



TOWN OF WESTON, MA

Updated Final Report

JUNE 2024

Tank Site Alternatives Analysis



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Town of Weston, MA

Updated
June 2024

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List of Abbreviations

CET	composite elevated storage tank
DEIR	Draft Environmental Impact Report
DPW	Department of Public Works
EIR	Environmental Impact Report
EL	elevation
ENR CCI	Engineering News-Record Construction Cost Index
MassDEP	Massachusetts Department of Environmental Protection
MEPA	Massachusetts Environmental Policy Act
MGs	million gallons
NAVD88	North American Vertical Datum of 1988
NFPA	National Fire Protection Association
PLPA	Public Lands Preservation Act
psi	pounds per square inch
psig	pounds per square inch gauge
USGS	United States Geological Survey

Executive Summary

Introduction

The Town of Weston has three water storage tanks: Paines Hill, Cat Rock and Doublet Hill, which range in age from 70 to 92 years old and have served the Town well during their useful life. New water storage tanks are proposed to replace the existing tanks. The replacement tanks are to be located on property directly adjacent to each existing tank because these sites are generally located at the highest elevations within the community. No other feasible locations exist in town for construction of the new tanks.

Each existing tank and site are surrounded by existing residential homes and Article 97 open space protected for conservation and recreation. To construct the replacement tanks, a small portion of the protected conservation land must be changed to land that is instead protected for water supply. An alternatives analysis is required for any project requiring a change in use of protected Article 97 land. The neighboring residents, as well as other concerned citizens, requested the opportunity to participate in the siting of each new tank.

Visits to each tank site occurred during May and June 2023 and were attended by representatives of the Town including the Town Manager, members of the Select Board, Department of Public Works, Planning Board, Conservation Commission, Tree Advisory Group, Town Engineer, and Wright-Pierce. The purpose of the site visits was to present an overview of the alternative locations and tank types being considered; highlight potential engineering and construction considerations; discuss environmental impacts such as the Article 97 land transfer for the tank site, and tank access, tree clearing, and proximity to natural resource features; and to provide direct abutters with an awareness of the proximity of the new tanks to their homes.

Comments received during the site walks were used to develop criteria for evaluating tank locations based on the comprehensive needs and concerns of the community, including residents as well as Town departments, boards, and committees. Thirteen criteria were developed and grouped into three general categories. Categories and criteria included:

- Impacts to Preserved Land
 - Area of Article 97 Land Change-in-Use
 - Proximity to Significant Landscape Features
 - Tree Clearing
 - Impacts to Contiguous Open Space Affecting Wildlife and Hikers
- Impacts to Abutters
 - Requires Acquiring of Private Property
 - Proximity to Closest House
- Engineering Evaluation
 - Site Access
 - Potential Ledge Removal
 - Cut and Fill Site Work
 - Tank Height
 - Impacts to Infrastructure
 - Constructability

Cost is included as the fourth category.

The thirteen criteria listed above vary in their importance to the project and the Town. To account for this, each criterion is assigned a "Maximum Criterion Score". The greater the Maximum Criterion Score, the more impact that criterion has on the feasibility and favorability of the project. The sum of the Maximum Criterion Score for all the criteria is 100.

For all three tank locations, "Impacts to Preserved Land" was weighted such that it could receive a maximum score of 38 points out of 100 points, "Impacts to Abutters" was weighted with a possible maximum score of 22 points out of 100, "Engineering Evaluation" was weighted with a possible maximum of score 34 points out of 100, and "Cost" was weighted with a possible maximum score of 6 points out of 100.

Each alternative site is scored for comparison against the other alternative sites for that tank using "Initial Scores." Initial Scores range from 1 to 3, with 1 being the least preferable and 3 being the most preferable. The Initial Score in each criterion is then weighted based on the Maximum Criterion Score. An Initial Score of 3 is given the full weight of the Maximum Criterion Score, an Initial Score of 2 is given $2/3^{\text{rd}}$ the weight of the Maximum Criterion Score, and an Initial Score of 1 is given $1/3^{\text{rd}}$ the weight of the Maximum Criterion Score. This weighting becomes the "Final Score" that the alternative receives for a given criterion. The Final Scores from each criterion are added together to calculate the "Total Score" for an alternative site. The Total Score is out of 100 with the highest Total Score indicating the most advantageous site location and access as compared to the other site locations and access. The site location alternative with the highest Total Score is the one that is recommended for construction.

The Site Alternatives Matrix and Scoring tables are included in Appendix A.

Updated Alternatives Analysis

The initial Tank Site Alternatives Analysis Report was issued to the Town and posted to the Town's website in November 2023. A virtual forum was held on December 5, 2023 to review the alternatives sites, evaluation criteria, and analysis and recommendations presented in the report. Two additional forums were held on January 23, 2024 and February 27, 2024 to discuss specifically the alternatives analysis for Cat Rock and Doublet Hill and evaluate additional site alternatives including Cat Rock Alternative Sites #2A and #3 and Doublet Hill Alternative Site #2A. Cat Rock Alternative Sites #2A and #3 were proposed by an abutter to the Cat Rock tank site. Alternative Site #3 was previously evaluated and eliminated from further consideration by the Town and Wright-Pierce due to potential impacts to the existing tank; however, the evaluation of this alternative, as proposed by the abutter, has been added into this report. Alternative Site #2A was an adjusted location for Site #2 proposed by the same abutter to the Cat Rock tank site. Doublet Hill Site #2A was developed to accommodate an abutter's request to move the proposed tank farther east.

These additional site alternatives have been scored using the same criteria as presented in the original report. For each tank site, the site alternatives are compared to one another. Therefore, introducing additional alternatives required re-ranking the scoring of the original alternatives. For example, when considering the criterion "Proximity to Significant Landscape Features" among the three alternatives for the Doublet Hill tank in the initial evaluation, Alternative #2 received the highest score primarily because Alternative #2 is farther away from the Doublet Hill peaks than Alternatives #1 and #3. However, for the updated evaluation, proposed tank location Alternative #2A is even farther away from the Doublet Hill peaks than Alternative #2 giving Alternative #2A the highest score and dropping Alternative #2 to a medium score. These changes to the alternatives analysis for Cat Rock and Doublet Hill tanks are reflected in this updated report. No changes to the Paines Hill tank site alternatives have been made since the November report.

Results

Paines Hill

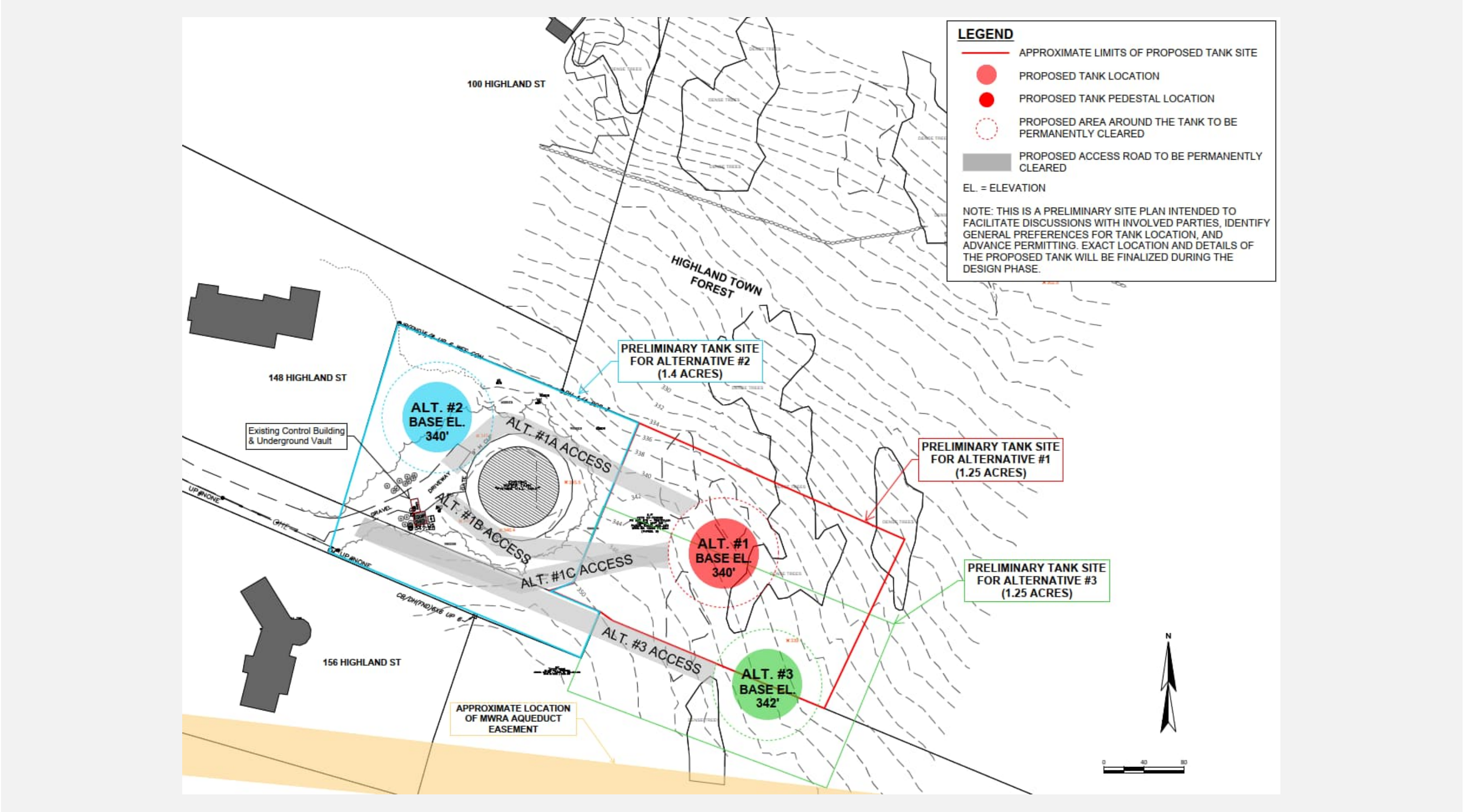
Five site and access road alternatives were considered for construction of the Paines Hill replacement tank (see Figure ES-1):

1. Replacement tank located southeast of the existing tank, in conservation land. Three ways to access the proposed tank were considered under this tank location alternative:
 - A. Access to the replacement tank is to the north of and behind the existing tank.
 - B. Access to the replacement tank is to the south of and directly in front of the existing tank.
 - C. Access to the replacement tank is farther south of the existing tank, along the hiking path.
2. Replacement tank located immediately west of the existing tank, on the existing tank parcel.
3. Replacement tank located southeast of the existing tank, beyond Alternative #1, in conservation land with an access road south of the existing tank.

Following the scoring of each alternative, Alternative #1A ranked the highest with 80.3 points followed by Alternative #1C with 74.3 points and Alternative #3 ranked the lowest with 65.3 points.

Alternative #1A locates the new tank farther away from residential homes than the existing tank and includes an access road that is farther away from homes than the other alternatives. Alternative #1A also ranks highest because it requires the least amount of tree clearing for the access driveway on the existing tank site, requiring only the removal of small undergrowth. It also does not require relocation of the existing valve vault and telemetry building which houses telemetry for both the Water Department and Fire Department.

Figure ES-1 Paines Hill Alternative Sites



Cat Rock

Four site alternatives were considered for construction of the Cat Rock replacement tank (see Figure ES-2):

1. Replacement tank located north of the existing tank along the existing access road, in conservation land.
2. Replacement tank located northwest of, but closer to the existing tank and to the west of the existing access road, partially in conservation land.
- 2A. Replacement tank located southwest of Alternative #2.
3. Replacement tank located immediately northeast of the existing tank and immediately south of the Cat Rock peak.

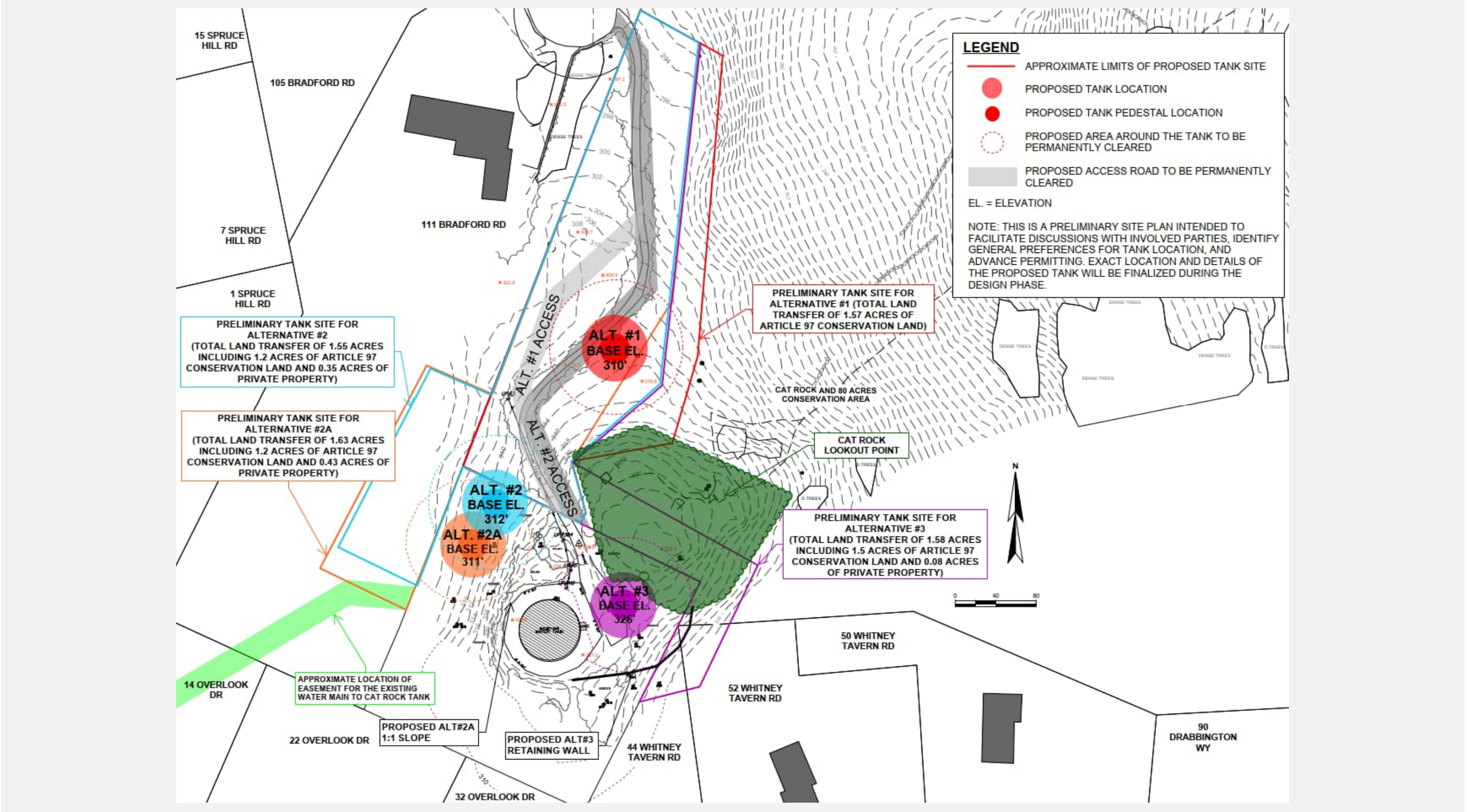
All the site alternatives for the Cat Rock tank will require transferring Article 97 land currently protected for conservation and recreation to Article 97 land protected for water supply use. All alternatives will also require clearing the vegetative screening along the western property line to accommodate construction.

Following the scoring of each alternative, Alternative #1 ranked the highest with 75 points followed by Alternative #2 with 67.3 points, Alternative #2A with 60.7 and Alternative #3 ranked lowest with 39.3 points. Alternative #1 would place the new tank closer to 111 Bradford Road and the Bradford Road cul-de-sac. This location is the only semi flat area suitable for construction within the narrow range of land available with higher elevations to site a tank.

Alternative #2 was suggested by a resident during the site walk, as an alternative to be considered. It would place the tank approximately 70 feet northwest of the existing tank. This location would require significant work to level the site for construction and future maintenance of the tank and would require acquisition of a small portion of property from 111 Bradford Road. It will also make demolition and removal of debris from the existing tank more difficult than Alternative #1.

Alternative #2A and Alternative #3 were suggested by an abutter in January 2024. Alternative #2A places the new tank farther south than Alternative #2. This alternative also requires acquisition of a portion of property at 111 Bradford Road but locates the tank approximately 80 feet farther from the home at this address. The required construction zone for Alternative #2A would be within 20 feet or less of the existing tank and the existing water main that provides water to and from the existing tank. This creates additional risks to safety and to critical infrastructure during construction. Alternative #3 would place the new tank directly adjacent to the existing tank, at the top of Cat Rock. The construction zone for Alternative #3 would be within 5 feet or less of the existing tank and construction equipment would be unable to access one side of the proposed tank due to this close proximity. Construction would require leveling a majority of the Cat Rock peak and would also require that a retaining wall be constructed to support the new tank on the eastern slope. Part of the retaining wall would be located on what is currently private property. For these reasons, Alternative #3 presents the greatest risk to safety and critical infrastructure during construction.

Figure ES-2 Cat Rock Alternative Sites



Doublet Hill

Four site alternatives were considered for construction of the Doublet Hill replacement tank (see Figure ES-3):

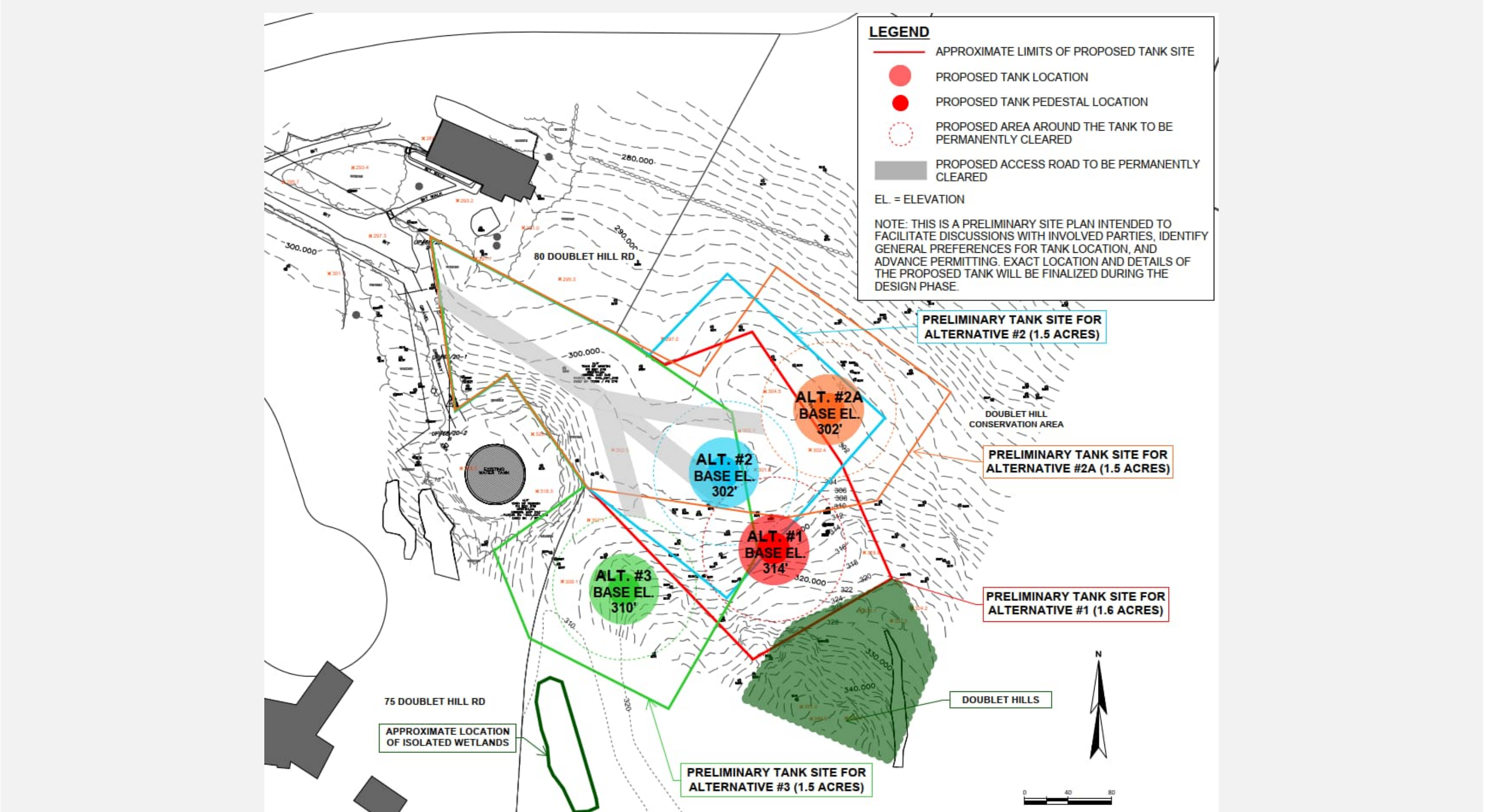
1. Replacement tank located southeast of the existing tank and on the slope of Doublet Hill.
2. Replacement tank located east of the existing tank and just northwest of Alternative #1, at the bottom of the Doublet Hill slope.
- 2A. Replacement tank located northeast of Alternative #2.
3. Replacement tank located southeast of the existing tank but closer than the other alternatives and on the slope of Doublet Hill.

All four alternative sites are on conservation land and access to all the alternative tank locations would be from the end of Doublet Hill Road.

Following the scoring of each alternative, Alternative #2A ranked the highest with 83 points, followed by Alternative #2 with 80.3 points, and Alternative #3 ranked the lowest with 48 points.

Alternative #2A would place the new tank farther from both of the closest homes (75 and 80 Doublet Hill Road) than the existing tank location. This tank location is also farthest away from the peaks of Doublet Hill compared to the other alternatives.

Figure ES-3 Doublet Hill Alternative Sites



Recommendations

Based on the Alternatives Analysis summarized above, we recommend that the Town proceed with replacing the existing water tanks at the alternative sites that scored the highest for each of the tank sites:

- Paines Hill – Alternative Tank Site #1A
- Cat Rock – Alternative Tank Site #1
- Doublet Hill – Alternative Tank Site #2A

Next steps include (1) preliminary design of the three water storage tanks including a geotechnical investigation at the selected sites to confirm soil and ledge conditions, and (2) begin the Article 97 land transfer process and identify land in town to swap for the Article 97 land that will be transferred for the new water storage tanks.

Section 1 Introduction

1.1 Background

The Weston Select Board has held three virtual open forums for the public to discuss the need and justification to replace and upgrade Weston's water storage tanks. Meeting #1 was held on February 16, 2023, and was dedicated to discussing the engineering and hydraulics concerns of the water system. Meeting #2 was held on March 21, 2023, and discussed proposed locations for the new tanks. Meeting #3 was held on April 25, 2023, and presented the estimated funding for design. The videos can be found at the following web address:

<https://www.weston.org/1828/Proposed-Water-Tank-Replacement-Project>

One key outcome of the forums was for the Town to conduct site walks at each tank location to further engage with the community and facilitate collaboration between the neighbors of the tanks and various town departments including the Town Manager, Select Board, Department of Public Works (DPW), Planning Board, Conservation Commission, and Fire Department.

The Town posted notification for the site walk meetings on their website and distributed letters to abutters of the tank sites. Site meetings were held at Doublet Hill and Paines Hill on May 31, 2023, and the site meeting at Cat Rock was held on June 7, 2023. Follow up meetings with individual abutters to Paines Hill were conducted on June 7 and June 28, 2023 upon request of the abutters. Minutes from the advertised site walks have been posted on Weston's website.

The primary objective of the site walk meetings was to obtain feedback on the proposed conceptual location of each tank to be considered in a final siting evaluation. This report has been prepared to provide an evaluation and recommendation for the preferred location of a new tank at the Paines Hill, Cat Rock and Doublet Hill locations based on engineering and hydraulic needs, construction challenges and costs, Article 97 constraints, and feedback received from the public site walks.

The initial Tank Site Alternatives Analysis Report was issued to the Town and posted to the Town's website in November 2023. A virtual forum was held on December 5, 2023, to review the alternatives sites, evaluation criteria, and analysis and recommendations presented in the report. Two additional forums were held on January 23, 2024, and February 27, 2024 to discuss the alternatives analysis and evaluate additional site alternatives. As a result of these forums, two additional alternative sites for the Cat Rock tank and one additional alternative site for the Doublet Hill tank have been evaluated and incorporated into this report.

Figure 1-1, Figure 1-2, and Figure 1-3 present the conceptual and alternative tank locations for the Paines Hill, Cat Rock, and Doublet Hill sites that were evaluated as part of this study. The conceptual design parameters presented in this report are preliminary and are intended to facilitate discussions with involved parties and advance the permitting process. Exact details of the proposed tank sites, tank dimensions, and other components will be finalized during the design phase of the project.

Figure 1-1 Paines Hill Alternative Sites

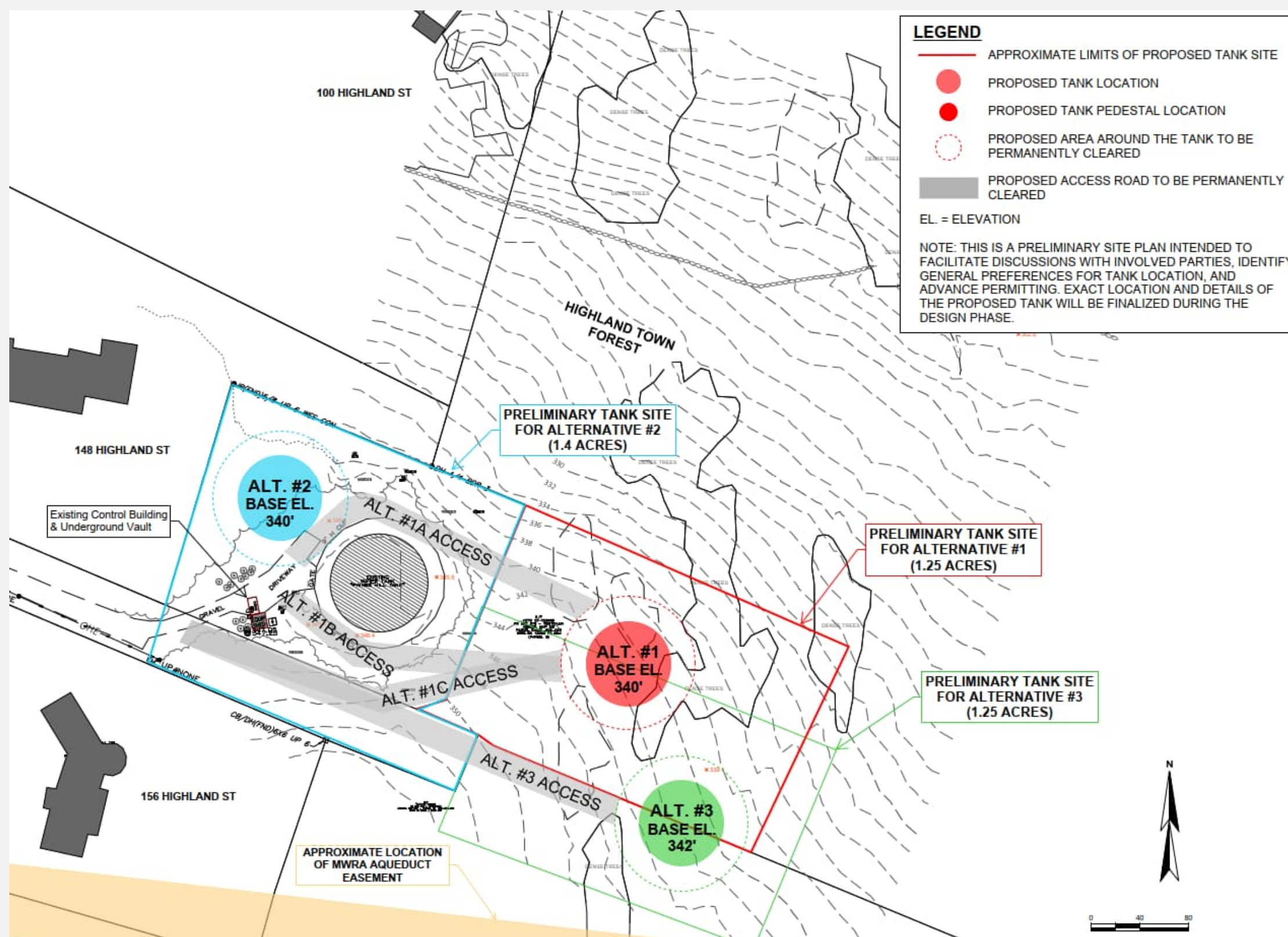


Figure 1-2 Cat Rock Alternative Sites

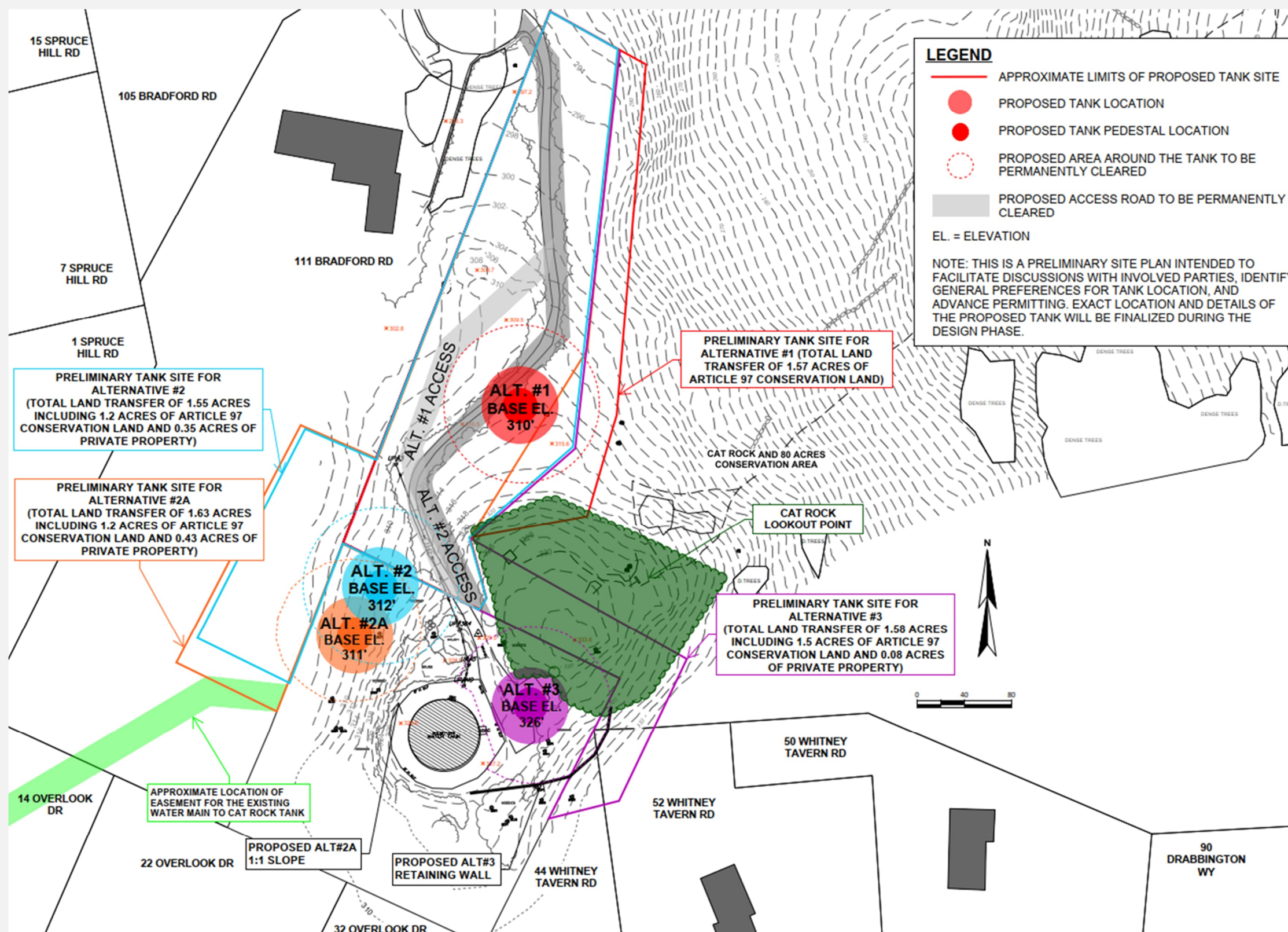
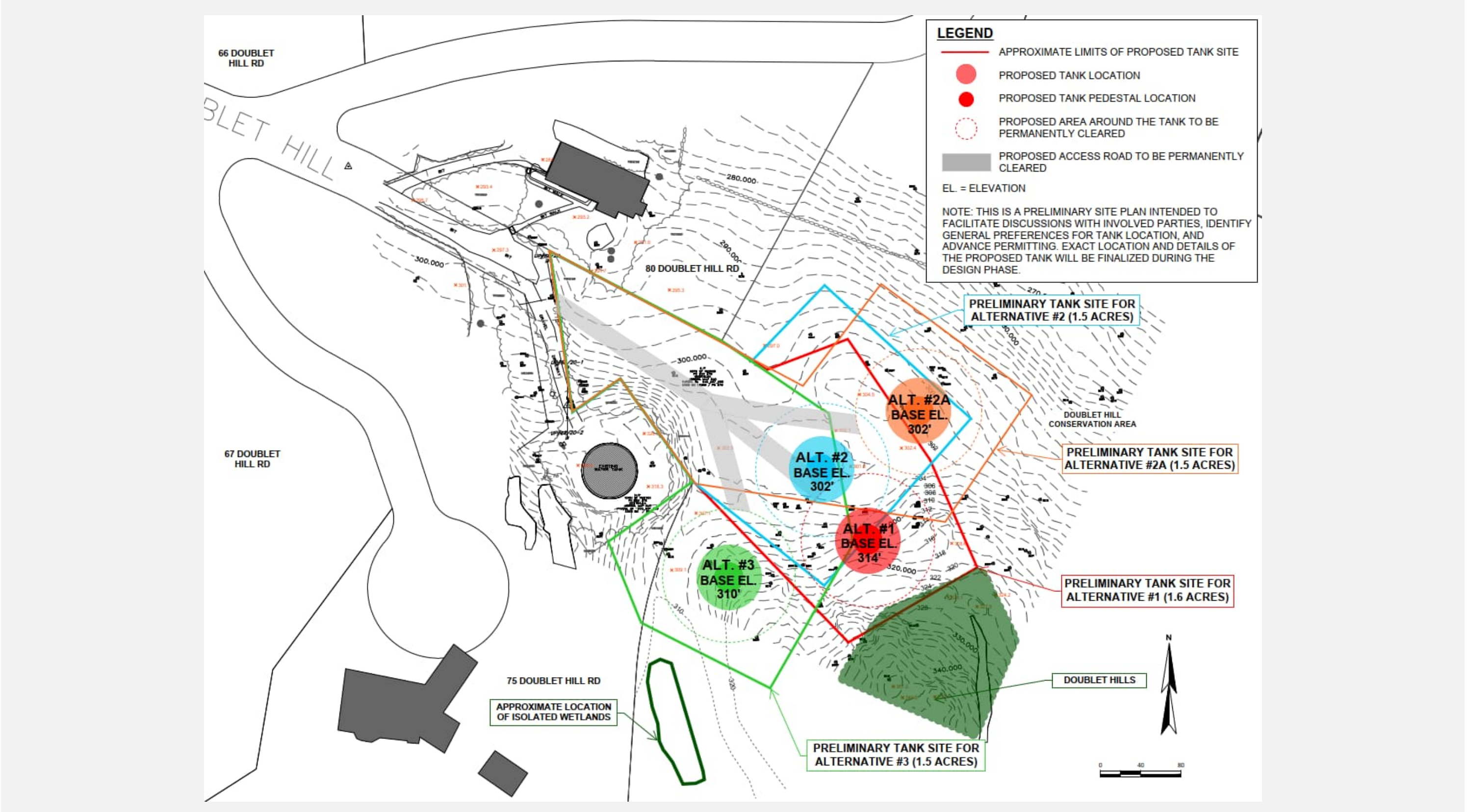


Figure 1-3 Doublet Hill Alternative Sites

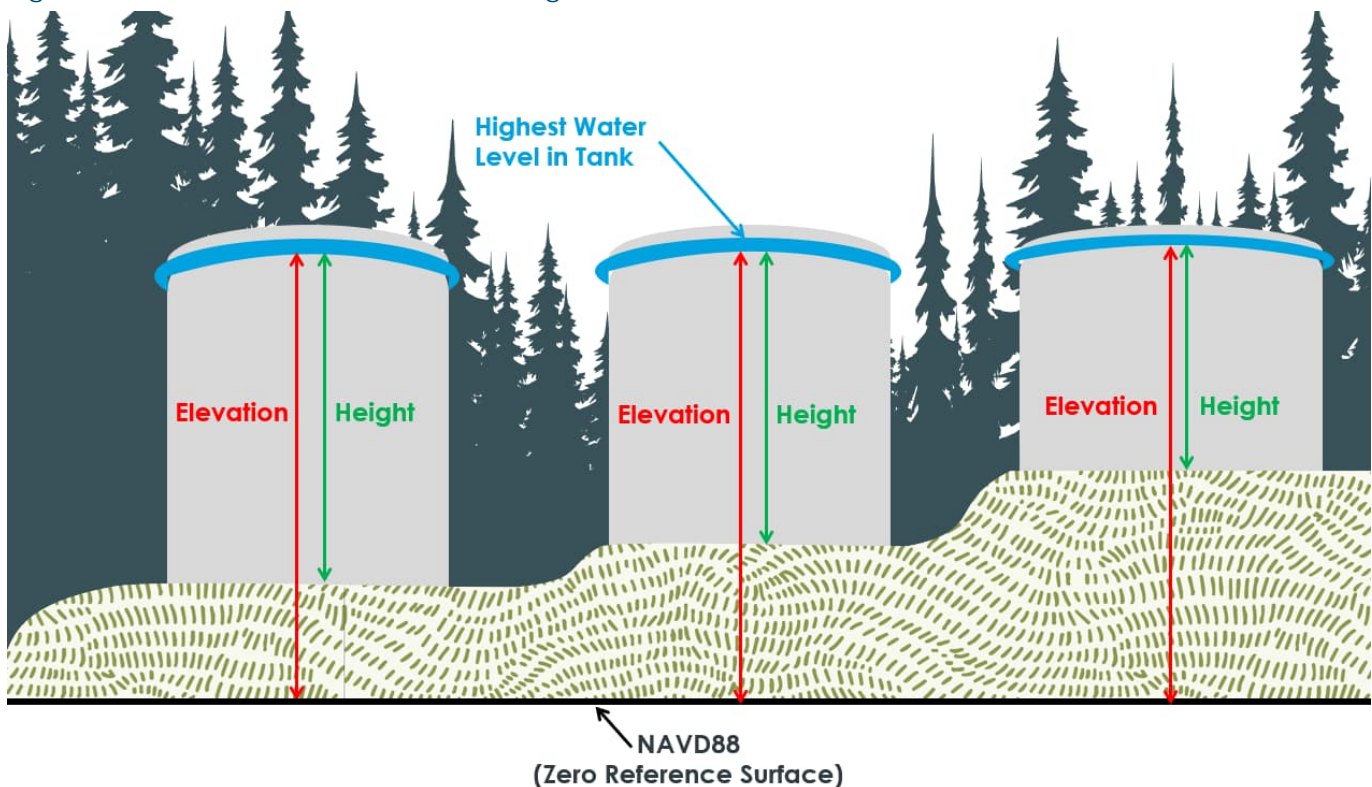


1.2 Elevation versus Height

This report uses both elevation and height to describe the tanks. Elevation is an absolute measure of height based on a set datum reference surface at zero elevation. Height is a relative measurement that is based on the ground surface. The tanks will have different heights depending on the ground elevation where they are located but should have the same maximum water elevation. The figure below depicts the difference between elevation and height.

All elevations presented in this report are in reference to NAVD88. NAVD88 is the North American Vertical Datum of 1988, which is the official geodetic vertical datum for the U.S. and is used by the United States Geological Survey (USGS). NAVD88 is a datum reference surface at zero elevation. The zero-reference surface of NAVD88 is similar to mean sea level (MSL) but varies slightly based on location.

Figure 1-4 Tank Elevation vs. Tank Height



1.3 Project Description

1.3.1 State Regulatory and Permitting Requirements

The design, operation, and maintenance of public water systems in Massachusetts must comply with *310 CMR 22: The Massachusetts Drinking Water Regulations* and the Massachusetts Department of Environmental Protection (MassDEP) Drinking Water Program's *Guidelines for Public Water Systems*. Public water systems which provide fire protection for the community must also comply with National Fire Protection Association (NFPA) codes.

The design of the tank replacements must be submitted for review and approval by MassDEP under the permit WS 32: Distribution Modifications for Systems that serve more than 3,300 people. MassDEP conducts their review of the project based on its compliance with the regulations stated above as well as compliance with the

Massachusetts Environmental Policy Act (MEPA). 301 CMR 11.00 encompasses the MEPA Regulations. This project meets a review threshold under 301 CMR 11.03(1)(b)(3) for change in use of land subject to Article 97 of the Amendments to the Constitution of the Commonwealth ("Article 97"). Article 97 establishes a right to a clean environment and declares that land subject to Article 97 shall not be used for other purposes without a two-thirds roll call vote of Legislature.

All three tank parcels are surrounded by private residences as well as land preserved under Article 97 for conservation or recreational purposes, as shown in Figures 1-5, 1-6, and 1-7 on the following pages. Due to the small size of the existing tank parcels, the replacement tanks must be built on a portion of the surrounding conservation/recreational land so that the existing tanks can remain in service during construction.

A petition to change the use of a portion of land from "preserved for conservation" to "preserved for water supply" must be approved by the Executive Office of Energy and Environmental Affairs (EEA) since there would be a change in use of Article 97 land. This process requires a Public Review of Environmental Impacts under MEPA. The Public Lands Preservation Act (PLPA) formalizes this process by requiring notifying the public, performing an alternatives analysis, and identifying replacement land (land swap) to achieve no net loss of conservation land.

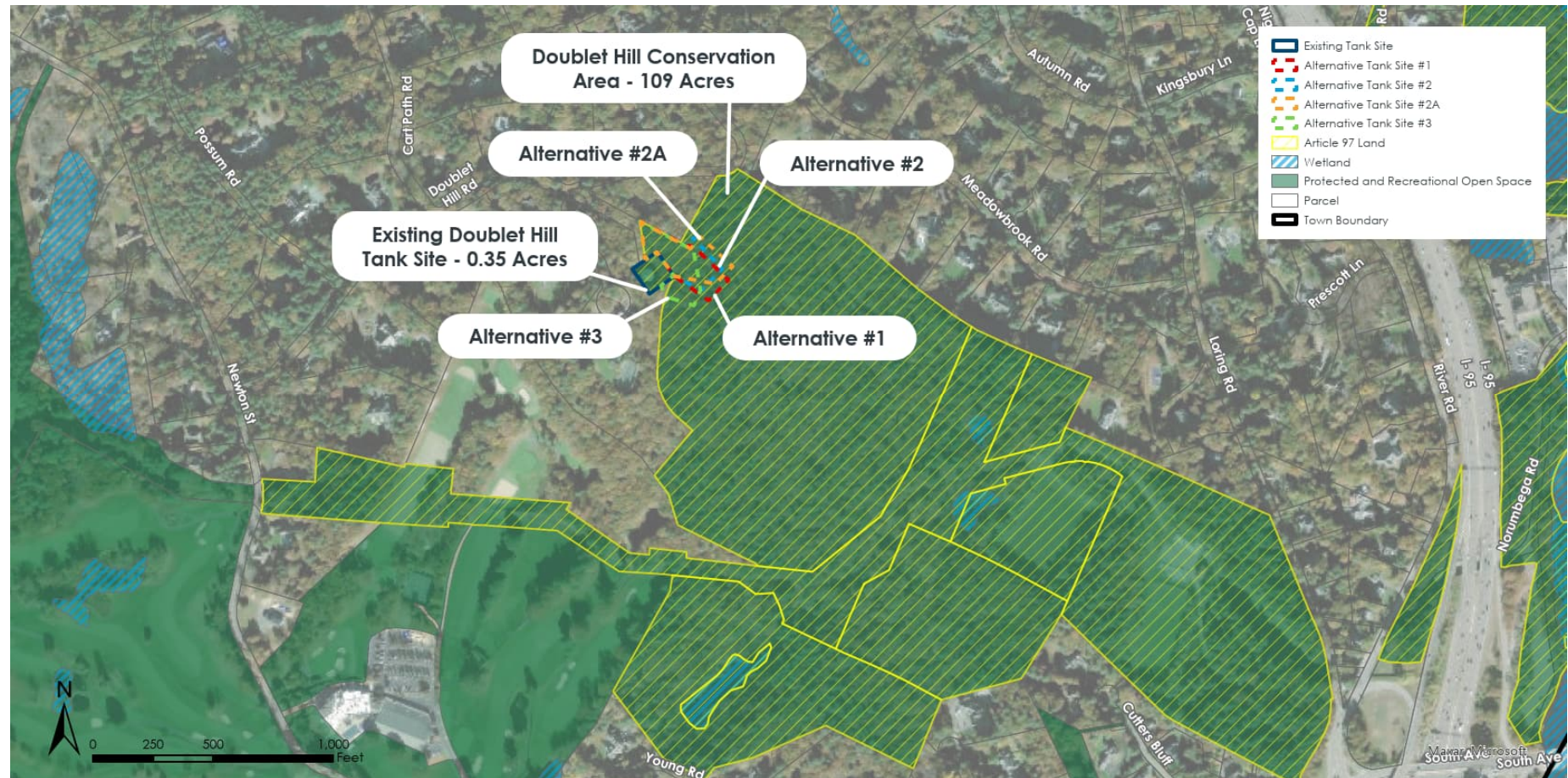
Figure 1-5 Paines Hill Site



Figure 1-6 Cat Rock Site



Figure 1-7 Doublet Hill Site



1.3.2 Need for Project

Weston's water system serves 95% of the town's population through approximately 3,600 service connections. The water system includes 3 water storage tanks: Paines Hill, Cat Rock, and Doublet Hill, which were constructed in 1953, 1946, and 1931, respectively. A summary of the existing tanks is provided in Table 1-1.

Table 1-1 Summary of Existing Tanks

Existing Tank Parameter	Paines Hill	Cat Rock	Doublet Hill
Year Constructed	1953	1946	1931
Type	Prestressed concrete	Welded steel	Riveted steel
Volume (million gallons)	1.00	0.85	0.78
Diameter (feet)	80	60	52
Height Above Ground Level (feet)	22	43	52
Highest Water Elevation in Tank (feet NAVD88)	367.60	366.84	367.50

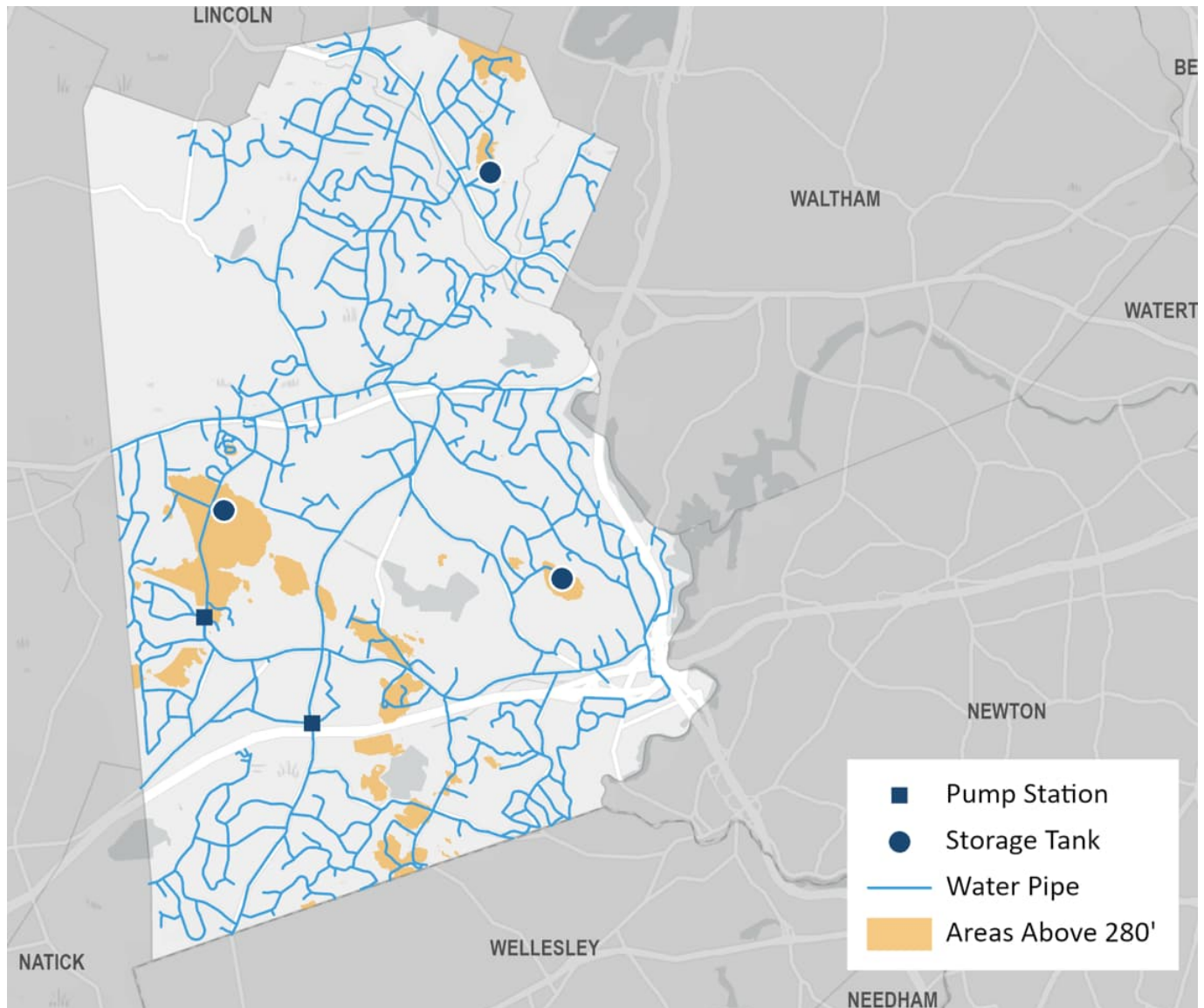
The existing tanks have served the community well throughout their history but are approaching or have exceeded their useful life and must be replaced. The replacement tanks will be designed such that they improve the hydraulics of Weston's water system and provide adequate pressure to homes and fire hydrants in accordance with regulations and standard water system engineering practice. Doing so requires that the top of the tanks be higher so that the water can be stored at a higher elevation.

The existing tanks were generally constructed at the highest elevations in the town and were designed to provide service up to approximate elevation 262 feet NAVD88. Locating water storage tanks at the highest ground elevations is ideal. However, over time, more and more homes have been constructed at elevations much higher than the tanks were designed to serve. This has caused a serious deficit in active storage (the portion of total storage that is available for use) and substandard pressures in portions of the hydraulic system. The impact of the active storage deficit is such that the system has no storage capacity for peak demand or to fight fire under maximum day demand conditions without significant loss of service. Due to the lack of active storage, the Wellesley Street booster pumps, which serve the entire town, tend to pump 24 hours a day during peak summer demands to try to keep up with demand. The addition of active storage would reduce pump run time to normal durations (16 hours), improve service reliability, improve operational flexibility, and improve firefighting capabilities.

Active storage should be located at an elevation to provide the required pressure and volume requirements described by MassDEP's *Guidelines for Public Water Systems* and the NFPA. The *Guidelines for Public Water Systems* require that the minimum working pressure at service connections be at least 35 pounds per square inch (psi) under maximum demand conditions while the normal working pressure should be between approximately 60 and 80 psi. Additionally, under maximum-day plus fire flow demand conditions, a system must be capable of providing the needed fire flow, while at the same time maintaining a minimum residual pressure of 20 psi throughout the distribution system. Approximately 300 to 400 houses and the fire hydrants around those houses do not currently meet these pressure requirements in Weston since they are located at elevations that are too high. The range of

300 to 400 is given because when the tanks are full, the higher water elevation means more homes can be served but when the water level in the tanks drops during peak demand or drought conditions, fewer homes can be served. The areas which experience deficient service all the time, even when the tanks are full, are shown below in Figure 1-8.

Figure 1-8 Areas in Weston with Deficient Service All the Time



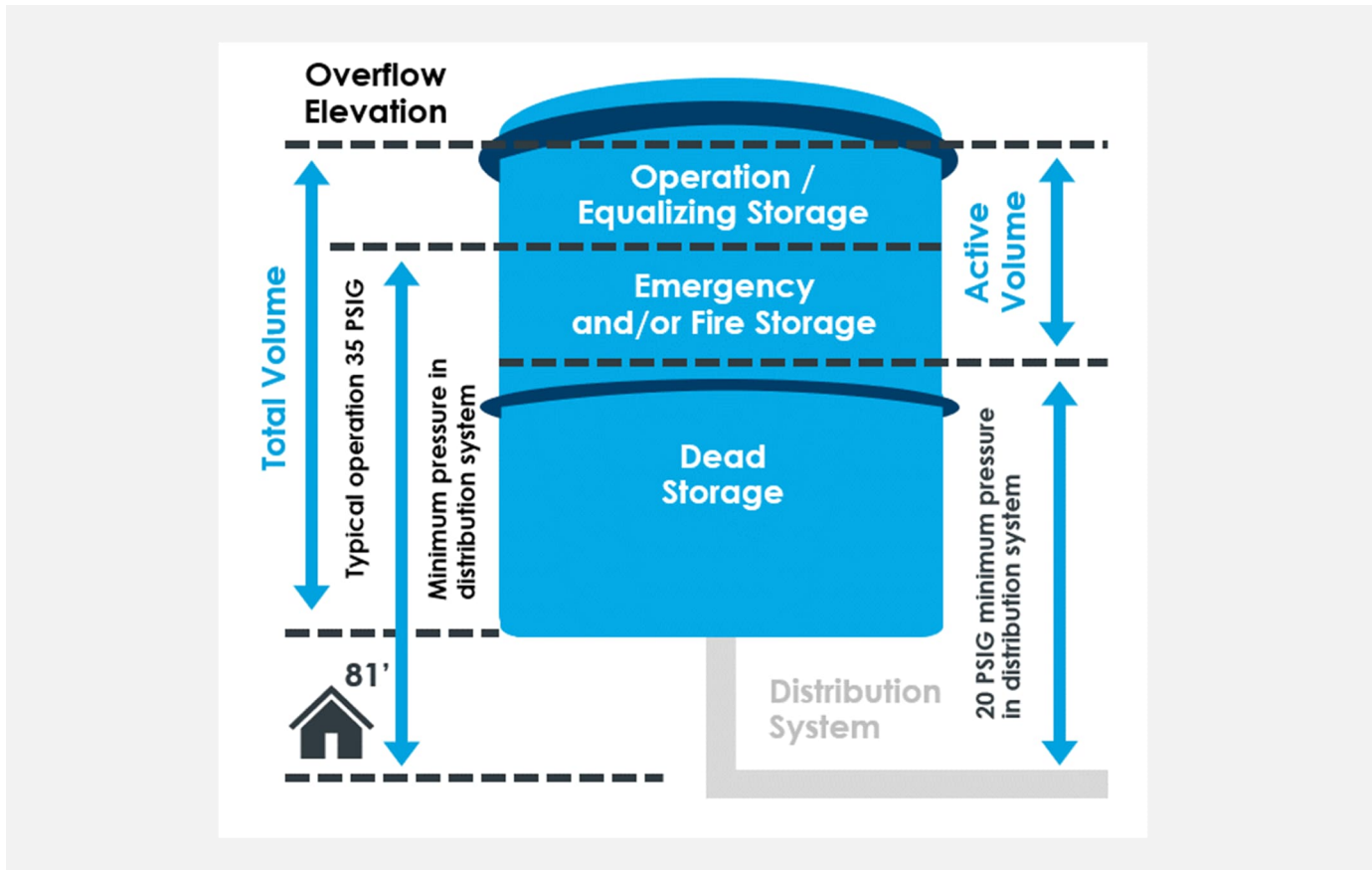
Notes:

1. The current system cannot provide gravity pressure to serve residences above elevation 280 feet NAVD88. Areas above elevation 280 feet are shown in orange in the figure above.

Water tanks should be designed to balance the requirements for active storage while maximizing the daily turnover of the water to minimize water age. At a minimum, there should be enough water stored in a tank to meet the daily demand and respond to a fire, if needed. A water system can also choose to store additional water for emergency

situations such as an issue with their source of water supply. Figure 1-9 depicts the requirements for storage volume in a water tank.

Figure 1-9 Storage Components of a Water Tank

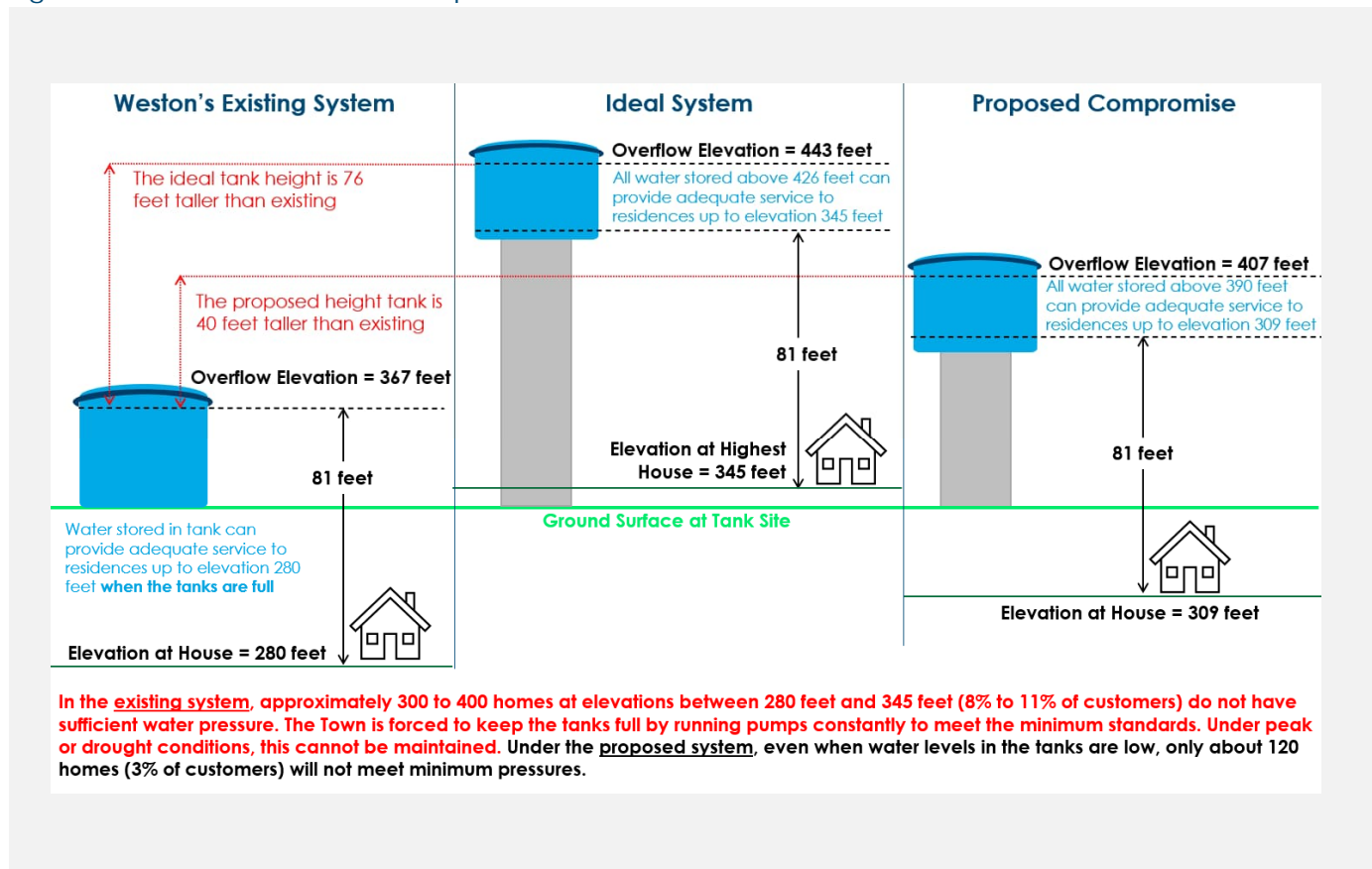


Currently, all the water in the active volume portion of Weston's tanks is used up on a daily basis. This means that there is no active storage available to fight fires or respond to emergencies while meeting the minimum pressure requirements (20 psi). Addressing the storage deficit and substandard pressure in the system requires the addition of approximately 2.5 MGs of active storage volume. We propose adding this active storage to Weston's system. This requires replacing the existing tanks with tanks that are higher, so that water can be stored at a high enough elevation to provide the volume of water that is needed for daily and emergency use, and to provide adequate pressure to residents. The water stored at an elevation above the existing tank heights will create the necessary active storage. Note that increasing the diameter of the tanks alone will not increase active storage nor will it increase pressure. Increasing the elevation at which the water is stored is what is needed to improve existing conditions.

We recommend that the elevation of the tanks be increased by 40 feet to achieve an overflow elevation of 407 feet NAVD88. This would provide at least 35 psi of pressure to customers located at elevations of approximately 309 feet NAVD88 or lower.

This proposed high-water elevation represents a compromise, balancing competing considerations of universal service against cost, value added, and aesthetics. In a technically ideal system, all the active storage volume would be located at least 81 feet above the highest customer. Based on existing conditions in Weston, the tanks *would ideally* be raised by 76 feet. Our recommendation is to raise the tanks by only 40 feet, which represents a compromise that optimizes cost, serviceability, and the concerns of abutters. At this height, approximately 97% of customers can be served adequately. The limited number of homes that cannot be adequately served would be addressed on an individual basis. It is important to note that MassDEP may not accept the proposed compromise and instead require that the new tanks provide service to 100% of customers. See Figure 1-10, which depicts Weston's existing conditions versus the ideal system and the proposed compromise.

Figure 1-10 Tank Elevation Compared to Residential House Elevation



More information regarding the need for the project can be found in the Water System Master Plan dated June 2019, found at <https://www.weston.org/DocumentCenter/View/21578/Water-System-Master-Plan-June-2019-PDF> and in the video recording or minutes of Water Tank Meeting #1 held on February 16, 2023 that was posted on <https://www.weston.org/1828/Proposed-Water-Tank-Replacement-Project>.

1.3.3 Tank Design and Construction

1.3.3.1 Project Sequence

This project is currently in the preliminary design phase. The goal of this phase is to establish sufficient detail to advance the permitting process. The proposed location of the tanks at each site must be settled before the Town

can submit the Article 97 petition requesting that protected conservation land be changed to protected water supply land. As part of the MEPA process, the Massachusetts Executive Office of Energy and Environmental Affairs must concur that the recommended alternative results in the lowest impact to the environment. These steps must be completed before the design of the tanks can be advanced further since many aspects of tank design are dependent on tank location and elevation.

1.3.3.2 Preliminary Design

Hydraulic modeling has been performed to evaluate what type of tanks will provide the optimal active volume and highest water quality for customers at the lowest cost. The proposed tank for Paines Hill is a Type III prestressed wire-wound concrete tank which is a ground-level storage tank constructed of precast concrete with an embedded steel diaphragm that is wrapped with stainless steel wire under tension. For typical, and most efficient, construction of this type of tank, the tank wall panels, and dome roof panels are first cast on-site and then set in place with a crane while being supported by a scaffolding system. After being set, the walls are placed into permanent compression by horizontal wire-wound pre-stressing. The wire is then encased by shotcrete to provide corrosion protection. The sequence of construction can be adjusted if required by the site constraints; however, this adds cost and time to the project. The design life for a Type III prestressed concrete tank ranges from 50 to 80 years.

A different type of tank, called a composite elevated storage tank (CET) is recommended at Cat Rock and Doublet Hill due to the lower ground elevation of these sites. A CET stores all the needed water in a bowl at a higher elevation to provide adequate pressure by gravity to the distribution system. This eliminates dead water storage that cannot be avoided in ground storage tanks. CETs consist of a steel tank on top of a concrete pedestal. The concrete pedestal is poured on-site, and the steel sheets are manufactured and then delivered to the site where they are welded or bolted together. The steel bowl is either lifted by crane or jacked up to the top of the pedestal. Finally, the steel dome roof panels are put into place by crane. The design life for a CET ranges from 50 to 75 years. The preliminary tank design parameters are summarized in Table 1-2 on the following page. Examples of the various tank types are shown in the photos on the following pages.

Table 1-2 Preliminary Design Parameters for Replacement Tanks

Preliminary Design Parameter	Paines Hill	Cat Rock	Doublet Hill
Type	Prestressed concrete	Composite elevated (painted steel or glass-fused-to-steel bowl with concrete pedestal)	Composite elevated (painted steel or glass-fused-to-steel bowl with concrete pedestal)
Active Storage Volume (million gallons)	1.0	0.75	0.75
Diameter (feet)	70 – 80	60 – 70	60 – 70
Range of Tank Height (feet)	60 – 70	30 – 40 ft	30 – 40
Pedestal Height (feet)	N/A (This type of tank does not have a pedestal)	57– 67	53– 75
Overall Tank and Pedestal Height Range (feet)	60 – 70	95– 97	93– 105

Notes:

1. Diameter depends on the type and volume of tank.
2. A range is given for the tank and pedestal height since the final tank and pedestal heights ultimately depend on the elevation of the tank's finished floor.

Figure 1-11 1.75 MG Prestressed Concrete Water Storage Tanks (Framingham, MA)



Figure 1-12 0.5 MG Prestressed Concrete Water Storage Tank (Bethel, CT)



Figure 1-13 1.5 MG Coated Steel CET Under Construction (Middleborough, MA)



Figure 1-14 Glass-Fused-to-Steel Composite Elevated Water Storage Tank (Peabody, MA)



Section 2 Alternatives Criteria and Scoring Values

This Section of the report describes the categories and criteria that were used to evaluate the tank location alternatives for Paines Hill, Cat Rock, and Doublet Hill replacement tanks. Alternatives criteria were developed from input provided by the Town as well as by abutters and other participants who attended the individual site walks. The following list outlines the categories and criteria that will be used in the evaluation:

Impacts to Preserved Land

- Area of Article 97 Land Change-in-Use
- Proximity to Significant Landscape Features
- Tree Clearing
- Impacts to Contiguous Open Space Affecting Wildlife and Hikers

Impacts to Abutters

- Requires Acquisition of Private Property
- Proximity to Closest House

Engineering Challenges

- Site Access
- Potential Ledge Removal
- Cut and Fill Site Work
- Tank Height
- Impacts to Infrastructure
- Constructability

Cost

- Opinion of Probable Construction Cost

This Section also describes how the individual criteria have been weighted to account for their varying degrees of importance to the project. For example, the criterion “Area of Article 97 Land Change-in-Use” has far more impact on the acceptability of an alternative site than “Impacts to Infrastructure” and therefore deserves more consideration. The score an alternative receives for “Area of Article 97 Land Change-in-use” will impact its overall score more than its “Impacts to Infrastructure” score. To accomplish this, the scoring system is comprised of two values that are applied to each criterion:

1. Maximum Criterion Score – recognizes that individual criteria may be more or less important than other criteria. The sum of the Maximum Criterion Scores for all criteria is 100. The higher the Maximum Criterion Score of an individual criterion, the more impact that criterion has on the feasibility and favorability of the project.
2. Initial Score – a value assigned to a criterion for each alternative site as compared to the other alternatives. Initial Scores range from 1 to 3, with 1 being the worst and 3 being the best. An Initial Score of 3 is given the full weight of the Maximum Criterion Score, an Initial Score of 2 is given $2/3^{\text{rd}}$ the weight of the Maximum Criterion Score, and an Initial Score of 1 is given $1/3^{\text{rd}}$ the weight of the Maximum Criterion Score.

This weighting of Initial Scores using the Maximum Criterion Scores results in the "Final Score" that the alternative receives for a given criterion. The Final Scores from each criterion are added together to calculate the "Total Score." The Total Score is out of 100 with the highest Total Score indicating the most advantageous site location and access as compared to the other site locations and access.

Table 2-1 presents the Maximum Criterion Score applied to criteria under each category. The reasoning for the Maximum Criterion Score assigned to each criterion is described in the sections below.

Table 2-1 Assigned Maximum Criterion Scores

Category	Criteria	Maximum Criterion Score
Impacts to Preserved Land	Area of Article 97 Land Change-in-Use	18
	Proximity to Significant Landscape Features	6
	Tree Clearing	8
	Impacts to Contiguous Open Space Affecting Wildlife and Hikers	6
Impacts to Abutters	Requires Acquisition of Private Property	12
	Proximity to Closest House	10
Engineering Challenges	Site Access	4
	Potential Ledge Removal	8
	Cut and Fill Site Work	8
	Tank Height	1
	Impacts to Infrastructure	1
	Constructability	12
Cost	Opinion of Probable Construction Cost	6

2.1 Impacts to Preserved Land

As discussed previously, the existing tank sites are bordered by land protected under Article 97 for the use of conservation and recreation. The Paines Hill tank site is bordered by the Highland Town Forest, which consists of dense and mature forest. The Cat Rock tank site is bordered by the Cat Rock & 80 Acres conservation land and the Doublet Hill tank site is bordered by the Doublet Hill conservation area, consisting of two rock outcroppings and forest. All three conservation areas bordering the tank sites are popular recreational areas used for hiking.

All the alternative sites require transferring some of the abutting Article 97 conservation and recreation land to water supply land to construct the new replacement tanks. This is because the existing tanks must remain in service during construction and the existing tank sites are too small to accommodate construction of new tanks. Removal

of the existing tank prior to the construction of the new tank would increase the storage deficit even further and leave the system and community highly vulnerable, unable to meet peak demands or respond to fire events.

Article 97 dictates that this protected land cannot be used for any purpose other than conservation or recreation without first being evaluated by the Executive Office of Energy and Environmental Affairs (EEA) and approved by the State Legislature. In addition to adhering to Article 97, the Town of Weston also values its conservation land highly and wishes to protect it in perpetuity for the benefit of all residents. Therefore, each tank alternative site location has been evaluated by its impact on these conservation lands and the significant landscape features found in each area.

2.1.1 Area of Article 97 Land Change-in-Use

The EEA will not support an Article 97 land disposition unless it determines that “the minimum acreage necessary for the proposed use is proposed for disposition and, to the maximum extent possible, the resources of the parcel proposed for disposition continue to be protected,” (Section II.4 of the Article 97 Land Disposition Policy, February 19, 1998). Per MEPA, any disturbance of Article 97 conservation land constitutes a change in use. In the EEA’s review of the alternatives analysis, they must agree that the recommended alternative disturbs the least amount of Article 97 land possible. Additionally, the proposed land must be replaced with another piece of land in town that is equivalent or greater in acreage, monetary value, and natural resource value. Therefore, the larger the area of Article 97 change-in-use proposed for the project, the larger the replacement parcel must be. For these reasons, this criterion is assigned a Maximum Criterion Score of 18 out of 100. This is the highest Maximum Criterion Score of all the thirteen criteria, indicating that it is the most important factor to consider for the project.

The more conservation land that an alternative site disturbs, the lower its score in this criterion. The highest score represents the alternative site which requires the smallest area of Article 97 land change-in-use.

2.1.2 Proximity to Significant Landscape Features

Another requirement for the disposition of Article 97 land is that “the subject parcel and its proposed use do not destroy or threaten a unique or significant resource (e.g., significant habitat, rare or unusual terrain, or areas of significant public recreation)” (Section II.2 of the Article 97 Land Disposition Policy, February 19, 1998). Comments from residents made during the site walks echoed the desire to maintain the significant features of the conservation areas. Due to the importance of this criterion to both the EEA and residents, it is assigned a Maximum Criterion Score of 6.

The alternative tank and access road locations have been specifically sited to avoid significant impacts to these features, but the closer in proximity an alternative is to a significant resource, the lower its score in this criterion. The highest score represents the least impact on resources as compared to the other alternatives.

2.1.3 Tree Clearing

Land for the construction of the new tanks will need to be permanently cleared in the following areas:

- The footprint of the new tank,
- The footprint of the access road to the new tank, and
- A 20- to 30-foot buffer area around the new tank to allow for construction, maintenance, and prevent trees from damaging the tank once constructed.

Additional areas around the tank will need to be temporarily cleared of trees to provide a laydown area during construction. The laydown area can be reforested once construction is completed. After the existing tank at each site is demolished, the footprint of the old tank can also be reforested.

The conservation land surrounding these tank sites consist of mature forest. While portions of the sites can be reforested, it will take many years for a mature ecosystem to redevelop. Therefore, destruction of the wooded areas will be weighed heavily during EEA's review. Furthermore, during the site walks residents expressed significant concern for any loss of trees. For these reasons, tree clearing is assigned a Maximum Criterion Score of 8.

An alternative which requires more permanent tree clearing or removing a natural buffer between the abutters and the proposed tank scores lower than an alternative that requires less tree clearing and does not impact tree buffers between abutting properties.

2.1.4 Impacts to Contiguous Open Space for Wildlife and Hikers

Weston's conservation land is shared by wildlife and hikers. During the site visits, residents expressed a desire to maintain the pleasant hiking experiences in these areas. While hiking trails are not protected features and can be easily re-routed by Weston's Conservation Commission, any adjusted trails would ideally provide an experience of integration with nature and seclusion from built structures, similar to the existing trails. The conservation areas also provide a natural habitat for wildlife. For these reasons, contiguity of land is important for both wildlife and hikers. Therefore, this criterion is assigned a Maximum Criterion Score of 6. An alternative that will cause more disruption to contiguous ecosystem areas has been scored lower than an alternative which causes less disruption.

2.2 Impacts to Abutters

2.2.1 Requires Acquisition of Private Property

All three tank sites are directly adjacent to residential properties. Some alternatives being considered would require purchasing private property to accommodate site grading. Purchasing private land requires an agreement from the owner which may significantly delay the project as well as add to the cost and duration of the project. Therefore, this criterion is assigned a Maximum Criterion Score of 12. An alternative which does not require purchasing private property scores the highest.

2.2.2 Proximity to Closest House

All three tanks are currently visible to abutting neighbors. At Paines Hill, the home of the closest resident on Highland Street is located approximately 210 feet from the existing tank. At Cat Rock, the home of the closest resident on Whitney Tavern Road is approximately 220 feet from the existing tank and the home of the closest resident on Bradford Road is 400 feet from the existing tank. At Doublet Hill, the home of the closest resident on Doublet Hill Road is approximately 200 feet from the existing tank. For most of the alternative sites being considered at each location, the proposed tank would be located farther from the residences than the existing tank. The proximity of the alternative access road locations to homes is also considered for this criterion. Input provided during the forums and site walks indicates that this criterion is very important to residents and is therefore assigned a Maximum Criterion Score of 10. The greater the distance between the closest residence and proposed tank/access road locations, the higher the alternative site scores in this category.

2.3 Engineering Evaluation

2.3.1 Site Access

Water tank manufacturers require adequate site access for construction. During construction, large equipment including tractor trailers, concrete trucks, and cranes need to be able to access the new tank location. Turning radius, grade, and length of the proposed access road are the key factors impacting site access. While site access is important for construction, in most cases, a new access road can be installed, and the site can be regraded to allow for construction. As such, this criterion is assigned a Maximum Criterion Score of 4.

The better the conditions at a site for building an access road and driving equipment into the site, the higher an alternative site scores. Additionally, following completion of the new tank, access to the existing tank is needed for demolition. An alternative in which the new tank blocks access to the old tank scores lower than an alternative which does not.

2.3.2 Potential Ledge Removal

New England is known for its exposed and shallow bedrock geological features. At Cat Rock and Doublet Hill, bedrock outcroppings are abundant. While competent ledge can provide foundational support for a water storage tank, a level surface with consistent composition in and around the footprint of the tank is needed. Leveling a site where ledge is present will require drilling and fracturing the ledge which damages the natural landscape and adds to project duration and cost. Additionally, installation of new water main through ledge is more challenging and costly than constructing in excavatable soil. For these reasons, this criterion is assigned a Maximum Criterion Score of 8.

The amount of ledge at each site was estimated based on observations made during site walks and from statewide digital mapping of surficial geology developed by the U.S. Geological Survey and accessed using MassMapper. Actual depth-to-ledge and integrity of ledge will be determined when geotechnical testing is performed during the preliminary design phase.

The more ledge that must be drilled and fractured at a site to allow for construction of the new tank and water main, the lower its score in this category.

2.3.3 Cut and Fill Site Work

As mentioned previously, a level working surface is needed to construct a storage tank. Somewhat level laydown area, crane staging area, and access road are also needed to facilitate construction. In the case of a Type III concrete style tank, a flat working surface is also needed to cast the wall and dome panels on-site. Depending on the location of the new tank and the ratio of cut (i.e., soil removal) to fill, imported fill may need to be brought in to properly grade the site. Regardless of the location, due to the small size of the project sites, material that is excavated from the site may need to be stockpiled off-site and then trucked back to the site to be re-used for filling. The steeper the existing site, the more grading is needed to level it, regardless of whether imported fill must be brought in. Filling and grading add to the project cost and duration and increase truck traffic. For these reasons, this criterion is assigned a Maximum Criterion Score of 8. The more cutting and filling material and/or labor that is needed at an alternative site, the lower its scores.

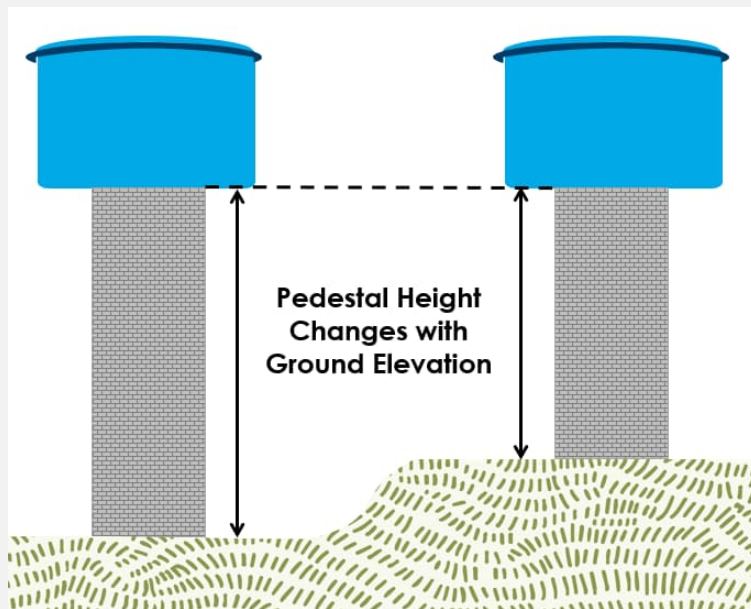
2.3.4 Tank Height

The elevation of the water in the tank equates to water pressure that can be supplied by gravity to customers. The higher the elevation of the water in the tank, the more pressure is available to customers and fire hydrants without

pumping. Tank height is dependent upon the ground elevation at the base of the new tank. The higher the ground elevation, the shorter the tank needs to be to achieve the target elevation. Tank height is being considered in this alternatives analysis because the taller a tank is, the more expensive it is and the more visible it will be in the town if it extends above the tree line. The maximum constructable height for a Type III concrete tank is approximately 80 feet. For this type of tank, the taller it is, the larger the steel diaphragms will be (which need to be delivered to the site in one piece) and the larger the wall casting beds will need to be at the site. In the case of elevated tanks, which are proposed at Cat Rock and Doublet Hill, changes in ground elevation would only change the pedestal height, not the height of the tank which holds the water above the pedestal. See the sketch below for an example of pedestal height differences. Elevated tanks are generally more costly to construct than ground-level tanks; however, it is relatively easy to add height to the concrete pedestal since it only involves pouring and casting more concrete onsite. Concrete elevated tank manufacturers estimate that every additional foot of pedestal height adds approximately \$5,000 to \$10,000 to the overall cost of the tank.

The potential height of the new tank does not vary considerably among the alternative sites. Therefore, slight changes in tank height will not significantly impact the project. This criterion is assigned a Maximum Criterion Score of 1. The taller a tank needs to be to meet the target elevation (i.e., the lower the ground elevation of a site), the lower it scores.

Figure 2-1 Example of Composite Elevated Tank Pedestal Height Differences



2.3.5 Impacts to Infrastructure

New water main and underground electric service need to be run into each site and connected to each new tank. At Paines Hill and Doublet Hill, the infrastructure will be brought to the new tank from the adjacent road. At Cat Rock, the existing tank is connected to the distribution system by a water main from Whitney Tavern Road through an easement between 32 and 44 Whitney Tavern Road. In the preliminary evaluation of the Cat Rock tank, it was determined that the water main feeding the tank from the distribution system is undersized and should be

replaced and increased in size to improve the hydraulics of filling and draining the tank. The existing easement runs from North Ave and through the properties of 6 North Avenue and 14 Overlook Drive to the tank. The 20-ft easement is very steep and heavily wooded making maintenance challenging and is located within approximately 10 feet of the residence at 14 Overlook Drive. It has been recommended to reconstruct and reroute this main from the distribution system along Bradford Road to improve access for maintenance and service for the Water Department and to avoid major disturbances to residences and land along the existing easement from Overlook Drive. Installing new water main and underground electric service is costly, especially when shallow ledge is present. However, the alternative sites are fairly close together and the length of new water main and underground electric required does not vary considerably among them. Therefore, this criterion is assigned a Maximum Criterion Score of 1. The longer the run of new water main and electric conduit that is required at an alternative site, the lower its score in this category.

2.3.6 Constructability

Constructability refers to the construction complexity of constructing a tank based on site-specific constraints. For instance, constructing a tank on a flat site with ample room to maneuver is easier and less costly than constructing on a steeply sloping site, with space constraints. Tank manufacturers have provided valuable input for each alternative site indicating what is feasible from a tank construction standpoint. Per discussions with the tank manufacturers, construction is possible at all the alternative sites, but the location of the tank heavily influences construction cost and schedule.

The tank contractors are responsible for the safety of the site during construction and integrity of the finished product. Site challenges have a direct impact to constructability and cost and is critical for site selection. This criterion is assigned a Maximum Criterion Score of 12. If the tank manufacturers indicated that a site will be more challenging, it will receive a lower score.

2.4 Opinion of Probable Cost

Like all municipalities, the Town of Weston must maximize the use of available funds. It is anticipated that this project will be funded through a combination of the Water Enterprise Fund and Weston tax dollars. Therefore, it is important to consider the impact of cost that come from siting decisions. Since these tanks must be replaced for the Town to be able to reliably continue providing drinking water to customers, the Town seeks to strike a balance between the community's concerns and cost. As such, cost is assigned a Maximum Criterion Score of 6. This Maximum Criterion Score also considers that many of the other criteria impact the cost of the project.

Preliminary cost estimates have been developed for each alternative site. The Opinion of Probable Construction Costs are based on June 2024 costs, which corresponds to an Engineering News-Record (ENR) Construction Cost Index (CCI) of 13546.8. Costs also include a 15% inflation contingency assuming construction starts in fiscal year 2026. The more expensive an alternative, the lower it scores.

Section 3 Evaluation of Alternative Sites

The alternatives for each tank site have been evaluated based on the criteria presented in Section 2. Site Alternatives Matrix and Scoring tables have been developed to summarize the comparison among alternative sites using a scoring system. Each alternative site is scored for comparison against the other alternative sites for that tank using "Initial Scores." Initial Scores range from 1 to 3, with 1 being the worst and 3 being the best.

The Initial Score is then weighted based on the Maximum Criterion Score in each criterion. An Initial Score of 3 is given the full weight of the Maximum Criterion Score, an Initial Score of 2 is given 2/3rd the weight of the Maximum Criterion Score, and an Initial Score of 1 is given 1/3rd the weight of the Maximum Criterion Score. This weighting becomes the "Final Score" that the alternative receives in one criterion. The Final Scores from each criterion are added together to calculate the "Total Score." The Total Score is out of 100 with the highest Total Score indicating the most advantageous site as compared to the other alternatives.

Site Alternatives Matrix and Scoring tables are provided in Appendix A. Table A-1 presents the Alternative Sites Matrix and Scoring for Paines Hill, Table A-2 presents the Alternative Sites Matrix and Scoring for Cat Rock, and Table A-3 presents the Alternative Sites Matrix and Scoring for Doublet Hill.

The sections below provide the context for the initial scoring of each of the alternative sites.

3.1 Paines Hill

Based on discussions with participants at the site walk, three alternative tank locations were considered for the Paines Hill tank. Alternative #1 is located southeast of the existing tank in Article 97 conservation land and would be accessed by constructing a road around the existing tank. Three different access road options were evaluated for Alternative #1 based on input from the neighbors. The access road alternatives include constructing an access road to the north of the existing tank (Alternative #1A), immediately south of the existing tank (Alternative #1B), or south of the control building (Alternative #1C). Alternative #2 is located west of the existing tank on the same parcel as the existing tank. Alternative #3 is located farther southeast of the existing tank than Alternative #1, in Article 97 conservation land with an access road south of the existing tank. In total, five alternatives were considered for the Paines Hill site. It should be noted that no changes to the Paines Hill tank site alternatives have been made since the November 2023 report. Alternative site locations at Paines Hill are shown in Figure 1-1. The Alternative Sites Matrix and Scoring table for Paines Hill is provided as Table A-1.

3.1.1 Area of Article 97 Land Change-in-Use

Alternatives #1A, #1B, #1C, and #3 will require changing the use of an approximately 1.25-acre section of the Highland Town Forest (Article 97 land) from protection for conservation use to protection for the purpose of water supply use. Alternative #2 would not require changing the use of any conservation land. As such, Alternative #2 would not impact protected conservation land and not require a MEPA review which would expedite MassDEP's and the Town's permitting processes. Therefore, Alternative #2 receives the highest score in this criterion. Alternative Sites #1A, #1B, #1C, and #3 are scored lower since they require a transfer of conservation-protected land for construction of the tanks. This initial score is lower than Alternative #2 but the three access roads are rated equally on this criterion since they would require the same acreage of land change-in-use.

3.1.2 Proximity to Significant Landscape Features

None of the alternative sites are near significant features of Highland Town Forest. Therefore, all the alternative sites received the highest score in this criterion.

3.1.3 Tree Clearing

The Highland Town Forest consists of areas of dense and mature tree coverage. Alternatives #1A, #1B, #1C, and #3 would require clearing large portions of these areas. This will weigh heavily in MEPA's review since mature trees cannot be replaced and any area identified for land swap would need to have a similarly mature forest ecosystem. Although mature trees will be lost, the portion of the new sites that would be used for construction staging can be reforested once construction is complete and left undisturbed in perpetuity, allowing for continuity with the existing forest ecosystem.

The other important consideration when it comes to tree clearing is the potential reduction in screening that the trees currently provide to neighboring residences. Alternatives #1A, #1B, and #1C vary in their disturbance of the vegetative buffer between residential neighbors due to their different access road locations. For Alternative #1A, the access road would swing north of and behind the existing tank which will primarily utilize the already-cleared area around the tank and require the removal of only a few small-caliper trees close to the existing tank. In this case, almost all the vegetative screening along the northern and southern property lines of the existing tank parcel would remain intact. For Alternative #1B, the access road will swing south of and immediately in front of the existing tank, also utilizing the already-cleared zone around the tank. For Alternative #1C, the access road would be close to the southern property line, requiring clearing of some of that vegetative screening. Since Alternatives #1A and #1B require minimal clearing between the tank and residential properties, they score higher than Alternative #1C.

Like Alternative #1C, Alternative #3 will require clearing in the area between the tank and the southern property line. For this reason, and since Alternative #3 requires clearing the most vegetation within the Article 97 conservation land, this alternative receives the lowest score.

For Alternative #2, the entire area to the west, north, and south of the existing tank will be cleared of vegetation to the edges of the property, eliminating all screening buffer between the tank site and neighbors. Some vegetation can be replaced but this will be limited because its proximity to the proposed tank will interfere with proper maintenance of the tank. Since this alternative does not require clearing any Article 97 conservation land but does remove all vegetative screening with residential neighbors, it receives a medium score.

3.1.4 Impacts to Contiguous Open Space Affecting Wildlife and Hikers

For Alternatives #1A, #1B, #1C, and #3, the level of disruption to the ecosystem would be similar since they all extend approximately the same distance into the conservation land. Construction at Alternatives #1A, #1B, #1C, and #3 will similarly disturb hiking trails; however, the Town of Weston Conservation Commission has indicated that trails are not protected features and are commonly re-routed. For Alternative #2, impacts will be limited to the existing tank parcel and would not disturb any conservation land. For these reasons, Alternative #2 receives the highest score while Alternatives #1A, #1B, #1C, and #3 all receive a medium score.

3.1.5 Requires Acquisition of Private Property

None of the alternatives necessitate acquiring private property; therefore, they all receive the highest score in this criterion.

3.1.6 Proximity to Closest House

The homes of the closest residents on Highland Street (148 and 156 Highland St) are located approximately 210 feet from the existing tank. The proposed tank location in Alternatives #1A, #1B, and #1C is located approximately 380 feet from the closest residence (156 Highland St), which is 170 feet farther than the existing tank. The proposed access road for Alternative #1A is approximately 175 feet from the closest home (148 Highland St). The proposed access road for Alternative #1B is also approximately 175 feet from the closest home (156 Highland St). However, the proposed access road for Alternative #1C is only 100 feet from the closest home (156 Highland St). This is the same as the proposed access road for Alternative #3. The tank location in Alternative #3 is located approximately 420 feet from the closest neighbor (156 Highland St), which is 210 feet farther from the closest neighbors' home to the existing tank.

Since Alternatives #1A and #1B have tank locations farther away from homes than the existing tank and have access roads farther away from homes than other alternatives, they receive the highest scores in this criterion. Alternative #1C brings the access road closer to a home and as such, receives a medium score. Alternative #3 presents a tank that is the farthest away from homes but an access road that is close to homes; therefore, this alternative receives a medium score.

The tank location in Alternative Site #2 is approximately 110 feet from the home at 148 Highland Street and 30 feet from the property line. Paines Hill is in Residential Zoning District A. Per zoning requirements, all structures in this district should be set back a minimum of 45 feet from the lot line. Therefore, a zoning variance for the setback requirements would need to be obtained for this alternative. For these reasons, Alternative #2 receives the lowest score in this criterion.

3.1.7 Site Access

In regard to the Alternative #1 options, Alternative #1A allows for adequate access to the site but requires minor tree clearing and grading to construct the access road. Alternative #1C allows for excellent access to the site since there is minimal turning required but results in the longest access road, requiring significant tree removal and grading. Both alternatives receive a high score.

The access road represented in Alternative #1B is not feasible for construction as-is because the existing control building and vault would restrict the turning radius for trucks and equipment. For trucks and equipment to be able to use this access road route, the control building and valve vault would need to be relocated prior to tank construction to ensure the safe and continuous operation of the equipment (vehicle loading on the vault is not recommended). The control building houses the telemetry equipment used to monitor the water level in the tank. The control building is located next to an underground vault that houses equipment to control tank level, monitor pressure, and piping that connects the tank to the Town's water distribution system. The piping and equipment are critical to the operation of the water distribution system since it controls when the pumps at the Town's water booster pump station turn on and off to fill the tanks. The valve, pressure transmitter, and control building must remain close to the tank to maintain accuracy in water level readings. Relocation of the control building and vault would add to the project's cost and duration. Therefore, Alternative #1B receives a low score.

No additional access road would need to be constructed to accommodate Alternative #2. However, due to the small size of the parcel, the equipment laydown area would be extremely limited, and construction would need to maneuver around the existing tank, requiring extra caution to avoid damaging the tank. The control building and

vault would also need to be moved to make room for panel casting beds and the crane. Therefore, Alternative #2 receives a low score for site access.

Constructing the Alternative #3 access road would require significant tree clearing and minor grading which in turn requires more equipment, labor, and time than the other alternatives. The new access road would also be located closer to an abutting residence than Alternatives #1A and #1B. However, these impacts are being considered under other criteria such as tree clearing, constructability, and proximity to closest house. Once the access road is constructed, it would provide easy access to the site. A truck would be able to back up all the way from Highland Street to the tank site and then be able to pull out without turning. Alternative #3 receives a high score.

3.1.8 Potential Ledge Removal

Although geotechnical borings are needed to verify existing conditions, available resources including USGS mapping and field observations preliminarily indicate that ledge conditions may be fairly consistent among the alternative sites. The USGS does not show shallow ledge or outcroppings in this area. Since available mapping shows conditions are consistent at all alternative locations but ledge removal may still be required based on conditions encountered in the field, all alternatives receive a medium score for this criterion.

3.1.9 Cut and Fill Site Work

All the alternatives require cutting and filling work to level the sites for construction, however, Alternatives #1A, #1B, and #1C require less than Alternatives #2 and #3. Therefore, Alternatives #1A, #1B, and #1C receive a high score. Alternative #2 requires significantly more cutting, filling, and off-site disposal of material than the other alternatives and due to the limited site space, the site does not allow for any stockpiling of site soils. This means that soil will need to be trucked and stored off-site until it can be reused on-site. Alternative #2 receives the lowest score. Alternative #3 receives a medium score since it requires more earthwork than Alternatives #1A, #1B, and #1C but soils can be managed on-site without staging elsewhere.

3.1.10 Tank Height

The tanks at all the alternative site locations will extend up to the same elevation in the air but the ground elevation at the base of the tanks varies slightly; therefore, while the elevation will be the same, the height of the tanks from the ground will vary. Alternatives #1 and #2 have similar ground elevations and will therefore result in similar tank heights. The ground elevation at Alternative #3 is slightly higher so that the tank height will be approximately 2 feet shorter than Alternatives #1 and #2. This slight difference is negligible in the construction and appearance of the tanks. Therefore, all alternatives receive a medium score for tank height.

3.1.11 Impacts to Infrastructure

Alternative #1A requires approximately 300 feet of new water main and electrical wiring to be installed and Alternative #1C requires 350 feet. Both receive higher scores than the other alternatives. Alternative #1B requires a slightly shorter length of new utilities but the control building and vault must be relocated. Alternative #2 also requires that the control building and vault be relocated but only adds approximately 50 feet of new utilities. Alternatives #1B and #2 require the relocation of the existing control building and vault which increases cost and duration of the project. For these reasons, Alternatives #1B and #2 received a low score. Alternative #3 requires approximately 430 feet of new water main and electrical wiring and receives a medium score.

3.1.12 Constructability

Alternatives #1A, #1C, and #3 provide sufficient space for laydown, panel casting, and crane placement. All three of these alternatives allow for two crane positions around the tank which makes erection of the tank faster and simpler. The tank manufacturers indicated that they could construct a tank at these locations using standard practices without exorbitant cost or time impacts resulting from the tank's proposed location. While Alternative #3 would require more work upfront to prepare the site for construction, once the ground is ready the tank constructor would not be constrained by site access, proximity to the existing tank, or proximity to neighboring properties. Alternatives #1A and #1C receive high scores and Alternative #3 receives a medium score.

Alternatives #1B and #2 are not constructable if the existing control building and vault remain in their current locations. Once the control building and vault are relocated, Alternative #1B would have similar constructability to Alternatives #1A and #1C. Alternative #1B receives a medium score. Alternative #2 presents the most challenges and inefficiencies for tank construction. The limited space on-site means that only one crane position is achievable. As a result, a tank manufacturer would need to modify its standard construction approach by installing scaffolding after the wall panels are placed and the dome would have to be cast-in-place. These modifications, which would be necessary to construct Alternative #2, will result in a longer construction timeline and add cost to the project. Therefore, Alternative #2 receives the lowest score of all the alternatives for constructability.

3.1.13 Opinion of Probable Cost

Alternatives #1A and #1C have the lowest probable construction costs based on their conceptual-level designs; therefore, they receive a high score. Alternatives #1B, #2 and #3 are expected to be slightly more expensive and receive a medium score.

3.2 Cat Rock

Two alternative sites were considered for the Cat Rock tank; two more alternatives have been added with this update.

Tank siting in this area is significantly restricted by the steep changes in grade, proximity to the popular Cat Rock lookout point, and need to maintain access to the existing tank for demolition. Alternative #1 was presented at the site walk. Alternative #1 is located north of the existing tank and along the existing access road in Article 97 conservation land. Based on discussions with participants at the site walk, Alternative #2 was proposed. The Alternative #2 tank location is located northwest but closer to the existing tank than Alternative #1 and partially in Article 97 conservation land. Alternative Sites #2A and #3 were proposed by an abutter to the Cat Rock tank site. The Alternative #2A tank is located approximately 50 feet from the Alternative #2 tank location. The Alternative #3 tank is located approximately 15 feet northeast of the existing tank. Alternative #3 was previously evaluated and eliminated from further consideration by the Town and Wright-Pierce due to potential impacts to the existing tank; however, the evaluation of this alternative has been reconsidered at the request of an abutter.

For all four alternatives, the access road would start at the end of Bradford Road. Alternative site locations at Cat Rock are shown in Figure 1-2. The Alternative Sites Matrix and Scoring table for Cat Rock is provided as Table A-2.

3.2.1 Area of Article 97 Land Change-in-Use

Both the Cat Rock and 80 Acres parcel and the existing tank parcel are preserved under Article 97. The existing tank parcel is protected for water supply use. The existing access road to the tank is currently preserved under Article 97 for conservation and recreation, not for water supply. Any disposition including change of use of any portion of

either of these properties will require going through the PLPA process including submission to the EOE, approval from legislature, and approval by the Town's Conservation Commission. EOE indicated that it would be prudent to include the access road in the disposition so that the Water Department obtains legal rights to the access road in perpetuity and can install utilities as needed. Therefore, for every alternative, at least 1.2 acres of Article 97 conservation land would be changed to Article 97 water supply land to accommodate the access road, construction laydown area, a stormwater management system, and potential new water main. Any disposition including change of use of any portion of either of these properties will require going through the PLPA process including submission to the EOE, approval from legislature, and approval by the Town's Conservation Commission.

Since all alternatives require a change in use of conservation land, none receive a high score. Alternative #1 will require changing the use of approximately 1.57 acres of the Cat Rock Conservation Area from protected for conservation use to protected for water supply use. Both Alternatives #2 and #2A will require changing the use of 1.2 acres, and Alternative #3 will require changing the use of at least 1.5 acres. Since Alternatives #2 and #2A would transfer a smaller area of conservation land than Alternatives #1 and #3, they receive a medium score while Alternatives #1 and #3 receive the lowest score.

3.2.2 Proximity to Significant Landscape Features

The attraction of the Cat Rock lookout is its preferred northeast and east facing views from which one can see the skyline of Boston and surrounding hills. The existing tank is located approximately 180 feet southwest of the lookout point and is not in the preferred field of view.

Alternative #1 is located 140 feet northwest of the lookout point. Therefore, the new tank would not be in the preferred viewscape but some trees on the periphery of the viewscape may be removed making it very visible in a northwest direction. Alternative #2 and #2A are located 180 and 210 feet, respectfully, southwest of the lookout point and will not impact preferred views. They therefore score higher when compared to Alternatives #1 and #3. Alternative #3 would be located approximately 100 feet from the lookout point and clearing for construction would extend to approximately 40 feet from the lookout point. Ledge removal of Cat Rock peak would be required for construction and maintenance of the tank including site security fencing. Further discussion on this impact is included in the following sections. Since Alternative #3 is located at the peak of Cat Rock and closer to the lookout point than all other alternatives, it receives the lowest score. As a result, the scores for Alternatives #1 and #2 have been increased from their original scores. Alternative #3 receives the lowest score, Alternative #1 receives a medium score, and Alternatives #2 and #2A receive the highest scores.

3.2.3 Tree Clearing

All the alternatives require significant clearing of trees to accommodate construction of the new tank. All alternatives require clearing the vegetative screening along the access road on the western property line to develop sufficient space for equipment laydown. For these reasons, no alternative receives a high score.

Alternative #1 will require the least amount of tree clearing overall; however, all the clearing will be on what is currently conservation land. Alternatives #2 and #2A will require clearing trees on what is currently conservation land and private property west of the existing tank. Alternative #3 will require clearing trees on the peak of Cat Rock as well as on two private property parcels east of the existing tank. Alternatives #1 and #3 will both require clearing approximately 1.3 acres of conservation land while Alternatives #2 and #2A will require clearing approximately 1 acre of conservation land. For this reason, Alternatives #2 and #2A receive medium scores while Alternatives #1 and #3 receive low scores.

3.2.4 Impacts to Contiguous Open Space Affecting Wildlife and Hikers.

Hikers can access the Cat Rock conservation area from the Bradford Road cul-de-sac or Overlook Drive. Hiking trails from Bradford Road will be disturbed by all alternatives during construction. The tank and retaining wall for Alternative #3 will also impact the hiking trail from Overlook Drive. The tank location at Alternative #1 will disturb more trails and a larger area of contiguous open space than Alternatives #2 and #2A since Alternatives #2 and #2A are located between the existing tank and developed land. Although hiking trails can be re-routed, the experience of nature in the vicinity of the new tank at Alternative #1 would be disturbed more than at Alternatives #2 and #2A. The tank location at Alternative #3 requires that the peak of Cat Rock be leveled which will result in significant disturbance to the top of Cat Rock. The tank, safety fencing, and security fencing will impact the experience of being in nature on the peak of Cat Rock. Alternative #3 receives the lowest score in this criterion. Since Alternative #1 will cause less disturbance to the top of Cat Rock than Alternative #3, its original low score has been increased to a medium score. Similarly, Alternatives #2 and #2A will have less impact than Alternative #1 and therefore receive higher scores.

3.2.5 Requires Acquisition of Private Property

Alternative #2 and Alternative #2A require the acquisition of approximately 0.35 acres and 0.43 acres, respectively, of private property west of the existing tank site to accommodate construction and permanent access around the new tank. Even though the new tank would be located outside of private property, the site must be graded around the new tank to allow for construction, provide foundational support, and provide safe access to the tank. Alternative #3 requires the acquisition of approximately 0.08 acres of private property from two different property owners east of the existing tank to accommodate construction of the proposed retaining wall and stormwater management system. Alternatives #2, #2A, and #3 receive the lowest score in this criterion. Since Alternative #1 does not require acquiring any private property, it receives the highest score. If private property owners agree to provide the land needed for construction at no cost, the score for the affected alternative should be increased.

3.2.6 Proximity to Closest House

The existing tank is approximately 400 feet from the closest residence on Bradford Road, 450 feet from the closest residence on Spruce Hill Road, 250 feet from the closest residence on Whitney Tavern Road, and 310 feet from the closest residence on Overlook Drive. Regardless of the alternative, the replacement tank will be closer than the existing tank is to at least one residence.

The Alternative #1 tank would be located approximately 150 feet from the nearest residence on Bradford Road (#111) and 390 feet from the closest residence on Whitney Tavern Road (#52). The Alternative #2 tank would be located approximately 260 feet from the residence at 111 Bradford Road, 330 feet from the residence at 52 Whitney Tavern Road, 370 feet from the closest residence on Overlook Drive (#22) and approximately 100 feet closer to the closest home on Spruce Hill Road, about 350 feet away, as compared to Alternative #1. The Alternative #2A tank would be located approximately 310 feet from the residence at 111 Bradford Road, 310 feet from the residence at 52 Whitney Tavern Road, and 340 feet from the residence at 22 Overlook Drive. The Alternative #3 tank would be located approximately 380 feet from 111 Bradford Road, 170 feet from 52 Whitney Tavern Road, 330 feet from the residence at 50 Whitney Tavern Road, and 345 feet from the residence at 32 Overlook Drive. Alternative #3 also requires a retaining wall to support the tank on the eastern side of the Cat Rock hill. This retaining wall would be approximately 140 feet from the residence at 52 Whitney Tavern Road. The retaining wall would also require a zoning variance due to its height which must be approved by the affected property owners located at 44 and 52 Whitney Tavern Road.

Alternatives #2 and #2A place the new tank farther from any residence as compared to Alternatives #1 and #3. Alternatives #2 and #2A receive high scores, Alternative #1 receives a medium score, and Alternative #3 receives a low score.

3.2.7 Site Access

The existing access road traverses from Bradford Road through Article 97 conservation land to the existing tank. For all the alternatives, the path of the existing access road can be reconstructed and used to access the new tank. For Alternatives #1 and #2, the new tank and/or flattened access area around the tank obstructs the existing path to the old tank which will be required for demolition. As such the new access road will be required to be re-routed from the existing path to access the existing tank for demolition. After demolition of the old tank is completed, the temporary access road to the old tank can be removed and reforested.

During construction of Alternative #1, trucks and equipment would be able to back into and pull out of the site without a turnaround. Due to the length and grade of the access road for Alternatives #2, #2A, and #3 a turnaround would likely be needed. Alternatives #2 and #2A can accommodate a turnaround although it will require significant regrading. Alternative #3 cannot accommodate a turnaround due to the limited space near the existing tank. Therefore, multiple cranes would be needed to move equipment from the bottom of the slope to the top. Alternative #3 is the most challenging site to access and receives the lowest score. Since Alternative #3 is less accessible than Alternative #2, the original score for Alternative #2 has been increased from low to medium. Likewise, the original score for Alternative #1 has been increased from medium to high. Alternative #2A receives a medium score as accessibility is like that of Alternative #2.

3.2.8 Potential Ledge Removal

Ledge rock outcroppings are visible at Cat Rock. It is assumed that all alternatives will require a significant amount of ledge removal to construct a level base for the tank. However, Alternatives #2 and #2A, and #3 are likely to require more ledge removal than Alternative #1. Alternative #3 will require the most ledge removal due to construction of the retaining wall southeast of the proposed tank location. Ledge removal for the tank base at Alternative #3 will cut into the peak of Cat Rock. Alternative #2A requires less ledge removal than Alternative #3; however Alternative #2A will require drilling and fracturing (as opposed to blasting) to remove ledge within 10 feet of the existing water main that connects the Cat Rock tank to the distribution system. This water main is 78 years and is critical to providing water to the distribution system. Due to the added risk and required caution that must be exercised to perform ledge removal at this location, Alternative #2A receives the lowest score. When the other alternatives are compared to Alternative #2A, they present less risk and therefore were given increased scores. Alternative #1 receives a high score while Alternatives #2 and #3 receive medium scores.

3.2.9 Cut and Fill Site Work

Existing grades at Alternative #2 and Alternative #2A are very steep. It is estimated that leveling the tank base area will require approximately twice as much cutting and filling sitework than Alternative #1 since Alternative #1 is on flatter ground. Alternative #3 will also require a significant amount of cutting and filling sitework on the peak of Cat Rock, east of the new tank to construct the retaining wall, and west of the existing tank to stabilize the crane staging area. Alternatives #2 and #2A receive low scores in this criterion while Alternative #3 receives a medium score and Alternative #1 receives a high score.

3.2.10 Tank Height

The tanks at all the alternative site locations will extend up to the same elevation in the air but the ground elevation at the base of the tanks varies; therefore, the height of the tank pedestals will vary (refer to Section 2.3.4 for a description of elevated tank pedestals). The height of the tank pedestal at Alternative #2 may be approximately 2 feet shorter than Alternative #1 and the height of pedestal at Alternative #2A may be approximately 1 foot shorter than Alternative #1. This slight difference is negligible in the construction and appearance of the tanks. Therefore, Alternatives #1, #2, and #2A receive the same medium scoring in this criterion. The pedestal height at Alternative #3 may be approximately 16 feet shorter than the other alternatives and therefore receives the highest score in this criterion.

3.2.11 Impacts to Infrastructure

Alternative #1 requires approximately 340 feet of new water main and electrical wiring to be installed from the end of Bradford Road to the new tank, Alternative #2 requires 520 feet, Alternative #2A requires 570 feet, and Alternative #3 requires 620 feet. Alternative #3 requires longer lengths of new utilities than the other alternatives. Therefore, it receives a low score and the original scores of Alternatives #1 and #2 must increase. Alternative #1 receives the highest score for impacts to infrastructure since it requires the shortest length of new infrastructure to be installed. Alternatives #2 and #2A receive medium scores.

3.2.12 Constructability

Steep slopes and limited space make all of these alternative sites challenging for construction of the new tank, but Alternatives #2, #2A, and #3 are not possible without the acquisition of private property and will require substantially more earthwork, which lengthens the project's duration. All alternatives have limited space available for equipment laydown and will require using the area along the access road for laydown. They may also require use of the Bradford Road cul-de-sac to facilitate construction.

Alternative #1 is farthest away from critical infrastructure including the existing tank and water main and therefore presents the least risk to Weston's water service. The site layout for Alternative #1 presents fewer construction constraints and safety concerns than the other alternatives. This alternative receives the highest score. Alternative #2 receives a medium score but since Alternative #2A presents increased risks associated with the proximity of construction activities near existing infrastructure and the proposed 1:1 slope adjacent to the existing tank which is not maintainable, Alternative #2A receives a low score. Alternative #3 also receives a low score due to numerous constructability concerns including the lack of space to set up a crane near the tank without significant filling, construction activities within very close proximity to the existing tank, and the need for a retaining wall to support the new tank on top of the Cat Rock peak.

3.2.13 Opinion of Probable Cost

Alternative #1 is estimated to have the lowest construction cost of all the alternatives. Construction of Alternative #1 is estimated to cost approximately \$660,000 less than Alternative #2, \$900,000 less than Alternative #2A, and \$1,400,000 less than Alternative #3. The higher costs for Alternatives #2 and #2A are associated with sitework, length of new utilities, and acquisition of private property. The higher costs for Alternative #3 are associated with the required retaining wall, length of new utilities, and construction inefficiencies which will increase labor hours and project duration. Since Alternative #3 has the most expensive construction costs and is estimated to be approximately \$700,000 more than Alternative #2, it must receive the lowest score and Alternative #2's score must increase. Due to the significant price difference, Alternative #1 receives the highest score, Alternatives #2 and #2A receive a medium score, and Alternative #3 receives the lowest score.

3.3 Doublet Hill

Four alternative sites are being considered for the Doublet Hill tank. Alternative #1 is located southeast of the existing tank and was presented at the site walk with residents. Based on discussions with participants at the site walk, Alternatives #2 and #3 were added to the evaluation to potentially move the proposed tank location farther from the Doublet Hills and closer to the existing tank. Alternative #2 is located east of the existing tank and Alternative #3 is located southeast of, and closer to, the existing tank than Alternative #1. Alternative #2A was developed subsequent to the public forums held to discuss the November 2023 report. Alternative #2A is located farther northeast of Alternative #2 to reduce impacts to an abutters' view from their residence. All four alternative tank locations are located entirely within the Doublet Hill Conservation Area. For all four alternatives, the access road would start at the end of Doublet Hill Road. Alternative site locations at Doublet Hill are shown in Figure 1-3. The Alternative Sites Matrix and Scoring tables for Doublet Hill is provided as Table A-3.

3.3.1 Area of Article 97 Land Change-in-Use

Alternative #1 will require changing the use of approximately 1.6 acres of the Doublet Hill Conservation Area from protected for conservation use to protected for water supply use. Alternatives #2, #2A, and #3 will each require changing the use of 1.5 acres of land. Since Alternatives #2, #2A, and #3 would take only slightly less conservation land than Alternative #1, they receive a medium score while Alternative #1 receives a low score.

3.3.2 Proximity to Significant Landscape Features

Alternatives #1, #2, and #3 are located northwest of the Doublet Hill peaks. For Alternatives #1, #2, and #3, the proposed tank would be 100 feet, 180 feet, and 150 feet, respectively, from the Doublet Hill peaks. For Alternative #2A, the proposed tank would be 230 feet north of the Doublet Hill peaks. The tank location in Alternative #2A is farther away from the Doublet Hill peaks than Alternative #2, therefore, Alternative #2A now receives the highest score while the score for Alternative #2 has decreased from the highest score to a medium score. Since Alternative #1 is closest to the peaks, it scores the lowest.

3.3.3 Tree Clearing

All four alternatives will require significant tree clearing but will allow for reforestation outside of the tank base and access road areas. Alternative #1 will require the most tree clearing since it is the largest site. Alternatives #2, #2A, and #3 will require similar areas of tree clearing; however, the tree clearing required for Alternative #3 will extend to what is currently private property and impact the vegetative screening between the new tank and the residence at 75 Doublet Hill Road. Alternative #1 scores the lowest, Alternative #2 scores the highest, and Alternative #3 scores in the middle.

3.3.4 Impacts to Contiguous Open Space Affecting Wildlife and Hikers

Alternatives #1 and #2A are located deeper into the forested conservation area than Alternatives #2 and #3, which are located closer to developed areas. Doublet Hill hiking trails can be accessed from the cul-de-sac at the end of Doublet Hill Road. The tank in all four alternatives would also be accessed from this point and therefore would interfere with hiking trails in this area. Alternatives #1 and #2A score the lowest in this criterion while both Alternatives #2 and #3 receive a medium score.

3.3.5 Requires Acquisition of Private Property

To accommodate construction of Alternative #3, approximately 0.1 acres of private property southeast of the existing tank will need to be purchased. Since private property does not need to be acquired for Alternatives #1, #2, and #2A, they receive a high score while Alternative #3 receives a low score.

3.3.6 Proximity to Closest House

The existing tank is 200 feet from the closest residence on Doublet Hill Road (75 Doublet Hill Road) and 220 feet from the second closest residence (80 Doublet Hill Road). For Alternatives #1, #2, and #2A, the proposed tank location is farther away from these residences than the current tank. The proposed tank in Alternative #1 is 350 feet from the closest residence (80 Doublet Hill Road), which is farther than any other alternative and therefore receives the highest score. The proposed tank location in Alternative #2 is 270 feet from the closest residence (75 Doublet Hill Road) while the tank location in Alternative #2A is 300 from the same residence. The proposed tank location in Alternative #2A is approximately 400 feet from the closest residence on Meadowbrook Road. Both Alternatives #2 and #2A receive a medium score. Alternative #3 places the new tank 220 feet from the closest residence (80 Doublet Hill Road) so this alternative receives the lowest score in this criterion. Access roads for all four alternatives will be similar in proximity to the closest residences.

3.3.7 Site Access

The access roads for Alternatives #1 and #3 would need to be constructed up steep grades that lead to the Doublet Hills. This will result in longer and steeper access roads which will require more filling and grading to construct, as compared to Alternatives #2 and #2A. The proposed tank and access road in Alternatives #2 and #2A is on comparatively flat land and will provide much easier access by trucks and heavy equipment. Therefore, Alternatives #2 and #2A receive the highest score in this criterion. Alternative #3 will have a steep access road but less so than Alternative #1 and receives a medium score. Alternative #1 receives a low score.

3.3.8 Potential Ledge Removal

Ledge rock outcroppings can be seen at Doublet Hill. The proposed tank location for Alternative #3 is on a very steep section of the hill and will require approximately twice as much ledge removal as Alternative #1, three times as much ledge removal as Alternative #2, and eight times as much ledge removal as Alternative #2A. Alternative #1 is also on a steep portion of the hill but less ledge removal (and therefore more filling) is proposed in this location to protect the integrity of the Doublet Hills. Alternative #2A will require the least amount of ledge removal since it is located on a semi-flat area and does not cut into the hill. Alternative #2 is located at the base of the hill and only slightly cuts into the hill and therefore requires more ledge removal than Alternative #2A but less than Alternatives #1 and #3. In the initial evaluation, Alternative #2 required the least amount of ledge removal and received the highest score; however, Alternative #2A requires even less ledge removal than Alternative #2. Alternative #2A now receives the highest score while the score for Alternative #2 has decreased from the highest score to a medium score. Alternative #1 also receives a medium score and Alternative #3 receives the lowest score for potential ledge removal.

3.3.9 Cut and Fill Site Work

For Alternative #1, a significant amount of filling will be required since less ledge removal to protect the Doublet Hills results in more fill required to level the tank base area. A large quantity of fill material will need to be imported to the site to construct Alternative #1, unlike the other alternatives. For Alternative #3, slightly less cut and fill site work will be needed but excess material will likely need to be trucked off site due to the large amount of ledge removal. Alternative #2 will require approximately half the amount of cutting and filling work as Alternative #3 and will result in cut and fill balance which minimizes the amount of imported fill that would be needed. Alternative #2A requires the least amount of cut and fill sitework but will require some imported fill to regrade the lower elevations on the northern portion of the site. Alternatives #2 and #2A receive the highest score. Since Alternative #3 requires approximately 3 times as much cut and fill sitework as Alternative #2A, its score has decreased from a medium to a low score. Now both Alternatives #1 and #3 receive the lowest score.

3.3.10 Tank Height

The tanks at the four alternative site locations will extend up to the same elevation in the air but the ground elevation at the base of the tanks varies; therefore, the height of the tank pedestals will vary (refer to Section 2.3.4 for a description of elevated tank pedestals). The tanks for Alternatives #2 and #2A will be constructed at the lowest ground elevation and therefore will have the tallest pedestals. The pedestal for Alternative #3 would be approximately 8 feet shorter than Alternatives #2 and Alternative #1 would be approximately 12 feet shorter than Alternative #2. Alternative #2 scores the lowest, Alternative #3 scores in the middle, and Alternative #1 scores the highest for tank height.

3.3.11 Impacts to Infrastructure

The new tank will connect to the existing water distribution system and electrical system from the end of Doublet Hill Road. The farther an alternative is from the road, the more water main and electrical wiring will be needed. Alternative #1 requires approximately 410 feet of new water main and electrical wiring and receives the lowest score. Alternative #2 requires approximately 330 feet and receives the highest score while Alternatives #2A and #3 require 360 feet and 370 feet, respectively, and score in the middle.

3.3.12 Constructability

All four alternatives can provide adequate space for laydown and tank erection; however, Alternatives #1 and #3 present numerous challenges since the proposed tanks are located on the slope of the hill. Working with these steep grades means there will be a significant amount of site preparation work to flatten the grades out enough to be able to construct the tank. Tank manufacturers have indicated that the flatter grade at Alternative #2 will make construction easier and therefore Alternative #2 receives the highest score. Similarly, the tank located at Alternative #2A is on semi-flat grade and receives a high score for constructability.

Another concern is that the tank should be constructed on uniform material whenever possible to reduce the potential for differential settlement of materials. The steep slopes at Alternatives #1 and #3 could require the removal of significant amounts of ledge to achieve this or they could be designed to rest on ledge while another portion rests on fill material.

Alternative #3 presents additional concerns due to the close proximity of the property boundary and the small portion of private land that would need to be acquired to accommodate construction. Therefore, Alternative #3 receives the lowest score for constructability, while Alternative #1 receives a medium score.

3.3.13 Opinion of Probable Cost

The construction of Alternative #2A is estimated to be the least expensive of the options. Alternative #2A is estimated to be approximately \$320,000 less expensive than Alternative #2, approximately \$790,000 less than Alternative #1 and \$1, 320,000 less than Alternative #3. Therefore, Alternative #2A and Alternative #2 receive high scores, Alternative #1 receives a medium score, and Alternative #3 receives a low score.

Section 4 Rankings and Recommendations

The criteria and associated scoring system presented in this evaluation were developed to screen and rank each of the sites under consideration using the four primary factors related to siting of the replacement water storage tanks.

The following details the results of the scoring and recommended sites for each tank.

4.1 Paines Hill

Table 4-1 below summarizes the results of the scoring of the 5 alternatives for Paines Hill.

Table 4-1 Summary of Paines Hill Alternatives Scoring and Ranking

Category	Alternative Site #1 A	Alternative Site #1B	Alternative Site #1C	Alternative Site #2	Alternative Site #3
Impacts to Preserved Land (out of 38)	21.3	21.3	18.7	35.3	18.7
Impacts to Abutters (out of 22)	22.0	22.0	18.7	15.3	18.7
Engineering Evaluation (out of 34)	31.0	23.7	31.0	14.3	24.0
Cost (out of 6)	6.0	4.0	6.0	4.0	4.0
Total Score (out of 100)	80.3	71.0	74.3	69.0	65.3
Overall Rank	1	3	2	4	5

From the scoring matrix Table A-1 included in the appendix, Alternative Site #1A received the highest score and is recommended for design and construction of the new tank at Paines Hill. It is important to note that Alternative Site #1A, #1B, and #1C have the tank sited in the same location; however, the access road to the tank differs between the three alternatives. For that reason, only the differences in the access road are discussed below in the summary of the alternative evaluation. For a more detailed assessment of the alternatives, refer to Section 3.

When evaluating the criteria identified in the “Impacts to Preserved Land” category, Alternative #2 scored highest because it would not require the transfer of Article 97 land nor would it impact contiguous open space for wildlife and hikers, unlike the other alternatives. Alternative #1A and #1B scored second highest in the category of “Impacts to Preserved Land” since both alternatives required a taking of approximately 1.25 acres of Article 97 land but limited the amount of tree clearing needed to site, access, and construct the tank.

Alternative #1A and #1B scored the highest in the category of “Impacts to Abutters” because these alternatives sited the tank farther from the abutting residences than the existing tank and the proposed access roads are farther from the residences than Alternative #1C and #3.

Finally, Alternative #1A and #1C ranked highest in the category of “Engineering Evaluation.” Site access for Alternatives #1A and #1C does not require relocation of the control building and vault, would require less site work, and allows for sufficient area to construct the tanks. Therefore, Alternatives #1A and #1C also ranked highest since the siting of the tank and accessways is the most cost effective based on the constructability of the project.

In summary, Alternative #1A scored the highest in three out of four of the categories and provides the best balance between the concerns of the EEA regulators and abutting residents while also limiting design and construction inefficiencies. Although Alternative #2 would not impact any Article 97 conservation land, clear cutting of the parcel and the tank location would drastically impact abutting residents and construction of the tank would be particularly difficult and inefficient due to the space constraints. The tank site in Alternative #3 is farther away from residences than any of the other alternatives but its access road is not. The Alternative #3 access road would materially and permanently disturb the vegetative buffer at the southern property boundary. Additionally, Alternative #3 would require the most site work including tree clearing and site grading during construction. This would lengthen the project's duration and create more truck traffic at times to and from the site during construction. The tank site in Alternative #1A is farther from all residences than the current tank, and the corresponding access road would have minimal impact to the vegetative buffer between residences and the tank site. Finally, Alternative #1A, along with Alternative #1C, have the lowest estimated construction costs of all the alternatives.

Alternative Site #1A, as shown in Figure 4-1, is recommended as the proposed site location for the Paines Hill replacement tank.

4.2 Cat Rock

Table 4-2 below summarizes the results of the scoring of the four alternatives for Cat Rock.

Table 4-2 Summary of Cat Rock Alternatives Scoring and Ranking

Category	Alternative Site #1	Alternative Site #2	Alternative Site #2A	Alternative Site #3
Impacts to Preserved Land (out of 38)	16.7	29.3	29.3	12.7
Impacts to Abutters (out of 22)	18.7	14.0	14.0	7.3
Engineering Evaluation (out of 34)	33.7	20.0	13.3	17.3
Cost (out of 6)	6.0	4.0	4.0	2.0
Total Score (out of 100)	75.0	67.3	60.7	39.3
Overall Rank	1	2	3	4

When evaluating the criteria identified in the “Impacts to Preserved Land” category, Alternative Sites #2 and #2A scored highest since they require less Article 97 land to be transferred and are farthest away from the Cat Rock lookout point. Alternative Sites #2 and #2A are also located closer to private property which reduces the impact to contiguous land for wildlife and hikers, versus Alternatives #1 and #3.

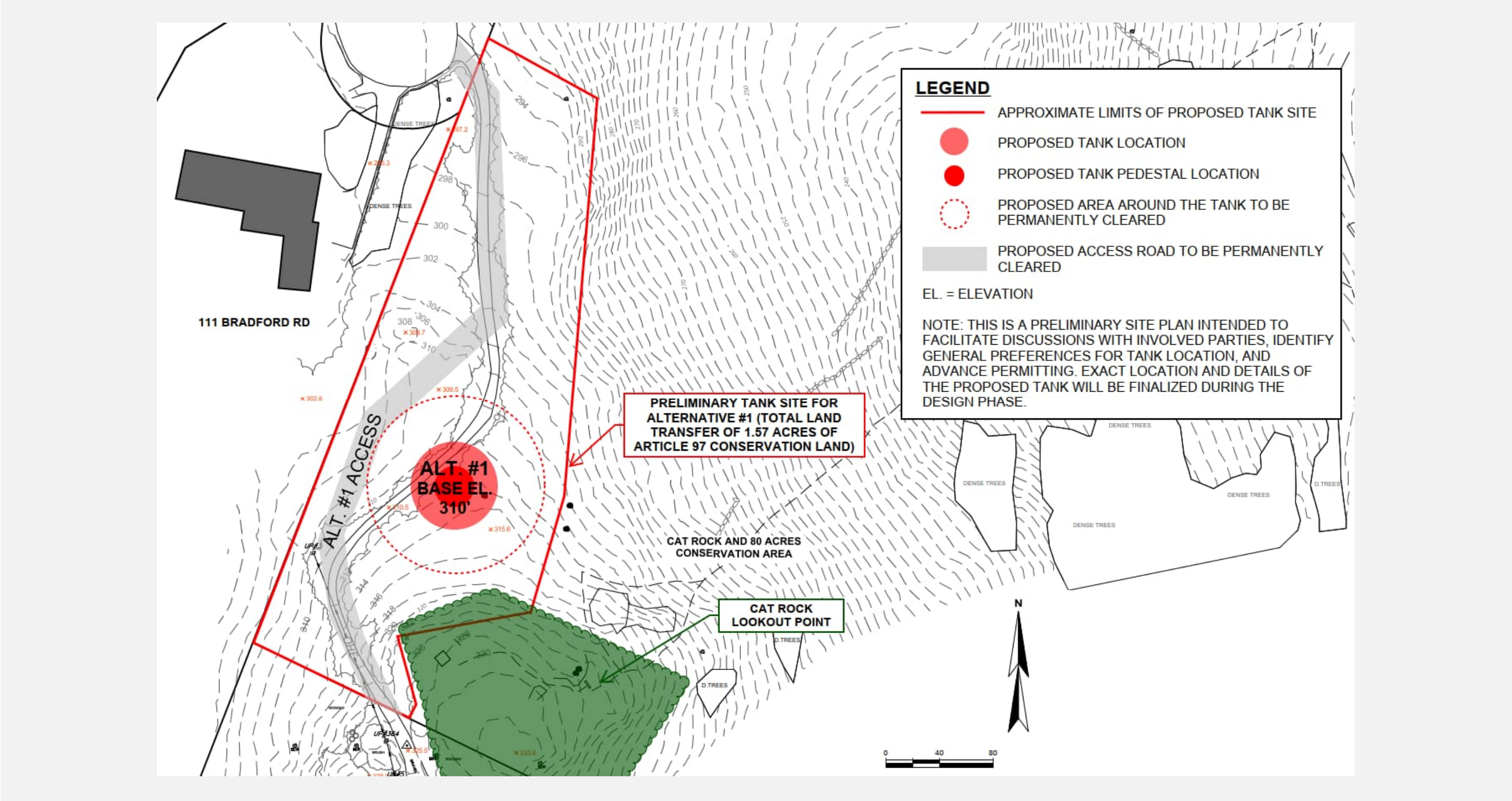
When evaluating the criteria under the “Impacts to Abutters” category, Alternative #1 scores highest since it does not require acquisition of private property to construct the tank and a retaining wall, even though the tank is closer to 111 Bradford Road.

Alternative #1 scores the highest under the “Engineering Evaluation” category since the proposed tank site is relatively flat and would require less earthwork than the other alternatives. Alternative #1 is also farthest away from the existing tank and water main and therefore, presents the least risk to this critical infrastructure.

In summary, the Cat Rock tank replacement is the most challenging of all the tanks. Maintaining the integrity of the Cat Rock lookout point while keeping the existing tank in service leaves little room for a new tank. There is no feasible location that would preserve vegetation along the western property line. Although Alternatives #2 and #2A would require the taking of a slightly smaller area of conservation land than Alternative #1, it would require a portion of private land be acquired in its place and ultimately cause much more disturbance to the natural landscape from significant site grading on the hill. Alternative #3 would require leveling the peak of Cat Rock and construction of a retaining wall on private property. Alternative #1 is also the least expensive of all the alternatives by approximately \$660,000.

Alternative #1, as shown on Figure 4-2, is recommended as the proposed site location for the Cat Rock replacement tank.

Figure 4-2 Cat Rock Recommended Site



4.3 Doublet Hill

Table 4-1 below summarizes results of the scoring of the 3 alternatives for Doublet Hill.

Table 4-3 Summary of Doublet Hill Alternatives Scoring and Ranking

Category	Alternative Site #1	Alternative Site #2	Alternative Site #2A	Alternative Site #3
Impacts to Preserved Land (out of 38)	12.7	25.3	25.3	25.3
Impacts to Abutters (out of 22)	22.0	18.7	18.7	7.3
Engineering Evaluation (out of 34)	18.7	30.3	33.0	13.3
Cost (out of 6)	4.0	6.0	6.0	2.0
Total Score (out of 100)	57.3	80.3	83.0	48.0
Overall Rank	3	2	1	4

When evaluating the criteria identified in the “Impacts to Preserved Land” category, Alternative Sites #2, #2A, and #3 scored highest since they require approximately the same area of Article 97 land to be transferred for siting the new tank, approximately the same amount of tree clearing, and are farther from the Doublet Hill peaks than Alternative #1.

When evaluating the criteria under the “Impacts to Abutters” category, Alternative #1 scores highest since unlike Alternative #3, it does not require acquisition of private property for construction of the tank. Alternative #1 is also located farthest from existing residences; however, all three alternatives are farther from residences than the existing tank is.

Alternative #2A scores the highest under the “Engineering Evaluation” category since the tank site is more accessible from Doublet Hill Road, is relatively flat requiring the least amount of earthwork, does not require construction on the Doublet Hill slope and therefore requires the least amount of ledge removal. The siting of the tank and accessway is also the most cost effective based on the constructability of the tank and site.

In summary, Alternative Site #2A receives the highest score and Alternative #2 receives the second highest score. Alternative Sites #2 and #2A are the most advantageous sites when considering impacts to preserved land, engineering, construction, and cost. Alternative #2A is also slightly farther away from abutting residences than Alternative #2 and requires less ledge removal. Although Alternative #2A is located 50 feet closer to one residence than Alternative #1, it will require the least damage to the natural landscape and vegetation. Alternative #2A is also estimated to be the least expensive to construct.

Alternative Site #2A, as shown on Figure 4-3, is recommended as the proposed site location for the new Doublet Hill tank.

Section 5 Next Steps

Perhaps the most critical responsibility of any municipality is to provide its residents with safe water for drinking and fire protection, both being central to public health and safety. This is not only for the benefit of the community but also to comply with regulations established by state and federal agencies regarding the operation of water systems. Based on the age of the existing tanks and the need to improve the hydraulic conditions of the system, the Town of Weston needs to make investments to replace their aging infrastructure to ensure the reliability of its public water system as well as to update their distribution system to meet the constantly changing needs of the community. The Town of Weston looks far different now than it did almost 100 years ago, when the original water system and tanks were constructed. It has been recommended that the existing water tanks be replaced to enable the Town to reliably serve the community of today and the future. Not doing so would put the public at risk.

The following outlines recommended next steps in the process of upgrading the infrastructure.

1. Obtain Public Support for Recommended Tank Sites

Present the report, findings, and recommendations to the public.

2. Article 97 Process/MEPA

Once the Select Board has adopted the recommended sites for each of the three tanks, the permitting/approval process for the land transfer under Article 97 should proceed. The initial work will involve the preparation and submission of an Expanded Environmental Notification Form and a Proposed Environmental Impact Report (EIR) to MEPA. Per MEPA's recommendation, both submittals will be filed at the same time in request of a "Rollover" EIR to expedite the review and issuance of a final certificate. The Rollover EIR will address the MEPA scope requirements and will request to change the new tank sites from Article 97 conservation/recreation land to water supply protected lands. It will also detail the land to be included as a swap for use of the Article 97 lands to construct the new tanks. Other requirements under the Article 97 process will include:

- A. The proposed tank locations and the land swap property proposed by the Selectboard must receive two-thirds approval by a Town Meeting vote,
- B. Must receive unanimous approval from the Town of Weston Conservation Commission, and
- C. Must obtain two-thirds approval of the legislature in support of the Article 97 disposition.

If the Rollover EIR is supported and accepted, MEPA will issue a certificate of approval allowing the project to move forward.

3. Design

Upon issuance of a certificate of approval from MEPA, design of the new tanks, as well as other related upgrades listed below, can proceed.







- A. Three replacement water storage tanks,
- B. Upgrades to the Wellesley Street pump station,
- C. Distribution system pressure reducing stations, and

D. Water main improvements to the Cat Rock tank.

During final design, all components of the tanks and sites will be determined including exact tank height, volumes, tank style and color, landscaping, storm water management and drainage systems, and security.

The estimated project schedule is provided below.

Table 5-1 Estimated Project Schedule

	2023		2024		2025		2026		2027	
Tasks	Jul-Dec		Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec
Site Coordination with Stakeholders										
MEPA/Article 97 Permitting										
Design										
Town Meeting Approval for Construction										
Bidding										
Construction										

Section 6 References

EEA, 1998. EOE Article 97 Land Disposition Policy. Commonwealth of Massachusetts Executive Office of Environmental Affairs. February 19, 1998.

MassDEP, 2020. 310 CMR 22: The Massachusetts Drinking Water Regulations. Massachusetts Department of Environmental Protection. Effective October 2, 2020.

MassDEP, 2017. Guidelines for Public Water Systems. Massachusetts Department of Environmental Protection. Last updated August 27, 2017.

Wright-Pierce, 2019. Water System Master Plan for the Weston Water Department, Weston, MA. Wright-Pierce. June 2019.



Appendix A

Site Alternatives Matrix and Scoring Tables

Table A-1: Paines Hill Site Alternatives Matrix and Scoring

Table A-2: Cat Rock Site Alternatives Matrix and Scoring

Table A-3: Doublet Hill Site Alternatives Matrix and Scoring

Table A-1
Paines Hill
Site Alternatives Matrix and Scoring

Explanation of Scoring System:

- This evaluation uses a scoring system to compare the tank siting alternatives for each tank based on 13 criteria which vary in their importance to the project.
- Each criterion is assigned a "Maximum Criterion Score". The greater the Maximum Criterion Score, the more impact that criterion has on the feasibility and favorability of the project. The sum of the Maximum Criterion Score for all of the criteria is 100.
 - Each alternative site is scored for comparison against the other alternative sites for that tank using "Initial Scores". Initial Scores range from 1 to 3, 1 being the worst and 3 being the best.
 - The Initial Score is then weighted based on the Maximum Criterion Score in each criterion. An Initial Score of 3 is given the full weight of the Maximum Criterion Score, an Initial Score of 2 is given 2/3rd weight of the Maximum Criterion Score, and an Initial Score of 1 is given 1/3rd weight of the Maximum Criterion Score. This weighting becomes the "Final Score" that the alternative receives in one criterion.
 - The Final Scores from each criterion are added together to calculate the "Total Score". The Total Score is out of 100 with the highest Total Score indicating the most advantageous site as compared to the other alternatives. The alternative site with the highest Total Score is the one that is recommended for construction.

Criteria	Maximum Criterion Score	Alternative Site #1A			Alternative Site #1B			Alternative Site #1C			Alternative Site #2			Alternative Site #3		
		Initial Score (1 to 3)	Final Score (Initial Score x Maximum Criterion Score / Maximum Initial Score)	Rationale	Initial Score (1 to 3)	Final Score	Rationale	Initial Score (1 to 3)	Final Score	Rationale	Initial Score (1 to 3)	Final Score	Rationale	Initial Score (1 to 3)	Final Score	Rationale
Impacts to Preserved Land	38		21.3			21.3			18.7			35.3			18.7	
Area of Article 97 Land Change-in-Use	18	1	6.0	Approximately 1.25 acres of Article 97 conservation land would be changed to water supply land.	1	6.0	Approximately 1.25 acres of Article 97 conservation land would be changed to water supply land.	1	6.0	Approximately 1.25 acres of Article 97 conservation land would be changed to water supply land.	3	18.0	No Article 97 conservation land would be changed to water supply land.	1	6.0	Approximately 1.25 acres of Article 97 conservation land would be changed to water supply land.
Proximity to Significant Landscape Features	6	3	6.0	Site is not near significant features of Highland Town Forest.	3	6.0	Site is not near significant features of Highland Town Forest.	3	6.0	Site is not near significant features of Highland Town Forest.	3	6.0	Site is not near significant features of Highland Town Forest.	3	6.0	Site is not near significant features of Highland Town Forest.
Tree Clearing	8	2	5.3	An area of dense, mature trees would be cleared. The eastern portion can be reforested upon completion of construction, allowing for continuity with preserved land. Trees along property lines that abut neighbors would remain during construction but a few small caliper trees north of the existing tank would need to be removed.	2	5.3	An area of dense, mature trees would be cleared. The eastern portion can be reforested upon completion of construction, allowing for continuity with preserved land. Trees along property lines that abut neighbors would remain during construction.	1	2.7	An area of dense, mature trees would be cleared. The eastern portion can be reforested upon completion of construction, allowing for continuity with preserved land. Some tree screening along property lines that abut neighbors would remain during construction but the screening to the south would be reduced to accommodate the access road.	2	5.3	Requires clearing the site completely up to the property line and around the existing tank. All tree buffers with neighboring properties would be removed but no trees on conservation land would be removed.	1	2.7	This alternative requires the most clearing including areas of dense, mature trees. Tree buffers along property lines that abut neighbors would remain during construction but the buffer to the south would be reduced to accommodate the access road. The northern portion of the new site can be reforested upon completion of construction, allowing for continuity with
Impacts to Contiguous Open Space Affecting Wildlife and Hikers	6	2	4.0	Disruption to ecosystem is similar to Alternatives #1B, #1C, and #3.	2	4.0	Disruption to ecosystem is similar to Alternatives #1A, #1C, and #3.	2	4.0	Disruption to ecosystem is similar to Alternatives #1A, #1B, and #3.	3	6.0	All impacts are limited to the already-developed existing tank site parcel.	2	4.0	Disruption to ecosystem is similar to Alternatives #1A, #1B, and #1C.
Impacts to Abutters	22		22.0			22.0			18.7			15.3			18.7	
Requires Acquisition of Private Property	12	3	12.0	This alternative does not require purchasing any private property.	3	12.0	This alternative does not require purchasing any private property.	3	12.0	This alternative does not require purchasing any private property.	3	12.0	This alternative does not require purchasing any private property.	3	12.0	This alternative does not require purchasing any private property.
Proximity to Closest House	10	3	10.0	The proposed tank is 380 feet from the residence at 156 Highland Street while the proposed access road is approximately 175 feet from the residence at 148 Highland St. With this alternative, the proposed tank is farther from residences than the existing tank and the proposed access road is farther from residences than Alternatives #1C and #3.	3	10.0	The proposed tank is 380 feet from the residence at 156 Highland Street while the proposed access road is approximately 175 feet from the residence at 148 Highland St. With this alternative, the proposed tank is farther from residences than the existing tank and the proposed access road is farther from residences than Alternatives #1C and #3.	2	6.7	The proposed tank is 380 feet from the residence at 156 Highland Street and the proposed access road is approximately 100 feet from the same residence. With this alternative, the proposed tank is farther from residences than the existing tank but the access road is closer to a residence than Alternatives #1A and #1B.	1	3.3	The proposed tank is 110 feet from the residence at 148 Highland Street. A zoning variance would be needed since the tank does not meet setback requirements. With this alternative, the proposed tank is closer to residences than the existing tank.	2	6.7	The proposed tank is 420 feet from the residence at 156 Highland Street and the proposed access road is approximately 100 feet from the same residence. With this alternative, the proposed tank is farther from residences than the existing tank and the other alternative sites but the access road is closer to a residence than the Alternatives #1A and #1B.
Engineering Evaluation	34		31.0			23.7			31.0			14.3			24.0	
Site Access	4	3	4.0	Requires minor tree clearing and filling to construct portion of road. Turning radius around the existing tank is adequate for equipment.	1	1.3	Requires minor tree clearing and filling; however, limited turning radius prohibits equipment access unless control building and vault are relocated.	3	4.0	Requires some tree clearing and minor filling to construct road. Excellent access to site.	1	1.3	No new roadway would be needed but the equipment laydown area would be extremely limited in space and construction would need to maneuver around the existing tank.	3	4.0	Access road construction requires significant tree clearing and minor grading. The new access road would provide easy access to the new tank but is the longest driveway of all the alternatives.
Potential Ledge Removal	8	2	5.3	Appears to be limited ledge based on MassMapper and field observations. Geotechnical borings are needed to confirm existing conditions.	2	5.3	Appears to be limited ledge based on MassMapper and field observations. Geotechnical borings are needed to confirm existing conditions.	2	5.3	Appears to be limited ledge based on MassMapper and field observations. Geotechnical borings are needed to confirm existing conditions.	2	5.3	Appears to be limited ledge based on MassMapper and field observations. Geotechnical borings are needed to confirm existing conditions.	2	5.3	Appears to be limited ledge based on MassMapper and field observations. Geotechnical borings are needed to confirm existing conditions.
Cut and Fill Site Work	8	3	8.0	Requires a significant amount of cutting and filling site work but less than Alternatives #2 and #3.	3	8.0	Requires a significant amount of cutting and filling site work but less than Alternatives #2 and #3.	3	8.0	Requires a significant amount of cutting and filling site work but less than Alternatives #2 and #3.	1	2.7	Requires more cut and fill site work than other alternatives. Alternative #2 does not provide any extra space to stockpile excavated soils for re-use on site; therefore, material will need to be trucked to an off-site location for temporary storage.	2	5.3	Requires a significant amount of cutting and filling site work but less than Alternative #2.
Tank Height	1	2	0.7	The finished floor elevation would be the same at Alternative Sites #1A, #1B, #1C, and #2.	2	0.7	The finished floor elevation would be the same at Alternative Sites #1A, #1B, #1C, and #2.	2	0.7	The finished floor elevation would be the same at Alternative Sites #1A, #1B, #1C.	2	0.7	The finished floor elevation would be the same at Alternative Sites #1A, #1B, and #1C.	2	0.7	Potentially 2 feet shorter than other alternative sites but this will have almost no impact on constructability or cost.
Impacts to Infrastructure	1	3	1.0	Increases water main and electrical wiring by 300 feet. Control building and vault remain during construction.	1	0.3	Increases water main and electrical wiring by 240 feet. Control building and vault must be temporarily relocated.	3	1.0	Increases water main and electrical wiring by 350 feet. Control building and vault remain during construction.	1	0.3	Increases water main and electrical wiring by 50 feet. Control building and vault must be temporarily relocated.	2	0.7	Increases water main and electrical wiring by 430 feet. Control building and vault remain during construction.
Constructability	12	3	12.0	This alternative offers sufficient space for laydown, panel casting, and crane placement. A tank manufacturer can construct at the site without exorbitant cost or time impacts.	2	8.0	Access road does not allow for construction if control building and vault remain in place. Relocation of control building and vault adds cost and time. Once the control building and vault are relocated, constructability will be similar to Alternatives #1A and #1C.	3	12.0	This alternative offers sufficient space for laydown, panel casting, and crane placement. A tank manufacturer can construct at the site without exorbitant cost or time impacts.	1	4.0	This alternative offers very limited space for equipment laydown, panel casting, and crane placement, resulting in inefficiencies to the project. Scaffolding would need to be installed after walls are placed and dome would need to be cast-in-place, adding cost and time.	2	8.0	This alternative will require a lot of preparation and restoration work but is not constrained by proximity to existing site or neighboring properties. This alternative offers sufficient space for laydown, panel casting, and crane placement. A tank manufacturer can construct at the site without exorbitant cost or time impacts.
Cost	6		6.0			4.0			6.0			4.0			4.0	
Opinion of Probable Construction Cost	6	3	6.0	\$7,520,000	2	4.0	\$7,670,000	3	6.0	\$7,520,000	2	4.0	\$7,590,000	2	4.0	\$7,620,000
Total Score	100		80.3			71.0			74.3			69.0			65.3	

Notes:
1. The Opinion of Probable Construction Costs are based on June 2024 costs (ENR Construction Cost Index 13546.80) but include a 15% inflation contingency assuming construction starts in fiscal year 2026.

Table A-2
Cat Rock
Site Alternatives Matrix and Scoring
Updated June 2024 to include Alternatives #2A and #3

Explanation of Scoring System:
This evaluation uses a scoring system to compare the tank siting alternatives based on 13 criteria, which vary in their importance to the project.
- Each criterion is assigned a "Maximum Criterion Score". The greater the Maximum Criterion Score, the more impact that criterion has on the feasibility and favorability of the project. The sum of the Maximum Criterion Score for all of the criteria is 100.
- Each alternative site is scored in comparison against the other alternative sites for that tank using "Initial Scores". Initial Scores range from 1 to 3, 1 being the worst and 3 being the best.
- The Initial Score is then weighted based on the Maximum Criterion Score in each criterion. An Initial Score of 3 is given the full weight of the Maximum Criterion Score, an Initial Score of 2 is given 2/3rd weight of the Maximum Criterion Score, and an Initial Score of 1 is given 1/3rd weight of the Maximum Criterion Score. This weighting becomes the "Final Score" that the alternative receives in one criterion.
- The Final Scores from each criterion are added together to calculate the "Total Score". The Total Score is out of 100 with the highest Total Score indicating the most advantageous site as compared to the other alternatives. The alternative site with the highest Total Score is the one that is recommended for construction.
- Alternatives #2A and #3 were added to this evaluation in June 2024. Initial Scores are based on how much better or worse an alternative site is compared to the other alternative sites. Therefore, the inclusion of more alternatives changes the Initial Scores. These changes are described in the matrix below.

Criteria	Maximum Criterion Score	Alternative Site #1					Alternative Site #2					Alternative Site #2A					Alternative Site #3				
		Original Scoring (11/2023)		Updated Scoring (6/2024) ⁽¹⁾		Rationale	Original Scoring (11/2023)		Updated Scoring (6/2024) ⁽¹⁾		Rationale	Scoring (6/2024)		Rationale	Scoring (6/2024)		Rationale				
		Initial Score (1 to 3)	Final Score	Initial Score (1 to 3)	Final Score		Initial Score (1 to 3)	Final Score	Initial Score (1 to 3)	Final Score		Initial Score (1 to 3)	Final Score								
Impacts to Preserved Land	38		12.7		16.7								29.3								
Area of Article 97 Land Change-in-Use	18	1	6.0	1	6.0	Approximately 1.57 acres of Article 97 conservation land would be changed to Article 97 water supply land.	2	12.0	2	12.0	Approximately 1.2 acres of Article 97 conservation land would be changed to Article 97 water supply land.	2	12.0	Both the Cat Rock & 80 Acres parcel and the existing tank parcel are preserved under Article 97. The existing tank parcel is protected for water supply use. Any disposition including change of use of any portion of either of these properties will require going through the Public Lands Preservation Act (PLPA) process including submission to the Massachusetts Executive Office of Environmental Affairs (EOEA), approval from legislature, and approval by the Town's Conservation Commission. The existing access road to the tank is currently preserved under Article 97 for conservation/recreation, not for water supply. EOEA indicated that it would be prudent to include the access road in the disposition so that the Water Department obtains legal rights to the access road in perpetuity and can install utilities as needed. At least 1.2 acres of Article 97 conservation land would be changed to Article 97 water supply land to accommodate the access road, construction laydown area, a stormwater management system, and potential new water main.	1	6.0	Both the Cat Rock & 80 Acres parcel and the existing tank parcel are preserved under Article 97. The existing tank parcel is protected for water supply use. Any disposition including change of use of any portion of either of these properties will require going through the Public Lands Preservation Act (PLPA) process including submission to the Massachusetts Executive Office of Environmental Affairs (EOEA), approval from legislature, and approval by the Town's Conservation Commission. The existing access road to the tank is currently preserved under Article 97 for conservation/recreation, not for water supply. EOEA indicated that it would be prudent to include the access road in the disposition so that the Water Department obtains legal rights to the access road in perpetuity and can install utilities as needed. At least 1.5 acres of Article 97 conservation land would be changed to Article 97 water supply land to accommodate the access road, construction laydown area, a stormwater management system, and potential new water main.				
Proximity to Significant Landscape Features	6	1	2.0	2	4.0	The new tank would be located approximately 140 feet northwest of the lookout point at Cat Rock and clearing for construction would extend to approximately 60 feet from the Cat Rock lookout point. These impacts are farther from those in Alternative #3, but closer than Alternatives #2 and #2A. Since Alternative #3 is closer to the lookout point than Alternative #1, Alternative #3 receives the lowest score and the score for Alternative #1 must increase to a medium score.	2	4.0	3	6.0	The new tank would be located approximately 180 feet southwest of the lookout point at Cat Rock and clearing for construction would extend to approximately 130 feet from the Cat Rock lookout point. The new tank and construction impacts resulting from Alternatives #2 and #2A are farther from the Cat Rock lookout point and will have less impact to the viewscape facing northwest than Alternatives #1 and #3. Alternatives #2 and #2A must receive the highest score when Alternative #3 is included in the comparison.	3	6.0	The new tank would be located approximately 210 feet from the Cat Rock lookout point and clearing for construction would extend to approximately 130 feet from the Cat Rock lookout point. The new tank and construction disturbances resulting from Alternatives #2 and #2A are farther from the Cat Rock lookout point than Alternatives #1 and #3. Alternatives #2 and #2A receive the highest score.	1	2.0	The new tank would be located approximately 100 feet from the Cat Rock lookout point and clearing for construction would extend to approximately 40 feet from the Cat Rock lookout point. This tank and its construction disturbances are closer to the Cat Rock lookout point than all other alternatives and therefore, receives the lowest score.				
Tree Clearing	8	1	2.7	1	2.7	Alternative #1 will require approximately 1.35 acres of tree clearing, all of which will be on what is currently conservation land. This alternative requires the smallest overall area of tree clearing, but approximately 0.3 more acres of conservation land will be cleared compared to Alternatives #2 and #2A. All alternatives will require clearing the vegetative screening along the western property line for laydown during construction.	1	2.7	2	5.3	Alternative #2 will require approximately 1.55 acres of tree clearing overall, 0.6 acres of which will be on the existing tank parcel and private property. Unlike Alternative #3, Alternative #2 will not require clearing trees on the peak of Cat Rock and therefore, receives a higher score than Alternative #3. All alternatives will require clearing the vegetative screening along the western property line for laydown during construction.	2	5.3	Alternative #2A will require approximately 1.75 acres of tree clearing overall, 0.8 acres of which will be on the existing tank parcel and private property. Unlike Alternative #3, Alternative #2A will not require clearing trees on the peak of Cat Rock and therefore, receives a higher score than Alternative #3. All alternatives will require clearing the vegetative screening along the western property line for laydown during construction.	1	2.7	Alternative #3 will require approximately 1.53 acres of tree clearing overall. However, 0.27 acres of clearing will be on the existing tank parcel or private property, rather than in what is currently conservation land. Alternative #3 will require tree clearing on the peak of Cat Rock and the east of the existing tank parcel on private property. For these reasons, Alternative #3 receives the lowest score for tree clearing. All alternatives will require clearing the vegetative screening along the western property line for laydown during construction.				
Impacts to Contiguous Open Space Affecting Wildlife and Hikers	6	1	2.0	2	4.0	This alternative causes more disruption to contiguous conservation land and hiking trails than Alternatives #2 and #2A, but less than Alternative #3 since it will not cut into the Cat Rock peak or disrupt trail access from Overlook Drive. Therefore, the score for Alternative #1 increases in comparison to Alternative #3.	2	4.0	3	6.0	Since this alternative is located between the existing tank and private property, it will result in the less permanent disruption to contiguous undeveloped land than Alternatives #1 and #3. A laydown area adjacent to the existing tank will block the trail to Cat Rock outlook from Overlook Drive for the duration of construction. The score for Alternative #2 increases in comparison to Alternative #3.	3	6.0	Since this alternative is located between the existing tank and private property, it will result in less permanent disruption to contiguous undeveloped land than Alternatives #1 and #3. A laydown area adjacent to the existing tank will block the trail to Cat Rock outlook from Overlook Drive for the duration of construction.	1	2.0	This alternative will significantly impact the hiker's experience at the peak of Cat Rock due to flattening of the peak and installation of permanent safety and security fencing required around the tank. The tank and retaining wall for this alternative are located on the hiking trail that travels from Overlook Drive to the Cat Rock outlook. Although the view facing northeast from the Cat Rock outlook point would be undisturbed, Alternative #3 receives the lowest score due to its impact to the peak.				
Impacts to Abutters	22		15.3		18.7			10.7		14.0			14.0			7.3					
Requires Acquiring Private Property	12	3	12.0	3	12.0	Alternative #1 is the only alternative that does not require acquisition of any private property and therefore receives the highest score.	1	4.0	1	4.0	Alternative #2 requires purchasing approximately 0.35 acres of private property from 111 Bradford Road (located west of the existing tank site) to accommodate construction. This alternative receives a low score due to the unknowns and outcome as well as the likely substantial time of the negotiation process with the landowner that would be required. If the abutting landowner agrees to provide the land needed to construct Alternative #2 at no cost, this score can be increased.	1	4.0	Alternative #2A requires purchasing approximately 0.43 acres of private property from 111 Bradford Road (located west of the existing tank site) to accommodate construction. This alternative receives a low score due to the unknowns and outcome as well as the likely substantial time of the negotiation process with the landowner that would be required. If the abutting landowner agrees to provide the land needed to construct Alternative #2 at no cost, this score can be increased.	1	4.0	Alternative #3 requires purchasing 0.08 acres of private property from 44 Whitney Tavern Road and 52 Whitney Tavern Road (located east of the existing tank site) to accommodate construction of the proposed retaining wall and stormwater controls. This alternative receives a low score due to the unknowns and outcome as well as the likely substantial time of the negotiation process with the landowner that would be required, especially when considering that two separate purchase agreements with the property owners will be needed. If the abutting landowners agree to provide the land needed to construct Alternative #3 at no cost, this score can be increased.				
Proximity to Closest House	10	1	3.3	2	6.7	The new tank in Alternative #1 would be 150 feet from the residence at 111 Bradford Road and 390 feet from the closest residence on Whitney Tavern Road (#52). This alternative is closer to one than the other alternatives, however, unlike Alternative #3, a retaining wall is not required. This alternative receives a medium score.	2	6.7	3	10.0	The new tank in Alternative #2 would be 260 feet from the residence at 111 Bradford Road, 330 feet from the closest residence on Whitney Tavern Road (#52), and 370 feet from the closest residence on Overlook Drive (#22). This alternative is 100 feet closer to the closest residence on Spruce Hill Road than Alternative #1. With this alternative, the proposed tank is closer to one residence than the existing tank. Alternative #2 and Alternative #2A place the new tank farther from any one residence than is the case in Alternatives #1 and #3 and therefore receives the highest score.	3	10.0	The new tank in Alternative #2A would be 310 feet from the residence on 111 Bradford Road, 310 feet from the closest residence on Whitney Tavern Road (#52), and 340 feet from the closest residence on Overlook Drive (#22). This alternative is 110 feet closer to the closest residence on Spruce Hill Road than Alternative #1. With this alternative, the proposed tank is closer to one residence than the existing tank. Alternative #2 and Alternative #2A place the new tank farther from any one residence than is the case in Alternatives #1 and #3 and therefore receives the highest score.	1	3.3	The new tank in Alternative #3 would be approximately 380 feet from the residence at 111 Bradford Road, 170 feet from the residence at 52 Whitney Tavern Road, 330 feet from the residence at 50 Whitney Tavern Road, and 345 feet from the residence at 32 Overlook Drive. The retaining wall required to support the tank base would be located approximately 140 feet from the residence at 52 Whitney Tavern Road. In addition, retaining walls greater than 36" in height are considered a structure and must meet the Weston zoning setback requirement of 45 feet. A zoning variance would likely be required for the retaining wall which is subject to the affected property owner's approval (44 and 52 Whitney Tavern Road). Due to the proximity of both the tank and the retaining wall to nearby residences, Alternative #3 receives the lowest score.				

Criteria	Maximum Criterion Score	Alternative Site #1					Alternative Site #2					Alternative Site #2A			Alternative Site #3		
		Original Scoring (11/2023)		Updated Scoring (6/2024) ⁽¹⁾		Rationale	Original Scoring (11/2023)		Updated Scoring (6/2024) ⁽¹⁾		Rationale	Scoring (6/2024)		Rationale	Scoring (6/2024)		Rationale
		Initial Score (1 to 3)	Final Score	Initial Score (1 to 3)	Final Score		Initial Score (1 to 3)	Final Score	Initial Score (1 to 3)	Final Score		Initial Score (1 to 3)	Final Score		Initial Score (1 to 3)	Final Score	
Engineering Evaluation	34		29.3		33.7			11.7		20.0			13.3			17.3	
Site Access	4	2	2.7	3	4.0	An access road to the new tank exists but may need to be adjusted slightly to accommodate construction. A truck would likely be able to back into and pull out of the site without a turnaround. This alternative will require re-routing around the new tank to access the existing tank for demolition. Compared to the other alternatives, Alternative #1 is the most accessible and receives the highest score. This score is higher than the original scoring due to the inclusion of Alternative #3 which presents more serious access concerns than the other alternatives.	1	1.3	2	2.7	An access road to the new tank exists but grading will be needed to accommodate site access. Due to the length and grade of the access road, a truck turnaround would likely be needed near the new tank. This alternative will require re-routing around the new tank to access the existing tank for demolition. Regrading for the tank will result in a steep cliff east of the new tank which will complicate access to the old tank for demolition. This score is higher than the original scoring due to the inclusion of Alternative #3 which presents more serious access concerns than the other alternatives.	2	2.7	An access road partway to the new tank exists but grading between the existing access road and new tank location will be needed to accommodate site access. Due to the length and grade of the access road, a truck turnaround would likely be needed near the new tank. Alternative #2A is more accessible than Alternative #3 but less so than Alternative #1 and therefore receives a medium score.	1	1.3	An access road to the new tank exists but cannot accommodate equipment and trucks as-is due to the steep grade and lack of space for truck turnaround near the new tank. Therefore, multiple cranes would be needed to move equipment from the bottom of the slope to the top. Compared to other alternatives, Alternative #3 is the least accessible.
Potential Ledge Removal	8	2	5.3	3	8.0	Significant ledge removal will be required for the tank foundation, but it is estimated to be less than all other alternatives. Ledge removal will extend approximately 100 feet northwest of the Cat Rock overlook and approximately 200 feet north of the existing water main to the Cat Rock tank. Since Alternative #1 requires the least amount of ledge removal and at the farthest distance from critical infrastructure, it receives the highest score. This score is higher than the original scoring due to the inclusion of Alternative #3 which presents more serious ledge removal concerns than the other alternatives.	1	2.7	2	5.3	Significant ledge removal will be required for the tank foundation, but it is estimated to be less than Alternative #3. Ledge removal will extend approximately 110 feet west of the Cat Rock overlook and approximately 30 feet north of the existing water main to the Cat Rock tank. This score is higher than the original scoring due to the inclusion of Alternative #3 which presents more serious ledge removal concerns than the other alternatives.	1	2.7	Alternative #2A will require drilling and fracturing to remove ledge at a distance of less than 10 feet from the 78 year old water main and less than 20 feet from the existing tank. This location also pushes the project into an area with more abundant bedrock outcrops than the other alternatives. Due to the added risk and required caution that must be exercised to perform ledge removal for this alternative, it receives the lowest score. When comparing Alternatives #1 and #2 to Alternative #2A, their scores are increased due to the lesser risk they pose to the existing water transmission main and tank.	2	5.3	It is estimated that Alternative #3 will require the most ledge removal due to construction of the retaining wall southeast of the proposed tank location. Ledge removal will cut into the peak of Cat Rock.
Cut and Fill Site Work	8	3	8.0	3	8.0	This alternative requires significant cutting and filling sitework but less than Alternatives #2 and #2A.	1	2.7	1	2.7	This alternative requires significant cutting and filling to level the tank base area though slightly less than Alternative #2A.	1	2.7	This alternative requires the most cutting and filling sitework to level the tank base area, requiring a significant amount of imported fill.	2	5.3	This alternative will require slightly more cut and fill as Alternative #1. More cut will be required on Cat Rock and fill will be required to the east for the retaining wall and west of the tank to stabilize crane staging.
Tank/Pedestal Height	1	2	0.7	2	0.7	The tank pedestal height may be approximately 2 feet taller than Alternative #2 but this will negligible impact on constructability, appearance, or cost.	2	0.7	2	0.7	The tank pedestal height may be approximately 2 feet lower than Alternative #1 but this will have negligible impact on constructability, appearance, or cost.	2	0.7	The tank pedestal height may be approximately 1 foot lower than Alternative #1 but this will have negligible impact on constructability, appearance, or cost.	3	1.0	The tank pedestal height may be approximately 16 feet lower than the other alternatives.
Impacts to Infrastructure	1	2	0.7	3	1.0	Increases water main and electrical wiring from Bradford Road by 340 feet, which is less than all other alternatives.	1	0.3	2	0.7	Increases water main and electrical wiring from Bradford Road by 520 feet. Since this is less than Alternative #3, its score increases relative to Alternative #3.	2	0.7	Increases water main and electrical wiring from Bradford Road by 570 feet.	1	0.3	Increases water main and electrical wiring from Bradford Road by 620 feet.
Constructability	12	3	12.0	3	12.0	Construction of all the alternatives will be challenged by the tight site with steep slopes and may require use of Bradford Road cul-de-sac for equipment laydown. This alternative is the farthest away from critical infrastructure including the existing tank and water main which must remain online to continue providing water to the community. The site layout for Alternative #1 will provide the most flexibility for the contractor and it presents fewer constraints and safety concerns than the other alternatives. Therefore, it receives the highest score.	1	4.0	2	8.0	Construction of all the alternatives will be challenged by the tight site with steep slopes and may require use of Bradford Road cul-de-sac for equipment laydown. The site layout for Alternative #2 presents steeper grades requiring more regrading than Alternative #1 and is not possible without acquisition of private property. Alternative #2 presents more site constraints than Alternative #1 but less than Alternatives #2A and #3 and therefore receives a medium score.	1	4.0	Construction of all the alternatives will be challenged by the tight site with steep slopes and may require use of Bradford Road cul-de-sac for equipment laydown. Alternative #2A presents increased risk associated with the proposed 1:1 slope adjacent to the existing tank which is not maintainable, performing ledge removal within 10-20 feet of the 78 year old water main that connects the existing tank to the distribution system, and staging equipment/materials up against the existing tank. Due to these site constraints, safety issues, and potential impacts to critical infrastructure, Alternative #2A receives the lowest score.	1	4.0	The retaining wall required for Alternative #3 presents numerous constructability concerns including that it will require a global stability analysis to determine wall type and location, it will need to be constructed on what is currently private property requiring an easement or property acquisition. Constructability concerns associated with the tank include the lack of space to set a large crane near the tank without significant filling to stabilize the area and a crawler crane cannot access all sides of the tank due to proximity to the existing tank. Of significant concern to tank manufacturers is the liability and safety issues associated with conducting construction activities in very close proximity to the existing tank. For these reasons, this alternative receives the lowest score.
Cost	6		6.0		6.0			2.0		4.0			4.0			2.0	
Opinion of Probable Construction Cost ⁽²⁾	6	3	6.0	3	6.0	The estimated construction costs for Alternative #1 are \$8,250,000, which is the lowest cost of all the alternatives.	1	2.0	2	4.0	The estimated construction costs for Alternative #2 are \$8,910,000 which is more than Alternative #1 and less than Alternative #3.	2	4.0	The estimated construction costs for Alternative #2A are \$9,150,000 which is more than Alternatives #1 and #2 and less than Alternative #3. Risk is the primary factor considered by tank manufacturers when costing a project. Alternative Site #2A presents greater risk due to the close proximity of the proposed laydown area to the existing tank, the constricted area allotted around the tank for construction, and steep grades as compared to Alternative Site #1.	1	2.0	The estimated construction costs for Alternative #3 are \$9,630,000, which is higher than all other alternatives. This alternative will incur cost premiums for the retaining wall, ledge removal in close proximity to the existing tank and water main, multiple cranes and/or small equipment to move materials up the steep grade from Bradford Road to the tank site, and more man hours due to the site constraints, increased duration, and safety precautions.
Total Score	100	63.3		75.0			47.0		67.3			60.7			39.3		

Notes:

1. Updated scores take into consideration Alternatives #2A and #3 which were not evaluated as part of the 11/2023 Tank Site Alternatives Analysis Report. Since the alternative sites are scored as compared to one another, inclusion of additional alternative sites may change the original scoring.

2. The Opinion of Probable Construction Costs are based on June 2024 costs (ENR Construction Cost Index 13546.80) but include a 15% inflation contingency assuming construction starts in fiscal year 2026.

Table A-3
Doublet Hill
Site Alternatives Matrix and Scoring
Updated June 2024 to include Alternative #2A
Explanation of Scoring System:

This evaluation uses a scoring system to compare the tank siting alternatives based on 13 criteria, which vary in their importance to the project.

- Each criterion is assigned a "Maximum Criterion Score". The greater the Maximum Criterion Score, the more impact that criterion has on the feasibility and favorability of the project. The sum of the Maximum Criterion Score for all of the criteria is 100.
- Each alternative site is scored in comparison against the other alternative sites for that tank using "Initial Scores". Initial Scores range from 1 to 3, 1 being the worst and 3 being the best.
- The Initial Score is then weighted based on the Maximum Criterion Score in each criterion. An Initial Score of 3 is given the full weight of the Maximum Criterion Score, an Initial Score of 2 is given 2/3rd weight of the Maximum Criterion Score, and an Initial Score of 1 is given 1/3rd weight of the Maximum Criterion Score. This weighting becomes the "Final Score" that the alternative receives in one criterion.
- The Final Scores from each criterion are added together to calculate the "Total Score". The Total Score is out of 100 with the highest Total Score indicating the most advantageous site as compared to the other alternatives. The alternative site with the highest Total Score is the one that is recommended for construction.

- Alternative #2A was added to this evaluation in June 2024. Initial Scores are based on how much better or worse an alternative site is compared to the other alternative sites. Therefore, the inclusion of more alternatives changes the Initial Scores. These changes are described in the matrix below.

Criteria	Maximum Criterion Score	Alternative Site #1					Alternative Site #2					Alternative Site #2A		Alternative Site #3					
		Original Scoring (11/2023)		Updated Scoring (6/2024) ⁽¹⁾		Rationale	Original Scoring (11/2023)		Updated Scoring (6/2024) ⁽¹⁾		Rationale	Scoring (6/2024)		Rationale	Initial Score (1 to 3)	Final Score	Updated Scoring (6/2024) ⁽¹⁾		Rationale
		Initial Score (1 to 3)	Final Score	Initial Score (1 to 3)	Final Score		Initial Score (1 to 3)	Final Score	Initial Score (1 to 3)	Final Score		Initial Score (1 to 3)	Final Score						
Impacts to Preserved Land	38		12.7		12.7			30.0		25.3			25.3			25.3		25.3	
Area of Article 97 Land Change-in-Use	18	1	6.0	1	6.0	Approximately 1.6 acres of Article 97 conservation land would be changed to water supply land.	2	12.0	2	12.0	Approximately 1.5 acres of Article 97 conservation land would be changed to water supply land.	2	12.0	Approximately 1.5 acres of Article 97 conservation land would be changed to water supply land.	2	12.0	2	12.0	Approximately 1.5 acres of Article 97 conservation land would be changed to water supply land.
Proximity to Significant Landscape Features	6	1	2.0	1	2.0	The new tank would be approximately 100 feet northwest of the Doublet Hill peaks.	3	6.0	2	4.0	The new tank would be approximately 180 feet northwest of the Doublet Hill peaks. These impacts are farther from those in Alternatives #1 and #3, but closer than Alternative #2A. Therefore, the score for Alternative #2 decreases in comparison to Alternative #2A.	3	6.0	The new tank would be approximately 230 feet north of the Doublet Hill peaks, which is farther away than all other alternatives.	2	4.0	2	4.0	The new tank would be approximately 150 feet northwest of the Doublet Hill peaks.
Tree Clearing	8	1	2.7	1	2.7	Requires the most clearing compared to other alternatives. Potential for reforestation north and northwest of the new tank.	3	8.0	2	5.3	Significant clearing required but less than Alternative #1. Potential for reforestation north and east of the new tank.	2	5.3	Significant clearing required but less than Alternative #1. Potential for reforestation west of the new tank.	2	5.3	2	5.3	Significant clearing required but less than Alternative #1. Some tree clearing will be on private property and impact screening between the new tank and 75 Doublet Hill Road. Potential for reforestation northeast of the new tank.
Impacts to Contiguous Open Space Affecting Wildlife and Hikers	6	1	2.0	1	2.0	This alternative is located deeper in the forested conservation area than Alternatives #2 and #3.	2	4.0	2	4.0	This alternative is closer to the roadway and developed land than Alternative #1 but similar to Alternative #3.	1	2.0	This alternative is located deeper in the forested conservation area than Alternatives #2 and #3.	2	4.0	2	4.0	This alternative is closer to the roadway and developed land than Alternative #1 but similar to Alternative #3.
Impacts to Abutters	22		22.0		22.0			18.7		18.7			18.7			7.3		7.3	
Requires Acquisition of Private Property	12	3	12.0	3	12.0	This alternative does not require purchasing any private property.	3	12.0	3	12.0	This alternative does not require purchasing any private property.	3	12.0	This alternative does not require purchasing any private property.	1	4.0	1	4.0	This alternative requires purchasing approximately 0.1 acres of private property southeast of the existing tank site to accommodate construction.
Proximity to Closest House	10	3	10.0	3	10.0	350 feet from 80 Doublet Hill Road. With this alternative, the proposed tank is farther from residences than the existing tank and the other alternative sites.	2	6.7	2	6.7	270 feet from 80 Doublet Hill Road. With this alternative, the proposed tank is farther from residences than the existing tank.	2	6.7	300 feet from 80 Doublet Hill Road. With this alternative, the proposed tank is farther from residences than the existing tank.	1	3.3	1	3.3	220 feet from 75 Doublet Hill Road. With this alternative, the proposed tank is slightly farther away from this residence than the existing tank but closer than the other alternatives.
Engineering Evaluation	34		18.7		18.7			33.3		30.3			33.0			16.0		13.3	
Site Access	4	1	1.3	1	1.3	The new access road would be long and steep, requiring a lot of filling and grading.	3	4.0	3	4.0	The new access road would be shorter and flatter than Alternatives #1 and #3.	3	4.0	The new access road would be shorter and flatter than Alternatives #1 and #3.	2	2.7	2	2.7	The new access road would be long and steep but less so than Alternative #1, requiring a lot of filling and grading.
Potential Ledge Removal	8	2	5.3	2	5.3	Significant amount of ledge removal required but less than Alternative #3.	3	8.0	2	5.3	Significant amount of ledge removal required but slightly less than Alternative #1. Alternative #2 score decreases in comparison to Alternative #2A which requires approximately 1/3rd the amount of ledge removal.	3	8.0	Requires the least amount of ledge removal.	1	2.7	1	2.7	Requires approximately twice as much ledge removal as Alternative #1, 3 times as much as Alternative #2, and 8 times as much as Alternative #2A.
Cut and Fill Site Work	8	1	2.7	1	2.7	Requires the most cutting and filling sitework. A significant amount of imported fill will be needed.	3	8.0	3	8.0	Requires approximately half as much cutting and filling sitework than Alternatives #1 and #3 but slightly more than Alternative #2A. Cut and fill quantities balances such that minimal imported fill would be needed.	3	8.0	Requires the least amount of cutting and filling sitework. More fill than cut sitework will require that imported fill material be brought to site.	2	5.3	1	2.7	Significant amount of cutting and filling sitework required, but slightly less than Alternative #1. A significant amount of off-site disposal of excess cut materials will be needed. This alternative requires approximately 3 times as much cut and fill sitework as Alternative #2A. Therefore, the score for Alternative #3 decreases in comparison to Alternative #2A.
Tank/Pedestal Height	1	3	1.0	3	1.0	Tank pedestal would be approximately 4 feet shorter than Alternative #3 and 12 feet shorter than Alternative #2.	1	0.3	1	0.3	Tank pedestal would be approximately 8 feet shorter than Alternative #3 and 12 feet shorter than Alternative #1.	1	0.3	Tank pedestal would be approximately 8 feet shorter than Alternative #3 and 12 feet shorter than Alternative #1.	2	0.7	2	0.7	Second tallest tank.
Impacts to Infrastructure	1	1	0.3	1	0.3	Increases water main and electrical wiring by 410 feet.	3	1.0	2	0.7	Increases water main and electrical wiring by 330 feet.	2	0.7	Increases water main and electrical wiring by 360 feet.	2	0.7	2	0.7	Increases water main and electrical wiring by 370 feet.
Constructability	12	2	8.0	2	8.0	Steep grade will complicate construction and restoration.	3	12.0	3	12.0	The relatively level area presents fewer challenges than the other alternatives.	3	12.0	The relatively level area presents fewer challenges than the other alternatives.	1	4.0	1	4.0	Steep grade will complicate construction and restoration. Requires acquisition of private property.
Cost	6		4.0		4.0			6.0		6.0			6.0			2.0		2.0	
Opinion of Probable Construction Cost ⁽²⁾	6	2	4.0	2	4.0	The estimated construction costs for Alternative #1 are \$8,970,000, which is more than Alternatives #2 and #2A but less than Alternative #3.	3	6.0	3	6.0	The estimated construction costs for Alternative #2 are \$8,500,000, which is less than Alternatives #1 and #3 and slightly more than Alternative #2A.	3	6.0	The estimated construction costs for Alternative #2A are \$8,200,000, which is the lowest cost of all the alternatives.	1	2.0	1	2.0	The estimated construction cost for Alternative #3 is \$9,500,000, which is more expensive than all other alternatives.
Total Score	100	57.3		57.3			88.0		80.3			83.0			50.7		48.0		

Notes:

1. Updated scores take into consideration Alternative #2A which was not evaluated as part of the 11/2023 Tank Site Alternatives Analysis Report. Since the alternative sites are scored as compared to one another, inclusion of additional alternative sites may change the original scoring.

2. The Opinion of Probable Construction Costs are based on June 2024 costs (ENR Construction Cost Index 13546.80) but include a 15% inflation contingency assuming construction starts in fiscal year 2026.



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