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ENVIRONMENT

Michael Schmoller
Wisconsin Department of Natural Resources
South Central Region
3911 Fish Hatchery Road
Fitchburg, WI 53711

Subject:
Supplemental Site Information/Addendum 1, Madison-Kipp Corporation, 201 Waubesa Street, Madison, Wisconsin. Facility ID No. 113125320, BRRTS No. 02-13-001569

Date:
May 29, 2013

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WI001283.0009

Dear Mr. Schmoller:

On behalf of Madison-Kipp Corporation, a *Site Investigation and Interim Actions Report, February 2012 – January 2013* (SI Report) was submitted to the Wisconsin Department of Natural Resources (WDNR) on March 15, 2013 for the facility located at 201 Waubesa Street (Site) (ARCADIS, 2013a). On April 10, 2013, ARCADIS presented a summary of the investigation and interim action activities and findings at a meeting held at Madison-Kipp. The WDNR, United States Environmental Protection Agency (U.S. EPA), Wisconsin Department of Justice, City of Madison Department of Public Health, and the Wisconsin Department of Health Services attended the presentation.

As requested by the WDNR at the April 10, 2013 meeting, this letter report provides a summary of impacts by media (soil, groundwater, and vapor), identifies potential receptors, and presents a summary of transport mechanisms and the remedial actions recommended to address the impacts. In addition, Appendix A includes minor text and figure clarifications for the SI Report. This information supplements and is Addendum 1 to the SI Report.

Potential Sources

An expert report prepared by Thomas M. Johnson (Appendix B) summarizes Madison-Kipp's historic and current operations, as well as Madison-Kipp's chemical use, storage, handling and disposal practices. Mr. Johnson's report is based on his review of technical reports from previous investigations and communications with certain Madison-Kipp personnel for the Site. A Site Location Map is presented as Figure 1.

Soil Characterization

As presented in the SI Report, a total of 189 on-Site soil borings were advanced in 2012 (ARCADIS, 2013a). The borehole depths ranged from 4 to 35 feet below land surface (bls). A 50 by 50-foot grid pattern was used initially to select boring locations at each of the three parking lot areas and the western portion of the Site. A denser spacing was used along the north, east, and west property boundaries to improve delineation in known or suspected historical areas of operation and to identify potential for off-Site impacts. Additionally, soil borings were advanced inside the Atwood and Waubesa Buildings in areas of historic and current operations, as discussed above.

Soil samples were collected and submitted for laboratory analyses, including volatile organic compounds (VOCs), polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs), Resource Conservation Recovery Act (RCRA) metals, and total cyanide to evaluate background conditions and potential source areas in shallow soils (0 to 4 feet), and soil above the groundwater table. Soil analytical results are summarized in Tables 5-1 and 5-2 and presented on Figures 5-1 through 5-20 in the SI Report. Below is a brief summary of locations where impacted soils were observed, as reported in the SI Report (ARCADIS, 2013a).

Soil VOCs

Soil VOC concentrations exceeding soil industrial direct contact residual contaminant levels (RCLs) were observed on-Site near the oil shed within the upper 3 feet of soil. Figures 5-1 through 5-3 in the SI Report present the locations of VOC impacts in on-Site soil. VOCs in soil exceeded industrial RCLs at Soil Borings B-15, B-17, and B-18. Soil VOC concentrations decrease with depth, and the lateral and vertical extent of VOCs in soil was delineated on- and off-Site. VOC concentrations in off-Site soils did not exceed regulatory criteria.

Soil PCBs

On-Site soil PCB concentrations exceeding regulatory criteria were generally observed in the upper 4 feet of soil beneath the north parking lot, along the northern and western property lines, and under a portion of the Atwood Building. PCB concentrations exceeding regulatory criteria were also reported in soil beneath the Atwood Building at depths greater than 4 feet, but above the water table. Figures 5-4 through 5-6 in the SI Report present the location of PCB impacts on-Site. Figures 5-15 and 5-16 in the SI Report present the location of PCB impacts off-Site. Soil PCB concentrations are delineated by on-Site and off-Site soil analytical results and

generally decrease with depth. The limited mobility and migration of PCBs is due to their affinity to strongly absorb to soils.

PCB concentrations in soil above 50 milligrams per kilogram (mg/kg) (Toxic Substances Control Act [TSCA] disposal limit) were found beneath the Atwood Building near the abandoned concrete-lined piping trench described in the Thomas M. Johnson expert report (Appendix B). Soils with the highest PCB concentrations beneath the Atwood Building are covered by 6 to 8 inches of concrete and, therefore, do not represent a threat to humans through the direct contact exposure pathway.

Off-Site soil PCB concentrations were reported above the WDNR non-industrial RCL (0.222 mg/kg) at 241, 245, 253, and 257 Waubesa Street (Figures 5-15 and 5-16 in the SI Report). Off-Site soil PCB concentrations were reported above the WDNR industrial soil criterion (0.744 mg/kg) in shallow soils along the northern property line and in the landscaped area between the bike path and the northern property line (Figures 5-4 and 5-5).

Soil PAHs

Soil PAH concentrations above the industrial direct contact RCLs were generally observed across the Site and in the surrounding area. Figures 5-7 through 5-9, 5-17, and 5-18 in the SI Report present the locations of PAH sampling, and comparison of sampling results with regulatory criteria. Soil PAH concentrations decrease with depth and the lateral and vertical extent have been delineated on- and off-Site. These sampling results indicate that background levels of PAHs are widely present in these soils. The *Polynuclear Aromatic Hydrocarbons Evaluation Report* presented a discussion of the PAH sources in the Madison area, statistical analysis of on-Site and off-Site PAH sampling data, and a forensic evaluation of fingerprint analyses of PAHs in urban area soils (ARCADIS, 2013c). The findings in this report indicate that PAHs in soils on residential properties are consistent with background levels in urban areas and not related to Madison-Kipp source-derived PAHs found in soils at the Site (ARCADIS, 2013c).

Soil RCRA Metals

Concentrations of several RCRA metals (lead, mercury, barium, and selenium) exceeding industrial direct contact RCLs were found at various on-Site locations. Figures 5-11, 5-12, 5-19, and 5-20 in the SI Report present locations of RCRA metals soil sampling, and comparison of sampling results with regulatory criteria. Soil RCRA metal concentrations decrease with depth and the lateral and vertical extent have been delineated by on and off-Site soil analytical results.

Exposure Pathways and Receptors – Soil Remedial Actions

The potential exposure pathways for soil include direct contact through ingestion, dermal contact, and migration from soil to groundwater. There are no soil VOC impacts above regulatory criteria in the off-Site soils. The direct contact pathway for on-Site soil VOCs in the area of Soil Borings B-15, B-17, and B-18 was addressed through an excavation completed in December 2012/January 2013 in conjunction with the PCB remedial excavation activities.

As approved by WDNR and U.S. EPA, on-Site soils exceeding 50 mg/kg PCBs in the north parking area were excavated in December 2012/January 2013 (ARCADIS, 2012). The excavation locations are presented on Figure 2. PCB concentrations in soils exceeding 50 mg/kg remain beneath the Atwood Building. This soil is covered by 6 to 8 inches of concrete and, therefore, does not represent a threat to humans through the direct contact exposure pathway. Based on the groundwater data presented below, PCB migration in groundwater is not considered to be a pathway for exposure.

Madison-Kipp shares a property line with residential properties to the east and west. As approved by WDNR and U.S. EPA, soil with PCBs at concentrations above the WDNR's non-industrial direct contact residual contaminant level of 0.222 mg/kg are currently being excavated from the backyards of four properties (241, 245, 253, and 257 Waubesa Street). In addition, at WDNR and U.S. EPA's request, soils will be excavated from a portion of the backyard at 249 Waubesa Street. No other off-Site soils contained detectable PCBs above the WDNR's non-industrial direct contact residual contaminant level of 0.222 mg/kg.

The direct contact pathway for on-Site soils is currently mitigated by the presence of the Site buildings, clean soil backfill material (from recent PCB excavation activities), and paving that serves as an engineered barrier (cap). The cap will be repaired and upgraded, as necessary, to meet the WDNR's engineered barrier design standards as outlined in the WDNR's Guidance for Cover Systems for Soil Performance Standard Remedies dated March 2013 (WDNR PUB-RR-709) (WDNR 2013). A Cap Maintenance and Materials Handling Plan will be prepared and submitted to the WDNR for approval and the Plan will document long term inspection and maintenance requirements. A deed restriction for the residual soil impacts located along the bike path, 'rain garden' and land leased by Madison-Kipp from the City of Madison will also be prepared for approval and recording. Locations of residual on-Site soil exceedances will also be placed on the WDNR's Soil Geographic Information System Registry. Additionally, in areas where PCBs remain in shallow on-Site soils, U.S. EPA TSCA regulations for engineered caps will be followed.

Groundwater Characterization

Since March 2013 when the SI Report was submitted to the WDNR, three additional single-cased monitoring wells (MW-24, MW-25D, and MW-25D2) were installed, developed and sampled. Monitoring Well MW-24 was installed in the southeast parking lot as part of the underground storage tank investigation. Monitoring Wells MW-25D and MW-25D2 were installed approximately 900 feet southeast of the Site to provide groundwater delineation between the Site boundary and Municipal Unit Well 8. The WDNR approved the installation of Monitoring Wells MW-25D and MW-25D2 with screens placed from 120 to 130 feet and 160 to 170 feet bls, respectively. The current groundwater monitoring well network at the Site includes 38 single-cased wells and four multiport wells with a total of 20 sample intervals. The sampling intervals are designed to collect water samples from four geologic units including (from shallowest to deepest): the Water Table (9 to 50 feet bls; 887 to 821 feet above mean sea level [amsl]); Lone Rock Formation (29 to120 feet bls; 845 to 781 feet amsl); Wonewoc Formation (87 to 232 feet bls; 767 to 640 feet amsl); and the Eau Claire Formation (200 to 434 feet bls; 647 to 434 feet amsl). Note there are two Site wells (MW-3D3 and MW-5D3) screened from 214 to 224 feet and 225 to 235 feet bls, respectively, in the Eau Claire Formation).

Groundwater elevations and samples were collected in April 2013 (second quarter 2013). Groundwater samples were collected and submitted for laboratory analysis of VOCs from the entire well network from April 15 through April 29, with the exception of MW-25D and MW-25D2, which were sampled in May. Monitoring Wells MW-25D and MW-25D2 were installed on May 3, developed on May 4, and sampled on May 6. Groundwater samples were also collected and submitted for laboratory analysis of filtered and unfiltered PCBs from MW-22S/D and MW-23D, located inside the Madison-Kipp Atwood Building. Groundwater elevations and analytical results are summarized in Tables 1 and 2, respectively.

Groundwater Elevations

Site-wide groundwater elevations were collected in April 2013. Groundwater elevations are summarized in Table 1. Below is a summary of the findings.

Water Table Potentiometric Surface

The water table potentiometric surface using April 2013 data is shown on Figure 3. In April 2013, the water table was present at depths of 2.35 to 32.47 feet bls. The wells used to map the water table potentiometric surface have screens located at depths ranging from approximately 3 to 50 feet bls or 857 to 834 feet amsl. The

hydraulic gradient at the water table is generally toward the south-southeast. Shallow groundwater levels are influenced by the lock and dam where the Yahara River drains from Lake Mendota south into Lake Monona. Furthermore, shallow groundwater levels and flow directions are influenced by local topography and high infiltration of precipitation and storm water. The Madison area received approximately 3.5 inches of precipitation in April. Shallow groundwater elevations were generally 3 feet higher in April 2013 as compared to January 2013. The greatest elevation change (approximately 7 feet) was measured in MW-12S, located in the landscaped area just south of the rain garden (Figure 2). The shallow groundwater horizontal gradient was calculated as 0.02 foot per foot (ft/ft) in the northern half of the Site and 0.003 ft/ft in the southern half of the Site.

Lower Lone Rock Formation Potentiometric Surface

The potentiometric surface in the lower Lone Rock Formation using April 2013 data is shown on Figure 4 and is present from 7.79 to 32.99 feet bls. Wells in the lower Lone Rock Formation have screens located between depths ranging from approximately 64 to 96 feet bls or 816 to 777 feet amsl. The hydraulic gradient in the lower Lone Rock Formation is generally toward the southeast in the southern half of the Site, and toward the north in the northern half of the Site. The northerly gradient direction is based on the groundwater elevation high measured at Multiport Well MP-13. This groundwater elevation high at MP-13 was also observed in April 2013. Groundwater elevations were generally 3 feet higher in the lower Lone Rock in April as compared to January 2013. The horizontal gradient in the lower Lone Rock Formation was calculated as 0.002 ft/ft north of Multiport Well MP-13 and 0.003 ft/ft south of Multiport Well MP-13.

Upper Wonewoc Formation Potentiometric Surface

The potentiometric surface in the upper Wonewoc Formation using April 2013 data is shown on Figure 5 and is present from 8.27 to 41.65 feet bls. Wells in the upper Wonewoc Formation have screens located between depths ranging from approximately 88 to 170 feet bls or 768 to 698 feet amsl. Groundwater elevations were generally 3 feet higher in the upper Wonewoc in April as compared to January 2013. The hydraulic gradient in the upper Wonewoc Formation is toward the southeast, consistent with the regional hydraulic gradient. The horizontal gradient in the upper Wonewoc Formation was calculated as 0.002 ft/ft.

Groundwater Analytical Results - Water Table Wells

Shallow groundwater monitoring wells (Water Table) include MW-1, MW-2S, MW-3S, MW-4S, MW-6S, MW-7, MW-8, MW-10S, MW-11S, MW-12S, MW-18S, MW-22S, MW-23S, and MW-24. Groundwater analytical results through April/May 2013 are presented in Table 2.

During the April 2013 event, groundwater VOC concentrations were reported above the WDNR's NR 140 Enforcement Standard (ES) for tetrachloroethene (PCE), trichloroethene (TCE), cis-1,2-dichloroethene (cis-1,2-DCE), and benzene in one or more well. PCE was the primary VOC reported above the ES (5 micrograms per liter [µg/L]) in the groundwater samples collected at MW-1, MW-3S, MW-18S, MW-22S, and MW-23S. Benzene was reported above the ES (5 µg/L) in the groundwater sample collected at MW-6S. PCE was reported below the ES in the groundwater samples collected at MW-2S, MW-4S, MW-6S, MW-7, MW-8, MW-10S, MW-11S, MW-12S, and MW-24. The presence of PCE degradation products (i.e., TCE, cis-1,2-DCE) in groundwater is generally limited to the on-Site area and localized in extent.

PCE concentrations detected in groundwater in April 2013 are presented on Figure 6 and in cross-sections on Figures 7 and 8. The locations of the cross sections are presented on Figure 9. The area of highest PCE concentrations is in the area of the MW-3 well nest and the MP-13 sampling location in the north parking lot. PCE impacts in groundwater are delineated to the north by Monitoring Well MW-12S, to the east by Monitoring Wells MW-7, MW-8, and MW-11S, to the south by MW-6S and MW-24, and to the west by Monitoring Well MW-10S.

PCBs were detected at low concentrations in unfiltered groundwater samples at Monitoring Well MW-22S (located beneath the Atwood building); however, subsequent sampling has demonstrated that these detections were associated with PCBs adsorbed to soil particles in the water samples indicating that PCBs are not present in groundwater in dissolved form (ARCADIS, 2013a).

Groundwater Analytical Results - Lone Rock Formation

Groundwater analytical results through April/May 2013 data for the Lone Rock Formation are presented in Table 2. Monitoring wells screened in the Lone Rock Formation include Monitoring Wells MW-2D, MW-3D, MW-3D2, MW-4D, MW-4D2, MW-5S, MW-5D, MW-6D, MW-9D, MW-9D2, MP-13 (44 to 48 feet; 67 to 71 feet bls; 81 to 85 feet bls), MP-14 (70 to 75 feet bls), MP-16 (80 to 84 feet bls), MW-19D, MW-20D, MW-21D, MW-22D, and MW-23D.

During the April/May 2013 event, groundwater VOC concentrations were reported above the respective ESs for PCE, TCE, cis-1,2-DCE, and benzene in one or more well. PCE was the most prevalent VOC reported above the ES in groundwater samples collected at Monitoring Wells MW-2D, MW-3D, MW-3D2, MW-5S, MW-5D, MW-6D, MW-9D2, MP-13 (44 to 48 feet), MP-13 (67 to 81 feet), MP-13 (81 to 85 feet), MW-14 (135 to 140 feet), MW-19D, MW-20D, MW-21D, MW-22D, and MW-23D. Benzene was reported above the ES in the groundwater sample collected at Monitoring Well MW-6D. PCE was reported below the ES in the groundwater samples collected at MW-4D, MW-4D2, MW-9D, MP-14 (70 to 75 feet), and MP-16 (80 to 84 feet).

PCE concentrations detected in groundwater in April/May 2013 in the lower Lone Rock Formation are presented on Figure 10 and in cross-sections on Figures 7 and 8. The area of highest PCE concentrations in the lower Lone Rock Formation is in the area of Multiport Well MP-13 in the north parking area, extending south under the Atwood Building. PCE is delineated in groundwater in the lower Lone Rock Formation to the north by Monitoring Well MW-9D2, to the east by Multiport Well MP-16, and to the west by Multiport Well MP-14.

PCBs were detected at low concentrations in unfiltered groundwater samples at Monitoring Wells MW-22D and MW-23D (located beneath the Atwood building); however, subsequent sampling has demonstrated that these detections were associated with PCBs adsorbed to soil particles in the water samples indicating that PCBs are not present in groundwater in dissolved form (ARCADIS, 2013a).

Groundwater Analytical Results - Wonewoc Formation

Groundwater analytical results for the Wonewoc Formation are presented in Table 2. Monitoring wells screened in the Wonewoc Formation include Monitoring Wells MW-3D3, MW-5D2, MW-5D3, MP-13 (102 to 106 feet; 121 to 125 feet; 135 to 139 feet; 163 to 167 feet), MP-14 (100 to 105 feet; 135 to 140 feet; 170 to 178 feet), MP-15 (88 to 92 feet; 100 to 105 feet; 120 to 125 feet; 142 to 146 feet; 177 to 187 feet), MP-16 (106 to 116 feet; 140 to 144 feet; 175 to 179 feet), MW-17, MW-19D2, MW-20D2, MW-21D2, MW-25D, and MW-25D2.

PCE was the primary VOC reported above the ES at Multiport Wells MP-13 (102 to 106 feet, 121 to 125 feet, 135 to 139 feet, and 163 to 167 feet), MP-14 (135 to 140 feet, 170 to 178 feet), MP-15 (88 to 92 feet, 100 to 105 feet, 120 to 125 feet, 142 to 146 feet, 177 to 187 feet, MP-16 (106 to 116 feet, 140 to 144 feet, and 175 to 179 feet, and Monitoring Wells MW-17, MW-19D2, MW-20D2 and MW-21D2. PCE

concentrations were below the ES at Multiport Well MP-14 (100 to 105 feet), MW-25D, and MW-25D2.

PCE concentrations detected in groundwater in April/May 2013 in the upper Wonewoc Formation are presented on Figure 11 and in cross-sections on Figures 7 and 8. The area of the highest PCE concentrations in the upper Wonewoc Formation is in the area north and south of Multiport Well MP-13 in the north parking area. The Wonewoc Formation is delineated vertically by Monitoring Wells MW-3D3, MW-5D3, MP-14 (100 to 105 feet), MW-25D, and MW-25D2.

Exposure Pathways and Receptors – Groundwater Remedial Actions

The potential exposure pathways for groundwater include direct contact through ingestion and dermal contact.

The City of Madison drinking water source is groundwater from various sandstone bedrock formations. Municipal Unit Well 8 is the closest municipal well to the Site and is approximately 1,400 feet southeast of the Site (Figure 1). Municipal Unit Well 8 is cased to 280 feet bls, below the Eau Claire shale aquitard, and is an open bedrock well across the Mount Simon Formation from 280 to 774 feet bls (McCarthy, 1945). According to the Unit Well 8 boring log (Appendix C), dynamite shots were used in a nearby test borehole at depths of approximately 380 feet, 430 feet, 480 feet, and 530 feet to fracture the bedrock between the test and Unit Well 8 borehole to increase the specific capacity of Unit Well 8. After the boreholes were connected by fracturing the bedrock, Unit Well 8 was tested at a pumping rate of approximately 1,965 gallons per minute with 65 feet of drawdown, yielding a specific capacity of approximately 30 gallons per minute per foot of drawdown. Municipal Unit Well 8 is a seasonal well typically operated in the summer months when the water demand by the City of Madison is higher. According to the City of Madison Water Utility, 11,043,000 gallons were pumped in 2012. This well has had limited operation due primarily to high levels of iron and manganese (Madison Water Utility, 2013a). Iron and manganese are naturally occurring in the Mount Simon Formation.

Monitoring Wells MW-25D and MW-25D2 were installed approximately 900 feet southeast of the Site and approximately 545 feet northwest of Unit Well 8 to evaluate groundwater conditions between the Site boundary and Unit Well 8. Monitoring Wells MW-25D and MW-25D2 were screened from 120 to 130 feet and 160 to 170 feet bls, respectively. Groundwater samples were collected and submitted for VOC analysis on May 6, 2013. A summary of groundwater VOC analytical results is presented in Table 2. VOCs in groundwater from Monitoring Wells MW-25D and MW-25D2 were below laboratory detection limits and/or the ES, indicating that the

pathway to Unit Well 8 is incomplete. These monitoring wells will continue to be sampled to confirm that PCE has not migrated further southeast or vertically toward Unit Well 8. Concentrations of cis-1,2-DCE, below laboratory reporting limits, have been detected in Unit Well 8 (Madison Water Utility, 2013b). Although cis-1,2-DCE is a degradation product of PCE, cis-1,2-DCE was not detected in MW-25D and MW-25D2. Furthermore, there are multiple possible contaminant sources in the area of Unit Well 8. Therefore, based on the very low concentrations of cis-1,2-DCE detected in Unit Well 8, and the lack of cis-1,2-DCE in MW-25D and MW-25D2, the occurrence in Unit Well 8 of cis-1,2-DCE is not attributed to a release from the Madison-Kipp Site.

An In-Situ Chemical Oxidation (ISCO) groundwater remediation pilot test was initiated in December 2012. Ongoing groundwater monitoring has been conducted to characterize the extent of injection response and treatment performance to serve as the basis for evaluating the effectiveness of treating VOCs in groundwater at the Site and developing a remedial design. These results will be summarized in a final ISCO remedial summary report.

Soil Vapor Characterization

As presented in the SI Report, the occurrence of VOCs in soil vapor has been evaluated with sampling locations both on-Site and off-Site, and the sampling of VOCs in indoor air in off-Site residential homes. A summary of the 2012 to 2013 indoor air and sub-slab soil vapor analytical results from samples collected by ARCADIS and/or the WDNR's consultant is presented in the SI Report. None of the VOC detections in the indoor air or sub-slab soil vapor samples collected by ARCADIS exceeded the Wisconsin vapor action levels or calculated residential screening levels.

The potential source of the soil vapor PCE is impacted vadose zone soil and shallow groundwater in the Unconsolidated Aquifer (water table). Deeper groundwater is not a source of VOCs in soil vapor in the vadose zone (ARCADIS 2013b).

Exposure Pathways and Receptors – Soil Vapor Remedial Actions

For soil vapor, the potential exposure pathway is inhalation of PCE in soil vapor migrating from vadose zone soil and shallow groundwater. The extent of PCE in soil and shallow groundwater has been defined and the potential exposure pathway has been fully investigated by off-Site sub-slab and indoor air sampling. The vapor intrusion pathway to off-Site residential indoor air has been determined to be incomplete (ARCADIS, 2013d). Nevertheless, the following activities related to this media are being performed in 2013: 1) semi-annual sampling of the on-Site soil

vapor probes and quarterly sampling of soil vapor probes located within the bike path north of the Site, 2) operation of the on-Site full scale soil vapor extraction system, and 3) maintenance of the five sub-slab depressurization systems installed by Madison-Kipp. Site investigation and monitoring data indicate that expansion of the on-Site SVE system is not warranted.

Summary of Contaminant Fate and Transport

Results of soil, soil vapor, and groundwater sampling conducted in conjunction with comprehensive Site investigation activities and historical monitoring events are consistent with impacts/releases from historical Site operations. (See Appendix B, Report of Thomas M. Johnson)

PCB Fate and Transport and Exposure Pathways

PCBs were primarily observed in shallow on-Site soils beneath the Atwood Building, and beneath parking lot areas where waste oils were previously applied to suppress dust. Based on their limited mobility and low solubility, PCBs are confined to vadose zone soils.

Direct contact with soils containing PCBs is a potential exposure pathway. However, on-Site soils containing more than 50 mg/kg PCBs in the north parking area were excavated and disposed of off-Site during December 2012 and January 2013. Further excavation of on-Site and off-Site PCB-impacted soil has recently been conducted along the Waubesa property line. In the off-Site area, soils at four off-Site properties containing PCBs above the RCLs, as well as soils at a fifth property where the non-industrial RCL was not exceeded, are currently being excavated and disposed of off-Site. PCB-impacted soil remaining beneath the Atwood Building is covered by 6 to 8 inches of concrete and does not represent a direct contact exposure pathway. The foundations of the Atwood and Waubesa Buildings, clean soil backfill material (from recent PCB excavation activities), and surface paving outside of the Buildings, and institutional controls, mitigate the potential direct contact exposure pathway.

PCBs were detected at low concentrations in unfiltered groundwater samples at Monitoring Wells MW-22S, MW-22D, and MW-23D (located beneath the Atwood building); however, subsequent sampling has demonstrated that these detections were associated with PCBs adsorbed to soil particles in the water samples indicating that PCBs are not present in groundwater in dissolved form (ARCADIS, 2013a). Therefore, the soil to groundwater pathway for PCB migration is incomplete.

PCE Fate and Transport and Exposure Pathways

The occurrence of PCE in soil, soil vapor, and groundwater is consistent with reported historic site activities. PCE migration from the land surface through the vadose zone to groundwater was transported downward by infiltration of precipitation. The extent of PCE in shallow groundwater is generally limited to the on-Site area and is consistent with variable shallow groundwater flow direction and significant downward vertical hydraulic gradient. The downward vertical gradient between the shallow groundwater and the lower Lone Rock Formation resulted in transport of groundwater containing PCE from the unconsolidated soils to the bedrock. The area of PCE-impacted groundwater in the lower Lone Rock Formation is larger than the area observed in the shallow groundwater, extending south/southeast and north of the Site. Downward vertical hydraulic gradients also have resulted in migration of PCE-impacted groundwater from the lower Lone Rock Formation into the underlying Wonewoc Formation.

Regionally, groundwater flow in the Wonewoc Formation, above the Eau Claire Shale aquitard, is primarily toward the southeast. The resulting hydraulic gradient within the Wonewoc Formation is primarily horizontal, compared to the more significant vertical hydraulic gradients observed in the overlying Unconsolidated and Lone Rock Formations. PCE concentrations in groundwater decrease significantly with depth within the Wonewoc Formation, above the Eau Claire Shale aquitard.

Most importantly, newly installed groundwater monitoring wells MW-25D and MW-25D2, between the Site and Unit Well 8, confirmed that PCE was not present above laboratory detection limits or was below the ES (5 µg/L) in the upper Wonewoc Formation 900 feet southeast of the Site. The transport of PCE-impacted groundwater in the bedrock is controlled by the dual-porosity relationship between the bedrock matrix and fractures (ARCADIS 2013a). The bedrock matrix can store considerably more PCE mass than the fractures, resulting in significant retardation of PCE transport through the bedrock. Based on these findings, the exposure pathway currently associated with migration of PCE in groundwater to Unit Well 8 from Madison-Kipp is incomplete.

For soil vapor, the potential exposure pathway is inhalation of PCE in soil vapor migrating from vadose zone soil and shallow groundwater. The extent of PCE in soil and shallow groundwater has been defined and the potential exposure pathway has been fully investigated by off-Site sub-slab and indoor air sampling. The vapor intrusion pathway to off-Site residential indoor air has been determined to be incomplete (ARCADIS, 2013d).

Proposed Recommendations for Further Groundwater Remediation

Ongoing evaluation is being completed utilizing Site investigation data and data collected during the ISCO pilot test. Through this evaluation, the remedial strategy will be developed for the Site. Proposed recommendations will be provided to WDNR for consideration and approval in a separate transmittal.

References

ARCADIS. December 2012. Final Revised Work Plan for Polychlorinated Biphenyl Recommended Activities

ARCADIS. March 2013a. Site Investigation and Interim Actions Report February 2012 – January 2013

ARCADIS. January 2013b. Expert Report of Thomas M. Johnson, P.G.

ARCADIS, January 2013c, Polynuclear Aromatic Hydrocarbons Evaluation Report

ARCADIS. January 2013d. Expert Report of Nadine Weinberg; Kathleen McHugh and Deanna Schneider et al. v. Madison-Kipp Corporation, et al.; United States District Court for the Western District of Wisconsin; Case No. 11-cv-724-bbc;

Madison Water Utility. 2013a. Website: http://www.cityofmadison.com/water/waterQuality/notices.cfm. Accessed: May 20, 2013.

Madison Water Utility. 2013b. Madison Water Utility 2012 Water Quality Report.

McCarthy Well Co. 1945. Madison City Well #8 Boring Log and Well Construction Forms.

Wisconsin Department of Natural Resources. March 2013. Guidance for Cover Systems as Soil Performance Standard Remedies PUB-RR-709.Sincerely,

ARCADIS U.S., Inc.

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Attachments:
- Tables
- Figures
- Appendix A
- Appendix B
- Appendix C

Table 1. Groundwater Elevations, Madison-Kipp Corporation, 201 Waubesa Street, Madison, Wisconsin.

Well/ Boring	Date	Screen Interval (feet bls)	Ground Elevation (feet amsl)	Top of Casing Elevation (feet amsl)	Depth to Water (feet btoc)	Groundwater Elevation (feet amsl)	Lithology
MW-1	05/01/04	14 - 24	861.71	861.08	16.30	844.78	Unconsolidated
MW-1	07/01/04	14 - 24	861.71	861.08	11.94	849.14	Unconsolidated
MW-1	10/01/04	14 - 24	861.71	861.08	13.41	847.67	Unconsolidated
MW-1	01/01/05	14 - 24	861.71	861.08	14.37	846.71	Unconsolidated
MW-1	03/01/05	14 - 24	861.71	861.08	13.50	847.58	Unconsolidated
MW-1	07/01/05	14 - 24	861.71	861.08	15.56	845.52	Unconsolidated
MW-1	09/01/05	14 - 24	861.71	861.08	17.16	843.92	Unconsolidated
MW-1	12/01/05	14 - 24	861.71	861.08	18.18	842.90	Unconsolidated
MW-1	03/01/06	14 - 24	861.71	861.08	17.32	843.76	Unconsolidated
MW-1	07/01/06	14 - 24	861.71	861.08	14.80	846.28	Unconsolidated
MW-1	10/01/06	14 - 24	861.71	861.08	14.05	847.03	Unconsolidated
MW-1	12/01/06	14 - 24	861.71	861.08	14.21	846.87	Unconsolidated
MW-1	03/01/07	14 - 24	861.71	861.08	13.45	847.63	Unconsolidated
MW-1	08/01/07	14 - 24	861.71	861.08	13.92	847.16	Unconsolidated
MW-1	09/01/07	14 - 24	861.71	861.08	11.68	849.40	Unconsolidated
MW-1	03/01/08	14 - 24	861.71	861.08	9.87	851.21	Unconsolidated
MW-1	06/01/08	14 - 24	861.71	861.08	6.14	854.94	Unconsolidated
MW-1	09/01/08	14 - 24	861.71	861.08	10.97	850.11	Unconsolidated
MW-1	12/01/08	14 - 24	861.71	861.08	12.67	848.41	Unconsolidated
MW-1	04/01/09	14 - 24	861.71	861.08	10.00	851.08	Unconsolidated
MW-1	06/01/09	14 - 24	861.71	861.08	9.34	851.74	Unconsolidated
MW-1	09/01/09	14 - 24	861.71	861.08	12.64	848.44	Unconsolidated
MW-1	07/01/10	14 - 24	861.71	861.08	9.49	851.59	Unconsolidated
MW-1	10/01/10	14 - 24	861.71	861.08	10.59	850.49	Unconsolidated
MW-1	04/09/12	14 - 24	861.71	861.08	13.50	847.58	Unconsolidated
MW-1	07/23/12	14 - 24	861.71	861.08	14.52	846.56	Unconsolidated
MW-1	11/30/12	14 - 24	861.71	861.08	15.32	845.76	Unconsolidated
MW-1	01/14/13	14 - 24	861.71	861.08	15.22	845.86	Unconsolidated
MW-1	04/15/13	14 - 24	861.71	861.08	10.17	850.91	Unconsolidated
MW-2S	05/01/04	19 - 29	866.34	868.94	25.79	843.15	Unconsolidated
MW-2S	07/01/04	19 - 29	866.34	868.94	21.23	847.71	Unconsolidated
MW-2S	10/01/04	19 - 29	866.34	868.94	22.61	846.33	Unconsolidated
MW-2S	01/01/05	19 - 29	866.34	868.94	23.19	845.75	Unconsolidated
MW-2S	03/01/05	19 - 29	866.34	868.94	23.24	845.70	Unconsolidated
MW-2S	07/01/05	19 - 29	866.34	868.94	24.38	844.56	Unconsolidated
MW-2S	09/01/05	19 - 29	866.34	868.94	26.02	842.92	Unconsolidated
MW-2S	12/01/05	19 - 29	866.34	868.94	26.90	842.04	Unconsolidated
MW-2S	03/01/06	19 - 29	866.34	868.94	26.66	842.28	Unconsolidated
MW-2S	07/01/06	19 - 29	866.34	868.94	23.81	845.13	Unconsolidated
MW-2S	10/01/06	19 - 29	866.34	868.94	23.15	845.79	Unconsolidated
MW-2S	12/01/06	19 - 29	866.34	868.94	22.75	846.19	Unconsolidated
MW-2S	03/01/07	19 - 29	866.34	868.94	22.67	846.27	Unconsolidated
MW-2S	08/01/07	19 - 29	866.34	868.94	22.51	846.43	Unconsolidated
MW-2S	09/01/07	19 - 29	866.34	868.94	20.43	848.51	Unconsolidated
MW-2S	03/01/08	19 - 29	866.34	868.94	19.69	849.25	Unconsolidated
MW-2S	06/01/08	19 - 29	866.34	868.94	14.41	854.53	Unconsolidated
MW-2S	09/01/08	19 - 29	866.34	868.94	18.61	850.33	Unconsolidated
MW-2S	04/01/09	19 - 29	866.34	868.94	19.20	849.74	Unconsolidated

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Table 1. Groundwater Elevations, Madison-Kipp Corporation, 201 Waubesa Street, Madison, Wisconsin.

Well/ Boring	Date	Screen Interval (feet bls)	Ground Elevation (feet amsl)	Top of Casing Elevation (feet amsl)	Depth to Water (feet btoc)	Groundwater Elevation (feet amsl)	Lithology
MW-2S	06/01/09	19 - 29	866.34	868.94	17.90	851.04	Unconsolidated
MW-2S	09/01/09	19 - 29	866.34	868.94	20.63	848.31	Unconsolidated
MW-2S	12/01/09	19 - 29	866.34	868.94	20.63	848.31	Unconsolidated
MW-2S	07/01/10	19 - 29	866.34	868.94	18.50	850.44	Unconsolidated
MW-2S	10/01/10	19 - 29	866.34	868.94	18.57	850.37	Unconsolidated
MW-2S	12/01/10	19 - 29	866.34	868.94	20.20	848.74	Unconsolidated
MW-2S	04/09/12	19 - 29	866.34	868.94	22.11	846.83	Unconsolidated
MW-2S	07/23/12	19 - 29	866.34	868.94	23.01	845.93	Unconsolidated
MW-2S	11/30/12	19 - 29	866.34	868.94	23.80	845.14	Unconsolidated
MW-2S	01/14/13	19 - 29	866.34	868.94	24.00	844.94	Unconsolidated
MW-2S	04/15/13	19 - 29	866.34	868.94	21.16	847.78	Unconsolidated
MW-2D	05/01/04	39 - 44	866.50	868.74	25.51	843.23	Upper Lone Rock
MW-2D	07/01/04	39 - 44	866.50	868.74	21.38	847.36	Upper Lone Rock
MW-2D	10/01/04	39 - 44	866.50	868.74	22.85	845.89	Upper Lone Rock
MW-2D	01/01/05	39 - 44	866.50	868.74	23.12	845.62	Upper Lone Rock
MW-2D	03/01/05	39 - 44	866.50	868.74	23.12	845.62	Upper Lone Rock
MW-2D	07/01/05	39 - 44	866.50	868.74	24.63	844.11	Upper Lone Rock
MW-2D	09/01/05	39 - 44	866.50	868.74	26.10	842.64	Upper Lone Rock
MW-2D	12/01/05	39 - 44	866.50	868.74	26.79	841.95	Upper Lone Rock
MW-2D	03/01/06	39 - 44	866.50	868.74	26.33	842.41	Upper Lone Rock
MW-2D	07/01/06	39 - 44	866.50	868.74	23.83	844.91	Upper Lone Rock
MW-2D	10/01/06	39 - 44	866.50	868.74	23.15	845.59	Upper Lone Rock
MW-2D	12/01/06	39 - 44	866.50	868.74	22.70	846.04	Upper Lone Rock
MW-2D	03/01/07	39 - 44	866.50	868.74	22.58	846.16	Upper Lone Rock
MW-2D	08/01/07	39 - 44	866.50	868.74	22.67	846.07	Upper Lone Rock
MW-2D	09/01/07	39 - 44	866.50	868.74	20.43	848.31	Upper Lone Rock
MW-2D	12/01/07	39 - 44	866.50	868.74	21.96	846.78	Upper Lone Rock
MW-2D	03/01/08	39 - 44	866.50	868.74	19.62	849.12	Upper Lone Rock
MW-2D	06/01/08	39 - 44	866.50	868.74	14.80	853.94	Upper Lone Rock
MW-2D	09/01/08	39 - 44	866.50	868.74	19.03	849.71	Upper Lone Rock
MW-2D	12/01/08	39 - 44	866.50	868.74	20.88	847.86	Upper Lone Rock
MW-2D	04/01/09	39 - 44	866.50	868.74	19.25	849.49	Upper Lone Rock
MW-2D	06/01/09	39 - 44	866.50	868.74	18.18	850.56	Upper Lone Rock
MW-2D	09/01/09	39 - 44	866.50	868.74	20.98	847.76	Upper Lone Rock
MW-2D	12/01/09	39 - 44	866.50	868.74	20.59	848.15	Upper Lone Rock
MW-2D	07/01/10	39 - 44	866.50	868.74	18.66	850.08	Upper Lone Rock
MW-2D	10/01/10	39 - 44	866.50	868.74	18.81	849.93	Upper Lone Rock
MW-2D	12/01/10	39 - 44	866.50	868.74	20.33	848.41	Upper Lone Rock
MW-2D	04/09/12	39 - 44	866.50	868.74	21.97	846.77	Upper Lone Rock
MW-2D	07/23/12	39 - 44	866.50	868.74	23.20	845.54	Upper Lone Rock
MW-2D	11/30/12	39 - 44	866.50	868.74	23.65	845.09	Upper Lone Rock
MW-2D	01/14/13	39 - 44	866.50	868.74	23.83	844.91	Upper Lone Rock
MW-2D	04/15/13	39 - 44	866.50	868.74	20.63	848.11	Upper Lone Rock
MW-3S	05/01/04	19 - 29	867.87	867.41	23.54	843.87	Unconsolidated
MW-3S	07/01/04	19 - 29	867.87	867.41	19.35	848.06	Unconsolidated
MW-3S	10/01/04	19 - 29	867.87	867.41	20.83	846.58	Unconsolidated
MW-3S	01/01/05	19 - 29	867.87	867.41	21.36	846.05	Unconsolidated

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Table 1. Groundwater Elevations, Madison-Kipp Corporation, 201 Waubesa Street, Madison, Wisconsin.

Well/ Boring	Date	Screen Interval (feet bls)	Ground Elevation (feet amsl)	Top of Casing Elevation (feet amsl)	Depth to Water (feet btoc)	Groundwater Elevation (feet amsl)	Lithology
MW-3S	03/01/05	19 - 29	867.87	867.41	21.39	846.02	Unconsolidated
MW-3S	07/01/05	19 - 29	867.87	867.41	22.63	844.78	Unconsolidated
MW-3S	09/01/05	19 - 29	867.87	867.41	24.12	843.29	Unconsolidated
MW-3S	12/01/05	19 - 29	867.87	867.41	24.92	842.49	Unconsolidated
MW-3S	03/01/06	19 - 29	867.87	867.41	24.64	842.77	Unconsolidated
MW-3S	07/01/06	19 - 29	867.87	867.41	21.87	845.54	Unconsolidated
MW-3S	10/01/06	19 - 29	867.87	867.41	21.25	846.16	Unconsolidated
MW-3S	12/01/06	19 - 29	867.87	867.41	21.04	846.37	Unconsolidated
MW-3S	03/01/07	19 - 29	867.87	867.41	20.98	846.43	Unconsolidated
MW-3S	05/01/07	19 - 29	867.87	867.41	19.09	848.32	Unconsolidated
MW-3S	08/01/07	19 - 29	867.87	867.41	20.81	846.60	Unconsolidated
MW-3S	09/01/07	19 - 29	867.87	867.41	18.69	848.72	Unconsolidated
MW-3S	12/01/07	19 - 29	867.87	867.41	20.60	846.81	Unconsolidated
MW-3S	03/01/08	19 - 29	867.87	867.41	18.06	849.35	Unconsolidated
MW-3S	06/01/08	19 - 29	867.87	867.41	13.58	853.83	Unconsolidated
MW-3S	09/01/08	19 - 29	867.87	867.41	16.98	850.43	Unconsolidated
MW-3S	12/01/08	19 - 29	867.87	867.41	19.23	848.18	Unconsolidated
MW-3S	04/01/09	19 - 29	867.87	867.41	17.53	849.88	Unconsolidated
MW-3S	06/01/09	19 - 29	867.87	867.41	16.35	851.06	Unconsolidated
MW-3S	09/01/09	19 - 29	867.87	867.41	18.95	848.46	Unconsolidated
MW-3S	12/01/09	19 - 29	867.87	867.41	19.12	848.29	Unconsolidated
MW-3S	07/01/10	19 - 29	867.87	867.41	16.96	850.45	Unconsolidated
MW-3S	10/01/10	19 - 29	867.87	867.41	16.91	850.50	Unconsolidated
MW-3S	04/09/12	19 - 29	867.87	867.41	20.31	847.10	Unconsolidated
MW-3S	07/23/12	19 - 29	867.87	867.41	21.39	846.02	Unconsolidated
MW-3S	11/30/12	19 - 29	867.87	867.41	22.15	845.26	Unconsolidated
MW-3S	01/14/13	19 - 29	867.87	867.41	22.28	845.13	Unconsolidated
MW-3S	04/15/13	19 - 29	867.87	867.41	19.10	848.31	Unconsolidated
MW-3D	05/01/04	48 - 53	867.68	867.25	23.64	843.61	Upper Lone Rock
MW-3D	07/01/04	48 - 53	867.68	867.25	19.82	847.43	Upper Lone Rock
MW-3D	10/01/04	48 - 53	867.68	867.25	21.32	845.93	Upper Lone Rock
MW-3D	01/01/05	48 - 53	867.68	867.25	21.68	845.57	Upper Lone Rock
MW-3D	03/01/05	48 - 53	867.68	867.25	21.45	845.80	Upper Lone Rock
MW-3D	07/01/05	48 - 53	867.68	867.25	23.01	844.24	Upper Lone Rock
MW-3D	09/01/05	48 - 53	867.68	867.25	24.39	842.86	Upper Lone Rock
MW-3D	12/01/05	48 - 53	867.68	867.25	25.15	842.10	Upper Lone Rock
MW-3D	03/01/06	48 - 53	867.68	867.25	24.56	842.69	Upper Lone Rock
MW-3D	07/01/06	48 - 53	867.68	867.25	22.11	845.14	Upper Lone Rock
MW-3D	10/01/06	48 - 53	867.68	867.25	21.78	845.47	Upper Lone Rock
MW-3D	12/01/06	48 - 53	867.68	867.25	21.18	846.07	Upper Lone Rock
MW-3D	03/01/07	48 - 53	867.68	867.25	20.86	846.39	Upper Lone Rock
MW-3D	05/01/07	48 - 53	867.68	867.25	19.11	848.14	Upper Lone Rock
MW-3D	08/01/07	48 - 53	867.68	867.25	21.11	846.14	Upper Lone Rock
MW-3D	09/01/07	48 - 53	867.68	867.25	19.05	848.20	Upper Lone Rock
MW-3D	12/01/07	48 - 53	867.68	867.25	21.22	846.03	Upper Lone Rock
MW-3D	03/01/08	48 - 53	867.68	867.25	18.01	849.24	Upper Lone Rock
MW-3D	06/01/08	48 - 53	867.68	867.25	13.68	853.57	Upper Lone Rock
MW-3D	09/01/08	48 - 53	867.68	867.25	17.89	849.36	Upper Lone Rock

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Table 1. Groundwater Elevations, Madison-Kipp Corporation, 201 Waubesa Street, Madison, Wisconsin.

Well/ Boring	Date	Screen Interval (feet bls)	Ground Elevation (feet amsl)	Top of Casing Elevation (feet amsl)	Depth to Water (feet btoc)	Groundwater Elevation (feet amsl)	Lithology
MW-3D	12/01/08	48 - 53	867.68	867.25	19.48	847.77	Upper Lone Rock
MW-3D	04/01/09	48 - 53	867.68	867.25	17.52	849.73	Upper Lone Rock
MW-3D	06/01/09	48 - 53	867.68	867.25	17.11	850.14	Upper Lone Rock
MW-3D	09/01/09	48 - 53	867.68	867.25	19.61	847.64	Upper Lone Rock
MW-3D	12/01/09	48 - 53	867.68	867.25	19.10	848.15	Upper Lone Rock
MW-3D	07/01/10	48 - 53	867.68	867.25	17.16	850.09	Upper Lone Rock
MW-3D	10/01/10	48 - 53	867.68	867.25	17.50	849.75	Upper Lone Rock
MW-3D	04/09/12	48 - 53	867.68	867.25	20.38	846.87	Upper Lone Rock
MW-3D	07/23/12	48 - 53	867.68	867.25	21.80	845.45	Upper Lone Rock
MW-3D	11/30/12	48 - 53	867.68	867.25	22.27	844.98	Upper Lone Rock
MW-3D	01/14/13	48 - 53	867.68	867.25	22.28	844.97	Upper Lone Rock
MW-3D	04/15/13	48 - 53	867.68	867.25	18.90	848.35	Upper Lone Rock
MW-3D2	05/01/04	76 - 81	867.58	867.39	24.65	842.74	Lower Lone Rock
MW-3D2	07/01/04	76 - 81	867.58	867.39	21.03	846.36	Lower Lone Rock
MW-3D2	10/01/04	76 - 81	867.58	867.39	22.43	844.96	Lower Lone Rock
MW-3D2	01/01/05	76 - 81	867.58	867.39	22.57	844.82	Lower Lone Rock
MW-3D2	03/01/05	76 - 81	867.58	867.39	22.37	845.02	Lower Lone Rock
MW-3D2	07/01/05	76 - 81	867.58	867.39	24.11	843.28	Lower Lone Rock
MW-3D2	09/01/05	76 - 81	867.58	867.39	25.31	842.08	Lower Lone Rock
MW-3D2	12/01/05	76 - 81	867.58	867.39	25.84	841.55	Lower Lone Rock
MW-3D2	03/01/06	76 - 81	867.58	867.39	25.19	842.20	Lower Lone Rock
MW-3D2	07/01/06	76 - 81	867.58	867.39	23.10	844.29	Lower Lone Rock
MW-3D2	10/01/06	76 - 81	867.58	867.39	23.66	843.73	Lower Lone Rock
MW-3D2	12/01/06	76 - 81	867.58	867.39	21.87	845.52	Lower Lone Rock
MW-3D2	03/01/07	76 - 81	867.58	867.39	21.73	845.66	Lower Lone Rock
MW-3D2	05/01/07	76 - 81	867.58	867.39	20.15	847.24	Lower Lone Rock
MW-3D2	08/01/07	76 - 81	867.58	867.39	22.10	845.29	Lower Lone Rock
MW-3D2	09/01/07	76 - 81	867.58	867.39	20.04	847.35	Lower Lone Rock
MW-3D2	12/01/07	76 - 81	867.58	867.39	20.37	847.02	Lower Lone Rock
MW-3D2	03/01/08	76 - 81	867.58	867.39	18.95	848.44	Lower Lone Rock
MW-3D2	06/01/08	76 - 81	867.58	867.39	14.90	852.49	Lower Lone Rock
MW-3D2	09/01/08	76 - 81	867.58	867.39	18.96	848.43	Lower Lone Rock
MW-3D2	12/01/08	76 - 81	867.58	867.39	20.43	846.96	Lower Lone Rock
MW-3D2	04/01/09	76 - 81	867.58	867.39	18.70	848.69	Lower Lone Rock
MW-3D2	06/01/09	76 - 81	867.58	867.39	18.05	849.34	Lower Lone Rock
MW-3D2	09/01/09	76 - 81	867.58	867.39	20.60	846.79	Lower Lone Rock
MW-3D2	12/01/09	76 - 81	867.58	867.39	19.86	847.53	Lower Lone Rock
MW-3D2	07/01/10	76 - 81	867.58	867.39	18.34	849.05	Lower Lone Rock
MW-3D2	10/01/10	76 - 81	867.58	867.39	18.61	848.78	Lower Lone Rock
MW-3D2	04/09/12	76 - 81	867.58	867.39	21.09	846.30	Lower Lone Rock
MW-3D2	07/23/12	76 - 81	867.58	867.39	22.71	844.68	Lower Lone Rock
MW-3D2	11/30/12	76 - 81	867.58	867.39	22.64	844.75	Lower Lone Rock
MW-3D2	01/14/13	76 - 81	867.58	867.39	22.70	844.69	Lower Lone Rock
MW-3D2	04/15/13	76 - 81	867.58	867.39	19.36	848.03	Lower Lone Rock
MW-3D3	07/23/12	214 - 224	867.61	867.35	25.38	841.97	Lower Wonewoc/Upper Eau Claire
MW-3D3	11/30/12	214 - 224	867.61	867.35	23.84	843.51	Lower Wonewoc/Upper Eau Claire

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Table 1. Groundwater Elevations, Madison-Kipp Corporation, 201 Waubesa Street, Madison, Wisconsin.

Well/ Boring	Date	Screen Interval (feet bls)	Ground Elevation (feet amsl)	Top of Casing Elevation (feet amsl)	Depth to Water (feet btoc)	Groundwater Elevation (feet amsl)	Lithology
MW-3D3	01/14/13	214 - 224	867.61	867.35	23.85	843.50	Lower Wonewoc/Upper Eau Claire
MW-3D3	04/15/13	214 - 224	867.61	867.35	21.13	846.22	Lower Wonewoc/Upper Eau Claire
MW-4S	05/01/04	35 - 50	880.81	880.31	37.14	843.17	Unconsolidated/Upper Lone Rock
MW-4S	07/01/04	35 - 50	880.81	880.31	32.60	847.71	Unconsolidated/Upper Lone Rock
MW-4S	10/01/04	35 - 50	880.81	880.31	33.47	846.84	Unconsolidated/Upper Lone Rock
MW-4S	01/01/05	35 - 50	880.81	880.31	34.10	846.21	Unconsolidated/Upper Lone Rock
MW-4S	03/01/05	35 - 50	880.81	880.31	34.46	845.85	Unconsolidated/Upper Lone Rock
MW-4S	07/01/05	35 - 50	880.81	880.31	35.61	844.70	Unconsolidated/Upper Lone Rock
MW-4S	09/01/05	35 - 50	880.81	880.31	36.85	843.46	Unconsolidated/Upper Lone Rock
MW-4S	12/01/05	35 - 50	880.81	880.31	37.75	842.56	Unconsolidated/Upper Lone Rock
MW-4S	03/01/06	35 - 50	880.81	880.31	37.93	842.38	Unconsolidated/Upper Lone Rock
MW-4S	07/01/06	35 - 50	880.81	880.31	35.10	845.21	Unconsolidated/Upper Lone Rock
MW-4S	10/01/06	35 - 50	880.81	880.31	34.17	846.14	Unconsolidated/Upper Lone Rock
MW-4S	12/01/06	35 - 50	880.81	880.31	33.86	846.45	Unconsolidated/Upper Lone Rock
MW-4S	03/01/07	35 - 50	880.81	880.31	33.72	846.59	Unconsolidated/Upper Lone Rock
MW-4S	08/01/07	35 - 50	880.81	880.31	32.98	847.33	Unconsolidated/Upper Lone Rock
MW-4S	09/01/07	35 - 50	880.81	880.31	31.08	849.23	Unconsolidated/Upper Lone Rock
MW-4S	12/01/07	35 - 50	880.81	880.31	31.86	848.45	Unconsolidated/Upper Lone Rock
MW-4S	03/01/08	35 - 50	880.81	880.31	30.88	849.43	Unconsolidated/Upper Lone Rock
MW-4S	06/01/08	35 - 50	880.81	880.31	25.51	854.80	Unconsolidated/Upper Lone Rock
MW-4S	09/01/08	35 - 50	880.81	880.31	28.43	851.88	Unconsolidated/Upper Lone Rock
MW-4S	12/01/08	35 - 50	880.81	880.31	30.94	849.37	Unconsolidated/Upper Lone Rock
MW-4S	04/01/09	35 - 50	880.81	880.31	31.44	848.87	Unconsolidated/Upper Lone Rock
MW-4S	06/01/09	35 - 50	880.81	880.31	28.72	851.59	Unconsolidated/Upper Lone Rock
MW-4S	09/01/09	35 - 50	880.81	880.31	33.53	846.78	Unconsolidated/Upper Lone Rock
MW-4S	07/01/10	35 - 50	880.81	880.31	29.70	850.61	Unconsolidated/Upper Lone Rock
MW-4S	10/01/10	35 - 50	880.81	880.31	28.99	851.32	Unconsolidated/Upper Lone Rock
MW-4S	12/01/10	35 - 50	880.81	880.31	30.86	849.45	Unconsolidated/Upper Lone Rock
MW-4S	04/09/12	35 - 50	880.81	880.31	33.21	847.10	Unconsolidated/Upper Lone Rock
MW-4S	07/23/12	35 - 50	880.81	880.31	33.89	846.42	Unconsolidated/Upper Lone Rock
MW-4S	11/30/12	35 - 50	880.81	880.31	34.57	845.74	Unconsolidated/Upper Lone Rock
MW-4S	01/14/13	35 - 50	880.81	880.31	34.89	845.42	Unconsolidated/Upper Lone Rock
MW-4S	04/15/13	35 - 50	880.81	880.31	32.47	847.84	Unconsolidated/Upper Lone Rock
MW-4D	05/01/04	65 - 70	881.18	880.38	37.81	842.57	Lower Lone Rock
MW-4D	07/01/04	65 - 70	881.18	880.38	33.72	846.66	Lower Lone Rock
MW-4D	10/01/04	65 - 70	881.18	880.38	35.10	845.28	Lower Lone Rock
MW-4D	01/01/05	65 - 70	881.18	880.38	35.50	844.88	Lower Lone Rock
MW-4D	03/01/05	65 - 70	881.18	880.38	35.42	844.96	Lower Lone Rock
MW-4D	09/01/05	65 - 70	881.18	880.38	38.28	842.10	Lower Lone Rock
MW-4D	12/01/05	65 - 70	881.18	880.38	39.00	841.38	Lower Lone Rock
MW-4D	03/01/06	65 - 70	881.18	880.38	38.66	841.72	Lower Lone Rock
MW-4D	07/01/06	65 - 70	881.18	880.38	36.32	844.06	Lower Lone Rock
MW-4D	10/01/06	65 - 70	881.18	880.38	35.58	844.80	Lower Lone Rock
MW-4D	12/01/06	65 - 70	881.18	880.38	34.96	845.42	Lower Lone Rock
MW-4D	03/01/07	65 - 70	881.18	880.38	34.95	845.43	Lower Lone Rock
MW-4D	08/01/07	65 - 70	881.18	880.38	35.03	845.35	Lower Lone Rock

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Table 1. Groundwater Elevations, Madison-Kipp Corporation, 201 Waubesa Street, Madison, Wisconsin.

Well/ Boring	Date	Screen Interval (feet bls)	Ground Elevation (feet amsl)	Top of Casing Elevation (feet amsl)	Depth to Water (feet btoc)	Groundwater Elevation (feet amsl)	Lithology
MW-4D	09/01/07	65 - 70	881.18	880.38	32.70	847.68	Lower Lone Rock
MW-4D	12/01/07	65 - 70	881.18	880.38	34.03	846.35	Lower Lone Rock
MW-4D	03/01/08	65 - 70	881.18	880.38	32.26	848.12	Lower Lone Rock
MW-4D	06/01/08	65 - 70	881.18	880.38	27.05	853.33	Lower Lone Rock
MW-4D	09/01/08	65 - 70	881.18	880.38	31.22	849.16	Lower Lone Rock
MW-4D	12/01/08	65 - 70	881.18	880.38	33.03	847.35	Lower Lone Rock
MW-4D	04/01/09	65 - 70	881.18	880.38	30.79	849.59	Lower Lone Rock
MW-4D	06/01/09	65 - 70	881.18	880.38	30.55	849.83	Lower Lone Rock
MW-4D	07/01/10	65 - 70	881.18	880.38	31.03	849.35	Lower Lone Rock
MW-4D	10/01/10	65 - 70	881.18	880.38	30.96	849.42	Lower Lone Rock
MW-4D	12/01/10	65 - 70	881.18	880.38	32.46	847.92	Lower Lone Rock
MW-4D	04/09/12	65 - 70	881.18	880.38	34.26	846.12	Lower Lone Rock
MW-4D	07/23/12	65 - 70	881.18	880.38	35.50	844.88	Lower Lone Rock
MW-4D	11/30/12	65 - 70	881.18	880.38	35.59	844.79	Lower Lone Rock
MW-4D	01/14/13	65 - 70	881.18	880.38	35.87	844.51	Lower Lone Rock
MW-4D	04/15/13	65 - 70	881.18	880.38	32.99	847.39	Lower Lone Rock
MW-4D2	05/01/04	91 - 96	880.36	880.20	37.57	842.63	Lower Lone Rock
MW-4D2	07/01/04	91 - 96	880.36	880.20	34.06	846.14	Lower Lone Rock
MW-4D2	10/01/04	91 - 96	880.36	880.20	35.43	844.77	Lower Lone Rock
MW-4D2	01/01/05	91 - 96	880.36	880.20	35.68	844.52	Lower Lone Rock
MW-4D2	03/01/05	91 - 96	880.36	880.20	35.56	844.64	Lower Lone Rock
MW-4D2	09/01/05	91 - 96	880.36	880.20	38.53	841.67	Lower Lone Rock
MW-4D2	12/01/05	91 - 96	880.36	880.20	39.05	841.15	Lower Lone Rock
MW-4D2	03/01/06	91 - 96	880.36	880.20	38.62	841.58	Lower Lone Rock
MW-4D2	07/01/06	91 - 96	880.36	880.20	36.73	843.47	Lower Lone Rock
MW-4D2	10/01/06	91 - 96	880.36	880.20	35.81	844.39	Lower Lone Rock
MW-4D2	12/01/06	91 - 96	880.36	880.20	35.05	845.15	Lower Lone Rock
MW-4D2	03/01/07	91 - 96	880.36	880.20	35.21	844.99	Lower Lone Rock
MW-4D2	08/01/07	91 - 96	880.36	880.20	35.09	845.11	Lower Lone Rock
MW-4D2	09/01/07	91 - 96	880.36	880.20	32.98	847.22	Lower Lone Rock
MW-4D2	12/01/07	91 - 96	880.36	880.20	33.76	846.44	Lower Lone Rock
MW-4D2	03/01/08	91 - 96	880.36	880.20	32.60	847.60	Lower Lone Rock
MW-4D2	06/01/08	91 - 96	880.36	880.20	28.12	852.08	Lower Lone Rock
MW-4D2	09/01/08	91 - 96	880.36	880.20	31.61	848.59	Lower Lone Rock
MW-4D2	12/01/08	91 - 96	880.36	880.20	33.20	847.00	Lower Lone Rock
MW-4D2	04/01/09	91 - 96	880.36	880.20	32.01	848.19	Lower Lone Rock
MW-4D2	06/01/09	91 - 96	880.36	880.20	30.88	849.32	Lower Lone Rock
MW-4D2	07/01/10	91 - 96	880.36	880.20	31.39	848.81	Lower Lone Rock
MW-4D2	10/01/10	91 - 96	880.36	880.20	31.26	848.94	Lower Lone Rock
MW-4D2	12/01/10	91 - 96	880.36	880.20	32.65	847.55	Lower Lone Rock
MW-4D2	04/09/12	91 - 96	880.36	880.20	31.33	848.87	Lower Lone Rock
MW-4D2	07/23/12	91 - 96	880.36	880.20	35.76	844.44	Lower Lone Rock
MW-4D2	11/30/12	91 - 96	880.36	880.20	35.82	844.38	Lower Lone Rock
MW-4D2	01/14/13	91 - 96	880.36	880.20	35.92	844.28	Lower Lone Rock
MW-4D2	04/15/13	91 - 96	880.36	880.20	32.99	847.21	Lower Lone Rock
MW-5S	05/01/04	34 - 44	872.56	872.14	28.68	843.46	Upper Lone Rock
MW-5S	07/01/04	34 - 44	872.56	872.14	24.68	847.46	Upper Lone Rock

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Table 1. Groundwater Elevations, Madison-Kipp Corporation, 201 Waubesa Street, Madison, Wisconsin.

Well/ Boring	Date	Screen Interval (feet bls)	Ground Elevation (feet amsl)	Top of Casing Elevation (feet amsl)	Depth to Water (feet btoc)	Groundwater Elevation (feet amsl)	Lithology
MW-5S	10/01/04	34 - 44	872.56	872.14	26.34	845.80	Upper Lone Rock
MW-5S	01/01/05	34 - 44	872.56	872.14	26.66	845.48	Upper Lone Rock
MW-5S	03/01/05	34 - 44	872.56	872.14	26.62	845.52	Upper Lone Rock
MW-5S	07/01/05	34 - 44	872.56	872.14	28.13	844.01	Upper Lone Rock
MW-5S	09/01/05	34 - 44	872.56	872.14	29.54	842.60	Upper Lone Rock
MW-5S	12/01/05	34 - 44	872.56	872.14	30.14	842.00	Upper Lone Rock
MW-5S	03/01/06	34 - 44	872.56	872.14	29.79	842.35	Upper Lone Rock
MW-5S	07/01/06	34 - 44	872.56	872.14	27.32	844.82	Upper Lone Rock
MW-5S	10/01/06	34 - 44	872.56	872.14	26.72	845.42	Upper Lone Rock
MW-5S	12/01/06	34 - 44	872.56	872.14	26.21	845.93	Upper Lone Rock
MW-5S	03/01/07	34 - 44	872.56	872.14	26.04	846.10	Upper Lone Rock
MW-5S	08/01/07	34 - 44	872.56	872.14	26.40	845.74	Upper Lone Rock
MW-5S	09/01/07	34 - 44	872.56	872.14	24.09	848.05	Upper Lone Rock
MW-5S	12/01/07	34 - 44	872.56	872.14	25.55	846.59	Upper Lone Rock
MW-5S	03/01/08	34 - 44	872.56	872.14	23.30	848.84	Upper Lone Rock
MW-5S	06/01/08	34 - 44	872.56	872.14	17.98	854.16	Upper Lone Rock
MW-5S	09/01/08	34 - 44	872.56	872.14	18.82	853.32	Upper Lone Rock
MW-5S	12/01/08	34 - 44	872.56	872.14	24.45	847.69	Upper Lone Rock
MW-5S	04/01/09	34 - 44	872.56	872.14	22.43	849.71	Upper Lone Rock
MW-5S	06/01/09	34 - 44	872.56	872.14	21.65	850.49	Upper Lone Rock
MW-5S	09/01/09	34 - 44	872.56	872.14	21.81	850.33	Upper Lone Rock
MW-5S	12/01/09	34 - 44	872.56	872.14	24.10	848.04	Upper Lone Rock
MW-5S	07/01/10	34 - 44	872.56	872.14	22.30	849.84	Upper Lone Rock
MW-5S	10/01/10	34 - 44	872.56	872.14	21.61	850.53	Upper Lone Rock
MW-5S	12/01/10	34 - 44	872.56	872.14	23.84	848.30	Upper Lone Rock
MW-5S	04/09/12	34 - 44	872.56	872.14	25.48	846.66	Upper Lone Rock
MW-5S	07/23/12	34 - 44	872.56	872.14	26.73	845.41	Upper Lone Rock
MW-5S	01/14/13	34 - 44	872.56	872.14	27.36	844.78	Upper Lone Rock
MW-5S	04/15/13	34 - 44	872.56	872.14	23.71	848.43	Upper Lone Rock
MW-5D	05/01/04	75 - 80	872.58	872.10	29.12	842.98	Lower Lone Rock
MW-5D	07/01/04	75 - 80	872.58	872.10	25.21	846.89	Lower Lone Rock
MW-5D	10/01/04	75 - 80	872.58	872.10	26.67	845.43	Lower Lone Rock
MW-5D	01/01/05	75 - 80	872.58	872.10	27.05	845.05	Lower Lone Rock
MW-5D	03/01/05	75 - 80	872.58	872.10	26.91	845.19	Lower Lone Rock
MW-5D	07/01/05	75 - 80	872.58	872.10	28.48	843.62	Lower Lone Rock
MW-5D	09/01/05	75 - 80	872.58	872.10	29.84	842.26	Lower Lone Rock
MW-5D	12/01/05	75 - 80	872.58	872.10	30.38	841.72	Lower Lone Rock
MW-5D	03/01/06	75 - 80	872.58	872.10	29.91	842.19	Lower Lone Rock
MW-5D	07/01/06	75 - 80	872.58	872.10	27.63	844.47	Lower Lone Rock
MW-5D	10/01/06	75 - 80	872.58	872.10	27.06	845.04	Lower Lone Rock
MW-5D	12/01/06	75 - 80	872.58	872.10	26.48	845.62	Lower Lone Rock
MW-5D	03/01/07	75 - 80	872.58	872.10	26.45	845.65	Lower Lone Rock
MW-5D	08/01/07	75 - 80	872.58	872.10	26.60	845.50	Lower Lone Rock
MW-5D	09/01/07	75 - 80	872.58	872.10	24.47	847.63	Lower Lone Rock
MW-5D	12/01/07	75 - 80	872.58	872.10	25.68	846.42	Lower Lone Rock
MW-5D	03/01/08	75 - 80	872.58	872.10	23.61	848.49	Lower Lone Rock
MW-5D	06/01/08	75 - 80	872.58	872.10	18.93	853.17	Lower Lone Rock
MW-5D	09/01/08	75 - 80	872.58	872.10	23.08	849.02	Lower Lone Rock

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Table 1. Groundwater Elevations, Madison-Kipp Corporation, 201 Waubesa Street, Madison, Wisconsin.

Well/ Boring	Date	Screen Interval (feet bls)	Ground Elevation (feet amsl)	Top of Casing Elevation (feet amsl)	Depth to Water (feet btoc)	Groundwater Elevation (feet amsl)	Lithology
MW-5D	12/01/08	75 - 80	872.58	872.10	24.85	847.25	Lower Lone Rock
MW-5D	04/01/09	75 - 80	872.58	872.10	23.17	848.93	Lower Lone Rock
MW-5D	06/01/09	75 - 80	872.58	872.10	22.29	849.81	Lower Lone Rock
MW-5D	09/01/09	75 - 80	872.58	872.10	25.20	846.90	Lower Lone Rock
MW-5D	12/01/09	75 - 80	872.58	872.10	24.55	847.55	Lower Lone Rock
MW-5D	07/01/10	75 - 80	872.58	872.10	22.79	849.31	Lower Lone Rock
MW-5D	10/01/10	75 - 80	872.58	872.10	22.91	849.19	Lower Lone Rock
MW-5D	12/01/10	75 - 80	872.58	872.10	24.26	847.84	Lower Lone Rock
MW-5D	04/09/12	75 - 80	872.58	872.10	27.10	845.00	Lower Lone Rock
MW-5D	07/23/12	75 - 80	872.58	872.10	27.15	844.95	Lower Lone Rock
MW-5D	11/30/12	75 - 80	872.58	872.10	27.38	844.72	Lower Lone Rock
MW-5D	01/14/13	75 - 80	872.58	872.10	27.52	844.58	Lower Lone Rock
MW-5D	04/15/13	75 - 80	872.58	872.10	23.41	848.69	Lower Lone Rock
MW-5D2	05/01/04	165 - 170	872.59	872.20	31.87	840.33	Lower Wonewoc
MW-5D2	07/01/04	165 - 170	872.59	872.20	29.36	842.84	Lower Wonewoc
MW-5D2	10/01/04	165 - 170	872.59	872.20	30.26	841.94	Lower Wonewoc
MW-5D2	01/01/05	165 - 170	872.59	872.20	29.59	842.61	Lower Wonewoc
MW-5D2	03/01/05	165 - 170	872.59	872.20	28.84	843.36	Lower Wonewoc
MW-5D2	07/01/05	165 - 170	872.59	872.20	31.60	840.60	Lower Wonewoc
MW-5D2	09/01/05	165 - 170	872.59	872.20	32.52	839.68	Lower Wonewoc
MW-5D2	12/01/05	165 - 170	872.59	872.20	32.62	839.58	Lower Wonewoc
MW-5D2	03/01/06	165 - 170	872.59	872.20	30.98	841.22	Lower Wonewoc
MW-5D2	07/01/06	165 - 170	872.59	872.20	30.59	841.61	Lower Wonewoc
MW-5D2	10/01/06	165 - 170	872.59	872.20	30.16	842.04	Lower Wonewoc
MW-5D2	12/01/06	165 - 170	872.59	872.20	28.66	843.54	Lower Wonewoc
MW-5D2	03/01/07	165 - 170	872.59	872.20	28.69	843.51	Lower Wonewoc
MW-5D2	08/01/07	165 - 170	872.59	872.20	30.01	842.19	Lower Wonewoc
MW-5D2	09/01/07	165 - 170	872.59	872.20	28.17	844.03	Lower Wonewoc
MW-5D2	12/01/07	165 - 170	872.59	872.20	28.48	843.72	Lower Wonewoc
MW-5D2	03/01/08	165 - 170	872.59	872.20	26.56	845.64	Lower Wonewoc
MW-5D2	06/01/08	165 - 170	872.59	872.20	23.96	848.24	Lower Wonewoc
MW-5D2	09/01/08	165 - 170	872.59	872.20	27.31	844.89	Lower Wonewoc
MW-5D2	12/01/08	165 - 170	872.59	872.20	27.55	844.65	Lower Wonewoc
MW-5D2	04/01/09	165 - 170	872.59	872.20	26.08	846.12	Lower Wonewoc
MW-5D2	06/01/09	165 - 170	872.59	872.20	26.47	845.73	Lower Wonewoc
MW-5D2	09/01/09	165 - 170	872.59	872.20	28.45	843.75	Lower Wonewoc
MW-5D2	12/01/09	165 - 170	872.59	872.20	26.83	845.37	Lower Wonewoc
MW-5D2	07/01/10	165 - 170	872.59	872.20	26.59	845.61	Lower Wonewoc
MW-5D2	10/01/10	165 - 170	872.59	872.20	26.69	845.51	Lower Wonewoc
MW-5D2	12/01/10	165 - 170	872.59	872.20	26.94	845.26	Lower Wonewoc
MW-5D2	04/09/12	165 - 170	872.59	872.20	27.68	844.52	Lower Wonewoc
MW-5D2	07/23/12	165 - 170	872.59	872.20	30.48	841.72	Lower Wonewoc
MW-5D2	11/30/12	165 - 170	872.59	872.20	28.95	843.25	Lower Wonewoc
MW-5D2	01/14/13	165 - 170	872.59	872.20	28.89	843.31	Lower Wonewoc
MW-5D2	04/15/13	165 - 170	872.59	872.20	26.16	846.04	Lower Wonewoc
MW-5D3	07/23/12	225 - 235	872.34	871.89	30.08	841.81	Lower Wonewoc/Upper Eau Claire
MW-5D3	11/30/12	225 - 235	872.34	871.89	28.50	843.39	Lower Wonewoc/Upper Eau Claire

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Table 1. Groundwater Elevations, Madison-Kipp Corporation, 201 Waubesa Street, Madison, Wisconsin.

Well/ Boring	Date	Screen Interval (feet bls)	Ground Elevation (feet amsl)	Top of Casing Elevation (feet amsl)	Depth to Water (feet btoc)	Groundwater Elevation (feet amsl)	Lithology
MW-5D3	01/14/13	225 - 235	872.34	871.89	28.47	843.42	Lower Wonewoc/Upper Eau Claire
MW-5D3	04/15/13	225 - 235	872.34	871.89	25.77	846.12	Lower Wonewoc/Upper Eau Claire
MW-6S	05/01/04	32 - 42	877.20	876.69	34.16	842.53	Unconsolidated/ Upper Lone Rock
MW-6S	07/01/04	32 - 42	877.20	876.69	29.87	846.82	Unconsolidated/ Upper Lone Rock
MW-6S	10/01/04	32 - 42	877.20	876.69	31.00	845.69	Unconsolidated/ Upper Lone Rock
MW-6S	01/01/05	32 - 42	877.20	876.69	31.51	845.18	Unconsolidated/ Upper Lone Rock
MW-6S	03/01/05	32 - 42	877.20	876.69	31.93	844.76	Unconsolidated/ Upper Lone Rock
MW-6S	07/01/05	32 - 42	877.20	876.69	33.09	843.60	Unconsolidated/ Upper Lone Rock
MW-6S	09/01/05	32 - 42	877.20	876.69	34.17	842.52	Unconsolidated/ Upper Lone Rock
MW-6S	12/01/05	32 - 42	877.20	876.69	35.83	840.86	Unconsolidated/ Upper Lone Rock
MW-6S	03/01/06	32 - 42	877.20	876.69	34.89	841.80	Unconsolidated/ Upper Lone Rock
MW-6S	07/01/06	32 - 42	877.20	876.69	32.52	844.17	Unconsolidated/ Upper Lone Rock
MW-6S	10/01/06	32 - 42	877.20	876.69	31.81	844.88	Unconsolidated/ Upper Lone Rock
MW-6S	12/01/06	32 - 42	877.20	876.69	31.34	845.35	Unconsolidated/ Upper Lone Rock
MW-6S	03/01/07	32 - 42	877.20	876.69	31.54	845.15	Unconsolidated/ Upper Lone Rock
MW-6S	08/01/07	32 - 42	877.20	876.69	31.96	844.73	Unconsolidated/ Upper Lone Rock
MW-6S	09/01/07	32 - 42	877.20	876.69	28.95	847.74	Unconsolidated/ Upper Lone Rock
MW-6S	12/01/07	32 - 42	877.20	876.69	30.23	846.46	Unconsolidated/ Upper Lone Rock
MW-6S	03/01/08	32 - 42	877.20	876.69	28.84	847.85	Unconsolidated/ Upper Lone Rock
MW-6S	06/01/08	32 - 42	877.20	876.69	24.08	852.61	Unconsolidated/ Upper Lone Rock
MW-6S	09/01/08	32 - 42	877.20	876.69	26.88	849.81	Unconsolidated/ Upper Lone Rock
MW-6S	12/01/08	32 - 42	877.20	876.69	29.09	847.60	Unconsolidated/ Upper Lone Rock
MW-6S	04/01/09	32 - 42	877.20	876.69	28.69	848.00	Unconsolidated/ Upper Lone Rock
MW-6S	06/01/09	32 - 42	877.20	876.69	26.67	850.02	Unconsolidated/ Upper Lone Rock
MW-6S	09/01/09	32 - 42	877.20	876.69	28.95	847.74	Unconsolidated/ Upper Lone Rock
MW-6S	12/01/09	32 - 42	877.20	876.69	29.26	847.43	Unconsolidated/ Upper Lone Rock
MW-6S	07/01/10	32 - 42	877.20	876.69	27.66	849.03	Unconsolidated/ Upper Lone Rock
MW-6S	10/01/10	32 - 42	877.20	876.69	26.91	849.78	Unconsolidated/ Upper Lone Rock
MW-6S	12/01/10	32 - 42	877.20	876.69	28.55	848.14	Unconsolidated/ Upper Lone Rock
MW-6S	04/09/12	32 - 42	877.20	876.69	30.80	845.89	Unconsolidated/ Upper Lone Rock
MW-6S	07/23/12	32 - 42	877.20	876.69	31.40	845.29	Unconsolidated/ Upper Lone Rock
MW-6S	01/14/13	32 - 42	877.20	876.69	32.31	844.38	Unconsolidated/ Upper Lone Rock
MW-6S	04/15/13	32 - 42	877.20	876.69	30.72	845.97	Unconsolidated/ Upper Lone Rock
MW-6D	05/01/04	65 - 70	877.11	876.69	34.34	842.35	Lower Lone Rock
MW-6D	07/01/04	65 - 70	877.11	876.69	30.45	846.24	Lower Lone Rock
MW-6D	10/01/04	65 - 70	877.11	876.69	31.72	844.97	Lower Lone Rock
MW-6D	01/01/05	65 - 70	877.11	876.69	32.17	844.52	Lower Lone Rock
MW-6D	03/01/05	65 - 70	877.11	876.69	32.17	844.52	Lower Lone Rock
MW-6D	07/01/05	65 - 70	877.11	876.69	33.70	842.99	Lower Lone Rock
MW-6D	09/01/05	65 - 70	877.11	876.69	34.87	841.82	Lower Lone Rock
MW-6D	12/01/05	65 - 70	877.11	876.69	35.39	841.30	Lower Lone Rock
MW-6D	03/01/06	65 - 70	877.11	876.69	35.06	841.63	Lower Lone Rock
MW-6D	07/01/06	65 - 70	877.11	876.69	33.06	843.63	Lower Lone Rock
MW-6D	10/01/06	65 - 70	877.11	876.69	32.42	844.27	Lower Lone Rock
MW-6D	12/01/06	65 - 70	877.11	876.69	31.72	844.97	Lower Lone Rock
MW-6D	03/01/07	65 - 70	877.11	876.69	31.87	844.82	Lower Lone Rock
MW-6D	08/01/07	65 - 70	877.11	876.69	31.73	844.96	Lower Lone Rock

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Table 1. Groundwater Elevations, Madison-Kipp Corporation, 201 Waubesa Street, Madison, Wisconsin.

Well/ Boring	Date	Screen Interval (feet bls)	Ground Elevation (feet amsl)	Top of Casing Elevation (feet amsl)	Depth to Water (feet btoc)	Groundwater Elevation (feet amsl)	Lithology
MW-6D	09/01/07	65 - 70	877.11	876.69	29.64	847.05	Lower Lone Rock
MW-6D	12/01/07	65 - 70	877.11	876.69	30.86	845.83	Lower Lone Rock
MW-6D	03/01/08	65 - 70	877.11	876.69	29.39	847.30	Lower Lone Rock
MW-6D	06/01/08	65 - 70	877.11	876.69	24.50	852.19	Lower Lone Rock
MW-6D	09/01/08	65 - 70	877.11	876.69	28.10	848.59	Lower Lone Rock
MW-6D	12/01/08	65 - 70	877.11	876.69	29.87	846.82	Lower Lone Rock
MW-6D	04/01/09	65 - 70	877.11	876.69	28.93	847.76	Lower Lone Rock
MW-6D	06/01/09	65 - 70	877.11	876.69	27.51	849.18	Lower Lone Rock
MW-6D	09/01/09	65 - 70	877.11	876.69	29.95	846.74	Lower Lone Rock
MW-6D	12/01/09	65 - 70	877.11	876.69	29.70	846.99	Lower Lone Rock
MW-6D	07/01/10	65 - 70	877.11	876.69	28.11	848.58	Lower Lone Rock
MW-6D	10/01/10	65 - 70	877.11	876.69	27.80	848.89	Lower Lone Rock
MW-6D	12/01/10	65 - 70	877.11	876.69	29.24	847.45	Lower Lone Rock
MW-6D	04/09/12	65 - 70	877.11	876.69	31.15	845.54	Lower Lone Rock
MW-6D	07/23/12	65 - 70	877.11	876.69	32.25	844.44	Lower Lone Rock
MW-6D	01/14/13	65 - 70	877.11	876.69	32.38	844.31	Lower Lone Rock
MW-6D	04/15/13	65 - 70	877.11	876.69	30.11	846.58	Lower Lone Rock
MW-7	04/09/12	25 - 35	870.91	870.42	23.82	846.60	Unconsolidated
MW-7	07/23/12	25 - 35	870.91	870.42	24.91	845.51	Unconsolidated
MW-7	11/30/12	25 - 35	870.91	870.42	25.48	844.94	Unconsolidated
MW-7	01/14/13	25 - 35	870.91	870.42	25.82	844.60	Unconsolidated
MW-7	04/15/13	25 - 35	870.91	870.42	22.64	847.78	Unconsolidated
MW-8	04/09/12	24 - 34	867.69	866.78	19.74	847.04	Unconsolidated
MW-8	07/23/12	24 - 34	867.69	866.78	21.12	845.66	Unconsolidated
MW-8	11/30/12	24 - 34	867.69	866.78	21.71	845.07	Unconsolidated
MW-8	01/14/13	24 - 34	867.69	866.78	21.97	844.81	Unconsolidated
MW-8	04/15/13	24 - 34	867.69	866.78	17.57	849.21	Unconsolidated
MW-9D	04/09/12	44 - 49	855.80	855.47	9.33	846.14	Upper Lone Rock
MW-9D	07/23/12	44 - 49	855.80	855.47	11.49	843.98	Upper Lone Rock
MW-9D	01/14/13	44 - 49	855.80	855.47	10.79	844.68	Upper Lone Rock
MW-9D	04/15/13	44 - 49	855.80	855.47	7.57	847.90	Upper Lone Rock
MW-9D2	04/09/12	64 - 69	855.89	855.48	9.52	845.96	Lower Lone Rock
MW-9D2	07/23/12	64 - 69	855.89	855.48	11.66	843.82	Lower Lone Rock
MW-9D2	01/14/13	64 - 69	855.89	855.48	10.86	844.62	Lower Lone Rock
MW-9D2	04/15/13	64 - 69	855.89	855.48	7.79	847.69	Lower Lone Rock
MW-10S	04/09/12	11 - 21	864.88	864.42	17.21	847.21	Unconsolidated
MW-10S	07/23/12	11 - 21	864.88	864.42	18.31	846.11	Unconsolidated
MW-10S	01/14/13	11 - 21	864.88	864.42	19.30	845.12	Unconsolidated
MW-10S	04/15/13	11 - 21	864.88	864.42	16.08	848.34	Unconsolidated
MW-11S	04/11/12	24 - 34	874.10	873.47	27.53	845.94	Unconsolidated
MW-11S	07/23/12	24 - 34	874.10	873.47	28.31	845.16	Unconsolidated
MW-11S	11/30/12	24 - 34	874.10	873.47	28.80	844.67	Unconsolidated

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Table 1. Groundwater Elevations, Madison-Kipp Corporation, 201 Waubesa Street, Madison, Wisconsin.

Well/ Boring	Date	Screen Interval (feet bls)	Ground Elevation (feet amsl)	Top of Casing Elevation (feet amsl)	Depth to Water (feet btoc)	Groundwater Elevation (feet amsl)	Lithology
MW-11S	01/14/13	24 - 34	874.10	873.47	29.10	844.37	Unconsolidated
MW-11S	04/15/13	24 - 34	874.10	873.47	26.82	846.65	Unconsolidated
MW-12S	04/11/12	3 - 13	859.78	859.41	9.38	850.03	Unconsolidated
MW-12S	07/23/12	3 - 13	859.78	859.41	10.80	848.61	Unconsolidated
MW-12S	11/30/12	3 - 13	859.78	859.41	11.85	847.56	Unconsolidated
MW-12S	01/14/13	3 - 13	859.78	859.41	9.32	850.09	Unconsolidated
MW-12S	04/15/13	3 - 13	859.78	859.41	2.35	857.06	Unconsolidated
MP-13	12/01/12	44 - 48	864.49	863.99	18.50	845.49	Upper Lone Rock
MP-13	01/14/13	44 - 48	864.49	863.99	18.40	845.59	Upper Lone Rock
MP-13	02/20/13	44 - 48	864.49	863.99	17.82	846.17	Upper Lone Rock
MP-13	04/17/13	44 - 48	864.49	863.99	14.66	849.33	Upper Lone Rock
MP-13	12/01/12	67 - 71	864.49	863.99	18.80	845.19	Lower Lone Rock
MP-13	01/14/13	67 - 71	864.49	863.99	18.77	845.22	Lower Lone Rock
MP-13	02/20/13	67 - 71	864.49	863.99	18.14	845.85	Lower Lone Rock
MP-13	04/17/13	67 - 71	864.49	863.99	15.14	848.85	Lower Lone Rock
MP-13	12/01/12	81 - 85	864.49	863.99	18.90	845.09	Lower Lone Rock
MP-13	01/14/13	81 - 85	864.49	863.99	18.90	845.09	Lower Lone Rock
MP-13	02/20/13	81 - 85	864.49	863.99	18.30	845.69	Lower Lone Rock
MP-13	04/17/13	81 - 85	864.49	863.99	15.37	848.62	Lower Lone Rock
MP-13	12/01/12	102 - 106	864.49	863.99	19.90	844.09	Upper Wonewoc
MP-13	01/14/13	102 - 106	864.49	863.99	19.97	844.02	Upper Wonewoc
MP-13	02/20/13	102 - 106	864.49	863.99	19.39	844.60	Upper Wonewoc
MP-13	04/17/13	102 - 106	864.49	863.99	16.93	847.06	Upper Wonewoc
MP-13	12/01/12	121 - 125	864.49	863.99	20.00	843.99	Upper Wonewoc
MP-13	01/14/13	121 - 125	864.49	863.99	20.01	843.98	Upper Wonewoc
MP-13	02/20/13	121 - 125	864.49	863.99	19.46	844.53	Upper Wonewoc
MP-13	04/17/13	121 - 125	864.49	863.99	16.99	847.00	Upper Wonewoc
MP-13	12/01/12	135 - 139	864.49	863.99	20.10	843.89	Lower Wonewoc
MP-13	01/14/13	135 - 139	864.49	863.99	20.10	843.89	Lower Wonewoc
MP-13	02/20/13	135 - 139	864.49	863.99	19.55	844.44	Lower Wonewoc
MP-13	04/17/13	135 - 139	864.49	863.99	17.10	846.89	Lower Wonewoc
MP-13	12/01/12	163 - 167	864.49	863.99	20.40	843.59	Lower Wonewoc
MP-13	01/14/13	163 - 167	864.49	863.99	20.26	843.73	Lower Wonewoc
MP-13	02/20/13	163 - 167	864.49	863.99	19.68	844.31	Lower Wonewoc
MP-13	04/17/13	163 - 167	864.49	863.99	17.37	846.62	Lower Wonewoc
MP-14	01/14/13	70 - 75	866.88	867.28	21.73	845.55	Lower Lone Rock
MP-14	04/16/13	70 - 75	866.88	867.28	18.06	849.22	Lower Lone Rock
MP-14	01/14/13	100 - 105	866.88	867.28	23.03	844.25	Upper Wonewoc
MP-14	04/16/13	100 - 105	866.88	867.28	19.82	847.46	Upper Wonewoc

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Table 1. Groundwater Elevations, Madison-Kipp Corporation, 201 Waubesa Street, Madison, Wisconsin.

Well/ Boring	Date	Screen Interval (feet bls)	Ground Elevation (feet amsl)	Top of Casing Elevation (feet amsl)	Depth to Water (feet btoc)	Groundwater Elevation (feet amsl)	Lithology
MP-14	01/14/13	135 - 140	866.88	867.28	23.34	843.94	Lower Wonewoc
MP-14	04/16/13	135 - 140	866.88	867.28	20.15	847.13	Lower Wonewoc
MP-14	01/14/13	170 - 178	866.88	867.28	23.57	843.71	Lower Wonewoc
MP-14	04/16/13	170 - 178	866.88	867.28	20.40	846.88	Lower Wonewoc
MP-15	01/14/13	88 - 92	855.98	855.50	11.12	844.38	Upper Wonewoc
MP-15	01/14/13	100 - 105	855.98	855.50	11.08	844.42	Upper Wonewoc
MP-15	04/15/13	100 - 105	855.98	855.50	8.27	847.23	Upper Wonewoc
MP-15	01/14/13	120 - 125	855.98	855.50	11.15	844.35	Lower Wonewoc
MP-15	04/15/13	120 - 125	855.98	855.50	8.31	847.19	Lower Wonewoc
MP-15	01/14/13	142 - 146	855.98	855.50	11.30	844.20	Lower Wonewoc
MP-15	04/15/13	142 - 146	855.98	855.50	8.55	846.95	Lower Wonewoc
MP-15	01/14/13	177 - 187	855.98	855.50	11.36	844.14	Lower Wonewoc
MP-15	04/15/13	177 - 187	855.98	855.50	8.63	846.87	Lower Wonewoc
MP-16	01/14/13	80 - 84	870.68	870.17	25.79	844.38	Lower Lone Rock
MP-16	04/16/13	80 - 84	870.68	870.17	22.98	847.19	Lower Lone Rock
MP-16	01/14/13	106 - 116	870.68	870.17	26.72	843.45	Upper Wonewoc
MP-16	04/16/13	106 - 116	870.68	870.17	23.76	846.41	Upper Wonewoc
MP-16	01/14/13	140 - 144	870.68	870.17	26.88	843.29	Lower Wonewoc
MP-16	04/16/13	140 - 144	870.68	870.17	23.90	846.27	Lower Wonewoc
MP-16	01/14/13	175 - 179	870.68	870.17	27.13	843.04	Lower Wonewoc
MP-16	04/16/13	175 - 179	870.68	870.17	24.18	845.99	Lower Wonewoc
MW-17	01/14/13	160 - 170	877.26	876.65	33.80	842.85	Upper Wonewoc
MW-17	04/15/13	160 - 170	877.26	876.65	30.96	845.69	Upper Wonewoc
MW-18S	11/30/12	20 - 30	867.89	867.24	21.89	845.35	Unconsolidated
MW-18S	01/14/13	20 - 30	867.89	867.24	22.02	845.22	Unconsolidated
MW-18S	04/15/13	20 - 30	867.89	867.24	18.79	848.45	Unconsolidated
MW-19D	11/30/12	60 - 90	867.44	866.75	21.93	844.82	Lower Lone Rock
MW-19D	01/14/13	60 - 90	867.44	866.75	21.93	844.82	Lower Lone Rock
MW-19D	04/15/13	60 - 90	867.44	866.75	18.58	848.17	Lower Lone Rock
MW-19D2	11/30/12	110 - 140	867.44	866.71	23.11	843.60	Upper Wonewoc
MW-19D2	01/14/13	110 - 140	867.44	866.71	23.06	843.65	Upper Wonewoc
MW-19D2	04/15/13	110 - 140	867.44	866.71	20.28	846.43	Upper Wonewoc

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Table 1. Groundwater Elevations, Madison-Kipp Corporation, 201 Waubesa Street, Madison, Wisconsin.

Well/ Boring	Date	Screen Interval (feet bls)	Ground Elevation (feet amsl)	Top of Casing Elevation (feet amsl)	Depth to Water (feet btoc)	Groundwater Elevation (feet amsl)	Lithology
MW-20D	11/30/12	60 - 90	867.36	866.96	22.09	844.87	Lower Lone Rock
MW-20D	01/14/13	60 - 90	867.36	866.96	22.09	844.87	Lower Lone Rock
MW-20D	04/15/13	60 - 90	867.36	866.96	18.80	848.16	Lower Lone Rock
MW-20D2	11/30/12	110 - 140	867.36	867.04	23.32	843.72	Upper Wonewoc
MW-20D2	01/14/13	110 - 140	867.36	867.04	23.42	843.62	Upper Wonewoc
MW-20D2	04/15/13	110 - 140	867.36	867.04	20.58	846.46	Upper Wonewoc
MW-21D	11/30/12	60 - 90	867.77	867.49	22.56	844.93	Lower Lone Rock
MW-21D	01/14/13	60 - 90	867.77	867.49	22.60	844.89	Lower Lone Rock
MW-21D	04/15/13	60 - 90	867.77	867.49	19.27	848.22	Lower Lone Rock
MW-21D2	11/30/12	110 - 170	867.77	867.46	23.85	843.61	Upper Wonewoc
MW-21D2	01/14/13	110 - 170	867.77	867.46	23.79	843.67	Upper Wonewoc
MW-21D2	04/15/13	110 - 170	867.77	867.46	21.05	846.41	Upper Wonewoc
MW-22S	01/14/13	25 - 35	874.45	874.12	29.47	844.65	Unconsolidated
MW-22S	04/15/13	25 - 35	874.45	874.12	26.64	847.48	Unconsolidated
MW-22D	01/14/13	45 - 50	874.45	874.15	29.39	844.76	Upper Lone Rock
MW-22D	04/15/13	45 - 50	874.45	874.15	26.49	847.66	Upper Lone Rock
MW-23S	01/14/13	25 - 35	874.55	874.20	29.24	844.96	Unconsolidated
MW-23S	04/15/13	25 - 35	874.55	874.20	26.68	847.52	Unconsolidated
MW-23D	01/14/13	45 - 50	874.55	874.27	29.45	844.82	Upper Lone Rock
MW-23D	04/15/13	45 - 50	874.55	874.27	26.62	847.65	Upper Lone Rock
MW-24	04/29/13	30 - 40	876.66	876.41	29.36	847.05	Unconsolidated/ Upper Lone Rock
MW-25D	05/06/13	120 - 130	886.97	886.69	41.55	845.14	Upper Wonewoc
MW-25D2	05/06/13	160 - 170	886.97	886.68	41.65	845.03	Upper Wonewoc
IW-1S	11/30/12	16 - 26	867.82	867.62	22.16	845.46	Unconsolidated
IW-1S	04/15/13	16 - 26	867.82	867.62	19.11	848.51	Unconsolidated
IW-2D	11/30/12	60 - 90	867.57	866.61	21.61	845.00	Lower Lone Rock
IW-2D2	11/30/12	110 - 140	867.57	866.57	22.77	843.80	Upper Wonewoc
IW-2D2	04/15/13	110 - 140	867.57	866.57	20.05	846.52	Upper Wonewoc

amsl Above mean sea level.
bls Below land surface.
btoc Below top of casing.

Table 2. Groundwater VOC and PCB Analytical Results, Madison-Kipp Corporation, 201 Waubesa Street, Madison, Wisconsin.

Well ID	Preventive	Enforcement	MW-1					MW-2S		
Sample Interval (feet bls)	Action	Standard	14-24	14-24	14-24	14-24	14-24	19-29	19-29	19-29
Sample Date	Limit		4/8/2010	3/29/2011	4/11/2012	1/15/2013	4/21/2013	4/8/2010	3/30/2011	4/11/2012
VOCs (µg/L)										
1,1,1,2-Tetrachloroethane	7	70	<0.25	<0.25	<0.31	<0.25	<0.25	<0.25	<0.25	<0.31
1,1,2-Trichloroethane	0.5	5	<0.25	<0.25	<0.3	<0.28	<0.28	<0.25	<0.25	<0.3
1,1-Dichloroethene	0.7	7	***1.1***	***0.95***	***0.94 J***	***0.84 J***	<0.31	<0.5	<0.5	<0.29
1,2,4-Trimethylbenzene	96	480	<0.2	<0.2	<0.22	<0.14	<0.14	<0.2	<0.2	<0.22
1,2-Dibromoethane	0.005	0.05	<0.2	<0.2	NA	NA	NA	<0.2	<0.2	NA
1,2-Dichlorobenzene	60	600	<0.2	<0.2	<0.21	<0.27	<0.27	<0.2	<0.2	<0.21
1,2-Dichloropropane	0.5	5	<0.5	<0.5	<0.36	<0.2	<0.2	<0.5	<0.5	<0.36
1,3,5-Trimethylbenzene	96	480	<0.2	<0.2	<0.23	<0.18	<0.18	<0.2	<0.2	<0.23
Benzene	0.5	5	<0.2	<0.2	<0.12	<0.074	<0.074	<0.2	<0.2	<0.12
Bromoform	0.44	4.4	<0.2	<0.2	<0.45	<0.28	<0.28	<0.2	<0.2	<0.45
Bromomethane	1	10	<0.5	<0.5	<0.49	<0.31	<0.31	<0.5	<0.5	<0.49
Carbon tetrachloride	0.5	5	<0.8	<0.8	<0.28	<0.26	<0.26	<0.8	<0.8	<0.28
Chloroform	0.6	6	<0.2	<0.2	<0.25	<0.2	<0.2	<0.2	<0.2	<0.25
Chloromethane	3	30	<0.3	<0.3	<0.24	<0.18	<0.18	<0.3	<0.3	<0.24
cis-1,2-Dichloroethene	7	70	***51***	***58***	***38***	***41***	***23***	<0.5	<0.5	<0.22
Dibromochloromethane	6	60	NA	NA	<0.25	<0.32	<0.32	NA	NA	<0.25
Ethylbenzene	140	700	<0.5	<0.5	<0.14	<0.13	<0.13	<0.5	<0.5	<0.14
Isopropylbenzene	NE	NE	<0.2	<0.2	<0.21	<0.14	<0.14	<0.2	<0.2	<0.21
Methyl tert-butyl ether	12	60	<0.5	<0.5	<0.28	<0.24	<0.24	<0.5	<0.5	<0.28
Methylene Chloride	0.5	5	<1	<1	***8.5***	<0.68	<0.68	<1	<1	***8.6***
Naphthalene	10	100	<0.25	<0.25	<0.24	<0.16	<0.16	<0.25	<0.25	<0.24
n-Butylbenzene	NE	NE	<0.2	<0.2	<0.21	<0.13	<0.13	<0.2	<0.2	<0.21
N-Propylbenzene	NE	NE	<0.5	<0.5	<0.19	<0.13	<0.13	<0.5	<0.5	<0.19
p-Isopropyltoluene	NE	NE	<0.2	<0.2	<0.24	<0.17	<0.17	<0.2	<0.2	<0.24
sec-Butylbenzene	NE	NE	<0.25	<0.25	<0.19	<0.15	<0.15	<0.25	<0.25	<0.19
Styrene	10	100	<0.5	<0.5	<0.26	<0.1	<0.1	<0.5	<0.5	<0.26
tert-Butylbenzene	NE	NE	<0.2	<0.2	<0.24	<0.14	<0.14	<0.2	<0.2	<0.24
Tetrachloroethene	0.5	5	***32***	***9***	***23***	***22***	***10***	***1.6***	***1.3***	***1.2***
Toluene	160	800	<0.5	<0.5	<0.15	<0.11	<0.11	<0.5	<0.5	<0.15
trans-1,2-Dichloroethene	20	100	0.97	0.93	0.77 J	0.78 J	<0.25	<0.5	<0.5	<0.27
Trichloroethene	0.5	5	***33***	***20***	***24***	***25***	***23***	<0.2	<0.2	<0.18
Vinyl chloride	0.02	0.2	***1.5***	***1.1***	***0.86***	***0.63***	<0.1	<0.2	<0.2	<0.13
Xylenes, Total	400	2,000	<0.5	<0.5	<0.3	<0.068	<0.068	<0.5	<0.5	<0.3
Total VOCs	NE	NE	119.57	89.98	96.07	90.25	56	1.6	1.3	9.8

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Table 2. Groundwater VOC and PCB Analytical Results, Madison-Kipp Corporation, 201 Waubesa Street, Madison, Wisconsin.

Well ID	Preventive	Enforcement	MW-1					MW-2S		
Sample Interval (feet bls)	Action	Standard	14-24	14-24	14-24	14-24	14-24	19-29	19-29	19-29
Sample Date	Limit		4/8/2010	3/29/2011	4/11/2012	1/15/2013	4/21/2013	4/8/2010	3/30/2011	4/11/2012
Total PCBs (µg/L)										
Aroclor-1016	0.03	0.03	NA	NA	NA	<0.17	NA	NA	NA	NA
Aroclor-1232	0.03	0.03	NA	NA	NA	<0.091	NA	NA	NA	NA
Aroclor-1242	0.03	0.03	NA	NA	NA	<0.13	NA	NA	NA	NA
Total Detected PCBs	NE	NE	NA	NA	NA	ND	NA	NA	NA	NA
Dissolved PCBs										
Aroclor-1016	0.03	0.03	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1221	0.03	0.03	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1232	0.03	0.03	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1242	0.03	0.03	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1248	0.03	0.03	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1254	0.03	0.03	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1260	0.03	0.03	NA	NA	NA	NA	NA	NA	NA	NA
Total Detected PCBs	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA

Only VOCs, PAHs, and PCBs detected in one or more water samples are listed on the table. Refer to laboratory analytical reports for a complete list of constituents analyzed.

100	Concentration exceeds the NR 140 Wis. adm. code Preventive Action Limit.
100	Concentration exceeds the NR 140 Wis. adm. code Enforcement Standard.
<	Constituent not detected above noted laboratory detection limit.
bls	Below land surface.
DUP	Duplicate sample.
J	Result is between the method detection limit and the limit of quantitation.
µg/L	Micrograms per liter.
NA	Not analyzed.
NE	Not established.
ND	Total detected PCBs were reported less than the laboratory detection limit.
PCBs	Polychlorinated Biphenyls.
VOCs	Volatile Organic Compounds.

Table 2. Groundwater VOC and PCB Analytical Results, Madison-Kipp Corporation, 201 Waubesa Street, Madison, Wisconsin.

Well ID	MW-2S (continued)		MW-2D						MW-3S	
Sample Interval (feet bls)	19-29	19-29	39-44	39-44	39-44	39-44	39-44	39-44	19-29	19-29
Sample Date	1/14/2013	4/20/2013	4/8/2010	10/1/2010	3/30/2011	4/11/2012	1/15/2013	4/20/2013	4/7/2010	3/29/2011
VOCs (µg/L)										
1,1,1,2-Tetrachloroethane	<0.25	<0.25	<8	<0.25	<4	<0.31	<0.5	<0.5	<8	<6.3
1,1,2-Trichloroethane	<0.28	<0.28	<8	<0.25	<4	<0.3	<0.56	<0.56	<8	<6.3
1,1-Dichloroethene	<0.31	<0.31	<16	<0.5	<8	<0.29	<0.62	<0.62	<16	<13
1,2,4-Trimethylbenzene	<0.14	<0.14	<6.4	<0.2	<3.2	<0.22	<0.28	<0.28	<6.4	<5
1,2-Dibromoethane	NA	NA	<6.4	<0.2	<3.2	NA	NA	NA	<6.4	<5
1,2-Dichlorobenzene	<0.27	<0.27	<6.4	<0.2	<3.2	<0.21	<0.54	<0.54	<6.4	<5
1,2-Dichloropropane	<0.2	<0.2	<16	<0.5	<8	<0.36	<0.4	<0.4	<16	<13
1,3,5-Trimethylbenzene	<0.18	<0.18	<6.4	<0.2	<3.2	<0.23	<0.36	<0.36	<6.4	<5
Benzene	<0.074	<0.074	<6.4	<0.2	<3.2	<0.12	<0.15	<0.15	<6.4	<5
Bromoform	<0.28	<0.28	<6.4	<0.2	<3.2	<0.45	<0.56	<0.56	<6.4	<5
Bromomethane	<0.31	<0.31	<16	<0.5	<8	<0.49	<0.62	<0.62	<16	<13
Carbon tetrachloride	<0.26	<0.26	<26	<0.8	<13	<0.28	<0.52	<0.52	<26	<20
Chloroform	<0.2	<0.2	<6.4	<0.2	<3.2	<0.25	<0.4	<0.4	<6.4	<5
Chloromethane	<0.18	<0.18	<9.6	<0.3	<4.8	<0.24	<0.36	<0.36	<9.6	<7.5
cis-1,2-Dichloroethene	<0.12	<0.12	<16	0.67	<8	<0.22	<0.24	<0.24	***83***	***37***
Dibromochloromethane	<0.32	<0.32	NA	NA	NA	<0.25	<0.64	<0.64	NA	NA
Ethylbenzene	<0.13	<0.13	<16	<0.5	<8	<0.14	<0.26	<0.26	<16	<13
Isopropylbenzene	<0.14	<0.14	<6.4	<0.2	<3.2	<0.21	<0.28	<0.28	<6.4	<5
Methyl tert-butyl ether	<0.24	<0.24	<16	<0.5	<8	<0.28	<0.48	<0.48	<16	<13
Methylene Chloride	<0.68	<0.68	<32	<1	<16	***8.1***	<1.4	<1.4	<32	<25
Naphthalene	<0.16	<0.16	<8	<0.25	<4	<0.24	<0.32	<0.32	<8	<6.3
n-Butylbenzene	<0.13	<0.13	<6.4	<0.2	<3.2	<0.21	<0.26	<0.26	<6.4	<5
N-Propylbenzene	<0.13	<0.13	<16	<0.5	<8	<0.19	<0.26	<0.26	<16	<13
p-Isopropyltoluene	<0.17	<0.17	<6.4	<0.2	<3.2	<0.24	<0.34	<0.34	<6.4	<5
sec-Butylbenzene	<0.15	<0.15	<8	<0.25	<4	<0.19	<0.3	<0.3	<8	<6.3
Styrene	<0.1	<0.1	<16	<0.5	<8	<0.26	<0.2	<0.2	<16	<13
tert-Butylbenzene	<0.14	<0.14	<6.4	<0.2	<3.2	<0.24	<0.28	<0.28	<6.4	<5
Tetrachloroethene	***1.3***	***1.3***	***1,400***	***1,300***	***1,000***	***610***	***720***	***910***	***2,000***	***1,100***
Toluene	<0.11	<0.11	<16	<0.5	<8	<0.15	<0.22	<0.22	<16	<13
trans-1,2-Dichloroethene	<0.25	<0.25	<16	<0.5	<8	<0.27	<0.5	<0.5	<16	<13
Trichloroethene	<0.19	<0.19	***20***	***16***	***9.8***	***5.4***	***5.1***	***6.4***	***130***	***66***
Vinyl chloride	<0.1	<0.1	<6.4	<0.2	<3.2	<0.13	<0.2	<0.2	<6.4	<5
Xylenes, Total	<0.068	<0.068	<16	<0.5	<8	<0.3	<0.14	<0.14	<16	<13
Total VOCs	1.3	1.3	1,420	1,316.67	1,009.8	623.5	725.1	916.4	2,213	1,203

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Table 2. Groundwater VOC and PCB Analytical Results, Madison-Kipp Corporation, 201 Waubesa Street, Madison, Wisconsin.

Well ID	MW-2S (continued)		MW-2D						MW-3S	
Sample Interval (feet bls)	19-29	19-29	39-44	39-44	39-44	39-44	39-44	39-44	19-29	19-29
Sample Date	1/14/2013	4/20/2013	4/8/2010	10/1/2010	3/30/2011	4/11/2012	1/15/2013	4/20/2013	4/7/2010	3/29/2011
Total PCBs (µg/L)										
Aroclor-1016	<0.17	NA	NA	NA	NA	NA	<0.18	NA	NA	NA
Aroclor-1232	<0.091	NA	NA	NA	NA	NA	<0.096	NA	NA	NA
Aroclor-1242	<0.13	NA	NA	NA	NA	NA	<0.14	NA	NA	NA
Total Detected PCBs	ND	NA	NA	NA	NA	NA	ND	NA	NA	NA
Dissolved PCBs										
Aroclor-1016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1221	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1232	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1242	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1248	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1254	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1260	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Detected PCBs	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Only VOCs, PAHs, and PCBs detected in one or more water samples are listed on the table. Refer to laboratory analytical reports for a complete list of constituents analyzed.

100	Concentration exceeds the NR 140 Wis. adm. code Preventive Action Limit.
100	Concentration exceeds the NR 140 Wis. adm. code Enforcement Standard.
<	Constituent not detected above noted laboratory detection limit.
bls	Below land surface.
DUP	Duplicate sample.
J	Result is between the method detection limit and the limit of quantitation.
µg/L	Micrograms per liter.
NA	Not analyzed.
NE	Not established.
ND	Total detected PCBs were reported less than the laboratory detection limit.
PCBs	Polychlorinated Biphenyls.
VOCs	Volatile Organic Compounds.

Table 2. Groundwater VOC and PCB Analytical Results, Madison-Kipp Corporation, 201 Waubesa Street, Madison, Wisconsin.

Well ID	MW-3S (continued)						MW-3D			
Sample Interval (feet bls)	19-29	19-29	19-29	19-29	19-29	19-29	48-53	48-53	48-53	48-53
Sample Date	4/12/2012	11/30/2012	1/15/2013	2/12/2013	3/12/2013	4/16/2013	4/7/2010	10/1/2010	3/30/2011	4/12/2012
VOCs (µg/L)										
1,1,1,2-Tetrachloroethane	<1.6	<1.3	<0.25	<0.25	<0.25	<0.25	<8	<0.25	<5	<0.31
1,1,2-Trichloroethane	<1.5	<1.4	<0.28	<0.28	<0.28	<0.28	<8	<0.25	<5	<0.3
1,1-Dichloroethene	<1.5	<1.6	<0.31	<0.31	<0.31	<0.31	<16	<0.5	<10	<0.29
1,2,4-Trimethylbenzene	<1.1	<0.7	<0.14	<0.14	<0.14	<0.14	<6.4	<0.2	<4	<0.22
1,2-Dibromoethane	NA	NA	NA	NA	NA	NA	<6.4	<0.2	<4	NA
1,2-Dichlorobenzene	<1.1	<1.4	<0.27	<0.27	<0.27	<0.27	<6.4	<0.2	<4	<0.21
1,2-Dichloropropane	<1.8	<1	<0.2	<0.2	<0.2	<0.2	<16	<0.5	<10	<0.36
1,3,5-Trimethylbenzene	<1.2	<0.9	<0.18	<0.18	<0.18	<0.18	<6.4	<0.2	<4	<0.23
Benzene	<0.6	***1.5 J***	0.42 J	***0.88***	***1***	***0.6***	<6.4	0.31	<4	0.39 J
Bromoform	<2.3	<1.4	<0.28	<0.28	<0.28	<0.28	<6.4	<0.2	<4	<0.45
Bromomethane	<2.5	<1.6	<0.31	<0.31	<0.31	<0.31	<16	<0.5	<10	<0.49
Carbon tetrachloride	<1.4	<1.3	<0.26	<0.26	<0.26	<0.26	<26	<0.8	<16	<0.28
Chloroform	***3.7 J***	***5***	***1.6***	***3***	***4.1***	***2.7***	<6.4	***0.78***	<4	***0.93 J***
Chloromethane	<1.2	<0.9	<0.18	<0.18	<0.18	<0.18	<9.6	<0.3	<6	<0.24
cis-1,2-Dichloroethene	***89***	***98***	<0.12	1.6	5	<0.12	***510***	***310***	***300***	***350***
Dibromochloromethane	<1.3	<1.6	<0.32	<0.32	<0.32	<0.32	NA	NA	NA	<0.25
Ethylbenzene	<0.7	<0.65	0.36 J	<0.13	<0.13	<0.13	<16	<0.5	<10	<0.14
Isopropylbenzene	<1.1	<0.7	<0.14	<0.14	<0.14	<0.14	<6.4	<0.2	<4	<0.21
Methyl tert-butyl ether	<1.4	<1.2	<0.24	<0.24	<0.24	<0.24	<16	<0.5	<10	<0.28
Methylene Chloride	<3.2	<3.4	<0.68	<0.68	<0.68	<0.68	<32	<1	<20	<0.63
Naphthalene	<1.2	<0.8	<0.16	<0.16	<0.16	<0.16	<8	<0.25	<5	<0.24
n-Butylbenzene	<1.1	<0.65	<0.13	<0.13	<0.13	<0.13	<6.4	<0.2	<4	<0.21
N-Propylbenzene	<0.95	<0.65	<0.13	<0.13	<0.13	<0.13	<16	<0.5	<10	<0.19
p-Isopropyltoluene	<1.2	<0.85	<0.17	<0.17	<0.17	<0.17	<6.4	<0.2	<4	<0.24
sec-Butylbenzene	<0.95	<0.75	<0.15	<0.15	<0.15	<0.15	<8	<0.25	<5	<0.19
Styrene	<1.3	<0.5	<0.1	<0.1	<0.1	<0.1	<16	<0.5	<10	<0.26
tert-Butylbenzene	<1.2	<0.7	<0.14	<0.14	<0.14	<0.14	<6.4	<0.2	<4	<0.24
Tetrachloroethene	***1,600***	***2,400***	***88***	***600***	***750***	***20***	***1,700***	***1,500***	***1,200***	***1,100***
Toluene	<0.75	<0.55	0.38 J	<0.11	<0.11	<0.11	<16	<0.5	<10	<0.15
trans-1,2-Dichloroethene	5.4	6	<0.25	<0.25	<0.25	<0.25	<16	6.6	<10	5.9
Trichloroethene	***120***	***160***	<0.19	***6.8***	***16***	<0.19	***270***	***200***	***170***	***160***
Vinyl chloride	<0.65	<0.5	<0.1	<0.1	<0.1	<0.1	<6.4	<0.2	<4	<0.13
Xylenes, Total	<1.5	<0.34	2.4	<0.068	<0.068	<0.068	<16	<0.5	<10	<0.3
Total VOCs	1,818.1	2,670.5	93.16	612.28	776.1	23.3	2,480	2,017.69	1,670	1,617.22

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Table 2. Groundwater VOC and PCB Analytical Results, Madison-Kipp Corporation, 201 Waubesa Street, Madison, Wisconsin.

Well ID	MW-3S (continued)						MW-3D			
Sample Interval (feet bls)	19-29	19-29	19-29	19-29	19-29	19-29	48-53	48-53	48-53	48-53
Sample Date	4/12/2012	11/30/2012	1/15/2013	2/12/2013	3/12/2013	4/16/2013	4/7/2010	10/1/2010	3/30/2011	4/12/2012
Total PCBs (µg/L)										
Aroclor-1016	NA	NA	<0.18	NA	NA	NA	NA	NA	NA	NA
Aroclor-1232	NA	NA	<0.096	NA	NA	NA	NA	NA	NA	NA
Aroclor-1242	NA	NA	<0.14	NA	NA	NA	NA	NA	NA	NA
Total Detected PCBs	NA	NA	ND	NA	NA	NA	NA	NA	NA	NA
Dissolved PCBs										
Aroclor-1016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1221	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1232	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1242	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1248	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1254	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1260	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Detected PCBs	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Only VOCs, PAHs, and PCBs detected in one or more water samples are listed on the table. Refer to laboratory analytical reports for a complete list of constituents analyzed.

100	Concentration exceeds the NR 140 Wis. adm. code Preventive Action Limit.
100	Concentration exceeds the NR 140 Wis. adm. code Enforcement Standard.
<	Constituent not detected above noted laboratory detection limit.
bls	Below land surface.
DUP	Duplicate sample.
J	Result is between the method detection limit and the limit of quantitation.
µg/L	Micrograms per liter.
NA	Not analyzed.
NE	Not established.
ND	Total detected PCBs were reported less than the laboratory detection limit.
PCBs	Polychlorinated Biphenyls.
VOCs	Volatile Organic Compounds.

Table 2. Groundwater VOC and PCB Analytical Results, Madison-Kipp Corporation, 201 Waubesa Street, Madison, Wisconsin.

Well ID	MW-3D (continued)					MW-3D2				
Sample Interval (feet bls)	48-53	48-53	48-53	48-53	48-53	76-81	76-81	76-81	76-81	76-81
Sample Date	11/30/2012	1/16/2013	2/12/2013	3/13/2013	4/16/2013	12/31/2009	4/7/2010	7/1/2010	10/1/2010	3/30/2011
VOCs (µg/L)										
1,1,1,2-Tetrachloroethane	<1.3	<0.25	<0.25	<0.25	<0.25	<6.3	<13	<13	<0.25	<13
1,1,2-Trichloroethane	<1.4	<0.28	<0.28	<0.28	<0.28	<6.3	<13	<13	<0.25	<13
1,1-Dichloroethene	<1.6	<0.31	<0.31	<0.31	<0.31	<13	<25	<25	<0.5	<25
1,2,4-Trimethylbenzene	<0.7	<0.14	<0.14	<0.14	<0.14	<5	<10	<10	<0.2	<10
1,2-Dibromoethane	NA	NA	NA	NA	NA	<5	<10	<10	<0.2	<10
1,2-Dichlorobenzene	<1.4	<0.27	<0.27	<0.27	<0.27	<5	<10	<10	<0.2	<10
1,2-Dichloropropane	<1	<0.2	<0.2	<0.2	<0.2	<13	<25	<25	<0.5	<25
1,3,5-Trimethylbenzene	<0.9	<0.18	<0.18	<0.18	<0.18	<5	<10	<10	<0.2	<10
Benzene	<0.37	0.32 J	0.29 J	<0.074	0.27 J	<5	<10	<10	<0.2	<10
Bromoform	<1.4	<0.28	<0.28	<0.28	<0.28	<5	<10	<10	<0.2	<10
Bromomethane	<1.6	<0.31	<0.31	<0.31	<0.31	<13	<25	<25	<0.5	<25
Carbon tetrachloride	<1.3	<0.26	<0.26	<0.26	<0.26	<20	<40	<40	<0.8	<40
Chloroform	<1	***0.89 J***	<0.2	<0.2	<0.2	<5	<10	<10	0.37	<10
Chloromethane	<0.9	<0.18	<0.18	<0.18	<0.18	<7.5	<15	<15	<0.3	<15
cis-1,2-Dichloroethene	***520***	***290***	***200***	***54***	***210***	***520***	***510***	***460***	***400***	***440***
Dibromochloromethane	<1.6	<0.32	<0.32	<0.32	<0.32	NA	NA	NA	NA	NA
Ethylbenzene	<0.65	<0.13	<0.13	<0.13	<0.13	<13	<25	<25	<0.5	<25
Isopropylbenzene	<0.7	<0.14	<0.14	<0.14	<0.14	<5	<10	<10	<0.2	<10
Methyl tert-butyl ether	<1.2	<0.24	<0.24	<0.24	<0.24	<13	<25	<25	<0.5	<25
Methylene Chloride	<3.4	<0.68	<0.68	<0.68	<0.68	<25	<50	<50	<1	<50
Naphthalene	<0.8	<0.16	<0.16	<0.16	<0.16	<6.3	<13	***240***	<0.25	***13***
n-Butylbenzene	<0.65	<0.13	<0.13	<0.13	<0.13	<5	<10	<10	<0.2	<10
N-Propylbenzene	<0.65	<0.13	<0.13	<0.13	<0.13	<13	<25	<25	<0.5	<25
p-Isopropyltoluene	<0.85	<0.17	<0.17	<0.17	<0.17	<5	<10	<10	<0.2	<10
sec-Butylbenzene	<0.75	<0.15	<0.15	<0.15	<0.15	<6.3	<13	<13	<0.25	<13
Styrene	<0.5	<0.1	<0.1	<0.1	<0.1	<13	<25	<25	<0.5	<25
tert-Butylbenzene	<0.7	<0.14	<0.14	<0.14	<0.14	<5	<10	<10	<0.2	<10
Tetrachloroethene	***1,800***	***660***	***760***	***150***	***740***	***4,900***	***4,400***	***3,900***	***3,900***	***3,800***
Toluene	<0.55	<0.11	<0.11	<0.11	<0.11	<13	<25	<25	<0.5	<25
trans-1,2-Dichloroethene	7.7	6	4	1.1	4.2	<13	<25	<25	7	<25
Trichloroethene	***250***	***140***	***130***	***30***	***120***	***280***	***240***	***240***	***240***	***230***
Vinyl chloride	<0.5	<0.1	<0.1	<0.1	<0.1	<5	<10	<10	***0.65***	<10
Xylenes, Total	<0.34	<0.068	<0.068	<0.068	<0.068	<13	<25	<25	<0.5	<25
Total VOCs	2,577.7	1,097.21	1,094.29	235.1	1,074.47	5,700	5,150	4,840	4,548.02	4,483

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Table 2. Groundwater VOC and PCB Analytical Results, Madison-Kipp Corporation, 201 Waubesa Street, Madison, Wisconsin.

Well ID	MW-3D (continued)					MW-3D2				
Sample Interval (feet bls)	48-53	48-53	48-53	48-53	48-53	76-81	76-81	76-81	76-81	76-81
Sample Date	11/30/2012	1/16/2013	2/12/2013	3/13/2013	4/16/2013	12/31/2009	4/7/2010	7/1/2010	10/1/2010	3/30/2011
Total PCBs (µg/L)										
Aroclor-1016	NA	<0.18	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1232	NA	<0.096	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1242	NA	<0.14	NA	NA	NA	NA	NA	NA	NA	NA
Total Detected PCBs	NA	ND	NA	NA	NA	NA	NA	NA	NA	NA
Dissolved PCBs										
Aroclor-1016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1221	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1232	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1242	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1248	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1254	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1260	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Detected PCBs	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Only VOCs, PAHs, and PCBs detected in one or more water samples are listed on the table. Refer to laboratory analytical reports for a complete list of constituents analyzed.

100	Concentration exceeds the NR 140 Wis. adm. code Preventive Action Limit.
100	Concentration exceeds the NR 140 Wis. adm. code Enforcement Standard.
<	Constituent not detected above noted laboratory detection limit.
bls	Below land surface.
DUP	Duplicate sample.
J	Result is between the method detection limit and the limit of quantitation.
µg/L	Micrograms per liter.
NA	Not analyzed.
NE	Not established.
ND	Total detected PCBs were reported less than the laboratory detection limit.
PCBs	Polychlorinated Biphenyls.
VOCs	Volatile Organic Compounds.

Table 2. Groundwater VOC and PCB Analytical Results, Madison-Kipp Corporation, 201 Waubesa Street, Madison, Wisconsin.

Well ID	MW-3D2 (continued)						MW-3D3			
Sample Interval (feet bls)	76-81	76-81	76-81	76-81	76-81	76-81	214-224	214-224	214-224	214-224
Sample Date	4/12/2012	11/30/2012	1/16/2013	2/12/2013	3/13/2013	4/16/2013	7/24/2012	11/27/2012	1/18/2013	2/15/2013
VOCs (µg/L)										
1,1,1,2-Tetrachloroethane	<1.6	<1.3	<0.5	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25
1,1,2-Trichloroethane	<1.5	<1.4	<0.56	<0.28	<0.28	<0.28	<0.28	<0.28	<0.28	<0.28
1,1-Dichloroethene	<1.5	<1.6	<0.62	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31
1,2,4-Trimethylbenzene	<1.1	<0.7	<0.28	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14
1,2-Dibromoethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	<1.1	<1.4	<0.54	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27
1,2-Dichloropropane	<1.8	<1	<0.4	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
1,3,5-Trimethylbenzene	<1.2	<0.9	<0.36	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18
Benzene	<0.6	<0.37	<0.15	<0.074	<0.074	<0.074	<0.074	<0.074	0.30 J	<0.074
Bromoform	<2.3	<1.4	<0.56	<0.28	<0.28	<0.28	<0.28	<0.28	<0.28	<0.28
Bromomethane	<2.5	<1.6	<0.62	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31 *
Carbon tetrachloride	<1.4	<1.3	<0.52	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26
Chloroform	<1.3	<1	<0.4	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Chloromethane	<1.2	<0.9	<0.36	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18
cis-1,2-Dichloroethene	***440***	***420***	***320***	***250***	***100***	***45***	2.2	6.8	***15***	***7.7***
Dibromochloromethane	<1.3	<1.6	<0.64	<0.32	<0.32	<0.32	<0.32	<0.32	<0.32	<0.32
Ethylbenzene	<0.7	<0.65	<0.26	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13
Isopropylbenzene	<1.1	<0.7	<0.28	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14
Methyl tert-butyl ether	<1.4	<1.2	<0.48	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24
Methylene Chloride	<3.2	<3.4	<1.4	***7.3***	<0.68	<0.68	<0.68	<0.68	<0.68	<0.68
Naphthalene	<1.2	<0.8	<0.32	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16
n-Butylbenzene	<1.1	<0.65	<0.26	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13
N-Propylbenzene	<0.95	<0.65	<0.26	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13
p-Isopropyltoluene	<1.2	<0.85	<0.34	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
sec-Butylbenzene	<0.95	<0.75	<0.3	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15
Styrene	<1.3	<0.5	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
tert-Butylbenzene	<1.2	<0.7	<0.28	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14
Tetrachloroethene	***2,600***	***2,800***	***1,200***	***1,700***	***800***	***850***	***6.6***	***1.7***	***1.3***	***0.72 J***
Toluene	<0.75	<0.55	<0.22	<0.11	<0.11	<0.11	<0.11	<0.11	0.21 J	<0.11
trans-1,2-Dichloroethene	6.4	5.6	4.9	3.2	0.62 J	<0.25	<0.25	<0.25	<0.25	<0.25
Trichloroethene	***190***	***190***	***110***	***120***	***50***	***24***	***1.1***	***1.1***	0.40 J	<0.19
Vinyl chloride	<0.65	<0.5	<0.2	***0.22 J***	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Xylenes, Total	<1.5	<0.34	<0.14	<0.068	<0.068	<0.068	<0.068	<0.068	<0.068	<0.068
Total VOCs	3,236.4	3,415.6	1,634.9	2,080.72	950.62	919	9.9	9.6	17.21	8.42

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Table 2. Groundwater VOC and PCB Analytical Results, Madison-Kipp Corporation, 201 Waubesa Street, Madison, Wisconsin.

Well ID	MW-3D2 (continued)						MW-3D3			
Sample Interval (feet bls)	76-81	76-81	76-81	76-81	76-81	76-81	214-224	214-224	214-224	214-224
Sample Date	4/12/2012	11/30/2012	1/16/2013	2/12/2013	3/13/2013	4/16/2013	7/24/2012	11/27/2012	1/18/2013	2/15/2013
Total PCBs (µg/L)										
Aroclor-1016	NA	NA	<0.17	NA	NA	NA	NA	NA	<0.18	NA
Aroclor-1232	NA	NA	<0.093	NA	NA	NA	NA	NA	<0.096	NA
Aroclor-1242	NA	NA	<0.13	NA	NA	NA	NA	NA	<0.14	NA
Total Detected PCBs	NA	NA	ND	NA	NA	NA	NA	NA	ND	NA
Dissolved PCBs										
Aroclor-1016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1221	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1232	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1242	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1248	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1254	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1260	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Detected PCBs	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Only VOCs, PAHs, and PCBs detected in one or more water samples are listed on the table. Refer to laboratory analytical reports for a complete list of constituents analyzed.

100	Concentration exceeds the NR 140 Wis. adm. code Preventive Action Limit.
100	Concentration exceeds the NR 140 Wis. adm. code Enforcement Standard.
<	Constituent not detected above noted laboratory detection limit.
bls	Below land surface.
DUP	Duplicate sample.
J	Result is between the method detection limit and the limit of quantitation.
µg/L	Micrograms per liter.
NA	Not analyzed.
NE	Not established.
ND	Total detected PCBs were reported less than the laboratory detection limit.
PCBs	Polychlorinated Biphenyls.
VOCs	Volatile Organic Compounds.

Table 2. Groundwater VOC and PCB Analytical Results, Madison-Kipp Corporation, 201 Waubesa Street, Madison, Wisconsin.

Well ID	MW-3D3 (continued)		MW-4S					MW-4D		
Sample Interval (feet bls)	214-224	214-224	35-50	35-50	35-50	35-50	35-50	65-70	65-70	65-70
Sample Date	3/13/2013	4/19/2013	4/8/2010	3/30/2011	4/10/2012	1/15/2013	4/18/2013	4/8/2010	3/30/2011	4/10/2012
VOCs (µg/L)										
1,1,1,2-Tetrachloroethane	<0.25	<0.25	<0.25	<0.25	<0.31	<0.25	<0.25	<0.25	<0.25	<0.31
1,1,2-Trichloroethane	<0.28	<0.28	<0.25	<0.25	<0.3	<0.28	<0.28	<0.25	<0.25	<0.3
1,1-Dichloroethene	<0.31	<0.31	<0.5	<0.5	<0.29	<0.31	<0.31	<0.5	<0.5	<0.29
1,2,4-Trimethylbenzene	<0.14	<0.14	<0.2	<0.2	<0.22	<0.14	<0.14	<0.2	<0.2	<0.22
1,2-Dibromoethane	NA	NA	<0.2	<0.2	NA	NA	NA	<0.2	<0.2	NA
1,2-Dichlorobenzene	<0.27	<0.27	<0.2	<0.2	<0.21	<0.27	<0.27	<0.2	<0.2	<0.21
1,2-Dichloropropane	<0.2	<0.2	<0.5	<0.5	<0.36	<0.2	<0.2	<0.5	<0.5	<0.36
1,3,5-Trimethylbenzene	<0.18	<0.18	<0.2	<0.2	<0.23	<0.18	<0.18	<0.2	<0.2	<0.23
Benzene	<0.074	<0.074	<0.2	<0.2	<0.12	<0.074	<0.074	<0.2	<0.2	<0.12
Bromoform	<0.28	<0.28	<0.2	<0.2	<0.45	<0.28	<0.28	<0.2	<0.2	<0.45
Bromomethane	<0.31	<0.31	<0.5	<0.5	<0.49	<0.31	<0.31	<0.5	<0.5	<0.49
Carbon tetrachloride	<0.26	<0.26	<0.8	<0.8	<0.28	<0.26	<0.26	<0.8	<0.8	<0.28
Chloroform	<0.2	<0.2	<0.2	<0.2	<0.25	<0.2	<0.2	<0.2	<0.2	<0.25
Chloromethane	<0.18	<0.18	<0.3	<0.3	<0.24	<0.18	<0.18	<0.3	<0.3	<0.24
cis-1,2-Dichloroethene	6.2	4	<0.5	<0.5	<0.22	<0.12	<0.12	<0.5	<0.5	<0.22
Dibromochloromethane	<0.32	<0.32	NA	NA	<0.25	<0.32	<0.32	NA	NA	<0.25
Ethylbenzene	<0.13	<0.13	<0.5	<0.5	<0.14	<0.13	<0.13	<0.5	<0.5	<0.14
Isopropylbenzene	<0.14	<0.14	<0.2	<0.2	<0.21	<0.14	<0.14	<0.2	<0.2	<0.21
Methyl tert-butyl ether	<0.24	<0.24	<0.5	<0.5	<0.28	<0.24	<0.24	<0.5	<0.5	<0.28
Methylene Chloride	<0.68	<0.68	<1	<1	<0.63	<0.68	<0.68	<1	<1	<0.63
Naphthalene	<0.16	<0.16	1.4	<0.25	<0.24	<0.16	<0.16	<0.25	<0.25	<0.24
n-Butylbenzene	<0.13	<0.13	<0.2	<0.2	<0.21	<0.13	<0.13	<0.2	<0.2	<0.21
N-Propylbenzene	<0.13	<0.13	<0.5	<0.5	<0.19	<0.13	<0.13	<0.5	<0.5	<0.19
p-Isopropyltoluene	<0.17	<0.17	<0.2	<0.2	<0.24	<0.17	<0.17	<0.2	<0.2	<0.24
sec-Butylbenzene	<0.15	<0.15	<0.25	<0.25	<0.19	<0.15	<0.15	<0.25	<0.25	<0.19
Styrene	<0.1	<0.1	<0.5	<0.5	<0.26	<0.1	<0.1	<0.5	<0.5	<0.26
tert-Butylbenzene	<0.14	<0.14	<0.2	<0.2	<0.24	<0.14	<0.14	<0.2	<0.2	<0.24
Tetrachloroethene	***0.95 J***	***0.63 J***	***1.5***	***1.6***	***0.96 J***	***1.4***	***1.8***	***0.9***	***0.7***	<0.22
Toluene	<0.11	0.53	<0.5	<0.5	0.20 J	<0.11	<0.11	<0.5	<0.5	<0.15
trans-1,2-Dichloroethene	<0.25	<0.25	<0.5	<0.5	<0.27	<0.25	<0.25	<0.5	<0.5	<0.27
Trichloroethene	<0.19	<0.19	<0.2	<0.2	<0.18	<0.19	<0.19	<0.2	<0.2	<0.18
Vinyl chloride	<0.1	<0.1	<0.2	<0.2	<0.13	<0.1	<0.1	<0.2	<0.2	<0.13
Xylenes, Total	<0.068	<0.068	<0.5	<0.5	<0.3	<0.068	<0.068	<0.5	<0.5	<0.3
Total VOCs	7.15	5.16	2.9	1.6	1.16	1.4	1.8	0.9	0.7	ND

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Table 2. Groundwater VOC and PCB Analytical Results, Madison-Kipp Corporation, 201 Waubesa Street, Madison, Wisconsin.

Well ID	MW-3D3 (continued)		MW-4S					MW-4D		
Sample Interval (feet bls)	214-224	214-224	35-50	35-50	35-50	35-50	35-50	65-70	65-70	65-70
Sample Date	3/13/2013	4/19/2013	4/8/2010	3/30/2011	4/10/2012	1/15/2013	4/18/2013	4/8/2010	3/30/2011	4/10/2012
Total PCBs (µg/L)										
Aroclor-1016	NA	NA	NA	NA	NA	<0.17	NA	NA	NA	NA
Aroclor-1232	NA	NA	NA	NA	NA	<0.091	NA	NA	NA	NA
Aroclor-1242	NA	NA	NA	NA	NA	<0.13	NA	NA	NA	NA
Total Detected PCBs	NA	NA	NA	NA	NA	ND	NA	NA	NA	NA
Dissolved PCBs										
Aroclor-1016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1221	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1232	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1242	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1248	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1254	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1260	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Detected PCBs	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Only VOCs, PAHs, and PCBs detected in one or more water samples are listed on the table. Refer to laboratory analytical reports for a complete list of constituents analyzed.

100	Concentration exceeds the NR 140 Wis. adm. code Preventive Action Limit.
100	Concentration exceeds the NR 140 Wis. adm. code Enforcement Standard.
<	Constituent not detected above noted laboratory detection limit.
bls	Below land surface.
DUP	Duplicate sample.
J	Result is between the method detection limit and the limit of quantitation.
µg/L	Micrograms per liter.
NA	Not analyzed.
NE	Not established.
ND	Total detected PCBs were reported less than the laboratory detection limit.
PCBs	Polychlorinated Biphenyls.
VOCs	Volatile Organic Compounds.

Table 2. Groundwater VOC and PCB Analytical Results, Madison-Kipp Corporation, 201 Waubesa Street, Madison, Wisconsin.

Well ID	MW-4D (continued)		MW-4D2				MW-5S		
Sample Interval (feet bls)	65-70	65-70	91-96	91-96	91-96	91-96	34-44	34-44	34-44
Sample Date	1/16/2013	4/18/2013	3/30/2011	4/10/2012	1/16/2013	4/18/2013	4/7/2010	10/1/2010	4/12/2012
VOCs (µg/L)									
1,1,1,2-Tetrachloroethane	<0.25	<0.25	<0.25	<0.31	<0.25	<0.25	<0.25	<0.25	<0.31
1,1,2-Trichloroethane	<0.28	<0.28	<0.25	<0.3	<0.28	<0.28	<0.25	<0.25	<0.3
1,1-Dichloroethene	<0.31	<0.31	<0.5	<0.29	<0.31	<0.31	<0.5	<0.5	<0.29
1,2,4-Trimethylbenzene	<0.14	<0.14	<0.2	<0.22	<0.14	<0.14	<0.2	<0.2	<0.22
1,2-Dibromoethane	NA	NA	<0.2	NA	NA	NA	<0.2	<0.2	NA
1,2-Dichlorobenzene	<0.27	<0.27	<0.2	<0.21	<0.27	<0.27	<0.2	<0.2	<0.21
1,2-Dichloropropane	<0.2	<0.2	<0.5	<0.36	<0.2	<0.2	<0.5	<0.5	<0.36
1,3,5-Trimethylbenzene	<0.18	<0.18	<0.2	<0.23	<0.18	<0.18	<0.2	<0.2	<0.23
Benzene	<0.074	<0.074	<0.2	<0.12	<0.074	<0.074	<0.2	<0.2	<0.12
Bromoform	<0.28	<0.28	<0.2	<0.45	<0.28	<0.28	<0.2	<0.2	<0.45
Bromomethane	<0.31	<0.31	<0.5	<0.49	<0.31	<0.31	<0.5	<0.5	<0.49
Carbon tetrachloride	<0.26	<0.26	<0.8	<0.28	<0.26	<0.26	<0.8	<0.8	***1.2***
Chloroform	<0.2	<0.2	<0.2	<0.25	<0.2	<0.2	<0.2	0.55	***0.84 J***
Chloromethane	<0.18	<0.18	<0.3	<0.24	<0.18	<0.18	<0.3	<0.3	<0.24
cis-1,2-Dichloroethene	<0.12	<0.12	<0.5	<0.22	<0.12	<0.12	1.4	***10***	***13***
Dibromochloromethane	<0.32	<0.32	NA	<0.25	<0.32	<0.32	NA	NA	<0.25
Ethylbenzene	<0.13	<0.13	<0.5	<0.14	<0.13	<0.13	<0.5	<0.5	<0.14
Isopropylbenzene	<0.14	<0.14	<0.2	<0.21	<0.14	<0.14	<0.2	<0.2	<0.21
Methyl tert-butyl ether	<0.24	<0.24	<0.5	<0.28	<0.24	<0.24	<0.5	<0.5	<0.28
Methylene Chloride	<0.68	<0.68	<1	<0.63	<0.68	<0.68	<1	<1	<0.63
Naphthalene	<0.16	<0.16	<0.25	<0.24	<0.16	<0.16	1.4	<0.25	<0.24
n-Butylbenzene	<0.13	<0.13	<0.2	<0.21	<0.13	<0.13	<0.2	<0.2	<0.21
N-Propylbenzene	<0.13	<0.13	<0.5	<0.19	<0.13	<0.13	<0.5	<0.5	<0.19
p-Isopropyltoluene	<0.17	<0.17	<0.2	<0.24	<0.17	<0.17	<0.2	<0.2	<0.24
sec-Butylbenzene	<0.15	<0.15	<0.25	<0.19	<0.15	<0.15	<0.25	<0.25	<0.19
Styrene	<0.1	<0.1	<0.5	<0.26	<0.1	<0.1	<0.5	<0.5	<0.26
tert-Butylbenzene	<0.14	<0.14	<0.2	<0.24	<0.14	<0.14	<0.2	<0.2	<0.24
Tetrachloroethene	<0.17	***0.51 J***	***1.9***	***0.73 J***	***1.2***	***0.92 J***	***41***	***670***	***360***
Toluene	<0.11	<0.11	<0.5	0.40 J	<0.11	0.45 J	<0.5	<0.5	<0.15
trans-1,2-Dichloroethene	<0.25	<0.25	<0.5	<0.27	<0.25	<0.25	<0.5	0.5	<0.27
Trichloroethene	<0.19	<0.19	<0.2	<0.18	<0.19	<0.19	***1***	***13***	***9.8***
Vinyl chloride	<0.1	<0.1	<0.2	<0.13	<0.1	<0.1	<0.2	<0.2	<0.13
Xylenes, Total	<0.068	<0.068	<0.5	<0.3	<0.068	<0.068	<0.5	<0.5	<0.3
Total VOCs	ND	0.51	1.9	1.13	1.2	1.37	44.8	694.05	384.84

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Table 2. Groundwater VOC and PCB Analytical Results, Madison-Kipp Corporation, 201 Waubesa Street, Madison, Wisconsin.

Well ID	MW-4D (continued)		MW-4D2				MW-5S		
Sample Interval (feet bls)	65-70	65-70	91-96	91-96	91-96	91-96	34-44	34-44	34-44
Sample Date	1/16/2013	4/18/2013	3/30/2011	4/10/2012	1/16/2013	4/18/2013	4/7/2010	10/1/2010	4/12/2012
Total PCBs (µg/L)									
Aroclor-1016	<0.17	NA	NA	NA	<0.16	NA	NA	NA	NA
Aroclor-1232	<0.093	NA	NA	NA	<0.087	NA	NA	NA	NA
Aroclor-1242	<0.13	NA	NA	NA	<0.12	NA	NA	NA	NA
Total Detected PCBs	ND	NA	NA	NA	ND	NA	NA	NA	NA
Dissolved PCBs									
Aroclor-1016	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1221	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1232	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1242	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1248	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1254	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1260	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Detected PCBs	NA	NA	NA	NA	NA	NA	NA	NA	NA

Only VOCs, PAHs, and PCBs detected in one or more water samples are listed on the table. Refer to laboratory analytical reports for a complete list of constituents analyzed.

100	Concentration exceeds the NR 140 Wis. adm. code Preventive Action Limit.
100	Concentration exceeds the NR 140 Wis. adm. code Enforcement Standard.
<	Constituent not detected above noted laboratory detection limit.
bls	Below land surface.
DUP	Duplicate sample.
J	Result is between the method detection limit and the limit of quantitation.
µg/L	Micrograms per liter.
NA	Not analyzed.
NE	Not established.
ND	Total detected PCBs were reported less than the laboratory detection limit.
PCBs	Polychlorinated Biphenyls.
VOCs	Volatile Organic Compounds.

Table 2. Groundwater VOC and PCB Analytical Results, Madison-Kipp Corporation, 201 Waubesa Street, Madison, Wisconsin.

Well ID	MW-5S (continued)				MW-5D					
Sample Interval (feet bls)	34-44	34-44	34-44	34-44	75-80	75-80	75-80	75-80	75-80	75-80
Sample Date	11/28/2012	1/17/2013	2/13/2013	4/19/2013	4/7/2010	4/12/2012	11/28/2012	1/17/2013	2/13/2013	4/19/2013
VOCs (µg/L)										
1,1,1,2-Tetrachloroethane	<0.25	<0.25	<0.25	<0.25	<5	<0.31	<1.3	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	<0.28	<0.28	<0.28	<0.28	<5	<0.3	<1.4	<0.56	<0.56	<0.56
1,1-Dichloroethene	<0.31	<0.31	<0.31	<0.31	<10	<0.29	<1.6	<0.62	<0.62	<0.62
1,2,4-Trimethylbenzene	<0.14	<0.14	<0.14	<0.14	<4	<0.22	<0.7	<0.28	<0.28	<0.28
1,2-Dibromoethane	NA	NA	NA	NA	<4	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	<0.27	<0.27	<0.27	<0.27	<4	<0.21	<1.4	<0.54	<0.54	<0.54
1,2-Dichloropropane	<0.2	<0.2	<0.2	<0.2	<10	<0.36	<1	<0.4	<0.4	<0.4
1,3,5-Trimethylbenzene	<0.18	<0.18	<0.18	<0.18	<4	<0.23	<0.9	<0.36	<0.36	<0.36
Benzene	<0.074	<0.074	<0.074	<0.074	<4	0.29 J	***1.1 J***	***1.2***	***1***	***0.88 J***
Bromoform	<0.28	<0.28	<0.28	<0.28	<4	<0.45	<1.4	<0.56	<0.56	<0.56
Bromomethane	<0.31	0.73 J	<0.31 *	<0.31	<10	<0.49	<1.6	<0.62	<0.62 *	<0.62
Carbon tetrachloride	***1.1***	<0.26	***1.4***	***1.1***	<16	<0.28	<1.3	<0.52	<0.52	<0.52
Chloroform	***0.79 J***	***0.79 J***	<0.2	<0.2	<4	<0.25	<1	***1.0 J***	<0.4	<0.4
Chloromethane	<0.18	<0.18	<0.18	<0.18	<6	<0.24	<0.9	<0.36	<0.36	<0.36
cis-1,2-Dichloroethene	4.2	3.8	2.7	2	***48***	***26***	***93***	***110***	***94***	***100***
Dibromochloromethane	<0.32	<0.32	<0.32	<0.32	NA	<0.25	<1.6	<0.64	<0.64	<0.64
Ethylbenzene	<0.13	<0.13	<0.13	<0.13	<10	<0.14	<0.65	<0.26	<0.26	<0.26
Isopropylbenzene	<0.14	<0.14	<0.14	<0.14	<4	<0.21	<0.7	<0.28	<0.28	<0.28
Methyl tert-butyl ether	<0.24	<0.24	<0.24	<0.24	<10	<0.28	<1.2	<0.48	<0.48	<0.48
Methylene Chloride	<0.68	<0.68	<0.68	<0.68	<20	<0.63	<3.4	<1.4	<1.4	<1.4
Naphthalene	<0.16	<0.16	<0.16	<0.16	<5	<0.24	<0.8	<0.32	<0.32	<0.32
n-Butylbenzene	<0.13	<0.13	<0.13	<0.13	<4	<0.21	<0.65	<0.26	<0.26	<0.26
N-Propylbenzene	<0.13	<0.13	<0.13	<0.13	<10	<0.19	<0.65	<0.26	<0.26	<0.26
p-Isopropyltoluene	<0.17	<0.17	<0.17	<0.17	<4	<0.24	<0.85	<0.34	<0.34	<0.34
sec-Butylbenzene	<0.15	<0.15	<0.15	<0.15	<5	<0.19	<0.75	<0.3	<0.3	<0.3
Styrene	<0.1	<0.1	<0.1	<0.1	<10	<0.26	<0.5	<0.2	<0.2	<0.2
tert-Butylbenzene	<0.14	<0.14	<0.14	<0.14	<4	<0.24	<0.7	<0.28	<0.28	<0.28
Tetrachloroethene	***240***	***260***	***210***	***130***	***1,100***	***400***	***2,000***	***1,800***	***1,700***	***1,200***
Toluene	<0.11	<0.11	<0.11	<0.11	<10	0.30 J	<0.55	<0.22	<0.22	<0.22
trans-1,2-Dichloroethene	<0.25	<0.25	<0.25	<0.25	<10	1.3	3.9 J	3.9	3.1	3.4
Trichloroethene	***4.7***	***4.4***	***3.8***	***2.8***	***100***	***48***	***190***	***180***	***180***	***170***
Vinyl chloride	<0.1	<0.1	<0.1	<0.1	<4	<0.13	<0.5	<0.2	<0.2	<0.2
Xylenes, Total	<0.068	<0.068	<0.068	<0.068	<10	<0.3	<0.34	<0.14	<0.14	<0.14
Total VOCs	250.79	269.72	217.9	135.9	1,248	475.89	2,288	2,096.1	1,978.1	1,474.28

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Table 2. Groundwater VOC and PCB Analytical Results, Madison-Kipp Corporation, 201 Waubesa Street, Madison, Wisconsin.

Well ID	MW-5S (continued)				MW-5D					
Sample Interval (feet bls)	34-44	34-44	34-44	34-44	75-80	75-80	75-80	75-80	75-80	75-80
Sample Date	11/28/2012	1/17/2013	2/13/2013	4/19/2013	4/7/2010	4/12/2012	11/28/2012	1/17/2013	2/13/2013	4/19/2013
Total PCBs (µg/L)										
Aroclor-1016	NA	<0.17	NA	NA	NA	NA	NA	<0.17	NA	NA
Aroclor-1232	NA	<0.091	NA	NA	NA	NA	NA	<0.094	NA	NA
Aroclor-1242	NA	<0.13	NA	NA	NA	NA	NA	<0.13	NA	NA
Total Detected PCBs	NA	ND	NA	NA	NA	NA	NA	ND	NA	NA
Dissolved PCBs										
Aroclor-1016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1221	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1232	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1242	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1248	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1254	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1260	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Detected PCBs	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Only VOCs, PAHs, and PCBs detected in one or more water samples are listed on the table. Refer to laboratory analytical reports for a complete list of constituents analyzed.

100	Concentration exceeds the NR 140 Wis. adm. code Preventive Action Limit.
100	Concentration exceeds the NR 140 Wis. adm. code Enforcement Standard.
<	Constituent not detected above noted laboratory detection limit.
bls	Below land surface.
DUP	Duplicate sample.
J	Result is between the method detection limit and the limit of quantitation.
µg/L	Micrograms per liter.
NA	Not analyzed.
NE	Not established.
ND	Total detected PCBs were reported less than the laboratory detection limit.
PCBs	Polychlorinated Biphenyls.
VOCs	Volatile Organic Compounds.

Table 2. Groundwater VOC and PCB Analytical Results, Madison-Kipp Corporation, 201 Waubesa Street, Madison, Wisconsin.

Well ID	MW-5D2					MW-5D3				
Sample Interval (feet bls)	165.8-170.8	165.8-170.8	165.8-170.8	165.8-170.8	165.8-170.8	225-235	225-235	225-235	225-235	225-235
Sample Date	4/8/2010	4/12/2012	1/17/2013	2/13/2013	4/19/2013	7/24/2012	11/28/2012	1/18/2013	2/13/2013	4/21/2013
VOCs (µg/L)										
1,1,1,2-Tetrachloroethane	<0.25	<0.31	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25
1,1,2-Trichloroethane	<0.25	<0.3	<0.28	<0.28	<0.28	<0.28	<0.28	<0.28	<0.28	<0.28
1,1-Dichloroethene	<0.5	<0.29	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31
1,2,4-Trimethylbenzene	<0.2	<0.22	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14
1,2-Dibromoethane	<0.2	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	<0.2	<0.21	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27
1,2-Dichloropropane	<0.5	<0.36	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
1,3,5-Trimethylbenzene	<0.2	<0.23	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18
Benzene	<0.2	<0.12	<0.074	<0.074	<0.074	<0.074	<0.074	0.28 J	<0.074	<0.074
Bromoform	<0.2	<0.45	<0.28	<0.28	<0.28	<0.28	<0.28	<0.28	<0.28	<0.28
Bromomethane	<0.5	<0.49	<0.31	<0.31 *	<0.31	<0.31	<0.31	<0.31	<0.31 *	<0.31
Carbon tetrachloride	<0.8	<0.28	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26
Chloroform	<0.2	<0.25	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Chloromethane	<0.3	<0.24	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18
cis-1,2-Dichloroethene	<0.5	<0.22	6.6	***9.2***	4.7	3.7	3.1	***12***	***12***	1.6
Dibromochloromethane	NA	<0.25	<0.32	<0.32	<0.32	<0.32	<0.32	<0.32	<0.32	<0.32
Ethylbenzene	<0.5	<0.14	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13
Isopropylbenzene	<0.2	<0.21	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14
Methyl tert-butyl ether	<0.5	<0.28	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24
Methylene Chloride	<1	<0.63	<0.68	<0.68	<0.68	<0.68	<0.68	<0.68	<0.68	<0.68
Naphthalene	1.6	<0.24	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16
n-Butylbenzene	<0.2	<0.21	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13
N-Propylbenzene	<0.5	<0.19	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13
p-Isopropyltoluene	<0.2	<0.24	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
sec-Butylbenzene	<0.25	<0.19	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15
Styrene	<0.5	<0.26	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
tert-Butylbenzene	<0.2	<0.24	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14
Tetrachloroethene	***81***	***47***	***650***	***650***	***640***	***23***	***19***	***0.59 J***	***0.83 J***	***1.8***
Toluene	<0.5	<0.15	0.7	0.22 J	0.35 J	<0.11	<0.11	<0.11	<0.11	0.29 J
trans-1,2-Dichloroethene	<0.5	<0.27	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25
Trichloroethene	***0.71***	<0.18	***9.5***	***8.4***	***7.4***	***2.4***	***2.6***	<0.19	<0.19	<0.19
Vinyl chloride	<0.2	<0.13	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Xylenes, Total	<0.5	<0.3	<0.068	<0.068	<0.068	<0.068	<0.068	<0.068	<0.068	<0.068
Total VOCs	83.31	47	666.8	667.82	652.45	29.1	24.7	12.87	12.83	3.69

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Table 2. Groundwater VOC and PCB Analytical Results, Madison-Kipp Corporation, 201 Waubesa Street, Madison, Wisconsin.

Well ID	MW-5D2					MW-5D3				
Sample Interval (feet bls)	165.8-170.8	165.8-170.8	165.8-170.8	165.8-170.8	165.8-170.8	225-235	225-235	225-235	225-235	225-235
Sample Date	4/8/2010	4/12/2012	1/17/2013	2/13/2013	4/19/2013	7/24/2012	11/28/2012	1/18/2013	2/13/2013	4/21/2013
Total PCBs (µg/L)										
Aroclor-1016	NA	NA	<0.19	NA	NA	NA	NA	<0.16	NA	NA
Aroclor-1232	NA	NA	<0.1	NA	NA	NA	NA	<0.09	NA	NA
Aroclor-1242	NA	NA	<0.14	NA	NA	NA	NA	<0.13	NA	NA
Total Detected PCBs	NA	NA	ND	NA	NA	NA	NA	ND	NA	NA
Dissolved PCBs										
Aroclor-1016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1221	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1232	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1242	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1248	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1254	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1260	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Detected PCBs	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Only VOCs, PAHs, and PCBs detected in one or more water samples are listed on the table. Refer to laboratory analytical reports for a complete list of constituents analyzed.

100	Concentration exceeds the NR 140 Wis. adm. code Preventive Action Limit.
100	Concentration exceeds the NR 140 Wis. adm. code Enforcement Standard.
<	Constituent not detected above noted laboratory detection limit.
bls	Below land surface.
DUP	Duplicate sample.
J	Result is between the method detection limit and the limit of quantitation.
µg/L	Micrograms per liter.
NA	Not analyzed.
NE	Not established.
ND	Total detected PCBs were reported less than the laboratory detection limit.
PCBs	Polychlorinated Biphenyls.
VOCs	Volatile Organic Compounds.

Table 2. Groundwater VOC and PCB Analytical Results, Madison-Kipp Corporation, 201 Waubesa Street, Madison, Wisconsin.

Well ID	MW-6S								MW-6D	
Sample Interval (feet bls)	31.4-41.4	31.4-41.4	31.4-41.4	31.4-41.4	31.4-41.4	31.4-41.4	31.4-41.4	31.4-41.4	65.5-70.5	65.5-70.5
Sample Date	12/31/2009	4/7/2010	7/1/2010	10/1/2010	12/28/2010	4/11/2012	1/17/2013	4/20/2013	12/31/2009	4/7/2010
VOCs (µg/L)										
1,1,1,2-Tetrachloroethane	<0.25	<0.25	<0.25	<0.25	<0.25	<0.31	<0.25	<0.25	<13	<20
1,1,2-Trichloroethane	<0.25	<0.25	<0.25	<0.25	<0.25	<0.3	<0.28	<0.28	<13	<20
1,1-Dichloroethene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.29	<0.31	<0.31	<25	<40
1,2,4-Trimethylbenzene	4.3	3.3	1.3	2.2	3.2	4.8	12	0.92 J	***330***	***130***
1,2-Dibromoethane	<0.2	<0.2	<0.2	<0.2	<0.2	NA	NA	NA	***15***	<16
1,2-Dichlorobenzene	<0.2	<0.2	<0.2	<0.2	<0.2	<0.21	<0.27	<0.27	<10	<16
1,2-Dichloropropane	<0.5	<0.5	<0.5	<0.5	<0.5	<0.36	<0.2	<0.2	<25	<40
1,3,5-Trimethylbenzene	0.92	7.3	0.27	4.6	0.39	1.5	3.4	<0.18	23	<16
Benzene	***7.6***	***7.9***	***5***	***5.3***	***5***	***4.1***	***9.3***	***1.9***	***3,900***	***3,200***
Bromoform	<0.2	<0.2	<0.2	<0.2	<0.2	<0.45	<0.28	<0.28	<10	<16
Bromomethane	<0.5	<0.5	<0.5	<0.5	<0.5	<0.49	<0.31	<0.31	<25	<40
Carbon tetrachloride	<0.8	<0.8	<0.8	<0.8	<0.8	<0.28	<0.26	<0.26	<40	<64
Chloroform	<0.2	<0.2	<0.2	<0.2	<0.2	<0.25	<0.2	<0.2	<10	<16
Chloromethane	<0.3	<0.3	<0.3	<0.3	<0.3	<0.24	<0.18	<0.18	<15	<24
cis-1,2-Dichloroethene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.22	<0.12	<0.12	<25	<40
Dibromochloromethane	NA	NA	NA	NA	NA	<0.25	<0.32	<0.32	NA	NA
Ethylbenzene	23	14	6	13	15	9.8	40	0.18 J	47	<40
Isopropylbenzene	12	9.4	5.3	7.5	6.4	4.1	12	<0.14	54	43
Methyl tert-butyl ether	<0.5	<0.5	<0.5	<0.5	<0.5	<0.28	<0.24	<0.24	<25	<40
Methylene Chloride	<1	<1	<1	<1	<1	***8.3***	<0.68	<0.68	<50	<80
Naphthalene	***26***	***14***	6.4	10	***16***	***19***	***43***	<0.16	***380***	***280***
n-Butylbenzene	1.6	1.6	0.92	1.2	0.86	<0.21	<0.13	<0.13	12	<16
N-Propylbenzene	4.9	3.7	1.9	3.3	3	1.8	6.8	<0.13	49	<40
p-Isopropyltoluene	1.7	1.6	0.72	1.1	0.83	<0.24	2.4	<0.17	<10	<16
sec-Butylbenzene	1.9	1.8	1.5	1.5	1	0.56 J	1.8	<0.15	<13	<20
Styrene	0.53	0.51	<0.5	<0.5	1.1	<0.26	0.64 J	<0.1	<25	<40
tert-Butylbenzene	0.27	0.31	0.22	0.24	<0.2	<0.24	<0.14	<0.14	<10	<16
Tetrachloroethene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.22	<0.17	***0.53 J***	***36***	***45***
Toluene	3.3	3.3	1.2	1.8	2	2.5	6.3	0.82	130	100
trans-1,2-Dichloroethene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.27	<0.25	<0.25	<25	<40
Trichloroethene	<0.2	<0.2	<0.2	<0.2	<0.2	<0.18	<0.19	<0.19	<10	<16
Vinyl chloride	<0.2	<0.2	<0.2	<0.2	<0.2	<0.13	<0.1	<0.1	<10	<16
Xylenes, Total	9.6	8.2	2.6	4.5	6.4	7.8	25	1.8	***630***	320
Total VOCs	97.62	76.92	33.33	56.24	61.18	64.26	162.64	6.15	5,606	4,118

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Table 2. Groundwater VOC and PCB Analytical Results, Madison-Kipp Corporation, 201 Waubesa Street, Madison, Wisconsin.

Well ID	MW-6S								MW-6D	
Sample Interval (feet bls)	31.4-41.4	31.4-41.4	31.4-41.4	31.4-41.4	31.4-41.4	31.4-41.4	31.4-41.4	31.4-41.4	65.5-70.5	65.5-70.5
Sample Date	12/31/2009	4/7/2010	7/1/2010	10/1/2010	12/28/2010	4/11/2012	1/17/2013	4/20/2013	12/31/2009	4/7/2010
Total PCBs (µg/L)										
Aroclor-1016	NA	NA	NA	NA	NA	NA	<0.17	NA	NA	NA
Aroclor-1232	NA	NA	NA	NA	NA	NA	<0.094	NA	NA	NA
Aroclor-1242	NA	NA	NA	NA	NA	NA	<0.13	NA	NA	NA
Total Detected PCBs	NA	NA	NA	NA	NA	NA	ND	NA	NA	NA
Dissolved PCBs										
Aroclor-1016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1221	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1232	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1242	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1248	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1254	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1260	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Detected PCBs	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Only VOCs, PAHs, and PCBs detected in one or more water samples are listed on the table. Refer to laboratory analytical reports for a complete list of constituents analyzed.

100	Concentration exceeds the NR 140 Wis. adm. code Preventive Action Limit.
100	Concentration exceeds the NR 140 Wis. adm. code Enforcement Standard.
<	Constituent not detected above noted laboratory detection limit.
bls	Below land surface.
DUP	Duplicate sample.
J	Result is between the method detection limit and the limit of quantitation.
µg/L	Micrograms per liter.
NA	Not analyzed.
NE	Not established.
ND	Total detected PCBs were reported less than the laboratory detection limit.
PCBs	Polychlorinated Biphenyls.
VOCs	Volatile Organic Compounds.

Table 2. Groundwater VOC and PCB Analytical Results, Madison-Kipp Corporation, 201 Waubesa Street, Madison, Wisconsin.

Well ID	MW-6D (continued)							MW-7	
Sample Interval (feet bls)	65.5-70.5	65.5-70.5	65.5-70.5	65.5-70.5	65.5-70.5	65.5-70.5	65.5-70.5	25-35	25-35
Sample Date	7/1/2010	10/1/2010	12/28/2010	3/31/2011	4/12/2012	1/16/2013	4/20/2013	8/26/2011	4/10/2012
VOCs (µg/L)									
1,1,1,2-Tetrachloroethane	<13	<0.25	<2.5	<10	<0.62	<0.5	<0.5	<0.25	<0.31
1,1,2-Trichloroethane	<13	<0.25	<2.5	<10	<0.6	<0.56	<0.56	<0.25	<0.3
1,1-Dichloroethene	<25	<0.5	<5	<20	<0.58	<0.62	<0.62	<0.5	<0.29
1,2,4-Trimethylbenzene	***130***	***160***	***180***	74	19	23	11	<0.2	<0.22
1,2-Dibromoethane	<10	***11***	***9.7***	<8	NA	NA	NA	<0.2	NA
1,2-Dichlorobenzene	<10	<0.2	<2	<8	<0.42	<0.54	<0.54	<0.2	<0.21
1,2-Dichloropropane	<25	***7.2***	***6***	<20	<0.72	<0.4	***1.9 J***	<0.5	<0.36
1,3,5-Trimethylbenzene	<10	13	13	<8	<0.46	<0.36	<0.36	<0.2	<0.23
Benzene	***2,900***	<0.2	***2,900***	***2,100***	***1,500***	***1,300***	***600***	<0.2	<0.12
Bromoform	<10	<0.2	<2	<8	<0.9	<0.56	<0.56	<0.2	<0.45
Bromomethane	<25	<0.5	<5	<20	<0.98	<0.62	<0.62	<0.5	<0.49
Carbon tetrachloride	<40	<0.8	<8	<32	<0.56	<0.52	<0.52	<0.8	<0.28
Chloroform	<10	<0.2	<2	<8	***3.6***	<0.4	<0.4	<0.2	<0.25
Chloromethane	<15	<0.3	<3	<12	<0.48	<0.36	<0.36	<0.3	<0.24
cis-1,2-Dichloroethene	<25	1.4	<5	<20	<0.44	<0.24	<0.24	<0.5	<0.22
Dibromochloromethane	NA	NA	NA	NA	<0.5	<0.64	<0.64	NA	<0.25
Ethylbenzene	26	39	35	<20	8.7	7.5	3.5	<0.5	<0.14
Isopropylbenzene	32	45	40	35	23	30	16	<0.2	<0.21
Methyl tert-butyl ether	<25	<0.5	<5	<20	<0.56	<0.48	<0.48	<0.5	<0.28
Methylene Chloride	<50	<1	<10	<40	<1.3	<1.4	<1.4	<1	<0.63
Naphthalene	***370***	***370***	***360***	***190***	***110***	***54***	3.9	<0.25	<0.24
n-Butylbenzene	<10	10	7.9	<8	<0.42	<0.26	<0.26	<0.2	<0.21
N-Propylbenzene	27	36	31	21	11	13	5.4	<0.5	<0.19
p-Isopropyltoluene	<10	6.5	5.1	<8	2.6	3.8	1.7 J	<0.2	<0.24
sec-Butylbenzene	<13	4.7	4.2	<10	2.2	3.4	2	<0.25	<0.19
Styrene	<25	3.5	***12***	<20	<0.52	<0.2	<0.2	<0.5	<0.26
tert-Butylbenzene	<10	<0.2	<2	<8	<0.48	<0.28	<0.28	<0.2	<0.24
Tetrachloroethene	***27***	***30***	***26***	***28***	***20***	***25***	***22***	<0.5	<0.22
Toluene	88	120	120	58	36	30	9.4	<0.5	<0.15
trans-1,2-Dichloroethene	<25	<0.5	<5	<20	<0.54	<0.5	<0.5	<0.5	<0.27
Trichloroethene	<10	***4.5***	***4.5***	<8	***3.9***	***11***	***13***	<0.2	<0.18
Vinyl chloride	<10	<0.2	<2	<8	<0.26	<0.2	<0.2	<0.2	<0.13
Xylenes, Total	250	***450***	400	130	40	40	12	<0.5	<0.3
Total VOCs	3,850	1,311.8	4,154.4	2,636	1,780	1,540.7	701.8	ND	ND

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Table 2. Groundwater VOC and PCB Analytical Results, Madison-Kipp Corporation, 201 Waubesa Street, Madison, Wisconsin.

Well ID	MW-6D (continued)							MW-7	
Sample Interval (feet bls)	65.5-70.5	65.5-70.5	65.5-70.5	65.5-70.5	65.5-70.5	65.5-70.5	65.5-70.5	25-35	25-35
Sample Date	7/1/2010	10/1/2010	12/28/2010	3/31/2011	4/12/2012	1/16/2013	4/20/2013	8/26/2011	4/10/2012
Total PCBs (µg/L)									
Aroclor-1016	NA	NA	NA	NA	NA	<0.17	NA	NA	NA
Aroclor-1232	NA	NA	NA	NA	NA	<0.094	NA	NA	NA
Aroclor-1242	NA	NA	NA	NA	NA	<0.13	NA	NA	NA
Total Detected PCBs	NA	NA	NA	NA	NA	ND	NA	NA	NA
Dissolved PCBs									
Aroclor-1016	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1221	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1232	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1242	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1248	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1254	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1260	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Detected PCBs	NA	NA	NA	NA	NA	NA	NA	NA	NA

Only VOCs, PAHs, and PCBs detected in one or more water samples are listed on the table. Refer to laboratory analytical reports for a complete list of constituents analyzed.

100	Concentration exceeds the NR 140 Wis. adm. code Preventive Action Limit.
100	Concentration exceeds the NR 140 Wis. adm. code Enforcement Standard.
<	Constituent not detected above noted laboratory detection limit.
bls	Below land surface.
DUP	Duplicate sample.
J	Result is between the method detection limit and the limit of quantitation.
µg/L	Micrograms per liter.
NA	Not analyzed.
NE	Not established.
ND	Total detected PCBs were reported less than the laboratory detection limit.
PCBs	Polychlorinated Biphenyls.
VOCs	Volatile Organic Compounds.

Table 2. Groundwater VOC and PCB Analytical Results, Madison-Kipp Corporation, 201 Waubesa Street, Madison, Wisconsin.

Well ID	MW-7 (continued)		MW-8				MW-9D			
Sample Interval (feet bls)	25-35	25-35	24-34	24-34	24-34	24-34	44-49	44-49	44-49	44-49
Sample Date	1/14/2013	4/16/2013	8/26/2011	4/10/2012	1/15/2013	4/16/2013	9/9/2011	4/11/2012	1/15/2013	4/18/2013
VOCs (µg/L)										
1,1,1,2-Tetrachloroethane	<0.25	<0.25	<0.25	<0.31	<0.25	<0.25	<0.25	<0.31	<0.25	<0.25
1,1,2-Trichloroethane	<0.28	<0.28	<0.25	<0.3	<0.28	<0.28	<0.25	<0.3	<0.28	<0.28
1,1-Dichloroethene	<0.31	<0.31	<0.5	<0.29	<0.31	<0.31	<0.5	<0.29	<0.31	<0.31
1,2,4-Trimethylbenzene	<0.14	<0.14	<0.2	<0.22	<0.14	<0.14	<0.2	<0.22	<0.14	<0.14
1,2-Dibromoethane	NA	NA	<0.2	NA	NA	NA	<0.2	NA	NA	NA
1,2-Dichlorobenzene	<0.27	<0.27	<0.2	<0.21	<0.27	<0.27	<0.2	<0.21	<0.27	<0.27
1,2-Dichloropropane	<0.2	<0.2	<0.5	<0.36	<0.2	<0.2	<0.5	<0.36	<0.2	<0.2
1,3,5-Trimethylbenzene	<0.18	<0.18	<0.2	<0.23	<0.18	<0.18	<0.2	<0.23	<0.18	<0.18
Benzene	<0.074	<0.074	<0.2	<0.12	<0.074	<0.074	<0.2	<0.12	<0.074	<0.074
Bromoform	<0.28	<0.28	<0.2	<0.45	<0.28	<0.28	<0.2	<0.45	<0.28	<0.28
Bromomethane	<0.31	<0.31	<0.5	<0.49	<0.31	<0.31	<0.5	<0.49	<0.31	<0.31
Carbon tetrachloride	<0.26	<0.26	<0.8	<0.28	<0.26	<0.26	<0.8	<0.28	<0.26	<0.26
Chloroform	<0.2	<0.2	<0.2	<0.25	<0.2	<0.2	<0.2	<0.25	<0.2	<0.2
Chloromethane	<0.18	<0.18	<0.3	<0.24	<0.18	<0.18	<0.3	<0.24	<0.18	<0.18
cis-1,2-Dichloroethene	<0.12	<0.12	<0.5	<0.22	<0.12	<0.12	<0.5	<0.22	<0.12	<0.12
Dibromochloromethane	<0.32	<0.32	NA	<0.25	<0.32	<0.32	NA	<0.25	<0.32	<0.32
Ethylbenzene	<0.13	<0.13	<0.5	<0.14	<0.13	<0.13	<0.5	<0.14	<0.13	<0.13
Isopropylbenzene	<0.14	<0.14	<0.2	<0.21	<0.14	<0.14	<0.2	<0.21	<0.14	<0.14
Methyl tert-butyl ether	<0.24	<0.24	<0.5	<0.28	<0.24	<0.24	<0.5	<0.28	<0.24	<0.24
Methylene Chloride	<0.68	<0.68	<1	<0.63	<0.68	<0.68	<1	***9***	<0.68	<0.68
Naphthalene	<0.16	<0.16	<0.25	<0.24	<0.16	<0.16	<0.25	<0.24	<0.16	<0.16
n-Butylbenzene	<0.13	<0.13	<0.2	<0.21	<0.13	<0.13	<0.2	<0.21	<0.13	<0.13
N-Propylbenzene	<0.13	<0.13	<0.5	<0.19	<0.13	<0.13	<0.5	<0.19	<0.13	<0.13
p-Isopropyltoluene	<0.17	<0.17	<0.2	<0.24	<0.17	<0.17	<0.2	<0.24	<0.17	<0.17
sec-Butylbenzene	<0.15	<0.15	<0.25	<0.19	<0.15	<0.15	<0.25	<0.19	<0.15	<0.15
Styrene	<0.1	<0.1	<0.5	<0.26	<0.1	<0.1	<0.5	<0.26	<0.1	<0.1
tert-Butylbenzene	<0.14	<0.14	<0.2	<0.24	<0.14	<0.14	<0.2	<0.24	<0.14	<0.14
Tetrachloroethene	<0.17	<0.17	<0.5	<0.22	<0.17	<0.17	<0.5	<0.22	<0.17	<0.17
Toluene	<0.11	<0.11	<0.5	<0.15	<0.11	<0.11	<0.5	<0.15	<0.11	<0.11
trans-1,2-Dichloroethene	<0.25	<0.25	<0.5	<0.27	<0.25	<0.25	<0.5	<0.27	<0.25	<0.25
Trichloroethene	<0.19	<0.19	<0.2	<0.18	<0.19	<0.19	<0.2	<0.18	<0.19	<0.19
Vinyl chloride	<0.1	<0.1	<0.2	<0.13	<0.1	<0.1	<0.2	<0.13	<0.1	<0.1
Xylenes, Total	<0.068	<0.068	<0.5	<0.3	<0.068	<0.068	<0.5	<0.3	<0.068	<0.068
Total VOCs	ND	ND	ND	ND	ND	ND	ND	9	ND	ND

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Table 2. Groundwater VOC and PCB Analytical Results, Madison-Kipp Corporation, 201 Waubesa Street, Madison, Wisconsin.

Well ID	MW-7 (continued)		MW-8				MW-9D			
Sample Interval (feet bls)	25-35	25-35	24-34	24-34	24-34	24-34	44-49	44-49	44-49	44-49
Sample Date	1/14/2013	4/16/2013	8/26/2011	4/10/2012	1/15/2013	4/16/2013	9/9/2011	4/11/2012	1/15/2013	4/18/2013
Total PCBs (µg/L)										
Aroclor-1016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1232	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1242	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Detected PCBs	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dissolved PCBs										
Aroclor-1016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1221	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1232	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1242	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1248	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1254	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1260	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Detected PCBs	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Only VOCs, PAHs, and PCBs detected in one or more water samples are listed on the table. Refer to laboratory analytical reports for a complete list of constituents analyzed.

100	Concentration exceeds the NR 140 Wis. adm. code Preventive Action Limit.
100	Concentration exceeds the NR 140 Wis. adm. code Enforcement Standard.
<	Constituent not detected above noted laboratory detection limit.
bls	Below land surface.
DUP	Duplicate sample.
J	Result is between the method detection limit and the limit of quantitation.
µg/L	Micrograms per liter.
NA	Not analyzed.
NE	Not established.
ND	Total detected PCBs were reported less than the laboratory detection limit.
PCBs	Polychlorinated Biphenyls.
VOCs	Volatile Organic Compounds.

Table 2. Groundwater VOC and PCB Analytical Results, Madison-Kipp Corporation, 201 Waubesa Street, Madison, Wisconsin.

Well ID	MW-9D2				MW-10S				MW-11S	
Sample Interval (feet bls)	64-69	64-69	64-69	64-69	11-21	11-21	11-21	11-21	24-34	24-34
Sample Date	9/9/2011	4/11/2012	1/15/2013	4/18/2013	4/10/2012	5/9/2012	1/15/2013	4/17/2013	4/12/2012	5/9/2012
VOCs (µg/L)										
1,1,1,2-Tetrachloroethane	<0.25	<0.31	<0.25	<0.25	<0.31	<0.25	<0.25	<0.25	<0.31	<0.25
1,1,2-Trichloroethane	<0.25	<0.3	<0.28	<0.28	<0.3	<0.28	<0.28	<0.28	<0.3	<0.28
1,1-Dichloroethene	<0.5	<0.29	<0.31	<0.31	<0.29	<0.31	<0.31	<0.31	<0.29	<0.31
1,2,4-Trimethylbenzene	<0.2	<0.22	<0.14	<0.14	0.76 J	<0.14	<0.14	<0.14	0.55 J	<0.14
1,2-Dibromoethane	<0.2	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	<0.2	<0.21	<0.27	<0.27	<0.21	<0.27	<0.27	<0.27	<0.21	<0.27
1,2-Dichloropropane	<0.5	<0.36	<0.2	<0.2	<0.36	<0.2	<0.2	<0.2	<0.36	<0.2
1,3,5-Trimethylbenzene	<0.2	<0.23	<0.18	<0.18	<0.23	<0.18	<0.18	<0.18	<0.23	<0.18
Benzene	<0.2	<0.12	<0.074	<0.074	<0.12	<0.074	<0.074	<0.074	<0.12	<0.074
Bromoform	<0.2	<0.45	<0.28	<0.28	<0.45	<0.28	<0.28	<0.28	<0.45	<0.28
Bromomethane	<0.5	<0.49	<0.31	<0.31	<0.49	<0.31	<0.31	<0.31	<0.49	<0.31
Carbon tetrachloride	<0.8	<0.28	<0.26	<0.26	<0.28	<0.26	<0.26	<0.26	<0.28	<0.26
Chloroform	<0.2	<0.25	<0.2	<0.2	<0.25	<0.2	<0.2	<0.2	<0.25	<0.2
Chloromethane	<0.3	<0.24	<0.18	<0.18	<0.24	<0.18	<0.18	<0.18	<0.24	<0.18
cis-1,2-Dichloroethene	***12***	***11***	***14***	***16***	<0.22	<0.12	<0.12	<0.12	<0.22	<0.12
Dibromochloromethane	NA	<0.25	<0.32	<0.32	<0.25	<0.32	<0.32	<0.32	<0.25	<0.32
Ethylbenzene	<0.5	<0.14	<0.13	<0.13	0.20 J	<0.13	<0.13	<0.13	<0.14	<0.13
Isopropylbenzene	<0.2	<0.21	<0.14	<0.14	<0.21	<0.14	<0.14	<0.14	<0.21	<0.14
Methyl tert-butyl ether	7.4	9.3	***20***	10	<0.28	<0.24	<0.24	<0.24	<0.28	<0.24
Methylene Chloride	<1	***8.8***	<0.68	<0.68	<0.63	<0.68	<0.68	<0.68	<0.63	<0.68
Naphthalene	<0.25	<0.24	<0.16	<0.16	<0.24	<0.16	<0.16	<0.16	<0.24	<0.16
n-Butylbenzene	<0.2	<0.21	<0.13	<0.13	<0.21	<0.13	<0.13	<0.13	<0.21	<0.13
N-Propylbenzene	<0.5	<0.19	<0.13	<0.13	<0.19	<0.13	<0.13	<0.13	<0.19	<0.13
p-Isopropyltoluene	<0.2	<0.24	<0.17	<0.17	<0.24	<0.17	<0.17	<0.17	<0.24	<0.17
sec-Butylbenzene	<0.25	<0.19	<0.15	<0.15	<0.19	<0.15	<0.15	<0.15	<0.19	<0.15
Styrene	<0.5	<0.26	<0.1	<0.1	<0.26	<0.1	<0.1	<0.1	<0.26	<0.1
tert-Butylbenzene	<0.2	<0.24	<0.14	<0.14	<0.24	<0.14	<0.14	<0.14	<0.24	<0.14
Tetrachloroethene	***29***	***10***	***26***	***28***	<0.22	<0.17	***0.85 J***	<0.17	<0.22	<0.17
Toluene	<0.5	<0.15	<0.11	<0.11	0.54	<0.11	<0.11	<0.11	0.73	<0.11
trans-1,2-Dichloroethene	<0.5	<0.27	<0.25	<0.25	<0.27	<0.25	<0.25	<0.25	<0.27	<0.25
Trichloroethene	***5***	***3.8***	***5.5***	***6***	<0.18	<0.19	<0.19	<0.19	<0.18	<0.19
Vinyl chloride	<0.2	<0.13	<0.1	<0.1	<0.13	<0.1	<0.1	<0.1	<0.13	<0.1
Xylenes, Total	<0.5	<0.3	<0.068	<0.068	0.83 J	<0.068	<0.068	<0.068	0.86 J	<0.068
Total VOCs	53.4	42.9	65.5	60	2.33	ND	0.85	ND	2.14	ND

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Table 2. Groundwater VOC and PCB Analytical Results, Madison-Kipp Corporation, 201 Waubesa Street, Madison, Wisconsin.

Well ID	MW-9D2				MW-10S				MW-11S	
Sample Interval (feet bls)	64-69	64-69	64-69	64-69	11-21	11-21	11-21	11-21	24-34	24-34
Sample Date	9/9/2011	4/11/2012	1/15/2013	4/18/2013	4/10/2012	5/9/2012	1/15/2013	4/17/2013	4/12/2012	5/9/2012
Total PCBs (µg/L)										
Aroclor-1016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1232	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1242	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Detected PCBs	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dissolved PCBs										
Aroclor-1016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1221	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1232	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1242	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1248	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1254	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1260	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Detected PCBs	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Only VOCs, PAHs, and PCBs detected in one or more water samples are listed on the table. Refer to laboratory analytical reports for a complete list of constituents analyzed.

100	Concentration exceeds the NR 140 Wis. adm. code Preventive Action Limit.
100	Concentration exceeds the NR 140 Wis. adm. code Enforcement Standard.
<	Constituent not detected above noted laboratory detection limit.
bls	Below land surface.
DUP	Duplicate sample.
J	Result is between the method detection limit and the limit of quantitation.
µg/L	Micrograms per liter.
NA	Not analyzed.
NE	Not established.
ND	Total detected PCBs were reported less than the laboratory detection limit.
PCBs	Polychlorinated Biphenyls.
VOCs	Volatile Organic Compounds.

Table 2. Groundwater VOC and PCB Analytical Results, Madison-Kipp Corporation, 201 Waubesa Street, Madison, Wisconsin.

Well ID	MW-11S (continued)		MW-12S				MP-13			
Sample Interval (feet bls)	24-34	24-34	1-13	1-13	1-13	1-13	44-48'	44-48'	44-48'	44-48'
Sample Date	1/15/2013	4/17/2013	4/12/2012	5/9/2012	1/16/2013	4/17/2013	12/6/2012	1/19/2013	2/21/2013	4/17/2013
VOCs (µg/L)										
1,1,1,2-Tetrachloroethane	<0.25	<0.25	<0.31	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.5
1,1,2-Trichloroethane	<0.28	<0.28	<0.3	<0.28	<0.28	<0.28	<0.28	<0.28	<0.28	<0.56
1,1-Dichloroethene	<0.31	<0.31	<0.29	<0.31	<0.31	<0.31	***0.92 J***	***1.1***	***0.88 J***	<0.62
1,2,4-Trimethylbenzene	<0.14	<0.14	1.2	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.28
1,2-Dibromoethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	<0.27	<0.27	<0.21	<0.27	0.79 J	<0.27	<0.27	<0.27	<0.27	<0.54
1,2-Dichloropropane	<0.2	<0.2	<0.36	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.4
1,3,5-Trimethylbenzene	<0.18	<0.18	<0.23	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.36
Benzene	<0.074	<0.074	<0.12	<0.074	<0.074	<0.074	0.34 J	0.38 J	0.32 J	0.38 J
Bromoform	<0.28	<0.28	<0.45	<0.28	<0.28	<0.28	<0.28	<0.28	<0.28	<0.56
Bromomethane	<0.31	<0.31	<0.49	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.62
Carbon tetrachloride	<0.26	<0.26	<0.28	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	<0.52
Chloroform	<0.2	<0.2	<0.25	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.4
Chloromethane	<0.18	<0.18	<0.24	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.36
cis-1,2-Dichloroethene	<0.12	<0.12	<0.22	<0.12	<0.12	<0.12	***540***	***450***	***460***	***460***
Dibromochloromethane	<0.32	<0.32	<0.25	<0.32	<0.32	<0.32	<0.32	<0.32	<0.32	<0.64
Ethylbenzene	<0.13	<0.13	<0.14	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.26
Isopropylbenzene	<0.14	<0.14	<0.21	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.28
Methyl tert-butyl ether	<0.24	<0.24	<0.28	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.48
Methylene Chloride	<0.68	<0.68	<0.63	<0.68	<0.68	<0.68	<0.68	<0.68	<0.68	<1.4
Naphthalene	<0.16	<0.16	<0.24	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.32
n-Butylbenzene	<0.13	<0.13	<0.21	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.26
N-Propylbenzene	<0.13	<0.13	<0.19	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.26
p-Isopropyltoluene	<0.17	<0.17	<0.24	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.34
sec-Butylbenzene	<0.15	<0.15	<0.19	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.3
Styrene	<0.1	<0.1	<0.26	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2
tert-Butylbenzene	<0.14	<0.14	<0.24	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.28
Tetrachloroethene	<0.17	<0.17	***0.78 J***	***1.7***	***0.93 J***	<0.17	***640***	***760***	***630***	***680***
Toluene	<0.11	<0.11	0.64	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.22
trans-1,2-Dichloroethene	<0.25	<0.25	<0.27	<0.25	<0.25	<0.25	7.3	6.7	6.1	6.9
Trichloroethene	<0.19	<0.19	<0.18	0.26 J	<0.19	<0.19	***230***	***200***	***220***	***230***
Vinyl chloride	<0.1	<0.1	<0.13	<0.1	<0.1	<0.1	***15***	***17***	***17***	***13***
Xylenes, Total	<0.068	<0.068	1.6	<0.068	<0.068	<0.068	<0.068	<0.068	<0.068	<0.14
Total VOCs	ND	ND	4.22	1.96	1.72	ND	1,433.56	1,435.18	1,334.3	1,390.28

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Table 2. Groundwater VOC and PCB Analytical Results, Madison-Kipp Corporation, 201 Waubesa Street, Madison, Wisconsin.

Well ID	MW-11S (continued)		MW-12S				MP-13			
Sample Interval (feet bls)	24-34	24-34	1-13	1-13	1-13	1-13	44-48'	44-48'	44-48'	44-48'
Sample Date	1/15/2013	4/17/2013	4/12/2012	5/9/2012	1/16/2013	4/17/2013	12/6/2012	1/19/2013	2/21/2013	4/17/2013
Total PCBs (µg/L)										
Aroclor-1016	NA	NA	NA	NA	NA	NA	<0.16	NA	NA	NA
Aroclor-1232	NA	NA	NA	NA	NA	NA	<0.085	NA	NA	NA
Aroclor-1242	NA	NA	NA	NA	NA	NA	<0.12	NA	NA	NA
Total Detected PCBs	NA	NA	NA	NA	NA	NA	ND	NA	NA	NA
Dissolved PCBs										
Aroclor-1016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1221	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1232	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1242	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1248	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1254	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1260	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Detected PCBs	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Only VOCs, PAHs, and PCBs detected in one or more water samples are listed on the table. Refer to laboratory analytical reports for a complete list of constituents analyzed.

100	Concentration exceeds the NR 140 Wis. adm. code Preventive Action Limit.
100	Concentration exceeds the NR 140 Wis. adm. code Enforcement Standard.
<	Constituent not detected above noted laboratory detection limit.
bls	Below land surface.
DUP	Duplicate sample.
J	Result is between the method detection limit and the limit of quantitation.
µg/L	Micrograms per liter.
NA	Not analyzed.
NE	Not established.
ND	Total detected PCBs were reported less than the laboratory detection limit.
PCBs	Polychlorinated Biphenyls.
VOCs	Volatile Organic Compounds.

Table 2. Groundwater VOC and PCB Analytical Results, Madison-Kipp Corporation, 201 Waubesa Street, Madison, Wisconsin.

Well ID	MP-13 (continued)									
Sample Interval (feet bls)	67-71'	67-71'	67-71'	67-71'	81-85'	81-85'	81-85'	81-85'	102-106'	102-106'
Sample Date	12/6/2012	1/19/2013	2/21/2013	4/17/2013	12/6/2012	1/19/2013	2/21/2013	4/17/2013	12/4/2012	1/18/2013
VOCs (µg/L)										
1,1,1,2-Tetrachloroethane	<1.3	<1.3	<1.3	<2.5	<2.5	4.8 J	4.5 J	<5	<1.3	<0.5
1,1,2-Trichloroethane	<1.4	<1.4	<1.4	<2.8	<2.8	<2.8	<1.4	<5.6	<1.4	<0.56
1,1-Dichloroethene	***2.8 J***	***3.1 J***	<1.6	<3.1	<3.1	<3.1	***4.2 J***	<6.2	<1.6	<0.62
1,2,4-Trimethylbenzene	<0.7	<0.7	<0.7	<1.4	<1.4	<1.4	<0.7	<2.8	<0.7	<0.28
1,2-Dibromoethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	<1.4	<1.4	<1.4	<2.7	<2.7	<2.7	<1.4	<5.4	<1.4	<0.54
1,2-Dichloropropane	<1	<1	<1	<2	<2	<2	<1	<4	<1	<0.4
1,3,5-Trimethylbenzene	<0.9	<0.9	<0.9	<1.8	<1.8	<1.8	<0.9	<3.6	<0.9	<0.36
Benzene	<0.37	***1.1 J***	<0.37	<0.74	<0.74	<0.74	<0.37	<1.5	<0.37	<0.15
Bromoform	<1.4	<1.4	<1.4	<2.8	<2.8	<2.8	<1.4	<5.6	<1.4	<0.56
Bromomethane	<1.6	<1.6	<1.6	<3.1	<3.1	<3.1	<1.6	<6.2	<1.6	<0.62
Carbon tetrachloride	<1.3	<1.3	<1.3	<2.6	<2.6	<2.6	<1.3	<5.2	<1.3	<0.52
Chloroform	<1	<1	<1	<2	<2	<2	<1	<4	<1	<0.4
Chloromethane	<0.9	<0.9	<0.9	<1.8	<1.8	<1.8	<0.9	<3.6	<0.9	<0.36
cis-1,2-Dichloroethene	***3,500***	***3,100***	***2,900***	***3,200***	***1,900***	***1,800***	***2,100***	***2,700***	***1,100***	***690***
Dibromochloromethane	<1.6	<1.6	<1.6	<3.2	<3.2	<3.2	<1.6	<6.4	<1.6	<0.64
Ethylbenzene	<0.65	<0.65	<0.65	<1.3	<1.3	<1.3	<0.65	<2.6	<0.65	<0.26
Isopropylbenzene	<0.7	<0.7	<0.7	<1.4	<1.4	<1.4	<0.7	<2.8	<0.7	<0.28
Methyl tert-butyl ether	<1.2	<1.2	<1.2	<2.4	<2.4	<2.4	<1.2	<4.8	<1.2	<0.48
Methylene Chloride	<3.4	<3.4	<3.4	<6.8	<6.8	<6.8	<3.4	<14	<3.4	<1.4
Naphthalene	<0.8	<0.8	<0.8	<1.6	<1.6	<1.6	<0.8	<3.2	<0.8	<0.32
n-Butylbenzene	<0.65	<0.65	<0.65	<1.3	<1.3	<1.3	<0.65	<2.6	<0.65	<0.26
N-Propylbenzene	<0.65	<0.65	<0.65	<1.3	<1.3	<1.3	<0.65	<2.6	<0.65	<0.26
p-Isopropyltoluene	<0.85	<0.85	<0.85	<1.7	<1.7	<1.7	<0.85	<3.4	<0.85	<0.34
sec-Butylbenzene	<0.75	<0.75	<0.75	<1.5	<1.5	<1.5	<0.75	<3	<0.75	<0.3
Styrene	<0.5	<0.5	<0.5	<1	<1	<1	<0.5	<2	<0.5	<0.2
tert-Butylbenzene	<0.7	<0.7	<0.7	<1.4	<1.4	<1.4	<0.7	<2.8	<0.7	<0.28
Tetrachloroethene	***3,800***	***4,300***	***2,900***	***3,800***	***5,600***	***6,800***	***7,000***	***7,900***	***1,800***	***1,100***
Toluene	<0.55	<0.55	<0.55	<1.1	<1.1	<1.1	<0.55	<2.2	<0.55	<0.22
trans-1,2-Dichloroethene	***60***	***56***	***48***	***52***	***29***	***38***	***38***	***48***	15	9.5
Trichloroethene	***1,100***	***1,000***	***800***	***940***	***940***	***1,100***	***1,100***	***1,200***	***440***	***330***
Vinyl chloride	***150***	***180***	***140***	***130***	***64***	***120***	***110***	***99***	***33***	***23***
Xylenes, Total	<0.34	<0.34	<0.34	<0.68	<0.68	<0.68	<0.34	<1.4	<0.34	<0.14
Total VOCs	8,612.8	8,640.2	6,788	8,122	8,533	9,862.8	10,356.7	11,947	3,388	2,152.5

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Table 2. Groundwater VOC and PCB Analytical Results, Madison-Kipp Corporation, 201 Waubesa Street, Madison, Wisconsin.

Well ID	MP-13 (continued)									
Sample Interval (feet bls)	**67-71'**	**67-71'**	**67-71'**	**67-71'**	**81-85'**	**81-85'**	**81-85'**	**81-85'**	**102-106'**	**102-106'**
Sample Date	**12/6/2012**	**1/19/2013**	**2/21/2013**	**4/17/2013**	**12/6/2012**	**1/19/2013**	**2/21/2013**	**4/17/2013**	**12/4/2012**	**1/18/2013**
Total PCBs (µg/L)										
Aroclor-1016	<0.16	NA	NA	NA	<0.15	NA	NA	NA	<0.15	NA
Aroclor-1232	<0.085	NA	NA	NA	<0.083	NA	NA	NA	<0.083	NA
Aroclor-1242	<0.12	NA	NA	NA	<0.12	NA	NA	NA	<0.12	NA
Total Detected PCBs	ND	NA	NA	NA	ND	NA	NA	NA	ND	NA
Dissolved PCBs										
Aroclor-1016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1221	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1232	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1242	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1248	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1254	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1260	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Detected PCBs	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Only VOCs, PAHs, and PCBs detected in one or more water samples are listed on the table. Refer to laboratory analytical reports for a complete list of constituents analyzed.

100	Concentration exceeds the NR 140 Wis. adm. code Preventive Action Limit.
100	Concentration exceeds the NR 140 Wis. adm. code Enforcement Standard.
<	Constituent not detected above noted laboratory detection limit.
bls	Below land surface.
DUP	Duplicate sample.
J	Result is between the method detection limit and the limit of quantitation.
µg/L	Micrograms per liter.
NA	Not analyzed.
NE	Not established.
ND	Total detected PCBs were reported less than the laboratory detection limit.
PCBs	Polychlorinated Biphenyls.
VOCs	Volatile Organic Compounds.

Table 2. Groundwater VOC and PCB Analytical Results, Madison-Kipp Corporation, 201 Waubesa Street, Madison, Wisconsin.

Well ID	MP-13 (continued)										
Sample Interval (feet bls)	**102-106'**	**102-106'**	**121-125'**	**121-125'**	**121-125'**	**135-139'**	**135-139'**	**135-139'**	**163-167'**	**163-167'**	**163-167'**
Sample Date	**2/21/2013**	**4/17/2013**	**12/4/2012**	**1/18/2013**	**4/17/2013**	**12/4/2012**	**1/17/2013**	**4/17/2013**	**12/4/2012**	**1/16/2013**	**4/17/2013**
VOCs (µg/L)											
1,1,1,2-Tetrachloroethane	<0.5	<1.3	<0.5	<1.3	<5	<0.5	<1.3	<2.5	<1.3	<0.25	<0.5
1,1,2-Trichloroethane	<0.56	<1.4	<0.56	<1.4	<5.6	<0.56	<1.4	<2.8	<1.4	<0.28	<0.56
1,1-Dichloroethene	<0.62	<1.6	<0.62	<1.6	<6.2	***1.5 J***	<1.6	<3.1	<1.6	***0.97 J***	<0.62
1,2,4-Trimethylbenzene	<0.28	<0.7	<0.28	<0.7	<2.8	<0.28	<0.7	<1.4	<0.7	<0.14	<0.28
1,2-Dibromoethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	<0.54	<1.4	<0.54	<1.4	<5.4	<0.54	<1.4	<2.7	<1.4	<0.27	<0.54
1,2-Dichloropropane	<0.4	<1	<0.4	<1	<4	<0.4	<1	<2	<1	<0.2	<0.4
1,3,5-Trimethylbenzene	<0.36	<0.9	<0.36	<0.9	<3.6	<0.36	<0.9	<1.8	<0.9	<0.18	<0.36
Benzene	<0.15	<0.37	<0.15	<0.37	<1.5	0.41 J	***1.1 J***	<0.74	<0.37	<0.074	<0.15
Bromoform	<0.56	<1.4	<0.56	<1.4	<5.6	<0.56	<1.4	<2.8	<1.4	<0.28	<0.56
Bromomethane	<0.62	<1.6	<0.62	<1.6	<6.2	<0.62	<1.6	<3.1	<1.6	<0.31	<0.62
Carbon tetrachloride	<0.52	<1.3	<0.52	<1.3	<5.2	<0.52	<1.3	<2.6	<1.3	<0.26	<0.52
Chloroform	<0.4	<1	<0.4	<1	<4	<0.4	<1	<2	<1	<0.2	<0.4
Chloromethane	<0.36	<0.9	<0.36	<0.9	<3.6	<0.36	<0.9	<1.8	<0.9	<0.18	<0.36
cis-1,2-Dichloroethene	***520***	***720***	***910***	***1,000***	***930***	***1,100***	***910***	***540***	***970***	***730***	***460***
Dibromochloromethane	<0.64	<1.6	<0.64	<1.6	<6.4	<0.64	<1.6	<3.2	<1.6	<0.32	<0.64
Ethylbenzene	<0.26	<0.65	<0.26	<0.65	<2.6	<0.26	<0.65	<1.3	<0.65	<0.13	<0.26
Isopropylbenzene	<0.28	<0.7	<0.28	<0.7	<2.8	<0.28	<0.7	<1.4	<0.7	<0.14	<0.28
Methyl tert-butyl ether	<0.48	<1.2	<0.48	<1.2	<4.8	<0.48	<1.2	<2.4	<1.2	<0.24	<0.48
Methylene Chloride	<1.4	<3.4	<1.4	<3.4	<14	<1.4	<3.4	<6.8	<3.4	<0.68	<1.4
Naphthalene	<0.32	<0.8	<0.32	<0.8	<3.2	<0.32	<0.8	<1.6	<0.8	<0.16	<0.32
n-Butylbenzene	<0.26	<0.65	<0.26	<0.65	<2.6	<0.26	<0.65	<1.3	<0.65	<0.13	<0.26
N-Propylbenzene	<0.26	<0.65	<0.26	<0.65	<2.6	<0.26	<0.65	<1.3	<0.65	<0.13	<0.26
p-Isopropyltoluene	<0.34	<0.85	<0.34	<0.85	<3.4	<0.34	<0.85	<1.7	<0.85	<0.17	<0.34
sec-Butylbenzene	<0.3	<0.75	<0.3	<0.75	<3	<0.3	<0.75	<1.5	<0.75	<0.15	<0.3
Styrene	<0.2	<0.5	<0.2	<0.5	<2	<0.2	<0.5	<1	<0.5	<0.1	<0.2
tert-Butylbenzene	<0.28	<0.7	<0.28	<0.7	<2.8	<0.28	<0.7	<1.4	<0.7	<0.14	<0.28
Tetrachloroethene	***670***	***1,400***	***1,500***	***2,600***	***7,000***	***1,900***	***2,300***	***3,800***	***1,400***	***930***	***840***
Toluene	<0.22	<0.55	<0.22	<0.55	<2.2	<0.22	<0.55	<1.1	<0.55	<0.11	<0.22
trans-1,2-Dichloroethene	4.8	6.6	12	17	12 J	17	15	8.5 J	15	13	7.5
Trichloroethene	***270***	***500***	***340***	***460***	***600***	***450***	***430***	***310***	***370***	***250***	***200***
Vinyl chloride	***13***	***20***	***36***	***54***	***13***	***50***	***42***	***11***	***41***	***27***	***6.8***
Xylenes, Total	<0.14	<0.34	<0.14	<0.34	<1.4	<0.14	<0.34	<0.68	<0.34	<0.068	<0.14
Total VOCs	1,477.8	2,646.6	2,798	4,131	8,555	3,518.91	3,698.1	4,669.5	2,796	1,950.97	1,514.3

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Table 2. Groundwater VOC and PCB Analytical Results, Madison-Kipp Corporation, 201 Waubesa Street, Madison, Wisconsin.

Well ID	MP-13 (continued)										
Sample Interval (feet bls)	**102-106'**	**102-106'**	**121-125'**	**121-125'**	**121-125'**	**135-139'**	**135-139'**	**135-139'**	**163-167'**	**163-167'**	**163-167'**
Sample Date	**2/21/2013**	**4/17/2013**	**12/4/2012**	**1/18/2013**	**4/17/2013**	**12/4/2012**	**1/17/2013**	**4/17/2013**	**12/4/2012**	**1/16/2013**	**4/17/2013**
Total PCBs (µg/L)											
Aroclor-1016	NA	NA	<0.15	NA	NA	<0.15	NA	NA	<0.15	NA	NA
Aroclor-1232	NA	NA	<0.084	NA	NA	<0.083	NA	NA	<0.083	NA	NA
Aroclor-1242	NA	NA	<0.12	NA	NA	<0.12	NA	NA	<0.12	NA	NA
Total Detected PCBs	NA	NA	ND	NA	NA	ND	NA	NA	ND	NA	NA
Dissolved PCBs											
Aroclor-1016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1221	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1232	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1242	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1248	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1254	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1260	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Detected PCBs	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Only VOCs, PAHs, and PCBs detected in one or more water samples are listed on the table. Refer to laboratory analytical reports for a complete list of constituents analyzed.

100	Concentration exceeds the NR 140 Wis. adm. code Preventive Action Limit.
100	Concentration exceeds the NR 140 Wis. adm. code Enforcement Standard.
<	Constituent not detected above noted laboratory detection limit.
bls	Below land surface.
DUP	Duplicate sample.
J	Result is between the method detection limit and the limit of quantitation.
µg/L	Micrograms per liter.
NA	Not analyzed.
NE	Not established.
ND	Total detected PCBs were reported less than the laboratory detection limit.
PCBs	Polychlorinated Biphenyls.
VOCs	Volatile Organic Compounds.

Table 2. Groundwater VOC and PCB Analytical Results, Madison-Kipp Corporation, 201 Waubesa Street, Madison, Wisconsin.

Well ID	MP-14								MP-15	
Sample Interval (feet bls)	70-75'	70-75'	100-105'	100-105'	135-140'	135-140'	170 - 178'	170-178'	88-92'	88-92'
Sample Date	1/21/2013	4/16/2013	1/21/2013	4/16/2013	1/21/2013	4/16/2013	1/21/2013	4/16/2013	1/22/2013	4/15/2013
VOCs (µg/L)										
1,1,1,2-Tetrachloroethane	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25
1,1,2-Trichloroethane	<0.28	<0.28	<0.28	<0.28	<0.28	<0.28	<0.28	<0.28	<0.28	***2.2***
1,1-Dichloroethene	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31
1,2,4-Trimethylbenzene	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14
1,2-Dibromoethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27
1,2-Dichloropropane	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
1,3,5-Trimethylbenzene	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18
Benzene	<0.074	<0.074	<0.074	<0.074	<0.074	<0.074	<0.074	<0.074	<0.074	<0.074
Bromoform	<0.28	<0.28	<0.28	<0.28	<0.28	<0.28	<0.28	<0.28	<0.28	<0.28
Bromomethane	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31
Carbon tetrachloride	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26
Chloroform	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Chloromethane	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18
cis-1,2-Dichloroethene	<0.12	<0.12	<0.12	<0.12	<0.12	***17***	<0.12	<0.12	***7.5***	***23***
Dibromochloromethane	<0.32	<0.32	<0.32	<0.32	<0.32	<0.32	<0.32	<0.32	<0.32	<0.32
Ethylbenzene	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13
Isopropylbenzene	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14
Methyl tert-butyl ether	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	2.3	0.84 J
Methylene Chloride	<0.68	<0.68	<0.68	<0.68	<0.68	<0.68	<0.68	<0.68	<0.68	<0.68
Naphthalene	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16
n-Butylbenzene	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13
N-Propylbenzene	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13
p-Isopropyltoluene	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
sec-Butylbenzene	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15
Styrene	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
tert-Butylbenzene	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14
Tetrachloroethene	***0.71 J***	<0.17	***1.5***	<0.17	***1.7***	***430***	***1.2***	***9.2***	***130***	***160***
Toluene	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
trans-1,2-Dichloroethene	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25
Trichloroethene	<0.19	<0.19	<0.19	<0.19	0.24 J	***31***	<0.19	***0.78***	***11***	***15***
Vinyl chloride	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Xylenes, Total	<0.068	<0.068	<0.068	<0.068	<0.068	<0.068	<0.068	<0.068	<0.068	<0.068
Total VOCs	0.71	ND	1.5	ND	1.94	478	1.2	9.98	150.8	201.04

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Table 2. Groundwater VOC and PCB Analytical Results, Madison-Kipp Corporation, 201 Waubesa Street, Madison, Wisconsin.

Well ID	MP-14								MP-15	
Sample Interval (feet bls)	70-75'	70-75'	100-105'	100-105'	135-140'	135-140'	170 - 178'	170-178'	88-92'	88-92'
Sample Date	1/21/2013	4/16/2013	1/21/2013	4/16/2013	1/21/2013	4/16/2013	1/21/2013	4/16/2013	1/22/2013	4/15/2013
Total PCBs (µg/L)										
Aroclor-1016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1232	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1242	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Detected PCBs	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dissolved PCBs										
Aroclor-1016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1221	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1232	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1242	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1248	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1254	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1260	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Detected PCBs	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Only VOCs, PAHs, and PCBs detected in one or more water samples are listed on the table. Refer to laboratory analytical reports for a complete list of constituents analyzed.

100	Concentration exceeds the NR 140 Wis. adm. code Preventive Action Limit.
100	Concentration exceeds the NR 140 Wis. adm. code Enforcement Standard.
<	Constituent not detected above noted laboratory detection limit.
bls	Below land surface.
DUP	Duplicate sample.
J	Result is between the method detection limit and the limit of quantitation.
µg/L	Micrograms per liter.
NA	Not analyzed.
NE	Not established.
ND	Total detected PCBs were reported less than the laboratory detection limit.
PCBs	Polychlorinated Biphenyls.
VOCs	Volatile Organic Compounds.

Table 2. Groundwater VOC and PCB Analytical Results, Madison-Kipp Corporation, 201 Waubesa Street, Madison, Wisconsin.

Well ID	MP-15 (continued)								MP-16	
Sample Interval (feet bls)	100-105'	100-105'	120-125'	120-125'	142-146'	142-146'	177 - 187'	177-187'	80-84'	80-84'
Sample Date	1/22/2013	4/15/2013	1/22/2013	4/15/2013	1/22/2013	4/15/2013	1/22/2013	4/15/2013	1/22/2013	4/16/2013
VOCs (µg/L)										
1,1,1,2-Tetrachloroethane	<0.25	<0.25	<0.5	<0.5	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25
1,1,2-Trichloroethane	<0.28	<0.28	<0.56	<0.56	<0.28	<0.28	<0.28	<0.28	<0.28	<0.28
1,1-Dichloroethene	<0.31	<0.31	<0.62	<0.62	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31
1,2,4-Trimethylbenzene	<0.14	<0.14	<0.28	<0.28	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14
1,2-Dibromoethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	<0.27	<0.27	<0.54	<0.54	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27
1,2-Dichloropropane	<0.2	<0.2	<0.4	<0.4	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
1,3,5-Trimethylbenzene	<0.18	<0.18	<0.36	<0.36	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18
Benzene	<0.074	<0.074	<0.15	<0.15	<0.074	<0.074	<0.074	<0.074	<0.074	<0.074
Bromoform	<0.28	<0.28	<0.56	<0.56	<0.28	<0.28	<0.28	<0.28	<0.28	<0.28
Bromomethane	<0.31	<0.31	<0.62	<0.62	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31
Carbon tetrachloride	<0.26	<0.26	<0.52	<0.52	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26
Chloroform	<0.2	<0.2	<0.4	<0.4	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Chloromethane	<0.18	<0.18	<0.36	<0.36	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18
cis-1,2-Dichloroethene	***9.3***	***37***	***200***	***230***	***9.7***	***75***	***9.5***	6.7	<0.12	<0.12
Dibromochloromethane	<0.32	<0.32	<0.64	<0.64	<0.32	<0.32	<0.32	<0.32	<0.32	<0.32
Ethylbenzene	<0.13	<0.13	<0.26	<0.26	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13
Isopropylbenzene	<0.14	<0.14	<0.28	<0.28	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14
Methyl tert-butyl ether	2.2	1.3	<0.48	<0.48	2	<0.24	2.5	1.6	<0.24	<0.24
Methylene Chloride	<0.68	<0.68	<1.4	<1.4	<0.68	<0.68	<0.68	<0.68	<0.68	<0.68
Naphthalene	<0.16	<0.16	<0.32	<0.32	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16
n-Butylbenzene	<0.13	<0.13	<0.26	<0.26	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13
N-Propylbenzene	<0.13	<0.13	<0.26	<0.26	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13
p-Isopropyltoluene	<0.17	<0.17	<0.34	<0.34	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
sec-Butylbenzene	<0.15	<0.15	<0.3	<0.3	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15
Styrene	<0.1	<0.1	<0.2	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
tert-Butylbenzene	<0.14	<0.14	<0.28	<0.28	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14
Tetrachloroethene	***230***	***440***	***1,100***	***1,900***	***170***	***580***	***240***	***140***	***0.76 J***	<0.17
Toluene	<0.11	<0.11	<0.22	<0.22	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
trans-1,2-Dichloroethene	<0.25	<0.25	1.3 J	1.7 J	<0.25	0.86 J	<0.25	<0.25	<0.25	<0.25
Trichloroethene	***16***	***41***	***160***	***210***	***14***	***78***	***17***	***12***	<0.19	<0.19
Vinyl chloride	<0.1	<0.1	<0.2	***1***	<0.1	***0.39 J***	<0.1	<0.1	<0.1	<0.1
Xylenes, Total	<0.068	<0.068	<0.14	<0.14	<0.068	<0.068	<0.068	<0.068	<0.068	<0.068
Total VOCs	257.5	519.3	1,461.3	2,342.7	195.7	734.25	269	160.3	0.76	ND

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Table 2. Groundwater VOC and PCB Analytical Results, Madison-Kipp Corporation, 201 Waubesa Street, Madison, Wisconsin.

Well ID	MP-15 (continued)								MP-16	
Sample Interval (feet bls)	100-105'	100-105'	120-125'	120-125'	142-146'	142-146'	177 - 187'	177-187'	80-84'	80-84'
Sample Date	1/22/2013	4/15/2013	1/22/2013	4/15/2013	1/22/2013	4/15/2013	1/22/2013	4/15/2013	1/22/2013	4/16/2013
Total PCBs (µg/L)										
Aroclor-1016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1232	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1242	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Detected PCBs	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dissolved PCBs										
Aroclor-1016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1221	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1232	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1242	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1248	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1254	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1260	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Detected PCBs	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Only VOCs, PAHs, and PCBs detected in one or more water samples are listed on the table. Refer to laboratory analytical reports for a complete list of constituents analyzed.

100	Concentration exceeds the NR 140 Wis. adm. code Preventive Action Limit.
100	Concentration exceeds the NR 140 Wis. adm. code Enforcement Standard.
<	Constituent not detected above noted laboratory detection limit.
bls	Below land surface.
DUP	Duplicate sample.
J	Result is between the method detection limit and the limit of quantitation.
µg/L	Micrograms per liter.
NA	Not analyzed.
NE	Not established.
ND	Total detected PCBs were reported less than the laboratory detection limit.
PCBs	Polychlorinated Biphenyls.
VOCs	Volatile Organic Compounds.

Table 2. Groundwater VOC and PCB Analytical Results, Madison-Kipp Corporation, 201 Waubesa Street, Madison, Wisconsin.

Well ID	MP-16 (continued)						MW-17		MW-18S	
Sample Interval (feet bls)	106-116'	106-116'	140-144'	140-144'	175-179'	175-179'	160-170	160-170	20-30	20-30
Sample Date	1/22/2013	4/16/2013	1/22/2013	4/16/2013	1/22/2013	4/16/2013	1/17/2013	4/20/2013	11/28/2012	1/15/2013
VOCs (µg/L)										
1,1,1,2-Tetrachloroethane	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.5	<0.5	<1.3	<0.25
1,1,2-Trichloroethane	<0.28	<0.28	<0.28	<0.28	<0.28	<0.28	<0.56	***11***	<1.4	<0.28
1,1-Dichloroethene	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.62	<0.62	<1.6	<0.31
1,2,4-Trimethylbenzene	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.28	<0.28	<0.7	<0.14
1,2-Dibromoethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.54	<0.54	<1.4	<0.27
1,2-Dichloropropane	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.4	<0.4	<1	<0.2
1,3,5-Trimethylbenzene	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.36	<0.36	<0.9	<0.18
Benzene	<0.074	<0.074	<0.074	<0.074	<0.074	<0.074	***20***	***1.2***	***3.2***	0.46 J
Bromoform	<0.28	<0.28	<0.28	<0.28	<0.28	<0.28	<0.56	<0.56	<1.4	<0.28
Bromomethane	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31	<0.62	<0.62	<1.6	<0.31
Carbon tetrachloride	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	***1.2 J***	<0.52	<1.3	<0.26
Chloroform	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	***1.8 J***	<0.4	***7.2***	***2.3***
Chloromethane	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.36	<0.36	<0.9	<0.18
cis-1,2-Dichloroethene	2.6	5.8	1.9	1.2	1.9	0.99 J	3.5	1.7 J	***150***	***40***
Dibromochloromethane	<0.32	<0.32	<0.32	<0.32	<0.32	<0.32	<0.64	<0.64	<1.6	<0.32
Ethylbenzene	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.26	<0.26	<0.65	<0.13
Isopropylbenzene	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.28	<0.28	<0.7	<0.14
Methyl tert-butyl ether	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.48	<0.48	<1.2	<0.24
Methylene Chloride	<0.68	<0.68	<0.68	<0.68	<0.68	<0.68	<1.4	<1.4	<3.4	<0.68
Naphthalene	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.32	<0.32	<0.8	<0.16
n-Butylbenzene	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.26	<0.26	<0.65	<0.13
N-Propylbenzene	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.26	<0.26	<0.65	<0.13
p-Isopropyltoluene	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.34	<0.34	<0.85	<0.17
sec-Butylbenzene	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.3	<0.3	<0.75	<0.15
Styrene	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.2	<0.5	<0.1
tert-Butylbenzene	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.28	<0.28	<0.7	<0.14
Tetrachloroethene	***23***	***330***	***14***	***11***	***13***	***6.7***	***1,300***	***790***	***3,300***	***690***
Toluene	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	1.8	<0.22	1.1 J	<0.11
trans-1,2-Dichloroethene	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	1.5 J	<0.5	7.4	2.6
Trichloroethene	***3.8***	***44***	***2.1***	***2***	***2.2***	***1.2***	***86***	***46***	***230***	***59***
Vinyl chloride	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.2	<0.5	<0.1
Xylenes, Total	<0.068	<0.068	<0.068	<0.068	<0.068	<0.068	3.1	<0.14	<0.34	<0.068
Total VOCs	29.4	379.8	18	14.2	17.1	8.89	1,418.9	849.9	3,698.9	794.36

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Table 2. Groundwater VOC and PCB Analytical Results, Madison-Kipp Corporation, 201 Waubesa Street, Madison, Wisconsin.

Well ID	MP-16 (continued)						MW-17		MW-18S	
Sample Interval (feet bls)	106-116'	106-116'	140-144'	140-144'	175-179'	175-179'	160-170	160-170	20-30	20-30
Sample Date	1/22/2013	4/16/2013	1/22/2013	4/16/2013	1/22/2013	4/16/2013	1/17/2013	4/20/2013	11/28/2012	1/15/2013
Total PCBs (µg/L)										
Aroclor-1016	NA	NA	NA	NA	NA	NA	<0.17	NA	NA	NA
Aroclor-1232	NA	NA	NA	NA	NA	NA	<0.093	NA	NA	NA
Aroclor-1242	NA	NA	NA	NA	NA	NA	<0.13	NA	NA	NA
Total Detected PCBs	NA	NA	NA	NA	NA	NA	ND	NA	NA	NA
Dissolved PCBs										
Aroclor-1016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1221	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1232	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1242	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1248	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1254	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1260	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Detected PCBs	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Only VOCs, PAHs, and PCBs detected in one or more water samples are listed on the table. Refer to laboratory analytical reports for a complete list of constituents analyzed.

100	Concentration exceeds the NR 140 Wis. adm. code Preventive Action Limit.
100	Concentration exceeds the NR 140 Wis. adm. code Enforcement Standard.
<	Constituent not detected above noted laboratory detection limit.
bls	Below land surface.
DUP	Duplicate sample.
J	Result is between the method detection limit and the limit of quantitation.
µg/L	Micrograms per liter.
NA	Not analyzed.
NE	Not established.
ND	Total detected PCBs were reported less than the laboratory detection limit.
PCBs	Polychlorinated Biphenyls.
VOCs	Volatile Organic Compounds.

Table 2. Groundwater VOC and PCB Analytical Results, Madison-Kipp Corporation, 201 Waubesa Street, Madison, Wisconsin.

Well ID	MW-18S (continued)			MW-19D					MW-19D2	
Sample Interval (feet bls)	20-30	20-30	20-30	60-90	60-90	60-90	60-90	60-90	110-140	110-140
Sample Date	2/12/2013	3/12/2013	4/19/2013	11/29/2012	1/16/2013	2/11/2013	3/11/2013	4/19/2013	11/29/2012	1/17/2013
VOCs (µg/L)										
1,1,1,2-Tetrachloroethane	<0.5	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<0.5	<0.5
1,1,2-Trichloroethane	<0.56	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<0.56	<0.56
1,1-Dichloroethene	<0.62	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<0.62	<0.62
1,2,4-Trimethylbenzene	<0.28	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7	<0.28	<0.28
1,2-Dibromoethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	<0.54	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<0.54	<0.54
1,2-Dichloropropane	<0.4	<1	<1	<1	<1	<1	<1	<1	<0.4	<0.4
1,3,5-Trimethylbenzene	<0.36	<0.9	<0.9	<0.9	<0.9	<0.9	<0.9	<0.9	<0.36	<0.36
Benzene	***1.4***	***1.9 J***	***2.2 J***	<0.37	<0.37	<0.37	<0.37	<0.37	<0.15	<0.15
Bromoform	<0.56	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<0.56	<0.56
Bromomethane	<0.62	<1.6	<1.6	<1.6	<1.6	<1.6 *	<1.6	<1.6	<0.62	<0.62
Carbon tetrachloride	<0.52	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<1.3	<0.52	<0.52
Chloroform	***4.5***	***7.5***	***6.2***	<1	<1	<1	<1	<1	<0.4	<0.4
Chloromethane	<0.36	<0.9	<0.9	<0.9	<0.9	<0.9	<0.9	<0.9	<0.36	<0.36
cis-1,2-Dichloroethene	***77***	***110***	***99***	***530***	***170***	***450***	***420***	***520***	***250***	***320***
Dibromochloromethane	<0.64	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<0.64	<0.64
Ethylbenzene	<0.26	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.26	<0.26
Isopropylbenzene	<0.28	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7	<0.28	<0.28
Methyl tert-butyl ether	<0.48	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<0.48	<0.48
Methylene Chloride	<1.4	<3.4	<3.4	<3.4	<3.4	<3.4	<3.4	<3.4	<1.4	<1.4
Naphthalene	<0.32	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.32	<0.32
n-Butylbenzene	<0.26	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.26	<0.26
N-Propylbenzene	<0.26	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.65	<0.26	<0.26
p-Isopropyltoluene	<0.34	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<0.85	<0.34	<0.34
sec-Butylbenzene	<0.3	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.3	<0.3
Styrene	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<0.2
tert-Butylbenzene	<0.28	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7	<0.28	<0.28
Tetrachloroethene	***1,900***	***2,600***	***2,600***	***2,400***	***1,700***	***2,700***	***2,100***	***2,200***	***680***	***1,200***
Toluene	<0.22	<0.55	<0.55	<0.55	<0.55	<0.55	<0.55	<0.55	<0.22	<0.22
trans-1,2-Dichloroethene	3.8	5.3	4.1 J	7.2	<1.3	4.4 J	5.1	6.3	3.4	4.9
Trichloroethene	***130***	***160***	***170***	***230***	***69***	***180***	***180***	***200***	***110***	***160***
Vinyl chloride	<0.2	<0.5	<0.5	***9.1***	***3.2***	***8***	***11***	***18***	***0.93 J***	<0.2
Xylenes, Total	<0.14	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.14	<0.14
Total VOCs	2,116.7	2,884.7	2,881.5	3,176.3	1,942.2	3,342.4	2,716.1	2,944.3	1,044.33	1,684.9

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Table 2. Groundwater VOC and PCB Analytical Results, Madison-Kipp Corporation, 201 Waubesa Street, Madison, Wisconsin.

Well ID	MW-18S (continued)			MW-19D					MW-19D2	
Sample Interval (feet bls)	20-30	20-30	20-30	60-90	60-90	60-90	60-90	60-90	110-140	110-140
Sample Date	2/12/2013	3/12/2013	4/19/2013	11/29/2012	1/16/2013	2/11/2013	3/11/2013	4/19/2013	11/29/2012	1/17/2013
Total PCBs (µg/L)										
Aroclor-1016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1232	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1242	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Detected PCBs	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dissolved PCBs										
Aroclor-1016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1221	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1232	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1242	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1248	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1254	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1260	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Detected PCBs	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Only VOCs, PAHs, and PCBs detected in one or more water samples are listed on the table. Refer to laboratory analytical reports for a complete list of constituents analyzed.

100	Concentration exceeds the NR 140 Wis. adm. code Preventive Action Limit.
100	Concentration exceeds the NR 140 Wis. adm. code Enforcement Standard.
<	Constituent not detected above noted laboratory detection limit.
bls	Below land surface.
DUP	Duplicate sample.
J	Result is between the method detection limit and the limit of quantitation.
µg/L	Micrograms per liter.
NA	Not analyzed.
NE	Not established.
ND	Total detected PCBs were reported less than the laboratory detection limit.
PCBs	Polychlorinated Biphenyls.
VOCs	Volatile Organic Compounds.

Table 2. Groundwater VOC and PCB Analytical Results, Madison-Kipp Corporation, 201 Waubesa Street, Madison, Wisconsin.

Well ID	MW-19D2 (continued)			MW-20D					MW-20D2	
Sample Interval (feet bls)	110-140	110-140	110-140	60-90	60-90	60-90	60-90	60-90	110-140	110-140
Sample Date	2/11/2013	3/12/2013	4/18/2013	11/29/2012	1/16/2013	2/12/2013	3/12/2013	4/18/2013	11/29/2012	1/16/2013
VOCs (µg/L)										
1,1,1,2-Tetrachloroethane	<0.5	<0.5	<1.3	<1.3	<0.25	<0.25	<0.25	<1.3	<0.5	<0.25
1,1,2-Trichloroethane	<0.56	<0.56	<1.4	<1.4	<0.28	<0.28	<0.28	<1.4	<0.56	<0.28
1,1-Dichloroethene	<0.62	<0.62	<1.6	<1.6	<0.31	<0.31	<0.31	<1.6	<0.62	<0.31
1,2,4-Trimethylbenzene	<0.28	<0.28	<0.7	<0.7	<0.14	<0.14	<0.14	<0.7	<0.28	<0.14
1,2-Dibromoethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	<0.54	<0.54	<1.4	<1.4	<0.27	<0.27	<0.27	<1.4	<0.54	<0.27
1,2-Dichloropropane	<0.4	<0.4	<1	<1	<0.2	<0.2	<0.2	<1	<0.4	<0.2
1,3,5-Trimethylbenzene	<0.36	<0.36	<0.9	<0.9	<0.18	<0.18	<0.18	<0.9	<0.36	<0.18
Benzene	<0.15	<0.15	<0.37	<0.37	<0.074	<0.074	<0.074	<0.37	<0.15	<0.074
Bromoform	<0.56	<0.56	<1.4	<1.4	<0.28	<0.28	<0.28	<1.4	<0.56	<0.28
Bromomethane	<0.62 *	<0.62	<1.6	<1.6	<0.31	<0.31	<0.31	<1.6	<0.62	<0.31
Carbon tetrachloride	<0.52	<0.52	<1.3	<1.3	<0.26	<0.26	<0.26	<1.3	<0.52	<0.26
Chloroform	<0.4	<0.4	<1	<1	<0.2	<0.2	<0.2	<1	<0.4	0.47 J
Chloromethane	<0.36	<0.36	<0.9	<0.9	<0.18	<0.18	<0.18	<0.9	<0.36	<0.18
cis-1,2-Dichloroethene	***270***	***260***	***200***	***370***	0.69 J	***20***	***39***	***220***	***330***	<0.12
Dibromochloromethane	<0.64	<0.64	<1.6	<1.6	<0.32	<0.32	<0.32	<1.6	<0.64	<0.32
Ethylbenzene	<0.26	<0.26	<0.65	<0.65	<0.13	<0.13	<0.13	<0.65	<0.26	<0.13
Isopropylbenzene	<0.28	<0.28	<0.7	<0.7	<0.14	<0.14	<0.14	<0.7	<0.28	<0.14
Methyl tert-butyl ether	<0.48	<0.48	<1.2	<1.2	<0.24	<0.24	<0.24	<1.2	<0.48	<0.24
Methylene Chloride	<1.4	<1.4	<3.4	<3.4	<0.68	<0.68	<0.68	<3.4	<1.4	<0.68
Naphthalene	<0.32	<0.32	<0.8	<0.8	<0.16	<0.16	<0.16	<0.8	<0.32	<0.16
n-Butylbenzene	<0.26	<0.26	<0.65	<0.65	<0.13	<0.13	<0.13	<0.65	<0.26	<0.13
N-Propylbenzene	<0.26	<0.26	<0.65	<0.65	<0.13	<0.13	<0.13	<0.65	<0.26	<0.13
p-Isopropyltoluene	<0.34	<0.34	<0.85	<0.85	<0.17	<0.17	<0.17	<0.85	<0.34	<0.17
sec-Butylbenzene	<0.3	<0.3	<0.75	<0.75	<0.15	<0.15	<0.15	<0.75	<0.3	<0.15
Styrene	<0.2	<0.2	<0.5	<0.5	<0.1	<0.1	<0.1	<0.5	<0.2	<0.1
tert-Butylbenzene	<0.28	<0.28	<0.7	<0.7	<0.14	<0.14	<0.14	<0.7	<0.28	<0.14
Tetrachloroethene	***1,300***	***1,400***	***1,000***	***1,600***	***190***	***690***	***650***	***1,100***	***1,300***	***190***
Toluene	<0.22	<0.22	<0.55	<0.55	0.45 J	<0.11	<0.11	<0.55	<0.22	0.34 J
trans-1,2-Dichloroethene	4.2	4.2	2.6 J	5	<0.25	<0.25	<0.25	<1.3	4.3	<0.25
Trichloroethene	***150***	***150***	***130***	***170***	***0.54***	***20***	***29***	***100***	***150***	<0.19
Vinyl chloride	<0.2	<0.2	<0.5	***3.2***	<0.1	<0.1	<0.1	***1.0 J***	***1.7***	<0.1
Xylenes, Total	<0.14	<0.14	<0.34	<0.34	<0.068	<0.068	<0.068	<0.34	<0.14	<0.068
Total VOCs	1,724.2	1,814.2	1,332.6	2,148.2	191.68	730	718	1,421	1,786	190.81

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Table 2. Groundwater VOC and PCB Analytical Results, Madison-Kipp Corporation, 201 Waubesa Street, Madison, Wisconsin.

Well ID	MW-19D2 (continued)			MW-20D					MW-20D2	
Sample Interval (feet bls)	110-140	110-140	110-140	60-90	60-90	60-90	60-90	60-90	110-140	110-140
Sample Date	2/11/2013	3/12/2013	4/18/2013	11/29/2012	1/16/2013	2/12/2013	3/12/2013	4/18/2013	11/29/2012	1/16/2013
Total PCBs (µg/L)										
Aroclor-1016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1232	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1242	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Detected PCBs	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dissolved PCBs										
Aroclor-1016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1221	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1232	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1242	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1248	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1254	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1260	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Detected PCBs	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Only VOCs, PAHs, and PCBs detected in one or more water samples are listed on the table. Refer to laboratory analytical reports for a complete list of constituents analyzed.

100	Concentration exceeds the NR 140 Wis. adm. code Preventive Action Limit.
100	Concentration exceeds the NR 140 Wis. adm. code Enforcement Standard.
<	Constituent not detected above noted laboratory detection limit.
bls	Below land surface.
DUP	Duplicate sample.
J	Result is between the method detection limit and the limit of quantitation.
µg/L	Micrograms per liter.
NA	Not analyzed.
NE	Not established.
ND	Total detected PCBs were reported less than the laboratory detection limit.
PCBs	Polychlorinated Biphenyls.
VOCs	Volatile Organic Compounds.

Table 2. Groundwater VOC and PCB Analytical Results, Madison-Kipp Corporation, 201 Waubesa Street, Madison, Wisconsin.

Well ID	MW-20D2 (continued)			MW-21D					MW-21D2	
Sample Interval (feet bls)	110-140	110-140	110-140	60-90	60-90	60-90	60-90	60-90	110-170	110-170
Sample Date	2/12/2013	3/12/2013	4/18/2013	11/28/2012	1/17/2013	2/14/2013	3/12/2013	4/17/2013	11/28/2012	1/17/2013
VOCs (µg/L)										
1,1,1,2-Tetrachloroethane	<0.25	<0.25	<1.3	<0.5	<0.25	<0.5	<0.5	<1.3	<1.3	<0.25
1,1,2-Trichloroethane	<0.28	<0.28	<1.4	<0.56	<0.28	<0.56	<0.56	<1.4	<1.4	***1.4***
1,1-Dichloroethene	<0.31	<0.31	<1.6	<0.62	<0.31	<0.62	<0.62	<1.6	<1.6	<0.31
1,2,4-Trimethylbenzene	<0.14	<0.14	<0.7	<0.28	<0.14	<0.28	<0.28	<0.7	<0.7	<0.14
1,2-Dibromoethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	<0.27	<0.27	<1.4	<0.54	<0.27	<0.54	<0.54	<1.4	<1.4	<0.27
1,2-Dichloropropane	<0.2	<0.2	<1	<0.4	<0.2	<0.4	<0.4	<1	<1	<0.2
1,3,5-Trimethylbenzene	<0.18	<0.18	<0.9	<0.36	<0.18	<0.36	<0.36	<0.9	<0.9	<0.18
Benzene	0.19 J	<0.074	<0.37	<0.15	<0.074	<0.15	<0.15	<0.37	<0.37	0.25 J
Bromoform	<0.28	<0.28	<1.4	<0.56	<0.28	<0.56	<0.56	<1.4	<1.4	<0.28
Bromomethane	<0.31	<0.31	<1.6	<0.62	<0.31	<0.62 *	<0.62	<1.6	<1.6	<0.31
Carbon tetrachloride	<0.26	<0.26	<1.3	<0.52	<0.26	<0.52	<0.52	<1.3	<1.3	<0.26
Chloroform	<0.2	<0.2	<1	<0.4	<0.2	<0.4	<0.4	<1	<1	<0.2
Chloromethane	<0.18	<0.18	<0.9	<0.36	<0.18	<0.36	<0.36	<0.9	<0.9	<0.18
cis-1,2-Dichloroethene	2.8	2.8	***30***	***380***	***85***	***270***	***310***	***310***	***300***	<0.12
Dibromochloromethane	<0.32	<0.32	<1.6	<0.64	<0.32	<0.64	<0.64	<1.6	<1.6	<0.32
Ethylbenzene	<0.13	<0.13	<0.65	<0.26	0.43 J	<0.26	<0.26	<0.65	<0.65	0.62
Isopropylbenzene	<0.14	<0.14	<0.7	<0.28	<0.14	<0.28	<0.28	<0.7	<0.7	<0.14
Methyl tert-butyl ether	<0.24	<0.24	<1.2	<0.48	<0.24	<0.48	<0.48	<1.2	<1.2	<0.24
Methylene Chloride	<0.68	<0.68	<3.4	<1.4	<0.68	<1.4	<1.4	<3.4	<3.4	<0.68
Naphthalene	<0.16	<0.16	<0.8	<0.32	<0.16	<0.32	<0.32	<0.8	<0.8	<0.16
n-Butylbenzene	<0.13	<0.13	<0.65	<0.26	<0.13	<0.26	<0.26	<0.65	<0.65	<0.13
N-Propylbenzene	<0.13	<0.13	<0.65	<0.26	<0.13	<0.26	<0.26	<0.65	<0.65	<0.13
p-Isopropyltoluene	<0.17	<0.17	<0.85	<0.34	<0.17	<0.34	<0.34	<0.85	<0.85	<0.17
sec-Butylbenzene	<0.15	<0.15	<0.75	<0.3	<0.15	<0.3	<0.3	<0.75	<0.75	<0.15
Styrene	<0.1	<0.1	<0.5	<0.2	<0.1	<0.2	<0.2	<0.5	<0.5	<0.1
tert-Butylbenzene	<0.14	<0.14	<0.7	<0.28	<0.14	<0.28	<0.28	<0.7	<0.7	<0.14
Tetrachloroethene	***700***	***490***	***1,100***	***1,200***	***700***	***1,600***	***1,500***	***1,100***	***2,600***	***1,200***
Toluene	<0.11	<0.11	<0.55	<0.22	0.38 J	<0.22	<0.22	<0.55	<0.55	0.48 J
trans-1,2-Dichloroethene	<0.25	<0.25	<1.3	5.1	<0.25	<0.5	2.9	<1.3	2.7 J	<0.25
Trichloroethene	***7.9***	***5.3***	***41***	***180***	***23***	***130***	***160***	***140***	***160***	<0.19
Vinyl chloride	<0.1	<0.1	<0.5	***1.4***	<0.1	<0.2	<0.2	<0.5	<0.5	<0.1
Xylenes, Total	<0.068	<0.068	<0.34	<0.14	2.5	<0.14	<0.14	<0.34	<0.34	4.3
Total VOCs	710.89	498.1	1,171	1,766.5	811.31	2,000	1,972.9	1,550	3,062.7	1,207.05

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Table 2. Groundwater VOC and PCB Analytical Results, Madison-Kipp Corporation, 201 Waubesa Street, Madison, Wisconsin.

Well ID	MW-20D2 (continued)			MW-21D					MW-21D2	
Sample Interval (feet bls)	110-140	110-140	110-140	60-90	60-90	60-90	60-90	60-90	110-170	110-170
Sample Date	2/12/2013	3/12/2013	4/18/2013	11/28/2012	1/17/2013	2/14/2013	3/12/2013	4/17/2013	11/28/2012	1/17/2013
Total PCBs (µg/L)										
Aroclor-1016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1232	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1242	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Detected PCBs	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dissolved PCBs										
Aroclor-1016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1221	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1232	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1242	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1248	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1254	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1260	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Detected PCBs	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Only VOCs, PAHs, and PCBs detected in one or more water samples are listed on the table. Refer to laboratory analytical reports for a complete list of constituents analyzed.

100	Concentration exceeds the NR 140 Wis. adm. code Preventive Action Limit.
100	Concentration exceeds the NR 140 Wis. adm. code Enforcement Standard.
<	Constituent not detected above noted laboratory detection limit.
bls	Below land surface.
DUP	Duplicate sample.
J	Result is between the method detection limit and the limit of quantitation.
µg/L	Micrograms per liter.
NA	Not analyzed.
NE	Not established.
ND	Total detected PCBs were reported less than the laboratory detection limit.
PCBs	Polychlorinated Biphenyls.
VOCs	Volatile Organic Compounds.

Table 2. Groundwater VOC and PCB Analytical Results, Madison-Kipp Corporation, 201 Waubesa Street, Madison, Wisconsin.

Well ID	MW-21D2 (continued)			MW-22S			MW-22D		
Sample Interval (feet bls)	110-170	110-170	110-170	25-35	25-35	25-35	45-50	45-50	45-50
Sample Date	2/14/2013	3/12/2013	4/17/2013	1/15/2013	3/7/2013	4/19/2013	1/15/2013	3/8/2013	4/19/2013
VOCs (µg/L)									
1,1,1,2-Tetrachloroethane	<1.3	<1.3	<2.5	<0.25	NA	<0.25	<0.25	NA	<0.25
1,1,2-Trichloroethane	<1.4	<1.4	<2.8	<0.28	NA	<0.28	<0.28	NA	<0.28
1,1-Dichloroethene	<1.6	<1.6	<3.1	<0.31	NA	<0.31	<0.31	NA	<0.31
1,2,4-Trimethylbenzene	<0.7	<0.7	<1.4	0.86 J	NA	<0.14	<0.14	NA	<0.14
1,2-Dibromoethane	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	<1.4	<1.4	<2.7	<0.27	NA	<0.27	<0.27	NA	<0.27
1,2-Dichloropropane	<1	<1	<2	<0.2	NA	<0.2	<0.2	NA	<0.2
1,3,5-Trimethylbenzene	<0.9	<0.9	<1.8	<0.18	NA	<0.18	<0.18	NA	<0.18
Benzene	<0.37	<0.37	<0.74	***1.1***	NA	<0.074	<0.074	NA	<0.074
Bromoform	<1.4	<1.4	<2.8	<0.28	NA	<0.28	<0.28	NA	<0.28
Bromomethane	<1.6 *	<1.6	<3.1	<0.31	NA	<0.31	<0.31	NA	<0.31
Carbon tetrachloride	<1.3	<1.3	<2.6	<0.26	NA	<0.26	<0.26	NA	<0.26
Chloroform	<1	<1	<2	***1***	NA	***0.91 J***	<0.2	NA	<0.2
Chloromethane	<0.9	<0.9	<1.8	<0.18	NA	<0.18	0.47 J	NA	<0.18
cis-1,2-Dichloroethene	<0.6	<0.6	***190***	1.8	NA	6.1	3.6	NA	4.9
Dibromochloromethane	<1.6	<1.6	<3.2	<0.32	NA	<0.32	<0.32	NA	<0.32
Ethylbenzene	<0.65	<0.65	<1.3	0.5	NA	<0.13	<0.13	NA	<0.13
Isopropylbenzene	<0.7	<0.7	<1.4	<0.14	NA	<0.14	<0.14	NA	<0.14
Methyl tert-butyl ether	<1.2	<1.2	<2.4	<0.24	NA	<0.24	<0.24	NA	<0.24
Methylene Chloride	<3.4	<3.4	<6.8	<0.68	NA	<0.68	<0.68	NA	<0.68
Naphthalene	<0.8	<0.8	<1.6	<0.16	NA	<0.16	<0.16	NA	<0.16
n-Butylbenzene	<0.65	<0.65	<1.3	<0.13	NA	<0.13	<0.13	NA	<0.13
N-Propylbenzene	<0.65	<0.65	<1.3	<0.13	NA	<0.13	<0.13	NA	<0.13
p-Isopropyltoluene	<0.85	<0.85	<1.7	<0.17	NA	<0.17	<0.17	NA	<0.17
sec-Butylbenzene	<0.75	<0.75	<1.5	<0.15	NA	<0.15	<0.15	NA	<0.15
Styrene	<0.5	<0.5	<1	<0.1	NA	<0.1	<0.1	NA	<0.1
tert-Butylbenzene	<0.7	<0.7	<1.4	<0.14	NA	<0.14	<0.14	NA	<0.14
Tetrachloroethene	***3,900***	***2,200***	***3,500***	***180***	NA	***160***	***520***	NA	***450***
Toluene	<0.55	<0.55	<1.1	1.7	NA	<0.11	<0.11	NA	<0.11
trans-1,2-Dichloroethene	<1.3	<1.3	<2.5	<0.25	NA	<0.25	<0.25	NA	<0.25
Trichloroethene	***11***	***14***	***150***	***4.8***	NA	***5.4***	***5.8***	NA	***5.8***
Vinyl chloride	<0.5	<0.5	<1	<0.1	NA	<0.1	<0.1	NA	<0.1
Xylenes, Total	<0.34	<0.34	<0.68	1.5	NA	<0.068	<0.068	NA	<0.068
Total VOCs	3,911	ND	3,840	193.26	ND	172.41	529.87	NA	460.7

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Table 2. Groundwater VOC and PCB Analytical Results, Madison-Kipp Corporation, 201 Waubesa Street, Madison, Wisconsin.

Well ID	MW-21D2 (continued)			MW-22S			MW-22D		
Sample Interval (feet bls)	110-170	110-170	110-170	25-35	25-35	25-35	45-50	45-50	45-50
Sample Date	2/14/2013	3/12/2013	4/17/2013	1/15/2013	3/7/2013	4/19/2013	1/15/2013	3/8/2013	4/19/2013
Total PCBs (µg/L)									
Aroclor-1016	NA	NA	NA	***12***	<0.033	***4***	***2.4***	<0.033	<0.064
Aroclor-1232	NA	NA	NA	<0.49	***13***	<0.19	<0.092	***2.6***	<0.19
Aroclor-1242	NA	NA	NA	<0.69	<0.099	<0.19	<0.13	<0.1	<0.19
Total Detected PCBs	NA	NA	NA	12	13	4	2.4	2.6	ND
Dissolved PCBs									
Aroclor-1016	NA	NA	NA	NA	<0.037	<0.068	NA	<0.033	<0.064
Aroclor-1221	NA	NA	NA	NA	<0.11	<0.2	NA	<0.1	<0.19
Aroclor-1232	NA	NA	NA	NA	<0.11	<0.2	NA	<0.1	<0.19
Aroclor-1242	NA	NA	NA	NA	<0.11	<0.2	NA	<0.1	<0.19
Aroclor-1248	NA	NA	NA	NA	<0.11	<0.2	NA	<0.1	<0.19
Aroclor-1254	NA	NA	NA	NA	<0.11	<0.2	NA	<0.1	<0.19
Aroclor-1260	NA	NA	NA	NA	<0.038	<0.071	NA	<0.035	<0.067
Total Detected PCBs	NA	NA	NA	NA	ND	ND	NA	ND	ND

Only VOCs, PAHs, and PCBs detected in one or more water samples are listed on the table. Refer to laboratory analytical reports for a complete list of constituents analyzed.

100	Concentration exceeds the NR 140 Wis. adm. code Preventive Action Limit.
100	Concentration exceeds the NR 140 Wis. adm. code Enforcement Standard.
<	Constituent not detected above noted laboratory detection limit.
bls	Below land surface.
DUP	Duplicate sample.
J	Result is between the method detection limit and the limit of quantitation.
µg/L	Micrograms per liter.
NA	Not analyzed.
NE	Not established.
ND	Total detected PCBs were reported less than the laboratory detection limit.
PCBs	Polychlorinated Biphenyls.
VOCs	Volatile Organic Compounds.

Table 2. Groundwater VOC and PCB Analytical Results, Madison-Kipp Corporation, 201 Waubesa Street, Madison, Wisconsin.

Well ID	MW-23S		MW-23D				MW-24	MW-25D	MW-25D2
Sample Interval (feet bls)	25-35	25-35	45-50	45-50	45-50	45-50	30-40	120-130	160-170
Sample Date	1/15/2013	4/19/2013	1/14/2013	3/8/2013	4/19/2013	4/20/2013	4/29/2013	5/6/2013	5/6/2013
VOCs (µg/L)									
1,1,1,2-Tetrachloroethane	<0.25	<0.25	<0.25	NA	<0.25	NA	<0.25	<0.25	<0.25
1,1,2-Trichloroethane	<0.28	<0.28	<0.28	NA	<0.28	NA	<0.28	<0.28	<0.28
1,1-Dichloroethene	<0.31	<0.31	<0.31	NA	<0.31	NA	<0.31	<0.31	<0.31
1,2,4-Trimethylbenzene	<0.14	<0.14	<0.14	NA	<0.14	NA	<0.14	<0.14	<0.14
1,2-Dibromoethane	NA	NA	NA	NA	NA	NA	<0.36	<0.36	<0.36
1,2-Dichlorobenzene	<0.27	<0.27	<0.27	NA	<0.27	NA	<0.27	<0.27	<0.27
1,2-Dichloropropane	<0.2	<0.2	<0.2	NA	<0.2	NA	<0.20	<0.20	<0.20
1,3,5-Trimethylbenzene	<0.18	<0.18	<0.18	NA	<0.18	NA	<0.18	<0.18	<0.18
Benzene	***0.73***	<0.074	0.32 J	NA	<0.074	NA	<0.074	<0.074	<0.074
Bromoform	<0.28	<0.28	<0.28	NA	<0.28	NA	<0.28	<0.28	<0.25
Bromomethane	<0.31	<0.31	<0.31	NA	<0.31	NA	<0.31	<0.31	<0.31
Carbon tetrachloride	<0.26	<0.26	<0.26	NA	<0.26	NA	<0.26	<0.26	<0.26
Chloroform	<0.2	<0.2	<0.2	NA	<0.2	NA	<0.20	<0.20	<0.20
Chloromethane	1.2	<0.18	<0.18	NA	<0.18	NA	<0.18	<0.18	<0.18
cis-1,2-Dichloroethene	<0.12	3.7	<0.12	NA	<0.12	NA	<0.12	<0.12	<0.12
Dibromochloromethane	<0.32	<0.32	<0.32	NA	<0.32	NA	<0.32	<0.32	<0.32
Ethylbenzene	0.43 J	<0.13	0.20 J	NA	<0.13	NA	<0.13	<0.13	<0.13
Isopropylbenzene	<0.14	<0.14	<0.14	NA	<0.14	NA	<0.14	<0.14	<0.14
Methyl tert-butyl ether	<0.24	<0.24	<0.24	NA	<0.24	NA	<0.24	<0.24	<0.24
Methylene Chloride	<0.68	<0.68	<0.68	NA	<0.68	NA	<0.68	<0.68	<0.68
Naphthalene	<0.16	<0.16	<0.16	NA	<0.16	NA	<0.16	<0.16	<0.16
n-Butylbenzene	<0.13	<0.13	<0.13	NA	<0.13	NA	<0.13	<0.13	<0.13
N-Propylbenzene	<0.13	<0.13	<0.13	NA	<0.13	NA	<0.13	<0.13	<0.13
p-Isopropyltoluene	<0.17	<0.17	<0.17	NA	<0.17	NA	<0.17	<0.17	<0.17
sec-Butylbenzene	<0.15	<0.15	<0.15	NA	<0.15	NA	<0.15	<0.15	<0.15
Styrene	<0.1	<0.1	<0.1	NA	<0.1	NA	<0.10	<0.10	<0.10
tert-Butylbenzene	<0.14	<0.14	<0.14	NA	<0.14	NA	<0.14	<0.14	<0.14
Tetrachloroethene	***290***	***580***	***100***	NA	***86***	NA	***3.0***	0.76 J	<0.17
Toluene	1.3	<0.11	0.6	NA	<0.11	NA	<0.11	<0.11	<0.11
trans-1,2-Dichloroethene	<0.25	<0.25	<0.25	NA	<0.25	NA	<0.25	<0.25	<0.25
Trichloroethene	***0.64***	***1.4***	<0.19	NA	***0.53***	NA	<0.19	<0.19	<0.19
Vinyl chloride	<0.1	<0.1	<0.1	NA	<0.1	NA	<0.10	<0.10	<0.10
Xylenes, Total	0.95 J	<0.068	0.68 J	NA	<0.068	NA	<0.068	<0.068	<0.068
Total VOCs	295.25	585.1	101.8	NA	86.53	NA	3.0	0.76	ND

Footnotes on Page 48.

Table 2. Groundwater VOC and PCB Analytical Results, Madison-Kipp Corporation, 201 Waubesa Street, Madison, Wisconsin.

Well ID	MW-23S		MW-23D				MW-24	MW-25D	MW-25D2
Sample Interval (feet bls)	25-35	25-35	45-50	45-50	45-50	45-50	30-40	120-130	160-170
Sample Date	1/15/2013	4/19/2013	1/14/2013	3/8/2013	4/19/2013	4/20/2013	4/29/2013	5/6/2013	5/6/2013
Total PCBs (µg/L)									
Aroclor-1016	<0.19	NA	<0.16	<0.034	NA	<0.065	NA	NA	NA
Aroclor-1232	<0.11	NA	<0.089	<0.1	NA	<0.19	NA	NA	NA
Aroclor-1242	<0.15	NA	***0.24 J***	<0.1	NA	<0.19	NA	NA	NA
Total Detected PCBs	ND	NA	0.24	ND	NA	ND	NA	NA	NA
Dissolved PCBs									
Aroclor-1016	NA	NA	NA	<0.034	NA	<0.066	NA	NA	NA
Aroclor-1221	NA	NA	NA	<0.1	NA	<0.2	NA	NA	NA
Aroclor-1232	NA	NA	NA	<0.1	NA	<0.2	NA	NA	NA
Aroclor-1242	NA	NA	NA	<0.1	NA	<0.2	NA	NA	NA
Aroclor-1248	NA	NA	NA	<0.1	NA	<0.2	NA	NA	NA
Aroclor-1254	NA	NA	NA	<0.1	NA	<0.2	NA	NA	NA
Aroclor-1260	NA	NA	NA	<0.035	NA	<0.069	NA	NA	NA
Total Detected PCBs	NA	NA	NA	ND	NA	ND	NA	NA	NA

Only VOCs, PAHs, and PCBs detected in one or more water samples are listed on the table. Refer to laboratory analytical reports for a complete list of constituents analyzed.

100	Concentration exceeds the NR 140 Wis. adm. code Preventive Action Limit.
100	Concentration exceeds the NR 140 Wis. adm. code Enforcement Standard.
<	Constituent not detected above noted laboratory detection limit.
bls	Below land surface.
DUP	Duplicate sample.
J	Result is between the method detection limit and the limit of quantitation.
µg/L	Micrograms per liter.
NA	Not analyzed.
NE	Not established.
ND	Total detected PCBs were reported less than the laboratory detection limit.
PCBs	Polychlorinated Biphenyls.
VOCs	Volatile Organic Compounds.

Table 2. Groundwater VOC and PCB Analytical Results, Madison-Kipp Corporation, 201 Waubesa Street, Madison, Wisconsin.

Well ID	IW-1S	IW-2D	IW-2D2
Sample Interval (feet bls)	16-26	60-90	110-140
Sample Date	11/29/2012	11/29/2012	11/29/2012
VOCs (µg/L)			
1,1,1,2-Tetrachloroethane	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	<0.56	<0.56	<0.56
1,1-Dichloroethene	<0.62	<0.62	<0.62
1,2,4-Trimethylbenzene	<0.28	<0.28	<0.28
1,2-Dibromoethane	NA	NA	NA
1,2-Dichlorobenzene	<0.54	<0.54	<0.54
1,2-Dichloropropane	<0.4	<0.4	<0.4
1,3,5-Trimethylbenzene	<0.36	<0.36	<0.36
Benzene	***0.71 J***	<0.15	<0.15
Bromoform	<0.56	<0.56	<0.56
Bromomethane	<0.62	<0.62	<0.62
Carbon tetrachloride	<0.52	<0.52	<0.52
Chloroform	***1.9 J***	<0.4	<0.4
Chloromethane	<0.36	<0.36	<0.36
cis-1,2-Dichloroethene	***67***	***400***	***390***
Dibromochloromethane	<0.64	<0.64	<0.64
Ethylbenzene	<0.26	6.5	1.6
Isopropylbenzene	<0.28	<0.28	<0.28
Methyl tert-butyl ether	<0.48	<0.48	<0.48
Methylene Chloride	<1.4	<1.4	<1.4
Naphthalene	<0.32	<0.32	<0.32
n-Butylbenzene	<0.26	<0.26	<0.26
N-Propylbenzene	<0.26	<0.26	<0.26
p-Isopropyltoluene	<0.34	<0.34	<0.34
sec-Butylbenzene	<0.3	<0.3	<0.3
Styrene	<0.2	<0.2	<0.2
tert-Butylbenzene	<0.28	<0.28	<0.28
Tetrachloroethene	***1,200***	***1,500***	***1,300***
Toluene	<0.22	1.1	0.45 J
trans-1,2-Dichloroethene	3.4	5.4	5.2
Trichloroethene	***100***	***180***	***170***
Vinyl chloride	<0.2	***2.6***	***2.6***
Xylenes, Total	<0.14	25	7.2
Total VOCs	1,373.01	2,120.6	1,877.05

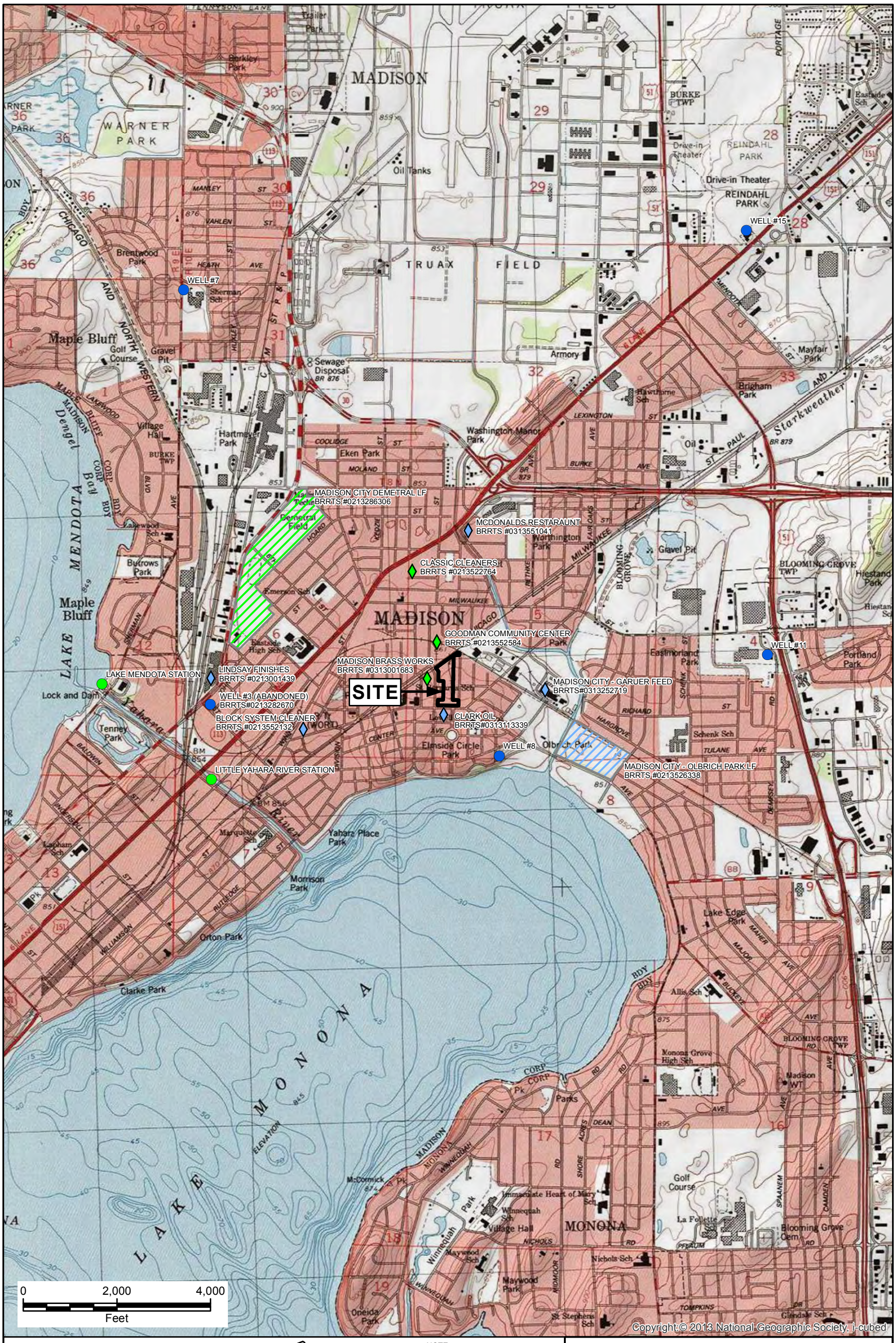
Footnotes on Page 50.

Table 2. Groundwater VOC and PCB Analytical Results, Madison-Kipp Corporation, 201 Waubesa Street, Madison, Wisconsin.

Well ID	IW-1S	IW-2D	IW-2D2
Sample Interval (feet bls)	**16-26**	**60-90**	**110-140**
Sample Date	**11/29/2012**	**11/29/2012**	**11/29/2012**
Total PCBs (µg/L)			
Aroclor-1016	NA	NA	NA
Aroclor-1232	NA	NA	NA
Aroclor-1242	NA	NA	NA
Total Detected PCBs	NA	NA	NA
Dissolved PCBs			
Aroclor-1016	NA	NA	NA
Aroclor-1221	NA	NA	NA
Aroclor-1232	NA	NA	NA
Aroclor-1242	NA	NA	NA
Aroclor-1248	NA	NA	NA
Aroclor-1254	NA	NA	NA
Aroclor-1260	NA	NA	NA
Total Detected PCBs			

Only VOCs, PAHs, and PCBs detected in one or more water samples are listed on the table. Refer to laboratory analytical reports for a complete list of constituents analyzed.

100	Concentration exceeds the NR 140 Wis. adm. code Preventive Action Limit.
100	Concentration exceeds the NR 140 Wis. adm. code Enforcement Standard.
<	Constituent not detected above noted laboratory detection limit.
bls	Below land surface.
DUP	Duplicate sample.
J	Result is between the method detection limit and the limit of quantitation.
µg/L	Micrograms per liter.
NA	Not analyzed.
NE	Not established.
ND	Total detected PCBs were reported less than the laboratory detection limit.
PCBs	Polychlorinated Biphenyls.
VOCs	Volatile Organic Compounds.



LEGEND

- OPEN SITE (ONGOING CLEANUP)
- OPEN SITE - SITE BOUNDARIES
- CLOSED SITE (COMPLETED CLEANUP)
- CLOSED SITE - SITE BOUNDARIES
- GAUGING STATION
- MUNICIPAL WATER SUPPLY WELL
- PROJECT BOUNDARY

NOTE:
TOPO BASE MAP OBTAINED FROM ESRI ONLINE MAPPING, USING ARCMAP 10, ACCESSED 5/22/2013 USGS 15' QUADRANGLE, MADISON EAST, WISCONSIN, 1983.

MADISON-KIPP CORPORATION
201 WAUBESA STREET
MADISON, WISCONSIN

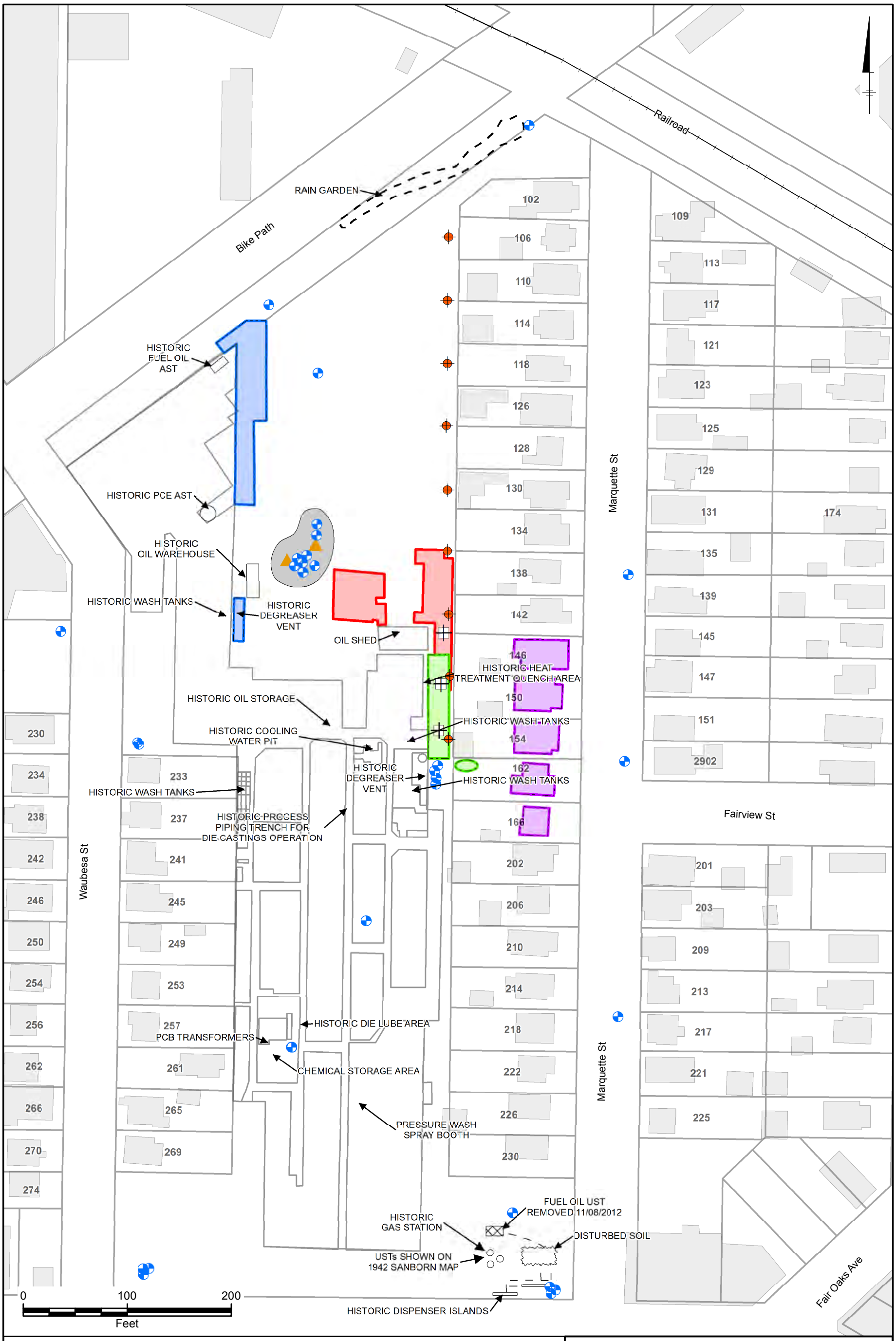
SUPPLEMENTAL SITE INFORMATION/ADDENDUM 1

SITE LOCATION MAP

ARCADIS

FIGURE 1

CITY: MKE DIV/GROUP: IM DB: GM LD: CK MADISON-KIPP
I:\Madison_Kipp\Madison_Kipp\2013\Fig1_Site_Location_Map.mxd



LEGEND

- MONITORING WELL
- INJECTION WELL
- SOIL VAPOR EXTRACTION WELL
- OZONE SPARGE WELL
- PARCELS
- BUILDING FOOTPRINTS
- ISCO INJECTION AREA (2012)
- APPROXIMATE EXCAVATION AREAS (2012 - 2013)
- BiOX SOIL TREATMENT (1998, 1999)
- COOL-OX SOIL TREATMENT (2004, 2005)
- RESIDENCE WITH SUB-SLAB DEPRESSURIZATION SYSTEM INSTALLED BY MADISON-KIPP (2011)

ALL LOCATIONS ARE APPROXIMATE

MADISON-KIPP CORPORATION
201 WAUBESA STREET
MADISON, WISCONSIN

SUPPLEMENTAL SITE INFORMATION/ADDENDUM 1

POTENTIAL ONSITE SOURCE AND REMEDIATION LOCATIONS

ARCADIS

FIGURE 2

CITY: MKE DIV/GROUP: IM DB: GM LD: CK MADISON-KIPP
I:\Madison_Kipp\Madison_Kipp\2013\Fig2_PotentialSourceAndRemediation.mxd

CLASSIC CLEANERS
BRRTS #0213522764

MP-15
MW-9D
MW-9D2

MW-12S
(857.06)

MW-1
(850.91)

MW-19D2
MW-19D
MW-3D3
MW-3D2
MW-3S
(848.31)
MW-3D
MP-13
MW-20D2
MW-20D
MW-18S
(848.45)
MW-21D2
MW-21D

MW-8
(849.21)

MP-14
MW-10S
(848.34)

MW-2D
MW-2S
(847.78)

MW-5S
MW-5D3
MW-5D
MW-5D2

MW-7
(847.78)

MP-16

MW-22S
(847.48)
MW-22D

MW-11S
(846.65)

MW-23S
(847.52)
MW-23D

MW-4D
MW-4D2
MW-4S
(847.84)

MW-24

MW-6S
(845.97)
MW-17
MW-6D

MW-25D2

UNIT
WELL 8

LAKE MONONA

0 350 700
Feet

LEGEND

- CLOSED SITE (COMPLETED CLEANUP)
- MUNICIPAL UNIT WELL 8
- MONITORING WELL
- (845.97) GROUNDWATER ELEVATION (FEET ABOVE MEAN SEA LEVEL)
- INFERRED GROUNDWATER FLOW DIRECTION
- 850 GROUNDWATER CONTOUR INTERVAL (DASHED WHERE INFERRED)

WATER TABLE ENCOUNTERED
BETWEEN APPROXIMATELY
2 - 33' BELOW LAND SURFACE
WITH SCREEN ELEVATIONS
RANGING FROM 857 - 834'
ABOVE MEAN SEA LEVEL

MADISON-KIPP CORPORATION
201 WAUBESA STREET
MADISON, WISCONSIN

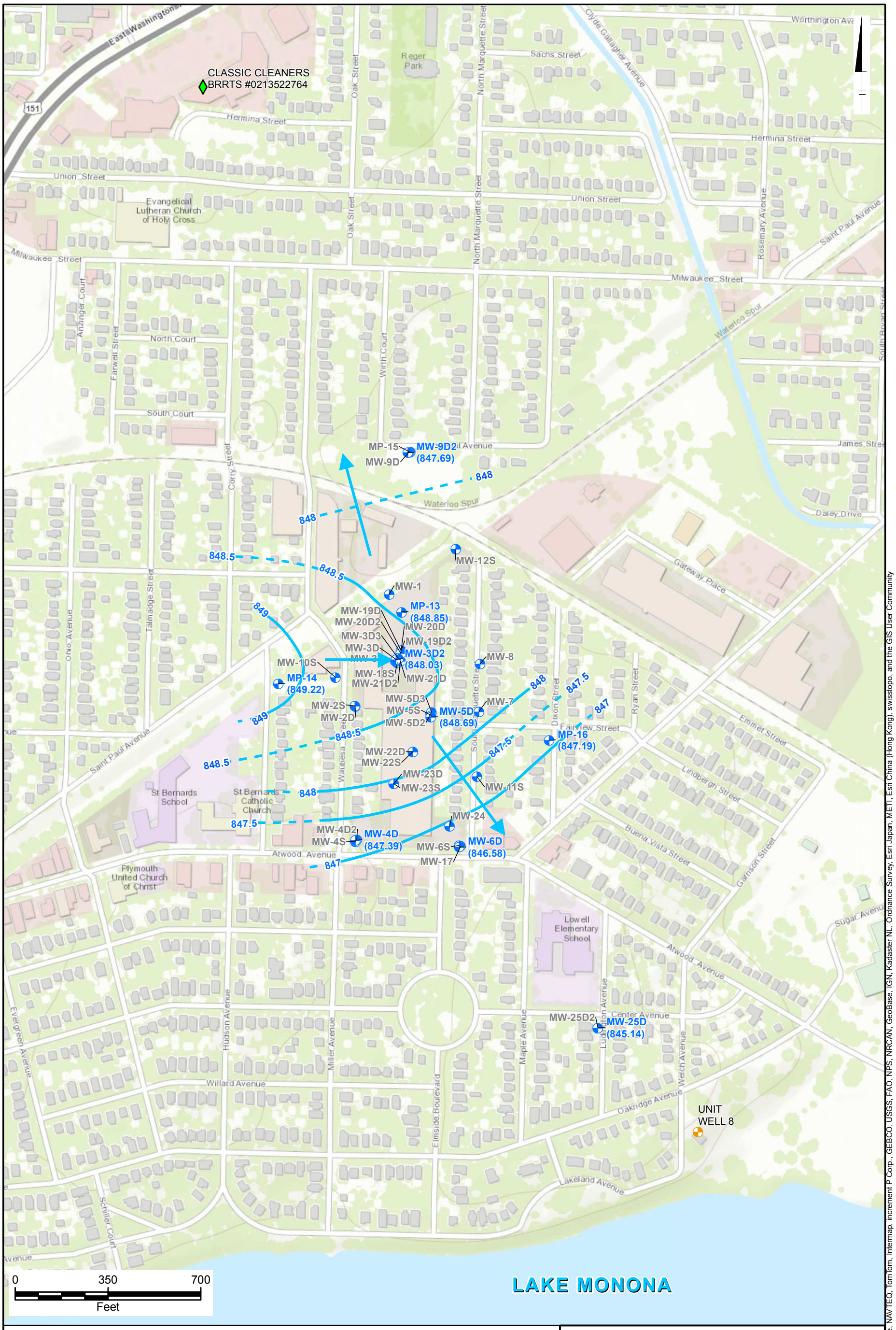
SUPPLEMENTAL SITE INFORMATION/ADDENDUM 1

WATER TABLE ELEVATION MAP APRIL 2013

ARCADIS

FIGURE 3

CITY: MKE DIV/GROUP: IM DB: GM LD: CK MADISON-KIPP
I:\Madison_Kipp\Madison_Kipp\2013\Fig3_GW_gradient_April2013.mxd



LEGEND

- CLOSED SITE (COMPLETED CLEANUP)
- MUNICIPAL UNIT WELL 8
- MONITORING WELL
- (845.97) GROUNDWATER ELEVATION (FEET ABOVE MEAN SEA LEVEL)
- INFERRED GROUNDWATER FLOW DIRECTION
- 850 GROUNDWATER CONTOUR INTERVAL (DASHED WHERE INFERRED)

LOWER LONE ROCK FORMATION WATER LEVELS ENCOUNTERED BETWEEN APPROXIMATELY 7 - 33' BELOW LAND SURFACE WITH SCREENS RANGING FROM 816 - 777' ABOVE MEAN SEA LEVEL

MADISON-KIPP CORPORATION
201 WAUBESA STREET
MADISON, WISCONSIN

SUPPLEMENTAL SITE INFORMATION/ADDENDUM 1

LOWER LONE ROCK FORMATION POTENTIOMETRIC SURFACE MAP APRIL 2013

ARCADIS

FIGURE 4

CITY: MKE DIV/GROUP: IM DB: GM LD: CK MADISON-KIPP
I:\Madison_Kipp\Madison_Kipp\2013Fig4_GW_gradient_LoneRock_April2013.mxd

CLASSIC CLEANERS
BRRTS #0213522764

MW-9D2
MW-9D
MP-15
(847.23)

MW-12S
MW-1
MP-13
(847.06)
MW-20D
MW-19D
MW-19D2
MW-3D
MW-20D2
MW-3D2
MW-3D3
MW-10S
MW-3S
MW-21D2
MW-18S
MW-21D
MP-14
(847.46)
MW-8
MW-5D3
MW-5D
MW-2S
MW-7
MW-2D
MW-5D2
MW-5S
MW-22D
MW-22S
MW-11S
MW-23D
MW-23S
MW-24
MW-4S
MW-4D
MW-4D2
MW-17
(845.69)
MW-6S
MW-6D
MW-25D
MW-25D2
MW-25D
(845.03)
MP-16
(846.41)

847.00
846.50
846.00

UNIT
WELL 8

LAKE MONONA

0 350 700
Feet

LEGEND

- CLOSED SITE (COMPLETED CLEANUP)
- MUNICIPAL UNIT WELL 8
- MONITORING WELL
- (845.97) GROUNDWATER ELEVATION (FEET ABOVE MEAN SEA LEVEL)
- INFERRED GROUNDWATER FLOW DIRECTION
- 850 GROUNDWATER CONTOUR INTERVAL (DASHED WHERE INFERRED)

UPPER WONEWOC FORMATION WATER LEVELS ENCOUNTERED BETWEEN APPROXIMATELY 8 - 42' BELOW LAND SURFACE WITH SCREEN ELEVATIONS RANGING FROM 768 - 698' ABOVE MEAN SEA LEVEL

MADISON-KIPP CORPORATION
201 WAUBESA STREET
MADISON, WISCONSIN

SUPPLEMENTAL SITE INFORMATION/ADDENDUM 1

UPPER WONEWOC FORMATION POTENTIOMETRIC SURFACE MAP APRIL 2013

ARCADIS

FIGURE 5

CITY: MKE DIV/GROUP: IM DB: GM LD: CK MADISON-KIPP
I:\Madison_Kipp\Madison_Kipp\2013\Fig5_GW_gradient\Wonewoc_April2013.mxd

CLASSIC CLEANERS
BRRTS #0213522764

MW-9D
MW-9D2
MP-15

MW-12S (<0.17)
MW-1 (10)
MP-13
MW-20D2
MW-20D
MW-19D
MW-19D2
MW-3D3
MW-3D2
MW-18S (2,600)
MW-3D
MW-21D2
MW-3S
MW-21D
MW-5D2
MW-10S (<0.17)
MP-14
MW-2S (1.3)
MW-5S
MW-5D3
MW-2D
MW-5D
MW-8 (<0.17)
MW-7 (<0.17)
MW-22D
MW-22S (160)
MP-16
MW-11S (<0.17)
MW-23D
MW-23S (580)
MW-24 (3.0)
MW-4D
MW-4D2
MW-4S (1.8)
MW-6S (0.53 J)
MW-6D
MW-17

MW-25D2
MW-25D

UNIT WELL 8

LAKE MONONA

0 350 700
Feet

LEGEND

- CLOSED SITE (COMPLETED CLEANUP)
- MUNICIPAL UNIT WELL 8
- MONITORING WELL
- (845.97) TETRACHLOROETHENE (PCE) CONCENTRATIONS REPORTED IN MICROGRAMS PER LITER (µg/L).
- 1;000 PCE ISOCONCENTRATION CONTOUR (DASHED WHERE INFERRED)

THE WATER TABLE IS INTERPRETTED TO BE FROM APPROXIMATELY 2 - 50' BELOW LAND SURFACE OR 887 - 821' ABOVE MEAN SEA LEVEL

NOTES:
1) MW-3S WAS NOT USED IN CONTOURING PCE CONCENTRATIONS.

MADISON-KIPP CORPORATION
201 WAUBESA STREET
MADISON, WISCONSIN

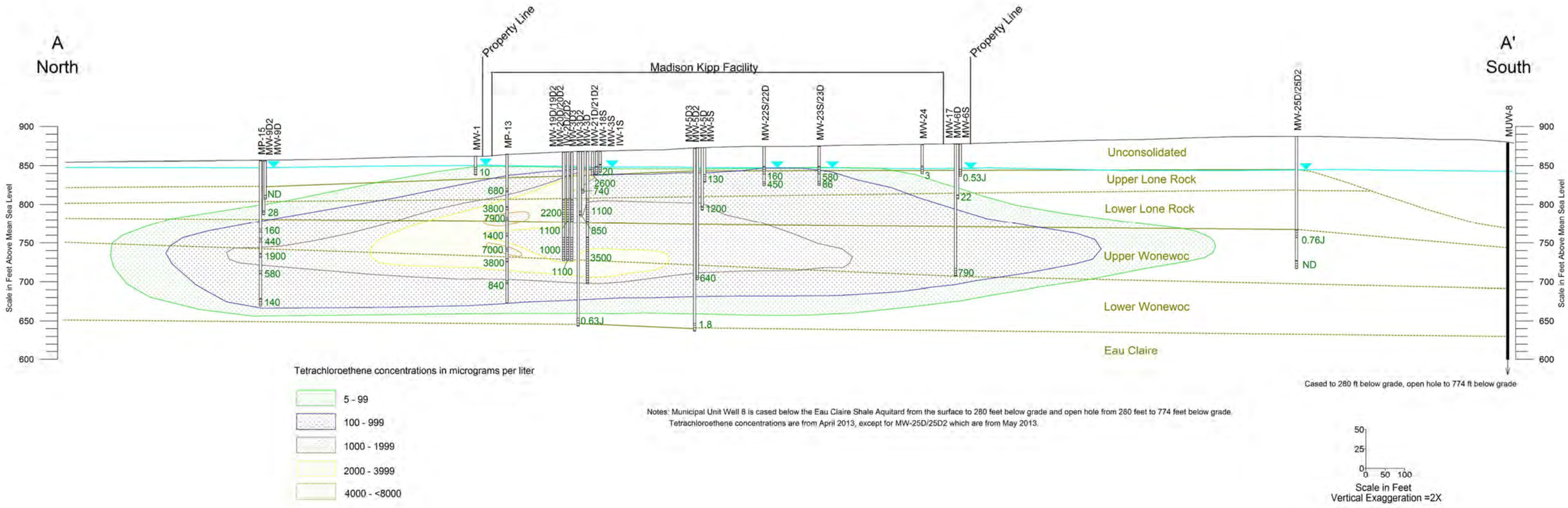
SUPPLEMENTAL SITE INFORMATION/ADDENDUM 1

WATER TABLE
PCE ISOCONCENTRATIONS APRIL 2013

ARCADIS

FIGURE 6

CITY: MKE DIV/GROUP: IM DB: GM LD: CK MADISON-KIPP
I:\Madison_Kipp\Madison_Kipp\2013\Fig6_GW_PCEwatertable_April2013.mxd



Notes: Municipal Unit Well 8 is cased below the Eau Claire Shale Aquitard from the surface to 280 feet below grade and open hole from 280 feet to 774 feet below grade.
Tetrachloroethene concentrations are from April 2013, except for MW-25D/25D2 which are from May 2013.

MADISON-KIPP CORPORATION
201 WAUBESA STREET
MADISON, WISCONSIN

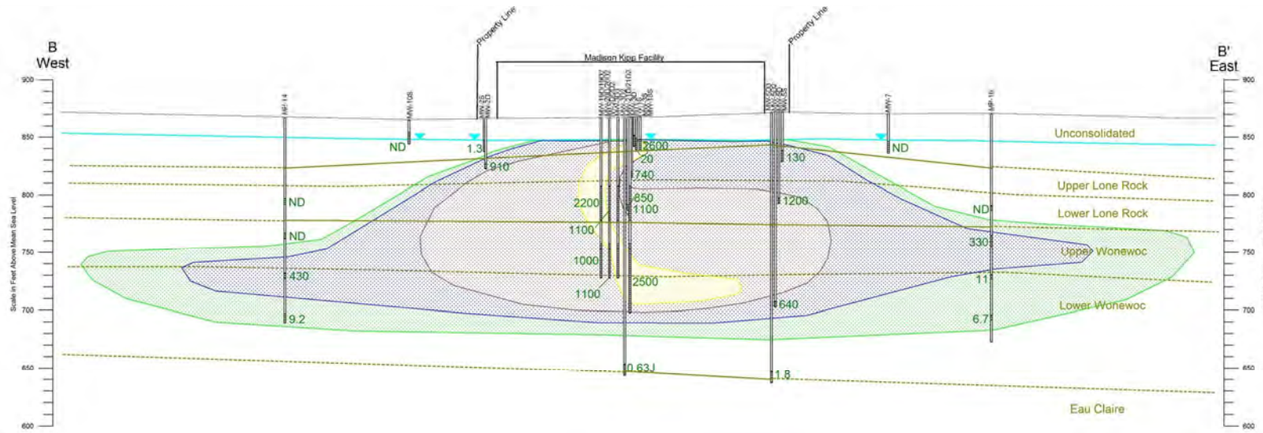
SUPPLEMENTAL SITE INFORMATION/ADDENDUM 1

TETRACHLOROETHENE ISOCONCENTRATION CROSS-SECTION A - A'

ARCADIS

FIGURE
7

CITY:(HIGHLANDS RANCH) DIV/GROUP:(ENV/GIS) DB: GMCKINNEY LD: PIC: PM: TM:
PROJECT: PATH: I:\MADISON_KIPP\MADISON_KIPP\2013\FIG7_CROSSSECTIONA.MXD DATE SAVED: 5/23/2013 10:18:30 AM



CITY:(HIGHLANDS RANCH) DIV/GROUP:(ENV/GIS) DB: GMCKINNEY LD: PIC: PM: TM:
PROJECT: PATH: PATH: I:\MADISON_KIPP\MADISON_KIPP\2013\FIG8_CROSSSECTIONB.MXD DATE SAVED: 5/23/2013 10:20:32 AM

MADISON-KIPP CORPORATION
201 WAUBESA STREET
MADISON, WISCONSIN

SUPPLEMENTAL SITE INFORMATION/ADDENDUM 1

TETRACHLOROETHENE ISOCONCENTRATION CROSS-SECTION B - B'

ARCADIS

FIGURE
8

CLASSIC CLEANERS
BRRTS #0213522764

A

A'

B

B'

MW-9D
MW-9D2
MP-15
MW-12S
MW-1
MP-13
MW-20D
MW-3D3
MW-3D2
MW-3D
MW-3S
MW-19D2
MW-19D
MW-20D2
MW-21D
MW-21D2
MW-18S
MW-10S
MP-14
MW-2S
MW-2D
MW-5D3
MW-5D2
MW-5S
MW-5D
MW-8
MW-7
MP-16
MW-22D
MW-22S
MW-23D
MW-23S
MW-11S
MW-24
MW-4D2
MW-4D
MW-4S
MW-6S
MW-6D
MW-17
MW-25D
MW-25D2
UNIT
WELL 8

LAKE MONONA

0 350 700
Feet

LEGEND

- CLOSED SITE (COMPLETED CLEANUP)
- MUNICIPAL UNIT WELL 8
- MONITORING WELL

MADISON-KIPP CORPORATION
201 WAUBESA STREET
MADISON, WISCONSIN

SUPPLEMENTAL SITE INFORMATION/ADDENDUM 1

LOCATION OF GEOLOGIC CROSS SECTIONS

ARCADIS

FIGURE 9

CITY: MKE DIV/GROUP: IM DB: GM LD: CK MADISON-KIPP
I:\Madison_Kipp\Madison_Kipp\2013\Fig9_CrossSections_April2013.mxd

CLASSIC CLEANERS
BRRTS #0213522764

MP-15
MW-9D2 (28)
MW-9D
MW-12S
MW-20D2
MW-1
MW-19D2
MP-13 (7,900)
MW-3D3
MW-3D
MW-21D2
MW-3S
MW-20D
MW-21D
MW-19D (2,200)
MW-10S
MW-18S
MW-8
MP-14 (<0.17)
MW-3D2 (850)
MW-5S
MW-7
MW-2D
MW-5D2
MW-2S
MW-5D3
MW-5D (1,200)
MP-16 (<0.17)
MW-22D
MW-22S
MW-23S
MW-23D
MW-11S
MW-24
MW-17
MW-4S
MW-4D2 (0.92 J)
MW-4D
MW-6D (22)
MW-6S
MW-25D2
MW-25D (0.76 J)
UNIT WELL 8

100
1000
5

Reger Park
Evangelical Lutheran Church of Holy Cross
St Bernards School
St Bernards Catholic Church
Plymouth United Church of Christ
Lowell Elementary School

East Washington
151
Worthington Ave
Sachs Street
Clyde Gallagher Avenue
Hermina Street
Union Street
Oak Street
North Marquette Street
Rosemary Avenue
Saint Paul Avenue
Milwaukee Street
Waterloo Spur
Anzinger Court
Farwell Street
North Court
South Court
Wirth Court
Corry Street
James Street
Daley Drive
Gateway Place
Ohio Avenue
Talmadge Street
Wabesa Street
South Marquette Street
Dixon Street
Ryan Street
Fairview Street
Emmet Street
Lindbergh Street
Buena Vista Street
Garnson Street
Sugar Avenue
Atwood Avenue
Evergreen Avenue
Hudson Avenue
Miller Avenue
Elmside Boulevard
Maple Avenue
Lakeview Avenue
Center Avenue
Welch Avenue
Willard Avenue
Oakridge Avenue
Lakeland Avenue
Schiller Court

0 350 700
Feet

LAKE MONONA

LEGEND

- CLOSED SITE (COMPLETED CLEANUP)
- MUNICIPAL UNIT WELL 8
- MONITORING WELL
- (845.97) TETRACHLOROETHENE (PCE) CONCENTRATIONS REPORTED IN MICROGRAMS PER LITER (µg/L).
- 850 PCE ISOCONCENTRATION CONTOUR (DASHED WHERE INFERRED)

THE LOWER LONE ROCK FORMATION IS INTERPRETTED TO BE FROM APPROXIMATELY 65 - 120' BELOW LAND SURFACE OR 818 - 781' ABOVE MEAN SEA LEVEL

NOTES:
1) PCE CONCENTRATION FROM MW-3D2, MW-20D, AND MW-21D WERE NOT USED IN CONTOURING PCE CONCENTRATIONS.

MADISON-KIPP CORPORATION
201 WAUBESA STREET
MADISON, WISCONSIN

SUPPLEMENTAL SITE INFORMATION/ADDENDUM 1

LOWER LONE ROCK FORMATION PCE ISOCONCENTRATIONS APRIL 2013

ARCADIS

FIGURE 10

CITY: MKE DIV/GROUP: IM DB: GM LD: CK MADISON-KIPP
I:\Madison_Kipp\Madison_Kipp\2013\Fig10_GW_PCELoneRock_April2013.mxd

CLASSIC CLEANERS
BRRTS #0213522764

MW-15 (1,900)
MW-9D
MW-9D2
MW-12S
MW-1
MP-13 (7,000)
MW-20D
MW-20D2
MW-3D3
MW-3D2
MW-3D
MW-3S
MW-18S
MW-19D
MW-21D (3,500)
MW-19D2
MW-21D2
MW-10S
MP-14 (430)
MW-2S
MW-2D
MW-5D2
MW-5S
MW-5D
MW-5D3
MW-7
MW-8
MW-22D
MW-22S
MW-23D
MW-23S
MW-11S
MP-16 (330)
MW-24
MW-4D2
MW-4S
MW-4D
MW-17 (790)
MW-6D
MW-6S
MW-25D
MW-25D2 (<0.17)
UNIT WELL 8

100
1000
2000
4000
5

Reger Park
Evangelical Lutheran Church of Holy Cross
St Bernards School
St Bernards Catholic Church
Plymouth United Church of Christ
Lowell Elementary School

East Washington
Worthington Ava
Sachs Street
Clyde Gallagher Avenue
Hermina Street
Union Street
Oak Street
North Marquette Street
Rosemary Avenue
Saint Paul Avenue
Milwaukee Street
Waterloo Spur
South Bryan Street
James Street
Daley Drive
Gateway Place
Emmet Street
Lindbergh Street
Buena Vista Street
Garnson Street
Sugar Avenue
Dixon Street
Ryan Street
Fairview Street
Wabesa Street
South Marquette Street
Anzinger Court
Farwell Street
North Court
South Court
Wirth Court
Corry Street
Ohio Avenue
Talmadge Street
Atwood Avenue
Evergreen Avenue
Hudson Avenue
Miller Avenue
Willard Avenue
Elmside Boulevard
Maple Avenue
Center Avenue
Welch Avenue
Oakridge Avenue
Lakeland Avenue
Schiller Court

151

0 350 700
Feet

LAKE MONONA

LEGEND

- CLOSED SITE (COMPLETED CLEANUP)
- MUNICIPAL UNIT WELL 8
- MONITORING WELL
- (845.97) TETRACHLOROETHENE (PCE) CONCENTRATIONS REPORTED IN MICROGRAMS PER LITER (µg/L).
- 850 PCE ISOCONCENTRATION CONTOUR (DASHED WHERE INFERRED)

THE UPPER WONEWOC FORMATION IS INTERPRETTED TO BE FROM APPROXIMATELY 87 - 139' BELOW LAND SURFACE OR 767 - 690' ABOVE MEAN SEA LEVEL

NOTES:
1) PCE CONCENTRATION FROM MW-19D AND MW-20D WERE NOT USED FOR CONTOURING PCE CONCENTRATIONS.

MADISON-KIPP CORPORATION
201 WAUBESA STREET
MADISON, WISCONSIN

SUPPLEMENTAL SITE INFORMATION/ADDENDUM 1

UPPER WONEWOC FORMATION PCE ISOCONCENTRATIONS APRIL 2013

ARCADIS

FIGURE 11

CITY: MKE DIV/GROUP: IM DB: GM LD: CK MADISON-KIPP
I:\Madison_Kipp\Madison_Kipp\2013\Fig11_GW_PCEWonewoc_April2013.mxd

Appendix A

Text and Figure Clarification

ARCADIS

Below is a summary of clarifications and corrections to information and data presented in the *Site Investigation and Interim Actions Report, February 2012 – January 2013* (SI Report) submitted to the Wisconsin Department of Natural Resources (WDNR) on March 15, 2013.

Clarifications/corrections are provided in **bold underline**:

- Executive Summary, Page 3. Advanced and sampled **194** soil borings on the Site to evaluate the extent and degree of soil impacts.

- Executive Summary, Page 3. Advanced and sampled **113** hand auger borings off Site at 32 residential properties to evaluate the extent and degree of soil impacts in the upper 4 feet at these locations.

- Section 3.3, Page 33. Advanced and sampled **194** soil borings on the Site to evaluate the extent and degree of soil impacts.

- Section 3.6.1, Page 36. A total of **96** soil borings were advanced at 32 adjacent residences from April 27 through August 22, 2012.

- Section 4.3.3, Page 51. Lake Mendota is located approximately 6,800 feet west of the Site and Lake Monona is located approximately 1,500 feet **south** of the Site.

- Section 4.4.1, Page 52. The sand content ranges from approximately **55 to 85**% with approximately **5 to 30**% silt, and approximately **5 to 20**% clay.

- Section 4.5.2.1, Page 67. Site-wide groundwater elevations were collected in April, July 2012, **and November 2012**, and January 2013.

- Section 4.5.2.3, Page 70. Table to be replaced as follows:

Geologic Unit	Hydraulic Conductivity Range (feet/day)	Hydraulic Conductivity Average (feet/day)
Unconsolidated Aquifer	0.09 – 1.69	0.5
Upper Lone Rock Formation	0.84 – 13.2	5.9
Lower Lone Rock Formation	2.7 – 8.2	5.6
Upper Wonewoc Formation	2.55 – 3.16	2.8
Lower Wonewoc Formation	12.7 – 13.2	12.9
Wonewoc/Eau Claire Formations	7.9 – 9.2	8.4

- Section 5.4.1, Page 73. Soil VOC concentrations were reported above the industrial direct contact RCL in four soil borings (**B-15, B17,** B-18, and B-35) from 0 to 2 feet and in one soil boring (B-24) from 10 to 12 feet bls.

- Section 5.5, Page 76. A total of **113** hand auger borings were advanced at 32 residential properties. A total of **183** soil samples were collected and submitted for laboratory analyses including VOCs, PAHs, PCBs, RCRA metals, and total cyanide.

- Section 5.5.4, Page 78. Soil RCRA metal concentrations, excluding arsenic, were reported above the **non-**industrial direct contact RCL for lead (400 mg/kg) at 106 Marquette Street (900 mg/kg), 142 Marquette Street (470 mg/kg), and 261 Waubesa Street (660 mg/kg) from 0 to 1 foot.

- Section 5.6.1, Page 79. Replace "Estimated porewater concentrations of PCE based on equilibrium-assumed partitioning calculations ranged from 0.17 to 180 µg/L." with **"Rock PCE concentrations ranged from 0.17 to 180 µg/kg."**

- Section 5.6.1, Page 79. There was also a spike in the calculated PCE concentration at approximately 160 feet bls of **510** µg/L.

- Section 5.6.2, Page 79. Rock PCE concentrations ranged from 0.24 to 260 **µg/kg**.

- Section 5.6.2, Page 79. After 152.5 feet, the PCE concentrations decreased to 10 **µg/kg** or less.

- Section 5.7.1, Page 80. Temporary well locations and PCE concentrations are presented on Figure **5**-25.

- Section 5.7.3.1, Page 82. PCB concentrations were detected in groundwater samples collected at Monitoring Well MW-22S (12 µg/L)**, MW-22D (2.4 µg/L)** and MW-23S**D** (0.24 µg/L) above the ES of 0.03 µg/L.

- Section 8.1, Page 105. A total of **194** on-Site soil borings and **113** off-Site hand auger borings were advanced. A total of **327** on-Site and **183** off-Site soil samples were collected and submitted for laboratory analyses including VOCs, PCBs, PAHs, and RCRA metals.

- For clarification, Soil Boring 106-1(2) on Figure 5-14 does not exceed the non-industrial direct contact RCL.

- Figures 5-21 and 5-23: data is presented in **µg/kg.**

Appendix B

Thomas M. Johnson
Expert Report

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Expert Report of
Thomas M. Johnson, P.G.

Kathleen McHugh and Deanna Schneider et al.
v. Madison-Kipp Corporation et al.
U.S. District Court,
Western District of Wisconsin
(Case No. 11-CV-724)

January 21, 2013

ARCADIS

Thomas M. Johnson, P.G.
Executive Vice President, Technical Director and
Principal Hydrogeologist

Expert Report of
Thomas M. Johnson, P.G.

Kathleen McHugh and Deanna Schneider et al. v. Madison-Kipp Corporation et al.
U.S. District Court,
Western District of Wisconsin
(Case No. 11-CV-724

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Date:
January 21, 2013

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Appendices

Expert Report of
Thomas M. Johnson, P.G.

Kathleen McHugh and Deanna Schneider
et al. v. Madison-Kipp Corporation et al.
U.S. District Court,
Western District of Wisconsin

1. Introduction

This report presents the expert opinions of Thomas M. Johnson, P.G., Executive Vice President, Technical Director, and Principal Hydrogeologist for ARCADIS U.S., Inc. (ARCADIS), regarding alleged environmental impacts in the vicinity of the Madison-Kipp Corporation (Madison-Kipp) facility at 201 Waubesa Street, Madison, Wisconsin (the site).

This report was prepared for Michael, Best & Friedrich, LLP (Michael Best) on behalf of Madison-Kipp in conjunction with litigation captioned Kathleen McHugh and Deanna Schneider et al. v. Madison-Kipp Corporation et al., U.S. District Court, Western District of Wisconsin (Case No. 11-CV-724). Appendix A presents additional supporting materials that provide additional bases for my opinions. A list of the documents referenced in this report, reviewed, or relied upon is presented in Appendix B. A copy of my curriculum vitae, which includes a list of publications that I have authored in the past 10 years, is presented in Appendix C. Appendix C also includes a list of the cases in which I have testified as an expert witness during the past four years. Because review of documents is ongoing and ARCADIS is continuing to receive information and documents regarding the site, the information and opinions presented in this report may be modified as additional information is reviewed or becomes available.

The opinions set forth in this report are presented to a reasonable degree of scientific certainty and are based on a review of the documents provided by Michael Best, documents and information obtained by ARCADIS, review of the files of the Wisconsin Department of Natural Resources (WDNR), interviews with current and former Madison-Kipp employees, interview of Madison-Kipp environmental consultant, my education and experience, and personal inspection of the Madison-Kipp facility and surrounding area. My opinions also rely on methods of analysis and equations that are generally accepted and are commonly used by hydrogeologists, scientists, and engineers to evaluate environmental, hydrogeologic, and groundwater conditions.

2. Summary of Expert Opinions

The following presents my expert opinions and a summary of the bases for those opinions regarding environmental conditions at the Madison-Kipp facility and in the surrounding area.

2.1 Expert Opinion 1

Madison-Kipp's use, handling, and disposal of industrial products, including tetrachloroethylene (PCE) and oils, was consistent with the standard of care in the industry at the time.

2.1.1 Summary of Bases for Opinion

2.1.1.1 Tetrachloroethylene (PCE)

PCE Use

Historically, PCE has been used widely in metal degreasing operations at industrial facilities, and continues to be used in numerous industrial, commercial, and household cleaning products, as well as in dry cleaning processes. The peak years of PCE production occurred during 1975-1980, when as much as 700 million pounds of PCE was manufactured annually (Morrison 2000a; Doherty 2000a). The primary use for PCE since the 1930s in the United States has been for dry cleaning, and PCE is still used extensively for dry cleaning purposes today (Morrison 2000a). In 1967, approximately 88 percent of all PCE produced in the United States was used in dry cleaning, while metal degreasing and cleaning accounted for 10 to 15 percent of PCE production (Morrison 2000a). PCE was commonly used in industry for degreasing aluminum materials in manufacturing, due to the high stability of PCE(Doherty 2000a).

PCE Use at Madison-Kipp

Based upon interviews with current and former employees, PCE was used to clean metal parts prior to manufacturing (Jellings 2012; Keyes 2012; Largen 2013; Lenz Dep. 2012, p. 37; Lenz 2013; Schluter 2012). PCE was also used to clean grease and dust from Madison-Kipp's die cast machines (Keyes 2012; Lenz Dep. 2012, p. 61).

Based on these interviews, Madison-Kipp used a PCE vapor degreaser that was 8 feet (ft) long, 4 ft in depth, and 4 ft high, with a ventilation hood and ducting that vented to the outside (Keyes 2012; Lenz Dep. 2012, p 38). This vapor degreaser held 75 to 100 gallons

of PCE (Lenz Dep. 2012, p. 41). The degreaser was heated with natural gas and included a cooling system (condenser) that produced the vapor cloud that the degreaser used to clean the metal parts (Keyes 2012; Schluter 2012). Based upon employee descriptions, this vapor degreaser was similar to that described in the 1962 and 1976 ASTM International (ASTM) Vapor Degreaser Handbooks (ASTM 1962, 1976), and is also consistent with my experience.

When used by the Die Cast Division, the vapor degreaser was located along the eastern wall of the Atwood Building (Lenz Dep. 2012, p. 42; Schluter 2012). It was later transferred to the Lubricator Division and physically moved to a location in the Waubesa Building (Lenz Dep. 2012, p. 64), where it was used until the late 1980s. At both locations, the vapor degreaser was present inside the building and ventilated to the outside.

In addition to the vapor degreaser described above, employees also report that there was formerly a smaller PCE parts cleaner or degreaser, approximately 3 to 4 ft square and 4 ft tall (Keyes 2012). Metal parts were reportedly cleaned by dipping parts directly into the liquid PCE in this parts cleaner.

Based upon my experience and review of industry guidance (ASTM 1962, 1976), the use of PCE as a solvent for degreasing was a common and accepted industrial practice up to and including the late 1980s, when its use at Madison-Kipp ceased. The use of PCE solvent for degreasing as described by current and former employees meets the standard of care recognized in the industry at the time.

PCE was also used to clean Madison-Kipp die machines through sometime in the 1980s. If PCE would drip onto the floor adjacent to the machine being cleaned, it would be cleaned up using “oil-dri” (Lenz Dep. 2012, p. 62). There were no floor drains in the area of the die cast machines. The practice of using solvents, including PCE, for this purpose was also entirely consistent with industry practice at the time.

PCE Storage and Handling at Madison-Kipp

Until the vapor degreaser was transferred to the Lubricator Division, PCE used by the Die Cast Division was stored in an aboveground storage tank (AST) located in the oil shed. (Jellings 2012). The oil shed had a concrete floor (Lenz Dep. 2012, p. 69). Thereafter, PCE was stored in an AST located on a concrete pad in the alcove outside the east wall of the Waubesa Building (Lenz Dep. 2012, p. 42). PCE would be delivered by a tanker truck that would use a hose system to fill the AST (Keyes 2013). PCE transfer from the AST to a degreaser was commonly performed by employees filling buckets through a spigot on the

AST, placing the buckets on a rolling cart, and transporting the buckets to a degreaser and pouring the PCE into the degreaser (Lenz Dep. 2012, pp. 39, 41; Schluter 2012). A similar process was used for obtaining PCE to clean the die cast machines. These methods of receiving, storing, and handling PCE are consistent with industry standards and practice at the relevant time. This opinion is not only based on my experience, it is consistent with industry guidance (ASTM 1962, 1976).

PCE Reclamation and Disposal at Madison-Kipp

Since at least 1971, spilled waste liquids and sludge, including those containing PCE, were transferred into a 500-gallon waste container and removed by a waste hauler (Jellings 2012; Keyes 2012; Largen 2013; Lenz 2013; Schluter 2012). No current or former employees recall solvent or waste of any kind being disposed outside the building, except for use as dust suppression (discussed elsewhere herein).

Periodically, the degreasers would have been cleaned to remove accumulated degreasing waste and sludge. Consistent with my experience and industry guidance for the operation of degreasers (ASTM 1962, 1976), used PCE was recovered and recycled for reuse through the use of a still operated at various times by Madison-Kipp former employee, Joe Lindsay, (Jellings 2012; Schluter 2012). Industry guidance recommended reclamation of PCE solvent to decrease PCE solvent costs (ASTM 1962, 1976). After removing the used PCE for reclamation, the remaining waste would consist of a semi-solid sludge comprised of oils, metal particles, dirt, and PCE residue (ASTM 1962, 1976). Although there is no direct evidence that it was done at Madison-Kipp during the period from the 1940s to 1970s, industry guidance regarding the disposal of chlorinated solvent waste recommended that PCE waste be poured on the ground (ASTM 1962, 1976; Manufacturing Chemists' Association, Inc. [MCA] 1948). Thus, if this were done at Madison-Kipp, it would have been consistent with industry standard and guidance at the time.

2.1.1.2 Polychlorinated Biphenyls (PCBs)

PCB Use

PCBs were produced in the United States beginning in 1929 for a variety of industrial uses, including electrical transformers and capacitors and oils used in hydraulic systems, paints, coatings, and plastics (Morrison 2000a). For many decades prior to the late 1970s, when production was essentially stopped, PCBs were commonly present in waste oils because of chemical properties that were exceptionally useful in industrial applications, such as hydraulic oils. Production of PCBs peaked in 1970, and production essentially ceased in the

United States in 1979, when most PCB use was banned by the U.S. Environmental Protection Agency (USEPA) (Morrison 2000a). Until 1974, PCBs were used in many industrial applications; however, after 1974, PCB use was limited to electrical transformers and capacitors (Morrison 2000a). Due to limitations in analytical methods, it was not until 1970 that PCBs could be detected in environmental samples (Morrison 2000a).

Use of PCB-Containing Material at Madison-Kipp

At some point in time, hydraulic oils containing PCBs were used at Madison-Kipp. Records indicate that the last purchase of hydraulic oils containing PCBs was in 1971 (Ecology and Environment, Inc. 1983). Use of hydraulic oils that may have contained PCBs was consistent with industry standards at the time, and no claim to the contrary has been made by Plaintiff's experts.

Storage, Handling, and Disposal of PCB-Containing Material at Madison-Kipp

Hydraulic oil containing PCBs was kept in the oil shed in two large, approximately 3,000-gallon ASTs (Keyes 2013). The hydraulic oil would have been delivered by tanker truck and transferred into these ASTs through a hose that connected to a coupling outside the shed (Keyes 2013; Schluter 2012). Hydraulic oil was historically supplied to the die cast machines through a central hydraulic piping system that serviced multiple machines (Keyes 2013). Hydraulic oil was transported from the large ASTs in the oil shed in 55-gallon drums on rolling carts (barrel carts) to a central reservoir in the facility (Keyes 2013). The hydraulic fluid in this central hydraulic system was then supplied to die cast machines in a closed loop system through pipelines within a concrete-lined trench oriented north/south in the Atwood Building (Keyes 2012; Lenz 2013; Schluter 2012). The trench was approximately 4 ft wide, 2 to 4 ft deep, and covered with steel plates. It did not connect or discharge to any sewer or drain system in the facility (Keyes 2012; Schmoller Dep. 2012, p. 286). This process was subsequently changed, as newer die cast machines had individual hydraulic systems and hydraulic oil reservoirs at each machine (Keyes 2013). Hydraulic oil was transferred to each of these newer machines in 55-gallon barrel carts and pumped into the machine (Keyes 2013).

From time to time, wastes including hydraulic oils, PCE, water, and other liquids would have entered the concrete-lined trench. These wastes and spill residues that may have occurred on the Madison-Kipp plant floor were suctioned into an industrial vacuum (Seacor machine), transferred to a waste container, and removed off site by a waste hauler (Jellings 2012; Keyes 2012; Lenz Dep. 2012, p. 62; Lenz 2013; Schluter 2012).

Madison-Kipp's storage, handling, and disposal of hydraulic oil were consistent with industry standards. Plaintiff's experts have offered no opinion to the contrary.

Use of Waste Oil as Dust Suppressant at Madison-Kipp

Until the parking lots were paved in 1976 or 1977, waste oils, which may have contained PCBs or PCE, were periodically applied using the industrial vacuum (Seacor machine) to the parking areas as a dust suppressant (Schluter 2012). Use of waste oils for this purpose was consistent with industry practices and met the standard of care at the time.

The use of waste oils for dust control and use of oils and tar on roadways for dust suppression has been commonplace for decades throughout the United States (CSWAB 2005; Ledbetter 1983; Mueller Associates, Inc. 1987; USEPA 1984a, 1984b). These waste oils usually contained many contaminants, including heavy metals, organic solvents, and PCBs (USEPA 1984a, 1984b). Studies by USEPA, U.S. Department of Energy, and others indicated that waste oils used for road oiling typically contained high concentrations of PCBs, as high as 3,800 parts per million (Ledbetter 1983; Mueller Associates, Inc. 1987; USEPA 1984a, 1984b;).

In 1982, USEPA estimated that approximately 50 to 80 million gallons of waste oil was being used in the United States for dust suppression on unpaved roads(USEPA 1984a, 1984b). Wisconsin was one of the states that used the largest quantities of waste oil on roads for dust suppression (Ledbetter 1983; USEPA 1984a, 1984b). This included the use of large quantities of waste oil on unpaved roads (road oils) in the 1980s for dust suppression at the Badger Army Ammunition Plant in Baraboo, Wisconsin (CSWAB 2005). It was not until 1992 that USEPA banned the use of road oils for dust suppression, due to the possible presence of hazardous substances (CSWAB 2005). Although the use of waste oil for unpaved roads has declined since the 1990s, as recently as 2006, Wisconsin regulations permitted the use of used oil for dust suppression (NR 679.62). In fact, based on my experience, it is still common practice to use petroleum oil and tar for dust control on roads in the United States.

This is also true from my personal experience since 1975 in the environmental industry, and previously from my experience as an employee of the DuPage County, Illinois, Forest Preserve District in 1967 and 1968 when I worked in the maintenance department and was directed to spread waste oil on Forest Preserve District gravel roads for dust suppression.

2.2 Expert Opinion 2

The environmental site investigations and remedial activities conducted by Madison-Kipp, and the timing of those activities, have been consistent with the standards of practice for such activities at the time.

In July 1994, in response to a letter from WDNR (WDNR 1994) regarding the detection of PCE in groundwater at the adjacent Madison Brass Works site to the north, Madison-Kipp retained the environmental consulting firm of Dames & Moore, Inc. (Dames & Moore) to prepare a work plan for site investigation. This work plan was submitted to WDNR in September 1994 (Dames & Moore 1994a).

Multiple phases of site investigation have been conducted at the site for Madison-Kipp by a number of environmental consultants beginning in 1994. These site investigations have focused on evaluating soil and groundwater conditions and the magnitude and extent of contamination at the site under the direct oversight of WDNR.

Although the full extent of the site area contamination was not entirely known from initial phases of investigation, each of these investigation phases provided the information needed at the time, regarding the soil and groundwater conditions and the extent of contamination in the area of investigation, to make decisions regarding further investigation and remedial actions (Schmoller Dep. 2012, p. 56). Such an investigation conducted in a phased or step-wise fashion was and is the standard in the industry. As to be expected, there have been occasional disagreements with WDNR regarding site activities, including the timing of those activities (Schmoller Dep. 2012 Exhibit 26, p. 206; Exhibit 34, p. 292). In my experience, such disagreements are not unusual given the nature of subsurface contamination, the complexity of the subsurface environment, and evolutions in technical knowledge and regulations. As a consequence, the process typically takes years. In my opinion, the WDNR project manager, Michael Schmoller, has correctly concluded that site investigations and remedial actions since 1994 were “appropriate and adequate” at the time they were conducted (Schmoller Dep. 2012, p. 56).

Further investigations and evolving technical knowledge over time have resulted in increased awareness of the significance and impacts of contamination at the Madison-Kipp site and surrounding area. This includes increased awareness of possible importance of vapor intrusion from volatile organic compounds (VOCs) in the subsurface in 2009 through 2012. For example, WDNR project manager, Michael Schmoller, has indicated that the vapor intrusion issue was not understood at the time of the initial investigations conducted at the Madison-Kipp site (Schmoller Dep. 2012, p. 14).

In 2006, as part of a Phase I Environmental Site Assessment (ESA), Madison-Kipp's consultant became aware of anecdotal information suggesting that PCB-containing oils may have been historically used for dust suppression in the north parking lot. Since the parking lots were paved and/or covered by the building in 2006, there was no immediate need for action. In my opinion, PCBs in soils under paved areas or buildings, such as at Madison-Kipp, would not be addressed or even investigated until and only if excavation of soils occurred at the site, or in the context of requesting regulatory closure for soil at a site.

During the installation of the soil vapor extraction (SVE) system in 2012, PCBs were detected in sampling of excavated soil performed to characterize those soils prior to appropriate disposal of the soils (ARCADIS 2012e). Since then, an extensive on-site and off-site soil investigation has been conducted, and on-site excavation of PCB-impacted soils has been completed. Based on the information available prior to the 2012 discovery of PCBs in on-site soils, there was no evidence to indicate that PCBs would be present in off-site soils. When PCBs were detected in soils during the SVE installation, the results also indicated the presence of other polynuclear aromatic hydrocarbons (PAHs). In my opinion, Madison-Kipp has subsequently responded appropriately in conducting further investigations and remediation to address PCBs and PAHs in on-site and off-site soil.

Since 1994, Madison-Kipp has maintained continuous communications and interaction with WDNR throughout the site investigation process. This has included submittal of required reports of site investigation and remediation activities; routine status reports; and regular meetings, correspondence, and telephone communications with the WDNR project manager and other agency representatives. Madison-Kipp's activities in this regard have been consistent with the standard of care for potentially responsible parties in environmental cleanup matters.

2.3 Expert Opinion 3

Site investigations at the Madison-Kipp facility and surrounding area have defined the extent of PCE, PCBs, and other site-related contaminants in soil, soil vapor, and groundwater for the purposes of selecting remedial actions.

2.3.1 Summary of Bases for Opinion

2.3.1.1 Extent of Contamination

Based on the locations and timing of contaminant sources that have been identified at the site, the distance to adjacent properties, the shallow depth to groundwater, and the extent

and magnitude of PCE and other contaminants that have been found in the subsurface, PCE, PCBs, PAHs, and other contaminants were already present in soil and/or shallow groundwater beneath the Madison-Kipp site and immediately adjacent surrounding properties well before 1994, and have not materially increased in lateral extent or magnitude since that time.

2.3.1.2 Soil Vapor

It is my opinion, with which WDNR concurs, that the extent of PCE and other VOCs in soil vapor in the off-site area has been defined, and that there is an adequate understanding of the site conceptual model at this time regarding VOC occurrence and migration in soil vapor (Schmoller Dep. 2012, pp. 33, 240). In fact, PCE has not been detected in shallow groundwater beyond the area of residential properties immediately adjacent to Madison-Kipp and, therefore, could not be a source of VOCs to soil vapor beyond that area. Furthermore, it is my opinion, with which WDNR concurs, deeper groundwater is not a source of VOCs to soil vapor in the vadose zone (Schmoller Dep. 2012, p. 102).

In addition to PCE, multiple other VOCs, including petroleum compounds, have been detected in soil vapor samples on various residential properties (ARCADIS 2013b). However, these VOC compounds are commonly present in ambient air in urban areas, and within residences as a result of household chemical use, as well as from dry cleaning and building materials (USEPA 2011). WDNR has concluded that many of the VOCs detected in sub-slab soil vapor and indoor air at residential properties in the site area are present in ambient air, and may have resulted from sources within the residences (Schmoller Dep. 2012, p.128). Furthermore, many of the VOCs detected in soil vapor or indoor air on adjacent residential properties have not been detected on the Madison-Kipp property (ARCADIS 2013b; Schmoller Dep. 2012, p. 131). Most importantly, the current SVE system is controlling the off-site migration of soil vapor containing VOCs (Schmoller Dep. 2012, p. 76).

In the off-site area, it is my opinion that further investigation of VOCs in soil vapor is not needed because there is no migration pathway, and shallow groundwater beyond the area immediately adjacent to Madison-Kipp does not contain VOCs (Schmoller Dep. 2012, p. 88). WDNR project manager, Michael Schmoller, further testified that no further sampling of soil vapor is planned to be required in the areas east of South Marquette Street, west of Waubesa Street, or on Dixon Street (Schmoller Dep. 2012, p. 224). PCE in soil vapor samples from residential locations in these areas further from Madison-Kipp are likely not due to releases at Madison-Kipp, as PCE has not been detected in shallow groundwater

and sub-slab soil vapor samples in these areas. PAHs and PCBs have correctly not been identified as a source of contamination in soil vapor.

This opinion is further supported by the hydrogeological conditions in the Madison area and at the site, as discussed in Appendix A.

2.3.1.3 Soil

In my opinion, through multiple phases of site investigation, the magnitude and lateral extent of soil contamination at the site and surrounding area has been defined and will not materially change in the future, even if no further remediation occurs. I agree with WDNR that there is "a good understanding" of soil contamination in the east and northwest portions of the site, and that no further investigations are needed in those areas (Schmoller Dep. 2012, p. 72). Soil investigations in the southwest portion of the site and beneath the facility building were conducted in 2012 (Schmoller Dep. 2012, p. 72). Moreover, WDNR has correctly concluded there is a good understanding of shallow soil contamination (at depths to 4 ft below ground surface [bgs]) from the more than 100 soil borings that have been completed at the site (Schmoller Dep. 2012, p. 73).

Chemical analyses for PCBs have been conducted on more than 300 samples from on-site and off-site areas (ARCADIS 2013b). These sample results have, in my opinion, defined the extent of PCB contamination in the soil for the purposes of selecting remedial actions to address PCB impacts to soil.

Soil sampling results from residential properties during 2012 indicate that one or more PAH compounds have been detected in soils at concentrations above one or more WDNR PAH screening levels at most residential properties in the area and on the Madison-Kipp property (ARCADIS 2013a). ARCADIS has correctly concluded that PAHs are ubiquitous in an urban environment from many different activities, the majority of which are not related to activities at Madison Kipp (ARCADIS 2013a). In a subsequent letter from WDNR, Madison-Kipp was directed to submit a work plan "either…for determining whether any of the health-based direct contact exceedances can be attributed to background concentrations or…a remedial action plan to be employed by MKC…" (WDNR 2012aa). On December 14, 2012, ARCADIS submitted a work plan to WDNR to evaluate background levels of PAHs in the site area (ARCADIS 2012s). Results of this study, which has included review of PAH sources in the Madison area, statistical analysis of on-site and off-site PAH sampling data, and a forensic evaluation of fingerprint analyses of PAHs in urban area soils, indicate that PAHs in soils on residential properties are consistent with background levels in urban areas

and are not related to Madison-Kipp source-derived PAHs found in soils at Madison-Kipp (ARCADIS 2013a).

2.3.1.4 Groundwater

Shallow Groundwater

In my opinion, the magnitude and lateral extent of PCE in shallow groundwater has not materially changed since a time well before it was first discovered in 1994, and will not materially change in the future, even if no further remediation occurs. In my opinion, the direction of groundwater flow at the site has been variable. Shallow groundwater flow has been toward the north in the northernmost portion of the site; generally toward the south, southwest, and southeast beneath a majority of the site; and downward from the shallow zone into deeper groundwater intervals throughout the site vicinity. WDNR correctly concludes that there is not significant lateral movement of shallow groundwater containing VOCs in the site vicinity, as hydraulic gradients are strongly downward (Schmoller Dep. 2012, pp. 39-40). The limited extent of PCE and other VOCs in shallow groundwater is also directly related to the low rates of groundwater flow and contaminant migration through sediments and bedrock aquifers in the site vicinity. Based on these findings, the passage of time from well before 1994 to the present has not resulted in the need for increased remedial actions for the shallow groundwater.

Based on documented values of hydraulic conductivity, effective porosity, and measured hydraulic gradients, groundwater flow in the Unconsolidated Aquifer and Upper Bedrock Aquifer is generally downward (vertically) at calculated flow rates of only 1 to 36 ft per year (ft/yr). Rates of PCE migration in groundwater would be even lower, as PCE is known to be retarded in sediments and moves slower than the rate of groundwater flow (USEPA 2009). It is my conclusion that shallow groundwater containing PCE is not continuing to migrate or expand onto neighboring properties, and that the extent of PCE in shallow groundwater is essentially the same as that found in 1994 or before. This opinion is based on directions of groundwater flow, the limited extent of PCE and other VOCs in shallow groundwater, the fact that PCE was not detected in off-site wells (MW-7, MW-8, MW-10S and MW-11S), and the very stable PCE concentrations that have been observed in shallow groundwater at the site since at least 1994.

Groundwater sampling results indicate that PCE-impacted shallow groundwater is not present beneath residences beyond the area immediately surrounding Madison-Kipp. WDNR has also correctly concluded that contaminated shallow groundwater associated

with the Madison-Kipp site is not believed to be present south of Atwood Avenue (Schmoller Dep. 2012, p. 90).

Deep Groundwater

The estimated rate of groundwater movement in the deep aquifer is as much as approximately 30 ft/yr (Bradbury et al. 1999). Based on this rate of flow, deeper groundwater containing PCE would have migrated no more than approximately 540 ft in a northerly or southerly and downward direction, since it was first discovered in 1994. It is my opinion that deeper groundwater containing PCE has had no impact on neighboring properties, as there is no use of that deeper groundwater at the site or in the immediate residential area surrounding Madison-Kipp, and VOC-impacted deeper groundwater is not a source of vapor intrusion. As to whether the extent of PCE in the deep groundwater has been defined for the purposes of selecting remedial actions, I understand that further investigations will be done that may impact the selection and/or scope of additional remedial measures that may be needed to augment the use of in-situ chemical oxidation (ISCO) as the primary remedy for groundwater (see discussion in Opinion 4 that this does not present or threaten an imminent and substantial endangerment to health or the environment).

2.3.1.5 Remediation

Technologies

Multiple technologies and approaches are available to remediate PCE and other VOCs in subsurface soil and groundwater, including ISCO, in-situ bioremediation, thermal treatment, surfactant/co-solvent flushing, groundwater extraction and treatment, and natural attenuation (Interstate Technology & Regulatory Council [ITRC] 2004, 2009; McGuire et al. 2006; State Coalition for Remediation of Dry Cleaners [SCRDC] 2007; USEPA 2004, 2009). Each of these technologies and approaches has been applied with varying degrees of success at VOC-impacted sites throughout the United States. A comprehensive 2007 study of more than 100 PCE-contamination sites by the SCRDC indicated that soil vapor extraction was the most widely used remedial technology for soils, and that ISCO and in-situ bioremediation were the most widely used groundwater remedial technologies (SCRDC 2007).

Prior Remedial Actions at Madison-Kipp

Several phases of on-site groundwater remediation have been completed at the Madison-Kipp site to address soil and shallow groundwater. Recent pilot tests have also been conducted to assist in design of an in-situ remediation system to further address VOCs in groundwater (ARCADIS 2012t). Contrary to assertions by Plaintiff expert, Dr. Lorne Everett, no further investigations are warranted to address soil or shallow groundwater. WDNR has also correctly concluded that further site investigations are not needed to make decisions about shallow groundwater remediation at the site (Schmoller Dep. 2012, p. 76).

Remedial actions previously implemented at the site include in-situ treatment of VOCs in soil and groundwater using chemical oxidation and SVE. ISCO was successful in reducing VOC concentrations in soils at multiple locations, and SVE has effectively removed substantial quantities of VOCs from soil and shallow groundwater. Investigations have also confirmed that natural attenuation is also occurring at the site, indicated by the presence of PCE degradation products and generally decreasing concentrations of PCE with depth and distance from on-site source areas.

In-Situ Chemical Oxidation

Based on evaluation of possible remedial alternatives, ISCO was selected as the most appropriate technology to treat PCE and other VOCs in groundwater (ARCADIS 2012t). Some technologies, such as groundwater extraction and treatment (GWET) were eliminated from consideration due to lack of effectiveness.

In-situ treatment of groundwater contaminants using ISCO is a proven technology that is much more efficient and effective than GWET in remediating VOC-impacted groundwater (ITRC 2004, 2009; USEPA 2004). In-situ treatment technologies, such as ISCO, have proven to be effective in remediating VOCs in groundwater to remedial goals at sites, such as the Madison-Kipp site, within a short period of time of one to two years. In contrast, GWET may require many decades to achieve significant improvement in groundwater quality (ITRC 2004; USEPA 1994). This is why WDNR has indicated that it does not expect groundwater pumping to be an option for remediation at this site (Schmoller Dep. 2012, p. 46). Instead, WDNR agrees that in-situ treatment and continued natural biodegradation is the most likely remedial approach for this site, and that this approach should be successful in reducing VOC levels to maximum contaminant levels (MCLs) within two decades (Schmoller Dep. 2012, p. 46, 51).

A pilot study of ISCO is currently underway to evaluate the use of this technology as a component of the final remedial plan for the site (ARCADIS 2012t). In-situ treatment of dissolved VOCs in groundwater effectively destroys or transforms the contaminants to non-hazardous compounds, often within months. In the 2007 SCRDC study, ISCO and bioremediation were found to be the most effective and successful technologies in achieving regulatory site closure at PCE contamination sites (SCRDC 2007). The same study reported that groundwater pump and treat was widely criticized as inefficient and too expensive as a groundwater remediation technology (SCRDC 2007).

Final Site Remediation

The groundwater remediation pilot test currently underway will provide information to assist in design and implementation of the remedy for shallow and deep groundwater. The final groundwater remedial system for PCE and any other contaminant will depend on the results of this pilot test and ongoing groundwater monitoring. I also understand that further investigations will be done that may impact the selection and/or scope of additional remedial measures that may be needed to augment the use of ISCO as the primary remedy. Ongoing remedial actions at the site involving SVE, in-situ treatment, and ongoing natural attenuation will continue to reduce dissolved-phase VOC concentrations. Remedial actions at the site will continue until WDNR-approved remedial action objectives are achieved. It is expected that the final approved cleanup levels for the site will also rely on ongoing natural attenuation processes that will continue to reduce VOC concentrations with time after source removal. Regardless, remedial actions will be conducted to achieve levels protective of health and the environment, all under the oversight of the WDNR.

2.4 Expert Opinion 4

Releases of PCE and other constituents from the Madison-Kipp facility do not present or threaten an “imminent and substantial endangerment to health or the environment.”

2.4.1 Summary of Bases for Opinion

2.4.1.1 Legal Standard

I have been instructed as to the following legal standards for the Resource Conservation and Recovery Act (RCRA), and provide my opinions based upon these standards.

RCRA Section 6972(a)(1)(B) permits a private party to bring suit only upon a showing that the solid or hazardous waste at issue “may present an imminent and substantial

endangerment to health or environment." 42 United States Code § 6972(a)(1)(B). I understand that the U.S. Supreme Court has held: "To be imminent, a threat must be present now, although the impact of that threat may not be felt until later." Meghrig v. KFC Western, Inc., 516 U.S. 479 (1996).

The *Meghrig* Court further held:

> *The meaning of this timing restriction is plain: An endangerment can only be 'imminent' if it "threaten[s] to occur immediately," Webster's New International Dictionary of English Language 1245 (2d ed. 1934), and the reference to waste which "may present" imminent harm quite clearly excludes waste that no longer presents such a danger.* Meghrig v. KFC Western, 516 U.S. 479, 485-86 (1996).

As to a substantial danger, the threat must be serious and there must be some necessity for the action.

I understand that courts will not find that an imminent and substantial endangerment exists if the risk of harm is remote in time, completely speculative in nature, or de minimis in degree. In other words, if there is no near-term threat, there is no imminent endangerment.

2.4.1.2 Site Conditions

Soil, Soil Vapor, and Shallow Groundwater

As previously discussed, it is my opinion that the extent of contamination in soil, soil vapor, and shallow groundwater has been defined, is limited, and that appropriate remedial actions have been or will be implemented to address this contamination. It is my opinion, based on these findings, the reports of other experts (Dr. Barbara Beck [Beck 2013] and Nadine Weinberg [Weinberg 2013]), and the legal standard set forth above, that releases of PCE or other constituents from Madison-Kipp do not present or threaten an imminent or substantial endangerment to health or the environment.

Because the low rates of groundwater flow and contaminant migration at the site have limited the extent of migration from the site in shallow groundwater, remedial actions being tested currently at the site are expected to be effective in remediating VOC-impacted shallow groundwater. Although the scope of the groundwater remedy may be somewhat greater than if such a remedy could have been implemented in 1994, the application of in-situ treatment technology was not yet documented to be a proven and effective technology to address groundwater at that time, as it is today. It is also my opinion that additional PCE

migration that may have occurred during the period since 1994 has not substantially changed the overall scope and effectiveness of the shallow groundwater remedy given the low rates of shallow groundwater flow and contaminant migration.

Ongoing remedial actions, including SVE, in-situ treatment, and natural attenuation, will continue to reduce dissolved-phase VOC concentrations in groundwater. These remedial actions at the site will continue until WDNR-approved remedial action objectives are achieved.

Deep Groundwater

There is no groundwater use in the residential area and immediate site vicinity. The deep groundwater is not a source of sub-slab soil vapors. Furthermore, PCE has not been detected in City of Madison Unit Well 8, the closest water supply well, located approximately 1,500 ft southeast of the site. Unit Well 8 is 774 ft deep and obtains water from the Lower Bedrock Aquifer. This well, which is used only seasonally, has protective casing and an annular seal extending from the surface through the Eau Claire Aquitard, isolating the Lower Bedrock Aquifer from shallow sediments (Ruekert/Mielke 2011). The Eau Claire Aquitard provides an important barrier to possible vertical movement of contaminants into the Lower Bedrock Aquifer that might be present in the overlying Upper Bedrock Aquifer. Only trace levels of cis-1,2-dichloroethylene (cis-1,2-DCE) have been detected in Unit Well 8, and the City has identified 51 known or potential sources of contamination in the vicinity of the well, including sanitary sewers, industrial sites, AST and underground storage tank (UST) sites, spill sites, landfills, solid waste sites, electrical transformers, remediation sites, RCRA sites, road salt use, and the use of pesticides and herbicides throughout the area.

PCE is commonly found in groundwater in urban areas, as a result of the continuing widespread use of PCE in dry cleaning and other industrial uses. Monitoring by the City of Madison has detected PCE in multiple water supply wells (Madison Water Utility 2012). Recent studies by the U.S. Geological Survey (USGS) have documented that PCE and other VOCs are widespread and commonly present at low concentrations in groundwater in urban areas (Lawrence Livermore National Laboratory 2005; USGS 2009). Although commonly used laboratory reporting limits for VOCs may not detect PCE in groundwater, using much lower detection limits, the USGS found that PCE was commonly present in groundwater samples in urban areas.

Routine groundwater monitoring of Unit Well 8 conducted by the City of Madison provides the city an early warning of possible contamination impacts to that well by any contaminant, from any source. PCE has never been detected in Unit Well 8. Even if PCE were to be

detected in Unit Well 8, in my experience such detections (which would be at extremely low levels) would provide sufficient time (i.e. at least several years) in which appropriate remedial actions could be taken, if warranted, before actionable levels were present in the well. Therefore, even if the City of Madison detected PCE in Unit Well 8 tomorrow, there would be enough time for appropriate remedial actions to be taken, such that there would be no threat of an imminent and substantial endangerment to health or the environment.

My opinion is supported by hydrogeologic conditions, the low rates of migration of VOCs in groundwater, groundwater remedial actions that are currently being or will be implemented, the lack of detection of PCE in the closest water supply well, the depth of that water supply well, and the presence of natural barriers to contamination. It is also my understanding that any remediation that may be required with respect to the deep groundwater will be undertaken to address PCE or other VOCs that are related to Madison-Kipp in the deep groundwater.

2.5 Rebuttal Responses to Opinions of Plaintiff Expert, Dr. Lorne Everett

Following are rebuttal responses to certain opinions of Plaintiff's expert, Dr. Lorne Everett. It should be noted that review of Dr. Everett's expert report is ongoing and additional rebuttal responses may be provided at some future date.

> Dr. Everett suggests that "In the technical literature, the presence of TCE….in the environment was noted as early as 1949 by Lyne and McLachlan. The article, published in The Analyst published by the Royal Society of Chemistry (London), describes two cases of groundwater contaminated by TCE…. The publication concluded that 'contamination by compounds of this nature is likely to be very persistent'." (Everett 2012, p. 23)

Dr. Everett neglects to mention, however, the comprehensive study of the historical context and influence of 1949 Lyne and McLachlan's article by Rivett et al. in 2006 (Rivet et al. 2006). Rivett et al. (2006) concluded that this article received very little notice at the time, as the authors were conducting a very limit study for local authorities and, as such, it was unlikely that trichloroethene (TCE) would have become an emerging issue in the United Kingdom (UK) or elsewhere. This article was reportedly not cited at all in the 1970s and 1980s literature describing increasing concerns in the United States and Europe regarding solvents in groundwater, and was not cited in the UK until 2000. Rivett et al. (2006) concluded that the 1949 Lyne and McLachlan article did not result in any awareness of the problem of TCE (or other chlorinated solvents) in groundwater at the local, national, or international levels. Furthermore, Rivett et al. (2006) concluded that the results of the 1949

study did not trigger any general recognition of this problem by the scientific, engineering, or regulatory community.

Consistent with my personal experience in the environmental industry during the last 37 years, there was not general recognition of the problem of solvents (such as PCE) in groundwater until the late 1970s and early 1980s (Rivett et al. 2006). The study by Rivett et al. (2006) of the history of awareness of chlorinated solvent in groundwater, indicated that there were almost no publications that confirmed solvent concentrations in groundwater in the United States before 1975.

It was not until the mid- to late 1970s, after the discovery of chloroform and other trihalomethanes in drinking water supplies resulting from chlorination, that USEPA surveys and other local studies revealed the contamination by chlorinated solvents, leading to the conclusion between 1976 and 1979 that groundwater in many areas of the United States was contaminated by chlorinated solvents (Pankow and Cherry 1996; Rivett et al. 2006). This is consistent with studies I have personally conducted regarding the historical discovery of chlorinated solvents, including PCE and TCE, in groundwater (Johnson 2003; Johnson and Nichols 2002).

> Dr. Everett suggests that "When a regulatory agency requires a responsible party to "determine the horizontal and vertical extent of contamination." This typically means conducting sampling programs until non-detects are found and the true edge of the contaminant plumes can be mapped out." (Everett 2012, p. 46)

This statement is incorrect. In my 37 years of experience working on hundreds of sites, regulatory agencies typically do not require sampling and definition to non-detect levels. The actual levels used to define the extent of contamination vary depending on the location and the chemical. However, concentration levels, such as drinking water MCLs, are commonly used to define the extent of contamination.

> Dr. Everett suggests that "Manmade structures such as buried utility lines and sewers can serve as preferential pathways for contaminant migration in the subsurface." (Everett 2012, p. 39)

In my opinion, there is no evidence that preferential pathways, such as utility corridors, sanitary sewers, and storm drains, have influenced contaminant migration in the site vicinity. This opinion matches WDNR's conclusion that soil vapor and groundwater sampling data do not indicate that contaminant migration has occurred through preferential pathways (Schmoller Dep. 2012, p. 69). For example, WDNR concluded that the sanitary

sewers along South Marquette Street and Waubesa Street are oriented north-south and do not provide a pathway from the Madison-Kipp facility (Schmoller Dep. 2012, p. 70). Because WDNR has determined that there is no evidence of contamination related to sewer lines, WDNR has no plans to investigate sewers or utilities as preferential pathways for contaminant migration (Schmoller Dep. 2012, pp. 70-71).

> Dr. Everett suggests that PCE "likely infiltrated into the groundwater in a "free product" or DNAPL (dense non-aqueous phase liquid…". He also suggests that "the 1% rule" (referring to the comparison of the dissolved concentration of a compound in groundwater with the aqueous solubility of the compound) indicates the presence of DNAPL in the subsurface. (Everett 2012, p. 47)

There is no direct evidence of dense non-aqueous phase liquid (DNAPL) in subsurface soil or groundwater at the site. DNAPL has not been encountered from any of the more than 100 soil borings and monitoring wells at Madison-Kipp. WDNR has also concluded that there is "no indication" of DNAPL, and that no DNAPL is present at the site (Schmoller Dep. 2012, p. 115).

There are indirect methods for assessing whether PCE or other chemicals in soil and groundwater are present as non-aqueous phase liquids (NAPL) (Cohen et al. 1992; Feenstra et al. 1992; ITRC 2004; USEPA 2009). In soil, concentrations of chemicals exceeding 1 percent of the soil mass (above 10,000 milligrams per kilogram [mg/kg]) have been reported as generally indicative of the possible presence of NAPL (Feenstra et al.1992; USEPA 1992). The highest concentration of PCE in soil at the Madison-Kipp site is 5,000 mg/kg, less than half of the concentration suggestive of NAPL presence (ARCADIS 2013b).

For groundwater, comparison of chemical concentrations in groundwater with the aqueous solubility of the chemical was developed as a "rule of thumb" (USEPA 1992), and not a "fixed rule," as suggested by Plaintiffs' expert, Dr. Everett, indicating the presence of NAPL. Multiple studies of NAPL occurrence indicate that, where present as a separate phase, DNAPL compounds are generally present at concentrations less than 10 percent of their aqueous solubility limit in groundwater samples (Cohen et al. 1992; Cohen and Mercer 1993; United Kingdom Environment Agency 2003; USEPA 1993a, 1994). The aqueous solubility of PCE is reported to be as high as 200,000 micrograms per liter (µg/L) (Cohen et al. 1992). The PCE concentration in water corresponding to 10 percent of this solubility would be 200,000 µg/L. The highest PCE concentration detected in groundwater at the Madison-Kipp site is only 9,400 µg/L (ARCADIS 2013b). In my experience, chemicals often occur in groundwater plumes at concentrations above 1 percent of the chemical's solubility,

and do not indicate that NAPL is present in the nearby groundwater. Additionally, due to the qualitative nature and uncertainty of these "rules of thumb" and the inherent variability of subsurface conditions, the USEPA has found in a review of multiple site investigations that this criterion rule was "indeterminate at best" for DNAPL delineation, and that "…the 1% solubility rule of thumb was therefore not a good estimator…" at some sites (USEPA 2004).

Pankow and Cherry, in their textbook *Dense Chlorinated Solvents* (Pankow and Cherry 1996) indicate that this 1 percent "rule-of-thumb…should not be viewed as a strict criterion" because the dissolved concentrations in a monitoring well depend on factors other than the presence or absence of DNAPL source zones. Therefore, they indicate that the use of a 1 percent rule of thumb to assess DNAPL presence "could be an extreme overestimate" (Pankow and Cherry 1996).

> Dr. Everett presents a suggested remediation program for soil, soil vapor, and groundwater "at and around the Madison-Kipp Site" (Everett 2012, pp. 56-59)

The remediation program suggested by Dr. Everett is not supported by the facts and extensive data from the site area. While his suggested remediation technology for VOCs is appropriate for on-site soils, which are effective in controlling VOC off-site migration in soils, there is no basis for further remediation of VOCs in off-site soils. Furthermore, as concluded by WDNR, sampling data indicate that no further remediation or mitigation is required to address off-site VOCs.

For groundwater, Dr. Everett does correctly conclude that ISCO for groundwater remediation is "probably appropriate"; however, he provides unsupported speculation regarding the number and depths of injection locations that will be needed. Pilot tests are underway to determine the scope of this groundwater remedy, and the depths and locations of ISCO injection will be determined based on the results of that testing, ongoing groundwater monitoring results, and WDNR review.

Dr. Everett's incorrectly suggests that groundwater extraction and treatment be included as a component of the groundwater remedy. Groundwater monitoring data indicate that the extent of VOCs in shallow groundwater is defined for the purposes of selecting remedial actions. Based on those monitoring data and concurrence from the WDNR, in-situ treatment technology is being evaluated in pilot tests as the remedial approach for shallow groundwater. Due to the limited extent of VOCs in groundwater and the low rates of groundwater movement at the site, groundwater extraction and treatment is not warranted for shallow groundwater. I understand that further investigations will be done that may

impact the selection and/or scope of additional remedial measures that may be needed to augment the use of ISCO as the primary remedy for groundwater.

> Dr. Everett suggests that environmental managers at Madison-Kipp did not have "environmental training", and as a result they did not have the necessary "training and authority" to address environmental matters at the site. (Everett 2012, p. 24)

My experience indicates that industrial facility managers and employees have generally been facilities specialists, not trained environmental engineers. Also, it has been my experience that these facilities managers and employees relied on industry guidance and local regulations in the use of equipment and waste disposal activities, and were not trained environmental engineers. When needed, Madison-Kipp hired engineering and environmental professionals to address more complex technical issues.

> Dr. Everett incorrectly suggests that Madison-Kipp has not been "responsive" to WDNR in the environmental investigation and cleanup process. (Everett 2012, p. 31)

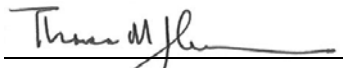
The interactive process between WDNR and responsible parties, such as Madison-Kipp, involves submittal of work plans and reports by the responsible party (Madison-Kipp) for review and approval by the WDNR. It is typical for there to be differences in technical interpretation and occasional disagreements regarding various aspects of these plans and reports. The WDNR cannot unilaterally direct the responsible party how to perform specific work tasks, but relies on the process whereby the responsible party and their environmental consultant negotiate the appropriate actions. Additionally, in 1994 immediately following receipt of the July 1994 letter from WDNR requiring on-site investigations of possible VOC releases, Madison-Kipp also evaluated the possibility that VOCs in groundwater may have originated from other nearby off-site industrial facilities. In my 37 years of experience, this is not only a common step; it is a necessary step in evaluating the occurrence of groundwater contamination. Furthermore, the WDNR project manager, Michael Schmoller, has concluded that Madison-Kipp did not intend to make "someone else" responsible for the contamination discovered in 1994 (Schmoller Dep. 2012, p. 212).

> Dr. Everett incorrectly suggests that it is "unusual" for a company's attorney to attend every meeting with regulating agency representatives. (Everett 2013, p. 35)

In my experience, it is common for attorneys for a potentially responsible party to be present at every meeting with regulating agency representatives.

3. Signature Page

Appendix C to this report presents a copy of my current Curriculum Vitae, a list of publications that I have authored in the past 10 years, and a list of cases in which I have provided expert testimony during the past four years. My employer, ARCADIS U.S., Inc., (ARCADIS), charges $345 per hour for my time on this project.



January 21, 2013

Thomas M. Johnson, P.G., C.HG.
Executive Vice President, Technical Director
and Principal Hydrogeologist
Wisconsin Professional Geologist No.

Date

Appendix A

Supporting Materials

Site Description and Background Information

1. Site Description

The Madison-Kipp site is approximately 7.5 acres in size. A 130,000-square ft building occupies much of the site, with asphalt parking lots located in the northeastern, southwestern, and southeastern portions of the site. The building has a 25,000-square ft second floor and a 25,000-square ft basement. The site is currently used as a metals casting facility. The site is located in the eastern portion of Madison in a mixed-use area of commercial, industrial, and residential land use. The site is also located at the northeast end of the Madison isthmus, approximately 1,500 ft north of Lake Monona and approximately 6,800 ft east of Lake Mendota.

2. Historical Site Operations and Land Use

2.1 Historical Madison-Kipp Site Operations

Historical site operations are summarized in multiple Phase I ESAs completed in 2002 (URS Corporation [URS] 2002a), 2006 (RSV Engineering [RSV] 2006b), and 2010 (RJN Environmental Services, LLC [RJN] 2010b). Additional information regarding current and historical site operations was obtained from interviews with multiple current and former Madison-Kipp employees. Information regarding land use and layout of the Madison-Kipp facility and the surrounding area was obtained from review of aerial photographs and Sanborn Fire Insurance Maps.

The site has been used as an industrial metal casting facility for more than 100 years, producing metal parts and components for military, automotive, and various industrial uses. Historically, the company included two divisions: 1) the Lubricator Division, which operated in the northern (Waubesa) end of the building; and 2) the Die Casting Division, which operated in the southern (Atwood) building. Currently, natural gas-fired furnaces are used for melting metals, which are then poured into molds to cast parts. The facility conducts limited post-casting processing of parts.

Initial development of the Madison-Kipp facility consisted of a building at the north end of the property (the Waubesa Building) and a second building along Atwood Avenue to the south (the Atwood building). Building additions were constructed in several phases, and ultimately the two buildings were connected by these additions. The current configuration of the building was established by 1968.

2.2 Historical Chemical Use and Handling

Facility operations and chemical use and waste handling procedures have changed over the years. Information regarding chemical use and waste handling was obtained from the 2002, 2006, and 2010 Phase I ESA reports (URS 2002; RSV 2006; RJN 2010) and from interviews in December 2012 and January 2013 with the following current and former Madison-Kipp employees:

- Marv Jellings (1956 to 2011) – Maintenance department, hydraulics specialist, crane operator, and machine maintenance (Jellings 2012)
- Dan Keyes (1976 to present) – Maintenance department and currently alloy manufacturing specialist (Keyes 2012, 2013)
- Walt Largen (1965 to 2005) – Die cast department, Maintenance department, electrical specialist (Largen 2013)
- Jim Lenz (1980 to 2011) – Facility Engineer, Manufacturing Engineer, Facilities Engineering and Environmental Manager (Lenz Dep. 2012; Lenz 2013)
- Doug Peterson (1973 to present) – Maintenance department (Peterson 2013)
- George Schluter (1971 to 2012) – Maintenance department and Group Leader (Schluter 2012).

Chemical usage at the facility has included hydraulic oils, chlorinated solvents including PCE, chlorine, caustic solutions, and other water-based compounds, as well as Stoddard solvent. Since at least 1971, waste liquids and sludge from spills, degreaser wastes, and other sources at the facility were transferred into a 500-gallon waste container, from which the waste was removed by a waste hauler for off-site treatment or disposal (Jellings 2012; Keyes 2012 ; Largen 2013; Lenz 2013; Schluter 2012). Spills that did occur were cleaned up using “oil-dri” absorbent and transferred to a waste container (Jellings 2012; Schluter 2012).

Waste oils from a central piping trench in the facility and any spill residues that may have occurred on the Madison-Kipp plant floor were recovered using an industrial vacuum machine (Seacor machine) and transferred into a 500-gallon waste container for off-site treatment or disposal (Jellings 2012; Keyes 2012; Lenz 2013; Schluter 2012).

Hydraulic oil and PCE waste liquids were recycled in the oil shed to recover and reuse the hydraulic oil and PCE (Jellings 2012). Mr. Joe Lindsay operated an oil separator, sand filter, and a centrifuge to recover hydraulic oils and used a still to recover PCE for reuse at the facility (Jellings 2012). PCE was reportedly recycled multiple times in this process, and waste residues from this process were placed in 55-gallon drums (Jellings 2012). For an unknown period prior to 1976 or 1977, when the parking and driveway areas were covered or paved, some oil wastes were periodically used for dust control and sprayed by employees in the parking lots and driveways (Lenz Dep. 2012, p. 73-74). After the parking areas and driveways were paved in 1976 or 1977, all wastes from the facility were collected for off-site disposal (Lenz Dep. 2012, p. 74).

If PCE used to clean die machines would drip onto the floor adjacent to the machine being cleaned, it was cleaned up using “oil-dri” (Lenz Dep. 2012, p 62). There were no floor drains in the area of the die machines; however, beneath some machines, there were shallow collection trenches that contained spills and led to a collection area in the facility (Lenz Dep. 2012, p. 62). Mr. Lenz testified that he was not aware that there were any spills to floor drains in the facility (Lenz Dep. 2012, p. 65). Mr. Lenz testified that since at least 1980, when he started working at Madison-Kipp, liquid wastes in this collection area were removed using an industrial vacuum and transferred to the 500-gallon waste tank, and that a waste hauler would pick up those wastes for off-site disposal (Lenz Dep. 2012, p. 62). Mr. George Schluter, Maintenance Department Group Manager, who worked at Madison-Kipp from 1971 to 2012, and Marv Jellings, Maintenance Department employee from 1956 to 2010, reported that they did not recall anyone disposing of PCE or oils outside the facility, other than oils applied to the parking area for dust control, and that all wastes during that period were removed for off-site disposal by a waste hauler (Jellings 2012; Largen 2013; Schluter 2012).

Historically, there was a central piping trench that ran from south to north through the center of the Atwood Building. This concrete-lined trench was constructed to house piping for natural gas, vacuum, hydraulic oil, and cooling water for the die machines (die water) (Keyes 2012; Lenz 2013; Schluter 2012). This trench, which was approximately 4 ft wide, 2 to 4 ft deep, and covered with steel plates, was not constructed for waste collection and drainage and did not connect to any sewer or drain systems in the facility (Keyes 2012). WDNR has concurred that wastes released to the piping trench were contained within the trench and did not discharge to any location (Schmoller Dep. 2012, p. 286). Wastes that could have entered the piping trench included spilled hydraulic oils, PCE, water, and other liquid wastes. These hydraulic oils may have contained PCBs. From some period prior to 1980 until the piping trench was closed, wastes from the piping trench were periodically removed and transferred to a dumpster or 500-gallon waste container in the facility prior to

removal by a waste hauler for off-site disposal (Jellings 2012; Keyes 2012; Lenz Dep. 2012, p. 62; Lenz 2013; Schluter 2012).

2.3 PCE and Degreaser Use

Historically, prior to approximately 1987, PCE was used by Madison-Kipp to clean machines, equipment, and metal parts in the manufacturing process (Lenz Dep. 2012, p. 61). PCE was also used in vapor degreasers to clean metal parts prior to manufacturing (Lenz Dep. 2012, p. 37; Lenz 2013). Multiple wash tanks using water and other non-PCE cleaning compounds, such as Stanisol, were also commonly used to clean metal parts at the facility throughout its history (Lenz Dep. 2012, p. 61). During the period that it was used at the facility, PCE and other chemicals were also used for cleaning of grease and dirt from the die cast machines (Keyes 2012; Lenz Dep. 2012, p. 61). Machine operators used small buckets containing a “few inches” of PCE and a brush to clean these machines (Lenz Dep. 2012, p. 61).

PCE solvent degreasers were used at the facility from some unknown date prior to 1980 until the late 1980s. Degreasers and wash tanks were reportedly located in different locations at different times within the facility (Jellings 2012; Keyes 2012; Lenz 2013; Schluter 2012). A large vapor degreaser used by the Die Cast Division was located along the eastern wall of the southern (Atwood) building, close to the eastern property line (Lenz Dep. 2012, p. 42; Schluter 2012). The vapor degreaser vent discharged along an east exterior wall of the northern portion of the building (Lenz Dep. 2012, p. 42). There were reportedly no floor drains in the vicinity of this degreaser (Lenz Dep. 2012, p. 64).

Based on interviews with current and former employees, the large PCE vapor degreaser was approximately 8 ft long, 4 ft wide, and 4 ft high, with a ventilation hood and ducting that vented to the outside (Keyes 2012; Lenz Dep. 2012, p. 38). This large degreaser held an estimated 75 to 100 gallons (Lenz Dep. 2012, p. 41). The large vapor degreaser at the Madison-Kipp facility was heated by natural gas and included a cooling system (condenser) that produced the vapor cloud in the machine that the degreaser used to clean the metal parts (Keyes 2012; Schluter 2012). Based on employee descriptions, this vapor degreaser, which contained a condenser, was similar to that described in the 1948 and 1976 ASTM Vapor Degreaser Manuals, and also is consistent with my experience that all such vapor degreasers would use a cooling mechanism (condenser). PCE used in this degreaser was stored in an approximately 250-gallon AST located in the oil shed (Lenz Dep. 2012, p. 42). The PCE tank was situated on a concrete floor in the oil shed, and there were no floor drains in the area where the PCE tank was located (Lenz Dep. 2012, p. 68).

The large vapor degreaser was subsequently transferred from the Die Cast Division to the Lubricator Division in 1983 or 1984, and moved to a location in the northern (Waubesa) building (Lenz Dep. 2012, p. 34-35). Venting from this vapor degreaser was to the outside adjacent to the parking lot. There were reportedly no floor drains in the vicinity of this degreaser (Lenz Dep. 2012, p. 64), and I did not observe any floor drains in that area during my inspections of the facility. PCE was obtained from an AST located in the alcove outside the east wall of the northern (Waubesa) building (Lenz Dep. 2012, p. 42). This PCE AST was also situated in an area of concrete paving that sloped to a grassy drainage area along the northeast side of the building (Lenz Dep. 2012, p. 69). The degreaser in the north Waubesa Building was reportedly removed from the building when the Lubricator Division was sold in the late 1980s.

PCE was manually transferred from the approximately 250-gallon AST located in the oil shed to the degreaser located adjacent to the east side of the Waubesa Building (Lenz Dep. 2012, pp. 39, 43; Schluter 2012). PCE transfer was performed by employees using approximately 5-gallon buckets placed on a rolling cart and was poured into the degreaser (Lenz Dep. 2012, pp. 39, 41; Schluter 2012). Former employee Jim Lenz, who worked at the facility from 1980 to 2011, reported that he heard that that there were spills, including some spills near the PCE ASTs, but did not see any spills (Lenz Dep. 2012, pp. 44-45).

In addition to the large vapor degreaser, employees also report that there was a smaller PCE parts cleaner or degreaser, approximately 3 to 4 ft square and 4 ft tall (Keyes 2012). Metal parts were reportedly cleaned by dipping parts directly into the liquid PCE in this parts cleaner. This smaller parts cleaner was reportedly removed from the facility at some unknown time after 1976 (Keyes 2012).

2.4 PCE Waste Handling

Periodically, PCE degreasers were cleaned to remove the accumulated degreasing waste and sludge from the degreaser tank. Consistent with industry guidance for the operation of vapor degreasers (ASTM 1962, 1976), used PCE liquid from degreasers was routinely recycled and recovered by Madison-Kipp for reuse through the use of a still (Jellings 2012; Schluter 2012). Reclamation of PCE solvent from waste liquids and degreaser sludge was important for economic reasons and done whenever possible, to decrease PCE solvent costs (ASTM 1976). After removing the used PCE, the remaining wastes would have consisted of semi-solid sludge, comprised of oils, metal particles, dirt, and PCE residues (ASTM 1962, 1976). This sludge material was shoveled out of the degreaser at Madison-Kipp (Lenz 2013). Former employees recall that the sludge material that was shoveled out

went into shallow trays or a rolling dumpster, to be sent off-site for treatment or disposal (Schluter 2012, Jellings 2012).

At the Madison-Kipp facility, former employees indicate that since at least 1971, no degreaser wastes were spread on the land surface (Schluter 2012). Further, since at least 1971, all spent PCE solvent and degreaser wastes were picked up by a waste hauler for off-site disposal (Schluter 2012). Although there is no direct evidence that it was done at Madison-Kipp, during the period from the 1940s to 1970s, industry guidance regarding the disposal of chlorinated solvent waste recommended that PCE waste be poured on the ground (ASTM 1962, 1976; MCA 1948). Thus, if this were done at Madison-Kipp, it would have been consistent with industry standard and guidance.

2.5 Chemical Storage and Recycling

Historically, chemicals, including hydraulic oils and PCE were stored in large ASTs in a separate facility building known as the "oil shed" (Jellings 2012; Keyes 2012; Schluter 2012). The oil shed is currently located at the northeast end of the eastern or Atwood Building, adjacent to the north parking lot. For many years prior to the 1970s, PCE and hydraulic oil were stored in the oil shed in approximately 250-gallon ASTs. PCE to be used in the facility was transferred from the AST using 5-gallon buckets placed on a rolling cart (Jellings 2012; Schluter 2012). In addition to chemical storage, operations in the oil shed also included recycling of waste hydraulic oils and PCE (Jellings 2012). Waste hydraulic oils were recycled there, using filters and a centrifuge, so that the oils could be used "many times over" (Schluter 2012). Waste PCE was also routinely recycled and recovered in the oil shed through the use of a still for reuse in the degreasers (Jellings 2012; Schluter 2012). The filters, centrifuge and still were operated at various times by Madison-Kipp former employee Joe Lindsay (Jellings 2012, Schluter 2012).

PCE used by the Lubricator Division was obtained from an AST located in an outside alcove on the northeast side of the Waubesa Building, where it remained until the AST was removed.

Prior to 1976 or 1977, when the parking lots and driveways were paved, waste oils from the facility were also periodically spread on the parking areas and driveways of the Madison-Kipp facility to help control dust. These wastes included waste oils collected in the facility from the waste tank, piping trench and spills using an industrial vacuum machine ("Seacor" machine) (Schluter 2012). It is likely that these oil wastes contained PCBs and PCE. The parking areas and driveways where these waste oils were placed have been covered by asphalt or concrete paving or buildings since at least 1976 or 1977.

2.6 Off-Site Commercial and Industrial Land Use

Immediately northwest of the Madison-Kipp facility, at 214 Waubesa Street, is Madison Brass Works, which has operated at that location since at least 1950 (ARCADIS 2012g). Releases of petroleum from leaking USTs have resulted in soil and groundwater contamination at Madison Brass Works, directly upgradient relative to groundwater flow from the Madison-Kipp property (Dames & Moore 1995b; Ruekert/Mielke 2011).

Directly north of the Madison-Kipp site, at 149 Waubesa Street, is the former location of Theo Kupfer Iron Works, where at least eight USTs ranging from 275 to 12,000 gallons were located (Ruekert/Mielke 2011). This former industrial facility is currently occupied by the Goodman Community Center.

On the south side of Atwood Avenue across from the Madison-Kipp facility is the location of a former Clark Oil service station (2801 Atwood Avenue, now operating as a BP service station), where site investigation and remediation activities have been conducted to address releases of petroleum hydrocarbons to the subsurface.

3. Hydrogeologic Conditions

The Madison area lies in a part of Wisconsin underlain by a thick sequence of Paleozoic sedimentary rock that was deeply eroded during Pleistocene glaciations (Clayton and Attig 1977). In the vicinity of the site, bedrock surface lies beneath approximately 35 ft of unconsolidated glacial sediments.

3.1 Geology

Glacial sediments in the site vicinity include interbedded lake sediments (e.g., stratified sand, silt, and clay) and glacial till (much denser and poorly sorted gravelly, clayey silty sand). Glacial sediments underlying the site area generally consist of the following:

- Surficial fill materials generally less than 5 ft thick
- Clay or silty clay at depths of approximately 5 to 15 ft bgs
- Sand at depths of approximately 10 ft bgs to the top of the underlying bedrock at approximately 35 ft bgs. The sand is typically fine-grained and silty, with occasional gravel beds.

While the sedimentary bedrock in the Madison area is nearly flat-lying, the bedrock surface was deeply eroded by glaciers. Lakes Mendota and Monona, located to the north and south of the site, respectively, occupy deep glacial valleys that were scoured into bedrock at least 200 ft deeper than the bedrock surface at the site (Bradbury et al.1999).

The site area is underlain by approximately 750 ft of Cambrian-aged sandstone, shale, and dolomite. The expected stratigraphy at the site is described in the following sections (Ruekert/Mielke 2011).

3.2 Hydrogeology

Sediments and bedrock units underlying the site and surrounding area have been divided into four primary hydrogeologic units (Bradbury et al. 1999):

- **Unconsolidated Zone (Upper Unconsolidated Aquifer)**
  This upper groundwater zone consists of discontinuous glacial sediments between the groundwater surface and the underlying bedrock. This zone is very thin or absent in the southern part of the site, where the groundwater surface is close to or below the bedrock surface and is as thick as 10 to 15 ft in the northern portion of the site, where it occurs within the coarser-grained sandy sediments of the unconsolidated zone.

  Results of hydraulic conductivity calculated from testing at the Madison Brass Works site were 0.85 ft per day (ft/d) for shallow silt sand sediments (Dames & Moore 1997a). The Wisconsin Geological and Natural History Survey (WGNHS) reported that the hydraulic conductivity of unconsolidated lake bed sediments in the area is 0.1 to 1.4 ft/d (Bradbury et al. 1999). Based on groundwater elevations measured at the site in July 2012, the horizontal hydraulic gradient in the shallow zone was 0.001 ft/ft (ARCADIS 2013b). Rates of groundwater vary depending on hydrogeologic conditions; however, based on a range of hydraulic conductivity from 0.1 to 1.4 ft/d, a horizontal hydraulic gradient of 0.001 ft/ft, and assumed effective porosity of 25 percent, the calculated rate of groundwater flow in this zone ranges from 0.2 to 2 ft/yr.

- **Upper Paleozoic Aquifer (Upper Bedrock Aquifer)**
  The Upper Bedrock Aquifer includes sediments of the Tunnel City Group and Wonewoc Formation, approximately 210 ft in total thickness. This unit is not used extensively for water supply in the Madison area; however, there is no groundwater use for water supply in the immediate vicinity of the Madison-Kipp facility.

Regionally, this unit is reported to be moderately permeable, with an estimated hydraulic conductivity ranging from 4.4 to 5 ft/d (Bradbury et al. 1999; Ruekert/Mielke 2011). However, site-specific hydraulic testing at the Madison-Kipp site indicated that the hydraulic conductivity of the Upper Bedrock Aquifer is 0.6 ft/d (Dames & Moore 1997a). The porosity of this unit has been estimated to be as low as 5 percent (Bradbury et al. 1999).

Based on groundwater elevations measured at the site in July 2012, the horizontal hydraulic gradient in the Upper Bedrock Aquifer ranged from 0.0003 to 0.001 ft/ft (ARCADIS 2013b). Rates of groundwater vary depending on hydrogeologic conditions. Based on a range of hydraulic conductivity from 0.6 to 5 ft/d, a horizontal hydraulic gradient ranging from 0.0003 to 0.001 ft/ft, and assumed effective porosity of 5 percent, the calculated rate of groundwater flow in this zone ranges from 1 to 36 ft/yr.

- **Eau Claire Aquitard**
  This low-permeability aquitard consists of thin shale layers near the top of the Eau Claire Formation. Where present, this aquitard separates the Upper Bedrock Aquifer from the Mt. Simon Aquifer below. The Eau Claire Aquitard is present beneath the immediate site vicinity, but has been eroded and may be absent in the glacial bedrock valleys beneath Lake Monona and Lake Mendota.

  The hydraulic conductivity of the Eau Claire Aquitard has been estimated to be 0.006 ft/d (Bradbury et al. 1999), indicating that, where present, this aquitard significantly restricts vertical groundwater flow.

- **Mt. Simon Aquifer (Lower Bedrock Aquifer)**
  The Lower Bedrock Aquifer includes the Mt. Simon Formation, the portion of the Eau Claire Formation below the Eau Claire Aquitard, and has a total thickness of approximately 500 ft. The Lower Bedrock Aquifer is the primary water-supply aquifer in the region and provides water to City of Madison water-supply wells.

  The hydraulic conductivity of the Mt. Simon Aquifer has been estimated to be approximately 10 ft/d (Bradbury et al. 1999), and the porosity is estimated to be 30 percent (Bradbury et al. 1999).

The sandstone bedrock aquifers are relatively permeable and have porosities generally ranging from 5 to 30 percent, providing significant groundwater flow and storage. However, significant groundwater flow also occurs through secondary fractures in the bedrock.

The average annual precipitation in the Madison area is approximately 30 inches per year (in/yr), and the average rate of recharge to groundwater is 6 in/yr (Ruekert/Mielke 2011). The groundwater surface beneath the site generally occurs at depths of ranging from 15 to 35 ft bgs and varies seasonally in response to changes in precipitation (ARCADIS 2013b). Shallow groundwater flow in the site area in the glacial sediments and Upper Bedrock varies somewhat, but is generally toward the south and southeast, and vertically downward in response to significant vertical hydraulic gradients. The horizontal hydraulic gradient in the shallow groundwater zone in the site vicinity ranges from 0.00003 to 0.001 ft/ft, while the downward vertical hydraulic gradient is significantly greater, ranging from 0.03 to 0.05 ft/ft (ARCADIS 2013b), reflecting the presence of lower-permeable sediments in the bedrock that restrict groundwater flow.

4. Summary of Previous Site Investigation and Remediation Activities

Extensive site investigations have been conducted at the Madison-Kipp since 1994 under the direction of WDNR. Following is a chronological summary of site investigations conducted by Madison-Kipp.

4.1 Site Investigations – 1994 to 1995

Site investigation activities were initiated by Madison-Kipp in 1994 in response to a July 18, 1994 WDNR letter (WDNR 1994), requesting that Madison-Kipp investigate the occurrence of VOCs found in shallow groundwater at two neighboring properties. Prior site investigations had been conducted at two adjacent properties and reported to the WDNR. Subsurface investigations in 1987 at the former Theo Kupfer Iron Works facility at 149 Waubesa Street, directly north of the site detected low concentrations of TCE up to 1.6 µg/L in shallow groundwater in the southeast corner of the property, and reported that shallow groundwater flow varied from east-southeast to west-southwest (Dames & Moore 1995b). A subsequent subsurface investigation was conducted in1993 at the Madison Brass Works facility, at 214 Waubesa Street, directly northwest of the Madison-Kipp property to investigate petroleum releases from a leaking UST (Ruekert/Mielke 2011). Investigations at the Madison Brass Works site also detected 11 µg/L PCE and 1.3 µg/L TCE in shallow groundwater. Groundwater flow at the Madison Brass Works was reported to be toward the west-southwest.

Madison-Kipp then retained the environmental consulting firm Dames & Moore to conduct a site investigation. Dames & Moore submitted a work plan for initial site investigation to the WDNR on September 14, 1994 (Dames & Moore 1994a). Following approval by WDNR, site investigations were initiated by Dames & Moore in September 1994 to evaluate the

presence of VOCs, including PCE, in soil and groundwater the northern portion of the Madison-Kipp property. Based on the results of this initial investigation provided in the December 14, 1994 Progress Report, Dames & Moore recommended additional soil and groundwater samples (Dames & Moore 1994b).

These initial Dames & Moore site investigations included multiple soil borings, extensive soil and groundwater sampling, and installation of one monitoring well (MW-1). Results of these site investigations were presented to WDNR by Dames & Moore in a report dated April 20, 1995 (Dames & Moore 1995b). Based on groundwater elevation data from monitoring wells at Madison-Kipp and the Madison Brass Works site, groundwater was encountered at a depth of 18 ft and flow was generally toward the south. Elevated concentrations of VOCs were found in shallow groundwater in the vicinity of a former drainage ditch on the northern portion of the Madison-Kipp property. VOCs detected in shallow groundwater included PCE (860 µg/L), TCE (470 µg/L), cis-1,2-DCE (2,200 µg/L), and vinyl chloride (400 µg/L). Elevated concentrations of VOCs were also found in shallow groundwater in the northeast portion of the parking lot, including PCE (1,000 µg/L) and cis-1,2-DCE (6,900 µg/L). However, much lower VOC concentrations were found in groundwater monitoring well MW-1, a short distance away in the north parking area, including PCE(150 µg/L), and in downgradient well MW-3 at Madison Brass Works. Site investigations indicated that fine-grained soils at depths up to 8 ft bgs retarded the migration of contaminants.

Additional site investigation activities were conducted by Dames & Moore in 1995 and were presented to WDNR in the March 20, 1996 Dames & Moore Progress Report (Dames & Moore 1996a). Review of historical site information by Dames & Moore indicated that a PCE AST was formerly located outside the northern portion of the building. The former drainage ditch identified in the 1995 Site Investigation Report was located along the east side of the building and extended from the former AST area northward to the property boundary. This AST was reportedly taken out of service at an unknown date, the ditch was filled, and most of the area was paved in 1995. Based on this historical site information and results of the first phase of investigations, further soil and groundwater investigations, including the installation of three additional groundwater monitoring wells (MW-2, MW-2A, and MW-3), were conducted to further define the extent of subsurface VOCs in the northern portion of the site, in the vicinity of the former AST and ditch. Sampling of groundwater monitoring wells in August 1995 found PCE in shallow groundwater at concentrations ranging from 90 µg/L (MW-2A) to 2,600 µg/L (MW-3), and groundwater flow was toward the south and southeast.

4.2 Site Investigation and Remediation Activities – 1996 to 1999

Further site investigations were conducted in 1996 by Dames & Moore and presented in a report submitted to the WDNR March 18, 1997 (Dames & Moore 1997a). This report also presented an evaluation of soil remediation options and proposed the excavation of VOC-impacted soils from source areas.

These investigations included a review of historical information to identify potential sources of contamination. Based on historical site use information and results of prior investigations, in June 1996 Dames & Moore installed additional monitoring wells MW-4S and MW-4D at multiple depths along the south property boundary to define the lateral extent of shallow groundwater contamination in the bedrock and conducted additional soil sampling in suspected source areas. Dames & Moore also installed a groundwater extraction test well (EW-1) for hydraulic test purposes. Hydraulic pumping testing in July 1996 indicated a hydraulic conductivity of 0.6 ft/d for the shallow bedrock (Dames & Moore 1997a).

There was a former PCE vapor degreaser at the Madison-Kipp facility. The external vent for the vapor degreaser was located in the northern portion of the Waubesa building, along the east exterior wall. Dames & Moore found elevated concentrations of VOCs in soil in the vicinity of this former degreaser, including PCE (4 mg/kg), TCE (7.5 mg/kg), and cis-1,2-DCE (6.3 mg/kg). Based on the sampling results collected to date, Dames & Moore had identified two sources of chlorinated VOCs at the site: 1) the north end of the former drainage ditch at the northeast corner of the building, and 2) the vapor degreaser vent. A former fuel oil AST was also reported to be located in the northern portion of the Waubesa building; however, investigations by Dames & Moore found no evidence of any contamination attributable to this AST.

By July 1996, a total of six groundwater monitoring wells had been installed at the site. Results of groundwater sampling in July 1996 indicated that VOC concentrations in groundwater were generally similar to prior sampling results, with the highest concentration of PCE in monitoring well MW-3 (2,000 µg/L) in the north parking area (Dames & Moore 1997a). Groundwater flow was found to be toward the south-southeast. These further investigations were successful in defining the lateral downgradient extent of VOCs toward the south in shallow groundwater on the Madison-Kipp property. Monitoring Wells MW-4S and MW-4D, located along the south property boundary, contained only low concentrations of PCE (1.3 µg/L in MW-4S and 2.1 µg/L in MW-4D). Based on the measured groundwater flow direction toward the south and the much lower VOC concentrations found in MW-2, Dames & Moore concluded that the lateral definition of VOCs in shallow groundwater was also generally defined.

Dames & Moore conducted additional site investigations in April 1997, including extensive soil sampling in the area of the drainage ditch along the north property boundary and in the area of the former degreaser vent to further define the extent of contamination. The results were submitted to the WDNR in a report dated May 30, 1997 (Dames & Moore 1997c). Elevated PCE concentrations were found in shallow soil samples along the drainage ditch (6.44 mg/kg). However, much lower VOC concentrations were found in soil immediately to the south and east, generally defining the lateral extent of soil contamination in the drainage ditch area. VOC concentrations in soil from the area of the former degreaser vent were lower than the concentrations detected at the north end of the former drainage ditch.

Site-wide groundwater sampling of all monitoring wells was conducted in February 1998, May 1999, and August 1999. VOC concentrations remained stable in almost all monitoring wells, while VOC concentrations in MW-2S decreased significantly. Measurements of groundwater levels indicated that the direction of groundwater flow was generally toward the south and southeast with a horizontal hydraulic gradient of 0.005 ft/ft, and that there was a significant downward vertical gradient ranging from 0.01 to 0.034 ft/ft.

In 1999, two additional deeper monitoring wells (MW-3D and MW-4D2) were installed. A report presenting the results of well installation and sampling was submitted to WDNR on September 14, 1999 (Dames & Moore 1999c). Elevated PCE concentrations were found in MW-3D (1,400 µg/L); however, much lower PCE levels were found in deeper well MW-4D2 (15 µg/L), further defining the extent of PCE in shallow groundwater.

On August 12, 1999, WDNR sent a letter to residents in the Madison-Kipp vicinity summarizing results of soil and groundwater investigations (WDNR 1999a). In that letter, WDNR indicated that “The degree and extent of groundwater contamination at the facility has, for the most part, been determined.” WDNR also indicated that “Efforts to fully delineate the contaminated groundwater plume have been delayed due to the difficulty of finding appropriate locations to advance groundwater quality monitoring wells near the site which are not obstructed by utilities or other physical barriers.” Additionally, WDNR indicated that “Madison-Kipp has to date complied with requirements to investigate and remediate the contamination found at the site.”

4.3 Site Remediation Activities – 1996 to 1999

Several soil and groundwater remedial action options were evaluated during the early phases of the site investigation. The March 18, 1997, Dames & Moore report proposed excavation of VOC-impacted soils in source areas (Dames & Moore 1997a). Several groundwater remedial action options were also evaluated during these initial phases of site

investigation. The March 18, 1997, Dames & Moore report initially proposed continued groundwater monitoring, with the potential installation of an ozone-sparge system for groundwater remediation at some time, if deemed necessary (Dames & Moore 1997a).

Based on additional site investigation activities and further evaluation of remedial alternatives for soil remediation, soil excavation in the area of the drainage ditch and degreaser vent was determined to be infeasible due to the close proximity of VOC-impacted soils to the building and the presence of underground utilities (Dames & Moore 1997c).

Based on further evaluation of remedial alternatives, Dames & Moore subsequently proposed in-situ remediation of VOC-impacted soils in the area of the former PCE UST, drainage ditch and the degreaser vent using the soil treatment process BiOx Process (BiOx – Deep Earth Technology) in a March 11, 1998, meeting with WDNR and in a Dames & Moore report to WDNR, dated April 6, 1998. BiOx results in oxidation and destruction of chlorinated VOCs, including PCE. WDNR approved the proposed soil remediation plan with a site-specific residual contaminant level (RCL) remedial goal of 1 mg/kg for PCE in soil. Three BiOx injections were completed at multiple locations during June and July 1998 within the two source areas. Additional injections of BiOx reagent were completed to further treat VOC-impacted soils in the former drainage ditch area in December 1998 and May 1999.

Confirmation soil sampling indicated that in-situ remediation was successful in reducing PCE concentrations in soil in these source areas to levels below the site-specific RCL of 1 mg/kg. Results of these soil remediation activities were submitted to WDNR in a March 21, 2000, report (Dames & Moore 2000). This report concluded that soil in both source areas were remediated to the extent practicable and recommended no further action for VOC-impacted soils in these areas. Additionally, this report concluded that the extent of PCE-impacted groundwater was adequately defined and recommended continued groundwater monitoring.

4.4 Site Investigation Activities – 2001 to 2003

From 2001 to 2003, further soil and groundwater investigations were conducted to better define the extent of VOCs in the subsurface and investigate additional possible VOC source areas. This work included installation of additional shallow and deeper monitoring wells (MW-3D2 in the north parking area, and wells MW-5 and MW-5D along the eastern side of the property) in March 2001 to further define groundwater conditions and the extent of VOCs in the bedrock.

In March 2001, Dames & Moore began routine groundwater monitoring at the site to evaluate groundwater conditions and to monitor natural attenuation of VOCs in groundwater. Groundwater monitoring results were presented to WDNR in a December 27, 2001, report (Dames & Moore 2001), which concluded that concentrations of chlorinated VOCs in groundwater were stable or decreasing.

Groundwater flow in the unconsolidated sediments was toward the south and toward the south-southwest in the shallow bedrock. Groundwater flow in the deeper bedrock was more variable, with flow directions toward the north, west, and south. Variably elevated PCE concentrations were found in newly installed groundwater monitoring wells MW-3D2 (1,900 µg/L in April 2001 and 450 µg/L in July 2001), but were lower than more shallow nearby wells MW-3S and MW-3D.

Significantly elevated PCE concentrations consistent with an additional VOC source area were unexpectedly found in 2001 in the two newly installed monitoring wells along the east property boundary (MW-5S 520 µg/L and MW-5D 8,800 µg/L). Review of facility operations indicated that there was an additional location where a vapor degreaser and vent was formerly located in the eastern portion of the building and loading dock area, very close to groundwater monitoring wells MW-5S and MW-5D.

An investigation was subsequently completed in 2002 (RSV 2002) to evaluate soil conditions in the area of this former vapor degreaser vent location. Extensive soil sampling was conducted in the area between the building and east property boundary to define the extent of VOCs in soil. PCE was detected in shallow soils at concentrations up to 782 mg/kg, and there were decreasing VOC concentrations with depth and distance from the loading dock. Results of this investigation were submitted to WDNR by RSV in a report dated August 30, 2002 (RSV 2002).

In February 2003, three additional monitoring wells (MW-5D2, MW-6S, and MW-6D) were installed at multiple depths at the site (URS 2003b). Groundwater flow in the unconsolidated soil and bedrock was generally toward the south and southwest and vertically downward. PCE concentrations in newly installed deep monitoring well MW-5D2 (35 µg/L) were much lower than in shallower nearby monitoring wells, further defining the vertical extent of VOCs in groundwater in the source areas. The lateral extent of PCE in shallow groundwater along the downgradient south property boundary was further defined by the low concentration of PCE in MW-6S (1.4µg/L) and relatively lower PCE concentration found in MW-6D (71 µg/L).

Soil sampling was conducted adjacent to the eastern property line on the Madison-Kipp property in November 2002 and provided to WDNR in December 2002 (URS 2002d). Soil

sampling was also conducted in an off-site area in November 2002 at three adjacent residential properties (150, 154 and 162 South Marquette Street) directly adjacent to the eastern Madison-Kipp property boundary to further evaluate the extent of PCE in soils. Sampling was performed according to procedures reviewed and approved by WDNR (WDNR 2002). Sampling results from multiple soil borings indicated one sample exceeded 1 mg/kg (at 154 South Marquette Street), while all other samples contained much lower PCE concentrations (up to 0.221 mg/kg at 154 South Marquette Street). The homeowners were informed of the results in January 2003. Further sampling occurred at the same three residential properties in June 2003 and sampling results were provided to homeowners and WDNR in July 2003 (URS 2003c, 2003d, 2003e).

Additional soil sampling occurred at these three properties in July 2003 and Madison-Kipp shared the sampling results with WDNR and drafted transmittal letters to the homeowners for WDNR's review in October 2003 (URS 2003f). With WDNR's input, Madison-Kipp sent letters to homeowners of 150, 154 and 162 South Marquette with the sampling results (as well as the homeowner of 146 South Marquette as a neighboring property to the soil sampling) in December 2003 (URS 2003g). These letters informed residents that the WDNR, Wisconsin Department of Health and the City of Madison's Health Department had concluded that the low PCE concentrations in soil did not pose a public health concern.

4.5 Site Investigation and Remediation Activities – 2004 to 2005

4.5.1 Site Investigation Activities – 2004 to 2005

RSV, on behalf of Madison-Kipp, summarized the results of the 2003 groundwater sampling efforts in an April 12, 2004 report to WDNR (RSV 2004a). At the time, the monitoring network consisted of 14 monitoring wells at 6 locations. In their June 21, 2004, report submitted to WDNR on behalf of Madison-Kipp (RSV 2004b), RSV summarized prior site investigation results in a Proposal and Remedial Options Analysis for Soil and Groundwater Remediation. In a subsequent July 21, 2004 letter sent by WDNR to Madison-Kipp, WDNR concluded that "The network of monitoring wells has primarily defined the extent of groundwater contamination…" WDNR also concluded that "Groundwater contamination in the bedrock aquifer appears to be determined to the south, downgradient of the source of the PCE release," and that "The vertical extent of contamination has been investigated with the deepest on-site well MW-5D2 extending 170 feet BGS."

In 2004 and 2005, further site investigations were completed to better define the extent of VOCs in soils along the eastern property boundary near the loading dock driveway and former vapor degreaser vent location and were reported to WDNR in reports by RSV dated

March 25, 2005 (RSV 2005) and March 23, 2006 (RSV 2006a). Soil samples collected in 2004 contained PCE at concentrations up to 9.54 mg/kg. Subsequent soil sampling in 2005 was conducted in the loading dock area of the former degreaser vent to further define the extent of VOCs. The highest PCE concentration (74 mg/kg) was found in soil north of the loading dock.

In their May 7, 2004 letter, WDNR (WDNR 2004a) requested monitoring of soil vapor on the property boundary to assess migration of vapors onto adjacent property. Four shallow soil-vapor monitoring probes (VP-1S, VP-2S, VP-1N, and VP-2N) were subsequently installed along the east property boundary in 2005. PCE was detected in shallow soil vapor at concentrations between 7.2 and 48 parts per million by volume (ppmv) at locations immediately adjacent to areas of contaminated soil.

4.5.2 Soil Remediation Activities – 2004 to 2005

Based on the success of prior in-situ soil remediation activities in the on-site area in 1998 and 1999, RSV conducted an evaluation of remedial alternatives for soil and groundwater and submitted the June 21, 2004 Proposal and Remedial Options Analysis for Soil and Groundwater Remediation to WDNR. This report recommended chemical oxidation for in-situ soil treatment. WDNR approved the proposed remedial action options in a letter dated July 21, 2004 (WDNR 2004b). A pilot test was subsequently conducted by RSV in December 2004 for remediation of VOC-impacted soils in the loading dock area using Cool-Ox, an oxidizing agent similar to BiOx (RSV 2005). Cool-Ox reagent was injected into shallow soils at multiple locations in the area of the loading dock, and in a small off-site area in the back yard of 162 South Marquette Street. In August 2005, CoolOx was also injected into soils under the loading dock driveway. Confirmation soil sampling results indicated that in-situ treatment was successful in reducing PCE concentrations soil from 782 mg/kg range to as low as 0.2 mg/kg. Results of soil remediation activities were presented to WDNR in a report dated March 23, 2006 (RSV 2006a).

4.5.3 Off-Site Soil Investigation and Remediation Activities – 2004-2005

In 2004, soil samples were collected from multiple soil borings on three residential properties (150, 154, and 162 South Marquette Street) adjacent to the eastern boundary of the Madison-Kipp property. PCE concentrations in shallow soils ranged from nondetectable levels to 2.68 mg/kg. Based on these sampling results (which were provided to the homeowners in November 2004), a focused soil remediation program was conducted by RSV in December 2004 in the area of highest off-site PCE concentrations (RSV 2005). A reagent treatment compound was injected at 12 off-site locations. Based on prior soil

sampling on the adjacent properties, reagent was also injected in the area of the one sampling location (at 162 South Marquette Street) where PCE was previously found to exceed 1 mg/kg. Results of this off-site sampling and remediation program were presented in several reports submitted to WDNR during 2003 to 2005, including the report dated March 25, 2005 (RSV 2005). Confirmation soil sampling conducted at the off-site residential properties in 2006 indicated that VOCs were not detected (RSV 2006a), and the residents were notified of these results in letters from WDNR in November 2006 (WDNR 2006).

4.6 Site Investigation and Remediation Activities – 2007 to 2009

4.6.1 Site Investigation Activities – 2007-2009

Groundwater monitoring activities continued in 2007-2009, and soil vapor samples continued to be collected from on-site and off-site soil vapor monitoring probes. Soil vapor samples were collected from vapor probes installed at multiple depths on three off-site properties (150, 154, and 162 South Marquette Street) between 2005 and 2009. Results of soil vapor sampling of on- and off-site soil vapor probes from October 2006 to April 2007 indicated that VOC concentrations decreased significantly at all locations since December 2006. Also, with the exception of one sample in December 2006 (150D), VOCs were not detected in soil vapor probes at off-site residential properties from October 2006 to April 2007 (RSV 2007b).

Beginning August 2007, lower laboratory detection limits were used for soil vapor samples collected on the neighboring properties. Subsequent sampling indicated that PCE was present in soil vapor probes on adjacent properties at concentrations ranging up to 110 parts per billion by volume (ppbv) (at 150 South Marquette Street) in August 2007; while samples from other soil vapor probes ranged from nondetect to 86 ppbv. In later soil vapor samples collected from the same locations in September 2009, PCE concentrations ranged from nondetect to 56 ppbv.

4.6.2 Site Remediation Activities – 2007-2009

In order to evaluate the feasibility of groundwater remediation, a pilot test was proposed and completed in 2007 by RSV to assess the performance of ozone sparging for in-situ VOC treatment of shallow and intermediate zone groundwater (RSV 2007a, 2007c). Results of the pilot test were submitted to WDNR in a report dated June 6, 2007 (RSV 2007c). The pilot test involving ozone injection was conducted for two weeks in April 2007 in the area of MW-3S, resulting in significant reductions in PCE concentrations in groundwater at MW-3S. Based on the success of the pilot test, a larger-scale ozone injection/sparge system,

including three injection wells, was installed in the eastern portion of the site, north of MW-5S. An overview of the system installation and system component locations was provided to WDNR in a report dated February 11, 2009 (RSV 2009). This ozone sparge system operated from 2008 to 2012.

4.7 Site Investigation and Remedial Activities – 2010 to Present

4.7.1 Off-Site Sampling – 2010 to Present

4.7.1.1 Off-Site Soil Vapor Sampling

Additional soil vapor probes were installed by RJN in June 2011 on the properties at 142 and 202 South Marquette Street to further define the extent of VOCs in soil vapor (RJN 2011). Soil vapor samples were collected in June 2011 from off-site soil vapor probes at 142, 150, 154, and 202 South Marquette Street (the homeowner at 162 South Marquette Street had previously removed the vapor probe on that property). Sampling results indicated that PCE was the only VOC detected, and that PCE concentrations in the soil vapor probes ranged from 0.341 ppbv (202 South Marquette Street) to 188 ppbv (154 South Marquette Street) (RJN 2011e). Much lower PCE concentrations were found in soil vapor probes on the furthest north and south properties at 142 and 202 South Marquette Street.

The initial sampling of sub-slab soil vapor on adjacent residential properties was conducted in November 2010 at 150, 154 and 162 South Marquette Street. In February 2011, RJN collected samples of sub-slab soil vapor and indoor air at 150, 154 and 162 South Marquette Street, and sampled outdoor air at 150 South Marquette Street (RJN 2011e). Sampling results indicated that PCE was only detected in indoor air at one location (0.668 ppbv at 154 South Marquette Street), while PCE in sub-slab soil vapor samples ranged from 5.78 ppbv (150 South Marquette Street) to 470 ppbv (154 South Marquette Street).

In spring 2012, sampling of soil vapor and indoor air at residential properties adjacent to the eastern property boundary was conducted. Samples of sub-slab soil vapor and indoor air were collected for VOC analysis at ten residences located along the eastern portion of the site (102, 110, 114, 118, 126, 128, 130, and 134 South Marquette Street). Analytical results for indoor air samples were compared to the Wisconsin residential action levels, and the sub-slab vapor analytical results were compared to calculated screening levels in accordance with the guidelines presented in the WDNR's *Addressing Vapor Intrusion at Remediation and Redevelopment Sites in Wisconsin*. The action levels and calculated residential screening levels are based on USEPA Residential Air Screening Levels. None of

the VOC detections in the indoor air or sub-slab vapor samples exceeded the Wisconsin residential vapor action levels or USEPA calculated residential screening levels.

4.7.1.2 Off-Site Soil Sampling

Soil samples were collected in May 2011 from the back yards of three adjacent properties (150, 154 and 162 South Marquette Street) by RJN, where prior sampling and soil remediation in 2003 had been conducted (RJN 2012). Sample results indicated that PCE concentrations ranged from nondetect (<0.031 mg/kg) at 162 South Marquette Street to 0.610 mg/kg at 154 South Marquette Street. No other VOCs were detected in the soil samples, indicating that the prior 2003 soil remediation was effective.

Soil samples were collected from back yards on South Marquette Street starting in April 2012 and from back yards on Waubesa Street starting in June 2012. In accordance with an August 3, 2012, letter from WDNR regarding *Additional Soil Investigation Requirements*, additional soil samples were collected in August 2012 from residential properties along South Marquette Street (206 through 230 South Marquette Street) and analyzed for PCBs, VOCs, PAHs, RCRA metals, and total cyanide. The details of all off-site investigation activities were provided to WDNR in the *Off-Site Soil Investigation Report*, dated October 9, 2012 (ARCADIS 2012o).

In summary, from April to August 2012, 121 soil samples were collected from 32 off-site residential properties during the period June through August 2012 (ARCADIS 2013b). Two off-site residential properties (237 and 269 Waubesa Street) have not been sampled as access was not granted by these property owners. At that time, PCBs were not detected above laboratory detection limits, above 1 mg/kg (USEPA's residential action level) or above 0.22 mg/kg (WDNR's non-industrial direct contact residual contaminant level) in any of the 121 soil samples collected from the 32 off-site residential properties. VOCs were detected in only one soil sample (102 South Marquette Street), including PCE (2.19 mg/kg), TCE (0.445 mg/kg), and cis-1,2-DCE (0.49 mg/kg). PAHs and VOCs were detected in soil samples from most of the residential properties (ARCADIS 2013b).

Subsequent soil sampling results indicated that PCBs in almost all residential soil samples were either not detected, or were detected at only low concentrations below the WDNR residential action level of 0.22 mg/kg and well below the USEPA residential action level of 1 mg/kg for PCBs. PCBs were detected in soil above the USEPA action level at only one off-site sample location (23 mg/kg at 245 Waubesa Street) (see discussion at 3.4.7.2 below). PCE and certain metals were detected in soils from some properties; however, these results were below protective WDNR screening levels (WDNR 2012, DNR Update 9/27/12).

Soil sampling results from residential properties during 2012 indicate that one or more PAH compounds have been detected in soils at concentrations above one or more WDNR PAH screening levels at most residential properties in the area and on the Madison-Kipp property. In September 2012, ARCADIS submitted results of further investigations regarding the off-site occurrence of PAHs to the WDNR in the letter report *Off-Site Residential Polycyclic Aromatic Hydrocarbon (PAH) Results Summary,* dated September 11, 2012 (ARCADIS 2012k). The ARCADIS letter also concluded that PAHs are ubiquitous in an urban environment from many different activities, the majority of which are not related to activities at Madison-Kipp. WDNR subsequently sent a December 7, 2012 letter (WDNR 2012aa) directing Madison-Kipp to submit a work plan "either…for determining whether any of the health-based direct contact exceedances can be attributed to background concentrations or…a remedial action plan to be employed by MKC…" On December 14, 2012, ARCADIS, on behalf of Madison-Kipp, submitted the *Polynuclear Aromatic Hydrocarbons (PAH) Work Plan, Determination of Whether Health-Based Direct Contact Exceedances Can Be Attributed to Background Concentrations* to evaluate background levels of PAHs in the site area (ARCADIS 2012s). Results of this study, which has included a review of PAH sources in the Madison area, statistical analysis of on-site and off-site PAH sampling data, and evaluation of fingerprint analyses of PAHs in urban area soils, indicate that PAHs in soils on residential properties are consistent with background levels in urban areas, and are not related to PAHs found in soils at Madison-Kipp (ARCADIS 2013a).

WDNR has consistently explained to the public that PAHs are present in soil in all urban settings, and result from any combustion process, including backyard grilling, fire pits, and automotive exhaust, as well as common industrial processes (WDNR 2012, DNR Update 9/27/12). WDNR also advises the public that it is important to note that the WDNR screening levels for PAHs, PCBs, PCE, and other contaminants are conservative and are highly protective of public health and the environment. The agency also advises that screening level exceedances do not mean there is a health or environmental risk, but rather help determine if additional actions are necessary (WDNR 2012, DNR Update 9/27/12).

4.7.1.3 Further Site Investigations – 2010 to Present

In 2011, four additional monitoring wells were installed in the surrounding off-site area to further define the extent of VOCs in groundwater (MW-7, MW-8, MW-9D, and MW-9D2). VOCs were not detected in groundwater at off-site monitoring wells MW-7, MW-8, or MW-9D. VOCs were only detected in the off-site upgradient deeper monitoring well MW-9D2 at relatively low concentrations, including 29 µg/L PCE.

On May 22, 2012, ARCADIS submitted a Bedrock Characterization Work Plan to further refine the conceptual site model regarding hydrogeologic conditions and the occurrence and migration of PCE and other VOCs in the underlying bedrock (ARCADIS 2012f). The work plan included the installation of additional deeper borings and monitoring wells in the vicinity of MW-3 and MW-5 to collect data on bedrock characteristics, VOC occurrence, and groundwater conditions throughout the bedrock aquifer. This work plan was approved by the WDNR in a letter dated June 7, 2012 (WDNR 2012x).

On May 31, 2012, ARCADIS submitted a *Site Investigation Work Plan* to WDNR for more comprehensive site investigations, including 37 soil borings to investigate PCBs in soil and VOCs in soil and groundwater, installation of six additional monitoring wells to further assess the horizontal and vertical extent of VOCs in groundwater, and continued sampling of soil vapor probes (ARCADIS 2012g). This work plan was approved by WDNR in a letter dated June 25, 2012 (WDNR 2012y).

On September 13, 2012, ARCADIS submitted a *Site Investigation Work Plan Addendum* to WDNR documenting the installation and sampling of additional on- and off-site groundwater monitoring wells (ARCADIS 2012k). Three additional shallow monitoring wells (MW-10S, MW-11S, and MW-12S) were installed by ARCADIS in 2012 at off-site locations west, east, and northeast of the Madison-Kipp facility. Groundwater samples from these wells contained only low or nondetectable concentrations of VOCs, further indicating that the extent of VOCs in shallow groundwater was defined, consistent with prior site investigations and groundwater sampling activities in the site area.

On September 28, 2012, ARCADIS submitted *a Site Investigation Work Plan Addendum, Building Subsurface Investigation* (ARCADIS 2012n), which included proposed additional site investigations of soil and groundwater conditions beneath or adjacent to the Madison-Kipp building. In October 2012, soil samples were collected from 42 soil borings at depths up to 15 ft beneath or adjacent to Madison-Kipp facility buildings (B-134 to B-174) (ARCADIS 2013). Soil boring locations were selected based on historical information regarding chemical use and handling at the facility and were approved by WDNR (Schmoller Dep. 2012, p. 247; WDNR 2012z). Soil samples were collected beneath areas of former solvent use and degreaser areas and analyzed for PCBs, VOCs, PAHs, RCRA metals, and cyanide.

Elevated concentrations of PCBs, PCE, and other VOCs were found in soil samples collected beneath or directly adjacent to facility buildings at depths ranging from approximately 2 to 8 ft bgs. PCB analysis results are discussed in the following section of this report. PCE and other VOCs were detected in soil samples from multiple sampling

locations. Where found, the highest concentrations of PCE were generally found in shallow soil samples, including B-134 (26 mg/kg) and B-135 (19 mg/kg) from soil borings within the oil shed building. PCE concentrations in other soil samples were generally much lower or below laboratory detection limits.

4.7.2 PCB Investigations – 2010 to Present

4.7.2.1 Background – PCB Investigations

As part of ongoing remediation and interim actions, an SVE system was installed by ARCADIS on site in March 2012 to mitigate off-site migration of vapors. During installation of the SVE system (located along the northeastern property boundary), soil was excavated to install wells and conveyance piping. Excess soil that could not be placed back in the conveyance piping trenches was stockpiled, and a waste characterization sample was collected. The sample contained detectable concentrations of PCBs. WDNR was notified of the PCB results by ARCADIS via email on March 26, 2012. WDNR subsequently sent a letter to Madison-Kipp dated April 19, 2012, indicating that Madison-Kipp was responsible for investigation and cleanup of PCB contamination (WDNR 2012s).

PCBs appear to have been present in hydraulic oils historically used in Madison-Kipp operations that were periodically applied as a dust suppressant to the parking areas of the facility prior to the paving of these areas in 1976 or 1977. It is believed by WDNR that migration of PCBs onto some adjacent residential properties occurred as a result of rainfall runoff (Schmoller Dep. 2012, p. 95). It is also known that PCBs are present at varying levels in shallow soils throughout the Madison area (Schmoller Dep. 2012, p. 106) and are commonly present in shallow soils in urban areas.

In April 2012, at the request of WDNR, RJN collected soil samples from multiple locations on the adjacent properties at 102, 110, 114, 118, 126, 128, 130 (one sample at this address), 134 and 142 South Marquette Street (RJN 2012). Access was not granted for sampling at 106 and 138 South Marquette Street. Soil samples were analyzed for VOCs and PCBs. No PCBs were detected in any soil samples, and VOCs were detected in only one soil sample at 102 South Marquette Street, including 2.19 mg/kg PCE.

In a letter dated May 4, 2012, WDNR requested a work plan for conducting an investigation to evaluate the sources, and degree and extent of impacts associated with PCBs (WDNR 2012t). On May 11, 2012, WDNR sent a letter to Madison-Kipp outlining the requirements for the comprehensive investigation and remediation of the Madison-Kipp property (WDNR 2012v). This letter expanded on the WDNR's expectations presented in their May 4, 2012,

letter regarding PCB investigations and remediation, addressed the broader scope of requirements for conducting site-wide environmental response actions.

A *Work Plan for Polychlorinated Biphenyl Investigation* dated May 21, 2012 (ARCADIS 2012e), was submitted to WDNR by ARCADIS for approval to complete site investigation activities associated with PCBs. The WDNR provided Conditional Approval of this work plan in a letter dated May 30, 2012 (WDNR 2012w), and investigation activities were initiated on June 1, 2012.

Results of PCB investigations through June 26, 2012, were submitted to the WDNR by ARCADIS on July 2012 (ARCADIS 2012i). In a telephone call on July 12, 2012, the WDNR subsequently requested a work plan for conducting supplemental investigation activities to further evaluate the extent of impacts associated with PCBs. ARCADIS submitted the requested *Work Plan for Supplemental Polychlorinated Biphenyl Investigation* to WDNR on July 23, 2012 (ARCADIS 2012i) to complete the requested supplemental site investigation. The WDNR provided final approval in a letter dated August 6, 2012 (WDNR 2012), for this work plan, and also sent a letter to Madison-Kipp regarding *Additional Soil Investigation Requirements* on August 3, 2012. This letter requested additional investigation activities, including PCB sampling, on residential properties immediately adjacent to the site.

4.7.2.2 Initial PCB Investigations – April 2012

As part of WDNR-approved ongoing site investigation activities since April 2012, soil sampling has been conducted at depths up to 4 ft bgs in the backyards of numerous residences adjacent to the site (ARCADIS 2013b). Additionally, soil sampling from 84 soil borings was completed on site at depths up to 35 ft bgs. These soil samples were analyzed for PCBs, VOCs, PAHs, RCRA metals, and total cyanide.

The PCB data were compared to WDNR's non-industrial direct contact residual contaminant level (0.22 mg/kg), WDNR's industrial direct contact residual contaminant level (0.74 mg/kg), USEPA's self-implementing high-occupancy cleanup level with no site restrictions (1 mg/kg), and the Toxic Substance Control Act (TSCA) disposal limit (50 mg/kg).

4.7.2.3 Supplemental PCB Investigation – August 2012

Supplemental on-site PCB investigation activities were completed in August 2012 and included sampling of 32 additional soil borings on site along the eastern property boundary,

and 22 soil borings on site in the north parking lot at depths from 0 to 4 ft bgs (ARCADIS 2012r).

PCBs were not detected above laboratory detection limits nor above the USEPA's high occupancy cleanup level of 1 mg/kg in any soil samples from the area of the eastern fence line adjacent to the residential properties. Sampling of additional on-site soil borings in the north parking lot was successful in defining the extent of PCBs in on-site soils. PCBs were not detected above laboratory detection limits or above 1 mg/kg in the majority of shallow soil samples from 0 to 2 ft bgs. Soil samples from six shallow sampling locations contained PCB concentrations above 1 mg/kg, but below 50 mg/kg. Only one on-site shallow soil sample (B-101) contained PCB concentrations above 50 mg/kg, and PCBs were not detected above 50 mg/kg in any deeper soil samples.

The supplemental site investigation activities confirmed that PCBs are not present in shallow soils at the site eastern property line above 1 mg/kg, and the areas on site containing PCB concentrations above 50 mg/kg have been delineated and were limited in depth.

4.7.2.4 Additional On-Site and Off-Site PCB Investigation Activities – August 2012 to Present

Soil

In August 2012, additional soil sampling from multiple locations at depths up to 4 ft bgs was conducted in the southwest portion of the Madison-Kipp facility (ARCADIS 2012r). Soil samples were analyzed for PCBs, VOCs, PAHs, RCRA metals, and total cyanide. Twelve of these additional 23 soil samples contained PCB concentrations below laboratory detection limits or below 1 mg/kg. Eleven soil samples contained PCB concentrations above 1 mg/kg, but below 50 mg/kg.

Additional laboratory analysis of selected soil samples was conducted to provide information regarding concentrations of specific PCB isomers using PCB homolog Method 680 compared to the results of PCB laboratory analytical results from USEPA Method 8082. In all cases, the PCB homolog analysis results were lower than comparable PCB analysis results from Method 8082. Thus, utilizing the PCB results by Method 8082 provides a conservative approach for evaluating remedial actions.

On September 28, 2012, ARCADIS submitted *a Site Investigation Work Plan Addendum, Building Subsurface Investigation*, which included proposed additional site investigations of soil and groundwater conditions beneath or adjacent to the Madison-Kipp building. In

October 2012, soil samples were collected from 42 soil borings at depths up to 15 ft beneath or adjacent to Madison-Kipp facility buildings (B-134 to B-174) (ARCADIS 2012n). Soil samples were collected beneath areas of former solvent use and degreaser areas and analyzed for PCBs, VOCs, PAHs, RCRA metals, and cyanide.

Elevated concentrations of PCBs (above 50 mg/kg) were found in soil samples collected beneath or directly adjacent to facility buildings at six sampling locations at depths ranging from approximately 2 to 8 ft bgs. The highest concentrations of PCBs were found in soil samples from borings B-148 (20,000 mg/kg), B-149 (12,000 mg/kg), and B-150 (2,800 mg/kg), all in the area of the former central piping trench, and B-158 (1,900 mg/kg) in the southwestern portion of the building. PCE and other VOCs were also detected in soil samples from multiple sampling locations.

On December 14, 2012, ARCADIS submitted an *Addendum to the Final Revised Work Plan for Polychlorinated biphenyl Recommended Activities* to WDNR (ARCADIS 2012r). This report presented results of supplemental soil investigations in November 2011 on off-site residential properties west of Madison-Kipp to further refine the extent of PCBs in soil. A total of 27 soil samples were collected within 5 ft of the Madison-Kipp property line at 233 through 269 Waubesa Street, except for 237 and 269 Waubesa Street, where access was not granted. Results indicated that 22 of the 27 soil samples did not contain PCBs above detection limits or above 0.22 mg/kg at depths of 0 to 1 and 3 to 4 ft bgs. Seven soil samples contained PCBs above 0.22 mg/kg, but below 50 mg/kg (at 241, 245, 253, and 257 Waubesa Street), and the maximum (23 mg/kg) was found at 245 Waubesa Street. Based on these findings, ARCADIS recommended excavation and off-site disposal of soils in four areas where soil containing PCBs exceeding 0.22 mg/kg was found at depths up to 4 ft bgs. WDNR and USEPA are considering the December 14, 2012 *Addendum to the Final Revised Work Plan for Polychlorinated biphenyl Recommended Activities,* and Madison-Kipp will proceed with excavation activities when it receives agency approval to do so.

Groundwater

In addition to the recent soil sampling in the facility buildings, four groundwater monitoring wells were installed at two depth intervals at two locations in December 2012 to sample groundwater in the area where the highest concentrations of PCBs were found in soils beneath the building. Two groundwater monitoring wells were installed at depths of 25-35 ft bgs (MW-22S) and 45-50 ft (MW-22D) near boring B-148, in the area of the former central piping trench where the highest PCB concentrations were previously found in soil. Two groundwater monitoring wells were also installed at depths of 25-35 ft bgs (MW-23S) and 45-50 ft bgs (MW-23D) near boring B-158, in the southwest portion of the building. Soil

samples collected during drilling of the borings for these monitoring wells indicated elevated concentrations of PCBs in soils below the building. Groundwater samples were collected from these monitoring wells on January 14, 2013, and chemical analysis results are expected by February 2013.

PCB Mobility

Studies by USEPA have demonstrated that PCBs are "insoluble in water," strongly adsorb to soils, and generally will not leach significantly in aqueous soil systems (USEPA 2012). As a result, PCBs are not expected to dissolve or migrate in groundwater. PCBs are soluble in oils and are able to migrate limited distances in soil or groundwater; however, oils containing PCBs also preferentially adsorb and are retarded by soils (USEPA 2009).

4.7.3 Site Remediation Activities – 2012 to Present

4.7.3.1 Soil Vapor Extraction (SVE)

In February 2012, a pilot test was conducted in by ARCADIS to evaluate SVE technology for removing subsurface VOCs and controlling the off-site migration of vapors at the site. Results of the pilot test were submitted to the WDNR in a report dated February 27, 2012 (ARCADIS 2012a). Following the pilot test, a full-scale SVE system was installed to address vapor migration in the northeast portion of the facility. The SVE system, which started continuous operation on March 9, 2012, includes nine SVE wells installed to depths ranging from 8 to 15 ft bgs and a carbon treatment system. The SVE system was designed to operate at a maximum flow rate of 288 standard cubic feet per minute and with a radius of influence of 35 ft for each extraction well. Monitoring data indicate the SVE system is operating as intended, and off-site vapor migration is being controlled.

4.7.3.2 Soil Remediation – 2012 to Present

Elevated concentrations of PCBs, PAHs, and VOCs have been detected in on-site and off-site soils (ARCADIS 2013b). WDNR has determined that remedial actions to address concerns regarding direct contact exposure will be conducted where required for VOCs and PCBs in soil at off-site residential properties (Schmoller Dep. 2012, Exhibit 30). WDNR sent a letter to Madison-Kipp dated December 7, 2012, requesting either a work plan for remediation of PAHs, or information documenting background levels of PAHs (WDNR 2012aa). Further studies have been conducted to investigate sources of PAHs in soils at the site in order to determine background levels of PAHs in soils (ARCADIS 2013a).

Remedial actions to address PCBs in on-site soils and further investigations to better define the subsurface extent of PCBs were proposed to WDNR in a final work plan dated December 4, 2012 (ARCADIS 2012u), and approved by USEPA and by WDNR in their December 5, 2012 letter. On-site soils containing PCB concentrations above 50 mg/kg were proposed to be excavated and disposed of at a TSCA-approved landfill. Excavation of shallow soils has recently been completed in two on-site areas in the north parking lot and near the eastern property boundary, where PCBs were previously found to exceed 50 mg/kg in shallow soils at depths of 0 to 2 ft bgs (ARCADIS 2013c). One excavation area, near soil boring B-40, was approximately 45 ft by 45 ft wide, while the another excavation area, near soil boring B-13, was approximately 125 ft by 25 ft wide. Soils in both areas were generally excavated to a depth of 2 ft, and up to 3 ft deep in some areas. The extent and depth of excavation was determined during excavation, in coordination with WDNR, based on confirmation soil samples collected throughout the excavation process to verify removal of soils meeting excavation criteria. Excavations have been backfilled with crushed stone and will be covered with asphalt, concrete, or 2 ft of clean fill.

For those areas where on-site soils contained PCB concentrations between 1 and 50 mg/kg, a combination of engineering and institutional controls (deed notification) will be utilized to address those soils that will remain in place. A Soil Management Plan, documenting the location of impacted soils, will provide procedures for handling any soils that may be encountered in possible future subsurface work in these areas. Institutional controls may include registration with the WDNR soil geographic information system, and/or a deed notification to notify current and future site owners regarding locations of impacted soil.

To further define the extent of PCBs in soils in the southwest portion of the site, additional investigations were completed in November 2011 on adjacent off-site residential properties (233 through 269 Waubesa Street), as described above.

4.7.3.3 Groundwater Remediation

In October 2012, ARCADIS submitted the *In-Situ Chemical Oxidation (ISCO) Groundwater Pilot Test Work Plan* (ARCADIS 2012t) for treatment of VOCs in groundwater plume. This pilot test, which was approved by WDNR (WDNR 2012z), was designed to determine the geologic and hydraulic design parameters necessary for full-scale remedial implementation and evaluating the effectiveness of ISCO as a potential groundwater treatment remedy. This pilot test will also provide critical information concerning aquifer characteristics such as fracture flow, hydraulics, bedrock storage capacity, and aquifer contaminant mass delineation. ISCO is a method of in-situ remediation that adds a chemical oxidant to the

subsurface to break the carbon bonds in VOCs and allow complete degradation of chlorinated ethenes (e.g., PCE and TCE) to non-toxic compounds.

In accordance with regulatory requirements, ARCADIS submitted a *Request for a Temporary Exemption for Injection of Remedial Materials for an In-Situ Chemical Oxidation Groundwater Pilot Test* to WDNR on November 27, 2012 (ARCADIS 2012p). WDNR approved this temporary exemption on a letter dated December 7, 2012 (WDNR 2012dd), and approved Madison-Kipp's request for permit coverage for a general Wisconsin Pollutant Discharge Elimination System permit in a letter dated December 7, 2012 (WDNR 2012ee). Work on this pilot test began in December 2012.

4.8 Summary of Groundwater Monitoring Results

4.8.1 Site Groundwater Monitoring

Periodic site-wide groundwater monitoring has been ongoing since 1995. There are currently 58 groundwater monitoring wells, multi-port (MP) groundwater sampling wells, and pilot test injection wells (IW) at depths from 13 to 235 ft bgs on the Madison-Kipp property and in the surrounding area. Routine groundwater monitoring was initially conducted and reported on an annual basis, and a consistent monitoring schedule was established in 2006.

Groundwater monitoring wells have been grouped into the following general depth intervals based on the depths of well screens.

- Well screen intervals less than 50 ft bgs
  (MW-1, MW-2S, MW-2D, MW-3S, MW-4S, MW-5S, MW-6S, MW-7, MW-8, MW-9, MW-10S, MW-11S, MW-12S, MW-18S, MW-22S, MW-22D, MW-23S, MW-23D, MP13(44-48), and IW-1S)

- Well screen intervals from 50 to 75 ft bgs
  (MW-3D, MW-4D, MW-6D, MW-9D, MP13[67-71], and MP14[70-75])

- Well screen intervals greater than 75 ft bgs
  (MW-3D2, MW-3D3, MW-4D2, MW-5D, MW-5D2, MW-5D3, MW-17, MW-19D, MW-19D2, MW-20D, MW-20D2, MW-21D, MW-21D2, MP13[102-106], MP13[81-85], MP13[121-125], MP13[135-139], MP13[163-167], MP14[100-105], MP14[135-140], MP14[178-187], MP15[88-92], MP15[100-105], MP15[120-125], MP15[142-146],

MP15[183-187], MP16[80-84], MP16[106-116], MP16[140-144], MP16[175-179], IW2D, and IW2D2).

The following sections summarize the historical and recent groundwater conditions and monitoring results.

4.8.1.1 Groundwater Flow Directions

The lateral direction of shallow groundwater flow at the site has been variable. The lateral direction of shallow groundwater flow has been toward the north in the northernmost portion of the site; toward the northeast in the southwest corner of the site; and toward the south, southwest, and southeast beneath a majority of the site. The predominant direction of groundwater flow at the site, however, has consistently been downward from the shallow zone into deeper groundwater intervals throughout the site vicinity The lateral direction of deeper groundwater flow in the bedrock (at depths of 50 to 75 ft) has generally varied from northward in the northernmost portion of the site, to southeast and south-southwest in other areas of the site. The lateral direction of deeper groundwater flow in the bedrock (at depths more than 75 ft) has varied from north beneath portions of the site, to east to south-southwest. The lateral hydraulic gradient in this deeper zone has been very flat (0.0006 ft/ft in July 2010). Groundwater flows downward from shallow to deeper intervals in response to much greater vertical downward hydraulic gradients reported to range from 0.10 to 0.034 ft/ft.

4.8.1.2 Primary Constituents of Concern

The primary constituents of concern in groundwater are chlorinated VOCs, including PCE and the associated daughter products formed during biodegradation (TCE, DCE isomers, and vinyl chloride). Petroleum hydrocarbon compounds, including benzene (3,900 µg/L), have also been detected locally in monitoring wells in the southeastern portion of the site, near the location of a former gasoline service station on the site and another service station across Atwood Avenue where petroleum releases have occurred.

4.8.1.3 Extent of VOC-Impacted Groundwater

As a result of the varying directions of groundwater and the significant downward vertical hydraulic gradients and the significant downward vertical hydraulic gradients from shallow to deeper zones in the bedrock, the lateral extent of VOCs in shallow groundwater is limited and does not extend significant distances at the site. This is illustrated by the consistent and relatively limited lateral extent of VOCs in shallow groundwater, and the consistently low

VOC concentrations that have been found in downgradient shallow groundwater near the southern boundary of the Madison-Kipp property.

The extent of VOC contamination in the shallow groundwater interval is defined by the consistently low or nondetectable VOC concentrations found in off-site shallow groundwater monitoring wells. The highest VOC concentrations in shallow groundwater have consistently been found in the northern portion of the site, at MW-3S, where the PCE concentration was 1,600 µg/L in April 2012. However, VOC levels decrease rapidly in shallow groundwater with distance in all directions, and are very low in monitoring wells at the downgradient southern property boundary. In general, concentrations have also been stable or decreasing with time in shallow groundwater since well before 1994, and the extent of VOC-impacted groundwater in this interval has not increased significantly since that time.

The extent of chlorinated VOCs in groundwater at depths of 50 to 75 ft is defined in some locations by the relatively lower concentrations in MW-4D, MW-9D, MW-6D, and MW-9D. Lateral migration of VOC-impacted groundwater in this zone is also limited by the predominant downward flow of groundwater. Chlorinated VOC concentrations in groundwater wells in this interval have also remained relatively stable.

In the deep groundwater, investigations have been successful in generally defining the vertical extent of VOC-impacted groundwater in the deepest on-site monitoring wells (ARCADIS 2012j, 2013b). The maximum concentration of VOCs in this zone has been found in on-site monitoring well MW-3D2 (2,600 µg/L PCE in April 2012) at a depth of 76 to 81 ft bgs. Three additional deeper on-site monitoring wells (MW-3D3 from 214 to 224 ft bgs, MW-5D2 from 165 to 170 ft bgs, and MW-5D3 from 224 to 234 ft bgs) were installed to further define the vertical extent of VOCs in deep groundwater at the site. Sampling of these deeper wells in April and July 2012 revealed much lower VOC concentrations in MW-3D3 (6.6 µg/L), MW-5D3 (23 µg/L), and MW-5D2 (47 µg/L) than in shallower on-site wells.

4.9 City of Madison Water Supply Unit Well 8

City of Madison Unit Well 8 is located at 3206 Lakeland Avenue, approximately 1,500 ft southeast of the Madison-Kipp facility and 200 ft north of Lake Monona. Unit Well 8, which is used only seasonally, was constructed in 1945, is 774 ft deep, and obtains water from the Lower Bedrock Aquifer (sandstone) below the Eau Claire Aquitard (Ruekert/Mielke 2011). Bedrock was encountered below a thin layer of glacial and alluvial sediments at a depth of 110 ft bgs. The bedrock generally consists of sandstone, with an interval of lower-permeability siltstone and shale of the Eau Claire Formation (Eau Claire Aquitard) from 250 to 255 ft bgs. At the bottom of the well, low permeability clay was encountered from 760 to

774 ft bgs. The well has an annular seal and well casing extending from the surface to a depth of 280 ft bgs below the Eau Claire Aquitard and has an open borehole from 280 to 774 ft bgs. The Eau Claire Aquitard provides an important barrier to vertical movement of contaminants that might be present in the overlying Upper Bedrock Aquifer.

Unit Well 8, operated seasonally from June through September, has a design capacity of 1,800 gallons per minute and pumps to an adjacent storage reservoir. Other city wells are also available in this pressure zone in the event that Unit Well 8 is out of service.

A Wellhead Protection Plan (WHPP) report for Unit Well 8 was prepared in 2011 for Madison Water Utility (Ruekert/Mielke 2011). The WHPP describes regional groundwater conditions and presents results of regional groundwater flow modeling to evaluate zones of time-related potential contaminant contribution and protection for the well. The WHPP also includes a contaminant source inventory (CSI) of known and potential sources of contamination to the well. The CSI identified 51 known or potential sources of contamination in the wellhead protection area of Unit Well 8, including sanitary sewers, industrial sites, AST and UST sites, spill sites, landfills, solid waste sites, electrical transformers, remediation sites, RCRA sites, road salt use, and the use of pesticides and herbicides throughout the area.

The WHPP concludes that the general direction of groundwater flow in 2000 was toward Unit Well 8 from the east, northeast, and southwest (Ruekert/Mielke 2011). Routine sampling of Unit Well 8 conducted since at least 1990 has detected only very low concentrations of cis-1,2-DCE (approximately 0.25 µg/L), less than the laboratory reporting limit and far less than the MCL (70 µg/L) (WGNHS 2011). PCE has not been detected in water from this well. Sampling has also detected viruses in the water from this well, indicative of contamination from nearby near-surface sources. Based on these findings, WGNHS concluded that the very low levels of cis-1,2-DCE levels in this well were not increasing, and that this well is “vulnerable” to contamination (WGNHS 2011) from multiple nearby surface sources.

4.10 Summary of Soil Vapor Monitoring and Mitigation

Monitoring of chlorinated VOCs in soil vapor was initiated in 2004. Four vapor probes (VP-1S, VP-2S, VP-1N, and VP-2N) were installed along the east property boundary, near the loading dock where the highest VOC concentrations were found in on-site soils. PCE was detected in soil vapor at concentrations up to 48 ppmv. These probes were periodically sampled from 2004 to 2005, indicating that PCE concentrations in soil vapor were generally declining (RSV 2005).

In response to a WDNR letter dated September 2006, additional soil vapor monitoring probes were installed on three adjacent residential properties (WDNR 2006). Vapor sampling results in 2006 showed somewhat higher PCE concentrations in the on-site area; however, only low or nondetectable PCE concentrations were found in soil vapor on the residential properties. Sampling in April 2007 indicated significantly lower PCE concentrations in soil vapor from on-site and off-site locations (RSV 2009).

From 1994 to approximately 2010, soil vapor samples were analyzed for VOCs using standard laboratory procedures and detection limits under the oversight of the WDNR. The results indicated generally low or nondetectable VOC concentrations in most soil vapor samples. Based on these findings, RJN and RSV recommended no further off-site soil vapor sampling (RJN 2009; RSV 2009). Subsequently, however, soil vapor samples collected from on-site and off-site areas were analyzed for VOCs using lower laboratory detection limits, resulting in a greater number of detections and an increased number of VOCs in soil vapor in the on-site and off-site areas (Schmoller Dep. 2012, p. 187). Technical discussions occurred in 2010 and 2011 with WDNR regarding the significance of low VOC concentrations in sub-slab soil vapor samples and the need for further on-site and off-site soil vapor sampling (Schmoller Dep. 2012, pp. 194-195, 205).

The WDNR project manager has testified that the agency was not concerned with vapor intrusion and off-site vapor migration until sometime between 2010 and late 2011 (Schmoller Dep. 2012, p. 206). In 2010, soil vapor samples were collected beneath certain residences, indicating elevated concentrations of PCE. In spring 2011, soil vapor probes were installed at 146, 150, 154, 162, and 166 South Marquette Street. Since 2011, soil vapor samples have been collected from off-site residential properties. PCE has been detected in two areas along the Madison-Kipp property line at concentrations up to 4.6 ppmv.

In April 2012, soil vapor probes were installed along the bike path located north of the site. Sampling results of the vapor samples indicated that none of the samples contained VOC concentrations above the non-residential sub-slab screening levels.

WDNR has recently concluded that no further sampling of soil vapor is planned to be required in the areas east of South Marquette Street, west of Waubesa Street, or on Dixon Street (Schmoller Dep. 2012, p. 224).

ARCADIS

Appendix B

List of Documents Referenced, Reviewed, or Relied Upon

Appendix B

List of Documents Referenced, Reviewed, or Relied Upon

Aerial Photographs. 1955-1986. Map and Air Photo Library, University of Wisconsin, Madison, Wisconsin. Photos: 9/5/55, 9/7/62. 5/8/68, 9/12/76, 4/22/80, 4/10/86.

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_____2012j. *April Through June Soil Sampling Results (PAH).* Available online on WDNR Website.

_____2012k. *April through June Soil Sampling Results (VOC).* Available online on WDNR Website.

_____2012l. *April Through June Soil Sampling Results (VOC & PAH).* Available online on WDNR Website.

_____2012m. *Sub-Slab Vapor/Indoor Sampling Status.* July. Available online on WDNR Website.

_____2012n. *Update Soil Sampling Results (PAH).* September. Available online on WDNR Website.

_____2012o. *Update Soil Sampling Results (PCB).* September. Available online on WDNR Website.

_____2012p. *Update Soil Sampling Results (VOC).* September. Available online on WDNR Website.

_____2012q. *Sub-Slab Vapor/Indoor Sampling Study.* September. Available online on WDNR Website.

_____2012r. *DNR Letter to Homeowners Adjacent to Madison-Kipp.* January 30.

_____2012s. *Madison Kipp Corporation Responsible Party Letter (PCB Contamination).* April 19.

_____2012t. *Letter to Madison-Kipp Regarding PCB Contamination.* May 4.

_____2012u. *Notice of Violation to Madison-Kipp for PCB Contamination*. May 4.

_____2012v. *Letter to Madison-Kipp Regarding Comprehensive Investigation.* May11.

_____2012w. *Conditional Approval of Madison-Kipp PCB Investigation Work Plan*. May 30.

_____2012x. *Conditional Approval of Madison-Kipp Bedrock Characterization Work Plan.* June 7.

_____2012y. *Additional Comments on Madison-Kipp Comprehensive Contamination Investigation.* June 25.

_____*2012z. Letter to Madison-Kipp, Additional Soil Investigation Requirements.* August 3.

_____*2012aa. Approval of Work Plan for Supplemental Polychlorinated Biphenyl Investigation.* August 6.

_____2012bb. *Approval of Madison-Kipp Work Plan.* December 5.

_____2012cc. *Letter to Madison-Kipp Requesting Work Plan for PAHs*. December 7.

_____2012dd. *Letter to Madison-Kipp, Temporary Exemption for the Injection of a Remedial Material to Groundwater.* December 7.

_____2012ee. *Letter to Madison-Kipp, Permit Coverage for Contaminated Groundwater from Remedial Action Operations (WPDES)*. December 7.

_____2012dd. *Review of Vapor Sampling Results for the Neighborhood Surrounding the Madison-Kipp Corporation.* December 12.

_____*Miscellaneous correspondence and memoranda.* WDNR files.

Wisconsin Geological and Natural History Survey (WGNHS). 2011. *Email Correspondence regarding City of Madison Unit Well 8*.

ARCADIS

Appendix C

Curriculum Vitae of
Thomas M. Johnson, P.G.
List of Publications, and List of Cases
Involving Expert Testimony

ARCADIS

Education
PhD program (Non-Degree ABD), Geology, University of Illinois, Champaign-Urbana, 1976-1986
MS, Geology, University of Wisconsin, Madison, 1976
MS, Water Resources Management, University of Wisconsin, Madison, 1975
BA, Geology, Augustana College, Illinois, 1972

Years of Experience
Total – 37

Professional Registrations
Professional Geologist, CA No. 4286
Certified Hydrogeologist, CA No. 317
Professional Geologist, IL No. 196-000926
Professional Geologist, WI No. 1286-13
Registered Geologist, AZ No. 31899
Certified Geologist, IN No. 547
Professional Geologist: PA No. PG-003073-G
Professional Hydrogeologist: American Institute of Hydrology
Professional Geologist: American Institute of Professional Geologists

Professional Associations
National Ground Water Assoc., Assoc. of Ground Water Scientists and Engineers
California Groundwater Resources Association
CA GRA Contemporary Issues Groundwater Council
American Institute of Hydrology
American Institute of Professional Geologists
Geological Society of America
Northern CA Geological Society
UW-Madison, Department of Geoscience Advisory Board

Thomas M. Johnson, PG, CHG

Executive Vice President / Technical Director
Principal Hydrogeologist and Quality Director

Mr. Johnson is Executive Vice President, Technical Director, and Principal Hydrogeologist for ARCADIS. He directs environmental contamination investigation and remediation projects and is Director of ARCADIS' Environment Expert Services Practice and Quality Program. Mr. Johnson has extensive expertise in hydrogeology and groundwater flow, contaminant fate and transport, and risk assessment. He is also an expert in subsurface vapor migration, modeling of groundwater flow and contaminant transport, and evaluating remedial technologies for soil and groundwater contamination.

Mr. Johnson has 37 years of consulting and research experience involving investigation and remediation of environmental contamination. He has directed and managed hundreds of projects involving environmental contamination. At the Illinois State Geological Survey, prior to joining ARCADIS, Mr. Johnson conducted research for 11 years on groundwater contamination resulting from the disposal of solid wastes, hazardous chemical wastes, and low-level radioactive waste. Major areas of expertise include hydrogeology and groundwater flow-system evaluation, vadose-zone processes, soil gas and vapor migration, environmental site investigation and remediation, computer modeling of water movement and contaminant transport, aerial photography interpretation, risk assessment, regulatory interaction, and cost allocation for environmental remediation. Mr. Johnson has published numerous articles and reports on these topics.

Mr. Johnson has provided expert testimony in both state and federal courts and in alternative dispute resolution hearings in numerous cases involving environmental contamination and water resources. He has served multiple terms on the Board of Directors and has served as Board Chairman for the National Ground Water Association, Association of Ground Water Scientists and Engineers. Mr. Johnson has also served on the Board of Directors and is Past-President of the California Groundwater Resources Association. He served for 10 years on the editorial review board for the journal *Groundwater Monitoring and Remediation*. He has been appointed to National Academy of Sciences/National Research Council panels to evaluate state and local groundwater protection programs for the U.S. Environmental Protection Agency (USEPA), and to assess innovative technology decision-making programs for the U.S. Department of Energy (USDOE). He also lectures extensively throughout the United States and internationally on groundwater contamination and

remedial actions for various universities, state and federal agencies, and organizations such as the National Ground Water Association. He has also been an invited instructor and lecturer at numerous seminars on environmental contamination, groundwater flow, and hydrogeology.

His professional interests and areas of expertise include:

- Groundwater flow system and water supply evaluation
- Evaluation of contaminant migration resulting from disposal of hazardous chemical wastes, petroleum hydrocarbons, solid wastes, and radioactive wastes
- Environmental monitoring and sampling techniques
- Unsaturated/vadose-zone water, soil gas and vapor movement, and contaminant migration
- Computer modeling of water flow, vapor movement, and contaminant migration
- Remote sensing and aerial photograph interpretation
- Environmental and human health risk assessment
- Evaluation and implementation of remedial actions for soil and groundwater contamination
- Cost evaluation and environmental cost allocation.

General Experience and Qualifications

Representative Experience – Industrial Chemicals

Mr. Johnson has directed or managed more than 200 projects across the United States involving organic and inorganic chemicals. This includes multiple large projects involving soil and groundwater contamination by industrial solvents and associated chemical additives, such as 1,4-dioxane, as well as projects involving industrial metals, perchlorate, agricultural chemicals, and petroleum hydrocarbons. This work includes environmental remediation projects to address solvent releases at large industrial client sites, and investigation and remediation of solvent contamination at dry cleaning and petroleum sites. This work has involved extensive interaction with state regulatory agencies and USEPA.

Mr. Johnson has also provided litigation consulting and expert witness services since 1981 in numerous cases across the United States involving environmental contamination of soil and groundwater by organic, inorganic, and radioactive substances. This includes expert witness testimony at deposition in more than 50 cases and expert trial testimony in state and federal courts in more than 20 cases. These cases have included expert testimony regarding the nature, source, and timing

of environmental contamination; hydrogeology; groundwater flow; fate and transport of contaminants; costs and methods of environmental investigation and remediation; and impacts to water supply systems.

For more than 30 years, Mr. Johnson has lectured and published on the subject of environmental contamination investigation, monitoring, and remediation. He has lectured for the National Groundwater Association at multiple seminars for environmental professionals and regulatory agency staff in many states.

General Experience

Project director and manager for environmental assessments, investigations, and remediation at sites throughout the United States involving soil and groundwater contamination by chlorinated organic solvents, petroleum hydrocarbons, metals, methyl tert-butyl ether (MtBE), perchlorate, radionuclides, polychlorinated biphenyls (PCBs), 1,4-dioxane, 1,2,3-trichloropropane, and other contaminants. This includes numerous sites with dense nonaqueous-phase liquid (DNAPL) and light NAPL (LNAPL).

Project management and direction of projects involving the full spectrum of state and federal environmental laws and regulations, including federal Resource Conservation and Recovery Act (RCRA); Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA); National Pollutant Discharge Elimination System; Federal Insecticide, Fungicide, and Rodenticide Act; and U.S. Nuclear Regulatory Commission (USNRC) laws and regulations. Mr. Johnson also has extensive experience with the complex network of state regulatory agencies, laws and regulations in California, Wisconsin, Illinois, Indiana, Florida, Arizona, Washington, Hawaii, and numerous other states.

Directed comprehensive environmental assessments and human health and environmental risk assessments at multiple sites within the United States, including abandoned waste disposal sites, landfills, and chemical and radioactive waste disposal facilities.

Program director for one the first studies in the United States of MtBE releases at operating gasoline service stations. This study, in the Santa Clara Valley of northern California, evaluated hydrogeologic conditions and the occurrence of MtBE in soil and groundwater beneath 28 operating service stations.

Directed programs to assess potential sources of trichloroethylene (TCE) groundwater contamination at multiple site locations in the Silicon Valley area of northern California.

These projects have included local and regional investigations to evaluate possible sources of TCE contamination from numerous electronics manufacturing facilities. Mr. Johnson also has performed site investigations and developed and implemented remediation activities to address soil and groundwater contaminated by volatile organic compounds (VOCS), petroleum hydrocarbons, metals, PCBs, perchlorate, MtBE, 1,2,3-trichloropropane, and other contaminants at sites throughout the United States.

Mr. Johnson has also has served as an expert witness in numerous cases involving environmental contamination, providing testimony regarding hydrogeology; groundwater conditions; the nature, source, and timing of contamination, fate, and transport of contaminants; impacts to groundwater supplies and the selection and costs of remediation.

Special advisor to the USEPA for preparation of a Technical Enforcement Guidance Document to address groundwater monitoring for RCRA facilities.

Performed groundwater resource assessments and evaluations at locations throughout the United States, including studies of conjunctive use of surface water and groundwater, groundwater recharge, and groundwater well design and installation. He also has performed water resources evaluations, groundwater recharge studies, waste containment designs, monitoring leachate migration from sanitary landfills, natural resource inventories, and environmental impact studies.

Program director for USEPA and USNRC studies of landfill containment systems, including comprehensive laboratory, field, and computer studies of covers and liners for sanitary landfills, hazardous chemical disposal sites, and radioactive waste management facilities. He also has conducted hydrogeologic investigations for siting of sanitary and hazardous waste landfills in Illinois, California, and Georgia.

Designed and implemented groundwater monitoring systems and remediation programs for sites throughout the United States, including sites subject to federal CERCLA and RCRA regulations, and sites in multiple states with complex environmental regulations, such as California.

Lectures and presentations at professional meetings and university seminars and conferences in the United States and internationally. Lectured at University of California (UC) Berkeley, UC Davis, UC Riverside, Purdue University, University of Wisconsin, and the University of Alaska.

Technical co-author of the environmental law textbook, *Environmental Liability Allocation*, published from 2008 to 2012 by Thomson West.

Former Head of the Groundwater Section, Illinois State Geological Survey, where he directed field and laboratory research programs for USEPA, USNRC, and state agencies involving evaluation of waste disposal technologies and environmental impacts from the disposal of solid and hazardous wastes, radioactive wastes, petroleum wastes, and industrial wastes.

Appointed to serve on two National Academy of Sciences/National Research Council panels to evaluate state and local groundwater protection programs for the USEPA, and to assess innovative technology decision-making programs for the USDOE.

Representative Project Experience

Chlorinated Solvents Experience

Extensive experience involving industrial sites throughout the United States, including solvent manufacturing facilities, electronics manufacturing operations, dry cleaners, aerospace manufacturers, equipment manufacturing facilities, automobile manufacturing and repair operations, and other industrial facilities. Most of these facilities used chlorinated solvents and commonly used vapor degreasers during their operations spanning many decades from at least the 1940s to the 1980s. Mr. Johnson has served as project director and manager for environmental assessments, investigations, and remediation at sites throughout the United States. These projects have involved soil and groundwater contamination by chlorinated organic solvents, including tetrachloroethene (PCE), TCE, 1,1,1-trichloroethane, and solvent additives, such as 1,4-dioxane and other contaminants, and numerous sites with DNAPL and LNAPL.

This project experience includes evaluation, investigation, and remediation of chlorinated solvent contamination at industrial facilities and dry cleaner sites in California, Florida, Arizona, Massachusetts, Wisconsin, Illinois, New Jersey, North Carolina, and other states. Mr. Johnson has directed programs to assess multiple potential sources of TCE groundwater contamination at multiple locations in the Silicon Valley area of northern California. These projects included local and regional investigations to evaluate possible sources of PCE and TCE contamination from numerous electronics manufacturing facilities.

Lead and Metals Experience

Former Lead Battery Disposal Site, San Francisco Bay, CA – Investigation and remediation of large lead battery disposal site adjacent to San Francisco Bay. Project included investigation impacts of lead battery waste disposal primarily during the 1950s and 1960s to soil, sediments, groundwater, and biota. The remedy included off-site disposal of battery debris, lead-contaminated sediment, and biota (clams, mussels) containing hazardous levels of lead, zinc, chromium, and other metals. The final remedy consisted of dredging bay sediments and placing the sediments and lead-impacted soils into a lined and covered disposal cell along the bay shore.

Former Shooting Range, Sacramento, CA – Mr. Johnson provided expert services related to the evaluation of impacts from a former shooting range in an area of proposed residential development. The property was impacted by the widespread use of the property as a former shooting range for pistol, rifle, and black-powder. Work included review of site history, assessment of site investigation results, evaluation of alternative proposed remedial actions and costs to address lead-impacted soils, and review of regulatory requirements.

Former Battery Manufacturing Site, Los Angeles, CA – This project included expert review of site history and investigations of soil and groundwater at a former battery manufacturing site. Soil and groundwater were impacted by lead, zinc, chromium, and acid.

Petroleum and MtBE Experience

Upstream Petroleum

Major Oil Company, San Joaquin Valley Oil Field, Kern County, CA – Mr. Johnson was retained by a major oil company to evaluate environmental impacts from upstream oil production in western Kern County, California. This project was related to litigation over impacts to groundwater from more than 80 years of oil production activities, and impacts from the discharge of more than a billion barrels of produced water (brine) to the environment. Work included assessment of hydrogeologic conditions, geophysical evaluation of production and disposal horizons, geochemical study of native water quality, evaluation of groundwater monitoring data from hundreds of monitoring wells, analysis of groundwater stable isotope data, evaluation of naturally occurring radioactive materials, calculations of produced water migration, assessment of impacts from deep-well injection of produced water, evaluation of remedial methods and costs to address oil-field impacts, and evaluation of alternative methods for dealing with produced water and oil field wastes. Litigation by nearby land owners

included claims for damages in amounts as high as $10 billion. Mr. Johnson testified as an expert witness in multiple jury trials in the case in California Superior Court. Key issues in these trials included evaluation of naturally poor native water quality and claims of damages by the plaintiff related to oil field operations.

Oil Field Investigation and Remediation, Central Coast, California – ARCADIS was retained to define and remediate environmental impacts associated with oil production operations at the Guadalupe oil field, in a sensitive coastal ecosystem on the coast of California. Mr. Johnson provided technical direction for work conducted under the direction of the California Regional Water Quality Control Board, including site investigations of hydrogeologic conditions in an ecologically sensitive coastal sand dune environment and groundwater monitoring to assess impacts from oil field activities, including impacts from releases of petroleum diluents used to facilitate transport of petroleum through pipelines. Other work included groundwater modeling, evaluating and implementing remedial actions including in-situ remedial methods, phytoremediation, soil treatment, and groundwater remediation. Additional issues included evaluation of impacts to sensitive and endangered biota from oil field production and remediation activities. Finally, ARCADIS participated in a multi-agency and multi-party mediation to assess and resolve issues regarding environmental impacts at the site.

Multiple Pipeline Releases, California – ARCADIS represented a major pipeline operator in responding to pipeline ruptures and petroleum releases at locations throughout the western United States. Mr. Johnson has worked on pipeline release projects involving crude oil and other petroleum products at multiple sites in California. This work has included emergency response activities, remedial investigations, ecological assessment and mitigation, and site remediation involving multiple state and federal regulatory agencies. Mr. Johnson has also provided expert testimony regarding the timing and sources of petroleum releases from multiple pipelines.

Refinery/Terminal Experience

Petroleum Refinery, San Francisco Bay, CA – In this litigation project, Mr. Johnson and his staff evaluated releases of petroleum hydrocarbons and other chemicals since 1914 at a large refinery on San Francisco Bay. This included studies of refinery history and operations by multiple owners and operators, and evaluation of sources of contamination related to ship loading and unloading, handling, piping, processing, and storage of crude oil and petroleum products. Mr. Johnson provided expert testimony regarding sources and timing of contamination, volumes of petroleum released to the environment, and methods for remediation.

Petroleum Refinery, Bakersfield, CA – This litigation case involved releases of petroleum products and MtBE from a refinery and associated distribution terminal adjacent to a mixed commercial, industrial, and residential area. MtBE was detected in water supply wells serving the residential area. Mr. Johnson was retained by the former refinery owner to assess environmental impacts from the refinery and the occurrence and migration of MtBE in soil and groundwater. Using historical groundwater flow data, groundwater quality data, and the relative distribution of petroleum hydrocarbons and MtBE, Mr. Johnson provided expert testimony regarding sources and timing of contamination at the site and impacts to off-site wells.

Petroleum Terminal, Los Angeles, CA – Mr. Johnson represented a major oil company in litigation with a nearby landowner involving the petroleum and MtBE contamination associated with a major petroleum distribution terminal. Primary issues included sources, occurrence, and extent of contamination; effectiveness of remedial actions; and regulatory oversight.

Service Station / MtBE Experience

Confidential Client, United States – Mr. Johnson has represented a major oil company involved with litigation over environmental impacts of MtBE releases from service stations at hundreds of locations in several states. This work has included evaluation of sources and timing of MtBE impacts to groundwater from service stations operated by a large number of parties at multiple locations, and potential impacts to public water supplies. Additional work has included evaluation of remedial technologies for MtBE contamination and assessment of natural attenuation mechanisms for MtBE.

Merced, CA – Mr. Johnson represented a joint defense group of multiple major oil companies in litigation involving multiple service stations. The primary issues involved the occurrence and extent of MtBE contamination, possible impacts to public water supplies, effectiveness of remedial actions, and regulatory oversight. Mr. Johnson provided expert testimony in California Superior Court during a five-month jury trial.

Multiple Gasoline Service Stations, CA, NV, OR, WA – Mr. Johnson was retained by a major oil company to represent them in a large arbitration involving environmental claims regarding the exchange of more than 250 service stations with another major oil company. The arbitration was conducted by JAMS in San Francisco and involved more than 10 hearings over a two-year period before three former federal judges. Each arbitration hearing involved four to six sites, with issues including the timing and sources of contamination by petroleum hydrocarbons and MtBE. Mr. Johnson prepared expert reports for each site and provided expert testimony in each arbitration hearing.

Multiple Gasoline Service Stations, Northern California – A major oil company retained Mr. Johnson to represent them in arbitration with another oil company to evaluate relative contributions of petroleum hydrocarbons and MtBE in soil and groundwater at several service stations in the San Francisco Bay area. Mr. Johnson assisted the client in developing a strategy to allocate responsibility for MtBE and petroleum impacts and provided expert testimony in the arbitration hearing.

MtBE Groundwater Vulnerability Pilot Study, California – Mr. Johnson was program manager for one the first studies in the United States of MtBE releases at operating gasoline service stations. This study, funded by the Santa Clara Valley Water District, evaluated hydrogeologic conditions and the occurrence of MtBE in soil and groundwater beneath 28 operating service stations. The study provided valuable information to industry and regulatory agencies regarding the effectiveness of recently upgraded petroleum piping and containment systems at operating service stations.

Superfund/CERCLA and State Superfund Experience

Multiple CERCLA Superfund Sites – California, Illinois, Florida

Mr. Johnson has directed and managed multiple projects at federal Superfund sites in multiple states, including California, Illinois, and Florida. This includes assessment of remedial investigations, risk assessment, feasibility studies, and remedial actions for chlorinated solvents in soil and groundwater, such as the Intersil-Siemens Site, the Gencorp-Aerojet Superfund Site, the San Fernando Valley Superfund site, the San Bernardino Superfund Site, and the San Gabriel Valley Superfund Site in California; the Acme Solvents Superfund Site in Illinois; and the Reeves Superfund Site in Florida.

PCB Disposal Sites, Bloomington, IN

Mr. Johnson represented USEPA and the U.S. Department of Justice in litigation involving Westinghouse Corporation and the disposal of wastes containing PCBs at multiple locations in the Bloomington, Indiana, area. PCB-containing liquids and solid wastes were placed in landfills and other locations during the 1950s to the 1970s in an area of highly permeable and weathered karst limestone. Sampling of soil, sediment, groundwater, and surface water indicate extensive occurrence of PCBs in soils, surface water, and groundwater. The primary concern was the occurrence of highly permeable karst limestone, containing large fissures, sinkholes, and caves, which facilitated the movement of PCBs into groundwater and to sediments, springs, and nearby surface water. Mr. Johnson provided expert testimony regarding the occurrence of PCBs in the environment and methods to contain PCB-contaminated

soil and groundwater. The work included evaluating groundwater/surface-water interaction, delineating the extent of PCB contamination of sediment, determining the extent of groundwater and surface-water quality impacts, and evaluating groundwater recharge and waste isolation.

Former Radioactive Material Processing Facility – West Chicago, IL

Expert hydrogeologist for the State of Illinois in assessment of hydrogeologic conditions and investigation of radioactive thorium, radium, and uranium releases during the 1930s to 1950s at a former chemical processing plant located in a residential area. The investigation focused on shallow and deep groundwater flow patterns, groundwater/surface-water interaction, natural attenuation processes for radionuclides in soil and groundwater, and possible migration to nearby water supply wells. Additional issues included the off-site use of radioactive fill material from the plant at locations throughout the residential community. Mr. Johnson provided expert testimony in Illinois Superior Court regarding hydrogeologic conditions, the occurrence and extent of radionuclide migration in soil and groundwater, and the effectiveness of proposed remedial measures.

Hazardous Chemical and Radioactive Waste Disposal Sites – Illinois

Mr. Johnson served as expert hydrogeologist and program manager for the State of Illinois Department of Nuclear Safety, USEPA, and the Illinois Environmental Protection Agency to evaluate possible releases of hazardous chemical wastes and radioactive wastes from chemical waste landfills and low-level radioactive waste disposal sites in Illinois. This included a comprehensive study of the failure mechanisms resulting in the migration of chemical wastes from the Wilsonville, Illinois, Hazardous Waste Disposal site. Following extensive litigation, courts ruled that the more than 86,000 containers of wastes at the state-permitted Wilsonville disposal site be excavated and removed from the site to another, more secure facility. During the approximate two-year waste excavation and removal process, Mr. Johnson directed a USEPA-funded program to investigate the nature of chemical releases from the facility and the failure mechanisms that enabled chemical migration in groundwater from the site.

Other such sites include assessment of releases of radioactive materials from the state-permitted Sheffield Low-Level Radioactive Waste Disposal Site, in Princeton, Illinois. On behalf of the Illinois Department of Nuclear Safety, Mr. Johnson evaluated hydrogeologic conditions and the migration of radioactive tritium, cesium, and other chemicals in groundwater at the site. Studies showed that the emplacement of wastes in unsaturated soils was not sufficient to prevent radionuclide migration from the site.

Further studies directed by Mr. Johnson and funded by the USNRC confirmed that improvements were needed to waste containment systems, including covers and liners, to isolate radioactive wastes.

Sanitary Landfill Experience

Evaluation of Sanitary Landfills – Illinois

Mr. Johnson directed a research program at the Illinois State Geological Survey to evaluate the performance of sanitary landfills and other waste disposal sites in Illinois. This program included field studies of existing sanitary landfills in various hydrogeologic settings throughout the state to evaluate whether contaminants from the landfill were being released to the environment. This included site investigations and groundwater monitoring at multiple landfill sites to determine whether landfill leachate had impacted the underlying soil and groundwater. Mr. Johnson also was one of the first researchers in the United States to study the migration of landfill leachate through the unsaturated (vadose) zone beneath sanitary landfills. Mr. Johnson was also the principal investigator for the USEPA and USNRC research programs to assess the performance of covers and liners for landfill sites. He has published many articles regarding this research.

Perchlorate Experience

Sacramento Area Superfund Site – California

Mr. Johnson and ARCADIS have provided expert consulting and site investigation and remediation services to a major aerospace manufacturer at a USEPA Superfund site in the Sacramento area involving soil and groundwater contamination by perchlorate and chlorinated VOCs, including TCE and PCE, resulting from industrial activities and waste disposal from the 1950s to the 1980s. Mr. Johnson and ARCADIS evaluated contaminant source locations and plume migration and developed remedial plans to address perchlorate and VOC migration in groundwater and impacts to public water supply wells. ARCADIS also conducted critical evaluations of alternative sources of perchlorate in the environment, including natural sources, such as perchlorate formed during chlorination of public water supplies, historical sources of perchlorate from nitrate fertilizers, and natural sources of perchlorate in arid environments. ARCADIS evaluated alternative remedial actions and conducted computer modeling of groundwater flow and perchlorate migration to evaluate the timing and sources of contamination and possible impacts to off-site public water supply wells. Mr. Johnson provided expert testimony on multiple related toxic tort litigation cases in California Superior Court and provided expert testimony in California regulatory hearings regarding water resource allocation.

Southern California Superfund Site

Mr. Johnson has provided expert consulting services to the U.S. Department of Defense regarding a USEPA Superfund site in southern California involving soil and groundwater contamination by perchlorate and chlorinated VOCs. Mr. Johnson and ARCADIS have evaluated sources of contamination related to historical aerospace and fireworks manufacturing operations, and possible military use in World War II. These sources included wastes from solvent degreasers used at the site from the 1950s to the 1980s This work included evaluation of plume migration and remedial plans to address perchlorate and VOC impacts to public water supply wells. ARCADIS also evaluated alternative sources of perchlorate from nitrate fertilizers and natural sources of perchlorate in arid environments.

Perchlorate Remediation

Technology Overview Document – Perchlorate: Overview of Issues, Status, and Remedial Options, prepared by the Interstate Technology & Regulatory Council, Perchlorate Team, September 2005. Team member.

National Aeronautics and Space Administration (NASA) – Cape Canaveral, FL

ARCADIS served as a primary contractor for NASA at Cape Canaveral to investigate and remediate environmental impacts resulting from the United States space program. This work has included investigation and evaluation of possible impacts by VOCs and perchlorate on soil and groundwater. ARCADIS has assisted NASA, under the technical direction of Mr. Johnson, in assessing the impacts of contamination and devising remedial action plans.

Groundwater Resource and Water Supply Experience

Water Rights Evaluation – Sacramento, CA

Evaluation of groundwater flow and surface water-groundwater interaction in the American River, Sacramento, California. Mr. Johnson provided testimony to the California State Water Resources Control Board regarding surface water-groundwater interaction at a hearing involving water rights claims and disputes between multiple parties.

Recharge and Surface Water-Groundwater Interaction – San Diego County, CA

Assessment of surface water conditions, groundwater flow, recharge, and water quality impacts in large groundwater basin at U.S. Marine Corps Base – Camp Pendleton from 1940-2008. This included evaluation of historical stream flow and groundwater levels and assessment of impacts of urbanization, agricultural land use, and military site use on surface water and groundwater quality. Mr. Johnson provided expert testimony in Los Angeles Federal Court for the clients, Eastern Municipal Water District and Rancho California Water District.

Groundwater Basin Assessment - Santa Clara Valley, CA

Evaluation of hydrogeology, groundwater conditions, surface water-groundwater conjunctive use, and groundwater recharge in the southern Santa Clara Valley. This included study of groundwater basin boundaries and interaction with adjacent groundwater basins for the Santa Clara Valley Water District. Mr. Johnson provided expert testimony on these subjects in California Superior Court.

Litigation Support and Expert Testimony

Mr. Johnson has served as an expert witness in numerous litigation cases involving a wide range of issues related to environmental contamination and remediation and groundwater resources. He has testified in state and federal court on multiple occasions in both bench and jury trials, and has testified in arbitration and mediation hearings and in legislative and regulatory agency hearings. He has represented public- and private-sector clients and has worked with law firms throughout the United States. Areas of expert testimony have included the nature, sources, and timing of environmental impacts to soil and groundwater, hydrogeologic conditions and groundwater flow, water balance, remedial investigations, evaluation and costs of remedial actions, computer modeling of groundwater flow and contaminant migration, aerial photograph interpretation, vadose zone contaminant migration, vapor intrusion, human health and environmental risk assessment, and regulatory interaction. A list of cases in which Mr. Johnson has provided expert testimony follows, with information regarding the client, a case citation, and the client law firm(s).

Selected Publications in Last 10 Years

Zuckerman, T.I., T.J. Bois and T.M. Johnson. 2007, 2008, 2009, 2010, 2011, 2012. *Environmental Liability Allocation: Law and Practice.* Thomson West Publishers, Environmental Law Series, St. Paul, MN. 1260 pp.

Nichols, E.M., T.M. Johnson, S.T Potter. 2011. Modeling: The Need for Transparency. Association for Environmental Health and Sciences (AEHS) 21st Annual Meeting and West Coast Conference on Soils, Sediments and Water, San Diego, CA. March 15.

Johnson, T.M. and J.S. Seyfried. 2006. Forensic Investigation of Sources of Perchlorate in Water-Supply Wells: A Case Study. National Groundwater Association, Western Focus Conference, San Francisco, CA. Abstracts. May 2006.

Seyfried, J.S. and T.M. Johnson. 2006. Investigation of Perchlorate-Containing Fertilizer and Other Potential Sources of Perchlorate Detected in Water Supply Wells - A Case Study: California Groundwater Resources Association Perchlorate Symposium, Santa Clara, CA. Abstracts. January 2006.

Johnson, T.M. 2003. Forensic Evaluation of Contamination by Solvents Originating from Coatings Used in Public Water Supply Storage and Distribution Facilities: International Society of Environmental Forensics, San Diego, CA, Abstracts. November 2003.

Johnson, T.M. 2003. Forensic Evaluation of Contaminant Sources and Migration in a Regional Superfund Site: Univ. of California-Water Resources Center, California Groundwater Resources Association of California Biennial Meeting, Anaheim, CA, Abstracts. October 2003.

Johnson, T.M. and E. Nichols. 2002. Environmental litigation involving public water supply systems: Forensic evaluation of contamination of groundwater by volatile organic solvents originating from historical coating and lining of public water supply storage and distribution facilities: National Ground Water Association Conference, Litigation, Ethics, and Public Awareness, Washington, D.C., Abstracts with Program, August 2002.

Johnson, T.M. 2002. Litigation in paradise: The case of the disconnected UST, National Ground Water Association Conference, Litigation, Ethics, and Public Awareness, Washington, D.C., Abstracts with Program, August 2002.

Presentations

“From ASR to CPR: California Groundwater Issues and Legislative Activities,” Industrial Environmental Coalition of Orange County, Orange, California

“Litigation in Paradise: The Case of the Disconnected UST and the Role of the Hydrogeologist as an Expert Witness in Environmental Litigation” California

Groundwater Resources Association, San Joaquin Valley Branch Meeting, Fresno, California

"MtBE – Impacts and Remediation" California Ground Water Association, Annual Meeting Seminar, Monterey, California.

"Environmental Sampling Techniques: Implications for Cost Allocation Litigation," Los Angeles County Bar Association, Environmental Law Section Seminar, Los Angeles, California.

"Litigation and Expert Witness Services," Groundwater Resources Association of California, Oakland, California.

"Environmental Remediation: New Technologies and Old Limitations," Purdue University School of Civil Engineering and the Environmental Science and Engineering Institute (ESEI) at Purdue, West Lafayette, Indiana.

"Innovative In Situ Environmental Remediation Technologies: Recent Developments." Keynote Address at Groundwater Studies, Tools, and Technology Symposium, Groundwater Division of The Water Management Association of Ohio, Columbus, Ohio.

"Innovative In Situ Environmental Remediation Technologies – Recent Developments," Environmental Clean Up: Litigation, Legislation and Technological Innovation Conference, sponsored by The Bar Association of San Francisco, California.

"The Role of the Expert Witness in Environmental Litigation," Florida Air and Waste Management Association Annual Meeting, Sandestin, Florida.

"Groundwater Hydrology: Theory, Monitoring and Remediation," University of California at Davis - Extension, Continuing Course Series.

"Site Assessment and Remediation," University of California at Berkeley - Extension, Continuing Course Series.

"Unsaturated Zone Monitoring and Remedial Actions," University of California at Davis -Extension, Continuing Course Series.

"Corrective Actions for Containing and Controlling Groundwater Contamination," National Ground Water Association, Continuing Course Series.

"Theory and Practice of Groundwater Monitoring and Sampling," National Groundwater Association, Continuing Short Course Series.

"Groundwater Pollution Remedial Actions," University of California at Davis Extension, Continuing Seminar Series.

"Groundwater Monitoring," USEPA Seminar: Transport of Viruses and Organics in the Subsurface, Ada, Oklahoma.

"Geologic Considerations in Hazardous Waste Disposal," Univ. of Wisconsin-Extension, Dept. of Engineering: Hazardous Waste Management Practices Institute, Madison, Wisconsin.

"Monitoring the Unsaturated Zone," Conference on Environmental Monitoring, sponsored by Geraghty and Miller, Inc., Arlington, Virginia.

"Groundwater Monitoring for Landfills," Univ. of Wisconsin-Extension, Dept. of Engineering: Sanitary Landfill Site Selection and Design Institute, Madison, Wisconsin.

"Interpretation of Groundwater Monitoring Data Collected in the Vicinity of Landfills" and "Monitoring in the Unsaturated Zone," National Council of the Paper Industry for Air and Stream Improvement, Technical Workshop: Groundwater Quality Monitoring at Land Disposal Sites, Chicago, Illinois.

"Groundwater Contamination -- Remedial Actions," University of Wisconsin-Extension, Dept. of Engineering: Groundwater Quality Protection Institute, Madison, Wisconsin.

"Field Investigative Procedures and Remedial Measures Related to Groundwater Contamination," Univ. of Wisconsin-Extension, Dept. of Engineering: Seminar for Wisconsin Department of Natural Resources, Madison, Wisconsin.

"Modeling of Moisture Movement Through Covers Designed to Limit Infiltration at Waste Disposal Sites," U.S. Nuclear Regulatory Commission, Symposium on Low-Level Radioactive Waste Disposal, Washington, DC.

"Waste Disposal and Groundwater Contamination," Minnesota Groundwater Association, Minneapolis, Minnesota.

"Hydrogeologic Investigations of Failure Mechanisms and Migration of Organic Chemicals at Wilsonville, Illinois," National Ground Water Association, National Symposium on Aquifer Restoration and Ground Water Monitoring, Columbus, Ohio.

"Groundwater Monitoring and Sampling Technology," American Society for Testing and Materials (ASTM) Training Course Series.

List of Expert Witness Testimony Cases Involving Deposition/Trial/Arbitration Testimony in Last 4 Years

Date	Case (Client(s) in bold)	Client Law Firm(s)
2011-2012	Zwulon Zelikowski, AAW Door, Inc.; and 13900 South Broadway, LLC v. **ConocoPhillips Company**, Unocal Corporation, et al.; Deposition	Hunton & Williams LLP, Los Angeles, CA; Glynn & Finley LLP, Walnut Creek, CA
2011-2012	City of Merced v. **Chevron U.S.A., Inc., ExxonMobil, and Shell Oil Company:** Deposition/Trial	Munger Tolles & Olson LLP, Latham & Watkins LLP, King & Spalding LLP; Sheppard Mullin, Richter & Hampton LLP
2011	**SEMA Construction, Inc**. v. City of Tustin, CA: Deposition/Trial	Musick, Peeler & Garrett LLP, Irvine, CA
2011	Hinds Investments et al. v. Gregory et al. (**Cooper Industries**): Deposition	Gordon & Rees LLP, San Diego, CA
2010	**Port LA Distribution Center,** et al. v. United National Insurance Company, Inc.: Deposition	Jones Day, San Francisco, CA
2009-2010	Robert C. Cook, Sr. v. **Shell Oil Company**, et al.: Deposition	Munger, Tolles & Olson, San Francisco, CA
2009-2003	City of Modesto v. **The Dow Chemical Co., et al.** (**Occidental Chemical Co.**): Depositions/Trials	Barg, Coffin, Lewis & Trapp, San Francisco, CA; Filice Brown Eassa & McLeod LLP, Oakland, CA
2009-2004	Starrh and Starrh Cotton Growers v. **Aera Energy LLC**: Depositions/Trials	Munger, Tolles & Olson, Los Angeles, CA
2008	Great Oaks Water Co. v. **Santa Clara Valley Water District:** Deposition/Trial	Duane Morris LLP, San Francisco

Date	Case (Client(s) in bold)	Client Law Firm(s)
2008	Safety-Kleen Envirosystems Company vs. **London Market Insurers, et al.**: Deposition	Duane Morris LLP, San Francisco/Los Angeles, CA
2008-2007	U.S., et al. vs**. Eastern Municipal Water District**, et al.: Deposition/Trial	Bingham McCutchen, Los Angeles, CA

Appendix C

Unit Well 8 Boring Log

well 8

WISCONSIN UNIQUE WELL NUMBER **BF508**
Source: SWAP PROJECT KEYED

State of Wi-Private Water Systems-DG/2
Department Of Natural Resources, Box 7921
Madison, WI 53707

Form 3300-77A
(Rev 02/02)bw

Depth 774 FT

Property Owner: MADISON, CITY OF	Telephone Number: 608 -266 -4656	1. Well Location: T=Town C=City V=Village C of MADISON	Fire#
Mailing Address: 523 E MAIN ST		Street Address or Road Name and Number: 3206 LAKELAND AVE #8	
City: MADISON	State: WI / Zip Code: 53703	Subdivision Name	Lot# / Block #
County of Well Location: 13 DANE	Co Well Permit No W	Well Completion Date: January 1, 1945	
Well Constructor: MCCARTHY WELL CO	License #: 391	Facility ID (Public): 113022470	
Address: 2700 E 80TH ST		Public Well Plan Approval#	
City: BLOOMINGTON	State: MN / Zip Code: 55425	Date Of Approval: 01/05/1945	
Hicap Permanent Well #: 77128	Common Well #: 008	Specific Capacity: 300 gpm/ft	

Gov't Lot or NE 1/4 of NW 1/4 of Section 8 T 7 N;R 10 E
Latitude Deg. Min.
Longitude Deg Min.

2. Well Type 1 (See item 12 below) Lat/Long Method: GPS003
1=New 2=Replacement 3=Reconstruction
of previous unique well # _____ constructed in 0
Reason for replaced or reconstructed Well?

3. Well Serves M # of homes and or (eg: barn, restaurant, church, school, industry, etc.)
M=Munic O=OTM N=NonCom P=Private Z=Other X=NonPot A=Anode L=Loop H=Drillhole
High Capacity: Well? Property?

1 1=Drilled 2=Driven Point 3=Jetted 4=Other

4. Is the well located upslope or sideslope and not downslope from any contamination sources, including those on neighboring properties?
Well located in floodplain?
Distance in feet from well to nearest: (including proposed)

1. Landfill
2. Building Overhang
3. 1=Septic 2= Holding Tank
4. Sewage Absorption Unit
5. Nonconforming Pit
6. Buried Home Heating Oil Tank
7. Buried Petroleum Tank
8. 1=Shoreline 2= Swimming Pool
9. Downspout/ Yard Hydrant
10. Privy
11. Foundation Drain to Clearwater
12. Foundation Drain to Sewer
13. Building Drain 1=Cast Iron or Plastic 2=Other
14. Building Sewer 1=Gravity 2=Pressure 1=Cast Iron or Plastic 2=Other
15. Collector Sewer: ___ units ___ in . diam.
16. Clearwater Sump
17. Wastewater Sump
18. Paved Animal Barn Pen
19. Animal Yard or Shelter
20. Silo
21. Barn Gutter
22. Manure Pipe 1=Gravity 2=Pressure 1=Cast iron or Plastic 2=Other
23. Other manure Storage
24. Ditch
25. Other NR 812 Waste Source

Drillhole Dimensions and Construction Method

Dia.(in.)	From (ft)	To (ft)
24.0	surface	102
23.0	102	280
16.0	280	774

Upper Enlarged Drillhole / Lower Open Bedrock
1. Rotary - Mud Circulation
2. Rotary - Air
3. Rotary - Air and Foam
4. Drill-Through Casing Hammer
5. Reverse Rotary
6. Cable-tool Bit _ n. dia
7. Temp. Outer Casing _ in. dia. _____ depth ft. Removed ?
Other

Geology Codes	8. Geology Type, Caving/Noncaving, Color, Hardness, etc	From (ft.)	To (ft.)
__T_	TILL	0	80
__G_	GRAVEL	80	110
__N_	SANDSTONE FRANCO	110	135
_HML	SILTSTONE EC	250	255
__HL	SHALE EC	255	264
I_NL	SANDSTONE EC	264	445
I_N_	SANDSTONE MT SIMON	445	605
_HM_	SILTSTONE MT SIMON	605	615
__N_	SANDSTONE MT SIMON	615	700
_HM_	SILTSTONE	700	725
G_N_	SANDSTONE MT SIMON	725	760
_DQC	LAY DECOMPOSED IGNEOUS PC	760	774

6. Casing/Liner Screen

Dia. (in.)	Material, Weight, Specification Manufacturer & Method of Assembly	From (ft.)	To (ft.)
0.0	r = 0.67 ft	surface	102
18.0		102	280

Dia.(in.)	Screen type, material & slot size	From	To

7. Grout or Other Sealing Material

Method / Kind of Sealing Material	From (ft.)	To (ft.)	# Sacks Cement
CEMENT	surface	280.0	

9. Static Water Level: 42.0 feet B ground surface (A=Above B=Below)

10. Pump Test: Pumping level 107.0 ft. below surface
Pumping at 1965.0 GP M 10.0 Hrs

11. Well Is: 0 in. Grade (A=Above B=Below)
Developed?
Disinfected? 107-42 = 65'
Capped?

12. Did you notify the owner of the need to permanently abandon and fill all unused wells on this property?
If no, explain

13. Initials of Well Constructor or Supervisory Driller Date Signed

Initials of Drill Rig Operator (Mandatory unless same as above) Date Signed

Additonal Comments? Y Variance Issued?
Owner Sent Label? Y More Geology?

SC = 1965 / 65 = 30.23 gpm/ft

Batch 548

NE,NW, sec. 8, 7N, 10E
UNIT WELL NO. 8, MADISON, WIS.

Dn-54

Welch and Lakeland Sts.; NE¼NW¼ sec. 8, T. 7 N., R. 10 E.
McCarthy Well Co., Contractors, 1945 Elevation 878-880
Samples examined by F. T. Thwaites, Nos. 123238-123380

DRIFT		0-50	50	Till, rusty gray, sandy, dolomitic
		50-80	30	Till with more stone than above
	110	80-110	30	Gravel, stony
FR	25	110-125	15	Sandstone, fine, light gray, dol., glaucon.
		125-135	10	Sandstone, fine to coarse, light gray
DRESBACH		135-180	45	Sandstone, medium to fine, light gray
		180-190	10	Sandstone, medium to fine, yellow-gray, pink
		190-220	30	Sandstone, medium to fine, light yellow-gray
		220-230	10	Sandstone, fine, yellow-gray to white
	115	230-250	20	Sandstone, medium to fine, white
		250-255	5	Siltstone, gray, dolomitic
		255-264	9	Shale, red and dark green, dolomitic
		264-270	6	Sandstone, fine, gray, dolomitic
		270-285	15	Sandstone, medium to fine, light gray to pink
EAU CLAIRE		285-300	15	Sandstone, silty to medium, light gray to p.
		300-305	5	Sandstone, fine to medium, gray, dol.
		305-315	10	Sandstone, fine to medium, li. gray to pink
		315-340	25	Sandstone, fine, white, hard dolomitic layers
		340-350	10	Sandstone, fine to medium, white
		350-360	10	Sandstone, fine to medium, hard dol. layers
		360-370	10	Sandstone, medium to fine, white
		370-400	30	Sandstone, fine to medium, white; some hard dolomitic layers
		400-410	10	Sandstone, fine to medium, white
		410-415	5	Sandstone, fine to medium, gray, dol, hard
		415-420	5	Sandstone, fine, white
		420-425	5	Sandstone, like above, hard pink, dol. layers
	195	425-440	15	Sandstone, medium to fine, white
		440-445	5	Sandstone, fine, white, red, gray dol. layers
		445-455	10	Sandstone, fine to medium, white
		455-470	15	Sandstone, fine to silty, white
		470-495	25	Sandstone, medium to silty, white
		495-500	5	Sandstone, fine to coarse, white
		500-510	10	Sandstone, fine to medium, white
		510-520	10	Sandstone, medium to fine, white
		520-530	10	Sandstone, coarse to fine, light gray
		530-540	10	Sandstone, fine to coarse, light gray
		540-555	15	Sandstone, fine to medium, white
		555-565	10	Sandstone, fine to coarse, light gray
		565-585	20	Sandstone, silty to medium, white
		585-600	15	Sandstone, fine to medium, white
		600-605	5	Sandstone, fine to coarse, white
		605-615	10	Siltstone, light pink
		615-630	15	Sandstone, silty to fine, light pink
		630-640	10	Sandstone, silty to fine, light gray
		640-645	5	Sandstone, fine to medium, light gray
		645-650	5	Sandstone, medium to fine, light gray
		650-660	10	Sandstone, fine, light gray
		660-675	15	Sandstone, fine to medium, light gray
		675-695	20	Sandstone, silty to fine, light gray
		695-700	5	Sandstone, fine to medium, white
		700-725	25	Siltstone, light gray, pink at bottom
		725-735	10	Sandstone, silty to coarse, light gray
	115	735-755	20	Sandstone, fine to medium, light gray
		755-760	5	Sandstone, silty to fine, light gray
	14	760-774	14	Clay, dark red, probably decomposed igneous

24" pipe
42
water
8" pipe filled
102.4
107
23" hole
8" hole
18" pipe cement.
280
16" hole
25# shot
380
430
100→25# shots
480
50→25# shots
530
540 214+ 25# sh.
680 200# sh.

Formations: Drift; Franconia (formerly Mazomanie); Dresbach (Galesville); Eau Claire.

Search

Home About A-Z Index Contact

DNR Drinking Water System: High Capacity Wells

Help Reports

High Capacity Well Number:	77128	**WI Unique Well No:**	BF508
DNR Region:	South Central	**County:**	Dane
Water Basin:	012 - Rock River (lower)	**DNR Facility ID:**	113022470
Operator's Well ID:	008	**Owner's Well Id:**	008
Well Town:	MADISON(CITY OF)	**Well Mailing City:**	
County Approval No:	0011	**File Ref. #:**	13-9-0011
Classification:	Municipal Water Supply	**Status:**	ACTIVE Formerly
Chief Aquifer:	Sandstone	**Approved Date:**	01/05/1945 mm/dd/yyyy
Completed Date:	mm/dd/yyyy	**Driller:**	MC CARTHY WELL CO
Driller License No:	391	**Normal pumpage:**	1296000 gpd
Maximum Pumpage:	2592000 gpd	**Pump Capacity:**	1800 gpm
Gravel Pack:		**Well Depth:**	774 feet
Depth to Rock:	110 feet	**Type of Rock:**	Sandstone
Multiple Aquifers:	N	**Drilling Method:**	
Enlarged Drillhole Depth:	280 feet	**Enlarged Drillhole Diameter:**	23 inches
Lower Drillhole Diameter:	16 inches	**Lower Drillhole Length:**	494 feet
More than 2 drillholes:	Y	**Primary Casing Diameter:**	18 inches
Primary Casing Depth:	280 feet	**Liner Casing Diameter:**	inches
Liner Casing Length:	feet	**Liner Casing Depth:**	feet
Screen Diameter:	inches	**Screen Length:**	feet
Screen Type:		**Sealing Material Type:**	Cement Grout
Sealing Material Depth:	280 feet	**Yield Test Time:**	10 Hours
Yield Test Pump Rate:	1965 gpm	**Static Water Level:**	42 feet
Pumping Water Level:	107.5 feet	**Specific Capacity:**	30 gpm/foot
Image File Name:	DN8757.TIF		

Annual Well Pumpage (gallons)

Disclaimer: Please be advised that pumpage data may be measured or estimated. The method code provided by the owner/operator each year is displayed with the pumpage data. Because the pumpage data are submitted on paper forms, transcription errors may occur. Data for public water supply wells such as municipal wells will be available in the future. It is very important that the user of this data not make conclusions based on limited information such as one piece of data from one monitoring point. Instead, the data as a whole should be evaluated by a scientist or engineer who is experienced with such evaluations, considers changes over time, and takes into account the location of each well and changes in weather patterns. **Pumpage for private residential wells is not displayed.**

No Records returned