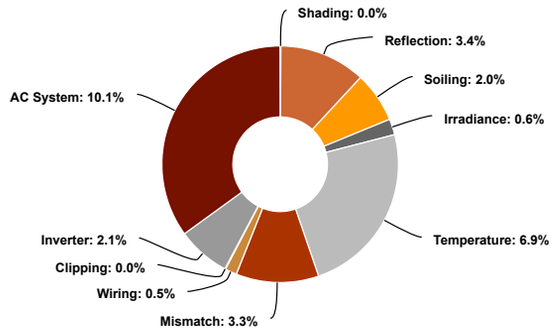
Project Location



Production



System Loss



Annual Production

	Description	Output	% Delta
Irradiance (kWh/m²)	Annual Global Horizontal Irradiance	1,427.4	-
	POA Irradiance	1,612.0	12.9%
	Shaded Irradiance	1,611.5	-0.0%
	Irradiance After Reflection	1,556.4	-3.4%
	Irradiance After Soiling	1,525.3	-2.0%
	Total Collector Irradiance	**1,525.3**	**0.0%**
Energy (kWh)	Nameplate	56,340.7	-
	Output at Irradiance Levels	55,987.5	-0.6%
	Output at Cell Temperature Derate	52,137.3	-6.9%
	Output After Mismatch	50,427.6	-3.3%
	Optimal DC Output	50,193.5	-0.5%
	Constrained DC Output	50,180.6	-0.0%
	Inverter Output	49,125.0	-2.1%
	Energy to Grid	**44,149.1**	**-10.1%**

Temperature Metrics	
Avg. Operating Ambient Temp	11.9°C
Avg. Operating Cell Temp	28.6°C

Simulation Metrics	
Operating Hours	4,669
Solved Hours	4,669
Pending Hours	-
Error Hours	-

Condition Set

Description	Condition Set 1
Weather Dataset	TMY10km grid (42.85,-70.95)NREL(prospector) (download)
Solar Angle Location	Meteo Lat/Lng
Transposition Model	Perez Model
Temperature Model	Sandia Model

Temperature Model Parameters

Rack Type	a	b	Temperature Delta
Fixed Tilt	-3.56	-0.08	3.0°C
Flush Mount	-2.81	-0.05	0.0°C
East-West	-3.56	-0.08	3.0°C
Carport	-3.56	-0.08	3.0°C

Soiling (%)

J	F	M	A	M	J	J	A	S	O	N	D
2	2	2	2	2	2	2	2	2	2	2	2

Irradiation Variance	5.0%
Cell Temperature Spread	4.0°C
Module Binning Range	-2.5% to 2.5%
AC System Derate	0.50%

Component Characterizations

Type	Component	Characterization
Module	LG450S2W-U6 (1000V) (LG)	Spec Sheet Characterization,PAN
Module	LG450S2W-U6 (1000V) (LG)	Spec Sheet Characterization,PAN
Inverter	Sunny Tripower_Core1 33-US-41 (SMA)	Default Characterization

Design BOM

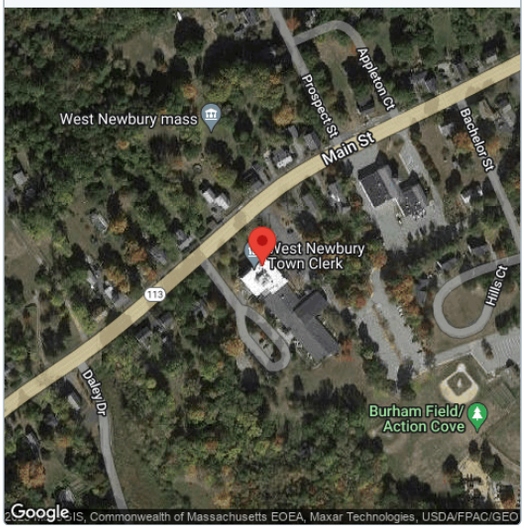
Component	Type	Quantity
1/0 AWG (Aluminum)	AC Home Runs	1
2 input Combiners	Combiners	1
3 input Combiners	Combiners	1
12 AWG (Copper)	Home Runs	2
Sunny Tripower_Core1 33-US-41	Inverters	1
LG450S2W-U6 (1000V)	Modules	82
10 AWG (Copper)	Strings	5

Monthly Shading

Month	GHI (kWh/m^2)	POA (kWh/m^2)	Shaded (kWh/m^2)	Nameplate (kWh)	Grid (kWh)
January	60.4	86.1	86.1	2,977.5	2,576.9
February	81.1	103.9	103.8	3,609.0	3,063.8
March	125.9	147.5	147.5	5,156.8	4,180.0
April	146.3	158.9	158.9	5,574.6	4,307.0
May	169.5	174.6	174.5	6,122.4	4,658.1
June	171.2	173.0	172.9	6,057.1	4,572.9
July	188.3	193.0	192.9	6,771.5	4,996.3
August	160.2	170.4	170.4	5,972.9	4,452.3
September	128.4	146.3	146.3	5,123.4	3,897.0
October	89.4	111.4	111.3	3,885.6	3,099.0
November	60.3	79.9	79.9	2,771.4	2,336.6
December	46.4	67.0	67.0	2,318.5	2,009.3

Design Render

Project Location



Design Wiring Zone

Description	Combiner Poles	String Size	Stringing Strategy
Wiring Zone	12	4 - 17	Along Racking

Field Segments

Description	Racking	Orientation	Tilt	Azimuth	Intrarow Spacing	Frame Size	Frames	Modules	Power
Field Segment 1	Flush Mount	Landscape (Horizontal)	20°	160.161°	0.0 ft	1x5	10	50	22.50 kW
Field Segment 2	Flush Mount	Landscape (Horizontal)	12°	160.161°	0.0 ft	1x4	8	32	14.40 kW

1.5 Pipestave Parking Lot West Newbury 381 Main St, West Newbury, MA 01985, USA

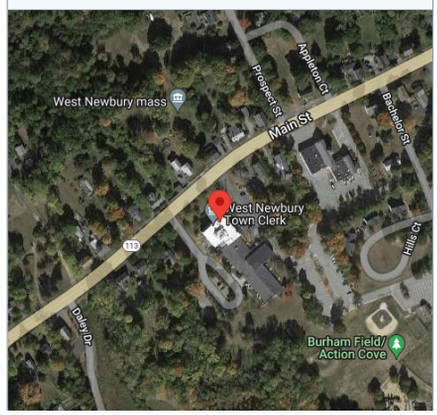
Project Details

Address	381 Main St, West Newbury, MA 01985, USA
Owner	Gabrielle Cole
Last Modified	Gabrielle Cole a few seconds ago
Location	(42.80050330000001, -70.9892665) (GMT -5)
Profile	Default Commercial

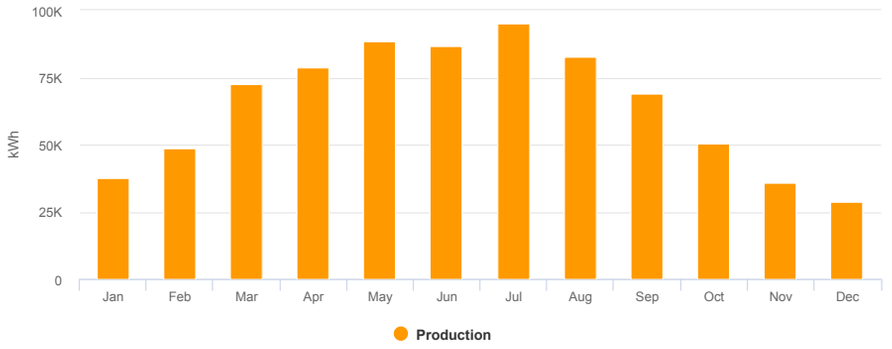
System Metrics

Design	1.5 Pipestave Parking Lot
Module DC Nameplate	595.4 kW
Inverter AC Nameplate	480.0 kW Load Ratio: 1.24
Annual Production	774.7 MWh
Performance Ratio	86.2%
kWh/kWp	1,301.3
Weather Dataset	TMY, 10km grid (42.85,-70.95), NREL (prospector)
Simulator Version	e0419dc019-dcabad097e-4d5d0f02fa-0e176ffd8f

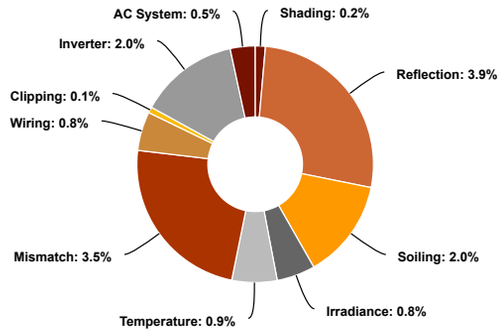
Project Location



Production



System Loss



Annual Production

	Description	Output	% Delta
Irradiance (kWh/m²)	Annual Global Horizontal Irradiance	1,427.4	-
	POA Irradiance	1,509.1	5.7%
	Shaded Irradiance	1,506.0	-0.2%
	Irradiance After Reflection	1,446.7	-3.9%
	Irradiance After Soiling	1,417.7	-2.0%
	Total Collector Irradiance	**1,417.7**	**-0.0%**
Energy (kWh)	Nameplate	844,840.6	-
	Output at Irradiance Levels	838,316.0	-0.8%
	Output at Cell Temperature Derate	830,677.6	-0.9%
	Output After Mismatch	801,712.8	-3.5%
	Optimal DC Output	795,433.2	-0.8%
	Constrained DC Output	794,505.0	-0.1%
	Inverter Output	778,596.8	-2.0%
	Energy to Grid	**774,703.9**	**-0.5%**

Temperature Metrics	
Avg. Operating Ambient Temp	11.9°C
Avg. Operating Cell Temp	19.4°C

Simulation Metrics	
Operating Hours	4,669
Solved Hours	4,669
Pending Hours	-
Error Hours	-

Condition Set

Description	Condition Set 1
Weather Dataset	TMY10km grid (42.85,-70.95)NREL(prospector) (download)
Solar Angle Location	Meteo Lat/Lng
Transposition Model	Perez Model
Temperature Model	Sandia Model

Temperature Model Parameters

Rack Type	a	b	Temperature Delta
Fixed Tilt	-3.56	-0.08	3.0°C
Flush Mount	-2.81	-0.05	0.0°C
East-West	-3.56	-0.08	3.0°C
Carport	-3.56	-0.08	3.0°C

Soiling (%)

J	F	M	A	M	J	J	A	S	O	N	D
2	2	2	2	2	2	2	2	2	2	2	2

Irradiation Variance	5.0%
Cell Temperature Spread	4.0°C
Module Binning Range	-2.5% to 2.5%
AC System Derate	0.50%

Component Characterizations

Type	Component	Characterization
Module	LG450S2W-U6 (1000V) (LG)	Spec Sheet Characterization,PAN
Inverter	Sunny Tripower X 30-US (SMA)	Spec Sheet

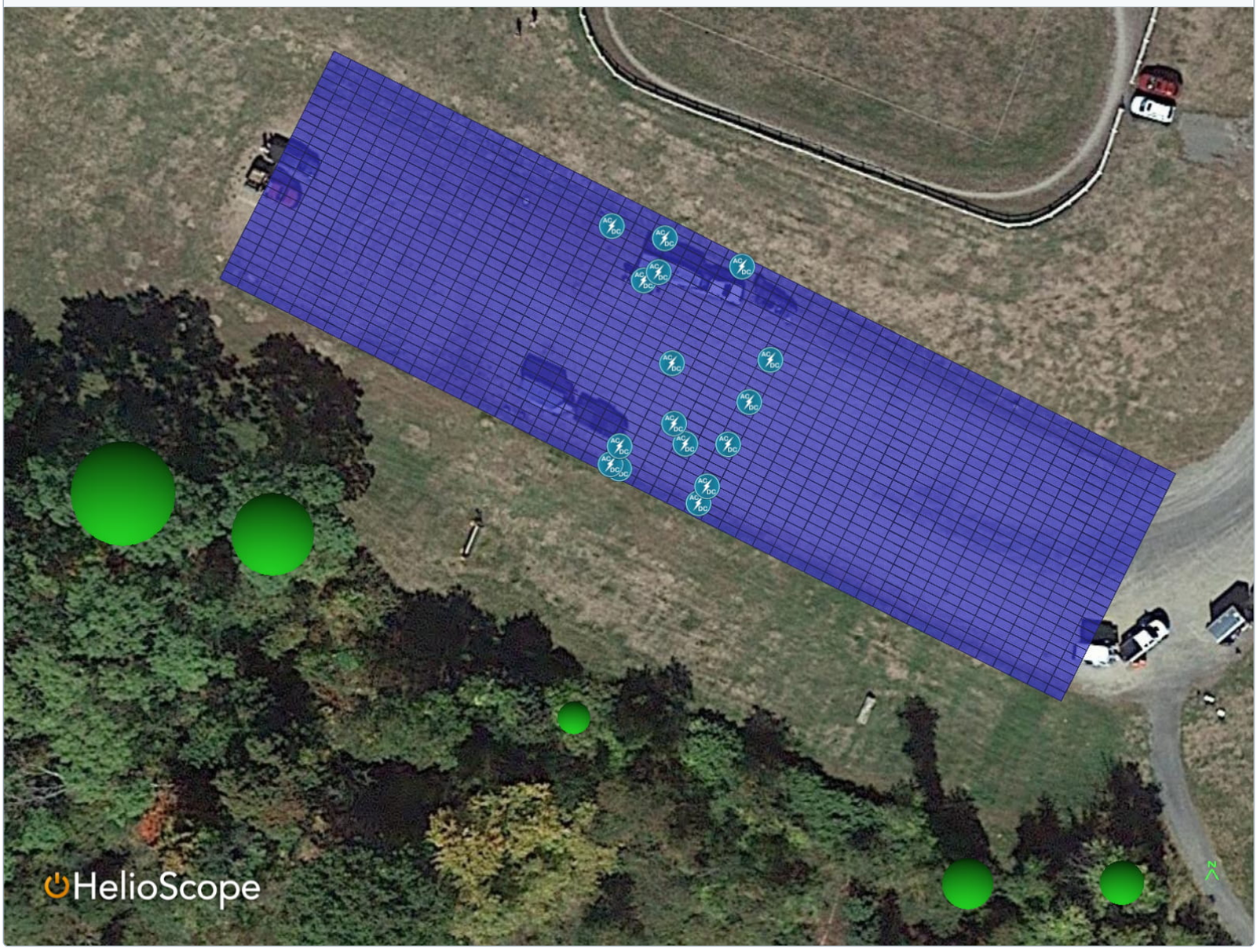
Design BOM

Component	Type	Quantity
2 input Combiners	Combiners	16
3 input Combiners	Combiners	16
12 AWG (Copper)	Home Runs	32
Sunny Tripower X 30-US	Inverters	16
LG450S2W-U6 (1000V)	Modules	1,323
10 AWG (Copper)	Strings	80

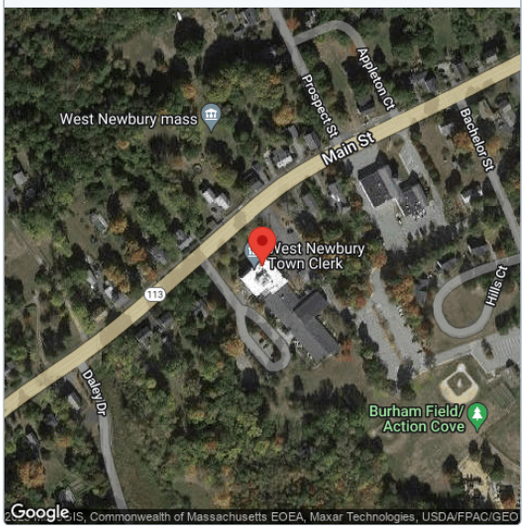
Monthly Shading

Month	GHI (kWh/m^2)	POA (kWh/m^2)	Shaded (kWh/m^2)	Nameplate (kWh)	Grid (kWh)
January	60.4	70.8	70.3	38,524.8	37,497.5
February	81.1	90.7	90.3	50,107.9	48,893.6
March	125.9	135.5	135.3	75,795.8	72,691.9
April	146.3	151.3	151.1	85,224.0	78,680.8
May	169.5	172.8	172.6	97,538.3	88,308.3
June	171.2	173.1	172.9	97,558.6	86,927.5
July	188.3	191.1	190.9	107,931.3	94,969.0
August	160.2	165.6	165.4	93,361.4	82,710.5
September	128.4	136.4	136.2	76,541.7	68,935.4
October	89.4	98.2	98.0	54,631.4	50,484.1
November	60.3	68.9	68.5	37,873.7	35,826.9
December	46.4	54.7	54.3	29,751.7	28,778.3

Design Render



Project Location



Design Wiring Zone

Description	Combiner Poles	String Size	Stringing Strategy
Wiring Zone	12	13 - 17	Along Racking

Field Segments

Description	Racking	Orientation	Tilt	Azimuth	Intrarow Spacing	Frame Size	Frames	Modules	Power
Field Segment 1	Carport	Landscape (Horizontal)	7°	206.658°	0.0 ft	1x1	1,323	1,323	595.35 kW

1.6 Page School Ground Mount West Newbury 381 Main St, West Newbury, MA 01985,

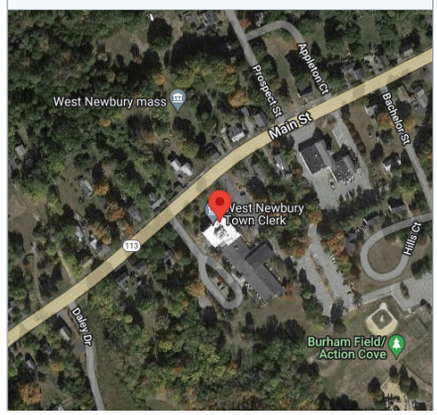
Project Details

Address	381 Main St, West Newbury, MA 01985, USA
Owner	Gabrielle Cole
Last Modified	Gabrielle Cole a few seconds ago
Location	(42.80050330000001, -70.9892665) (GMT -5)
Profile	Default Commercial

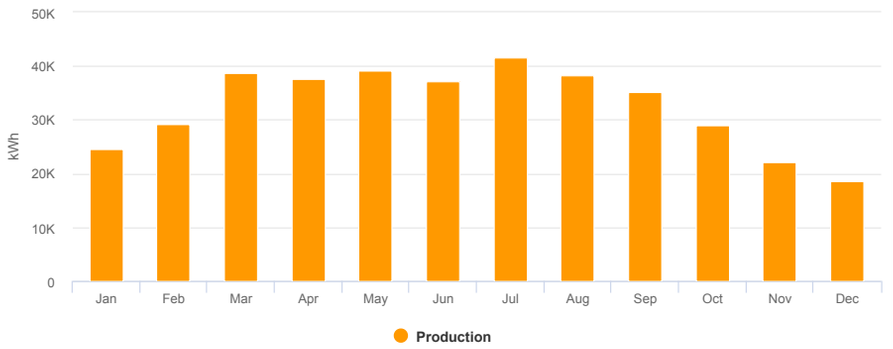
System Metrics

Design	1.6 Page School Ground Mount
Module DC Nameplate	270.0 kW
Inverter AC Nameplate	250.0 kW Load Ratio: 1.08
Annual Production	391.2 MWh
Performance Ratio	85.0%
kWh/kWp	1,448.9
Weather Dataset	TMY, 10km grid (42.85,-70.95), NREL (prospector)
Simulator Version	e0419dc019-dcabad097e-4d5d0f02fa-0e176ffd8f

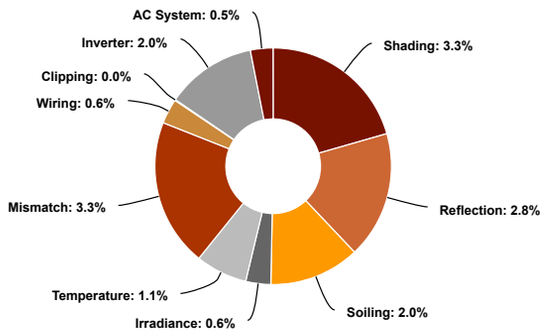
Project Location



Production



System Loss



Annual Production

	Description	Output	% Delta
Irradiance (kWh/m²)	Annual Global Horizontal Irradiance	1,427.4	-
	POA Irradiance	1,704.7	19.4%
	Shaded Irradiance	1,648.1	-3.3%
	Irradiance After Reflection	1,601.8	-2.8%
	Irradiance After Soiling	1,569.8	-2.0%
	Total Collector Irradiance	**1,569.8**	**-0.0%**
Energy (kWh)	Nameplate	424,254.9	-
	Output at Irradiance Levels	421,905.9	-0.6%
	Output at Cell Temperature Derate	417,092.7	-1.1%
	Output After Mismatch	403,476.9	-3.3%
	Optimal DC Output	401,255.1	-0.6%
	Constrained DC Output	401,186.2	-0.0%
	Inverter Output	393,161.3	-2.0%
	Energy to Grid	**391,195.5**	**-0.5%**

Temperature Metrics	
Avg. Operating Ambient Temp	11.9°C
Avg. Operating Cell Temp	20.2°C

Simulation Metrics	
Operating Hours	4,669
Solved Hours	4,669
Pending Hours	-
Error Hours	-

Condition Set

Description	Condition Set 1
Weather Dataset	TMY10km grid (42.85,-70.95)NREL(prospector) (download)
Solar Angle Location	Meteo Lat/Lng
Transposition Model	Perez Model
Temperature Model	Sandia Model

Temperature Model Parameters

Rack Type	a	b	Temperature Delta
Fixed Tilt	-3.56	-0.08	3.0°C
Flush Mount	-2.81	-0.05	0.0°C
East-West	-3.56	-0.08	3.0°C
Carport	-3.56	-0.08	3.0°C

Soiling (%)

J	F	M	A	M	J	J	A	S	O	N	D
2	2	2	2	2	2	2	2	2	2	2	2

Irradiation Variance	5.0%
Cell Temperature Spread	4.0°C
Module Binning Range	-2.5% to 2.5%
AC System Derate	0.50%

Component Characterizations

Type	Component	Characterization
Module	LG450S2W-U6 (1000V) (LG)	Spec Sheet Characterization,PAN
Inverter	Sunny Tripower Core1/US (SMA)	Spec Sheet

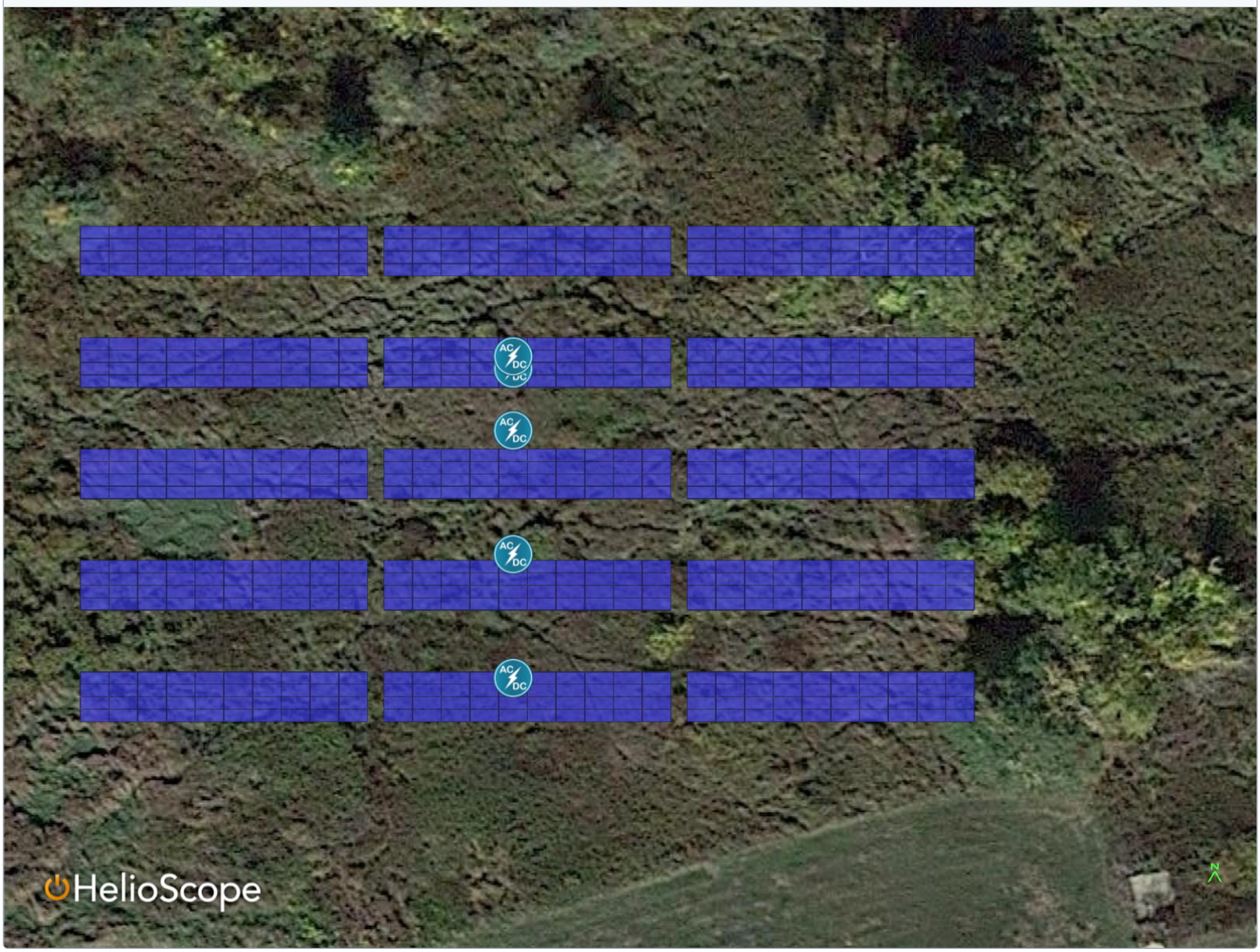
Design BOM

Component	Type	Quantity
8 input Combiners	Combiners	5
12 AWG (Copper)	Home Runs	5
Sunny Tripower Core1/US	Inverters	5
LG450S2W-U6 (1000V)	Modules	600
10 AWG (Copper)	Strings	40

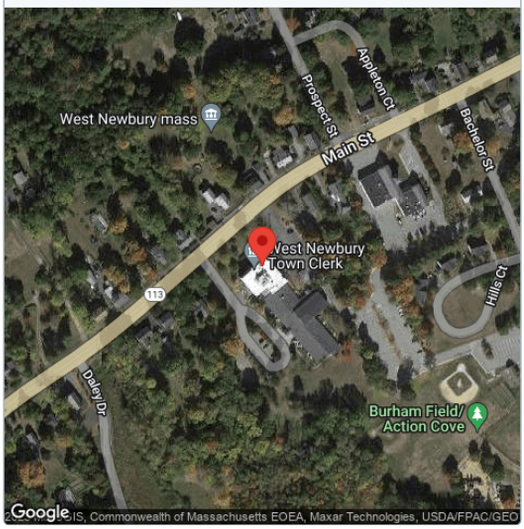
Monthly Shading

Month	GHI (kWh/m^2)	POA (kWh/m^2)	Shaded (kWh/m^2)	Nameplate (kWh)	Grid (kWh)
January	60.4	105.1	97.9	25,205.7	24,543.1
February	81.1	119.6	116.2	29,909.4	29,178.0
March	125.9	160.6	157.0	40,443.6	38,699.0
April	146.3	161.4	157.3	40,511.4	37,541.4
May	169.5	172.3	167.3	43,029.5	39,225.8
June	171.2	167.5	162.2	41,628.8	37,278.6
July	188.3	188.2	182.9	47,045.6	41,542.0
August	160.2	172.7	168.1	43,293.0	38,367.2
September	128.4	155.6	152.0	39,174.6	35,170.5
October	89.4	125.1	122.1	31,484.8	28,973.8
November	60.3	94.8	90.7	23,350.9	22,112.0
December	46.4	81.9	74.5	19,177.6	18,564.2

Design Render



Project Location



Design Wiring Zone

Description	Combiner Poles	String Size	Stringing Strategy
Wiring Zone	12	13 - 17	Along Racking

Field Segments

Description	Racking	Orientation	Tilt	Azimuth	Intrarow Spacing	Frame Size	Frames	Modules	Power
Field Segment 1	Fixed Tilt	Landscape (Horizontal)	30°	180°	15.0 ft	4x10	15	600	270.00 kW

1.7 Dunn Property North Field West Newbury 381 Main St, West Newbury, MA 01985, USA

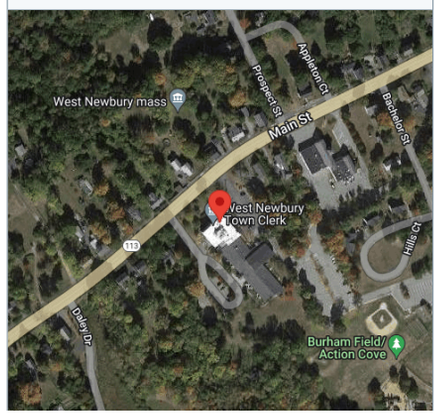
Project Details

Address	381 Main St, West Newbury, MA 01985, USA
Owner	Gabrielle Cole
Last Modified	Gabrielle Cole a minute ago
Location	(42.80050330000001, -70.9892665) (GMT -5)
Profile	Default Commercial

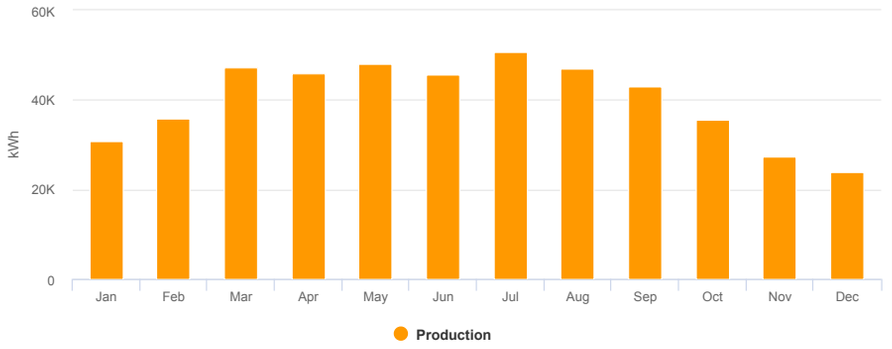
System Metrics

Design	1.7 Dunn Property North Field
Module DC Nameplate	331.2 kW
Inverter AC Nameplate	300.0 kW Load Ratio: 1.10
Annual Production	480.9 MWh
Performance Ratio	85.2%
kWh/kWp	1,452.0
Weather Dataset	TMY, 10km grid (42.85,-70.95), NREL (prospector)
Simulator Version	d423b631b6-68d7c4abe6-363b74c662-adeef4321e

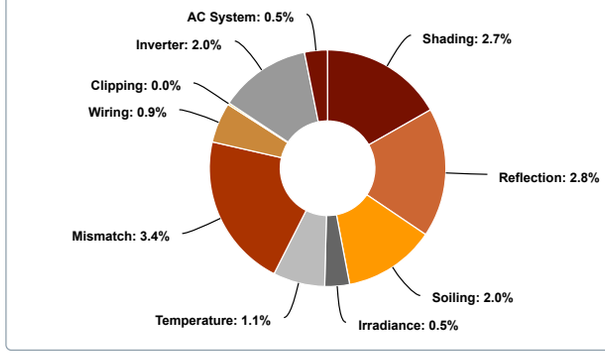
Project Location



Production



System Loss



Annual Production

	Description	Output	% Delta
Irradiance (kWh/m²)	Annual Global Horizontal Irradiance	1,427.4	-
	POA Irradiance	1,704.7	19.4%
	Shaded Irradiance	1,659.1	-2.7%
	Irradiance After Reflection	1,612.3	-2.8%
	Irradiance After Soiling	1,580.0	-2.0%
	Total Collector Irradiance	**1,579.9**	**-0.0%**
Energy (kWh)	Nameplate	523,766.2	-
	Output at Irradiance Levels	520,939.6	-0.5%
	Output at Cell Temperature Derate	515,053.6	-1.1%
	Output After Mismatch	497,713.1	-3.4%
	Optimal DC Output	493,356.4	-0.9%
	Constrained DC Output	493,169.3	-0.0%
	Inverter Output	483,302.5	-2.0%
	Energy to Grid	**480,886.0**	**-0.5%**

Temperature Metrics	
Avg. Operating Ambient Temp	11.9°C
Avg. Operating Cell Temp	20.3°C

Simulation Metrics	
Operating Hours	4,669
Solved Hours	4,669
Pending Hours	-
Error Hours	-

Condition Set

Description	Condition Set 1
Weather Dataset	TMY10km grid (42.85,-70.95)NREL(prospector) (download)
Solar Angle Location	Meteo Lat/Lng
Transposition Model	Perez Model
Temperature Model	Sandia Model

Temperature Model Parameters

Rack Type	a	b	Temperature Delta
Fixed Tilt	-3.56	-0.08	3.0°C
Flush Mount	-2.81	-0.05	0.0°C
East-West	-3.56	-0.08	3.0°C
Carport	-3.56	-0.08	3.0°C

Soiling (%)

J	F	M	A	M	J	J	A	S	O	N	D
2	2	2	2	2	2	2	2	2	2	2	2

Irradiation Variance	5.0%
Cell Temperature Spread	4.0°C
Module Binning Range	-2.5% to 2.5%
AC System Derate	0.50%

Component Characterizations

Type	Component	Characterization
Module	LG450S2W-U6 (1000V) (LG)	Spec Sheet Characterization,PAN
Inverter	Sunny Tripower Core1/US (SMA)	Spec Sheet

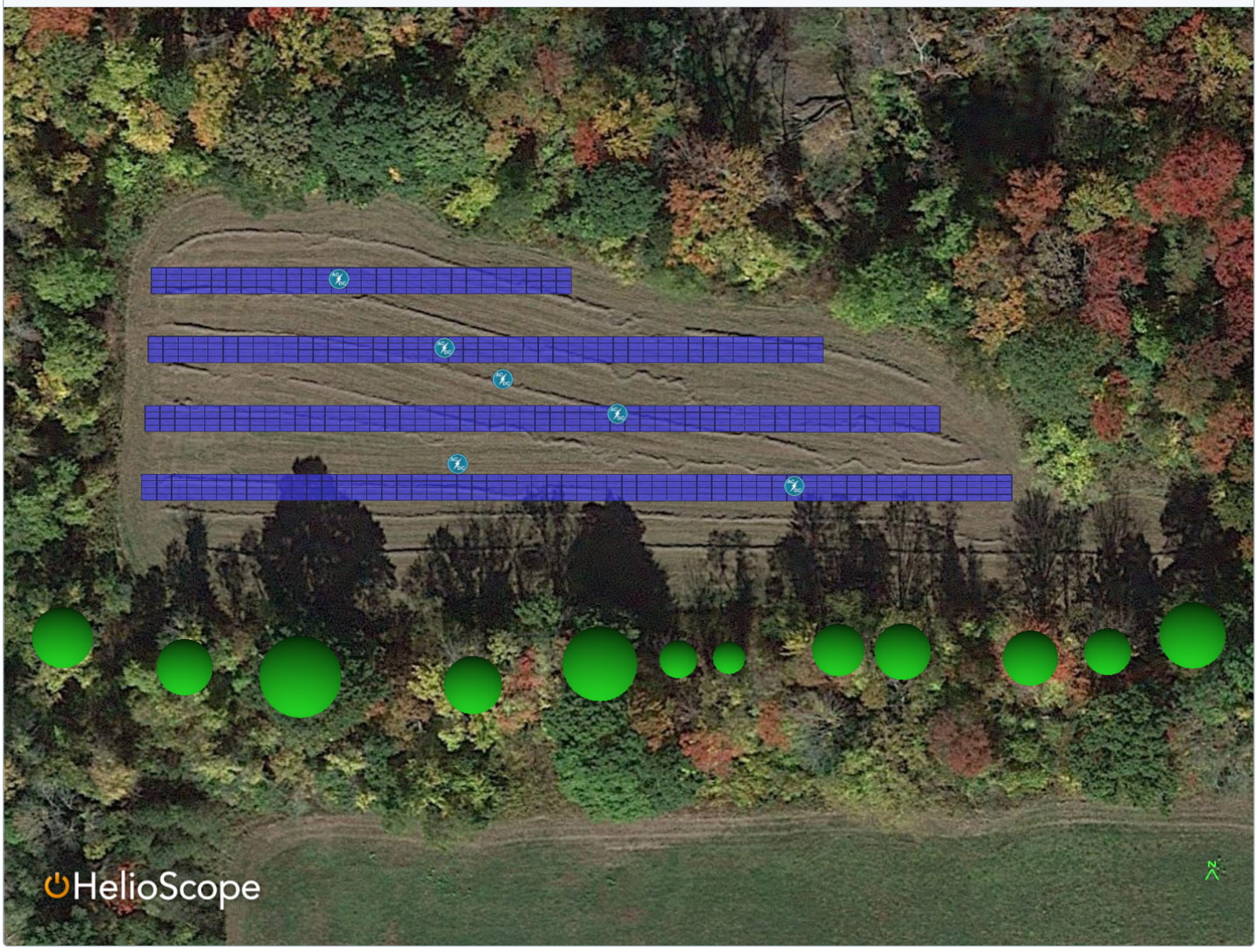
Design BOM

Component	Type	Quantity
3 input Combiners	Combiners	6
5 input Combiners	Combiners	6
12 AWG (Copper)	Home Runs	12
Sunny Tripower Core1/US	Inverters	6
LG450S2W-U6 (1000V)	Modules	736
10 AWG (Copper)	Strings	48

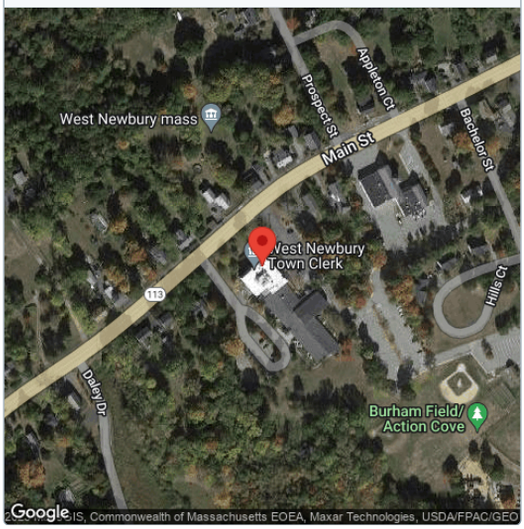
Monthly Shading

Month	GHI (kWh/m^2)	POA (kWh/m^2)	Shaded (kWh/m^2)	Nameplate (kWh)	Grid (kWh)
January	60.4	105.1	101.0	31,882.4	30,813.3
February	81.1	119.6	116.7	36,854.5	35,830.8
March	125.9	160.6	157.1	49,662.1	47,279.1
April	146.3	161.4	157.5	49,754.9	45,883.1
May	169.5	172.3	167.6	52,855.1	47,998.0
June	171.2	167.5	162.5	51,137.6	45,638.1
July	188.3	188.2	183.2	57,788.6	50,835.9
August	160.2	172.7	168.4	53,174.4	46,946.3
September	128.4	155.6	152.2	48,108.3	43,031.1
October	89.4	125.1	122.3	38,691.5	35,488.6
November	60.3	94.8	92.0	29,056.0	27,373.7
December	46.4	81.9	78.5	24,800.7	23,767.9

Design Render



Project Location



Design Wiring Zone

Description	Combiner Poles	String Size	Stringing Strategy
Wiring Zone	12	13 - 17	Along Racking

Field Segments

Description	Racking	Orientation	Tilt	Azimuth	Intrarow Spacing	Frame Size	Frames	Modules	Power
Field Segment 1	Fixed Tilt	Landscape (Horizontal)	30°	180.031°	20.0 ft	4x1	184	736	331.20 kW

1.7 Dunn Property South Field West Newbury 381 Main St, West Newbury, MA 01985, USA

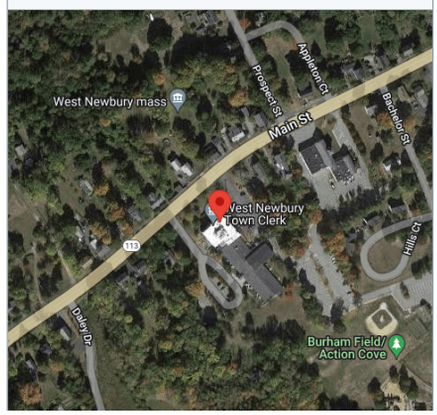
Project Details

Address	381 Main St, West Newbury, MA 01985, USA
Owner	Gabrielle Cole
Last Modified	Gabrielle Cole a few seconds ago
Location	(42.80050330000001, -70.9892665) (GMT -5)
Profile	Default Commercial

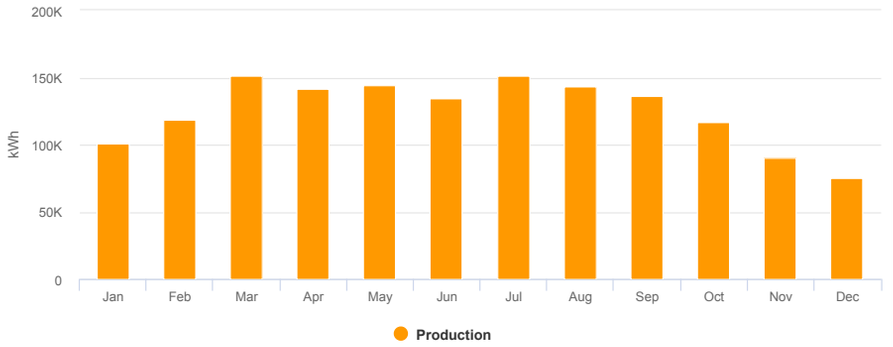
System Metrics

Design	1.7 Dunn Property South Field
Module DC Nameplate	1.1 MW
Inverter AC Nameplate	937.5 kW Load Ratio: 1.13
Annual Production	1.5 GWh
Performance Ratio	82.9%
kWh/kWp	1,425.1
Weather Dataset	TMY, 10km grid (42.85,-70.95), NREL (prospector)
Simulator Version	e0419dc019-dcabad097e-4d5d0f02fa-0e176ffd8f

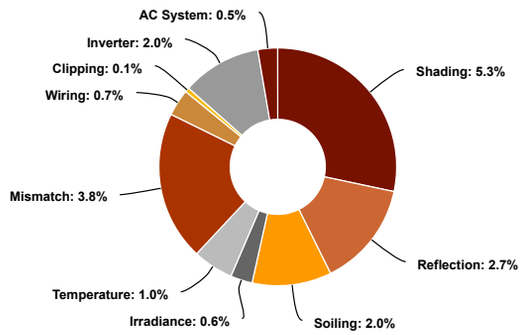
Project Location



Production



System Loss



Annual Production

	Description	Output	% Delta
Irradiance (kWh/m²)	Annual Global Horizontal Irradiance	1,427.4	-
	POA Irradiance	1,719.2	20.4%
	Shaded Irradiance	1,628.9	-5.3%
	Irradiance After Reflection	1,585.5	-2.7%
	Irradiance After Soiling	1,553.8	-2.0%
	Total Collector Irradiance	**1,553.7**	**-0.0%**
Energy (kWh)	Nameplate	1,643,165.4	-
	Output at Irradiance Levels	1,634,074.8	-0.6%
	Output at Cell Temperature Derate	1,617,388.2	-1.0%
	Output After Mismatch	1,556,404.6	-3.8%
	Optimal DC Output	1,545,940.7	-0.7%
	Constrained DC Output	1,544,212.6	-0.1%
	Inverter Output	1,513,295.6	-2.0%
	Energy to Grid	**1,505,729.2**	**-0.5%**

Temperature Metrics	
Avg. Operating Ambient Temp	11.9°C
Avg. Operating Cell Temp	20.1°C

Simulation Metrics	
Operating Hours	4,669
Solved Hours	4,669
Pending Hours	-
Error Hours	-

Condition Set

Description	Condition Set 1
Weather Dataset	TMY10km grid (42.85,-70.95)NREL(prospector) (download)
Solar Angle Location	Meteo Lat/Lng
Transposition Model	Perez Model
Temperature Model	Sandia Model

Temperature Model Parameters

Rack Type	a	b	Temperature Delta
Fixed Tilt	-3.56	-0.08	3.0°C
Flush Mount	-2.81	-0.05	0.0°C
East-West	-3.56	-0.08	3.0°C
Carport	-3.56	-0.08	3.0°C

Soiling (%)

J	F	M	A	M	J	J	A	S	O	N	D
2	2	2	2	2	2	2	2	2	2	2	2

Irradiation Variance	5.0%
Cell Temperature Spread	4.0°C
Module Binning Range	-2.5% to 2.5%
AC System Derate	0.50%

Component Characterizations

Type	Component	Characterization
Module	LG450S2W-U6 (1000V) (LG)	Spec Sheet Characterization,PAN
Inverter	Sunny Tripower CORE1 62-US (SMA)	Spec Sheet

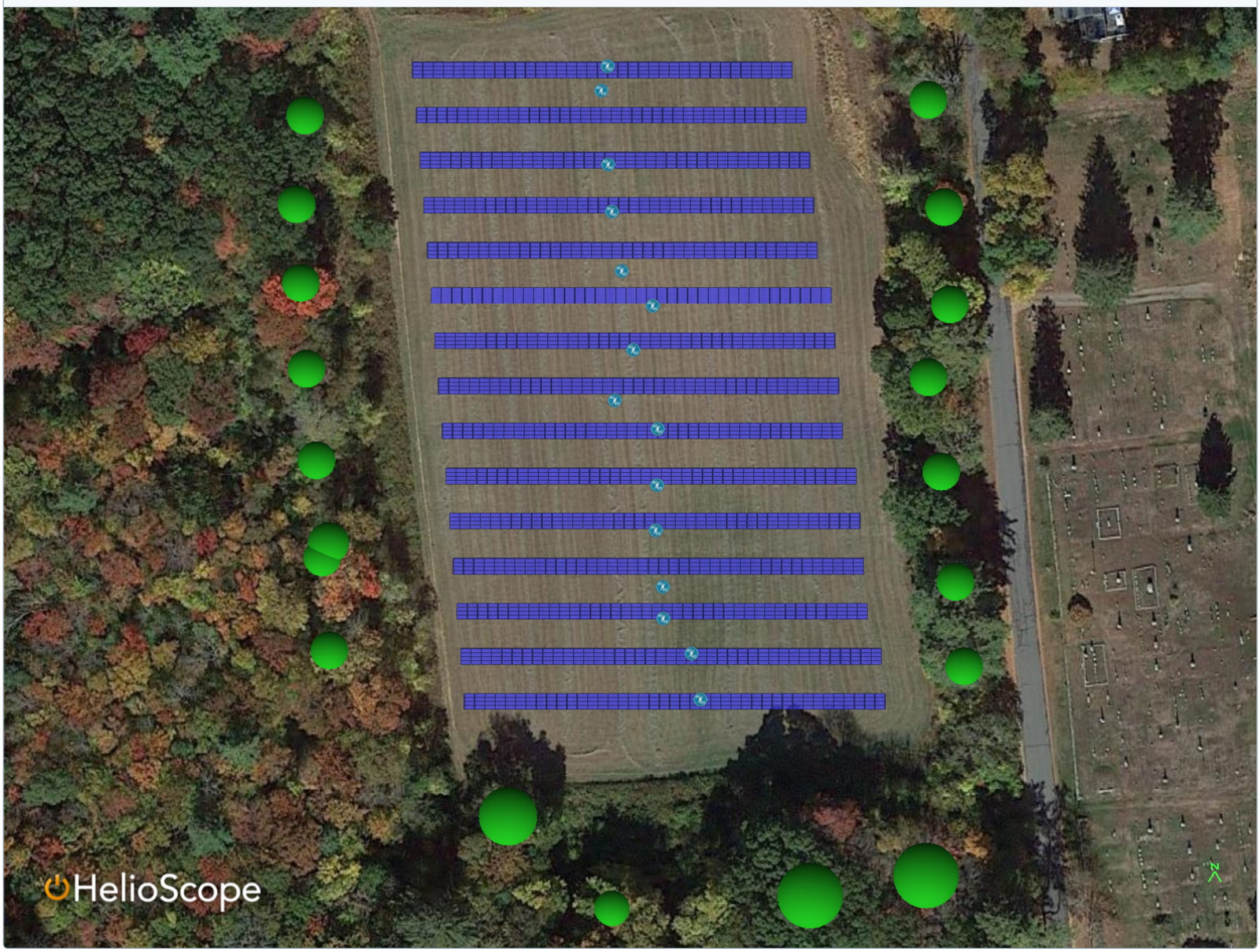
Design BOM

Component	Type	Quantity
3 input Combiners	Combiners	11
4 input Combiners	Combiners	4
6 input Combiners	Combiners	4
7 input Combiners	Combiners	11
12 AWG (Copper)	Home Runs	30
Sunny Tripower CORE1 62-US	Inverters	15
LG450S2W-U6 (1000V)	Modules	2,348
10 AWG (Copper)	Strings	150

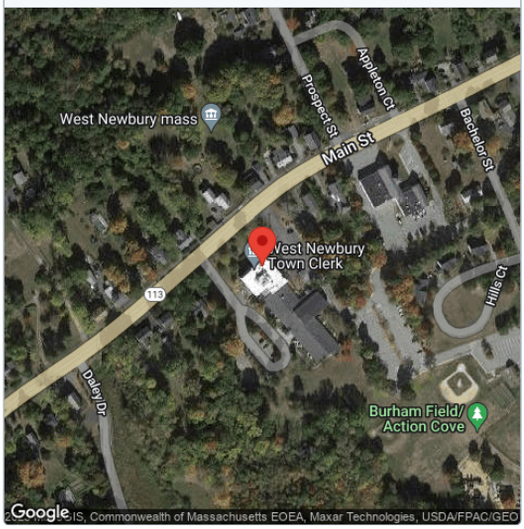
Monthly Shading

Month	GHI (kWh/m^2)	POA (kWh/m^2)	Shaded (kWh/m^2)	Nameplate (kWh)	Grid (kWh)
January	60.4	115.2	104.9	106,339.1	100,804.6
February	81.1	126.9	121.3	122,713.0	118,663.9
March	125.9	164.6	158.4	160,041.4	151,584.9
April	146.3	158.9	152.0	153,184.9	141,378.9
May	169.5	165.5	157.2	158,029.5	143,882.7
June	171.2	159.0	150.4	150,701.0	134,860.6
July	188.3	179.7	170.9	171,554.5	151,436.4
August	160.2	168.9	161.2	162,328.4	143,617.5
September	128.4	157.4	151.2	152,642.4	136,598.9
October	89.4	131.2	126.1	127,721.2	116,864.4
November	60.3	102.0	95.7	97,013.1	90,555.5
December	46.4	90.0	79.8	80,896.8	75,480.8

Design Render



Project Location



Design Wiring Zone

Description	Combiner Poles	String Size	Stringing Strategy
Wiring Zone	12	14 - 17	Along Racking

Field Segments

Description	Racking	Orientation	Tilt	Azimuth	Intrarow Spacing	Frame Size	Frames	Modules	Power
Field Segment 1	Fixed Tilt	Landscape (Horizontal)	40°	180°	20.0 ft	4x1	587	2,348	1.06 MW

APPENDIX B: SAMPLE BATTERY ENERGY STORAGE SYSTEM CUT SHEET

DYNAPOWER
COMPANY
Trusted Worldwide Since **1963**

MPS®-i-125 EHV
ENERY STORAGE SYSTEM
2, 4 or 6 HOUR SYSTEMS

The MPS®-i-125 EHV is a fully integrated behind-the-meter energy storage system that combines Dynapower's efficient UL 1741 SA **MPS®-125 EHV** inverter with Li-Ion batteries in a temperature controlled battery NEMA-rated enclosure. The highly compact integrated system is easily deployed on a concrete pad, crushed stone or on the ground with a forklift and minimal labor, reducing system installation costs for integrators and system owners. The system features Dynapower's propreitary Dynamic Transfer™ which in the event of grid disturbance seamlessly switches a facility from grid-tied to battery backup power. Multiple **MPS®-i-125 EHV** systems can be paralleled together to meet the sizing needs of any behind-the-meter installation.

FEATURES:

- AC Overcurrent Protection
- DC Disconnect
- Integrated DC Input Fuses
- Redundant HVAC cooling systems
- Fire Suppression System
- All AC and DC Switchgear
- DC Pre-Charge
- Black Start (Optional)
- Dynamic Transfer™

DYNAMIC TRANSFER TO OFF GRID MODE

Dynapower's patented Dynamic Transfer™ algorithm monitors grid stability, and upon detecting a grid disturbance, disconnects from the grid. The equipment seamlessly transitions critical loads to stand-alone mode on the load connection and supports 100% phase imbalance in UF mode.

BLACK START

In the event of a complete system power outage, Dynapower's patented Black Start restores power to the facility without the need for external power. Dynapower's Black Start technology can start distribution networks even with transformer magnetizing currents that exceed the power rating of the inverters. Multiple MPS®-i-125 EHV units can be restarted at once.

E COMP: AUTONOMOUS VOLT/VAR SUPPORT

A Volt Var function that provides immediate and automatic voltage support to the grid.

F COMP: AUTONOMOUS Hz/WATT SUPPORT

A Hz-Watt function that provides immediate and automatic frequency support to the grid.

East Coast/Headquarters **85 Meadowland Drive South Burlington, Vermont 05403**

West Coast **2913 Whipple Road Union City, California 94587**

DYNAPOWER

MPS®-i125 EHV ENERGY STORAGE SYSTEM

BATTERY SPECIFICATIONS

Energy Rating	2, 4, and 6 Hour
Power Rating	BTM 125: 125kW @ 480v 150kW @ 600v BTM 250: 250kW @ 480v 300kW @ 600v
Certifications	UL 1973 (Tray), UL 1642

GRID CONNECTION

AC Line Voltage	480-600 V_{AC} 3 Phase
AC Line Nominal Frequency	60 Hz
Continuous AC Current	150 A RMS per MPS Inverter
Overload AC Current	180 A RMS
Continuous AC Power	125 kW (@480) 150 kW (@600)
Power Factor	0 - 1.0 Leading or Lagging
Current Harmonics	IEEE 1547 Compliant, <5% TDD
Roundtrip Efficiency	93%

ENVIRONMENTAL SPECIFICATIONS

Operating Temp	-25 to 50°C, De-rated from 45 to 50°C
Cooling	Forced Air Cooled
Rated Max Elevation	1,000 Meters Full Power; Up to 3,000 Meters With Derating
Enclosure	UL 3R / IP 54 (Outdoor)

ADDITIONAL FEATURES

Faults	AC Over Voltage, AC Under Voltage, AC Under Frequency, AC Over Frequency, AC Overload, Over-temperature, DC Over Voltage, DC Over Current
Standards Compliance	IEEE 1547, UL 1741 SA Listing
Safety Features	Anti-islanding with UL Compliant trip points, Hardware Over Current Protection, Surge Protection

certifications

EXPERIENCE YOU CAN TRUST

Dynapower is a leader in the design and manufacture of four-quadrant bi-directional energy storage inverters. The MPS®, CPS® and MPS®-i product lines are IEEE and UL 1741 SA certified; offer sub-cycle response with zero voltage ride-through; feature a Dynamic Transfer™ function that can be operated in both grid-tied or stand-alone (grid forming) modes. Dynapower inverters and integrated energy storage systems are deployed globally, enabling increased penetration of renewable generation resources on the grid, peak shaving and valuable grid resiliency.

1.802.860.7200

rpratt@dynapower.com

East Coast:
85 Meadowland Drive
South Burlington, Vermont 05403

West Coast:
2913 Whipple Road
Union City, California 94587

MEMORANDUM

To: Select Board, Town Manager

From: Wendy Reed

Re: Town Manager Project/Initiatives Priority Rankings

Date: August 4, 2023

The individual rankings received from Select Board members are compiled on pages 5 – 7. This is still a draft so if on reviewing or after discussion Monday night you'd like to change/add your ranking, the table can be updated. The combined rankings that follow were determined by:

1. Assigning a point value to timeframe (A=1, B=2) and averaging SB members ranking
    a. FY24 indicates all SB members in agreement on A
    b. FY24/FY25 indicates partial agreement between A and B
    c. FY25 indicates all SB in agreement on B
2. Averaging point value of priority (1, 2 or 3)
3. Sorting combined rankings by timeframe point value and then priority.

The following legend applies to both tables:

Legend		
Project Rankings		Project Completion Status
A	FY24	Complete
B	FY25 and later	Underway
1	Vital	Not Underway (at all; or in a meaningful way)
2	Important	
3	Optional	

Combined Select Board Rankings – July 2023		
Town Manager Projects/Initiatives	Timeframe	Priority
Peer Review: Dole Place cost estimates; permitting/design review ($)	FY24	1.0
Water financial plan	FY24	1.0
Water hydraulic plan ($)	FY24	1.0
Water Rate Study ($)	FY24	1.0
MOU with Newburyport: Water	FY24	1.3
Page School Conditions Assessment ($)	FY24	1.3
Realistic/sustainable water capital program/plan	FY24	1.3
Restructure DPW; figure out FY24 expense and FY25 budget implications	FY24	1.3
Form of Government: Review Town Manager legislation; begin process to consider potential amendments to improve efficiency and effectiveness. Consider establishment of Charter Committee or Commission.	FY24	1.7
Page School lintels evaluation ($)	FY24	1.7
Emerald Ash Borer: treatments / tracking ($)	FY24	2.0
Expand/empower "Land Agent" role with BCCs	FY24	2.0
Remote Work (personnel policy)	FY24	2.0
Solar: feasibility study of Town-owned parcels ($)	FY24	2.0
Stabilization Fund: refine account structure to distinguish Capital Stabilization from regular Stabilization funds	FY24	2.0
Summer Rec Program	FY24	2.0
Town Hall Restoration (painting) ($)	FY24	2.0
Investment Manager procurement process	FY24	2.5
Acquire site for new public water source	FY24/FY25	1.0
Replace phone systems: Town Offices and Public Safety ($)	FY24/FY25	1.3
Adopt financial policies: Employee Reimbursement, Procurement, Procurement Conflict-of-Interest (priority 1)	FY24/FY25	1.7
Adopt financial policies: Grant Management; Overlay; Reconciliations; Revenue Turnover; Tailings; Tax Recapitulation; and Year-End Closing (priority 2)	FY24/FY25	1.7
HVAC equipment upgrades: Annex/COA ($)	FY24/FY25	1.7
Identify and apply for grants: Middle Street Bridge	FY24/FY25	1.7
MBTA Communities planning/zoning ($)	FY24/FY25	1.7
MOU with Newburyport: Middle Street Bridge	FY24/FY25	1.7
Road paving IFB	FY24/FY25	1.7
Wage/Classification study (cont'd implementation: job desc.; perf. evals)	FY24/FY25	1.7
Ash Street management plan	FY24/FY25	2.0
Build multi-year budget forecasting tool	FY24/FY25	2.0
Hazard Mitigation Plan updates	FY24/FY25	2.0
Housing Production Plan updates ($)	FY24/FY25	2.0
Zoning amendments: ADUs	FY24/FY25	2.0
Capital Bylaw: revise for consistency with policy	FY24/FY25	2.3

Combined Select Board Rankings – July 2023		
Town Manager Projects/Initiatives	Timeframe	Priority
Coffin Street land acquisition (establish parking, access) ($)	FY24/FY25	2.3
Hearing Room improvements, cont'd ($)	FY24/FY25	2.3
New resident info/welcome package	FY24/FY25	3.0
Establish reliable accrual tracking process in payroll software	FY24/FY25	1.0
Self-evaluation of pay practices (MGL Ch. 149)	FY24/FY25	1.5
Expand/broaden GIS user group	FY24/FY25	2.0
Invasive Species (permitting, contractor management) ($)	FY24/FY25	2.0
Stormwater/culvert mapping/engineering (beyond River Rd)	FY24/FY25	2.0
Surface Water Protection Bylaw (within MOU with Newburyport)	FY24/FY25	2.0
Invasive Species intern program ($)	FY24/FY25	2.5
Building security/access protocols	FY24/FY25	1.7
Improve structure/utilization of network servers, records management in Town Offices	FY24/FY25	1.7
Review EMA dept. structure/function	FY24/FY25	1.7
Review/update employee classifications/grades	FY24/FY25	1.7
River Road resiliency: engineering study	FY24/FY25	1.7
Advance consideration of regionalization	FY24/FY25	2.0
Cable License Agreement renewal, Verizon (2026)	FY24/FY25	2.0
GAR Library: implementation of 5-year strategic plan	FY24/FY25	2.0
Page/Pipestave crossing (25% design)	FY24/FY25	2.0
Pentucket Regional Agreement: review/update	FY24/FY25	2.0
Route 113 Corridor Plan / TIP ($)	FY24/FY25	2.0
Sawmill Brook land acquisition; incl. LAND grant; land management plan ($)	FY24/FY25	2.0
Soldiers & Sailors Building: resolve public plan, whether by authorizing disposition to a third party (subject to historic preservation restriction) or otherwise	FY24/FY25	2.0
Propose new Wetlands Bylaw	FY24/FY25	2.3
Town Center traffic calming ($50k earmark) ($)	FY24/FY25	2.3
Mowing: Town-wide fields management/mowing plan	FY24/FY25	2.3
LED streetlight conversion	FY24/FY25	2.7
Parks/Rec capital planning	FY24/FY25	2.7
Relocate public safety equipment from Parks/ Rec bldg.; propose bldg. demo ($)	FY24/FY25	2.7
Update 2001 Committee Handbook	FY24/FY25	2.7
Special Legislation: Select Board name	FY24/FY25	3.0
Improvements recommended in ADA facilities audit, cont'd ($)	FY25	1.5
New/Updated Comp Master Plan	FY25	1.7
Establish COA Revolving Fund	FY25	2.0
Evaluate applicability, administration of Scenic Roads Bylaw	FY25	2.0

Combined Select Board Rankings – July 2023		
Town Manager Projects/Initiatives	Timeframe	Priority
Fire Dept operational/asset structure review (incl. improve daytime coverage/ops)	FY25	2.0
Pipestave/Dunn access/parking/circulation/management plan	FY25	2.0
Potential land disposition for housing	FY25	2.0
River Road boat launch	FY25	2.0
Secure "Complete Streets" community designation	FY25	2.0
Sustainable long-term plan for cemeteries O&M, capacity	FY25	2.0
Zoning amendments: wireless comm facilities	FY25	2.0
Artichoke River Woods land acquisition (establish parking, access)	FY25	2.3
Establish public access to Merrimack River	FY25	2.3
Parks/Rec O&M plans	FY25	2.3
Mill Pond All Access trail (with or without broader reorientation plan) ($)	FY25	2.5
Pursue "Housing Choice" community designation	FY25	2.5
Whetstone Greenway ($)	FY25	2.5
Edits/Updates to Mill Pond Management Plan	FY25	2.7
Way to the River: vehicle access questions	FY25	2.7
Potential Mooring Field	FY25	3.0

Legend		
Project Rankings		Project Completion Status
A	FY24	Complete
B	FY25 and later	Underway
1	Vital	Not Underway (at all; or in a meaningful way)
2	Important	
3	Optional	

TOWN MANAGER PROJECTS / INITIATIVES Select Board Member Priorities – July 2023			
WR	RP	CW	Project/Initiative
A1	A1	B1	Acquire site for new public water source
A2	A1	B2	**Adopt financial policies: Employee Reimbursement, Procurement, Procurement Conflict-of-Interest (priority 1)**
B2	A1	A2	Adopt financial policies: Grant Management; Overlay; Reconciliations; Revenue Turnover; Tailings; Tax Recapitulation; and Year-End Closing (priority 2)
B2	A1	B3	Advance consideration of regionalization
B2	B2	B3	Artichoke River Woods land acquisition (establish parking, access)
A2	A2	B2	**Ash Street management plan**
B2	A2	A2	Build multi-year budget forecasting tool
A2	B1	B2	Building security/access protocols
A2	B1	B3	Cable License Agreement renewal, Verizon (2026)
A3	A2	B2	Capital Bylaw: revise for consistency with policy
A2	A2	B3	Coffin Street land acquisition (establish parking, access) ($)
B3	B2	B3	Edits/Updates to Mill Pond Management Plan
A2	A1	A3	Emerald Ash Borer: treatments / tracking ($)
B2	B2	B2	Establish COA Revolving Fund
B2	B2	B3	Establish public access to Merrimack River
B1	A1		Establish reliable accrual tracking process in payroll software
B2	B2		**Evaluate applicability, administration of Scenic Roads Bylaw**
B2	A2		Expand/broaden GIS user group
A2	A2		**Expand/empower "Land Agent" role with BCCs**
B2	B2		Fire Dept operational/asset structure review (incl. improve daytime coverage/ops)
A2	A2	A1	Form of Government: Review Town Manager legislation; begin process to consider potential amendments to improve efficiency and effectiveness. Consider establishment of Charter Committee or Commission.
B2	A2	B2	GAR Library: implementation of 5-year strategic plan
A2	A1	B3	Hazard Mitigation Plan updates
A2	A3	B2	Hearing Room improvements, cont'd ($)
A2	A2	B2	Housing Production Plan updates ($)
B2	A1	A2	HVAC equipment upgrades: Annex/COA ($)
B2	A1	A2	Identify and apply for grants: Middle Street Bridge
B2	A1	B2	Improve structure/utilization of network servers, records management in Town Offices
B2	B1		Improvements recommended in ADA facilities audit, cont'd ($)
B2	A2		Invasive Species (permitting, contractor management) ($)
B3	A2		Invasive Species intern program ($)
A3	A2		Investment Manager procurement process

TOWN MANAGER PROJECTS / INITIATIVES Select Board Member Priorities – July 2023			
WR	RP	CW	Project/Initiative
B3	A2	B3	LED streetlight conversion
A2	A1	B2	**MBTA Communities planning/zoning ($)**
B3	B2		Mill Pond All Access trail (with or without broader reorientation plan) ($)
B2	A1	A2	**MOU with Newburyport: Middle Street Bridge**
A1	A1	A2	**MOU with Newburyport: Water**
A3	A3	B3	New resident info/welcome package
B2	B1	B2	New/Updated Comp Master Plan
A2	A1	A1	**Page School Conditions Assessment ($)**
A2	A2	A1	Page School lintels evaluation ($)
B2	A2	B2	Page/Pipestave crossing (25% design)
B3	A2	B3	Parks/Rec capital planning
B2	B2	B3	**Parks/Rec O&M plans**
A1	A1	A1	**Peer Review: Dole Place cost estimates; permitting/design review ($)**
B2	B2	A2	Pentucket Regional Agreement: review/update
B2	B2	B2	Pipestave/Dunn access/parking/circulation/management plan
B2	B2	B2	Potential land disposition for housing
B3	B3	B3	Potential Mooring Field
A2	B2	B3	Propose new Wetlands Bylaw
B3	B2		Pursue “Housing Choice” community designation
A1	A1	A2	Realistic/sustainable water capital program/plan
B3	A2	B3	Relocate public safety equipment from Parks & Rec bldg.; propose bldg. demo ($)
A2	A2	A2	Remote Work (personnel policy)
A2	A1	B1	**Replace phone systems: Town Offices and Public Safety ($)**
A1	A1	A2	**Restructure DPW; figure out FY24 expense and FY25 budget implications**
A2	B1	B2	Review EMA dept. structure/function
B2	A1	B2	Review/update employee classifications/grades
B2	B1	B3	River Road boat launch
B2	A1	B2	River Road resiliency: engineering study
A2	A1	B2	**Road paving IFB**
B2	A2	B2	**Route 113 Corridor Plan / TIP ($)**
B2	A2	B2	Sawmill Brook land acquisition; incl. LAND grant; land management plan ($)
	B2		Secure “Complete Streets” community designation
A2	B1		Self-evaluation of pay practices (MGL Ch. 149)
A2	A2		Solar: feasibility study of Town-owned parcels ($)
B2	B2	A2	Soldiers & Sailors Building: resolve public plan, whether by authorizing disposition to a third party (subject to historic preservation restriction) or otherwise

TOWN MANAGER PROJECTS / INITIATIVES Select Board Member Priorities – July 2023			
WR	RP	CW	Project/Initiative
B3	A3	B3	Special Legislation: Select Board name
A2	A2	A2	Stabilization Fund: refine account structure to distinguish Capital Stabilization from regular Stabilization funds
A2	B2		Stormwater/culvert mapping/engineering (beyond River Rd)
A2	A2		Summer Rec Program
B2	A2		Surface Water Protection Bylaw (within MOU with Newburyport)
B2	B2		Sustainable long-term plan for cemeteries O&M, capacity
B3	A2	B2	Town Center traffic calming ($50k earmark) ($)
Comp	A2	Done	Town Hall Restoration (painting) ($)
B2	A2	B3	**Mowing: Town-wide fields management/mowing plan**
B3	A3	B2	Update 2001 Committee Handbook
A2	A1	B2	**Wage/Classification study (cont'd implementation: job desc.; perf. evals)**
A1	A1	A1	Water financial plan
A1	A1	A1	**Water hydraulic plan ($)**
A1	A1	A1	**Water Rate Study ($)**
B3	B2	B3	Way to the River: vehicle access questions
B3	B2		Whetstone Greenway ($)
A2	B2	A2	Zoning amendments: ADUs
B2	B2		Zoning amendments: wireless comm facilities

Legend		
Project Rankings		Project Completion Status
A	FY24	Complete
B	FY25 and later	Underway
1	Vital	Not Underway (at all; or in a meaningful way)
2	Important	
3	Optional	

This GRANT AGREEMENT made this XXth day of August, 2023 by and between the Town of West Newbury, a municipal corporation duly organized under the laws of Massachusetts and having an address of 381 Main Street, West Newbury, MA 01985, (the "TOWN") acting by and through its Select Board, and the Trustees (the "TRUSTEES") of the West Newbury Municipal Affordable Housing Trust, established pursuant to G.L. c. 44 Section 55C, having its principal place of business at 381 Main Street, West Newbury, MA 01985 (the "GRANTEE" or the "TRUST").

WITNESSETH

WHEREAS, Town Meeting voted under Article 12 of the Special Town Meeting held October 23, 2021 to establish a municipal affordable housing trust under M.G. L. c. 44 Section 55C as, among other things, a mechanism to utilize annual revenues for community housing consistent with the Community Preservation Act, G.L. c. 44B (the "CPA" or the "Act"); and

WHEREAS, upon recommendation of the Community Preservation Committee "CPC" or "COMMITTEE"), Town Meeting voted under Article 29 of the Annual Town Meeting held May 14, 2022 to adopt the Municipal Affordable Housing Trust Bylaw ("Bylaw"), which describes the membership, operation and limitations on the TRUST; and

WHEREAS, A Declaration of Trust is recorded at So. Essex #197 Bk 41431 Pg: 1; and

WHEREAS, Town Meeting voted under Article 15 of the Annual Town Meeting held April 24, 2023 to appropriate $172,178.00 ("Grant Funds") from CPA Community Housing Funds to the TRUST for uses consistent with the purposes of the TRUST as defined in the bylaw and Declaration of Trust; and

WHEREAS, Town Meeting may vote to appropriate additional money from CPA Community Housing Funds to the TRUST annually or for specific Community Housing projects in the future; and

WHEREAS, General Laws c.30B, §2 defines a grant agreement as "an agreement between a governmental body and an individual or nonprofit entity the purpose of which is to carry out a public purpose of support or stimulation instead of procuring supplies or services for the benefit or use of the governmental body"; and

WHEREAS, the expenditure of public funds must be for public purposes and not unfairly or primarly benefit any one group or oganization to the detriment of the public.

WHEREAS, the purpose of the Grant Agreement is to ensure that the CPA Community Housing Funds are used for the acquisition, creation, preservation and support of community housing, as defined by the CPA (Massachusetts General Laws c. 44B).

NOW, THEREFORE, the TOWN and the GRANTEE wish to set forth in this Grant Agreement the terms and conditions of the Grant, and hereby agree as follows:

1. Recitals. The recitals above are true and accurate and are incorporated herein by reference.

2. Payment. Within thirty (30) days from the execution of this Grant Agreement, the TOWN shall transfer the sum of $172,178.00 from CPA Community Housing Funds to GRANTEE, in accordance with Town Meeting vote.

3. Conditions.

   a) GRANTEE agrees that any dwelling units created or acquired with the use of the Grant funds, whether in part or in full, shall be used for community housing purposes, as that term is defined in Section (2) of the Act, in perpetuity. Sale or transfer of the dwelling shall be subject to an affordable housing deed rider requiring occupancy by or rented to low- or moderate-income households, and no other sale or transfer shall be permitted. GRANTEE acknowledges that Section 12(a) of the Act states that "a real property interest that is acquired with monies from the Community Preservation Fund shall be bound by a permanent restriction, recorded as a separate instrument, that meets the requirements of sections 31 to 33, inclusive, of chapter 184 limiting the use of the interest to the purpose for which it was acquired. The permanent restriction shall run with the land and shall be enforceable by the TOWN, the Commonwealth, and/or a nonprofit or charitable organization. The deed restrictions must be approved and accepted by the TOWN.

   b) Notwithstanding GRANTEE'S bylaws, all Grant Funds expended pursuant to this Agreement shall be limited to the allowable community housing spending purposes as set forth in Sections 2 and 5(c) of the CPA.

   c) Until all the Grant Funds have been expended, GRANTEE shall prepare and submit to the CPC quarterly reports concerning the use of such monies, which report shall outline the purposes for which the Grant Funds have been used and any problems encountered. GRANTEE shall submit these reports in writing and may be requested to make oral presentations at CPC or Select Board meetings. GRANTEE shall provide a final report immediately following its final expenditure of all the Grant Funds.

d) Any publicity involving the use of the Grant Funds by the GRANTEE shall include explicit reference to the CPC.

4. Reports; Inspections; Record-Keeping. GRANTEE agrees to keep such records with respect to the use of the Grant Funds as are kept in the normal course of business and such additional records as may be reasonably required by the TOWN. During normal business hours and as often as the TOWN may reasonably deem necessary, the TOWN shall have full and free access to such records and may examine and copy such records. As specified in Section 3(f), above, the GRANTEE shall report quarterly to the TOWN concerning its use of the Grant Funds.

5. Liability of the Town. The TOWN's liability hereunder shall be to make the payment specified in Paragraph 1 of this Grant Agreement and the TOWN shall be under no further obligation or liability. Nothing in this Grant Agreement shall be construed to render the TOWN or any elected or appointed official or employee of the TOWN, or their successors in office, personally liable for any obligation under this Grant Agreement.

6. Indemnification. GRANTEE shall indemnify, defend, and hold the TOWN and its departments, officers, employees, representatives and agents harmless from and against any and all claims, demands, liabilities, actions, causes of actions, costs and expenses, including attorneys' fees, of any nature whatsoever arising as a result of (a) any injury to person or property resulting from expenditure of the Grant Funds, (b) the quality of any work required or undertaken with use of the Grant Funds, (c) GRANTEE's performance or the negligence or misconduct of GRANTEE or GRANTEE's agents, employees, contractors and invitees, (d) the failure of any contractor hired by GRANTEE to perform work thereunder or any other act or omission of any such contractor, and (e) any and all claims for the payment by the TOWN of any amount in excess of the Grant Amount.

7. Termination. This Agreement shall terminate upon GRANTEE'S final expenditure of all the Grant Funds and the delivery of copies of the restrictions recorded pursuant to Section 3(A) hereof, if any. In the event that GRANTEE fails to fulfill its obligations under the terms of this Agreement as determined by the Town, the Town shall have the right, in its sole discretion, to terminate this Agreement upon written notice to GRANTEE. Upon receipt of such notice, GRANTEE shall refund all undisbursed Grant Funds to the TOWN, and such Grant Funds shall be returned to the CPA account from which the funds were appropriated.

8. Return of Funds. If GRANTEE fails to fulfill its obligations under the terms of this Agreement as a result of negligent or intentional acts or omissions of GRANTEE, its agents, employees, contractors or invitees, GRANTEE shall be liable to repay to the TOWN the entire Grant Amount, or any lesser amount it received pursuant to this Agreement, provided under this Agreement, and the TOWN may take such steps as are necessary, including legal action, to recover such funds. Any funds so returned or recovered shall be placed in the TOWN'S Community Preservation Fund. In the event that the TOWN takes legal action under this Agreement, GRANTEE shall pay any and all costs, including reasonable attorneys' fees, expended by the TOWN for the enforcement of this Agreement.

9. Successors and Assigns. This Agreement is binding upon the parties hereto, their successors, assigns and legal representatives. GRANTEE shall not assign, subcontract or otherwise transfer this Agreement, in whole or in part, without the prior written consent of the TOWN.

10. Compliance with Laws. GRANTEE shall comply with all Federal, State and local laws, rules, regulations and orders applicable to the use of the Grant Funds, such provisions being incorporated herein by reference, and shall be responsible for obtaining all necessary licenses, permits, and approvals as may be required in connection with the use of such funds. No local permit or license is waived by the award of this Grant or by this Agreement.

11. Notice. Any and all notices, or other communications required or permitted under this Agreement shall be in writing and delivered by hand or mailed postage prepaid, return receipt requested, by registered or certified mail or by other reputable delivery service, to the parties at the addresses set forth on Page 1 or furnished from time to time in writing hereafter by one party to the other party. Any such notice or correspondence shall be deemed given when so delivered by hand, if mailed, when deposited with the U.S. Postal Service or, if sent by private overnight or other delivery service, when deposited with such delivery service.

12. Survival. Notwithstanding anything to the contrary herein contained, the obligations imposed on the GRANTEE under Sections 3-11, 13 and 16 shall survive the termination or expiration of this Agreement.

13. Entire Agreement. This Agreement, and all documents incorporated herein by reference, constitutes the entire integrated agreement between the parties with respect to the matters described. This Agreement supersedes all prior agreements, negotiations and representations, either written or oral, and it shall not be modified or amended except by a written document executed by the parties hereto.

14. Renewal. This Grant Agreement shall be renewed annually, coincident with the application for and Town Meeting approval of annual transfer of CPA Community Housing Funds to the GRANTEE. A separate Grant Agreement shall be created for any other CPA Fund disbursements to the GRANTEE.

15. Severability. If any term or condition of this Grant Agreement or any application thereof shall to any extent be held invalid, illegal or unenforceable by a court of competent jurisdiction, the validity, legality, and enforceability of the remaining terms and conditions of this Grant Agreement shall not be deemed affected thereby unless one or both parties would be substantially or materially prejudiced.

16. Governing Law. This Grant Agreement shall be governed by, construed and enforced in accordance with the laws of the Commonwealth of Massachusetts and the GRANTEE submits to the jurisdiction of any of its appropriate courts in Essex County, MA for the adjudication of disputes arising out of this Grant Agreement.

17. Counterparts. This Agreement may be executed in several counterparts, each of which shall be an original and which shall constitute the same instrument. The exchange of counterparts by electronic or facsimile transmission (including telecopier and scanned "PDF" transmitted by email) shall constitute effective execution and delivery of this Agreement by the parties hereto. Signatures of Town and GRANTEE delivered by electronic or facsimile transmission (including telecopier and scanned "PDF" transmitted by email) shall be deemed to be their original signatures for all purposes.

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IN WITNESS WHEREOF, the parties hereto have executed this Grant Agreement on the day and year first written above.

Town of West Newbury SELECT BOARD	Town of West Newbury AFFORDABLE HOUSING TRUST
Chair Wendy Reed	Trustee Kevin Bowe
Vice Chair Richard Parker	Trustee Donna Garcia
Clerk Christopher Wile	Trustee Deborah Hamilton
	Trustee Karen Holmes
	Trustee Derek Mitchell
	Trustee Wendy Reed
	Trustee Pamela Shaffer
Angus Jennings West Newbury Town Manager	

Town of West Newbury
Select Board
Monday, July 10, 2023 @ 7:00pm
381 Main Street, Town Office Building
www.wnewbury.org
Meeting Minutes

Open Session: Chairwoman Reed opened the session at 7:11pm.

Participation at the Meeting:

- Rick Parker, Wendy Reed, Chris Wile- Select Board
- Angus Jennings- Town Manager
- Jim Blatchford- Town Clerk
- Jennifer Walsh- Town Accountant
- Sam Joslin- Inspections, via Zoom
- Julianne Ruscio- Council on Aging Applicant
- Walter Burmeister- Finance Committee Applicant
- Eric Boucher- Harborside Half Marathon Representative, via Zoom
- Denise Allard, Mark Cappadonna- Colonial Power Representatives, via Zoom
- PTO Representatives, via Zoom

Announcements:

- This meeting is being broadcast on local cable TV and recorded for rebroadcast on the local cable channels and on the internet. Meeting also accessible by remote participation; instructions below.
- West Newbury Historical Commission Tales of Our Town, July 2023 – "The West Newbury Cadet Band"
- 2023 Summer Bandstand Concert Series – Thursdays at 6:30pm – list of performers located on Town website
- Call for volunteers! FY24 positions on Boards/Commissions/Committees. See www.wnewbury.org/volunteer
- Reminder to subscribe for emailed Town agendas/news/announcements at www.wnewbury.org/subscribe

Regular Business

A. **Request for appointment of Julianne Ruscio to Council on Aging**
(See Exhibit A). Ruscio offered insight on her background and her interest in joining the Board for the balance of a three-year term. **Parker motioned to appoint Ruscio to the Council. Reed seconded. The motion unanimously passed. (3 Yes, 0 No, 0 Abstain).**

B. **Request for reappointment of Walter Burmeister to Finance Committee**
(See Exhibit B). Parker stated that he felt Burmeister's reaching out to other Finance Committees in a "unilateral" fashion was not proper, and Wile provided examples of this from his tenure with Burmeister on the Committee. The re-appointee defended his actions saying that he always notified the Chair of his actions. Wile suggested to Burmeister the proper methods for representing the Town properly in future. **Wile motioned to reappoint Burmeister the Committee. Reed seconded. The motion unanimously passed. (3 Yes, 0 No, 0 Abstain).**

C. **Requests for Special Event permits**
   a. **Apple Harvest Road Race – Oct. 15, 2023 from 8am-3pm – West Newbury PTO**
   (See Exhibit Ca). Wile was curious if a police detail was needed for the event. The representative from the PTO offered to send further information to the Select Board if any was missing, as it was determined it might be from the Board's meeting materials. **The Item was tabled for a future meeting.**
   b. **Harborside Half Marathon and 5K – Nov. 12, 2023 from 9am-1pm – Loco Sports**
   (See Exhibit Cb). The Board questioned the race representative about the police detail needed for the half marathon. Boucherd told the Board he believed the approval of the police had been given, but Chief Dwyer had not yet sent the approval to the Select Board. Reed requested that the information be sent to the Board directly by the representative. Reed also requested that the applicants include the physical address of the water stations. **The Item was tabled for a future meeting.**

D. **Review of draft Municipal Energy Aggregation Plan and vote to post for public comment – Denise Allard and Mark Cappadonna, Colonial Power Group, Inc.**
(See Exhibit D). The representatives from the Group outlined the fundamentals of the Aggregation Plan. The community would be offered a choice between the standard rates of National Grid, or Colonial Power Group Inc. acting as a negotiating entity on behalf of the Town to secure a potentially lower rate for energy. The Town had previously approved the pursuit of this Plan at the Fall Town Meeting. Rick Parker explained to the representative that much of the power in West Newbury was generated locally through their West Newbury's field, but confirmed that despite this West Newbury would still be able to participate, and that the Colonial Power Plan would provide additional power to the community as needed at the lower rate. Wile asked if the Town could have an opt-in versus an opt-out option for consumers and Cappadonna explained the need for the program to work this way, but that citizens could opt-out at any time they wished. Wile emphasized the point that consumers would be forced to look at their bills each month to determine if buying through the Colonial Power program or through National Grid directly was more efficient which he thought was perhaps burdensome. The conversation wound down confirming the next steps in the implementation of the plan, and what cybersecurity steps would be undertaken to protect consumers and their data. **Parker motioned to approve posting the notice of the Aggregation Plan for public comment on the Town website and other locations, and to have Counsel review. Reed seconded. The motion unanimously passed. (3 Yes, 0 No, 0 Abstain).**

E. **Review of proposed FY23 Line-Item Transfer requests**
(See Exhibit E). The Town Manager briefed the Board on a handful of invoices that caused changes on some of the line items presented in the Select Board Packet. Going through a review/explanation of each of the transfer requests, the Board asked questions. On tax title and foreclosure over-expenditure, Wile wanted to know if the costs were recovered by the Town. Jennings said it would be except in the case of properties with unknown owners. On funds for the maintenance and operations of Town buildings, Reed confirmed that this transfer was in addition to funds raised at Town Meeting. Wile raised questions about the usage of funds and predictions of expenses for the Department of Public Works. The Board discussed the mistaken usage of standard Board of Health funds for their purchase of trash collection barrels for Town residents, leading to

a buildup of funds in the appropriate account that went unused. Discussion occurred on best usage of Board of Health funds to manage these expenses. On Parade funding, the group discussed how funds had been used/unused in past and whether it made sense to change the approach for future (specifically for the Memorial Day Parade). Wile suggested keeping the line item in future even if it was not fully utilized year to year. **Wile motioned to approve the transfers as presented. Parker seconded. The motion unanimously passed. (3 Yes, 0 No, 0 Abstain).**

F. Discussion of Short-Term Rental bylaw

(See Exhibit F). Joslin offered his perspective regarding this issue, stating he had also discussed the matter with Town Planner Sue Brown. He listed off problems he had faced in past monitoring short-term rentals on Plum Island with regard to health and safety. He believed that the Town wasn't facing a major issue with regard to an abundance of short-term rental applicants and additionally he stated he did not feel the present Bylaw was "very good" and could be rescinded, with hopes to further hash out language surrounding usage of Accessory Dwelling Units as short-term rentals. The Board discussed bringing the matters to Town Meeting concurrently. **No motion was made at this time.**

G. Review of draft questionnaire to Boards / Commissions / Committees

(See Exhibit G). Reed explained the origins of this questionnaire, which seeks to establish the purview and work of the BCCs and puts it in step with the Select Board's needs/approval, as well as the Town Manager form of local government. The document would establish and confirm the BCC's charge, goals, and membership. Wile floated the idea of combining Boards, Committees, and Commissions with similar purviews. Reed felt that potentially a Select Board member should be appointed to each BCC, and Jennings wholeheartedly agreed, calling it a great suggestion. The Select Board settled on interviewing the Personnel Committee and the Historic District Commission at the next Select Board meeting to begin the process. **No motion was made at this time.**

H. Review of Elliot Fund draft program summary; update on work to create draft loan application

Reed provided background on the Fund, and the Board's interest in establishing a standard set of procedures around the Fund with input from the Town Counsel and the Town Accountant. A formal application will be eventually available on the Town website. **No motion was made at this time.**

I. DPW structure- review of proposal to restructure staffing in the Department

Jennings presented his case for the restructuring, to allow current long-time employees to gain and grow, and to redistribute hours for DPW employees to allow for administrative responsibilities. The idea to restructure the Department came about throughout the DPW Director interview process. The restructuring would allow the duties of the Director to be distributed to other employees, many of whom are already fulfilling those obligations as part of their work. Jennings also recapped changes in hours of the Project Manager and Business Manager positions, among others. The largest byproduct of the restructuring would be the elimination of the Director position in favor of four Division heads to lead the DPW, reporting directly to the Town Manager which are Administration, Procurement, and Contracting (to include the Chief Procurement Officer for West Newbury); Highway; Buildings and Grounds; and Programs and Projects. Jennings made suggestions on the parameters and sequence of promotions and hirings that would occur under this proposal. As a result of the discussion, **Parker motioned to withdraw the job listing post for a DPW Director. Reed seconded. The motion unanimously passed. (3 Yes, 0 No, 0 Abstain).**

J. Referral to public hearing: proposed amendment to Personnel Policy, Sec. 5.7 Jury Duty Leave

(See Exhibit J). This Item followed up discussion from the previous Select Board meeting to establish a hearing on the amendment of the Policy. The proposal is to cover five days of jury duty, with a rate of pay covering the difference between the employee's wage and the stipend provided by the court system. **Parker motioned to refer the amendment to the Personnel Policy to a hearing. Reed seconded. The motion unanimously passed. (3 Yes, 0 No, 0 Abstain).**

K. Acknowledgement of receipt of Ethics Disclosure from Town Manager regarding proposed appointment (as a Groveland resident) to Groveland Economic Development Committee

(See Exhibit K). Jennings told the group he had received the appointment to the Development Committee but was unsure he could manage the time commitment. His statement served as his disclosure, and he promised to follow up if he accepted the appointment. **Wile motioned to acknowledge receipt of the disclosure. Parker seconded. The motion unanimously passed. (3 Yes, 0 No, 0 Abstain).**

L. Meeting minutes: Feb. 13, 2023; Feb. 27, 2023; March 29, 2023; June 26, 2023

(See Exhibit L). **Parker motioned to approve the minutes for February 13 (without corrections), February 27 (with corrections), and March 29 (with corrections). Reed seconded. The motion unanimously passed (2 Yes, 0 No, Wile Abstaining). Parker motioned to approve minutes for June 26 (with corrections). Reed seconded. The motion unanimously passed. (3 Yes, 0 No, 0 Abstain).**

Town Manager Updates

M. Update from initial mtg w/Weston & Sampson re Dole Place review

(See Exhibit M). Jennings recapped a productive meeting with Weston and Sampson. Jennings felt that they would be an ideal partner in the wellfield development process. **No motion was made at this time.**

N. Update from Planning Board housing opportunities session held on June 27th

(See Exhibit N). Jennings stated Planner Sue Brown was working on a recap of the event, which would be finalized shortly. Jennings said the presentation at the session provided relevant examples to high-density housing in semi-rural settings, which he felt were valuable. Reed, who attended the session, stated she enjoyed the hands-on portion which demonstrated what physical structures would look like on certain West Newbury sites. **No motion was made at this time.**

O. Procurement updates

Jennings let the Select Board know a contract for the Page School Assessment had been signed. **No motion was made at this time.**

P. Updates on other ongoing/active projects/initiatives

Jennings said he signed a change order for the Town Hall painting, to update the instructions for the project based on recommendations from Building and Grounds to apply two coats and not one. Jennings also stated he was actively pushing to wrap up ongoing paving projects and investment management activities. **No motion was made at this time.**

Q. Follow up meeting assignment; placing items for future agendas

(See Exhibit Q). Parker discussed the adoption of Flashvote in Newburyport, which allows residents to provide feedback to municipal government through text messages. It struck Parker that it seemed like it was a good way to gain and synthesize information. The Flashvote system would require a contract to sign on, and Reed asked if there was a way to trial the system. **The Item was tabled for a future meeting.** Reed also requested that a remote work policy for official use be brought before the Board for a future session. **No motion was made at this time.** Wile stated that a wrap-up discussion on Ash Street would be a valuable addition to the next agenda, noting that Conservation Agent Michelle Greene would be meeting with the

Massachusetts Dept. of Fish and Wildlife on the topic. Additionally, he urged consideration of planning a joint Finance Committee and Select Board meeting. **No motion was made at this time.**

Reed motioned to adjourn the session. Parker seconded. The motion unanimously passed. (3 Yes, 0 No, 0 Abstain). The session adjourned at 10:20pm.

To access a video recording of the meeting, use the link below:
https://www.youtube.com/watch?v=CHTh-Zm37r4

O

WATER DISTRIBUTION SYSTEM STUDY UPDATE

August 2023

West Newbury, Massachusetts

TATA & HOWARD

August 1, 2023

Mr. Mark Marlowe, Water Manager/Superintendent
West Newbury Water Department
381 Main Street
West Newbury, MA 01985

Subject: Water Distribution System Study Update
T&H No. 7152

Dear Mr. Marlowe:

In accordance with our agreement, Tata & Howard is pleased to provide four paper copies and electronic copy of the Water Distribution System Study Update for the West Newbury water distribution system. The adequacy of the distribution system was evaluated. Supply and storage needs were also evaluated in this report.

Hydraulic recommendations were developed as part of this study by updating the existing hydraulic model for the system to reflect current conditions. A detailed description of the improvements and estimated costs is presented in Section 7.

During the course of this project, Mr. Steve Daunais, P.E. served as Project Manager, Ms. Justine Carroll, P.E. provided technical reviews and the undersigned served as Project Officer.

At this time, we wish to express our continued appreciation to the Town for their participation in this study and for their help in collecting information and data. We appreciate the opportunity to assist the Town of West Newbury on this important project. Please call should you have any questions or require additional information.

Sincerely,

TATA & HOWARD, INC.

Jon W. Gregory, P.E.
Vice President

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SECTION 1 - EXECUTIVE SUMMARY

1.1 General

Tata & Howard, Inc. was retained by the Town of West Newbury to conduct a hydraulic model update and water distribution system (WDS) study update of the West Newbury water system. The study evaluates the overall distribution system relative to its ability to meet current and estimated future demands and provides prioritized recommendations for implementation.

Tasks in this study included the following:

- Update and verify the existing hydraulic model.
- Utilize Department of Conservation and Recreation (DCR) demand projections to project demands through the year 2042.
- Assess water supply needs based on existing and future demands.
- Assess water storage needs based on existing and future demands, as well as fire flow protection.
- Estimate needed fire flow recommendations throughout the distribution system.
- Recommend distribution system improvements to meet the existing and future needs of the system.
- Prepare a capital improvements plan with prioritized recommendations and budget estimates for system upgrades necessary to correct existing deficiencies and meet future needs.

The analysis was completed in two phases. The first phase included updating and verifying the existing WaterGEMS hydraulic model of the water distribution system under steady state conditions. An updated system map was created incorporating recent infrastructure improvements, such as new water mains and the new Brake Hill Water Storage Tank. The updated Water Distribution System Map, included in Appendix A, shows water mains, supply sources, and storage facilities. The Town of West Newbury will be able to use the computer model as a planning tool to assess the potential impact of proposed developments and system improvements prior to their construction.

A water distribution analysis was conducted in the second phase. Future population and water demands through the year 2042 were estimated and the inherent capability of the distribution system to meet water demands was evaluated. Demand projections were calculated based on DCR's draft water needs forecast dated January 23, 2017. DCR developed demand projections through 2033 under two different scenarios. The first set of calculated demand projections assumes that water usage will follow established conservation standards of 65 gallons per capita day (gpcd) and ten percent unaccounted for water. This calculates to a 2042 projected average day demand (ADD) of 0.31 million gallons per day (mgd), including a five percent buffer as allowed by DCR. The second set of projections assumes usage will remain at West Newbury's current trends of residential water usage of 50 gpcd and unaccounted-for water of six percent. This calculates to a 2042 projected ADD of 0.23 mgd including the five percent buffer allowed by DCR.

The existing water supply sources were evaluated relative to current and future water demands. The Town currently exceeds its total authorized withdrawal volume of 0.16 mgd by approximately 0.01 mgd and must purchase water from the Town of Newburyport to meet demands. Using DCR guidelines, this deficit is projected to increase to 0.15 mgd by 2042. It is recommended the Town pursue additional sources so it is not dependent on other systems which may not have spare capacity to supply the Town in future years.

The projected demands and existing water distribution system operating conditions were considered to evaluate the available storage in the system. The current needed storage was estimated to be 0.30 million gallons (mg) in the High Service Area (HSA) and 0.25 mg in the Low Service Area (LSA) and was based on storage needed to meet peak demands and provide fire protection. Based on the ground elevations of the highest customers served, there is a current storage surplus of approximately 0.10 mg of usable storage in the HSA and a current storage surplus of 0.11 mg of usable storage in the LSA. Based on the DCR projected demands using 65 gpcd and 10 percent unaccounted-for water, the projected needed storage for the year 2042 in the HSA is approximately 0.34 mg and 0.26 mg in the LSA. Based on the total usable storage in the HSA, there is projected to be a storage surplus of approximately 0.06 mg for the design year 2042. Based on the total usable storage in the LSA, there is projected to be a storage surplus of approximately 0.10 mg for the design year 2042.

The adequacy of the water distribution system was evaluated using the computer model. The model was updated and verified under steady state conditions based on data collected during flow testing completed in October 2022. Once the computer model was verified and considered representative of the existing system, future demand conditions were simulated. As a result of these simulations, distribution improvements were recommended to address deficiencies in the system and the recommendations were prioritized for future implementation. The recommendations are broken into three components as follows:

- General Operation and Maintenance Practices: General operation and maintenance practices should be completed on an as-needed basis. Regularly scheduled maintenance programs should include tank inspections, hydrant flushing, well cleaning, meter replacement, and hydrant replacement. To improve maintenance of system water mains, it is recommended that the Town develop and complete a Unidirectional Flushing Plan.

- Priority I Recommended Improvements: Priority I recommended improvements are intended to increase water supply for the system strengthen transmission capabilities and improve fire flow capabilities. Recommended Priority I Improvements include the development of the Dole Place Wellfield, replacement of the water mains along Main Street, Church Street, Prospect Street, Crane Neck Street, and Bailey's Lane. The Priority I Recommended Improvements are estimated to cost approximately $18,347,000.

- Priority II Recommended Improvements: Priority II recommended improvements are intended to remove bottlenecks and a 2-inch diameter water main in the distribution system. Recommended Priority II Improvements include the replacement of water mains on Crane Neck Street, Pleasant Street, and a cross country water main. The Priority II Recommended Improvements are estimated to cost approximately $1,506,000.

SECTION 2 - EXISTING WATER DISTRIBUTION SYSTEM

2.1 Distribution System

The Town of West Newbury water distribution system serves approximately 3,030 customers with 1,093 service connections. The distribution system consists of approximately 28 miles of water mains ranging in diameter from two to twelve inches. These mains are constructed of various materials including ductile iron (DI), unlined cast iron (CI), and asbestos cement (AC). Approximately two percent of the system is 4-inch diameter or less, 18 percent is 6-inch diameter, 63 percent is 8-inch diameter, 11 percent is 10-inch diameter, and six percent is 12-inch diameter. The Town's distribution system service elevations range from approximately ten feet near the Merrimack River shoreline to 200 feet on Crane Neck Street. All elevations in this report are expressed in feet above mean sea level (MSL). The water system includes two water supply sources and two water storage tanks. The sources are located within the Merrimack Watershed.

The distribution system is divided into two service areas, the Low Service Area (LSA) and the High Service Area (HSA). The LSA includes Wellfield No. 1, the Bedrock Well and the Pipestave Tank and has a hydraulic gradeline elevation of 232 feet. Approximately 17 percent of the system demand is in the LSA. The Pipestave Booster Pump Station conveys water from the LSA to the HSA. The Brake Hill Tank is located in the HSA and has a hydraulic gradeline elevation of 300 feet. Approximately 83 percent of the system demand is in the HSA.

A map of the existing water distribution system is included in Appendix A.

2.2 Existing Water Supply Sources

As previously stated, the Town of West Newbury has two water supply sources which are equipped with chemical injection facilities. The chemicals include sodium hypochlorite for disinfection, potassium hydroxide for pH adjustment, and sodium fluoride for fluoridation. The Town purchases additional water from Newburyport at an interconnection located at the well site. Water from Newburyport is purchased most days except during low demand periods in the winter months. In addition, a new intermunicipal agreement with the Town of Groveland allows the Town of West Newbury to purchase additional water on an emergency basis.

Wellfield No. 1

Originally constructed in 1991, Wellfield No. 1 consists of seven 2-1/2 inch diameter wells and one horizontal well. The horizontal well was drilled in 1994 in an effort to regain capacity due to the declining yield in the wellfield. The 2-1/2 inch wells range in depth from 32 feet to 47 feet. The wellfield pump station houses chemical feed equipment for pH adjustment, fluoridation, and chlorination. Wellfield No. 1 is located at the end of Parsons Road off Main Street (Route 113) in West Newbury. The maximum permitted daily withdrawal volume for Wellfield No. 1 is 0.155 mgd.

Bedrock Well

The Bedrock Well is located at the same location as Wellfield No. 1. The well was constructed to a depth of 645 feet and brought online in 2021. The maximum permitted daily withdrawal volume of the Bedrock Well is 0.081 mgd.

Newburyport Interconnection

The Town of West Newbury has a water supply interconnection with the City of Newburyport. The interconnection is an 8-inch diameter water main located at the same location as Wellfield No. 1 and the Bedrock Well. The connection is automated and metered. In 2021, the year that the Bedrock Well was put in service, the Town was supplied an average of 35,000 gallons per day by Newburyport. The highest daily average for a month occurred in July 2022 when Newburyport supplied an average of 128,000 gallons per day.

Groveland Interconnection

The Town has recently signed an intermunicipal agreement with the Town of Groveland to supply water on an emergency basis. The interconnection is located off Main Street near the Pentucket Regional High School. Valves at the interconnection must be manually opened to allow water to flow by gravity from the Town of Groveland to the HSA in West Newbury.

2.3 Existing Water Storage Facilities

Brake Hill Water Storage Tank

The Brake Hill Water Storage Tank, constructed in 2021, is a 0.4 million-gallon (mg) capacity tank located off Hilltop Circle and serves the HSA. The tank is a spheroid-style tank with a pedestal height of 17.5 feet, a tank height of 37.5 feet. The overflow elevation is 300 feet above MSL, and the base water elevation is 262.5 feet.

Pipestave Water Storage Tank

The Pipestave Water Storage Tank, located at the Dr. John C Page School off Main Street, was constructed in 1982. The pre-stressed concrete tank has a height of approximately 40 and is 46 feet in diameter with a storage capacity of 0.50 mg. The tank has an overflow elevation of approximately 232 feet above MSL. The tank serves the LSA and the Page School fire suppression system. The tank is schedule to be cleaned and rehabilitated in the Spring of 2023.

2.4 Supervisory Control and Data Acquisition System (SCADA)

The Town of West Newbury currently uses a Supervisory Control and Data Acquisition (SCADA) system to operate and monitor flows from the wells, interconnection, and pump station and water levels in the water storage tanks.

SECTION 3 – WATER SYSTEM DEMANDS

3.1 General

For the purposes of evaluating the water needs of a community, several parameters are typically reviewed to better understand the demands of a distribution system. These parameters are defined in the sections below and are presented with their existing and projected demand estimates.

The DCR follows specific guidelines when projecting the water usage for communities in conjunction with the MassDEP WMA. These guidelines incorporate trends in the use of water conservation devices in homes and industry and emphasize the importance of monitoring the distribution system through water audits and leak detection surveys to reduce unaccounted-for water. It is important to note that the DCR has a key role in the water management approval process. Draft water demand projections were completed for the Town by the DCR in January 2017. Any alternative demand projections must be approved by the DCR before the MassDEP will approve development of a new water supply source or authorize the withdrawal of additional volume from existing sources.

The MassDEP has adopted Water Management Standards for all withdrawals. The policy includes performance standards and conditions for all public water suppliers in the following areas:

- Maximum residential consumption of 65 residential gallons per capita day (rgpcd),
- Maximum of 10 percent unaccounted-for water.

3.2 Residential Consumption

Residential consumption is calculated by dividing water supplied to residential connections by the reported population. The DCR guideline for residential water consumption is 65 gpcd. Public Water Suppliers currently not meeting 65 rgpcd will be required to develop an Offset Feasibility Study to manage non-essential outdoor water usage. According to MassDEP, the Town had a residential consumption ranging between 47 rgpcd and 49 rgpcd (see Table No. 3-1).

Table No. 3-1
2017 – 2021 RGPCD

Year	RGPCD
2017	47
2018	46
2019	46
2020	49
2021	49

3.3 Unaccounted-for Water

Unaccounted-for water consists of unmetered water used for street cleaning, water main flushing, meter inaccuracy, unauthorized water uses, firefighting, leakage in the distribution system, and other uses. This term is typically expressed as a percentage of the total water supplied to the system. Unaccounted-for water can be estimated by taking the difference between the total amount of water supplied and the total water billed and dividing by the total water supplied.

The Town's unaccounted-for water from 2017 through 2021 ranged from 6 to 16 percent.

3.4 Average Day Demand

Average day demand (ADD) is the total water supplied to a community in one year divided by 365 days. This term is commonly expressed in million gallons per day (mgd) and includes all water used for domestic (residential), commercial, institutional, industrial, agricultural, and municipal purposes. The municipal component includes water used for municipal buildings and recreational areas. The ADD includes unaccounted-for water from unmetered water uses and system leakage. Unmetered water uses include water used for system maintenance such as hydrant flushing, fire flows, and bleeders. According to ASRs and distribution system pumping records from 2017 through 2021, the ADD for the West Newbury water system ranged from 0.16 mgd to 0.18 mgd.

DCR used two sets of criteria to develop the 2034 ADD. The first using West Newbury water distribution system usage between 2011 and 2015 (current trends):

- Residential consumption of 50 gpcd
- Unaccounted-for water of 6 percent
- Year 2034 service population of 3,669

The second using DCR performance standards used:

- Residential consumption of 65 gpcd
- Unaccounted-for water of 10 percent
- Year 2034 service population of 3,669

The DCR demand projection methodology also allows for a five percent buffer to account for uncertainty in growth projections. Utilizing a residential consumption of 50 rgpcd and unaccounted for water of six percent plus a five percent buffer, the estimated 2042 ADD for the Town is approximately 0.23 mgd. Utilizing a residential consumption of 65 rgpcd and unaccounted-for water of 10 percent, the estimated 2042 ADD for the Town is approximately 0.31 mgd, including a five percent buffer.

3.5 Summer Average Day Demand

MassDEP guidelines recommend that a system consider a projected summer ADD (SADD). The current SADD is estimated by averaging demands from the three maximum months for each of the past five years. As shown in Table No. 3-2, the SADD ranged from 0.18 mgd to 0.23 mgd from 2017 to 2021. The SADD peaking factor is determined by dividing the SADD by the annual ADD for each of the past five years. These peaking factors are averaged to estimate the future summer peaking factor. Based on the 2017 through 2021 monthly demand data, the average summer peaking factor is 1.20. Based on the projected ADD using current trends of 0.23 mgd, the estimated 2042 SADD is 0.28 mgd. Based on the projected ADD using DCR performance standards of 0.31 mgd, the estimated 2042 SADD is 0.37 mgd.

3.6 Maximum Day Demand

Maximum day demand (MDD) is the maximum one-day (24-hour) total quantity of water supplied during a one-year period. This term is typically expressed in mgd.

MDD is a critical factor when determining the adequacy of a water supply system. The water distribution system must be capable of meeting MDD with coincident fire demands at a minimum pressure of 20 psi. Estimates of the projected MDD and an allowance for the required fire flow are used to evaluate or design pumping, transmission, and storage facilities.

The MDD/ADD ratio provides a relationship between the two demands, which can be used to estimate future demands. As shown on Table No. 3-2, the MDD from 2017 to 2021 ranged from 0.26 mgd to 0.38 mgd. Upon comparison of MDD to ADD, the ratios ranged from 1.5 to 2.08. To be conservative, the highest historical peaking factor was used to estimate future MDD. The resulting projected MDD for 2042 using current trends is estimated to be 0.48 mgd based on the 2042 ADD of 0.23 mgd. The projected MDD for 2042 using the DCR's performance standards is estimated to be 0.64 mgd based on the 2042 ADD of 0.31 mgd.

3.7 Peak Hour Demand

Peak hour demand is the maximum total quantity of water supplied in a single hour over a one-year period typically expressed in mgd. These demands are typically met by distribution water storage facilities.

Since system records of peak hourly demands are not available, the peaking factor for the current usage and design year 2042 was estimated based on typical historical consumption for communities of similar size. The peak hour peaking factor for the system is estimated to be 3.5. Using the current trends projected ADD of 0.23 mgd, the projected peak hour demand for the year 2042 is estimated at 0.81 mgd. Using the projected ADD from DCR performance standards of 0.31 mgd, the projected peak hour demand for the year 2042 is estimated at 1.09 mgd.

Table No. 3-2
Historic and Projected Water Use

Year	ADD (mgd)	SADD (mgd)	Peaking Factor (SADD/ADD)	MDD (mgd)	Peaking Factor (MDD/ADD)	Peak Hour (mgd)
2017	0.17	0.21	1.24	0.28	1.62	*
2018	0.18	0.21	1.18	0.28	1.58	*
2019	0.16	0.18	1.12	0.26	1.62	*
2020	0.18	0.23	1.26	0.38	2.08	*
2021	0.17	0.21	1.20	0.35	2.04	*
-						
2042 Current Trends	0.23	0.28	1.20	0.48	2.08	0.81
2042 DCR Performance Standards	0.31	0.37	1.20	0.64	2.08	1.09
*Peak Hour Information for 2017 through 2021 is not available.						

SECTION 4 – WATER SUPPLY EVALUATION

4.1 General

In accordance with standard waterworks practices and current MassDEP guidelines, the supply sources of a water system must be capable of meeting MDD conditions with all supplies online and SADD conditions with the largest source out of service. Additionally, the sources should be permitted or registered to withdraw volumes adequate to meet ADD.

4.1 Adequacy of Existing Water Supply Sources

In 1987, the WMA program was implemented by MassDEP to regulate withdrawal of water from the State's watershed basins. Under this program, all new sources withdrawing more than 100,000 gallons per day (gpd) and existing sources exceeding their registered withdrawal volume by 100,000 gpd are required to obtain a withdrawal permit under the WMA. When first implemented, the registered withdrawal volume for a public water system was based on that system's historical pumping rate of the water supply source(s) between 1981 and 1985. Permits can be renewed and amended as system demands increase and additional supply sources are utilized. The WMA program considers the need for the withdrawal, the impact of the withdrawal on other hydraulically connected water suppliers, the environmental impacts of the withdrawal and the water available in the river basin or subbasin (the basin safe yield) prior to issuing a permit. It is important to note that the basin safe yield is different from the safe yield of a supply. In accordance with the WMA Permit application instructions, the basin safe yield is the total water available to be withdrawn from a river basin or subbasin, whereas the safe yield of a well is the volume of water the well is capable of pumping under the most severe pumping and recharge conditions that can be realistically anticipated.

As stated in Section 3, the projected ADD, SADD, and MDD using DCR performance standards for the year 2042 are 0.31 mgd, 0.37 mgd, and 0.64 mgd, respectively. The projected ADD, SADD and MDD for the year 2042 using current trends are 0.23 mgd, 0.28 mgd, and 0.48 mgd, respectively. MassDEP recommends that a system have adequate supply to meet (1) the projected MDD and (2) the projected SADD with the largest source offline.

The system's total combined maximum pumping rate of all active supply sources is 0.236 mgd. Compared to the projected MDD of 0.64 mgd in 2042, a deficit of 0.404 mgd is estimated. Wellfield No. 1 is the largest source. Therefore, the available pumping rate with Well No. 1 offline is 0.081 mgd. Compared to the projected 2042 SADD of 0.37 mgd, a deficit of 0.289 mgd is estimated.

The total permitted authorized withdrawal volume for the West Newbury water system is 0.16 mgd. The Town does not have a registered withdrawal volume. The 2042 projected ADD based on current trends is 0.23 mgd. Compared to the total permitted withdrawal volume of 0.16 mgd, a deficit of 0.07 mgd is estimated. The 2042 projected ADD using

DCR performance standards is 0.31 mgd. Compared to the total permitted withdrawal volume of 0.16 mgd, a deficit of 0.15 mgd is estimated. Table No. 4-1 shows the maximum daily withdrawal rate for each source.

Table No. 4-1
Source Details
West Newbury, Massachusetts

Name	I.D. Number	Max Daily Withdrawal Volume (MGD)
Wellfield No. 1	3324000-01G	0.155
Bedrock Well	3324000-02G	0.081
Total		0.236

It should be noted that the Dole Place Wellfield has been approved by MassDEP for a maximum daily withdrawal rate of 0.98 mgd. It is recommended the Town develop this source to eliminate the projected supply deficit. MassDEP has granted approval of the Source Final Report for the proposed Dole Place Wellfield. As detailed in the Dole Place Wellfield Development Evaluation dated January 28, 2021, the Town will need to complete several steps to develop this source. A new Water Management Act (WMA) permit application will need to be submitted to increase the Town's authorized withdrawal volume. Drilling and development of three 18-inch by 12-inch gravel packed wells by a qualified well driller, construction of a new chemical feed building to treat the raw water, and installation of approximately 500 linear feet of 8-inch diameter water main to connect the gravel packed wells to the chemical feed building will need to be completed to bring the well online. In addition, three phase power will need to be brought to the site. Due to the close proximity of the wellfield to the Merrimack River, a microparticulate analysis (MPA) at each of the three wells will be required to determine whether the wellfield is considered "groundwater under the direct influence of surface water" (GWUDI). This analysis is performed after the wellfield has been in service for six months. The results of this analysis will determine if the wellfield is considered GWUDI and if design and construction of the 1.0 mgd water filtration plant will be required. The Dole Place Wellfield Development Evaluation provides further information on cost estimates and other WMA permit requirements to develop this source.

Development of this source will eliminate the need to purchase water from Newburyport on a regular basis. It is recommended the interconnection remain in the event of an emergency or in the event that the Town of Newburyport wants to purchase water from West Newbury.

SECTION 5 – COMPUTER MODEL

5.1 General

To evaluate the Town's existing water distribution system and to obtain a basis for recommending water distribution system improvements, a comprehensive computer model was utilized to mathematically simulate the water distribution system. The Town of West Newbury will be able to use the updated computer model as a planning tool to assess the potential impact of proposed developments and system improvements prior to construction.

A hydraulic computer model software WaterGEMS was used to update the existing West Newbury water distribution system model. WaterGEMS allows the user to conduct hydraulic simulations using mathematical algorithms while in an ArcGIS environment. As part of this study, the hydraulic model was verified under steady state conditions based on fire flow testing and information pertaining to the sources and storage facilities provided by the Town of West Newbury.

5.2 Model Verification

The computer model was updated and verified in three phases. First, the model was updated to include improvements to the distribution system since the Town's 2009 Water Distribution System Study Update based on data provided by the Town. Water system demands were allocated to the nearest junctions to represent actual metered demand in the system. When allocating demands, the ADD and MDD for 2021 and 2042 were used to obtain a gallons per minute (gpm) rate. Then, using the existing demands in the model, ratios were used to multiply the base demand to represent current and future demands.

The computer model is represented by the node, pipe, and tank information provided in Appendix B. A link map of the water distribution system model is also provided in Appendix C. The water distribution system map in Appendix A provides information on storage facilities, water supply sources, and sizes of water mains and a general layout of the distribution system. The hydraulic input data in Appendix B provides data on system demands, length and diameter of water mains, roughness coefficient or "C-value" of water mains, elevations, pumping rates at water supply sources, and overflow elevations at storage facilities.

In the second phase of the model update, fire flow testing was conducted at various locations throughout the distribution system. Thirteen fire flow tests were conducted on October 26, 2022. The flow tests provided data for the computer model verification and for available fire flows and pressures in the area of each test. Table No. 5-1 presents the results of the fire flow tests conducted by the Town and Tata & Howard personnel.

Table No. 5-1
Fire Flow Tests – October 16, 2022

Test No.	Location of Flowing Hydrant	Flowing Hydrant Static Pressure (psi)	Residual Hydrant Static Pressure (psi)	Residual Hydrant Residual Pressure (psi)	Observed Flow (gpm)	Estimated Flow at 20 psi (gpm)
1	87 Bridge Street	124	122	60	1,000	1,300
2	3 Main Street	110	100	90	650	1,900
3	30 Rivercrest Drive	118	114	70	1,250	1,800
4	On Pleasant Street Behind 13 Waterside Lane	114	108	70	1,220	1,900
5	13 Mechanic Street	86	82	64	750	1,400
6	38 Meeting House Hill Road	54	40	16	590	500
7	191 Crane Neck Street	43	56	40	190	250
8	134 Stewart Street	68	68	24	750	750
9	14 Cortland Lane	85	90	34	590	650
10	15 Norino Drive	74	70	30	650	700
11	On Main Street Behind 1 Parsons Road	73	72	28	530	550
12	16 Bailey’s Lane	66	72	60	200	400
13	66 Maple Street	66	84	48	650	850

Verification of the computer model was completed under steady state conditions in the third phase. The data obtained from the fire flow tests served as input data for the model verification. This data included water levels in storage tanks, pumping rates of water supply sources, static and residual pressure readings, and measurement of flows from hydrants. It is important that each simulation reflect actual field conditions at the time of testing. Actual field conditions include current demands on the system, varying flows from each water supply source and pump station that is online, as well as varying tank elevations.

When the results of the computer runs compared to within five percent of the hydraulic data collected from the fire flow tests, the computer model was considered verified under steady state conditions and mathematically represented the physical operating conditions of the current West Newbury water distribution system. It should be noted that verification under an Extended Period Simulation (EPS) was outside the scope of work of this study. EPS verified models allow simulations over time to evaluate items such as water age and water quality in various locations of the system.

During the current flow testing, the observed pressure and modeled pressure did not verify along Meeting House Hill Road. A residual pressure of 16 psi was observed at this location. The model did not verify within five percent, but is within five psi.

In addition, the observed pressure and modeled pressure did not verify along Bailey's Lane. A residual pressure of 60 psi was observed. The residual pressure in the model was 67 psi. A C-factor test is recommended along various stretches of Main Street to help determine the accuracy of the C-factor along Main Street.

Once the model was verified, hypothetical conditions such as increased demands and required fire flows were simulated using the model. The simulation of these conditions provided the opportunity to identify system deficiencies and to develop necessary improvements. Projected demands through the design year 2042 were simulated.

SECTION 6 – WATER DISTRIBUTION SYSTEM ANALYSIS

6.1 General

A hydraulic analysis, using available data on the water distribution system and fire flow test results, provides an indication of the distribution system's ability to meet the criteria described in this section. A computerized hydraulic analysis was conducted on West Newbury's water distribution system. Recommendations set forth by the Insurance Services Office (ISO) for water storage necessary for fire protection, fire flows, and peak demands were utilized in the analysis of the distribution system.

6.2 Adequacy of Existing Distribution System

A distribution system must be able to provide adequate pressures during varying demand conditions. For the purposes of this study, a minimum pressure of 35 psi at street level was required during average day, maximum day, and peak hour demand conditions. An upper limiting pressure of 120 psi is generally recommended, as older fittings in the system are generally rated at 125 to 150 psi. The MassDEP published Guidelines for Public Water Systems recommends that pressure reducing devices be utilized on mains or on individual services lines when static pressures exceed 100 psi. Pressure above this level can result in increased water use and leaks from fixtures and also increased leakage throughout the distribution system. In addition, plumbing code states that water heaters in homes can be affected when pressures exceed 80 psi.

During fire flow conditions, a minimum pressure of 20 psi is required at ground level throughout the system.

Minimum/Maximum Pressures

During the projected year 2042 ADD, MDD, and peak hour demand conditions, the recommended minimum pressure requirement to be met at street level throughout the distribution system is 35 psi. In general, customers with ground elevations in the LSA of 146 feet above MSL, or greater, could experience pressure less than 35 psi during normal operating conditions. The current highest water users in the LSA are located at approximately 144 feet above MSL. These users are located off Main Street east of the Pipestave Water Storage Tank. Elevations in the HSA above 214 feet above MSL could experience pressure less than 35 psi during normal operating conditions, respectively. The current highest water user in the HSA is located at approximately 200 feet above MSL. Therefore, the West Newbury water distribution system can meet the minimum pressure requirement of 35 psi under projected 2042 average day, maximum day, and peak hour demand conditions.

Based on the lowest elevation in the LSA and the overflow elevation of the Pipestave Tank, the highest pressures in the LSA are approximately 86 psi. Based on the lowest elevation in the HSA and the overflow elevation of the Brake Hill Tank, the highest pressures in the HSA are approximately 125 psi, which exceeds the recommended upper limit of 100 psi. Pressure above this level can result in increased water use from fixtures

and also increased leakage throughout the distribution system. The MassDEP published Guidelines for Public Water Systems recommends that pressure reducing devices be utilized on mains or on individual services lines when static pressures exceed 100 psi. Also, plumbing code states that water heaters in homes can be affected when pressures exceed 80 psi. These locations are near the riverbank of the Merrimack River. Pressure reducing valves (PRV) should be installed at customers where pressures exceed 100 psi.

Fire Flow Recommendations

A review of the water system was completed to identify areas where larger buildings exist. This review of buildings and estimates of necessary fire flow does not factor in fire protection systems. Examples include condominiums, apartment complexes, schools, and other commercial or industrial buildings. Typically, the recommended fire flow in any community is established by the Insurance Services Office (ISO). The ISO determines a theoretical flow rate needed to combat a major fire at a specific location; taking into account the building structure, floor area, the building contents, and the availability of fire suppression systems. In general, the flows required for proper fire protection are based on maintaining a residual pressure of 20 psi in the system. This residual pressure is considered necessary to maintain a positive pressure on the suction side of a fire department pumper truck with an allowance for frictional losses in the hydrant and fire hose. Because the ISO data was not available and it was unknown when the last time the ISO reviewed the system, recommended flows were estimated for these areas using the 2014 ISO published Guide for Determination of Needed Fire Flow. The guide uses factors including building size, material, location and contents. These factors were estimated based on aerial photos and street level observations. For the West Newbury system, individual fire flows for each large building identified were estimated. The fire flow recommendations were applied in the hydraulic model at each building identified in the water system review.

According to the 2014 ISO published Guide for Determination of Needed Fire Flow, the minimum recommended fire flow in residential areas with homes greater than 30 feet apart is approximately 500 gpm. The recommended fire flow for homes between 21 feet and 30 feet apart is approximately 750 gpm. Areas with homes between 11 feet and 20 feet apart have a recommended fire flow of 1,000 gpm. A fire flow of 1,500 gpm is recommended for homes closer than 10 feet apart. The residential neighborhoods in the Town were evaluated to determine average distances between homes for determination of the recommended residential fire flow in those areas. An estimated fire flow of 500 gpm was used for most residential areas of the system with homes greater than 30 feet apart. Improvements were recommended for areas in the system that could not meet the minimum fire flow recommendation. A description of the recommended improvements is provided in Section 7.

6.3 Adequacy of Existing Water Storage Facilities

Distribution storage is provided to meet peak consumer demands such as peak hour demands and to provide a reserve for firefighting. Storage may also serve as emergency water supply in case of temporary breakdown of pumping facilities, or for pressure

regulating during periods of fluctuating demand. West Newbury has two storage tanks that serve two distinct service zones. The Brake Hill tank serves the HSA and the Pipestave tank serves the LSA. Approximately 83 percent of the water system demand is in the HSA and 17 percent of the demand is in the LSA.

There are three components that must be considered when evaluating storage requirements: equalization, fire flow requirements, and emergency storage.

Equalization storage provides water from the tanks during peak hourly demands in the system. Typically, this quantity is a percentage of the maximum day demands. The percentages can range from fifteen to twenty-five percent, with fifteen percent used for a large system, twenty percent for a mid-sized system, and twenty-five percent used for a small system. A system is considered small if it has less than 3,300 customers, while a system is considered large if it has more than 50,000 customers. The Town currently serves a population of approximately 3,030 people and is considered a small system. As a result, twenty-five percent of the current MDD was used for the current equalization storage calculation. To be conservative, the 2020 MDD was used to calculate equalization because it is the highest MDD. With a projected 2042 population served of approximately 3,669 people, the West Newbury system would be considered a medium size system because the population is projected to increase to more than 3,300 people. As a result, twenty percent of 2042 projected DCR MDD was used for the projected equalization storage calculation.

The fire flow storage component is based on a representative fire flow multiplied by the required duration of the flow. For the West Newbury water system, a fire flow of 2,000 gpm with a duration of two hours was used for the storage evaluation based on the estimated needed fire flow in the downtown area.

The emergency storage component is typically equivalent to one ADD. However, if there is emergency power available at the pumping stations allowing the stations to supply a minimum of one ADD on emergency power, the emergency storage component of one ADD can be waived. This component was waived from subsequent calculations because West Newbury's well site and the pump station have emergency generators.

The three components of the storage evaluation were calculated under current and future demand conditions:

High Service Area

1. Equalization

- Small-sized system (2020) = 25 percent of the Maximum Day Demand
- Mid-sized system (2042) = 20 percent of the Maximum Day Demand
- Maximum Day Demand in year 2020 = 0.38 mgd
- HSA represents 83 percent of the total demand
- HSA Maximum Day Demand in year 2020 = 0.38 x 0.83 = 0.32 mgd
- Estimated Maximum Day Demand in year 2042 (DCR guidelines) = 0.64 mgd

- HSA Estimated Maximum Day Demand in year 2042 = 0.64 x 0.83 = 0.53 mgd

- Equalization (2020) = 0.25 x 0.32 = 0.08 mg
- Equalization (2042) = 0.20 x 0.53 = 0.11 mg

2. Basic Fire Flow Requirement
- Representative fire flow for West Newbury = 2,000 gpm
- Duration of 2 hours or 120 minutes
- Basic Fire Flow Requirement = 2,000 x 120 = 0.24 mg

3. Emergency – waived

The total required storage for any given year is the equalization component plus the basic fire flow requirement. Therefore, the current (year 2020) and projected (year 2042) total required storage is as follows:

- HSA Total Required Storage (2020) = 0.08 + 0.24 = 0.32 mg
- HSA Total Required Storage (2042) = 0.11 + 0.24 = 0.35 mg

A minimum pressure of 20 psi should be maintained at the highest served customer under MDD conditions with a coincident fire flow. The highest customer in the HSA is located at an elevation of approximately 200 feet above MSL. To maintain a minimum pressure of 20 psi at the highest customer elevation of 200 feet, the level of the water in the storage tanks should not drop below 247 feet. The low water level of the Brake Hill Tank is 262.5 feet. Based on this scenario, the entire volume of the Brake Hill Tank is usable and the HSA has a useable storage volume of 0.40 mg. The HSA currently has a storage surplus of 0.08 mg and is projected to have a storage surplus of 0.05 mg in 2042.

Low Service Area

1. Equalization
- Small-sized system (2020) = 25 percent of the Maximum Day Demand
- Mid-sized system (2042) = 20 percent of the Maximum Day Demand
- Maximum Day Demand in year 2020 = 0.38 mgd
- LSA represents 17 percent of the total demand
- LSA Maximum Day Demand in year 2020 = 0.38 x 0.17 = 0.06
- Estimated Maximum Day Demand in year 2042 (DCR guidelines) = 0.64 mgd
- LSA Estimated Maximum Day Demand in year 2042 = 0.64 x 0.17 = 0.11

- Equalization (2020) = 0.25 x 0.06 = 0.02 mg
- Equalization (2042) = 0.20 x 0.11 = 0.02 mg

2. Basic Fire Flow Requirement
- Representative fire flow for West Newbury = 2,000 gpm
- Duration of 2 hours or 120 minutes
- Basic Fire Flow Requirement = 2,000 x 120 = 0.24 mg

3. Emergency – waived

The total required storage for any given year is the equalization component plus the basic fire flow requirement. Therefore, the current (year 2020) and projected (year 2042) total required storage is as follows:

- LSA Total Required Storage (2020) = 0.02 + 0.24 = 0.26 mg
- LSA Total Required Storage (2042) = 0.02 + 0.24 = 0.26 mg

The highest customer in the LSA is located at an elevation of approximately 157 feet above MSL. To maintain a minimum pressure of 20 psi at the highest customer elevation of 157 feet, the level of the water in the storage tanks should not drop below 203 feet. The low water level of the Pipestave Tank is 192 feet. Based on this scenario, the LSA has a useable storage volume of 0.36 mg. The LSA currently has a storage surplus of 0.10 mg under existing and projected conditions.

SECTION 7 – RECOMMENDATIONS

7.1 General

The following summarizes the findings of the study and presents a prioritized plan for recommended improvements and associated costs. The prioritization of improvements allows for constructing the necessary reinforcements over an extended period of time as funds allow.

The recommendations are broken into three components. The first presents general recommendations that include general maintenance and operations practices that the Town should complete on an annual basis. The second and third components are the Priority I and II recommendations for system improvements relative to the water distribution system. Priority I improvements are intended to increase the Town's water supply, strengthen the transmission capabilities of the system, and improve fire flow capabilities. Priority II improvements are intended to eliminate bottlenecks and replace small diameter mains in the distribution system. Table No. 7-1 presents the estimated costs for the Priority I and Priority II recommended improvements for the water distribution system. Construction costs are based on the January 2023 Engineering News Record (ENR) construction cost index of 13175.03 and include costs associated with water services, hydrants, and permanent and temporary trench pavement and a 25 percent allowance for engineering and contingencies. Estimates do not include costs for land acquisition, easements, or legal fees. Costs were increased for water main improvements of less than 1,000 feet. Cost savings may be realized if the smaller projects are grouped together. The recommended improvements are described herein and shown on the Recommended Improvements Map provided in Appendix D.

7.2 General Operation and Maintenance Practices and Improvements

It is recommended the Town implement a unidirectional flushing program. A unidirectional flushing program starts at a point of origin, usually a water supply source or tank, and works outward flushing each portion of water main through clean water mains. The budgetary cost for development of a unidirectional flushing plan is $15,000.

The Town should continue performing regularly scheduled maintenance programs, including routine inspection and maintenance at the pump stations and meter testing/calibration. In addition, all wells in the system should be evaluated annually and maintenance should be performed depending upon results of performance tests. The frequency of cleaning will depend on the source water quality.

The Town should also implement a replacement program during which hydrants and valves that do not function as intended are identified and replaced. These deficiencies are normally identified through routine operation and during the system-wide flushing program. By replacing hydrants that are old or broken, the Town will improve fire protection in the system and eliminate potential leaks. The Town should create a database of all hydrants. Information regarding the make, model, repair history, and maintenance

records should be included in the database. Over time, the database will provide the Town with a means of identifying problem hydrants to include in replacement programs. Eliminating broken valves will help improve the transmission capacity of the system.

Whenever improvements or expansion of a water distribution system occur, factors such as size and location of the water main should be considered to provide adequate flows and pressures. Any water main that is designed to provide fire protection should have a minimum diameter of 8-inches. Wherever possible, dead-end mains should be eliminated by looping or interconnecting and all water mains should be interconnected at reasonable intervals. All older and smaller water mains that do not meet fire flow recommendations in an area should be replaced with larger diameter mains. In addition, "bottlenecks" such as smaller water mains being the sole means of transporting water between larger mains should be eliminated. Improvements necessary to address these recommendations are included below. The Town should also evaluate all areas with parallel water mains in the distribution system to see if existing hydrants should be moved to the parallel water main.

In addition, the availability of the updated computer hydraulic model will provide the Town with an important tool in evaluating expansion or changes in the future, particularly when evaluating impacts of proposed new developments or water main replacement.

7.3 Priority I Recommended Improvements – New Source and Water Distribution

1. To meet projected system demands, it is recommended the Town develop the Dole Place Wellfield. An evaluation of developing and bringing this source online was completed in January 2021. The estimated cost of developing and bringing this source online from the January 2021 letter is $4,060,000. Due to the close proximity of the Dole Place property to the Merrimack River, there is the potential that the wellfield will be considered "ground water under the direct influence of surface water" (GWUDI) under the Federal Surface Water Treatment Rule (SWTR) and susceptible to *Giardia* contamination. This analysis would be performed after the wellfield has been in service for six months and includes spring and fall sampling rounds. In the event that the wellfield is classified as GWUDI, design and construction of a 1.0 mgd capacity water filtration plant at the Dole Place Wellfield will be required. The estimated cost to construct a new 1.0 mgd water filtration plant from the January 2021 letter is approximately $8,770,000. Tata & Howard will be preparing an update to the letter and costs in 2023.

2. To improve flows from the Brake Hill Water Storage Tank to the center of town, a new 16-inch diameter water main from the Brake Hill Water Storage Tank to Main Street (Route 113) and along Main Street (Route 113) to the intersection with Church Street is recommended. This improvement will improve transmission in the HSA and help to assist in improving the inherent capacity for fire flow in several areas of the system. The estimated probable construction cost of approximately 6,600 linear feet of 16-inch diameter water main is approximately $3,322,000. This cost includes an

additional 15 percent markup for additional MassDOT paving requirements and assumes that a waiver for control density fill (CDF) will be obtained from MassDOT.

3. To improve flows from the Pipestave Booster Pump Station to the center of town, a new 12-inch diameter water main along Main Street from the intersection with Church Street to the booster pump station is recommended. This improvement will improve transmission in the HSA and assist in improving the inherent capacity for fire flow in several areas of the system. The estimated probable construction cost of approximately 10,800 linear feet of 12-inch diameter water main is approximately $5,047,000. This cost includes an additional 15 percent markup for additional MassDOT paving requirements and assumes that a waiver for control density fill (CDF) will be obtained from MassDOT.

4. To provide the inherent capacity for the recommended fire flow of 500 gpm along Church Street, Prospect Street, and Old Wharf Road, a new 8-inch diameter water main is recommended along Church Street from Main Street (Route 113) to Ferry Lane and along Church Street from Main Street (Route 113) to Church Street. This water main is currently in the design phase. The Town will be purchasing the water main and all appurtenances in 2023. Construction is expected to begin in 2024. The estimated probable construction cost of approximately 7,600 linear feet of 8-inch diameter water main is approximately $3,550,000.

5. The recommended fire flow for Crane Neck Street is 500 gpm. To meet this recommended fire flow on the southern end of Crane Neck Street, a new 8-inch diameter water main is recommended to replace the existing 6-inch diameter water main on the eastern end of Crane Neck Street. The estimated probable construction cost of 4,200 linear feet of 8-inch diameter ductile iron water main is approximately $1,444,000.

6. The estimated available fire flow along Bailey's Lane is less than 500 gpm. To meet the recommended residential fire flow of 500 gpm, a new 8-inch diameter water main is recommended from Main Street (Route 113) to the end of the 6-inch diameter water main. At the end of the 6-inch diameter main there is approximately 1,000 linear feet of 2-inch diameter main serving one house. Unless fire protection service will be extended to this location, it is recommended that the existing 2-inch diameter water main remain in place. The estimated probable construction cost of 1,600 linear feet of 8-inch diameter ductile iron water main is approximately $550,000.

7. To further strengthen the transmission grid in the HSA, the existing 6-inch diameter water main along Main Street from the end of the 10-inch diameter water main to the existing 8-inch diameter water main should be replaced with a new 8-inch diameter water main. In addition, a flow test should be conducted on the existing 8-inch diameter water main to the interconnection with the Groveland system to determine if the pipe has adequate carrying capacity to handle peak flows from the newly activated interconnection with Groveland. This section of main may need to be cleaned and lined or replaced. The estimated probable construction cost of 800 linear

feet of new 8-inch diameter ductile iron water main is approximately $374,000. This cost includes an additional 15 percent markup for additional MassDOT paving requirements and assumes that a waiver for control density fill (CDF) will be obtained from MassDOT.

7.4 Priority II Recommended Improvements – Water Distribution

8. To eliminate a bottleneck and improve flows in the HSA, a new 8-inch diameter water main along Crane Neck Street is recommended to replace the existing 6-inch diameter water main from the intersection with Main Street (Route 113) to the existing 8-inch diameter water main. The estimated probable construction cost of 1,400 linear feet of 8-inch diameter ductile iron water main is $482,000.

9. A bottleneck exists at the intersection of Pleasant Street and Main Street (Route 113). To eliminate this bottleneck, a new 8-inch diameter water main along Pleasant Street from Main Street (Route 113) to Harrison Avenue is recommended to replace the existing 6-inch diameter water main. The estimated probable construction cost of 600 linear feet of 8-inch diameter ductile iron water main is $244,000.

10. A new 8-inch diameter water main is recommended to replace the existing 6-inch diameter cross country water main from Barberry Lane to Meadowsweet Road to eliminate the bottleneck between two, 8-inch diameter water mains. The estimated probable construction cost of 1,200 linear feet of 8-inch diameter ductile iron water main is $413,000.

11. A 2-inch diameter water main currently services residences on Middle Street, located off Crane Neck Street. Industry standard states that any main less than 8-inch will not provide recommended fire flows for residences. Therefore, it is recommended that if the recommended fire flow is to be provided to homes on Mill Street, the 2-inch should be upgraded to an 8-inch diameter water main. The estimated probable construction cost for 900 linear feet of 8-inch diameter ductile iron water main improvement is $367,000.

Table No. 7-1
Priority I and Priority II Recommended Improvements – New Source and Water Distribution

Improvement No.	Location	Length (LF)	Proposed Diameter (in.)	Estimated Cost
Priority I Improvement				
1	New Source – Dole Place Wellfield	n/a	n/a	$4,060,000
2	Main Street – Brake Hill Tank to Church Street	6,600	16	$3,322,000
3	Main Street – BPS to Church Street	10,800	12	$5,047,000
4	Church Street and Prospect Street	7,600	8	$3,550,000
5	Crane Neck Street	4,200	8	$1,444,000
6	Baily Lane	1,600	8	$550,000
7	Main Street – 10-inch main leading to the Brake Hill Tank to the 8-inch main	800	8	$374,000
Priority I Recommended Improvements Total:				$18,347,000
Priority II Improvements				
8	Crane Neck Street	1,400	8	$482,000
9	Pleasant Street	600	8	$244,000
10	Cross Country	1,200	8	$413,000
11	Middle Street	900	8	$367,000
Priority II Recommended Improvements Total:				$1,506,000

Pipe Input Data
Water Distributiuon System Study
West Newbury, MA

Label	Diameter (in)	Hazen-Williams C	Length (Scaled) (ft)
P-1	8	50	638
P-2	10	110	724
P-2	8	50	561
P-4	8	110	925
P-4	8	110	995
P-5	8	90	689
P-6	8	90	845
P-7	10	70	634
P-8	10	100	422
P-8	10	70	602
P-9	8	110	880
P-10	10	100	669
P-10	8	110	903
P-11	8	110	496
P-12	10	100	718
P-12	8	110	557
P-14	8	100	714
P-15(1)	8	25	670
P-15(2)	8	25	455
P-16	12	110	402
P-16	8	25	594
P-17(1)	6	60	419
P-17(2)	6	100	427
P-18	6	100	527
P-18(1)	12	110	1,417
P-18(2)	12	110	1,458
P-19	8	32	103
P-20	12	110	234
P-20	8	32	497
P-21	8	110	2,159
P-22	8	110	93
P-23	8	25	459
P-24	8	25	290
P-25	8	110	1,566
P-26	8	110	268
P-26	8	110	223
P-27	8	110	59
P-28	8	110	17
P-29	8	110	40
P-30	8	110	20
P-30(1)	8	110	414
P-30(2)	8	110	28
P-31	8	110	649
P-32	8	70	315

Pipe Input Data
Water Distributiuon System Study
West Newbury, MA

Label	Diameter (in)	Hazen-Williams C	Length (Scaled) (ft)
P-32	8	110	41
P-33(1)	8	110	544
P-33(2)	8	110	132
P-34	8	70	198
P-36	8	70	620
P-36	6	110	231
P-37	6	110	146
P-38	8	70	1,033
P-38	6	110	211
P-39	6	110	143
P-40	10	70	171
P-42	10	70	182
P-42	8	110	308
P-45	6	110	637
P-46(1)	8	130	394
P-46(2)	8	130	166
P-48	10	70	379
P-48	6	110	495
P-49	6	45	341
P-50	10	70	307
P-57	6	110	231
P-58	8	110	110
P-61	6	45	87
P-63	6	42	148
P-64	10	70	478
P-65	10	70	858
P-67(1)	8	50	577
P-67(2)	8	50	464
P-68	6	90	763
P-68	8	50	172
P-70(1)	8	90	345
P-70(2)	8	90	494
P-72	8	50	281
P-73(1)	8	120	318
P-73(2)(1)	8	120	358
P-73(2)(2)	8	120	415
P-74	8	50	232
P-74	8	120	202
P-75	8	120	744
P-76	8	50	478
P-77	12	120	183
P-78	8	100	539
P-78	12	120	75
P-79	12	120	1,204

Pipe Input Data
Water Distributiuon System Study
West Newbury, MA

Label	Diameter (in)	Hazen-Williams C	Length (Scaled) (ft)
P-80	8	100	812
P-80	12	120	539
P-81	8	120	265
P-82	8	100	377
P-82	8	120	464
P-84	8	100	667
P-86	8	100	619
P-88	8	100	457
P-90	6	95	599
P-91	6	110	288
P-92	6	100	1,155
P-94	6	100	439
P-98	8	55	963
P-100	8	55	232
P-102	8	55	563
P-104(1)	8	55	591
P-104(2)	8	32	820
P-112	8	110	1,024
P-114	8	110	529
P-116(1)	6	50	753
P-116(2)	6	50	812
P-118	2	50	1,355
P-120	6	40	936
P-122	6	40	556
P-124	6	40	252
P-126	8	100	920
P-128	6	40	173
P-130	8	100	793
P-132	8	100	896
P-134(1)	8	100	998
P-134(2)	8	110	380
P-136	8	100	427
P-138	8	100	1,230
P-142	8	110	624
P-144	8	110	1,049
P-146	8	110	993
P-148	8	110	327
P-150	2	50	165
P-152	2	50	300
P-154	6	55	909
P-162	6	90	987
P-164	8	110	1,291
P-166	8	110	1,820
P-168	8	110	1,820

Pipe Input Data
Water Distributiuon System Study
West Newbury, MA

Label	Diameter (in)	Hazen-Williams C	Length (Scaled) (ft)
P-170(1)	8	110	1,096
P-170(2)	8	100	564
P-172	6	100	585
P-178	8	50	253
P-180	8	50	1,571
P-182	8	50	173
P-184	8	50	1,417
P-186	8	50	2,235
P-188	10	100	1,501
P-190	10	100	1,096
P-192	10	100	469
P-194	6	100	55
P-196	6	100	147
P-198	6	100	411
P-200	6	100	51
P-202	6	100	178
P-204	6	100	142
P-206	8	25	1,079
P-212	6	42	515
P-216	8	120	116
P-218	8	100	728
P-220	8	100	454
P-222(1)	6	55	215
P-222(2)	6	55	328
P-224	6	55	628
P-226	6	55	988
P-228	10	60	693
P-230	6	50	589
P-232	8	110	1,342
P-234(1)	8	110	720
P-234(2)	8	100	544
P-236	8	110	452
P-238	8	110	725
P-240	8	110	246
P-242	8	110	202
P-244	8	110	173
P-246	8	110	249
P-248	8	110	238
P-252	8	110	541
P-254	8	110	484
P-256	8	110	215
P-258	8	110	847
P-260	8	110	773
P-262	8	110	1,336

Pipe Input Data
Water Distributiuon System Study
West Newbury, MA

Label	Diameter (in)	Hazen-Williams C	Length (Scaled) (ft)
P-264	8	110	1,245
P-266	8	110	389
P-268(1)	8	110	404
P-268(2)	8	110	539
P-270	8	110	478
P-272	8	110	681
P-276	6	90	1,102
P-278	8	110	1,613
P-280	8	110	446
P-282	8	110	860
P-284	8	110	425
P-286	8	110	802
P-288	8	90	290
P-290	8	110	626
P-292	6	50	402
P-294	6	50	144
P-296	6	50	493
P-298	6	110	1,311
P-300	8	110	685
P-302	8	110	1,053
P-304	8	120	322
P-306	8	120	1,009
P-308	6	100	886
P-310	6	70	1,072
P-312	6	60	783
P-316	2	50	843
P-318(1)	6	50	672
P-318(2)	6	50	853
P-320	8	90	618
P-322	8	90	692
P-324	8	90	206
P-326	8	90	590
P-328	8	90	494
P-330	8	90	745
P-332	8	90	868
P-334	8	110	1,585
P-336	6	100	584
P-338	6	100	632
P-342	8	110	1,137
P-344	8	90	743
P-346	8	100	208
P-348	8	90	587
P-350(2)	10	90	1,181
P-352	8	110	718

Pipe Input Data
Water Distributiuon System Study
West Newbury, MA

Label	Diameter (in)	Hazen-Williams C	Length (Scaled) (ft)
P-366	10	110	147
P-368(1)	10	110	353
P-368(2)	10	110	207
P-370(1)	10	110	348
P-370(2)	10	110	156
P-372	10	40	682
P-374	10	45	1,024
P-376	10	70	539
P-378	10	70	266
P-380	8	110	455
P-382	8	110	300
P-384	8	120	440
P-386	12	110	398
P-388	12	110	631
P-390	12	110	887
P-392	12	110	196
P-394	12	110	572
P-396	12	110	362
P-398	8	130	94
P-402	8	130	103
P-406	8	130	92
P-410	8	130	84
P-413	8	110	813
P-414	8	110	268
P-415	8	130	278
P-416(1)	8	130	1,060
P-416(2)	8	110	1,399
P-417	8	110	774
P-418	8	100	824
P-419	10	70	465
P-420	10	40	376
P-421	10	40	109
P-422	10	40	251
P-423	10	45	163
P-424	10	45	618
P-425	10	110	149
P-426	10	110	306

Junction Input Data
Water Distributiuon System Study
West Newbury, MA

Label	Zone	Elevation (ft)	Demand (gpm)	Pressure (psi)
J-2	596: Low Service	10	0	95.6
J-4	596: Low Service	13	0	94.3
Wellfield	596: Low Service	20	0	91.3
J-8	596: Low Service	64	0.11	72.2
J-10	596: Low Service	59	0.18	74.4
J-12	596: Low Service	56	0.67	75.7
J-14	596: Low Service	57	0.49	75.3
J-16	596: Low Service	75	0.25	67.5
J-18	596: Low Service	75	0.54	67.5
J-20	596: Low Service	157	0.26	32
J-22	596: Low Service	157	0	32
J-24	595: High Service	82	1.07	91.9
J-26	595: High Service	75	0.2	95
J-28	595: High Service	89	0.27	88.9
J-30	595: High Service	121	1.32	75.1
J-32	595: High Service	132	0.27	70.3
J-34	595: High Service	121	0.42	75.1
J-36	595: High Service	113	1.21	78.5
J-38	595: High Service	115	1.26	77.7
J-40	595: High Service	131	0.87	70.8
J-42	595: High Service	131	0.19	70.8
J-44	595: High Service	125	0.39	73.4
J-46	595: High Service	115.4	1.42	77.5
J-48	595: High Service	118	0.07	76.4
J-50	595: High Service	112	1.56	79
J-52	595: High Service	113	0.98	78.6
J-54	595: High Service	115	0.89	77.7
J-56	595: High Service	109	0.78	80.3
J-58	595: High Service	108	0.37	80.8
J-60	595: High Service	108	0.47	80.8
J-62	595: High Service	95	0.89	86.4
J-64	595: High Service	102	0.83	83.4
J-66	595: High Service	118	0.96	76.5
J-68	595: High Service	89	1.06	89.1
J-70	595: High Service	66	0.62	99
J-72	595: High Service	46	0.42	107.6
J-74	595: High Service	43	0.3	108.9
J-76	595: High Service	39	0.01	110.7
J-78	595: High Service	43	0.28	108.9
J-80	596: Low Service	59	0.91	74.4
J-82	596: Low Service	60	0.57	74
J-84	596: Low Service	62	0.35	73.1
J-86	596: Low Service	69	0.5	70.1

Junction Input Data
Water Distributiuon System Study
West Newbury, MA

Label	Zone	Elevation (ft)	Demand (gpm)	Pressure (psi)
J-88	596: Low Service	62	0.61	73.1
J-90	596: Low Service	62.3	0.14	73
J-92	596: Low Service	71.4	0.68	69
J-94	596: Low Service	71.3	0.37	69.1
J-96	596: Low Service	66	0.31	71.4
J-98	596: Low Service	66	0.37	71.4
J-100	596: Low Service	59.7	0.41	74.1
J-104	595: High Service	39	0.11	110.6
J-106	595: High Service	90	1.77	88.5
J-108	595: High Service	102	0.61	83.3
J-110	595: High Service	138	0.46	67.7
J-112	595: High Service	108	0	80.7
J-114	595: High Service	134	0.52	69.5
J-116	595: High Service	108	0.66	80.7
J-118	595: High Service	98	0.4	85
J-120	595: High Service	148	0.53	63.4
J-122	595: High Service	85	1.27	90.7
J-124	595: High Service	69	0.69	97.6
J-126	595: High Service	13	0	121.8
J-128	595: High Service	11	0.15	122.7
J-130	595: High Service	35	0.18	112.3
J-132	595: High Service	27.5	0.8	115.5
J-134	595: High Service	39	0.49	110.6
J-136	595: High Service	85	1.48	90.7
J-138	595: High Service	128	0.64	72.1
J-140	595: High Service	128	0.41	72.1
J-142	595: High Service	23	0.96	117.5
J-144	595: High Service	23	1.93	117.5
J-146	595: High Service	72	1.57	96.3
J-148	595: High Service	111.5	0.3	79.2
J-150	595: High Service	138	0.43	67.7
J-152	595: High Service	138	0.23	67.7
J-154	595: High Service	89	0.35	88.9
J-156	595: High Service	131	0.35	70.8
J-158	595: High Service	206	0	38.3
J-160	595: High Service	128	0.33	72.1
J-162	595: High Service	121	0.23	75.1
J-164	595: High Service	108	0.31	80.8
J-166	595: High Service	108	0.56	80.8
J-168	595: High Service	82	0.57	92.1
J-170	595: High Service	128	0.07	72.1
J-172	595: High Service	128	0.42	72.1
J-174	595: High Service	128	0	72.1

Junction Input Data
Water Distributiuon System Study
West Newbury, MA

Label	Zone	Elevation (ft)	Demand (gpm)	Pressure (psi)
J-176	595: High Service	128	0.94	72.1
J-178	595: High Service	128	0.06	72.1
J-180	595: High Service	128	0.69	72.1
J-182	595: High Service	100	0.96	84.2
J-184	595: High Service	43	0.08	108.9
J-186	595: High Service	30	0.32	114.5
J-188	595: High Service	35	0	112.3
J-190	595: High Service	43	0.1	108.9
J-192	595: High Service	102	1.05	83.4
J-194	595: High Service	102	0.44	83.4
J-196	595: High Service	95	0.23	86.4
J-198	595: High Service	108	0.97	80.8
J-200	595: High Service	98	0.99	85.1
J-202	595: High Service	89	1.16	89
J-204	595: High Service	59	1.62	102
J-206	595: High Service	35	0.44	112.3
J-208	595: High Service	29.3	0.57	114.8
J-210	595: High Service	43	0.83	108.9
J-212	595: High Service	43	0	108.9
J-214	595: High Service	43	0	108.9
J-216	595: High Service	39	0.83	110.6
J-218	595: High Service	59	0.39	102
J-220	595: High Service	43	0.46	108.9
J-222	595: High Service	43	0.15	108.9
J-224	595: High Service	30	0.48	114.5
J-226	595: High Service	30	0.26	114.5
J-228	595: High Service	43	1.66	108.9
J-230	595: High Service	41	0.4	109.8
J-232	595: High Service	30	0.51	114.5
J-234	595: High Service	49	1.92	106.3
J-236	595: High Service	36.2	0.61	111.9
J-238	595: High Service	25	0.94	116.7
J-240	595: High Service	23	1.42	117.6
J-242	595: High Service	39	1.16	110.7
J-244	595: High Service	66	0.52	99
J-246	595: High Service	184	1.13	47.9
J-248	595: High Service	49	0.62	106.3
J-250	595: High Service	39	0.26	110.7
J-252	595: High Service	66	0.84	99
J-254	595: High Service	30	0.19	114.6
J-256	595: High Service	30	0	114.6
J-258	595: High Service	30	0	114.6
J-260	595: High Service	30	0	114.6

Junction Input Data
Water Distributiuon System Study
West Newbury, MA

Label	Zone	Elevation (ft)	Demand (gpm)	Pressure (psi)
J-262	595: High Service	98	0.57	85.2
J-264	595: High Service	92	1.23	87.8
J-266	595: High Service	89	0.52	89.1
J-268	595: High Service	92	0.15	87.8
J-270	595: High Service	82	0.6	92.1
J-272	595: High Service	121	0.33	75.2
J-274	595: High Service	161	0.29	57.9
J-276	595: High Service	200	0.61	41
J-278	595: High Service	112	0.15	79.1
J-280	595: High Service	102	0.99	83.4
J-282	595: High Service	88	0.06	89.5
J-284	595: High Service	98	1.2	85.2
J-286	595: High Service	108	0.7	80.9
J-288	595: High Service	149.6	1.22	62.9
J-290	595: High Service	177.5	0.75	50.8
J-292	595: High Service	98	0.67	85.2
J-294	595: High Service	118	0.96	76.5
J-296	595: High Service	16	0.15	120.5
J-298	595: High Service	79	0.61	93.4
J-300	595: High Service	71	0.23	96.8
J-302	595: High Service	82	0.08	91.9
J-306	596: Low Service	26	0	88.7
J-308	596: Low Service	33	0.04	85.7
J-310	595: High Service	90	1.35	88.6
J-312	595: High Service	98	1.05	85.1
J-314	595: High Service	39	0.56	110.6
J-316	595: High Service	33	0	113.3
J-318	596: Low Service	90	0	61
J-320	596: Low Service	88	4.38	61.9
J-322	596: Low Service	82	0	64.5
J-324	596: Low Service	84	0	63.6
J-326	596: Low Service	95	0.58	58.8
J-331	595: High Service	75	0.4	95
J-332	595: High Service	89	0.62	88.9
J-333	595: High Service	111	0	79.4
J-334	596: Low Service	157	0	32
J-1	595: High Service	88.4	0.07	89.2
J-2	595: High Service	138.7	1.42	67.4
J-3	595: High Service	124	0.56	73.8
J-4	595: High Service	99.1	1.05	84.6
J-5	595: High Service	27.6	0.82	115.5
J-6	595: High Service	25.3	0.06	116.5
J-7	595: High Service	122.3	0.59	74.6

Junction Input Data
Water Distributiuon System Study
West Newbury, MA

Label	Zone	Elevation (ft)	Demand (gpm)	Pressure (psi)
J-8	595: High Service	122.3	0.91	74.6
J-10	595: High Service	175.1	0.12	51.8
J-11	596: Low Service	75	0.21	67.5
J-12	595: High Service	118	0.14	76.4
J-13	595: High Service	121	0.08	75.1
J-14	595: High Service	66	0.5	99
J-15	596: Low Service	157	0	32
J-16	595: High Service	157	0	59.5
J-18	595: High Service	82	0	92
J-19	595: High Service	72	2.32	96.3
J-20	595: High Service	76	0	94.6
J-21	595: High Service	86	0	90.3
J-23	595: High Service	94	0	86.8
J-27	595: High Service	78	0	93.7
J-28	595: High Service	43	0.11	108.9
J-29	595: High Service	37.6	0	111.2
J-30	595: High Service	73.9	0	95.5
J-31	595: High Service	121.2	1.57	75
J-33	595: High Service	190.2	0.2	45.2
J-34	595: High Service	150	0	62.5
J-35	595: High Service	128	0	72.1
J-36	595: High Service	123	1.12	74.2
J-37	595: High Service	242	0	22.9
J-38	595: High Service	245	0	21.6
J-39	595: High Service	190	0	45.4
J-40	595: High Service	37	0.4	111.5
J-41	595: High Service	30	0.32	114.5
J-42	595: High Service	134.2	0	69.4
J-43	595: High Service	141.3	1.92	66.3
J-44	595: High Service	41	0.71	109.7
J-56	595: High Service	74	0.11	95.5
J-59	596: Low Service	113.3	1.67	50.9
J-60	595: High Service	17	0.76	120.1
J-61	595: High Service	67	0.29	98.6
J-62	595: High Service	34.2	1.07	112.7
J-63	595: High Service	50	0.49	105.9
J-64	595: High Service	100	0.46	84.2
J-65	595: High Service	171	0.27	53.5
J-66	595: High Service	168	0.23	54.9
J-67	595: High Service	138	0.34	67.7
J-68	596: Low Service	69	0.33	70.1
J-69	596: Low Service	63	0	72.7
J-70	595: High Service	143	0.45	65.6

Junction Input Data
Water Distributiuon System Study
West Newbury, MA

Label	Zone	Elevation (ft)	Demand (gpm)	Pressure (psi)
J-71	595: High Service	116	1.08	77.3
J-72	596: Low Service	64	0.15	72.2
J-73	595: High Service	129	0.36	71.6
J-74	595: High Service	99.1	0.33	84.7

Water Storage Tanks Input Data
Water Distributiuon System Study
West Newbury, MA

Label	Zone	Base Elevation (ft)	Overflow Elevation (ft)
PIPE STAVE TANK	596: Low Service	192	232
Brake Hill Tank - New	595: High Service	262.5	300

Pump Input Data
Water Distributiuon System Study
West Newbury, MA

Label	Elevation (ft)	Hydraulic Grade (Discharge) (ft)	Head (Design) (ft)	Flow (design) (gpm)
Newbury Port Pump	18.5	231	323	355
Pipe Stave Hill BPS No.	157	294.5	70	360
Pipe Stave Hill BPS No.	157	294.5	70	360
West Newbury Pump	18.5	231	231	130

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Water Withdrawals / Purchased Water (Calendar Year)

West Newbury (Wellfield #1)

	Numbers from page 1	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
	January	3,069,000	3,589,000	3,575,000	3,974,000	3,037,000	3,448,000	3,032,000	3,869,000	4,726,000	3,139,000	
	February	2,819,000	2,927,000	3,406,000	4,137,000	3,703,000	2,955,000	2,434,000	3,615,000	3,996,000	2,642,000	
	March	3,476,000	2,888,000	3,893,000	4,563,000	4,471,000	3,293,000	4,638,000	4,016,000	4,568,000	3,424,000	
	April	4,005,000	3,917,000	4,077,000	4,767,000	4,923,000	4,221,000	4,513,000	4,284,000	4,360,000	1,549,000	
	May	4,296,000	4,608,000	4,451,000	5,023,000	5,385,000	4,247,000	4,597,000	4,557,000	3,660,000	-	
	June	3,600,000	3,747,000	3,435,000	4,208,000	4,210,000	3,910,000	4,188,000	4,079,000	2,497,000	3,487,000	
	July	3,345,000	3,808,000	2,834,000	3,962,000	3,756,000	3,680,000	3,432,000	3,970,000	3,773,000		
	August	2,990,000	3,469,000	2,359,000	3,590,000	3,123,000	3,119,000	3,219,000	4,887,000	3,662,000		
	September	2,426,000	2,628,000	1,502,000	3,183,000	3,046,000	2,875,000	3,104,000	4,037,000	4,733,000		
	October	2,495,000	2,692,000	2,533,000	2,889,000	3,234,000	2,788,000	2,679,000	4,549,000	3,626,000		
	November	2,666,000	2,662,000	2,533,000	2,918,000	3,554,000	2,601,000	2,417,000	3,990,000	2,879,000		
	December	3,279,000	1,321,000	2,609,000	2,893,000	4,221,000	2,827,000	3,415,000	4,649,000	3,033,000		
CY, West Newbury Wellfield Pumped =		38,466,000	38,256,000	37,207,000	46,107,000	46,663,000	39,964,000	41,668,000	50,502,000	45,513,000	-	-
Gallons CY 1998 - CY 2013=	727,169,909											
WEST NEWBURY WELLFIELD TOTAL GALLONS PUMPED FROM CALENDAR YEAR 1999 THROUGH PRESENT=												1,108,482,909

Newburyport (Purchased)

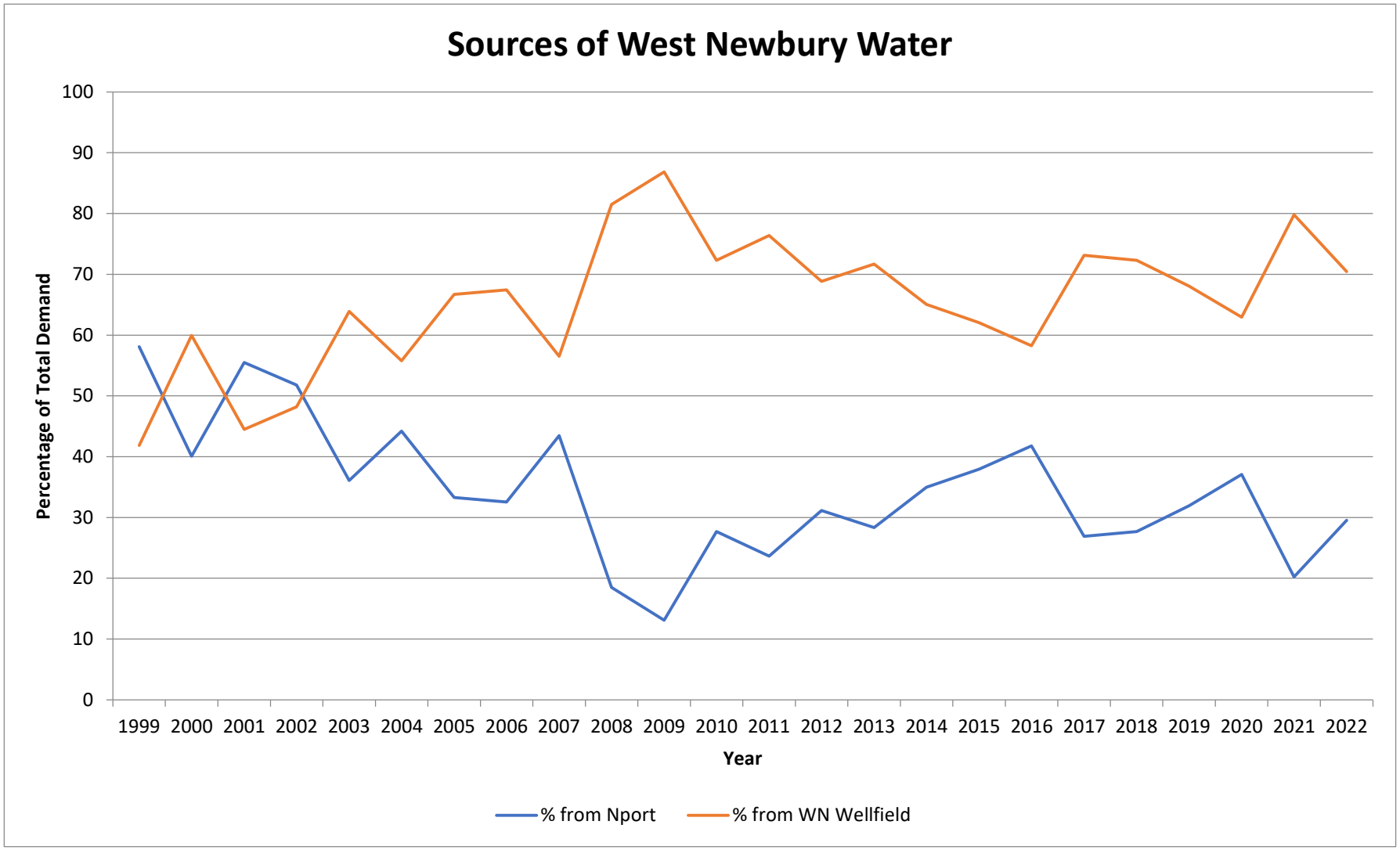
	January	1,707,400	800,000	794,000	968,000	1,798,000	1,545,000	1,329,000	810,000	121,000	1,826,000	
	February	1,089,330	843,000	412,000	-	349,000	1,077,000	1,729,000	1,150,000	-	-	

	March	728,000	1,501,000	418,000	-	-	1,113,000	-	819,000	-	36,000	
	April	542,200	693,000	613,000	514,000	-	749,000	767,000	1,241,000	815,000	3,738,000	
	May	852,000	2,394,000	1,444,000	650,000	485,000	786,000	2,204,000	2,240,000	2,348,000	6,750,000	
	June	2,623,000	2,346,000	3,624,000	2,166,000	2,382,000	1,079,000	3,617,000	2,612,000	3,960,000	1,773,000	
	July	2,666,000	2,411,000	4,212,000	2,471,000	3,133,000	2,455,000	2,916,000	1,219,000	2,814,000		
	August	2,380,000	2,366,000	3,962,000	2,763,000	2,857,000	2,282,000	2,577,000	702,000	1,995,000		
	September	2,679,000	2,548,000	3,551,000	1,892,000	2,271,000	2,201,000	2,810,000	604,000	1,563,000		
	October	2,490,000	2,543,000	2,913,000	2,715,000	2,426,000	2,140,000	2,660,000	940,000	1,703,000		
	November	1,802,000	1,954,000	2,263,000	1,808,000	1,306,000	1,688,000	2,345,000	459,000	1,745,000		
	December	1,119,000	2,989,000	2,467,000	1,008,000	864,000	1,631,000	1,575,000	-	2.030,000		
CY, Gallons Purchased from NBPT =		20,677,930	23,388,000	26,673,000	16,955,000	17,871,000	18,746,000	24,529,000	12,796,000	19,094,000	-	-
Gallons CY 1998 - CY 2013=	442,491,290											
												621,191,220
West Newbury and Newburyport Combined Calendar Year Totals (Gallons) =	1,066,702,559	59,143,930	61,644,000	63,880,000	63,062,000	64,534,000	58,710,000	66,197,000	63,298,000	64,607,000	-	
												2,796,376,688
NOTE: vfd's on pumps at wellfield fully operational in the spring of 2008												

Gallons Pumped to meet Demand

Year	WN Wellfield		Newburyport		Total
	gallons	%total	gallons	%total	
1999	35,898,800	42	49,822,900	58	85,721,700
2000	45,624,700	60	30,504,590	40	76,129,290
2001	38,520,600	44	48,047,900	56	86,568,500
2002	37,500,900	48	40,298,000	52	77,798,900
2003	48,962,100	64	27,648,400	36	76,610,500
2004	46,362,900	56	36,732,700	44	83,095,600
2005	54,725,100	67	27,312,400	33	82,037,500
2006	51,525,600	67	24,878,050	33	76,403,650
2007	45,412,229	57	34,927,950	43	80,340,179
2008	59,292,876	82	13,458,440	18	72,751,316
2009	57,689,360	87	8,722,670	13	66,412,030
2010	50,355,944	72	19,292,710	28	69,648,654
2011	48,930,000	76	15,139,980	24	64,069,980
2012	47,586,000	69	21,528,760	31	69,114,760
2013	42,262,000	72	16,698,140	28	58,960,140
2014	38,466,000	65	20,677,930	35	59,143,930
2015	38,256,000	62	23,388,000	38	61,644,000
2016	37,207,000	58	26,673,000	42	63,880,000
2017	46,107,000	73	16,955,000	27	63,062,000
2018	46,663,000	72	17,871,000	28	64,534,000
2019	39,964,000	68	18,746,000	32	58,710,000
2020	41,668,000	63	24,529,000	37	66,197,000
2021	50,502,000	80	12,796,000	20	63,298,000
2022	45,513,000	70	19,094,000	30	64,607,000
average	45,624,796	66	24,822,647	34	70,447,443

Data source: West Newbury Water Dept.



Source: West Newbury Open Space Committee (through 2017); updated by Town Manager. July 24, 2023

Water Usage Trends, 1999-2022								
	Pumped		Purchased from Newburyport			Gallons per Day		
Calendar Year	Gallons	Percent	Gallons	Percent	Total	Pumped	Purchased	Total
1999	35,898,800	41.9%	49,822,900	58.1%	85,721,700	98,353	136,501	234,854
2000	45,624,700	59.9%	30,504,590	40.1%	76,129,290	124,999	83,574	208,573
2001	38,520,600	44.5%	48,047,900	55.5%	86,568,500	105,536	131,638	237,174
2002	37,500,900	48.2%	40,298,000	51.8%	77,798,900	102,742	110,405	213,148
2003	48,962,100	63.9%	27,648,400	36.1%	76,610,500	134,143	75,749	209,892
2004	46,362,900	55.8%	36,732,700	44.2%	83,095,600	127,022	100,638	227,659
2005	54,725,100	66.7%	27,312,400	33.3%	82,037,500	149,932	74,828	224,760
2006	51,525,600	67.4%	24,878,050	32.6%	76,403,650	141,166	68,159	209,325
2007	45,412,229	56.5%	34,927,950	43.5%	80,340,179	124,417	95,693	220,110
2008	59,292,876	81.5%	13,458,440	18.5%	72,751,316	162,446	36,872	199,319
2009	57,689,360	86.9%	8,722,670	13.1%	66,412,030	158,053	23,898	181,951
2010	50,355,944	72.3%	19,292,710	27.7%	69,648,654	137,961	52,857	190,818
2011	48,930,000	76.4%	15,139,980	23.6%	64,069,980	134,055	41,479	175,534
2012	47,586,000	68.9%	21,528,760	31.1%	69,114,760	130,373	58,983	189,356
2013	42,262,000	71.7%	16,698,140	28.3%	58,960,140	115,786	45,748	161,535
2014	38,466,000	65.0%	20,677,930	35.0%	59,143,930	105,386	56,652	162,038
2015	38,256,000	62.1%	23,388,000	37.9%	61,644,000	104,811	64,077	168,888
2016	37,207,000	58.2%	26,673,000	41.8%	63,880,000	101,937	73,077	175,014
2017	46,107,000	73.1%	16,955,000	26.9%	63,062,000	126,321	46,452	172,773
2018	46,663,000	72.3%	17,871,000	27.7%	64,534,000	127,844	48,962	176,805
2019	39,964,000	68.1%	18,746,000	31.9%	58,710,000	109,490	51,359	160,849
2020	41,668,000	62.9%	24,529,000	37.1%	66,197,000	114,159	67,203	181,362
2021	50,502,000	79.8%	12,796,000	20.2%	63,298,000	138,362	35,058	173,419
2022	45,513,000	70.4%	19,094,000	29.6%	64,607,000	124,693	52,312	177,005
Avg (1999-2022)	45,624,796		24,822,647	34.4%		124,999	68,007	193,007
Avg (2008-22)	46,030,812		18,371,375	28.7%		126,112	50,333	176,444
Avg (2018-22)	44,862,000		18,607,200	29.3%		122,910	50,979	173,888
Avg (2020-22)	45,894,333		18,806,333	28.9%		125,738	51,524	177,262

Source: Angus Jennings, Town Manager; data from West Newbury Water Department

Water budget trends, FY15-FY24

		Budgeted catetories								Changes (expense budget)	
Fiscal Year	Expense Budget	Salaries/ Wages	BOWC Stipends	Insurances	Expenses	Debt Service	Extraordinary & Unforeseen	Indirect Costs	TOTAL	$	%
FY2015	$ 627,788	177,757	1,700	23,346	335,518	30,772	12,000	46,695	627,788	n/a	n/a
FY2016	$ 633,835	177,758	1,700	24,514	340,396	30,772	12,000	46,695	633,835	$ 6,047	1.0%
FY2017	$ 684,379	179,901	1,700	33,514	378,396	30,772	12,000	48,096	684,379	$ 50,544	8.0%
FY2018	$ 698,525	184,426	1,700	30,514	400,594	16,772	15,000	49,519	698,525	$ 14,146	2.1%
FY2019	$ 793,518	187,541	1,700	41,931	393,590	103,747	15,000	50,009	793,518	$ 94,993	13.6%
FY2020	$ 795,099	195,903	1,700	34,282	395,564	101,696	15,000	50,954	795,099	$ 1,581	0.2%
FY2021	$ 861,446	203,879	1,700	27,141	379,896	176,920	20,000	51,910	861,446	$ 66,347	8.3%
FY2022	$ 863,649	278,338	1,700	47,248	339,399	124,068	20,000	52,896	863,649	$ 2,203	0.3%
FY2023	$ 950,948	317,597	1,700	73,196	340,313	144,188	20,000	53,954	950,948	$ 87,299	10.1%
FY2024	$ 1,051,559	308,536	1,700	52,191	445,027	167,913	20,000	56,192	1,051,559	$ 100,611	10.6%

Source: Angus Jennings, Town Manager; revenue data from MDOR year-end reporting (A-2s)

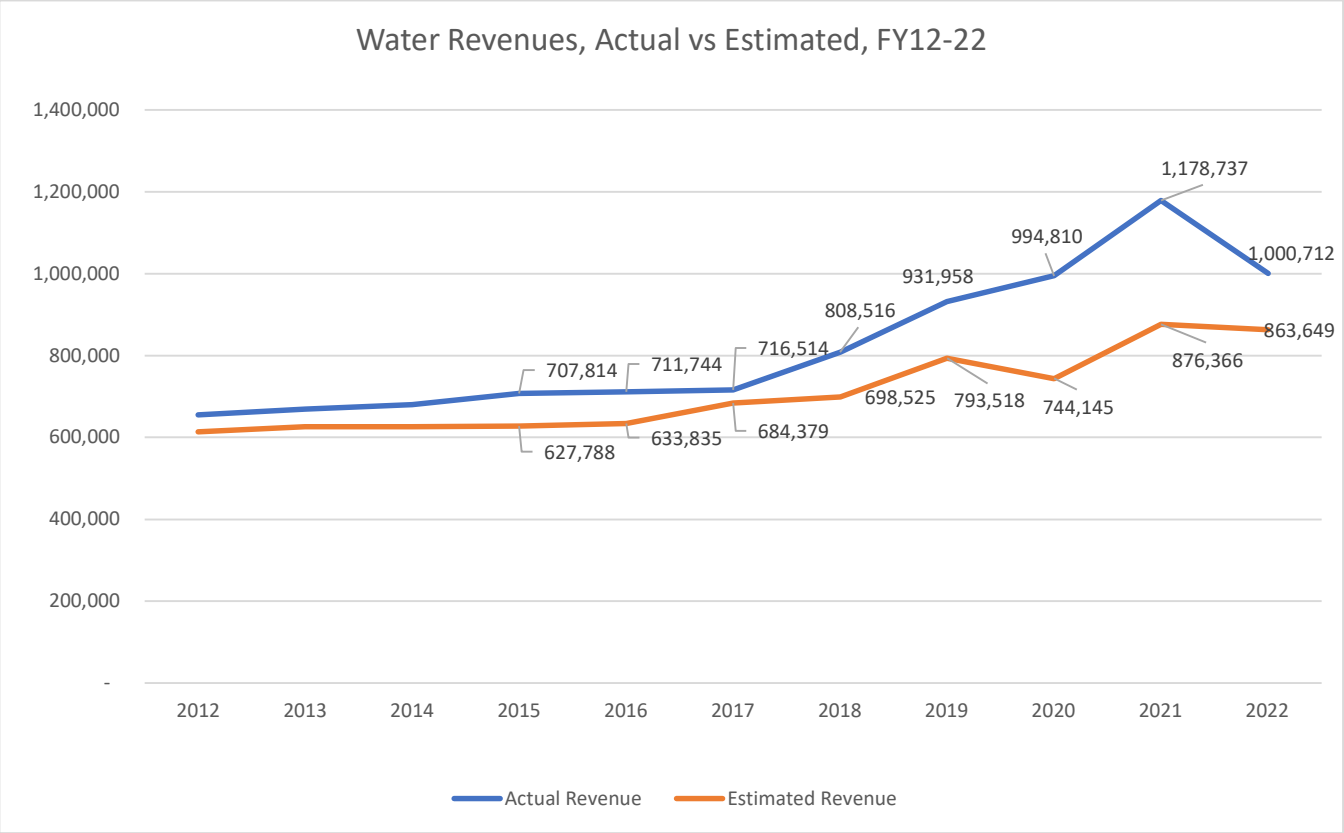
Water purchased from Newburyport

Paid to Newburyport

Fiscal Year	Amt Paid (total)*	Amt Paid (non-Water)*	Amt Paid (Water)*
2008	$ 188,499	$ -	$ 188,499
2009	$ 53,232	$ 393	$ 52,839
2010	$ 60,023	$ -	$ 60,023
2011	$ 116,174	$ -	$ 116,174
2012	$ 79,757	$ -	$ 79,757
2013	$ 125,202	$ -	$ 125,202
2014	$ 80,081	$ -	$ 80,081
2015	$ 124,366	$ -	$ 124,366
2016	$ 203,333	$ 20,000	$ 183,333
2017	$ 178,533	$ 20,000	$ 158,533
2018	$ 176,074	$ 21,500	$ 154,574
2019	$ 161,398	$ 21,500	$ 139,898
2020	$ 188,218	$ 24,170	$ 164,048
2021	$ 178,336	n/a	$ 178,336
2022	$ 71,305	n/a	$ 71,305
2023	$ 228,953	n/a	$ 228,953
		Avg (2008-23)	131,620
		Avg (2019-23)	156,508
		Avg (2021-23)	159,531

Source: Angus Jennings, Town Manager; data from Town Accounting software (Vadar FY20-FY23; Softright FY19 and prior)

West Newbury Water Revenues, FY12-22			
Fiscal Year	Actual Revenue	Estimated Revenue	Delta (Actual minus Estimated)
2012	654,989	614,081	40,908
2013	669,465	626,415	43,050
2014	680,339	626,415	53,924
2015	707,814	627,788	80,026
2016	711,744	633,835	77,909
2017	716,514	684,379	32,135
2018	808,516	698,525	109,991
2019	931,958	793,518	138,440
2020	994,810	744,145	250,665
2021	1,178,737	876,366	302,371
2022	1,000,712	863,649	137,063



Source: Angus Jennings, Town Manager
Data Source: MassDOR A-2 Forms, 2012-23

Water Rate Schedule and Estimated Customer Cost Trends, 1994-2018 Updated 2/11/2019

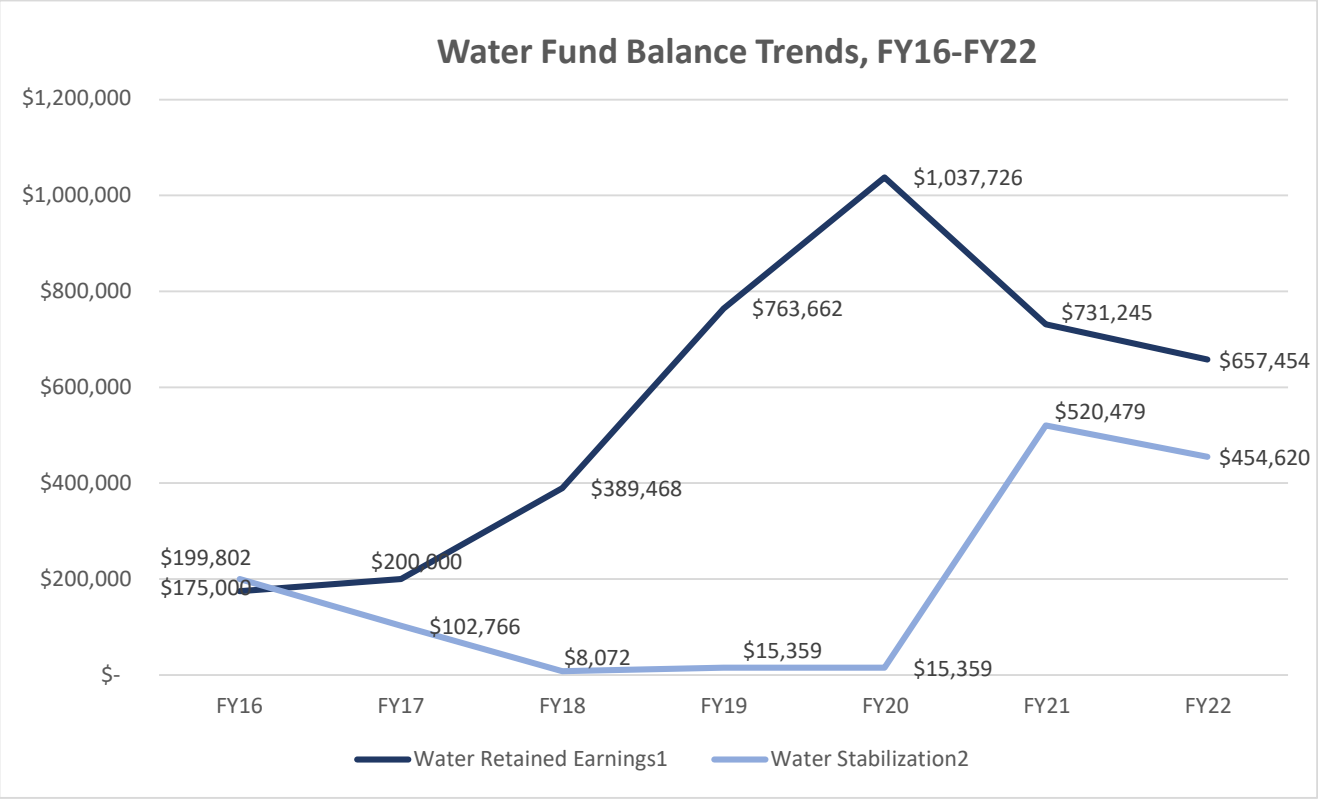
Rate Change	Year	Per 1,000 gallons (base rate)	Base Charge	Household cost at monthly use of (gallons): 4,230	5,800	10,000	Percent Increase	Annual cost (est.): 50,760	69,600	120,000
Spring	1994	$ 4.95	$ -	20.94	28.71	49.50		251.26	344.52	594.00
	1995	$ 4.95	$ -	20.94	28.71	49.50	0.0%	251.26	344.52	594.00
	1996	$ 4.95	$ -	20.94	28.71	49.50	0.0%	251.26	344.52	594.00
	1997	$ 4.95	$ -	20.94	28.71	49.50	0.0%	251.26	344.52	594.00
Fall	1998	$ 5.25	$ -	22.21	30.45	52.50	6.1%	266.49	365.40	630.00
	1999	$ 5.25	$ -	22.21	30.45	52.50	0.0%	266.49	365.40	630.00
	2000	$ 5.25	$ -	22.21	30.45	52.50	0.0%	266.49	365.40	630.00
	2001	$ 5.70	$ -	24.11	33.06	57.00	8.6%	289.33	396.72	684.00
Spring	2002	$ 7.25	$ -	30.67	42.05	72.50	27.2%	368.01	504.60	870.00
	2003	$ 7.25	$ -	30.67	42.05	72.50	0.0%	368.01	504.60	870.00
	2004	$ 7.25	$ -	30.67	42.05	72.50	0.0%	368.01	504.60	870.00
	2005	$ 7.25	$ -	30.67	42.05	72.50	0.0%	368.01	504.60	870.00
Spring	2006	$ 7.90	$ -	33.42	45.82	79.00	9.0%	401.00	549.84	948.00
Spring	2007	$ 8.22	$ 10.00	36.44	49.34	83.87	6.2%	437.25	592.11	1,006.40
Spring	2008	$ 8.55	$ 10.00	37.83	51.26	87.17	3.9%	454.00	615.08	1,046.00
	2009	$ 8.55	$ 10.00	37.83	51.26	87.17	0.0%	454.00	615.08	1,046.00
Spring	2010	$ 8.55	$ 20.00	39.50	52.92	88.83	1.9%	474.00	635.08	1,066.00
Fall	2011	$ 9.31	$ 20.00	42.71	57.33	96.43	8.6%	512.58	687.98	1,157.20
	2012	$ 9.31	$ 20.00	42.71	57.33	96.43	0.0%	512.58	687.98	1,157.20
	2013	$ 9.31	$ 20.00	42.71	57.33	96.43	0.0%	512.58	687.98	1,157.20
Fall	2014	$ 9.68	$ 20.00	44.28	59.48	100.13	3.8%	531.36	713.73	1,201.60
	2015	$ 9.68	$ 20.00	44.28	59.48	100.13	0.0%	531.36	713.73	1,201.60
Spring	2016	$ 10.07	$ 20.00	45.93	61.74	104.03	3.9%	551.15	740.87	1,248.40
Spring	2017	$ 10.07	$ 40.00	49.26	65.07	107.37	3.2%	591.15	780.87	1,288.40
Fall	2017	$ 11.80	$ 40.00	56.58	75.11	124.67	16.1%	678.97	901.28	1,496.00
Fall	2018	$ 12.40	$ 50.00	60.79	80.25	132.33	7.1%	729.42	963.04	1,588.00
						Est. cost change, 2008-2018:		**60.7%**	**56.6%**	**51.8%**

Source: Angus Jennings, Town Manager; data from West Newbury Water Department

Water Fund Balance Trends, FY16-FY22			
Fiscal Year	Water Retained Earnings[1]	Water Stabilization[2]	Water Stabilization + Retained Earnings
FY16	$ 175,000	$ 199,802	$ 374,802
FY17	$ 200,000	$ 102,766	$ 302,766
FY18	$ 389,468	$ 8,072	$ 397,540
FY19	$ 763,662	$ 15,359	$ 779,021
FY20	$ 1,037,726	$ 15,359	$ 1,053,085
FY21	$ 731,245	$ 520,479	$ 1,251,724
FY22	$ 657,454	$ 454,620	$ 1,112,074
Avg (FY16-FY22)	$564,936	$188,065	$ 753,002

[1] *Source: MA DOR Retained Earnings Calculations, FY18-FY22; Finance Committee Town Meeting booklets, FY16-17.*

[2] *Source: Finance Committee Town Meeting booklets, FY16-22.*



Source: Angus Jennings, Town Manager - WORKING DRAFT

Housing Opportunities Initiative (MBTA Community Multi-Family Zoning District)
Peter Flinker attended the July 18 PB Meeting to present a summary of the June 20 Forum and June 27 Public Workshop. The written summaries are posted on the Project website.
Peter also led a discussion of the Board regarding next steps in the process, which potential sites to continue assessing for feasibility and to create draft concept plans for. At this point, the Consultant Team will continue to assess 317, 331 and 347 Main Street, 187 Main Street and 0 Church Street also know as the Mullen property.

A letter was sent to the owners of the properties being assessed to explain the intent of the proposed zoning and how it could impact their property.

At the next public forum on August 15th, the Consultant Team will present concept plans and draft regulations for the potential districts.

ADU Bylaw
The draft ADU Bylaw was updated with residency requirements that allow up to a year of temporary absence during which time the homeowner may rent the owners unit. Notice to the Building Inspector is required.

The ADU Bylaw will be one of the projects/initiatives highlighted in an anticipated Land Management and Planning Summit anticipated in the fall.

Housing Production Plan
The 4th HPP Stakeholder Working Group meeting is scheduled for August 8th at 10 AM The Group meets in person at Town Offices and via zoom.
The meeting will focus on identifying outreach opportunities to begin in the fall.

Land Management and Planning Summit
The Town is considering a Land Management and Planning Summit for the fall. The purpose of the summit is to share information about a substantial number of projects underway, to show the depth and diversity of planning that is going on, and to gather public input on those projects ready.

The summit is intended to highlight three Town Projects: the Housing Opportunities Initiative, the 113 Corridor Improvement Study and the Water (Modeling and Financial Assessment) Study.

We anticipate an Open House format with brief presentations for the three highlighted studies and with stations for the various other projects (Hazard mitigation Plan, Housing Production Plan, Page School Conditions Assessment, Solar Installation Feasibility Study, Sawmill Brook Purchase, and others.)

Executive Office of Housing and Livable Communities
Chapter 40B Subsidized Housing Inventory (SHI)
as of June 29, 2023*

Community	2020 Census Year Round Housing Units	Total Development Units**	SHI Units	%
Abington	6,799	666	489	7.19%
Acton	9,151	1,517	737	8.05%
Acushnet	4,275	125	95	2.22%
Adams	4,299	324	324	7.54%
Agawam	12,313	620	558	4.53%
Alford	237	0	0	0.00%
Amesbury	7,808	841	663	8.49%
Amherst	10,684	1,467	1,252	11.72%
Andover	13,464	2,212	1,675	12.44%
Aquinnah	215	33	33	15.35%
Arlington	20,400	1,615	1,299	6.37%
Ashburnham	2,448	144	29	1.18%
Ashby	1,206	0	0	0.00%
Ashfield	800	20	19	2.38%
Ashland	7,456	1,021	419	5.83%
Athol	5,207	261	261	5.01%
Attleboro	19,049	1,166	1,166	6.12%
Auburn	6,979	366	366	5.24%
Avon	1,830	75	75	4.10%
Ayer	3,783	381	226	5.97%
Barnstable	21,915	1,816	1,485	6.78%
Barre	2,234	83	83	3.72%
Becket	950	1	1	0.11%
Bedford	5,424	1,243	989	18.23%
Belchertown	6,301	402	376	5.97%
Bellingham	6,732	983	755	11.22%
Belmont	10,839	785	673	6.21%
Berkley	2,352	158	40	1.70%
Berlin	1,307	320	204	15.61%
Bernardston	954	22	22	2.31%
Beverly	17,754	2,538	1,992	11.22%
Billerica	15,460	1,982	1,668	10.79%
Blackstone	3,864	165	123	3.18%
Blandford	543	0	0	0.00%
Bolton	1,967	409	298	15.15%
Boston	299,238	58,823	57,443	19.20%
Bourne	8,930	1,127	589	6.60%
Boxborough	2,343	323	266	11.35%
Boxford	2,796	85	44	1.57%

Boylston	1,943	159	100	5.15%
Braintree	15,036	1,728	1,399	9.30%
Brewster	5,170	502	327	6.32%
Bridgewater	9,321	1,216	1,006	10.79%
Brimfield	1,593	56	56	3.52%
Brockton	37,277	4,612	4,494	12.06%
Brookfield	1,490	13	13	0.87%
Brookline	27,742	4,012	3,123	11.26%
Buckland	874	8	8	0.92%
Burlington	10,376	2,038	1,320	12.72%
Cambridge	53,467	7,089	6,896	12.90%
Canton	9,875	1,422	1,173	11.88%
Carlisle	1,893	57	51	2.69%
Carver	4,640	141	141	3.04%
Charlemont	576	3	3	0.52%
Charlton	5,114	93	93	1.82%
Chatham	3,698	184	178	4.81%
Chelmsford	14,696	1,904	1,438	9.78%
Chelsea	14,521	2,421	2,416	16.64%
Cheshire	1,484	0	0	0.00%
Chester	574	0	0	0.00%
Chesterfield	552	8	8	1.45%
Chicopee	25,481	2,659	2,623	10.29%
Chilmark	592	0	0	0.00%
Clarksburg	736	9	9	1.22%
Clinton	6,918	547	547	7.91%
Cohasset	3,247	321	307	9.45%
Colrain	733	0	0	0.00%
Concord	7,172	920	715	9.97%
Conway	796	0	0	0.00%
Cummington	428	14	14	3.27%
Dalton	2,845	159	159	5.59%
Danvers	11,706	1,594	1,178	10.06%
Dartmouth	12,547	1,298	980	7.81%
Dedham	10,412	1,170	1,125	10.80%
Deerfield	2,261	37	37	1.64%
Dennis	8,043	492	438	5.45%
Dighton	2,968	427	151	5.09%
Douglas	3,395	140	140	4.12%
Dover	2,018	123	57	2.82%
Dracut	12,304	882	606	4.93%
Dudley	4,595	108	108	2.35%
Dunstable	1,145	0	0	0.00%
Duxbury	5,987	541	440	7.35%
East Bridgewater	5,186	230	176	3.39%
East Brookfield	915	0	0	0.00%
East Longmeadow	6,340	528	452	7.13%

Eastham	3,156	125	116	3.68%
Easthampton	7,790	1,022	555	7.12%
Easton	9,087	1,087	853	9.39%
Edgartown	2,440	78	73	2.99%
Egremont	697	0	0	0.00%
Erving	696	0	0	0.00%
Essex	1,549	40	40	2.58%
Everett	18,177	819	819	4.51%
Fairhaven	7,189	495	495	6.89%
Fall River	44,213	4,631	4,535	10.26%
Falmouth	15,903	1,515	1,177	7.43%
Fitchburg	17,407	1,750	1,556	8.94%
Florida	347	0	0	0.00%
Foxborough	7,652	936	878	11.47%
Framingham	28,957	4,225	3,041	10.50%
Franklin	12,511	1,821	1,359	10.86%
Freetown	3,447	104	86	2.49%
Gardner	9,358	1,346	1,346	14.38%
Georgetown	3,151	361	351	11.14%
Gill	655	24	24	3.66%
Gloucester	13,896	1,248	1,043	7.51%
Goshen	442	10	10	2.26%
Gosnold	39	0	0	0.00%
Grafton	7,740	1,126	428	5.53%
Granby	2,488	77	77	3.09%
Granville	635	0	0	0.00%
Great Barrington	3,303	483	348	10.54%
Greenfield	8,577	1,297	1,280	14.92%
Groton	4,114	402	216	5.25%
Groveland	2,582	148	89	3.45%
Hadley	2,321	277	277	11.93%
Halifax	3,088	36	36	1.17%
Hamilton	2,804	130	114	4.07%
Hampden	2,005	64	64	3.19%
Hancock	363	0	0	0.00%
Hanover	5,247	568	568	10.83%
Hanson	3,922	229	188	4.79%
Hardwick	1,215	1	1	0.08%
Harvard	2,199	262	108	4.91%
Harwich	6,581	328	328	4.98%
Hatfield	1,621	47	47	2.90%
Haverhill	27,869	2,951	2,735	9.81%
Hawley	153	0	0	0.00%
Heath	315	0	0	0.00%
Hingham	9,823	2,801	1,010	10.28%
Hinsdale	927	0	0	0.00%
Holbrook	4,404	436	436	9.90%

Holden	7,419	518	410	5.53%
Holland	1,149	0	0	0.00%
Holliston	5,544	520	253	4.56%
Holyoke	16,829	3,376	3,254	19.34%
Hopedale	2,384	115	115	4.82%
Hopkinton	6,597	843	725	10.99%
Hubbardston	1,737	49	49	2.82%
Hudson	8,455	1,054	896	10.60%
Hull	5,005	83	83	1.66%
Huntington	937	30	30	3.20%
Ipswich	6,215	800	589	9.48%
Kingston	5,251	358	235	4.48%
Lakeville	4,382	433	250	5.71%
Lancaster	2,736	224	138	5.04%
Lanesborough	1,371	28	28	2.04%
Lawrence	29,976	3,989	3,969	13.24%
Lee	2,796	176	176	6.29%
Leicester	4,338	176	176	4.06%
Lenox	2,642	178	172	6.51%
Leominster	18,687	1,407	1,370	7.33%
Leverett	806	2	2	0.25%
Lexington	12,252	1,551	1,320	10.77%
Leyden	323	0	0	0.00%
Lincoln	2,322	370	298	12.83%
Littleton	3,861	666	452	11.71%
Longmeadow	5,931	282	282	4.75%
Lowell	43,370	5,197	5,127	11.82%
Ludlow	8,720	290	290	3.33%
Lunenburg	4,702	386	386	8.21%
Lynn	36,699	4,307	4,307	11.74%
Lynnfield	4,734	632	562	11.87%
Malden	27,676	2,761	2,594	9.37%
Manchester	2,293	137	115	5.02%
Mansfield	9,266	1,218	965	10.41%
Marblehead	8,650	399	333	3.85%
Marion	2,263	201	159	7.03%
Marlborough	17,498	2,179	1,872	10.70%
Marshfield	10,594	1,024	821	7.75%
Mashpee	7,342	368	342	4.66%
Mattapoisett	2,884	68	68	2.36%
Maynard	4,730	610	425	8.99%
Medfield	4,432	474	393	8.87%
Medford	25,711	3,209	1,766	6.87%
Medway	4,819	838	548	11.43%
Melrose	12,580	1,511	967	7.69%
Mendon	2,215	77	40	1.81%
Merrimac	2,746	402	146	5.32%

Methuen	20,100	2,280	1,982	9.86%
Middleborough	9,732	1,126	936	9.62%
Middlefield	190	0	0	0.00%
Middleton	3,312	258	160	4.83%
Milford	11,922	1,484	702	5.89%
Millbury	5,947	244	221	3.72%
Millis	3,399	185	122	3.59%
Millville	1,191	26	26	2.18%
Milton	9,801	1,159	748	7.63%
Monroe	59	0	0	0.00%
Monson	3,526	120	120	3.40%
Montague	4,083	407	375	9.18%
Monterey	539	0	0	0.00%
Montgomery	350	0	0	0.00%
Mount Washington	122	0	0	0.00%
Nahant	1,609	48	48	2.98%
Nantucket	6,184	591	332	5.37%
Natick	15,563	2,020	1,494	9.60%
Needham	11,849	1,599	1,404	11.85%
New Ashford	116	0	0	0.00%
New Bedford	44,454	5,209	5,169	11.63%
New Braintree	396	0	0	0.00%
New Marlborough	731	0	0	0.00%
New Salem	448	0	0	0.00%
Newbury	2,809	97	97	3.45%
Newburyport	8,300	948	784	9.45%
Newton	33,116	3,240	2,870	8.67%
Norfolk	3,587	521	151	4.21%
North Adams	6,754	866	866	12.82%
North Andover	11,872	1,397	948	7.99%
North Attleborough	12,501	375	363	2.90%
North Brookfield	2,082	142	142	6.82%
North Reading	5,829	658	546	9.37%
Northampton	13,543	1,510	1,445	10.67%
Northborough	5,873	713	604	10.28%
Northbridge	6,655	468	453	6.81%
Northfield	1,308	27	27	2.06%
Norton	6,945	1,076	696	10.02%
Norwell	3,779	541	220	5.82%
Norwood	13,614	1,240	1,228	9.02%
Oak Bluffs	2,518	130	118	4.69%
Oakham	727	0	0	0.00%
Orange	3,426	410	410	11.97%
Orleans	3,389	340	310	9.15%
Otis	843	0	0	0.00%
Oxford	5,657	404	404	7.14%
Palmer	5,828	303	262	4.50%

Paxton	1,677	71	71	4.23%
Peabody	23,121	3,323	2,585	11.18%
Pelham	570	5	5	0.88%
Pembroke	6,933	770	615	8.87%
Pepperell	4,588	197	130	2.83%
Peru	363	0	0	0.00%
Petersham	532	0	0	0.00%
Phillipston	694	5	5	0.72%
Pittsfield	21,228	1,981	1,865	8.79%
Plainfield	304	0	0	0.00%
Plainville	4,364	619	572	13.11%
Plymouth	25,689	2,252	1,254	4.88%
Plympton	1,062	67	55	5.18%
Princeton	1,375	26	26	1.89%
Provincetown	2,502	249	201	8.03%
Quincy	46,838	4,294	4,217	9.00%
Randolph	12,885	1,272	1,268	9.84%
Raynham	5,728	604	487	8.50%
Reading	9,901	1,592	966	9.76%
Rehoboth	4,592	165	44	0.96%
Revere	24,459	1,738	1,728	7.06%
Richmond	665	4	4	0.60%
Rochester	2,077	8	8	0.39%
Rockland	7,240	648	453	6.26%
Rockport	3,565	135	135	3.79%
Rowe	202	0	0	0.00%
Rowley	2,389	179	94	3.93%
Royalston	552	3	3	0.54%
Russell	691	0	0	0.00%
Rutland	3,341	86	86	2.57%
Salem	20,235	2,569	2,065	10.21%
Salisbury	4,429	799	387	8.74%
Sandisfield	438	0	0	0.00%
Sandwich	8,296	503	353	4.26%
Saugus	11,265	1,632	775	6.88%
Savoy	317	0	0	0.00%
Scituate	7,484	510	365	4.88%
Seekonk	6,014	114	87	1.45%
Sharon	6,526	756	690	10.57%
Sheffield	1,581	30	30	1.90%
Shelburne	964	46	46	4.77%
Sherborn	1,547	253	48	3.10%
Shirley	2,592	106	106	4.09%
Shrewsbury	14,888	1,228	893	6.00%
Shutesbury	763	4	4	0.52%
Somerset	7,398	269	269	3.64%
Somerville	36,167	3,247	3,236	8.95%

South Hadley	7,375	426	426	5.78%
Southampton	2,521	44	44	1.75%
Southborough	3,734	812	297	7.95%
Southbridge	7,871	385	385	4.89%
Southwick	4,038	132	132	3.27%
Spencer	5,397	312	311	5.76%
Springfield	62,653	10,165	9,899	15.80%
Sterling	3,086	347	216	7.00%
Stockbridge	1,079	113	113	10.47%
Stoneham	10,130	503	497	4.91%
Stoughton	11,698	1,566	1,294	11.06%
Stow	2,743	393	179	6.53%
Sturbridge	4,020	362	214	5.32%
Sudbury	6,523	994	775	11.88%
Sunderland	1,771	183	183	10.33%
Sutton	3,542	176	55	1.55%
Swampscott	6,262	257	251	4.01%
Swansea	6,817	275	243	3.56%
Taunton	24,922	1,915	1,724	6.92%
Templeton	3,148	500	222	7.05%
Tewksbury	12,098	1,380	1,088	8.99%
Tisbury	2,360	160	136	5.76%
Tolland	235	0	0	0.00%
Topsfield	2,316	219	201	8.68%
Townsend	3,545	184	145	4.09%
Truro	1,333	64	25	1.88%
Tyngsborough	4,622	854	476	10.30%
Tyringham	198	0	0	0.00%
Upton	2,967	234	189	6.37%
Uxbridge	5,698	429	259	4.55%
Wakefield	11,261	1,908	995	8.84%
Wales	805	20	20	2.48%
Walpole	10,001	942	656	6.56%
Waltham	26,438	2,914	1,766	6.68%
Ware	4,675	366	366	7.83%
Wareham	10,806	934	804	7.44%
Warren	2,189	74	74	3.38%
Warwick	363	0	0	0.00%
Washington	233	0	0	0.00%
Watertown	16,936	2,902	1,248	7.37%
Wayland	5,227	687	478	9.14%
Webster	8,255	664	664	8.04%
Wellesley	9,184	1,160	981	10.68%
Wellfleet	1,969	40	40	2.03%
Wendell	440	5	5	1.14%
Wenham	1,441	246	178	12.35%
West Boylston	3,031	417	227	7.49%

West Bridgewater	2,884	175	121	4.20%
West Brookfield	1,625	67	67	4.12%
West Newbury	1,726	150	43	2.49%
West Springfield	12,819	421	421	3.28%
West Stockbridge	665	0	0	0.00%
West Tisbury	1,619	38	23	1.42%
Westborough	8,303	1,262	969	11.67%
Westfield	16,783	1,170	1,170	6.97%
Westford	8,929	1,507	1,069	11.97%
Westhampton	680	17	17	2.50%
Westminster	3,178	138	87	2.74%
Weston	3,999	467	151	3.78%
Westport	7,028	462	272	3.87%
Westwood	5,760	972	610	10.59%
Weymouth	25,302	1,905	1,630	6.44%
Whately	717	5	5	0.70%
Whitman	5,974	208	208	3.48%
Wilbraham	5,678	304	303	5.34%
Williamsburg	1,179	96	96	8.14%
Williamstown	2,752	261	213	7.74%
Wilmington	8,294	1,349	1,022	12.32%
Winchendon	4,191	326	326	7.78%
Winchester	8,073	476	248	3.07%
Windsor	382	0	0	0.00%
Winthrop	8,760	476	476	5.43%
Woburn	17,480	2,121	1,874	10.72%
Worcester	84,071	10,217	10,205	12.14%
Worthington	577	22	22	3.81%
Wrentham	4,567	597	531	11.63%
Yarmouth	12,391	722	615	4.96%
Totals	**2,889,863**	**327,915**	**279,736**	**9.68%**

*This data is derived from information provided to the Executive Office of Housing and Livable Communities (EOHLC) by individual communities and is subject to change as new information is obtained and use restrictions expire.
**Total units in developments containing SHI Units