

May 18, 2022

Project Reference #14411  
Email: [joseph.martinez@wisconsin.gov](mailto:joseph.martinez@wisconsin.gov)

Joseph J. Martinez  
Hydrogeologist – Remediation and Redevelopment Program  
Wisconsin Department of Natural Resources  
1027 West St. Paul Avenue  
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**RE: Emerging Contaminants Evaluation  
Village of Whitefish Bay Landfill  
5201 W. Good Hope Road, Milwaukee, WI 53223  
WDNR BRRTS #02-41-000254**

Dear Mr. Martinez:

The Sigma Group, Inc. (Sigma), on behalf of the Village of Whitefish Bay (Village), has prepared this letter to present findings of an evaluation of emerging contaminants, specifically per- and poly-fluoroalkyl substances (PFAS) and 1,4-dioxane, at the property located at 5201 West Good Hope Road, in Milwaukee, Wisconsin (hereinafter referred to as the “Site”). A site plan map is provided as **Figure 1**. The evaluation was completed in response to the Wisconsin Department of Natural Resources’ (WDNR) August 17, 2020, letter with the subject *Reminder to Include Evaluation of Emerging Contaminants in Site Investigation*.

#### **EMERGING CONTAMINANTS DISCUSSION**

On August 17, 2020, the WDNR requested that all Responsible Parties (RPs) with open contamination sites assess emerging contaminants and their potential impacts. Based on a review of the site history, Sigma focused the assessment of emerging contaminants on the following areas:

1. Historical fires;
2. Historical occupants;
3. Historical filling activities; and
4. Chlorinated solvents usage.

#### Historical Fires

According to the Interstate Technology Regulatory Council (ITRC), PFAS-containing aqueous film forming foams (AFFFs) have been in use to fight liquid fuel fires since the 1960s.

Sigma requested available fire department records for the Site on April 1, 2022. Fire department records in Milwaukee are available for the last 10 years. The Milwaukee Fire Department returned Sigma’s request for records on April 11, 2022 and reported no records of fires, spills, or hazardous materials releases for the Site.

Sigma conducted a series of keyword searches of archived newspaper articles using variations on the Site address and the word “fire”. No articles describing fires on the Site were identified. Sigma has not identified any records which would indicate that AFFF was used to suppress a fire at the Site.

#### Historical Occupants

To determine the uses of the Site, Sigma reviewed prior investigation documents as well as information available through Milwaukee County’s Geographic Information System (GIS) website. Prior investigation documents include Sigma’s *Project Update Report* (May 1, 2015) and *Site Investigation Completion Report* (November 18, 2020).

A Phase I Environmental Site Assessment has not been conducted on the Site by Sigma. At the time of this letter, Sigma reports no knowledge of any existing Phase I Environmental Assessments for the Site.

Aerial photographs from 1928 to 2020 were available via Milwaukee County’s Geographic Information System (GIS). Review of the aerial photographs indicated the Site was undeveloped agricultural land in 1928 and 1937. Review of the 1951 aerial photograph indicated a land disturbance on the southern side of the Site. Review of subsequent photographs in 1956, 1963, 1967, and 1970 showed the entire Site as disturbed, consistent with filling and/or dumping activities. Beginning with the 1975 photograph, an unpaved road appears to connect West Good Hope Road to the southern side of the Site. Vegetation appears to gradually take over the unpaved road until the 1990 photograph. Review of the 1990 photograph indicates West Hustis Road was developed to the southwest of the Site, with an unpaved road extending from West Hustis Road to the southern portion of the Site. Vegetation appears to gradually take-over the unpaved road from West Hustis Road in the remaining photographs. No structures or paved surfaces on the Site were identified during the aerial photograph review.

Based on a review of site investigation reports<sup>1</sup>, no historical commercial, residential, or industrial occupants were identified for the Site. The Village of Whitefish Bay acquired the approximate 13-acre landfill property in 1960. Historically, the Village used the Site for placement of incinerator ash and some street and demolition debris. The Village primarily used the northern half of the Site for material placement activities until early 1970s. The property was reportedly graded in 1980 to meet the WDNR requirements for closure. The Site has remained vacant since the closure; however, “midnight dumping” of industrial waste materials is suspected to have occurred on the Site, potentially as early as 1960. Sigma has not identified any additional documents describing sources and/or composition of materials disposed of at the landfill between 1960 to 1972 at the time of this report. Sanborn Fire insurance maps and city directories were not reviewed for the Site.

Sigma also searched the Milwaukee Journal Sentinel archives for further information related to the Site. Review of the archives did not reveal additional information concerning the Site.

Historic landfilling activities and subsurface investigations for the Site are discussed in the following section.

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<sup>1</sup> Site Investigation Report for the former Whitefish Bay Landfill, 5201 W. Good Hope Road, Milwaukee, dated May 20, 1992, prepared by STS Consultants Ltd.

### Historical Filling Activities, Chlorinated Solvents Usage, and Subsurface Investigations

Investigation activities at the Site have identified fill and/or reworked soil material comprised of organic clayey silt and/or silty clay material, as well as refuse or debris such as cinders, bricks, wood, and glass pieces to a depth of 16 feet below ground surface (bgs). Sigma reviewed environmental reports and historical documents to determine whether fill materials placed on the Site are a potential source of emerging contaminants. According to the ITRC, commercial-scale production of PFAS and 1,4-dioxane began in the 1950s. Therefore, historical filling activities prior to 1950 are not considered viable sources of these contaminants.

Due to the unknown source of fill and/or contamination, Sigma reviewed available Site data to determine the likelihood that industrial waste products which could have contained PFAS were dumped on the Site. Landfilling activities are known to have occurred on the Site since at least as early as 1960. Soil and groundwater samples from the Site have contained elevated concentrations of petroleum volatile organic compounds (PVOCs) and chlorinated volatile organic compounds (CVOCs), indicating that waste solvents from industrial facilities could have been dumped on the Site. Site investigations indicated that “midnight dumping” of industrial waste materials is the suspected source of contamination. Given the nature of contamination identified and the lack of knowledge of the waste source, as well as the period of time the Site is known to have been used for dumping, it is possible that PFAS were present in waste products dumped on the Site.

According to the ITRC, 1,4-dioxane has been used to stabilize chlorinated solvents, particularly 1,1,1-trichloroethane (TCA), since the late 1950s. Current estimates link 90% of 1,4-dioxane usage to 1,1,1-TCA stabilization. While 1,4-dioxane has been found at properties with trichloroethene (TCE), it is suggested that the 1,4-dioxane presence may be due to the past usage of both 1,1,1-TCA and TCE at those properties. Sigma reviewed soil and groundwater data from the Site to determine the likelihood of a release of 1,4-dioxane using 1,1,1-TCA and its degradation products, 1,1-dichloroethane (1,1-DCA) and 1,1-dichloroethene (1,1-DCE), as indicator chemicals.

Sigma reviewed available soil sample data and boring logs from the Site to further evaluate subsurface characteristics of historic landfilling activities. Soil samples collected in 1988 were not analyzed for 1,1,1-TCA, 1,1-DCE, or 1,1-DCA, or vinyl chloride; however, other CVOCs were detected, with tetrachloroethene (PCE), TCE, and Cis-1,2-dichloroethene (1,2-DCE) identified in one or more soil samples in exceedance of present-day NR 720 RCLs. Soil samples were collected by Sigma in 2014 and analyzed for CVOCs. No detections of 1,1-DCE or 1,1-DCA were reported; however, 1,1,1-TCA was detected in one soil sample from boring B-4 at a depth of 12-14 feet bgs with a concentration of 265 µg/kg, exceeding present-day NR 720 RCLs. Other CVOCs were also detected, with PCE, TCE, 1,2-DCE, and vinyl chloride identified in one or more soil samples at concentrations exceeding present-day NR 720 RCLs. The highest PCE and TCE concentrations detailed in the 2015 report were 620,000 ug/kg and 268,000 ug/kg, respectively, reflecting a reduction by a factor of 20 of the initial soil concentrations observed in 1988.

Since 1988, 1,1,1-TCA has been detected in multiple groundwater samples at concentrations greater than the NR 140 ES, with one sample containing a concentration of 1,100 ug/L (MW-22, 6/9/1996). Both 1,1-DCA and 1,1-DCE have also been detected in multiple groundwater samples, with 1,1-DCE detected at concentrations greater than NR 140 PALs and/or NR 140 ESs.

Both 1,1-DCA and 1,1-DCE can be produced during the degradation of PCE and TCE absent a release of 1,1,1-TCA, which is not independently indicative of 1,4-dioxane contamination. However, given the presence of 1,1,1-TCA in both soil and groundwater samples collected on the Site, Sigma cannot rule out the possibility that 1,4-dioxane was present in waste products dumped on the Site.

#### **EMERGING CONTAMINANTS CONCLUSIONS AND RECOMMENDATIONS**

Based on Sigma's assessment of potential historic fires, historic Site uses/occupants, potential chlorinated solvent usage, and subsurface investigations, there is insufficient information at present to determine whether a release of PFAS occurred on the Site. However, given the detection of 1,1,1-TCA in soil and groundwater at concentrations exceeding NR 720 RCLs and NR 140 ESs, respectively, and historic use of 1,4-dioxane in tandem with 1,1,1-TCA according to the ITRC, 1,4-dioxane is likely present on the Site. Therefore, further evaluation of 1,4-Dioxane, including groundwater sampling of select monitoring wells at the Site, is recommended.

#### **CLOSING**

We appreciate your assistance in this matter. If you have any questions regarding this submittal, please contact us at your convenience.

Sincerely,

**THE SIGMA GROUP, INC.**



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Attachment: Figure 1 - Site Plan Map

cc: John Edlebeck, P.E. / Village of Whitefish Bay

### LEGEND

- = MONITORING WELL
- = PIEZOMETER
- = CHAIN LINK FENCE
- = PROPERTY LINE
- = ADJACENT PROPERTY LINE

### NOTES:

- BOUNDARIES ARE APPROXIMATE.
- THIS MAP WAS DEVELOPED FROM A MILWAUKEE COUNTY MAP, THIENSVILLE QUADRANGLE TOPOGRAPHIC MAP, AND SURVEY DATA.
- AERIAL IMAGERY (DATED 2015) FROM SOUTHEAST WISCONSIN REGIONAL PLANNING COMMISSION (SEWRPC).

**FORMER LANDFILL PROPERTY**

**PRESIDIO SQUARE APARTMENT COMPLEX**

**STORAGE FACILITY**

**MMSD DETENTION BASIN**

**WYRICK PARK**

**WEBSTER MIDDLE SCHOOL  
(MILWAUKEE PUBLIC SCHOOL PROPERTY)**

**LINCOLN CREEK**

**RESIDENTIAL NEIGHBORHOOD**

**GRACELAND CEMETERY**

Project: 14411 | Directory: CAD | Filename: 14411\_SLM.dwg | Created By: JRS | Date: 11/16/20 | Filepath: I:\Whitfish Bay\14411-WFB Landfill\60 CAD\CADD\2018\_09\_SI\_Report\_Figures\010\_Modeling\012\_BaseMap\012\_01\_Site\_Layout\_Map\14411\_SLM.dwg



## SITE VICINITY MAP

FORMER WHITEFISH BAY LANDFILL/MPS PROPERTY  
5201 WEST GOOD HOPE ROAD  
MILWAUKEE, WISCONSIN

FIGURE

**1**