

5101Permit2003 - Batch No. ___

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2003

5101 2003



North Carolina Department of Environment and Natural Resources

Dexter R. Matthews, Director

Division of Waste Management

Michael F. Easley, Governor
William G. Ross Jr., Secretary

November 5, 2003

Mr. Haywood Phthisic
Director of Public Utilities
Johnston County
P.O. Box 2263
Smithfield, NC 27577

Re: Groundwater Assessment at the Johnston County Municipal Solid Waste Landfill and proposed C&D area. Permit No. 51-01.

Dear Mr. Phthisic,

The Solid Waste Section is in receipt of the groundwater assessment/geophysical report dated October 2003, submitted on behalf of Johnston County by G.N. Richardson and Associates. A more detailed evaluation was required to determine the extent of the groundwater contamination in the area of the proposed construction and demolition debris landfill (C&D). Additional information is needed to complete the review so a determination can be made concerning the use of this area for the proposed C&D. The following questions and comments require a response.

The introduction states ground water monitoring has been on going since 1994. When did routine groundwater monitoring begin and the subsequent assessment monitoring?

A total of 49 borings are reported as advanced at this site but the boring locations shown on Figure 1 do not reflect that number. Some of the geologic logs for these borings are reported to be included in Appendix A but were omitted.

There are two monitoring locations labeled PZ-3 one is located in the proposed C&D area and the other is near Phase 1 & 2. Provide some additional identification so the well locations can be easily recognized from one another.

Monitoring location MW-4B seems to be at a lower elevation than what is provided on Figure 3. A change in elevation will also impact the reported water table elevation as well as the vertical hydraulic gradient reported for MW-4b and MW-4d nest included on Table 3.

1646 Mail Service Center, Raleigh, North Carolina 27699-1646
Phone 919-733-4996 \ FAX 919-715-3605 \ Internet <http://wastenotnc.org>

Topographic lines included on Figure 3, shows PZ-1 at a lower elevation than PZ-1A. Review piezometer locations PZ-1 and PZ-1A and indicate the corrections.

It appears the vertical gradients were calculated incorrectly. Please use the midpoints of the saturated portion of the two piezometer screens of the nested wells when making this calculation. Well screen elevations appear to be calculated incorrectly.

Also on Table 3 monitoring locations MW-7b and MW-7d have vertical gradients included but in the text PZ-7b and PZ-7d are reported. It appears the PZ reference was inadvertently used, please correct. The Section agrees these wells are located too far apart to provide any meaningful data. Please drop the vertical gradients calculated from the MW-7's from Table 3 and the text.

Groundwater velocities included in the text are site wide but Table 3 is limited to the C&D area. The focus of this part of the assessment is on the C&D area so groundwater velocities in this area should be used.

The piezometer locations between the Magnetometer Survey on Figure 2 of and the Ground Water Potentiometric Surface Map on Figure 3 are different. Please reconcile and include the approximate diabase dike locations from both magnetometer surveys on the figure with the corrected potentiometric surface.

Is the anomaly reported in the recent geophysical survey one large or two small dikes? What effect does the dike(s) in the C&D area have on groundwater flow?

Boring logs for piezometers PZ-4, PZ-5, and PZ-6 indicate groundwater coming out of the augers during drilling. How does this information fit with apparent diabase dike reported in the most recent geophysical investigation?

When was MW-5A installed? Please provide the boring log for this monitoring well.

Correspondence records indicate a proposed change in the assessment monitoring, however it is not clear which wells were determined to be included in sampling. Please include a list of the assessment and/or monitoring wells to be included and the monitoring frequency for these locations so this can be reviewed and updated.

Why were piezometers PZ-9 and PZ-9d omitted from the sampling analysis? There is some data for these piezometers in Table 5 but nothing is included in Appendix D. The Chain of Custody Record shows they were excluded from the August 2003 sampling event.

Table 5 does not include all the detected parameters included in the laboratory report. Include all constituents detected on this table and correct the table to accurately reflect the analysis reported by the laboratory. Also there are some piezometers and monitoring wells not included in this table. Laboratory results show there are both inorganic and organic analytes with concentrations greater than the groundwater standard. This information should be reflected in the table as well as the text.

Provide a historical summary of all wells that have had both inorganic and organic detects during the on going assessment.

References to Phase 5 should be excluded from this study.

We encourage your consultant to arrange a meeting with the Solid Waste Section to discuss the concerns outlined in this letter. If you have any questions you may contact either Bobby Lutfy at (919) 733-0692 extension 258 or Cheryl Marks at extension 342.

Sincerely,

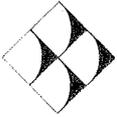


Bobby Lutfy
Hydrogeologist
Solid Waste Section



Cheryl Marks
Hydrogeologist
Environmental Compliance, SWS

cc: Jim Barber, Solid Waste Section
Mark Poindexter, Field Operations Branch, Solid Waste Section
Ed Mussler, Solid Waste Section
Mark Fry, Fayetteville Regional Office
Joan Smyth, G.N. Richardson & Associates
Central File



G.N. RICHARDSON & ASSOCIATES

Engineering and Geological Services

April 10, 2003

APR 2003

Ms. Cheryl Marks
Hydrogeologist
NCDENR Solid Waste Section
1646 Mail Service Center
Raleigh, NC 27699-1646

RE: Piezometer Removal and Ground Water Assessment Summary
Johnston County Landfill
Smithfield, North Carolina

Dear Ms. Marks:

During our recent phone conversation, a piezometer has been accidentally removed at the Johnston County Landfill. This piezometer (PZ-9) was located outside Borrow Area "B" along the entrance road. A map showing the piezometer location is included as **Figure 1**. This piezometer was originally installed to evaluate borrow area "B" and its surrounding area for useful materials and water levels. This piezometer has not been monitored for water level since the permitting of this borrow area. This piezometer is not part of the ground water monitoring network due to its distance from the landfill and the fact that there is no ground water impact from the landfill in this area.

This piezometer was accidentally removed by a backhoe which was removing stockpiled soil adjacent to it. The piezometer was originally installed to a depth of 32 feet. The entire length of pipe was removed by the backhoe. The boring log for this piezometer is attached for your review. The borehole was subsequently back-filled by the backhoe during continued operations in the area. Due to the fact that the entire length of piezometer was removed and the borehole collapsed with soil, no further action will be taken in this area.

We also discussed the on-going ground water assessment at this site. I would like to take this opportunity to summarize the assessment activities to date. Ground water monitoring began at the site in 1994. Routine ground water monitoring indicated exceedances of ground water standards in several wells around the site. In 1998, G. N. Richardson and Associates, Inc. (GNRA) submitted a Remedial Investigation Work Plan and Environmental Restoration Plan for the Phase 3 and 4 areas of the site.

The Environmental Restoration Plan for the site was the installation of a "piggy back" landfill between Phases 3 and 4. The Phase 4A landfill was permitted as a double-lined landfill with cells that "piggy-back" over Phase 3 and Phase 4. The planned effect of the Phase 4A landfill is reduce rainwater infiltration into the unlined Phase 3 and 4 landfills and therefore limit ground water impact from these landfills by removing a significant portion of the source (rainwater flowing through waste down to the ground water).

The Remedial Investigation Work Plan combined the need for additional information for the permitting of Phase 4A with the need for additional ground water monitoring wells downgradient of the site near Middle Creek. A total of 12 piezometers and 4 bedrock monitoring wells (MW-4d, MW-7d, MW-8d, and MW-13d) were installed at the site once approval of the Remedial Investigation Work Plan was received. The piezometers were primarily installed to gain water level information in the Phase 4A area, however, one piezometer (PZ-3) was added to the ground water monitoring network to evaluate any impact from Phases 1 and 2 on ground water at the site. A map depicting these well and piezometer locations is included as **Figure 2**.

These piezometers and ground water monitoring wells were installed in late 1998. In March 2000 the final Ground and Surface Water Assessment Report was submitted to NCDENR. This report concluded that analysis from monitoring well MW-7d indicated contaminants at levels above the ground water standards.

Upon NCDENR review, a geophysical study to evaluate the existence of diabase dikes in the area of MW-7d was required. The geophysical study indicated the possible presence of three diabase dikes in this area. Three deep wells (MW-14d, MW-15d, and MW-16d) were proposed immediately adjacent to each of the three dikes to evaluate if the fractures caused by the dikes were possible acting as a sump for impacted ground water to travel in the bedrock.

These wells have not yet been installed due to the difficulty getting a drill rig to the proposed well locations. These wells are to be located in the wetlands. There is a small stream that runs near them which is a tributary to Middle Creek. We have been awaiting a time when access would be easier and least amount of damage would be done to the wetland. We expect to install the wells early this summer weather permitting.

Although the Ground Water Quality Monitoring Plan has not been modified to reflect the addition of the four new bedrock monitoring wells, these wells have continued to be monitored since they were installed. The most recent ground water monitoring event was conducted in November 2002. The results of this event indicate detectable levels of inorganic constituents (barium, chromium, cobalt, tin and zinc) in monitoring wells MW-4b, MW-4d, MW-6, MW-7, MW-7d, MW-8d, MW-9c, MW-9d, MW-10, MW-12b, and MW-13d. These levels are likely due to turbid samples and siltation in the wells. Of the inorganic constituents, only cobalt and tin were found above the ground water standards, simply because there are no ground water standards for those constituents.

Analysis of organic constituents indicated detectable levels in monitoring wells MW-4b, MW-7, MW-7d, MW-12b, MW-13d and PZ-3. One pesticide, 2,4-D, was detected in monitoring wells MW-6 and MW-7. None of these constituents (organic and pesticide) were detected at levels above the ground water standards. Although the detection of cis-1,2 dichloroethene in MW-7d was found to be statistically significant, Sen's Slope Estimator indicates a decreasing trend for this constituent in this well. These data were submitted to NCDENR in February 2003 in the Semi-Annual Ground Water Monitoring Report.

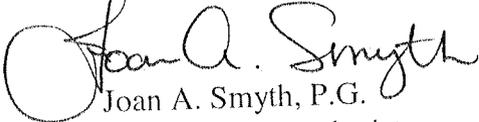
Ms. Marks
4/10/03
Page 3

Based upon the ground water assessment and subsequent ground water monitoring, it appears that the only area that requires additional assessment is the area where the three wells (MW-14d, MW-15d, and MW-16d) were proposed. It is unlikely that additional wells will be necessary in the proposed C&D footprint as this area is cross-gradient from Phase 3.

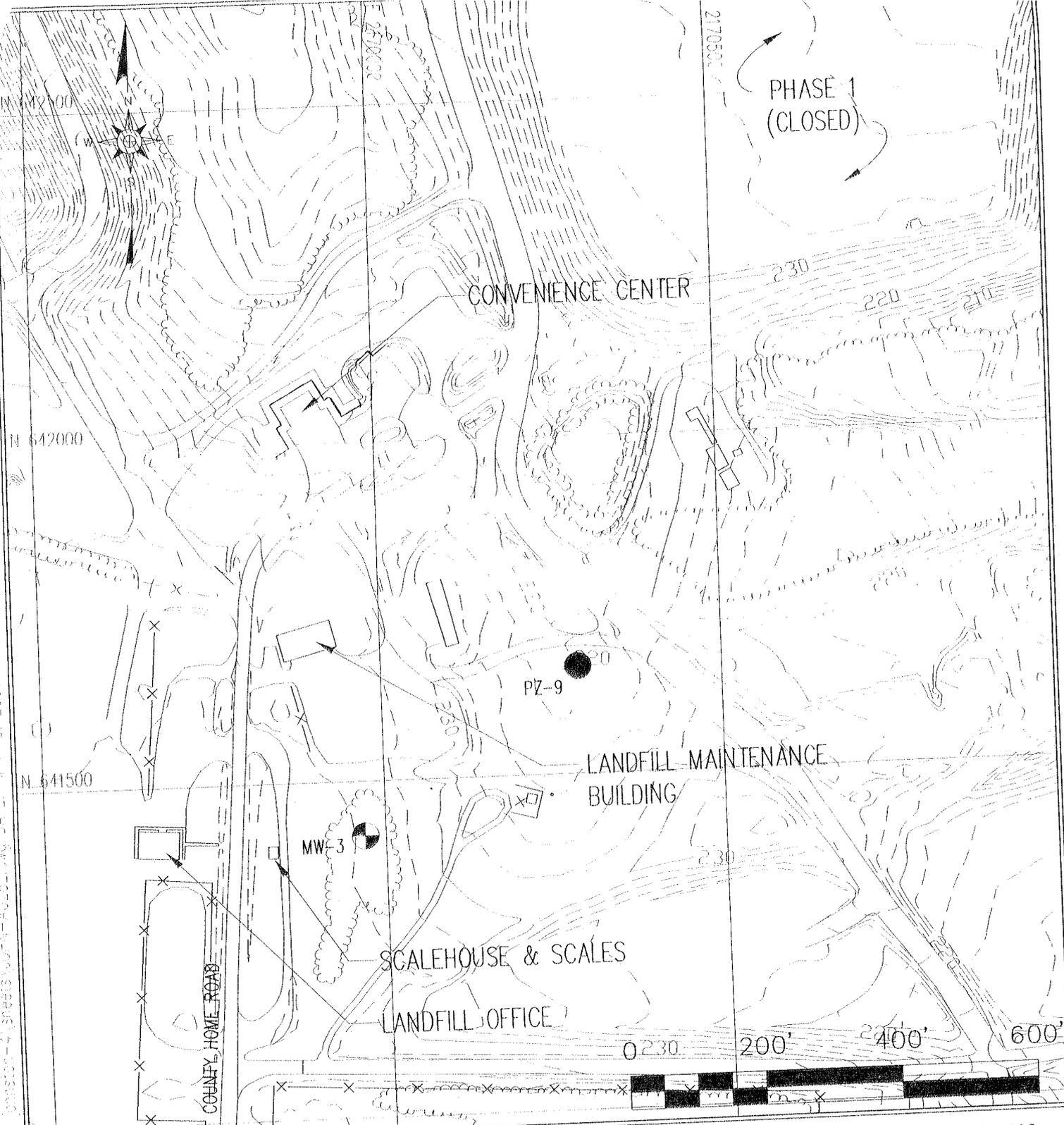
If you have any questions, or require additional information, please contact me at your earliest convenience.

Sincerely,

G. N. Richardson and Associates, Inc.


Joan A. Smyth, P.G.
Project Hydrogeologist

cc: Tim Broome - Johnston County

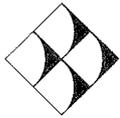


WELL LOCATION MAP

G.N. RICHARDSON & ASSOCIATES, INC.
Engineering and Geological Services

14 N. Boylan Avenue Raleigh, North Carolina
 (919)-828-0577 Fax:(919)-828-3899 www.gnra.com

SCALE: AS SHOWN	DRAWN BY: C.T.J.	CHECKED BY: J.A.S.	DATE: APR. 2003	PROJECT NO. JOHN-4	FIGURE NO. 1	FILE NAME JOHN-A0282
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G.N. RICHARDSON & ASSOCIATES

Engineering and Geological Services

March 3, 2003

Mr. Edward F. Mussler, P.E.
NC DENR Division of Waste Management
401 Oberlin Road, Suite 150
Raleigh, North Carolina 27605



**RE: Landfill Closure Extension Request
Johnston County MSW Landfill - Phase 5 (Permit No. 51-03)
Smithfield, North Carolina**

Dear Ed:

On behalf of Johnston County, G.N. Richardson & Associates (GNRA) would like to update you on the current status of the above referenced landfill unit and request an extension to closure of this landfill unit in accordance with Rule .1627.(c)(5) to allow for anticipated future airspace available due to the continued use of the current leachate recirculation system.

As we discussed in our meeting on February 18th, Phase 5 is currently nearing capacity and the unit will cease to receive waste in the near future. As we mentioned, much of the daily tonnage of the landfill has already been diverted to the new Phase 4A - Cell 1 landfill unit. Operation of the leachate recirculation system has been successful to date and GNRA and the County are in the process of preparing a summary report now that system installation is complete. This report will be forwarded to you in the near future.

The operation of the leachate recirculation system in the Phase 5 landfill unit is expected to provide for some additional airspace due to the accelerated decomposition of the waste. The expected life of the recirculation system is on the order of ten years. Johnston County would, thus, like to request an extension to closure through this period. In order to provide adequate protection of human health and the environment, Johnston County proposes to cover the entire Phase 5 landfill unit with 24 inches of soil cover which will be vegetated. Currently, much of the landfill unit has 18 inches or more of soil cover.

Should you have any further questions or comments on this request or if you require additional information, please contact us at your earliest convenience.

Sincerely,
G.N. Richardson & Associates, Inc.

Pieter K. Scheer, P.E.
Project Manager

Gregory N. Richardson, Ph.D., P.E.
President

cc: Haywood Phthisic, Johnston County
Tim Broome, Johnston County
Rick Proctor, Johnston County
Jim Barber, DWM