

TOWN OF BELMONT

THE WINNING COMBINATION
FOR
SEWER OVERFLOW MITIGATION
WINN'S BROOK AREA

NEWEA Collection Systems Specialty Conference
September 10, 2014



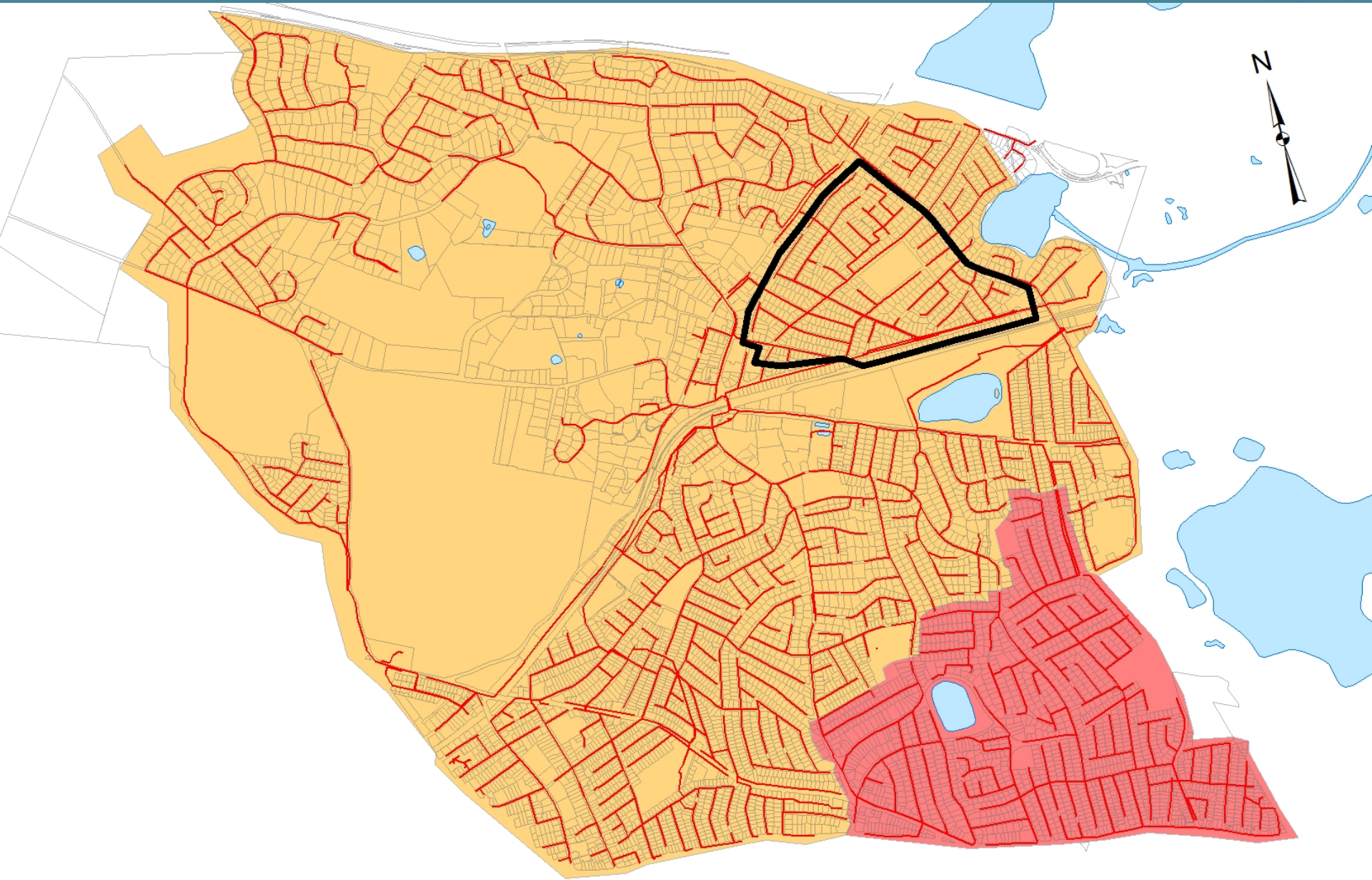
FAY, SPOFFORD & THORNDIKE

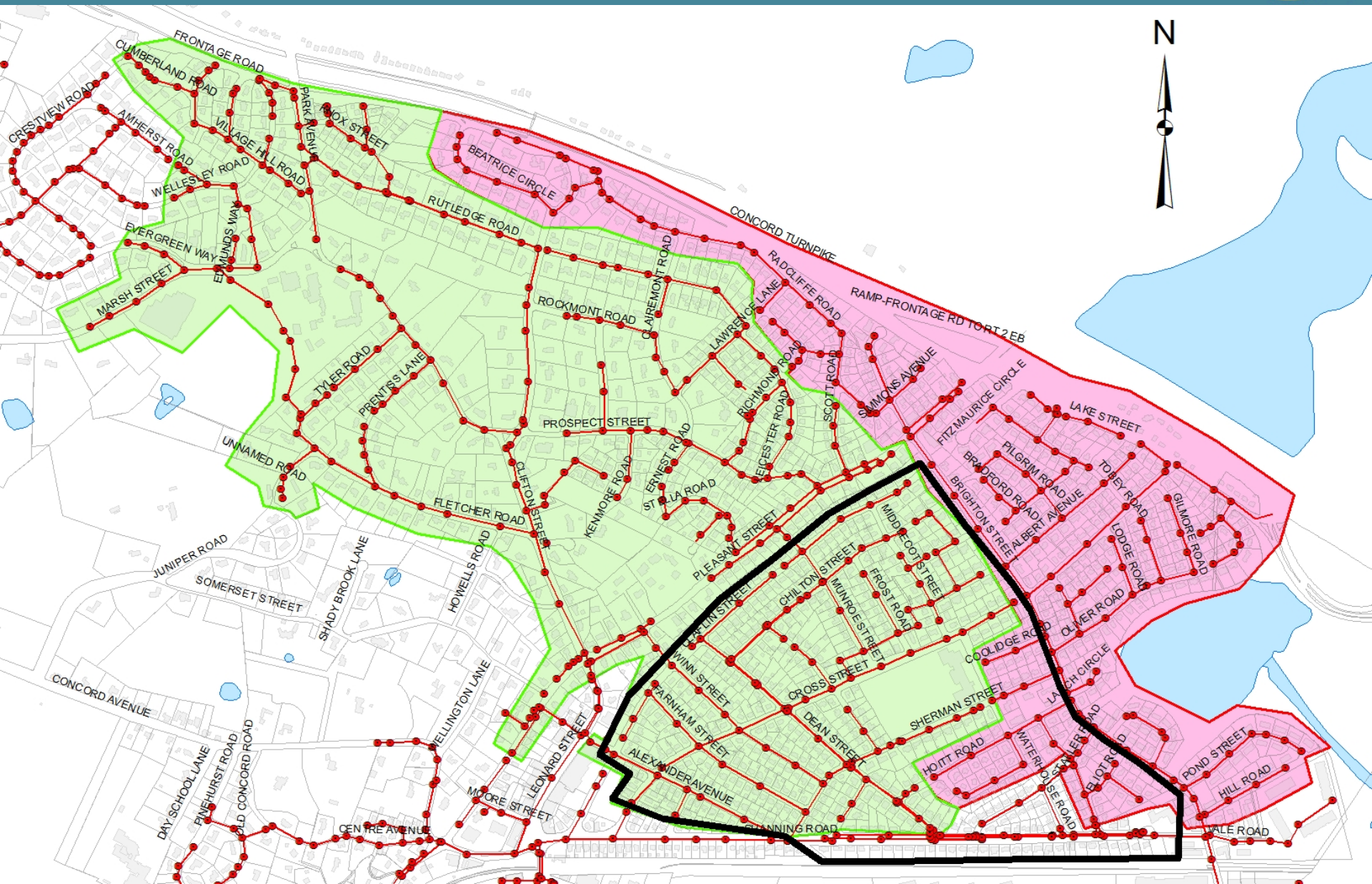


Winn's Brook Area

- Low-lying area in Northeast Belmont
- Close proximity to MWRA Flanders Road
- 85% of Belmont tributary to Flanders Road
- Extensive upstream sewer system
- Two different sewer subsystems







Reported Backups

Dates	Number	Rainfall (inches)
October 1996	29	10
June 1998	42	8
March 2001	32	7
May 2006	11	12

House Inspections

- 95 Houses have reported backups
- 69 Inspections conducted (73%)
- 49 Confirmed sewer overflows

Increased Hydraulic Grade Line Creates Sewer Overflows

- System Capacity Constraints
- Infiltration/Inflow in Belmont
 - 2007 Flow Monitoring Program
- Elevated downstream hydraulic grade line



Mitigation Concepts

- Increase sewer capacity
- Flow diversion
- Storage
- Isolation and Pumping
- I/I Removal

Solution Constraints

- No significant increase in flow to MWRA interceptor or transference of problem to Cambridge
- No transference of problem within Belmont
- Continued I/I reduction will be required
 - 2009 Sewer System Evaluation Survey



Alternative Combinations*

1. Increase gravity sewer capacity to pass 1-year storm
2. Divert upstream flow around WB (Brighton St.)
3. Divert, isolate with PS
4. Isolate with PS (no diversion)
5. Isolate with PS, extend FM to Flanders Rd.
6. Isolate with two pump stations

***InfoWorks Sewer Model used to compare reduction in Winn's Brook HGL**



Alternatives Combinations*

7. Two PS and line Channing & Brighton
8. Two PS, pump to 7.6 MG UST
9. Increase capacity to pass 06 Mother's Day
10. Divert, Two PS, pump to 3.3 MG UST
11. Divert, Two PS, pump to system

***InfoWorks Sewer Model used to compare reduction in Winn's Brook HGL**



Alternative 11

The map displays a residential neighborhood with a proposed water main and sewer system. The system is shown as a network of lines, with a large blue area labeled 'Alternative 11' indicating the main water main. The sewer system is shown as a network of lines, with a large blue area labeled 'Alternative 11' indicating the main sewer. The map includes streets such as Leonard Street, Dean Street, and Newcastle Road, and features like Dean St PS and Newcastle Rd PS. A large blue area is labeled 'Alternative 11'.

Cambridge Integration

- Cambridge not impacted
- Increased backwater condition
 - 3.6' increase
- Created transference within Belmont
 - Baker, Hittinger, Hamilton



Supplemental Alternatives

- 11A Divert (Dean St.), Two PS, pump to system
- 12 Divert with in-line storage (Dean St), Two PS, pump to system



Alternative 12

Baseline Conditions

Alternative 12

Alternative 12A – 15% I/I Reduction

Predicted Discharge

	Peak Discharge MGD	24-Hour Volume MG
Baseline	16.53	15.34
Alternative 11	18.35 (+11.0%)	17.01 (+10.9%)
Alternative 12A	16.84 (+1.98%)	14.90 (-2.84%)

Construction Cost

(completed 12/11)

Winn's Brook Sewer Overflow Mitigation Facilities	\$4.9 Million
Townwide I/I Removal	\$1.1 Million
TOTAL	\$6.0 Million

















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Questions?

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