Combined Sewer Overflow Master Plan for Town of Cape Elizabeth, Maine

Presented at Town Council Workshop Session
January 11, 2012

Presented by:

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Presentation Overview

- Summary of Wastewater infrastructure
- What is a Combined Sewer Overflow?
- Recent History of CSOs in Cape Elizabeth
- Reason for a CSO Master Plan
- What process was used to develop plan?
- Summary of 5-year implementation plan
- Next steps for the Town

Wastewater Infrastructure

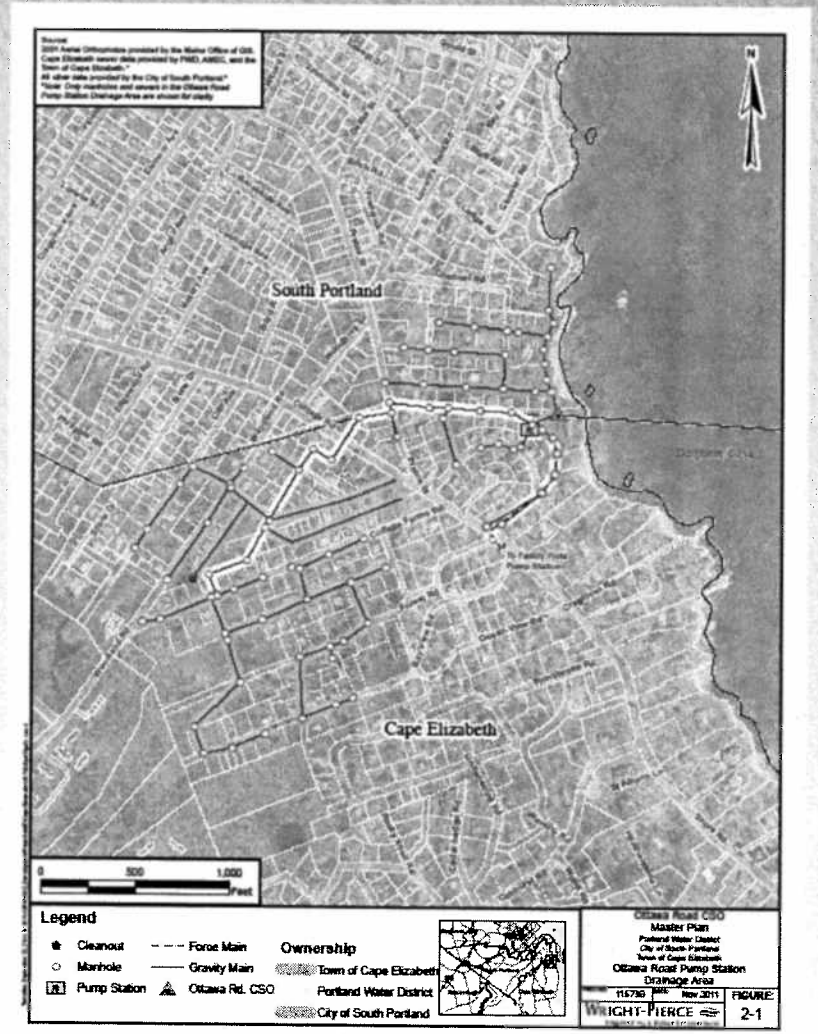
- Town owns/maintains select manholes, sewer pipes, and pump stations
- PWD owns select manholes and sewer pipes, pump stations and WWTF
- WWTF serving south Cape was recently upgraded to eliminate "emergency bypass"

Wastewater Infrastructure, cont'd.

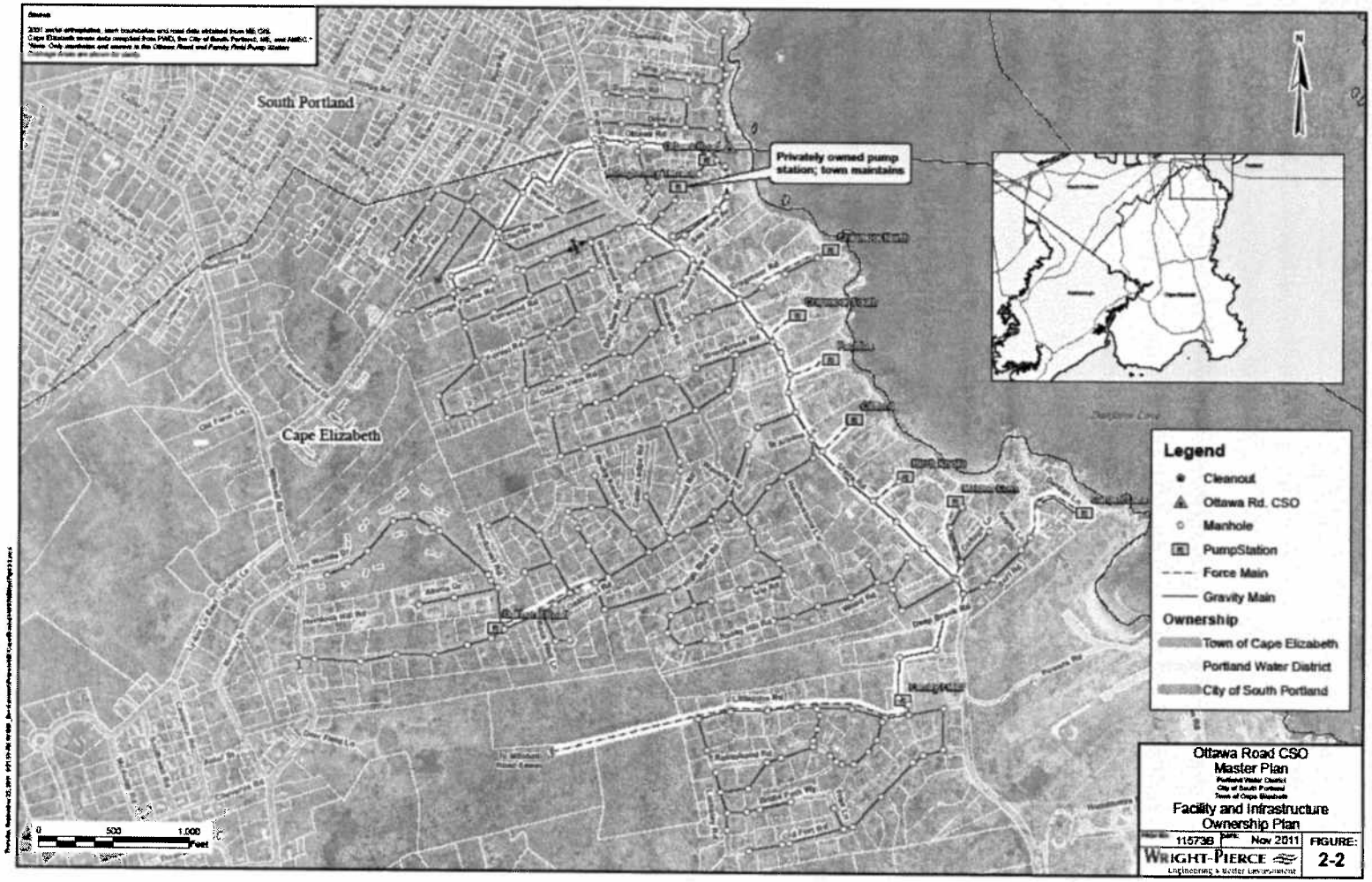
- Wastewater from north Cape is treated at S. Portland WWTF
- One CSO located at Ottawa Road Pump Station
- Jointly owned by Town, City and PWD
- While CSO has overflowed for decades, it was just licensed by Maine DEP in 2009

General Location Plan – Northern Cape

Ottawa Road Facilities



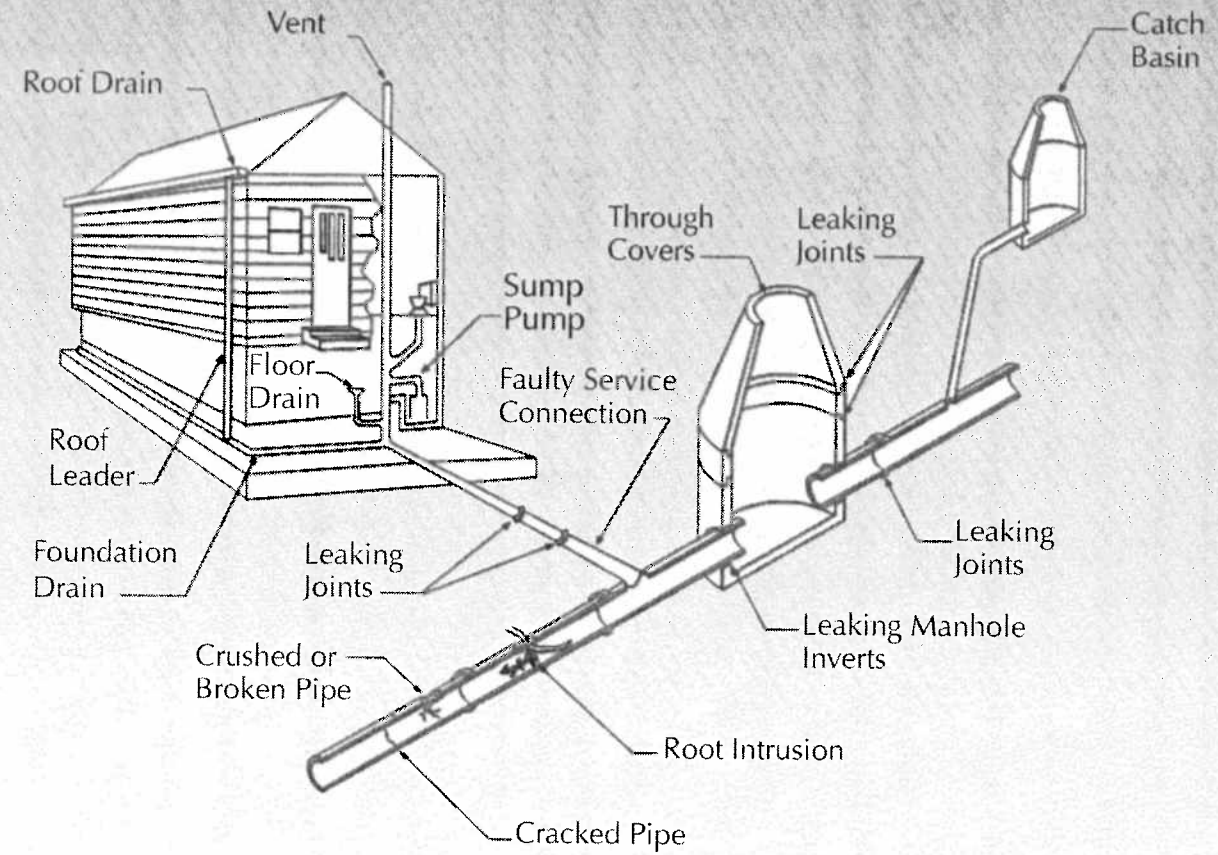
Ottawa Rd/Family Field Facilities



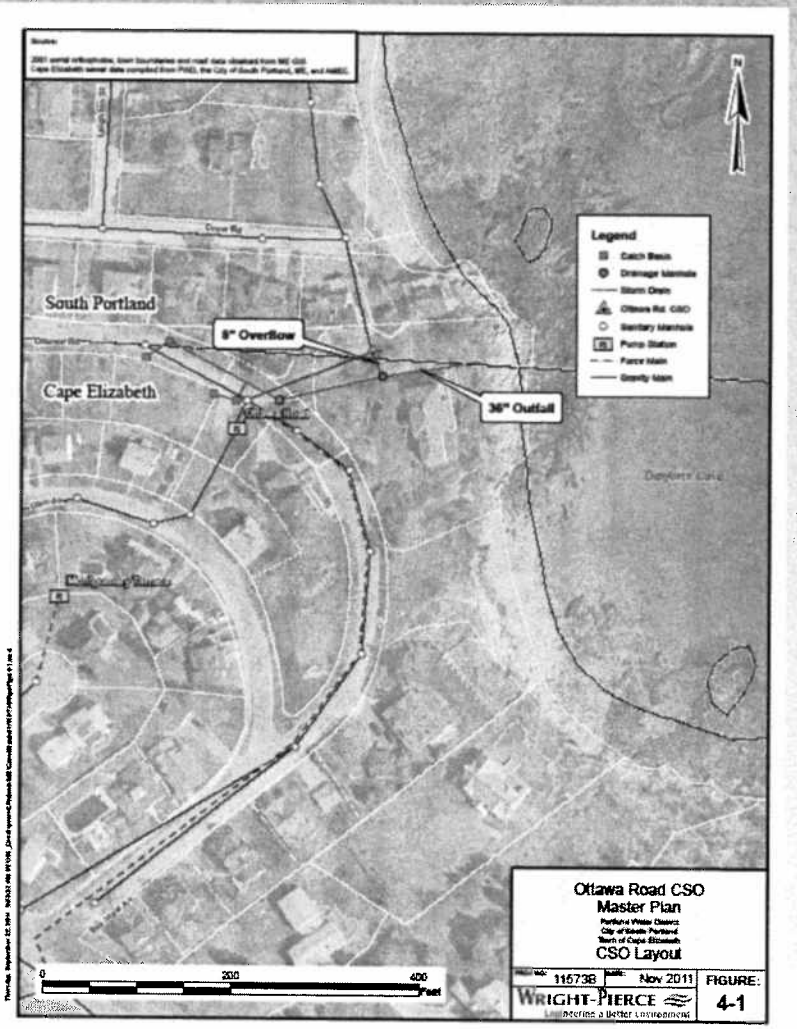
What is a CSO?

- Permitted wet weather discharge to Danforth Cove
- Before WWTF, all wastewater & stormwater went water bodies w/o treatment in same pipe–combined system
- With construction of WWTF and pump station, most of runoff redirected to storm water lines, but not all…
- During dry periods, all wastewater to WWTF
- During wet weather, surface and groundwater (I-I) enter sewer pipes, necessitating overflows to Danforth Cove

Infiltration-Inflow Sources



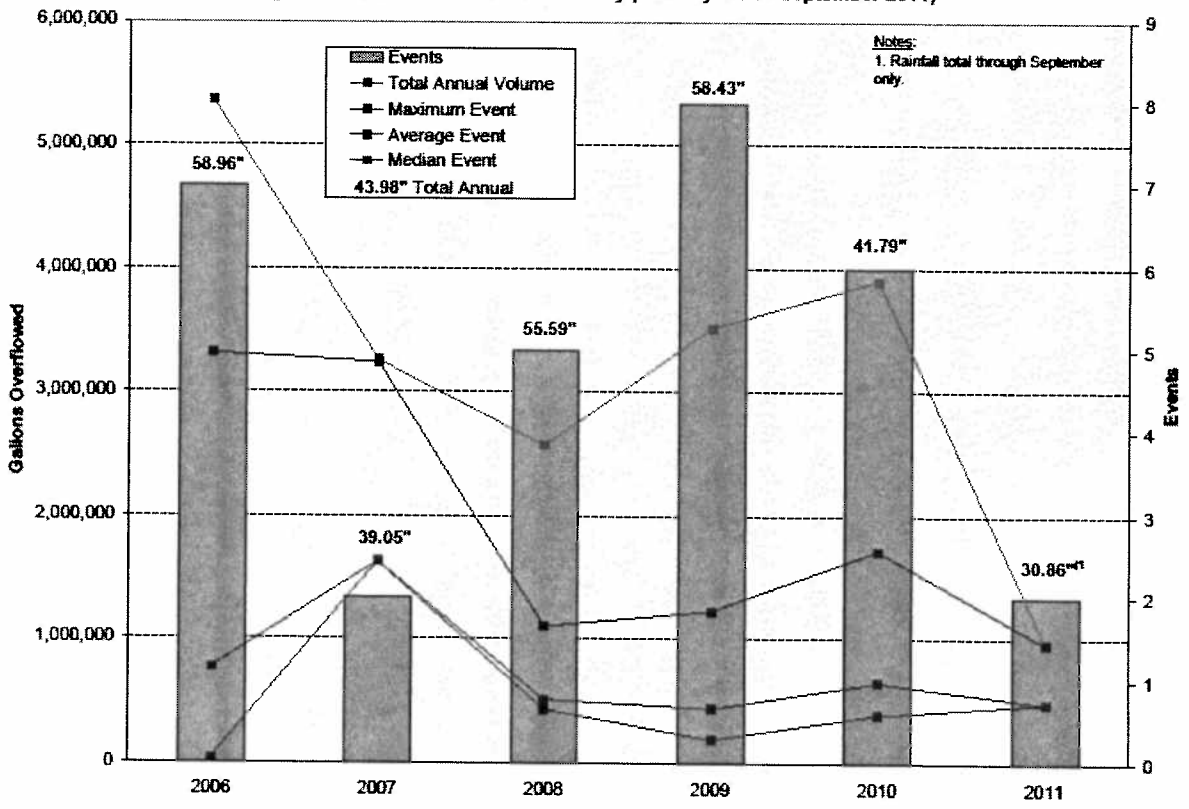
Ottawa Road CSO



CSO Event Summary

Portland Water District/City of South Portland/Town of Cape Elizabeth
Ottawa Road CSO Master Plan

Figure 4-2: Annual CSO Event Summary (January 2006 - September 2011)



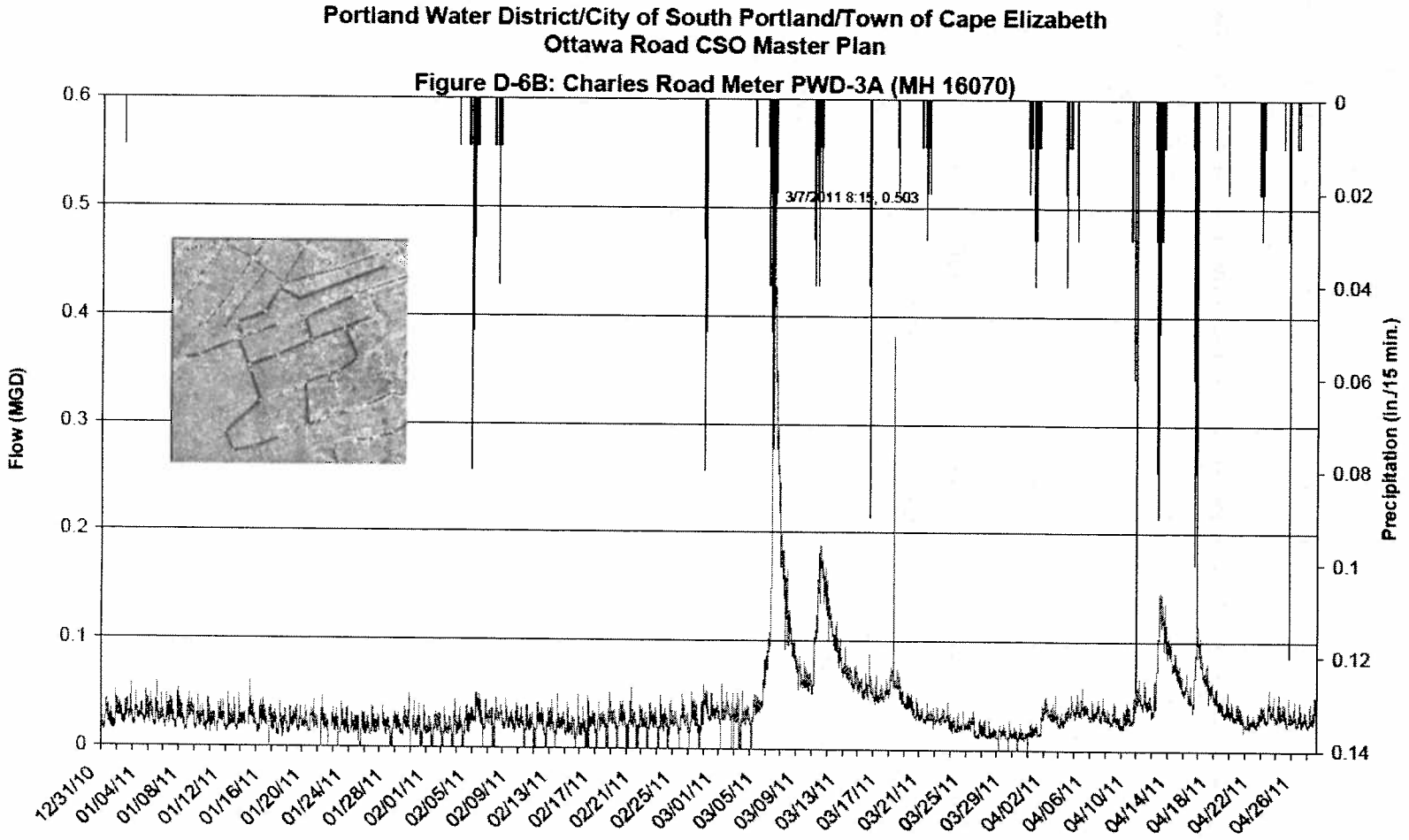
CSOs require Master Plans...

- Required by EPA and Maine DEP as part of 2009 discharge permit
- Establish a plan, with schedule and costs, to mitigate/eliminate CSO
- DEP required draft plan be submitted by December 31, 2011
- Town met milestone and plan is currently in review at Maine DEP

How was the plan developed?

- 22 month study – Feb '10 to Dec '11
- Extensive field work to find sources of infiltration and inflow
  - Flow metering
  - Smoke testing
  - Sewer TV inspection
  - Manhole inspections
  - Pump station flow testing
- Hydraulic modeling of Shore Rd. interceptor

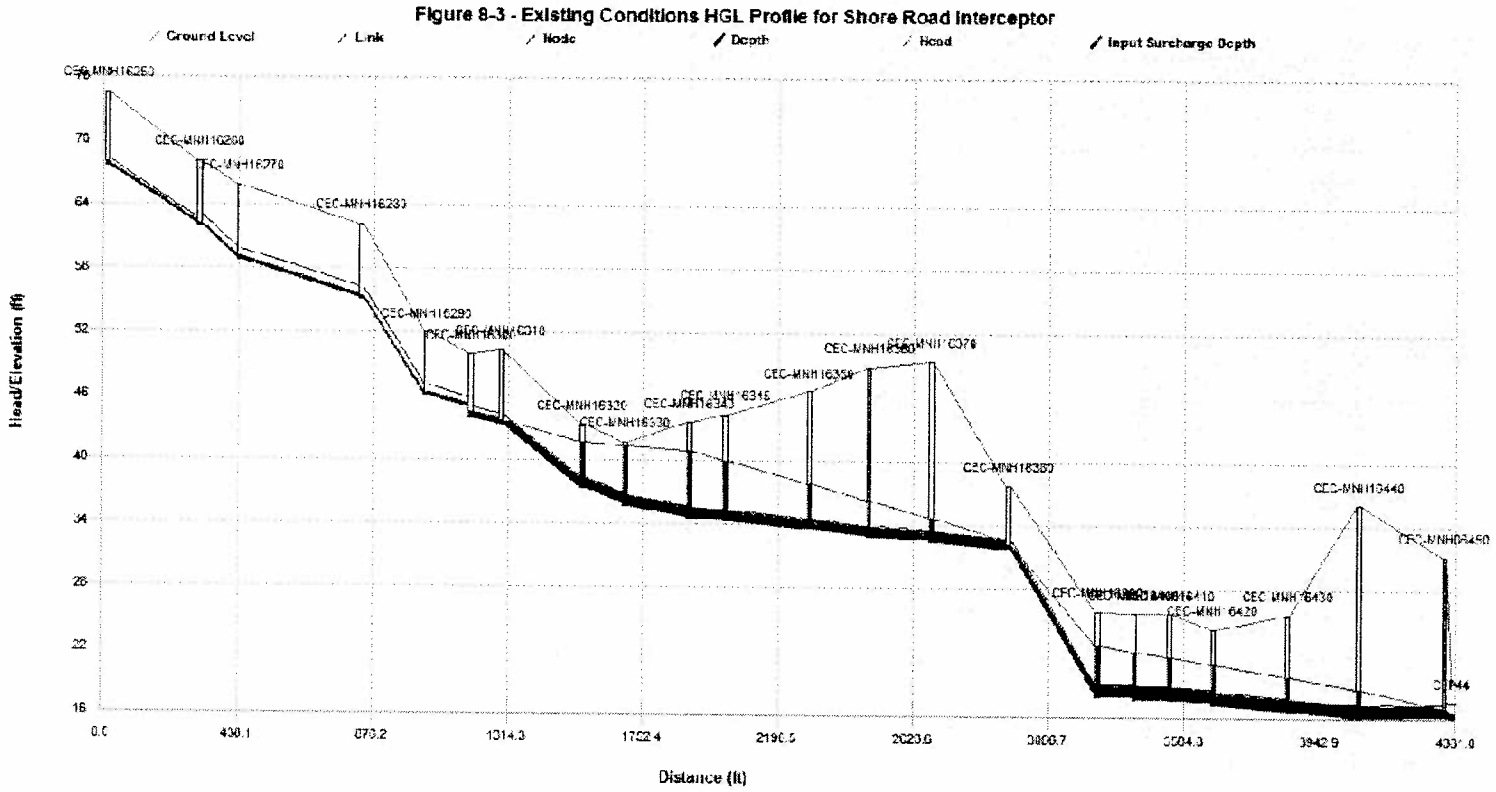
Typical Metering Results



Plan Development, cont'd

- Extensive evaluation of CSO flow data and sewer system data
- Development of a collection system model for Shore Rd interceptor
  - Interceptor currently overcapacity
  - Requires upgrade if P.S. capacity increased
  - Family Field Pump Station and downstream pipes also!

Model Schematic



Deciding how much to mitigate?

- Peak flow from CSO – 1,980 gals/min
- 3.3 million gals overflowed in one storm – football field covered in 9 feet of water
- Typically, plans target mitigating a certain amount of rain in 24-hours
- Given variability in CSO data for Cape, goal established to remove 1,100 gpm – 94% reduction in volumes overflowed!

Alternatives Evaluation

- Evaluated various options for different levels of mitigation
- Feasible improvements include:
  - I-I removal
  - Larger pipes and pump station
  - Off-line storage – U/G tanks
  - Primary treatment with disinfection
    - Swirl concentrators

Alternatives Evaluation, cont'd

- Each alternative evaluated for feasibility
  - Financial and technical, primarily
  - Social/political acceptance also considered by Town, City and PWD
- Very intensive effort, over 30 pages of report devoted to alternatives evaluation
- End result
  - Focus on infiltration and inflow removal
  - 5-year implementation plan

5-Year Plan

Year 1	Additional I-I investigation and design Phase 1 project	~$170,000
Year 2	Complete add'l I-I investigation and construct Phase 1 project	~$450,000
Year 3	Design Phase 2 project	~$230,000
Year 4	Construct Phase 2 project & pre-design pump station	~$730,000
Year 5	Complete Phase 2 project & update CSO plan	~$790,000

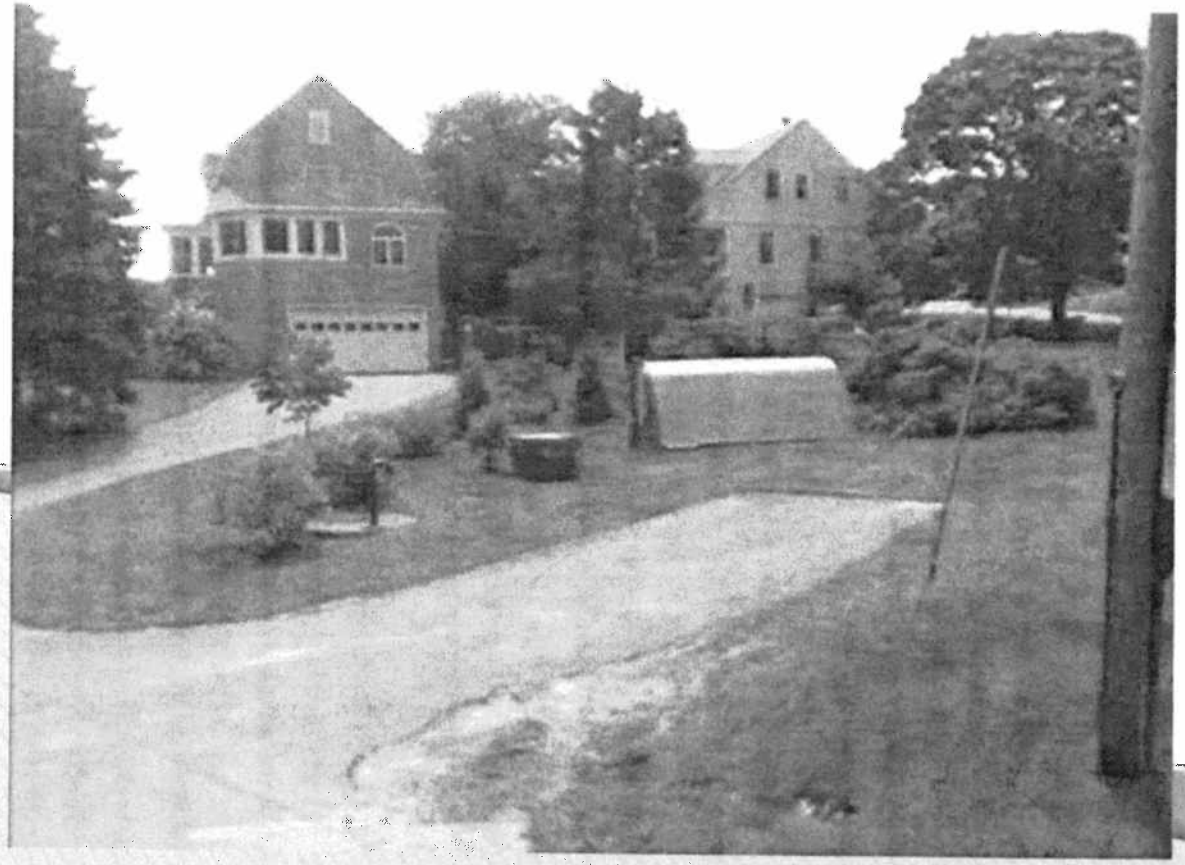
Estimated Cost of the Plan

- 5-year plan
  - $2.36 million, 2011 dollars
  - $2.56 million, future dollars
- Will result in sewer rate increase
- Mitigation to higher levels would have been 50% to 100% more costly

Next Steps

- Wait for DEP review and comment
- Respond to comments
- DEP and community approval
- 30-day public comment period
- Address public comments
- Final approval by DEP and community
- Start 5-year plan
- Mitigation to higher level in future?

Questions / Discussions



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