Scope of Existing Projects

1. **Town Neck Beach Nourishment**
   - Ongoing support for regulatory required monitoring (e.g., topographic profiles and eelgrass surveys)

2. **Sand Bypassing Program – “Scusset Borrow Site”**
   - Permitting of a sustainable source of beach nourishment sand

3. **Evaluation of Old Harbor for Dredging**
   - Feasibility study for using shoaled sand as nourishment source

4. **USACE Section 111 Study**
   - Technical determination of best approach for damage mitigation

5. **Climate Change and Coastal Vulnerability Assessment**
   - Identification of vulnerable municipal resources and development of cost effective adaptation measures
1. Town Neck Beach Nourishment: Overview

- Allows placement of 388,000 cubic yards of beach compatible sand
- Nourished in Jan. 2016 with approx. 110,000 c.y. sand from C.C. Canal
- Biannual (spring and fall) topographic survey of beach profiles
- Annual (Aug-Sept) eelgrass habitat mapping
2. Sand Bypassing Program – Scope and Progress

Data collection, analysis, and form preparation to permit a large sustainable source of sand that can be used to nourish Town Neck Beach

- Data collection, analysis, form preparations are complete
- Permits received include Order of Conditions, MassDEP Combined Chapter 91 and 401 Water Quality Certificate, MA-CZM Federal Consistency Certification;
- Permits outstanding: Federal – USACE Individual Permit, anticipated in January/February 2019
2. Sand Bypassing Program – Scope and Progress

- 8 Alternatives Evaluated
- Selected will provide >224,000cy
2. Sand Bypassing Program – Scope and Progress
2. Sand Bypassing Program – Plans Submitted
3. Old Harbor Dredging Evaluation: Scope and Progress

Phase I: Site Characterization
- Field Data Collection (complete)
  - Sediment Cores
  - Bathymetry/Topography
  - Shellfish/Eelgrass Surveys

Phase II: Water Quality Assessment
- Hydraulic Data Collection (complete)
- Coastal Modeling (underway)
- Preliminary Meeting with Regulators

Phase III: Permitting (to be determined)
3. Old Harbor Dredging Evaluation: Phase II Data

Tide and Current Data Collection
- 4 tide (water level and salinity) sites
- 2 current collection sites
3. Old Harbor Dredging Evaluation: Phase II Modeling

- Model calibration complete, validation underway
4. Section 111 Study: Scope of Work and Progress

EXISTING CONDITIONS ASSESSMENT AND PROBLEM QUANTIFICATION
- Task 1 – Develop Sediment Budget (underway)
- Task 2 – Projection of Conditions with No Project (underway)
- Task 3 – Coastal Modeling (underway)

ALTERNATIVE CONSIDERATION
- Task 4 – Alternative Development (underway)
- Task 5 – Alternative Simulation and Assessment (scheduled for Jan 2019)
- Task 6 – Climate Change Considerations (scheduled for Jan 2019)

GENERAL
- Task 7 – Project Management/Meetings (underway)
- Task 8 – Reporting and Deliverables (DUE May 2019)
4. Section 111 Study: Existing Conditions Assessment

Definition of the Alongshore Impact of Canal

Sandwich Shoreline Change 1994 to 2018

Rates of Change (ft/yr)
- -7.14 to -4.00
- -3.99 to -2.00
- -1.99 to 0.00
- 0.01 to 3.12

Rates of change (in feet per year) from 1994 to 2018. Negative numbers indicate an overall trend towards erosion. Positive numbers indicate an overall trend towards accretion.
4. Section 111 Study: Existing Conditions Assessment

Sandwich Shoreline Change

Alongshore Impact Zone

Town Neck Beach

Springhill Beach

Old Sandwich Harbor

1952-LIN-2018 (w/ '94)

1994-LIN-2018 (w/ '94)

Rate (ft/y)

Cape Cod Canal

1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31

10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160

Tract Number

Alongshore Impact Zone
4. Section 111 Study: Modeling – Wave Transformations

- Modeling grid extended from one developed for Scusset Borrow Site Project

- Waves dominate sediment transport in region; all scenarios (e.g., directions, water levels, storms) modeled.
4. Section 111 Study: Potential Alternatives

**Quantitative**
- Beach Nourishment with Recurring Maintenance
  - Potential variations with grain sizes
- South Jetty Lengthening
- North Jetty Modifications
- Groin/Old Harbor Jetty Modifications
  - Removal and Re-use
  - Additional Groins
  - Groin Notching
  - Added Jetties
- Dune Core Supplements – Coir Logs/Envelopes

**Qualitative / Semi-Quantitative**
- Revetment / Seawall
- Alternative Technology
- Canal Jetty Removal
- By-passing Plant (Fixed or Mobile)

PERFORMANCE EVALUATED OVER A 50-YEAR PERIOD
5. CV Assessment and Adaptation Planning

Grant Awarded from MA-CZM in June 2018

Primary Objectives:

• Provide data on likely future flooding scenarios
• Identify potential flooding impacts to municipally-owned infrastructure using Massachusetts Coast Flood Risk Model (MC-FRM)
• Identify potential flooding impacts to natural resources
• Identify potential adaptation strategies to reduce risk
• Prioritize investments in adaptation strategies
• Produce high-quality maps/graphics
• Public outreach and education
5. CV Assessment and Adaptation Planning

Phase I: (Underway)
- SLR / Storm Surge Projections
- Scenario Development
- Gather asset data

Phase II: (Spring 2019)
- Map Inundation Model Results
- Vulnerability/ Risk Assessment

Phase III: (Summer 2019)
- Adaptation Strategies
- Public Outreach

Priority-planning areas

Probability of occurrence
Summary

- **Town Neck** – ongoing regulatory surveys, potential for sand from Bourne.
- **Sand Bypassing Program** – awaiting final permit from USACE, anticipated by end of January 2019.
- **Old Harbor Dredging Evaluation** – ending Phase II (modeling), decision to proceed (or not) to Phase III in Jan/Feb. 2019.
- **Section 111 Study** – Technical work by WHG underway; USACE report due May 2019.
- **Coastal Vulnerability Assessment** – project underway, anticipated completion in June 2019
- **The Town of Sandwich is extremely proactive and progressive in addressing the resiliency of its coastal resources and infrastructure**
Questions and Discussion

Oct. 24, 2017

Mar. 5, 2018

Storm Conditions:
Example 10-yr ReturnPeriod Storm
Oct. 24, 2017 Mar. 5, 2018