

# Town of North Reading

Draft Environmental Impact Report

Project Meeting #1

September 18, 2014

Presented by: Paul Brinkman  
Amy Coppers Costantino, PE



**WRIGHT-PIERCE**   
Engineering a Better Environment

# Invite List

- Secretary Maeve Vallely Bartlett; 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
- 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

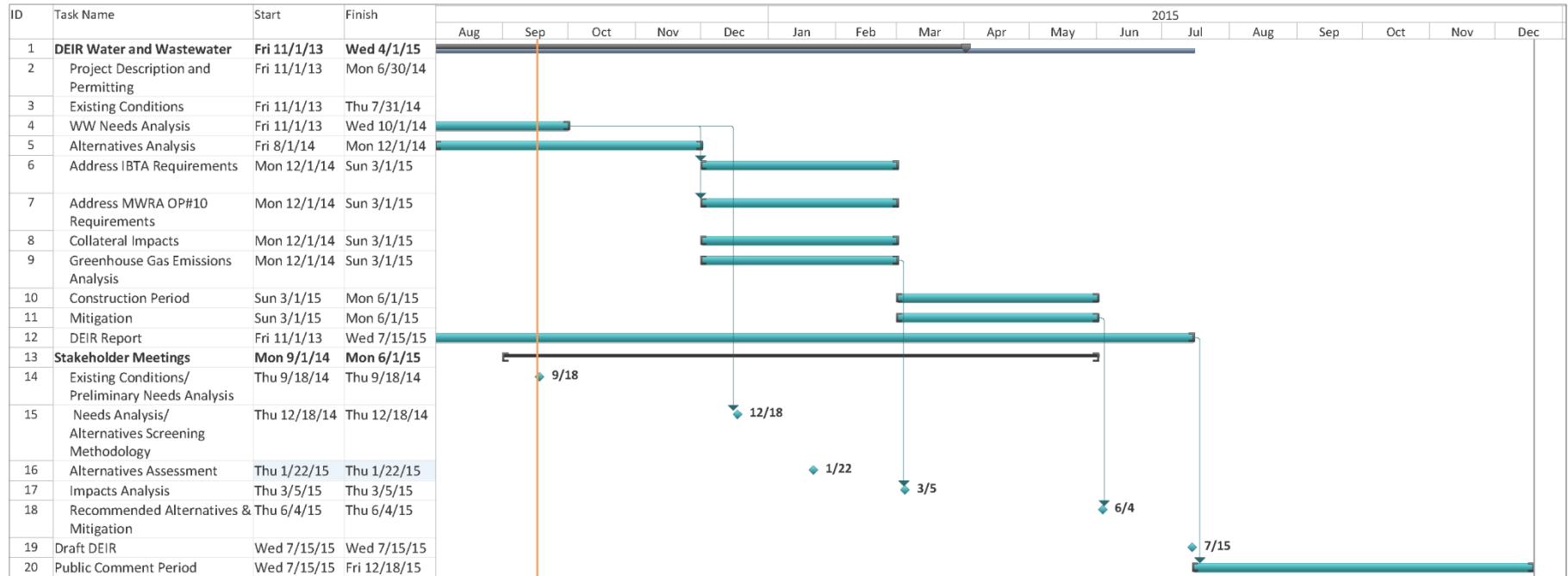


# North Reading MEPA Process Framework

Step		Water	Wastewater
1	Existing Conditions	Meeting #1	Meeting #1
2	Needs Assessment	Meeting #1/#2	Meeting #2
3	Alternatives Analysis	Meeting #2	Meeting #2/#3
4	Impact Analysis	Meeting #4	Meeting #4
5	Recommended Plan	Meeting #5	Meeting #5



# Anticipated Schedule



# Agenda - DEIR

- Project Background
  - Project History
  - Planning Tools
- Project Objectives and Goals
  - Water
  - Wastewater
- Project Scope
  - Alternatives
  - Permitting



# Background - Water

- 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



# 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



# Background - Wastewater

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



# 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



# North Reading, MA

- Area – 13.5 square miles
  - Water Surface 0.3 square miles
- 2010 Population – 14,892
- MHI - \$76,962
- Suburban
- Limited Commercial/Industrial Area



ACH 9/1/2014 9:54:57 AM \\GIS\_Development\Projects\MANorthReading\2820-EnvImpact\Report\MXD\external\_use\presentations\Town Meeting 9-18-14\base map.mxd



# Existing Environmental Conditions

- Natural Environment (Non-aqueous)
  - Climate
  - Geology and Soils
  - Topography
  - Species Habitats
  - Historical and Archaeological Sites
  - Air Quality

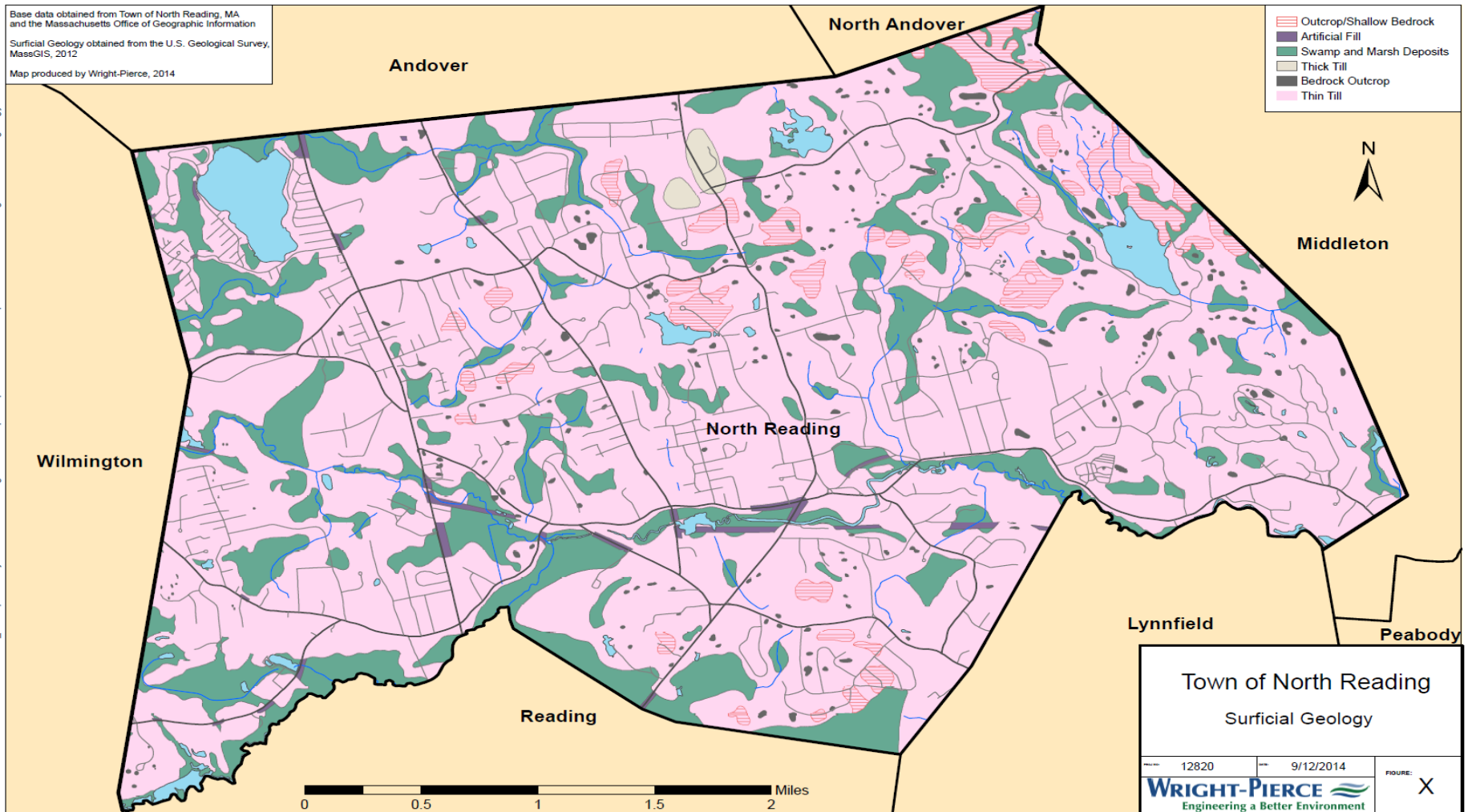


# Surficial Geology

Base data obtained from Town of North Reading, MA and the Massachusetts Office of Geographic Information

Surficial Geology obtained from the U.S. Geological Survey, MassGIS, 2012

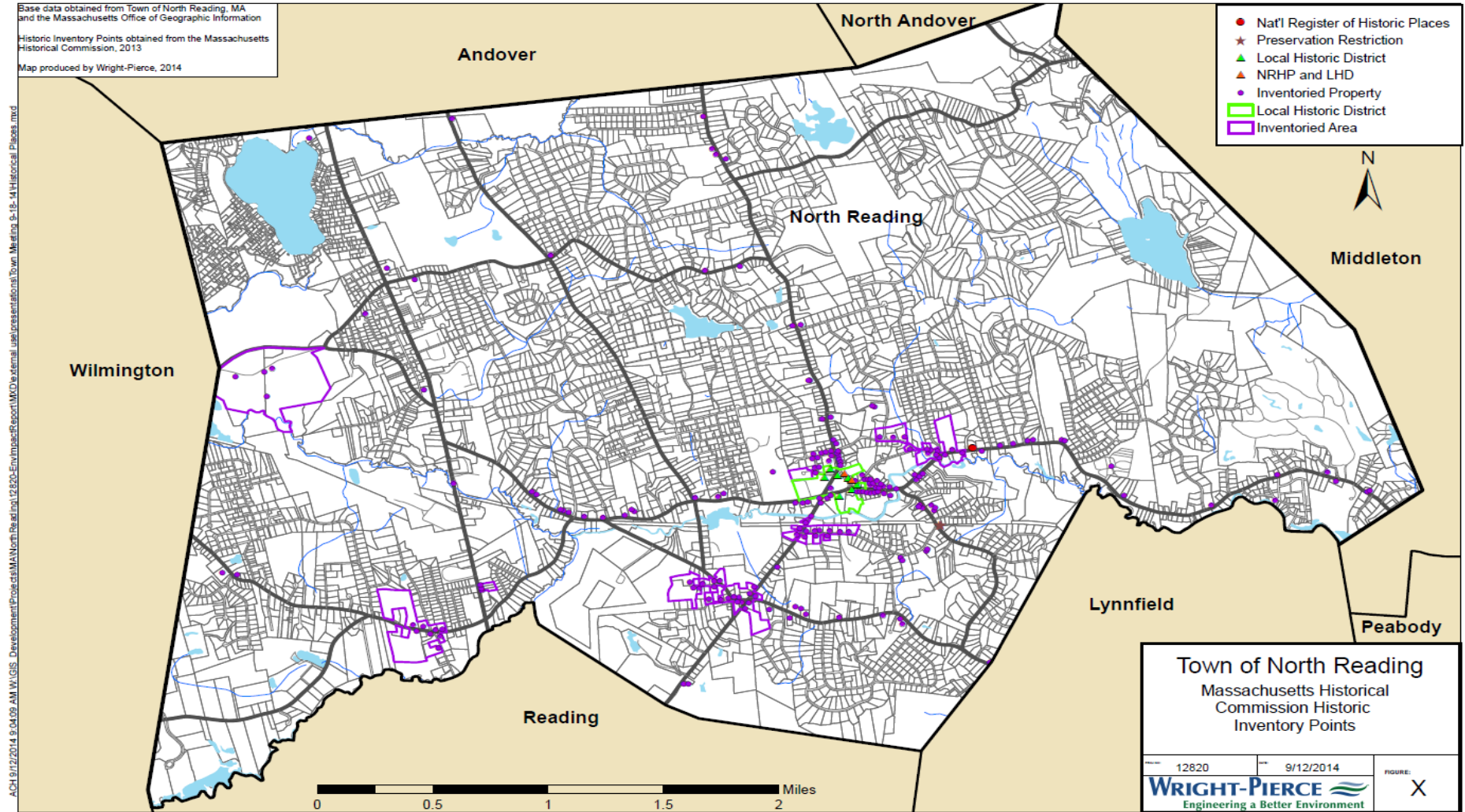
Map produced by Wright-Pierce, 2014



# Historic Resources

Base data obtained from Town of North Reading, MA  
and the Massachusetts Office of Geographic Information  
Historic Inventory Points obtained from the Massachusetts  
Historical Commission, 2013  
Map produced by Wright-Pierce, 2014

ACH 9/12/2014 9:04:09 AM W:\GIS Development\Projects\MA\North Reading\12820-Envmapas\Report\MXD\external\mappresentations\Town Meeting 9-16-14\Historic Places.mxd



# Existing Environmental Conditions

- Natural Environment (Aqueous)
  - Hydrologic Conditions and Water Resources
  - Hydrogeology
  - Water Quality
  - Wetlands
  - Floodplains

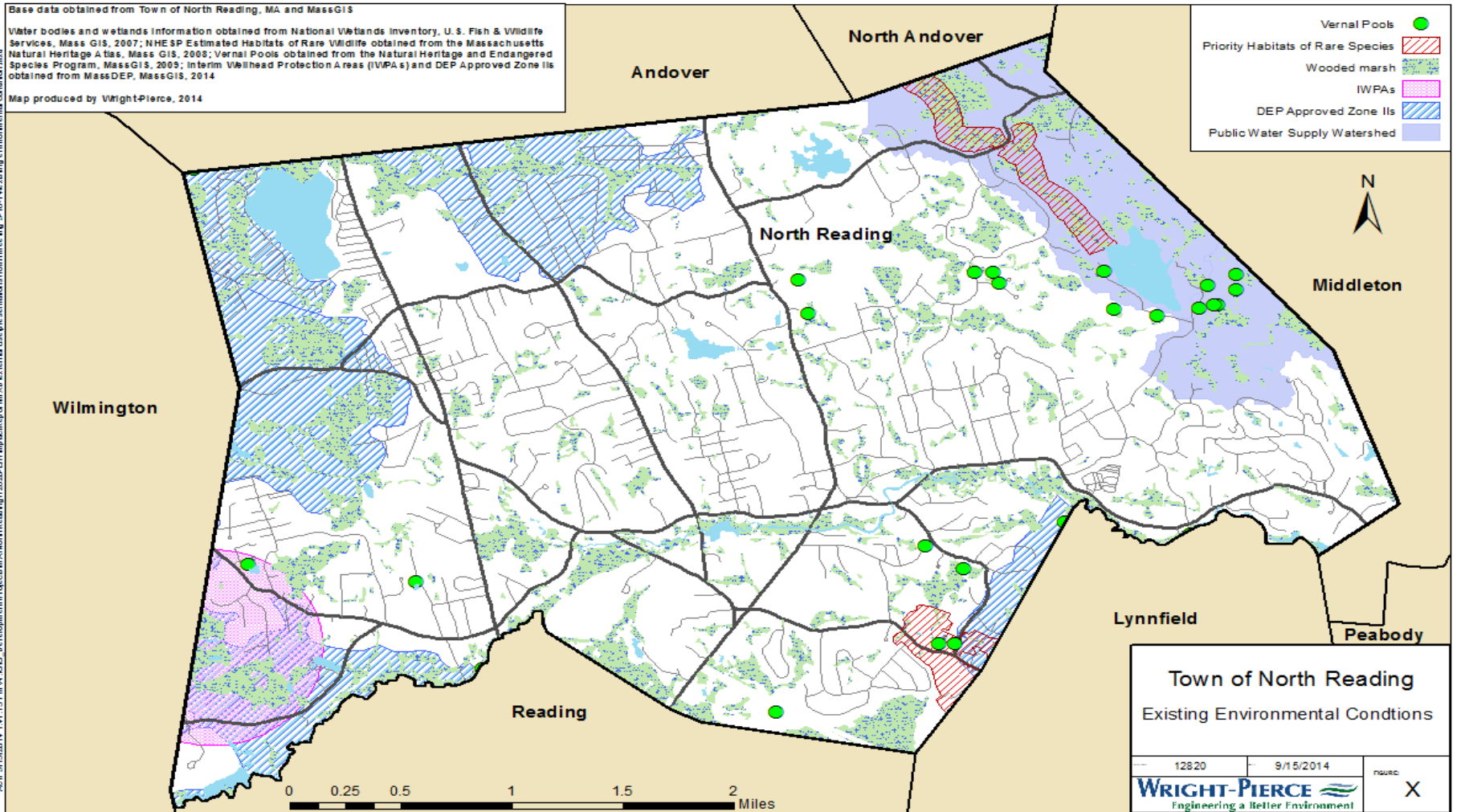


# Water Resources / Wildlife

Base data obtained from Town of North Reading, MA and MassGIS

Water bodies and wetlands information obtained from National Wetlands Inventory, U.S. Fish & Wildlife Services, Mass GIS, 2007; NHEHP Estimated Habitats of Rare Wildlife obtained from the Massachusetts Natural Heritage Atlas, Mass GIS, 2009; Vernal Pools obtained from the Natural Heritage and Endangered Species Program, MassGIS, 2009; Interim Wetland Protection Areas (IWPA's) and DEP Approved Zone IIs obtained from MassDEP, MassGIS, 2014

Map produced by Wright-Pierce, 2014






# Sub-Basins

Base data obtained from Town of North Reading, MA  
and the Massachusetts Office of Geographic Information

Drainage Sub Basins information obtained from USGS  
Water Resources Division and the Mass Water  
Resources Commission, MassGIS, 2007

Map produced by Wright-Pierce, 2014

**Major Basin**  
 IPSWICH  
 SHAWSHOEN  
 Sub Basin Delineation



Middleton

Wilmington

North Reading

Reading

Lynnfield

Peabody

**Town of North Reading**  
Sub Basins

12820

9/12/2014

FIGURE: X

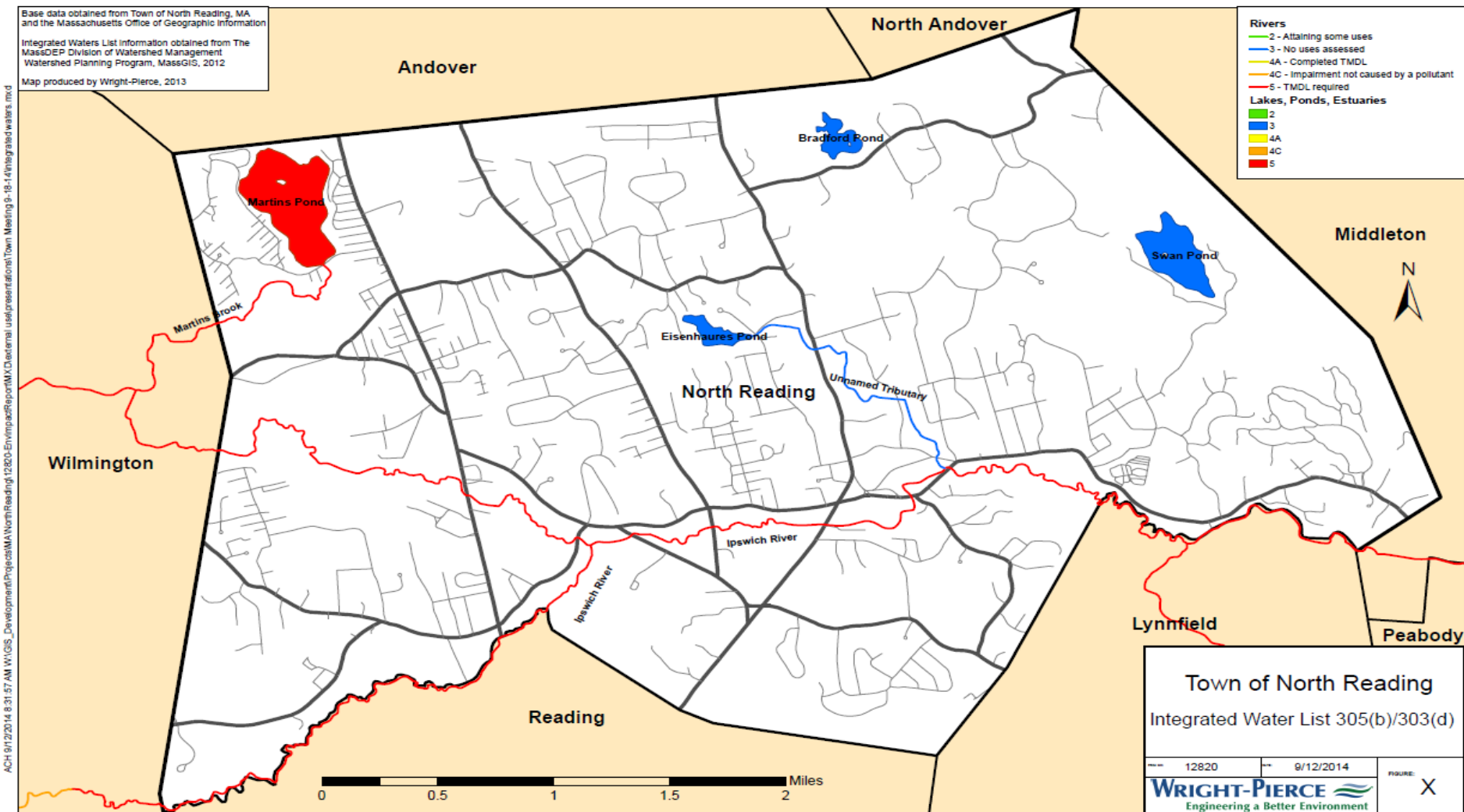
**WRIGHT-PIERCE**  
Engineering a Better Environment

0 0.5 1 1.5 2 Miles

ACH:9/12/2014 8:33:53 AM W:\GIS\_Development\Projects\MA\NorthReading\12820-EnvImpactReport\MXD\decimal\_us\presentations\Town Meeting 9-18-14\sub basins.mxd

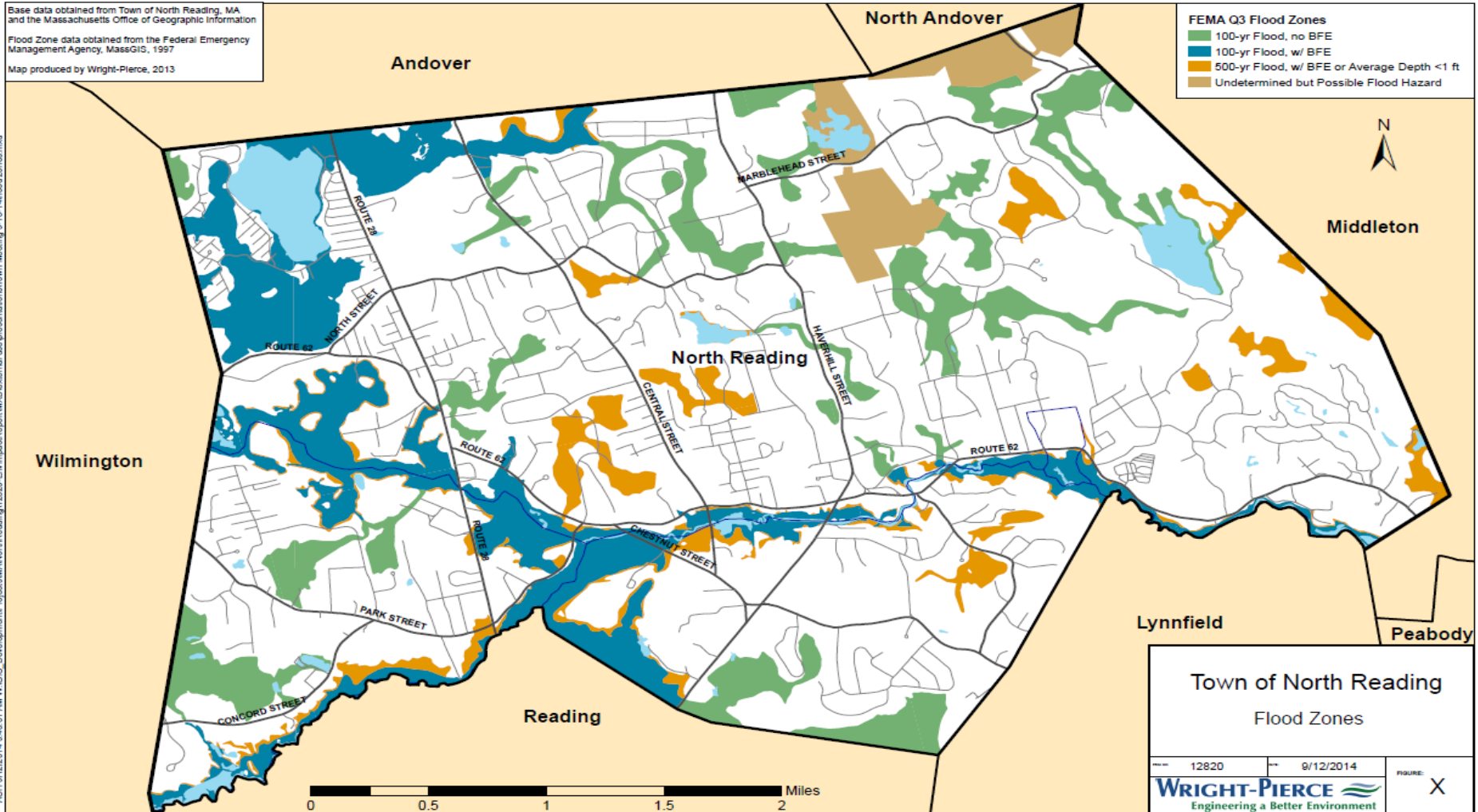


# Water Quality



# Floodplains/Zones

Base data obtained from Town of North Reading, MA and the Massachusetts Office of Geographic Information  
Flood Zone data obtained from the Federal Emergency Management Agency, MassGIS, 1997  
Map produced by Wright-Pierce, 2013



ACH: 9/12/2014 9:45 H: AM WVOIS: Development\Projects\NorthReading\12820-EnvImpactReport\Map\Presentations\Town Meeting 9-18-14\Flood Zones.mxd

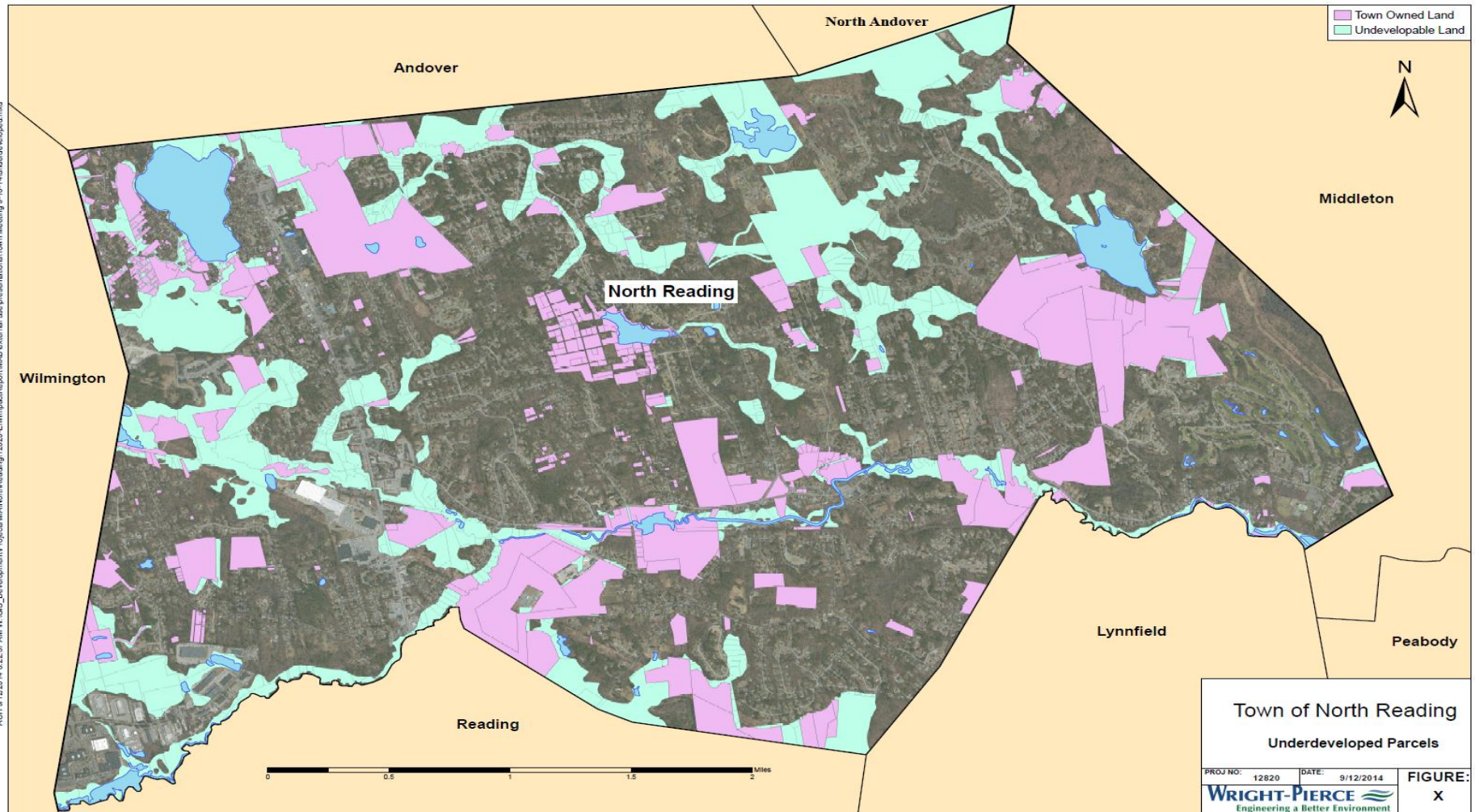


# Existing Conditions

- Infrastructure and Human Environment
  - Land Use
  - Zoning
  - Environmental Impacts
  - Buildout Analysis
    - ◆ Residential
    - ◆ Commercial/Industrial
  - Population Demographics
  - Planning Initiatives



# Town Owned Land

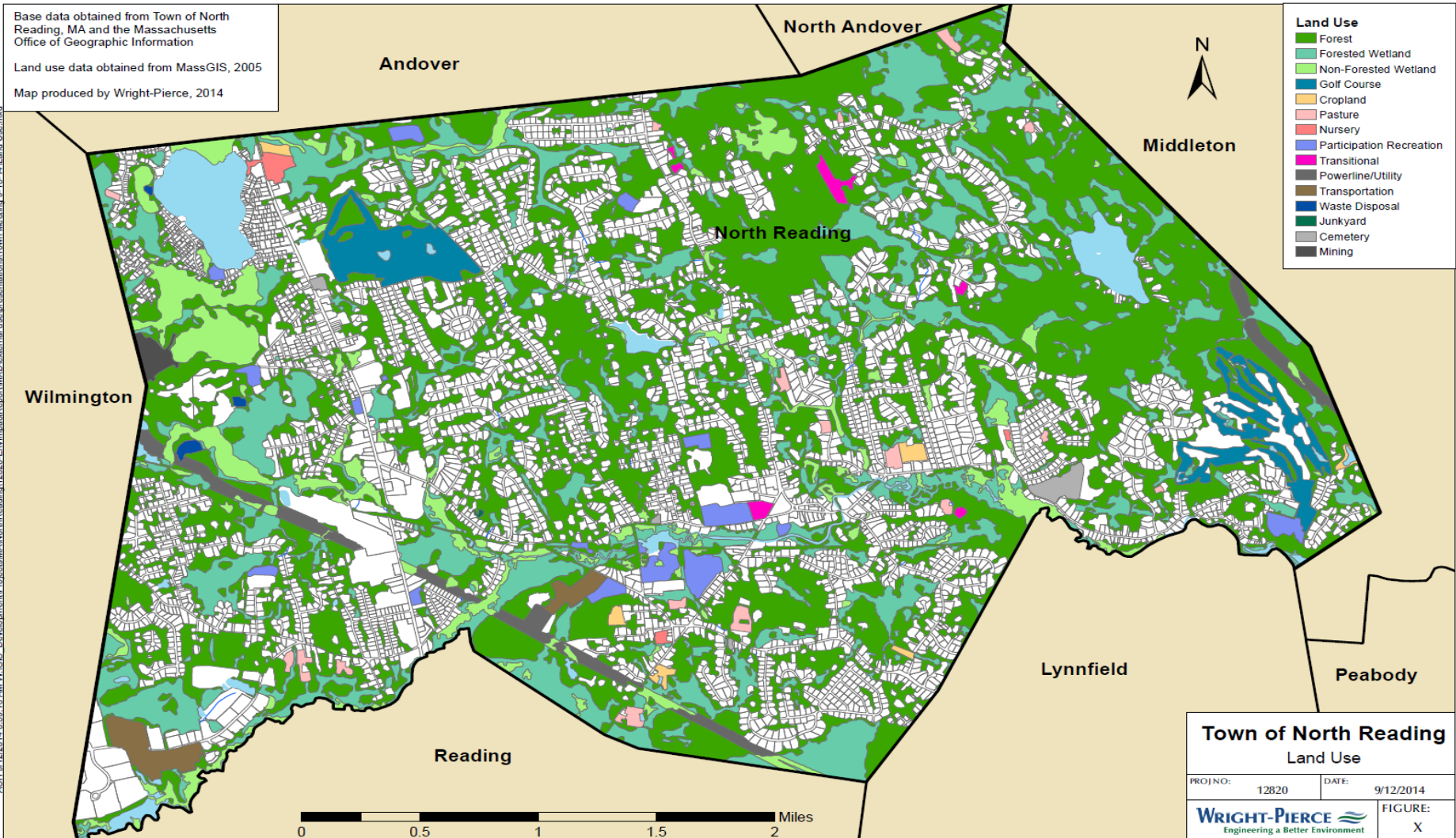


# Land Use

Base data obtained from Town of North Reading, MA and the Massachusetts Office of Geographic Information

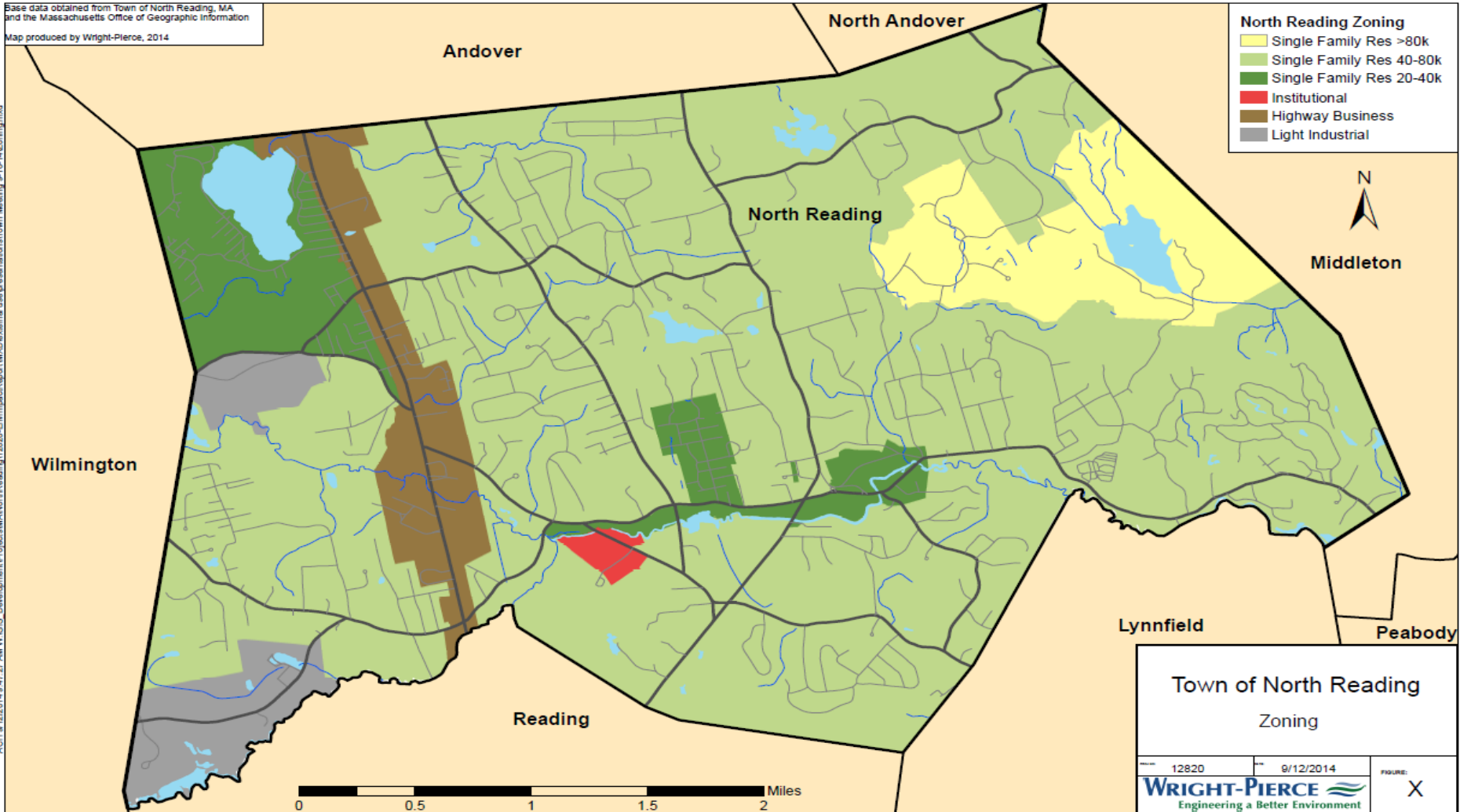
Land use data obtained from MassGIS, 2005

Map produced by Wright-Pierce, 2014



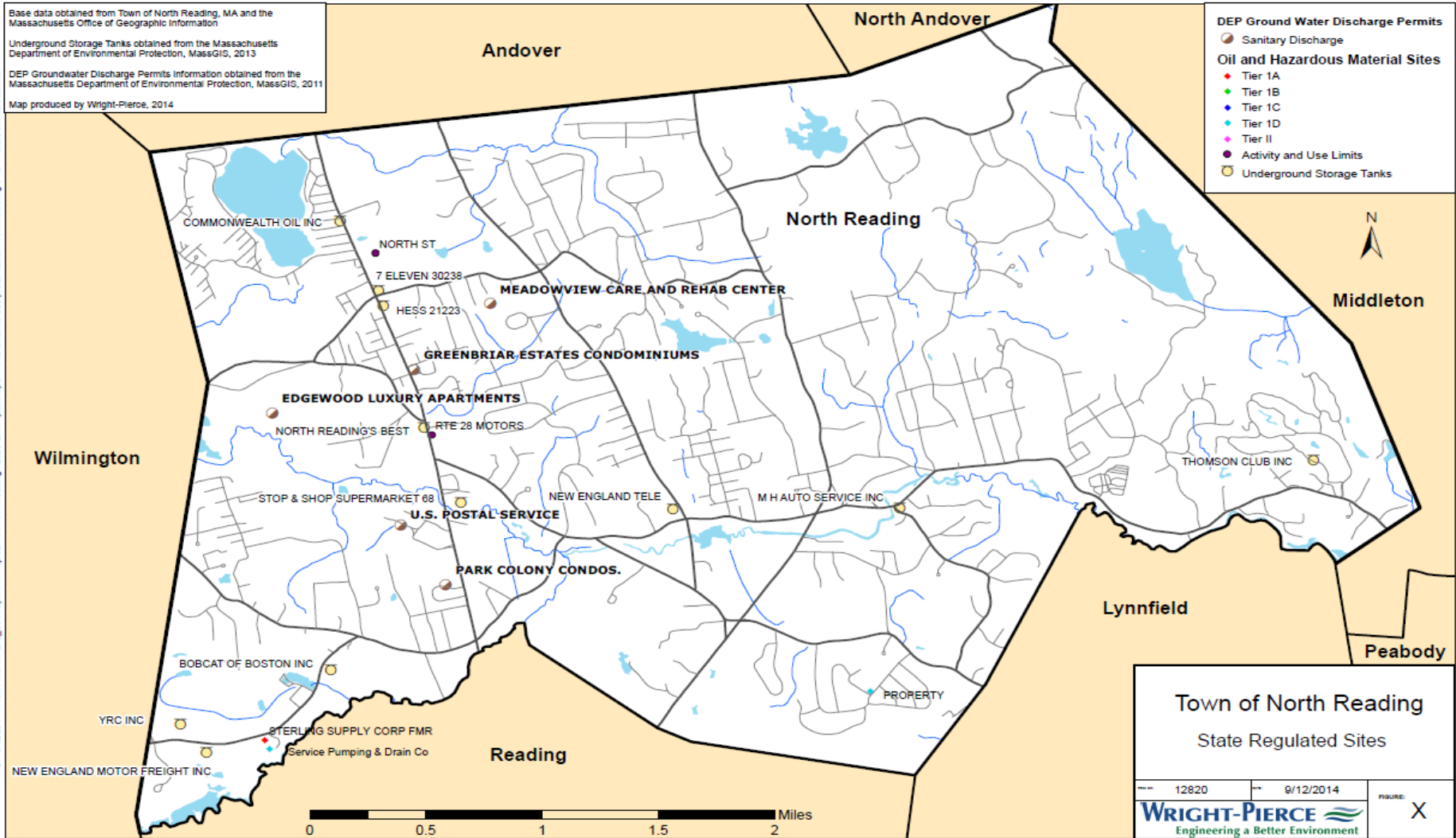
# Zoning

Base data obtained from Town of North Reading, MA  
and the Massachusetts Office of Geographic Information  
Map produced by Wright-Pierce, 2014



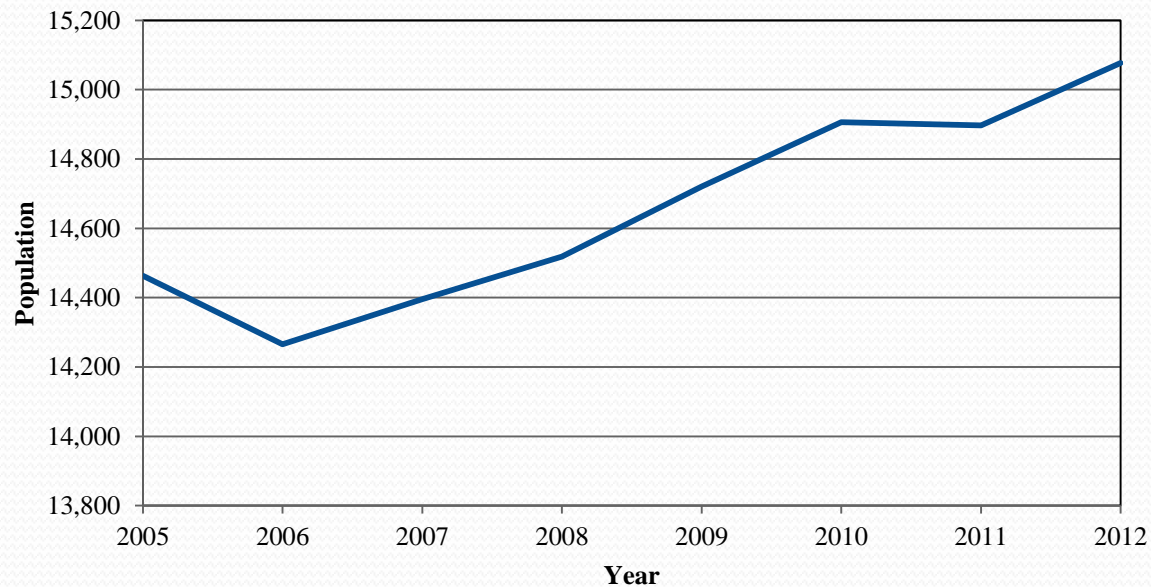
# State Regulated Sites

Base data obtained from Town of North Reading, MA and the Massachusetts Office of Geographic Information  
Underground Storage Tanks obtained from the Massachusetts Department of Environmental Protection, MassGIS, 2013  
DEP Groundwater Discharge Permits information obtained from the Massachusetts Department of Environmental Protection, MassGIS, 2011  
Map produced by Wright-Pierce, 2014



# Population Trend

## NORTH READING POPULATION TRENDS BASED ON CENSUS DATA



# Population Trend

## POPULATION TRENDS FOR NORTH READING AND SIMILAR NEIGHBORING COMMUNITIES

Town	1950	1960	1970	1980	1990	2000	2010	%Change 2000-2010
North Reading	4,402	8,331	11,264	11,455	12,002	13,837	14,892	7.08%
Andover	12,437	15,878	23,695	26,370	29,151	31,247	33,201	5.89%
Lynnfield	3,927	8,398	10,826	11,267	11,274	11,542	11,596	0.47%
Middleton	2,916	3,718	4,044	4,135	4,921	7,744	8,987	13.83%
North Andover	8,485	10,908	16,284	20,129	22,792	27,202	28,352	4.06%
Peabody	22,645	32,202	48,080	45,976	47,039	48,129	51,251	6.09%
Reading	14,006	19,259	22,539	22,678	22,539	23,708	24,747	4.20%
Tewksbury	7,505	15,902	22,755	24,635	27,266	28,851	28,961	0.38%
Wilmington	7,039	12,475	17,102	17,471	17,651	21,363	22,325	4.31%
							Average	5.79%



# Water System and Requirements



# Existing Water Supply Systems

- Water Supply and Interconnections
  - Local Sources
    - ♦ Wells with on-site treatment
      - Lakeside Boulevard WTP (Lakeside Wells and Rte 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



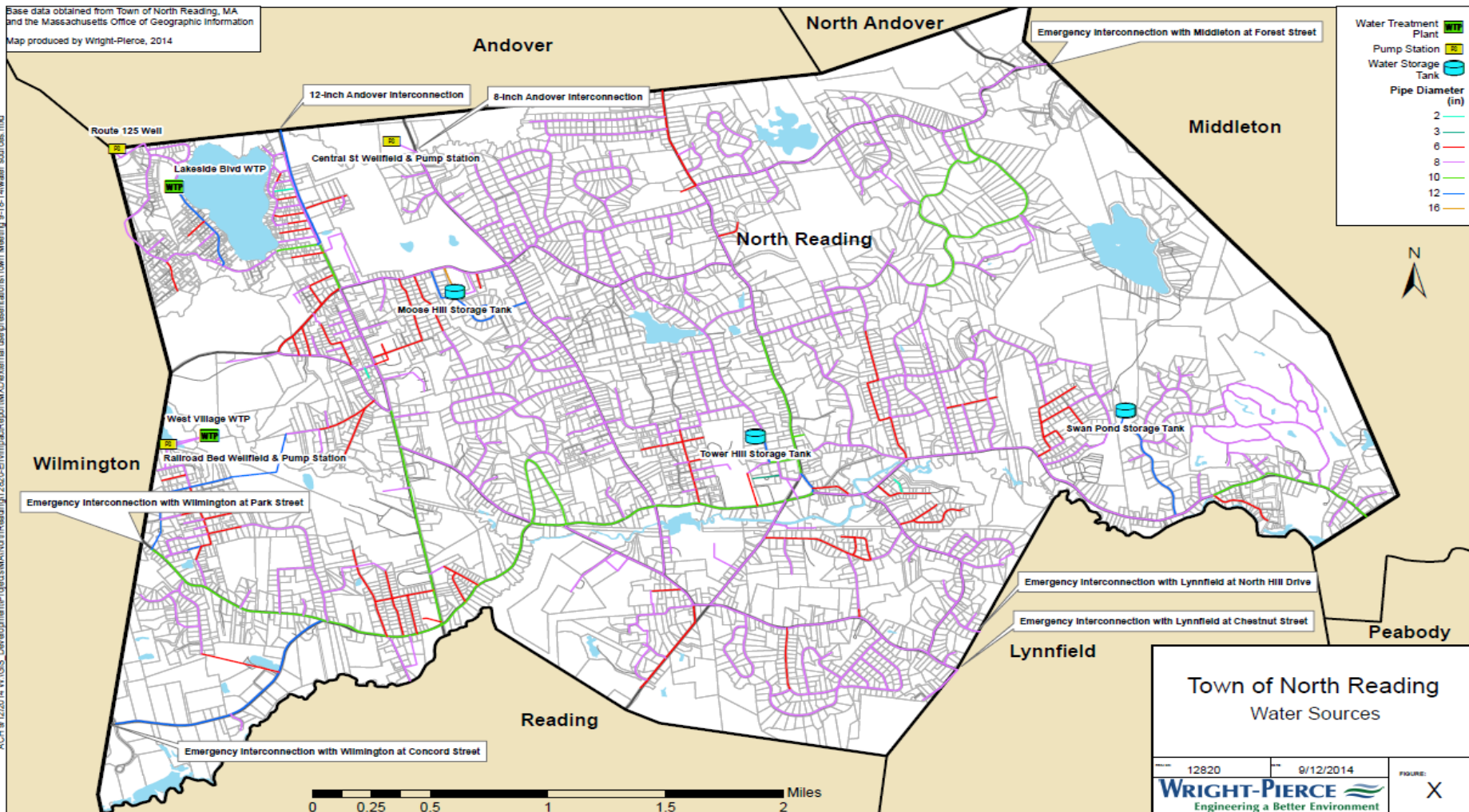
# Existing Water Supply Systems

- Water Distribution Storage
  - Three Water Storage Tanks
    - ◆ Tower Hill (0.525 M)
    - ◆ Moose Hill (1.58 M)
    - ◆ Swan Pond (1.3 M)
- Water Distribution Piping
  - 90 miles



# Facilities

Base data obtained from Town of North Reading, MA  
and the Massachusetts Office of Geographic Information  
Map produced by Wright-Pierce, 2014

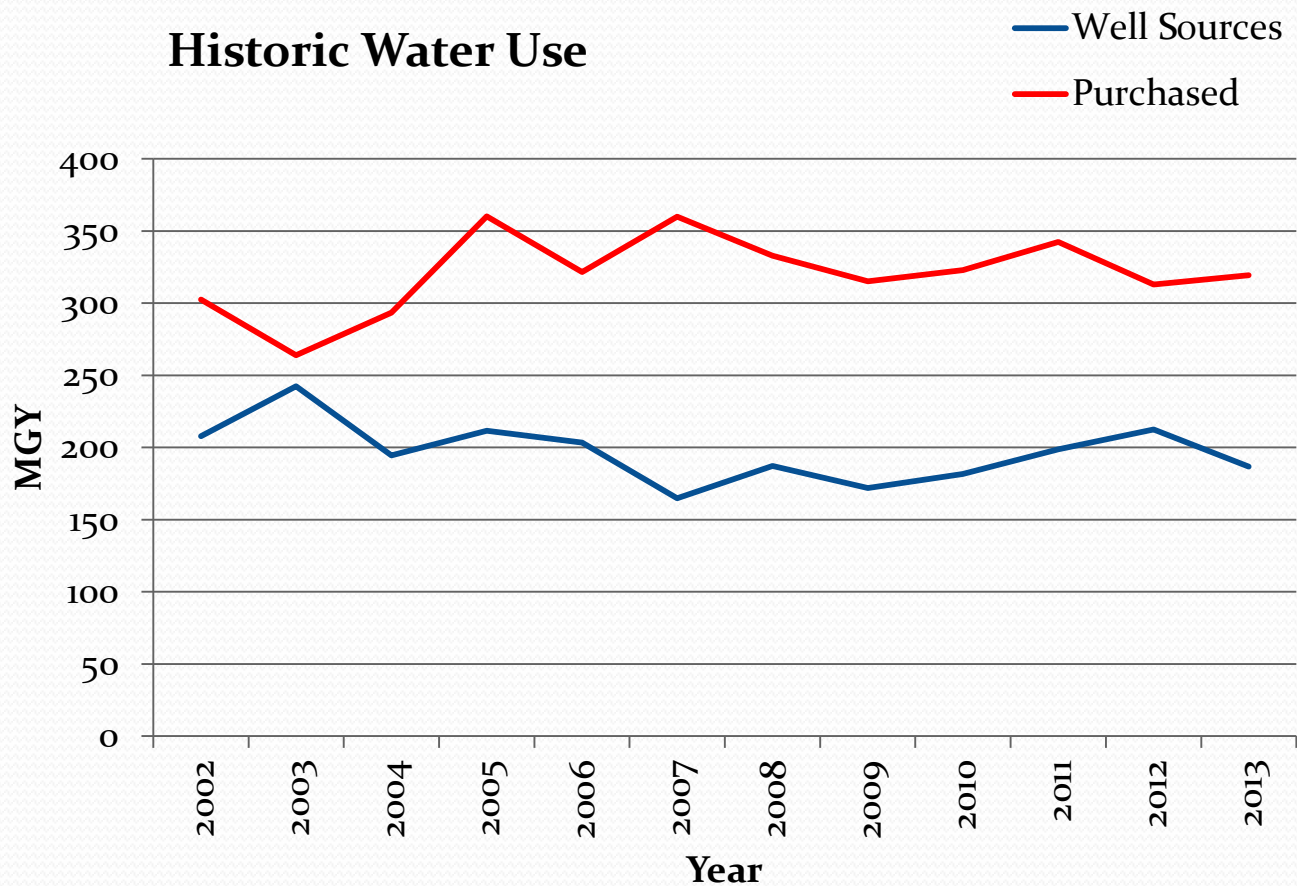


# Existing Water Use

- Historical Water Use
  - Residential Water Usage
  - Commercial Water Usage
  - Industrial Water Usage
  - Institutional Water Usage
  - Municipal Water Usage
  - Unaccounted For Water
  - Average Day Demand and Maximum Day Demand
  - Peak Hour Demand



# Historic Use



# Historical Water Demand

Year	Total Production (Town Sources) (MG/year)	Total Purchased (MG/year)	ADD (MGD)	MDD (MGD)	Ratio of MDD/ADD
2002	207.8	302.6	1.40	2.38	1.70
2003	242.5	263.9	1.39	2.39	1.72
2004	194.5	293.5	1.34	2.07	1.55
2005	211.7	360.2	1.57	2.56	1.63
2006	203.5	321.6	1.44	2.27	1.58
2007	164.9	359.9	1.43	2.27	1.58
2008	187.2	332.9	1.42	2.36	1.66
2009	171.8	315.2	1.33	2.17	1.62
2010	181.7	322.9	1.38	2.47	1.79
2011	198.7	342.3	1.48	2.38	1.61
2012	212.6	313.0	1.44	2.26	1.57
2013	186.8	319.4	1.39	2.15	1.55

\* Data as reported in the 2002 – 2013 Massachusetts DEP Annual Reports.



# Historical Water Use by Category

Year	Residential	Institution	Commercial	Total
2002	1.07	0.08	0.12	1.28
2003 <sup>1</sup>	1.0	0.11	0.11	1.22
2004	0.84	0.11	0.06	1.01
2005	0.90	0.10	0.06	1.07
2006	0.83	0.12	0.10	1.04
2007	0.93	0.11	0.07	1.11
2008	0.91	0.12	0.04	1.07
2009	0.86	0.14	0.08	1.07
2010	0.94	0.11	0.07	1.12
2011	1.07	0.08	0.06	1.21
2012	1.03	0.05	0.07	1.15
2013	0.89	0.05	0.05	1.00
Average	0.94	0.10	0.07	1.11

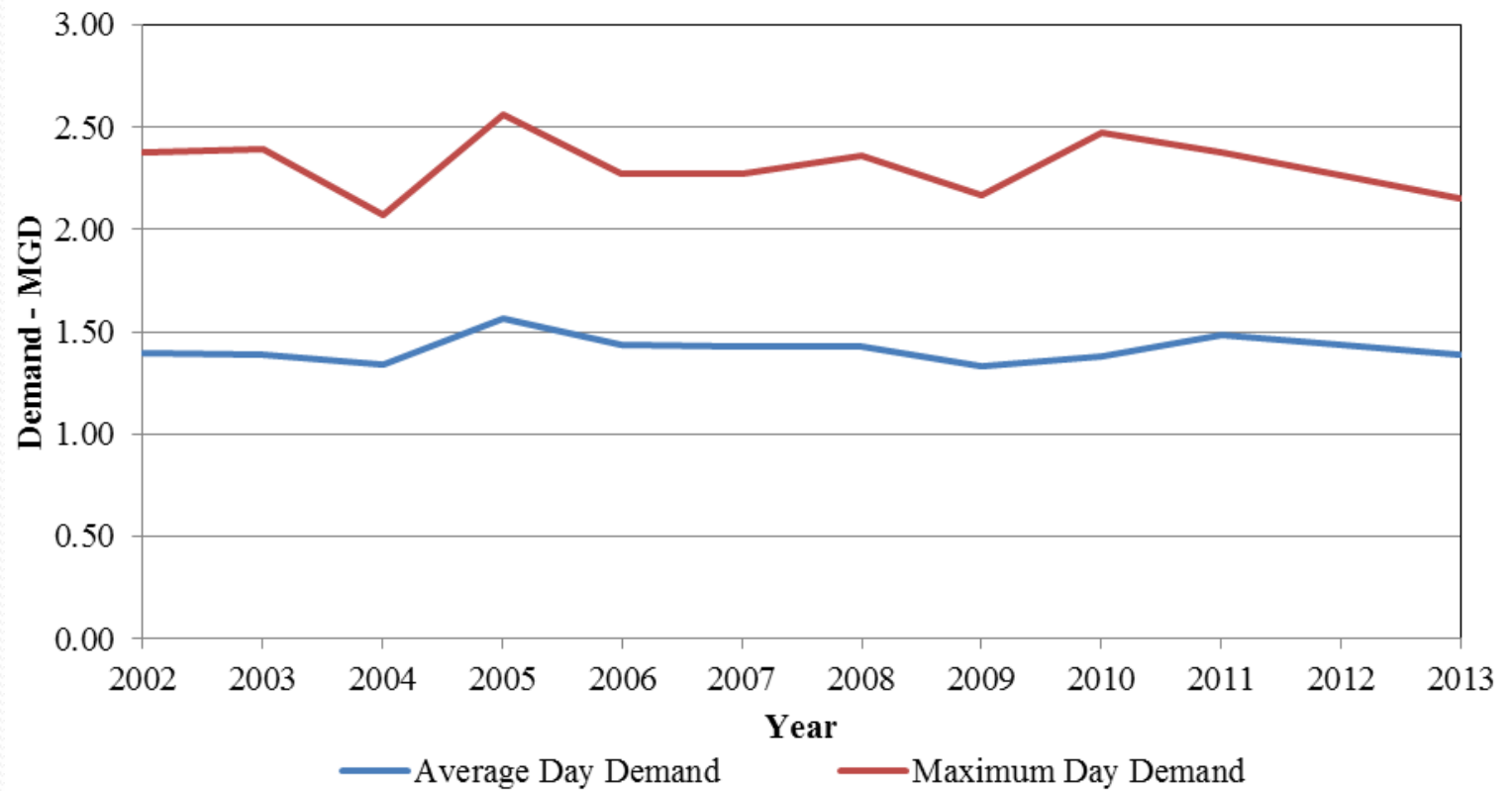


# Unaccounted For Water Use

Year	Total (MG/Yr)	% of Total Production
2002	44.4	8.7
2003	59.8	11.8
2004	59.8	12.2
2005	97	17
2006	85.7	16.3
2007	68	13.6
2008	76.1	15.0
2009	63.1	13.3
2010	64.5	13.2
2011	66.6	12.7
2012	70	13.72
2013	84.9	17.2



# ADD/MDD



# Future Demands

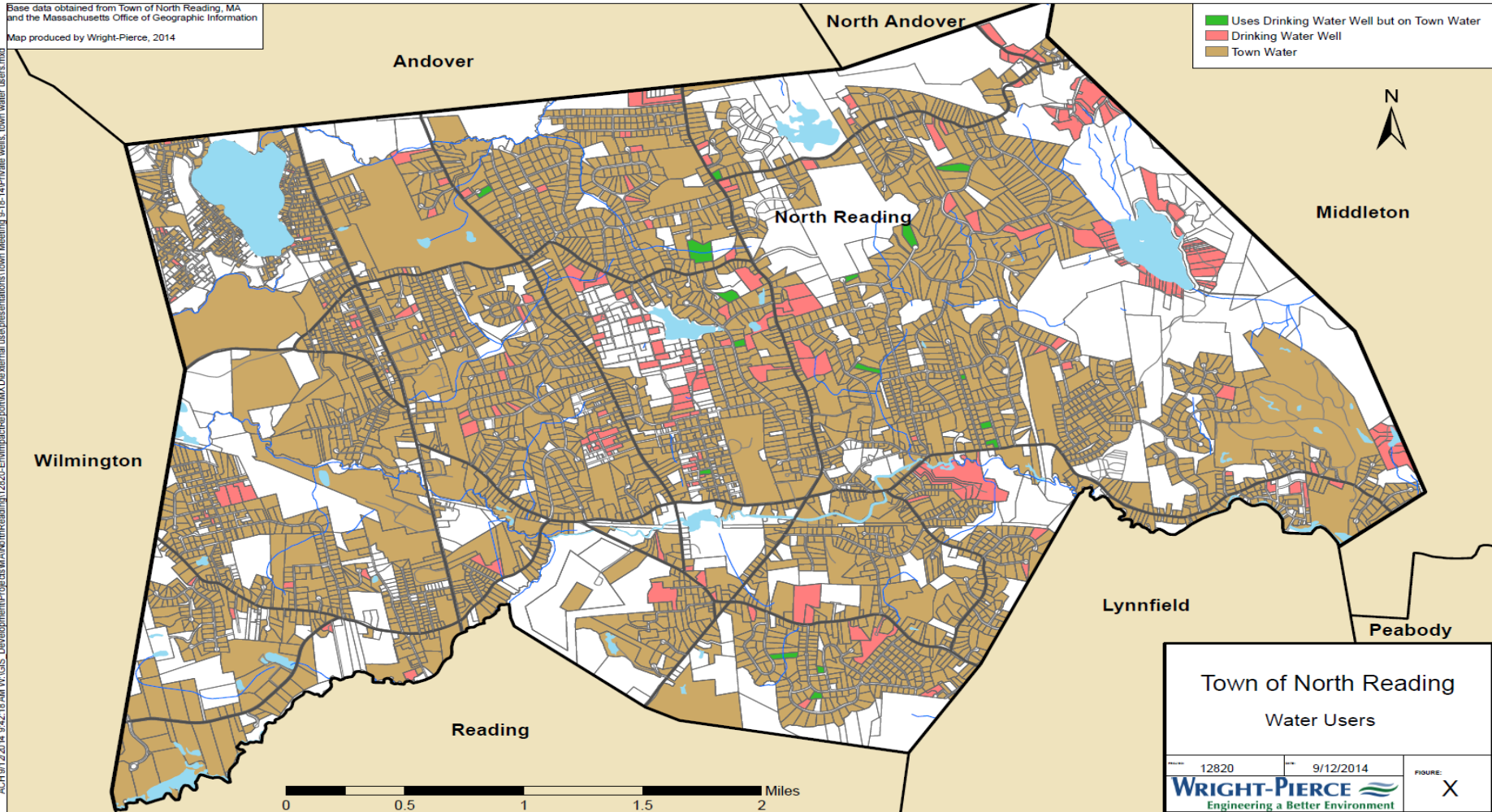
- Residential Use
- Commercial/Industrial
- Build-out
- Population
- MassDEP/MWRA OP.10 Requirements
- MDD/ADD



# Public/Private Water

Base data obtained from Town of North Reading, MA  
and the Massachusetts Office of Geographic Information  
Map produced by Wright-Pierce, 2014

ACH 9/12/2014 9:42:18 AM W:\GIS\_Development\Projects\MA\NorthReading\12820-EnvImpact\Report\MXD\Internal\Map\presentations\Town Meeting 9-15-14\Private wells, town water users.mxd



# Population Served - Existing

Source/Use	Number
Municipal Water	14,725
Private Potable Water Well	229 Parcels (621 persons)
Irrigations Wells	362 Parcels
Commercial Industrial Users	358 Parcels



# Future Requirements

<b>Base Population</b>	<b>14896</b>	2013 population
<b>Well users</b>	<b>0</b>	Well users (all transitioned public water)
<b>Population growth: Undeveloped/underdeveloped Future Users</b>	<b>2512</b>	un/underdeveloped lots *2.71 people per household
<b>Population Served</b>	<b>17408</b>	Includes Wells & growth
<b>Residential Average Day Demand (MGD)</b>	<b>1.13</b>	Based on 65 gpcd
<b>Non-Residential Average Day Demand (MGD)</b>	<b>0.19</b>	80% of 12yr max + undeveloped
<b>Unaccounted Water %</b>	<b>10.0%</b>	assume 10%
<b>Unaccounted Water (MGD)</b>	<b>0.16</b>	
<b>Confidently Estimated Municipal Use (MGD)</b>	<b>0.12</b>	based on 2013
<b>Total Average Day Demand (MGD)</b>	<b>1.60</b>	
<b>Total Maximum Day Demand (MGD)</b>	<b>2.58</b>	MDD/ADD of 1.79



# Water Conservation

- Comprehensive Planning & Drought Management Planning ✓
- Water Audit ✓
- Leak Detection ✓
- Metering ✓
- Pricing ✓
- Residential ✓
- Public Sector ✓
- Industrial, Commercial, and Institutional- relatively low % of North Reading Water Use- no FY 15 action planned
- Agricultural- relatively low % of North Reading Water Use- no FY 15 action planned
- Lawn & Landscape ✓
- Public Education & Outreach ✓



# Wastewater System and Requirements

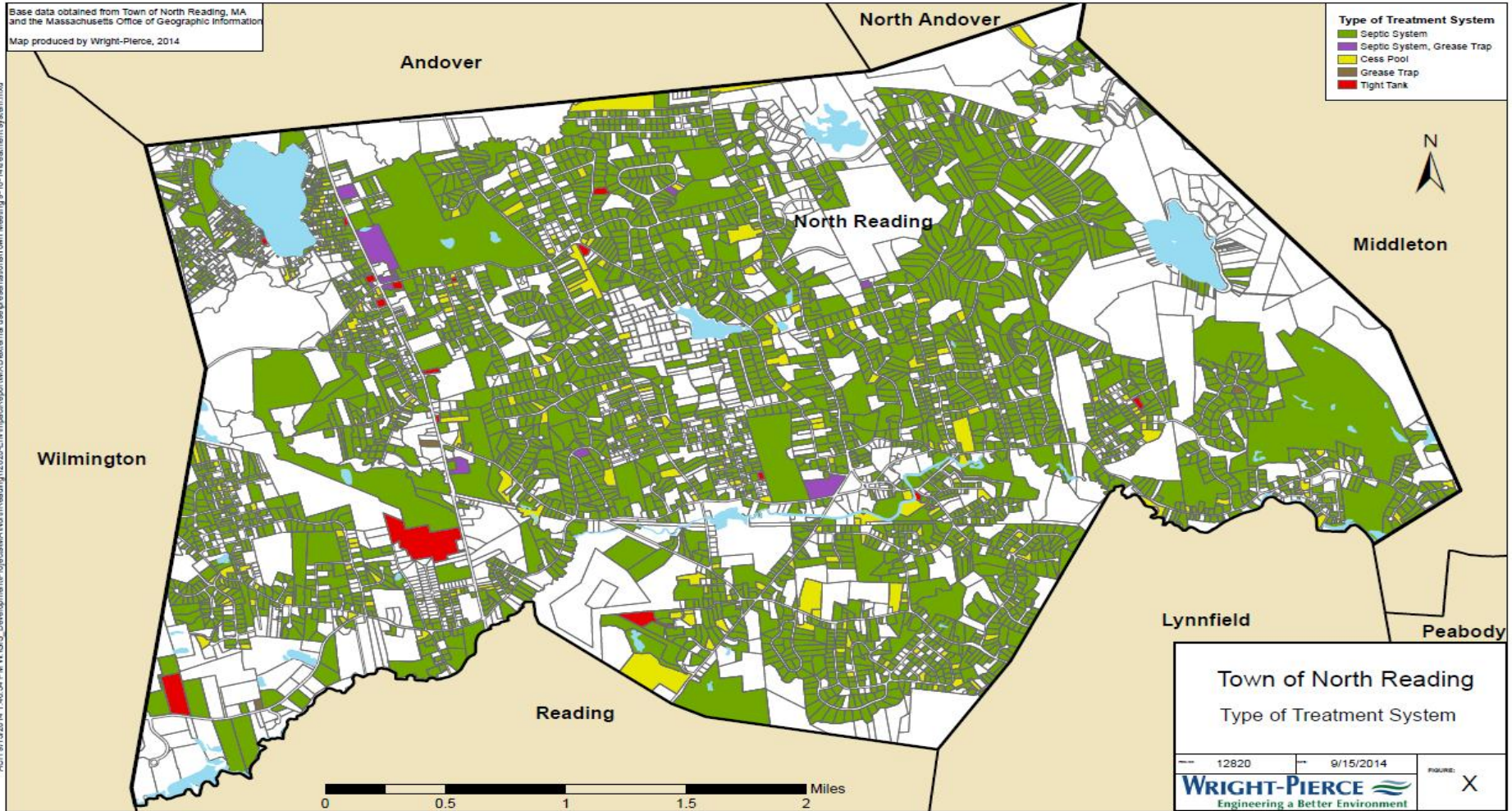


# Existing Wastewater Management Systems

- On-site Wastewater Disposal Systems
  - Septic Systems
  - Cesspools
  - Tight Tanks
  - Innovative/Alternative Technologies
  - Treatment Facilities (MassDEP GW Permit)
  - Residuals Management
- On-site Wastewater Disposal Systems Effectiveness
  - Septic System Failures
  - DEP Violations



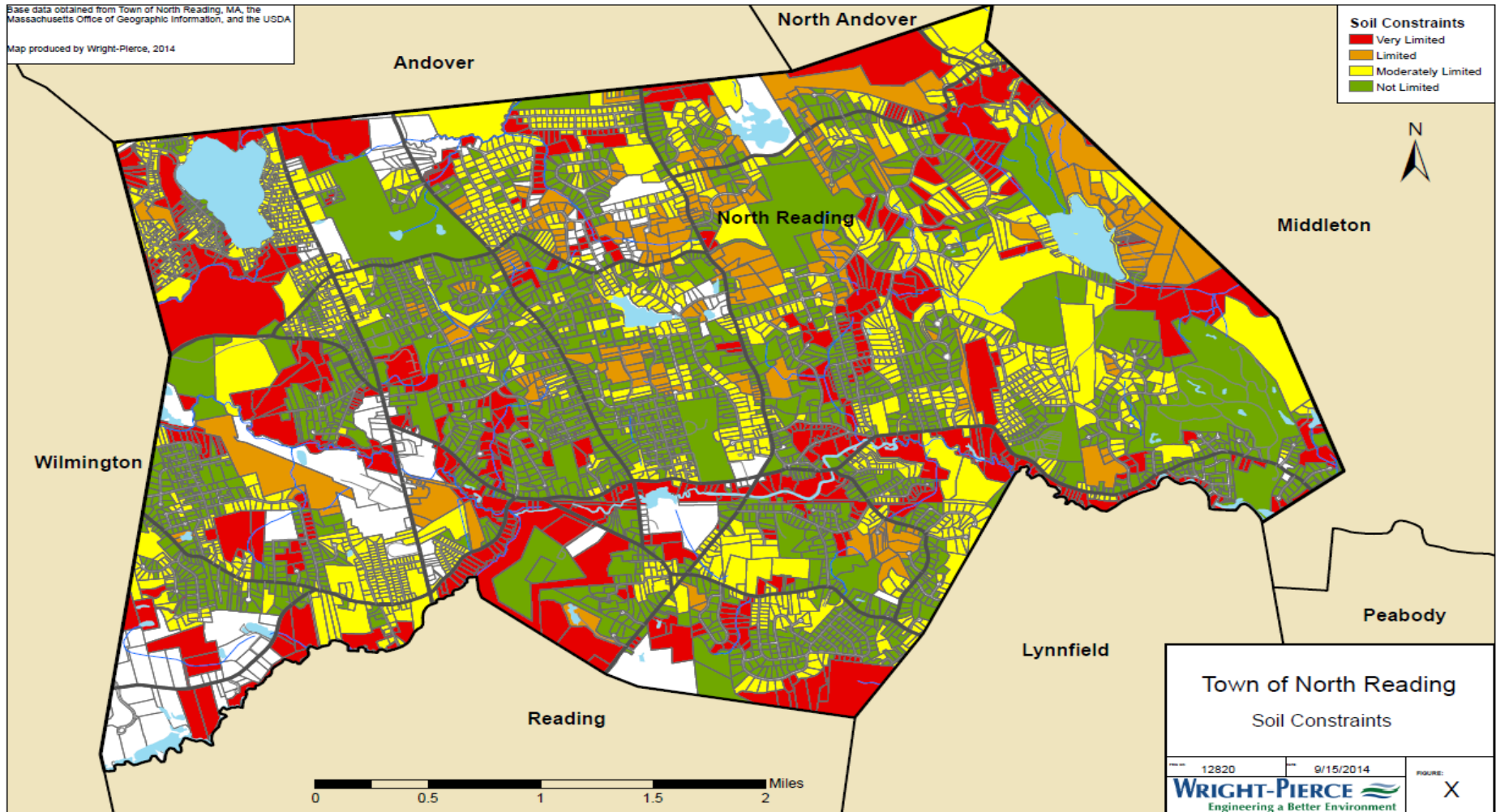
# Treatment System Types



# Soil Constraints

Base data obtained from Town of North Reading, MA, the Massachusetts Office of Geographic Information, and the USDA

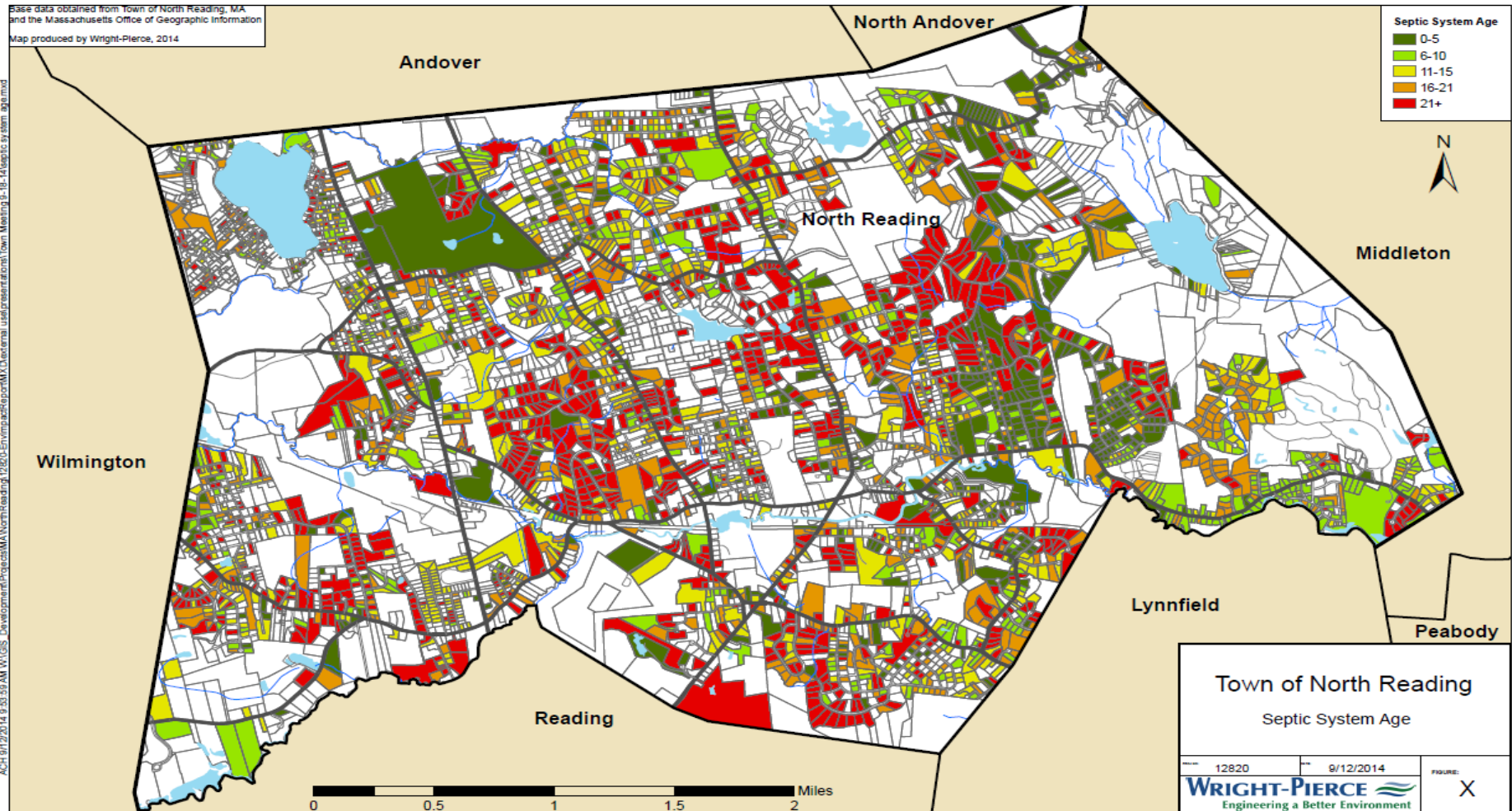
Map produced by Wright-Pierce, 2014



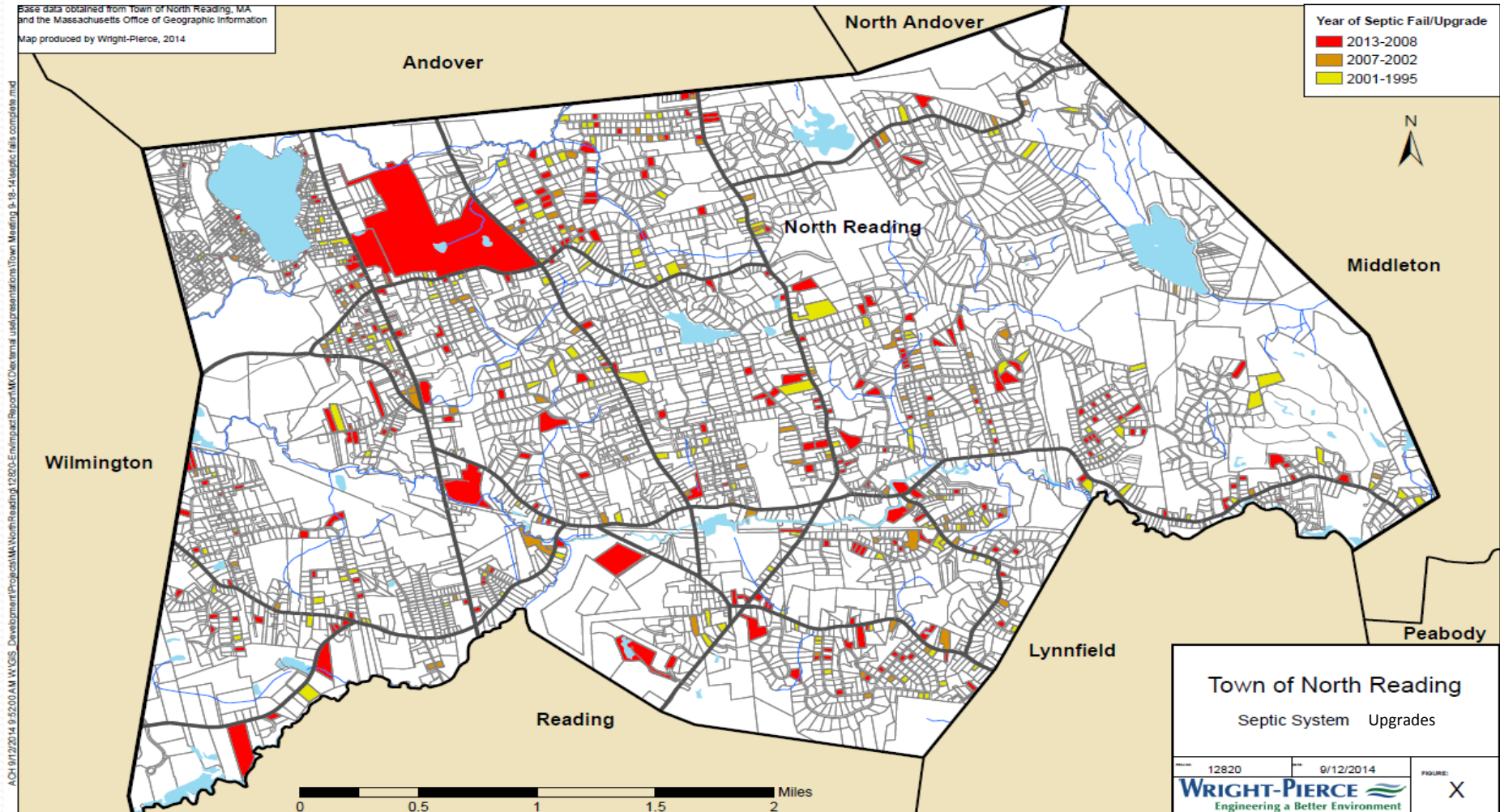
# Septic System Age

Base data obtained from Town of North Reading, MA  
and the Massachusetts Office of Geographic Information  
Map produced by Wright-Pierce, 2014

ACH 9/11/2014 9:53:59 AM W:\GIS\_Development\Projects\MA\NorthReading\12820-Enviro\asReport\MXD\external\asReport\Town Meeting 9-18-14\septic system age.mxd



# Septic System Upgrades



# Upgrades Data Set

2008	2009	2010	2011	2012	2013
40	52	37	48	52	48



# 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 - Physical

- Lot Size
- Water Use per SF
- Water Use Class
- Known Septic Failures
- Septic System Age
- System Type – Cesspool/Tight Tank/Treatment System
- Pump Out Frequency
- Permit Violations
- Household Size/No. of Rooms
- Percent Impervious
- Private Well



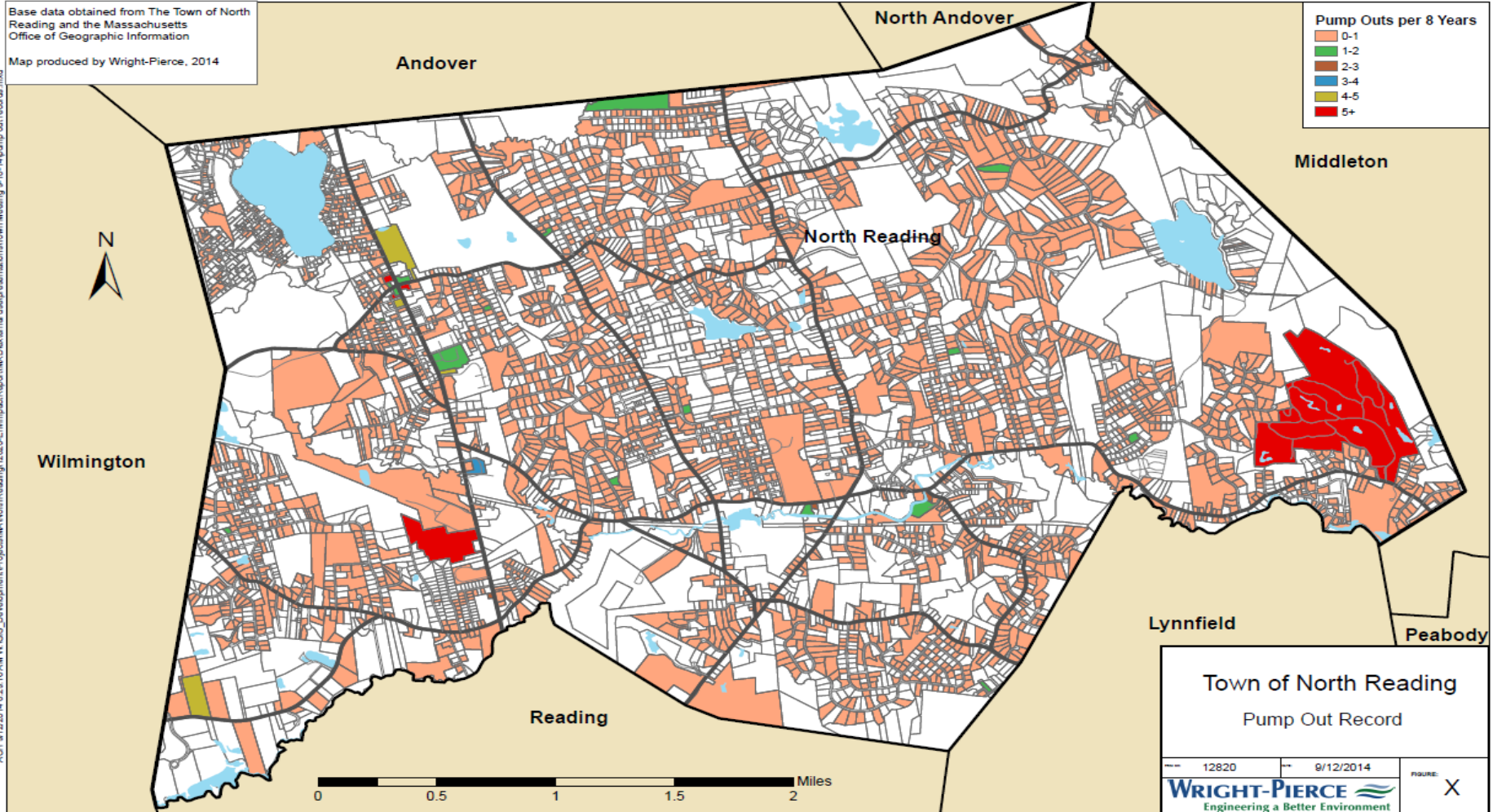
# Criteria - Location

- Depth to GW
- Depth to Restrictive Layer
- Soil Drainage
- Ponding
- Flooding
- Private Wells
- Within Zone 2
- Within IWPA
- Adjacent to Wetlands
- Proximity to Impaired Water
- Percent Impervious
- Surface Water Protection Zone



# Septic Pump Out Frequency

Base data obtained from The Town of North Reading and the Massachusetts Office of Geographic Information  
Map produced by Wright-Pierce, 2014



# Pump Out Data Set

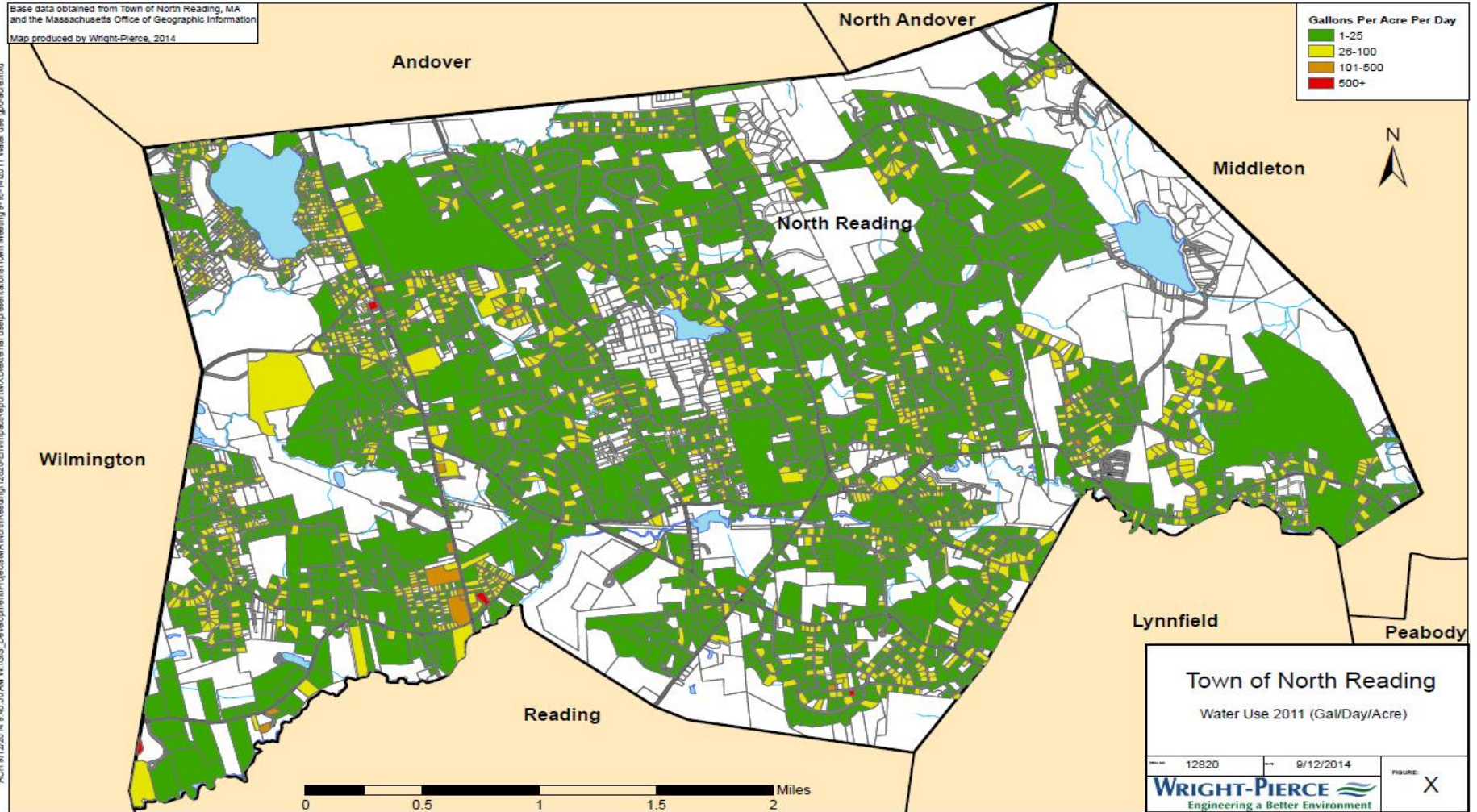
2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
217	603	610	838	745	687	713	738	760	62



# Water Use per Acre

Base data obtained from Town of North Reading, MA  
and the Massachusetts Office of Geographic Information  
Map produced by Wright-Pierce, 2014

AC:\9112014\9:40:30 AM W:\GIS\_Development\Projects\MA\NorthReading\12820-EnvImpactReport\MXD\external\usf\presentations\Town Meeting 9-18-14\0111 Water use gpd-acre.mxd

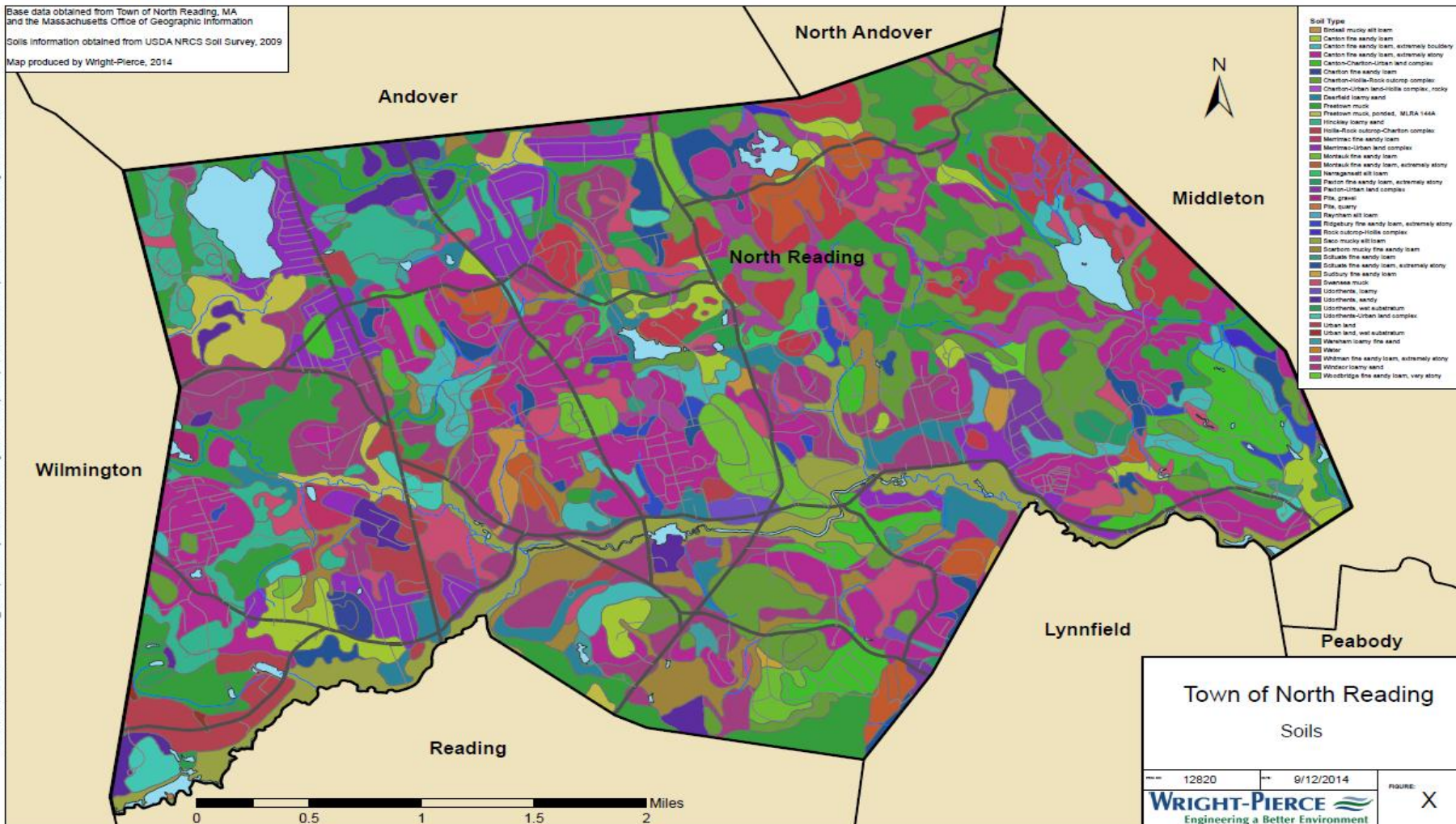


# Lot Size



# Soils

Base data obtained from Town of North Reading, MA  
and the Massachusetts Office of Geographic Information  
Soils information obtained from USDA NRCS Soil Survey, 2009  
Map produced by Wright-Pierce, 2014




# Preliminary Agenda for Next Meeting

Anticipated Date December 18, 2014

- Finalize Water Needs
- Water Supply Alternatives Analysis
- Detailed Wastewater Needs Analysis
- Preliminary Wastewater Management Alternatives



# Questions / Discussion

The image features a blue background with a wavy pattern at the top. In the center, a large, 3D red question mark is positioned inside a magnifying glass with a silver rim and a black handle. The magnifying glass is angled towards the right. Surrounding the central red question mark are numerous smaller, grey, 3D question marks of varying sizes, some appearing to float in the air and others resting on a light surface. The overall composition suggests a focus on inquiry and discussion.