UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, ILLINOIS 60604

SR-6J
Tel: (312)886-7251

DATE: **June 26, 2001**

FROM: Rosita Clarke-Moreno, SR-6J
U.S. EPA Region 5 - Five Year Review Coordinator

TO: Carol Bass, 5204 G
U.S. EPA - HQ

SUBJECT: **Region 5- FY01 Completed Five Year Review Reports**

Enclosed please find the Five-Year Review Reports for:

American Chemical Service, Inc.	04/05/01
Charlevoix Municipal Well Site	05/15/01
N.W. Mauthe	04/26/01
Ripon City Landfill	05/22/01

Enclosures (4)

cc: Mike Ballot, HQ (w/o enclosures)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

MAY 22 2001

REPLY TO THE ATTENTION OF
S-6J

Ms. Jennifer S. Pelczar
WDNR Project Manager
Wisconsin Department of Natural Resources
Northeast Region--Oshkosh
625 E. County Rd Y, Suite 700
Oshkosh, WI 54901-9731

Re: Ripon City Landfill (Ripon FF/NN Landfill), Ripon, Wisconsin--Five-Year Review Report

Dear Ms. Pelczar:

The U. S. Environmental Protection Agency (U. S. EPA) has reviewed the above referenced Five-Year Review Report dated May 2001. The report was prepared by the Wisconsin Department of Natural Resources, Northeast Region (Oshkosh), and signed by you on May 7, 2001. The report is hereby approved.

U. S. EPA appreciates your efforts in conducting this review. Please feel free to contact me if you have any questions.

Sincerely,

Wm. E. Muno

William E. Muno, Director
Superfund Division

Five-Year Review Report

First Five –Year Review Report
Ripon City Landfill
(Ripon FF/NN Landfill)
Ripon
Fond du Lac County, Wisconsin

U.S. EPA ID # WID 980610190

May 2001

Prepared by:

Wisconsin Department of Natural Resources
Northeast Region
Oshkosh, Wisconsin

I. Introduction

Wisconsin Department of Natural Resources (WDNR) has conducted the first five-year review of the remedial action (RA) implemented at the Ripon City Landfill (Ripon FF/NN Landfill) site, Ripon, WI (Fond du Lac County), a National Priorites List (NPL) site. This is a statutory five-year review intended to determine whether the current remedy is protective of human health and the environment. It is a statutory review because there was a post-SARA (Superfund Amendments and Reauthorization Act of 1986) remedial action that upon completion left hazardous substances, pollutants, or contaminants on the site above levels that allow unlimited use and unrestricted exposure. It is a basic review since there have been no indications that a deeper review is necessary. The review consisted of an evaluation of the results of the monitoring data and other information submitted for the site since construction was completed and a site visit. This report documents the results of the review.

Under section 121 of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 as amended by the Superfund Amendments and Reauthorization Act of 1986 (CERCLA), and under section 300.430(f)(4)(ii) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) (in Title 40 of the Code of Federal Regulations), periodic reviews, no less often than every five years, are required for sites where hazardous substances, pollutants, or contaminants remain at the site above levels that will allow for unlimited use or unrestricted exposure following the completion of all remedial actions for the site. USEPA's Office of Solid Waste and Emergency Response (OSWER) has provided guidance for conducting the five-year reviews. These documents are: *Structure and Components of Five-Year Reviews*, OSWER Directive 9355.7-02, May 23, 1991; *Supplemental Five-Year Review Guidance*, OSWER Directive 9355.7-02A, July 26, 1994; and *Second Supplemental Five-Year Review Guidance*, OSWER Directive 9355.7-03A, December 21, 1995.

II. Site History

A. Early History

The Ripon FF/NN Landfill (the Site) is located outside the northwestern city limits of Ripon, Wisconsin (see Figure 1). The landfill contains approximately 180,000 cubic yards of waste and resides on 7.3 acres in the northwest corner of Fond du Lac County in the Town of Ripon, Wisconsin (SE ¼ of the SE ¼ of Section 7, T16N, R14E). The Site is bordered on the north by a forest, on the west by a sand and gravel quarry, on the south by an old residence and on the east by a former quarry (see Figure 2). A wetland area is located to the southwest and is the shallow groundwater discharge area

The Site started out as a gravel pit, and in 1967 the property was leased to Speed Queen until 1968. The city of Ripon started leasing the property in 1968, and in 1969, was issued a license to operate the landfill (WDNR license # 467). In 1978, the City and Town of Ripon were signatory to the lease until 1983. The Site was capped with clay in 1985. In addition, a gas venting system was placed in a north – south orientation along the western edge of the landfill. From 1985 to 1992, hay was grown on the cap and then

discontinued in 1993 because of disturbance to the clay cap's integrity. The site accepted municipal, commercial and industrial solid wastes. Approximately 3,300,000 gallons of biologically processed sludge from the Ripon Wastewater Treatment Facility was disposed at the landfill between 1977 and 1983. The landfill has no liner or leachate collection system.

In 1984, volatile organic compounds (VOCs) were detected in a private water supply well located 350 feet south of the landfill. Sampling of a replacement well confirmed the elevated levels of VOCs at this location. The city of Ripon then purchased the property.

In May 1994, the Site was added to the NPL. A remedial investigation was conducted in August of 1994 and a feasibility study was submitted in December 1994. A Record of Decision (ROD) was signed on February 26, 1996 to specify the remedy. A composite landfill cap, passive gas venting in conjunction with a groundwater monitoring plan, and site maintenance was the remedial alternative selected. EPA signed a preliminary close out report signifying construction completion, on September 25, 1996. A construction documentation report for the final cover was submitted on June 23, 1997 and was approved by WDNR on July 18, 1997. Semi-annual monitoring began in May 1996.

B. Results of Site Investigation

The stratigraphy of the Site consists of waste material (0-25 feet thick) over unconsolidated glacial deposits (150 - 180 feet thick), primarily sand with some silty lenses, over Cambrian sandstone (150 feet thick). At approximately 330 feet in depth, the Precambrian granite is encountered. The glacial sand unit and the Cambrian sandstone are the two primary resources for both municipal and private wells in the area. The groundwater in the upper aquifer varies in depth from 5 to 50 feet and flows in a southwesterly direction. The water table is located approximately 20 feet below the base of the landfill. Based on regional information, groundwater flow in the sanstone is to the west. The hydraulic conductivity of the sandy glacial deposits and the Cambrian Sandstone ranged from 1.3×10^{-1} cm/sec to 1.4 cm/sec respectively.

An estimated 6 to 11 million gallons of leachate was within the landfill prior to installation of the composite cap. The landfill does produce a minimum amount of methane gas; however, the risk of explosion is extremely low. Leachate samples showed elevated levels of VOCs, both chlorinated and petroleum hydrocarbon related compounds.

A total of eight VOCs were detected in groundwater monitoring wells. Vinyl chloride, cis-l,2-dichloroethylene (cis-l,2-DCE), benzene, trichloroethylene (TCE), and tetrachloroethylene (PCE) were present at concentrations exceeding the preventive action limit (PAL) of Chapter NR 140, Wis. Adm. Code. Two of these compounds, vinyl chloride and cis 1,2-DCE exceeded WDNR NR 140 Wis. Adm. Code Enforcement Standards (ES). The WDNR has two groundwater standards; the PAL is used as an early warning system and the ES is a minimum enforceable cleanup standard and defines when action must be taken.

Following the groundwater flow paths, leachate exits from under the landfill and mixes with the groundwater and flows south-southwest. The discharge point for this contaminated groundwater is the wetland located southwest of the Site. Concentrations of VOCs in groundwater entering the wetland are low enough so as to not cause a problem to the wetland. The highest concentrations of VOCs are present along the southern edge of the landfill.

On March 30, 1995, the Wisconsin Division of Health completed a Public Health Assessment (PHA) of the Site. The PHA concluded that groundwater beneath and next to the Site is contaminated with VOCs at concentrations that could pose a health hazard if this water were used for domestic purposes such as drinking. In addition, lecachate seeps along the eastern edge of the landfill could also represent health risks where people could come into contact with the seeps. The PHA concludes that if the contaminated groundwater for domestic purposes is restricted, and the leachate seeps are eliminated, then the site will not pose a threat to human health. The contractor hired to install the composite cap mobilized to the Site on May 13, 1996.

C. Remedies and On Site Remedial Work

In response to the WDNR recommending the Site to EPA for inclusion on the NPL, several Potentially Responsible Parties (PRPs) formed a group to investigate the degree and extent of the environmental problems related to the Site. This group of PRPs entered into a contract with the WDNR on August 14, 1992 to complete the following:

- Conduct a remedial investigation (RI) which will adequately characterize the Site.
- Perform a feasibility study (FS) to identify and evaluate potential remedial options for the Site.
- Prepare plans and specifications for a landfill cap and passive landfill gas venting system (source control operable unit (OU)), that was to be selected and approved by WDNR. The OU might include any or all of the following: construction of a new, or repair of the existing landfill cap, and installation of a gas venting system, as necessary to comply with NR 500 series of the WI. Adm. Code and the OU ROD for the site prepared by the WDNR.
- Implement the source control operable unit.

The PRP group completed the RI and FS, and data from these documents were used to develop the ROD.

The ROD addressed a source control operable unit and a groundwater operable unit. The selected source control remedy was a composite landfill cap and passive gas venting in conjunction with a groundwater-monitoring plan. Specific components of the source control operable unit included:

- constructing a composite landfill cover (i.e. a landfill cap made with both a plastic membrane and soil materials) over the entire landfill;
- installing a passive landfill gas venting system as part of the composite cap to effectively vent landfill gas from the waste;

- monitoring of the groundwater quality to determine the effectiveness of the landfill cap towards improving groundwater quality;
- monitoring the passive landfill gas probes around the landfill to make sure that landfill gas is not migrating away from the Site in an uncontrolled manner;
- maintenance of the landfill cap to repair erosion that may develop;
- a deed restriction prohibiting disturbing the landfill cap except for maintenance purposes; and
- fencing of the landfill perimeter to restrict access.

The groundwater operable unit included a specific groundwater monitoring plan to sample private wells downgradient of the source area and groundwater monitoring wells around the Site. The goals of this plan included:
- effectively monitor contaminant concentrations with time; and
- determine that contaminants from the landfill don't affect any of the private residences located near the site.

III. Construction, Monitoring, and Operation and Maintenance

The landfill cap/gas venting system construction was completed and an as built report was submitted dated June 23, 1997. The cap consisted of: passive gas collection trenches within the waste, 6-12 inches of sandy clay, 24 inches of compacted clay, 40 millimeter thick low density polyethylene geosynthetic membrane, 12 inches of granular drainage material and piping, geofabric filter over granular drainage layer, 18 inches of fill soil over the geofabric, and final cover of 6 inches of topsoil to establish vegetation. A fence restricts access and the Site is mowed when necessary.

Beginning in May of 1996, the initial sampling schedule included: 11 groundwater monitoring wells (7 monitoring wells and 4 piezometers) on a semi-annual basis for VOCs; 7 potable drinking water wells located south - southwest of the landfill annually for VOCs; and 3 leachate head wells (depending upon a sufficient quantity of leachate available). A twelfth well was added in the second semiannual event. Four monitoring wells (2 monitoring wells and 2 piezometers) were removed from the sampling program in October 1998 when it was determined that the wells/piezometers were consistently free of detectable VOC concentrations. Landfill gas (methane, carbon dioxide, and oxygen) were measured from 12 passive gas vents, 3 leachate head wells, 4 and groundwater monitoring wells within and around the landfill (See Figure 3 for location of gas vents, leachate head wells, and monitoring wells).

There have never been any detectable levels of contaminants in the private water supply wells for the parameters analyzed. The leachate head wells showed decreasing amounts of leachate within the landfill. The recent head elevations indicate the volume of leachate has been reduced to approximately 2 to 3 million gallons as compared to the original 6 to 11 million without the new cap. The base of the landfill is approximately at 841 feet above mean sea level (msl). The level of leachate in the landfill has dropped from approximately 853 feet msl in 1993 to 842 feet msl in 2000, a difference of 11 feet. The composite cap is significantly reducing the amount of leachate produced, and therefore

reducing the amount of leachate reaching the groundwater, which is approximately 20 feet below (820 feet msl) the bottom of the landfill.

Concentrations of VOCs in the groundwater monitoring wells have decreased since the installation of the composite cap. The number of wells exceeding the PALs has reduced from 11 to 4 (See Figure 4 for isoconcentration map of VOCs).

The composite cap has provided an effective barrier to the waste, reducing the percolation of precipitation through the waste and promoting drainage of the surface off the landfill. The reduced production of leachate and decreasing concentrations of the contaminants in the groundwater show that the composite cap is working.

IV. Remedial Objectives

Remedial action objectives were developed for this site to address the source of contamination, to provide short term and long term protection of human health and the environment and to meet applicable or relevant and appropriate requirements. The site specific remedial objectives developed for this site include:

- prevent direct contact with landfill contents
- reduce contaminant leaching to the groundwater
- control surface water runon, runoff and erosion
- prevent off-site migration of landfill gas
- restore groundwater quality to NR 140 standards
- monitor groundwater quality, landfill gas and leachate for environmental control.

V. Community Relations Activities

There has been very little community involvement with this site, other than the work the PRP group is conducting. The WDNR Oshkosh office is the repository and all reports can be reviewed there.

VI. Applicable or Relevant and Appropriate Requirements

Long term use of this land will remain as a closed landfill. A deed restriction is currently in place that would restrict any construction on the Site or modifications to the cap. Wisconsin Adm. Code NR 812 forbids construction of a public waterpa supply well within 1200 feet of a landfill. A variance may be requested to install a well within this 1200 feet, but WDNR approval is necessary.

VII. Site Visit

The WDNR remedial project manager visited the Site on March 23, 2001. The Site remains as a large sloping hill with grassy vegetation. The grassy vegetation is mowed at least once a year to prevent deep rooting plants from developing. The property is properly fenced and signs are posted to alert unauthorized persons from entering the Site.

The cap, and all gas vents, monitoring wells and leachate head wells are in good condition.

VIII. Statement of Protectiveness

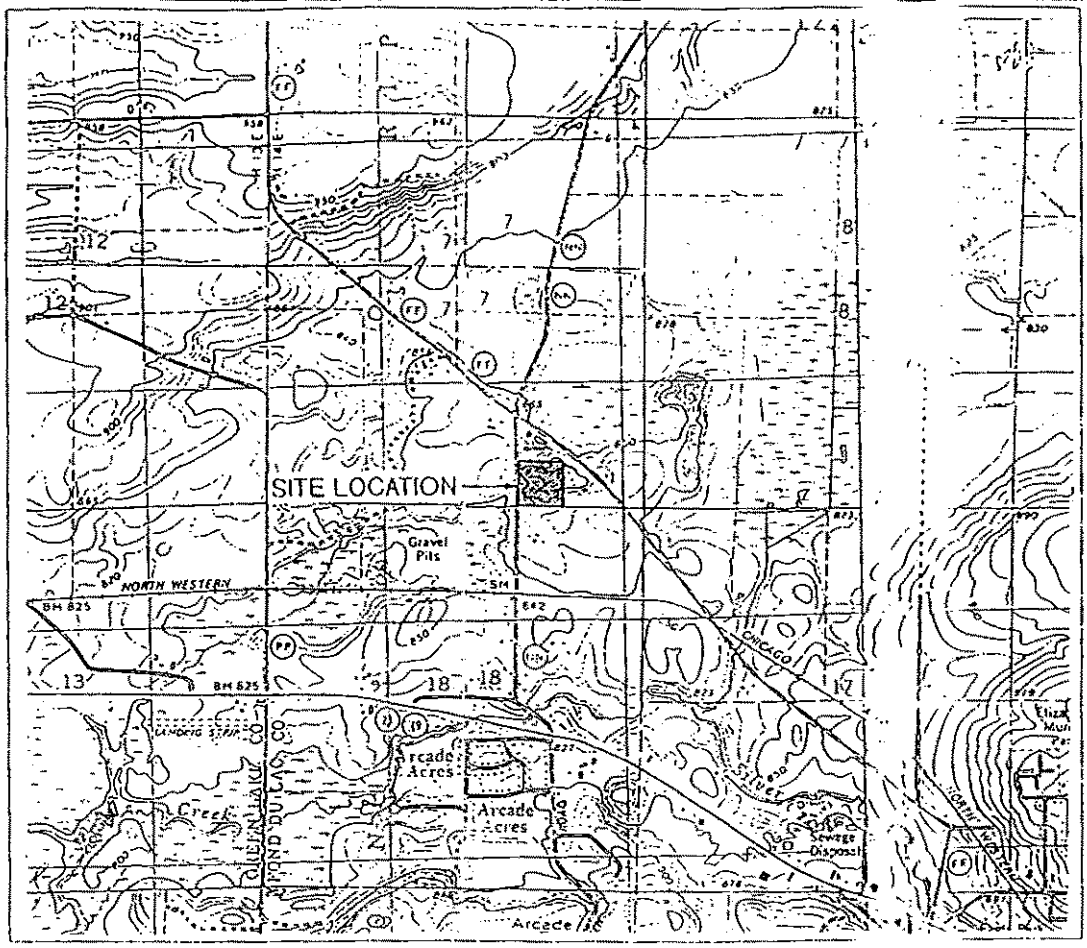
The WDNR certifies that the remedy selected for this Site remains protective of human health and the environment based upon the current evaluation of site conditions and the monitoring results. The deed restriction prevents/controls contact with waste that is present at the site. The cap is preventing exposures to wastes.

IX. Next Review

The next 5-year review will be completed by May 2006.

Jennifer S. Pelczar
WDNR Project Manager
Hydrogeologist

5-7-2001
Date



QUADRANGLE LOCATION

SCALE

0 5000

FEET

National Geodedic Vertical Datum of 1929
Contour Interval 10 Feet

Base map from U.S.G.S. 7.5' Berlin, Green Lake, Ripon, and Rush Lake, WI, topographic quadrangle maps, photorevised 1980.

RIPON FF/NN LANDFILL
RIPON, WISCONSIN

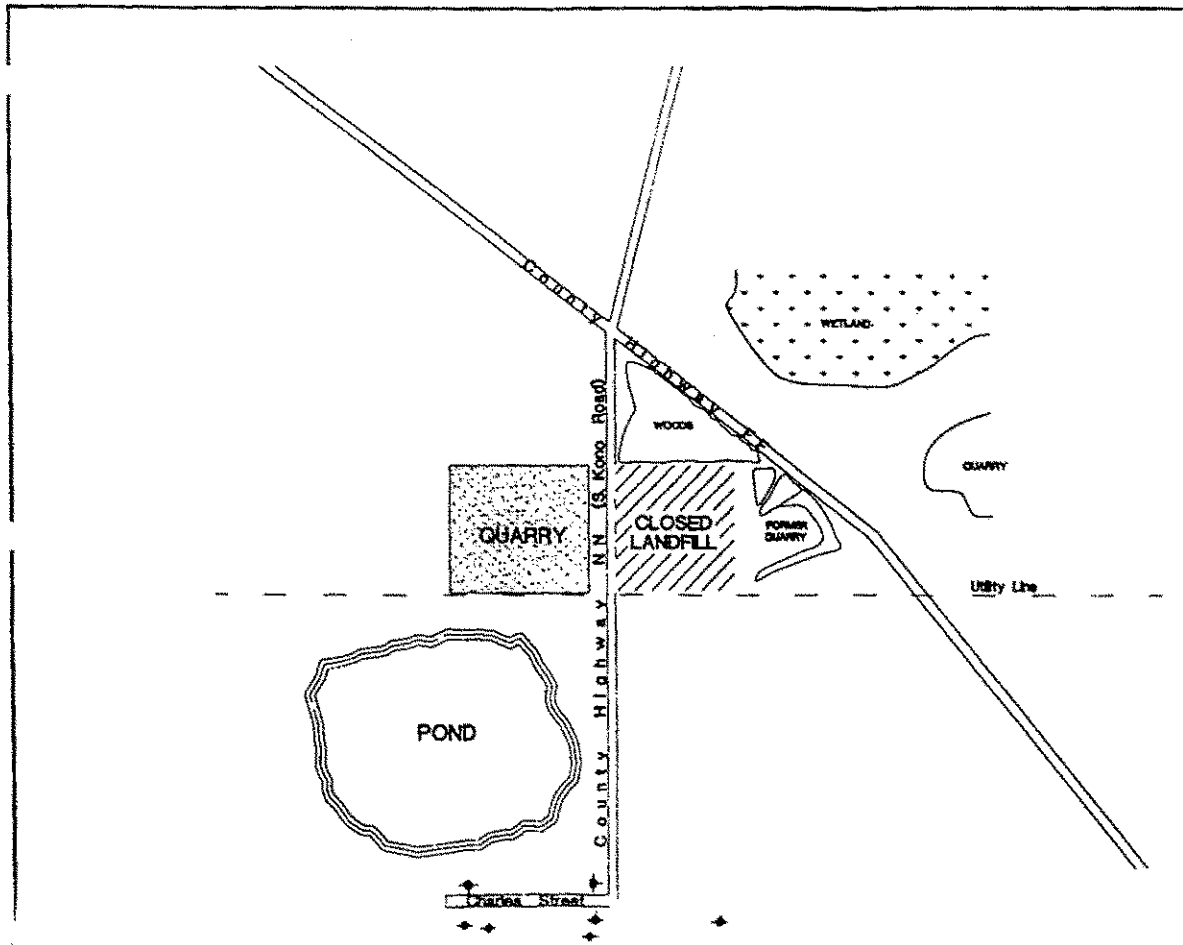
SITE LOCATION AND LOCAL TOPOGRAPHY

HSI GEOTRANS

DATE:	12/08/00
DESIGNED:	MCL
CHECKED:	VJF
APPROVED:	JEN
DRAWN:	MCL
PROJ.:	N734-104

Figure 1

S:\cad\Ripon\old-files\34vn05-a.dwg 12/08/2000 104538



EXPLANATION

✦ PRIVATE WELL LOCATION AND DESIGNATION

N

NOT TO SCALE

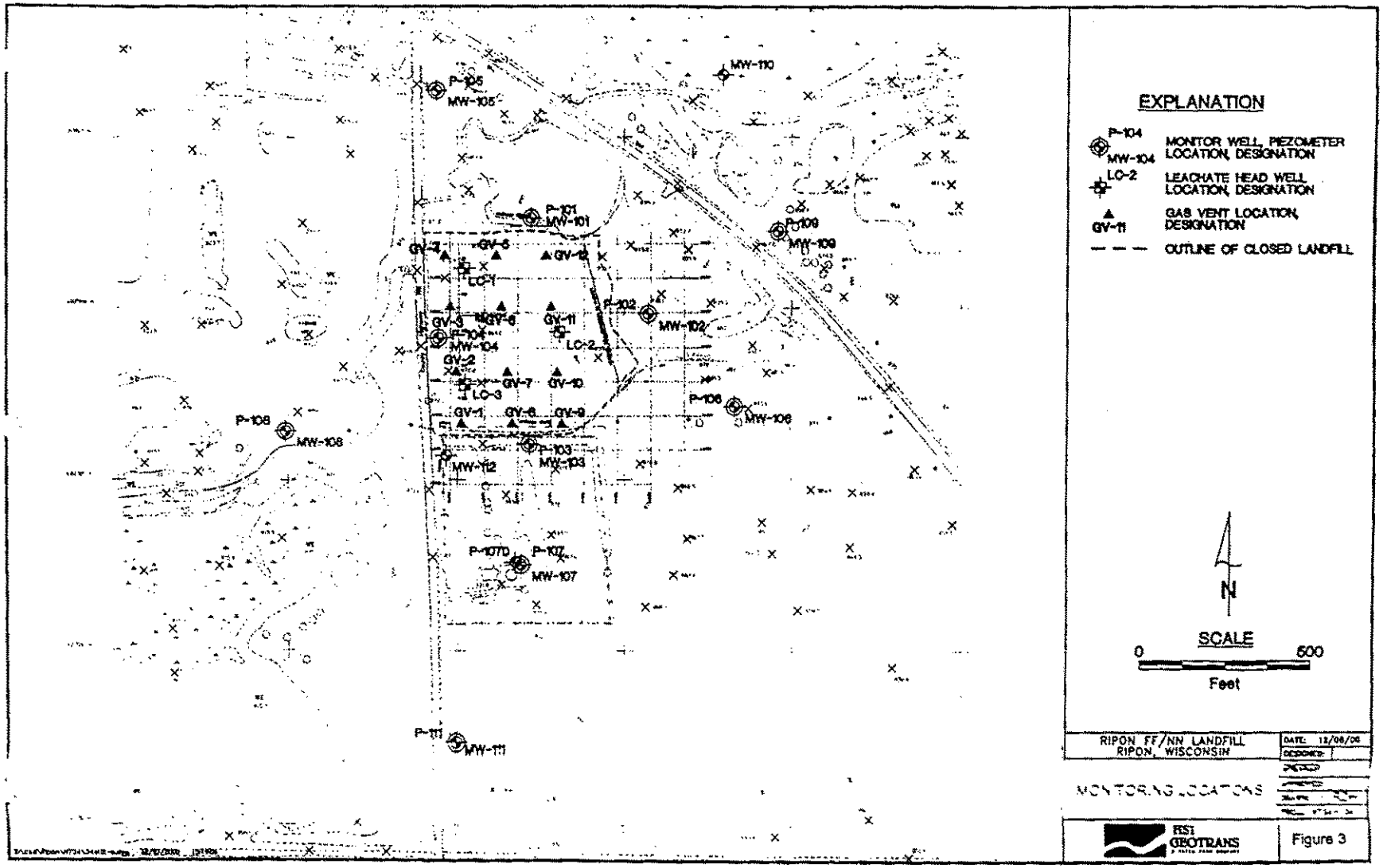
NOTE: WELL INFORMATION FROM CITY OF RIPON FILES.

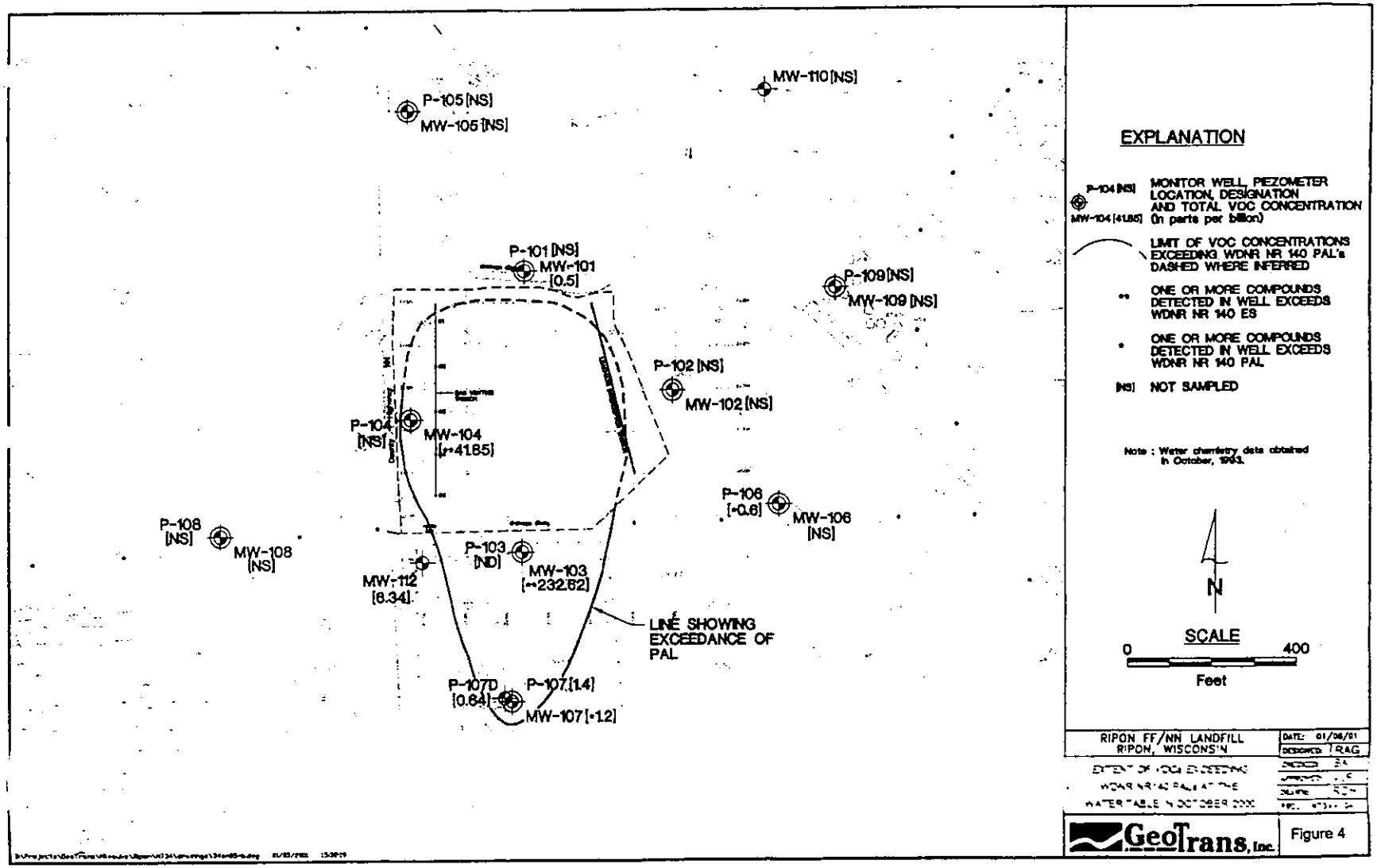
RIPON FF/NN LANDFILL
RIPON, WISCONSIN

PRIVATE WELL LOCATIONS

GeoTrans, Inc.

Figure 2


MW-110
P-105
MW-105
P-101
MW-101
P-109
MW-109
GV-4
GV-5
GV-12
LC-1
P-102
MW-102
GV-3
GV-6
GV-11
P-104
MW-104
LC-2
GV-2
GV-7
GV-10
LC-3
P-106
MW-106
GV-1
GV-8
GV-9
P-108
MW-108
P-103
MW-103
MW-112
P-107D
P-107
MW-107
P-111
MW-111
EXPLANATION
P-104
MW-104
MONITOR WELL, PIEZOMETER LOCATION, DESIGNATION
LC-2
LEACHATE HEAD WELL LOCATION, DESIGNATION
GV-11
GAS VENT LOCATION, DESIGNATION
OUTLINE OF CLOSED LANDFILL
N
SCALE
0
500
Feet
RIPON FF/NN LANDFILL
RIPON, WISCONSIN
DATE: 12/06/05
MONITORING LOCATIONS
FSI GROTRANS
Figure 3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LINE SHOWING
EXCEEDANCE OF
PAL
P-107D
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P-107 [1.4]
MW-107 [=1.2]
EXPLANATION
P-104 [NS]
MW-104 [4185]
MONITOR WELL, PIEZOMETER
LOCATION, DESIGNATION
AND TOTAL VOC CONCENTRATION
(in parts per billion)
LIMIT OF VOC CONCENTRATIONS
EXCEEDING WDNR NR 140 PAL's
DASHED WHERE INFERRED
** ONE OR MORE COMPOUNDS
DETECTED IN WELL EXCEEDS
WDNR NR 140 ES
* ONE OR MORE COMPOUNDS
DETECTED IN WELL EXCEEDS
WDNR NR 140 PAL
[NS] NOT SAMPLED
Note : Water chemistry data obtained
in October, 1993.
N
SCALE
0
400
Feet
RIPON FF/NN LANDFILL
RIPON, WISCONSIN
DATE: 01/26/01
DESIGNED R&G
EXTENT OF VOCs EXCEEDING
WDNR NR140 PAL AT THE
WATER TABLE IN OCTOBER 2000
GeoTrans, Inc.
Figure 4