10. Environmental Impact Analysis

The nitrogen management strategies outlined in the Great Pond TWMP are located within the Planning Area of the Town of Falmouth's Comprehensive Wastewater Management Planning Report (CWMP). An Environmental Impact Analysis was conducted for the 'Comprehensive Wastewater Management Plan and Final Environmental Impact Report, and Targeted Watershed Management Plan' prepared by GHD and dated September 2013 (see Appendix 10-1). Chapter 7 of the 2013 CWMP outlines existing conditions in the Town.

This section provides an analysis of effects for infrastructure projects outlined in the Great Pond TWMP for the Recommended Plan and No Action Alternative. Effects are analyzed in accordance with the criteria outlined in 301 CMR 11.00. Note that potential environmental impacts of treated effluent discharge at each of the potential discharge sites is evaluated in detail in Section 4.4, and that Section 7.3 describes mitigation measures identified to limit negative environmental impacts and/or create positive environmental impacts during development and operation of the Recommended Plan.

10.1 Topography, Geology, and Soils

10.1.1. Recommended Plan

Sewer expansion to TASA, as outlined in the Recommended Plan, requires construction and expansion of the Town's existing wastewater collection system. The majority of this construction is anticipated to occur beneath the roadway, which is already considered disturbed.

Construction of the TASA lift stations will modify the topography and soils to install a wet well and provide a level surface for the lift station building. The extent of impact to topography and soils will be limited to the lift station sites.

The conceptual layout for the TASA collection system includes crossing the Coonamessett River through either an aerial crossing (collection system piping secured to the existing bridge crossing the river) or by directional drilling underneath the river. It is anticipated that open cut trenching will not be used for this installation, in order to minimize disturbance to soils and sensitive areas.

Construction of the expansion to beds 14 & 15 is anticipated to modify the topography of less than 5 acres of land, in order to provide surface area for infiltration of treated wastewater. Soils unsuitable for infiltration will be reused onsite or removed as necessary. The landscape level impact of these modifications will be minimal due to abundance of similar topographical and soil features in the surrounding areas.

10.1.2. No Action Alternative

The No Action Alternative is not anticipated to increase the level of soil disturbance in the Planning Area.

10.2 Surface and Groundwater Hydrology and Quality

10.2.1. Recommended Plan

The Recommended Plan is intended to benefit the major surface water body in the Great Pond watershed, by reducing nitrogen migration through groundwater to Great Pond from septic systems.

Wastewater collection and treatment at the Blacksmith Shop Road WWTF will produce a higher quality effluent than achievable with on-site septic systems and will improve the water quality by reducing the nitrogen discharge to Great Pond, as required by the nitrogen TMDLs. Wastewater collection and a high level of treatment will have a positive impact on the health of Great Pond. The Recommended Plan will improve the groundwater quality, especially in areas

of dense development of the Teaticket Acapesket Study Area, because the groundwater will no longer be impacted by the nutrients and overall recharge from on-site septic systems.

The Recommended Plan involves recharge of an additional up to 500,000 gallons per day of tertiary-treated wastewater at Open Sand Beds 14 & 15 (current total permitted discharge from the WWTF is 710,000 gallons per day, of which 260,000 gpd is to Open Sand Beds 14 &15). The potential impacts of discharge at this site are evaluated in detail in Section 4.4.2.1. Initial groundwater modeling simulations indicate that up to 0.76 mgd (average annual flow) can be recharged at Open Sand Beds 14 & 15 without treated effluent migration via groundwater from Open Sand Beds 14 & 15 to West Falmouth Harbor. Additional simulations will be conducted once a conceptual layout has been established for a potential open sand bed expansion at this site to refine this value. The conceptual layout shall maintain the goal of developing a site layout with no treated effluent migrating with groundwater to West Falmouth Harbor. The recharge at Open Sand Beds 14 & 15 is not in a public water supply recharge area and will be treated to the same stringent standards that apply to current discharge under the groundwater discharge permit for the site. A phosphorus evaluation was conducted and indicated a soil absorption capacity between the beds and Crocker Pond of at least 100 years. The Town's groundwater monitoring program for Open Sand Beds 14 & 15 has indicated that the only well with a total phosphorus concentration trend increase associated with the discharge is MW-21A, the shallowest of two wells constructed less than 10 feet horizontally from the open sand beds (the increase at this location was anticipated).

The Recommended Plan does not involve water withdrawal, so will not exceed MEPA thresholds for water withdrawal.

10.2.2. No Action Alternative

The no action alternative would negatively impact the environment in terms of groundwater, surface water hydrology, and quality. Nitrogen and other pollutants would continue to flow from septic systems in the Teaticket and Acapesket areas into the groundwater then with the groundwater into Great Pond, exacerbating the existing eutrophication of Great Pond.

10.3 Air Quality, GHG Emissions, and Noise

10.3.1. Recommended Plan

During any construction, dust is often generated onsite. Emissions generated by construction equipment also have negative impacts on air quality. Proper pollution control measures will be employed during construction of TWMP-related projects to limit these effects and provide a positive means to prevent airborne dust and reduce vehicle emissions. Contractors will be required to follow the Massachusetts Diesel Retrofit Program for any and all diesel-powered non-road construction equipment and vehicles greater than 50 brake horsepower.

Odors generated during operations at the WWTF and lift stations can be limited by designing centralized treatment facilities with odor control units and tank covers. Onsite systems typically only generate odors during pump-outs, repairs, or system failures. The existing WWTF has odor control and new lift stations designed since 2013 have included odor control units, and that will be considered and evaluated for the TASA area as part of final design based on final locations of stations.

The WWTF and lift stations use electricity, the generation of which emits greenhouse gases. In addition, wastewater treatment releases greenhouse gases (though septic systems also release greenhouse gases). A greenhouse gas (GHG) evaluation of the WWTF is discussed in Section 6. Energy efficiency measures will be incorporated into the design of WWTF improvements and lift stations; for example, variable frequency drives will be used on equipment as appropriate to reduce energy use.

The majority of noise impacts are generated during the construction phase of any project. The larger the extent of construction, the more noise associated with that work. In Falmouth, noise impacts from collection system construction will be greatest in the Planning Area with narrow streets and where buildings are in close proximity to both the road

and each other. The Town has a local noise ordinance and will restrict contractor work to within acceptable construction times to minimize impacts.

Construction at the existing WWTF at the Blacksmith Shop Road Site will generate minimal noise impacts on neighboring properties. The existing properties have an adequate buffer from this site. Modifications to proposed wastewater treatment facilities will be engineered to minimize noise from pumps and blowers by designing the buildings accordingly. At lift stations, generator noise will be mitigated by locating them in buildings and/or with sound-reducing enclosures.

10.3.2. No Action Alternative

This alternative would not decrease the air quality or increase noise due to the actual construction of the project. However, this alternative may actually decrease air quality in terms of odors from failing septic systems or surface waters that become eutrophic from the nitrogen and phosphorus in the septic system effluent.

10.4 Plant and Animal Species and Habitat

10.4.1. Recommended Plan

Figure 10-1 (see Attachments) outlines NHESP Estimated Habitats or Rare Wildlife and NHESP Priority Habitats of Rare Species in the Town of Falmouth (map data dated August 2021). No NHESP habitats are currently mapped within the anticipated construction areas of the proposed TASA collection system area or proposed force main route from TASA to the Falmouth WWTF.

As shown in Figure 10-2 (see Attachments) the majority of the proposed construction areas are also outside of currently mapped DEP wetlands (map data dated 2005). The proposed TASA collection system includes crossing the Coonamessett River, which is in a wetland area. Construction is anticipated to utilize an aerial crossing (securing piping to the existing bridge crossing the river) or directional drilling to minimize potential impacts to the wetland. Wetland Protection Act Notices of Intent and/or Requests for Determination of Applicability will be submitted to the Falmouth Conservation Commission for any areas within Wetlands Protection Act jurisdiction during final design of the project. The Recommended Plan is not anticipated to exceed MEPA thresholds for alteration of bordering vegetated wetland (less than 1 acre in accordance with 301 CMR 11.03.3.a.1.a) or other wetland alteration (less than 10 acres in accordance with 301 CMR 11.03.3.a.1.b).

As discussed in Section 4, a State-Listed Rare Species request was submitted in 2020 for the parcel upon which Open Sand Beds 14 & 15 are located. A response letter was received from the Massachusetts Division of Fisheries and Wildlife (DFW) on February 7, 2020 (NHESP Tracking No. 02-23886) which stated that the Natural Heritage database indicates that the site is not currently mapped as a Priority or Estimated Habitat.

The health of Great Pond is anticipated to benefit from this alternate with decreased nutrient loading to the waterbody.

10.4.2. No Action Alternative

This alternative would continue to increase the nutrient loading to Great Pond. The increase in nitrogen and phosphorus loading would have increased and possible irreversible adverse effects on the marine plant and animal species, including shellfish species.

10.5 Traffic, Transit, and Pedestrian and Bicycle Transportation

10.5.1. Recommended Plan

This alternative is expected to have limited short-term negative impacts on traffic and transit, and minimal short-term effects on pedestrian and bicycle transportation. This alternative is likely to increase traffic during various phases of the construction project. However, with regulated traffic control measures and the effective management of the traffic, the public burden will be decreased. The project would have no long-term traffic impacts. The Recommended Plan will not exceed MEPA thresholds for vehicle trips per day (less than 1,000 in accordance with 301 CMR 11.03.6.b.xiv) or new parking spaces (less than 300 in accordance with 301 CMR 11.03.6.b.xv).

10.5.2. No Action Alternative

This alternative would have no effects on the traffic, transit, and pedestrian and bicycle transportation aspect of the existing environment.

10.6 Scenic Qualities, Open Space, and Recreational Resources

10.6.1. Recommended Plan

With this alternative, it is unlikely that protected open space will be negatively disturbed. The implementation of this alternative would decrease overall negative environmental impacts to the protected open spaces in the Planning Area, specifically to recreational water body areas such as ponds and beaches. These adverse impacts would also be a direct contributor to scenic quality degradation. All sites being considered for WWTF and effluent recharge are either currently owned or will have appropriate easements and are not on currently protected open space.

10.6.2. No Action Alternative

With this alternative, no disturbance to protected open space is anticipated. However, by allowing the elevated nutrient loadings to Great Pond to continue, the no action alternative will increasingly impact the environment adversely in the long-term. With this alternative there is a potential that recreationally zoned resources, scenic qualities, and recreational opportunities will be affected by the decreasing environmental health of waterbodies within the Great Pond watershed.

10.7 Historic Structures or Districts, and Archeological Sites

10.7.1. Recommended Plan

With this alternative, it is unlikely historic structures, historic districts, or archaeological sites located within the Planning Area will be adversely affected by collection system installation. Historic and Cultural resources are outlined in Figure 10-3 (see Attachments) (map data layer date October 3, 2022). An archaeological sensitivity assessment was completed for TASA as part of this project by the Public Archaeology Laboratory (PAL). A literature search (which included the sources listed below) was conducted to identify available existing information on known cultural resources:

- Massachusetts Historical Commission – Inventory of the Historic and Archaeological Assets of the Commonwealth files.
- Archaeological resources that are listed or evaluated as eligible for listing in the State or National Registers, and surveyed properties that have not been evaluated for registration.
- Cultural Resource Management (CRM) reports salient to the Study Area.
- Town histories and historic maps.

The archaeological assessment identified five archaeological areas (four pre-contact and one post-contact), one historic architectural area, and six historic buildings in TASA. The archeological sensitivity analysis for TASA will be further refined through an archaeological survey in archaeologically sensitive areas as project design plans are finalized and specific areas are slated for ground disturbance and/or construction activities. If necessary, onsite monitoring will be provided during construction.

10.7.2. No Action Alternative

With this alternative, it is unlikely that historic structures, historic districts, or archeological sites will be adversely impacted.

10.8 The Built Environment and Human Use of the Project Site

10.8.1. Recommended Plan

Improved wastewater treatment and extended collection systems could increase growth in the Planning Area if regulations were not in place to limit growth. Unregulated growth due to sewer expansion is considered a negative impact unless an area has been identified as a growth incentive type zone. In addition, the Town of Falmouth may be required to acquire land or establish rights-of-way in order to expand the existing collection system. This result may be considered a negative impact to the current owners of those properties.

The Town adopted a Flow Neutral Bylaw in 2014 to mitigate the growth impact of sewering. This bylaw is in effect and will mitigate the potential growth impact of the recommended plan.

The recommended plan positively addresses nutrient load caused by past growth and development with septic systems around Great Pond.

The Recommended Plan is anticipated to include construction of approximately 30 miles of new sewer main, as well as construction of up to 6 sewer lift stations each with a site area of <0.25 acre, and one booster station with a site area of <0.5 acres. The Recommended Plan does not include development of any new housing units. The Recommended Plan is therefore not anticipated to exceed MEPA thresholds for acres of land altered (less than 25 acres in accordance with 301 CMR 11.03.1.b.1) or acres of new impervious area (less than 5 acres in accordance with 301 CMR 11.03.1.b.2)

10.8.2. No Action Alternative

Under the No Action Alternative, development will continue in the Great Pond watershed without sewering and other actions to mitigate the nitrogen load, further impacting pond water quality and habitat value.

10.9 Rare or Unique Features

10.9.1. Recommended Plan

The Recommended Plan is not expected to impose any negative impacts on the unique features of the Town of Falmouth. As outlined in Figure 10-5 (see Attachments) the proposed TASA collection system area, force main route, and effluent recharge site are outside of currently mapped Areas of Critical Environmental Concern (ACECs) (map data April 2009). Protected and Recreational Open Space Areas (including Article 97 properties) are shown in Figure 10-4 (see Attachments) (map data layer dated August 2022). The Recommended Plan is anticipated to restore the health of Great Pond through reduction of nitrogen inputs into the coastal estuary. The Protected and Recreational Open Spaces Areas map shows the Augusta parcel (the location of the proposed Brick Kiln Booster Station) as a Protected and Recreational Open Space. The deed for the Augusta parcel notes that, due to the funding that was used to purchase the property, upon approval and permitting of wastewater and/or disposal facilities at the site the Board of Selectmen will designate a portion of the property for municipal purposes and a portion of the property for Open Space, Water Resource Protection, and/or Public Recreation.

10.9.2. No Action Alternative

The No Action alternative is not expected to impose any direct negative impacts on the unique features of the Town of Falmouth. However, continued nitrogen input into Great Pond is anticipated to continue environmental degradation of the coastal estuary.

10.10 Publicly Available Data on the Public Health Conditions in the Immediate Vicinity of the Project Site

10.10.1. Recommended Plan

The Recommended Plan is not anticipated to negatively affect public health conditions in the immediate vicinity of the Project Site.

10.10.2. No Action Alternative

The No Action Alternative is not anticipated to negatively affect public health conditions in the immediate vicinity of the Project Site.

10.11 Tidelands

10.11.1. Recommended Plan

The Waterways regulations, 310 CMR 9.02, define tidelands as “present and former submerged lands and tidal flats lying between the present or historical high water mark, whichever is farther landward, and the seaward limit of state jurisdiction.” Anticipated construction for the infrastructure projects outlined in the Recommended Plan are anticipated to be outside of tideland areas. The Recommended Plan is not anticipated to exceed MEPA thresholds for alteration of a tideland.

10.11.2. No Action Alternative

The No Action Alternative is not anticipated to affect tidelands.

Scope and limitations

This report: has been a collaborative effort between the Falmouth Water Quality Management Committee, GHD and Science Wares, Inc. for TOWN OF FALMOUTH, MA (EEA #14154) and may only be used and relied on by TOWN OF FALMOUTH, MA (EEA #14154) for the purpose agreed between GHD and TOWN OF FALMOUTH, MA (EEA #14154) as set out in this document.

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The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report. GHD disclaims liability arising from any of the assumptions being incorrect.

GHD has prepared the preliminary cost estimate set out in this report using information reasonably available to the GHD employee(s) who prepared this report; and based on assumptions and judgments made by GHD based on previous Cape Cod bidding prices. The Cost Estimate has been prepared for the purpose of a preliminary evaluation of alternatives and must not be used for any other purposes. The Cost Estimate is a preliminary estimate only. The Cost Estimate does not include for any effect on prices, costs and other variables, arising from the effects of the spread of COVID-19.