



The State of New Hampshire
DEPARTMENT OF ENVIRONMENTAL SERVICES



Robert R. Scott, Commissioner

EMAIL ONLY

August 25, 2017

Dartmouth College Trustees
Attn: Michael D. Cimis
37 Dewey Field Road
Hanover, NH 03755

Subject: **Hanover** – Rennie Farm Site, 572 Hanover Center Road
DES Site #201111109, Project #27737

Phase II Supplemental Hydrogeologic Investigation Report, Groundwater Management Zone Delineation and Application for Groundwater Management Permit, prepared by GZA GeoEnvironmental, Inc. (GZA), and dated July 14, 2017

Dear Mr. Cimis:

Please find enclosed Groundwater Management Permit **GWP-201111109-H-001**, approved by the New Hampshire Department of Environmental Services (NHDES). This Permit is issued for a period of 5 years to monitor the effects of past discharges of 1,4-dioxane at the above-referenced site.

Please submit all required sampling results and monitoring summaries to the NHDES Groundwater Management Permits Coordinator, at the address provided below. Include with all correspondence a cover letter that clearly shows the NHDES identification number for this site (i.e., DES Site #201111109).

The Groundwater Management Zone for this Permit includes properties that are not owned by the Permit holder. Therefore, Condition #9 requires the Permit holder to provide notice of the Permit, by certified mail, within 15 days of permit issuance, to all owners of lots of record within the Groundwater Management Zone. Documentation of the notification, in the form of a copy of the notice with return receipt(s), shall be submitted to NHDES within 45 days of permit issuance.

Also, please note that Condition #10 requires the Permit holder to record "Notice" of the Permit (not the Permit itself), within 60 days of issuance, at the registry of deeds in the chain of title for each lot (or portion thereof) within the Groundwater Management Zone. A separate Notice form for each property within the Groundwater Management Zone shall be generated and recorded. An example Notice can be found on NHDES' web page at the following link:

<https://www.des.nh.gov/organization/divisions/waste/hwrb/sss/grp/index.htm>

A copy of each recorded Notice shall be submitted to NHDES and the town of Hanover within 30 days of recordation.

www.des.nh.gov

PO Box 95, 29 Hazen Drive, Concord, NH 03302-0095

Telephone: (603) 271-2908 Fax: (603) 271-2181 TDD Access: Relay NH 1-800-735-2964

The approved Remedial Action Plan¹ (RAP) for this site includes operation of an on-site groundwater extraction and treatment system to mitigate the presence of 1,4-dioxane in on- and off-site groundwater. Accordingly, the Annual Summary Reporting requirements detailed in Condition #7 include site-specific performance evaluation criteria associated with the operation of the groundwater extraction and treatment system, consistent with the overall remedial objectives for the site as detailed in the site RAP, and the design details² for the groundwater pump and treat system.

Please note, pursuant to the May 18, 2017 NHDES letter, we requested that owners/permittees of waste sites managed by NHDES complete an initial screening for the presence of per- and polyfluoroalkyl substances (PFAS) in groundwater. Accordingly, please submit a proposed schedule by which Dartmouth intends to perform the initial PFAS screening at the Rennie Farm site. Please refer to the May 18, 2017 NHDES letter for information relative to the specific PFAS sampling, analytical testing, and reporting requirements. This letter as well as other technical information regarding PFAS may be found on the NHDES website via the following link:

<https://www.des.nh.gov/organization/commissioner/pfas.htm>

Should you have questions with regard to any of the requirements of the enclosed Groundwater Management Permit, or the initial PFAS screening, please contact me directly at NHDES' Waste Management Division.

Sincerely,



Paul Rydel, PG
Hazardous Waste Remediation Bureau
Tel: (603) 271-3116
Fax: (603) 271-2181
Email: paul.rydel@des.nh.gov

ec: Jim Wieck, PG, GZA
Attention Health Officer, Town of Hanover

¹ "Report – Remedial Action Plan" (dated September 1, 2016); prepared by GZA GeoEnvironmental, Inc. (GZA) on behalf of Dartmouth College Office of Environmental Health and Safety.

² "Remedial Design Plans and Construction Specification Report" (dated December 2, 2016); prepared by GZA on behalf of Dartmouth College Office of Environmental Health and Safety.



The
NEW HAMPSHIRE DEPARTMENT OF ENVIRONMENTAL SERVICES
hereby issues
GROUNDWATER MANAGEMENT PERMIT NO. GWP-201111109-H-001
to the permittee
DARTMOUTH COLLEGE TRUSTEES
to monitor the past discharge of
1,4-dioxane
at
RENNIE FARM SITE
(572 Hanover Center Road)
in HANOVER, N.H.

via the groundwater monitoring system comprised of
74 monitoring wells, 7 surface water sampling stations, and 15 private drinking water wells
as depicted on the Site Plans entitled:
"Proposed GMP Groundwater Monitoring Location Plan" (Figure 11), and
"Proposed GMP Water Supply Well and Surface Water Monitoring Locations" (Figure 12)
dated July 12 and July 10, 2017, respectively, prepared by GZA GeoEnvironmental, Inc.

TO: DARTMOUTH COLLEGE TRUSTEES
37 DEWEY FIELD ROAD
HANOVER, NH 03785

Date of Issuance: August 25, 2017
Date of Expiration: August 24, 2022

Pursuant to authority in N.H. RSA 485-C:6-a, the New Hampshire Department of Environmental Services (NHDES), hereby grants this Permit to monitor past discharges to the groundwater at the above-described location for five years, subject to the following conditions:

(continued)

STANDARD MANAGEMENT PERMIT CONDITIONS

1. The permittee shall not violate Ambient Groundwater Quality Standards adopted by NHDES (N.H. Admin. Rules Env-Or 600) in groundwater outside the boundaries of the Groundwater Management Zone, as shown on the referenced site plans.
2. The permittee shall not cause groundwater degradation that results in a violation of surface water quality standards (N.H. Admin. Rules Env-Wq 1700) in any surface water body.
3. The permittee shall allow any authorized staff of NHDES, or its agent, to enter the property covered by this Permit for the purpose of collecting information, examining records, collecting samples, or undertaking other action associated with this Permit.
4. The permittee shall apply for renewal of this Permit prior to its expiration date but no more than 90 days prior to expiration.
5. This Permit is transferable only upon written request to, and approval of, NHDES. Compliance with the existing Permit shall be established prior to Permit transfer. Transfer requests shall include the name and address of the person to whom the Permit transfer is requested, the signatures of the current and future permittees, and a summary of all monitoring results to date.
6. NHDES reserves the right, under N.H. Admin. Rules Env-Or 600, to require additional hydrogeologic studies and/or remedial measures if NHDES receives information indicating the need for such work.
7. The permittee shall maintain a water quality monitoring program and submit monitoring results to NHDES no later than 45 days after sampling. Samples shall be taken from the monitoring wells and surface water sampling points as shown and labeled on the referenced site plans, and other sampling points as listed on the following table in accordance with the schedule outlined herein:

| Monitoring Locations | Sampling Frequency | Parameters |
|--|--|--|
| <p><i>Groundwater Monitoring Wells:</i> GZ-2, GZ-9L, GZ-9D, GZ-14U, GZ-14L, GZ-24L, GZ-24D, GZ-27U, GZ-27L, GZ-27D, GZ-28L, GZ-28D, GZ-32U, GZ-32L, GZ-32D, GZ-34U, GZ-34L, GZ-34D, GZ-35U, GZ-35L, GZ-35D, GZ-36U, GZ-37U, GZ-37L, GZ-37D, GZ-39D, GZ-40U, GZ-40D, GZ-41U, and GZ-42U</p> <p><i>Surface Water Sampling Stations:</i> Stream-1, Stream-2, Stream-3, Stream-4, Stream-5, and Stream-6</p> | <p>March, June, September, and December of each year</p> | <p>1,4-dioxane (analytical reporting limit of ≤ 0.25 ug/L), and static water level elevation (wells only)</p> |

| Monitoring Locations | Sampling Frequency | Parameters |
|--|--|--|
| <p><u>Groundwater Monitoring Wells:</u> GZ-3, GZ-5U, GZ-5L, GZ-6, GZ-7U, GZ-7L, GZ-8U, GZ-8L, GZ-10L, GZ-11U, GZ-11L, GZ-15L, GZ-16D, GZ-17L, GZ-18U, GZ-18L, GZ-19U, GZ-19L, GZ-20U, GZ-20L, GZ-22U, GZ-23U, GZ-24U, GZ-25U, GZ-25L, GZ-25D, GZ-26U, GZ-28U, GZ-29L, GZ-30U, GZ-30L, GZ-31L, GZ-33U, GZ-33L, GZ-38U, GZ-39U, and GZ-39L</p> <p><u>Surface Water Sampling Station:</u> Stream-11</p> | <p>March and September of each year</p> | <p>Same as above</p> |
| <p><u>Groundwater Monitoring Wells:</u> GZ-1, GZ-4, GZ-9U, GZ-10U, GZ-12L, GZ-13L, and GZ-43U</p> | <p>September of each year</p> | <p>Same as above</p> |
| <p><u>Private Water Supply Wells at the Following Street Addresses:</u> 7, 9, 22, 26, 28, 30, 38, 39, 42, and 47 Rennie Road; 39 Tranquil Brook Lane; 594 and 612 Hanover Center Road; 8 and 10 Dairy Lane</p> | <p>March, June, September, and December of each year</p> | <p>1,4-dioxane (analytical reporting limit of ≤ 0.25 ug/L)</p> |

Sampling shall be performed in accordance with the documents listed in Env-Or 610.02 (e). Samples shall be analyzed by a laboratory certified by the U.S. Environmental Protection Agency (USEPA), or NHDES pursuant to Env-C 300.

Summaries of water quality shall be submitted annually to NHDES' Waste Management Division, in the month of February, using a format acceptable to NHDES. The Summary Report shall include the information listed in Env-Or 607.04 (a), as applicable, and an evaluation of the performance of the groundwater extraction and treatment system toward the overall performance standard of attainment of Ambient Groundwater Quality Standards (AGQS) for 1,4-dioxane within the area of hydraulic influence of the groundwater remediation system. This evaluation shall include an assessment of the groundwater capture zone of the treatment system in overburden and bedrock using updated water level measurements from selected monitoring wells, the remedial design/performance bedrock well couplets (GZ-PM-series wells), and the groundwater extraction wells.

The Annual Summary Report shall also provide updated time-series data plots of 1,4-dioxane concentrations in groundwater at selected source area and near-downgradient monitoring locations. At a minimum, source-area monitoring wells to be included in this analysis shall include: GZ-2, GZ-3, GZ-14U, GZ-14L, GZ-18U, and GZ-18L; and near-downgradient wells shall include: GZ-5U, GZ-5L, GZ-9U, GZ-9L, GZ-9D, GZ-10U, GZ-10L, and GZ-17L.

The Annual Summary Report shall be prepared and stamped by a professional engineer or professional geologist licensed in the State of New Hampshire.

8. Issuance of this Permit is based on the Groundwater Management Permit Application dated July 14, 2017, and the historical documents found in NHDES file DES #201111109. NHDES may require additional hydrogeologic studies and/or remedial measures if invalid or inaccurate data are submitted.
9. Within 15 days of the date of NHDES approval of this Groundwater Management Permit, the permittee shall provide notice of the Permit by certified mail, return receipt requested, to all owners of lots of record within the Groundwater Management Zone. The permittee shall submit documentation of this notification to NHDES within 45 days of Permit issuance.
10. Within 60 days of the date of NHDES approval of this Groundwater Management Permit, the Permit holder shall record notice of the Permit in the registry of deeds in the chain of title for each lot within the Groundwater Management Zone. **This recordation requires that the registry be provided with the name of current property owner and associated book and page numbers for the deed of each lot encumbered by this permit. Portions of State/Town/City roadways and associated right-of-way properties within the Groundwater Management Zone do not require recordation.** A copy of each recorded notice shall be submitted to NHDES and the Town of Hanover within 30 days of recordation.
11. Within 30 days of discovery of a violation of an ambient groundwater quality standard at or beyond the Groundwater Management Zone boundary, the permittee shall notify NHDES in writing. Within 60 days of discovery, the permittee shall submit recommendations to correct the violation. NHDES shall approve the recommendations if NHDES determines that they will correct the violation.
12. All monitoring wells at the site shall be properly maintained and secured from unauthorized access or surface water infiltration.

SPECIAL CONDITIONS FOR THIS PERMIT

13. Recorded property within the Groundwater Management Zone shall include the lots as listed and described in the following table:

| Tax Map / Lot No. | Property Address | Owner Name and Address | Deed Reference (Book / Page) |
|--------------------------|--|--|-------------------------------------|
| 13 / 19-1 | 594 Hanover Ctr. Road Hanover, NH 03755 | Trustees of Dartmouth College C/O Real Estate Office PO Box 5188 Hanover, NH 03755-5188 | 4296 / 204 |
| 13 / 14-1 | 572 Hanover Ctr. Road Hanover, NH 03755 | Trustees of Dartmouth College C/O Real Estate Office PO Box 5188 Hanover, NH 03755-5188 | 1850 / 166 |

| Tax Map / Lot No. | Property Address | Owner Name and Address | Deed Reference (Book / Page) |
|--------------------------|--|--|-------------------------------------|
| 16 / 17-1 | 612 Hanover Ctr. Road Hanover, NH 03755 | William and Alexander Braman 612 Hanover Ctr. Road Hanover, NH 03755-4921 | 1196 / 222 |
| 13 / 17-1 | 7 Rennie Road Hanover, NH 03755 | Donald and Alinda Roberts 7 Rennie Road Hanover, NH 03755-5188 | 2379 / 709 |
| 13 / 18-1 | 8 Rennie Road Hanover, NH 03755 | Trustees of Dartmouth College C/O Real Estate Office PO Box 5188 Hanover, NH 03755-5188 | 4239 / 510 |
| 13 / 81-1 | 9 Rennie Road Hanover, NH 03755 | Deborah A. & Richard D. Higgins 9 Rennie Road Hanover, NH 03755 | 4059 / 720 |
| 15 / 48-1 | 25 Rennie Road Hanover, NH 03755 | Trustees of Dartmouth College C/O Real Estate Office PO Box 5188 Hanover, NH 03755-5188 | 4283 / 211 |

14. UNDEVELOPED LOTS WITHIN THE GROUNDWATER MANAGEMENT ZONE

Consistent with Env-Or 607.06(d), for each undeveloped lot, or portion thereof, which is within the Groundwater Management Zone and lacks access to a public water supply, the permittee shall contact the property owner annually to determine if a water supply well has been installed. The results of these inquiries shall be documented in each Annual Summary Report.

Upon discovery of a new drinking water supply well within the Groundwater Management Zone, the permittee shall provide written notification to NHDES and, to ensure compliance with Env-Or 607.06(a), submit a contingency plan to provide potable drinking water in the event the well is or becomes contaminated above the ambient groundwater quality standards. The potable water supply shall meet applicable federal and state water quality criteria. This plan shall be submitted to NHDES for approval within 15 days of the date of discovery.

The permittee shall sample the new supply well within 30 days of discovery. The well shall be sampled for all the analytical parameters included in Standard Condition # 7, unless otherwise specified in writing by NHDES. The permittee shall forward all analytical results to NHDES' Waste Management Division, NHDES' Environmental Health Program, and the owner of the drinking water supply well within 7 days of receipt of the results.

If the results for the new well meet the ambient groundwater quality standards, the permittee shall continue to sample the new wells annually as part of the Permit.

If the results for the new well indicate a violation of the ambient groundwater quality standards, the permittee shall notify the owner immediately and conduct confirmatory sampling within 14 days of receiving the original results.

Upon confirmation of a violation of the ambient groundwater quality standards in a new drinking water well, the permittee shall immediately implement the contingency plan to provide a potable drinking water supply that meets applicable federal and state water quality criteria.

15. The permittee shall update the ownership information required by Env-Or 607.03(a)(20) for all properties within the Groundwater Management Zone prior to renewal of the Permit, or upon a recommendation for site closure.



Karlee A. Kenison, P.G., Administrator
Hazardous Waste Remediation Bureau
Waste Management Division

Any person aggrieved by any terms or conditions of this Permit may appeal to the N.H. Waste Management Council ("Council") by filing an appeal that meets the requirements specified in RSA 21-O:14 and the rules adopted by the Council, Env-WMC 200. The appeal must be filed **directly with the Council within 30 days** of the date of this decision and must set forth fully **every ground** upon which it is claimed that the decision complained of is unlawful or unreasonable. Only those grounds set forth in the notice of appeal can be considered by the Council.

Information about the Council, including a link to the Council's rules, is available at <http://nhec.nh.gov/> (or more directly at <http://nhec.nh.gov/waste/index.htm>). Copies of the rules also are available from NHDES' Public Information Center at (603) 271-2975.

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