

October 6, 2020

Rebecca Gendreau, Conservation Agent
Town of Sturbridge
301 Main Street
Sturbridge, MA 01566

**RE: Alternatives Analysis
Notice of Intent (NOI) Application – Peter Mimeault
76 S Shore Drive, Sturbridge, MA; Parcel ID: 598-/0 0615/-076**

Dear Commission Members:

On behalf of the project Applicant, Peter Mimeault, McClure Engineering, Inc. (McClure) is providing this letter as an Alternatives Analysis for the proposed work shown on plans prepared and filed as part of a Notice of Intent for the property located at 76 S Shore Drive, Sturbridge, MA (Property). The proposed work is for the proposed bank stabilization for the protection of an existing private drinking water well and water supply line located at the edge of Quacumquasit (South) Pond.

The Subject Site is referenced as Sturbridge Assessor's Parcel I.D. 598-/0 0615/-076 and consists of approximately 0.54+/- acres. The property lies on both the eastern and western side of South Shore Drive, approximately 1,300 feet off of Allen Road. The parcel is more particularly described in Deed Book 32906, Page 17 and Plan Book 893, Plan 73 as recorded with the Worcester District Registry of Deeds. The site is in the Rural Residential zoning district. There are on-site FEMA Flood Hazard areas per Flood Insurance Rate Map (FIRM) Worcester County Massachusetts (All Jurisdictions), Map Number 25027C0762E, effective Date July 4, 2011 (see Appendix C). These flood hazard areas are in relation to Quacumquasit (South) Pond which borders the east side of the parcel. The flood zone is an elevated flood zone, with a 100 year flood elevation of 605.00 (North American Vertical Datum of 1988).

The site was previously developed for a single family home in approximately 1970. The site abuts and slopes down towards the Quacumquasit (South) Pond to the east. The boundary of pond, estimated top of bank, was located in the field in accordance with the definitions set forth in the regulations at 310 CMR 10.55(2)(c). An unnamed perennial stream is located approximately 40' – 50' to the south of the property. The limits of the stream were not delineated as the stream is not located on the owner's property. The location of the stream as shown was taken from a previous plan for the site prepared by Jalbert Engineering dated March 26, 2004. Approximately 13,600 square feet of the property is located within the Riverfront Area.

The proposed modification to the Site includes lakefront bank stabilization for the purposes of protecting the home's private drinking water supply well, water line, and irrigation well which are located within close proximity to the pond and associated bank. The private drinking water supply well is located within the mean annual high water elevation. The electrical and water lines coming from the drinking water supply well are both within 2' of the toe of the existing bank slope. The existing bank is currently in poor condition as erosion has been deteriorating the hillside due to wave action and seasonal water level changes, as the embankment (elevation 598 to 602) is located between the mean annual low water (elevation 597.50) and high water (elevation 601.50) elevations as well as at the "no wake" elevation as indicated in the Sturbridge Wetland Bylaws Section 3.04 (elevation 601). A large tree was removed by the home owner via a permit issued by the Conservation Commission several years ago. The stump was conditioned to remain and continues to decompose and decrease the stability of the embankment. The bank area in this vicinity is currently being protected with a tarp to protect against further erosion. The bank should be armored to protect against further erosion and to protect the water supply to the residence.

The proposed armoring of the bank involves the installation of 8"x10"x48" granite stones along the shoreline and on the existing slope (no greater than 1 horizontal: 1.5 vertical), as well as the installation of 12" diameter coir logs above the stones to help stabilize the slope. Plantings are proposed within the coir logs as the top of the proposed armoring. The armoring of the bank is located within the 100-year FEMA elevation flood plain and would result in a filling of approximately 2.4 cubic yards of flood storage (approximately 18 cubic feet per vertical foot). None of the proposed work is within the Riverfront area on site. Also proposed is a new access way, including wooden stairs and a small deck, to the water supply well and irrigation well for maintenance, as required in the Sturbridge Board of Health Well Regulations. The wetland resource areas will be protected during construction with a proposed hay bale erosion control barrier.

ALTERNATIVE ANALYSIS

The Alternative Options discussed below detail different scenarios for the proposed bank stabilization project.

Removal of the Flood Zone Impact

One alternative to the bank stabilization as proposed that would establish a "net zero flood capacity loss" by removing existing bank material in an area of close proximity to the bank and at the same elevation of the stones proposed for bank stabilization which equates to 65 cubic feet of flood storage lost. This would cancel-out a relatively small negative impact of only about two cubic yards (65 cubic feet) of flood capacity. Note that the stone armoring introduces 65-cubic feet of new fill to the flood zone. This also maintains the need to protect the existing historic and natural bank above the water line. This option requires the removal of 65 cubic feet within the slope on the opposite side of the shorefront property away from the wells and at the same elevations as the new stones. This option would require a larger work area in the 25 foot buffer, at higher project cost and also include transferring 2.4 cubic yards of material up the slopes to an area outside of the buffer zones. This option would still require the access stairs/platform to maintain the two wells.

Relocation of Utilities

An alternative to the bank stabilization as proposed would be to install a new water line and electrical line from the house to the drilled-well, thus avoiding the majority of the eroding bank. The connection to the Pitless Adapter is currently only 24" below the shoreline grade and the orientation of that adapter pointing parallel to the bank would still result in a potential "freeze point" in the newly excavated bank and need some type of protection or armoring. This would disturb more land below the MAHW than the current proposal and also expand the "area of work" to include the existing brick patio and the path along the side of the house where the underground wires are currently located. The need to access the current irrigation well and the current drilled water supply well on the shoreline with stairs and a platform would still be necessary. The erosion issue on the bank near the irrigation well would continue unless it is mitigated with fill or a structure with plantings similar to the current proposal. This option involves significantly more disturbance in the 25 foot and 50 foot buffers and the rework of existing brick patio and stonework around the house. This would be a financial hardship for the property owners that would still need the shoreline protection and access stairs/platform to maintain the two wells.

Drill a New Drinking Water Well

Another alternative would be to drill a new drinking water well on the property. A new water well would need to be drilled away from the shoreline, and at least 100' away from the current septic soil absorption system and the reserve area previously determined on the westerly side of the South Shore Drive as depicted on the original septic system design plans. The alternate location of a new drilled water supply well would also require a setback study of the abutting properties to determine setbacks to the abutting septic systems. There are multiple concerns related to this alternative due to the small size and narrow shape of the lot which require the running of new water and electrical lines on the property. The need to access the current irrigation well with stairs and a platform would still be necessary. The erosion issue on the bank in question would also continue unless it is mitigated with fill or a barrier with plantings similar to the current proposal. This option would also involve work within the Riverfront Area which is in the mid-section of the lot, and extensive excavation for new infrastructure along with a significant time schedule requirement and very high cost compared to the proposed project.

No Build

The final alternative would be a no build scenario which would leave the project Site in its current state. While the no build alternative would result in no construction alteration to the resource area, the shoreline erosion issue at the bank in question would continue, leaving the existing essential utilities in jeopardy. The lake itself would also continue to be affected by erosion and sedimentation due to the continued failure of the bank.

ALTERNATIVES ANALYSIS CONCLUSION

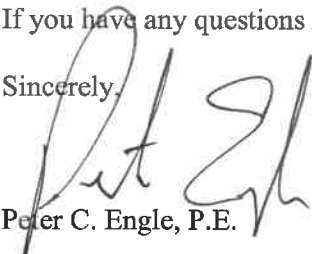
In conclusion, it is McClure's opinion that the only viable alternative which would not substantially extend the work schedule, not significantly expand the disturbance area, and not introduce a financial hardship on the property owner in order to correct a bank erosion issue would be to provide for the removal of 65-cubic feet of existing material from a selected slope, which would also provide a net zero flood storage impact. The primary negatives with this alternative are that it removes a portion of the existing historic and natural bank that would be protected under the current proposal and it would increase the total disturbance area on site within resource buffer zone areas.

The current NOI proposal involves:

- a) Minimized area of disturbance and site work;
- b) Minimal earth removal;
- c) The installation of a stabilized and armored bank;
- d) A de minimis 2.4 cubic yards (65 cubic-feet) of flood capacity loss on a 288-acre lake that has depths of 70-feet.

If you have any questions regarding the enclosed subject matter, please contact me at (508) 248-2005.

Sincerely,



Peter C. Engle, P.E.

Enclosures

cc: Peter Mimeault, 76 S Shore Drive, Sturbridge, MA 01566