

Town of North Reading

Draft Environmental Impact Report

Project Meeting #2

June 25, 2015

Presented by:

Paul Brinkman

Amy Coppers Costantino, PE



WRIGHT-PIERCE 
Engineering a Better Environment

Invite List

- Secretary Matthew A. Beaton; Executive Office of Energy and Environmental Affairs
- Department of Environmental Protection; Commissioner's Office
- MassDEP/Northeast Regional Office; MEPA Coordinator
- Mass DOT - District #4 Office; MEPA Coordinator
- Massachusetts Historical Commission
- Merrimack Valley Planning Commission
- Metropolitan Area Planning Council
- Town of North Reading Board of Selectmen
- Michael Gilleberto; Town Administrator Town of North Reading
- Town of North Reading Community Planning Department
- Town of North Reading Conservation Commission
- Town of North Reading Health Department
- Town of Reading Board of Selectmen
- Robert W. LeLacheur, Jr., Town Manager Town of Reading
- Town of Wilmington Planning Department
- Town of Wilmington Health Department
- Town of Wilmington Conservation Commission
- Town of Wilmington Board of Selectmen
- Town of Reading Planning Department
- Town of Reading Conservation Commission
- Town of Reading Health Department
- Town of Andover Board of Selectmen
- Reginald S. Stapczynski; Town Manager Town of Andover
- Town of Andover Planning Board
- Town of Andover Conservation Commission
- Town of Andover Board of Health
- Natural Heritage and Endangered Species Program; Commonwealth of Massachusetts
- DCR; MEPA Coordinator
- Department of Public Health ; Director of Environmental Health
- Pamela Heidell; Massachusetts Water Resource Authority; MEPA Coordinator
- Energy Facilities Siting Board; MEPA Coordinator
- Division of Energy Resources; MEPA Coordinator
- Ipswich River Watershed Association, Wayne Castonguay, Executive Director
- Martins Pond Association



MEPA Process/Outline

- ENF
- EIR Preparation and Filing Process
 - Draft EIR
 - Submission of Draft EIR and Public Comment Period
 - Issuance of Secretary's Certificates
 - Response to Comments
 - Final EIR



Draft EIR

- Table of Contents
- Secretary's Certificates
- Summary
- Project Description
- Existing Environment
- Alternatives to the Project
- Assessment of Impacts
- Statutory and Regulatory Standards and Requirements
- Mitigation Measures
- Proposed Section 61 Findings
- Appendices

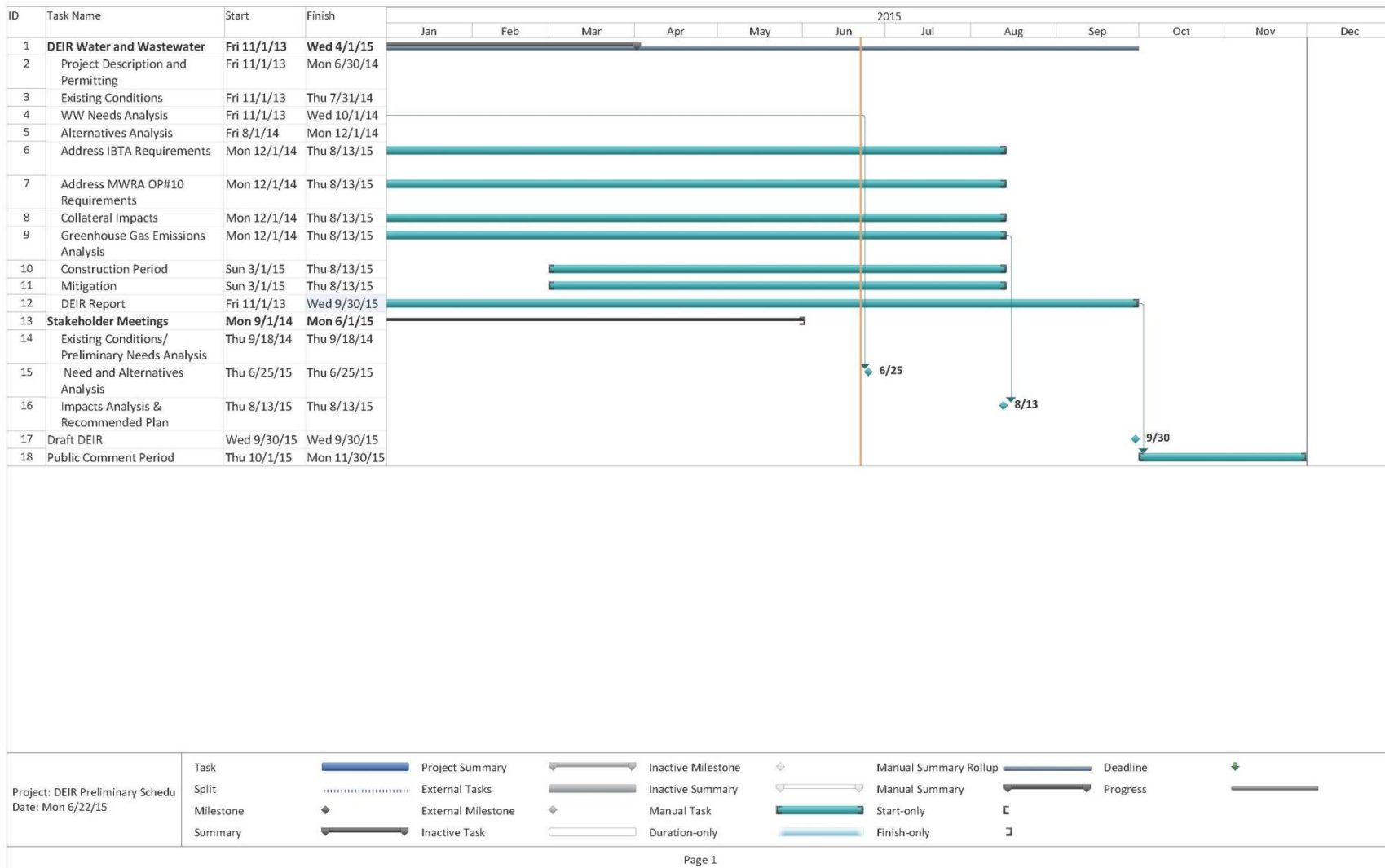


North Reading MEPA Process Framework

Tasks	Water & Wastewater	Tentative Date
Existing Conditions	Meeting #1	Completed
Needs and Identify Alternatives	Meeting #2	Current
Impact Analysis and Recommended Plan	Meeting #3	Fall 2015



Anticipated Schedule



Agenda - DEIR

- Water Needs Recap
 - Updates and Clarifications from last Meeting
- Water Alternatives Analysis
 - Alternatives Screening
 - Selected Alternatives
- Wastewater Needs Analysis
 - Scoring Matrix Methodology
 - Results
- Wastewater Alternatives Analysis
 - Preliminary Screening
 - Potential Alternatives



Project Background – Water & Stormwater

- North Reading Water Supplies
 - Wells through Water Registrations
 - ◆ Registered Use (0.96 MGD)
 - Surface Supply from Andover (Merrimack River)
 - ◆ IBTA (1.50 MGD)
- Can't meet all needs through either source (2.6 MGD)
- Ipswich River
 - Stressed Basin - "Over Allocated"
 - Stormwater



Project Background - Wastewater

- Primarily served through on-site disposal systems
- Water Quality Impairments from inadequate systems
- Known system rehabilitation/pumping rates
- Difficulty in areas of upgrades due to limited parcel area and soils
- Evaluated limited alternatives through CWMP process



Goals Water

- Provide long-term, sustainable option(s) for water supply
- Reduce water system complexity
- Allow community to provide services to maintain existing and future commercial/industrial base
- Manage capital and O&M costs
- Mitigate stress on the Ipswich River



Goals Wastewater

- Improve surface and ground water quality
- Provide long-term sustainable option(s) for wastewater treatment and disposal
- Allow community to provide services to maintain existing and future commercial/industrial base
- Address water quality impairments



Water Alternatives



Existing Water Supply Systems

- Local Sources
 - Wells with on-site treatment
 - ♦ Lakeside Boulevard WTP (Lakeside Wells and Rt 125)
 - ♦ West Village WTP (Railroad Bed Wellfield)
 - ♦ Central Street Wellfield
- Interconnections
 - 2 with Andover
 - ♦ Main Street
 - ♦ Central Street
- Emergency Interconnections
 - Wilmington at Park Street
 - Wilmington at Concord Street
 - Lynnfield at Chestnut Street
 - Lynnfield at North Hill Drive
 - Middleton at Forest Street



Future Demands

- Residential Use
- Commercial/Industrial
- Build-out
- Population
- MassDEP/MWRA OP.10 Requirements
- MDD/ADD



Future Requirements

2013 Base Population	14,896
Well Users (assuming well users transition to public water)	0
Population growth (undeveloped/underdeveloped lots * 2.71 people per household)	2,512
Population Served (Base + Well Users + Growth)	17,408

Gallons per capita per day	65 GPCD	50 GPCD
	Flow (MGD)	
Residential ADD	1.13	0.87
Non-Residential ADD 80% of highest recent year + undeveloped	0.19	0.19
2013 Confidently Estimated Municipal Use	0.12	0.12
Unaccounted Water (10% of total ADD)	0.16	0.13
Total ADD	1.60	1.31
Total Maximum Day Demand (1.6 peaking factor)	2.58	2.11



Water Alternatives: Overview

- Conservation
 - Mandatory
 - In addition to other alternatives
- No Build
- New supply sources
 - In town
 - Out of town



Water Alternatives: Conservation

- Comprehensive Planning & Drought Management Planning ✓
- Water Audit ✓
- Leak Detection ✓
- Metering ✓
- Pricing ✓
- Residential ✓
- Public Sector ✓
- Lawn & Landscape ✓
- Public Education & Outreach ✓
- Industrial, Commercial, and Institutional, Agricultural-
relatively low % of North Reading Water Use- action planned



Water Alternatives: No Build

- Optimize local sources
 - Replacement wells
 - Enhance treatment
- Maintain Andover connection



Water Alternatives: New Supply Sources In Town

- Optimize existing wells
- Identify potential groundwater withdrawal sites through geotechnical and hydrogeological exploration
 - Permits; SWMI
 - Ipswich-stressed basin
- Investigate in-town surface water sources
 - Martins Pond, Eisenhaures Pond, Bradford Pond, Swam Pond
 - Limited size, capacity and water quality

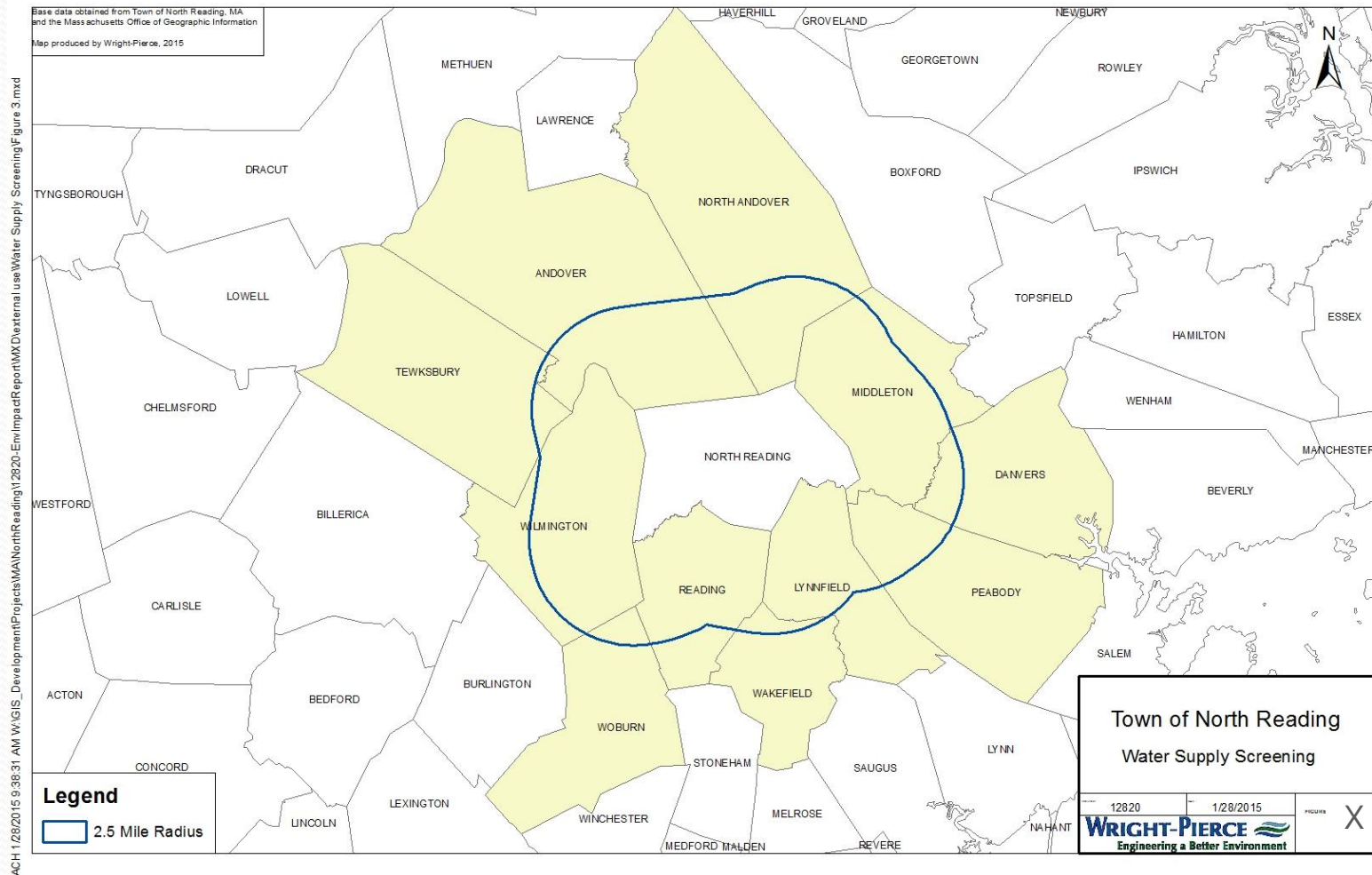


Water Alternatives: New Supply Sources Out of town

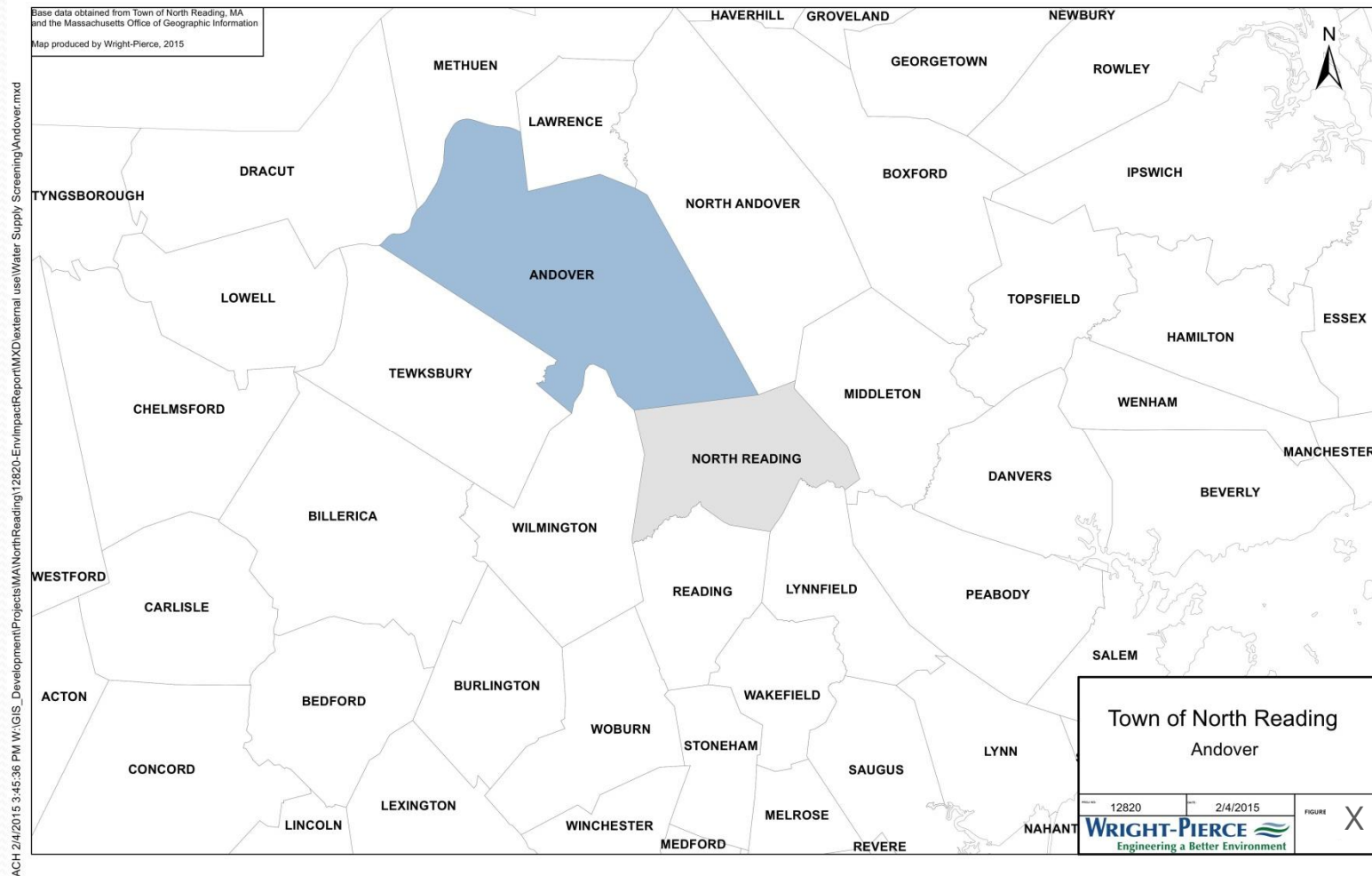
- Neighboring communities
- MWRA



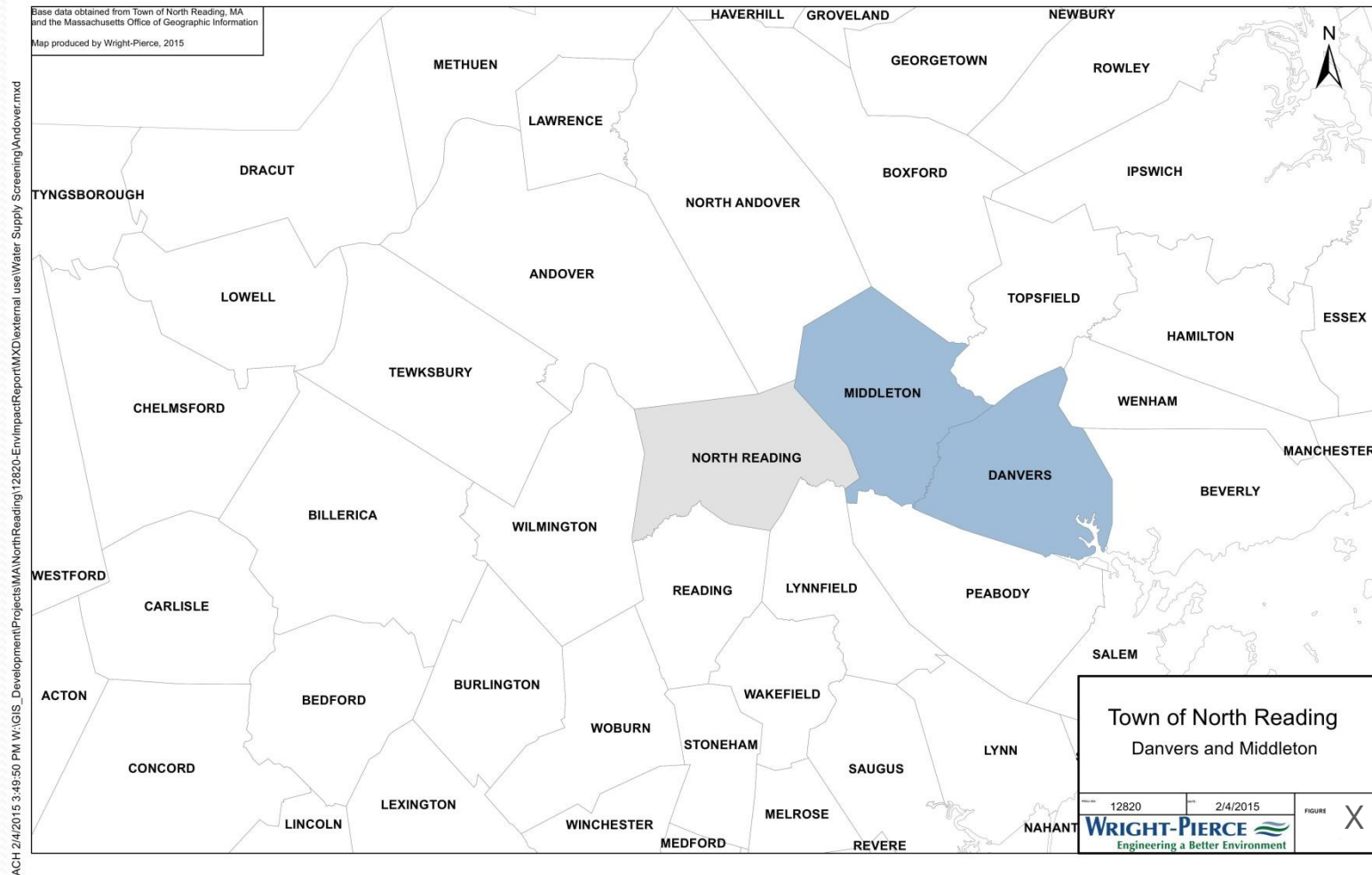
Water Supply Screening: Neighboring Communities



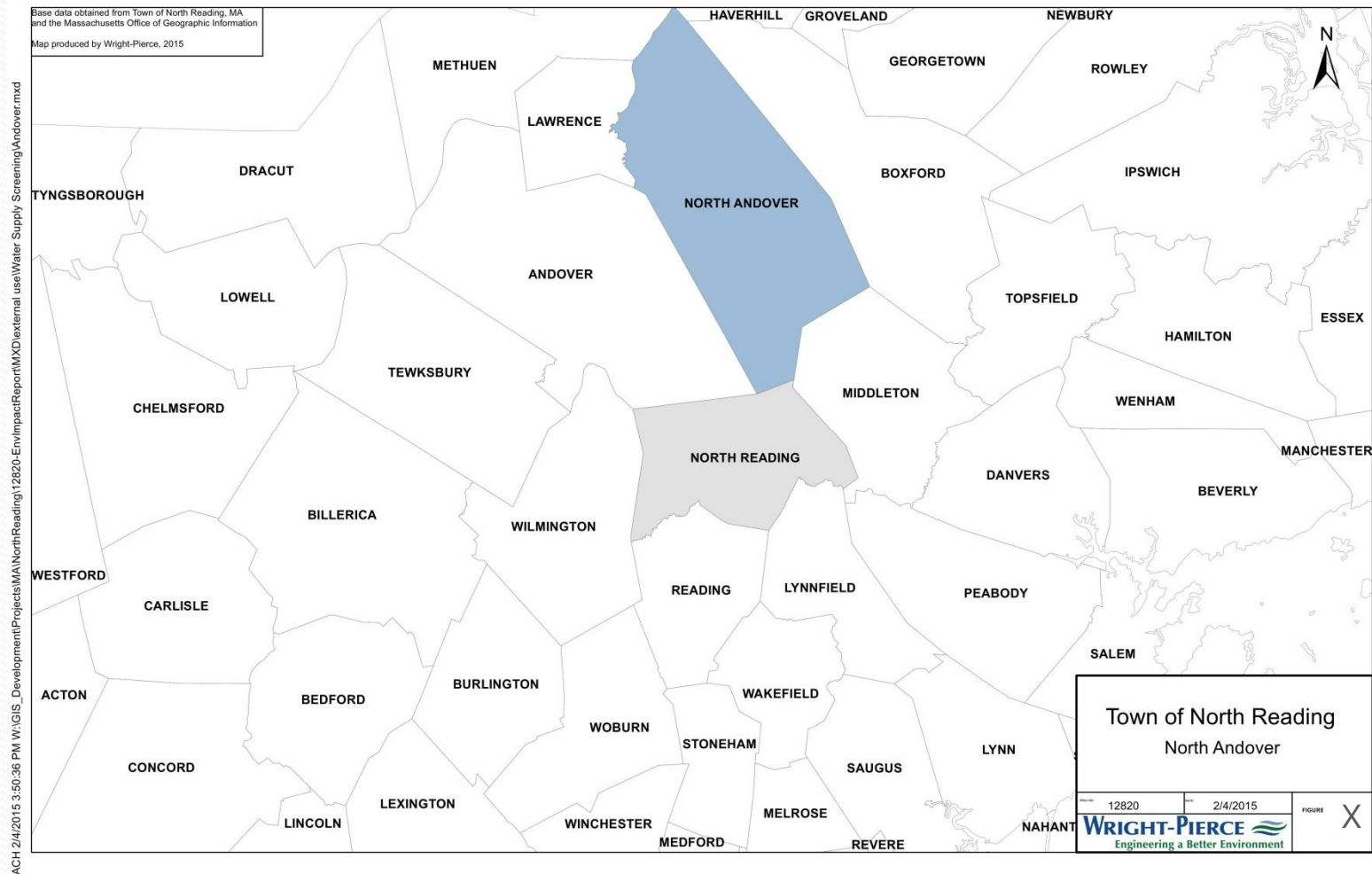
Andover — 8.51 MGD authorized, 7 MGD used in 2012



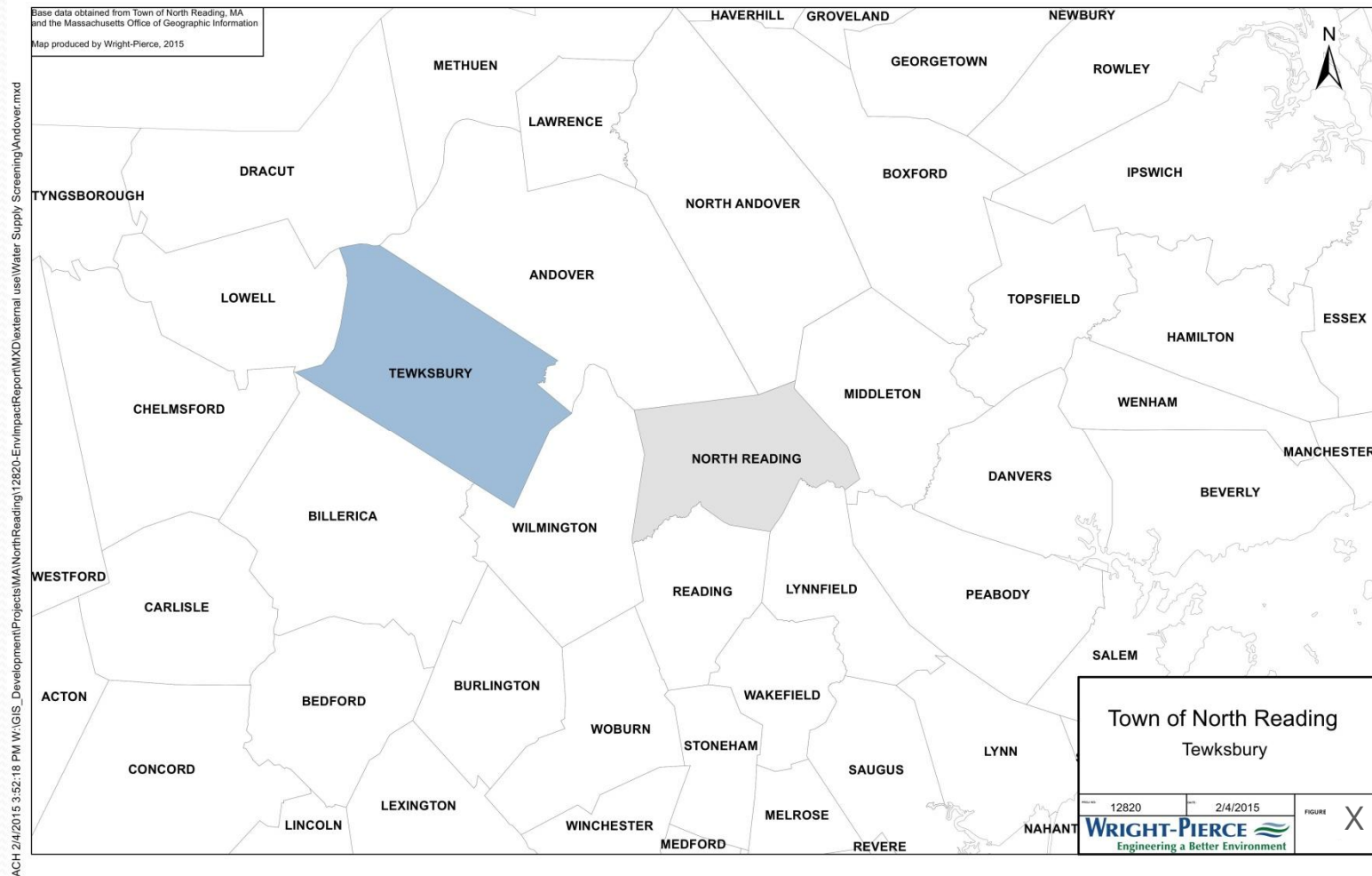
Middleton/Danvers- 3.72 MGD authorized, 3.14 MGD used in 2012



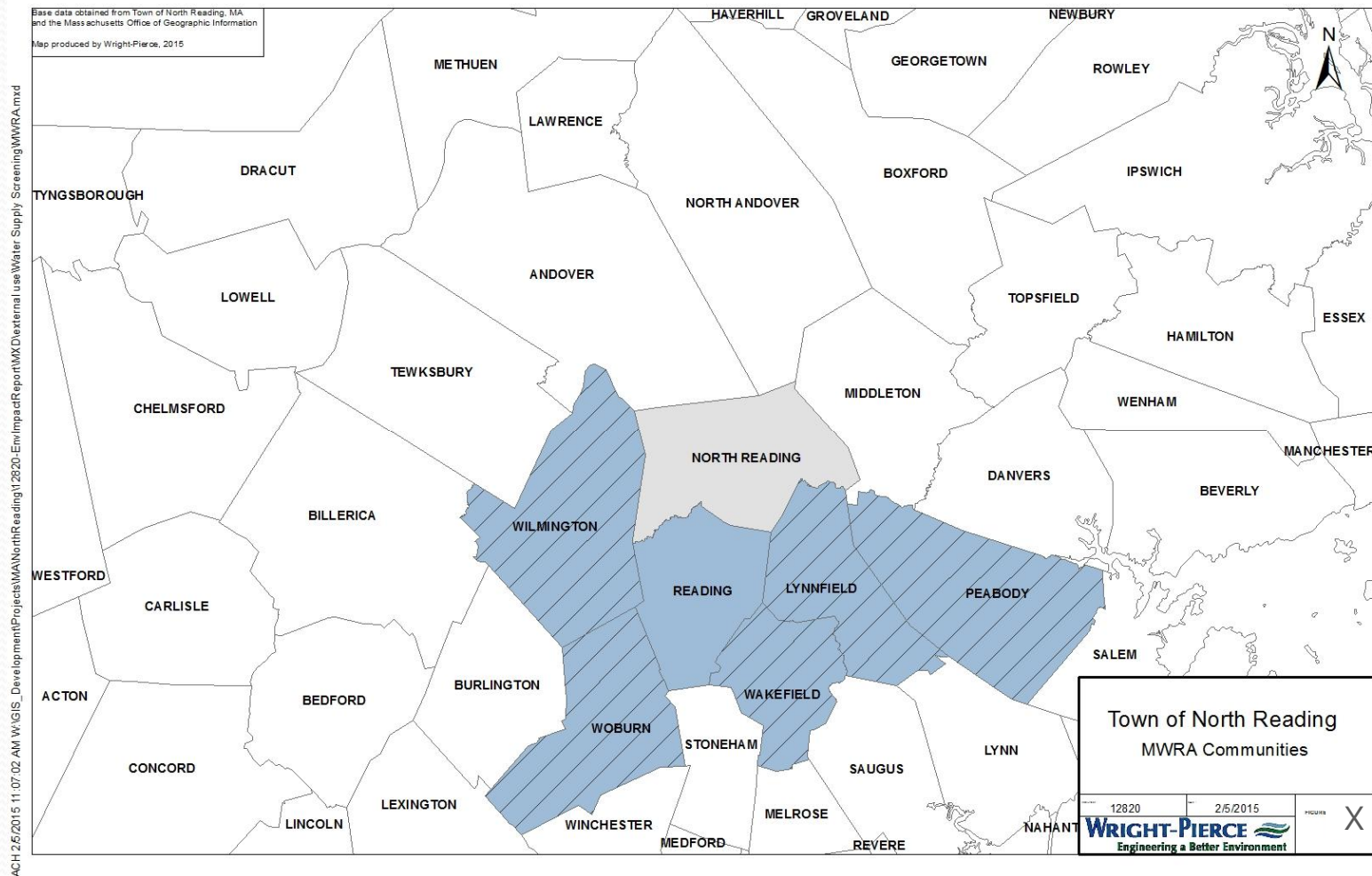
North Andover- 4.40 MGD authorized, 3.35 MGD used in 2012



Tewksbury- 3.17 MGD authorized, 2.39 MGD used in 2012



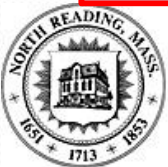
MWRA Communities



-  - Partial MWRA
-  - Full MWRA

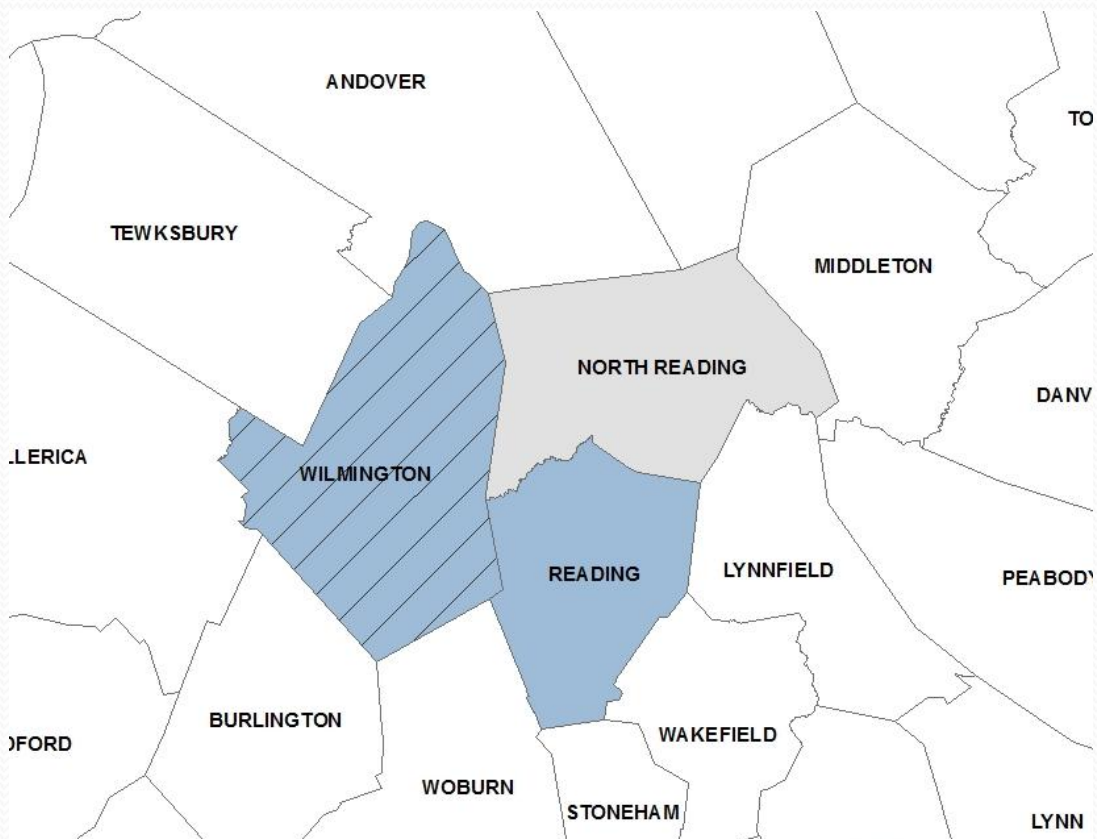
Water Alternatives Screening

Community	Local source (Y/N)	MWRA (Full/Partial/N)	Available Capacity (Y/N)
Andover	Y	N	N
Danvers/Middleton	Y	N	N
Lynnfield (LWD)	N	Full	Y
Lynnfield Center (LCWD)	Y	N	N
North Andover	Y	N	N
Peabody	Y	Partial	Y
Reading	N	Full	Y
Tewksbury	Y	N	N
Wakefield	Y	Partial	Y
Wilmington	Y	Partial	Y
Woburn	Y	Partial	Y



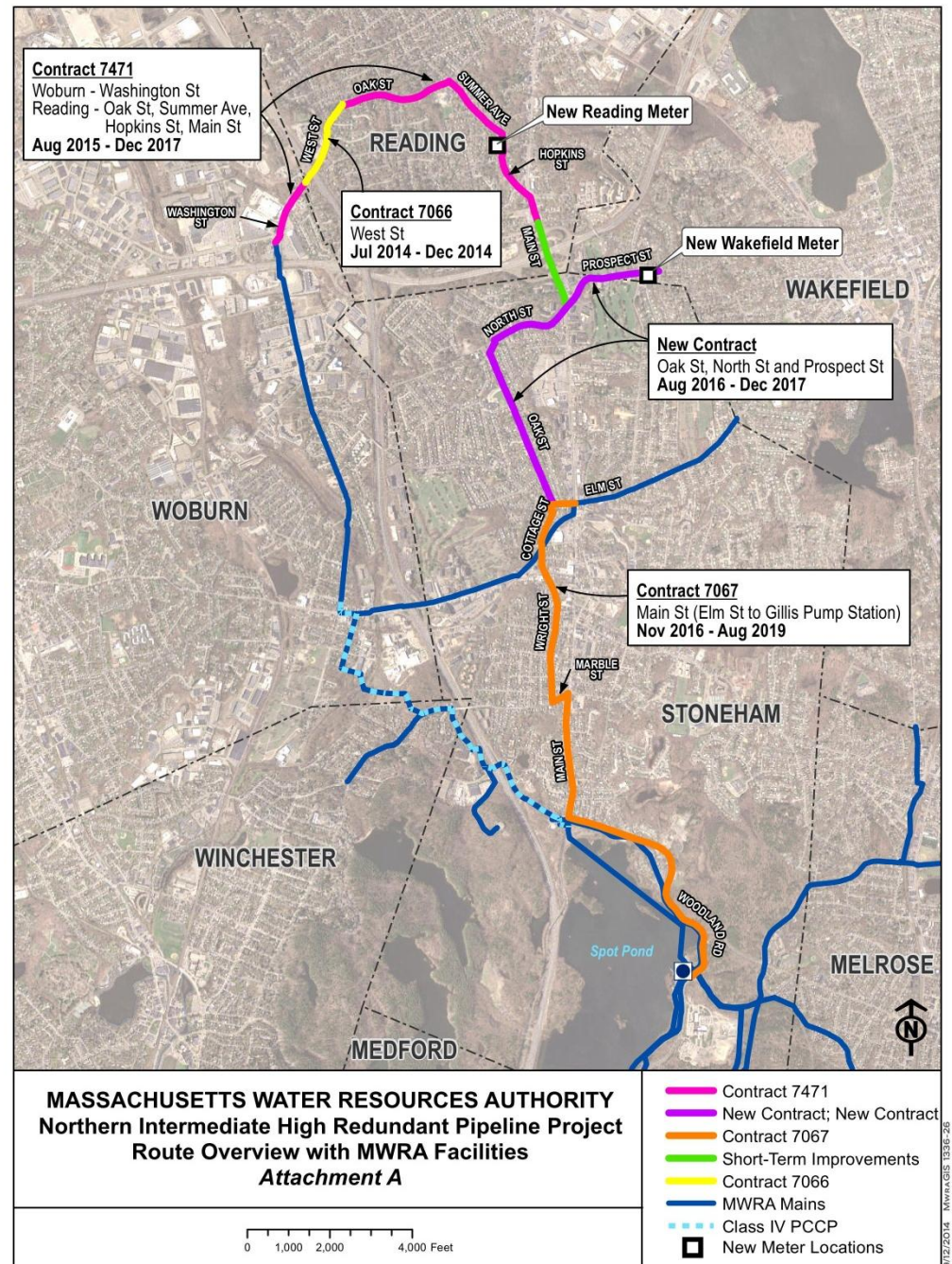
MWRA Alternatives

- Further screening
 - MWRA discussions
 - Reading
 - Wilmington

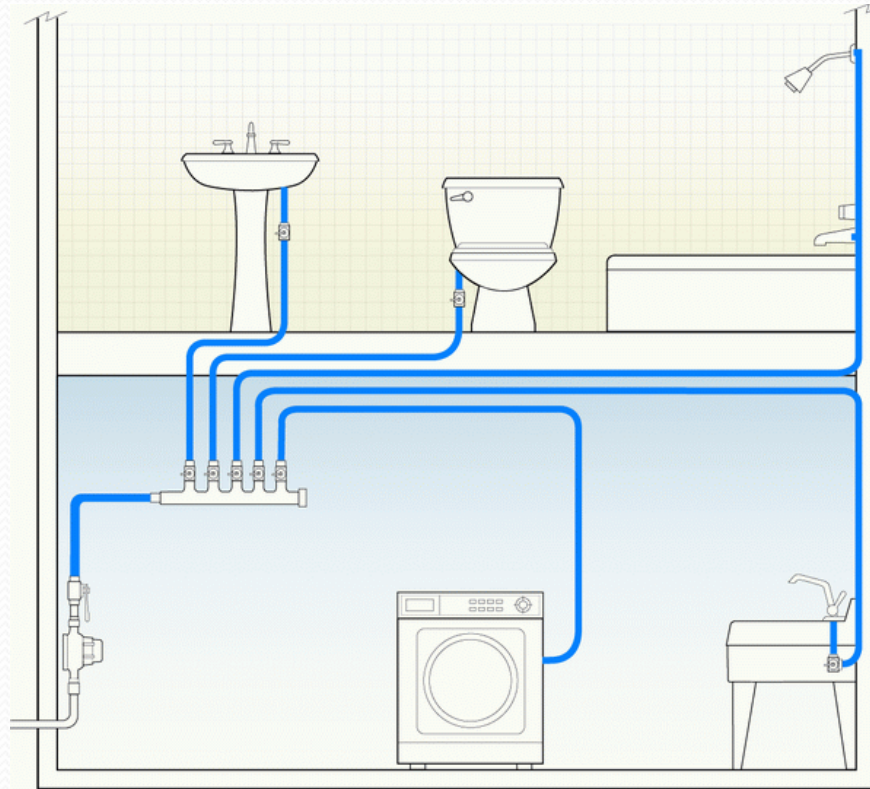


Final Alternatives:

- MWRA connection through Reading
- No build
- Local sources
- Conservation



Wastewater Alternatives



Existing Wastewater Management Systems

- North Reading Board of Health Septic System Regulations and Procedures
- Collection Systems
 - Private Collection Systems
 - Existing MWRA Sewer Connection



Wastewater Management Needs Assessment Process

- Develop Criteria
 - Physical
 - Location
- Collect Data – Validate
- Rank/weight Criteria
- Determine Needs



Criteria

Parameter	Unit	Source
Known Septic Failure	Yes/No	North Reading Board of Health Records
Has Tight Tank	Yes/No	North Reading Board of Health Records
Water Use Class	Class	North Reading Zoning GIS Layer
Proximity to impaired water	Miles	MassGIS Integrated Waters Layer
Lot size	Acres	North Reading Tax Parcel GIS Layer
Soil Drainage	Categories	USDA National Cooperative Soil Survey
Ponding	Yes/No	USDA National Cooperative Soil Survey
Flooding	Frequency	MassGIS FEMA Flood Mapping
Septic System Age	Years	North Reading Board of Health Records
Pump Out frequency	Years/pump	North Reading Board of Health Records
Within Zone 2 or IWPA	Yes/No	MassGIS Zone 2 and IWPA GIS Layers
Depth to GW	Feet	USDA National Cooperative Soil Survey
Depth to Restrictive Layer	Feet	USDA National Cooperative Soil Survey
Water Use per Acre	GPSF	North Reading Water Billing records
Adjacent to wetland	Yes/No	MassGIS MassDEP Wetlands Layer
Private well	Yes/No	North Reading Well Records
Outstanding Water Resource Protection Zone	Yes/No	MassGIS OWR Layer



Weighted Screening List

Parameter	Weight
Known Septic Failure	5
Has Tight Tank	5
Water Use Class	5
Proximity to impaired water	5
Lot size	2
Soil Drainage	2
Ponding	2
Flooding	2
Septic System Age	2
Pump Out frequency	2
Within Zone 2 or IWPA	2
Depth to GW	1
Depth to Restrictive Layer	1
Water Use per Acre	1
Adjacent to wetland	1
Private well	1
Outstanding Water Resource Protection Zone	1

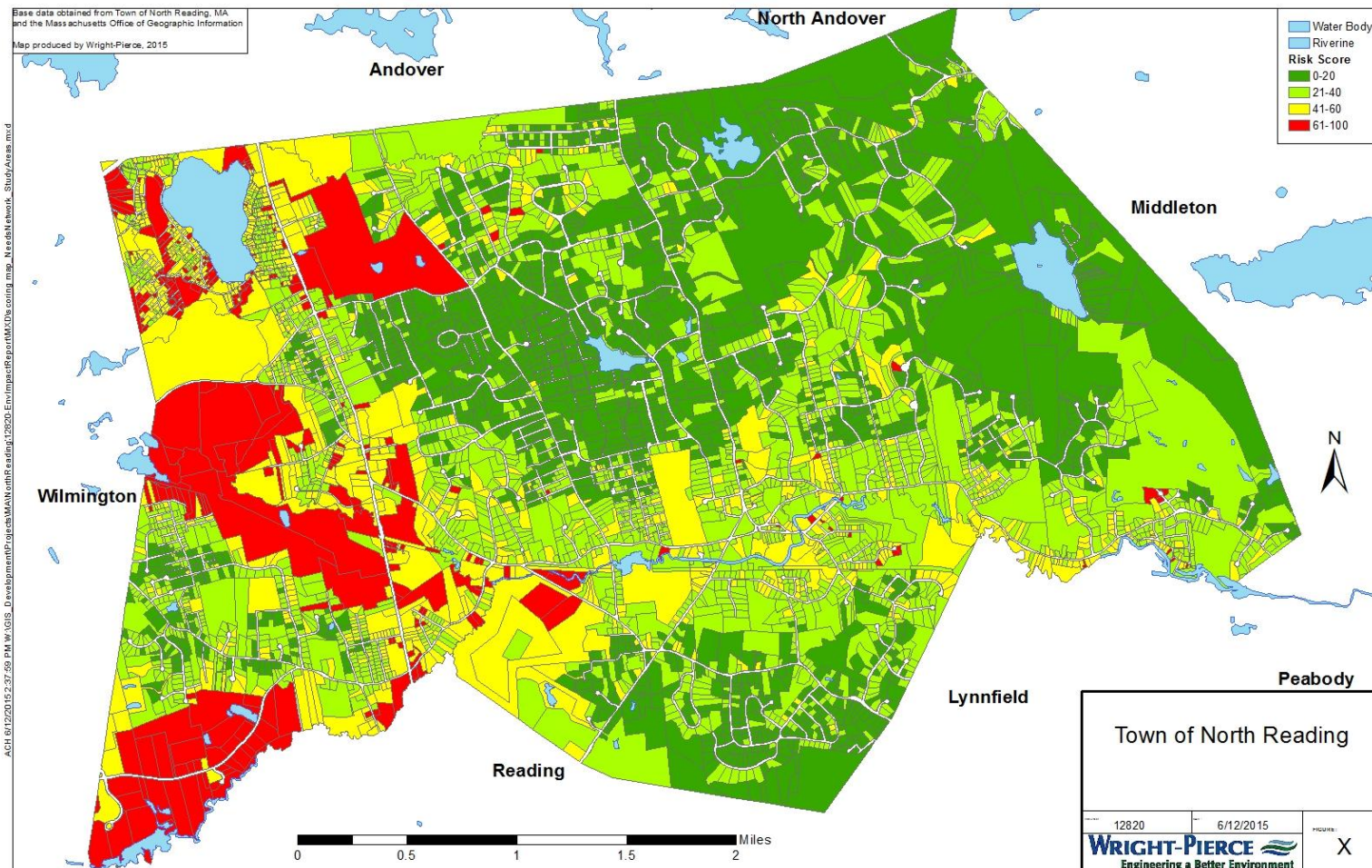


Wastewater Screening Map Results

Parameter	Weight	Range 1	Score 1	Range 2	Score 2	Range 3	Score 3	Range 4	Score 4	Range 5	Score 5
Known Septic Rehab	5	Yes	5	no	0						
Has Tight Tank	5	Yes	5	no	0						
Water Use Class	5	Industrial	5	Commercial	4	Institutional	3	All others	0		
Proximity to Impaired water	5	Within 1/4 mile	5	Within 1/2 mile	2	> ½ mile	0				
Lot size	2	<0.25 acre	5	0.26-0.33	3	0.34-0.5	2	0.51-1	1	>1	0
Soil Drainage	2	Very Poorly Drained	5	Poorly Drained	4	Moderately well drained or better					
Ponding	2	Frequent	5	Rare/Never	0						
Flooding	2	Within 100yr	5	Not in Floodplain	0						
Septic System Age	2	>20	5	15-20	3	10-15	1	<10	0		
Pump Out frequency	2	frequent	3	normal	0						
Within Zone 2 or IWPA	2	Yes	5	no	0						
Depth to GW	1	<1	5	2-1	2	4-2	1	>4	0		
Depth to Restrictive Layer	1	<1	5	2-1	2	4-2	1	>4	0		
Water Use (gpd per acre)	1	>500	5	250-499	4	100-249	3	25-99	2	<25	0
Adjacent to wetland	1	In Wetland	5	In buffer	3	not in buffer or wetland	0				
Private well	1	Yes	5	no	0						
Outstanding Water Resource Protection Zone	1	Yes	5	no	0						



Wastewater Risk Mapping

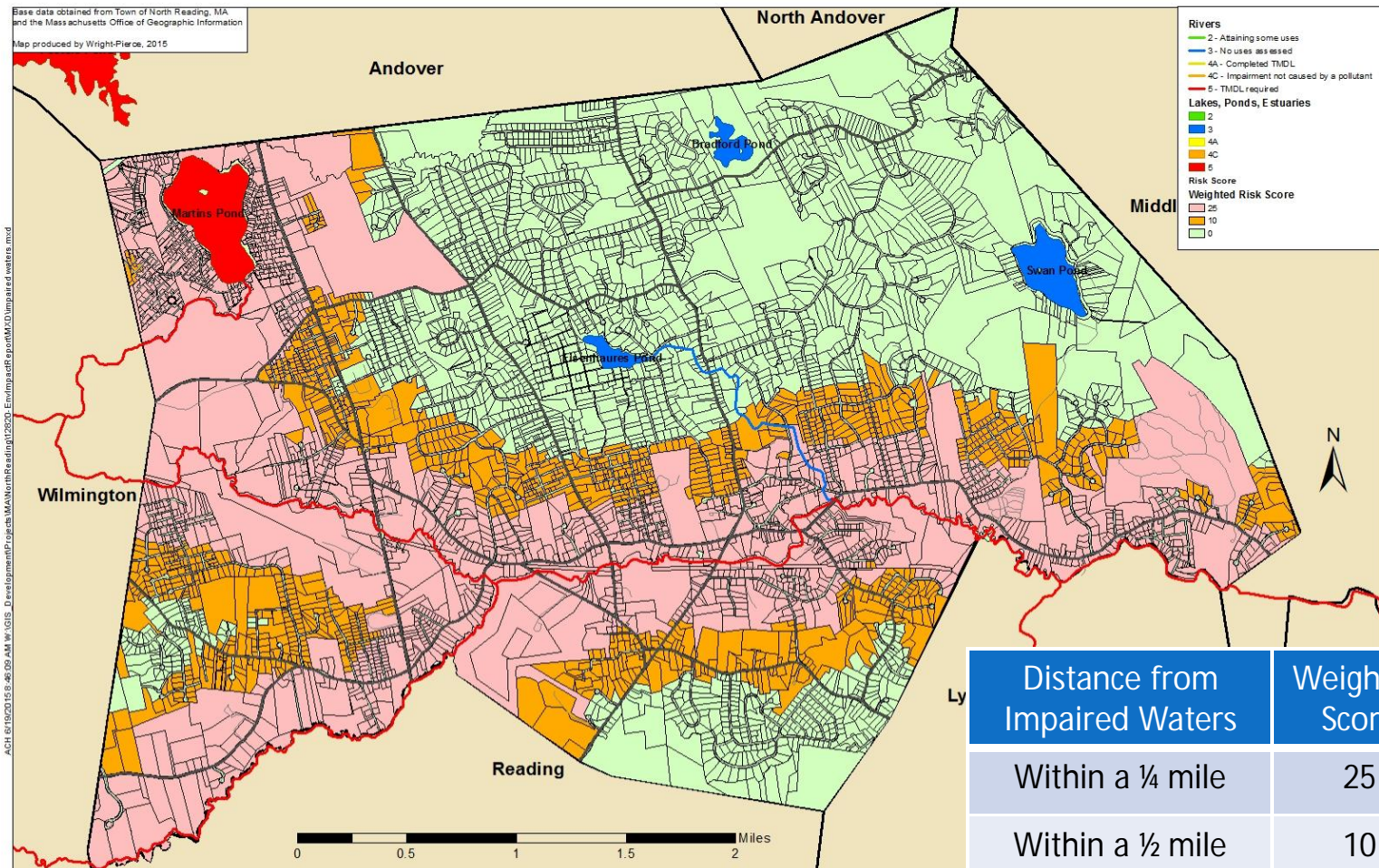


Risk Factor Trends Summary

Risk Factor Summary							
				Top 3 Factors Appearances			
Factors	Total Points for Town	% of Town Risk Points	Rank	1	2	3	Total
Impaired Water	60,990	32.5%	1	10	1	0	11
Lot Size	17,008	9.1%	2	0	3	3	6
System Age	14,806	7.9%	3	2	3	4	9
Water Use	12,789	6.8%	4	0	1	2	3
Wetlands	12,316	6.6%	5	2	0	0	2
Flood Zone	12,160	6.5%	6	0	1	4	5
Septic Fails	11,925	6.4%	7	0	3	0	3
Zone 2/IWPA	11,420	6.1%	8	1	1	2	4
Water Table	9,286	5.0%	9	0	0	0	0
Soil Drainage	8,210	4.4%	10	0	0	0	0
Zoning Class	7,635	4.1%	11	1	2	0	3
Ponding	4,900	2.6%	12	0	0	0	0
ORW	1,290	0.7%	13	0	1	1	2
Drinking Water Supply	1,135	0.6%	14	0	0	0	0
Restrictive Layer	1,044	0.6%	15	0	0	0	0
Tight Tank	475	0.3%	16	0	0	0	0
Pump Out	12	0.0%	17	0	0	0	0



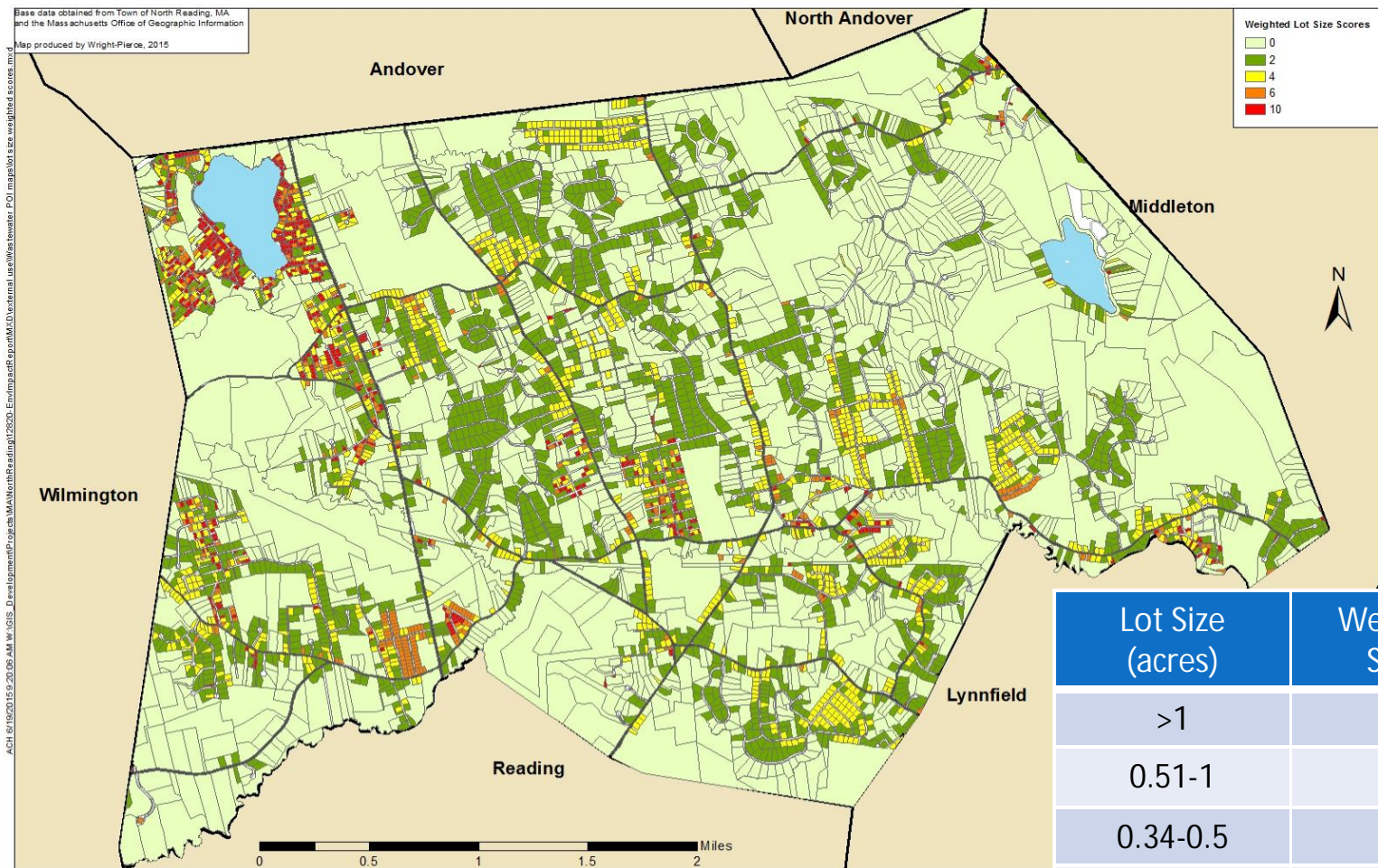
Impaired Waters



Distance from Impaired Waters	Weighted Score
Within a ¼ mile	25
Within a ½ mile	10
> 1/2	0



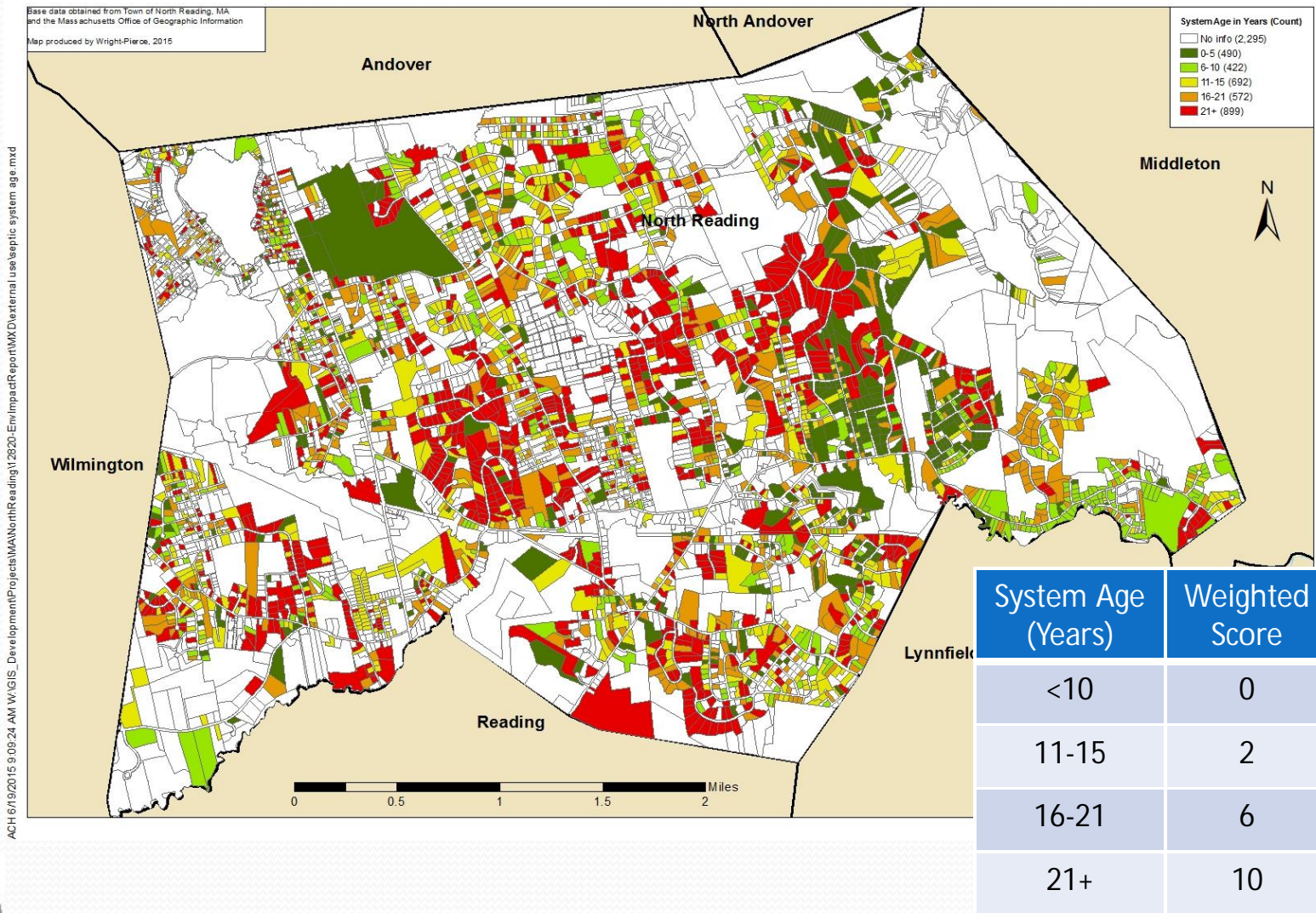
Lot Size



Lot Size (acres)	Weighted Score
>1	0
0.51-1	2
0.34-0.5	4
0.26-0.33	6
0.25	10



Septic System Age

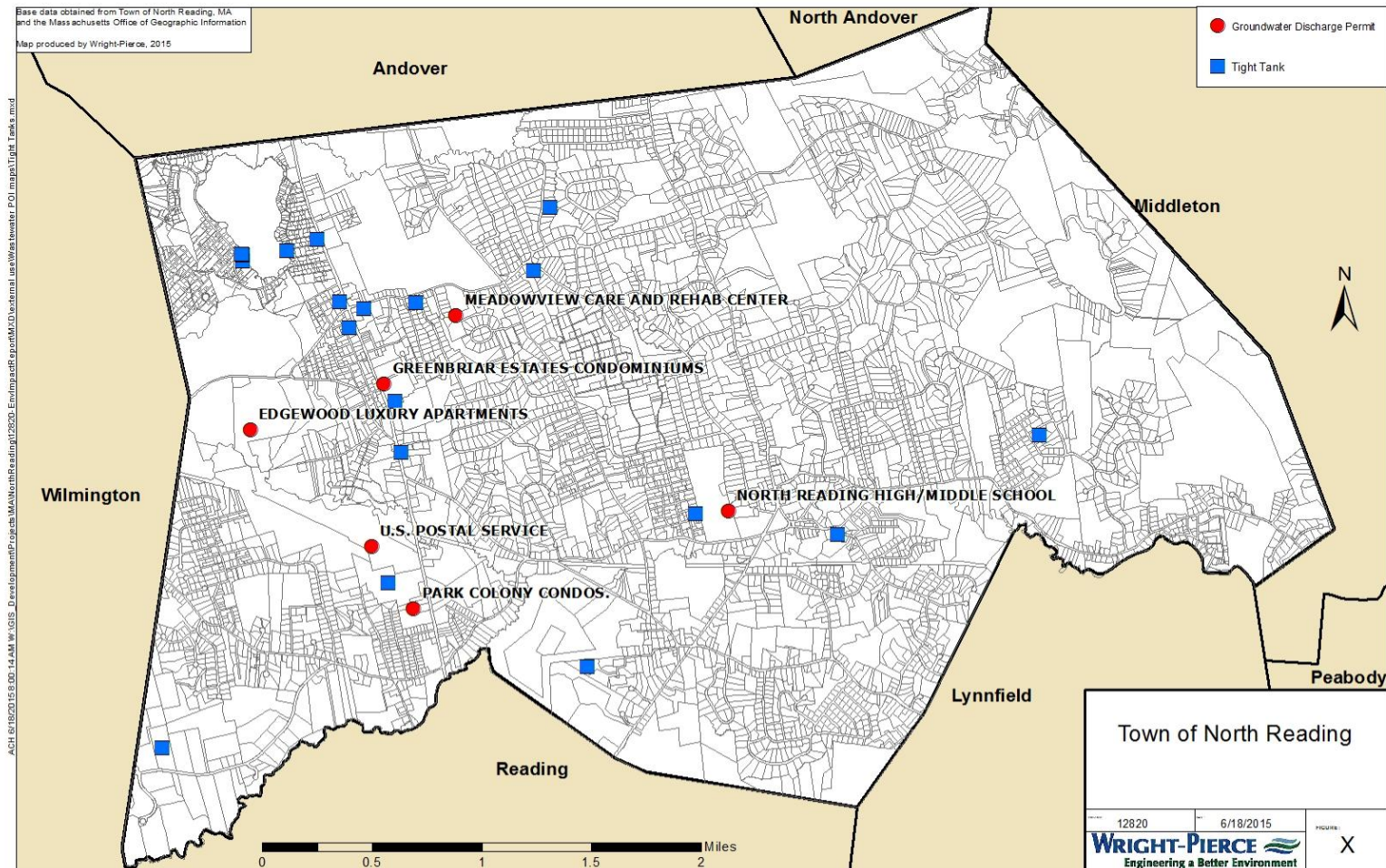


Additional Considerations

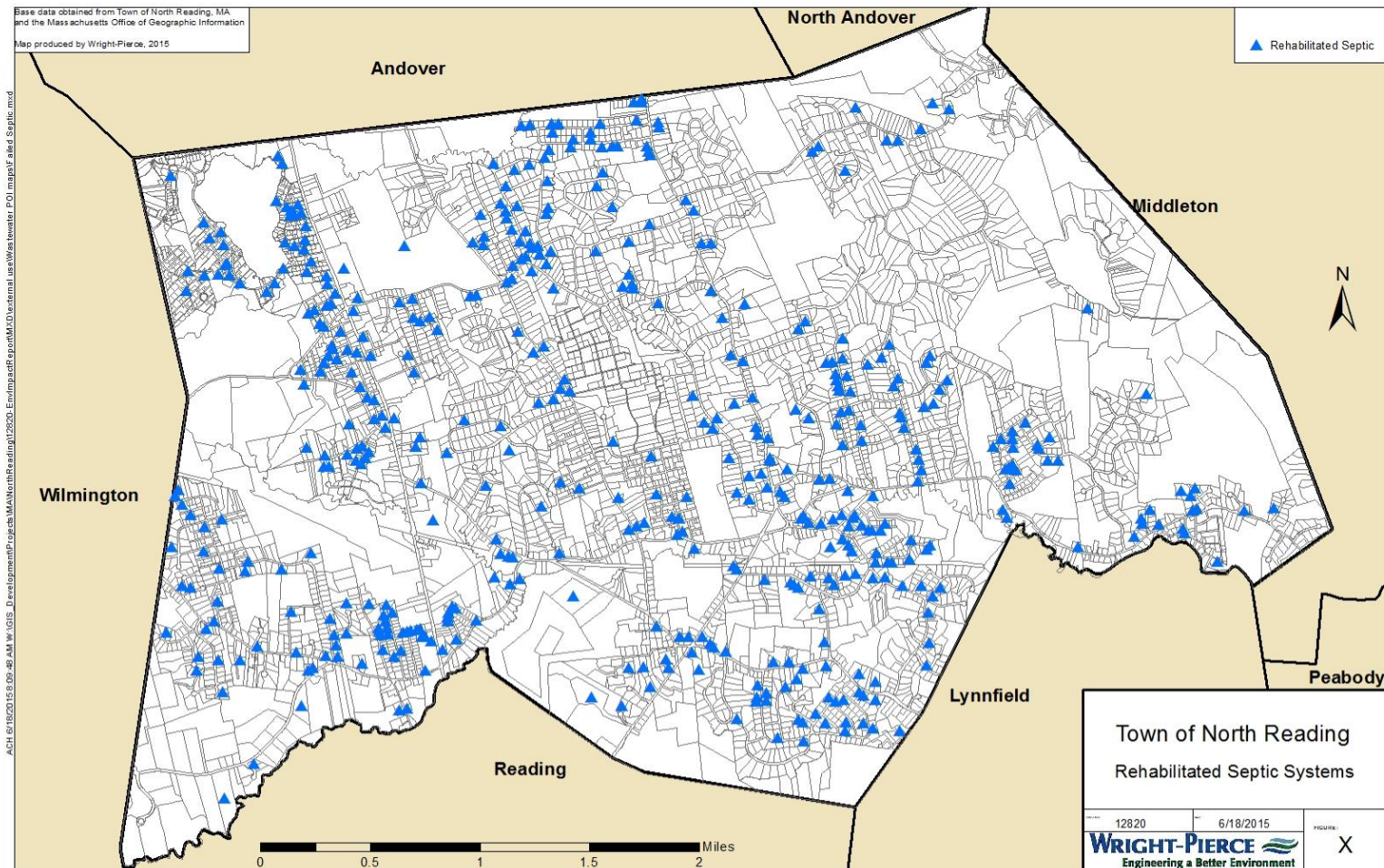
- TMDL for Martins Pond, Martins Brook and Ipswich River identified pollution from septic systems
- Sites with tight tanks, recent septic system rehabilitations, and Groundwater Discharge Permits
- Sites with recent septic system rehabilitation represent failed systems



Additional Considerations: Groundwater/Sanitary Discharge Permits and Tight Tanks

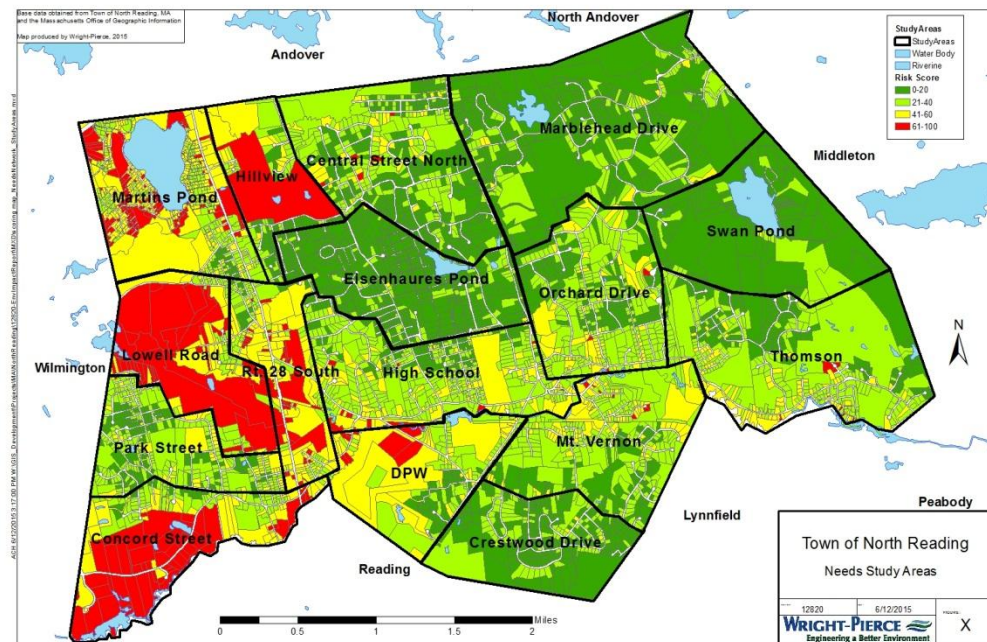


Additional Considerations : Rehabilitated Septic Systems

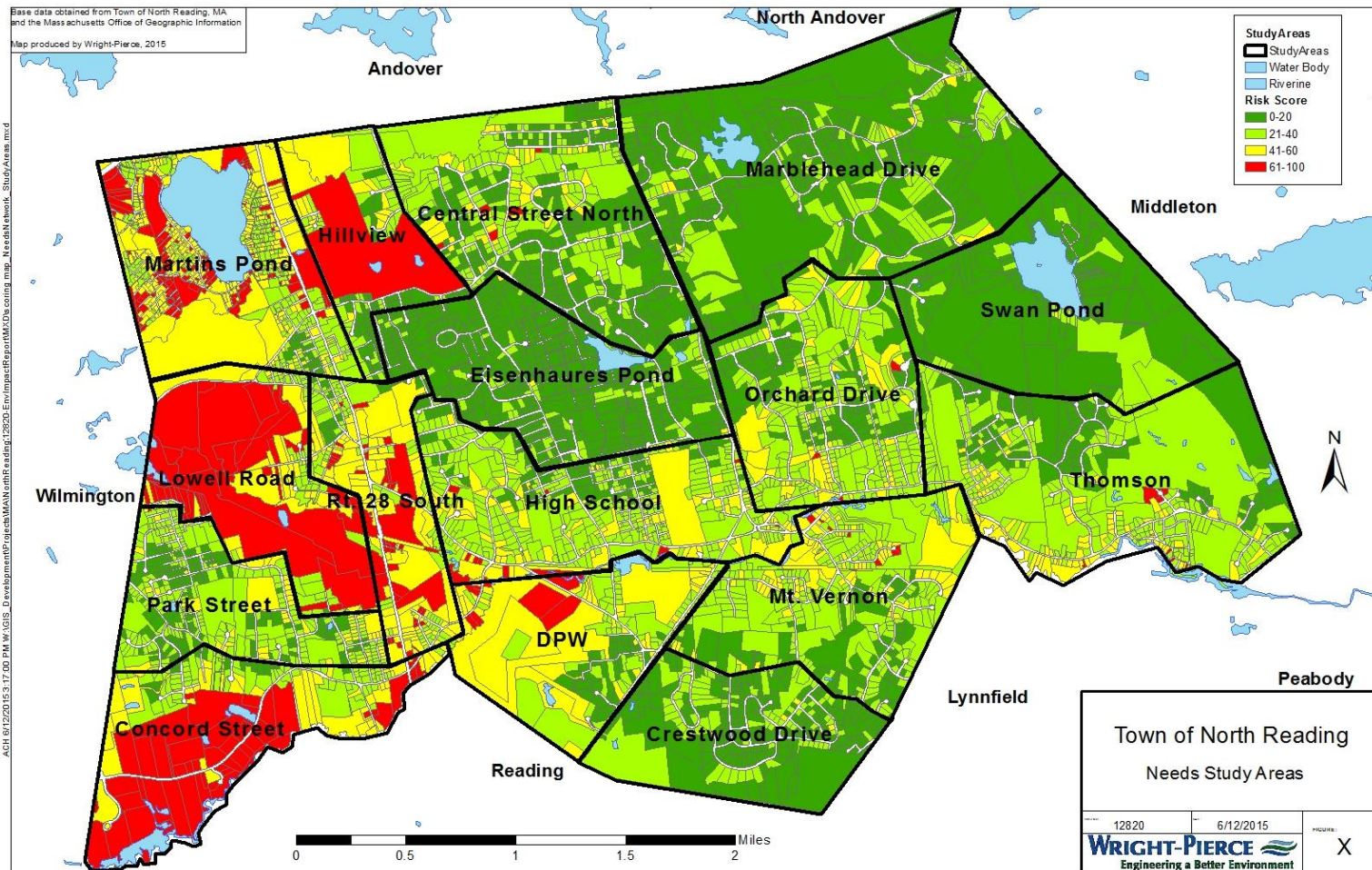


Needs Study Areas

- To facilitate a closer look at the risks, the Town was broken into 16 Needs Study Areas.
- The boundaries were developed based on geographical, characteristic, and risk similarities.
- The study areas do not represent potential sewer districts.



Needs Study Areas: A Closer Look

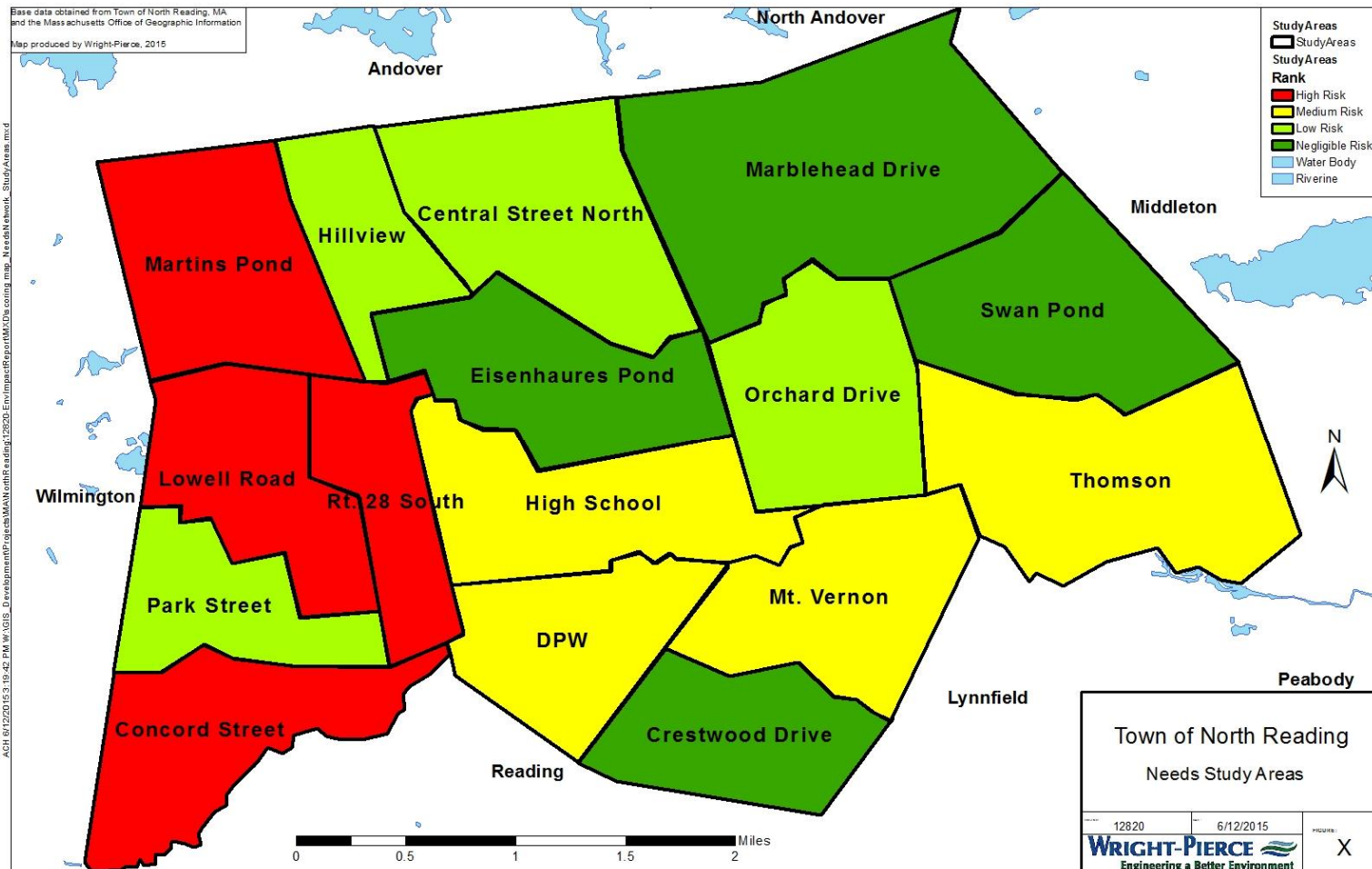


Needs Study Area Trends - Summary

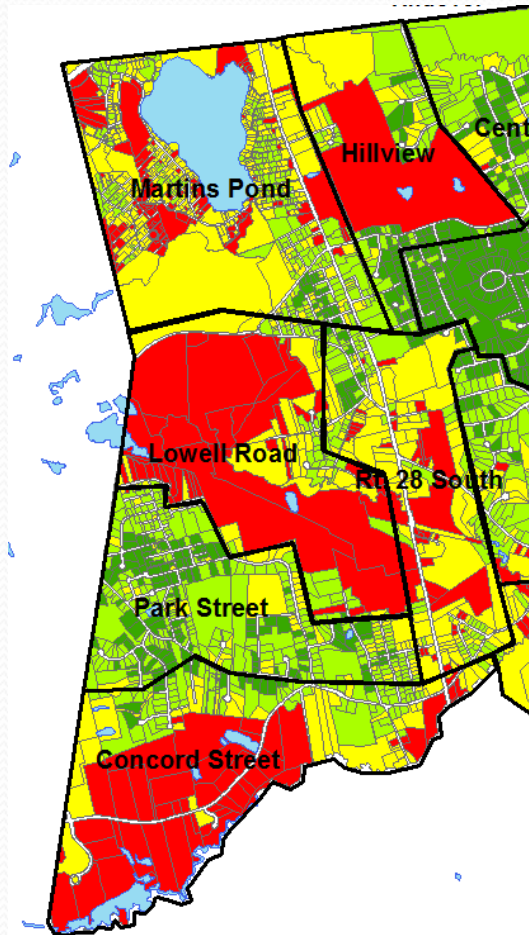
Study Area	Total Risk Points	% of Town Risk Points	Points per Lot	Rank	Top 3 Factors		
					1	2	3
Lowell Road	7,057	3.8%	56.5	1	Impaired Water	Zone2/IWPA	Flood Zone
Martin's Pond	39,288	21.0%	55.1	2	Impaired Water	LotSize	Zone2/IWPA
Rt 28 South	11,876	6.3%	53.5	3	Impaired Water	Water Use Class	Lot Size
Concord Street	9,387	5.0%	49.7	4	Impaired Water	Water Use Class	Zone2/IWPA
DPW	5,838	3.1%	39.7	5	Impaired Water	System Age	System Age
Mt. Vernon	14,198	7.6%	38.4	6	Impaired Water	Septic Fails	System Age
High School	19,287	10.3%	37.7	7	Impaired Water	System Age	Lot Size
Thomson	15,272	8.1%	35.3	8	Impaired Water	Water Use	Lot Size
Orchard Drive	13,453	7.2%	33.3	9	Impaired Water	System Age	Flood Zone
Park Street	13,024	6.9%	32.8	10	Impaired Water	Lot Size	System Age
Hillview	3,353	1.8%	29.9	11	Water Use Class	Impaired Water	System Age
Central Street North	12,815	6.8%	26.2	12	Zone2/IWPA	Septic Fails	Flood Zone
Marblehead Drive	8,216	4.4%	20.5	13	Wetlands	Flood Zone	ORW
Crestwood Drive	5,331	2.8%	20.0	14	System Age	Septic Fails	Water Use
Swan Pond	1,921	1.0%	19.6	15	Wetlands	ORW	Flood Zone
Eisenhuaer Pond	7,085	3.8%	15.3	16	System Age	Lot Size	Water Use
Town Total	187,401	100.0%	35.1				



Needs Study Areas



Wastewater Screening Analysis



Study Area	Top 3 Factors		
	1	2	3
Lowell Road	Impaired Water	Zone2/IWPA	Flood Zone
Martin's Pond	Impaired Water	Lot Size	Zone2/IWPA
Rt 28 South	Impaired Water	Water Use Class	Lot Size
Concord Street	Impaired Water	Water Use Class	Zone2/IWPA



Windshield survey summary

- Each study area was observed to verify results of risk analysis.
- Reviewed isolated high risk locations to determine if the lots are typical to the area.
- Neighborhood characteristics observed matched area summaries created.
- Windshield survey validated the criteria identified, and relative risk.



Wastewater Screening Analysis:

No Build Option

- Property owners responsible for maintaining their own disposal systems
- Limited improvement to water quality
- Non residential users continue to impact water quality
- Privately managed system operate less reliably and effectively
- I/A systems may improve water quality for individual lots, but not a town wide solution.
 - Does not reduce Title 5 septic system design requirements.



Wastewater Screening Analysis :

Municipal In-Town Options

- Consideration was given to a single centralized system and to a combination of decentralized systems.
- A wastewater flow of 0.5 MGD was used to determine approximate groundwater discharge system sizing.
- Required system sizes were compared to the lot size of underdeveloped Town-owned parcels.
- Each parcel in Town was given a groundwater discharge score based on its likelihood to be able to sustain a groundwater discharge system on site.



Wastewater Screening Analysis :

In-Town Centralized System

- Centralized System: GWDP facility for entire needs area.
- 28 acres or larger to accommodate the flows
- Criteria: minimum lot size, town owned, undeveloped or under developed, GW risk level moderate or below, no environmental constraints.
- Cross-referenced with the sites identified in the draft CWMP

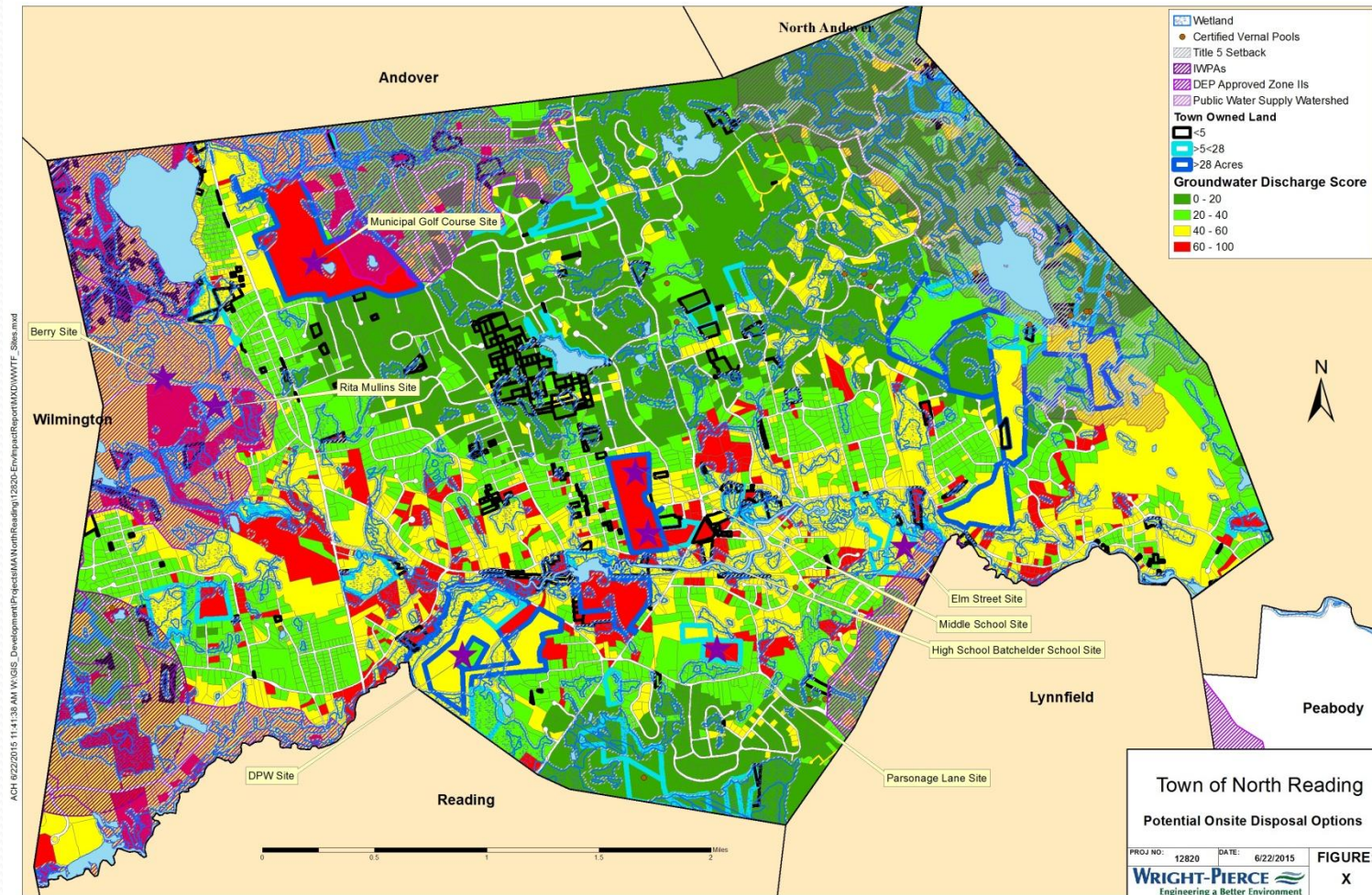


Wastewater Screening Analysis: In-Town Decentralized System

- Decentralized System: Multiple smaller GWDP systems (typically <150,000 gpd)
- Potential discharge sites reviewed in proximity to Needs Area.
- Used same criteria as Centralized System analysis
- Too many Decentralized Systems not feasible
 - Inefficient: increased cost per gallon and energy consumption.
- Minimum lots size 5 acres based on 50,000 gpd.

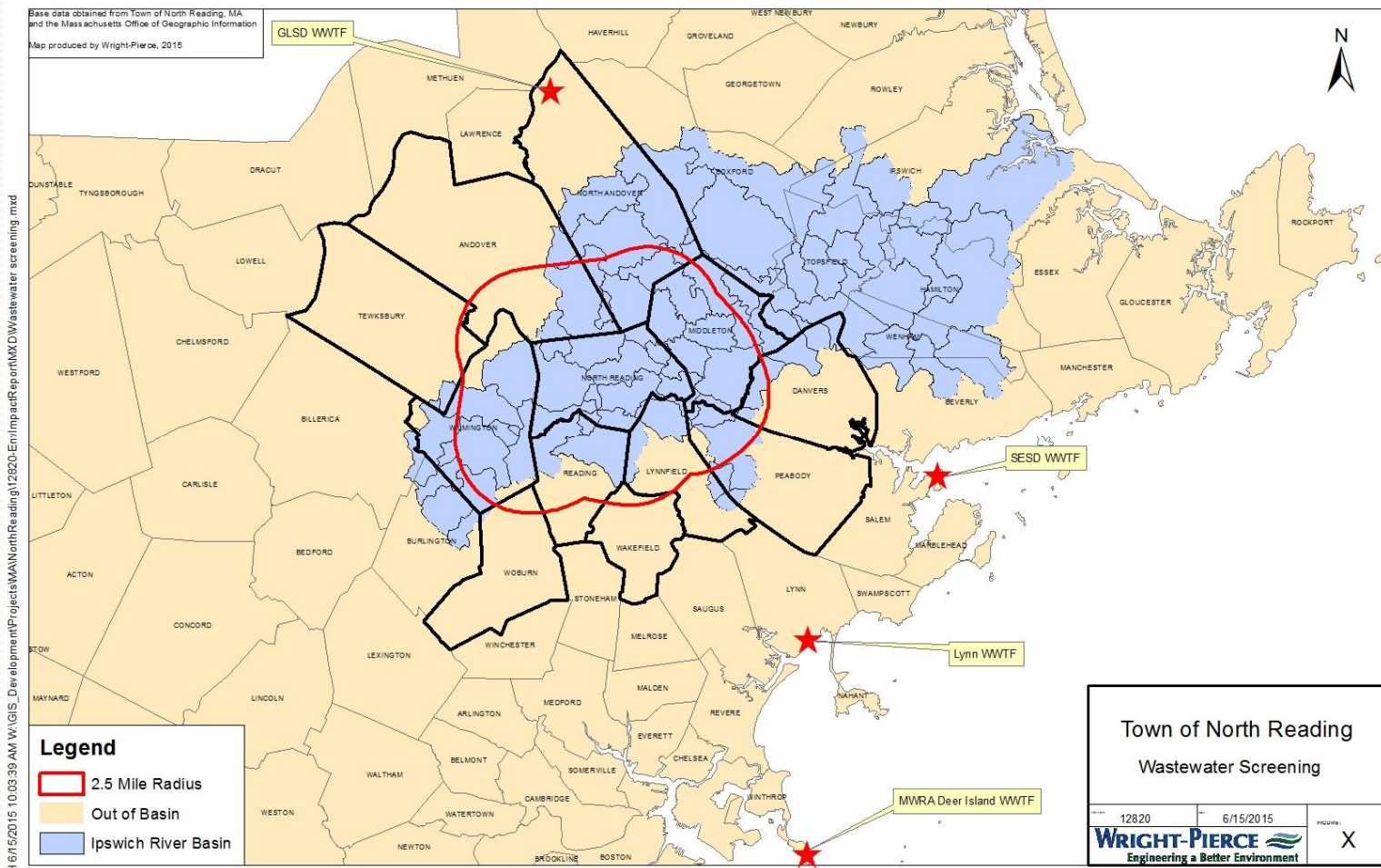


Wastewater Screening Analysis: In-Town System Potential Locations



Wastewater Screening Analysis: Out of Town Options

In-basin option preferred, but not possible



Wastewater Screening Analysis: Out of Town Options

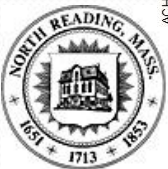
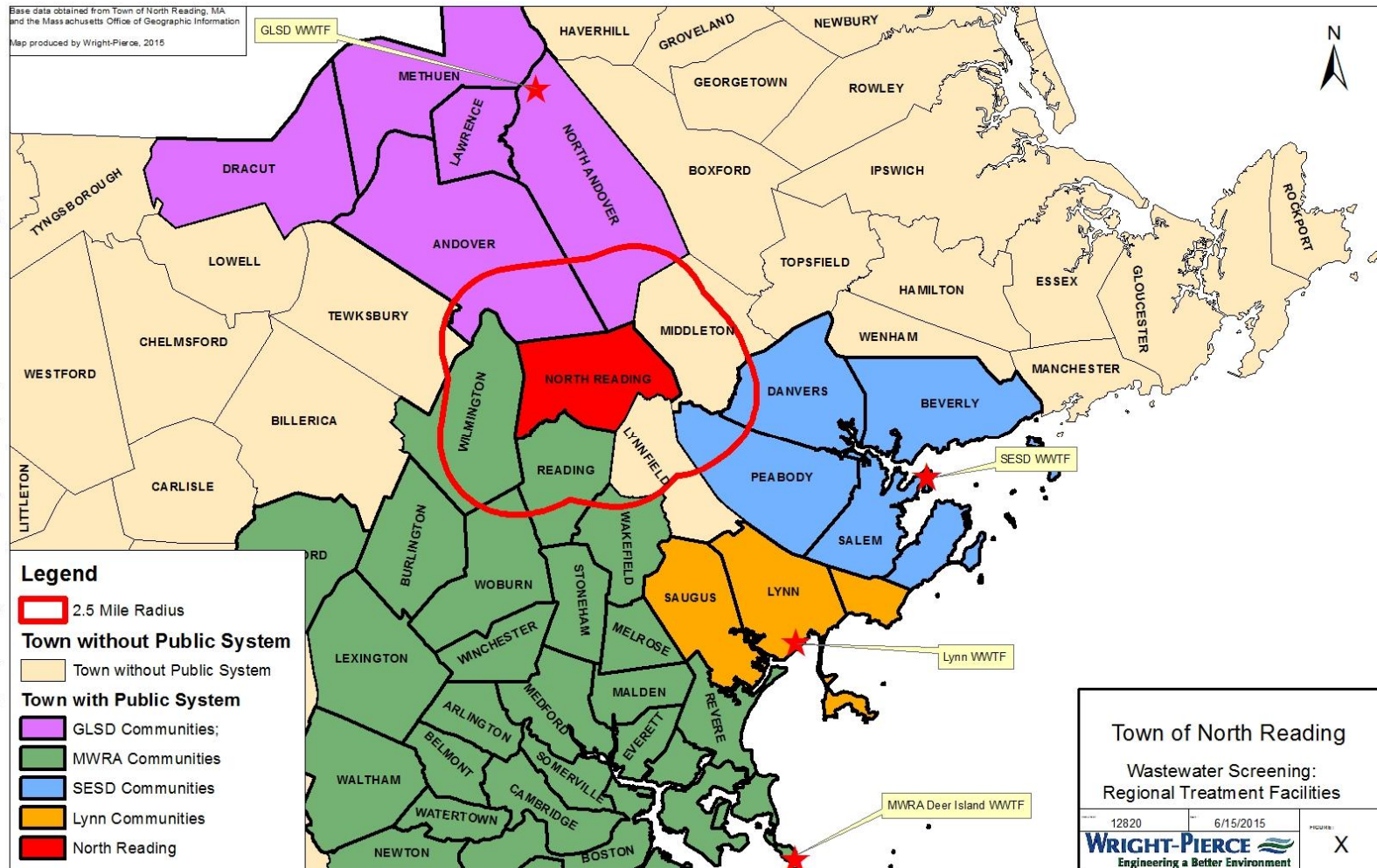
Community/District	Municipal System (Y/N)	Capacity (Y/N)
Greater Lawrence Sanitary District	Y	Y
MWRA	Y	Y ¹
South Essex Sewerage District	Y	N
Lynn Regional Sanitary District	Y	N
Lynnfield	N	N
Middleton	N	N
Tewksbury	Y ²	N

1: MWRA is not actively expanding wastewater service area. Connection possible with significant I/I removal within MWRA system by connecting community

2: Tewksbury discharges its sewer to the Greater Lowell WWTP



Wastewater Screening Analysis: Out of Town Options



ACH 6/15/2015 10:12:45 AM W:\GIS_Development\Projects\NorthReading\12820-EnvImpactReport\MXD\Wastewater screening_Fig2.mxd

Final Selected Alternatives

- No build
- In basin
 - Centralized
 - Decentralized
- Out of basin
 - GLSD
 - MWRA



Meeting Summary

- Presented water and wastewater needs
- Covered water and wastewater screening
- Water:
 - Selected alternatives
 - ◆ Further explore MWRA connection through Reading
- Wastewater:
 - Selected alternatives



Preliminary Agenda for Next Meeting

- Anticipated Date: Fall 2015, likely September
- Final Selected Alternatives
- Impacts Analysis



Questions / Discussion

