11-3-2003

reinhartlaw.com

REINHART
BOERNER▪VAN DEUREN s.c.
ATTORNEYS AT LAW

October 31, 2003

Raymond M. Roder
Direct Dial: 608-229-2206
rroder@reinhartlaw.com

R + R - OSH
RECEIVED
NOV 03 2003
TRACKED ☑
REVIEWED ☐

Jennifer S. Pelczar
Remediation and Redevelopment Program
Wisconsin Department of Natural Resources
Northeast Region Office
625 E. County Road Y, Suite 700
Oshkosh, WI 54901-9731

Dear Ms. Pelczar:

Re: Former FF/NN Landfill
WDNR License # 467
BRRTS # 02-20-00915

Enclosed is a copy of GeoTrans' correspondence to me dated October 29, 2003. The correspondence represents GeoTrans' responses to the Department's suggestions for additional monitoring locations as articulated at the September 23, 2003 meeting in Oshkosh among representatives of U.S. EPA, the Department (including yourself), the City of Ripon, GeoTrans and me as Chair of the PRP Group. The GeoTrans' letter also includes their recommendations to the PRPs regarding the suggested additional monitoring. The PRPs have considered GeoTrans' recommendations and have adopted them as their positions.

Among GeoTrans' recommendations is to use the Hadel and Wiese water supply wells as monitoring wells in exchange for connecting these residences to the public water supply available on Koro Road and Charles Street. We are pursuing those options at this time. If the Department objects or will insist that new monitoring wells be constructed on those properties in addition to converting the Hadel and Wiese wells, please advise me as soon as possible.

If you have any questions about GeoTrans' recommendations, please do not hesitate to contact Mike Noel, Heidi Yantz or Gerald DeMers.

11-11-03
Talked with Jerry DeMers
OK to convert private
wells to MW's.
J. Pelczar

Thank you for your consideration of the above.

Sincerely,

Raymond M. Roder

MADISON\117458RMR:EJW

Enc.

cc Nelson Olavarria (w/enc.)
Bernard Schorle (w/enc.)
Steve Barg (w/enc.)
Heidi Yantz (w/o enc.)

GeoTrans, Inc.
A TETRA TECH COMPANY

175 N. Corporate Drive
Suite 100
Brookfield, WI 53045

www.geotransinc.com

262-792-1282 FAX 262-792-1310

October 29, 2003
(1011.002)

Mr. Raymond Roder
Reinhart Boerner Van Deuren, s.c.
22 East Mifflin Street, Suite 600
P.O. Box 2018
Madison, WI 53701-2018

Re: Response to WDNR Letter and Meeting
FF/NN Landfill, Ripon, WI

Dear Ray:

GeoTrans has prepared this response to the August 13, 2003 letter from Jennie Pelczar of the Wisconsin Department of Natural Resources (WDNR) as well as the September 23, 2003 meeting with the WDNR. In this letter, we reiterate our position on the primary issues and provide our recommendations with respect to the requests for additional site investigation activities.

The primary issues addressed in the August 13, 2003 letter and discussed at the September 23, 2003 meeting with the WDNR deal with differences of opinion between the WDNR and the FF/NN Landfill PRP Group regarding the source of contaminants and the nature and extent of contaminant migration. Understanding the source and extent of contamination is obviously critical to the process of identifying and evaluating feasible remedial action alternatives.

For purposes of this response, we assume that the landfill was the initial source of groundwater contamination. However, we disagree with the WDNR's conclusion that the presence of contamination in the groundwater near the landfill means that the landfill is an ongoing active source of contamination. Our conclusion and related reasoning in this matter was provided in detail in our May 14, 2003 letter and presented at the September 23 meeting. The primary evidence for our conclusion includes:

- The landfill has been capped which the WDNR acknowledges does decrease further infiltration of water into the waste material, thus decreasing the contaminant input to the groundwater.
- In general, groundwater concentrations near the landfill have decreased since the cap was installed.
- Since the cap was installed, leachate has dropped to near non-existent levels, thus demonstrating the effectiveness of the cap at minimizing infiltration.
- The minor amount of leachate that can be sampled does not contain any of the contaminants observed in downgradient groundwater.

- The bottom of the waste is 20 feet above the water table, which prevents the leaching of contaminants via flow-through groundwater.
- Landfill gas is not an apparent source of VOCs as there is little gas being generated.

On this last point, because the WDNR does not believe the use of groundwater monitoring wells for gas monitoring is appropriate, we recommend accepting the request of the WDNR to install four gas probes to evaluate landfill gas migration. If the new gas probes confirm that landfill gas is not a problem at this site then no remedial alternatives for the landfill proper (e.g. gas control) will be considered in the Feasibility Study.

← Need several qtrly rounds to show this

At the meeting, we also explained the process of matrix diffusion. Under this process contaminants advance through relatively permeable pathways in heterogeneous media (the "matrix"), concentration gradients cause diffusion of contaminant mass into the less permeable media and thereby retard solute velocity relative to ground water velocity. This process can be quantified at this site by comparing the calculated advective flow velocity of 657 feet per year as noted in the Remedial Investigation with the apparent contaminant travel time of approximately 75 feet per year based on the observed contaminant extent. The retardation factor, R, is the ground-water flow velocity relative to velocity of dissolved contaminant movement, which in this case would be approximately 9 (657 ft/yr / 75 ft/yr).

Conversely, desorption can cause a concentration rebound. As normal advective flushing reduces dissolved contaminant concentrations, contaminants sorbed to subsurface media desorb from the matrix and dissolve back into groundwater. In this respect, the sorbed contaminants within relatively lower permeability matrices (such as silt and clay layers in the unconsolidated deposits and the sandstone matrix adjacent to fractures and bedding planes in the bedrock) act as a secondary source of contaminants. Typically, this phenomenon is most dramatically observed when contaminant rebound occurs after a pump and treat system is turned off.

As discussed above, the presence of contamination in the groundwater near the landfill does not mean that the landfill is an ongoing active source of contamination. As a function of reverse matrix diffusion, groundwater contamination can persist even after source control has been implemented successfully.

Additional Site Investigation Activities

In their August 13, 2003 letter and during the September 23, 2003 meeting, the WDNR requested additional site investigation activities. Those activities are noted below (shown in italics), along with GeoTrans' recommendations.

Requested in August 13, 2003 Letter

- *Due to the increased contaminant concentrations in MW-112, the WDNR requested that the wetland pond downgradient of this well be sampled for VOCs.*

As stated in our May 14, 2003 letter, once the groundwater system is back in equilibrium from the Northeast Asphalt pumping, a sample will be collected from the wetland pond downgradient of MW-112. During the October 2003 groundwater monitoring, water levels were observed in all of the water table wells. This would indicate that the system is near equilibrium. Therefore, contingent upon access permission from Roger Washkovick, a sample will be collected from the wetland pond during the next groundwater monitoring event. -OK

- *Per NR 507.06(3), hydraulic conductivity testing shall be completed on the wells recently added to the monitoring program (MW-3A, MW-3B, P-113A, P-114)*

Hydraulic conductivities for wells MW-3A and MW-3B have already been determined through a pumping test that was conducted for a graduate thesis. MW-3A was measured at 5.1 x 10^{-5} ft/sec (1.6 x 10^{-3} cm/sec) and MW-3B was measured at 7.2 x 10^{-4} ft/sec (2.2 x 10^{-2} cm/sec). The data can be found in Table 3.3 of "Groundwater Flow and Advective Modeling of Contaminant Migration near Ripon, Wisconsin" by Matthew Alan Swanson, University of Wisconsin, 1991.

Hydraulic conductivity testing will be completed on wells P-113A and P-114. This testing will be conducted after any additional wells have been installed so that all wells can be tested during the same field visit. -OK

Requested in September 23, 2003 Meeting

- *Install one well at the top of the sandstone unit between well nests 103 and 107 to investigate the extent of the clay unit and determine if higher concentrations of VOCs are present at depth that may be acting as a secondary source.*

GeoTrans agrees that this would be a good well location to provide information on the nature and extent of impacts at depth nearer the landfill. The well will also be useful to help evaluate the groundwater flow direction at that depth. The borehole for this well will help define the northern extent of the clay unit. GeoTrans proposes to install one well (P-103D) to be screened near the top of the sandstone and nested with MW-103 and P-103 (Figure 1). By nesting it with the two existing wells, this location will also provide information about the vertical gradient that may be influencing the contaminant migration pathway.

- *Install a water table well west and south of well MW-112 to determine if there are impacts to the wetlands related to the recent increase at MW-112.*

To more directly evaluate impacts to the wetlands, GeoTrans believes that surface water sampling as requested in the August 13, 2003 letter and agreed to above is more appropriate at this time, subject to obtaining property access.

- *Install one well near the top of the sandstone unit west of MW-112 and nested with the water table well described above or alternatively nested with well nest 108 to evaluate the potential for migration to the west in the upper sandstone unit.*

GeoTrans does not believe installing a well at this location is appropriate at this time. We would first like to obtain the results from proposed well P-103D, which will be completed in the same unit and nearer the landfill. P-103D will also help confirm the direction of flow. It may be appropriate to install a well as requested if elevated VOCs are detected in P-103D and if the direction of flow is confirmed to be to the west near the landfill.

- *Install one well east of well nest 111 that would be screened near the top of the sandstone to evaluate if high concentrations of VOCs are present at depth at that location that are serving as a secondary source for the deeper plume.*

The issue that is driving this proposed well location is the apparent westerly groundwater flow direction in the upper sandstone. The WDNR is speculating that impacted groundwater had migrated in the southeast direction from the landfill, which is now serving as a secondary source that is feeding a plume that is migrating to the west.

GeoTrans does not believe that additional delineation east of well nest 111 is necessary. There is historical data from several WP&L wells showing that the centerline of the vinyl chloride plume is traveling directly south from the landfill. During the remedial investigation, vertical profiling results showed that the Bosveld well and P-107D had concentrations ranging from 5 to 48 ppb. However, concentrations from WP&L well nest #2, located east of the Bosveld property and southeast of the landfill, showed that concentrations ranged from non-detect to 4.2 ppb. This would indicate that the area southeast of the landfill is on the periphery of the vinyl chloride plume. Current monitoring data confirm this pattern with well P-111D having concentrations ranging from 11-15 ppb yet wells MW-3A and 3B have no detections of vinyl chloride.

The WP&L MW-2 nest location was close to that requested by the WDNR, and its wells were screened at 180, 200 and 280 feet deep. Additional well information is attached. These wells were abandoned prior to the 1994 Remedial Investigation.

- *Install at least one well between P-114 and the Hadel well to serve as a sentinel well for the downgradient private wells. This well would be screened near the top of the sandstone and must be clean, or an additional well would then need to be installed downgradient of it.*

GeoTrans recommends connecting the Hadel and Weise households to the public water supply and converting their private wells to be used as monitoring wells (P-115 and P-116, Figure 1). Converting these two wells will fulfill two important goals. First, the wells will serve as sentinel wells directly downgradient of the vinyl chloride plume. Second, hooking the homes to public water will eliminate them as potential receptors.

- *If vinyl chloride concentrations continue to increase in well P-102, a well should be installed northeast of that well to provide a sentinel well for private wells northeast of the landfill*

GeoTrans agrees that significantly increasing concentrations at well P-102 could merit additional investigation. The type of additional investigation would be determined at that time and depend on the nature and distribution of contaminants, the existing monitor well network and the

direction of groundwater flow. However, given that normal groundwater flow is to the southwest at this well's screen elevation, there is no indication that contamination could be traveling northeast toward private wells except during periods of pumping at the Northeast Asphalt gravel pit. Groundwater elevations at this screen interval have returned to near historical levels, indicating the flow direction is to the southwest. It is also presumed that Northeast Asphalt will not be allowed to pump their gravel pit like they did to cause a flow reversal.

- *The WDNR requested that four gas probes be installed outside of the landfill boundaries, one in each compass direction. In addition, if monitoring wells are to be used as gas wells, they should be equipped with gas collection shut off valves.*

As previously noted we recommend installing four gas probes outside of the landfill boundaries, one in each compass direction. These locations are shown on Figure 1 and placement is dependent on access being authorized by the property owners. Probe GP-2 would be placed in the road right-of-way west of the landfill. The other three probes will be placed 145 feet from the edge of the waste, as allowed by NR 507.11(3)(b).

Each gas probe will be screened from 5 feet below the ground surface to the depth of the waste. Each probe will be provided with a shutoff valve. If property access is not authorized for installation of a particular probe, that gas probe will be placed at the landfill property boundary and outside of the waste boundaries.

With the installation of these gas probes, there is no longer a need to adapt the monitoring wells near the landfill to serve as gas probes.

****

We trust this information meets your needs. If you have any questions please give us a call.

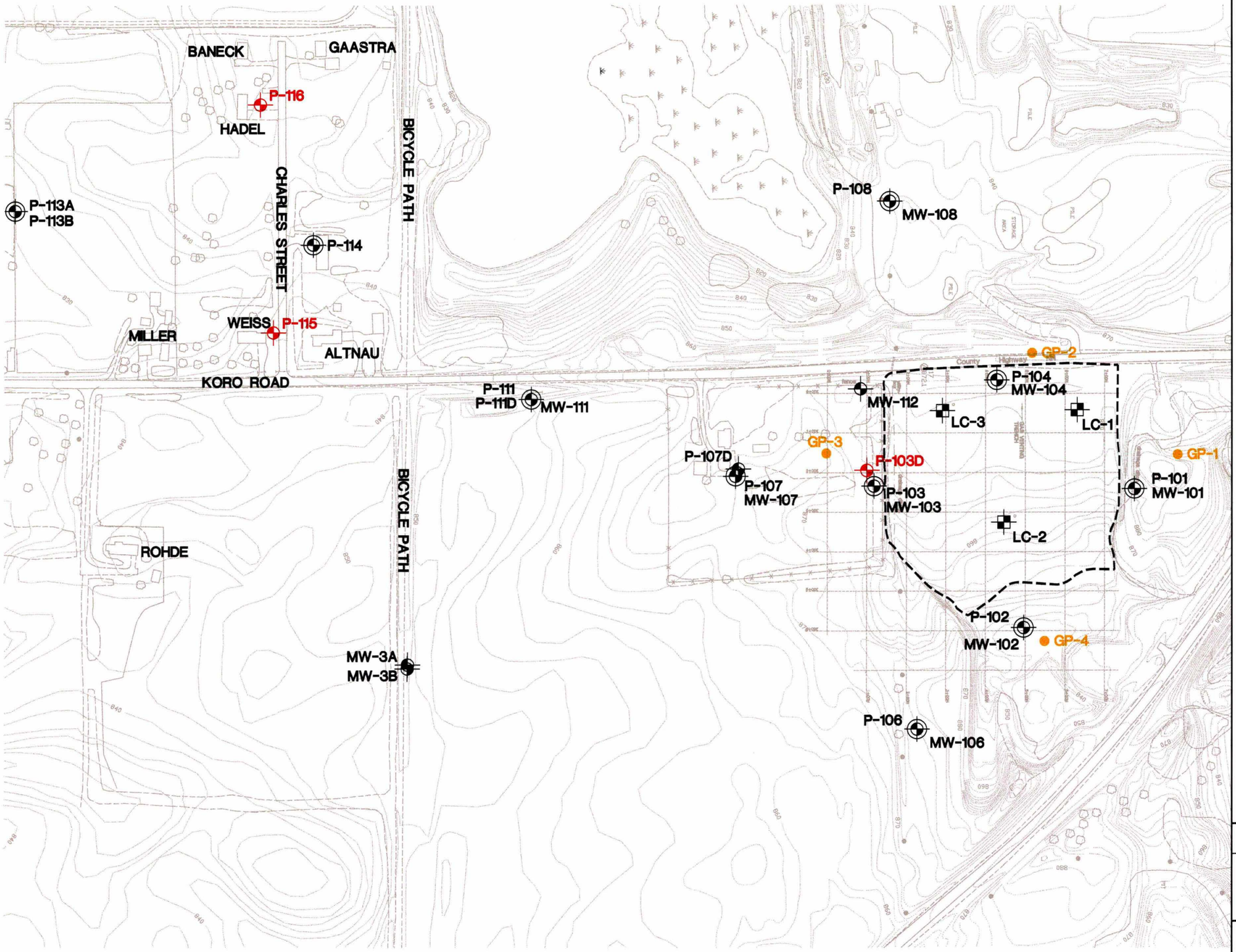
Sincerely,

GeoTrans, Inc.

Gerald L. DeMers
Senior Engineer, Associate

Michael R. Noel
Principal Hydrogeologist

Kevin Lurvick for
Heidi W. Yantz
Project Hydrogeologist



EXPLANATION

- P-104 / MW-104 — MONITOR WELL, PIEZOMETER LOCATION, DESIGNATION
- LC-2 — LEACHATE HEAD WELL LOCATION, DESIGNATION
- OUTLINE OF CLOSED LANDFILL
- P-116 — PROPOSED MONITORING WELL
- GP-1 — PROPOSED GAS PROBE

N

SCALE

0 500

Feet

FF/NN LANDFILL
RIPON, WISCONSIN

PROPOSED MONITORING WELLS AND GAS PROBES

DATE:	10/15/03
DESIGNED:	HWY
CHECKED:	HWY
APPROVED:	GLD
DRAWN:	HJW
PROJ.:	1011.002

GeoTrans, Inc. A TETRA TECH COMPANY

Figure 1

S:\CAD\Ripon\N734\10-15-03\34wl04-lb.dwg 10/15/2003 08:56:22

M. SAUER

A. SAUER

AGRICULTURAL

WETLAND

WOODS

County Highway FF

County Highway NN

MW-9

MW-8

FILL

FILL

QUARRY

FORMER QUARRY

GAS VENTING TRENCH

fence

LEACHATE INTERCEPTOR TRENCH

MW-5

MW-5A

MW-6

utility line

QUARRY

WETLAND

APPROXIMATE LOCATION FOR WP&L WELL NEST #2

FALKENBERG/ BOSVELD

AGRICULTURAL

EXPLANATION

MW-8 — OBSERVATION WELL LOCATION AND DESIGNATION

— — — LANDFILL CAP BOUNDARY

N

SCALE

0 500

FEET

Hydro-Search, Inc.
A Tetra Tech Company
HYDROLOGISTS-GEOLOGISTS-ENGINEERS
Reno • Denver • Milwaukee • Huntington Beach
Sacramento • Houston • Phoenix

Dsgn. by: RAG	Chk. by:	Apprv. by: GLD
PROJECT: 304733096	DATE: 07/14/94	

RIPON FF/NN LANDFILL
RIPON, WISCONSIN

1991 EXISTING CONDITIONS

DRAWING: 1511-b3 FIGURE: RI 2-3

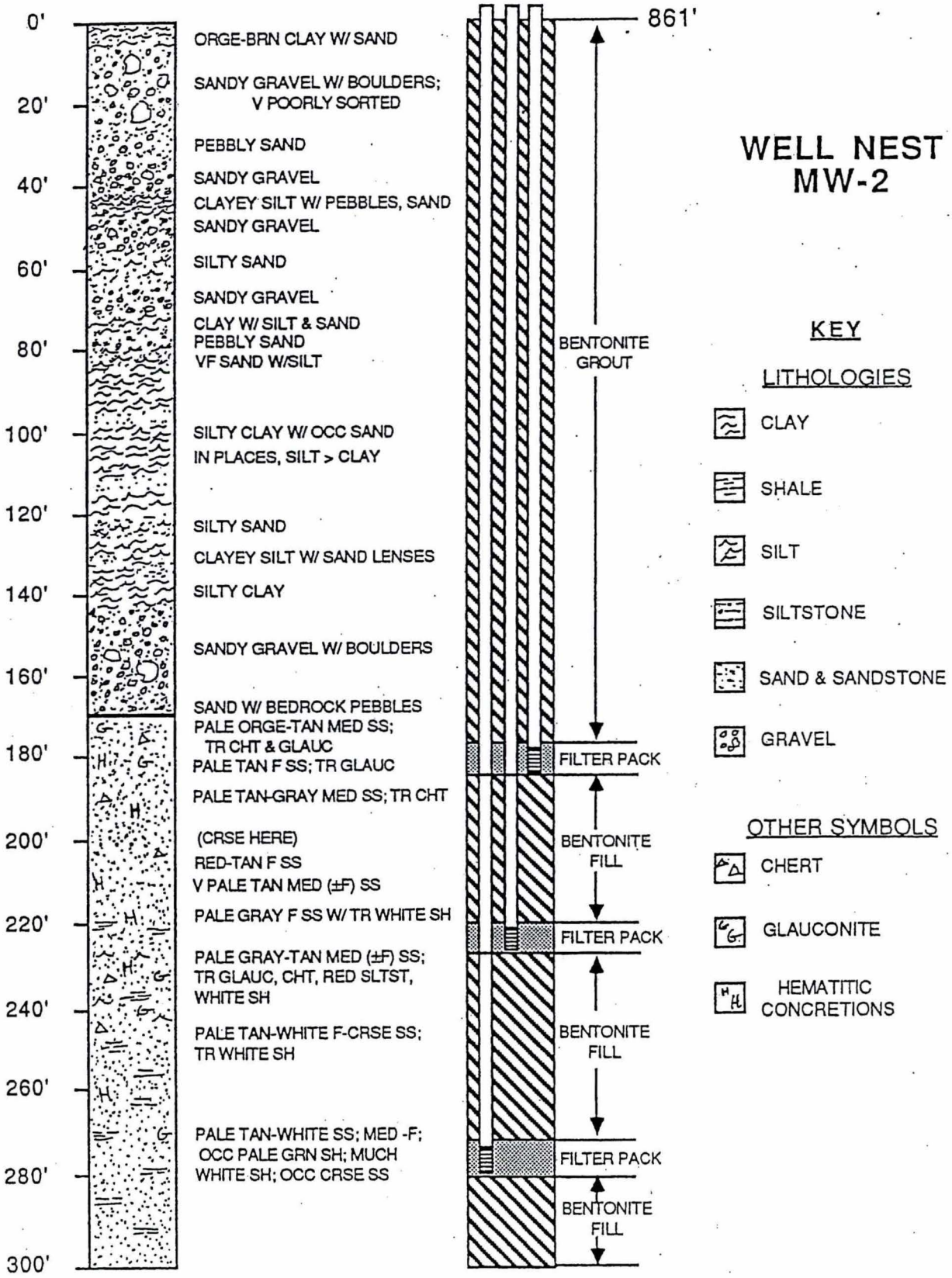
/hsi/473/3096/1511-b3

TABLE 2.1
SUMMARY OF SAMPLING RESULTS

WELL	DATE	VC (µg/l)	DCE (µg/l)	T (µg/l)
MW-1S	11/15/90	0	0	0
	5/5/91	0	0	0
MW-1I	11/15/90	0	0	0
	5/5/91	0	0	0
MW-1D	11/15/90	0	0	0
	5/5/91	0	0	0
MW-2S	11/15/90	4.2	4.2	0
	5/5/91	2.8	5.2	0
MW-2I	11/15/90	0	0	0
	5/5/91	0	0	0
MW-2D	11/15/90	3.4	3.3	0
	5/5/91	0	0	0
MW-3A	2/18/91	0	0	28
	5/7/91	0	0	35
MW-3B	2/18/91	0	0	25
	5/7/91	0	0	15

VC = vinyl chloride
DCE = 1,2-dichlorethylene
T = toluene

Source: "Groundwater Flow and Advective Modeling of Contaminant Migration near Ripon, Wisconsin," Master's Thesis by Matthew Alan Swanson, University of Wisconsin- Madison, 1991.



Source: "Groundwater Flow and Advective Modeling of Contaminant Migration near Ripon, Wisconsin," Master's Thesis by Matthew Alan Swanson, University of Wisconsin- Madison, 1991.