



State of New Hampshire
DEPARTMENT OF ENVIRONMENTAL SERVICES

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TDD Access: Relay NH 1-800-735-2964



14 November 1994

DES # 870433

PM FILE

Mr. Larry B. Lackey, P.E.
North Country Environmental Services, Inc.
501 South Street; Box E
Bow, New Hampshire 03304

Subject: North Country Environmental Services, Inc.,
Modification of Groundwater Permit
No. GWP-87-0433-B-001
#870433, Stage II Expansion
Bethlehem, New Hampshire

Dear Mr. Lackey:

The Department of Environmental Services, Groundwater Protection Bureau has reviewed the following documents submitted by Sanborn, Head & Associates (SHA) on behalf of North Country Environmental Services, Inc. (NCES):

1. SHA letter to Mr. John M. Regan, dated October 5, 1994, Re: Groundwater Permit GWP-87-0433-B-001, North Country Environmental Services, Inc. Stage II Expansion. This letter contains a request to modify the existing groundwater release detection permit, including a proposal to use bromide as a tracer, the installation of additional monitoring wells and the decommissioning of wells MW-405U&L and MW-406U&L.
2. SHA letter to Ms. Pamela Sprague, dated October 5, 1994, Re: North Country Environmental Services Facility, Bethlehem, New Hampshire. This letter contains an evaluation of the water quality trends at the site, including the elevated concentrations of VOCs detected in the "100" series wells and the seep.
3. SHA letter to Mr. John M. Regan, dated October 7, 1994. This letter contains water quality time series plots for the monitoring wells and the seep.
4. SHA letter to Mr. John Cotton, dated October 27, 1994, Re: Viability of Bromide (Br) as a Tracer. This letter contains supplemental information in support of the use of bromide for the intended purpose at this site.

Our review has concentrated on two primary issues: a) the source of the recent water quality increases in some of the monitoring wells and the seep, and b) the modification of the release detection permit to monitor the proposed Stage 2 lateral expansion.

SOURCE OF WATER QUALITY INCREASES

The Department concludes from our review of the water quality data that the former unlined and single lined landfill areas are the source of the recent increases in contaminant

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concentrations detected in some of the wells ("100" series and MW-406U) and the seep. The landfill wastes, which constituted the "source", have been removed from these areas and placed in the double lined landfill. The soil sampling performed after the landfill areas were excavated did not detect significant contamination. The Department's experience at other "source" removal projects has been that a short term release of contaminants occurs during the excavation of the source material. The increase in contaminant concentrations at these sites were shown to be a short term occurrence. The Department expects that contaminant concentrations in the wells and the seep will ultimately decrease with time, but future monitoring will determine the actual water quality trends.

The water quality information available from MW-405U & L and MW-406U & L was critical to support the conclusion that the release came from the unlined and single-lined landfill areas and not the double lined landfill of Stage I. The Department believes these wells must remain to provide long term data to support the conclusion that Stage I was not the source of the contaminant increases.

The October 5, 1994 SHA letter regarding the evaluation of water quality data indicates that the concentrations observed in MW-406U are likely from mounding during the waste removal work, but that the migration of landfill gas may be possible source of the VOCs detected in MW-406U (Page 5). Corrective action (e.g. more positive control of the landfill gas) will be required if the data indicate that landfill gas is migrating and resulting in a discharge to groundwater.

GROUNDWATER PERMIT MODIFICATION

The Department approves the proposed modifications to the release detection permit with the following conditions:

1. Well couplets MW-405U&L and MW-406U&L must continue to be sampled as part of the groundwater release detection permit until Stage I is closed and capped. Consequently, the request to decommission these wells is denied. A detailed proposal for the construction of lateral connections to these wells shall be submitted to the Department within 30 days. The proposal should include a discussion of the method that will be used to collect water samples.

2. The installation of two new well couplets MW-601U&L and MW-602U&L is acceptable as proposed. The Department also concurs with the general strategy for the well screen intervals. However, given that these new couplets are expected to be located in the existing plume and the current understanding of the contaminant plume indicates that preferential pathways are present in the geologic units and transmit the contaminants at different rates, the Department believes that several revisions are appropriate.

- a. The Department suggests that well casings and screens be no less than two (2) inches, inside diameter. Two inch wells allow for the use of down hole probes to measure electrical properties and natural gamma radiation from the saturated, subsurface materials. Such down hole surveys can be conducted to assure that no horizontal preferential pathways of contaminants exit between the screened

Intervals of the upper and lower wells.

b. Continuous split spoon samples of subsurface materials in the zone of saturation should be obtained during the drilling of the deep well at each site. The detailed soils information will provide the basis for a change in the anticipated well screen intervals, as well as providing the necessary material descriptions comparison with the down hole geophysical surveys.

3. The application of bromide as a tracer in the lateral expansion of Stage II is acceptable. The use of the bromide tracer is consistent with the Department's policy at other sites where a double lined landfill overlies an existing groundwater plume. To ensure the proper application of bromide is maintained, the permit will require the leachate be analyzed for bromide concentration, in addition to the proposal to analyze samples collected from the monitoring wells. The following information is also requested:

a. Verification from the laboratory that the expected concentrations of bromide (10 to 100 parts per million) can be detected given the historical chloride concentrations. High concentrations of chloride may interfere with the detection levels for bromide.

b. A description of how the bromide will be applied, handled and stored. The information should provide a general concept of the operational and practical aspects involved in applying the bromide to the working landfill.

c. Assurance that the bromide does not affect the disposal of the leachate.

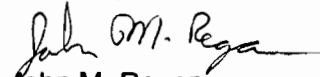
4. A Groundwater Management Zone (GMZ) must be established for the existing plume of contaminated groundwater emanating from the former unlined and single lined landfill areas. The Department routinely modifies groundwater permits to make them consistent with the GMZ provisions contained in the February 1993 rule changes. The GMZ must necessarily extend off site to the north and include the seep. Additional work may be necessary to delineate the GMZ. The additional work may include a reconnaissance survey of the specific conductance (and perhaps other chemical parameters) of other seeps that may exist along the steep terrace face bordering the Ammonoosuc River. The Department expects the specific conductance survey could provide useful information on the lateral and vertical extent contaminated groundwater seeps along the terrace face. The quality of water issuing from the contact of stratified drift and lower till may be very different from the quality of water from seeps within the lower till. The permit will include a schedule for the completion any additional work and the delineation of the GMZ. A scope of work, which includes a schedule for additional work and the GMZ delineation, should be submitted within 30 days.

The Department is available to discuss the conditions contained in this letter. Subsequent to the discussion of these conditions and the submittal of a scope of work for the

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GMZ, the Department will issue a revised groundwater release detection permit. If you have any questions please contact me (271-3744) or John Cotton (271-6573).

Sincerely,



John M. Regan
Groundwater Protection Program

cc
Paul M. Sanborn, SHA
Pamela Sprague, WMD
Richard Reed, WMD
Harry T. Stewart, P.E., WSPCD
John Cotton, WSPCD
Board of Selectman, Bethlehem