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REPORT

June 2017

TOWN OF
Lancaster
MASSACHUSETTS

Water Supply and Wastewater Assessment for EDTA

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1.0 INTRODUCTION

The Town of Lancaster has established an Economic Development Target Area (EDTA) in the northern portion of the town along State Route 2 and the Lunenburg road to encourage expanded commercial and residential land uses in the area (Figure 1). This report addresses, at a planning level, water supply and wastewater infrastructure issues that pertain to increased development in the EDTA. Alternatives for water supply and wastewater treatment, including extension of services from surrounding areas, are evaluated. The nature and location of existing infrastructure, watershed characteristics and permitting requirements for new or expanded infrastructure are considered as part of the alternatives analysis.

The water supply evaluation in Sections 2 and 3 begins with a description of future water needs and the project area, including regulatory issues associated with developing a new source of supply. Section 3 describes water supply alternatives, and after a preliminary screening, discusses both development of a new local supply and connecting to an existing system in a neighboring town (Lunenburg).

The wastewater treatment and disposal discussion in Section 4 identifies the likely level of wastewater generation and evaluates options for collection, treatment and disposal. After a comparative screening of alternatives, the discussion compares local treatment and disposal to collection and transportation of wastewater to a treatment plant in a neighboring town (Leominster).

Study goals were to:

- outline the Economic Development Target Area water supply and wastewater disposal needs,
- evaluate hydrogeologic conditions for potential water supply and wastewater disposal,
- describe water and wastewater infrastructure within and outside the Town boundaries, and
- discuss water supply and wastewater treatment opportunities at a planning level.

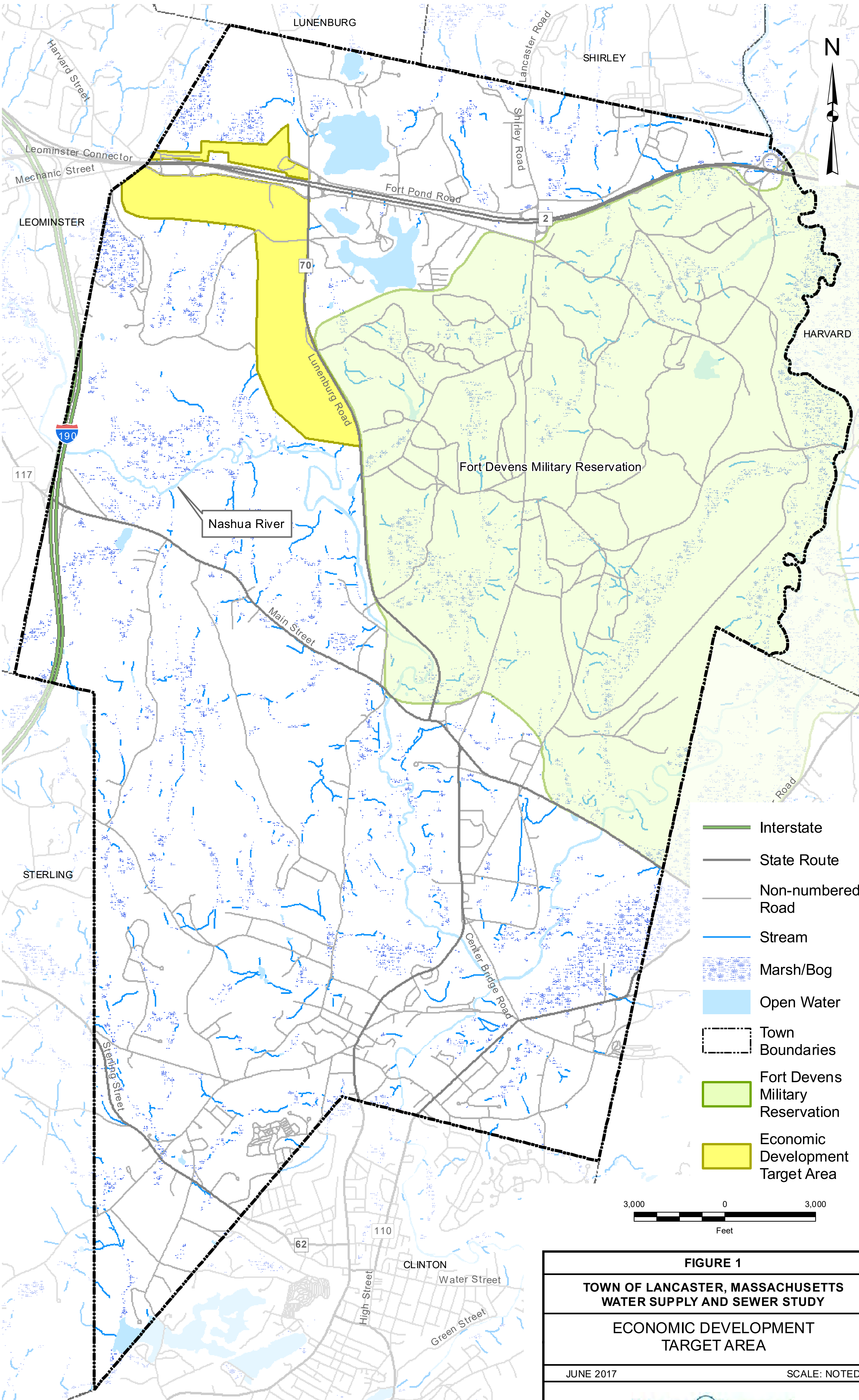

FIGURE 1

TOWN OF LANCASTER, MASSACHUSETTS
WATER SUPPLY AND SEWER STUDY

ECONOMIC DEVELOPMENT TARGET AREA

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2.0 WATER SUPPLY ASSESSMENT

This Water Source Assessment focuses on additional pubic water supplies needed to serve portions of the North Lancaster Economic Development Target Area EDTA (Figure 1). Supplemental supplies will facilitate commercial development in the Target Area, but the area will need infrastructure to handle water demands and wastewater discharge. Two general water supply alternatives are evaluated: 1) new groundwater sources within the Town of Lancaster and 2) supplemental supplies provided by adjacent public water suppliers. These alternatives are evaluated based on adequacy, timing, technical issues (including operational considerations), cost and feasibility (including permitting issues). Because public water supplies must be protected from potential sources of contamination, the implication of various wastewater treatment and disposal alternatives discussed in a subsequent section are also considered.

Supplemental supplies from adjacent public water suppliers were discussed by the Town of Lancaster in an Integrated Water Resources Management Plan dated 2007. That Plan investigated the use of public supplies from surrounding towns to meet increases in future water demand, including the northern portion of Lancaster. However, the 2007 Plan was prepared prior to adoption of new permitting regulations for public water supply under the Massachusetts Water Management Act enacted in 2014. The new regulations are enforced by the state Department of Environmental Protection and affect both supplies within the Town of Lancaster as well as existing supplies[1] that are increased to provide service within the Target Area. Regulatory issues are discussed in Section 2.2 below.

2.1 Project Area

The Project Area is located in the northern portion of the Town of Lancaster (Figure 1) and includes the Economic Development Target Area and the area south to the Nashua River. The EDTA comprises privately owned land (Figure 2). Much of the land between the EDTA and the Nashua River is publicly owned and designated an Area of Critical Environmental Concern.

Existing public water supply service areas near the EDTA, but outside the Town, are considered because of the potential to supply the EDTA. In the north-eastern portion of the town is Fort Devens, a military base which occupies a portion of northeast Lancaster. Water source development is precluded on the military use portion of Fort Devens. However, to the northeast of Lancaster is Devens, a former portion of the military base now comprising an economic development zone with a public water supply. Adjacent towns with public water supply systems include Lunenburg, Shirley, Leominster and Clinton.

2.2 Regulatory Issues

Public water suppliers must conform to rules that apply to their sources, and their distribution and storage systems. Regulations applying to new or increased supply needed to serve the EDTA can include mitigation of increased withdrawals from groundwater and protection of public water supply source areas. Onsite wells serving individual commercial or industrial uses may qualify as public water supplies and need to follow state regulations. These regulations pertain to both the location and amount

[1] Existing public and transient public water suppliers such as Kimball Farms and Nationwide Auto Recycling

of groundwater extraction, exposure to potential contamination sources, and distance from wastewater disposal systems.

Water Management Act permitting requires that new groundwater sources and/or increases in groundwater withdrawals from existing sources be evaluated for impact on streamflow.[2] New withdrawals are subject to mitigation based on the level of impact. In order to evaluate the impact of groundwater withdrawals, biological categories (BC) and groundwater withdrawal categories (GWC) (Figure 2) were established through the Sustainable Water Management Initiative (SWMI) process. The groundwater withdrawal categories in the Town of Lancaster are shown in Figure 3. The Massachusetts Water Indicators (MWI) are based on 1400-scale subbasins. Impacts to streamflow in each basin ae based on a percentage of estimated natural summer low flow.

In both BC and GWC, 5 categories or ratings were established to reflect existing conditions within each of the subbasins. The five Biological Categories (1 = least impacted to 5 = most impacted) used fish habitat data as a surrogate for aquatic health[3]. The five Groundwater Withdrawal Categories (1 = least withdrawals to 5 = most withdrawals) compare withdrawals to estimated natural stream flow in undeveloped conditions. Seasonal Groundwater Withdrawal Categories are based on a comparison of withdrawals to estimated natural flow for five "bioperiods" of the year. The upper boundaries of each category (both BC and GWC) are the Streamflow Criteria for that category. The new permitting guidelines increase the level of mitigation if proposed water withdrawals are shown to increase impacts and the score or level of an existing Biological Category or Groundwater Withdrawal Category. The categories of each of the subbasins within the Town of Lancaster are shown in Table 1.

Table 1 Subbasin Categories within the Town of Lancaster[4]

WMA Classification			Withdrawal that Would Trigger Change in Classification (mgd)	
WMA Subbasin	Biological Category	Groundwater Withdrawal Category	Biological Category	Groundwater Withdrawal Category
11001	4	3	5.19	3.25
11019	4	2	8.26	0.45
11022	4	2	2.04	1.14
11023	5	4	0.00	0.62
11048	4	2	2.43	1.20
11050	5	4	0.00	0.47
11051	4	3	8.04	9.05

[2] DEP. 2014. *Water Management Act Permit Guidance Document*. Massachusetts Department of Environmental Protection. November 7, 2014
[3] As shown in Table 1, the Subbasins within Lancaster are all classified within the 4 or 5 catagories.
[4] Source: Water Management Act Permitting Tool.

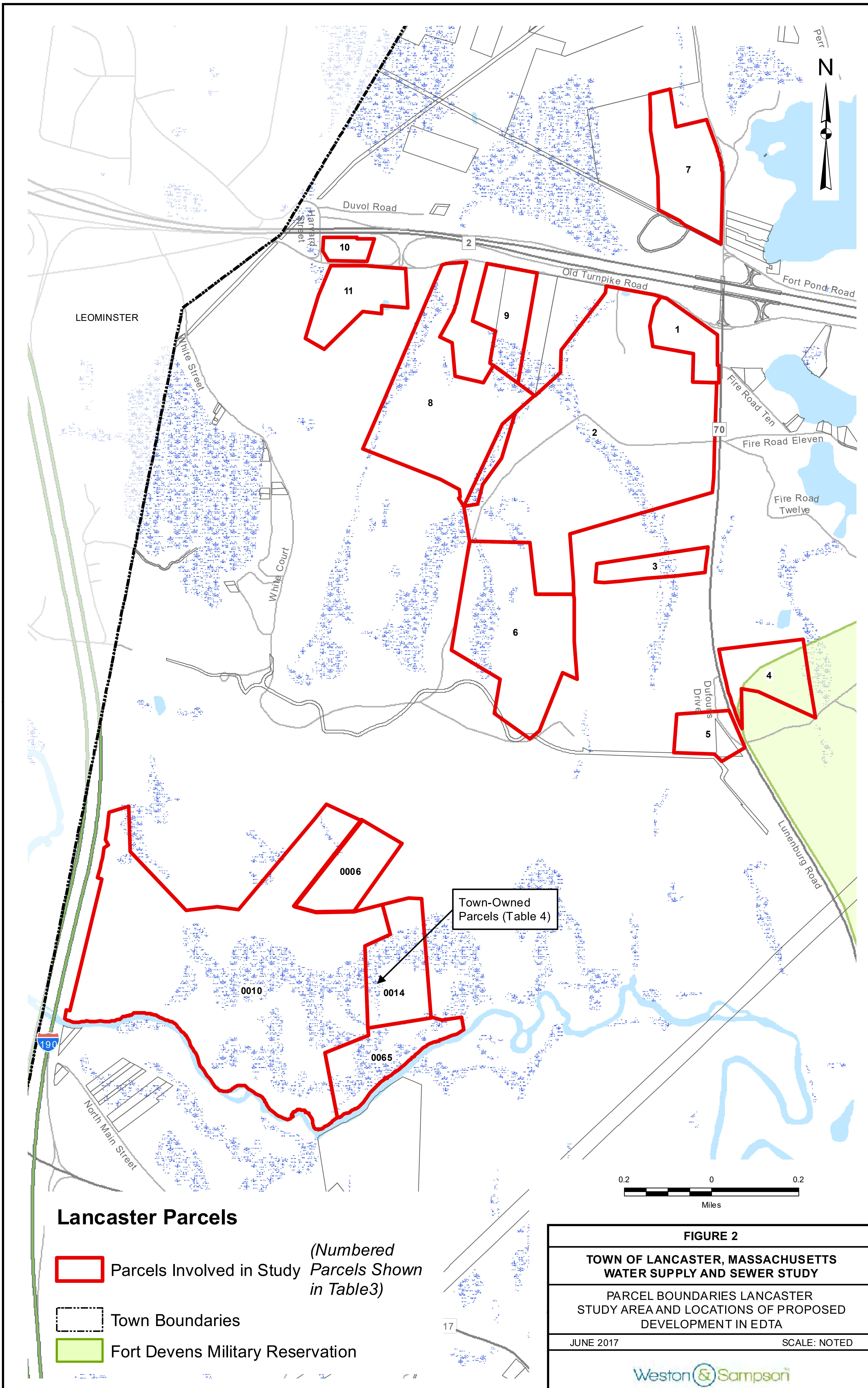

FIGURE 2

TOWN OF LANCASTER, MASSACHUSETTS
WATER SUPPLY AND SEWER STUDY

PARCEL BOUNDARIES LANCASTER STUDY AREA AND LOCATIONS OF PROPOSED DEVELOPMENT IN EDTA

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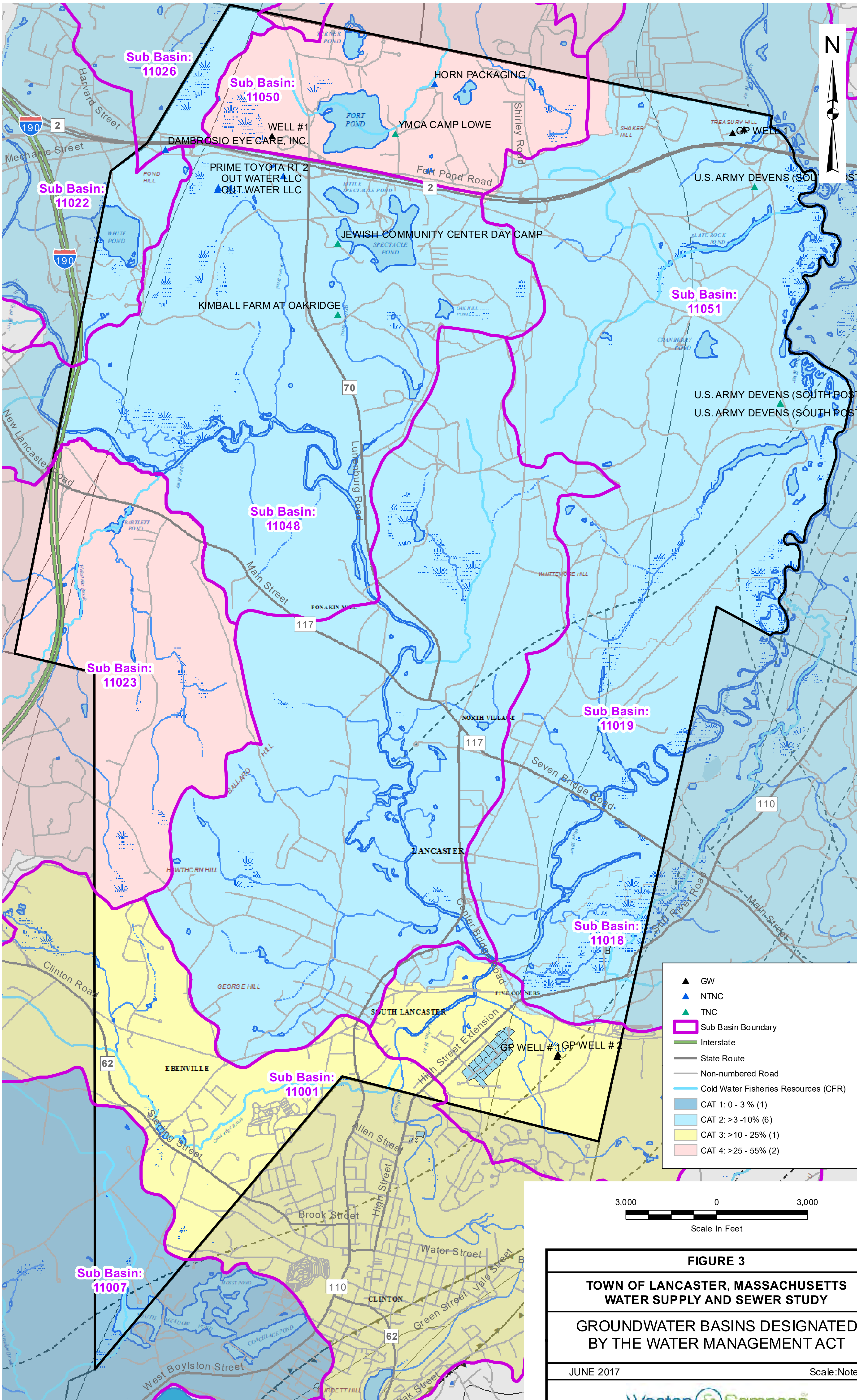

FIGURE 3

TOWN OF LANCASTER, MASSACHUSETTS
WATER SUPPLY AND SEWER STUDY

GROUNDWATER BASINS DESIGNATED BY THE WATER MANAGEMENT ACT

JUNE 2017 Scale:Noted

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Based on existing conditions, the Massachusetts Department of Environmental Protection (DEP) provides a calculation for each subbasin that indicates the amount of water that could be withdrawn without changing the Biological Category and the Groundwater Withdrawal Category. These available withdrawal volumes include consideration of currently registered and permitted withdrawals but do not include private wells. Table 1 shows the amounts within each subbasin that currently could be withdrawn without changing the classification category in the biological category and the groundwater withdrawal category. The area north of the Nashua River is within subbasin 11048 and the area near Fort Pond (north of Rte.2 and in southern Lunenburg) is within subbasin 11050. Therefore, the area north of the Nashua River may be developed for up to 1.2 MGD of withdrawals without changing either Biological or Groundwater Category. However, the area near Fort Pond is in a subbasin that is in a Biological Category 5 and would therefore may require extensive mitigation before additional withdrawals could be permitted.

In order to protect public source water quality, the State defines zones around public water supply wells in which certain activities are controlled or prohibited. In particular, significant waste discharge in an area defined as within the Zone II of a potential new public water supply would disqualify that site unless it can be demonstrated that travel times from the disposal area to the well are sufficient to allow attenuation of potential contaminants.[5]

[5] 310 CMR 22.21(2) Wellhead Protection Zoning and Non-zoning Controls

3.0 WATER SUPPLY ANALYSIS

3.1 Existing Service Areas and Supplies

Currently the southern portion of the Town is served by an existing distribution system supplied by two wells (Figure 4). An interconnection with the Town of Clinton provides water to a small area within Lancaster and serves as a backup supply (Table 2). Water to the northern portion of Lancaster including the EDTA is primarily through individual wells; however, two properties along Rte.2 and within the EDTA are served by the City of Leominster. Several properties along the Shirley Road and Fort Pond Road, but outside the EDTA, are served by the Shirley Water District (Figure 5).

The existing Lancaster water distribution system serves only that portion of the town south of the Nashua River. The water main near the intersection of Rte. 70 (Lunenburg Road) and 117 (Main Street) is shown as 8 inches in diameter and is part of a looped element connected to two storage tanks at George Hill and 2 supply wells located in the southeast portion of the town (Figure 4). Lancaster is in the process of permitting 2 additional wells in the southeastern portion of the town.

As summarized in Table 2, several surrounding communities are served by public water supplies. The Lunenburg Water District and Shirley Water District are currently served by groundwater supplies while the City of Leominster and Town of Clinton currently rely on surface water supply sources. These water supply systems serving these towns are the most proximate to Lancaster. Managers of the Shirley Water District, the Lunenburg Water District and the Town of Clinton Water Department have each recently expressed interest in possibly providing additional service to areas of Lancaster. These alternative water sources are discussed in Section 3.4.3 below.

Table 2. Neighboring Water Supply Service Areas

	Sources	Sources Capacity	Treatment	Storage	Interconnection	Interconnection Status*	Current Use	Distribution to EDTA
Lancaster	2 Wells	1.4 mgd		2 Tanks 1MG, 2 MG	Southern portion of Town	N/A	0.74 mgd	Requires new main along Hwy 70 & Distribution
Clinton	MWRA	2.2 mgd	1 plant 4 mgd Current 2 mgd	3 tanks 1, 5, 1.5, 1.0 mg	Existing	Limited service to Lancaster	700 MGY	Requires new main along Hwy 70 & Distribution
Devens	3 Wells	4.75 mgd	1 plant at each well	2 tanks 1.0 mg each	Shirley, Ayer	Ayer, Shirley MCI Facility	1.0 mgd (avg)	Requires upgraded connection to Shirley
Leominster	3 wells. 4 reservoirs, Backup with Wachusett	4 mgd	4 Plants 7.7 mgd; 1 Emergency Plant	4 tanks 0.75, 1,1, 3 mg	Existing	Limited service to Lancaster	3.8 mgd (avg)	Requires upgraded connection & Distribution

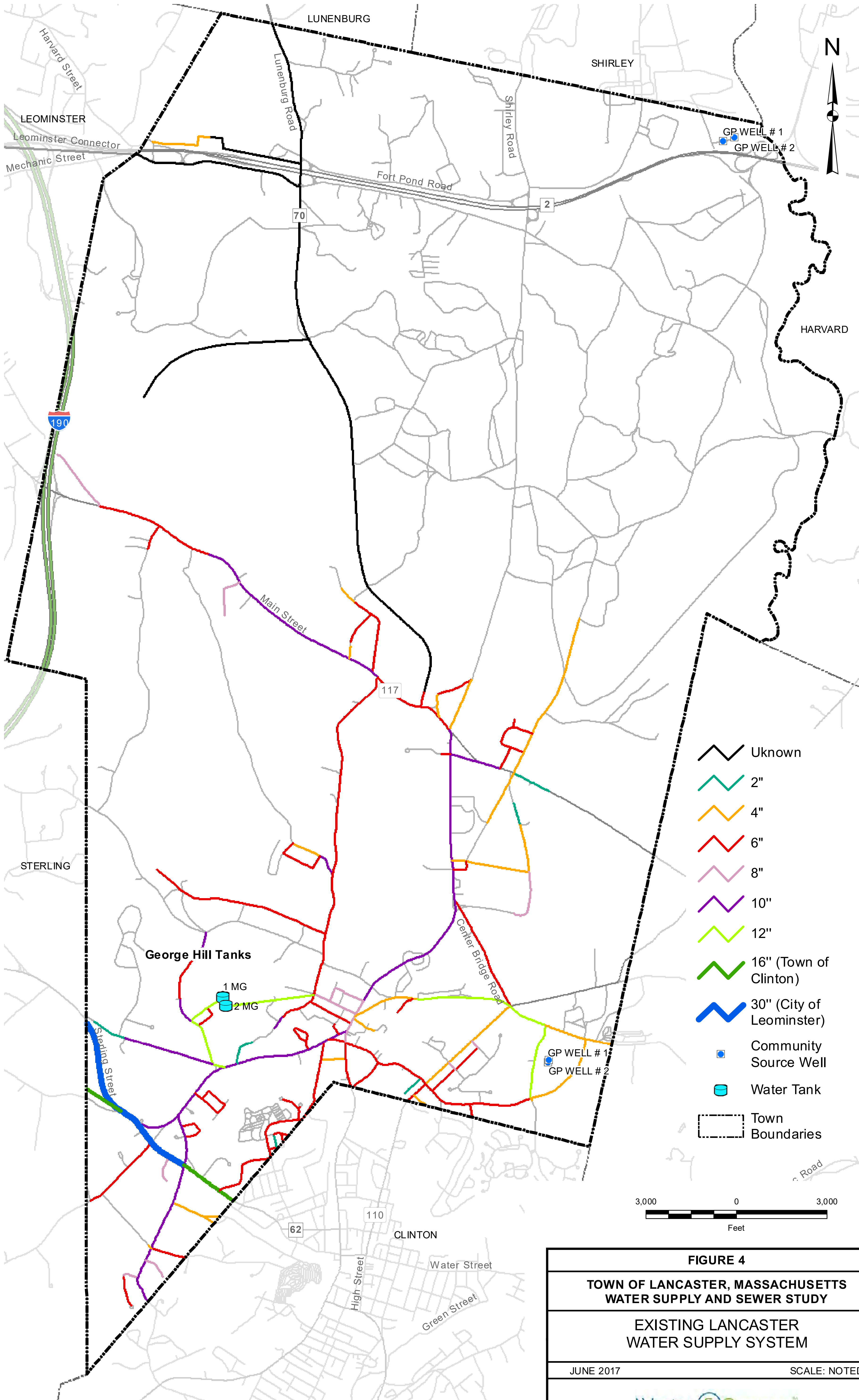

FIGURE 4

TOWN OF LANCASTER, MASSACHUSETTS
WATER SUPPLY AND SEWER STUDY

EXISTING LANCASTER
WATER SUPPLY SYSTEM

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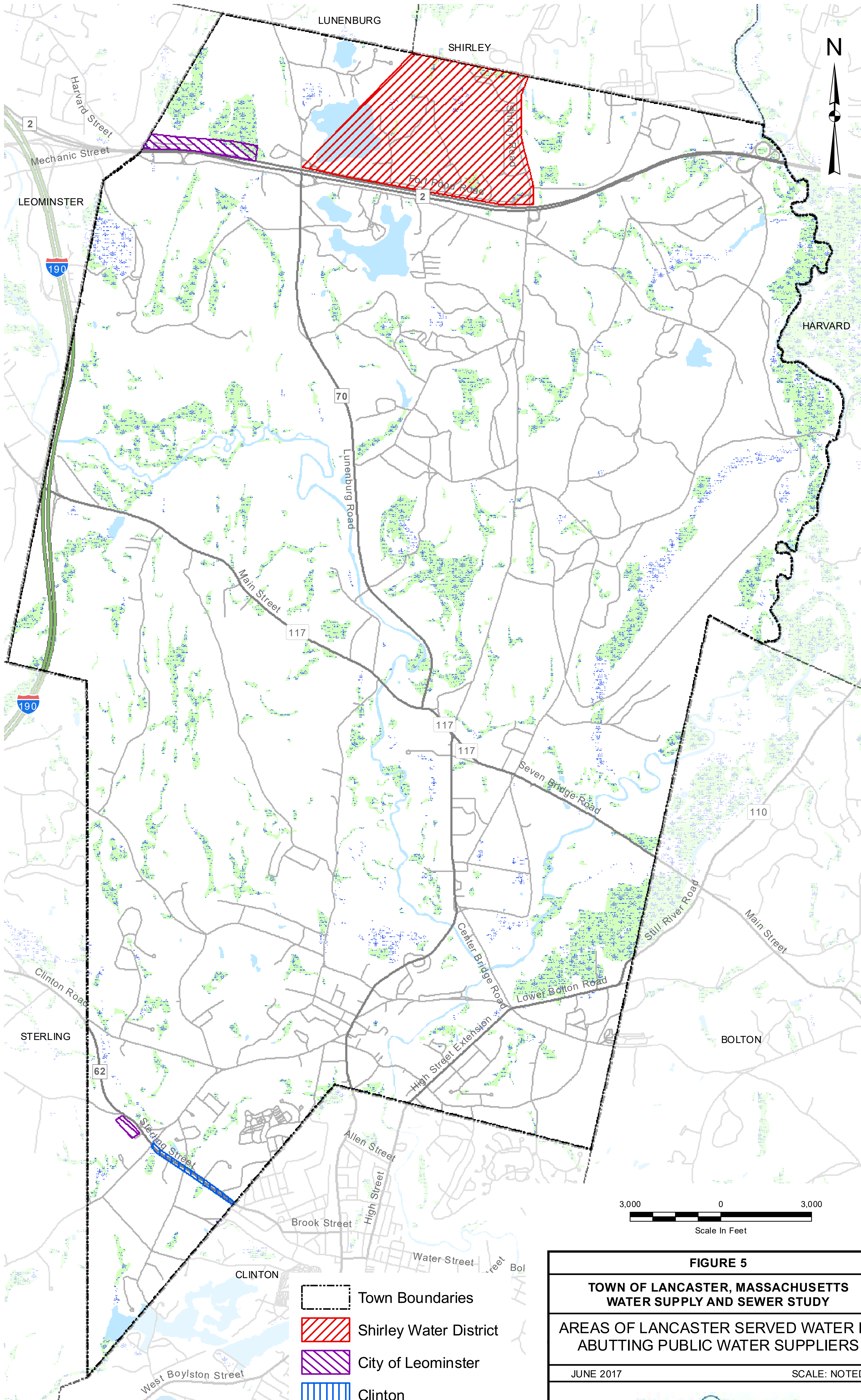

FIGURE 5

TOWN OF LANCASTER, MASSACHUSETTS
WATER SUPPLY AND SEWER STUDY

AREAS OF LANCASTER SERVED WATER BY ABUTTING PUBLIC WATER SUPPLIERS

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Lunenburg Water District	4 wells (3 In use) New Well in permitting	0.54 mgd	I Plant	2 tanks 2.8, 0.5 mg	None, agreement in discussion	Service under discussion	0.55 mgd (avg)	Requires new main down Lunenburg Rd. & Distribution
Shirley Water District	3 wells: New well in permitting	1.39 mgd	3 Plants 1.58 mgd	0.75 MG Tank in Lancaster	Existing	Limited service along Shirley Road and Fort Pond Road	0.41 mgd (avg)	Requires new main along Rte. 2 & Distribution
Ayer	5 wells	4.94 mgd	2 plants	1 tank active 1.5 MG	Devens	Uses Devens as backup	1.26 mgd (avg)	Through Shirley system

*Clinton interconnection serves a portion of Sterling St. Residences;
Leominster interconnection serves 2 facilities along Rte. 2 in Lancaster;
Lunenburg sources capacity shown is WMA Authorized Volume (2016 ASR)
Shirley Water District interconnection services an area east of Fort Pond and north of Rte. 2

3.2 Future Water Demand (North Lancaster Economic Zone)

As part of its development of plans for the EDTA, Lancaster has identified several future developments and has estimated future water needs for the EDTA (Table 3). New demand would occur in two subbasins: 11048 and 11050 as shown on Figure 2. As shown in Table 3, demand is expected to increase over the course of 3 to 4 years.

Table 3. Estimated Demand within the Lancaster EDTA[6]

Business / Location (Map #)	Use	Demand (GPD)	Year	Employee Count
Prime Motor Group / Old Union Trnpk. (1)	Auto Dealership	1,100	2018	55
MYSA / Old Union Trnpk. (2)	Soccer Complex	120	2018	30
Clear Summit / Lunenburg Rd. (3)	Wood Waste Recycle	2,000	2018	10
Kimball Farm / Lunenburg Rd. (4)	Restaurant/Retail Store	6,000	2018	100+ Seasonal
Nationwide Auto / Lunenburg Rd. (5)	Auto Parts Recycling	50	2018	15
McGovern Place / Lunenburg Rd. (6)	Mixed-use Development	130,750	2020	90
RHO Property / Lunenburg Rd. (7)	Residential	9,780	2019	0
J.C. Madigan / Old Union Trnpk. (8)	Truck Customization	9,865	2020	55
Bouchard Automotive / Old Union Trnpk. (9)	Auto Dealership	9,865	2020	75
D'Ambrosio Eye Care / Old Union Trnpk. (10)	Medical Facility	830	2018	60
Lancaster Tech Park / Old Union Trnpk. (11)	Mixed-use Development	92,400	2018	100+
Total GPD		262,760		

Parcel Locations are shown on Figure 2

3.3 Water Supply Alternatives

Based on the nature of existing water supplies, both within the EDTA and in surrounding areas, a range of water supply alternatives were considered. Based on the water needs and locations of identified

[6] Source Lancaster Community Development and Planning

water uses, three alternatives were evaluated for providing supply to the EDTA:

Alternative 1 – Individual Supplies
Alternative 2 – Public Groundwater Supply within Lancaster
Alternative 3 – Interconnection with a neighboring services area

These alternatives were subject to screening criteria that included suitability, availability and cost.

3.4 Screening of Alternatives

This section provides a screening of the water supply alternatives discussed above and analyzes their potential effectiveness in addressing water supply needs within the project area.

3.4.1 Alternative 1, Individual Supplies

The expanded use of individual supplies and development of small public water supply systems is one alternative to provide the demand needed to supply the water needs of the EDTA. If the project area were to be built out, additional supplies would be required to be developed and permitted (depending on the use) on the developed/redeveloped parcels. This alternative does not encourage growth within the region or supply fire flows, and it may prove problematic depending on the wastewater disposal employed. However, the town would have no long-term capital and operations/maintenance costs compared to the other alternatives. It should be noted that ground water sources supplying more than 25 persons for 60 days or more per year would require DEP approval as a Transient Public Water Supply System[7].

3.4.2 Alternative 2, Public Water Supply from Lancaster Area Sources

Based on a preliminary assessment of hydrogeologic conditions, sufficient groundwater resources may be available in within the Town of Lancaster to support development of a public water supply to serve the EDTA. Public water supplies operated and maintained under municipal guidance by licensed operators can provide a benefit to the community from a water quality perspective, a growth perspective, and a safety perspective. Typically, a public water supply will provide a higher level of treatment and monitoring than a standard homeowner well. Due to these potential benefits, two approaches to this alternative are discussed below: 1) development of a new source north of the Nashua River (just south of the EDTA) and 2) expanding the existing service area to include the EDTA.

New Source North of Nashua River - Sand and gravel deposits such as found north of the Nashua River are usually the first choice for municipal aquifers in the Northeast because they generally have higher yields than other geologic materials. Another important factor is that a well yield of 100,000 gpd or greater requires a protective radius of 400 feet[8] for a total land area greater than 10 acres. A review of the project area was conducted in an effort to understand whether a Public Water Supply is feasible within the study area under consideration. Using existing information available from the Massachusetts Office of Geographic Information (MassGIS), parcels that met the following criteria were selected:

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[7] CMR 310 22.02
[8] http://www.mass.gov/eea/agencies/massdep/water/drinking/water-supply-protection-area-definitions.html

- Greater than 10 acres (for Zone I protective radius)
- Overlying mapped sand and gravel deposits
- Current or prior land uses lacking potential contamination sources
- Distance to the Study Area

The selected parcels were further filtered by ownership to identify publicly owned or controlled properties (publicly owned parcels can significantly decrease the costs of source development). The resultant area is shown on Figure 6 with parcel ownership shown in Table 4.

Table 4. Favorable Publicly Owned Parcels North of the Nashua River for Water Supply

Ownership	Size (Acres)	Assessor Parcel Number	Subwatershed	SWMI Basin
Town	187.9	013-0010.0	North Nashua River	11408
Town	15.5	013-0006.0	North Nashua River	11408
Town	22.0	014-0014.0	North Nashua River	11408
Town	15.0	014-0065.0	North Nashua River	11408

Ground water sources for potable use must avoid potential contamination from existing or planned wastewater discharge facilities. Typically, a 6-month travel time is considered sufficient distance to filter the groundwater prior to withdrawal for public water supply. Using some basic assumptions about the aquifer properties in the area, a 200-day travel time would translate into a distance of approximately 1,000 feet. From an infrastructure perspective, the combined area comprising the 4 parcels identified as a potential source in Figure 6 is the most favorable location for a public water supply. This area is large enough to accommodate a site-specific search for the deepest, most transmissive deposit, a Zone I protective radius, and is close to the EDTA when planning on distributing the water throughout the project area.

Extend Service from Existing Town of Lancaster System - Increased production from the existing Lancaster supply wells and two additional wells now in development could be transported from the existing Lancaster water distribution system through a connection near the intersection of Rte. 70 (Lunenburg Road) and Rte. 117. Given the demand in the EDTA, a 10-inch main would need to be extended north along Rte. 70 (Lunenburg Rd.) for a length of approximately 20,000 linear feet to a new distribution system (Figure 7). Due to the length of the extended water main, travel time of treated water may cause water quality problems.

3.4.3 Alternative 3, Interconnections

Information collected on water infrastructure within communities abutting North Lancaster indicate Lunenburg and Shirley currently develop groundwater supplies and Leominster and Clinton currently rely on surface water supply sources. The water supply systems serving these towns are the most proximate to Lancaster. Managers of these communities' supplies have been approached to determine

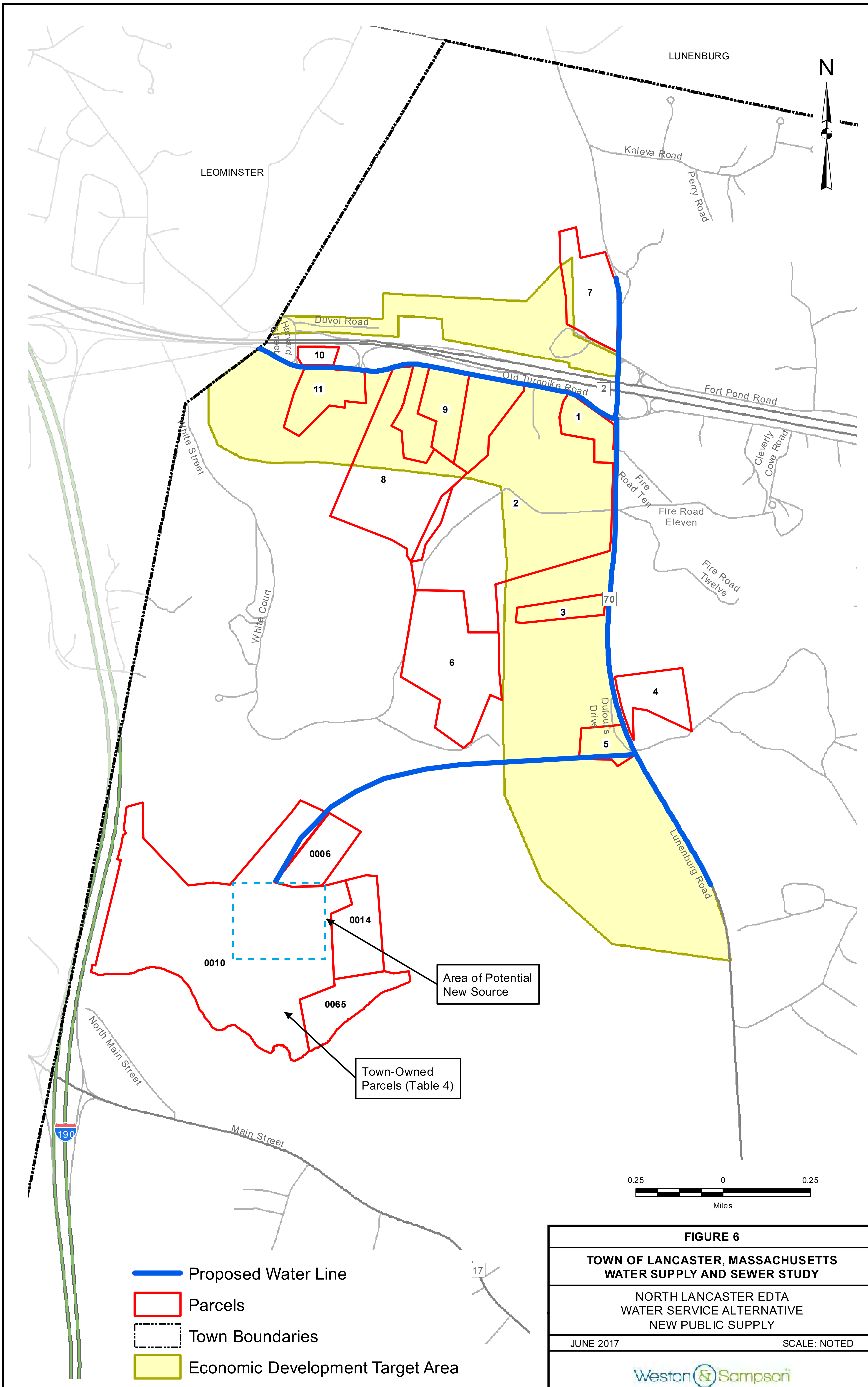

FIGURE 6

TOWN OF LANCASTER, MASSACHUSETTS
WATER SUPPLY AND SEWER STUDY

NORTH LANCASTER EDTA
WATER SERVICE ALTERNATIVE
NEW PUBLIC SUPPLY

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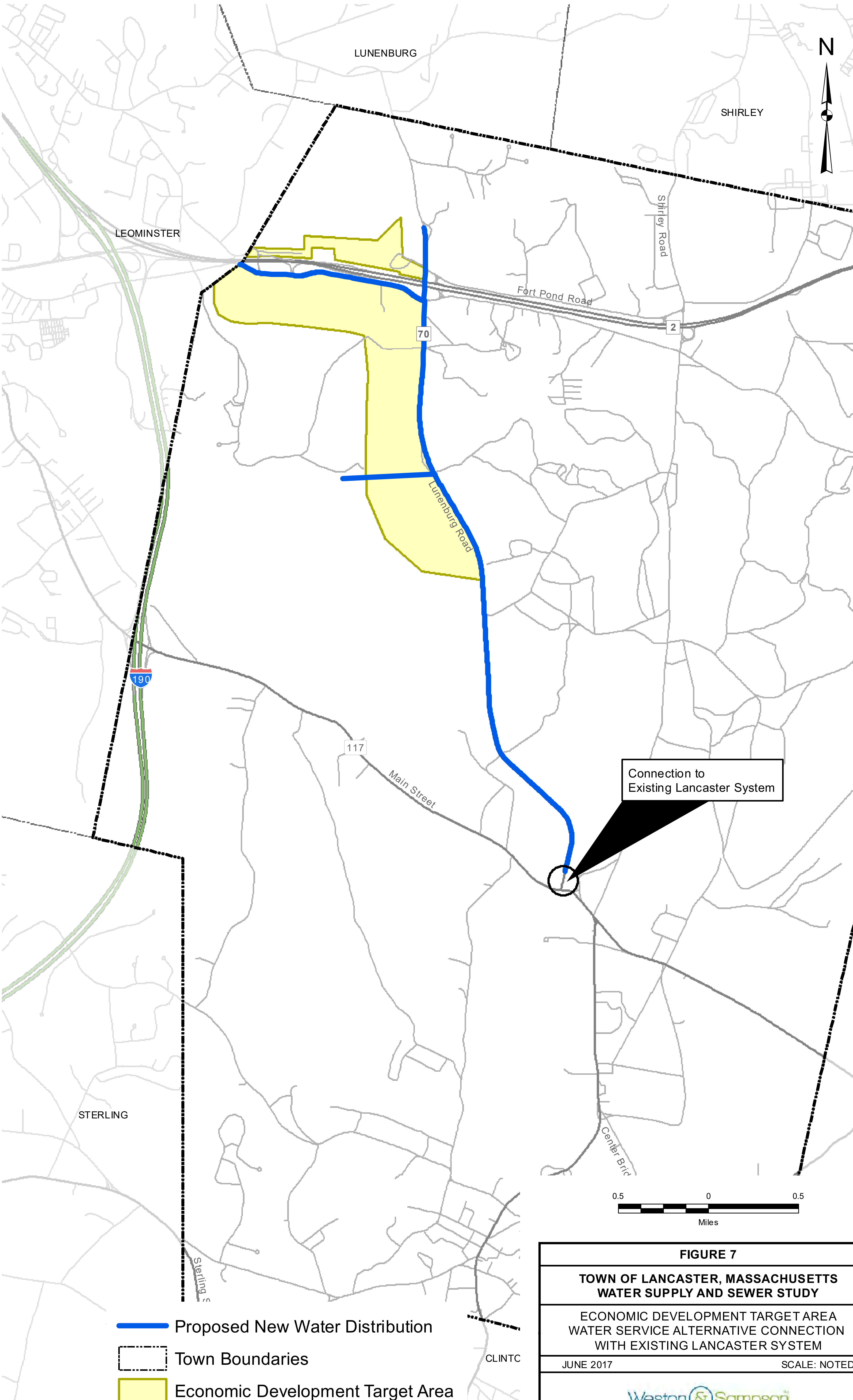

FIGURE 7

TOWN OF LANCASTER, MASSACHUSETTS
WATER SUPPLY AND SEWER STUDY

ECONOMIC DEVELOPMENT TARGET AREA
WATER SERVICE ALTERNATIVE CONNECTION
WITH EXISTING LANCASTER SYSTEM

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a) if they have surplus water available to meet EDTA projected demand and b) have an interest in providing water to, or expanding service within, the EDTA. Although interconnection with these adjacent water supply systems would not result in the interbasin transfer of water, other permitting would be required for increased withdrawals.

Lunenburg Water District (LWD) serves the area immediately north of the Study area (Figure 5). The LWD has constructed a new well in the area with sufficient capacity to serve the EDTA. LWD has expressed a willingness to work on the permitting for expanding their water extractions. Increased withdrawals from this well may require significant mitigation under regulations promulgated in 2014[9].

Shirley Water District (SWD) is in the process of permitting a new supply well in the Fort Pond area. SWD has expressed interest in serving that portion of Lancaster north of Rte.2 and east of Lunenburg Road, a portion of which is already within their service area (Figure 5). Permitting a new source in the areas of Fort Pond Rd. may require significant mitigation under regulations promulgated in 2014[10].

SWD also has an interconnection with Devens and receives deliveries from the Devens supply. Devens indicates that it has surplus supplies and is willing to serve the EDTA through the Shirley distribution system. This alternative may avoid the need for significant mitigation of a new well. The delivery of water from Devens to the EDTA would be an interbasin transfer.

Town of Clinton has expressed a willingness to provide additional supplies to the Town of Lancaster. The capital cost associated with this alternative will be potential modification of the interconnection itself (Figure 4), as well as a water main between the existing Lancaster distribution system and the EDTA (Figure 7). Considerable distances from the study area to Clinton may make this alternative too costly to consider further and would pose significant water quality problems due to residence time in a lengthy transmission main.

The City of Leominster has expressed they would explore providing sewer service to the EDTA, but the City indicates it has no surplus water available for supply to the EDTA. Leominster has a WMA Registration for 4.94 mgd[11]. Their average use in 2014 and 2015 was 3.8 mpd[12].

3.5 Water Supply Alternatives, Cost Estimates

The following sections discuss the feasibility and estimated cost of water supply alternatives. Water supply alternatives with significant permitting or water distribution problems were not subject to a cost

[9] DEP. 2014. Water Management Act Permit Guidance Document. Massachusetts Department of Environmental Protection. November 7, 2014.
[10] Ibid
[11] Registration 21115302 issued by the Massachusetts Department of Environmental Protection in 2007.
[12] Annual Statistical Reports for calendar years 2014 and 2015.

estimate.

3.5.1 Individual Supplies

Providing individual water supplies would involve construction of a well on each property, or serving multiple properties and permitting the well as either a public water supply or a transient public water supply. The nature of permitting and other reporting requirements would depend on the nature of the use. Given uncertainty of the number of wells, variation in subsurface conditions on each site and general description of proposed land uses, no cost estimates are possible for this alternative. In addition, this approach to developing supplemental supplies may not facilitate commercial development in the Target Area to the extent that developing a pubic supply serving the entire area.

3.5.2 Public Supplies from Lancaster Area Sources

Increase supply from the Town of Lancaster Wells: Increased production from the existing Lancaster supply wells and two additional wells now in development could be transported from the existing Lancaster water distribution system through a connection near the intersection of Rte. 70 (Lunenburg Rd.) and Rte. 117. Given the demand in the EDTA, a 10-inch main would need to be extended north along Rte. 70 (Lunenburg Rd.) for a length of approximately 20,000 linear feet (Figure 7). Given the length of the main, the residence time of water in the main would likely pose a water quality problem, particularly for customers along Rte.2 west of Lunenburg Road. The problem would be exacerbated during periods of lower seasonal demand in the EDTA. Due to this potential water quality problem, this alternative was not evaluated further.

New Supply from an area north of the Nashua River: Geologic materials beneath publicly owned property on the north side of the Nashua River may be an adequate source of water for the EDTA (Figure 6). However, no wells are known to exist in the area and only general geologic information is available. To evaluate the potential for developing supplies from the area, a subsurface exploration of the area with test wells would be required. A testing program should first receive the concurrence by the Town Conservation Commission. Permits to construct water supply wells on conservation land may eventually require action by the State legislature. It would be prudent to seek state level support for potential installation of wells prior to initiating test drilling.

Costs for evaluating and developing a supply to serve the EDTA from the area north of the Nashua river would include site exploration, test drilling, WMA permitting, pump testing with eventual approval from the DEP. The actual water system would include design and construction of a production well or wells, a distribution system including a potential storage tank and one pumping station as well as a treatment facility. A planning level cost estimate is provided in Table 5. However, this alternative is not recommended for two reasons; 1) developing a new water supply north of the Nashua River is uncertain because the potential source materials are poorly understood and 2) legislative action may be required to allow a change in land use.

Table 5 Cost Estimate for Developing Public Supply from New North Lancaster Area Source

System Element	Component	Amount	Unit Costs	Total Capital Costs	Capital Costs + 10% Contingency	Design/ Engineering/ Permitting (25%)	Construction Services (15%)	Total Element Cost
Potential source evaluation	Test Wells and Permitting		$ 200,000	NA	NA	N/A	N/A	$ 200,000
Production well	Construction/permitting	1	$ 150,000	$ 150,000	$ 165,000	$ 41,250.00	$ 24,750	$ 150,000
Treatment plant/Pump Station	Construction/permitting	1	$ 325,000	$ 325,000	$ 357,500	$ 89,375.00	$ 53,625	$ 500,500
200,000 gal storage	Storage tank	1	$ 1,000,000	$ 1,000,000	$ 1,100,000	$ 275,000.00	$ 165,000	$ 1,540,000
McGovern Road	10" Main/ linear feet	2,500	$ 280	$ 700,000	$ 770,000	$ 192,500	$ 115,500	$ 1,078,000
Lunenburg Rd north of McGovern Rd	10" main/ linear feet	3,500	$ 280	$ 980,000	$ 1,078,000	$ 269,500.00	$ 161,700	$ 1,509,200
Lunenburg Rd south of Mcovern Rd	8" main/ linear feet	2,500	$ 200	$ 500,000	$ 550,000	$ 137,500.00	$ 82,500	$ 770,000
Lunenburg Rd north of Rt. 2	8" main/ linear feet	1,000	$ 200	$ 200,000	$ 220,000	$ 55,000.00	$ 33,000	$ 308,000
Old Union Rd west of Lunenburg Rd	8" main/ linear feet	4,900	$ 200	$ 980,000	$ 1,078,000	$ 269,500.00	$ 161,700	$ 1,509,200
Total Estimated Cost					**$ 5,318,500**	**$ 1,329,625**	**$ 797,775**	**$ 7,445,900**

3.5.3 Interconnections with Neighboring Service Areas

Lunenburg Water District (LWD): The new demand (approximately 260,000 gpd) from the LWD will need mitigation pursuant to WMA Permit Guidelines promulgated by DEP in 2014. The Lunenburg Water District has indicated that Lancaster would be responsible for the cost of this mitigation. However, since the nature of the mitigation is not known, a reliable cost estimate is not possible. The planning level cost estimate of facilities needed to connect the EDTA to the LWD service area (Figure 8) is shown in Table 6.

Table 6 Cost Estimate for Interconnection with Lunenburg Water District and System for EDTA

System Element	Component	Amount	Unit Costs	Total Capital Costs	Capital Costs + 10% Contingency	Design/ Engineering/ Permitting (25%)	Construction Services (15%)	Total Element Cost
200,000 gal storage	Storage tank	1	$ 1,000,000	1,000,000	$ 1,100,000	$ 275,000.00	$ 165,000	$ 1,540,000
McGovern Road	8" Main/ linear feet	2,500	$ 200	$ 500,000	$ 550,000	$ 137,500	$ 82,500	$ 770,000
Lunenburg Rd north of McGovern Rd	10" main/ linear feet	3,500	$ 280	$ 980,000	$ 1,078,000	$ 269,500.00	$ 161,700	$ 1,509,200
Lunenburg Rd south of McGovern Rd	8" main/ linear feet	2,500	$ 200	$ 500,000	$ 550,000	$ 137,500.00	$ 82,500	$ 770,000
Lunenburg Rd north of Rt. 2 to LWD	10" main/ linear feet	6,000	$ 280	$ 1,680,000	$ 1,848,000	$ 462,000.00	$ 277,200	$ 2,587,200
Old Union Tpk. west of Lunenburg Rd	8" main/ linear feet	4,900	$ 200	$ 980,000	$ 1,078,000	$ 269,500.00	$ 161,700	$ 1,509,200
Total Estimated Cost					**$ 6,204,000**	**$ 1,551,000**	**$ 930,600**	**$ 8,685,600**

Shirley Water District (SWD): The new demand (approximately 260,000 gpd) from the SWD could be met from production from a new well in the Fort Pond area or excess permitted capacity in the Devens water supply that is interconnected to the SWD system. However, if the supply is obtained from Devens, it is possible that no mitigation costs would be associated with meeting demand in the EDTA through an interconnection with SWD. The planning level cost estimate of facilities needed to connect the EDTA to the SWD service area is shown in Table 7. This alternative may require somewhat more complex agreements among Devens, Shirley Water District and the Town of Lancaster and therefore should be subject to further discussion before any additional work is performed.

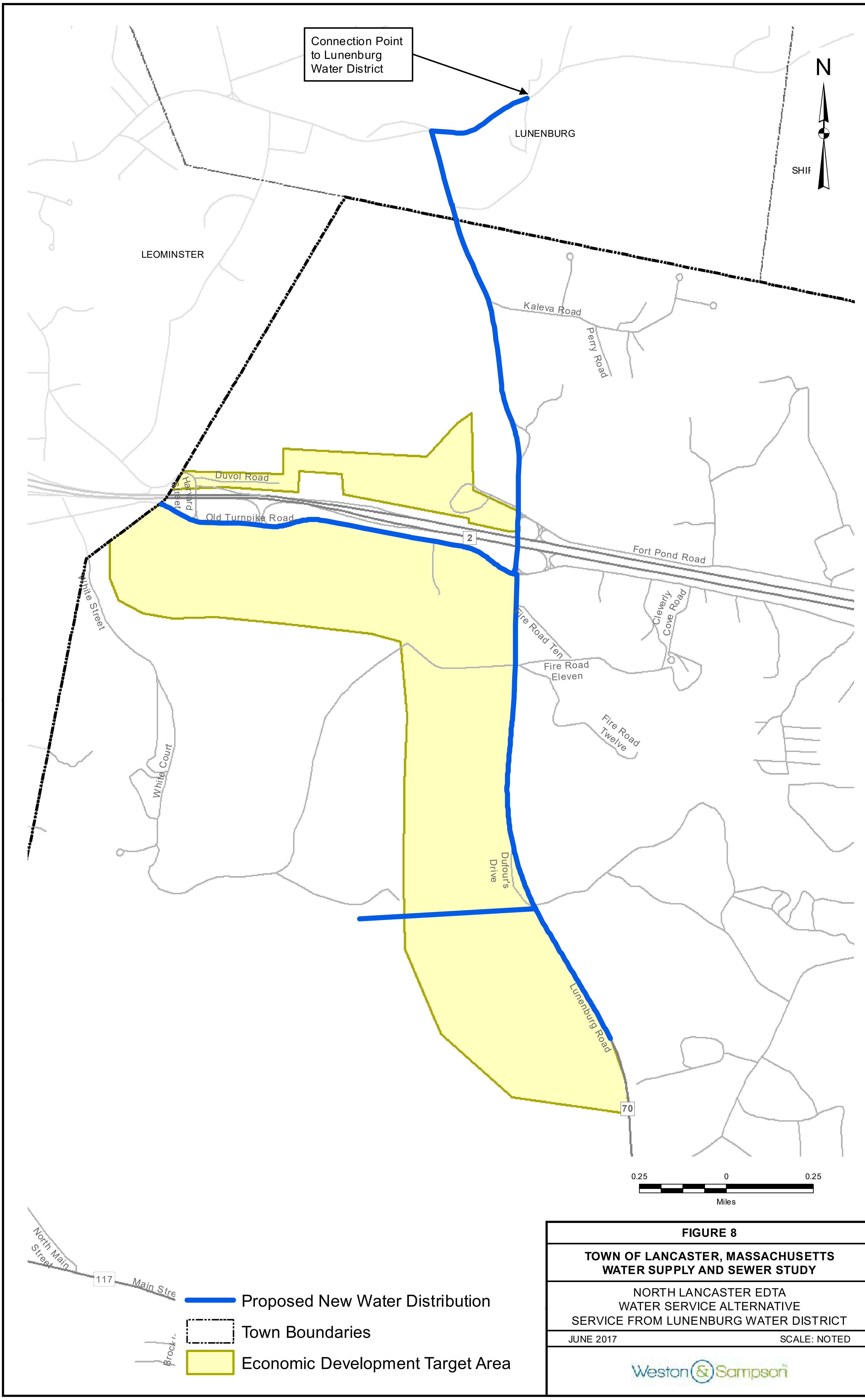

FIGURE 8

TOWN OF LANCASTER, MASSACHUSETTS
WATER SUPPLY AND SEWER STUDY

NORTH LANCASTER EDTA
WATER SERVICE ALTERNATIVE
SERVICE FROM LUNENBURG WATER DISTRICT

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Table 7 Cost Estimate for Interconnection with Shirley Water District and System for EDTA

System Element	Component	Amount	Unit Costs	Total Capital Costs	Capital Costs + 10% Contingency	Design/ Engineering/ Permitting (25%)	Construction Services (15%)	Total Element Cost
200,000 gal storage	Storage tank	1	$ 1,000,000	1,000,000	$ 1,100,000	$ 275,000.00	$ 165,000	$ 1,540,000
McGovern Road	8" Main/ linear feet	2,500	$ 200	$ 500,000	$ 550,000	$ 137,500	$ 82,500	$ 770,000
Lunenburg Rd north of McGovern Rd	10" main/ linear feet	3,500	$ 280	$ 980,000	$ 1,078,000	$ 269,500.00	$ 161,700	$ 1,509,200
Lunenburg Rd south of McGovern Rd	8" main/ linear feet	2,500	$ 200	$ 500,000	$ 550,000	$ 137,500.00	$ 82,500	$ 770,000
Lunenburg Rd north of Rt. 2	8" main/ linear feet	1,000	$ 200	$ 200,000	$ 220,000	$ 55,000.00	$ 33,000	$ 308,000
Old Union Tpk. west of Lunenburg Rd	8" main/ linear feet	4,900	$ 200	$ 980,000	$ 1,078,000	$ 269,500.00	$ 161,700	$ 1,509,200
Shirley Rd. to Lunenburg Rd.	10" main/ linear feet	8,500	$ 280	$ 2,380,000	$ 2,618,000	$ 654,500.00	$ 392,700	$ 3,665,200
McGovern pump station		1	$ 100,000	$ 100,000	$ 110,000	$ 27,500.00	$ 16,500	$ 154,000
Total Estimated Cost					**$ 7,304,000**	**$ 1,826,000**	**$ 1,095,600**	**$ 10,225,600**

City of Leominster: The interconnection with the City of Leominster has not been evaluated in detail since Leominster has indicated they do not have surplus supply to provide to EDTA. In all alternatives, Leominster is assumed to continue water service to 2 sites north of Rte. 2.

Town of Clinton: Supplying the EDTA from the Clinton system would include an upgrade of the current interconnection along Rte. 62 (Figure 4) and extension of the existing Lancaster water distribution system from the Intersection of Rte. 70 (Lunenburg Rd) and Rte.117 to the EDTA. The same water quality issues that are discussed above pertaining to supplying form the Lancaster sources would apply to this alternative due to the length of water main between Lancaster and or the Clinton source and certain users along Rte. 2 in the EDTA.

3.6 Water Supply Funding Options

There are several ways that the Town of Lancaster can fund water and wastewater infrastructure projects. One way is through the Massachusetts Clean Water and Drinking Water State Revolving Loan Fund (SRF). The SRF program is administered by the Division of Municipal Services of the Department of Environmental Protection (MADEP). This program provides subsidized loans to municipalities for various water system projects including the kinds of alternatives previously discussed in this report. Interest rates for a subsidized loan may range between 2 and 3 percent at this time, with a term of 20 years. A Project Engineering Report (PER) is required to be considered for this program. The PER is discussed in more detail in the recommendations section of the report.

The Community Development Block Grant (CDBG) program may be another option to fund water supply facility development in Lancaster. It is a federally funded, very competitive grant program through the Department of Housing and Urban Development (HUD) and the Commonwealth of Massachusetts. It is designed to help small cities and towns meet a broad range of community development needs including construction or repair of water systems. Municipalities with a population of under 50,000 that do not receive CDBG funds directly from HUD can apply for this funding. For a water supply construction project to be eligible for funding, it must benefit low and moderate-income persons. The town would need to conduct an income survey of the homes that will be affected by the infrastructure project to show that more than 51% of the residents are income eligible. CDBG grants range from $100,000 to $800,000 for infrastructure projects and can take several months to prepare (often longer). Due to the nature of development that would be served in the EDTA, the feasibility of this funding alternative should be vetted with the state Executive Office of Housing and Economic Development.

Funding is also available under the new MassWorks Infrastructure Program. This program provides funding options for municipalities seeking public infrastructure funding to support economic development. The program represents an administrative consolidation of the following six grant programs:

- Public Works Economic Development (PWED) Grants
- Community Development Action Grant (CDAG)
- Growth District Imitative (GDI) Grants
- Massachusetts Opportunity Relocation and Expansion Program (MORE)
- Small Town Rural Assistance Program (STRAP)
- Transit Oriented Development (TOD) Grant Program

The MassWorks Infrastructure Program provides grant funding for the construction, reconstruction and expansion of publicly owned infrastructure including, but not limited to water system improvements, sewers, utility extensions, streets, roads, curb-cuts, parking facilities, water treatment systems, and pedestrian and bicycle access. Eligible public infrastructure must be located on public land or on public leasehold, right-of-way, or easement. The project must be procured in accordance with Massachusetts General Laws c.30B, c.30 §39M, c.149, and c.7. In each year, there will be a set-aside of funds available only for projects in small, rural communities, with a population of 7,000 or less. The grant program also provides for commercial and residential transportation and infrastructure development, improvements and various capital investment projects under the Growth Districts Initiative established by the Executive Office of Housing and Economic Development. Due to the population of Lancaster and nature of development that would be served in the EDTA, the feasibility of this funding alternative should be vetted with the state Executive Office of Housing and Economic Development.

The MassWorks Infrastructure Program is administered by the Executive Office of Housing and Economic Development, in cooperation with the Department of Transportation and Executive Office of Administration and Finance. Primary funding rounds will open September 1st annually and decisions will be rendered approximately six weeks after the close of the application period. MassWorks Infrastructure Program applications will be available no later than May for the September funding round in that calendar year. The MassWorks Infrastructure Program may hold a second annual funding round to consider additional projects, and the availability of a second round will be announced as soon as the determination is made. Only those projects that are prepared to proceed to construction during the upcoming construction season should apply for consideration.

3.6.1 Recommended Plan of Action

The primary focus for moving this project forward remains in developing an Inter-Municipal Agreement (IMA) to deliver a sufficient volume of treated water to the EDTA from the Lunenburg Water District because it appears to be the lowest cost alternative involving connection to existing public water supply systems. The costs of a distribution and storage system still needs to be confirmed through additional engineering investigations. Understanding that the project is currently in the conceptual stage and any projections of schedule and timeframe are subject to wide variations, the remaining tasks to be considered in bringing the project to completion, with anticipated schedules and timeframes, and are as follows:

- Negotiate IMA with Lunenburg Water District
- Town Meeting Authorization of Funding for Planning
- Project Engineering Report (PER) (if required)
- Town Meeting Authorization of Design Funding
- Massachusetts Environmental Protection Act (MEPA) Review Process
- Final Design and Permitting
- SRF or MassWorks Application preparation
- Town Meeting Authorization of Construction Funding
- Public Bid/Award process
- Construction

4.0 WASTEWATER ANALYSIS

This wastewater assessment focuses on wastewater management options sufficient to serve portions of the North Lancaster Economic Development Target Area (EDTA) (Figure 1). Development of wastewater treatment is needed to accommodate commercial development in the Target Area. Three general wastewater disposal alternatives are evaluated: 1) onsite disposal through individual Title 5 compliant systems, 2) decentralized wastewater treatment systems each serving portions of the EDTA, and 3) collection and transport to a centralized wastewater treatment facility. These alternatives are evaluated based on adequacy, timing, technical issues (including operational considerations), cost and feasibility (including permitting issues).

There is a wastewater collection system in Lancaster that is under the jurisdiction of the Lancaster Sewer District Commission. The nearest tie-in point to their system is at the intersection of Main Street (Rte. 70) and Seven Bridge Road (Rte.117). There is a manhole with an existing 15-inch sewer at this location. The manhole, however, is almost three miles away and the cost to extend sewers from the EDTA to this point would be extensive to serve only a limited number of parcels.

The Lancaster Sewer District has served the south Lancaster area since 1967; its boundaries do not include the North Lancaster EDTA. Therefore, an act of the State Legislature would be required in order to expand the District's boundaries and allow the EDTA to connect to it.

For these reasons, it is not feasible to consider a connection to the Lancaster Sewer District as a viable alternative

To determine which wastewater management options can be used in the project area, an estimate of the existing and projected future wastewater flows (in gallons per day (gpd)) was prepared by the Town. This estimate is based on the available information pertaining to the existing properties within the project area and utilizing Title 5 regulations (the Department of Environmental Protection (DEP) State Environmental Code that regulates septic systems (310 CMR 15.00). Projected flows used for Title 5 are considered maximum daily flows and typically reflect a factor of 2 times the average daily volumes.

4.1 Wastewater Flow Analysis

4.1.1 Existing Flows

Currently properties within the EDTA are served by individual on-site septic systems except for two properties along Route 2 that are connected to the Leominster wastewater collection system.

4.1.2 Future Flows

The parcels identified as likely development in the EDTA are shown in Figure 2. Based on information provided by Lancaster, estimated wastewater generation from these parcels at the level of buildout anticipated by the Town is shown in Table 8.

Table 8– Estimated Future Maximum Wastewater Flows in the Lancaster EDTA[13]

Business / Location (Map #)	Use	Est ADF (GPD)	Title 5 (GPD)	Employee Count
Prime Motor Group / Old Union Trnpk. (1)	Auto Dealership	1,100	2,200	55
MYSA / Old Union Trnpk. (2)	Soccer Complex	120	240	30
Clear Summit / Lunenburg Rd. (3)	Wood Waste Recycle	2,000	4,000	10
Kimball Farm / Lunenburg Rd. (4)	Restaurant/Retail Store	6,000	12,000	100+ Seasonal
Nationwide Auto / Lunenburg Rd. (5)	Auto Parts Recycling	50	100	15
McGovern Place / Lunenburg Rd. (6)	Mixed-use Development	130,750	261,500	90
RHO Property / Lunenburg Rd. (7)	Residential	9,780	19,560	0
J.C. Madigan / Old Union Trnpk. (8)	Truck Customization	9,865	19,730	55
Bouchard Automotive / Old Union Trnpk. (9)	Auto Dealership	9,865	19,730	75
D'Ambrosio Eye Care / Old Union Trnpk. (10)	Medical Facility	830	1,660	60
Lancaster Tech Park / Old Union Trnpk. (11)	Mixed-use Development	92,400	184,800	100+
Total GPD		**262,760**	**525,520**	

4.2 Wastewater Management Alternatives

This section identifies potential long-term wastewater management alternatives for properties within the EDTA. To accommodate new sources, the following alternative approaches for providing wastewater treatment were evaluated:

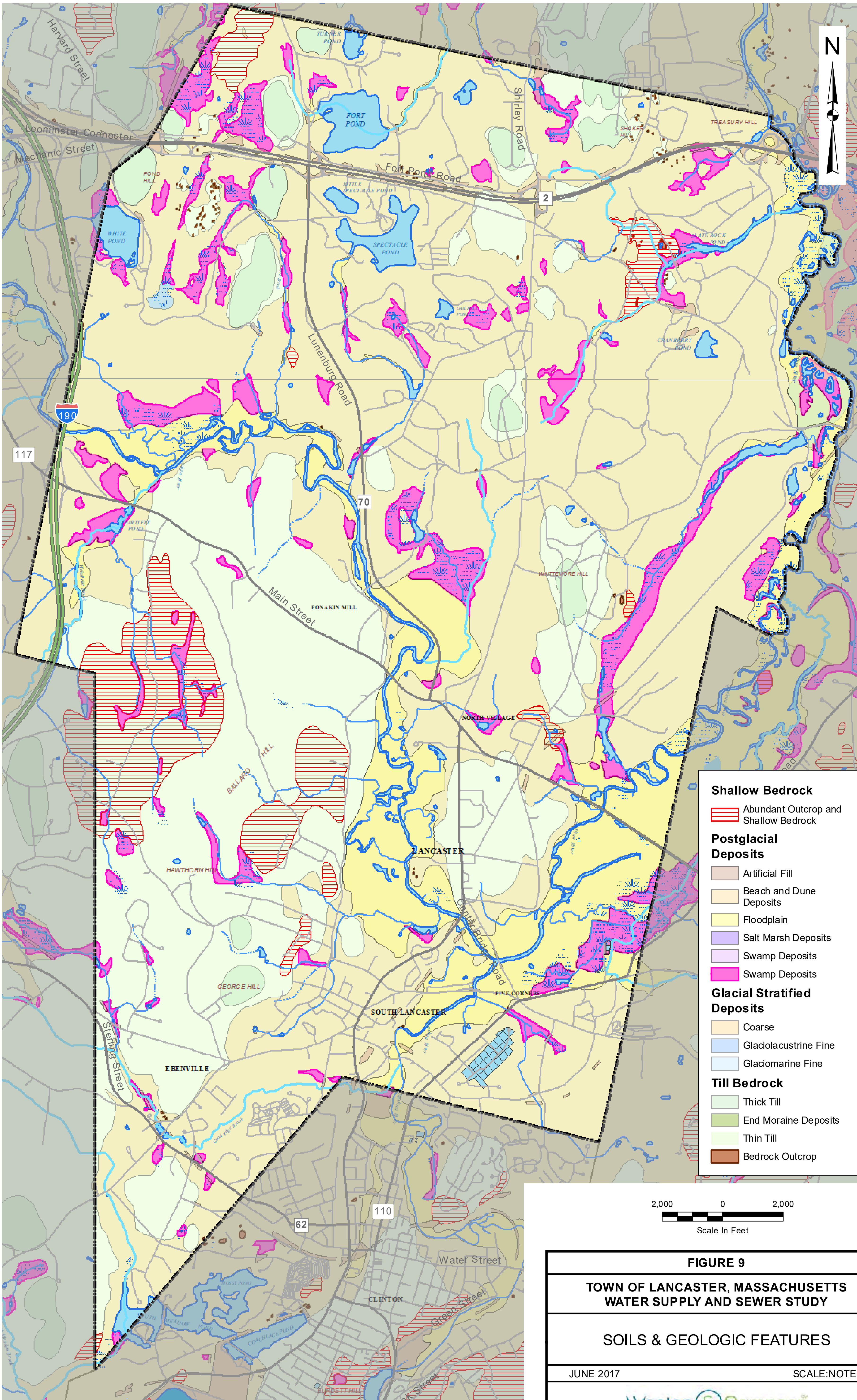
- use of onsite individual treatment (Title V septic systems),
- shared system that returns treated wastewater to areas within the EDTA,
- connection to an existing (permitted) sewer system of a neighboring community.
- connection to the Lancaster Sewer District.

Any sewage treatment facility discharging effluent greater than or equal to 10,000 gpd to the ground is subject to the DEP Massachusetts Clean Water Act regulations (314 CMR 5.00) which require a groundwater discharge permit. Therefore, conventional Title V systems for at least some of the likely development properties would require permitting similar to shared systems. In addition, geologic and soil conditions such as shallow or outcropping bedrock and wetland soils may preclude onsite disposal in some areas (Figure 9).

4.2.1 Alternative 1 – Onsite New Systems and Title 5 Repairs/Upgrades

With the exception of three properties along Route 2, the project area currently utilizes some type of on-

[13] Source: Lancaster Planning Board staff



2,000 0 2,000

Scale In Feet

FIGURE 9

TOWN OF LANCASTER, MASSACHUSETTS
WATER SUPPLY AND SEWER STUDY

SOILS & GEOLOGIC FEATURES

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site system for wastewater disposal[14]. Under this alternative, on-site systems designed and maintained by the individual property owners under Title 5 will continue to be utilized throughout the project area for those properties generating less than 10,000 GPD of wastewater. The purpose of Title 5 is to "provide for the protection of public health, safety, welfare and the environment by requiring the proper siting, construction, upgrade, and maintenance of on-site sewage disposal systems and appropriate means for transport and disposal of septage." As detailed above, it is administered and enforced by the Massachusetts DEP in coordination with local approving authorities. In Lancaster, the Lancaster Board of Health, in cooperation with the Nashoba Associated Boards of Health, acts as the local approving authority.

4.2.2 Alternative 2 – Shared Wastewater Treatment within the EDTA

One or more shared wastewater treatment systems would require some form of a wastewater collection system to transport wastewater flows to shared treatment plant (s). If wastewater flows in excess of 10,000 gpd are disposed of in one location, they require a groundwater discharge permit and a minimum of secondary treatment prior to discharge to a groundwater.

A package or small wastewater treatment facility refers to the assembly of various individual treatment process equipment into a compact area. Small facilities are found in the design flow range from individual facilities (300 gpd +/-) up to the range of approximately 100,000 gpd. Two basic types are: Sequencing Batch Reactor (SBR) and Membrane Bioreactor (MBR).

SBRs are a variation of the activated-sludge process. They differ from activated-sludge plants because they combine all of the treatment steps and processes into a single basin, or tank, whereas conventional facilities rely on multiple basins. [In essence] an SBR is no more than an activated-sludge plant that operates in time rather than space. The operation of an SBR is based on a fill-and-draw principle, which consists of five steps—fill, react, settle, decant, and idle. These steps can be altered for different operational applications.[15]

Membrane Bioreactor (MBR) employs a combination of a microfiltration or ultrafiltration process with a suspended growth bioreactor. MBR systems are widely used for municipal and industrial wastewater treatment. They can result in nearly complete separation of suspended solids and a dramatic reduction in contaminants in treatment effluent. However, an MBR facility may cost as much as twice a similar sized SBR facility

SBR and MBR facilities are examples of relatively small facilities that can achieve the same level of treatment as larger municipal wastewater treatment facilities; however, they must be monitored effectively by a certified operator. DEP design requirements necessitate redundant equipment for design flows in excess of 40,000 gpd and local regulations necessitate redundant equipment for design flows in excess of 10,000 gpd. Redundancy increases the complexity of the facility operation and associated capital and operating cost.

The size and type of each of these processes will depend on the discharge permit conditions that will

[14] The existing Orchard Hills and Roll-On America are connected to the Leominster sewage treatment plant through a force main.

[15] New England Interstate Water Pollution Control Commission. (2005) Sequencing Batch Reactor Design and Operational Considerations.

have to be met and the amount of flow to be treated. An operations building would typically include the electrical controls, a laboratory, operations office, effluent filtration equipment, solids dewatering equipment, and a utility/equipment storage room. The amount of land required for the wastewater treatment facility and related site items varies with the hydraulic treatment capacity of the plant. For example, recent installation of facilities treating and disposing of approximately 100,000 gpd of treated wastewater have required approximately an acre for the treatment facility and supporting infrastructure and 1 acre for the disposal field.

4.2.3 Alternative 3 – Centralized Wastewater Treatment

Large-scale public sewer systems (municipal wastewater treatment plants) are centralized systems. Centralized systems generally serve established cities and towns and sometimes provide treatment and disposal services for neighboring sewer districts. Where appropriate, centralized systems are generally preferred to decentralized systems, as one centralized system can take the place of several decentralized systems. This makes the centralized systems more economical, allows for greater control, requires fewer people, and produces only one discharge to monitor instead of several. In some cases, wastewater may be "passed through" existing collection systems to treatment facilities with sufficient capacity to accept the new flows. For example, sewage collected in the Lancaster Sewer District is treated in the Town of Clinton in the wastewater treatment plant (WWTP) operated by the Massachusetts Water Resources Authority (MWRA).

4.2.4 Alternative 4 – The Lancaster Sewer District

The Lancaster Sewer District has a centralized wastewater system that serves the southern portion of the town, approximately 3 miles from the EDTA. As previously mentioned, given the distance between the existing sewer collection system and the EDTA, other potential connections to existing collection and treatment systems are considered as a more viable alternative, specifically the collection systems in the City of Leominster (Figure 10) or in the Town of Lunenburg. Neighboring wastewater collection systems considered in this analysis are shown in Table 9. If new sources of wastewater in the EDTA are connected to permitted treatment facilities that have sufficient capacity, Lancaster would avoid the need to obtain permits for a new wastewater treatment and disposal system.

TABLE 9 – Neighboring Wastewater (Sewer) Service Areas

	System Type	WWTP	WWTP Design Capacity	Current Use	Interconnection to Lancaster*
Sterling	No Public System	N/A	N/A		N/A
Clinton (serves south Lancaster)	Municipal/MWRA	Clinton WWTP	4.0 mgd (avg)	2.97 mgd (avg)	Existing to South Lancaster for up to 370,000 gpd ADF
Devens (serves MCI Shirley, Shirley, Ayer)	Municipal	Devens WWTP	4.65 mgd	2.2 mgd (contract)	None, would be through Shirley
Leominster	Municipal	Leominster WWTP	9.3 mgd	5.8 mgd (avg)	Existing 4" force main to EDTA, 6,000 gpd
Lunenburg	Municipal	Leominster WWTP Fitchburg WWTP	Collection Only	Collection Only	None (4.5 miles)

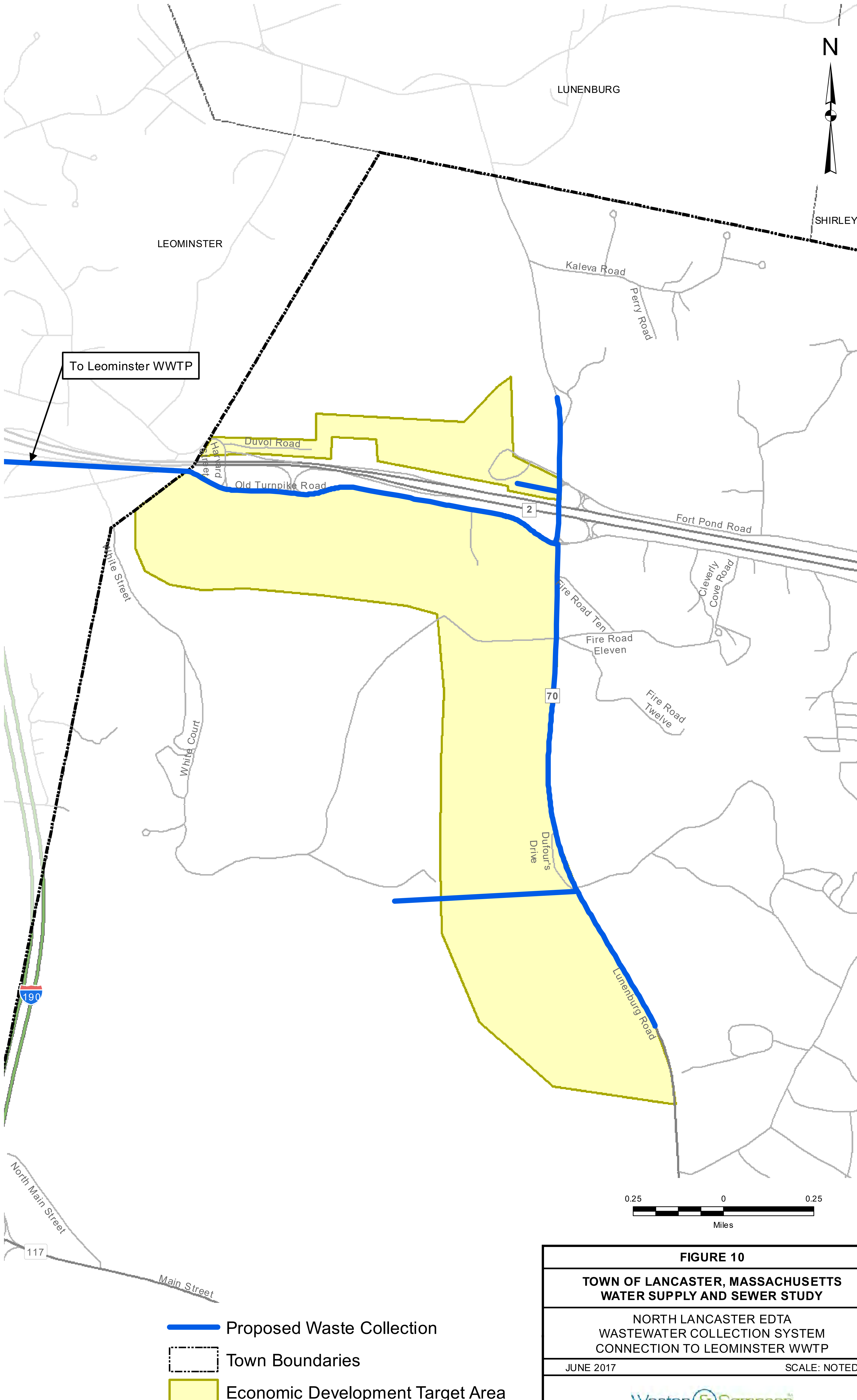

FIGURE 10

TOWN OF LANCASTER, MASSACHUSETTS
WATER SUPPLY AND SEWER STUDY

NORTH LANCASTER EDTA
WASTEWATER COLLECTION SYSTEM
CONNECTION TO LEOMINSTER WWTP

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Shirley	Municipal	Devens WWTP	Collection Only	Collection Only	Collection system ends just north of Lancaster town line
Ayer	Municipal	Ayer WWTP Devens WWTP	1.79 mgd (avg)	1.79 mgd (avg)	None (3 miles)

*Clinton connection serves Southern Lancaster
Leominster connection serves two facilities along Rte. 2 in Lancaster
Wastewater collected by the Town of Lunenburg is treated at the Leominster WWTP (90%) and Fitchburg WWTP (10%) Excess flow is routed to Devens WWTP

4.3 Wastewater Collection Alternatives

This section identifies the wastewater collection alternatives typically utilized to convey wastewater from individual residences and businesses. All the "off-site" alternatives for wastewater management that have been identified require the conveyance of wastewater from each property to a decentralized or centralized location for further treatment prior to effluent disposal. The following technologies are typically utilized for wastewater collection and have been evaluated for use in this project:

- Conventional gravity sewers, pump stations, and force mains.
- Grinder pumps and low-pressure sewers.
- Combination of these technologies.

The following sections provide a description of each wastewater collection technology evaluated as part of this plan. Innovative, alternative (I/A) technologies, such as septic tank effluent pump (STEP) systems, vacuum sewer systems, and small diameter variable slope (SDVS) gravity sewer systems, were also investigated as part of this study, however they do not lend themselves well to the proposed project area and are not recommended.

4.3.1 Conventional Gravity Sewers

A gravity sewer system consists of sewer lines that allow customers to discharge into a sanitary system consisting of gravity pipes, which flow downhill and are not pressurized, and manholes. Gravity sewer systems operate by collecting the wastewater via continuously sloped pipe, 8-inches minimum in diameter, and transport the wastewater to localized low points in the collection system. The design of a gravity sewer system is dependent on the velocity of the wastewater within the pipes. Minimum velocities (approximately 2 feet per second (fps)) are set to assure that suspended matter does not settle out in the conduit, while maximum velocities (typically 8-10 fps) are set to prevent excessive scouring of the pipe.

Extremely flat or hilly terrain poses a problem to gravity sewer installations since the gravity sewers must continually slope downward. This results in the sewer becoming increasingly deep or the need for a wastewater pumping station. Pump stations are located at low points to collect and pump the wastewater to the next high point in the collection system, then the process of gravity flow resumes.

Manholes are typically 4-foot in diameter and are spaced approximately 300- to 400-feet apart. Manholes are required to connect intersecting streets to the gravity systems. Depths of conventional gravity sewers and manholes typically range from 8- to 15-feet. This alternative is, typically, the most cost-effective and reliable long-term option and allows for future service area expansion without significant upgrade requirements. Installation costs are impacted by the presence of ledge, high groundwater, poor soils, and severe topography that impacts the depth of excavation.

4.3.2 Grinder Pumps with Low-Pressure Sewers

A low-pressure sewer system (LPSS) has proven to be a viable alternative where implementation of gravity sewer systems is impractical and/or uneconomical. A LPSS includes small diameter pressure sewers fed by individual on-lot grinder pumps at each source or configured to serve multiple sources. A pressure sewer system makes use of small diameter piping, ranging in size from 1 ¼- to 4-inches in diameter, buried at a shallow depth following the profile of the ground. The pressure main and service pipe are generally manufactured from polyvinyl chloride (PVC) or high-density polyethylene (HDPE). The pressure sewer mains and laterals are buried just below the depth of frost penetration and will follow the contour of the ground. Typically, pressure sewers have a minimum of 5-feet of cover.

The LPSS is separated into branches of sewers of different sizes depending on the number of connections to each branch. Standard manholes are not required in a pressure sewer system. Instead, flushing connections/drain manholes are installed at the end of branches and at major changes in direction or changes in pipe diameter. Air relief/vacuum valve manholes are installed at high points in the system to allow trapped air to escape.

Each customer utilizes a grinder pump for discharge of sewerage into the main. Each grinder pump unit is equipped with a grinder pump, check valve, tank, and all necessary controls. The units can be buried outdoors close to each customer's existing septic tank or cesspool, so the connection to the existing service pipe exiting the building can be made easily. The units can also be located inside the building. The grinder pump macerates the solids present in the wastewater, produces slurry, and discharges wastewater to the pressure sewer collection pipes. Depending on design flow, some commercial users may require a larger unit with increased reserve capacity. If a malfunction occurs, a high liquid alarm is activated. This alarm may be a light mounted on the outside of the building or an audible alarm that can be silenced by the customer. The customer will then notify the town or a town-approved technician or contractor to come and make the necessary repair.

A LPSS collects and transports the wastewater from each customer located in low points to the nearest gravity sewer or, if appropriate, to the decentralized wastewater treatment facility. Within the right-of-way, air relief manholes with air and vacuum valves would be installed at all high points, and terminal flushing drain manholes would be installed at all low points. In addition, cleanout manholes would be installed approximately every 500- to 1,000-feet to provide access for periodic maintenance. Grinder pumps and low-pressure sewers are increasingly prevalent due to the lower capital costs, long history of use, and adaptability in poor subsurface conditions (ledge, groundwater, etc.). Public acceptance may be lower due to the presence of a pump at each home or business. Additionally, pressure sewers rely on a consistent electrical power supply, and negative environmental impacts may occur during extended power failures due to the potential for backups and overflows.

4.3.3 Combination of Gravity Sewers and Grinder Pumps

The utilization of a combination of conventional wastewater collection system components, grinder pumps, and pressure sewers has proven to be a cost-effective approach on many recent projects in Massachusetts. These combined systems are designed to maximize the use of gravity sewers; however, where the topography or subsurface conditions (ledge, groundwater, etc.) warrant, a cost-effective approach is to utilize grinder pumps and low-pressure sewers to reduce capital construction costs. The evaluation of this approach is typically completed during the preliminary design of the collection system, when more detailed information (topographic mapping and borings) is available.

4.4 Effluent Disposal Alternatives

Wastewater treatment processes typically include effluent discharge facilities designed to minimize the impacts to nearby surface or ground waters. Potential impacts include groundwater mounding or increasing pollutant loads to a receiving water body. The following sections describe the available effluent disposal methods.

4.4.1 Surface Water Discharge

At this time, DEP is not readily issuing any new surface water discharge permits. Therefore, this option was not considered as an alternative for this project.

4.4.2 Subsurface Discharge to Groundwater

The discharge of treated wastewater to groundwater is the most common option for the disposal of treated wastewater currently being permitted in Massachusetts. This disposal option would involve the discharge of highly treated effluent from a wastewater treatment facility into an infiltration bed or subsurface distribution system, designed to handle the design flows. The location of the discharge may be independent of the location of the treatment facility since the treated effluent could be transmitted by force main to the infiltration bed or the subsurface distribution system.

The requirements for groundwater discharge of wastewater are outlined in the Groundwater Discharge Permit Program (314 CMR 5.00 and 6.00). The principal constituent of concern for groundwater discharges is nitrates, a primary component of treated wastewater. Potential sites for use as a groundwater disposal site must be comprised of sandy or gravely soils that exhibit medium infiltration rates. Sites that contain poor soil permeability, high groundwater levels, and ledge, inhibit the downward flow of water and are generally unacceptable (Figure 9). Soil properties can be amended by excavating and amending the soils in the discharge area; this approach may be infeasible for the larger systems designed for large wastewater flows but may be appropriate for small systems. The principal constituent of concern for groundwater discharges is nitrates, a primary component of treated wastewater. As a result, groundwater quality at the site should not be sensitive to an increase in nitrate.

4.4.3 Wastewater Reuse

Another option is to reuse the wastewater for non-potable needs. With proper treatment, reclaimed wastewater demonstrates few health risks, while providing the community with an alternative water source. Typical methods of reuse include watering landscape and agriculture. The main problem with this option is that a backup system must be in place to handle the wastewater when it cannot be used for irrigation. Due to New England's climate, the irrigation method cannot be used year-round because the water cannot penetrate the frozen ground; therefore, a subsurface disposal system is still required for the entire quantity of effluent disposal. Since this option requires duplication of disposal areas, this option is significantly higher in cost and not advised for use in Lancaster.

4.5 Screening of Alternatives

This section provides a screening of the wastewater management alternatives discussed above and analyzes their potential effectiveness in addressing the problems within the study area.

4.5.1 Shared Septic Systems

Shared septic systems can be used for a cluster of businesses where wastewater is collected and treated (conventional Title 5 or I/A technologies) and ultimately discharged using subsurface disposal. This category does not include a treatment plant; therefore, this alternative is for flows less than 10,000 gpd. Each shared system would require a "localized" parcel of land with suitable soil, geologic, and groundwater conditions for effluent disposal.

Based on an anticipated range of future flows from individual projects 0.02 to 0.26 mgd (Title 5 estimates) and widely spaced individual projects, shared septic systems do not appear to be a viable option for the project area since multiple shared systems would be required. It would be necessary to find multiple sufficiently sized sites that would be suitable for effluent disposal within or near the project area. In addition, for any sites producing more than 10,000 gpd of effluent, a waste discharge permit would be required.

Based on an initial review of tax assessor data, it does not appear that there are any town-owned parcels within the project area that would be feasible sites for effluent disposal with the exception of large parcels north of the Nashua River held as conservation land. All other vacant lots within the project area are zoned as either residential or commercial and are privately owned. To use these lots, it would be necessary for the town to purchase them or obtain easements from the current property owners. Since this alternative will require numerous sites and additional costs to purchase land or easements, this alternative is not cost effective and, therefore, shared septic systems were not considered further for this project.

4.5.2 Shared Wastewater Treatment within the EDTA

This alternative involves the use of wastewater treatment that returns the wastewater within or near the EDTA within the Town of Lancaster (Figure 11). As discussed above, this option requires some form of a wastewater collection system to transport flows to a treatment plant. For the purposes of this study, it will be assumed that the treatment plant would be designed for the projected future wastewater flow of an average of 0.26 to 0.53 mgd. The treatment and disposal site evaluated in this alternative is in the same potential location as the site for a supplemental water supply in the north Nashua River area. These potential uses are incompatible; the area cannot be used for both a new water supply and disposal of treated wastewater. This potential conflict may not be significant since viable options that

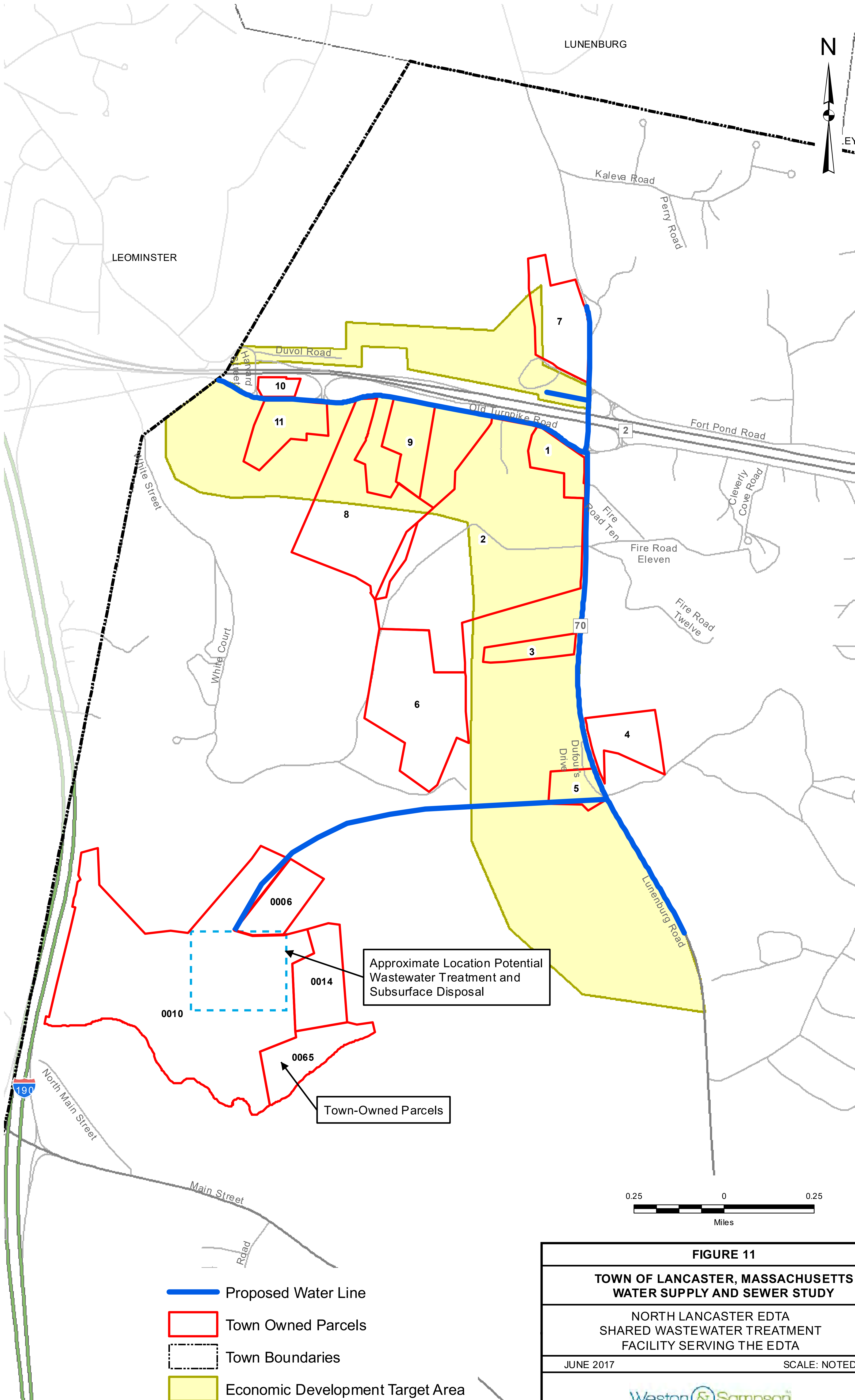

FIGURE 11

TOWN OF LANCASTER, MASSACHUSETTS
WATER SUPPLY AND SEWER STUDY

NORTH LANCASTER EDTA
SHARED WASTEWATER TREATMENT
FACILITY SERVING THE EDTA

JUNE 2017 SCALE: NOTED

Weston & Sampson

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do not involve this site exist for both water supply alternatives (Section 3.5) and for wastewater treatment and disposal options (Section 4.8). Specifically, neither the recommended water supply alternative nor the recommended wastewater collection and treatment alternative rely on the Town owned properties immediately north of the Nashua River.

4.5.3 New Wastewater Treatment Facility

Any new wastewater treatment facility must be sited to function properly and minimize potential impacts during construction and operations. The purpose of this section is to identify and screen alternative locations to site a new centralized treatment facility that could serve the EDTA. Should the town decide to proceed with this alternative, a more in-depth screening is recommended, including subsurface borings.

A general review of the assessor's maps and resource information was performed for the project area. The investigation was a preliminary screening that did not include soil testing or assumes use of publicly owned land. Based on tax assessor data, it appears that there is a town-owned parcel within the project area that may be feasible for effluent disposal. This site is West of McGovern Creek and north of the Nashua River (Figure 11). The site is located at the southern portion of the study area and is adjacent to sand and gravel mining areas that have been subject to reclamation. This site may have enough land area available to accept the projected average 0.26 to 0.53 mgd. Based on the location of this parcel, and the fact that it is municipally-owned, this site could be considered for further evaluation. If the town is amenable to investigating private property (through easements) for the siting of the wastewater treatment facility, there may be other alternatives available; however, the primary focus of this study was on town-owned land. According to GIS data, most of the soil in the project area is either till or lake deposits (see Figure 9).

The parameters that should be used to evaluate sites for suitability are as follows:

- Land Area – The land area to site a facility would have be a minimum of 1 acre. Larger land areas are preferred because they will allow for reserve/open areas around the site.
- Proximity to Service Area – The proximity to the service area is important so the raw wastewater does not have to be conveyed significant distances prior to treatment.
- Proximity to Disposal Site(s) – The proximity to disposal sites is important to minimize the distance that the effluent must be pumped. However, more efficient pumps can be utilized to pump effluent than raw sewage therefore having a location that is closer to disposal is not as significant as the proximity to the service areas.
- Ownership – Town-owned land is preferential. Otherwise, private land or use thereof will have to be obtained by the Town for use as a facility site.
- Proximity to Residential Areas – The preferred siting of a treatment facility is away from developed residential areas. Even though treatment facilities can be designed and constructed to be aesthetically pleasing and non-odorous, preferential selection would

be given to sites that are located away from residential areas.

- Minimal Adverse Construction Impacts – This parameter deals with the impacts that the construction of such a facility would have on the site and streets within the area. Areas that are tightly situated within existing developments would have higher impacts.

- Environmental Impacts – This parameter deals with the impacts that construction and operation of the facility would have on the surrounding environment. Additional field investigations will be necessary to confirm the optimum area for subsurface disposal. For this analysis, the undeveloped town owned area north of the Nashua River will be considered for effluent disposal based on the assumption that an adequate effluent disposal site of sufficient size (roughly 1 to 2 acres) can be sited on these parcels.

- Land Use Impacts – The publicly owned parcels large enough to accommodate a treatment facility and subsurface disposal system are designated conservation land and are wooded. Since both the WWTP and the disposal area would require clearing, this would be a permanent change in land use by as much as 4 acres.

4.5.4 Centralized Wastewater Treatment at an Existing Facility

This alternative involves the connection to a centralized wastewater treatment system. As with a decentralized system, this option requires some form of a wastewater collection system to transport flows to a neighboring treatment plant. There are 3 existing wastewater treatment facilities (WWTF) that serve South Lancaster, Leominster, Lunenburg and Shirley. These WWTF are located in Clinton, Leominster and Devens. Connection to wastewater treatment systems operated by the Town of Ayer and Town of Harvard are not considered due to the distance of new sewer main that would be required (Table 10). In addition to the costs associated with connecting to a new collection system serving the EDTA, any costs associated with necessary upgrades of the WWTP would be borne by the new customers.

Table 10- Summary of New Connection Facilities Needed to Connect EDTA to a WWTF

Facility location	New Connection		Pump station	Notes
Leominster WWTP	Force Main	13,000 lf	New	
Clinton WWTP	Gravity Main	9,000 lf		
	Force Main	6,000 lf	New	Through existing Lancaster system
Devens WWTP	Force Main	7,000 lf	New	Through existing Shirley system

The City of Leominster is the nearest neighboring town to the EDTA with a municipal sewer system. Its WWTP is approximately 1.1 mile west of the Lancaster town boundary near Rte. 2. Therefore, as discussed herein, this alternative would involve conveying flows from the study area to the City of Leominster. The nearest connection to the Leominster municipal sewer collection system is along Rte.2 which is within the north-west portion of the project area (Figure 10). This alternative would eliminate the need for a local treatment plant; however, the collection system has limited capacity and would need to be substantially upgraded. In addition, it would require a new Inter-Municipal Agreement (IMA) between the City and the Town. Both the alternative of connecting to the Clinton WWTP and the Devens WWTP would require substantially more new sewer main and therefore have higher cost. On this basis, these alternatives are not considered further.

4.6 Collection System Layout Alternatives

As discussed above, all of the “off-site” alternatives for wastewater management that have been identified require the conveyance of wastewater from each property to a decentralized or centralized location for further treatment prior to effluent disposal. This section of the report compares the various layout alternatives for conveying flows from the project area.

The major factors affecting collection system design are topography and cost. A conventional gravity sewer relies on a steady decrease in elevation to convey wastewater from a higher elevation to a lower elevation. When grades or excavation depths become, excessive or cost prohibitive, mechanical means are typically introduced to lift wastewater flows from a lower elevation to a higher one. As detailed above, this can be accomplished by either 1) running gravity sewers to a central pumping station at a common low point and discharging through a dedicated force main, or 2) using multiple pumps at various elevations and locations, then pumping into a common low-pressure sewer.

As part of this study, no topographic survey or soil explorations have been performed. Preliminary estimated costs have been developed for all viable alternatives for purposes of comparison and for use in making final recommendations.

Typically, the first exercise performed in determining the most appropriate sewer technology is to develop a profile of the proposed sewer route. Since no topographic survey has been performed for the study area, available USGS data (10-foot contours) has been utilized to estimate the direction of flow, as well as site visits to the project area. Based on this information, it appears that most of the study area can be served by gravity sewers. It appears that one central pump station will also be necessary at the low point of the area. A small portion of the project may require low-pressure sewers. Figure 5 presents the proposed layout of the wastewater collection system.

4.6.1 Route 2 West

There is an existing 6-inch polyvinyl chloride (PVC) force main sewer located in north of Rte.2 which conveys the wastewater flow from the 2 existing services to the Leominster WWTP. Depending on how much of the EDTA is served by the Leominster WWTP, the main may need to be replaced with a larger force main. Although the existing 6-inch line may prove to be sufficient with a new pumping station to increase velocity, this study estimates cost of a replacement force main as a worst-case analysis. This section of the main would extend from the Rte. 2 intersection with Rte. 70 (Lunenburg Road) and follow

Old Union Turnpike and Mechanic Street to the Leominster WWTP. The length of the main would be approximately 11,000 lf. The length of new gravity main required to serve properties south of Rte.2 would be approximately 4,900 lf.

4.6.2 Lunenburg Road South of Route 2

Based on the existing topography, most of this portion of Lunenburg Road would appear to require a force main to the intersection of Rte.2. The approximate length of this force main in Lunenburg Road is 6,000 lf, if it extends service south to the Nationwide Auto Recycling site.

4.6.3 Lunenburg Road North of Route 2

Based on the existing topography, most this portion of Lunenburg Road would appear to a gravity main to the intersection of Rte.2. The approximate length of this gravity main in Lunenburg Road is 1600 lf, if it extends service only north to serve the RHO property.

4.6.4 McGovern Boulevard

Based on the existing topography, the McGovern Boulevard area would appear to require a force main to the intersection of Rte. 70. The approximate length of this force main is approximately 2,500 lf.

4.7 Wastewater Alternatives Cost Estimates

This section of the report includes planning level costs for each of the investigated alternatives:

- use of onsite individual treatment (Title V septic systems),
- shared system that returns treated wastewater to areas within the EDTA, and
- connection to the Leominster WWTF.

4.7.1 Title 5 Repairs/Upgrades

Historic repair and new septic system costs have been utilized to develop the planning period costs for Title 5 upgrades. As discussed earlier in this report, this alternative was used as a “baseline” to evaluate the long-term capital and operations/maintenance costs of other alternatives. Based on our experience, the cost of repair/upgrades to existing septic systems to be in compliance with current Title 5 regulations could range from $30,000 to $40,000 for a system with 600 gpd capacity, or approximately $20 per gpd of effluent.

Therefore, for the purposes of this analysis, it was assumed that every property within the project area would require a conventional Title 5 repair/upgrade at an average cost of $20/gpd of effluent. Therefore, the estimated minimum overall capital cost to bring these systems into compliance would be approximately $10,600,000.

4.7.2 Shared Wastewater Treatment within the EDTA

In order to prepare a preliminary budget level opinion of probable construction and operation and maintenance costs for the shared wastewater treatment alternative, the following assumptions were made:

- The collection system will be comprised of gravity sewer and low-pressure sewer east along Rte.2 to Lunenburg Road, with one pump station required to convey flows along Lunenburg Road to McGovern Boulevard.
- The study area requires approximately 15,000 lf of collection system pipeline (gravity, low-pressure and force main) to front all the properties in the study area.
- The wastewater flows will be conveyed from the pump station site to a wastewater treatment facility and effluent disposal site on public land at the western portion of McGovern Boulevard.

The planning level cost for construction of the collection system has been estimated at $200 per foot of gravity sewer, $135 per foot of low-pressure sewer, $75 per foot of force main sewer, and $300,000 for each pump station. Based on the assumed quantities detailed above and in Table 11, the total estimated collection and treatment system cost would be approximately $9.7 million.

The cost of a 0.26 mgd packaged wastewater treatment plant permitted, designed and constructed under current local and DEP requirements, in accordance with requirements for municipally designed and constructed facilities, has been estimated between $2 million and $3 million, not including any land acquisition costs since it has been assumed to be sited on town-owned land. However, the cost of the facility may be higher if more stringent water quality standards are applied to the treated effluent.

Cost of additional required services were assumed as a percentage of the estimated construction cost as follows:

- Limited additional wastewater planning for MEPA approval, final design (including detailed hydrogeological investigations, groundwater modeling, and permitting in addition to typical design services) at 15%.
- Construction services at 15%.
- Contingency at 10%.

This information is summarized as follows:

Table 11 Estimate of Costs for Shared Wastewater Treatment within the EDTA

Area	Component	Amount	Unit Costs	Total Capital Costs	Capital Costs + 10% Contingency	Design/ Engineering/ Permitting (25%)	Construction Services (15%)	
Rt.2 west; new services	Low Pressure Main	4,900	$135/ft	$ 661,500	$ 727,650	$ 181,912.50	$ 109,148	
(South of Rt. 2)	Pump Station	1	$300,000 ea	$ 300,000	$ 330,000	$ 82,500.00	$ 49,500	
Along Lunenburg Road	Low Pressure Main	1,600	$135/ft	$ 216,000	$ 237,600	$ 59,400.00	$ 35,640	
(North of Rt.2)	Pump Station	1	$300,000 ea	$ 300,000	$ 330,000	$ 82,500.00	$ 49,500	
Along Lunenburg Road	Low Pressure Main	6,000	$135/ft	$ 810,000	$ 891,000	$ 222,750	$ 133,650	
(South of Rt.2)	Pump Station	1	$300,000 ea	$ 300,000	$ 330,000	$ 82,500	$ 49,500	
Along McGovern Road	Force Main	2,500	$75/ft	$ 187,500	$ 206,250	$ 51,562.50	$ 30,938	
	Pump station	1	$300,000 ea	$ 300,000	$ 330,000	$ 82,500.00	$ 49,500	
Treatment Facility	0.26 MGD WWTP	1	$2,500,000 ea	$ 2,500,000	$ 2,750,000	$ 687,500.00	$ 412,500	
SubsurfaceDisposal Facility	Tank/distribution	1	$750,000 ea	$ 750,000	$ 825,000	$ 206,250.00	$ 123,750	
Total Estimated Cost					**$ 6,957,500**	**$ 1,739,375**	**$ 1,043,625**	**$ 9,740,500**

Operation and maintenance costs will be the responsibility of the users. Based on similar wastewater treatment facilities and collection systems in Massachusetts similar to the system identified above, it is estimated that the total annual operation and maintenance costs will be approximately $50,000 per year. These costs assume privatization of the wastewater treatment and collection system operation and maintenance. The costs also assume that state and local regulations apply.

4.7.3 Centralized Wastewater Treatment

In order to prepare a preliminary budget level opinion of probable construction, operation, and maintenance costs for the centralized wastewater treatment alternative, the following assumptions were made:

- The collection system will collect wastewater from the same area as presented above for decentralized wastewater treatment.
- The flows from McGovern Boulevard area and along Lunenburg Road would be to the north by force main.
- The flows from the entire EDTA along Rte.2 would be to the west by a low-pressure pump station located near the intersection of Rte.2 and the Lunenburg Road.
- The wastewater flows from Lancaster will be conveyed approximately 1.1 miles (11,000 lf) from a pump station site on the Leominster/Lancaster line to the Leominster WWTP.

Again, the cost for construction of the collection system has been estimated at $200 per foot of gravity sewer, $135 per foot of low-pressure sewer, $75 per foot of force main sewer, and $300,000 for each pump station. Based on the assumed quantities detailed above and in Table 12, the estimated collection and treatment system cost is approximately $6.5 million.

As with the decentralized alternative, the costs of additional required services were assumed as a percentage of the estimated construction cost as follows:

- Limited additional wastewater planning for DEP approval, final design (including capacity analysis on the Leominster sewer system and permitting in addition to typical design services) at 15%.

- Construction services at 15%.
- Contingency at 10%.

This information is summarized as follows:

Table 12 Cost Estimate to Connect with Existing Leominster Waste Water Treatment Plant

Area	Component	Amount	Unit Costs	Total Capital Costs	Capital Costs + 10% Contingency	Design/ Engineering/ Permitting (25%)	Construction Services (15%)	
Rt.2 west to	Force Main (1)	11,000	$75/ft	$ 825,000	$ 907,500	$ 226,875.00	$ 136,125	
Leominster WWTP	Pump Station	1	$300,000 ea	$ 300,000	$ 330,000	$ 82,500	$ 49,500	
Rt.2 west; new services	Low Pressure Main	4,900	$135/ft	$ 661,500	$ 727,650	$ 181,913	$ 109,148	
(South of Rt. 2)	Pump Station	1	$300,000 ea	$ 300,000	$ 330,000	$ 82,500	$ 49,500	
Along Lunenburg Road	Low Pressure Main	1,600	$135/ft	$ 216,000	$ 237,600	$ 59,400	$ 35,640	
(North of Rt. 2)	Pump Station	1	$300,000 ea	$ 300,000	$ 330,000	$ 82,500	$ 49,500	
Along Lunenburg Road	Low Pressure Main	6,000	$135/ft	$ 810,000	$ 891,000	$ 222,750	$ 133,650	
(South of Rt.2)	Pump Station	1	$300,000 ea	$ 300,000	$ 330,000	$ 82,500	$ 49,500	
Along McGovern Road	Force Main	2,500	$75/ft	$ 187,500	$ 206,250	$ 51,563	$ 30,938	
	Pump station	1	$300,000 ea	$ 300,000	$ 330,000	$ 82,500	$ 49,500	
Total Estimated Cost					**$ 4,620,000**	**$ 1,155,000**	**$ 693,000**	**$ 6,468,000**
Note: (1) Assumes replacement of existing force main								

It should be noted that additional capital costs typically associated with IMAs have not been included in the projected cost of this alternative. Typically, there is an upfront capital cost to secure capacity within the neighboring treatment plant which in this case is the Leominster wastewater treatment facility located on Commercial Road. Based on this information, the cost of this alternative could be significantly higher than presented above in Table 12.

Most the operation and maintenance (O&M) costs for this alternative will be the user fees paid to Leominster. Current fees could range from $75,000 to $100,000 per year depending on the amount of wastewater flow from the EDTA. Assuming another $50,000 per year in O&M on the local Lancaster collection system brings the total estimated annual O&M to between $125,000 and $150,000.

Table 13 presents an overall cost summary of the wastewater treatment alternatives.

Table 13 - Overall Cost Summary of the Wastewater Treatment Alternatives

Alternative	Estimated Cost
Individual Systems (1)	$10.6 Million
Decentralized Treatment (New WWTP)	$9.7 Million
Centralized Treatment (Existing WWTP)	$6.5 Million

4.8 Wastewater Funding Options

There are several ways that the Town of Lancaster can fund wastewater infrastructure projects. One way is through the Massachusetts State Revolving Loan Fund (SRF) sometimes called the Clean Water State Revolving Fund (CWSRF) Loan program which is administered by the Division of Municipal Services of the Department of Environmental Protection (MADEP). This program provides subsidized loans to municipalities for various wastewater management projects including all the alternatives previously discussed in this report. The current interest rate of the subsidized loan is 2% for a term of 20 years. A Project Engineering Report (PER) is required to be considered for this program. The PER is discussed in more detail in the recommendations section of the report.

The Community Development Block Grant (CDBG) program can be another option to fund wastewater management in Lancaster. It is a federally funded, very competitive grant program through the Department of Housing and Urban Development (HUD). It is designed to help small cities and towns meet a broad range of community development needs including construction or repair of sewer lines. Municipalities such as Lancaster with a population of under 50,000 that do not receive CDBG funds directly from the HUD can apply for this funding. For a wastewater construction project to be eligible for funding, it would need to benefit low and moderate-income persons. The town would need to conduct an income survey of the homes that will be affected by the infrastructure project to show that more than 51% of the residents are income eligible. CDBG grants range from $100,000 to $800,000 for infrastructure projects and can take at least several months to prepare (often longer). Due to the nature of development that would be served in the EDTA, the feasibility of this funding alternative should be vetted with the state Executive Office of Housing and Economic Development.

Funding is also available under the new MassWorks Infrastructure Program. This program provides funding options for municipalities seeking public infrastructure funding to support economic development. The program represents an administrative consolidation of the following six grant programs:

- Public Works Economic Development (PWED) Grants
- Community Development Action Grant (CDAG)
- Growth District Imitative (GDI) Grants
- Massachusetts Opportunity Relocation and Expansion Program (MORE)
- Small Town Rural Assistance Program (STRAP)
- Transit Oriented Development (TOD) Grant Program

The MassWorks Infrastructure Program provides grant funding for the construction, reconstruction and expansion of publicly owned infrastructure including, but not limited to sewers, utility extensions, streets, roads, curb-cuts, parking facilities, water treatment systems, and pedestrian and bicycle access. Eligible public infrastructure must be located on public land or on public leasehold, right-of-way, or easement.

The project must be procured in accordance with Massachusetts General Laws c.30B, c.30 §39M, c.149, and c.7. In each year, there will be a set-aside of funds available only for projects in small, rural communities with a population of 7,000 or less. The grant program also provides for commercial and residential transportation and infrastructure development, improvements and various capital investment projects under the Growth Districts Initiative established by the Executive Office of Housing and Economic Development. Due to the population of Lancaster and nature of development that would be served in the EDTA, the feasibility of this funding alternative should be vetted with the state Executive Office of Housing and Economic Development.

The MassWorks Infrastructure Program is administered by the Executive Office of Housing and Economic Development, in cooperation with the Department of Transportation and Executive Office for Administration and Finance. Primary funding rounds will open September 1st annually and decisions will be rendered approximately six weeks after the close of the application period. MassWorks Infrastructure Program applications will be available no later than May for the September funding round in that calendar year. The MassWorks Infrastructure Program may hold a second annual funding round to consider additional projects, and the availability of a second round will be announced as soon as the determination is made. Only those projects that are prepared to proceed to construction during the upcoming construction season should apply for consideration.

Communities with a population of 7,000 or less are eligible to apply for design/engineering costs along with a construction grant. In that case, the project must be able to complete design/engineering in a period that allows the project to advance to construction during the upcoming construction season.

4.9 Recommendations

The recommended alternative to wastewater collection, treatment, and disposal in the center of town is transport to and use of the centralized wastewater treatment system within the City of Leominster. As shown above, this alternative is a technologically sound collection system for conveying wastewater from the properties located within the project area and avoids the cost of a decentralized centralized wastewater system. Several assumptions have been made as part of this initial Water and Sewer Feasibility Study, which should be further confirmed with field investigations and a more detailed report, such as a PER.

4.9.1 Recommended Plan of Action

The primary focus for moving this project forward remains in developing an IMA to treat a sufficient volume of treated wastewater effluent. The costs of a collection system still need to be confirmed through additional engineering investigations. Understanding that the project is currently in the conceptual stage and any projections of schedule and timeframe are subject to wide variations, the remaining tasks to be considered in bringing the project to completion, with anticipated schedules and timeframes, and are as follows:

- Negotiate IMA with Leominster
- Town Meeting Authorization of Planning Funding

- Project Engineering Report (PER)
- Town Meeting Authorization of Design Funding
- Massachusetts Environmental Protection Act (MEMA) Review Process
- Final Design and Permitting
- Submittal of Project Evaluation Form (PEF)
- SRF or MassWorks Application
- Town Meeting Authorization of Construction Funding
- Public Bid/Award Process
- Construction