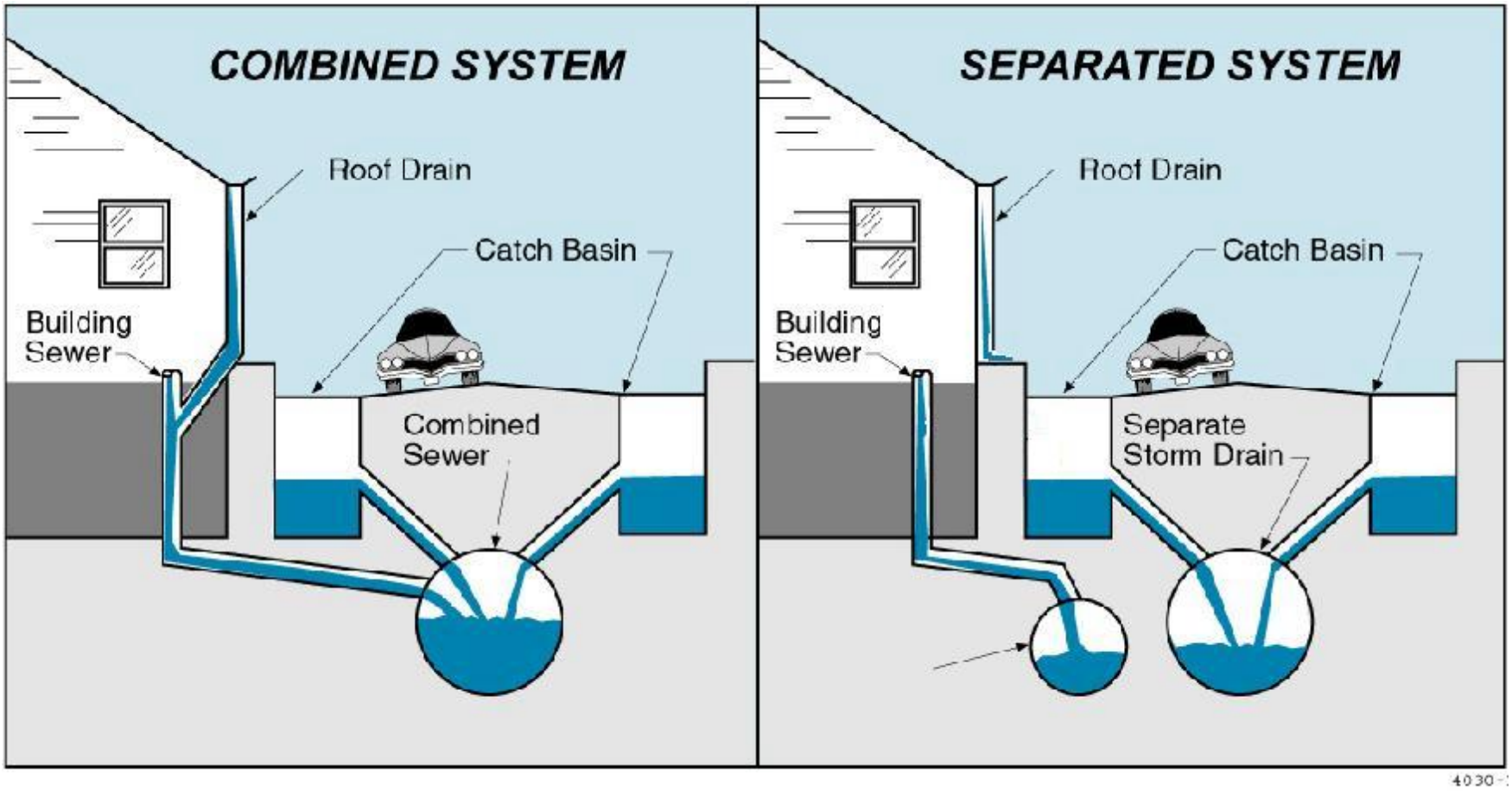
Massachusetts Water Resources Authority

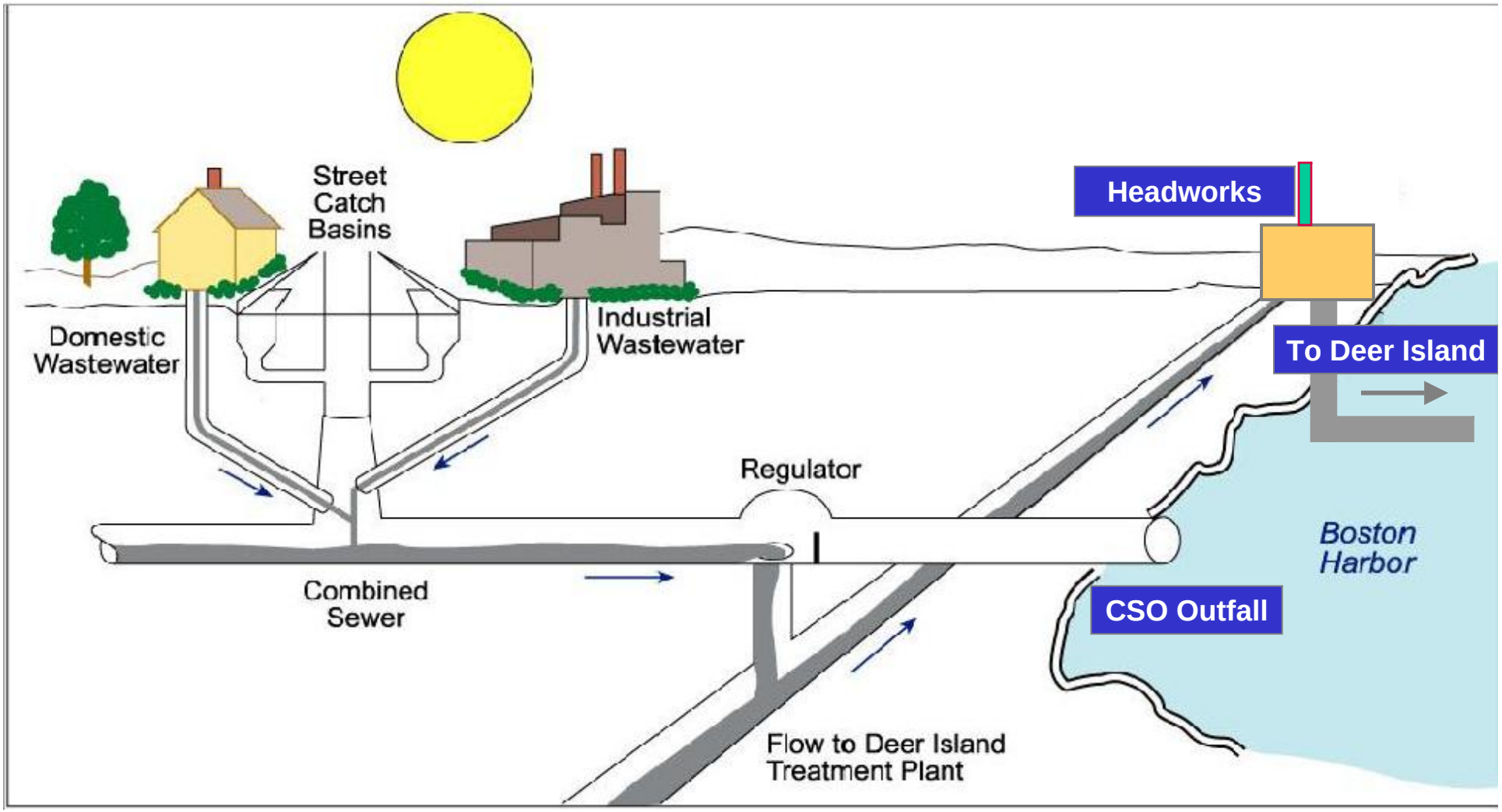
Long-Term CSO Control Plan for North Dorchester Bay and the Reserved Channel

March 8, 2004

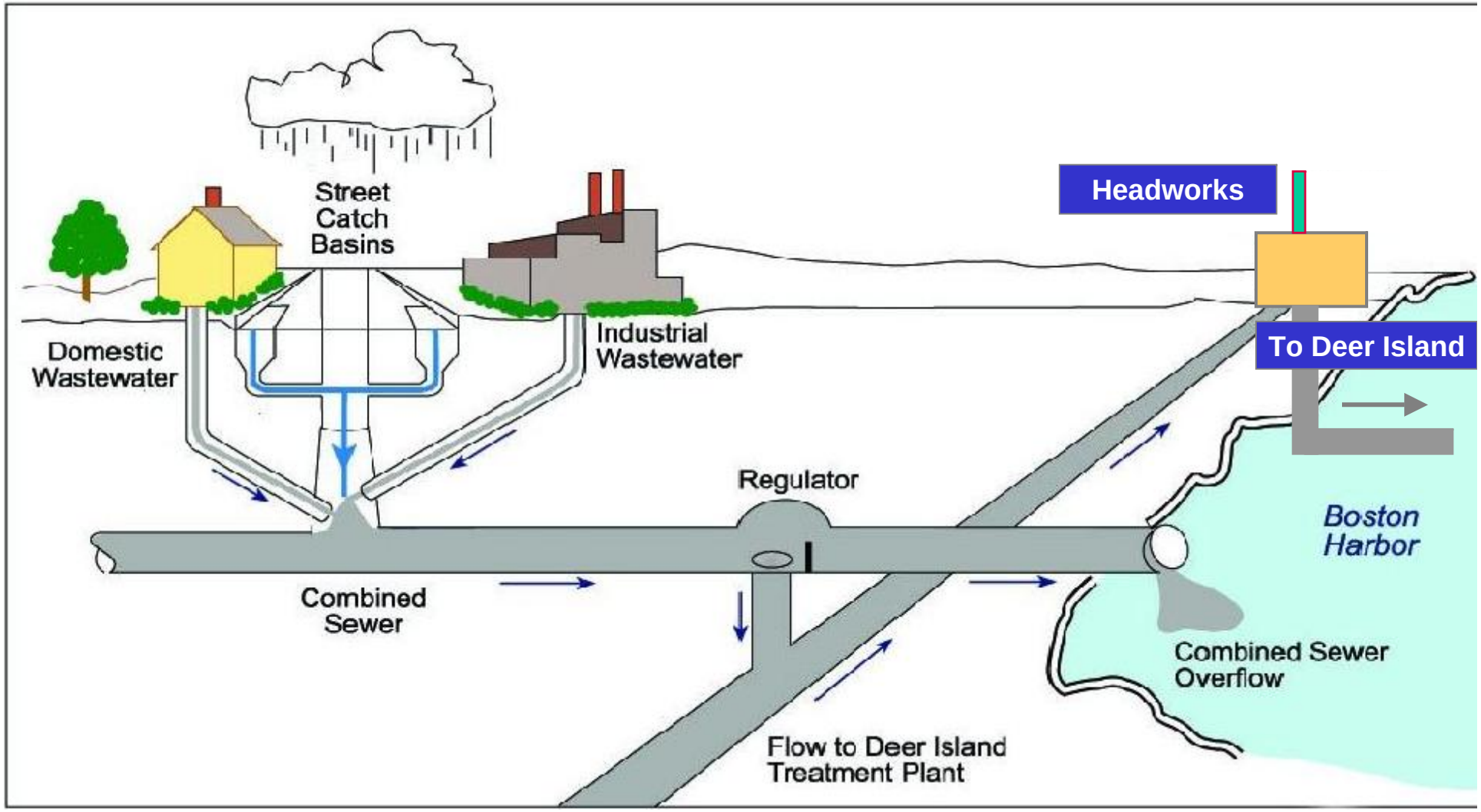
How Sewer Separation Works



How CSOs Work: Dry Weather



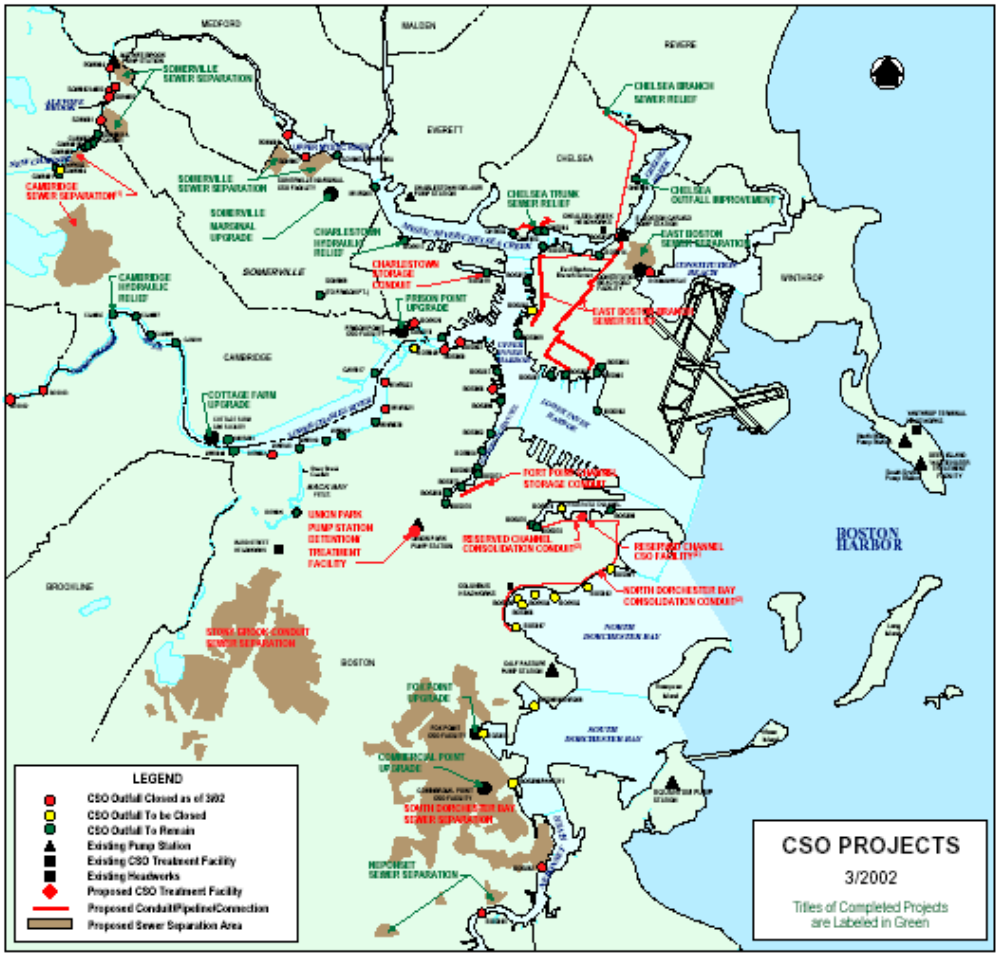
How CSOs Work: During Heavy Rains



MWRA's CSO Communities

- Boston, Cambridge, Chelsea and Somerville have combined sewer systems that connect to MWRA's sewer system

- Boston Harbor, the Charles, the Mystic and the Neponset Rivers are subject to overflows of combined stormwater and sewage during heavy rains



The CSO Problem

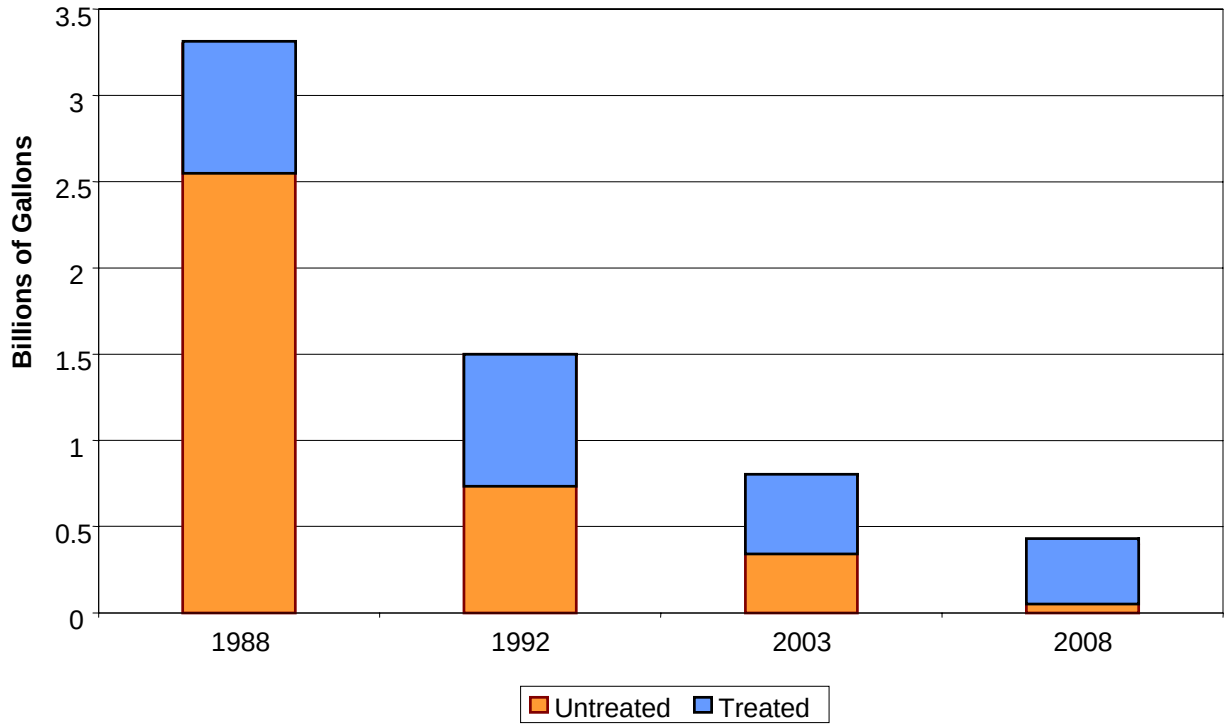
- In 1985, the service area had:
  - 84 combined sewer outfalls
  - Thousands of overflows per year
  - Over 3 billion gallons of CSO discharges

Status Of CSO Control Nation-Wide

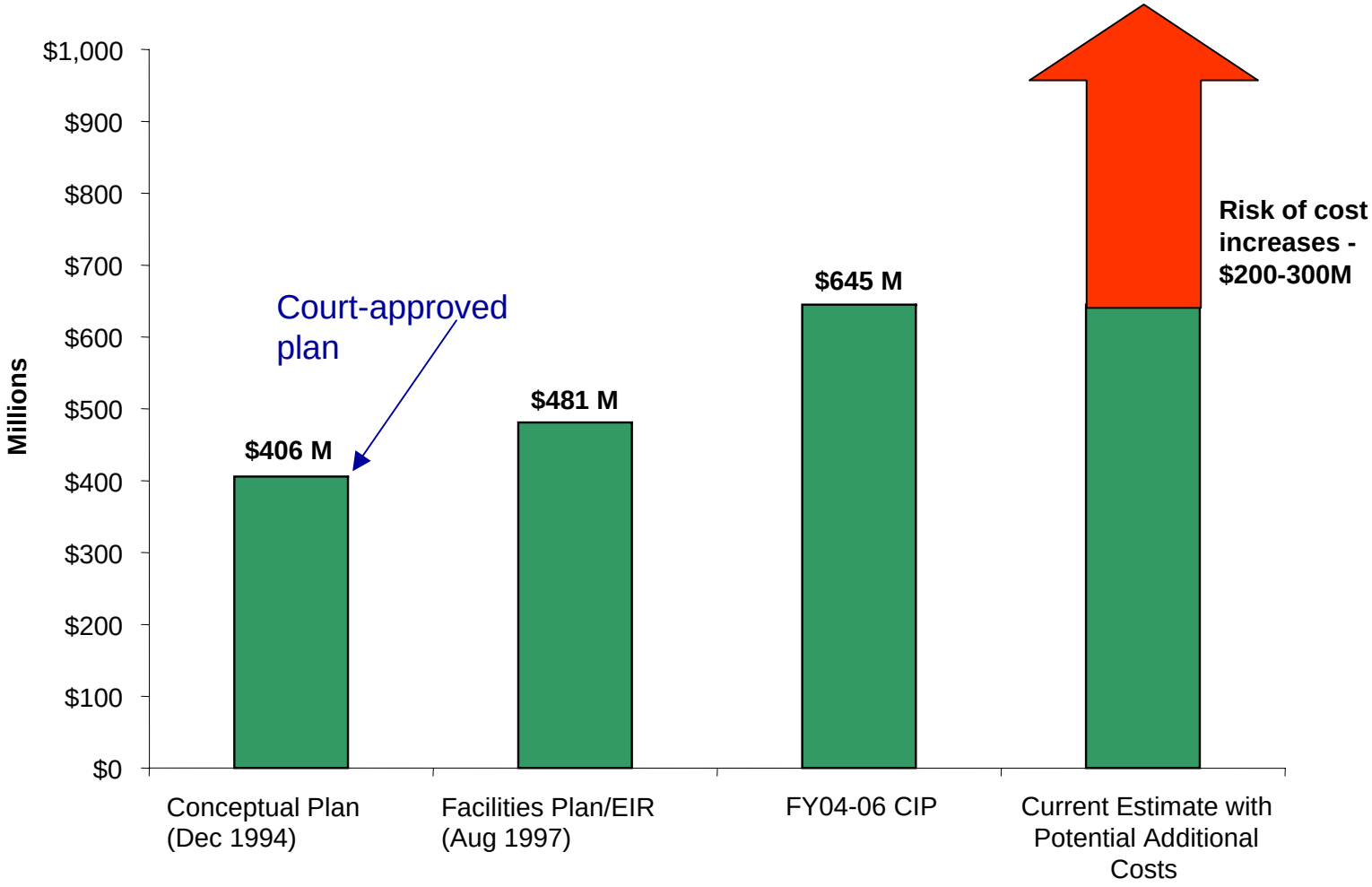
- 772 CSO communities
- 32% have submitted documentation on Nine Minimum Controls
  - ✓ **MWRA**
- 19% have approved long-term control plans
  - ✓ **MWRA**
- 17% have initiated implementation of long-term control plans or other CSO facility plans
  - ✓ **MWRA**

Annual CSO Volume Has Been Reduced Dramatically

- Annual CSO volumes have already been reduced by over 2.5 billion gallons
- By 2008, 95% of the remaining CSO flows will be treated



CSO Project Costs



Does not include overall system improvements (e.g. Deer Island)

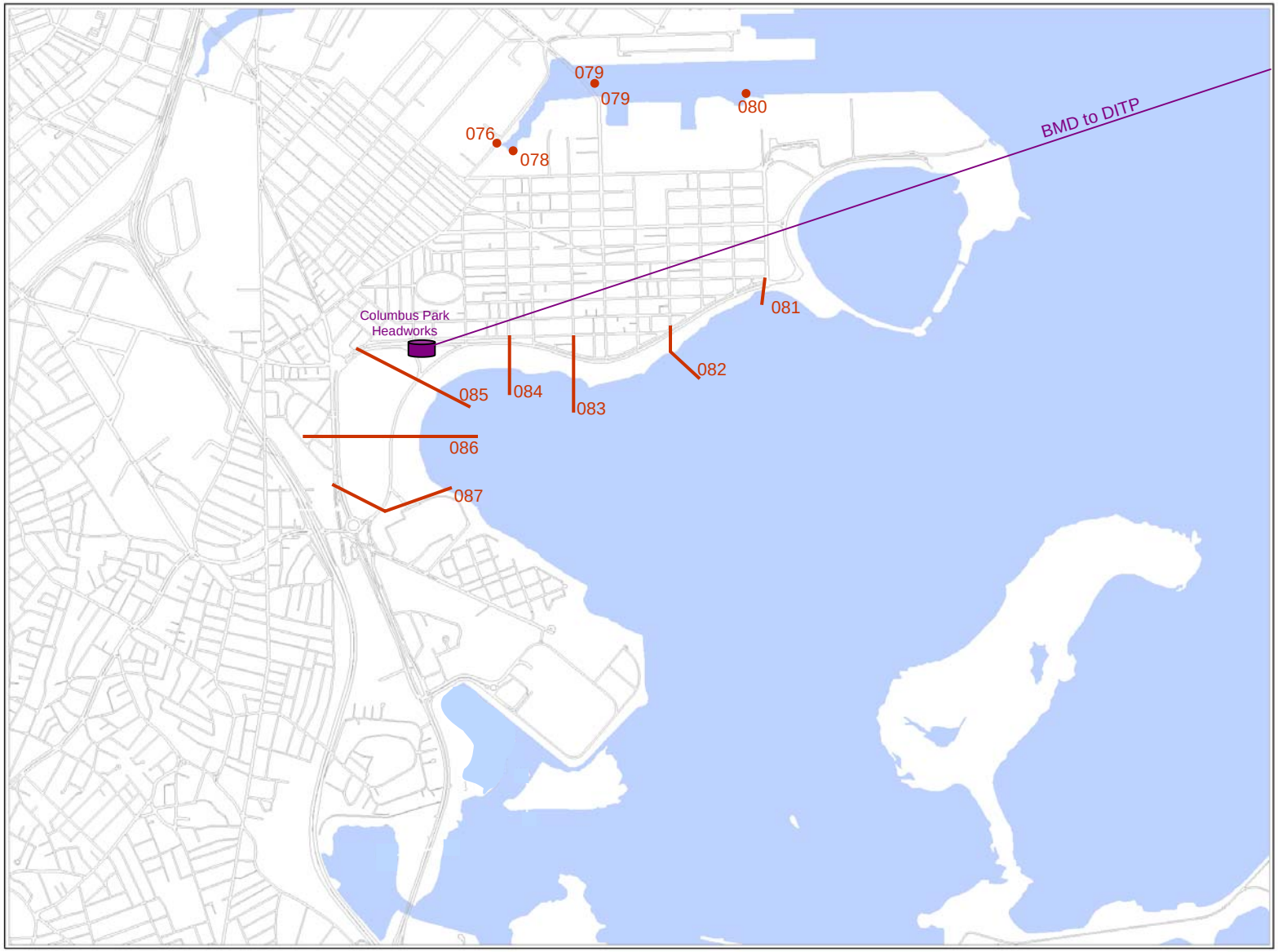
South Boston Beaches

South Boston Beaches

North Dorchester Bay: Existing Conditions

- Seven CSO outfalls discharge to North Dorchester Bay
- During a typical year, each outfall activates between one (BOS085) and 21 times (BOS081) per year and discharge a total of approximately 8 million gallons of CSO flow into North Dorchester Bay
- Discharges are caused both by constraints in the interceptor system and the capacity of the Columbus Park Headworks
- Rain events occur 108 times per year discharging approximately 144 million gallons of separate stormwater through these outfalls

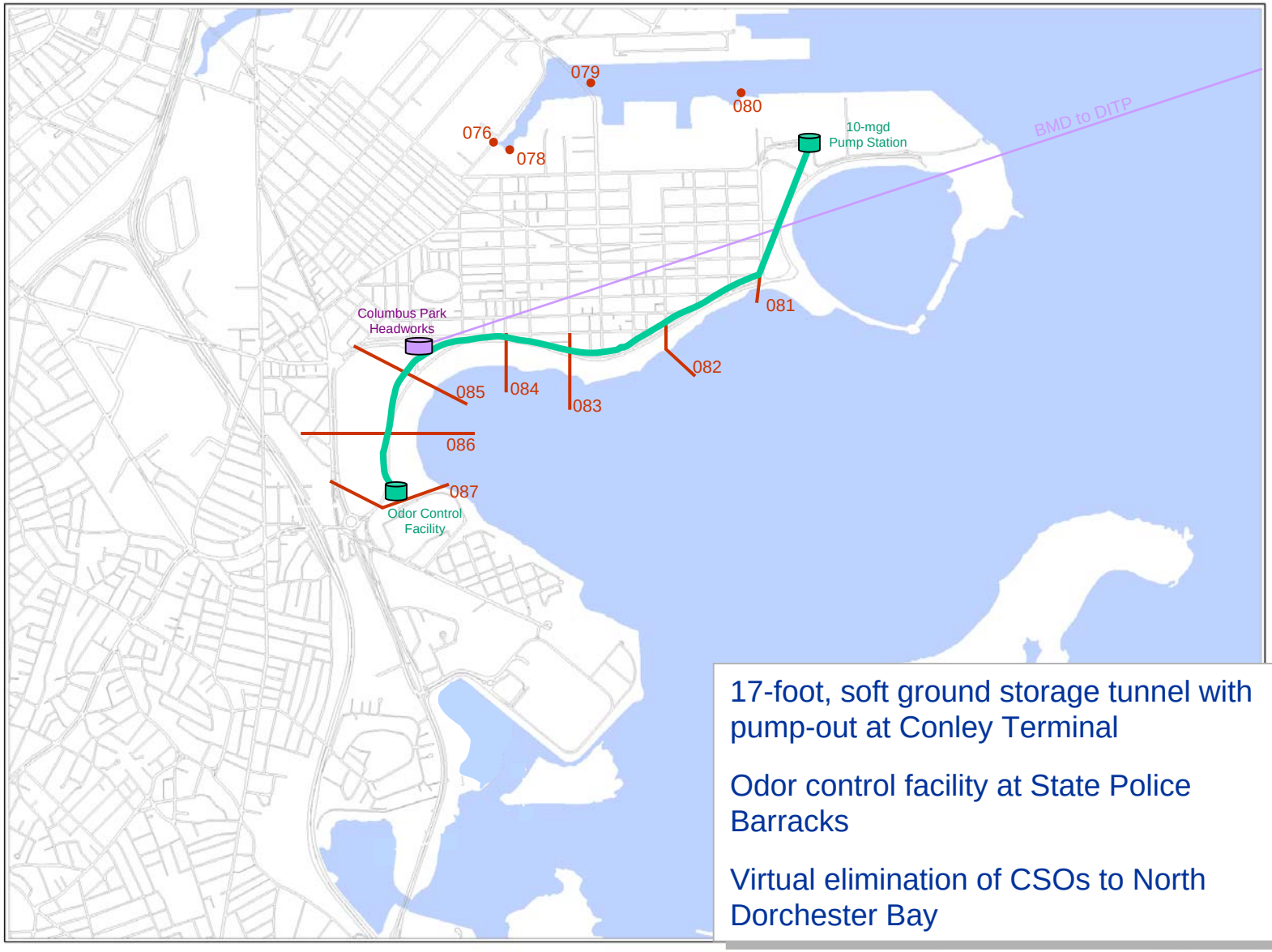
North Dorchester Bay/Reserved Channel: Existing System



CSO Control Plan Reassessment

- Reassessment initially examined 160 alternatives and identified 58 potential locations for siting CSO facilities
- North Dorchester Bay control alternatives were narrowed to interceptor relief and a storage tunnel, with sewer separation recommended for Reserved Channel
- Ultimately focused on four key objectives:
  - Increasing storage capacity to virtually eliminate CSO discharges without a massive pump station
  - Modifying design to accept some stormwater without compromising CSO control
  - Minimizing impacts during construction
  - Minimizing siting issues
- These objectives are met by a large diameter storage tunnel mined with a tunnel boring machine

17-Foot Soft Ground Tunnel: 25-Year CSO Control

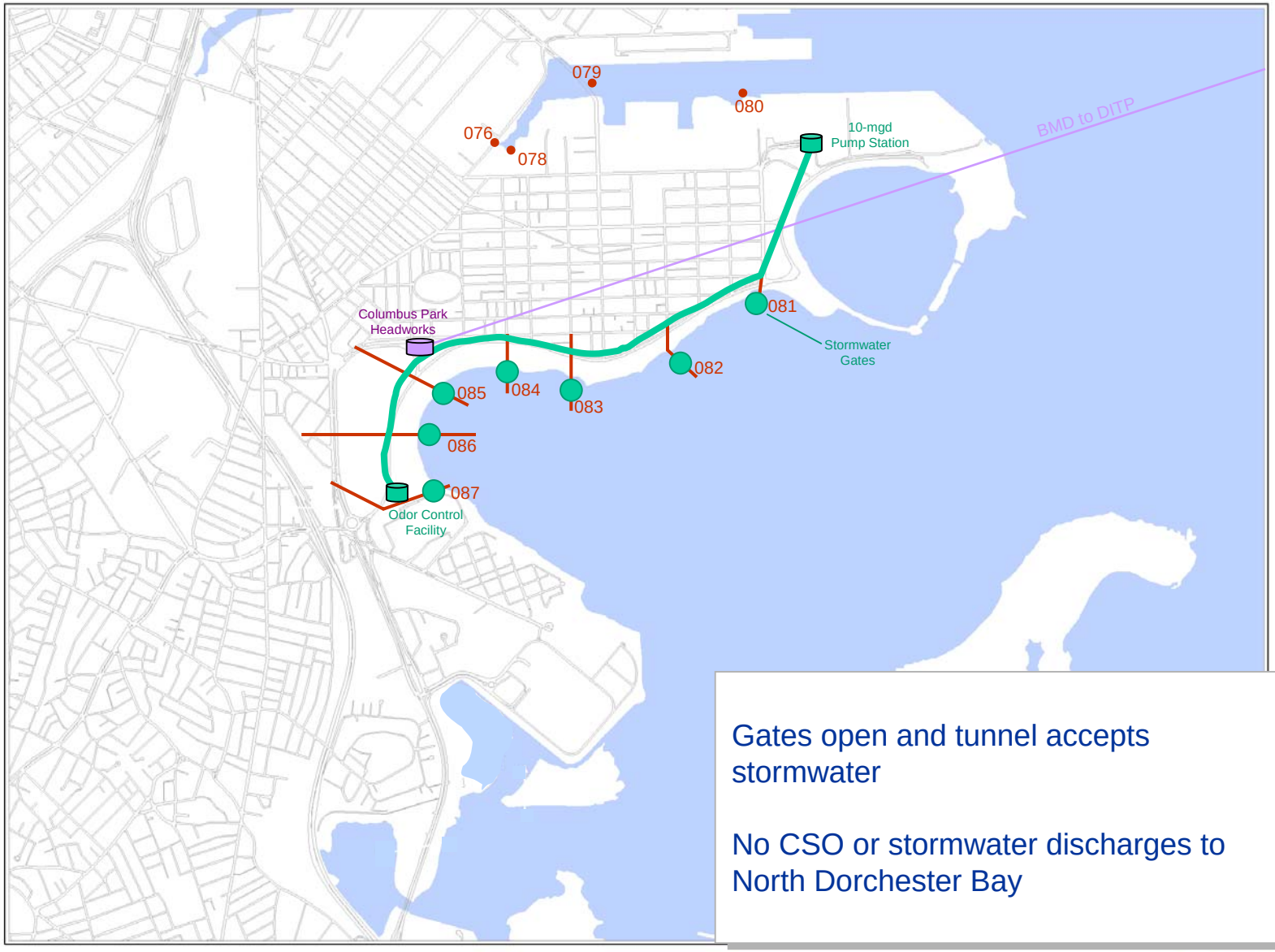


17-foot, soft ground storage tunnel with pump-out at Conley Terminal

Odor control facility at State Police Barracks

Virtual elimination of CSOs to North Dorchester Bay

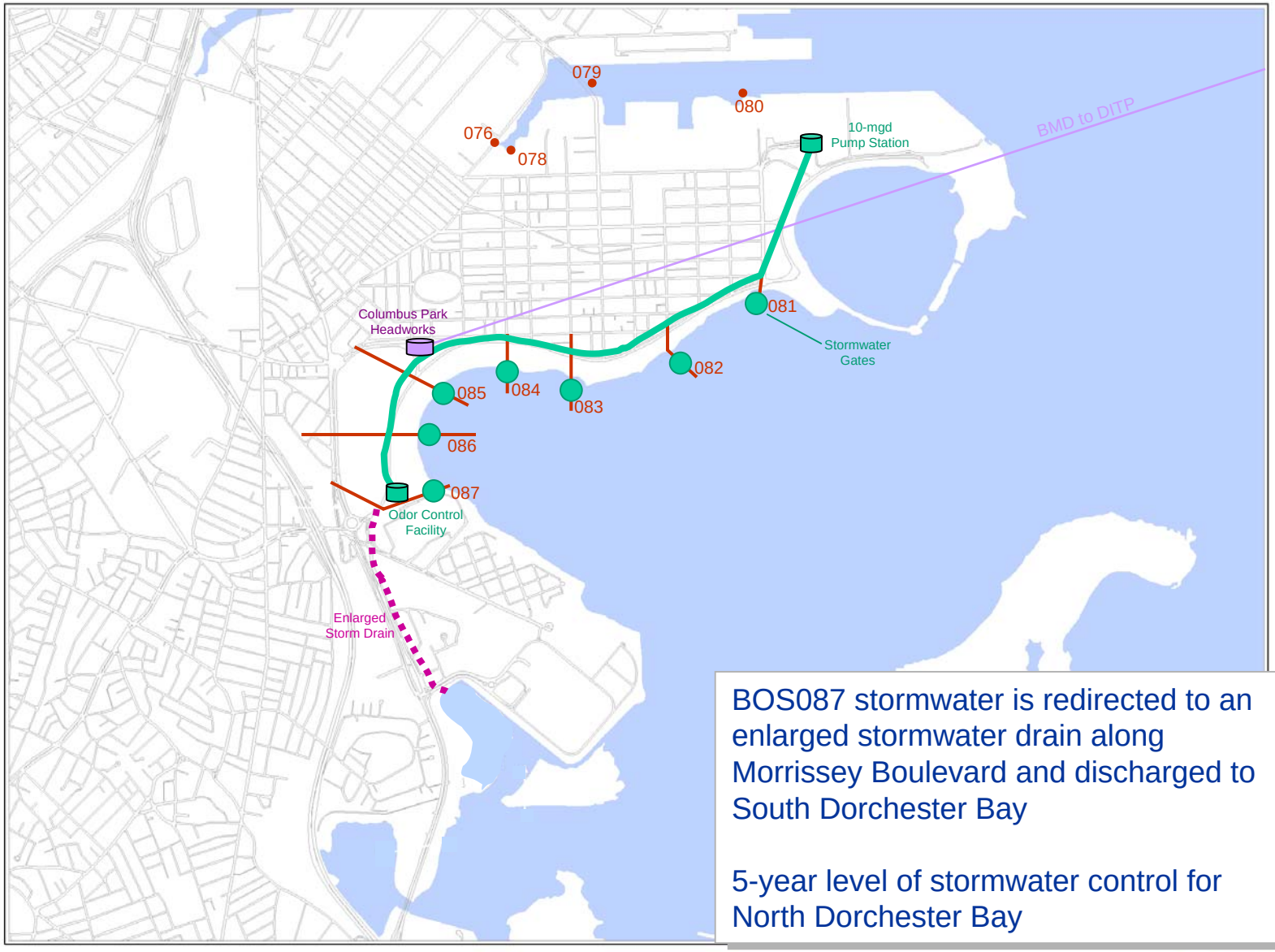
Operable Gates: 25-Year CSO Control and Up To 1-Year Stormwater Control



Gates open and tunnel accepts stormwater

No CSO or stormwater discharges to North Dorchester Bay

Enlarged Morrissey Boulevard Storm Drain: 25-Year CSO Control and Up To 5-Year Stormwater Control



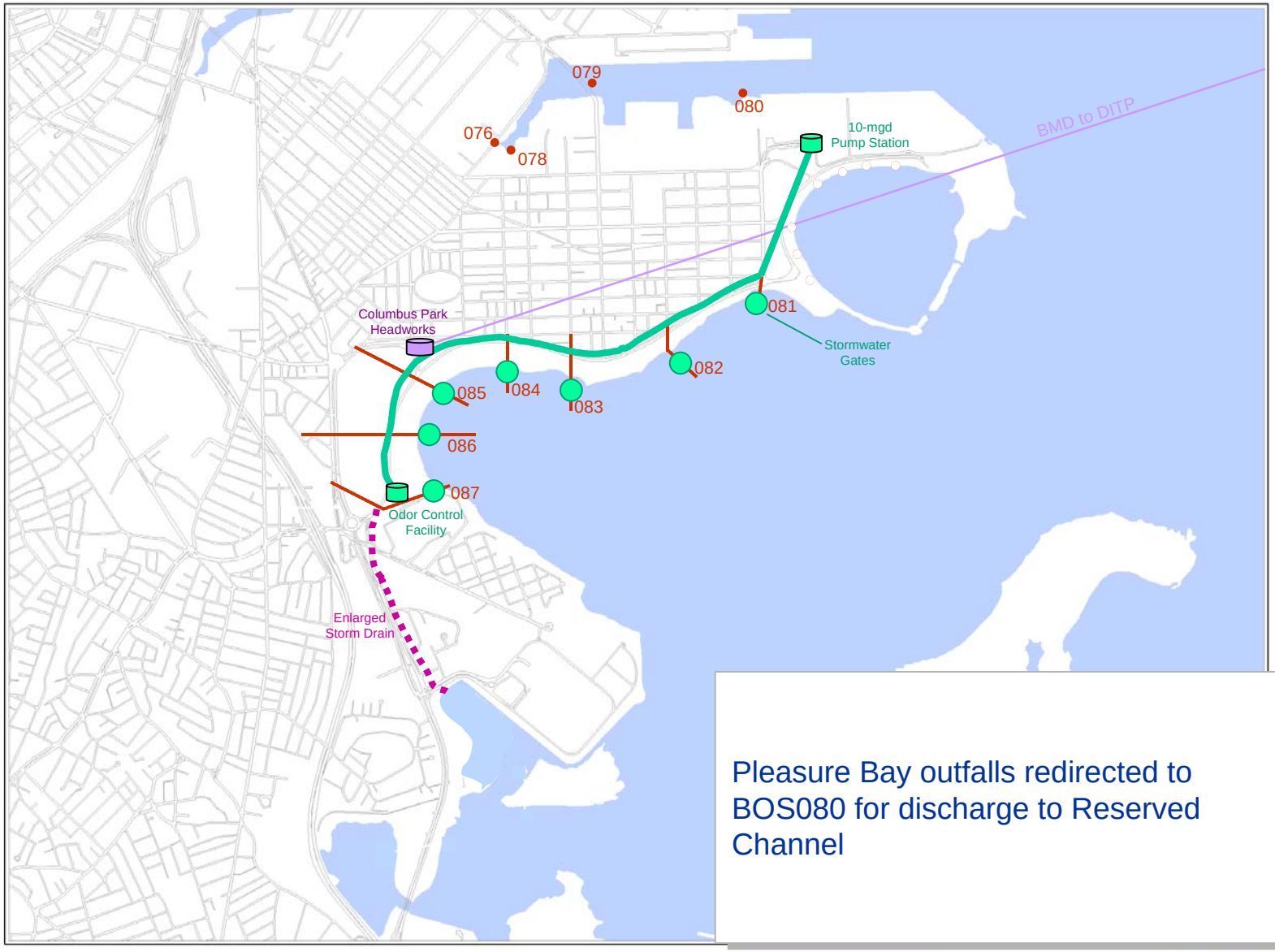
BOS087 stormwater is redirected to an enlarged stormwater drain along Morrissey Boulevard and discharged to South Dorchester Bay

5-year level of stormwater control for North Dorchester Bay

BOS087 Stormwater Tributary Area

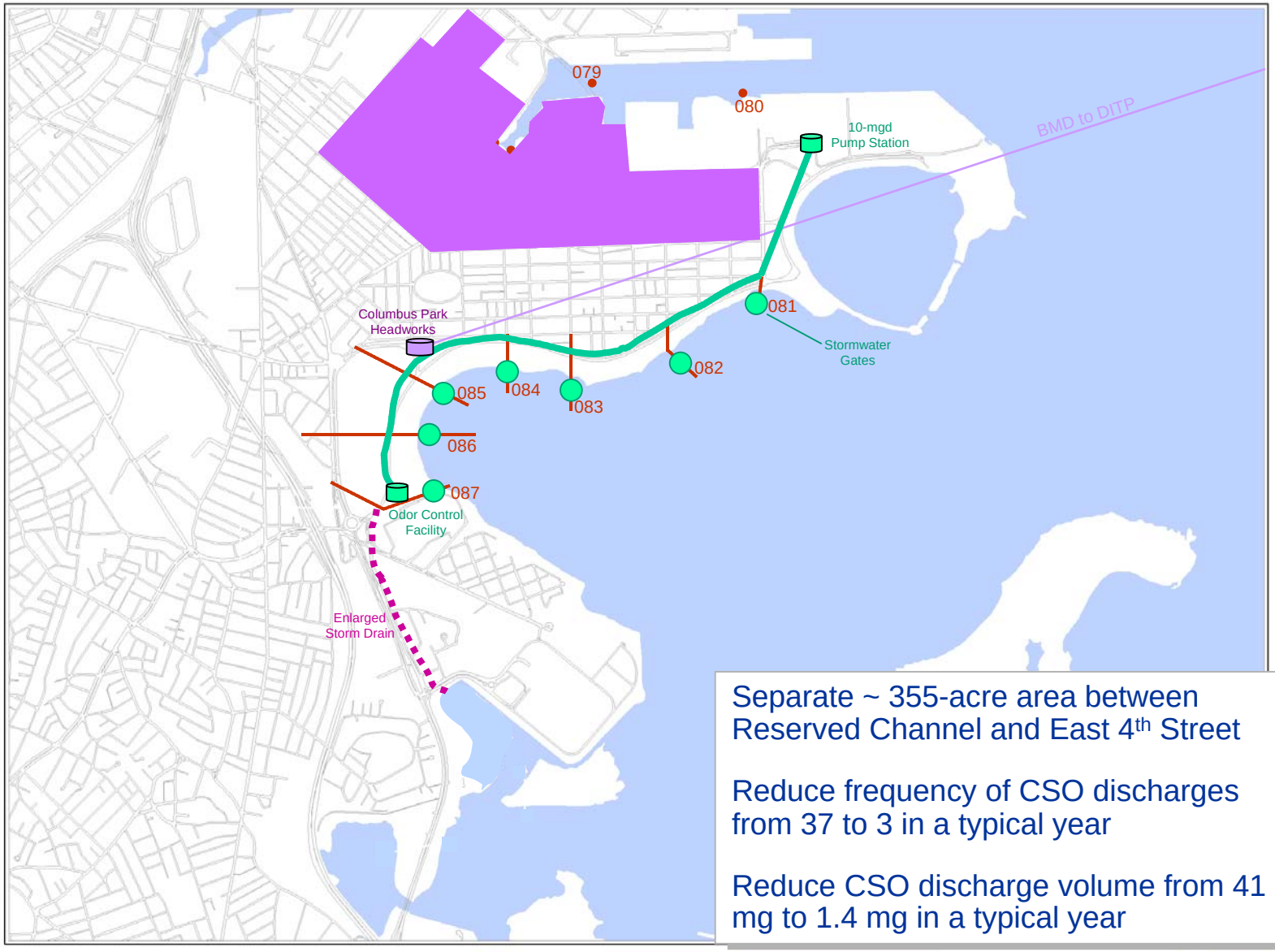
Pleasure Bay

Pleasure Bay Stormwater



Pleasure Bay outfalls redirected to BOS080 for discharge to Reserved Channel

Reserved Channel Sewer Separation



Separate ~ 355-acre area between Reserved Channel and East 4th Street

Reduce frequency of CSO discharges from 37 to 3 in a typical year

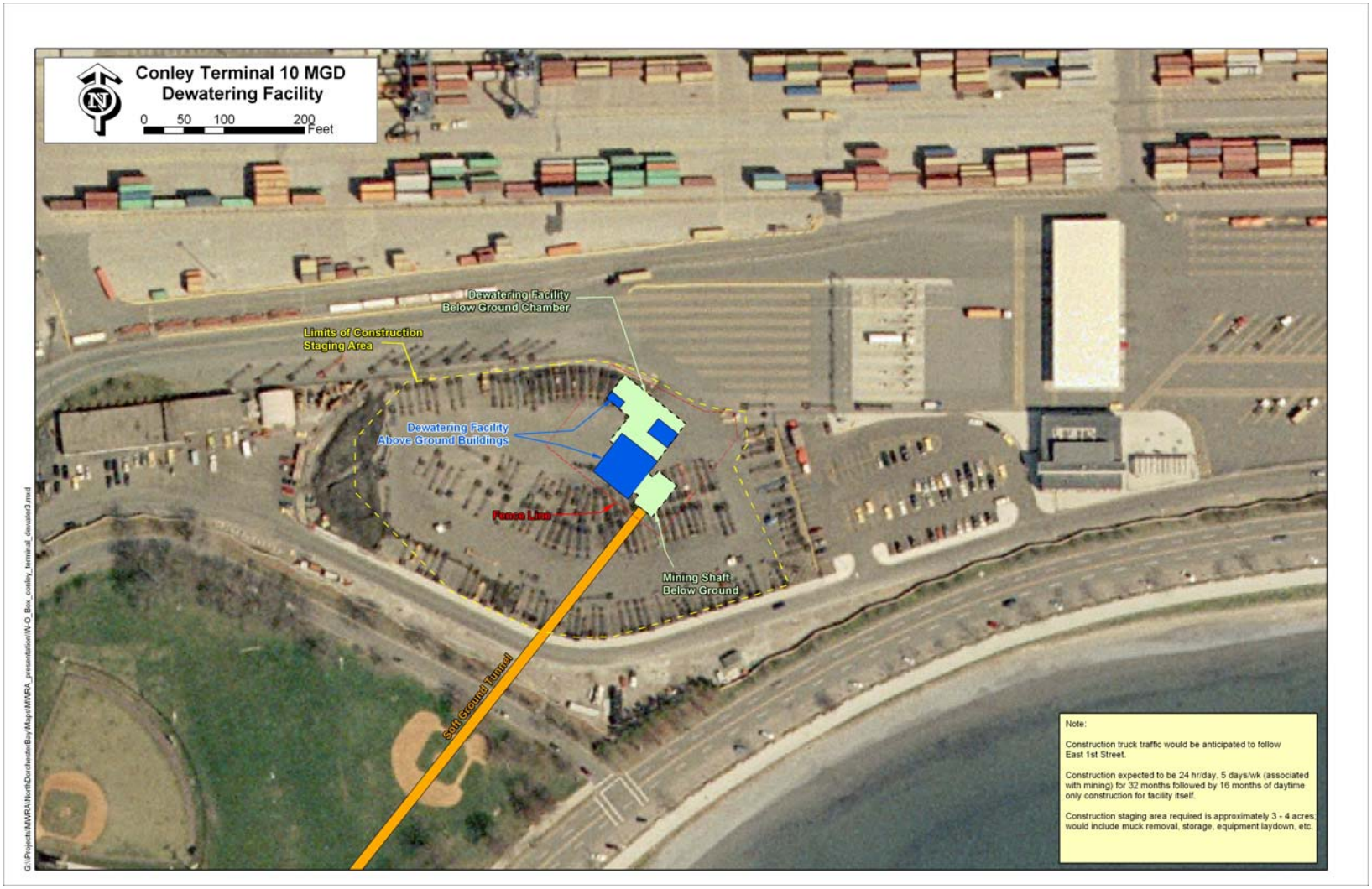
Reduce CSO discharge volume from 41 mg to 1.4 mg in a typical year

Performance Summary

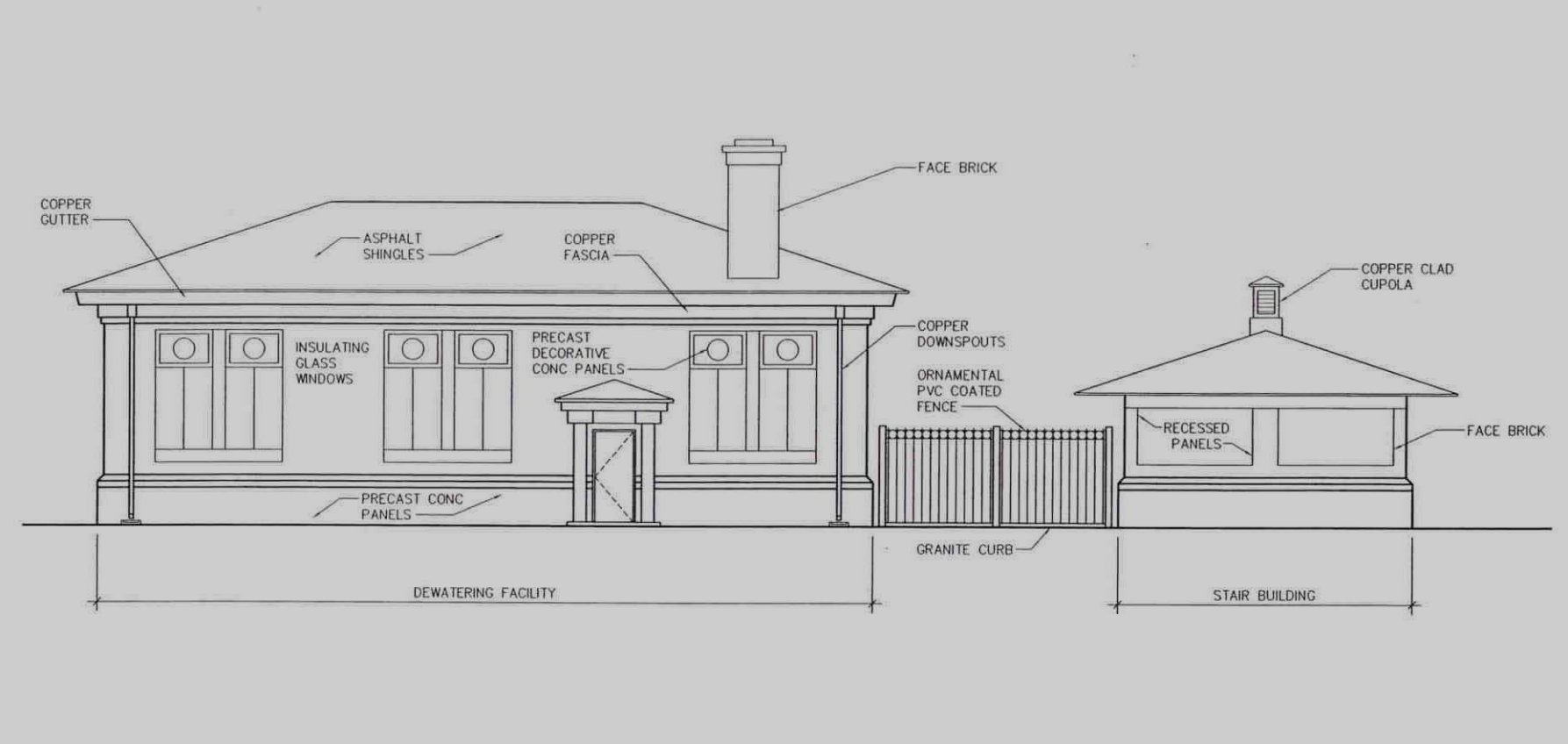
- North Dorchester Bay: 25-year level of CSO control and 5-year level of separate stormwater control
- Pleasure Bay: Eliminate stormwater discharges
- Reserved Channel: Reduce CSO discharges from 37 to 3 in a typical year
- South Dorchester Bay: Roughly 15% increase in stormwater discharges in a typical year

Recommended Plan

Pump Station Location



Pump Station Elevation View



3,360 square foot building, 56 ft. x 60 ft.

Comparison of Pump Station Sizes

- The proposed footprint is one-fifth the size of the previous plan
- The proposed building volume is one-tenth the size of the previous plan

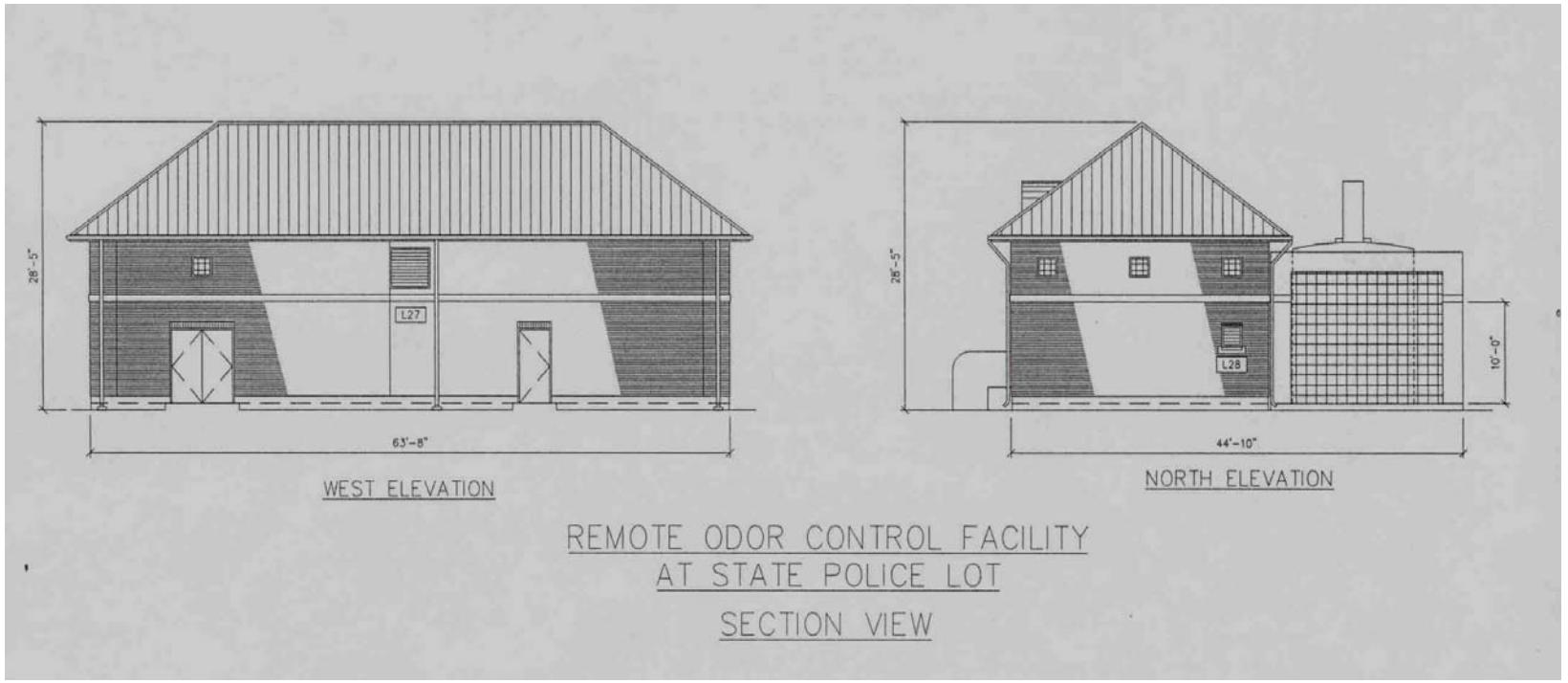
Pump Station Proximity to Residences

Proposed 20-Inch Dewatering Force Main

Farragut Street to East 5th Street to N Street

Odor Control Facility Location

Odor Control Facility Elevation View

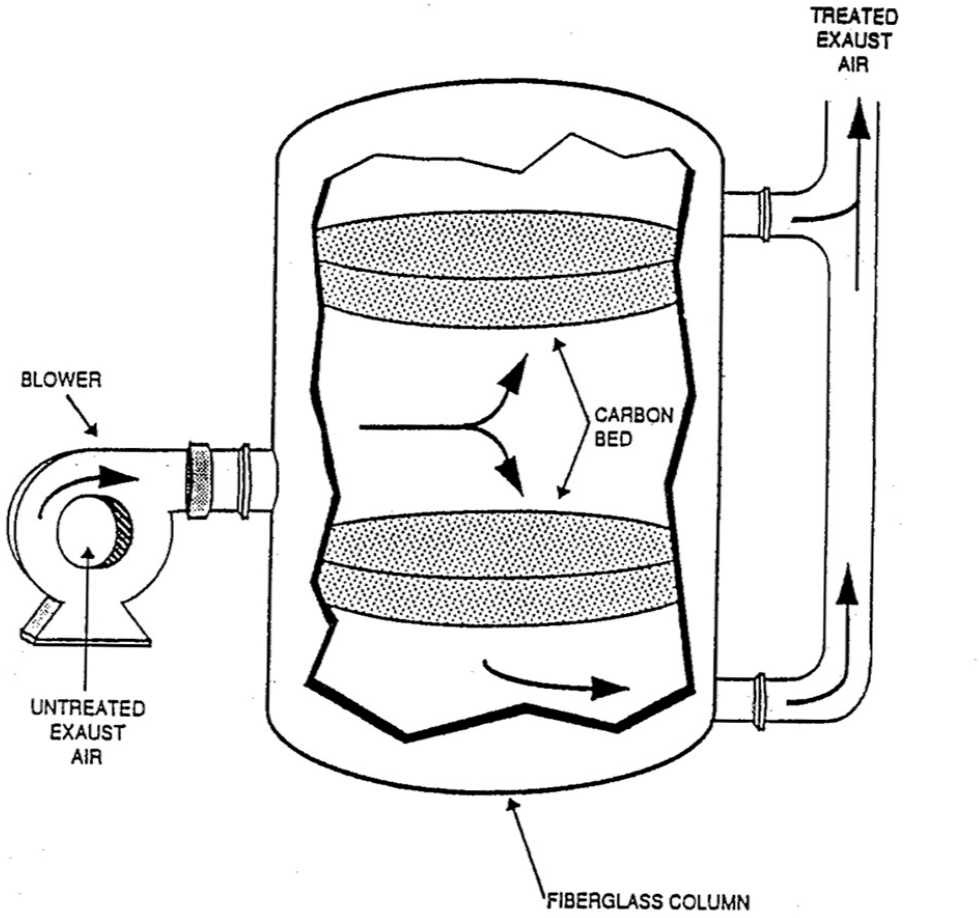


2,900 square foot building, 45 ft. x 64 ft.

Comparable MWRA Facility

How Odor Control Works

Activated Carbon



Tunnel Construction Methods

- Tunnel will be constructed using a soft-ground tunnel boring machine (TBM) designed and built specifically for this project
- Tunnel construction would proceed 24 hours per day
- As the tunnel is mined, a pre-cast, segmental concrete lining will be installed behind the TBM
- Construction of the tunnel will be performed from a mining shaft located near the entrance of Conley Terminal
- Upon completion, the TBM will be removed through a receiving shaft located behind the State Police barracks

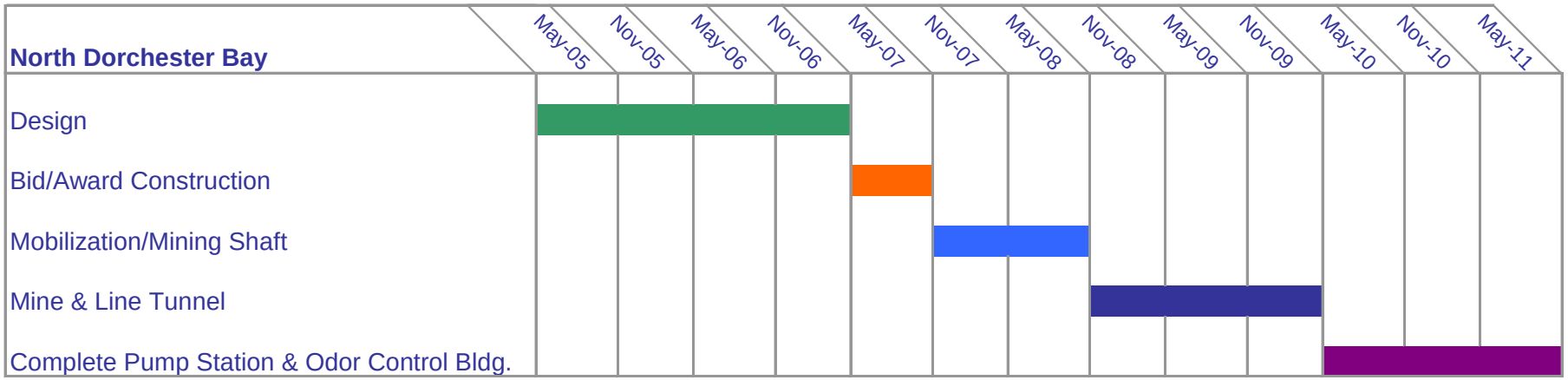
Dropshaft Locations

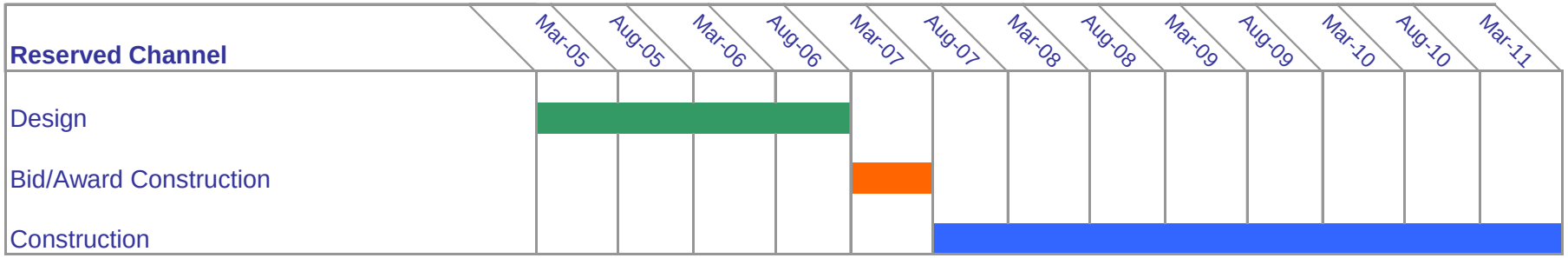
Example of Dropshaft at End of N Street

Example of Diversion Structure Construction at Dropshaft

Truck Route for Mining Operation and Pump Station Construction

Conceptual Construction Timeline

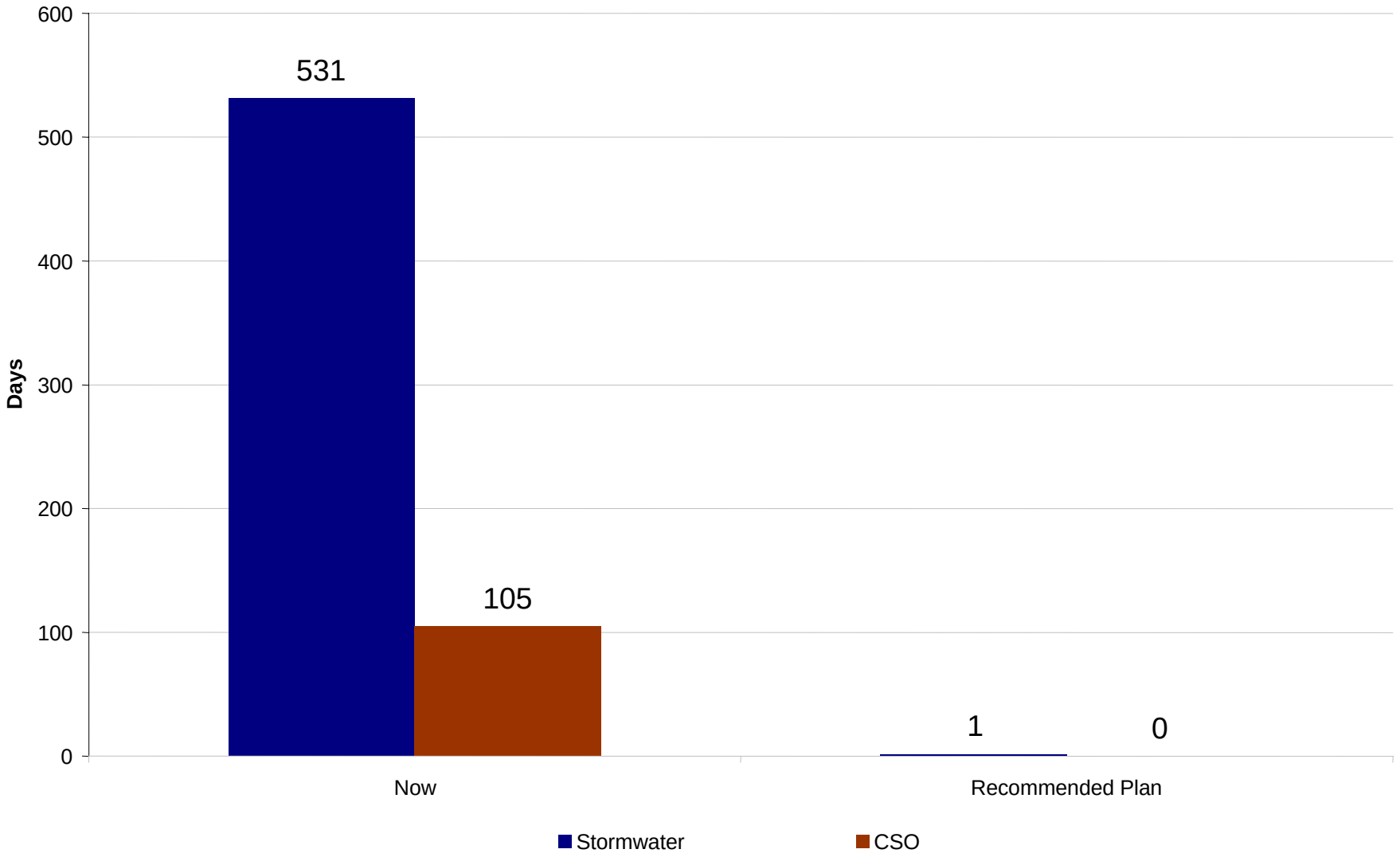




Projected Costs

	(in 2004 dollars)
Storage Tunnel	$186 million
Stormwater Gates	$2 million
Morrissey Boulevard Storm Drain	$18 million
Pleasure Bay Stormwater Diversion	$3 million
Reserved Channel sewer separation	$48 million
Estimated cost of recommended plan	$257 million
Total program cost with inflation but *not* site acquisition costs	$285 million

North Dorchester Bay CSO and Stormwater Discharges Over an Typical 5-Year Period



Conclusion

- Highest level of control of any Boston Harbor beaches
- Eliminate CSO discharges – no human waste on the beaches
- Reduce volume of stormwater discharges to North Dorchester Bay by over 96% and eliminate stormwater discharges to Pleasure Bay
- Reduce CSO discharges to Reserved Channel from 37 to 3 in a typical year
- No large permanent facilities
- Build tunnel with a tunnel boring machine to minimize construction impacts

Next Steps

- The MWRA Board of Directors will be asked to approve the submittal to MEPA by March 31, 2004 of Supplemental Facilities Plan and Environmental Impact Report
- A 60-day comment period will follow for public and agency review
- In the meantime, DEP and EPA conduct their review of the project's compliance with the Clean Water Act and national and state CSO policies
- MWRA will continue coordination with interested parties and hold an additional public meeting in May
- Once MEPA review is successfully completed, MWRA will renegotiate design and construction schedules with Court Parties for incorporation into Federal Court Order