ABB
ASEA BROWN BOVERI

March 28, 1994

Mr. David Mosby
Missouri Department of Natural Resources
P.O. Box 176
Jefferson City, MO 65102-0176

Subject: Transmittal of 1993 Annual Groundwater Monitoring Report
Sullivan Landfill
Sullivan, Missouri

Dear Mr. Mosby:

Enclosed are two copies of the final 1993 Annual Groundwater Monitoring Report for the Sullivan Landfill. This report summarizes the results of the two sampling events conducted during 1993, and briefly evaluates trends in the data since the initial monitoring well sampling during 1992.

We are planning to conduct sampling during April and August 1994 and are currently assisting the PRP Group with selection of a contractor to conduct the 1994 sampling program. The selected contractor is also tentatively anticipated to conduct the 1995 and 1996 post-closure monitoring program, which will be quarterly as defined in the Sullivan Landfill Closure Plan and Supplement (October, 1993).

If you have any questions about this report, please feel free to contact either Mark Stelmack (207-828-3592) or myself (207-828-3500).

Sincerely,

ABB ENVIRONMENTAL SERVICES, INC.

Andrew J. McCusker
Project Manager

Enclosure

cc: C. Bingham, TRW

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EXECUTIVE SUMMARY

ABB Environmental Services, Inc. (ABB-ES) and its subcontractor, Moore and Associates, performed the 1993 Groundwater Monitoring Program at the Sullivan Landfill site in Sullivan, MO. Groundwater samples were collected from six monitoring wells and the Voss well in February and August of 1993. A seventh shallow monitoring well was sampled during the August event. Groundwater samples were analyzed for volatile organic compounds (VOCs) and Target Analyte List (TAL) inorganics.

The 1993 analytical results extended trends observed in groundwater sample results dating from 1992 at the landfill site. The only VOCs detected above the laboratory's Practical Quantitation Levels (PQLs) were trichloroethene (TCE), toluene, methylene chloride, 1,1-dichloroethane (1,1-DCA), trichlorofluoromethane (TCFM), and dichlorofluoromethane (DCFM). The TCE, toluene, 1,1-DCA, TCFM, and DCFM concentrations were all below the federal and Missouri Department of Natural Resources (MDNR) standards. The methylene chloride concentrations were also low and there is no regulatory standard for this compound in groundwater. Manganese was the only inorganic element detected above either federal or MDNR standards; manganese exceeded the secondary MCLs, which are not promulgated health-based standards. These sample results confirm that the diffuse groundwater flow system in the vicinity and downgradient of the site has not been significantly impacted by landfill wastes.

1.0 INTRODUCTION

This report presents the results of the August 1993 semi-annual groundwater sampling event conducted at the Sullivan Landfill, and serves as the 1993 Annual Report, addressing water quality trends based on evaluation of the 1992 and 1993 results.

1.1 BACKGROUND

Six bedrock monitoring wells were installed by ABB-ES and its subcontractor, Geotechnology Services, Inc., of St. Louis, MO at the Sullivan Landfill in the spring of 1992. (For well locations see Figure 1). The monitoring wells were installed to

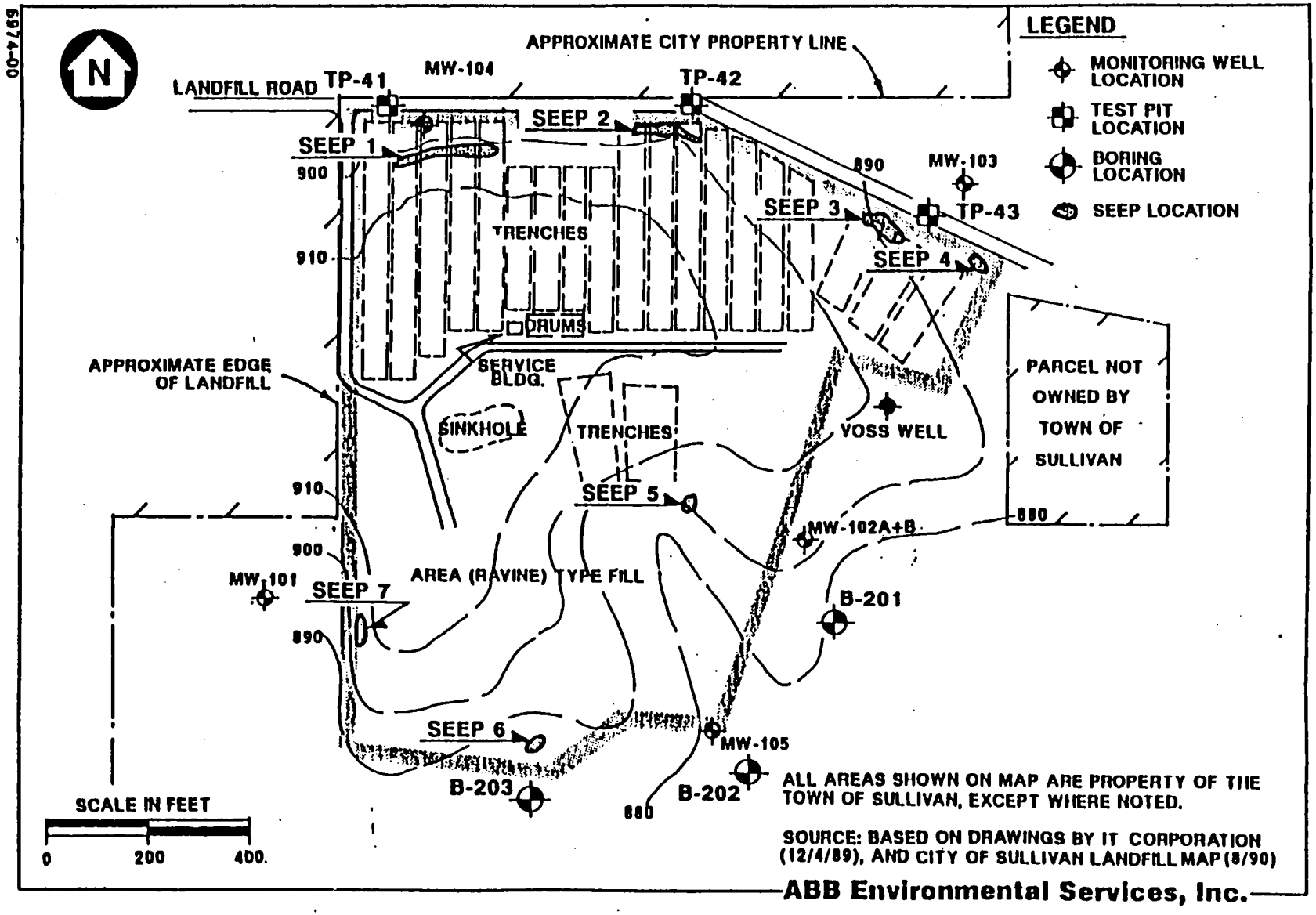

Figure 1: Groundwater Monitoring Locations, Sullivan Landfill Site, Sullivan, Missouri.

help characterize groundwater flow directions, assess groundwater quality in the vicinity of the site, and evaluate the hydraulic conductivity of the carbonate bedrock aquifer system. At one location, a well pair (MW-102A and B) was installed to evaluate vertical gradients and groundwater quality within the lower portions of the Gasconade Formation, stratigraphically located above the Eminence Formation.

All of the wells (with the exception of the deeper well, MW-102A) were installed as water table wells, with 5 feet of a 30-foot screened interval located above the observed water table. The deep well consisted of 20 feet of screen approximately 75 feet below the observed water table.

Monitoring well B-201 was installed in May 1993 as part of the Supplemental Site Investigation at the landfill (see Figure 1). It is a shallow well (17.5 feet deep) installed specifically to investigate the potential existence and location of a perched groundwater zone.

1.2 GROUNDWATER MONITORING PROGRAM

The six monitoring wells were sampled in May and July of 1992 as part of the Site Investigation Program. For 1993 and 1994, a semi-annual groundwater sampling schedule was established as part of an interim monitoring program. Following closure of the landfill, monitoring wells will be sampled quarterly for two years, and then annually for three years, as part of the post-closure monitoring program.

2.0 AUGUST 1993 SAMPLING RESULTS

Groundwater samples were collected on August 30 and 31, 1993. Field data records are included in Attachment 1. Three well volumes were removed at each well location prior to sampling. All groundwater samples were filtered in the field for inorganic analysis. During this sampling event, a soil drum sample was collected as a composite of samples from each of three soil drums at the site. The drum sample was collected to determine appropriate disposal for the drummed soil and data are included here to minimize the number of separate submittals to MDNR.

The analytical results for the August 1993 sample round are summarized in Table 1 and are presented in Attachment 2. In the following subsections, the groundwater results are discussed first, followed by the soil drum data. Where appropriate, the

in 1993. Similarly, the aluminum federal SMCL of 50 μg/L was exceeded in groundwater samples from all six of the monitoring wells in 1992. In 1993, aluminum was only detected in the sample collected from the Voss well in February, at a concentration of 300 μg/L, above the SMCL.

Calcium, magnesium, and sodium have been consistently detected in the landfill groundwater samples, but there are no federal or state standards for these parameters.

As the analytical data set for the Sullivan Landfill is expanded during post-closure monitoring, more detailed trends analyses will be performed.

4.0 CONCLUSIONS

The 1993 analytical data support laboratory analyses of groundwater samples previously collected at the site and indicate that the diffuse groundwater flow system has not been significantly impacted by landfill wastes. Although the landfill is considered to be a source of the DCFM and the TCFM, it is certainly not the only source for these compounds in the area. Specifically, USGS sampling of municipal well #5 in March 1992 detected 0.15 μg/L of TCFM. This location is both upgradient and at a significant distance from the landfill and the detection of TCFM indicates that other halomethane sources exist in the Sullivan area.

The TCLP results for the August 1993 composite soil sample indicate that the soil stored in the three on-site drums is at acceptable TCLP levels and this soil will be spread onto the landfill surface and incorporated under the overall landfill cap.

TCFM = Trichlorofluoromethane = CFC11