

GROUNDWATER and EAST BOSTON

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Why are low groundwater levels a problem?



Much of Boston is built on “made land”

FIGURE 13.2

DETAIL OF EAST BOSTON FROM 1781 CHART OF BOSTON HARBOR BY J. F. W. DYS BARRES

Noted for its accuracy (see Note on Sources, appendix 2), this eighteenth-century chart clearly shows the islands that became East Boston and the various drumlins and marshes on them.

Construction Techniques of Properties Built Before 1925, With Some Exceptions

- Many foundations were supported by wood pilings designed to be submerged/preserved in groundwater.
- Wood pilings were cut off at elevations of 5'-7' above Boston City Base.
- When ground water levels are low, pilings become exposed to air and can deteriorate over time.

Strategy to Address Problem

1. Collect Information

- Install monitoring groundwater wells
- Analyze historical records re: wood piling supported structures, etc.

2. Identify Hotspots of Low Groundwater

- Location
- Possible cause

3. Develop Targeted Solutions

- Fix infrastructure (leaks and pumps)
- Increase recharge

Implementation Steps

1. Boston Groundwater Trust

- City Council created in 1986
- Mayor expanded to all neighborhoods in 2005
- Installs wells, collects data, and provides public information

2. City/State MOU signed 2005

- Share information
- Identify problems
- Develop solutions

3. Groundwater Conservation Overlay District

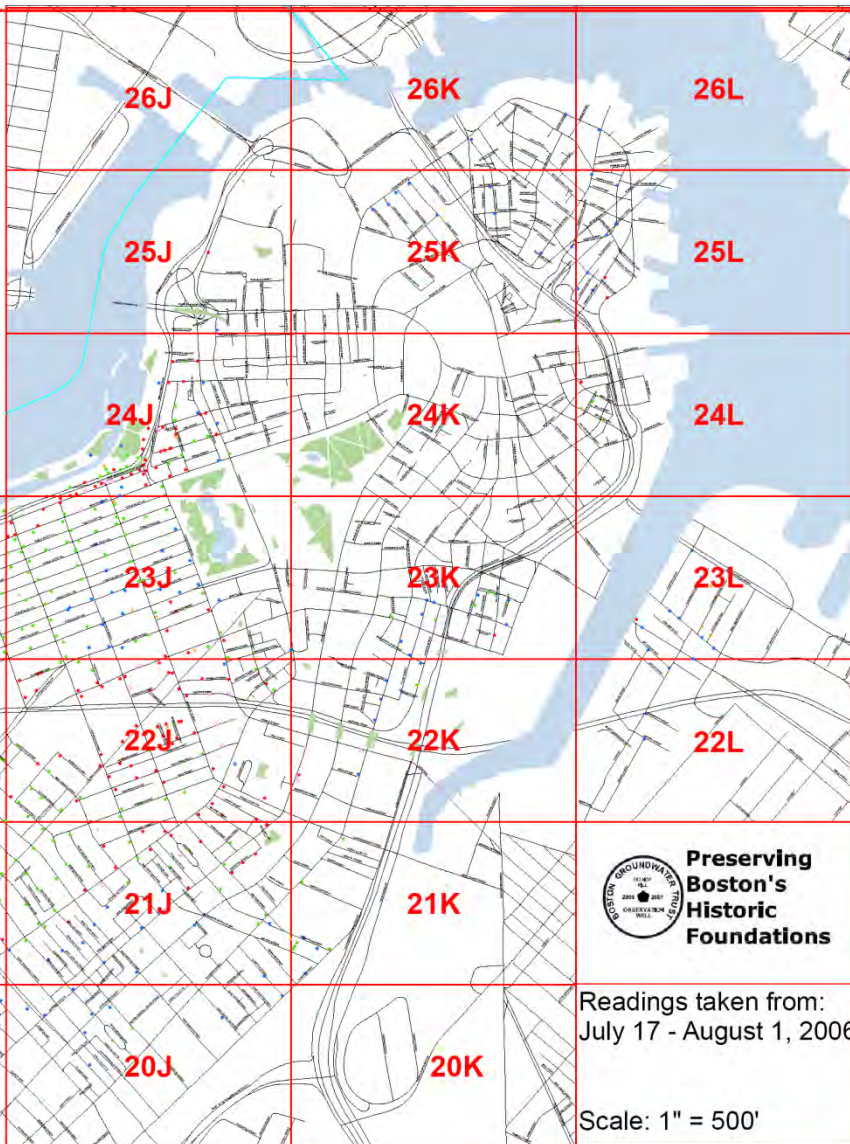
- Adopted into the Zoning Code in February 2006

Groundwater Monitoring Well Network

- The Commonwealth and the US EPA provided funding for the Trust to install a network of groundwater monitoring wells.
- The network, to be completed this month, includes over 800 wells.
- Approximately 100 installed in East Boston

**Boston Groundwater Trust (BGWT):
July 2006 Elevations for 678 Existing Wells**

- 180 Wells @ Elevation > 7 FT
- 291 Wells @ Elevation 5' to 7'
- 161 Wells @ Elevation 3' - 5'
- ⊕ 21 Wells @ Elevation < 3'
- 25 Wells @ No Reading

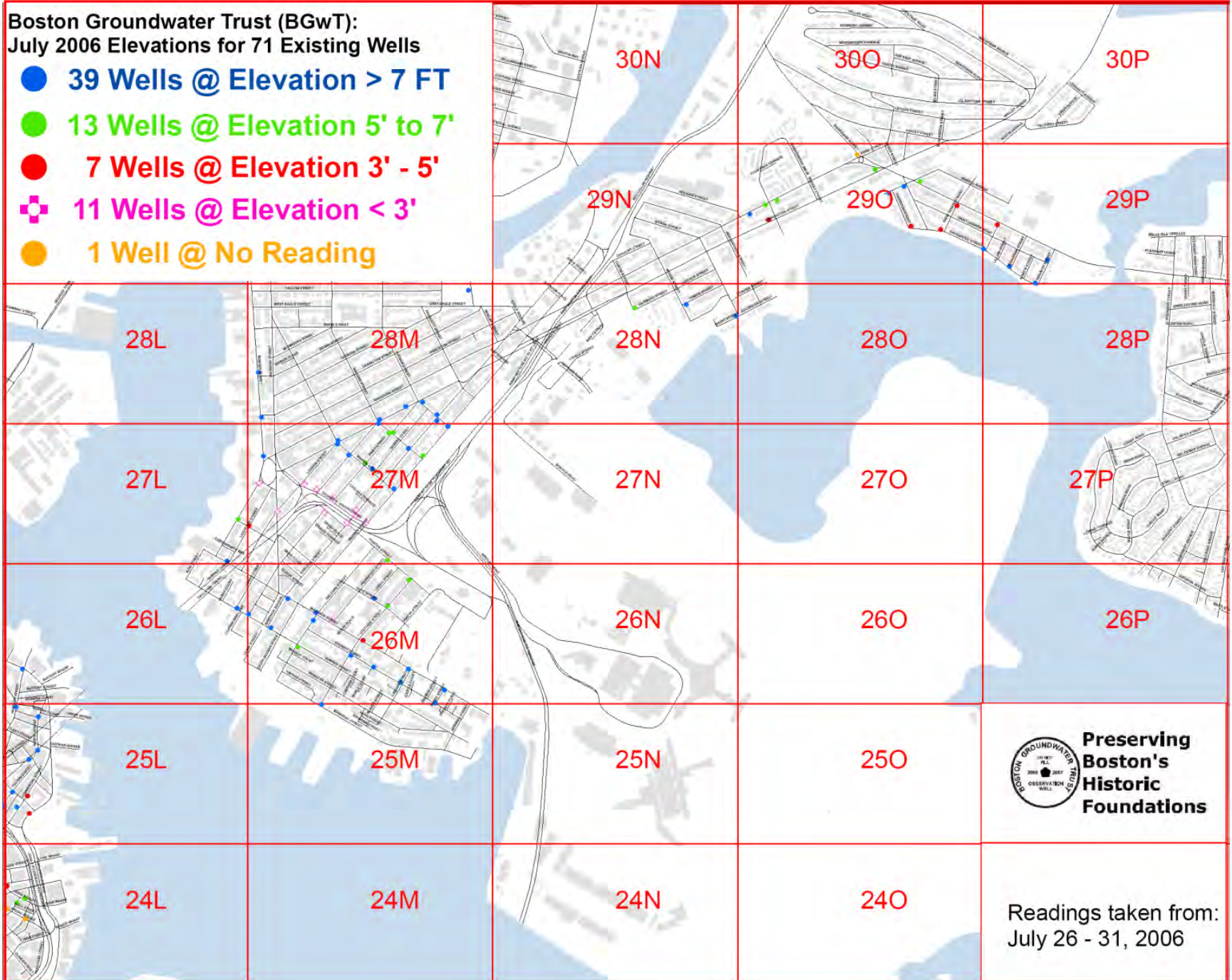


Readings taken from:
July 17 - August 1, 2006

Scale: 1" = 500'

**Boston Groundwater Trust (BGWT):
July 2006 Elevations for 71 Existing Wells**

- **39 Wells @ Elevation > 7 FT**
- **13 Wells @ Elevation 5' to 7'**
- **7 Wells @ Elevation 3' - 5'**
- ⊕ **11 Wells @ Elevation < 3'**
- **1 Well @ No Reading**



Readings taken from:
July 26 - 31, 2006

Groundwater Conservation Overlay District (GCOD)

- The GCOD was incorporated into Zoning in February of this year, covering neighborhoods where widespread low groundwater levels exist.
- The GCOD is a section of the City in which most new construction and rehabilitation must meet special regulations in order to minimize impact to groundwater levels and requires recharge of stormwater into the ground.
- GCOD allows for expansion into “Study Area” neighborhoods of the North End, East Boston, and areas of South Boston and Charlestown.

GCOD Thresholds

- Any project that involves:
 - 1) Elevation 7 Boston City Base;
 - 2) New surface coverage of an additional 50 square feet or more; or
 - 3) Substantial rehabilitation
 - 4) Requires a conditional use permit from the Board of Appeals

GCOD Requirements

- Projects within the GCOD must show they will not have a detrimental effect on groundwater levels on the site or abutting properties.
- Such projects must include a defined amount of recharge capacity.
of the surface area affected by the project.
- Any new paving must include the ability to recharge.

Next Steps in GCOD Study Area Process for East Boston

1. Examine ISD data to determine number and location of buildings constructed on wood pilings and determine piling cut off elevation, if possible.
2. Collect and analyze groundwater data.
3. Early Fall: The City will begin a community process to discuss preliminary findings and recommendations.