



Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

Department of Environmental Protection

Central Regional Office • 8 New Bond Street, Worcester MA 01606 • 508-792-7650

Charles D. Baker
Governor

Kathy E. Poite
Lieutenant Governor

Matthew A. Boston
Secretary

Martin Stueberg
Commissioner

RECEIVED
JAN 27 2018
BY: SPZ

January 24, 2018

Steven Zieff
EM Street Milford, LLC
c/o Eden Management, Inc.
80 Hope Avenue, Suite 512
Waltham, MA 02453

City/Town: Milford
Re: Hydrogeologic Report
Program Identifier: BRP WP 83
Transmittal No. : X276303
Facility Name: Robsham Village
Authorization Type: Approval

Dear Mr. Zieff:

The Massachusetts Department of Environmental Protection ("MassDEP") has completed its review of the above referenced hydrogeologic evaluation report dated October 17, 2017 that was submitted on your behalf by GeoHydroCycle, Inc ("GHC"). The report is titled as follows: "Hydrogeologic Evaluation Report, Robsham Village, Milford, MA, #X276303". The report summarizes the hydrogeologic findings of the subsurface investigation at 462-466 East Main Street (the "Site") to support a future groundwater discharge permit application. A scoping meeting was held at MassDEP Central Regional Office on March 17, 2017. The hydrogeologic evaluation was conducted in accordance with the revised scope of work submitted by GeoHydroCycle February 8, 2017. Notice of the availability of the scope of work was published in the Environmental Monitor on February 22, 2017.

The Site is undeveloped property located in Milford at 462-466 East Main Street, immediately east of Route 495. The Site is not located within a delineated Zone II or an Interim Wellhead Protection Area (IWPA) of a public water supply well. The Site will be served by outside providers for water supply.

The hydrogeologic evaluation was conducted to support development of the Site for residential use. The Site is generally an undeveloped upland area surrounded by wetlands that are interconnected and drain to the north. The Site is further described as approximately 117 acres of land. The purpose of this investigation was to determine if the Site could accept the proposed discharge of 55,000 gallons per day (gpd) of treated wastewater to the ground via three soil absorption systems ("SAS") comprised of a total of 69,281 square feet based on a loading rates of 0.75 gpd/sf, 0.87 gpd/sf, and 0.90 gpd/sf for Areas 1, 2, and 3 respectively. The discharge of treated wastewater will be authorized through a groundwater discharge permit, 314 CMR 5.00 Groundwater Discharge Permit Program.

This information is available in alternate format. Contact Michelle Waters-Ekanem, Director of Diversity/Civil Rights at 617-292-5751.

TTY# MassRelay Service 1-800-439-2370
MassDEP Website: www.mass.gov/dep

Printed on Recycled Paper

The Site will serve a 300-unit residential apartment complex with a total of 500 bedrooms. Total design flow based on bedrooms is 55,000 gpd based on 110 gallons per day per bedroom.

Subsurface explorations included test pit excavations witnessed by GHC and MassDEP staff on April 25, 2017. Percolation tests were also conducted at this time within or adjacent to the footprint of the proposed SAS locations ranged in value between 10 and 30 mpi. Soil mottling for groundwater elevation determination was encountered in some of the test pits and ranged between 24" and 40" below grade.

A total of ten monitoring wells were installed during July 18-19, 2017 using a hollow stem auger. Soils encountered during the drilling were primarily reworked glacial tills that were made of sands with varying amounts of silt. GHC used aquifer slug tests to estimate the hydraulic conductivity of the overburden aquifer beneath the three proposed SAS areas. Results of the analyses yield average values of hydraulic conductivity of 8.0 ft/day, 1.1 ft/day, and 1.9 ft/day for Areas 1, 2, and 3 respectively. The hydraulic conductivity was further modified using a constant saturated thickness to obtain conductivities for the model with values of 14.1 ft/day, 1.8 ft/day, and 3.0 ft/day for Areas 1, 2, and 3 respectively. These values were used for MODFLOW @ model for groundwater mounding.

Since the three leach areas are not located within a delineated Zone II or IWPA a time of travel analysis was not performed.

GHC used the Frimpter method to estimate seasonal high groundwater at the Site. The Frimpter results indicate that the groundwater elevations measured on August 8, 2017 were 3.79 feet below seasonal high groundwater. The water levels were adjusted by GHC by adding the 3.79 feet to the groundwater data; therefore, the adjusted seasonal high groundwater elevation ranged from 310.18' in MW-2 to 330.72' in MW-10.

MODFLOW @ was utilized for groundwater mounding analysis based on the following input values:

Mounding time:	90 days
Saturated thickness:	5'
Hydraulic conductivity:	14.1 ft/day, 1.8 ft/day, and 3.0 ft/day for Areas 1, 2, and 3 respectively
Model recharge rate:	0.079575 cubic feet per day per square foot, 0.089710 cf/d/sf, and 0.096147 cf/d/sf for Areas 1, 2, and 3 respectively.
Model SAS area:	47,680 s.f., 8,256 s.f., and 14,016 sf for Areas 1, 2, and 3 respectively.
Disposal rate:	28,380 gpd, 5,540 gpd, and 10,080 gpd (80% of design flow) for Areas 1, 2, and 3 respectively.

The results of MODFLOW groundwater mounding simulation indicate that the increase in groundwater elevations due to the application rate of wastewater into the three leach field areas (Area 1, 2, and 3) would cause a mound height of 8.0', 9.0', and 10.0' respectively. Superimposing the mounding on the seasonal high groundwater elevations yields a predicted mounded groundwater elevation beneath the leach fields of 320.0', 338.0', and 340.0' respectively. The bottom of the proposed leach fields must be 4' above the mounded seasonal high groundwater elevation which calculates to 324.0', 342.0', and 344.0' respectively.

As stated in the Report: "As shown in Figure 10, the majority of groundwater flow under mounded conditions beneath the proposed leach fields is to the north toward local wetlands. The amount of wastewater proposed to be discharged is 55,000 gallons per day. Under these flow conditions, it is unlikely that the (*vernal pools, Zone A or Zone II*) resource areas will be adversely impacted by the proposed wastewater discharge."

Supplemental data was received via email from GHC in the form of an email and attached figure ("Test Pit Weeping Elevations on SHGW from Wells (Frimpter)" on 01/16/18 regarding special note of weeping in some pits, primarily affecting Area 1 calculations. The adjustment would result in +0.1' change in SHGW contours. It is important to note that final site grading may involve filling of some lowlands (non-sensitive areas) to prevent emergence of mound affected groundwater. The slight increase is within the possible measurement limitations typically used to measure ground water, and is deemed not a substantive change.

The evaluation report also included a groundwater monitoring plan that outlines the procedures for the long-term monitoring of groundwater quality in the vicinity of the proposed soil absorption system. The plan proposes a monitoring well network that consists of three monitoring wells upgradient of the discharges and two wells downgradient of each of the three leach field areas. Monitoring wells (CMW-1, CMW-4, and CMW-7) will be upgradient capable of assessing ambient groundwater conditions at the site. Monitoring wells (CMW-2, CMW-3, CMW-5, CMW-6, CMW-8, and CMW-9) are downgradient of the three proposed discharge site areas (Area 1, Area 2, and Area3).

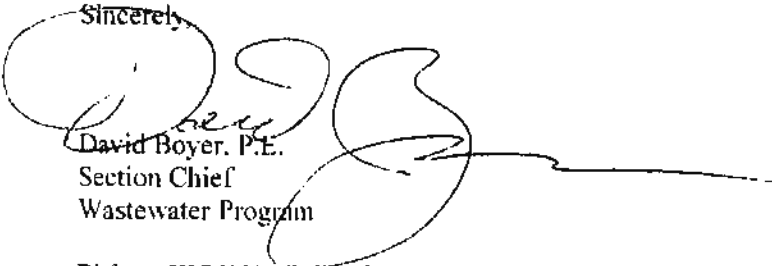
Pursuant to 314 CMR 5.09(1)(f), MassDEP hereby **approves** the hydrogeologic evaluation and authorizes the applicant to apply for an Individual Groundwater Discharge Permit (BRP WP 79) subject to the following conditions:

1. The design flow of the proposed groundwater discharge shall not exceed 55,000 gpd.
2. The long term application rate to the three leaching areas (SAS) shall not be greater than loading rates of 0.75 gpd/sf, 0.87 gpd/sf, and 0.90 gpd/sf for Areas 1, 2, and 3 respectively.
3. The proposed SAS shall not be constructed until a Groundwater Discharge Permit has been obtained from MassDEP. The proposed three SAS disposal areas (Area 1, 2, and 3) shall be constructed within the footprint depicted on Figure 2 "Site Features" within the evaluation report. The lateral footprint of the final disposal area cannot change from what was presented in the report. A final as built, location and elevation map be produced of the wells to be used in the compliance monitoring program. These shall be approved as part of the future permitting process. A synoptic water level round shall be made prior to discharge of waste water.
4. MassDEP approves the monitoring well locations proposed and as shown on Figure 13. "Proposed Locations of Compliance Wells" within the evaluation report. The proposed well locations and the approved monitoring plan will be referenced in the Groundwater Discharge Permit when issued. MassDEP recognizes that proposed locations are somewhat dependent upon final site development (e.g. building and road placement) and may require modification. However changes must be submitted to this office for approval prior to well installation. Final monitoring wells must be installed and sampled for all groundwater quality parameters listed in the issued permit no later than 90 days prior to startup of the wastewater treatment plant and discharge to the SAS.
5. Proper separation as previously described is maintained from the seasonal high groundwater elevation with mounding superimposed and the footprint of the three SAS disposal areas.
6. An Initial Groundwater Monitoring Well and Groundwater Quality Report must be submitted to this office prior to any discharge of wastewater. This report must include:
 - a. a final surveyed site plan with the location of the SAS, all monitoring wells and all appropriate elevation data,
 - b. boring logs and well construction details for all monitoring wells, and
 - c. The analytical results of the groundwater samples collected from the final groundwater monitoring wells. These results will establish the baseline groundwater quality for the site.

Please be advised that this approval is **not** a Groundwater Discharge Permit. It does, however, authorize the project proponent to submit an Individual Groundwater Discharge Permit application for the discharge described at the evaluated location. MassDEP requires that the Individual Groundwater Discharge Permit application (BRP WP 79) be accompanied by a MassDEP Transmittal form and include all required supporting documentation. Included in the supporting documentation shall be a certification from a Massachusetts Registered Professional Engineer that the approved Hydrogeological Report has been reviewed and accurately reflects site conditions as of the date of the permit application. Information on any changes noted during the review shall be included in the Engineering Report that accompanies the application. Please be advised, the submittal of plans and specifications may be required at any time during the review of the permit application.

Questions regarding this evaluation and approval may be directed to Steve Hallem at (617) 292-5681 or at stephen.hallem@state.ma.us.

Sincerely,



David Boyer, P.E.
Section Chief
Wastewater Program

Db's: X276303a (Milford)-185

Cc: Milford Board of Health

GeoHydroCycle, Inc.
151B California Street
Newton, MA 02458

Onsite Engineering, Inc.
279 East Central Street
PMB 241
Franklin, MA 02038

Stephen Hallem, MassDEP Boston - BWR

Purna Rao, MassDEP CERO