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Memorandum

To	George Meservey, Director of Planning & Community Development Michael Domenica, PE, Program Manager
CC	Betsy Shreve, AICP, AECOM Project Director Mark Owen, PG, AECOM
Subject	**Town of Orleans, MA** **Water Quality and Wastewater Planning** **Task Number 01 – Facilities Engineering** **Preliminary Effluent Disposal Evaluation – 30 Main Street, Parcel 25-71-0**
Project Number	60476644
From	Thomas Parece, P.E., AECOM Project Manager
Date	03/09/16

1. Introduction

The purpose of this Technical Memorandum is to develop an estimated groundwater discharge volume under the parking lot of 30 Main Street, Parcel 25-71-0.

2. Records

The following Board of Health records/information was reviewed for the location having a business known as Hole in One Restaurant:

- Test pit data at several locations;
- Test boring data at four locations, there is no data for the top 15 feet of test borings as these soils were not logged;
- The soils at depth (particularly below 15 feet) contain a fine to medium clean sand, but there are also some layers of finer sands, silts and clays. These finer soils do not appear to be contiguous, but will need to be further investigated and evaluated across the site;
- There was no percolation test data to review; and
- The test borings were drilled around 27 to 29 feet. No groundwater was incurred. Based on the site elevation of approximately 50 feet and an approximate the water table elevation of 10 feet (Cape Cod Commission data), the water table is estimated at around 40 feet below the ground surface.

3. Assumptions

The following assumptions have been made in order to develop and estimate of groundwater discharge under the parking lot:

- Finer materials near surface are removed and replaced by Title 5 sands;
- Soils below soils removed percolation at 2 inches per minute or faster;
- Any finer soils at depth are not contiguous across the site;
- The soils are approved by MassDEP for 3 gpm/sq.ft.;
- The discharge is designed for 2 gpm/sq.ft over the estimated discharge area;
- Reserve discharge area is located between laterals of primary discharge;
- Groundwater discharge area is approximately 250 by 100 feet (25,000 sq.ft). Additional parking area could potentially be used for discharge since the actual parking lot area is not rectangular in shape. Using the additional area would be dependent on the local requirements for the discharge offset from the buildings and potentially if a variance could be obtained from that offset if it is too limiting.
- Only the parking lot area was considered for the discharge. There may be some additional area for discharge to the northeast (presently wooded);
- No new site evaluations completed (i.e. test pits, boring, monitoring wells, loading tests, etc.); and
- The wastewater effluent discharged would be high quality (30 mg/L BOD, 30 mg/L TSS and 10 mg/L TN) as compared to a septic system discharge (50 mg/L BOD, 45 mg/L TSS and 25 mg/L TN).

4. Proposed Discharge Evaluation

a. Subsurface Discharge

- Area for discharge: 250 feet x 100 feet = 25,000 sq.ft. This is an estimate with the reserve discharge area between the laterals of the primary discharge;
- The size of the discharge area could be reduced if sufficient test pit, soil boring, monitoring well, double ring infiltrometer, and detailed hydrogeologic evaluation data is provided to MassDEP to justify a percolation rate over 3 gal/day/sq.ft. Based on the existing data, this does not appear to be likely; and
- The proposed discharge area could be phased.

b. Wick Discharge

- Area for Discharge (3 wicks): 250 feet x 100 feet = 25,000 sq.ft. This includes area for additional wicks should they be necessary; and

- As per MassDEP, the proposed effluent wick discharge would require identification of a traditional discharge reserve area and could be identified as the area proposed for a subsurface discharge. The reserve discharge area would not require the development of Contract Documents (drawings and specifications) nor require site clearing.

5. Conclusions

- Based on available information (ie. test pit logs, ground elevation, and square footage of existing parking lot) it is estimated that the location has the potential to be suitable for a 50,000 gpd groundwater discharge site;

- Based on the proposed discharge location, the discharge would flow into Rock Harbor and Town Cove;

- Poor soils located below the available records of 27 to 29 feet could greatly reduce the discharge estimate; and

- Offsets and/or underground utilities could also reduce the estimated discharge rate.