

# MEMORANDUM

Date: June 1, 2020

TO: Beth Suedmeyer  
Environmental Planning – Planning & Community Development  
Town of Sudbury  
278 Old Sudbury Road  
Sudbury, MA 01776

From: Chris Claussen, Quarry North Road LLC Applicant



RE: Response to Second Peer Review Comments of the Wastewater Treatment Facility  
Issued by Horsley Witten Group  
Cold Brook Crossing NRRD and SGOD Developments  
Sudbury, Massachusetts

*Comment on second paragraph page 1 – NOI Sudbury Conservation Commission*

**Response:** The Applicant has received a negative determination from the Sudbury Conservation Commission on May 18, 2020

## Wastewater Review

### Design Calculations

*Comment 1. The narrative does not break down the subtotals of bedrooms (i.e. there will be 101 one, two-, and three-bedroom rental units), because of this, it is difficult to verify the total bedroom count listed on the plans.*

***Provencher Engineering responded that a summary table was provided to the Town and attached to the response memo. However, there was no table attached to the memo received by HW.***

**Response:** The Applicant has provided a breakdown of the total bedrooms to the Town of Sudbury.

*Comment 2. The design flow calculated is based on the number of bedrooms and the number of age-restricted units for a total flow of 49,730 gallons per day (gpd). However, the actual design flow is also listed as 49,755 gpd on the plans, which is 25 gpd higher than the bedroom count design flow. There is a clubhouse and potentially office flow that may account for this additional flow. HW recommends that the Applicant confirm that the design flow includes any additional areas other than bedrooms (such as fitness room, meeting room, and other amenities) as required.*

*Provencher Engineering responded that design flows have been discussed with MassDEP. HW defers to MassDEP for the accepted design flow.*

**Response:** No further response required.

*Comment 3. The design flow of 49,755 gpd is a maximum daily flow. The average daily flow is 50% of 49,755 gpd or 24,878 gpd, which is less than the threshold average daily flow of 50,000 gpd. Therefore, there is no redundancy requirement necessary in accordance with the Guidelines for the Design, Construction, Operation, and Maintenance of Small Wastewater Treatment Facilities with Land Disposal.*

**The Applicant has adequately addressed this comment.**

**Response:** No further response required.

#### Piping System / Manholes

*Comment 4. The sewer manholes and pipes are very deep which will increase construction costs as well as maintenance costs. It appears that the reason for this is that the building inverts are located six feet beneath the lowest floor elevation (GF). HW recommends that the Applicant review the proposed sewer pipe and manhole elevations and consider raising the sewer inverts and gravity collection system to reduce the depth of sewer pipe and manholes.*

**The Applicant has not provided a response for this comment.**

**Response:** The Applicant has reviewed the proposed sewer pipe and manhole elevations. To keep a gravity transmission design the pipe and manhole elevations must remain as designed. Site geometry has control as the site elevation transitions from high to low from west to east.

*Comment 5. The proposed design includes eight to nine feet of cover over the precast tanks. HW recommends that the Applicant confirm with the tank manufacturer the depth of cover allowed for the load rating of the precast tanks.*

**The Applicant's response is reasonable however the revised drawings should be reviewed for confirmation.**

**Response:** No further response required.

*Comment 6. All pump chambers including the equalization tank and the final effluent pump chamber should provide a water-tight hatch for easy access to remove the pumps. Portable pump hoists should be considered in the detailed design.*

**The Applicant's response is reasonable however the revised drawings should be reviewed for confirmation. Additionally, a water tightness test should be performed as part of the installation.**

**Response:** No further response required at this time.

*Comment 7. Information is required in the detailed design for the pump on/off and alarm elevations throughout the treatment processes including influent equalization pumps, and final effluent pumps. The design provided for the Ground Water Discharge Permit (GWDP) application is typically at 50% design.*

**The Applicant's response is reasonable however the revised drawings should be reviewed for confirmation.**

**Response:** No further response required at this time.

*Comment 8. The piping inside all pump chambers and valve vaults should be ductile iron instead of PVC.*

***Onsite Engineering responded that it is their opinion that SCH 80 PVC pipe is appropriate. HW's concern is based on the pressure on the pipe during startup and also during winter conditions. There may not be a problem during the 12-month warranty period but it is our experience that ductile iron is the preferred material in this situation.***

**Response:** Applicant will install DIP pipe.

*Comment 9: The proposed screen system should be installed in a separate building because of the odor and hydrogen sulfide concern. Alternatively, the detailed design should demonstrate how the odor and hydrogen sulfide problem will be managed.*

***Onsite Engineering's response that the downstream process is not Class 1, Division 1 is correct. However, the screening is questionable. Can the design Engineer guarantee that the pretreatment unit will remove 100% of solids and not biodegradable solids? The screen area should be isolated with proper ventilation.***

**Response:** Based on discussions with Smith and Loveless, the system manufacturer, they have provided three options for additional screening in addition to the primary screening accomplished by the pretreatment tanks. The first option, which is the preferred option, is the proposed screen as shown on the design drawings. This system does not require a change in the size of pretreatment tanks and provides a mechanical means to remove fine solids if they are not captured in the pretreatment tank system. We wish to clarify that the screen system basis of design is not the primary screening of raw sewage, rather it is being used for enhanced removal of fine particulates from influent to add a layer of protection for the membranes. As indicated by OnSite Engineering, the design submitted has been reviewed and approved by MassDEP and successfully utilized at other MBR facilities, which include pretreatment tanks at their headworks. It has been established that, when designed in this manner, the screen system does not need to be installed in an isolated area to meet Class I Division I environment concerns and does not generate odors consistent with screening systems used in raw sewage. As part of the system design, the manufacturer will provide a continuous poly bagger which is mounted in a frame and is water proof, which will prevent additional draining of the screenings. The bagger system at the discharge end of the chute automatically collects the screenings and bags them for disposal.

The second option would be to increase the pretreatment tank size to provide 24-hour's retention (from 20,000 gallons to 25,000 gallons each). This option would eliminate the use of the screen system. However, this option represents the highest capital cost and does not provide the greatest level of protection to the membranes.

The third option is to provide an array of effluent filters on the outlet of the final pretreatment tank. The advantages to this are that the automated fine screen system is not required and there will be no need to increase the volume of the pretreatment tanks. The disadvantage with this system is that the effluent filters are labor intensive to maintain and will be at a depth below grade such that maintenance will be a challenge and therefore may not be done well enough to provide the membrane protection the system is supposed to afford.

*Comment 10. The proposed treatment process for biological oxygen demand (BOD), total suspended solids (TSS), and total nitrogen (TN) appears to be adequate. However, the proposed granulated activated carbon (GAC) system should be reviewed and confirmed. A typical influent total organic carbon (TOC) is approximately 25 mg/L, the GAC may not be able to remove adequate TOC to achieve less than 1 mg/L in a single pass. The Applicant may need to consider multiple GAC tanks in series or another treatment technology.*

***Onsite Engineering responded that the proposed system is expandable should actual conditions differ from design conditions and references a treatment TOC concentration of less than 5 mg/l, which may not meet the requirements of the GWDP.***

**Response:** For clarification, the actual loadings to the GAC system after membrane treatment is typically 5 mg/l or less, and our system is designed to achieve less than 1 mg/l in the GAC system effluent, based on an influent to the unit of 8 mg/l. TOC levels are monitored and reported to MassDEP monthly. Project buildout will take several years to complete, giving the plant operator time to see patterns. The GAC's can run in series or in parallel, giving the operator flexibility. Each GAC holds 2,000 pounds of media, resulting in a total of 4,000 pounds of activated carbon. When GAC material is approaching saturation, TOC starts to rise very slowly and signals to the plant operator that it is time to replace the media.

*Comment 11. HW recommends that the detailed design verify that there is adequate head space between the monorail and the top of the membrane bioreactor (MRB) system to remove the membrane cartridge.*

***The Applicant's response is reasonable however the revised drawings should be reviewed for confirmation.***

**Response:** No further response required.

*Comment 12. Each chemical, such as sodium bicarbonate and Micro C, should have its own containment area, which is 110% of the chemical holding tank.*

***The Applicant's response is reasonable however the revised drawings should be reviewed for confirmation.***

**Response:** No further response required.

*Comment 13. HW recommends that the detailed design consider proper drainage from the emergency shower location.*

***The Applicant's response is reasonable however the revised drawings should be reviewed for confirmation.***

**Response:** No further response required.

*Comment 14. HW recommends that the Applicant verify the information provided in the schedule of elevations (Sheet M-2), especially the screen system, MRB, GAC system, and ultraviolet (UV) disinfection. It appears that the elevation for the pre-treatment tank #1 invert out should be 128.85 (Sheet M-2).*

***The Applicant's response is reasonable however the revised drawings should be reviewed for confirmation.***

**Response:** No further response required.

*Comment 15. HW recommends that a detail be provided for the Final Effluent Pump Chamber.*

***The Applicant's response is reasonable however the revised drawings should be reviewed for confirmation.***

**Response:** No further response required.

*Comment 16. It appears that the proposed grading slopes toward the treatment building. HW recommends that the proposed grading be sloped away from the building to avoid any stormwater from flowing into the building.*

***Civil Design Group responded that there is a proposed swale on the western and northern sides of the proposed building. HW recommends that additional spot grades be added to the plan so that it is clear a***

***swale is proposed in this location. Additional spot grades on the southern side of the building (between the building and the driveway would also be helpful to ensure positive drainage, especially around the door.***

**Response:** No further response required at this time.

#### Disposal

*Comment 17. The design plan should show the setback requirement to all basements surrounding the leach field and reserve leach field area.*

***The Applicant has adequately addressed this comment.***

**Response:** No further response required.

*Comment 18. The design plan (M-2) mentioned that the leach field is designed for 37,380 gpd. However, the sewerage absorption system (SAS 2) details show a design capacity of 51,003 gpd, which is higher than 49,755 gpd.*

***The Applicant's response is reasonable however the revised drawings should be reviewed for confirmation.***

**Response:** No further response required.

*Comment 19. The leaching field reserve indicates a capacity of 25,500 gpd, which is 50% of the design SAS capacity of 51,003 gpd. The proposed reserve area is under a steep slope and may be a challenge to construct if needed.*

***The Applicant has acknowledged this comment.***

**Response:** No further response required.

*Comment 20. The existing grade at the proposed leach field/SAS is between 152 and 172. The proposed bottom of the leaching chambers is 155.67. A significant amount of grading will be required to construct the leach field/SAS.*

***The Applicant has acknowledged this comment.***

**Response:** No further response required.

#### General

*Comment 21. The full occupancy of the proposed development may take several years to achieve. A bypass of one of the pretreatment tanks should be reviewed and considered. Alternatively, the Applicant should consider the overall BOD loading.*

***The Applicant has adequately addressed this comment.***

**Response:** No further response required.

*Comment 22. Grease traps are shown for three of the buildings. HW recommends that the details and sizing calculations for these grease traps be provided.*

***The Applicant has clarified that gas traps are proposed, not grease traps. HW defers to MassDEP and appropriate Town Departments for approval of this connection/structure in lieu of a tight tank or grease trap.***

**Response:** No further response required.

Comment 23. The Site Plans and the Water Resource Recovery Facility plans both contain details for sewer manholes and pipes that differ. HW recommends that the Applicant review both sets of details for consistency.

The Applicant's response is reasonable however the revised drawings should be reviewed for confirmation.

**Response:** No further response required at this time.

*Comment 24. The Applicant should identify the owner of the WWTF including the sewer collection system in the GWDP. The Applicant should be aware of a one-time contribution to an Immediate repair and replacement reserve, which is 25% of the estimated construction cost of the WWTF.*

***The Applicant has not provided a response for this comment.***

**Response:** The owner of the WWTF including the sewer collection system will be Quarry North Road LLC's (Applicant). We acknowledge the MassDEP one-time contribution of 25% of the estimated construction cost. We understand that MassDEP will require that the reserve account not only be retained but replenished and increased if circumstances warrant.

*Comment 25. There are many utility crossings. HW recommends that the Applicant review the elevations to ensure there are no conflicts, particularly with the gravity drainage pipes.*

***The Applicant has adequately addressed this comment.***

**Response:** No further response required.