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Ms. Margaret Gielniewski
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77 W. Jackson Boulevard
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October 23, 2014
(1530)

RE: Response to USEPA Comments
Remedial Investigation Report – Revision 0
Manitowoc Former Manufactured Gas Plant Site, Manitowoc, Wisconsin
Wisconsin Public Service Corporation
CERCLA Docket No. V-W-06-C-847
Site Spill ID – B5BW
CERCLIS ID – WIN000509949

Dear Ms. Gielniewski:

On behalf of Integrys Business Support, LLC (IBS), Natural Resource Technology, Inc. (NRT) is providing this letter response to USEPA comments dated July 14, 2014 on the RI Report Revision 0 (NRT, May 30, 2014) for the Wisconsin Public Service Corporation Manitowoc Former Manufactured Gas Plant (MGP) Site. RI Report Revision 1 has been submitted with this response to comment letter and incorporates the responses as presented below.

For ease of review, USEPA comments are presented below in italics, followed by IBS responses. Note the following terminology is used to reference comments: GC= General comment, SC = Specific comment, LCGC = Lesser Comment General Comment, LCSC = Lesser Comment Specific Comment.

SUBSTANTIVE COMMENTS

General Comments

1. *The terminology describing screening levels with respect to nature and extent is inconsistent. The notes in Tables 1 and 11 describe analytical results compared to November 2013 U.S. EPA regional screening levels (RSL). However, the first paragraph under Section 4.1, Soil Results, states that soil analytical results are compared to "Wisconsin Industrial and Residential Soil RSLs" and Section 4.2, Groundwater Results, that groundwater analytical results are compared to "Wisconsin Residential Groundwater RSLs." It is suggested that more explicit text be written to describe the basis of the screening levels and consistent usages between text, figures, and tables, regarding U.S. EPA RSLs and Wisconsin RSLs. This might be best described in an introductory paragraph in Section 4.0, ahead of the media result sections.*
   Although it appears that the listed soil screening levels are from the U.S. EPA November 2013 RSLs for residential and industrial soils (as the Tables 1 and 2 match the U.S. EPA RSL tables), it is unclear where the groundwater screening levels values were obtained. For example, the maximum contaminant levels (MCLs) for certain analytes (toluene, anthracene, total xylenes, etc.) in Tables 11 and 12 do not match the MCLs as presented in the U.S. EPA MCLs for groundwater.
   Moreover, a number of analytes that do not have a groundwater criteria listed as a U.S. EPA RSL (MCL) for groundwater, and yet there is a value entered in Table 11 and 12 (xylene-a, 1,2,4- trimethylbenzene, manganese, etc.). Please specify the basis of these values and include that information in the associated tables and text.
   It is also recommended that for future versions of the RI report, screening levels be updated with the U.S. EPA May 2014 RSLs, since most of analytes have been updated.

IBS Response: In accordance with the Multi-Site framework and past discussions with USEPA, the screening levels (SLs) for soil, groundwater, soil vapor, sediment, and surface water used herein were presented in the Multi-Site Risk Assessment Framework (RAF) and Addendum Revision 3 (Exponent, July 2014) for sites located in the State of Wisconsin. The RAF and Addendum Revision 3 have been included as Attachment A4 to the RI Report. RAF Addendum Revision 3 includes the most current USPEA RSLs (May 2014). The groundwater SL presented is the more conservative of the State and MCL values presented in the RAF Addendum Revision 3. In the absence of a State or MCL value, the Tap Water value is used for reference purposes. The Multi-Site RAF SLs are used for consistency across the sites and across the MGP program. Text, tables, and figures used for discussion in this report also contain references to the RAF SLs.

2. *Describe how the health and safety of staff in the Winter Building, with respect to chemical inhalation and explosive hazards, will be ensured in the interim until the final remedy is implemented.*

IBS Response: Based on the results of two indoor air sampling events, the health and safety of personnel within the Winter Building is not considered to be at risk at this time. However, to ensure that there are no future potential risks, appropriate remedial options to mitigate this potential risk pathway will be considered as part of the Feasibility Study. WPSC is negotiating a contract with Mr. Winter to purchase the property in the next 5 years.

3. *The human health risk assessment does not acknowledge the ebullition exposure pathway, whereby gas or air bubbles rising from the sediment layer carry nonaqueous phase liquid (NAPL) oil up to the top of the surface water, release gas, and create oil sheens on the water surface. This is an observed phenomenon at the site; in fact, signs warning the public have been posted. Boaters or workers could come into contact with the oil sheens. The scenario should be qualitatively discussed in the RI report.*

IBS Response: The oil sheens on surface water were discussed in Section 4.2.1 and 6.1.5 of Appendix P. This discussion was expanded to describe the ebullition exposure pathway in BLRA Revision 1 (Appendix R). The surface water results section of the RI report was also expanded to include observations of ebullition.

4. *The vertical extent of polycyclic aromatic hydrocarbons (PAH), and MGP residual sediment contamination is largely undefined, as there are many sediment sample locations that indicate results above criteria in the deepest interval sampled. This is a product of the limitations inherent in the vibracore sampling technique. As evidenced by results of the limited native material sampling performed with a drill rig, there are instances of sediment contamination in the "native material," as deep as 14 feet below the sediment surface. This data limitation needs to be recognized in the report, and kept in mind during the feasibility study (FS) and subsequent steps. For instance, one approach to counter the lack of vertical definition is to conduct future predesign sampling, if a dredging option is chosen. Alternatively, a dredging approach could be designed based on a robust dredge-sample-redredge approach, chasing contamination vertically.*

IBS Response: RI Report Rev 1 contains a new figure (Figure 28) with sediment sampling locations identified as having concentrations above or below the break point concentration of 103 mg/kg at the end of boring. This map helps illustrate the lateral extent of vertical delineation within individual borings. As discussed in Section 4.4.5 of the RI Report sediment surface elevation has to be considered when looking at lateral and vertical extent. To account for this, vertical extent was monitored in the field during Step II sediment sampling, by actively completing concentration profiles using total PAH (13) results obtained from the mobile lab and top of sediment elevations calculated from depth to sediment and surface water field measurements. These rough profiles were used to identify places where additional borings could provide additional lateral or vertical control. Revision 1 of the RI Report has included copies of these field concentration profiles in a new Appendix F4. These materials will be used in the FS to evaluate the need for pre-construction sampling and discuss approaches to confirm cleanup goals. This is recognized in the native material observations section of the report.

5. *DNR remains concerned with risk modeling conclusions for sediment. Toxicity testing that formed the basis of the modeling was insensitive to the concentrations of PAHs. The dose-response in most cases was either flat or negatively correlated to concentration (showed decreasing effects with higher concentration). The toxicity modeling is contrary to the literature values and DNR's experience at other former MGP sites. DNR has not accepted the conclusions of the toxicity modeling for the sediment for this site.*

IBS Response: Comment noted. Based on the agreement reached during the meeting held on Monday September 8, 2014 between Integrys and USEPA to discuss the total PAH sediment risk breakpoints developed using the site- specific sediment toxicity testing, it was decided any refinement to the breakpoints would occur as part of the Feasibility Study.

6. *Sediment chemistry data has improved following the 2012 sampling. Similar to experiences at the Camp Marina and Marinette sites, there is a high probability that not all of the NAPL and NAPL impacted sediments have been identified. There is also a likelihood that not all of the sediments in excess of the given cleanup criteria have been identified. The cleanup area should be better delineated prior/during the Remedial Design phase.*
   a. *Specifically, determine the extent and degree of impacted downstream areas at TS2 10 SD001, TS2 11 SD001, and TS2 12 SD001.*

IBS Response: Comment noted. Based on the agreement reached during the meeting held on Monday September 8, 2014 between Integrys and USEPA to discuss the total PAH sediment risk breakpoints, the current data set is sufficient for the RI and further delineation will be evaluated in the FS associated with refinement of the risk breakpoints.

7. *WDNR does not accept the risk assessment and the RI's risk breakpoints, or the conclusions of no significant risk at 103 mg/kg PAH (13). The Risk Assessment is a key component of the RI. As was seen in past risk assessments, the testing has shown an insensitivity of the indicator organisms to contaminant concentration. The survival tests show an insensitivity to PAHs and BTEX with increasing concentration.*
   The growth tests are negatively correlated to contaminant concentrations (increases in contaminants are associated with increased growth). The conclusions of the risk assessment continue to be contrary to the trend in literature.

IBS Response: Comment noted. See response to Comment 5.

8. *Although for this site, sum of 13 PAH compounds have been evaluated as representative of total PAHs, it is recommended that all 16 parent PAH compounds are reported. Dibenz(ah)anthracene is missing in Table 5 of "Step II Risk Assessment Technical Memorandum - Manitowoc Former Manufactured Gas Plant Site, Manitowoc, Wisconsin, WIN 000509949", March 2014.*

IBS Response: Tables in the body of RI Report Revision 1 display compounds that exceed a RAF SL for discussion of extent and risk. Tables of all sample results have been included in the appendices of the report for reference.

9. *Throughout the report, broad statements made that are not presented with supporting data, evaluation, or reference. Such statements are pointed out in the specific comment section below.*

IBS Response: See responses to specific comments below.

Specific Comments

1. *Table 6 and Section 4.2.1.2. The methodology and parameters used to calculate vertical hydraulic gradient should be described. Without such a description, it is difficult to validate the calculations presented. Specifically, it is unclear why the elevation differences (dL) are changing when one methodology that is often used to calculate vertical gradients involves the difference in head (dH) divided by elevational differences (dL) of the well screens in paired or nested wells. In this example, dl would stay static, and the head would likely change during each groundwater level measurement event. Please clarify the methodology used, or make appropriate corrections.*

IBS Response: Clarification has been provided in section 4.2.1.2. Vertical gradients are calculated using the groundwater elevations in the water table well and piezometer (dH) compared to the distance between the water table and center of piezometer screen (dL). This method yields varying distances over which the elevation difference in the two wells are measured, but it is in accord with industry standards and is an accepted methodology for such calculations. This is also consistent with a response IBS provided on July 1, 2014 for the Sheboygan Camp Marina former MGP site which is also within the multi-site program.

2. *Table 17 and Section 4.2.2. Non-bedrock groundwater concentration trends as shown in Table 17 are mostly decreasing or flat over time for benzene, naphthalene, benzo(a)pyrene based on their coefficient of determination. Most notably, by looking at the analytical data tables and also Figures 16 through 18, there appears to be an increase in many of the wells in February or May 2013, or both. This includes bedrock wells (see PZ7B, benzene). This condition should be evaluated and discussed. The information presented shows the long-term decrease in chemicals, but there seems to be an anomalous increase in the presented COCs in the most recent sampling events. Additional discussion of the pumping system downtime during the past winter (January through March 2014) should be included. With the increased COC concentrations in groundwater experienced in late winter/spring 2013 and the shutdown of the pumping system a year later, particular attention should focus on possible groundwater impacts.*

IBS Response: The groundwater plume maps presented in the RI Report show that although concentrations may vary from sampling event to sampling event, the overall extent of the plume is relatively stable. This is true in the shallow soils as well as the underlying bedrock. Trend graphs of selected COPC concentrations have been observed to increase and decrease between sampling events; however, the long term trends continue to decrease which suggests that residual source is limited in nature. The limited source has also been confirmed through the soil borings and other site work. Groundwater results collected in November 2013 and May 2014 have returned to levels consistent with long term trends and have not shown any changes associated with the shutdown of the treatment system.

3. *Section 3.5.6, Page 26, Paragraph 1. Was aquifer testing ever conducted to provide site-specific hydraulic properties? Even though, the subsurface is characterized as "fine to medium grained sand," hydraulic conductivity of sand can span a fairly large range, typically 10·3 to 10·7 m/sec. This is a large enough range that without narrowing it down, it can significantly affect estimates regarding horizontal and vertical groundwater gradients, specific yield, and porosity, which can influence the FS.*

IBS Response: Because subsurface materials encountered at each new well location were comprised primarily of fine to medium grained sand (similar to existing wells), no additional aquifer testing was performed. In-situ hydraulic conductivity tests (slug tests) were performed to evaluate hydraulic characteristics of the aquifer in five monitoring wells in 1997 (Horizon, 1997) and used to complete the design of the pumping well construction and treatment system. Slug tests were completed on April 4, 1997 in wells MW12, MW12D, MW13, MW17T, and

MW19T, which are located in the general vicinity of the pumping well (and the plume). Based on the soils encountered at this site and the relative location of the plume to the wells that were tested, these are reliable estimates of the hydraulic conductivity that in the glacial sand unit and should be used for site evaluation. It is unlikely the conductivity of the glacial sand unit has reduced over time. Hydraulic conductivity tests have been attached as Appendix A5.

4. *The text should state whether all monitoring wells were screened in the purported fine to medium grained sand. When reviewing the boring logs and monitoring well installation information, it appears that monitoring wells were also screened in dolomites, lean clays (with or without gravel), well graded gravel with sand, clayey sand, etc., indicating a possible larger range in hydraulic conductivities likely spanning from 10·2 to 10·11 (Domenico and Schwartz 1990). After reading further in the report, it appears that historic data presented in the Groundwater Control Investigation Report (1997) by Horizon Environmental will be used. This reference should be presented up front, describing which monitoring wells were tested and the methodology used.*
   As a further comment, it seems that a round of updated slug testing may be prudent during the next groundwater sampling event, considering the data are roughly 17 years old. With the advent of new improved technologies, and pumping in the area, it is possible that hydraulic conductivities could change, and a refinement or a presentation and discussion of the validity of the 17-year-old data would be recommended.

IBS Response: Comment noted. See response to SC3. The slug tests were performed in wells that are closest to the pumping well and the plume. Wells screened in dolomite do not contain contaminant concentrations that require aquifer testing. If other portions of site and/or active remedies are selected additional aquifer testing would be considered as a pre-remedial activity.

5. *Section 4.1.2, Page 45, Paragraph 1. There is not much description regarding the nature and extent of soil contamination, aside from referencing Tables 1 to 3 and Figures 8a to 11, and describing the compounds commonly exceeded. Horizontal locations and vertical depths of MGP contamination should be discussed in depth, along with specifics of which compounds are of interest and the ranges in concentrations of those compounds. As a point of comparison, more text is spent describing the extent of contamination in and around SB95-3, located outside the MGP structures, and observed residuals than on all the other soil data collected. A more comprehensive discussion is recommended regarding soil contamination.*

IBS Response: Additional discussion regarding the nature and extent of soil impacts has been provided in the soil sampling results section. More time is spent on the presence of soil contamination around SB95-3 because this sample was collected from the western edge of the upland site boundary and additional explanation was required to describe how the soil results at this location are not related to the nature and extent of MGP residuals.

6. *Section 4.2.1.1, Page 47. Provide text regarding whether PW1 was pumping continuously over the years of the RI and during or around the time of groundwater level measurements, particularly during February 2013 (no noticeable cone of depression). This information should be included on the appropriate tables as well.*

IBS Response: Since January 1, 2012, pumping well PW1 has been operational with brief outages for routine maintenance and care. Over 10.8 million gallons of water were discharged from this well between January 2012 and September 2014. On February 4, 2014, the well was found to be off due to a frozen water line, and it did not come back on-line until April 8, 2014. Other than this, the well has generally been operational and only turned off for periods of up to 24 hours for service. This information is summarized in a new table (Table 12) of RI Report Revision 1.

7. *Section 4.2.1.1, Page 47, Paragraph 1. The RI report states that concentrations in MW12 and MW12D indicate that pumping in PW1 is effective. Please elaborate and provide support for this statement.*

IBS Response: Well nest MW12 and MW12D wells are screened in the upper and lower portions of the glacial sand unit very close to and down gradient of pumping well PW1. Given the high PAH concentrations present in monitoring wells MW14 and MW13 and the direction of groundwater flow, it appears well PW1 is effective in capturing contaminated groundwater, as PAH concentrations in the MW12 MW12D well nest are three orders of magnitude or more below the concentrations at MW14 and rarely exceed the SLs. See response to SC6 above for further description of the pumping well performance.

8. *Section 4.2.2. Additional information should be provided in the text, tables, and figures regarding the specifics and nuances of the groundwater analytical results, summaries, potentiometric surfaces, and trends. For example, the latest sampling results from groundwater sampling events in February 2013 and May 2013 seem to indicate the larger plume is growing towards PZ25, with a main difference is that concentrations in PZ25 are lower than the benzene groundwater screening level and higher in MW10 for May 2013.*

IBS Response: Additional description of the conditions around PZ25 have been included in RI Report Revision 1. During 2009 site investigation activities four borings/wells (PZ24, PZ25, PZ26, and PZ23B) were completed within the stabilized material near the shoreline (Figure 5). The observed depth of stabilized material was consistent with the design plans at all locations but PZ25 (Sheet 2). Presumably, a subsurface obstruction(s) prevented completion of soil stabilization at PZ25 to the project depth and left an isolated pocket of untreated material within the treatment area. Due to the site specific conditions around PZ25, the discussion and presentation of concentrations observed in this well are treated separately from the rest of the Site wells. This results in two groundwater plumes on the figures: 1) Concentrations localized to untreated material of the deep sand unit within the stabilized soil at PZ25; and, 2) Concentrations present in the shallow sand unit identified in monitoring wells MW13 and MW14.

9. *Section 4.2.2.1, Page 49. "Due to a lack of visual MGP residuals in 2009 and 2012 soil borings and low PAH concentrations in nearby monitoring wells, the MW14 area is well defined." It is unclear how MW14 is well defined, when in May and February 2013 there were increases in 6 of the 9 PVOC/VOCs that were previously decreasing. In February 2013, major increases in presented PAHs/SVOCs concentrations occurred, some greater than values from 2000. These deviations should be explained or characterized, and the statement "well defined" should be tempered.*

IBS Response: Monitoring wells MW2, MW21T, MW19T, MW22, MW12 and MW12D define lateral extent of groundwater impacts in the vicinity of well MW14. Due to a lack of visual MGP residuals in 2009 and 2012 soil borings and low PAH concentrations in the nearby and downgradient monitoring wells, impacts originating from the area around monitoring well MW14 are defined, though concentrations within well MW14 continue to fluctuate. Oil coated to oil wetted material was observed from 15 to 17.5 feet bgs in the soil boring for MW14R. A soil sample collected from just below that interval (18-20 feet bgs) did not have any exceedances of the industrial soil SL. Fluctuations in groundwater concentrations were discussed in previous comments.

10. *Section 4.2.2.1, Page 50. Paragraph 1. It is mentioned that the groundwater treatment system is effective at preventing offsite migration of groundwater contaminants and rescuing contaminant mass. This statement should be substantiated. Aside from the concentrations of various chemical constituents, calculations based on pumping rates, vapor extraction, etc. where vapor, and NAPL mass can be calculated could be included in this report. If such information is unavailable, then the last sentence in the first paragraph should be modified accordingly.*

IBS Response: The statement regarding reduction of contaminant mass at the end of the paragraph has been removed. See response to SC7 for discussion regarding effectiveness of preventing off-site migration.

11. *Section 4.2.2.6, Page 55, Bulleted List. Several of the bullet points should be reevaluated in light of the seemingly site wide increase in constituents of concern (COC) in many of the nonbedrock and some bedrock wells in February or May 2013, or both. As it appears that COC concentrations within MW12D, and MW10 in addition to MW13, MW14, and PZ25 increased.*

IBS Response: No changes are necessary to the bullet points due to short term fluctuations (see response to SC2).

12. *Section 4.2.2.6, Page 55, Bullet 6. In addition to the monitored natural attenuation (MNA) geochemical parameters suggesting biological degradation within the plume, other lines of evidence must be demonstrated to demonstrate MNA. Additional lines of evidence would include:*
    - *Geochemical data showing plume size reduction over time*
    - *Hydrogeological or geochemical data showing rates of attenuation*
    - *Microcosm studies directly showing the presence certain microorganisms associated with a particular natural attenuation process*

IBS Response: The RI report is setting the stage for more detailed discussion and evaluation of plume stability in the FS.

13. *Section 4.4 and Table 22. The text references soil screening levels for sediment and Table 22 presents a summary of the chemical analyses comparing the values to soil screening levels. This is inappropriate and does not inform the reader as to the significance of the concentrations of PAHs and BTEX to the aquatic environment. The RI should use accepted sediment screening values (Wisconsin Consensus Based Sediment Quality Guidelines, USEPA, ESB, MacDonald, Long &Morgan, and State of Washington).*

IBS Response: Sediment SLs to which the results are compared are those presented in the Multi-Site RAF Addendum Revision 3 (Exponent, July 2014) and site specific breakpoints for ecological risk in accordance with the agreement and approach developed between IBS and USEPA. See also response to comment GC5.

14. *Section 4.4.5.1. The second paragraph discusses PAH concentrations and refers the reader to Sheets 3 and 4. Sheet 3 has no PAH data. The reference should be to Sheets 4 and 5.*

IBS Response: The text, tables, and figures have been reorganized as requested in LCSC 7. The text has been corrected to refer to Sheets 5 and 6.

15. *Section 4.4.5.2. Discuss the relationship between depth of the petroleum volatile organic compounds (PVOC) and metal sediment exceedances near shoreline compared to depth of Total PAH exceedances near shoreline. That is, based on the existing data, whether PVOC and metals contamination coincides with Total PAH contamination should be presented and discussed.*

IBS Response: Review of the 2008 sediment results indicates total PAH concentrations were more-widespread than either PVOCs or metals in sediment. PAHs exceeded the SLs in about 30 to 40 samples, the metals (including lead, selenium, vanadium, and zinc) exceeded the SLs in 21 to 23 samples, and PVOCs exceeded the SLs in 12 or fewer of these samples. Further, there was no location where either PVOCs or metals exceeded the SLs but the PAHs did not. This is supported by the Sediment Summary Statistics (Table 29) that also indicate

PVOCs and metals exceed the SLs in much lower percentages than PAHs. Therefore, the PAHs are the most comprehensive indicator of contamination within sediments related to the former MGP facility.

16. *Sheen and Ebullition Transported MGP Product. The RI has no mention of surface water sheening from the sediment. Sheening is mentioned in the risk assessment Appendix P but only in the discussion of the human health risks. Sheening is also an ecological risk but is not discussed; the RI and conclude that surface water is not of concern to ecological receptors.*
    a. *Section 4.5; Baseline Risk Assessment Appendix P, Section 5.3.1, Section 6.2.1 first paragraph, and Section 6.3. Regarding surface water, add the following text: "Sheening from ebullition transported MGP product is known to occur at the site. The significance of sheen on ecological receptors has not been quantified."*
    b. *Baseline Risk Assessment Figure 1. Conceptual Site Model. Sheen/surface slicks on surface water is a potentially complete pathway to benthic invertebrates. It should be indicated in the exposure table.*

IBS Response:
a. The presence of sheen was discussed in the RI report to document the occurrence of this condition at the site. Also, in each section of the BLRA requested, the presence of sheen on the surface of the river was noted as requested. It will also be explained that these sheens are transitory in nature, and because of this, the exposure and associated risks of these sheens to human or ecological receptors was not quantified as part of the BLRA. However, these sheens will be mitigated by the remedial action in the river that will remove the tar-saturated sediments, which are the source of these sheens.
b. The footnote related to sheens will not be made specific to benthic invertebrates, but rather was generally applied to all aquatic ecological receptors that have the potential for exposure to the sheens on the surface of the water. Benthic invertebrates are typically located in the sediments or at the sediment-water interface and not where the sheens are present.

17. *Section 5, Page 67. As recommended in the RI/FS Guidance (U.S. EPA), the Fate and Transport section is typically presented independently from the summary of the baseline risk assessment (Table 3-13 in U.S. EPA 1988). The fate and transport section is also a culmination of the results of the site physical characteristics, source characteristics, and the extent of contamination analyses to evaluate fate and transport at the site. Data should be evaluated to describe the important fate and transport mechanisms. For example, if migration of contamination in groundwater is a concern, these factors may include the properties of the unsaturated zone, the rate and direction of flow in the aquifers, and the extent of subsurface systems. This sort of discussion is not presented in Section 5. It is recommended that physiochemical factors affecting chemical fate and transport (water solubility, adsorptions, partitioning, physical transport factors, etc.) be discussed, as well as chemical persistence (volatilization, degradation) followed by expected chemical fate and transport in the chemical constituents that are likely to be of concern at the site (those that were identified in the nature and extent section). Finally, the potential contaminant migration routes per media and chemical constituent/chemical group should be presented and assessed.*

IBS Response: Section 5 of RI Report Revision 1 has been expanded as requested to include discussion of physiochemical properties of COPCs that affect fate and transport. Discussion of potential contaminant migration routes has also been provided.

18. *Section 5.3.3, Page 70, Bullet 3. The text states "The current surface sediment elevated risk zone is generally co-located with the extent of MGP residuals observed in sediments." On a broad level, this statement appears accurate, but there are exceptions to this statement, and the area represented by the exceptions is substantial enough that such a statement should not be made without qualifications.*

Please modify report accordingly. Note that in the risk assessment, the sediment dataset was mapped into 3 zones: Figure 3, Surface Sediment Ecological Risk Zones (0-0.5 ft depth interval); Figure 4, Near-Surface Sediment Ecological Risk Zones (0.5-2.5 ft depth interval), and Figure 5, Subsurface Sediment Ecological Risk Zones (below 2.5 ft depth interval). Comparison of Figure 4 to the Sheet 4 MGP Residual Observations in Sediment drawing indicates that the area of elevated risk is at least twice the area where MGP residuals were observed along the shoreline of the facility. The ability of the "near-surface" sediments to be accessible to benthic receptors is acknowledged in the subsequent bullets.

IBS Response: Section 5.3.3. Bullet 3 has been modified to reference the BLRA figures mentioned above and acknowledges that some areas of risk are larger than the extent of MGP residuals.

19. *Section 5.3.3, Bullet 4 and Section 6.1, Page 74, Bullet 1. The bullet claims that the near surface sediment are inaccessible to ecological receptors and therefore are not an ecological concern. The text then goes on to say that the near surface sediment may be a future concern if exposed. As a turning basin in an active alluvial river, the risk of exposure is a current, present-day risk. The bullet should be changed to read: "Near-surface and deeper sediment are at risk for exposure due to river and vessel scour or channel maintenance activities." This statement is more consistent with the risk assessment, Appendix P, Section 5.6.2: "While near-surface sediment are below the biologically active zone, these near-surface sediment would be anticipated to be a potential source of contamination to the surface sediment layer due to the nature of the barge traffic in the turning basin.#*

IBS Response: Section 5.3.3 Bullet 4 and Section 6.1 Bullet 1 have been modified to incorporate the proposed language.

20. *Section 5.3.4. The statement regarding surface water conditions of the Manitowoc River needs qualifiers because no hydrodynamic conditions are documented. What does the river look like under turbulent conditions?*

IBS Response: Section 5.3.4 has been updated with the following: “It is acknowledged sediments may be disturbed during shipping activities within the turning basin. However, solids suspended as part of these disturbances are likely temporally limited due to re-settling. Due to the presence of the turning basin, the impact of sediment disturbance and its influence on surface water quality will be considered as part of any future proposed sediment remedy within the Feasibility Study.”

21. *Section 6.1, Page 73. Please acknowledge the vertical delineation data gaps associated with MGP residuals and sediments posing risk, as this uncertainty will factor into remedial dredging options.*

IBS Response: Section 6.1 3rd Bullet under Sediment has been modified to acknowledge any potential gaps in the vertical distribution of contaminant concentrations that will need to be considered for any potential future remedial option that would consider exposing the underlying sediments. This would likely require confirmation sampling during such remedial efforts to ensure concentrations achieve the established target.

22. *Appendix P, Figure 1. Add MGP residuals as another "primary media." Indicate that it is present in the subsurface, on groundwater, and on surface water, and indicate the receptors that may encounter it.*

IBS Response: The presence of MGP residuals (i.e., NAPL) in various media is discussed in the BLRA, and the discussion of potential exposure to it was expanded as noted in other comments. MGP residuals are a

contaminant of the various media, but are not themselves a medium. In Figure 1, NAPL is listed of source of chemical impacts which directly impacts subsurface soil and further impacts surface water, groundwater, sediment, and air. We believe that the current figure appropriately represents the source and exposure pathways.

23. *Appendix P, Table 2. Under the "Total Soil (0-10 ft)" header, on both the WPSC and Winter rows, indicate that NAPL is present in the subsurface. Under the "Surface Water" header, indicate that a NAPL sheen is present on surface water. Under the "Groundwater" header, indicate the NAPL is present on the WPCS property.*

IBS Response: The requested text was added to Table 2.

24. *Appendix P, Section 2.3, Page 5, Paragraph 2, Bullet 1. Add ingestion of groundwater; there are no institutional controls preventing its use and it is indicated on the CSM (Figure 1).*

IBS Response: The requested text was added.

25. *Appendix P, Section 2.3, Page 6, Bullet 3. Add ingestion of groundwater; there are no institutional controls preventing its use and it is indicated on the CSM (Figure 1).*

IBS Response: The requested text was added.

26. *Appendix P, Section 2.3.3, Page 9, Paragraph 3. Add MGP residuals (NAPL) in the subsurface as an additional source of impact for soil vapor.*

IBS Response: The requested text was added.

27. *Appendix P, Section 4.*
    a. *Revise the screening to incorporate the most recent EPA RSLs (May 2014).*
    b. *Provide an evaluation of cumulative noncarcinogenic effects for each exposure medium, and indicate the target organ/critical effect for each chemical of potential concern.*

IBS Response:
a. The screening levels were updated as requested.
b. For soil gas, the evaluation of cumulative noncarcinogenic effects was already incorporated into the BLRA by summing the noncancer hazard quotients for all detected chemicals, whether or not they exceeded the screening level. The text will be clarified to note this approach. For soil, the evaluation of cumulative noncarcinogenic effects was added as specified in the RAF Addendum (Revision 3). As a result of this check, no additional COPCs were identified. The target organ/critical effects that were considered during this risk check are included in the electronic versions of the tables provided as backup to the BLRA.

28. *Appendix P, Section 4.1.3.1, Page 25, Paragraph 1. Clarify why indoor air samples were not collected at the WPSC Building when the excessive lifetime cancer risk (ELCR) estimate from a shallow (2.5-3 ft) soil gas sample was 2 x 10-2 and the hazard index (HI) 400.*

IBS Response: Indoor air samples were not collected because results from sub-slab probes were much lower and did not indicate a risk to indoor air. The elevated soil gas results were collected from deeper probes in direct or near-direct contact of MGP residuals; whereas the sub-slab probes provide a much more relevant indication of soil gas chemical concentrations that would impact the building.

29. *Appendix P, Section 6.1. Discuss the cumulative ELCR and HI profile for each receptor group (onsite industrial, onsite residential) in each exposure area from multi-media and multi-chemical exposures, as applicable.*

IBS Response: The discussion of cumulative ELCR and HI was added as requested.

30. *Appendix P, Section 6.1.3, Page 48, Bullet 1. Clarify why indoor air samples were not collected at the WPSC Building when the ELCR estimate from a shallow {2.5-3 ft) soil gas sample was 2 x 10-2 and the HI 400.*

IBS Response: Please see response to comment SC28.

31. *Appendix P, Section 6.2.2.3, Paragraph 2. The text claims that subsurface sediment "represent no concern" for ecological receptors. The baseline risk assessment does not evaluate the effects of river or vessel scour and the risk of exposure of the sub-surface sediment to ecological receptors. The risk of exposure is unquantified; therefore, the statement should be less emphatic. The baseline risk assessment and RI should acknowledge that the changing conditions, such as river or vessel scour and/or dredging, could change the exposure risk.*

IBS Response: The first paragraph of this section points out that there is an elevated risk zone within the subsurface sediments that could pose risks to benthic invertebrates if the river was dredged. This paragraph was revised to drop the term 'hypothetical,' as the area has been dredged in the past, so we understand that the term 'hypothetical' unduly minimizes the likelihood of the potential for future dredging. The second paragraph states, "Under current conditions these subsurface sediments are not accessible to benthic invertebrates (or other ecological receptors) and thus represent no concern." We have expanded the discussion in the second paragraph to point out that changing conditions, such as future river or vessel scour and/or dredging, could change the potential for exposure to these subsurface sediments.

32. *Appendix P, Section 6.3_ Discuss the cumulative ELCR and HI profile for each receptor group (onsite industrial, onsite residential) in each exposure area from multi-media and multi-chemical exposures, as applicable.*

IBS Response: The requested discussion was added.

33. *Appendix P, Section 6.3, Page 54, Bullet 1. Add NAPL in groundwater as another reason why groundwater is not usable as a drinking water source.*

IBS Response: The requested text was added.

34. *Appendix P, Section 6.3, Page 55, Bullet 1. Acknowledge that NAPL is present on surface water.*

IBS Response: The requested text was added.

LESSER COMMENTS

General Comments

1. *While it is understood that certain decisions or approaches have been presented regarding various items (i.e. screening levels, risk assessment framework, etc.) in deliverables prior to this RI report,*

this report is for the public record, and is a stand-alone document. Therefore, critical or primary sources of information should be restated or presented again in the main part of the report. This pertains to figures, tables, and text. Referencing a report, figure, appendix, table, etc. from another document, when that information is primary and critical to establishing nature and extent, COPCs, etc. is not satisfactory. Such information must be presented again in the RI report and risk assessments. For examples, this includes slug test and other historical hydrogeological data information that are used in current calculations and evaluations and to several figures "buried" in appendixes of previous reports. Please review and present primary information appropriately in the RI report and risk assessments.

IBS Response: Information such as slug test results and geological information regarding well screens have been incorporated into the body of the text, tables, and figures and/or provided as appendices to Revision 1 of the RI Report as requested.

2. *Monitoring well identification should be consistent throughout the report. For example, MW5 should be presented as MW5, or MW-5, or MW05, but not all three. This applies to all well and sample names used in text, figures, and tables, and should be modified accordingly.*

IBS Response: This has been addressed in the text, tables, and figures.

3. *It is recommended that inorganic analytical results be presented as mg/kg in tables, figures, and text. This industry standard is recommended for ease in evaluating/assessing data results.*

IBS Response: This change has been made in the text, tables, and figures.

4. *It is recommended that a comma be used to denote "thousands" when presenting numerical data in tables, figures, and text. This industry standard is recommended for ease in evaluating/assessing data results.*

IBS Response: This change has been made in the text, tables, and figures.

5. *The surrogate chemicals used for chemicals with missing RSLs or other comparison criteria should be identified in table footnotes throughout the RI report, baseline HHRA, and ERA.*

IBS Response: Text, tables and figures will contain references to the Risk Assessment Framework (RAF) Addendum, Revision 3 (Exponent 2014), which contains complete details for all screening values selected including surrogates.

6. *Figure 1. It is unclear what area constitutes the Former Manitowoc MGP Site. The figure should outline the Site and indicate it clearly in the legend.*

IBS Response: The outline of the Site has been added to Figure 1.

7. *Sheets 1 and 2-Fence Diagrams. The purpose of these diagrams is to illustrate what is occurring across the site based on the gathered data and educated interpretation of the data between sample locations. It can be seen that the data on lithological layers (sand, silt, clay) are extrapolated across hundreds of feet. The diagrams should extrapolate the occurrence of NAPL between adjacent cores. There are cores within 30 feet of one another that exhibited NAPL, yet are shown as isolated occurrences. In diagrams B-B' and E-E', it is very likely that the NAPL observed in adjacent cores indicates a contiguous NAPL mass. This should be shown in the figures.*

IBS Response: The Fence Diagrams (now Sheets 2 and 3) have been updated as requested.

8. *Sheets 5 and 6. These sheets have polygons in the river that are not identified in the map legend. The polygon is in a solid line around the area of observed MGP residual observations in sediment. It is assumed that the polygon defines the "near shore" area but it should be explained in the report and in the map legend.*

IBS Response: The referenced polygons do identify the “near shore” sediments as implied by the title of Sheet 6. This polygon was defined in Revision 1 of both sheets.

Specific Comments

1. *Figure 2. It is unclear from the figure, what area constitutes the Former Manitowoc MGP Site as a whole. Does the "approximate extent of Upland Site" constitute the Manitowoc MGP Site? If so, this should be made clear. Several buildings (Braun, Kitzerow, 306 l0th St. LLC, and Fallier Automotive buildings) are labeled and bounded by a dark black line that the legend denotes as "existing building within site boundary." However the buildings are shown outside the "approximate extent of the upland site." From the RI report text (page 3, last three bullets), "Site" indicates where the MGP related contamination has been discovered and includes on-property and the former MGP facility. It is unclear with respect to the list and Figures 2 and 3 what constitutes "the Site." Please clarify in both the RI text (page 3 and 4) and Figure 2 what is the Site and which buildings and or structures are considered to be part of it. The text and figures should be identical in their descriptions.*

IBS Response: Figure 2 has been updated to more clearly illustrate the feature that are discussed in Section 1.3.1 and address these comments.

2. *Figures 8a, 8b, 9a, 9b, 10, and 11.*
   a. *The title of the figure or the notes on the figure should indicate that soil sample results from 1988 through 2012 are presented.*
   b. *All non-soil boring locations should be removed from the figures or significantly lightened on these figures that present soil data. There are so many sample locations shown for soil vapor, monitoring wells, piezometers, etc. that it is difficult to grasp the soil sampling campaign from these “soil figures.”*
   c. *Although it is explained in the text, these figures should also have a note describing the difference between the grey, black, and green sampling locations. These are stand-alone figures, the reader should not need to consult the text for explanations within the figures.*
   d. *It is suggested that text be included that discusses areas where MGP residual observations are coincident with soil results exceeding industrial RLS, and areas where observations of MGP residual observations do not coincide with exceedances.*
   Additionally, a figure combining these two types of information might be help to highlight the MGP-observation areas in the chemical boxes on Figures 5a, 5b, 9a, 9b, 10, and 11.

IBS Response:
a. The notes of the figure were updated to indicate the time period of soil results.
b. The figure was clarified as requested.
c. The color of the sampling locations is defined in the legend of the figure.
d. See comment SC5. Additional discussion regarding the nature and extent of soil impacts has been provided in the soil sampling results section.

3. *Figure 12. The 580.50-foot contour line should include (drawn to the left) MW19T (580.60 feet), and the 58l.50-foot contour line (drawn to the left) MW20T (58l.57 feet). Please revise.*

IBS Response: The contour lines (identified in the legend) represent watertable elevations and were developed using only the shallow well locations (identified in the legend as green) and pumping well PW1 (which affects watertable measurements). Groundwater elevations observed from wells screened in the deep sand (identified in the legend as blue) are provided in parenthesis for reference. Note 4 of the legend indicates groundwater elevations in parenthesis were not included in the development of the groundwater flow contours. Monitoring wells MW19T and MW20T are screened at the bottom of the glacial sand unit (as indicated by the blue symbol and label) and their groundwater elevations are in parenthesis indicating they were not included in the development of the watertable contours. No adjustment to the contour lines is required.

4. *Figure 14.*
   a. *MW19T (579.55) is sandwiched between the 58l.00- and 580.50-foot contours. This is incorrect, please revise.*
   b. *There should be a dashed (inferred) line to the east of the 580.00-foot contour line near MW16T. Please revise accordingly.*

IBS Response:
a. See response to comment LCSC 3 above. No adjustment to the contour lines is required.
b. This contour line has been modified as requested.

5. *Figure 15.*
   a. *The 58l.50-foot contour line should be drawn to the left of MW20T (58l.65 feet). Please revise.*
   b. *MW6 groundwater elevation is much higher than in other sampling/measurement months. This anomaly should be explained in the text.*

IBS Response:
a. See response to comment LCSC 3 above. No adjustment to the contour lines is required.
b. Text has been added to section 3.5.3 to discuss this anomaly.

6. *Figures 16 to l8. It should be clarified in the title that only sand aquifer or non-bedrock groundwater analytical results are being presented.*

IBS Response: The requested change has been made.

7. *Tables are presented out of order. Tables should be organized in the order that they are presented in the table of contents. Please change as appropriate.*

IBS Response: The document has been reviewed and references to tables, figures, and appendices have been reorganized in the order they are presented.

8. *Table 4 (or perhaps a new table). It is recommended that either an additional table be presented that lists site wells and describes, lithology where screened (sand, clay, dolomite, etc.), and what aquifer or water-bearing unit (shallow sand, deep sand, bedrock) is being screened. This may be a matter of adding additional columns to Table 4.*

IBS Response: The requested change has been made to Table 4.

9. *Tables 11 and 12.*
   a. *The units should be in µg/L. The header should not indicate "Residential," as there is no residential nor industrial distinction regarding the groundwater MCL.*
   b. *It is unclear where the groundwater screening level for manganese originates from. There is no U.S. EPA RSL (MCL) for manganese in groundwater. The 300 value as the screening level should be clarified. As described in general comment no. 5 above, these tables should be double checked for appropriate screening levels and notes included when the screening level does not match the U.S. EPA groundwater screening level (MCL).*

IBS Response: a. and b. The units have been modified and the header has been changed to be consistent with the source of the SLs (RAF Addendum Revision 3) which has been referenced in the footnotes.

10. *Tables 11and12 and Section 4.2.1.2. It is recommended that two columns be added to the groundwater summary tables to include number of wells sampled, and number of wells with results that exceed the groundwater screening levels. This gives a better idea regarding how widespread or limited in nature the "exceedances" are. For example, 33 samples exceeded the benzene groundwater screening level, 11 times in 3 wells or 3 times in 11 wells, etc. The two recommended columns allow a better sense of groundwater characterization in tabular form.*

IBS Response: The requested change has been made.

11. *Table 17. Naphthalene is spelled incorrectly. Please revise.*

IBS Response: The requested change has been made.

12. *Section 1.1, Paragraph 1. Redundant use of "former" in reference to the site.*

IBS Response: The text has been modified.

13. *Section 1.3, Page 3, Bullets 1, 2, and 3. The RI report is a stand-alone document and key figures, such as those that define the site extent, and detail the definitions of "facility," "on-property," and "site" should be included in the and not reference figures from another report included as an appendix.*
    It is recommended that the site figures for the RI report be more inclusive and descriptive, as described in specific comments no. 1 and 2 above.

IBS Response: The text and figures have been updated to clarify these areas.

14. *Section 1.3.1. In reference to the area being zoned for "general" use; it is preferred that different terminology be used to describe the zoning (i.e. commercial, residential, etc.).*

IBS Response: The City of Manitowoc identifies the zone as “B-3, General Business District” as presented on Figure 3. The text has been updated to reference the full name of the zone and discuss the intent of this zone.

15. *Section 1.3.1, Page 5, Paragraph 1. Figure 6 is referenced ahead of Figures 5a and 5b. Figures should be numbered in the order that appear in the report. Please reconcile and apply this method to all tables, figures, sheets, etc.*

IBS Response: Same response as LCSC 7. The document has been reviewed and references to tables, figures, and appendices have been reorganized in the order they are presented.

16. *Section 1.3.3, Page S, Paragraph 1. This section notes that the size of the two gas holders are "100 and 200 thousand cubic feet," but on page 6, bullet 4 in the second set of bullets, text indicates "100,000 cubic feet and 300,000 cubic feet gas holders." There are also figures throughout the document that indicate a 300,000-cubic-foot gas holder (rather than a 200,000-cubic-foot gas holder). Please clarify the size of the second gas holder.*

IBS Response: The size of the gas holder has been corrected in the text to 300,000 cubic foot gas holder.

17. *Section 1.3.3.1, Page 7. This section repeats the preceding two paragraphs. Please revise.*

IBS Response: The paragraph has been revised to remove redundant language.

18. *Section 1.3.3.2, Page 8, Paragraph 1. Figure 5 is referenced. There is no Figure 5, there is a Figure 5a and a Figure 5b, please reconcile this difference.*

IBS Response: The paragraph has been revised to reference the appropriate figure.

19. *Section 1.3.3.2, Page 8, Paragraph 2. Residual petroleum and groundwater petroleum impacts are shown on Figure 5 of the RI/FS site-specific work plan from Appendix A-2. This appears to be the same information shown on Figure 4 of the RI Report. Please cite or modify Figure 4 accordingly so that the reader does not have to dig through Appendix A-2.*

IBS Response: The reference has been updated to as requested.

20. *Section 3.4.1 page 19, paragraph 1. Figures 8 and 9 are referenced. Instead, cite Figures 8a, 8b, 9a, and 9b.*

IBS Response: The reference in Section 3.4.1 has been updated to cite appropriate figures with soil sampling locations.

21. *Section 3.4.3, Page 21, Paragraph 1. Figure 2 is cited, but it should be Figure 5a or 5b.*

IBS Response: The reference has been corrected.

22. *Section 3.5.4, Page 24, Inset Table. It is unclear why the table in the text, which indicates which well and parameters were sampled during the May 2013 sampling event, is presented, when this information is cited and included in Table 9. It is recommended that the inset table be removed for clarity's sake.*

IBS Response: The inset table has been removed.

23. *Section 5.2, Page 68. One objective of the RI is to collect and analyze data to develop a conceptual site model (CSM) that can be used to assess both the nature and extent of contamination and to identify potential exposure pathways and potential human health receptors. The CSM presented does only the later. At a minimum, Section 5.2 should present the CSM for the RI report showing geology, hydrogeology, site topography, surface water, etc. and the relationship among them. Typically, this is*

presented as a block diagram or 3D model-type diagram. Figure 24, a flow diagram, as presented, is a CSM for the risk assessments. This figure is better presented in the risk assessment and risk assessment summaries. Figure 24 could still be presented in 5.2 in the context of, or along with, a site physical CSM. The CSM text usually describes the site-specific physical characteristics, nature and extent, and the relevant fate and transport mechanisms applicable to the CSM.

IBS Response: A graphical CSM has been created and included in RI Report Revision 1.

24. *Section 2.1.2, Page 13, Paragraph 1. It appears from some soil borings that the glacial overburden deposits, generally consist of sand. Thus, this section should present more site-specific information regarding lenses of gravelly sand or similar.*

IBS Response: Groundwater flow at the site is predominantly influenced by the interactions with the Manitowoc River, the solidified soils, the pumping well, and the clay layer that separates the two groundwater units. The glacial sand unit is mostly composed of sand, the locally variable percentages of clay, silt, and gravel do not appear to significantly influence groundwater flow or plume extent at the site.

25. *Section 2.1.2, Page 13, Paragraph 3. Some description should be included in the text regarding whether the three different zones are three different aquifers or one large aquifer, and how the three zones were delineated.*

IBS Response: Based on site-specific data discussed in Section 4.2 it appears there are two groundwater units; the glacial sand and the bedrock which are separated by a laterally continuous clay layer. Monitoring wells in the glacial sand unit were constructed to monitor the top and bottom of this unit. Piezometers in the bedrock unit were constructed to monitor groundwater in bedrock below the clay layer.

26. *Section 4.2.1.2, Page 48, Paragraph 1. Previously completed slug tests are mentioned. Please include a reference. When reviewing Table 5, "K" is the average hydraulic conductivity reported through slug testing from Horizon Environmental in the Groundwater Control Investigation Report (Horizon 1997). Looking for these datum in the Completion Report (Appendix A-1 of the RI Report), Horizon 1997 is listed at E8 under Appendix E (in the Completion Report). The data are unfindable. Considering that hydraulic conductivity data are important primary data regarding the remedial investigation, it is recommended that the data from 1997 be presented in a tabular form, identifying which wells were tested and which aquifers measured. This will substantiate the hydraulic gradients in Tables 5 and 6 and the aquifer characterization.*

IBS Response: A summary table of the hydraulic conductivity tests is presented in the Aquifer Characterization Section 3.5.6. See also response to comment SC3.

27. *Section 4.2.1.2, Page 48, Paragraph 1. The statement regarding the Manitowoc River is a gaining "stream" should be supported by data. Please include text that describes the flow, or at least reference the above section, since in Section 4.2.1.1 the conclusion of a "gaining stream" was not made in the text.*

IBS Response: Text in Section 2.1.2 has been updated to include “Review of the river elevation data from staff gauge SG1 and the groundwater elevation and flow contours indicates groundwater flows toward and discharges into the Manitowoc River.”

28. *Section 4.2.2.1, Page 50, In-line graph. It is recommended to remove in-line tables and figures. Please include this groundwater influent graph figure as a separate figure.*

IBS Response: This graph has been included as a separate figure.

29. *Appendix P, Section 3.2, Page 15, Paragraph 2. Indicate whether groundwater data were validated.*

IBS Response: The requested text was added.

30. *Appendix P, Section 3.1, Page 15, Paragraph 2. Concentrations detected in field duplicate samples are as valid as the "normal" samples, and should be considered rather than removed from the dataset. Provide a comparison of the concentrations detected in normal and duplicate samples, and summarize the results.*

IBS Response: As requested, a comparison of the concentrations detected in normal and duplicate samples, and a summarization of the variability in these two analytical results, as measured by the relative percent difference (RPD), was added to the RI. However, for purposes of the BLRA (Revision 1), the duplicate samples will not be added to the data set because of the effort involved in updating the assessment at this stage. However, the uncertainty associated with the variability in these pairs of samples and the potential effect on the results of the BLRA was addressed in the uncertainty section of the BLRA (Revision 1).

31. *Appendix P, Section 4.1.1, Page 19, Paragraph 1. Correct "30-year lifetime" to "70-year lifetime."*

IBS Response: The text was corrected to specify that the residential RSLs incorporate a 26-year exposure duration rather than a 30-year lifetime

32. *Appendix P, Section 4.1.1.4, Page 22, Paragraph 2. Correct "surface soils" to "total soils."*

IBS Response: The text was corrected as specified.

33. *Appendix P, Section 4.2, Page 31, Paragraph 2. Change "MGF" to "MGP."*

IBS Response: The text was corrected as specified.

34. *Appendix P, Section 5.1, Page 35, Last Paragraph. The abbreviation for H. azteca appears for the first time in this paragraph, and thus should be spelled out.*

IBS Response: The abbreviation was spelled out as requested.

35. *Appendix P, Attachment C.*
    a. *The inclusion of the Excel tables in Attachment B-1 to the Step II risk assessment allows for verification of ESB TU calculations. However, these tables are complex and to enhance the readability of Attachment C, please add a summary table following current Table B-1 that presents in detail the main parts of the calculation of TUs based on bulk sediment PAH concentrations.*
    b. *A similar table should be added that shows the detailed calculation of TUs based on measured porewater concentrations.*

NATURAL RESOURCE TECHNOLOGY

IBS Response:
a. Table B-2a has been added as requested that shows the main parts of the calculation of TUs based on bulk sediment PAH concentrations. A cross-reference to Table B-2a was added to Table B-2.
b. Table B-2b has been added as requested that shows the detailed calculation of TUs based on measured pore water concentrations. A cross-reference to Table B-2b was added to Table B-2

Please contact Mr. Naren Prasad of IBS at 312.240.4569 if you should have any questions regarding the content of this letter.

Sincerely,

NATURAL RESOURCE TECHNOLOGY, INC.

Brian G. Hennings, PG
Hydrogeologist

Jennifer M. Hagen, PE
Senior Engineer

Enc: Remedial Investigation Report – Revision 1

cc: Ms. Margaret Gielniewski (2 hardcopies w/ CDs)
Mr. Kevin McKnight, WDNR (1 hardcopy w/ CDs)
Ms. Cheryl Bougie, WDNR (3 hardcopies w/ CDs)
Mr. Naren Prasad, IBS (Electronic copy)
Ms. Catherine Schripsema, CH2M Hill (Electronic copy)

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SMARTER SOLUTIONS

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Remedial Investigation Report

Wisconsin Public Service Corporation's
Manitowoc Former Manufactured Gas Plant Site
Manitowoc, Wisconsin

Project No: 1530

Revision 1
October 23, 2014

NATURAL RESOURCE TECHNOLOGY

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REMEDIAL INVESTIGATION REPORT

WISCONSIN PUBLIC SERVICE CORPORATION'S
MANITOWOC FORMER MANUFACTURED GAS PLANT SITE
MANITOWOC, WISCONSIN

Project No. 1530

Prepared For:

Wisconsin Public Service Corporation
700 North Adams Street
Green Bay, WI 54307

Prepared By:

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Milwaukee, WI 53204

Revision 1
October 23, 2014

Brian Hennings, PG
Hydrogeologist

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Senior Engineer/Project Manager

TABLE OF CONTENTS

FIGURES

TABLES

APPENDICES (Included On Enclosed CD)
Hard Copies provided for Appendix F4 and Appendix Q

SHEETS

ACRONYMS AND ABBREVIATIONS

AOC	Administrative Order On Consent
ARARs	Applicable or Relevant and Appropriate Requirements
bgs	Below Ground Surface
BERA	Baseline Ecological Risk Assessment
BLRA	Baseline Risk Assessment
BTEX	Benzene, Toluene, Ethylbenzene, Xylene
CERCLA ("Superfund")	Comprehensive Environmental Response, Compensation, and Liability Act
Commerce	Wisconsin Department of Commerce
COPCs	Contaminants of Potential Concern
CSM	Generalized Conceptual Site Model
DGPS	Differential Global Position System
DHFS	Wisconsin Department of Health and Family Services
DLs	Detection Limits
DNAPL	Dense Non-Aqueous Phase Liquid
DQOs	Data Quality Objectives
EDI	EDI Engineering & Science, Inc
EDR	Environmental Data Research Inc.
ERAGS	Ecological Risk Assessment Guidance For Superfund
ERP	Environmental Response Program
ES	Wisconsin NR 140 Enforcement Standard
FEMA	Federal Emergency Management Administration
FSP	Multi Site Field Sampling Plan
GIS	Geographic Information System
GLNPO	Great Lakes National Program Office
Gpm	Gallons Per Minute
HASP	Multi Site Health and Safety Plan
IBS	Integrys Business Support, LLC
IC	Institutional Control
ISS	In-Situ Solidification/Stabilization
LAST	Leaking Aboveground Storage Tank
LNAPL	Light Non-Aqueous Phase Liquid
LUST	Leaking Underground Storage Tank
mg/kg	Milligrams Per Kilogram
MGP	Manufactured Gas Plant
MNA	Monitored Natural Attenuation
MSL	Mean Sea Level
NAPL	Non-Aqueous Phase Liquid
NCP	National Contingency Plan
NRT	Natural Resource Technology, Inc
OSR	Off-site Rule

O&M	Operation and Maintenance
OM&M	Operation, Maintenance and Monitoring
PAHs	Polynuclear Aromatic Hydrocarbons
Total PAH (13)	Sum total of 13 PAHs
PAL	Wisconsin NR 140 Preventive Action Limit
PCBs	Polychlorinated Biphenyls
POTW	Publicly Owned Treatment Works
PQLs	Project Quantitation Limits
PVOCs	Petroleum Volatile Organic Compounds
QA/QC	Quality Assurance/Quality Control
QAPP	Multi Site Quality Assurance Project Plan
RAF	Multi Site Risk Assessment Framework
RAF SL	Multi Site Risk Assessment Framework Screening Level
RAO	Remedial Action Objective
RI	Remedial Investigation
RI/FS	Remedial Investigation and Feasibility Study
RLs	Reporting Limits
ROD	Record of Decision
RQD	Rock Quality Designation
SARA	Superfund Amendments and Reauthorization Act
SIM	Selected Ion Monitoring
SL	Screening Level
SLERA	Screening Level Ecological Risk Assessment
SSLs	Soil Screening Levels
SOP	Standard Operating Procedure
SOW	Statement of Work
SSWP	Site Specific Work Plan
SVOC	Semi Volatile Organic Compounds
TBC	To Be Considered
TOC	Total Organic Carbon
UCL	Upper Confidence Limit
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
UST	Underground Storage Tank
UTM	Universal Transverse Mercator
VOCs	Volatile Organic Compounds
WAC	Wisconsin Administrative Code
WAD	Weak Acid Dissociable Cyanide
WDNR	Wisconsin Department of Natural Resources
WF&L	Wisconsin Fuel & Light Co.
WPSC	Wisconsin Public Service Corporation
WWES	WW Engineering & Science

1 INTRODUCTION

1.1 Background

The former Wisconsin Public Service Corporation (WPSC) Manitowoc MGP is one of six historic MGP sites addressed through the Administrative Order on Consent (AOC) and Statement of Work (SOW), CERCLA Docket No. V-W-06-C-847, dated May 5, 2006. Under the AOC/SOW, a generic approach to address the sites was developed (the Multi Site approach), describing the procedures and tasks to be followed to complete the RI/FS at the former Manitowoc MGP facility (Figure 1), which, in turn, may be modified to account for site specific differences that may exist at a particular location. In accordance with the AOC, Natural Resource Technology, Inc. (NRT), on behalf of Integrys Business Support, LLC. (IBS), managing WPSC's former MGPs, prepared SSWP – Revision 1 (NRT, April 2008). USEPA approved the SSWP in a letter dated September 29, 2008.

This report presents the Remedial Investigation (RI) soil, groundwater, soil vapor, sediment and surface water site investigation work completed at the former Manitowoc MGP facility between 2008 and August 2014. At the former Manitowoc MGP facility a two-step approach was used to investigate sediments. Step I sediment sampling focused on collecting sediment samples representing a range of total of 13 polycyclic aromatic hydrocarbon (PAH) concentrations to be used in toxicity testing. The analytical and toxicity testing results were used to evaluate risk-zone breakpoint concentrations. After the risk-zone breakpoint concentrations were defined, Step II sediment sampling was completed to define the spatial extent of the risk zones (Multi-Site Risk Assessment Framework [RAF] Exponent, September 2007). Step II sediment sampling was performed in accordance with the USEPA-approved Step II Sediment Sampling Work Plan, Revision 2, dated April 30, 2012. Supplemental upland site investigation activities including soil sampling and further evaluation of vapor intrusion near the Winter Property were completed in 2014. Supplemental investigation data and semi-annual groundwater data collected between June 2013 (the data discussed in RI Rev 0) and September 2014 have been included in this revision of the RI report.

A summary of work plan approvals and site investigation activities is provided in the table below:

Table A. History of Reports, Work Plan/Activities with corresponding Dates

Work Plan/ Activity	Date Approved/Completed
Site Specific Work Plan (SSWP) Revision 1	September 2008
Step I sediment and surface water sampling	November 2008
Upland site investigation	September 2009
Step II Sediment Work Plan Revision 2	June 2012
Step II sediment sampling	September 2012
Technical Memorandum Number 3 Revision 2	July 2012
Supplemental soil, groundwater, and vapor investigation	July 2012
Technical Memorandum Number 4 Revision 1	January 2013
Supplemental vapor intrusion investigation	June 2013
Supplemental Work Plan/ Activity	**Date Approved/Completed**
Response to Pre-Scoping Meeting	February 2014
Supplemental upland investigation (Winter building VI)	March 2014
Supplemental soil boring and VI near Winter Building	August 2014

1.2 Work Objective

The overall objective of the RI/FS activities was to evaluate the nature and extent of MGP residuals in soil, groundwater, vapor, sediment, and surface water and to support human health and ecological risk assessments and feasibility studies. The results of the RI will be used to evaluate whether further evaluation or remedial actions are warranted at the site. Evaluation of remedial actions, if necessary, will be presented in the FS.

As described in the Completion Report (NRT, 2006) (Appendix A1), SSWP Revision 1 (NRT, 2008) (Appendix A2), Step II Sediment Work Plan (NRT, 2012) (Appendix A3) and other USEPA approved work plans mentioned in the table above; the media that required further assessment and/or were not fully addressed by previous work with respect to public health, welfare or the environment included the following:

- On-property and off-property surface soil sampling was performed to assess current conditions in remaining potential source areas and provide additional data for assessment of alternatives and pathways.
- On-property and off-property subsurface soil sampling was performed to assess current conditions in remaining potential source areas, evaluate the potential for vapor intrusion, and provide additional data for assessment of alternatives and pathways.

- Groundwater well installation and sampling was performed to define the lateral and vertical extent of MGP residuals in groundwater and evaluate concentrations trends.
- On-property and off-property soil vapor and indoor air samples were completed to assess pathways.
- Surface water sampling was performed to assess the distribution of Contaminants of Potential Concern (COPCs) and the potential risk to human health and the aquatic environment.
- Sediment sampling was performed to assess the distribution of COPCs and the potential risk to human health and the aquatic environment. In addition, geotechnical parameters were collected to support the FS.

1.3 Site Background

This section summarizes background information presented in SSWP Revision 1. Refer to SSWP Revision 1 (NRT, 2008), included in Appendix A2, for additional details.

Responsible Party:	Wisconsin Public Service Corporation Contact: Mr. Naren Prasad (312.240.4569) 200 East Randolph Drive, 24th Floor Chicago, Illinois 60601
Site Location:	T19N, R24E, Section 19 402 North Tenth Street Manitowoc, Wisconsin Manitowoc County (Figures 1 and 2)
USEPA ID (WDNR BRRTS #)	WIN000509949 (02-36-000219)

The property encompasses approximately 1.1 acres and is zoned I-2 and B-3, for heavy industrial and general business use (Figure 3). Consistent with the SSWP, the following definitions are used herein:

- On-property – Refers to the specific parcel(s) currently owned by WPSC within the approximate upland site boundary at 402 North Tenth Street, Manitowoc (Figure 2).
- Off-property – Refers to parcels currently owned by WPSC that are not within the approximate upland site boundary and parcels currently owned by 3rd parties (Figure 2).
- Facility – Refers to the former WPSC MGP structures and related areas (Figure 4).
- Upland Portion of the Site – Refers to the area identified on Figure 2 as the Approximate Extent of Upland Site where contamination related to the former MGP has been discovered through site investigation activities completed to-date and near-by areas necessary for implementation of the response action. These areas include the facility on-property as well as portions of City Property, Chicago Street and North Eleventh Street right-of-ways, privately owned and WPSC-owned parcels south of Chicago Street.
- Site – Refers to the Upland Site area and the adjacent portion of the Manitowoc River containing contaminated sediments related to the former MGP.

1.3.1 Site Description

The former Manitowoc MGP facility is located at 402 North Tenth Street, Manitowoc, Manitowoc County, Wisconsin (Figure 1). The current WPSC property (on-property parcels) is bounded on the northwest by City-owned property and the Manitowoc River; on the north by an additional "off-property" WPSC-owned parcel outside of the Approximate Extent of the Upland Site; on the east by North Tenth Street, on the south by Chicago Street, and on the west by North Eleventh Street (Figure 2).

A multi-tenant office building occupies much of the property, which was formerly used by Wisconsin Fuel & Light Company (WF&L). Areas north, east and west of the building are covered by asphalt pavement, whereas the south side area is mostly grass. The top floor of the Main building (Figure 2) is set up for office space, but is currently unoccupied. The top floor of the north wing of the Main building (Figure 2) is currently leased by Kroening, Stangel, Swetlik, & Zinkel LLP Certified Public Accountants. The bottom floor of the building is used mainly for WPSC vehicle storage and also contains the groundwater treatment system equipment. The former MGP structures were located mostly on-property, with the addition of a former gas holder located off-property to the south (Figure 2).

The City owns property between the subject property's north property line and the river (triangular-shape property shown on Figure 2). The property located west of the subject property on the west side of Eleventh Street (along the river) is owned by Canadian National Railroad (formerly Wisconsin Central Railroad Ltd). To be consistent with past reports, the property will continue to be referred to as the Wisconsin Central Railroad Property. Braun Building Center Inc. is located south of Wisconsin Central Railroad's property. Braun Building appears to use Wisconsin Central Railroad's property to store lumber for their pre-fabricated building operations. The properties located south of the subject property, on the south side of Chicago Street, are owned by Tom Kitzerow Enterprises LLC (parcel on the west), 306 North Tenth Street Building LLC (parcels in middle) and Mr. Rick Winter (parcel on the east). WPSC owns a small parcel with a small storage shed along the south side of Chicago Street, adjacent to the Winter Property. The building (Winter Building) on the Winter Property, where an MGP gas holder was located, is an attorney's office. The properties described in this paragraph are all zoned for either heavy industrial use or general business (Figure 3). Current and future land use are further discussed in a memorandum included as Appendix B.

The Manitowoc River is approximately 400 feet across adjacent to the former MGP facility and is utilized as a turning basin for large cargo ships (Sheet 1). A sheet pile wall exists adjacent to the City Property and steep banks exist on both the north and west ends of the wall. There is no obvious location to easily access the river and only a limited distance out into the river is possible for wading. At a distance of

approximately 60 feet from the shoreline, water depths are known to be more than 21 feet, the project depth within the U.S. Army Corps of Engineers (USACE) navigation channel.

The majority of the upland portion of the Site is covered with pavement and buildings with a slope toward the Manitowoc River. Twenty eight monitoring wells and piezometers and one pumping well are located on or near the Site. The monitoring wells are located on property currently owned by WPSC, property owned by others, City Property adjacent to the river, and City right-of-way of streets to the west and south (Figure 5).

1.3.2 Site Utilities

Existing underground utilities including storm water, sanitary, water, electric, and gas are shown on Figure 2 and in Appendix C1. Much of the site is covered with pavement, building or grass. Surface water runoff in the area is collected in storm sewers located in the streets. A waterline crosses the Manitowoc River approximately 900 feet west of the upland property (Sheet 1). This is the only known utility line to cross the Manitowoc River within the study area.

1.3.3 Site History

Wisconsin, Fuel and Light Company (WF&L) manufactured coal gas for lighting and heating from the turn of the century until 1947. The gas manufacturing facilities of the predecessor to WF&L, the Manitowoc Gas Company, were constructed between 1900 and 1906. The gas manufacturing facilities consisted of a carbureted water gas plant, retort, purifiers, and two gas holders with capacities of 100,000 cubic feet (ft^3) and 300,000 ft^3. The facilities were removed in the 1960's to make room for construction of the office building formerly used by WF&L. Locations of the former MGP structures relative to existing features are shown on Figure 4. WPSC purchased the property from WF&L in 2001.

A copy of the entire RI/FS SSWP (NRT, 2008) with appendices has been included on the enclosed compact disk as Appendix A2 in this RI report. The specific information contained within the 2008 RI/FS SSWP is as follows:

- Appendix A: Historical Structures Maps
  - Appendix A1: Sanborn Maps
  - Appendix A2: Historical Plant Drawings
- Appendix B: EDR and Other Site Vicinity Information
  - Appendix B1: EDR Radius Map and Report

  - Appendix B2: EDR Report Excerpts for Sites B6, B9 and C12
  - Appendix B3: Former Holmes Oil Information from WDNR BRRTS and GIS Registry Sites
- Appendix C: WWES In-situ Stabilization of Coal Impacted Soils Drawings (Sheets C1 through C4, S1 and S2)
- Appendix D: ISS Verification Sample Locations
- Appendix E: Site Reconnaissance Field Notes, Observations and Photo Log (January 5, 2007)
- Appendix F: Site Specific Modifications to Multi Site Documents
  - Appendix F1: Site Specific Quality Assurance Project Plan
  - Appendix F2: Site Specific Health and Safety Plan
  - Appendix F3: Site Specific Conceptual Site Model and Risk Assessment Framework
  - Appendix F4: Site Specific Field Sampling Plan
- Appendix G: Additional Analytical Data
  - Appendix G1: May 2005 Groundwater Laboratory Analytical Report
  - Appendix G2: Treatment System Analytical Summary Tables

Sanborn maps obtained for development of historical maps for the SSWP were from 1883 through 1966 and showed the presence of numerous former MGP related structures from the early 1900's to the 1950's. Also, a 1963 historical plant drawing indicated some former MGP related structures (Appendix A2, SSWP Appendix B). These maps were used as source maps to update the historical map for the facility. These structures are shown on Figure 4 and include:

- Retort building with condenser and purifier
- Water gas plant building
- Purifying boxes
- Two gas holders with capacities of 100,000 ft^3 (on-property) and 300,000 ft^3 (off-property to the south beneath the Winter Building)

1.3.3.1 Historical Releases and Dates

Background research was provided by Environmental Data Research Inc. (EDR). The report (Appendix A2, SSWP Appendix B1) indicates several aboveground storage tanks were present on the west side of North Eleventh Street on property previously owned by Shell Oil, Sinclair Refining Co., and

Standard Oil (approximate locations shown on Figure 4). This property is currently owned by Canadian National/Wisconsin Central Railroad.

- The Holmes Oil site is documented to have two leaking underground storage tanks (LUSTs) and one leaking above ground storage tank (LAST) in the EDR report (Figure 4); however, the responsible party is the Canadian National (CN)/Wisconsin Central Railroad (WCRR). The investigation was closed with deed restrictions by the Wisconsin Department of Commerce (Commerce) in September of 2005.

Additional near-by impacted sites documented in the EDR report include a LUST site located south of the property at 308 North Tenth Street, and an Environmental Response Program (ERP) site also south of the property at the corner of North Eleventh and Buffalo Street (Figure 4).

- Metz Baking Company was the responsible party for a LUST site closed by WDNR in August 1996 on the property currently owned by 306 North Tenth Street Building LLC. The Soo Line (Soo) and CN Railroads were the responsible parties for an ERP site with reported impacts of polynuclear aromatic hydrocarbons (PAHs) and volatile organic compounds (VOCs). This site was conditionally closed in July 2006 by WDNR with deed restrictions, and is currently owned by CN/WCRR.

1.3.3.2 On-site and Off-site Non-MGP Sources

Wisconsin Central Railroad Property

No former MGP structures are known to have been present on Wisconsin Central Railroad Property. However, due to suspected off-site migration of MGP contamination onto this property, several borings and wells were completed in 1995 including wells MW15T and MW16T and borings SB95-1, SB95-2, SB95-3, SB95-4, and SB95-6 (Figure 6A). Residual benzene and naphthalene concentrations in soil on this property are discussed in detail in Section 4.1. This property is no longer considered part of the upland Site because the boring logs on this property indicate the presence of coal and/or cinders in the shallow soils which are likely the cause for detections of contaminants (carbazole impacts, including 19 mg/kg naphthalene) in the soil sample collected from SB95-3 at 3 to 5 feet bgs. No MGP odors or elevated PID readings were noted in the borings on this property either.

As mentioned previously, two LUST sites and one LAST site existed in the locations of Sinclair Refining Co., Shell Oil Co., and Standard Oil Co. (all collectively known as Former Holmes Oil). Although the site was closed in September 2005, residual soil and groundwater petroleum impacts exist in the approximate areas shown on Figure 4. Information on the residual soil and groundwater concentrations from this site are included in Appendix A2, SSWP Appendix B3. Residual naphthalene concentrations in shallow soil range from non-detectable to 16.8 mg/kg near Eleventh Street. A residual petroleum impacted groundwater plume also exists. Groundwater flow beneath this site appears to have been influenced by the start-up of the pumping well PW-1 in November 1997 (Appendix A2, SSWP Appendix B3 flow maps).

The November 1997 flow map for the Holmes site indicates groundwater flow to the west. Subsequent flow maps (January 1998 and April 2004) indicate a component of flow to the northeast toward the pumping well.

Chlorinated Compounds

Chlorinated compounds Trichloroethene (TCE) and cis-1,2-Dichloroethene (c-DCE) have been observed in the groundwater treatment system influent samples (Appendix D, Table 1). The influent samples are collected from the pipe that connects the pumping well (PW-1) to the treatment system located inside of the WPSC main building (Figure 5). Detections of chlorinated compounds range from (non-detect to 54 ug/L). TCE is the only compound detected that exceeds the Wisconsin groundwater risk screening levels (RAF SLs) (Appendix D, Table 1).

Chlorinated compounds are not associated with former MGP facilities. Review of the WDNR Bureau of Remediation and Redevelopment Tracking System (BRRTS) on the web (BOTW) indicates there are several sites throughout the City of Manitowoc that have TCE appear in groundwater samples (Figure 4). Two of these sites (listed in the table below) are within 2,200 feet of the former MGP Site and also contain similar detections of TCE and other chlorinated compounds in groundwater. This indicates there is a non-MGP related source of TCE in groundwater in the area.

The table below presents the range of TCE values observed at the former MGP Site and two non-MGP sites located within 2,200 feet of the Site.

Table B. Range of TCE values

Site Name / Address	BRRTS #	Range of TCE Values
WPSC former MGP “Site”	02-36-000219	0.58 to 54 µg/L
Amoco Station #10064: 732 N 11th Street	02-36-000341	2 to 96 µg/L
WCL: 200 N 10th Street	02-36-176478	2 to 22 µg/L

1.3.4 Previous Investigations

Pre-remedial soil investigations (soil investigations that occurred prior to upland remediation activities described in the following section) occurred August 1988, September through November 1991, and April and September 1993. The 1988 and 1991 soil investigations were generally focused within and adjacent to former MGP structures and operations areas, and in the area adjacent to the Manitowoc River. Analyses of data obtained during investigations completed through November 1991 indicated a soil remedial action was necessary. The purpose of the April 1993 investigation was to further define the

extent of soil impacts and thereby approximate a volume of soil to be remediated. A final pre-remedial soil investigation in September 1993 was completed to characterize the material west and southwest of the building for anticipated excavation and disposal.

Detailed information regarding the pre-remedial soil investigation activities and results (including soil boring and well installation logs) summarized herein is contained in the following reports:

- EDI Engineering & Science (EDI), November 1988. Site Investigation, Former Coal Gas Manufacturing Plant, Manitowoc, Wisconsin
- EDI, November 1988. Site Investigation, Former Coal Gas Manufacturing Plant, Manitowoc, Wisconsin, Addendum Report for the Winter Property
- WW Engineering & Science (WWES), January 1992. Environmental Site Investigation, Former Coal Gas Manufacturing Plant, Manitowoc, Wisconsin
- WWES, June, 1993. Letter to Mr. Ted Vallis, Vice President, Manitowoc Division, Wisconsin Fuel & Light Company, Regarding: Work Plan for Interim Remediation of On-site Soils Using In-Situ Stabilization/Solidification (Including Collection and Analysis of Verification Samples and Installation and Sampling of Monitoring Wells), at the Wisconsin Fuel & Light Company Site, Manitowoc, Wisconsin
- WWES, October, 1993. Letter to Mr. Ted Vallis, Vice President, Manitowoc Division, Wisconsin Fuel & Light Company, Regarding: Soil Characterization Sampling

The investigations consisted of the following:

- A 1988 Phase I Environmental Site Assessment (ESA) by EDI that included installation and sampling of five soil borings (SB-1 through SB-5) and five groundwater monitoring wells (MW-1 through MW-5)
- A 1991 Environmental Site Investigation by WWES that included installation and sampling of 15 on-shore (SB-7 through SB-20 and SB-36) and 15 off-shore soil borings (SB-21 through SB-35), collection of five sediment samples (SD-01 through SD-05) and installation of one groundwater monitoring well off-property to the south (MW-6)
- An April 1993 Investigation by WWES that included installation and sampling of eight soil borings (SB-45 through SB-47 and SB-49 through SB-53)
- Analysis by WWES in September 1993 of samples from five soil borings (SB-54 through SB-58) for waste characterization

Additional investigation work occurred between 1995 and 1997 for the upland portion of the Site and between 2000 and 2003 for the Manitowoc River. All upland sampling locations completed prior to this RI are shown in Appendix A2, SSWP Figure 6, and all sediment poling and sampling locations in the Manitowoc River on shown in Appendix A2, SSWP Sheet 3.

1.3.5 Previous Response Actions

A number of response actions were previously performed at the Site and described in detail in the Completion Report (Appendix A1) and SSWP (Appendix A2). These previous response actions are illustrated on Figure 2 and include:

- Excavation for Sheet Pile Retaining Wall Reconstruction. As part of implementing in-situ solidification/stabilization (ISS), the anchor system for the existing sheet pile wall was replaced. These activities included removal and segregation of the top 2 feet of overburden soil and removal of 3,051 cubic yards (4,271 tons) of contaminated soil and disposal at Ridgeview Landfill in Whitelaw, Wisconsin in June and July 1993. Drawings of the retaining wall (Appendix A2, SSWP Appendix C Sheets S1 and S2) indicate that the wall is constructed of sheets that are approximately 36-feet in length. The elevation at the top of the wall is at approximately 585 feet and extends down to approximately 549 feet, which is near the till and/or bedrock surface as shown in the cross-sections (Appendix A2, SSWP Appendix C Sheets C3 and C4).

- In-situ stabilization and solidification (ISS). Approximately 13,772 cubic yards of soil was treated by ISS in 1993 and 1994 on the north, west and south sides of the on-property building, the majority of the ISS area being located on City-owned land or right-of-way. Soils were treated to reported depths of 32 to 40 feet below ground surface, ending in native sand material. As part of this activity, 4,093 cubic yards of overburden soils were required to be landfilled. This material expanded above ground during the ISS process. During 2009 site investigation activities four borings/wells (PZ24, PZ25, PZ26, and PZ23B) were completed within the stabilized material near the shoreline (Figure 5). The observed depth of stabilized material was consistent with the design plans at all locations but PZ25 (Sheet 2). Presumably, a subsurface obstruction(s) prevented completion of soil stabilization at PZ25 to the project depth and left an isolated pocket of untreated material within the treatment area.

- Surface Soil Removal. The top four feet of soil was excavated on the north side of the on-property building in 1994 (most likely). No documentation of this surface soil excavation was found in the 1995 Interim Closure Report with exception of a report figure showing the 4-foot excavation, and therefore the disposition of the soil is unknown. From this 1995 map, NRT estimates that the surface area of the 4-foot excavation is 17,575 square feet, with an estimated volume of 2,600 cubic yards (3,640 tons).

- Excavation and Disposal. Soils were excavated in January 1994 in the following areas: 1) a small area located west of the storm sewer; and 2) a larger area located west and south of the on-property building and east of the storm sewer. The majority of the soils were excavated in the right-of-way of North Eleventh Street and Chicago Street. Approximately 1,410 cubic yards (1,975 tons) of coal tar impacted soils were removed and disposed at Ridgeview Landfill. The final depth of the excavation was based on the depth to groundwater, ranging from 10 feet to 12 feet below ground surface.

- Backfilling and Surface Restoration. The excavation performed west and south of the on-property building, and presumably the surface soil excavation performed north of the building, were backfilled with clean imported fill. Following this, asphalt or concrete pavement was restored in all areas that were disturbed, including ISS and excavation.

- Groundwater Remediation. A single groundwater extraction well (PW-1) and pre-treatment system (filtration followed by granular activated carbon) were installed in 1997 to address residual product and MGP residuals outside of the stabilized area (e.g., well MW14 area). The well is located in the North Eleventh Street right-of-way. The system discharges to the City of Manitowoc wastewater treatment plant at flow rates ranging from 4 to 18 gallons per minute (gpm). Documents pertaining to the groundwater treatment system, including analytical results and transmittals to the City of Manitowoc are included in Appendix D. The influent and effluent from the treatment system are samples semi-annually to monitor performance. The influent samples are analyzed for VOCs and PAHs. The effluent is sampled for VOCs, SVOCs, and pH.

2 SITE CHARACTERISTICS

2.1 Site Geology and Hydrogeology

The information provided below incorporates information obtained during RI activities and previous site investigations, including observations from soil borings, test pits, groundwater monitoring wells, and relevant publications.

2.1.1 Regional Setting

Manitowoc is located on the western shore of Lake Michigan and lies within the Wisconsin-Lake Michigan basin. The Wisconsin-Lake Michigan basin is a 3,600 square mile drainage area that lies along eastern Wisconsin and borders the western shore of Lake Michigan (Skinner and Borman, 1973). The near-surface geology of the Manitowoc area is characterized by poorly permeable glacial lake deposits of sand, silt, and clay that range up to 150 feet thick. Stratified sand and gravel alluvial deposits also occur along the Manitowoc River.

Silurian dolomite bedrock underlies the glacial soils around Manitowoc, and is present at depths between 50 and 200 feet below ground surface (bgs). In the Manitowoc area, the Silurian bedrock is the top of a sequence of layered sedimentary rocks dating from the Cambrian to the Silurian which overlie crystalline pre-Cambrian rocks. Regionally, this sequence of sedimentary rocks slopes to the southeast.

The Wisconsin-Lake Michigan basin contains three main aquifers, the unlithified sand and gravel aquifer, the Niagara dolomite aquifer, and the Cambrian sandstone aquifer. The sand and gravel glacial alluvium in the basin is a significant source of water. These deposits may be inter-layered with or covered by less permeable overburden. Thick accumulations of sand and gravel have produced as much as 1,200 gpm in-land; while, collector (Ranney) wells in Manitowoc that induce recharge from Lake Michigan have produced as much as 5,500 gpm (Skinner and Borman, 1973). Generally, groundwater flow in the sand and gravel is toward rivers and streams that eventually discharge into Lake Michigan. Recharge is local from precipitation and surface water bodies.

The Niagara aquifer underlies the sand and gravel aquifer and is the most widely used source of groundwater. Water moves through cracks, crevices, and fractures within the dolomite bedrock. The distribution of those openings is not uniform throughout the formation and therefore well yields from this formation are not predictable. Most wells produce at least 10 gpm and some high capacity wells have

produced up to 1,200 gpm (Skinner and Borman, 1973). Many parts of the Niagara aquifer are artesian, due in part to the glacial clay till overburden present in most locations. Generally, groundwater flow in the Niagara is toward Lake Michigan. Recharge to the Niagara is local, and paths of movement are short.

The Cambrian sandstone aquifer underlies the entire Wisconsin-Lake Michigan basin and includes Ordovician and Cambrian units between the Maquoketa shale and Pre-Cambrian rocks. Where present, the Maquoketa shale is a regional aquatard that isolates the Niagara and Cambrian sandstone aquifers. The sandstone aquifer is most extensively used in the southern portions of the basin including the Milwaukee area. Yields from this aquifer vary with the thickness of the sandstone penetrated, with as much as 1,500 gpm being produced in a well near Milwaukee (Skinner and Borman, 1973). Generally, groundwater flow in the sandstone is toward Lake Michigan. Most recharge to the sandstone is by lateral movement of water from west of the basin, although a small amount of water moves down through the Maquoketa shale.

2.1.2 Local Setting

Soil stratigraphy at the former Manitowoc MGP Site consists of three to ten feet of fill material (sand, silt and clay) overlying glacial lake deposits of sand with varying amounts of gravel, silt and clay. The glacial deposits along the western portion of the property generally consist of sand and silt, while the deposits on the eastern portion of the property consist mostly of sand and gravel. A layer of gravelly lean clay approximately 10 feet thick (Sheets 2 & 3) lies between the sand and the top of dolomite bedrock. Unlithified materials extend down to bedrock which is between 55 and 65 feet bgs depending on surface elevation.

Soil borings, sediment borings, and related cross sections completed during RI activities indicate the bedrock surface is generally flat in the vicinity of the Site. Three piezometers were completed in bedrock at the site. Soil and sediment boring logs and well construction forms are included in Appendix E and F of this RI Report.

Groundwater is monitored in three different zones at the site (Figure 5):

1. Shallow Sand Wells screened near an elevation of 580 feet and monitor the water table
2. Deep Sand Wells screened near an elevation of 555 feet and monitor the deep sand above bedrock
3. Bedrock Wells screened near an elevation 525 feet and monitor shallow bedrock

Based on site-specific data discussed in (Section 4.2) there are two groundwater units; the glacial sand and the bedrock which are separated by a laterally continuous clay layer. Monitoring wells in the glacial sand unit were constructed to monitor the top and bottom of this unit. Piezometers in the bedrock unit

were constructed to monitor groundwater in bedrock below the clay layer. Groundwater flow at the site is predominantly influenced by the interactions with the Manitowoc River, the solidified soils, the pumping well and the clay layer that separates the two groundwater units. The glacial sand unit is mostly composed of sand, the locally variable percentages of clay, silt, and gravel do not appear to significantly influence groundwater flow or plume extent at the site.

Depth to groundwater measurements across the Site are variable (between 5 and 22 feet bgs, Table 1) due to changes in topography discussed above. Groundwater measurements indicate that shallow groundwater horizontal gradients are relatively flat (around 0.0073 ft/ft)(Table 2) and flow is generally north towards the Manitowoc River (Figure 7). Review of the river elevation data from staff gauge SG1 and the groundwater elevation and flow contours indicates groundwater flows toward and discharges into the Manitowoc River. The Manitowoc River is a gaining stream near Lake Michigan that receives groundwater and surface water from the Manitowoc area and discharges into the lake. Groundwater flow contours are drawn through areas of stabilized soil because the construction design did not fully penetrate the glacial sand layer which will allows groundwater to flow around and beneath the stabilized soil (i.e., there was clean sand above the clay layer that was not stabilized; therefore, the stabilized soil was not keyed into the clay beneath the sand unit) (Sheet 2).

Horizontal groundwater flow velocity is estimated to be 78 feet per year in the shallow sand (Table 2). Groundwater within the deep and shallow glacial sand unit from the central and western portions of the Site is currently captured within the cone of depression created when groundwater pumping well (PW-1) is active (this is further discussed in Section 4.2). Vertical gradients vary in direction and magnitude. Most of the locations have an upward or flat gradient, which reflects the influence of the river as the regional discharge point for groundwater (Table 3). Groundwater flow and vertical gradients are discussed in detail in Section 4.2.

2.2 Site Topography and Drainage

The Site is located along the southern bank of the Manitowoc River and contains topographic features related to the floodplains and bluffs of the river (Figure 2). River stage is approximately 580 feet above mean sea level (MSL) at the Site. The banks of the river in the vicinity of the Site are steep woody slopes and/or sheet pile walls. Areas within the 100 year floodplain defined by the Federal Emergency Management Agency (FEMA) are located adjacent to the river banks (Appendix A2, SSWP Rev 1 Figure 3), including:

- A portion of the triangular shaped City parking lot located along the river and a portion of the property located south of the City lot
- The northern end of North Eleventh Street approximately 60 feet south of the sheet pile wall

- The private road west of North Eleventh Street located on Wisconsin Central Railroad Property between the river and the storage buildings on Braun Building Property.

Generally, the floodplain is flat with a mild slope toward the Manitowoc River. Ground surface elevation of the floodplain is approximately 590 feet.

Slopes from the bluff down to the floodplain are found northeast of the parking lot between the on-property building and the fence on top of the bluff, and from the intersection of North Tenth and Chicago Streets down to the river along Chicago and North Eleventh Streets (Figure 2). On-property, the ground slopes steeply from the top of the bluff down to the northeast corner of the parking lot. Off-property, Chicago Street and North Eleventh Street slopes moderately from the top of the bluff down to the river along the southern and western edges of the property. The WPSC Main building that borders the parking lot on the east and south sides was constructed along the edge of the bluff so the basement floor is at the same elevation as the parking lot (100 year floodplain), and the first floor is at the same elevation as the top of the bluff.

2.3 Climate

The climate in the vicinity of Manitowoc is typically continental with some modification by Lake Michigan. The moderating effect of Lake Michigan is well illustrated by the fact that the growing season of 140 to 150 days along the east-central coastal area is of the same duration as in the southwestern Wisconsin valleys. The average date of last spring freeze is early May and the first autumn freezes occur in mid-October along the Lake Michigan coastline. Most of the streams and lakes in the area are ice-covered from late November to late March, and snow covers the ground for much of the same period. Flooding is most frequent and serious during April.[1]

Historic temperature and precipitation data for Manitowoc is summarized in the table below[2]. Average monthly temperatures range from about 18 degrees Fahrenheit (ºF) in January to about 70ºF in July. The high and low monthly averages range by approximately ±10ºF from the monthly mean. Almost 60 percent of the total annual rainfall generally occurs between May and October. Over 90 percent of the total annual snowfall occurs between December and March. Overall, the mean average temperature for the area is approximately 45ºF and over 30 total inches of precipitation (both rainfall and snow accumulation) is received.

[1] Climactic information from Wisconsin State Climatology Office website, http://www.aos.wisc.edu/%7Esco/state.html

[2] Historic data from the Midwestern Regional Climate Center (MRCC) website, http://mcc.sws.uiuc.edu/climate_midwest/mwclimate_data_summaries.htm#

Table C. Temperature and Precipitation Summary Table for vicinity of Manitowoc

Month	Monthly Temperature Ranges (°F)			Monthly Averages (in.)	
	High	Low	Mean	Precipitation	Snowfall
January	26.5	10.8	18.7	1.83	6.3
February	30.4	15.3	22.9	1.24	5.4
March	39.9	24.4	32.2	1.94	4
April	52.1	34.1	43.1	2.85	0.5
May	64.9	44.3	54.6	2.79	0
June	74.6	53.6	64.1	3.26	0
July	79.6	60.1	69.9	3.44	0
August	77.6	59.3	68.5	3.73	0
September	69.8	51.6	60.7	3.1	0
October	57.4	40.8	49.1	2.25	0
November	43.5	29.2	36.4	2.3	1.5
December	31.3	16.7	24	1.76	4.3
Annual Precipitation Totals				30.49	22

2.4 Surface Water Flow

There are no surface water bodies on the property, but the Manitowoc River borders the Upland Portion of the Site to the north. The Manitowoc River enters the turning basin adjacent to the Site from the north and exits the turning basin to the west of the Site. Surface Water flow velocity measurements were collected during Step I Sediment Activities (Appendix A2, Step II Sediment Work Plan Table 7). Flow measurements were collected in November of 2008 and ranged from 0 to 0.3 feet per second.

Generally, the floodplain is flat with a mild slope toward the Manitowoc River. Ground surface elevation of the floodplain is approximately 590 feet above sea level. Surface water run-off follows the slope of the land. Slopes from the bluff down to the floodplain are found northeast of the parking lot between the on-property building and the fence on top of the bluff, and from the intersection of North Tenth and Chicago Streets down to the river along Chicago and North Eleventh Streets (Figure 2). On-property, the ground slopes steeply from the top of the bluff down to the northeast corner of the parking lot. Off-property, Chicago Street and North Eleventh Street slopes moderately from the top of the bluff down to the river along the southern and western edges of the property.

Storm drains are located along Chicago Street to the south and Tenth Street to the east of the site which captures surface water run-off before it reaches the property (Figure 3).

2.5 Population and Land Use

The population of the City of Manitowoc is approximately 34,000 people, based on the 2010 U.S. census and current projection for 2014 is also approximately 34,000 people. The City of Manitowoc does not track land use outside of property zoning permits. The land around the former MGP facility has been zoned for business, commercial and industrial use (Figure 3). It is important to note that single and multi-family dwellings may be located within the business zones, but not the commercial or industrial zones. According to the Zoning Map for Manitowoc, portions of the Site are located within the business and industrial zones. The on-property former MGP structures and the land to the north and east is Zoned B-3 “Business (General)”. The intent of the general business district is to provide for the establishment of stores, shops and service establishments at the central focal points of the City’s arterial and transportation system[3]. It is known that a residence exists on the first parcel north of the off-property WPSC parcel north of the upland portion of the Site. The off-property land to the south and west where the 300,000 cubic foot gas holder was located (Winter Property) and the Wisconsin Central Railroad Property are Zoned I-2 “Industrial (Heavy)”. This zoning information was obtained through the City of Manitowoc interactive Geographic Information System (GIS) website[4].

The City of Manitowoc receives municipal water from intake pipes located 2-miles off-shore in Lake Michigan. The City also maintains an underground "Ranney Well", known as Collector C located just south of Silver Creek Park. Patented by the Ranney Corporation, these wells utilize horizontal shafts, like the spokes of a wheel, to increase collection capacities. Collector C was constructed and put into service in 1944. The Ranney Well is a standby well located approximately 3 miles south of the Site and by design induces recharge from Lake Michigan to supply the well. Site conditions have not affected the municipal water supply because the City uses Lake Michigan water either directly or indirectly to meet demands.

2.6 Cultural and Natural Resource Features

An inquiry was made by WPSC to the United States Fish and Wildlife Service (USFWS) regarding potential endangered or threatened species or critical habitat present in the vicinity of the Site. USFWS indicated that a threatened fish species (Greater Redhorse) was identified as being located in this section and within the Manitowoc River. It should be noted that this fish species was recently delisted on January 1, 2014 and is no longer a special-status species in Wisconsin because its population is now

[3] http://www.codepublishing.com’wi’manitowoc/?Manitowoc 15/Manitowoc15.html
[4] The City of Manitowoc Zoning Map was accessed using the city GIS website, http://webmap.manitowoc.org/website/PASystem/gisportal.htm

considered stable (refer to http://dnr.wi.gov/topic/EndangeredResources/ and search for Greater Redhorse). As reported by the WDNR, the Greater Redhorse prefers clear water of medium to large rivers, over bottoms of sand, gravel, or boulders. However, such habitat does not exist in the turning basin, so it is unlikely that this species would be found near the site. The spawning period for this fish species is between May and June.

A similar review of the state Historic Preservation database indicates the presence of Site MN-0331. This site is described as a campsite/village where a copper knife was found on or near the former MGP Site. As such, further archaeological survey work may be required to determine if the Site has any integrity. However, the severity of soil disturbance documented at the Site over the last 50 years suggests that the Site does not have any integrity; and therefore, additional survey work will likely not be required. If it is determined that additional archaeological work is required, it must be conducted in unfrozen conditions.

3 SITE CHARACTERIZATION ACTIVITIES

3.1 Timeline of Characterization Activities

Table D. Summary of Characterization Activities at the MGP Site

Activity	Date(s) Completed
Step I sediment sampling, poling, surface water sampling	November 2008
Upland RI field work – soil borings, wells, test pits	September 2009
Upland RI quarterly groundwater monitoring	October 2009 to July 2010
Resumed semi-annual groundwater monitoring	November 2010 to August 2012
Supplemental upland RI field work – soil borings, wells, vapor probes	July 2012
Upland RI quarterly groundwater monitoring	August 2012 to May 2013
Upland RI soil vapor sampling	August 2012 & June 2012
Step II sediment sampling	September 2012
Upland RI indoor air sampling	June 2013
Resumed semi-annual groundwater monitoring	May and November each year
Supplemental investigation activities to evaluate vapor intrusion in the vicinity of the Winter Property including upland indoor air and soil gas	March and August 2014

3.2 Site Specific COPCs

The following table summarizes Site COPCs for each media as presented in the work plan documents summarized in Section 1.1.

Table E. Summary Table of Site Media COPCs

Media	COPCs
Soil	PVOCs, PAHs, cyanide, lead and vanadium
Groundwater	PVOCs, PAHs; and aluminum, iron, manganese, and vanadium (metals - minimum one round) and available cyanide (minimum one round), arsenic was added to the list of metals in 2013.
Soil Vapor	BTEX, Naphthalene, and 1,2,4 Trimethylbenzene
Sediment	PVOCs, PAHs, phenols, cyanide, aluminum, antimony, barium, copper, iron, lead, manganese, nickel, selenium, silver, vanadium, and zinc
Surface Water	PVOCs, PAHs, phenols, cyanide, aluminum, antimony, arsenic, barium, cadmium, chromium, copper, iron, lead, manganese, mercury, nickel, selenium, silver, vanadium, and zinc

3.3 Site Surveying and Base Map Development

WPSC personnel surveyed site features in 2009 and 2012 to update drawings and base maps to reflect current conditions. The survey ensured the site features were referenced to the same horizontal and vertical datum. In the field, the Wisconsin County Coordinate System datum for Manitowoc County (WCCS-MC) was used for horizontal control and the 1988 National American Vertical Datum (NAVD 88) was used for the vertical datum. The location of all site features in the WCCS-MC coordinate system and vertical elevations are included in Appendix C.

3.4 Soil Sampling

3.4.1 2009 Sample Collection

Upland RI soil borings, test pit exploration, and well installations were conducted in September 2009 in accordance with RI/FS SSWP – Revision 1, April 2008, NRT). Specifically, twenty-six soil borings (SB100-SB125), one test pit (TP101), and six piezometers were installed (PZ7B, PZ18TB, PZ23B, PZ24, PZ25, and PZ26) in the locations shown on Figures 5, 6A, and 6B. Soil borings SB100, SB101 and SB102 were completed to evaluate the competency of the stabilized soil near the shoreline and were converted to piezometers PZ24, PZ25 and PZ26. TP101 was completed as an “L” shaped test pit around the southeast perimeter of the stabilized soil near MW14. TP101A describes the trench along the east end of the stabilized soil. TP101B describes the trench along the southern edge of the stabilized soil. No evidence of MGP residuals was observed in either arm of the test pit so only one sample was collected from each arm of the test pit. The pertinent soil boring logs concerning Supplemental RI Activities were provided in Enclosure A of the Final Technical Memorandum No. 3, Revision 2, April 2012, NRT, all boring logs and forms are included in Appendix E of this RI Report.

Installation, sampling methods and analyses were in accordance with Section 6.4, RI/ FS SSWP-Revision 1, April 2008, NRT. Visual, olfactory, and photoionization detector (PID) observations were used to assess the presence/absence of MGP residuals in the subsurface. A Mini-Rae 2000 PID with a 10.6 milliVolt lamp was used to screen soil samples. Samples for laboratory analysis were collected as described in Section 6.4 of the RI/FS SSWP, Revision 1, April 2008, NRT. The sample interval with either the greatest PID reading, and/or most visible contamination, and/or with the strongest odor was selected for laboratory analysis. Where boring refusal was not encountered, samples were also collected below the intervals that were suspected to be impacted to define vertical extent. To satisfy quality assurance/quality control (QA/QC) requirements, blind duplicates and matrix spike/matrix spike duplicates (MS/MSDs) sample were collected for every 20 environmental samples. Equipment blanks

were not collected (or required) because disposable and dedicated sampling equipment was used to collect the samples. Soil samples were analyzed by Pace Analytical Laboratories located in Green Bay, Wisconsin for the following parameters:

- PVOCs by SW846 Method 8260B
- PAHs by SW846 Method 8270C Selective Ion Monitoring (SIM)
- Lead and Vanadium by SW846 Method 6020A
- Total cyanide by SW846 Method 9012A

Soil borings SB100, SB101, SB102, PZ18TB, PZ23B, and PZ7B were completed by Boart Longyear using rotosonic drilling methods. Soil borings SB103 through SB125 were completed by On Site Environmental Services using direct push sampling methods. Test Pit 101 was completed by Gauthier and Sons Construction, Inc.

A permit was obtained from the City of Manitowoc to complete the soil borings in the Chicago and 11th Street right-of-ways. Observations and soil analytical results are discussed in Section 4.1 of this RI Report.

3.4.2 2012 Sample Collection

Soil borings were completed in accordance with Technical Memorandum Number 3 Revision 2 (April 2012, NRT) to define the lateral extent of MGP residuals (i.e. naphthalene-containing fill or NAPL) using a dynamic sampling/location selection approach as discussed below.

Soil Boring Rationale and Locations

Integrys obtained an access agreement to advance borings on the adjacent property west of the Winter Property (owned by 306 N. 10th Street LLC). Field observations from soil borings along the property line indicated MGP residuals extend on to the adjacent property, thus soil borings were advanced on the adjacent property.

Six soil borings (SB126 through SB131) and three monitoring wells (MW22, MW23, and PZ5) were completed between July 31 and August 1, 2012 (Figures 5, 6A, and 6B) to define the lateral extent of MGP residuals (i.e. naphthalene-containing fill or NAPL). Soil samples for laboratory analysis were collected from each boring. The boring locations were selected based on previous analytical results and field observations. Borings performed for soil sampling purposes include the following:

- SB126 and SB127 – located in the adjacent parking lot along the western property boundary of the Winter Building
- SB128 – located in Chicago Street east of boring SB-96-7 at the request of the USEPA
- SB129 through SB130 – located in Chicago Street
- SB131 - located in the parking lot west of the Winter Property (this location was added based on field observations at SB126 and SB127 and monitoring well MW23 was constructed in the borehole

Soil borings were field screened and sampled in the same fashion as the samples collected in 2009 described above. All soil borings and monitoring wells were completed by On Site Environmental Services using a combination of direct push sampling methods and hollow stem auger methods for monitoring well installation.

At the PZ5 location the direct push rig encountered difficult sampling conditions and the hollow stem auger hit refusal at 44 feet bgs in the sand. This is documented as soil boring log PZ5GP (Appendix E). Soil Exploration Services (formerly STS) completed PZ5 as a new soil boring and completed the well installation using hollow stem auger and split spoon sampling methods. This is documented as soil boring log PZ5 (Appendix E).

Soil boring locations SB128, SB129 and SB130 required a City of Manitowoc permit to install the borings in the City right-of-way, similar to the permit obtained for previous work in the right-of-way.

3.4.3 2014 Sample Collection

As indicated in the January 13, 2014 Response to Comment Letter (NRT), the 306 10th Street LLC building located west of the Fallier Automotive building was further evaluated by advancing a soil boring (SB132) in the pavement west of MW6 and southwest of SB126 (Figure 6B). Two soil samples were also collected from the soil boring of the MW14 replacement well. Soil sampling methods and analyses were completed in accordance with SSWP Revision 1, Section 6.4. This boring also provides lateral extent southwest of SB126 and SB127.

Nested soil vapor probes (SV123 and 123D) were installed in the soil boring in response to observed PID readings and faint odors below the water table. The vapor probes will be used to evaluate soil vapor concentrations near the 306 10th Street LLC Building. One probe was screened shallow (4.5 to 5 feet below the pavement) and the other probe was screened deep (14 to 14.5 feet below the pavement) just above groundwater. Laboratory soil results (discussed in Section 4.1) and vapor results collected in August 2014 (discussed in Section 4.3) did not indicate the presence of COPCs so no further action is proposed.

3.4.4 Differences between the SSWP and Field Work Completed

One additional soil boring (SB131) was added to the soil sampling program. SB131 was added down gradient of SB126 and SB127 because soil impacts (MGP odors and elevated PID readings) were observed in saturated soil between 15 and 20 feet bgs during completion of SB126 and SB127. No soil impacts were observed in SB131 and the boring was converted to monitoring well (MW23) to provide lateral definition of impacts observed at SB126 and SB127. Nested soil vapor probes were also installed in this location.

3.5 Groundwater Evaluation

3.5.1 Monitoring Well Installation

3.5.1.1 2009

Well installations were completed in September 2009 in accordance with RI/FS SSWP – Revision 1, April 2008, NRT). PZ7B, PZ18TB, PZ23B, PZ24, PZ25, and PZ26 were installed on the Site (Figure 5). Boring logs, well construction, and development forms can be found in Appendix E1. All well installations were completed by Boart Longyear using rotosonic drilling methods.

Piezometers PZ24, PZ25, and PZ26 were logged and sampled during drilling of soil borings (SB100, SB101, and SB102). These piezometers were constructed to monitor groundwater beneath the stabilized soil that could discharge into the sediment and surface water of the Manitowoc River.

PZB, PZ18TB, and PZ23B were installed adjacent to shallow wells to evaluate groundwater flow and quality in the dolomite bedrock.

Monitoring Well MW22 could not be installed as planned on the Wisconsin Central Railroad Property because an access agreement could not be completed. MW22 was installed in 2012 in the 11th Street right-of-way to monitor groundwater quality to the west and downgradient of the MW14 area.

3.5.1.2 2012

Two groundwater monitoring wells (MW22 and MW23) and one piezometer (PZ5) were installed in July and August 2012 (Figure 5). The wells were installed to address the following:

- MW22 was installed adjacent to the Braun Property, in the 11th Street right-of-way, to further define the extent of dissolved MGP constituents, particularly benzene and naphthalene down gradient of the MW14 area.

- MW23 was installed in the parking lot adjacent to the Winter Property to evaluate the presence / absence of dissolved MGP constituents downgradient of the Winter Property and soil borings SB126 and SB127. MW23 was added based on in field observations from soil borings SB126 and SB127.
- PZ5 was nested with MW5 to confirm flow direction, vertical gradients, and groundwater quality at depth on the eastern, upgradient portion of the site.

Well installations were performed in accordance with Section 6.6, the RI/FS SSWP, Revision 1, April 2008, NRT. Well construction details regarding screen placement, length, and well elevations are summarized in Table1. The boring logs, well construction, well development, and borehole abandonment forms for the new wells are included in Appendix E4 of this RI Report.

On-site Environmental Services (On-Site) installed wells MW22 and MW23 using hollow stem auger methods. The soil boring for PZ05 was attempted by On-Site at two different locations within a 10-foot radius of MW5 using hollow stem auger methods without success because the sand and gravel at depth was very dense. Boring PZ5 was completed by Soil Exploration Services using hollow stem auger drilling methods.

3.5.1.3 2014 Well Replacement and Repair

As discussed in the May 2014 Monthly Progress report, during the May semi-annual groundwater sampling event it was observed that MW14 was completely obstructed by bentonite several feet below ground surface. MW14 was abandoned and a replaced with a well (MW14R) screened at the same interval as the original well. The top of casing of MW8 was also trimmed and resurveyed as part of 2014 field activities. These activities were completed during the field mobilization to complete 2014 supplemental sampling discussed in Section 3.4.3 above.

3.5.2 Well Development

Following installation of the groundwater monitoring wells, each well was fully developed to remove fine grained sediment from the well and filter pack. Well development was performed at all wells installed in 2009, 2012, and 2014 using a submersible pump as described in Section 4 of the Multi-Site FSP. Purge water was containerized and disposed of as discussed in Section 3.12.2. Well development forms are included in Appendix E of this RI Report.

3.5.3 Groundwater Elevation Measurements

Groundwater levels were measured to assess the elevation and direction of groundwater flow, concurrent with groundwater monitoring events. Water levels were collected from all wells and piezometers during

each sampling event. If applicable, observations regarding the presence of MGP-residuals within a well were recorded on the field sampling forms. Groundwater elevation measurements were collected using a water level tape and recorded on field forms in accordance with the methods described in Section 4 of the Multi-Site FSP. Water table elevations are summarized on Table1. On May 29, 2013 an anomalous groundwater elevation reading was collected from MW6. The reading was confirmed in the field notes; however, it is unlikely that a 10-foot increase in head above historic values was truly observed. Therefore, this groundwater elevation was not included in development of groundwater flow contours for May 2013.

3.5.4 Sampling Schedule and Parameters

Groundwater sampling was completed for the following reasons.

- To detect changes in environmental conditions (e.g., hydrogeologic, chemical, or other changes) that may result in an increased risk or exposure potential
- To identify any potentially toxic and/or mobile transformation products
- To assess plume stability and groundwater concentration trends
- To verify there is no unacceptable impact to downgradient receptors
- To detect new releases of contaminants to the environment that could impact potential remedial action alternatives (e.g., Monitored Natural Attenuation (MNA), institutional controls, etc.)

Quarterly groundwater monitoring was done for the first year following installation of additional wells in 2009 and 2012. Outside of these quarterly monitoring periods groundwater sampling was completed on a semi-annual basis. Monitoring events were completed in accordance with the SSWP. A summary of the groundwater sampling events, along with the rationale for including various wells or parameters, is included on Tables 4 through 7. Level IV data packages were received from the analytical laboratory for the quarterly events completed between October 2009 and July 2010, and August 2012 through May 2013. These results underwent a full data validation by a third party contractor. Level II data packages were provided for all other prior and subsequent sampling events and the analytical results received an internal verification.

Samples were analyzed in a fixed-based laboratory (Pace Analytical) as described in the Multi-Site QAPP and FSP. Groundwater sampling was completed as described in Section 4 of the Multi-Site FSP. Additionally, USEPA sample identification protocol and sampling forms were used to ensure that samples were tracked accordingly, and that the laboratory analytical data was provided in a manner consistent with the USEPA database requirements. Groundwater sampling will continue semi-annually at the site consistent with Table 7.

Results from the collection of groundwater samples are discussed in Section 4.3 below. Results from the treatment system samples are included in Appendix D.

3.5.5 Differences between the SWPP and Field work Completed

Monitoring Well MW22 was scheduled for installation on the Wisconsin Central Railroad Property to monitor groundwater quality off-property to the west and downgradient of the MW14 residual source area and MW-12, and discharging to sediment and surface water in 2009. However, MW22 was installed in 2012 adjacent to the Braun Property, in the City right-of-way, to further define the extent of dissolved MGP constituents, particularly benzene and naphthalene, on the western portion of the site (Figure 5).

One additional monitoring well (MW23) was installed in the parking lot west of the Winter Property. Monitoring well MW23 (a water table well) was installed in the parking lot adjacent to the Winter Property to evaluate the presence / absence of dissolved MGP constituents downgradient of the Winter Property and soil borings SB126 and SB127. MW23 was added based on field observations from soil borings SB126 and SB127.

3.5.6 Aquifer Characterization

Because subsurface materials encountered at each new well location was comprised primarily of fine to medium grained sand (similar to existing wells), no additional aquifer testing was performed. In-situ hydraulic conductivity tests (slug tests) were performed to evaluate hydraulic characteristics of the aquifer in five monitoring wells in 1997 (Horizon, 1997) (Appendix A5). Slug tests were completed on April 4, 1997 in wells MW12, MW12D, MW13, MW17T, and MW19T, which are located in the general vicinity of the pumping well (and the benzene and naphthalene isocontours). The hydraulic conductivity results are summarized below.

Table F Summary of Horizon Hydraulic Conductivity Test Results

Well	Well Depth Below Grade	Screened Interval	K (cm/sec)	Screened Unit
MW12	14.5	9-14	2.9E-03	fine sand, silty
MW12D	35.5	20-35	2.6E-03	sand with trace gravel and silt
MW13	13.5	8-13	2.6E-03	fine sand, silty
MW17T	25	9.5-24.5	4.7E-03	fine to medium sand
MW17T(2)	25	9.5-24.5	3.8E-03	fine to medium sand
MW19T	40.5	25-40	4.4E-02	medium sand

Based on the soils encountered at this site, these are reliable estimates of the hydraulic conductivity that in the glacial sand unit and should be used for site evaluation. It is unlikely the conductivity of the glacial sand unit has reduced over time.

3.6 Soil Vapor Sampling

Forty soil vapor probes were installed at 22 locations between July 30 and August 2, 2012 (Figure 5). Two additional soil vapor probes SV123/SV123D were installed in August 2014:

- SV101D, SV101SS, SV102D, SV102SS, SV103D, SV103SS, SV104D, SV104SS, SV105D, SV105SS, SV106D, and SV106SS were located within the interior of the Main Building. One sub-slab probe and one vapor probe at depth (above the water table or perched water within the former gas holder) were installed at each location.
- SV107, SV107D, SV108, SV108D, SV109, SV109D, SV112, SV112D, SV120, SV120D, SV121, and SV121D were located near the Winter Building. One shallow and one deep soil vapor probe were installed at each location. The deep soil vapor probes inside of the former gas holder were set just above the base of the former gas holder. The deep vapor probes outside of the gas holder were set at the same depth below the ground surface as the ones inside of the holder.
- SV110, SV110D, SV111, and SV111D were located near the small WPSC building adjacent to the Winter Property. One shallow and one deep soil vapor probe were installed at each location.
- SV113, SV113D, SV114, SV114D, SV115, SV115D, SV116, SV117, SV118, and SV119 were located in the Chicago and 11th Streets utility corridors. Nested probes (shallow and deep) were installed at three locations; the remaining probes were installed at one depth in the backfill of the existing utilities.
- SV122 and SV122D were placed near MW-23 downgradient of the Winter Property to define lateral extent of soil gas.
- SV123 and SV123D were placed southwest of the Winter Property to define lateral extent of soil gas.

Note that an “SS” designation denotes a sub-slab soil vapor probe. The “D” designation denotes the deeper of the nested probes. The soil vapor probes which were not installed as sub-slab were generally installed at depths as described in the Technical Memorandum No. 3, Revision 2, July 2010, NRT. However screen depths were altered as necessary in the field based on the elevation of the water table. The vapor probes were installed at multiple depths at several locations to estimate attenuation effects of the soil column.

Soil vapor probes located outside the buildings were installed with flush mount covers. Soil vapor probes installed in concrete inside the building were covered with metal plates attached to the floor. Soil vapor probes were sampled in August 2012 and June 2013 to assess data consistency and temporal effects.

Poor weather conditions delayed the second sampling event into June 2013. Ambient temperatures were below 60 degrees and buildings were using heat during the June 2013 sampling event.

Soil vapor probes SV107, SV107D, SV109, SV109D, SV111, SV111D, SV120, SV120D, SV121, and SV121D were installed in grass; all other soil vapor probes were installed beneath asphalt or concrete. The probes were installed by On-Site in accordance with the Multi-Site FSP SOP No. SAS-11-03 using direct-push techniques. Soil samples were collected and logged at each vapor probe location during installation (Appendix E4). During installation of sub-slab vapor probes in the WPSC main building a building questionnaire was completed to document building conditions within the lower level of the building (Appendix G).

The probes consisted of ¼-inch outer diameter Teflon tubing connected to a ¼-inch diameter, 0.5-foot long stainless steel screen with a sand filter pack and bentonite grout seal. When two probes were nested within the same borehole the probes were separated with bentonite placed between the screens/filter packs to collect two samples at different depths from each location. The tubing remained closed to the atmosphere via a four-way micro-valve and was only opened during soil vapor sampling events.

Soil vapor samples were collected in one-liter Summa canisters supplied and batch certified by the laboratory. Samples were collected in accordance with the procedures and methods described in the Multi-Site FSP SOP Nos. SAS-11-04 (probe sampling) and SAS-11-01 (sub-slab sampling) including proper purge volume, sample collection, flow rate, and vacuum requirements. Mechanical and chemical leak detection testing was conducted using the direct method as described in the above SOPs, including the use of a helium tracer gas, shroud, and field screening using a MGD 2002 to detect the presence of helium in the soil vapor samples.

Samples were analyzed for the following parameters:

- Benzene, ethylbenzene, toluene, xylenes, 1,2,4-trimethylbenzene, and naphthalene by USEPA Method TO-15
- Carbon dioxide, oxygen, and methane by ASTM Method D1946 or EPA 3C

Samples were analyzed for carbon dioxide, oxygen, and methane for vertical profiling to assess bioattenuation and for quality control purposes. Vapor samples were submitted under chain-of-custody procedures to STAT Analysis Corporation (STAT), a Multi-Site QAPP and USEPA approved laboratory.

Note that the Manitowoc area had very little precipitation leading up to installation of the soil vapor probes. Several of the deep soil vapor probes (SV105D, SV107D, SV108D, SV109D, and SV112D) that were installed just above the base of the former gas holders became saturated as the holders captured

rain water. Heavy rains fell at the site just after the soil vapor probes were installed and soil vapor probe SV107D became saturated prior to initial sampling. Three attempts were made to sample the probe but were unsuccessful. As discussed in section 4.2 sufficient information has been collected from these probes within the former gas holders, that replacement probes are not necessary.

3.6.1 Supplemental Soil Vapor Sampling

The shallow soil gas probes (SV107, SV108, SV109, and SV112) around the Winter building were sampled concurrently with indoor air samples in March of 2014 to further evaluate the VI pathway. Shallow and deep vapor probes SV123 and SV123D were sampled in August 2014. Supplemental indoor air and soil gas sampling was completed at the Winter Building on March 8th 2014. Comments received from USEPA regarding soil vapor SOP revisions were incorporated into sampling methods used during this sampling event and were observed by a USEPA oversight representative. These comments were also incorporated into revised SOPs for soil gas sampling (SAS-11-01 Rev 1, SAS-11-04 Rev 1, and SAS-11-06 Rev 1) that were approved by USEPA on July 24, 2014. Subsequent vapor sampling has been completed in accordance with the revised SOPs.

3.6.2 Differences Between the SWPP and Field Work Completed

Co-located soil vapor probes SV122/122D were installed in the parking lot west of the Winter Property to define/assess the extent of soil vapor migration to the west of the Winter Property. Co-located soil vapor probes SV122/122D were added based on in-field observations from soil borings SB126 and SB127.

3.7 Indoor Air Sampling (Winter Building)

Supplemental RI activities discussed in the USEPA approved Technical Memorandum No. 3 (NRT, April 2012) were initiated in July 2012, including the first round of soil vapor sample collection which was completed in August 2012. Validated soil vapor results from the initial sampling event (received October 18, 2012) indicated the presence of COPC in excess of the health-based soil vapor screening levels developed based on United States Environmental Protection Agency (USEPA) regional screening levels (RSLs). Technical Memorandum Number 4 Revision 1, January 2013, NRT was developed to further evaluate the VI pathway.

During a site meeting in the Spring of 2013 between NRT, IBS, USEPA, and the property owner (Mr. Winter) to discuss the scope of work described in Technical Memorandum Number 4 Revision 1, Mr. Winter expressed reluctance to have holes drilled through his floor for completion of the sub-slab vapor samples; but he would be open to the possibility if it was required. Prior to installation of the sub-

slab vapor probes, Mr. Winter requested collection of indoor air samples to document indoor air quality prior to installation of the probes.

As requested, indoor air samples (IA123, IA124, IA125, and IA126) were collected on June 1, 2013 (Figure 6). Two ambient samples were also collected (AMB-1 and AMB-2) to evaluate ambient air contributions to indoor air quality. The Winter Building is divided into eastern and western sides each with their own thermostat. For this reason four indoor air samples were collected, two from one side and two from the other. Two ambient samples were collected, one was placed in the upwind direction the other was placed off the southwest corner of the building closest to 10th Street (a potential source of VOCs). Prior to collection of the samples, a building questionnaire was completed to document building conditions and chemical storage (Appendix G). The chemicals were removed from the building 24 hours prior to sample collection. The results of the indoor air sampling suggested that the soil gas to indoor air migration pathway was incomplete at this time.

Supplemental indoor air concurrent with shallow soil gas sampling was completed at the Winter Building on March 8, 2014. Samples were collected from the same indoor air locations as the first round. Two ambient locations (AMB-3 and AMB-4) were also collected. Comments received from USEPA regarding soil vapor SOP revisions were incorporated into sampling methods used during this sampling event and were observed by USEPA oversight representative. The results of this sampling event are discussed in Section 4.3.

3.8 Sediment Sampling

As described in Appendix A2 SSWP Section 6.7 and Appendix A3 Step II Sediment Sampling Work Plan sediment sampling was conducted in two steps. Step I sampling was conducted to collect samples for toxicity testing and to calculate a site-specific risk value based on results of ecological risk and human health risk assessments.

3.8.1 Step I Sediment Sampling (2009)

River surface sediment samples were collected to evaluate the following:

- Ambient sediment conditions and potential off-site sources of contaminants
- Sediment toxicity and bioavailability of COPCs
- Calculate a site-specific risk value based on results of ecological and human health risk assessments
- Refine COPCs for Step II sampling

3.8.1.1 Step I Sediment Sampling Locations

Previously collected sediment sampling results provided guidance for initial target sampling locations. Initial target sampling locations were identified in Appendix A2, SSWP Sheet 2. A total of 27 sampling locations were attempted with sediment recovery at 26 of those locations during November 3 through November 7, 2008. On November 13, 2008 an additional ten samples were collected to target a better distribution of PAHs concentration ranges. Actual sample locations are provided on Sheet 1 and Appendix A3, Step II Sediment Sampling Work Plan Sheet 2.

3.8.1.2 Ecological Risk Sampling Locations

Sample locations were adjacent to, upstream and downstream of the former MGP facility to provide samples with a range of PAH concentrations to support the screening level ecological risk assessment (SLERA). The optimal total PAH (13) concentrations distribution is summarized below.

Table G. Summary Table of Total PAH (13) Concentration Distribution

Sample Quantity	Total PAH (13) (micrograms per kilogram (µg/kg))
3	Ambient Reference Locations
5	10,000-90,000
10	100,000-900,000
5	1,000,000 +

The intent was not to limit the SLERA to the near-surface biologically active zone, but rather to evaluate risk correlations to different ranges of PAH concentrations regardless of depth. Samples were collected generally within the areas previously characterized, with a goal of obtaining several samples in each of four total PAH concentration ranges described above. Additional locations were chosen during the sampling event based on the field observations of nearby sampling locations. Sample locations labeled with SED on Sheet 1 were chosen to evaluate potential ecological risk.

3.8.1.3 Human Health Risk Sampling Locations

Three locations (labeled with HH, Sheet 1) along the shore of the former MGP facility and slightly downstream were chosen to assess potential human health risk. Soft sediment samples were collected adjacent to and slightly downstream of the former MGP facility, generally within the areas previously investigated based upon areas where there is a high probability of direct contact to MGP residuals in the sediments due to recreational activities (i.e., wading in river, fishing, etc). Based on field reconnaissance (summarized Appendix A2 SSWP) there is no indication that people are wading into the river (i.e. pathways to the river). People are prevented from wading into the water since: (1) the river drops off

abruptly approximately 5-feet from the shore, (2) the river is known to be over 20 feet deep in places within 50 feet of shore, and (3), the sheet pile wall and railing prevents access along most of the shore line adjacent to the former MGP facility.

3.8.1.4 Step I Sediment Sampling Methods

NRT utilized a Ponar® grab sampler to obtain soft sediment samples at majority of the sampling locations from a pontoon boat as described in Section 4 of the Multi-Site FSP, September 2008. The exception was the use of a push core sampler at sampling locations HH-02, HH-03, SED-20, SED-25 thru SED-29. Sampling locations were recorded using a differential global positioning system (DGPS) unit. Human health samples were intended to be collected via the push core, however HH-01 was collected with the Ponar® because the push core did not retain any material and did not penetrate more than a couple inches into the sediment. SED-20 was collected by the push core method because the Ponar® was only retrieving shells and gravel with little to no sediment. Sample locations SED-25 through SED-29 were collected with the push core to evaluate recoveries and the feasibility of using the push core in Step II sediment sampling.

Prior to grab sampling and push core collection, the water depth and presence of soft/loose sediment was measured using an aluminum pole. Consistent with Section 4 of the Multi-Site FSP, September 2008 a 2-inch diameter aluminum pole with a 3-inch by 6-inch plate attached to the bottom was used to measure the water and top of sediment depth. The plate and aluminum pole were manually pushed thru the water column to the top of sediment, and then the plate was removed and only the aluminum pole, without the plate, was pushed in to the sediment. Throughout the sediment sampling, the surface water elevation was recorded as a reference for converting water depth measurements to elevations of top of sediment. The depth to top of sediment and the relative thickness of soft sediment was recorded in field logs summarized in Appendix A3, Step II Sediment Work Plan Table 1.

Samples were visually characterized, logged and sampled in general accordance with Section 4 of the Multi Site FSP (September 2008). A summary of the field observations is also included in Appendix A3, Step II Sediment Work Plan Table 1.

3.8.1.5 Step I Sediment Sample Analysis

Step I sediment samples were analyzed for COPCs identified in the Generalized Conceptual Site Model, August 2007, NRT. The Step I sediment COPCs are summarized in the following table.

Table H. Step I Sediment COPCS list

Media	COPCs
Sediment	Petroleum volatile organic compounds (PVOCs), PAHs, phenols, and inorganics (aluminum, antimony, arsenic, barium, cadmium, chromium, copper, cyanide, iron, lead, manganese, mercury, nickel, selenium, silver, vanadium, zinc)

Samples for analysis of PVOCs were collected immediately, while all other COPCs were collected following sample homogenization in dedicated disposable plastic bags, as described in the RI/FS SSWP, Revision 1, NRT, April 2008, NRT. Samples were submitted to Pace Analytical Services (Pace) in Green Bay, Wisconsin under chain-of-custody procedures (Section 4 of the Multi-Site FSP, September 2008 on an expedited turn-around time for analysis of PVOCs and PAHs (16) to identify samples within the optimal range of total PAHs (using 13 of the 16 PAHs for the total PAHs) for use in the ecological risk assessment. A total of 46 sediment samples were collected and fall in the following ranges:

Table I. Step I Sediment Total PAH (13) Concentration result Range

Optimal Sample Quantity	Total PAH (13) Concentration (µg/kg)	Collected Sample Quantity
3	Ambient Reference Locations	6
5	10,000-90,000	16
10	100,000-900,000	14
5	1,000,000 +	10

Twenty-three of these samples were selected for additional analysis to support the SLERA based on the total PAH (13) concentrations which also represented a range of total PVOC concentrations. Appendix A3, Step II Sediment Work Plan Table 2 identifies the 23 samples selected for additional analysis, based on the total PAH concentrations. Each of the twenty-three selected samples were sent to the following laboratories for the following analyses:

- Pace Analytical (Pace) - Analysis of phenols and inorganics
- Test America Laboratories, Inc. (Test America) - Analysis of total organic carbon, black carbon, ammonia-nitrogen, total sulfide, and cyanide
- META Environmental, Inc. (META) - Analysis of parent and alkylated PAHs (total of 34)

For quality assurance/quality control (QA/QC) purposes, a blind duplicate sample and a matrix spike/matrix spike duplicate (MS/MSD) sample were also submitted to each laboratory at a rate of

approximately one for each 20 samples collected. Analytical methods were provided in Appendix A2, SSWP Table 4.

In addition, each of the twenty-three samples were submitted to Coastal Bioanalysts, Inc. for grain size analysis and to perform a modified version of the procedures described by EPA/600/R-99/064 *Methods for Measuring the Toxicity and Bioaccumulation of Sediment-Associated Contaminants with Freshwater Invertebrates*, Second Edition, Method 100.4. The test endpoints were a 28-day survival and growth (weight and length) test using *Hyalella azteca* (amphipod) to evaluate the toxicity of whole sediments (rather than the 48-day test with survival, growth, and reproduction endpoints). Results are discussed in Section 4.4. The Step I Risk Assessment Technical Memorandum toxicity testing report is provided as Attachment B to the Base Line Risk Assessment (BLRA).

The analytical results of Step I Sampling have been incorporated into the data tables of this RI Report. The following additional information can be found in Appendix A3, Step II Sediment Sampling Work Plan.

- Field observations are summarized on Tables 1 and 2
- Analytical laboratory reports are included in Appendix B-1

3.8.2 Step II Sediment Sampling (2012)

River sediment samples were collected to:

- Assess bioavailability in support of the evaluation of sediment toxicity and analytical data performed in the Step I Risk Assessment (e.g., collect samples for porewater and toxicity analysis)
- Further characterize sediment concentrations and the nature of soft sediment and parent material exceeding the calculated site-specific risk values (delineate risk zones)
- Refine grossly affected sediment areas
- Evaluate geotechnical properties of sediment
- Characterize sediment for waste disposal

3.8.2.1 Step II Sampling Locations

Soft Sediment

Step II sampling initially occurred along nine sampling transects labeled TS2-1 through TS2-9 (Sheet 3). The initial locations of transects were based on relative location to MGP affected sediments as observed from previously performed investigations and Step I sediment sampling. Transects TS2-4, TS2-5, and

TS2-6 are located approximately one quarter, one half, and three quarters of the length of the source area. Location of the originally proposed sediment sampling transects relative to source area has been summarized below:

- TS2-1: Upstream limit of sampling (approximately 700 river feet at the channel center upstream), provides potential ambient measurements of soft sediment.
- TS2-2: Fills data gap between upstream limit and upstream edge of source area transects (TS2-1 and TS2-3); provides soft sediment samples.
- TS2-3: Upstream edge of source area; provides soft sediment and parent material samples. In addition, a standard penetration test (SPT) core was advanced adjacent to the existing sheet pile wall to evaluate geotechnical properties.
- TS2-4: Upstream portion of source area (approximately ¼ length of source area); provides source area soft sediment and parent material samples. In addition, an SPT core was advanced adjacent to the existing sheet pile wall to evaluate geotechnical properties.
- TS2-5: Central portion of source area (approximately ½ length of source area); provides source area soft sediment and parent material. In addition an SPT core was advanced adjacent to the existing sheet pile wall to evaluate geotechnical properties.
- TS2-6: Downstream portion of source area (approximately ¾ length of source area); provides source area soft sediment and parent material samples, potential waste characterization samples.
- TS2-7: Downstream edge of source area; provides soft sediment and parent material samples.
- TS2-8: Fills data gap between downstream limit and downstream edge of source area transects (TS2-7 and TS2-9); provides soft sediment samples.
- TS2-9: Downstream limit of sampling (approximately 900 river feet at the channel center downstream); provides potential ambient measurements of soft sediment.

For purposes of delineating the extent of sediments that might pose a potential risk as part of the RI, the lower limit (120,000 µg/kg total PAHs [sum of 13]) of the "inconsistent risk zone" for total PAHs was used as a screening level concentration for field decision making. Similarly, the lower limit (482,000 µg/kg total PAHs [sum of 13]) of the "elevated risk zone" and areas of MGP residuals observed as NAPL were delineated to assist in the FS.

Additional sediment transects (between or downstream of initial transects) or sampling locations (on the initial proposed transects or between transects) were added in an iterative approach to refine the area/volume of sediment above the site-specific risk values and define the zones of acceptable versus unacceptable risk. Sediment cores and transects continued to extend in the downstream direction until either no soft sediment was present, or two consecutive sampling locations contained concentrations

below the screening levels, and/or were consistent with upstream concentrations. The following transects were added (Sheet 3):

- TS2-1C: Delineates area north and upstream of TS2-1
- TS2-1A,TS2-1B, TS2-1D, TS2-1E, TS2-1F, and TS2-1G: Fills data gap between TS2-1 and TS2-2
- TS2-7A: Fills data gap downstream between TS2-7 and TS2-8
- TS2-8A: Fills data gap downstream between TS2-8 and TS2-9 along the southern bank
- TS2-10 and TS2-10A: Fills data gap downstream of TS2-9
- TS2-11: Fills data gap downstream of TS2-10 along the eastern bank
- TS2-12: Fills data gap downstream of TS2-11 along the eastern bank

Sampling along each transect started from the east shore and progressed towards the west shore. A minimum spacing of 50 feet was maintained between sampling locations starting on the east side of the river on the bench of sediment outside of the navigation channel (east bench). Wherever possible, more than one sampling location was placed within the east bench river sediments. After collection of the east bench samples, one channel sample was collected 100 feet from the last east bench sample along the transect. On most transects, one sample was collected from the west bench sediments to evaluate the other side of the channel. All transects except TS2-1A, TS2-1D, TS2-1F, TS2-4, TS2-5, TS2-6, TS2-8A, TS2-10, TS2-10A, TS2-11, TS2-12 included samples collected from the west bench and the navigation channel.

Native Material Samples

Review of boring logs performed by WW Engineering and Science (WWE, January 1992) indicated MGP affected material in sand, silt, and clay material with blow counts between 5 to 50+ blows per foot. Therefore, samples of the native material (river sediments not classified as “soft sediment” is referred to as “native material” in this RI Report) were collected at select locations along transects discussed above using a rotary wash drilling method as described in Section 4 of the Multi-Site FSP, September 2008. Note that “native material” was previously referred to as “parent material” in earlier documents and these terms are considered synonymous between reports.

Native material sample locations were initially proposed on transects that were inside or adjacent-to the area of observed MGP-affected sediment. However the same drilling methods used to collect native material samples were also used to extend sediment borings in locations where vertical delineation was not achieved using vibracore sampling methods alone. Native material sample locations and soft

sediment sampling locations that were revisited with the drill rig to define vertical extent are labeled with the suffix “N” (e.g., TS2-3-SD003N).

Bioavailability Assessment

Ten soft sediment samples were collected adjacent to the former MGP facility to provide samples with total PAH (13) concentrations representative of the three risk zones identified in Step I Sampling. These samples were submitted for both solid phase micro extraction (SPME) and 28-day Hyallella Azteca toxicity testing to further support the Step I sediment risk evaluation. The intent was not to limit these samples to the near-surface biologically active zone, but rather to evaluate risk correlations to PAH concentrations representative of the different risk zones regardless of depth. Samples were collected generally within the areas previously characterized, with a goal of obtaining two samples from the “no significant risk zone” and four samples from each of the “inconsistent risk zone” and the “elevated risk zone” summarized in the table below.

Table J. Terminology to Identify Total PAH (13) Concentration Ranges

Sample Quantity	Risk Zone	Total PAH (13) Concentration (µg/kg)
2	No significant Risk	Ambient to less than 120,000 µg/kg
4	Inconsistent Risk	120,000 µg/kg to 482,000 µg/kg
4	Elevated Risk	>482,000 µg/kg

Samples were analyzed with a 1 day turn-around time to rapidly identify samples that fall within each zone. Once the samples were identified, portions of each sample were submitted for analysis as described in Section 3.8.2.3.

3.8.2.2 Step II Sampling Methods

Soft Sediment

NRT utilized a Vibracore, pushcore and/or a Ponar® grab sampler to obtain soft sediment samples at the sampling locations from a pontoon boat as described in Section 4 of the Multi-Site FSP, September 2008.

Prior to sampling, the water depth and presence of soft/loose sediment was measured using aluminum poles. Consistent with Section 4 of the Multi-Site FSP (September 2008) a 2-inch diameter aluminum pole with a 3-inch by 6-inch plate attached to the bottom was used to measure the water/top of sediment depth. The aluminum pole with plate attached was manually pushed thru the water column to the top of sediment and depth to sediment recorded. A 2-inch aluminum pole without a plate was then lowered

through the water column into the soft sediment and pushed until refusal. The depth of sediment was then recorded. Throughout the sediment sampling, the surface water elevation was recorded as a reference for converting water depth measurements to elevations of top of sediment. The depth to top of sediment and the relative thickness of soft sediment was recorded in field logs and in the summary table of field observations (Appendix F3 Table 1). When a vibracore or pushcore was used to sample, the length of push was recorded and the actual length of material recovery was recorded. The Step II Sediment Work Plan set a goal of 90% recovery. If the percent recovery was less than 75% another attempt was made at that sampling location.

Samples were visually characterized, logged and sampled in general accordance with Section 4 of the Multi Site FSP, September 2008. Sediment profiles are provided in Sheets 1 & 2 and a summary of the observations of MGP residuals is provided on Sheet 4. Boring logs are included in Appendix F.

The sediment cores were subdivided into the following intervals:

- 0 to 6 inches below mudline (river bottom)
- 6 to 18 inches below mudline
- 18 to 30 inches below mudline
- 30 to 42 inches below mudline
- 42 to 54 inches below mudline
- Continuing in one foot intervals until the end of the core

The 0 to 6 inch below mudline interval was collected to assess the current concentrations the benthic community is exposed to. The core was subdivided in one-foot intervals to the bottom of the core. If the last interval was less than 4 inches in thickness, it was added to the previous interval or analyzed as a separate interval. Each interval selected for laboratory analysis was homogenized in a stainless steel or aluminum bowl using a stainless steel spoon. Upon completion of sediment borings, non-dedicated sampling equipment was decontaminated as described in Section 8 of the Multi-Site FSP, September 2008.

Native Material Samples

Native material samples were collected using a drill rig and wash rotary sampling methods. As discussed above, the same drilling methods used to collect native material samples were also used to extend sediment borings in locations where vertical delineation was not achieved using vibracore sampling methods alone. Native material sample locations and soft sediment sampling locations that were revisited

with the drill rig to define vertical extent are labeled with the suffix “N” (e.g., TS2-3-SD003N); therefore, any sample with the suffix “N” was completed using wash rotary methods.

Native material cores were continuously sampled with a 2-ft split-spoon sampler and advanced approximately 20 feet below river bottom, or until 4 consecutive feet of un-affected material was encountered (determined in the field visually and using photoionization detector [PID]). Cores were subdivided into 2-foot sections, instead of 1-foot sections, for analysis of COPCs. The number and location of parent material cores was adjusted in response to the Step II soft sediment or parent material observations as described in the sampling approach presented in Section 4.3 and 4.3.2 of the Step II Sediment Sampling Plan (Attachment A3). The location and purpose of the native material samples is summarized in the table below:

Table K. Step II Sediment - Native Material Sample Locations and Description

Native Material Location	Purpose
TS2-1-SD003N	Added to evaluate 1B-SD003N lateral extent
TS2-1B-SD003N	Added to evaluate 1B-SD003 vertical extent
TS2-1D-SD001N	Added to evaluate 1D-SD001 vertical extent
TS2-2-SD003N	Added to evaluate 1B-SD003N lateral extent
TS2-2-SD004N	Added to evaluate 2-SD004 vertical extent
TS2-3-SD003N	Planned to evaluate lateral extent of borings near MGP affected sediments
TS2-3-SD005N	Planned to evaluate lateral extent of borings near MGP affected sediments
TS2-5-SD004N	Planned to evaluate lateral extent of borings near MGP affected sediments
TS2-6-SD001N	Planned to evaluate lateral extent of borings near MGP affected sediments
TS2-7-SD004N	Added to evaluate 7-SD004 vertical extent
TS2-8-SD002N	Planned to evaluate vertical extent along east bench
TS2-8A-SD002N	Added to evaluate vertical in mid channel near 9-SD002 and 8a-SD002

3.8.2.3 Step II Sample Analyses

Samples were analyzed to further characterize sediment concentrations identified in the Step I risk assessment. As presented in Appendix A3 Step II Sediment Work Plan, the best predictor of toxicity at this site is total PAHs (13). Sediment samples collected in Step II were analyzed by the following laboratories for the following parameters:

- Environmental Chemistry Consulting Services - PAHs (13) analysis in a mobile laboratory located at the site

- Test America -Total organic carbon, black carbon (approximately 20% of the samples), sulfide and ammonia
- Meta Laboratories - 10 Porewater PAHs (SPME) from the three risk zones and Alkylated PAHs
- Coastal Bio Laboratory - Toxicity testing at the same locations as the SPME samples.
- CGC, Inc.- Grain size, Atterberg limits, percent moisture, specific gravity, and organic carbon content by loss on ignition
- Pace Analytical – NR 347 parameters and Protocol B waste characterization

Results are discussed in Section 4.4 with supporting tables and figures.

3.8.3 Differences between the SWPP and Field work Completed

The following transects were added to the Step II sediment sampling as discussed in preceding paragraphs.

- TS2-1A,TS2-1B, TS2-1D, TS2-1E, TS2-1F: Fills data gap between TS2-1 and TS2-2
- TS2-1C: Delineates area north and upstream of TS2-1
- TS2-7A: Fills data gap downstream between TS2-7 and TS2-8
- TS2-8A: Fills data gap downstream between TS2-8 and TS2-9 along the southern bank
- TS2-10 and TS2-10A: Fills data gap downstream of TS2-9
- TS2-11: Fills data gap downstream of TS2-10 along the eastern bank
- TS2-12: Fills data gap downstream of TS2-11 along the eastern bank

As discussed above, the following native material boring locations were also added during sediment sampling.

Table L. Step II Sediment – Additional Native Borings

Native Material Location	Purpose
TS2-1-SD003N	Added to evaluate 1B-SD003N lateral extent
TS2-1B-SD003N	Added to evaluate 1B-SD003 vertical extent
TS2-1D-SD001N	Added to evaluate 1D-SD001 vertical extent
TS2-2-SD003N	Added to evaluate 1B-SD003N lateral extent
TS2-2-SD004N	Added to evaluate 2-SD004 vertical extent
TS2-7-SD004N	Added to evaluate 7-SD004 vertical extent
TS2-8A-SD002N	Added to evaluate vertical in mid channel near 9-SD002 and 8a-SD002

3.9 Surface Water Sampling

River surface water samples were collected to evaluate the following:

- Ambient surface water conditions and potential off-site sources of contaminants
- Support ecological risk and human health risk assessments
- Refine COPCs for Step II sampling, if performed

3.9.1 Surface Water Sample Locations

Surface water sampling in the Manitowoc River was completed on three transects (T1, T2, and T3) across the river on November 6, 2008 (Sheet 1).

The three transects extended perpendicular from the eastern shore to the opposite shore and were established in the following areas:

- Transect T1, located upstream of the former MGP property (ambient sample location)
- Transect T2, located in the approximate center of the former MGP property
- Transect T3, located downstream of the former MGP property, along the west side of the railroad bridge

There were three sub-sampling locations on each transect; generally at one quarter, at one half, and at three quarters of the distance across the river. Each transect sub-sample location was identified by the suffix a, b, or c as samples were collected from the south bank toward the north bank of the river. One discrete sample was collected from each sub-sample location, at depths consistent with velocity measurements (described below) depending on water column depth. Sampling locations were recorded using a DGPS.

3.9.2 Surface Water Sampling Methods

Prior to collecting the sub-samples, the total water column depth was measured using an aluminum pole as described above and in the sediment poling approach (Section 4 of the Multi-Site FSP, September 2008). A plastic tube Kemmerer sampler was used to collect the discrete surface water samples. This method of collection was selected over the peristaltic pump method for the ability to rapidly collect samples from a specific elevation within the water column. Three sample volumes (Kemmerer volumes) were collected from 0.8 times the total depth of the water column at each transect location (e.g. if the water column was 10 feet deep, the water sample was collected from 8 feet deep). A portable meter

was used to measure field characteristics including pH, temperature, dissolved oxygen, oxidation/reduction potential, conductivity, and turbidity.

River velocity measurements were made concurrent with the surface water sampling (Appendix A3, Step II Sediment Sampling Work Plan Table 7). The river velocity measurements were collected as described in Section 4 of the Multi-Site FSP, September 2008 at each surface water sub-sample location (Sheet 1). A digital velocity meter attached to a ridged steel rod was used to record river velocity from the sampling boat. After the sampling location was poled, the velocity meter was lowered into the water column. The velocity measurements were recorded at 0.2 and 0.8 times the total water column depth or 13 feet below water surface (because the velocity meter had maximum reach of 13 feet below water surface). At each depth the velocity meter was rotated around until the maximum velocity is recorded on the display. The average and maximum velocity at each depth and each location were recorded in a field notebook. The velocity measurements ranged from 0.0 to 0.3 feet per second (Appendix A3, Step II Sediment Sampling Work Plan Table 7).

3.9.3 Surface Water Sample Analysis

Surface water samples were analyzed for COPCs identified in the Generalized Conceptual Site Model (CSM, August 2007). The surface water COPCs are summarized in the following table.

Table M. Step II Surface Water COPC list

Media	COPCs
Surface Water	PVOCs, PAHs, phenols, total suspended solids (TSS), and inorganics (aluminum, antimony, arsenic, barium, cadmium, chromium, copper, cyanide, iron, lead, manganese, mercury, nickel, selenium, silver, vanadium, zinc)

Surface water samples were submitted to Pace for analysis of PVOCs, PAHs (16), phenols, aluminum, antimony, arsenic, barium, cadmium, chromium, copper, iron, lead, manganese, mercury, nickel, selenium, silver, vanadium, and zinc and to Test America for analysis of available cyanide. TSS was inadvertently not sampled. TSS analysis assists in evaluating the influence of colloidals in water samples which may bias PAH and metals concentrations high. However, because the concentrations of COPCs in surface water were below the screening levels, the TSS analysis is not critical at this site. For QA/QC purposes, one blind duplicate and one trip blank were submitted with the surface water samples. Analytical results are discussed in Section 4.5 with supporting tables and figures.

3.10 Qualitative Benthic Invertebrate Survey

A qualitative benthic invertebrate survey was completed during Step II sediment sampling to evaluate the presence/absence of bottom-dwelling species (Appendix H). The results of the qualitative benthic invertebrate survey are discussed in the Step II Risk Assessment Technical Memorandum issued by Exponent in February 2014 and attached to the BLRA.

A field biologist assessed the presence/absence of benthic invertebrates, following the general approach described in Section 4 of the Multi-Site FSP, September 2008 using sediment samples collected from a grab sampler. The benthic invertebrate survey samples were co-located along sediment and surface water transects and next to toxicity testing sample locations. Benthic invertebrate survey sample locations were determined in the field based on field observations of MGP-residuals.

Grab samples were collected from the upgradient transect TS2-1, considered as the background or "ambient" location as described in Appendix A2, SSWP Section 6.7.5.2, two mid-point transects (TS2-5 and TS2-7), and one of the downstream-most transects (TS2-9) to represent a range of areas (with and without MGP-residuals). Three sample locations were collected along each transect. Four replicate samples were collected from each sample location.

The sediments were collected from the top of the mudline to six inches below the mudline, generally considered the biologically active zone (BAZ) for burrowing and feeding in freshwater benthic organisms.

3.11 Geotechnical and Waste Characterization (WDNR Chapter 347) Sampling

In addition to the samples for analytical testing, 28 composite samples and two Shelby tubes were collected for analysis of geotechnical parameters for use in the FS. These parameters include:

- Atterberg Limits, grain-size, specific gravity, organic content by loss-on-ignition, and moisture content
- Unconfined compressive strength was completed on the Shelby tube samples

Representative sample intervals were selected from distinct types of soft sediment and native material for geotechnical analysis. The following table summarizes the type of materials and number of samples submitted from each material.

Table N. Media Materials used for Geotechnical and Waste Characterization Sampling

Material Type	Number of Samples
Clay	4 samples
Silt	16 samples
Silt with sand and/or gravel	5 samples
Sand and/or sand with gravel	6 samples

Because dredging of MGP-affected sediment may be included as a remedial alternative to be evaluated in the FS, analytical samples were collected pursuant to WDNR Chapter 347 “Sediment Sampling and Analysis, Monitoring Protocol and Disposal Criteria for Dredging Projects” (NR 347).

In accordance with the substantive requirements of NR 347, six samples at four sediment core locations from within and downstream-of the MGP-affected sediments were collected as representative waste characterization samples. Note distinct layers of contaminants were not encountered, thus these samples were submitted as composite samples. The following is a summary of NR 347 sampling:

- TS2-6-SD001 (0-2.5 ft) and (2.5-4.8 ft)
- TS2-7A0SD002 (0-1.9 ft)
- TS2-8-SD002 (0-2.5 ft) and (2.5-4.0 ft)
- TS2-8A-SD002N (3-9ft)

Pace analyzed the six samples for NR 347 parameters. In addition one sample was analyzed for Protocol B waste characterization parameters.

Also, because dredging of MGP-affected sediment may be included as a remedial alternative to be evaluated in the FS, the stability of the sediment in the vicinity of the existing sheet pile wall was assessed using three SPT cores (TS2-3-SPT001, TS2-4—SPT001, and TS2-5-SPT001) to evaluate the geotechnical characteristics of the entire core, depending on the variation of the distinct layers observed. Two Shelby tubes were collected to evaluate unconfined compressive strength.

Field measurements were also collected from all logged sample intervals to estimate shear strength using a pocket penetrometer and/or a torvane (using a large vane for soft soils) as described in Section 4 of the Multi-Site FSP, September 2008.

3.12 Disposal of Investigative Derived Waste

3.12.1 Soil and Sediment

Investigative wastes were containerized during Site investigation activities prior to disposal off-site. NRT ensured that disposal facilities met the requirements of the "Off-Site Rule (OSR)" (September 1993, USEPA) for the disposal of investigation-derived waste prior to undertaking any disposal activities.

Solid wastes, which include soil and a small volume of sediment generated from 2008/2009 investigation activities were disposed at the Veolia Hickory Meadow Landfill in Appleton, Wisconsin using waste profile (HML09-164). Soil waste, which includes soil from 2012 investigation activities was also disposed at this facility using the same profile.

Sediment from the 2012 investigation activities was also disposed at the Veolia Hickory Meadow Landfill in Appleton, Wisconsin. However a new profile (HML12-161) was created for the larger volume of sediment.

3.12.2 Groundwater and Surface Water

Purge water from well development, excess surface water, and decontamination water from drilling and other investigation activities was containerized in 55-gallon drums on-site, treated through a carbon filter, and discharged to the sanitary sewer for disposal at the Manitowoc POTW. Starting in 2014, purge water has been profiled with Chief Industrial Services for transport and disposal at their facility in Ripon, WI.

4 INVESTIGATION OBSERVATIONS AND RESULTS

This Section summarizes the nature and extent of MGP residuals in various media (soil, water, sediment, and vapor) within the areas of concern identified in the Appendix A2 SSWP (NRT, 2008) and subsequent work plans and technical memoranda summarized in Section 1. The discussion for each media addresses the potential for residual MGP contaminant sources at the Site and physical conditions that may affect their distribution and trends.

Soil, groundwater, soil vapor, sediment, and surface water results for the Site are discussed within this section. In accordance with the Multi-Site framework and past discussions with USEPA, the screening levels (SLs) used herein were presented in the Multi-Site Risk Assessment Framework (RAF) and Addendum Revision 3 (Exponent, July 2014) for sites located in the State of Wisconsin (Appendix A4). RAF Addendum Revision 3 includes the most current USPEA RSLs. The groundwater SL presented is the more conservative of the State and MCL values presented in the RAF Addendum Revision 3. In the absence of a State or MCL value, the Tap Water value is used for reference purposes. The Multi-Site RAF SLs are used for consistency across the sites and across the MGP program. Tables and figures used for discussion in this section also contain references to the RAF SLs.

4.1 Soil Results

The collection of soil samples was described above in Section 3.4. Sample locations are shown on Figures 6A and 6B. Soil analytical results were compared to the SLs included in the Multi-Site RAF Addendum Revision 3 (Exponent, July 2014) and summarized in Table 8 to help identify contaminants that may be of concern with respect to specific receptors or pathways. Soil results are presented in the following tables for discussion:

- Table 8 Soil Summary Statistics - Samples Exceeding Residential and Industrial SLs
- Table 9 Soil SVOCs Analytical Results Exceeding the Residential and Industrial SLs
- Table 10 Soil VOCs and Inorganics Analytical Results Exceeding Residential and Industrial SLs
- Table 11 Soil Analytical Results Exceeding the CSAT SLs

The analytical lab reports, tables of all soil analytical results, and tables of non-detects that exceed SLs are included in Appendix I. Selected PAHs and VOC results for the soil samples discussed below are also shown on Figures 8 through 12.

4.1.1 MGP Residual Observations and Stabilized Soil

MGP residuals in the form of oil-coated or oil-wetted soils were observed in several locations (Figure 8). Observations of MGP residuals can be grouped into five separate areas:

1. Residuals at PZ25: soil staining and trace tar globules were observed at PZ25/SB101 within the soil stabilization area. As discussed earlier, it is believed the soil could not be stabilized down to the full construction depth due to obstructions in the soil in this area. Unaffected soil and groundwater collected from neighboring wells (PZ24 and PZ26) suggest MGP residuals observed at this location are limited to the area immediately adjacent to PZ25.

2. Residuals near the former retorts: oil-coated soils were observed in two borings (SB103 and SB106) at the north end of the former retort building. SB106 hit refusal on the floor of the former retort and SB103 is defined vertically by the soil sample from 16-18 feet and horizontally by neighboring borings and the soil stabilization area. SB013 is locate outside of the soil stabilization area and does not indicate a failure of the remedy.

3. Residuals within the former 100,000 ft^3 gas holder: oil wetted soils were observed at the base of the former gas holder located beneath the WPSC main building. Soil borings within the holder encountered refusal at the base of the holder, and soil borings outside of the holder did not contain MGP residuals. MGP residuals are confined within the southern portion of the holder.

4. Residuals near MW14: oil coated and oil wetted soils have been observed at MW14 and areas to the south into Chicago Street. Note that none of the 2009 or 2012 RI investigation borings observed any MGP residuals in soil in this area. Soil impacts observed in Chicago Street do not appear to have an impact on groundwater as defined to the east by MW21T (deep sand well) and to the northwest by MW19T (a deep sand well). MGP residuals in this area are defined by the close proximity to clean borings and clean groundwater at depth. Oil coated to oil wetted material was observed from 15 to 17.5 feet bgs in the soil boring for MW14R. A soil sample collected from just below that interval (18-20 feet bgs) did not have any exceedances of the industrial soil SL.

5. Residuals associated with the former 300,000 ft^3 gas holder: oil-wetted and stained soils were observed at 3 locations at the base of the former gas holder on the Winter Property. Very high analytical results and platy grains of naphthalene were observed just outside of the former gas holder at SB122. MGP residuals within the former holder are confined to the eastern side of the holder. Soil borings SB119, SB126, and SB127 define the extent of residuals at SB122. Groundwater impacts have not been observed in monitoring wells MW1, MW6, and MW23 located on the Winter Property and down gradient of the Winter Property.

Test Pit 101 and soil borings PZ24, PZ25, and PZ26 encountered stabilized soil during 2009 upland investigation activities. Boring logs, test pit observations, and a photo log documenting the stabilized soils are included in Appendix E. During the 2009 upland investigation activities the following observations were made:

1. Stabilized soil encountered along the shoreline in borings PZ24, PZ25, and PZ26 were very hard and had the appearance of concrete (Appendix E3, Photo 1).

2. Stabilized soils were confirmed down to the target construction depths at PZ24 and PZ26.

3. Stabilized soils terminated at 17.5 feet bgs at PZ25, which is about 13 feet short of the target construction depth. It is likely that timbers and other large debris prevented soil stabilization from reaching the target depth at this location. Staining and trace amounts of NAPL in the form of viscous globules were observed in clayey sand from 24 to 28 feet bgs. A piezometer is screened from 35 to 40 feet bgs in poorly graded below the observed MGP residuals.

4. Stabilized soils in TP101 (near MW14) were observed from 0 to 15 feet bgs. The top of the stabilized soil is wider than the base (Appendix E3, Photos 2 through 7). Note that no MGP impacted materials were observed in the soils adjacent to the stabilized material.

4.1.2 Soil Sampling Results

Results of all soil samples (1988 through 2014) outside of the soil stabilization areas are summarized in Tables 8 through 10 for discussion of nature and extent. The PAH compounds that most commonly exceed the industrial RAF SLs are naphthalene and benzo(a)pyrene. The VOCs that most commonly exceed the industrial RAF SLs are ethylbenzene and benzene. Inorganic compounds cyanide and lead are the only ones to exceed the industrial RAF SLs. Soil results compared to the Csat and ceiling screening levels (Table 11) are discussed in the BLRA.

Figures 9A through 12 show the lateral distribution of soils exceeding screening levels of selected compounds with high frequency of detections based on the statistics provided in Table 8. Data boxes are only shown for boring locations that exceed a screening level. If there is no data box associated with a sample location then there were no exceedances of the RAF SLs, but compounds may have been detected (see Tables 9 and 10 for all results for compounds that exceed a SL). Sample intervals below intervals with exceedances are included in the data boxes when the data is available to illustrate vertical control.

Lateral extent is well defined at the Site and generally coincident with former MGP structures on both WPSC and Winter Properties. VOC exceedances are co-located with PAH exceedances and there are much fewer of them. Soil exceedances are closely associated with former MGP structures and observed MGP residuals discussed above. The horizontal and vertical extent of contamination has largely been defined on the Site. Along with the observations regarding the presence of MGP residuals discussed above, the majority of the impacts are associated with the 100,000 ft^3 and 300,000 ft^3 gas holders and Chicago Street directly south of the former purifier and condenser (MW14R area). Samples have been collected from numerous locations and the vertical extent of contamination has been identified at almost all locations with the exception of borings SB108 and SB114 (Figure 9A) and boring SB96-6 (Figure 12). These boring locations show increased concentrations at depth. These locations will be evaluated and considered during remedial options screening activities as part of the FS.

SB95-3 west of the stabilized soil near the shoreline is the only location to exceed a screening level outside of the MGP structures and observed MGP residuals. This boring is located in pavement west of the treatment area on property owned by a railroad. The boring log indicates the sample was collected from fill material which noted the presence of coal in the sample interval. The fill material ends at 6.5 feet, there were no elevated headspace readings observed at any depth in this boring, including the sample interval. The elevated PAH results with the absence of headspace readings or visual observations of MGP residuals indicates the soil sample is biased by the presence of coal fragments. Neighboring borings west of the remedy SB95-1, -2, -4 and -6 are all non-detects and define extent.

Soil sample results where the method detection limit (MDL) was greater than the SL are presented on Appendix I3 Tables 3 and 4 and highlighted on data boxes in Figures 9A through 12. The inclusion of nondetects in excess of SLs did change the lateral distribution of soil exceedances on these figures. In most instances there was a detected compound in excess of the SL from the same sample interval.

4.2 Groundwater

This section summarizes groundwater observations, analytical results, and trends through May 2014. Groundwater monitoring has been performed to assess the extent of groundwater impacts as well as the efficacy of monitored natural attenuation. Samples were collected from wells using bailer methods through 2009. In 2010 groundwater sampling switched to low-flow methods. Groundwater data are presented in the following tables for discussion:

- Table 12 Pumping Well PW1 Discharge Records - 2012 Through 2014
- Table 13 Groundwater Summary Statistics (non-bedrock) - Samples Exceeding SLs
- Table 14 Groundwater Summary Statistics (bedrock) - Samples Exceeding SLs
- Table 15 Groundwater Analytical Results - PAHs Exceeding SLs
- Table 16 Groundwater Analytical Results – PAHs Exceeding Tap Water SLs
- Table 17 Groundwater Analytical Results Exceeding GW Vapor SLs
- Table 18 Groundwater Analytical Results – PVOCs Exceeding SLs
- Table 19 Groundwater Analytical Results – PVOCs Exceeding Tap Water SLs
- Table 20 Groundwater Concentration Trend Summary – Benzene, Naphthalene, and Benzo(a)pyrene
- Table 21 Groundwater Analytical Results - MNA and Inorganics Exceeding SLs
- Table 22 Groundwater Analytical Results - MNA and Inorganics Exceeding Tap Water SLs
- Table 23 Comparison of MNA Parameters from selected Up Gradient, Plume, and Down Gradient Wells

The groundwater analytical lab reports, tables of all analytical results, and a table of non-detects that exceed SL are included in Appendix J. Groundwater analytical results are compared to Wisconsin Groundwater SLs for discussion of nature and extent of groundwater impacts. Groundwater analytical results have also been compared to groundwater to vapor screening levels for discussion of risk to vapor intrusion; and groundwater has been compared to tap water screening levels for discussion in the BLRA.

As discussed in Section 3, monitoring wells at the site are installed in the top and bottom of the glacial sand unit and the bedrock unit (Figure 5). Groundwater flow contours are illustrated in Figure 7 and Figures 13 through 18. Selected PAHs and VOC results in groundwater discussed below are also shown on Figures 19, 20, and 21.

4.2.1 Groundwater Flow

4.2.1.1 Groundwater flow direction

Groundwater elevation is measured in all monitoring network wells during each sample event (Table1). Groundwater in the shallow and deep sand flows northwest from the bluff (10th and Chicago Streets) towards the Manitowoc River (Figure 7 and Figures 13 through 18). Groundwater from the central and western portions of the Site is captured within the cone of depression created by groundwater pumping well (PW1). The pumping well was installed to prevent groundwater contaminants from the MW14 area from migrating off site. Well nest MW12 and MW12D wells are screened in the upper and lower portions of the glacial sand unit very close to and down gradient of pumping well PW1 and the benzene and naphthalene plumes identified in wells MW13 and MW14. Given the high PAH concentrations present in monitoring wells MW14 and MW13 (discussed below) and the direction of groundwater flow, it appears well PW1 is effective in capturing contaminated groundwater, as PAH concentrations in the MW12 MW12D well nest are three orders of magnitude or more below the concentrations at MW14 and rarely exceed the SLs (Figures 19, 20, and 21).

Since January 1, 2012, pumping well PW1 has been operational with brief outages for routine maintenance and care. Over 10.8 million gallons of water were discharged from this well between January 2012 and September 2014 (Table 12). On February 4, 2014, the well was found to be off due to a frozen water line, and it did not come back on-line until April 8, 2014. Other than this, the well has generally been operational and only turned off for periods of up to 24 hours for service.

Groundwater in the bedrock flows in generally the same direction as the shallow groundwater (northwest from the bluff toward the river) (Figure 18).

4.2.1.2 Aquifer Characteristics

As discussed in Section 2.1, the Manitowoc River is a gaining stream near Lake Michigan that receives groundwater and surface water from the Manitowoc area and discharges into the lake. The horizontal gradient of the shallow sand upgradient of the influence of PW-1 is estimated at 0.0073 ft/ft (Table 2). Previously completed slug test results discussed in Section 3.5.6 indicate the hydraulic conductivity of the sand is approximately $3.1x10^{-3}$ cm/sec. Groundwater flow velocity is approximately 78 feet per year (ft/yr) (Table 2).

Vertical hydraulic gradients are calculated in Table 3 and summarized below. Vertical gradients are calculated using the groundwater elevations in the water table well and piezometer (dH) compared to the distance between the water table and center of piezometer screen (dL). This method yields varying distances over which the elevation difference in the two wells are measured, but it is in accord with industry standards and is an accepted methodology for such calculations.

Table O. Representative Vertical Hydraulic Gradient for each Aquifer Type

Vertical Hydraulic Gradient (dH/dL)*						
	MW-7/PZ-7		MW-18T/PZ-18T		PZ-24/PZ-23B	
Date	shallow sand to bedrock		shallow sand to bedrock		Deep Sand to Bedrock	
10/26/2009	1.10E-03	flat	-3.54E-03	up	-1.80E-02	up
01/27/2010	0.00E+00	flat	-2.32E-03	up	-2.03E-02	up
04/27/2010	-9.99E-03	up	-1.43E-03	flat	-1.90E-02	up
07/26/2010	-1.28E-03	flat	-1.06E-03	flat	-1.97E-02	up
11/02/2010	9.28E-04	flat	-2.69E-03	up	1.27E-01	down
05/17/2011	-5.53E-04	flat	7.47E-03	down	-1.63E-02	up
11/01/2011	1.47E-03	flat	3.80E-02	down	-1.89E-02	up
08/08/2012	0.00E+00	flat	-1.26E-03	flat	-1.91E-02	up
11/14/2012	-1.32E-03	flat	-5.47E-03	up	-1.94E-02	up

Table O. continued

Vertical Hydraulic Gradient (dH/dL)*		
	MW-5/PZ-5	
Date	Shallow Sand to Deep Sand	
08/08/2012	-6.5E-03	up
11/13/2012	-8.1E-03	up
02/26/2013	-9.7E-03	up
05/29/2013	-1.1E-02	Up

Most nested wells have an upward or flat gradient which reflects the influence of the river as the regional discharge point for groundwater.

4.2.2 Groundwater Quality and Trends

Groundwater samples were analyzed for PAHs, PVOCs, and several monitored natural attenuation (MNA) indicators including: dissolved iron, manganese, nitrate/nitrite, sulfate, and dissolved oxygen (DO). Groundwater results from April 2000 to May 2014 have been included in summary tables for evaluation of groundwater in this RI report. Groundwater summary statistics provided on Tables 13 and 14 were used to select representative compounds for discussion and presentation in figures. Groundwater results are summarized in Tables 15 through 23.

PAHs that exceeded a SL are presented on Table 15. PVOCs that exceed a SL are presented on Table 18. Review of the groundwater statistics (Table 13) from the shallow and deep portions of the glacial sand unit (non-bedrock) wells indicates benzene is the VOC with the most exceedances of the RAF SL and dibenz(a,h)anthracene is the PAH with the most exceedances of the RAF SL. Figures 19 through 21 are plume maps that illustrate the extent of groundwater impacts. The isoconcentration lines plotted on these maps were created using the most recent 6 quarters of groundwater analytical results and then the fall sampling events from the prior 3 years to illustrate plume extent through time. Benzene and naphthalene are typical indicator parameters used to evaluate groundwater at MGP sites. Note that naphthalene is not one of compounds that frequently exceeds the RAF SLs in the statistics presented in Table13. Benzo(a)pyrene was also selected to examine the extent of groundwater impacts at the site to help provide a more in-depth look at the PAH exceedances (Figure 21). Other organic compounds that were detected in Site groundwater tend to occur along with the parameters selected for detailed discussion below.

Bedrock groundwater statistics are summarized in Table14. There are much fewer exceedances of SLs in the bedrock wells and the concentrations do not exceed the RAF SLs by much. Benzene was selected to evaluate groundwater quality in the bedrock (Figure 18).

Groundwater sample results where the method detection limit (MDL) was greater than the SL are presented in Appendix J7 Table 3. The graphs and isoconcentration lines presented on Figures 18 through 21 already use the full value of the reported detection limit for each compound; and therefore, already account for nondetects that exceed a SL.

4.2.2.1 MW14/MW14R NAPL and Treatment System Observations

Historically, LNAPL and DNAPL have been observed at MW14. Since November of 2011 there has been no measureable amount of LNAPL in this well and groundwater sample collection has resumed. Due to presence of trace amounts of NAPL observed on the sample tubing, groundwater field parameters have not been collected. Concentrations of PAHs observed in groundwater at MW14 are the highest at the Site. VOC concentrations are at or below concentrations observed at MW13. The 2009 and 2012 RI activities in the vicinity of MW14 did not observe any NAPL. No groundwater samples have been collected from the replacement well for discussion, though the presence of oil-wetted material in the screened interval would indicate there will be little change.

The direction of groundwater flow is north to north west toward the Manitowoc River located north of the WPSC property (Figure 7). Monitoring wells MW2, MW21T, MW19T, MW22, MW12 and MW12D define lateral extent of groundwater impacts in the vicinity of well MW14 (Figures 19 through 21). Due to a lack of visual MGP residuals in 2009 and 2012 soil borings and low PAH concentrations in the nearby and downgradient monitoring wells, impacts originating from the area around monitoring well MW14 are defined, though concentrations within well MW14 continue to fluctuate. Oil coated to oil wetted material was observed from 15 to 17.5 feet bgs in the soil boring for MW14R. A soil sample collected from just below that interval (18-20 feet bgs) did not have any exceedances of the industrial soil SL.

The groundwater treatment system has been operating since 1997. Concentrations of benzene and naphthalene observed in the treatment system influent samples (Appendix D, Table 1) are decreasing as indicated in Figure 22. Benzene and naphthalene concentrations in treatment system influent have been detected below their respective RAF SLs at least twice since 2011. The groundwater plume maps (Figures 19 through 21) indicate groundwater impacts do not extend beyond the water treatment system extraction well (PW1). This information suggests that the groundwater treatment system is effective at preventing off site migration of groundwater contaminants.

In response to a comment from WDNR regarding the efficiency of the pumping well; the radius of influence of PW-1 typically encompasses the area around MW14 (Figure 7 and Figures 13 through 17) and the observations of steadily decreasing concentrations of influent suggest the well is effective. Groundwater elevation measurements contoured in Figure 15 happen to be collected during a period when the pumping well was down for maintenance and illustrate the difference in groundwater flow near the pumping well, including the MW14 area, when the pumping well is inactive.

4.2.2.2 PZ25

As discussed in sections 1.3.5 and 4.1.1 this well is screened within the stabilized soil near the shoreline and likely represents groundwater that is locally isolated. Due to the site specific conditions around PZ25, the discussion and presentation of concentrations observed in this well are treated separately from the rest of the Site wells. This results in two groundwater plumes on the figures: 1) Concentrations localized to untreated material of the deep sand unit within the stabilized soil at PZ25; and, 2) Concentrations present in the shallow sand unit identified in monitoring wells MW13 and MW14. This is supported by the fact that surrounding monitoring wells in the deep sand (PZ 24 and PZ25) do not exceed groundwater SLs and there is an upper sand well (MW10) located between the shallow plume and the deep plume that rarely exceeds groundwater SL.

4.2.2.3 PVOCs

PVOC concentrations are generally below the MDL or below their respective RAF SLs with the exception of MW14, MW13, PZ25, and PZ07B. Benzene is typically the PVOC of concern in site groundwater, although other PVOCs including 1,2,4-trimethylbenzene, ethylbenzene, toluene, and xylenes are also present at low levels and at concentrations above the respective RAF SLs (Table 18) at the Site. The presence of other PVOCs at the Site are co-incident with benzene.

Benzene

Benzene concentrations and plume extents Figure 19. The October 2009 through May 2014 benzene plume is present in the western part of the Site with the southern portion of the plume located in the Chicago Street right-of-way and extending north towards the Manitowoc River. The benzene plume is mainly centered around downgradient well MW13 and upgradient well MW14. Benzene concentrations have been detected in well MW13 from April 2000 through May 2014; however, the benzene concentrations have been decreasing during this time.

The benzene plume in 2010 covers approximately the same area as in October 2009; however, the eastern edge of the plume extends east and encompasses well MW2. Low level benzene concentrations in MW2 exceeded the RAF SL during the November 2010 sampling event. The benzene concentrations in MW2 do not exceed the RAF SL during the sampling events prior to November 2010 or during any the sampling events after November 2010.

In May 2013, the benzene plume shifts further north and west compared to earlier plume extents and encompasses wells MW10 and MW12D. Benzene slightly exceeds the RAF SL in both MW10 and MW12D during the May 2013 sampling event; however, neither MW10 nor MW12D have benzene

concentrations that exceed the RAF SL during any of the sampling events prior to May 2013 or during the two sampling events that followed (Figure 19).

A separate benzene plume is centered around Piezometer PZ25, which is located in the northwestern part of the Site adjacent to the Manitowoc River. Benzene at PZ25 exceeded the RAF SL during various sampling events from October 2009 through February 2013 (Figure 19). PZ25 is located within the area of stabilized soil along shore. As discussed above, it is likely that soil stabilization was not completed to depth in this location. The absence of groundwater impacts in neighboring wells suggests that this plume is limited to a pocket of unsolidified soil in the immediate vicinity of PZ25.

Benzene concentrations in the bedrock piezometer (PZ7B) fluctuate above and below the RAF SL but are generally stable to decreasing (Figure 18) from October 2009 through May 2013. Benzene concentrations returned below the SL in November 2013 and May 2014. PZ7B is the only bedrock piezometer with benzene RAF SL exceedances. PZ7B is located north of the current Site building in the central portion of the Site.

4.2.2.4 PAHs

Naphthalene and benzo(a)pyrene were selected for the development of plume maps (Figures 20 and 21) to illustrate the extent of PAHs in groundwater at the site. 1-methylnaphthalene, benzo(a)anthracene, benzo(b)fluoranthene, Benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, and indeno(1,2,3-cd) pyrene are also present at low concentrations (Table 15). Groundwater results indicate PAH concentrations are decreasing similar to benzene.

Naphthalene

Naphthalene concentrations and plume extents in the wells and piezometers through May 2014 are summarized on Figure 21. The October 2009 through May 2014 naphthalene plume is similar to the benzene plume, as the elevated concentrations of naphthalene is mainly present in the western part of the Site with the southern portion of the plume located in the Chicago Street right-of-way and extending north towards the Manitowoc River. Wells with lower concentrations delineate the groundwater plume to the north, south, east, and west. The naphthalene plume is primarily centered around well MW13 and well MW14. Naphthalene concentrations in well MW13 are decreasing over time and fluctuate above and below the RAF SL.

A separate naphthalene plume is centered around Piezometer PZ25, which is located in the northwestern part of the Site. PZ25 was the only location where naphthalene exceeded the RAF SL in October 2009 and July 2010 (Table 15). Naphthalene concentrations have not exceeded the SL since 2010. As

discussed above, it is likely that soil stabilization was not completed to depth in this location. The absence of groundwater impacts in neighboring wells suggests that this plume is limited to a pocket of unsolidified soil in the immediate vicinity of PZ25.

Very low detections of naphthalene have been observed in bedrock wells PZ7B, PZ18TB, and PZ23B. There have been no exceedances of the naphthalene SL in bedrock wells (Table15).

Benzo(a)pyrene

Benzo(a)pyrene concentrations and plume extents in the wells and piezometers through May 2013 are summarized on Figure 21. The benzo(a)pyrene plume initially encompassed the majority of the site as well as the Chicago Street and North Eleventh Street right-of-ways in October 2009. However, the extent of the benzo(a)pyrene plume has retreated significantly after the wells started to be sampled using low-flow methods. Currently the benzo(a)pyrene plume in groundwater is consistent with the benzene and naphthalene plume in the western part of the Site as well as the Chicago Street and North Eleventh Street right-of-ways. As of May 213, the benzo(a)pyrene plume primarily extends north from Chicago Street towards the Manitowoc River. Elevated benzo(a)pyrene concentrations are mainly centered around well MW14. Benzo(a)pyrene trends (Table 15) are decreasing over time.

Low concentrations of benzo(a)pyrene have been observed in Piezometers PZ24, PZ25, and PZ26, which are located along the northern boundary of the Site adjacent to the Manitowoc River. Benzo(a)pyrene concentrations in PZ24 exceeded the RAF SL in October 2009; however, concentrations have not exceeded the RAF SL since 2010. Benzo(a)pyrene concentrations in PZ25 exceeded the RAF SL in October 2009, April 2010, and November 2011; however, concentrations have been decreasing over time. Benzo(a)pyrene concentrations in PZ26 did not exceeded the RAF SL from October 2009 through February 2013; however, concentrations did exceed the RAF SL in May 2013 and have dropped back below the SL over the last two sampling events. Low concentrations in the remaining piezometers located at the Site indicate the plume extent is greater near the water table than at depth.

Low level benzo(a)pyrene concentrations slightly exceeded the RAF SL in April 2010 in bedrock Piezometer PZ7B. Benzo(a)pyrene concentrations in PZ7B did not exceeded the RAF SL prior to or after the April 2010 sampling event. PZ7B is the only bedrock Piezometer with a benzo(a)pyrene RAF SL exceedance.

4.2.2.5 Regression Plots

Regression plots (Appendix K) were prepared to evaluate the relationship between groundwater concentrations and groundwater elevation; and groundwater concentrations and time for monitoring wells

and piezometers with either 1) elevated benzene, naphthalene, or benzo(a)pyrene concentrations or 2) are located within or on the edge of the plume. The concentration trend line and 95% confidence limits have been plotted on each graph for reference. Table 20 summarizes the results of the regression plots.

For concentration versus time and concentration versus elevation plots the coefficient of determination (R^2) is provided for each plot that indicates how well the data fits a linear regression. For concentration versus time plots, the general trend column indicates whether the trend line is increasing or decreasing. Slopes that are less than 0.0001 are considered flat.

Monitoring wells and piezometers at the site exhibit flat or decreasing trends (Table 20). MW14 was not sampled for a period of time due to the presence of NAPL in the well so only a limited number of samples were available for analysis which lowers the statistical significance of calculated trends at MW14. Similarly, MW22 and MW23 have limited data sets because these wells were recently installed in 2012 and thus have a limited number of samples which lowers the statistical significance of these results. Trends in these wells are also driven by low concentrations and may be influenced by fluctuating method detection limits.

Concentrations of benzene appear are generally flat or decreasing over time. Concentrations at MW13 (which has the highest statistically significant concentrations of benzene) are also decreasing. Concentrations of naphthalene and benzo(a)pyrene are generally decreasing over time and have relatively high R^2'd values which suggests that there is a good correlation between decreasing concentration and time.

Concentrations of benzene, naphthalene, and benzo(a)pyrene do not exhibit strong correlations with groundwater elevation across the site. A wide range of R^2'd values were observed (Table 20). The strongest correlations are in wells with low statistical significance (MW14, MW22, MW23) and MW9 (which was dropped from analytical sampling as discussed in Table 7). Most other wells exhibit low R^2'd values.

4.2.2.6 Inorganics and Monitored Natural Attenuation Parameters

Groundwater samples were analyzed for inorganics including aluminum, arsenic, cadmium, vanadium, and cyanide (Tables 21, 22, and 23). Arsenic exceeding the RAF SL was identified in well MW21T and Piezometers PZ7B and PZ25 during the May 2013 sampling event. PZ25 is the only well that is also associated with exceedances of benzene and naphthalene. Concentrations of arsenic continue to be monitored in these wells and fluctuate above and below the SL. Other metals were detected in site

monitoring wells but not at any significant levels of concern or with any duration. Available cyanide concentrations were below applicable RAF SLs.

Review of MNA parameters (Appendix J7 Table 2 and summarized in Table 23) suggest a reducing environment is present with anaerobic degradation occurring through methanogenesis within the plume. Chemically, the process of anaerobic respiration involves (in order): 1) denitrification; 2) sulfate reduction; 3) iron reduction; 4) manganese reduction, and 5) methanogenesis.

Typically, if reducing conditions are present beneath a site, the following will be observed:

- DO will typically be less than 0.5 mg or lower than DO readings in unaffected groundwater.
- Nitrate and sulfate concentrations will be lower than areas of unaffected groundwater.
- Iron and manganese are reduced and concentrations in groundwater will increase, as the reduced forms of these compounds have greater solubility than do the oxidized forms.
- Methane concentrations will increase as methanogenesis occurs.
- Alkalinity will increase with increased CO2 released during biodegradation
- ORP of groundwater generally ranges from about 800 millivolts to -400 millivolts; the lower the redox potential, the greater the potential for a reducing and anaerobic environment.
- Arsenic (dissolved) concentrations in groundwater may also increase, as it responds to redox conditions in the same way as iron and manganese (as observed in PZ25).

Groundwater samples were analyzed for several MNA indicators including dissolved iron, manganese, nitrate/nitrite, sulfate, DO, and Oxidation Reduction Potential. Manganese exceeding the RAF SL was identified in wells MW2, MW9, MW10, MW12, MW12D, MW14, and MW19T as well as Piezometers PZ18TB, PZ23B, and PZ26 during various sampling events.

Groundwater in the vicinity of the most highly impacted wells (MW13 and MW14) is under the influence of the extraction well PW1. Select monitoring wells were grouped together to evaluate the potential for microbial activity and biodegradation. The selected wells were grouped by relative location to the plume:

- Up gradient wells: MW5, PZ5, MW18T, and MW21T
- Plume wells: MW13, MW14, and PZ25
- Down gradient wells: MW12, MW12D, MW19T, MW22, and PZ24

MNA results from these groups of wells are summarized on Table 23. The statistics from the plume wells (minimum concentration, maximum concentration, and average concentration) were compared to

statistics from the up gradient wells to look for positive indicators for microbial activity and biodegradation within the plume. All of the indicator parameters demonstrated positive indications including:

- DO, nitrate, sulfate and ORP values are all lower within the plume
- Alkalinity, iron, manganese, and methane values are all higher within the plume

MNA conditions are further discussed in Section 5.7. The down gradient wells also show some positive indicators when compared to up gradient wells; however, wells MW12 and MW12D are located in close proximity to the pumping well (PW1) which likely influences some parameters such as DO and ORP. Although there was a slight increase in groundwater concentrations at some wells in 2013, these overall generalities regarding MNA are applicable to the site, and they respond as one would expect MNA parameters to react given an environment that fosters natural attenuation of these contaminants. Additional evaluation of other lines of evidence will be considered during the Feasibility Study, especially in the evaluation of MNA as a potential remedy.

4.2.2.7 Groundwater Summary

The groundwater plume maps presented in the RI Report show that although concentrations may vary from sampling event to sampling event, the overall extent of the plume is relatively stable. This is true in the shallow soils as well as the underlying bedrock. Trend graphs of selected COPC concentrations (Appendix K) have been observed to increase and decrease between sampling events; however, the long term trends continue to decrease which suggests that residual source is limited in nature. The limited source has also been confirmed through the soil borings and other site work.

After brief increases in May 2013, groundwater results collected in November 2013 and May 2014 have returned to levels consistent with long term trends and have not shown any changes associated with the shutdown of the treatment system. Further expansion of the plume is also inhibited by the soil stabilization monolith that was emplaced during the 1993 and 1994 remediation effort, and impacts noted at well PZ25 are generally confined to the impacted soil in the immediate vicinity within the monolith (see Figure 5 for the monolith footprint and Cross-Section B-B' on Sheet 2) for a profile view of PZ25. A summary of groundwater quality and trends indicate the following:

- The volume of NAPL observed in MW14 was decreasing prior to well replacement.
- The treatment system is effective at preventing impacted groundwater from migrating off site and groundwater concentrations entering the treatment system have decreased near the enforcement standards for benzene and naphthalene.

- Affected groundwater is generally associated with three wells (MW14, MW13, and PZ25) in two separate plumes: A shallow sand unit plume in wells MW14 and MW13 and a deep sand unit plume located within the stabilized soil at PZ25.
- Affected groundwater is well defined by the well network.
- The regression plots indicate generally stable or decreasing trends.
- The MNA geochemical indicator parameters suggest biological degradation is occurring within the plume.

Under current site conditions groundwater concentrations are stable to decreasing and natural attenuation mechanisms are present.

4.3 Vapor

This section summarizes the results of samples collected from 24 locations of soil vapor probes installed between July 2013 and August 2014. Soil vapor probes with the suffix “SS” are sub-slab vapor probes, all other soil vapor probes were constructed with 6-inch stainless steel screens (Figure 5). Vapor analytical results were compared to Wisconsin Industrial and residential RAF SLs and summarized in Tables 24 through 27 and Figures 23 and 24 to help identify contaminants that may be of concern with respect to specific receptors or pathways. Note that current and future land use does not include residential use, so discussion will be focused around exceedances of the Industrial SLs. Soil gas and indoor air results are presented in the following tables for discussion:

- Table 24 Soil Vapor Summary Statistics – Samples Exceeding Residential and Industrial SLs
- Table 25 Soil Vapor Results – Samples Exceeding Residential and Industrial SLs
- Table 26 Indoor Air Summary Statistics – Samples Exceeding Residential and Industrial SLs
- Table 27 Indoor Air Results – Samples Exceeding Residential and Industrial SLs

The analytical lab reports, tables of all soil gas and indoor air analytical results, and tables of non-detects that exceed SL, are included in Appendix L. Benzene and naphthalene results for soil gas and indoor air samples discussed below are also shown on Figures 24 through 27.

Soil vapor probes were installed to evaluate the vapor intrusion pathways into the WPSC main building and the Winter Building which qualified for additional investigation following the tiered evaluation completed in the SSWP. Vapor probes were also installed in the Chicago and 11th Street right-of-ways to evaluate potential vapor migration through utility corridors.

Samples were collected from these vapor probes in August 2012 and June 2013. The June 2013 sampling event was originally planned for late winter, however, inclement weather (frequent rain and ice) delayed sample collection to June.

The results of the initial soil vapor sampling event in August 2012 indicated further evaluation of the Winter Building would be required. Indoor Air samples were collected from the Winter Building in June of 2013 as the first step in additional investigation activities. The second round of indoor air and soil gas samples collected in March 2014 indicated the presence of VOCs above the Industrial SL in shallow soil gas outside of the Winter building, but no compounds were detected above the Industrial SLs in either the indoor air or ambient samples (Figure 24). These results suggest the vapor intrusion pathway remains incomplete at the Winter building. Further discussion is provided in the BLRA.

A single round of vapor samples have been collected from the new soil vapor probes SV123 and SV123D. As discussed in the validation section below the parent sample of SV123 was rejected but the duplicate sample was determined to be acceptable. Naphthalene was detected in both samples above the residential SL but below the industrial SL in these probes. No other compounds were detected above an SL. These results are similar to results at SV122 and SV122D and define the limit of soil vapor exceedances west of the Winter Property and in the direction of the 306 10th Street building.

4.3.1 Main WPSC Building

SV101D, SV101SS, SV102D, SV102SS, SV103D, SV103SS, SV104D, SV104SS, SV105D, SV105SS, SV106D, and SV106SS are located through the floor of the lower level of the WPSC Main Building. Naphthalene is the most frequently observed exceedance of the soil vapor RAF SLs (Table 24). Some vapor probes that had exceedances of naphthalene also had exceedances of other VOCs (Table 25).

Naphthalene and benzene exceedances are summarized in Figure 23:

- Exceedances of screening levels were limited to deep soil vapor probes with the exception of one naphthalene exceedance in sub-slab vapor probe SV102SS in August 2012. Naphthalene was not detected in the subsequent sample collected in June of 2013.
- Concentrations of benzene and naphthalene were detected above the 10-4 cancer risk (CR) level at SV105D. MGP residuals were observed in the soil boring near the screened interval of the soil vapor probe. This location could not be sampled in June 2013 due to water present in the probe. SV102D is also within the gas holder and did not contain water, so the entire holder was not saturated. Both samples collected from the sub-slab probe (SV105SS) paired with SV105D were below RAF SLs for benzene and naphthalene.
- Most of the Soil Vapor probes on the Main Building property had parameter results that were below the MDL or below their respective RAF SLs.

Oxygen is present between 14 and 17% in soil vapor samples collected from the probes within the building. The high oxygen content and sandy soils observed in the soil vapor boring logs (Appendix C4) are favorable conditions for attenuating vapors; which would contribute to the very low concentrations observed in sub-slab vapor probes.

4.3.2 Winter Building

SV107, SV107D, SV108, SV108D, SV109, SV109D, SV110, SV110D, SV111, SV111D, SV112, SV112D, SV120, SV120D, SV121, SV121D, SV122, SV122D are located near the Winter Building. As discussed in Section 3, the perched water accumulated in the former gas holder shortly after installation and some deep vapor probes could not be sampled. Naphthalene is the most frequently observed exceedance of the soil vapor RAF SLs (Table 24). Some vapor probes that had exceedances of naphthalene also had exceedances of other VOCs (Table 25).

Naphthalene and benzene results are summarized in Figure 23:

- Shallow and deep vapor probes (SV108 and SV108D) exceeded the 10-4 CR level during the August 2012 sampling event. These results prompted further vapor intrusion evaluation activities including the indoor air sampling discussed below. Note that concentrations in the shallow probe declined significantly during the June 2013 sampling event.
- Low levels of naphthalene were observed in several probes (SV107, SV109, SV120, SV120D, and SV121) during the August 2012 sampling event that were not duplicated in June 2013.
- Soil vapor probes SV122/SV122D and SV123/SV123D do not exceed any Industrial RAF SLs (Table 25) and define the limit of soil vapor exceedances west of the Winter Property and in the direction of the 306 10th Street building.

Oxygen is present between 2 and 15% in soil vapor samples collected from around the Winter Building (Appendix L4 Table 1); most oxygen concentrations were above 10%. The high oxygen content and sandy soils observed in the soil vapor boring logs (Appendix E4) are favorable conditions for attenuating vapors.

4.3.3 Utility Corridors and Other Areas

SV116, SV117, SV118, and SV119 were constructed in the backfill around the sanitary and storm utility corridors near the corner of Chicago and 11th Streets which is also near the MW14 area. Soil impacts in this area have been observed in saturated conditions at depth (approximately 6 feet below the lowest known utility invert in Chicago Street). Groundwater elevation (~582 ft.) is approximately 2.5 feet below the lowest utility invert observed in Chicago St. The lowest elevation of a utility corridor in Chicago Street is an invert located at the intersection with N 11th St. at an elevation of 584.6 ft.; while the highest

observed NAPL impacts in Chicago Street were observed at GP13 around elevation 578.5 ft. (about 6 feet lower than lowest utility corridor).

Soil vapor probes SV116, SV117, SV118, and SV119 were constructed in utility backfill to evaluate offsite migration and results from these probes are within the risk range and do not indicate the presence of preferential pathways. Soil vapor probes SV117, SV118, and SV119 were constructed in the backfill of interconnected storm sewer lines. If this utility corridor were a preferential pathway, similar concentrations would be expected at each location. Rather it appears that concentrations are related to proximity to observed soil and groundwater impacts near MW14 (i.e., the highest vapor concentrations were observed at SV117, which is located closest to MW14; and lower concentrations were observed at SV118 and SV119, which are located further from MW14).

SV113, SV113D, SV114, and SV144D, SV115 and SV115D were placed in the right of ways near the Kitzerow building and the Braun building to evaluate the vapors that may migrate in these areas. Low levels of naphthalene just above the RAF SL were observed in some of these probes consistent with concentrations observed in the nearby soil vapor probes set in the utility corridors. This also suggests that utility corridors are not preferential flow pathways.

The small WPSC storage building located north of the Winter Building is not intended for human occupancy. The building is divided into two sides: The west side is an empty storage room and the east side has a much smaller room used by Mr. Winter to store supplies like lawn care equipment and fertilizer. Nested vapor probes at SV111 and SV110 were placed to evaluate this building. The SV111 samples were below the screening levels for both rounds. The SV110 samples were below the screening levels except for naphthalene which was detected in the shallow SV110 vapor probe just above the 10^{-6}.

4.3.4 Winter Building (Indoor Air)

Indoor air samples IA123, IA124, IA125, and IA126 were collected from inside of the Winter Building along with ambient air samples (Amb1 and Amb2) in June of 2013. The second round of supplemental indoor air concurrent with shallow soil gas sampling was completed at the Winter Building on March 8, 2014. Samples were collected from the same indoor air locations as the first round. Two ambient locations (AMB-3 and AMB-4) were also collected. The summary statistics are in Table 26 and results are summarized in Table 27.

Naphthalene and benzene results are summarized on Figure 24. Low levels of naphthalene were detected just above the RAF SLs in all of the indoor air and ambient samples during the first round. Toluene was the only other VOC detected in the samples (Appendix L4 Table 3). During the second

round of indoor air sampling no VOCs were detected above the Industrial SLs in any samples. These results suggest that the vapor intrusion pathway is currently incomplete in the Winter Building.

4.3.5 Vapor Summary

Benzene and naphthalene results from the May 2014 groundwater sampling event were compared to the groundwater screening levels for protection of residential indoor air (CR 10^{-6}) and plotted on Figures 25 and 26 with results of vapor samples that exceeded the industrial soil gas screening levels (CR 10^{-6} and CR 10^{-4}). These figures illustrate how the presence of vapors associated with MGP residuals in subsurface soils within former MGP structures are above the risk management range; whereas, the presence of vapors associated with affected groundwater are within the risk management range. Results of vapor sampling indicate:

- Low levels of naphthalene (exceedances just above the 10-6 CR level) are present in soil gas at the Site.
- The highest concentrations of VOCs in soil gas are associated with MGP residuals observed at the base of the former gas holders, rather than groundwater impacts.
- Sandy soils with abundant oxygen near building foundations are favorable conditions for attenuation of vapors in soil.

Soil vapor sample results where the method detection limit (MDL) was greater than the SL are presented in Appendix L4 Table 2. Naphthalene is the only compound with nondetects that exceed a screening level, and they all exceed the residential SL which is not applicable under current and most likely future land use. The risks due to vapor intrusion are discussed in the BLRA and Sections 5 and 6 below.

4.4 Sediment Results

Samples were analyzed to further characterize sediment concentrations of the COPCs identified in the risk assessment (Step I). Soft sediment was present in much of the investigation area on the river bottom. Sediment samples were collected with a vibracore and ponar along transacts in the river (Sheet 1). Native sediment samples and deep soft sediment samples were also collected using a drill rig and mud rotary drilling methods to delineate vertical extent and assess geotechnical conditions of the adjacent to the sheet pile wall.

As determined during Step I sediment sampling and discussed in the Step II Sediment Sampling Work Plan, the best predictor of toxicity is total PAHs (13), so the bulk of the analytical samples were submitted for this analysis. The Step II Sediment Risk Assessment (attached to the BLRA) identified the break point between the no significant risk zone and the inconsistent risk zone at 103 mg/kg total PAH (13). Note that

during Step II Sediment sample collection in 2012 the break point had been identified as 120 mg/kg (based on Step I Sediment results) and field decisions regarding sample collection and extent of affected sediment were based on that break point. Also, sediment SLs to which the results are compared are those presented in the Multi-Site RAF Addendum Revision 3 (Exponent, July 2014) and site specific breakpoints for ecological risk in accordance with the agreement and approach developed between IBS and USEPA. Sediment results are presented in the following tables for discussion:

- Table 28 Sediment Summary Statistics - Samples Exceeding SLs
- Table 29 Sediment Analytical Results – Exceeding Human Health Soil Industrial SLs and Ecological Risk Site Specific SL
- Table 30 Sediment Porewater Results

Analytical results in this report were compared to both the human health industrial SL and the break point concentration 103 mg/kg, identified in the BLRA, for discussion of human health and ecological risk. The analytical lab reports, tables of all sediment analytical results, and a table of non-detects that exceed SL are included in Appendix M.

Sheets 1 through 6 contain cross-sections, sampling locations, and observations from sediment investigation activities. Figure 27 illustrates sediment sampling locations with concentrations below the break point concentration of 103 mg/kg at the end of boring and Appendix F4 contains field concentration profiles for use in discussion of extent.

As discussed in Section 3, Step II sampling initially occurred along nine sampling transects labeled TS2-1 through TS2-9 (Sheet 1). The initial locations of transects were based on relative location to MGP affected sediments as observed from previously performed investigations and Step I sediment sampling. Additional sample locations were added based on field observations and quick turn sample results.

Previously collected sediment data collected prior to these RI investigation activities were presented in the Completion Report and have been summarized in Appendix N for reference.

4.4.1 Observations of MGP Residuals

All sediment samples were logged and observations of MGP residuals were recorded in the boring logs (Appendix F), MGP residuals (oil-wetted and oil coated sediments) were observed adjacent to the shoreline of the upland Site (Sheet 4). Most of the residuals were identified in the top 5-feet of sediment. MGP residuals were observed below 5-feet at locations TS2-4-SPT001, SB-238, and TS2-5-SPT001 located immediately adjacent to the upland Site; and TS2-6-SD001N which is approximately 200 feet

downstream of the upland Site. All but two of the locations with observed MGP residuals were located on the bench of sediment south of the navigation channel limits. The two locations with MGP residual observations within the navigation channel (SB-30 and TS2-3-SD002) are located within 50 feet of the bench and limits of the navigation channel. The close proximity of MGP residuals to the shore line are further illustrated on Sheets 2 and 3 and Appendix F4 concentration profiles of the south shore line and transects TS2-3 through TS2-6. These materials will be used in the FS to assist the evaluation for preconstruction sampling.

4.4.2 Soft Sediment Observations

Thick accumulations of soft sediments (loose silt and organic silt) were observed throughout the turning basin as evidenced by deep penetration of the vibracore sampler (average of 5 feet) in and out of the navigation channel (Appendix F3, Table 1). The presence of gravel and shells along some shoreline areas occasionally prevented the vibracore from deep sample penetration. The drill rig using mud rotary methods was used to supplement vibracore sampling in these areas. Thickness of soft sediments also decreased in proximity to the water line and former railroad bridge that cross the river at the western end of the turning basin (Sheet 3). There was little to no soft sediment observed within the navigation channel further downstream of the former railroad bridge (transects 10A and 11). Soft sediments were observed within the bench east of the navigation channel downstream of the former railroad bridge (samples TS2-11-SD001 and TS2-12-SD001).

4.4.3 Native Material Observations

As discussed in Section 3, native material includes river sediments (hard silt, sand, and clay) not classified as “soft sediment” (loose silt and organic silt). Using the average depth of vibracore penetration as an approximation for soft sediment thickness, native material begins approximately 5-feet below the top of sediment. Native materials present beneath the soft sediment (Sheets 2 and 3) include:

1. Sand, between 5 and 15 feet of sand was observed just below the soft sediment.
2. Silt, between 0 and 5 feet of silt was occasionally observed between the sand and clay.
3. Clay, between 3 and 15 feet of clay was observed lying over bedrock.

MGP residuals were observed in the upper portions of some of the native sand material, but did not extend into the lower silt and clay layers. It is recognized that pre-design sampling may be required to delineate the extent of these impacts. The FS will evaluate the need for sampling and consider appropriate remedial options to mitigate these impacts and confirm cleanup goals.

4.4.4 River Morphology and Flow

Bathymetry survey was completed in June of 2008, prior to Step I sediment sampling and is included in Appendix C4. Side scan sonar indicated the majority of debris appears close to bulkheads and shorelines as expected. In general, the results of the survey show that the river bottom is relatively clear of large debris. Note that there were several floating trees and limbs observed during survey work and some areas of the river could not be surveyed due to the strength of the current. Sub-bottom sonar survey was unable to distinguish the contact from soft sediment to native material.

Within the Site area, the Manitowoc River varies in width from approximately 700 ft at its widest point to approximately 300 ft at its narrowest point, with water depths ranging from 4 to 24 ft. The portion of the river adjacent to the former MGP facility is used as a turning basin by local barge traffic. The river has a medium flow rate which varies by season and is based on localized rain events (Section 2.4). The river bank adjacent to the former MGP facility is a concrete and steel flood wall. Upstream of the former MGP facility along the east bank of the river is a steeply-sloped bluff which is covered with mature deciduous tree species. The east bank of the river downstream from the former MGP facility is lined with an engineered wall that is tree lined and abuts the gravel parking lot/ access road of a commercial property. The west bank of the river both upstream and downstream of the facility is lined with a concrete engineered wall and the upland area adjacent to the river consists of paved area for a heavy industrial facility.

The U.S. Army Corps of Engineers (USACE) maintains the Manitowoc River channel from the harbor entrance upstream to the Burger Boat Company at USACE river station 191+56. The MGP facility is downstream of the Burger Boat Company at approximately USACE river station 156+50. USACE maintains a depth of 21 ft in the vicinity of the former MGP facility; this project depth extends from the harbor river mouth upstream to river station 185+00. Upstream of this location, the USACE project depth was 12 ft, but the Water Resources Development Act of 2007 authorized a change in project depth from 12 ft to 18 ft. Generally, the entire channel is surveyed bi-annually by USACE and dredging of the river is performed as needed (if USACE funds are available) to maintain the project depth.

4.4.5 Sediment Sampling Results

4.4.5.1 PAH Results

Results of the Step I and Step II sediment risk assessments determined that total PAH (13) sediment concentrations were negatively associated with percent survival of the amphipod *Hyalella azteca*. Other MGP-related chemicals of potential concern (i.e., benzene, toluene, ethylbenzene, and xylenes and

metals) present in sediment were not found to adversely affect survival. Growth of H. azteca was also measured and not found to be adversely affected by exposure to Site sediments. Total sediment PAH (13) concentrations and corresponding survival data collected during the Step I sediment investigation were used to predict break points that represented “no significant risk,” “inconsistent risk,” and “elevated risk” of toxicity to benthic invertebrates. Step II sediment data, including PAH porewater results and additional toxicity testing were used to refine the break points.

The breakpoints identified in the Step II Sediment risk assessment (discussed in the BLRA). Are as follows:

- No significant risk: <103 mg/kg total PAH (13)
- Inconsistent risk: 130 mg/kg to 295 mg/kg total PAH (13)
- Elevated risk: > 295 mg/kg total PAH (13)

Total PAH (13) concentrations in excess of the elevated risk level were detected at various depths in sediment borings throughout the turning basin (i.e., from transect TS2-1 at the north end of the turning basin to the former railroad bridge at the south end of the turning basin) (Sheets 4 and 5). There were no exceedances of the elevated risk level observed downstream of the turning basin. Note that the Step I Sediment risk assessment estimated the elevated risk break point at 482 mg/kg, which was the breakpoint value used to make field decisions regarding extent of elevated risk concentrations during Step II sediment sampling.

Data boxes are only shown for boring locations that exceed a screening level (Sheets 4 and 5). If there is no data box associated with a sample location then there were no exceedances of the RAF SLs, but compounds may have been detected (see Appendix M3 Tables 1 and 2 for all results). Sample intervals below intervals with exceedances are included in the data boxes when the data is available to illustrate vertical extent. Figure 27 presents sediment sampling locations identified as having concentrations above or below the break point concentration of 103 mg/kg at the end of boring. This map helps illustrate the lateral extent of vertical delineation.

The lateral extent of the elevated risk zone is defined within the turning basin. The lateral extent of the no significant risk zone is nearly identical to the limits of the elevated risk zone. The upstream extent is defined by transects TS2-1C and TS2-1. These two transects defined the upper end of the sediment investigation during Step II because all sample intervals had total PAH (13) concentrations below the Step I no significant risk break point of 120 mg/kg used for making field decisions. The downstream extent of the no significant risk zone extends along the eastern shoreline downstream of the turning basin (former railroad bridge). A few samples collected from within the bench of sediment east of the navigation

channel at locations TS2-10-SD001 and TS2-11-SD001 fall within the inconsistent risk range. The downstream extent the no significant risk zone is defined by TS2-12-SD001 and two other sediment borings (TS2-10A-SD002 and TS2-11-SD002) that define lateral extent around locationsTS2-11-SD001 and TS2-10-SD001.

Sediment surface elevation has to be considered when looking at lateral and vertical extent at depth. To account for this, vertical extent was monitored in the field during Step II sediment sampling, by actively completing concentration profiles using total PAH (13) results obtained from the mobile lab and top of sediment elevations calculated from depth to sediment and surface water field measurements. These rough profiles were used to identify places where additional native material borings could provide additional vertical control as discussed in Section 3.8.2.2. Vertical control was not established at 100% of the boring locations; however, the lateral extent of contaminants at depth has been established and illustrated in Figure 27, Sheets 1 and 2, and the concentration profile sheets included at Attachment F4.

Sediment sample results where the method detection limit (MDL) was greater than the SL are presented in Appendix M3 Table 3. Dibenz(ah)anthracene is the only compound with nondetects that exceed a screening level and this only occurred in 4 instances out of 33 total nondetects and out of 407 total samples. The nature and extent of sediment impacts is evaluated using the total PAH (13) and is unlikely to be affected by a small percentage of nondetects in excess of the SL.

4.4.5.2 PVOC/Metals/Phenols Results

As discussed above and in the Step II Sediment Sampling Work Plan, the analysis of PVOCs, metals, and phenols in sediment was discontinued following Step I sediment sampling. Step I sediment sample locations with PVOC and metals concentrations that exceed the ecological screening levels (Table 29) were located near the shoreline adjacent to the upland Site, where PAH concentrations also exceeded their respective RAF SLs and the total PAH (13) (Table 29).

Review of the 2008 sediment results indicates total PAH concentrations were more-widespread than either PVOCs or metals in sediment. PAHs exceeded the SLs in about 30 to 40 samples, the metals (including lead, selenium, vanadium, and zinc) exceeded the SLs in 21 to 23 samples, and PVOCs exceeded the SLs in 12 or fewer of these samples. Further, there was no location where either PVOCs or metals exceeded the SLs but the PAHs did not. This is supported by the Sediment Summary Statistics (Table 28) that also indicates PVOCs and metals exceed the SLs in much lower percentages than PAHs. Therefore, the PAHs are the most comprehensive indicator of contamination within sediments related to the former MGP facility.

4.4.5.3 TOC/Black Carbon Results

Over 100 samples were analyzed for black carbon and total organic carbon (TOC). Dividing mg/kg by 10,000 converts the results to percent. Black carbon values ranged from 2.5% to 6.4%. TOC values ranged from 2% to 11.6%. The TOC results indicate the general presence of carbon, which can help bind organic compounds to reduce availability to benthic organisms and limit migration in the system.

4.4.5.4 Geotechnical Results

As discussed in Section 3.11 samples of different sediment materials (clay, silt, silt with sand, and sand and gravel) were submitted for geotechnical analysis including: grain size, atterberg limits, organic content, specific gravity, and moisture content. The lab reports are included in Appendix M.

4.4.5.5 NR 347 Results

As discussed in Section 3.11 six samples were collected for analysis of NR347 parameters to characterize potential waste in the event dredging is selected as a remedial option. The lab report is included in Appendix M.

4.4.6 Bulk Toxicity and Pore Water Results

As discussed in Section 3.8.2, ten soft sediment samples were collected adjacent to the former MGP facility to provide samples with total PAH (13) concentrations representative of the three risk zones identified in Step I Sampling. These samples were submitted for both solid phase micro extraction (SPME) and 28-day Hyallella Azteca toxicity testing to further support the Step I sediment risk evaluation. Analytical results are summarized in Table 30 and lab reports are provided in Appendix M (Coastal Bio – completed the toxicity testing, Meta – completed the SPME testing). These results were used to further support and refine the Step I breakpoints. Further discussion of the site-specific breakpoints are included in the Step II Sediment Risk Assessment included as Enclosure B of the BLRA (discussed in Section 5).

4.5 Surface Water Results

No VOCs were detected in the surface water samples (Table 31). In addition, most phenols and PAHs were only sporadically detected at trace concentrations in surface water samples. Metals were detected in a number of samples but the presence of metals appears to be consistent with ambient conditions, as they were detected in the ambient surface water samples at comparable concentrations. Surface water concentrations of analytes are below conservative ecological screening levels or representative of ambient conditions. The laboratory analytical report is included as Appendix O.

As discussed above sheens (ebullition) have been observed on surface water near the shoreline of the upland Site, these sheens are transitory in nature, and because of this, the exposure and associated risks of these sheens to human or ecological receptors was not quantified as part of the BLRA. However, these sheens will be mitigated by the remedial action in the river that will remove the tar-saturated sediments, which are the source of these sheens.

4.6 Sample Analysis and Validation

STAT was the laboratory for chemical analysis of all soil vapor (soil gas, sub-slab, and indoor air) samples collected during RI investigation activities. STAT was approved by USEPA in the Multi Site QAPP (Integrys, 2007) and was identified to USEPA prior to initiating field activities.

Pace was the laboratory for chemical analysis of all soil and groundwater samples collected during RI investigation activities. Pace also completed analysis of PAHs and PVOCs in Sediment in 2009; and NR347 analysis in 2012. Pace was also previously approved in the Multi-Site QAPP (Integrys 2007).

ECCS was the laboratory for chemical analysis of PAHs in sediment samples collected in 2012. ECCS was also previously approved in the Multi-Site QAPP (Integrys 2007) and completed analysis of sediment samples at the Sheboygan MGP site (Camp marina).

Test America was the laboratory for chemical analysis of sulfide, black carbon (Llyod Kahn), TOC, and Ammonia in sediment samples collected in 2009 and 2012. Test America was previously approved in the in the Multi-Site QAPP (Integrys 2007) and completed analysis of sediment samples at the Sheboygan MGP site (Camp marina).

Meta Environmental was the laboratory for chemical analysis of Alkylated PAHs in 2009 and 2012 and porewater (SPME) analysis in 2012. Meta was previously approved in the Multi-Site QAPP (Integrys 2007) and completed analysis of sediment samples at the WPSC Sheboygan MGP site (Camp marina).

The first four quarters of groundwater samples following installation of new monitoring wells in 2009 and 2012 were validated. Routine groundwater monitoring that took place outside of the initial four quarters were not validated. All soil, vapor, and sediment samples collected as part of this investigation, with the exception of the toxicity tests, have been validated.

Trip blanks, duplicate samples and MS/MSD samples were collected and analyzed to satisfy QA/QC requirements in accordance with Section 2 of the Multi Site QAPP. Shepherd Technical Services, in Austin, Texas validated laboratory procedures and sample results for all the laboratories as discussed in Section 4 of the Multi Site QAPP. The validation summaries are included in Appendix P and the data was

generally acceptable for use. For one sample pair (parent and field duplicate at SV123), the data validators rejected the results of the parent sample because the results were considered impacted from carry-over of contamination from a previous sample run where high concentrations of the same chemicals were detected. Since the validator did not reject the results of the field duplicate sample, those results were incorporated into the discussion of nature and extent in the RI Report.

The data validation reports calculated the relative percent differences and percent recoveries to assess precision and accuracy of the data sets. RI activities were performed in accordance with the standard operating procedures included in the Multi Site FSP and QAPP to minimize errors and ensure representativeness. Data comparability is not required because each media and sample were analyzed by the same methods.

4.6.1 Discussion of Field Duplicates

Parent and duplicate samples were summarized into tables by sample media and included in Appendix Q. The relative percent difference (RPD) was calculated for each pair, and the pairs were compared to the SL for reference to see if the difference between pairs would result in additional exceedances. Calculated RPDs generally meet the precision goal of 30% stated in the Multi-Site QAPP. In soil, indoor air, and surface water, there were no instances where the duplicate sample exceeded a SL where the parent sample did not (i.e., no new exceedances would affect interpretations of nature and extent).

There were 5 instances in groundwater samples where the duplicate sample exceeded a SL while the parent sample did not. At wells MW12 and MW13 there were other compounds detected in the parent sample that also identified these locations as exceeding a SL. Exceedances have been observed during other sampling events at both of the other wells MW5 and MW11. So there is no significant effect on interpretation of nature and extent.

There were two instances in soil gas samples where the duplicate sample exceeded the residential SL while the parent sample did not. At probes SV101SS and SV123 both samples were below the industrial SL. And the parent sample at SV123 was rejected by the validator so there is really no viable comparison to be made for this sample.

There were four instances in sediment samples where the duplicate sample exceeded a SL while the parent sample did not. In all four instances (SED7, SED10, TS2-1C-SD002 [two depths] there were other compounds detected in the parent sample that also identified these locations as exceeding a SL.

5 FATE AND TRANSPORT

This section discusses the potential routs of migration and summary of the overall understanding of site media.

5.1 Baseline Risk Assessment

Exponent prepared a baseline risk assessment (BLRA) using site data collected up through August 2014 (same data included in this RI Report). The BLRA is included in Appendix R. Potential risk from site media were evaluated using the following analytical data sets:

- Soil: Data previously collected and data collected during RI activities in 2008 through 2014
- Groundwater: Data collected from May 2011 through May 2013
- Sediment: Data collected from Step I and Step II sediment investigations (2008 and 2012)
- Surface Water: Data collected from Step I sediment investigations (2008)
- Soil Gas: Data collected from four of sampling events in August 2012, June 2013, March 2014 and August 2014
- Indoor Air: Data collected from two rounds of sampling in June 2013 and March 2014

The BLRA for the Manitowoc Former MGP Site was performed by Exponent in conformance with the RAF for the Wisconsin Public Service Corporation (WPSC), Peoples Gas Light and Coke Company, and North Shore Gas Company, collectively the “Companies,” MGP sites being addressed by the U.S. Environmental Protection Agency (USEPA). The RAF (Exponent 2007) addresses both human health and ecological risk assessment methods and was approved by USEPA in December 2007. RAF addenda were prepared in 2011 and 2014 (Exponent 2011 and 2014) to address changes to human health screening levels and vapor intrusion assessment guidelines since the RAF was developed in 2007. The RAF and RAF Addenda Revision 3 were used as guidelines for developing the BLRA for this Site.

The RAF (including the addenda) was developed in accordance with USEPA risk assessment guidance and provides a common framework that was used in conjunction with information obtained during the development of the USEPA approved SSWP (NRT 2008), subsequent work plans and technical memoranda, and the results of the RI to develop the BLRA.

5.2 Refined CSM

The site-specific CSM in the SSWP provided the framework to identify what data were needed to characterize the Site and evaluate potential human health and ecological risks. As additional data became available during the RI, the CSM was updated and refined. The post-RI CSM is included in the BLRA (Appendix R). A copy of the site specific CSM is included as Figure 28. A graphical presentation of the CSM has also been included as Figure 29.

5.3 Media of Concern

This section summarizes the conclusions of the BLRA grouped by media.

5.3.1 Soil

Soil data were used only to perform an evaluation related to human health, because lack of habitat in the upland area made an evaluation of ecological receptors unnecessary. The soil data were first segregated into surface soils and total soils. Soils that were collected in the top 2 ft of soil are referred to as surface soils. Total soils were categorized as soils sampled at depths from 0 to 10 ft bgs. Additionally, samples collected from beneath pavement, concrete, or gravel were also categorized as subsurface (and grouped with total soils) because of the barrier preventing human exposure under current conditions. Soil data were also segregated into two areas based on current and potential future land use. The first area consists of samples on the WPSC and surrounding properties. The second area consisted of the Winter Property. BLRA conclusions with respect to soil include:

- Based on the Site habitat assessment, the soils in the upland portion of the Site did not require further ecological evaluation because of the land use, which limited the ecological habitat in that portion of the Site.
- Surface soils on both the WPSC and Winter Properties were associated with estimated risks within the risk management range for an industrial and construction worker scenario, but above the risk management range under a hypothetical future residential scenario.
- Total soils on the WPSC Properties do not currently pose a risk to human receptors, because they are not available for contact, but under the assumption of potential future exposure to these soils, estimated risks are within the risk management range for an industrial scenario, but above the risk management range under a hypothetical future residential scenario.
- Total soils on the Winter Property do not currently pose a risk to human receptors because they are not available for contact, but estimated potential risks would be above the risk management range if future construction disturbed the soil sufficiently to allow exposure similar to either a residential or a generic industrial worker scenario.

- For a construction worker, the presence of MGP residuals in several wells or soil borings below 2 ft on both properties indicates that potential risks to a future construction worker would likely exceed the risk management range.

NAPL or MGP residuals in soil occur at depths greater than 4 feet and are associated with former MGP structures, the ISS treatment area, and the MW14 area (Figure 8). Soil samples exceeding the risk based screening levels are often located in the areas where NAPL and/or MGP residuals have been observed (Figures9A through 12).

Note that SB95-3 (Figure 9a) is located in pavement west of the treatment area and away from observations of NAPL or MGP residuals. The boring log indicates the sample was collected from fill material which noted the presence of coal in the sample interval. The fill material ends at 6.5 feet, there were no elevated headspace readings observed at any depth in this boring, including the sample interval. The elevated PAH results with the absence of headspace readings or visual observations of MGP residuals indicate the soil sample is biased by the presence of coal fragments. Neighboring borings west of the remedy SB95-1, -2, -4 and -6 (Figure 9A) are all non-detects.

5.3.2 Groundwater

Groundwater data from May 2011–May 2014 were included for evaluation in the risk assessment. All groundwater sampling locations (15 wells and 11 piezometers) were used in this assessment, with separate evaluations being done for the two wells on the Winter Property (MW01 and MW06) and all other wells on the WPSC and surrounding properties. BLRA conclusions with respect to groundwater:

- Groundwater at the Site is not a drinking water source. Groundwater is not usable as a drinking-water source as a result of numerous exceedances of the drinking-water standards in addition to the presence of NAPL. Additionally, if future construction in the area entails workers having direct physical contact with groundwater, NAPL, or associated vapors in excavations at or below the water table, there would be some potential for risks above the risk management range.

Groundwater plumes containing organic compounds as indicated by benzene, naphthalene, and benzo(a)pyrene (Figures 18 through 21) have been delineated at the site and concentration trends are stable or decreasing. These plumes are associated with MGP residuals observed from two distinct portions of the site:

1. NAPL observed in the vicinity of MW14, which also contributes to concentrations observed at well MW13.
2. MGP residuals observed in soil at PZ25 located within the ISS treatment area.

The extent of NAPL observed in the vicinity of MW14 has been delineated by soil borings. An active extraction well (PW1) is located near the down gradient edge of the groundwater plume (defined by MW12 and MW12D) in the vicinity of MW14. The extraction well was installed in 1997 to prevent impacted groundwater from migrating off property and continues to be effective.

The extent of MGP residuals at PZ25 is believed to be limited to the soils in the immediate vicinity of PZ25. It is likely that an obstruction (e.g., timbers or other debris) in the fill material near the sheet pile wall prevented the stabilization of soils down to the full construction depth in this area. This is supported by observations from PZ24 and PZ26 which indicate soil stabilization was completed to the full construction depth and concentrations of COPCs in groundwater are below screening levels in these wells.

The groundwater concentrations below screening levels observed in wells PZ24 and PZ26 (constructed below the stabilized material) also indicate the stabilized soil has effectively isolated MGP impacted soil from impacting upland groundwater as it migrates toward the surface water.

5.3.3 Sediment

The Step I and Step II sediment investigation data collected during the RI were used to perform the ecological risk assessment. As discussed in the BLRA, no sediment data were evaluated for the human health assessment because the site-specific conditions make the potential for human exposure to the sediments very low. BLRA conclusions with respect to sediment:

- Based on Site-specific conditions (discussed in Section 3.8.1.3), human receptors will not be exposed to the Manitowoc River sediments because of the limited access and depth of the river near the former MGP site. For this reason, sediments do not pose a risk to human receptors.
- Based on the SLERA, sediments of the Manitowoc River exceeded ecological benchmark values for a number of analytes including total PAHs, and BTEX, which required further ecological evaluation of the sediments (i.e., toxicity testing).
- Under current conditions, the Manitowoc River surface sediments are expected to pose a risk to benthic invertebrate populations in a specific area of the turning basin where sediment concentrations are above total PAH (13) concentrations representative of an elevated risk zone. Sediments in the elevated risk zone may be toxic to sensitive benthic invertebrate species based on the results of Site-specific sediment toxicity test results. The current surface sediment elevated risk zone is generally co-located with the extent of MGP residuals observed in sediments, although at depth the risk zone is larger (See BLRA Figures 3 through 5, Appendix R).
- Near-surface and deeper subsurface sediment are at risk for exposure due to river and vessel scour or channel maintenance activities.

- Near-surface and subsurface sediment PAH concentrations over a large portion of the turning basin are representative of concentrations that could potentially be toxic to sensitive benthic invertebrate species (i.e., inconsistent risk zone and elevated risk zone). The actual effect, if any, on the benthic invertebrate community of the sediments in these zones would be dependent on the spatial extent of these near-surface or subsurface sediments that are exposed in the future.
- Potential exposure to other ecological receptors (fish and aquatic bird species) were considered as part of the ERA, but due to the Site-specific conditions, these other ecological receptors were not considered to be at risk.

5.3.4 Surface Water

Nine surface water samples (three reference stations and six investigative stations) were collected from the Manitowoc River in 2008. BLRA conclusions with respect to surface water:

- Surface waters of the Manitowoc River do not pose a risk to human receptors based on the results of a screening-level human health risk evaluation that was performed.
- Surface waters of the Manitowoc River do not pose a risk to ecological receptors based on the results of the SLERA. Sheens related to tar-saturated sediments have been observed on the surface of the river water adjacent to the Site, due to gas or air bubbles rising from the sediment layer (i.e., ebullition). These sheens are transitory in nature, and because of this, the exposure and associated risks of these sheens to human or ecological receptors was not quantified as part of the BLRA. However, these sheens will be mitigated by the remedial action in the river that will remove the tar-saturated sediments, which are the source of these sheens.

It is acknowledged sediments may be disturbed during shipping activities within the turning basin. However, solids suspended as part of these disturbances are likely temporally limited due to re-settling. Due to the presence of the turning basin, the impact of sediment disturbance and its influence on surface water quality will be considered as part of any future proposed sediment remedy within the Feasibility Study.

5.3.5 Soil Gas

Four soil gas sampling events were completed during the RI in August 2012, June 2013, March 2014, and August 2014. Soil gas samples were collected outside of buildings or beneath buildings where MGP residuals were known to be present or suspected beneath the building. BLRA conclusions with respect to soil gas:

- For soil vapor underneath the WPSC Building, sub-slab samples were associated with risks within the risk management range under an industrial scenario, but above the risk management range for a hypothetical future residential scenario. For deeper samples, risks were estimated to be above the risk management range for both an industrial and a hypothetical future residential scenario.

- For subsurface exterior soil vapor samples near the WPSC Building, including utility corridors, and samples near the Fallier automotive building, estimated risks under an industrial scenario were within the risk management range, but were above the range for a hypothetical future residential scenario.
- For subsurface exterior soil vapor samples near the Winter Building, risks were estimated to exceed the risk management range under either an industrial or a hypothetical future residential scenario.
- For subsurface exterior soil vapor samples near the Kitzerow, 306 10th Street, Braun, and WPSC storage buildings, all estimated risks under either an industrial or hypothetical future residential scenario were within or below the risk management range.

Benzene and naphthalene results from the May 2014 groundwater sampling event were compared to the groundwater screening levels for protection of residential indoor air (CR 10^{-6}) and plotted on Figures 25 and 26 with results of vapor samples that exceeded the industrial soil gas screening levels (CR 10^{-6} and CR 10^{-4}). These figures illustrate how the presence of vapors associated with MGP residuals in subsurface soils within former MGP structures are above the risk management range; whereas, the presence of vapors associated with affected groundwater are within the risk management range.

5.3.6 Indoor Air

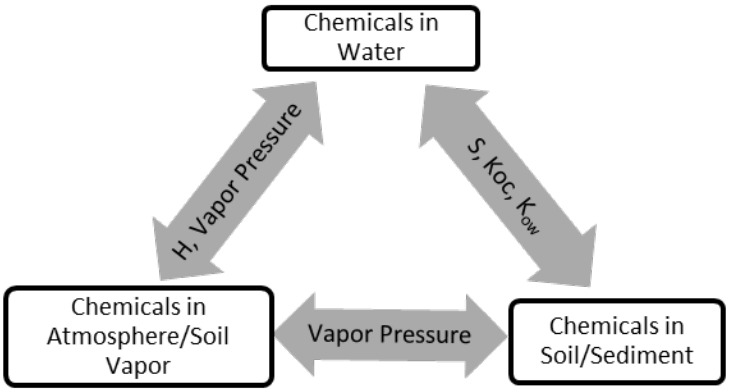
Two rounds of indoor air samples were collected from the Winter Building (June 2013 and March 2014). BLRA conclusions with respect to indoor air:

- An evaluation of the indoor air of the Winter Building provided evidence that subsurface soil vapors are not intruding into the indoor air of the existing building. The vapor intrusion pathway is not complete at the present time.

Based on this incomplete pathway, the health and safety of personnel within the Winter Building is not considered to be at risk at this time. However, to ensure that there are no future potential risks, appropriate remedial options to mitigate this potential risk pathway will be considered as part of Feasibility Study activities.

5.4 Physiochemical Factors Influencing Fate and Transport

This section discusses the potential routs of migration and summary of the overall understanding of site media for the compounds that were detected above the RAF SLs (i.e., compounds that appear in the statistical summary tables).



The fate and transport of chemicals depends on the physiochemical properties of: Density, Water Solubility, Organic carbon-water partitioning coefficient (Koc), Octanol-Water Partitioning Coefficient (Kow), vapor pressure, and Henry's law constant.

5.4.1 Density

Density is defined by USEPA as "A measure of how heavy a specific volume of a solid, liquid, or gas is in comparison to water, depending on the chemical." (USEPA, June 2009). In general, if a substance has a density of less than 1.0 g/cm^3 it will float on water while if it has a density of greater than 1.0 g/cm^3 it will sink in water.

5.4.2 Water Solubility

"The solubility of a chemical in water may be defined as the maximum amount of the chemical that will dissolve in pure water at a specified temperature. Above this concentration, two phases will exist if the organic chemical is a solid or a liquid at the system temperature: a saturated aqueous solution and a solid or liquid organic phase. Aqueous concentrations are usually stated in terms of weight per weight (ppm, ppb, g/kg, etc.) or weight per volume (mg/L, moles/L, etc.)." (Lyman and others, 1990) Chemicals with lower water solubility are more likely to transfer from surface water or groundwater to sediment and soil therefore become less mobile. If a chemical is water-soluble, it can leach in soil and is likely to be biodegraded by soil microbes. Lower water solubility of chemicals is preferred to prevent further transporting of the chemicals. Water solubility is used to estimate the tendency of chemicals to dissolve in groundwater and surface water. A list of the compounds detected above RAF SL and their water solubilities can be found in Table 32.

5.4.3 Organic Carbon-Water Partitioning Coefficient (K_{oc})

Koc is "the ratio of the amount of chemical adsorbed per unit weight of organic carbon (oc) in the soil or sediment to the concentration of the chemical in solution at equilibrium" (Lyman and others, 1990).

The common unit of Koc is L/kg. Water is a polar molecule and a lot of organic compounds in soil or sediments are non-polar, therefore hydrophobic organic chemical pollutants tend to dissolve into organic carbon in the soil and sediment. The Koc of an organic compound is related to its water solubility. The organic compounds with higher values of Koc (lower water solubility) tend to adsorb to soil and sediments matrix rather than dissolving into groundwater or surface water. Consequently Koc, the organic carbon-water partition coefficient is often applied to estimate the extent of the sorption of chemicals in the environment (USEPA, June 2009). A list of the compounds detected above RAF SL and their water solubilities can be found in Table 32.

5.4.4 Octanol-Water Partitioning Coefficient (K_{ow})

"A coefficient representing the ratio of the solubility of a compound in octanol (a non-polar solvent) to its solubility in water (a polar solvent). The higher the Kow, the more non-polar the compound. Log Kow is generally used as a relative indicator of the tendency of an organic compound to adsorb to soil. Log Kow values are generally inversely related to aqueous solubility and directly proportional to molecular weight. " (USEPA, 2012). Kow can be used to estimate how likely chemicals will partition out of surface and groundwater into soil and sediment containing hydrophobic constituents.

If the Kow value of a chemical is less than 10^2, the chemical is not expected to partition into or tend to accumulate in any hydrophobic compartment whereas the chemicals with Kow value larger than 10^6 will be likely to accumulate in to hydrophobic compartments such as soil and sediments (USEPA, April 1979). A list of the Compounds detected above RAF SL and their Octanol-water Partitioning Coefficient values can be found in Table 32.

5.4.5 Vapor Pressure

Vapor Pressure is defined by USEPA as "the force per unit area exerted by a vapor in an equilibrium state with its pure solid, liquid, or solution at a given temperature. Vapor pressure is a measure of a substance's propensity to evaporate. Vapor pressure increases exponentially with an increase in temperature." (USEPA, 2012).

The chemicals with higher values of vapor pressure are more likely to escape from liquid or solid such as groundwater or soil into a gaseous form into soil vapor or atmosphere, which is a larger area. The chemicals with low vapor pressure tend to stay in water phase, if is water soluble and accumulate in soil or biota if it is not water soluble.

5.4.6 Henry's Law Constant

Henry's Law constant is "The ratio of the concentration of a compound in air (or vapor) to the concentration of the compound in water under equilibrium conditions." (USEPA, 2012)

There are two expressed equations of Henry's law constant (HLC) (USEPA, December 2009):

$$Conventional\ HLC = \frac{Vapor\ Pressure\ \times Molecular\ Weight}{760\ \times Water\ Solubility}\ ,$$

Where vapor pressure is expressed as torr,
molecular weight is expressed in g/mole,
and water solubility is expressed in mg/L.
And

$$K_{AW}(Dimentionless\ HLC) = \frac{Chemical's\ Concentration\ in\ Gas\ Phase}{Chemical's\ Concentration\ in\ Liquid\ Phase} = HLC/RT$$

Where R is the ideal gas constant of 8.206 $\times 10^{-5}$ atm-m^3/K-mole, and T is absolute temperature expressed in Kelvin (K).

HLC can be expressed in dimensionless form or with units such as atm-m^3/mol and pa-m^3/mol.

HLC is related to the transport process of chemicals from a surface into atmosphere. Chemicals with a high value of HLC tend to volatilize from water to air whereas chemicals with a low HLC tend to stay in water or be adsorbed onto soil or sediment. Since vapor pressure and solubility of chemicals are subject to temperature Henry's law constant changes with temperature.

5.5 Chemical Persistence

A chemical's persistence in the environment is affected by the following mechanisms described below: volatilization, sorption, biodegradation, advection, dispersion, and diffusion.

5.5.1 Volatilization

"Volatilization is the process of transfer of a chemical from the aqueous or liquid phase to the gas phase. " (USEPA, 2012).

Temperature affects volatilization in several ways since the factors that affect volatilization process such as vapor pressure and Henry's law constant are also temperature dependent. Other factors such as solubility, molecular weight, chemical's concentration, and the nature of the gas-liquid interface also affect the rate of volatilization. In general, higher temperature increases volatilization rate. Chemicals with lower solubility are more likely to stay on the water-atmosphere surface and therefore the volatilization will be increased. The larger molecular weight a chemical has, the slower its volatilization process tend to happen since larger molecular weight results in lower moving of the chemical. In addition, chemical structure of the contaminant will also affect the volatilization because chemical structure of the contaminant will affect the bonds between the chemical and water molecule.

5.5.2 Sorption

USEPA defines sorption as the interaction of a contaminant with a solid, including adsorption and absorption processes, where adsorption refers to an excess contaminant concentration at the surface of a solid while absorption implies a more or less uniform penetration of the solid by a contaminant (USEPA, 2012).

Partition coefficient Kp can be applied to express sorption process (USEPA, October 1990).

$$K_p = \frac{C_s}{C_w} = K_{oc} \times f_{oc}, \qquad \left(\frac{L}{kg}\right)$$

Where,
C_s – Concentration of the contaminant in solid phase,
C_w – Concentration of the contaminant in solution phase,
K_{oc} – Organic Carbon-Water Partitioning Coefficient
f_{oc} – Organic carbon fraction.

Sorption can be affected by properties of the contaminants such as water solubility, polar/ionic character and octanol/water partition coefficient. Soil characteristics including mineralogy, permeability/porosity, texture, surface charge organic carbon content and surface area will also exert an influence on sorption process. In addition to soil characteristics and contaminant properties, surface/ground water characteristics will also influence sorption process and the factors include pH of the water, salt content, and dissolved organic carbon content.

Adsorption should be taken into account when estimating the amount of a contaminant at a site as well as the time required for a contaminant transport from one point to another.

5.5.3 Biodegradation

USEPA defines biodegradation as “A process by which microbial organisms transform or alter (through metabolic or enzymatic action) the structure of chemicals introduced into the environment.” (USEPA, October 2014)

Biodegradation is found to be very important for MGP sites since contaminants such as Non-Aqueous Phase Liquids (NAPLs) are hard to be treated by conventional pump and treat methods due to the capillary and interfacial forces. It may be cost-effective if enhanced natural attenuation is utilized at MGP sites. Biodegradation can take place over a wide range of temperatures although decreasing temperatures correlates decreasing biodegradation rate. In general chemicals with lower molecular weight are more likely to be biodegraded by microbes than those with larger molecular weight. The biodegradation rate will be enhanced if enough nutrients including nitrogen, phosphorus and potassium (NPK) are provided to local microbes. Soil moisture can provide water to biodegradation process, which is critical for bacterial metabolism so soil moisture will also exert an influence on biodegradation. (U.K. Environment Agency, June 2013)

5.5.4 Advection, Dispersion and Diffusion

Advection, dispersion and diffusion are the processes that may increase the spreading of the contamination in groundwater.

Advection is defined by USEPA as “Bulk transport of the mass of discrete chemical or biological constituents by fluid flow within a receiving water. Advection describes the mass transport due to the velocity, or flow, of the water body.” (USEPA, October 2014). Advection process can be affected by aquifer properties, especially hydraulic conductivity and effective porosity, and hydraulic gradient and are independent of contaminant properties. It is the main mechanism driving contaminant movement in the subsurface.

Dispersion is defined as “The spreading of chemical or biological constituents, including pollutants, in various directions from a point source, at varying velocities depending on the differential in-stream flow characteristics.” (USEPA, October 2014). Dispersion is dependent on aquifer properties and independent of contaminant properties. Dispersion process can cause longitudinal, transverse, and vertical spreading of the plume and reduce solute concentration.

Diffusion is defined as “The movement of suspended or dissolved particles (or molecules) from a more concentrated to a less concentrated area. The process tends to distribute the particles or molecules more uniformly.” (USEPA, October 2014). Diffusion will occur once a concentration gradient presents even if the fluid is not moving causing the spreading of the contaminants in groundwater or surface water system. Contaminant properties as well as concentration gradients will affect diffusion process.

5.6 Expected Fate And Transport

The expected fate and transport for the compounds and applicable environmental media presented in Table 32 are discussed below.

5.6.1 Benzene

Benzene in soil is more likely to volatilize into atmosphere near the surface and the remaining benzene in the soil will be very highly mobile and may leach to groundwater. Biodegradation of benzene can happen in shallow, aerobic groundwater rather than in anaerobic conditions. Benzene in the surface or groundwater will also be subject to volatilization with the half-life for evaporation from a model river one meter deep flowing 1m/sec with a wind velocity of 3m/sec of 2.7 hrs at 20 °C. It is not expected to significantly adsorb to sediment, bioconcentrate in aquatic organisms or hydrolyze. Due to its volatile property benzene in soil vapor will exist predominantly in the vapor phase. (USEPA Technical Factsheet on Benzene)

5.6.2 2,4-Dimethylphenol

In soil, freshwater and groundwater, 2,4-Dimethylphenol can be degraded by microorganisms with the typical halflives of less than 1 day to several weeks. 2,4-Dimethylphenol in coarse-grained sandy soils with low organic content or with very basic soils is more likely to leach to groundwater but it not likely to leach to groundwater in soil containing much organic matter. In water, the major process of 2,4-Dimethylphenol is biodegradation with typical half-lives of 10 to more than 50 days and the degradation of it will be rapid in sediments with the half-life of less than 1 day. Volatilization of 2,4-Dimethylphenol is negligible due to its extremely low henry’s Law constant (3.89×10^{-5}) and low vapor pressure. (USEPA Technical Factsheet on 2,4 – Dimethylphenol)

5.6.3 Ethylbenzene

In water, ethylbenzene is more likely to evaporate and be biodegraded. It will evaporate rapidly from the surface of moving and shallow water with a half-life for evaporation of 3.1 hours. Ethylbenzene is hard to

hydrolysis but it may be adsorbed by sediment. It is reported that ethylbenzene can be completely degraded in groundwater in 8 days. Ethylbenzene is likely to be adsorbed moderately by soil and it is likely to leach through soil to groundwater. (USEPA, Technical Factsheet on Ethylbenzene)

5.6.4 Toluene

The major process of toluene in soil and water is evaporation. Toluene in soil tends to evaporate from near-surface soil according to its high vapor pressure and leach to the groundwater due to its liquid phase. Its transportation from soil to groundwater will depend on soil composition. Most toluene is expected to be adsorbed to the soil with high level of organic material while in sandy soil toluene is more likely to transport with flowing groundwater. Toluene in surface water and groundwater is hard to be biodegraded but is easily to evaporate to atmosphere or soil vapor. (USEPA, Technical Factsheet on Toluene)

5.6.5 1,2,4-Trimethylbenzene

The major process of 1,2,4 - Trimethylbenzene in soil and water is evaporation. The volatilization half-life from a model river is reported as 3.4 hours. 1,2,4-Trimethylbenzene in soil tends to evaporate from near-surface soil according to its high vapor pressure and leach to the groundwater due to its liquid phase. According to its relatively high value of Koc, it may also be adsorbed to soil and sediment. (USEPA, August 1994)

5.6.6 1,3,5-Trimethylbenzene

Review of the data presented in Table 32 indicates the transport and fate of 1,3,5-Trimethylbenzene should be similar with the transport and fate of 1,2,4-Trimethylbenzene.

5.6.7 Xylene, o, Xylene, m and Xylene, p

Xylenes in soil and surface water are very likely to volatize to atmosphere and soil vapor with the high vapor pressure ranging from 6.6 to 8.8 mm Hg. With the values of Kow ranging from 1200 to 1600, only a small fraction of naphthalene in surface water is expected to be associated with particulate matter and benthic sediments while most fraction of naphthalene will be retained in solution phase. Similar scenario happens in soil. Since xylenes have low to moderate adsorption to soil, they are moderately mobile in soil and tend to leach to groundwater to some extent. (USEPA, Technical Factsheet on Xylenes)

5.6.8 Acenaphthene

Based on the relatively high value of Koc, which is 7.08×10^{3} L/kg, acenaphthene has slight tendency to mobilize in soil and sediment and tends to partition from water column to sediments and suspended solids. The reported biodegradation half-lives for acenaphthene in aerobic soil and surface water ranging from 10 to 60 days and 1 to 25 days indicates that acenaphthene should be biodegraded rapidly in water and soil under aerobic condition. The volatilization of acenaphthene may be a moderate process giving its Henry's Law constant of 6.36×10^{-3}. (U.S. National Library of Medicine)

5.6.9 Acenaphthylene

Acenaphthylene has a low to slight mobility in soil based on its relatively high value of Koc. Once in water, its partition from water column to suspended solids or sediments becomes significant. A Henry's law constant of 4.51×10^{-3} and 6.6×10^{-3} mm Hg indicate that volatilization of acenaphthylene from water and soil to atmosphere and soil vapor may happen. The half-life of biodegradation of acenaphthylene is reported ranging from 12 to 121 days indicating that acenaphthylene may be biodegraded by microorganisms in soil. It is also reported that biodegradation of acenaphthylene happened in groundwater by microbial populations taken from an aquifer which is contaminated with coal tar products. (NPS, July 1997)

5.6.10 Anthracene

Based on its relatively high value of Koc and Kow once released in water anthracene is likely to be adsorbed to sediments or suspended solids and it is not mobile in soil or sediment. Its Henry's Law Constant of 2.67×10^{-3} indicates that it may volatilize from water but the volatilization process is not significant. Degradation of anthracene is not significant because it tends to adsorb to particles and organic matter and the biodegradation of anthracene is negligible based on most available studies. Half-lives of dispassion of anthracene in water and sediment, which include biodegradation and mineralization, are reported as 13-42 days and 420-1,250 days respectively. (ECHA, October 2008)

5.6.11 Benzo(a)anthracene

Based on its high organic carbon partition coefficients and Kow and low solubility, benzo(a)anthracene expresses strong absorption in soil and sediment. In soil it tends to sorb to particles rather than leach to groundwater and in water it tends to associate with suspended solids or attach to sediment. With its low vapor pressure and Henry's Law constant benzo(a)anthracene will not volatize from soil or surface water to soil vapor or atmosphere.

5.6.12 Benzo(a)pyrene

According to its very high value of Kow (larger than 10^6), benzo(a)pyrene is dominantly associated with particulate matter, soil, and sediment. Therefore in water benzo(a)pyrene will primarily absorb to sediment and suspended solids in water column. In soil benzo(a)pyrene has very low mobility and will not leach to groundwater. With its low value of vapor pressure, benzo(a)pyrene is not likely to volatize from water and soil to atmosphere and soil vapor. (USEPA, August 2007).

5.6.13 Benzo(b)fluoranthene

Based on its very high value of organic carbon partition coefficients and very low solubility, benzo(b)fluoranthene is believed to be dominantly associated with particulate matter, soil, and sediment. Therefore in water Benzo(b)fluoranthene will primarily absorb to sediment and suspended solids in water column. In soil Benzo(b)fluoranthene has very low mobility and will not leach to groundwater. With its low value of vapor pressure and Henry's Law constant Benzo(b)fluoranthene is not likely to volatize from water and soil to atmosphere and soil vapor. (TOXNET, April 2010b)

5.6.14 Benzo(e)pyrene

Review of the data presented in Table 32, the transport and fate of benzo(e)pyrene in environment should be similar with the transport and fate of benzo(a)pyrene.

5.6.15 Benzo(ghi)perylene

Based on its very high value of Kow (larger than 10^6) and organic carbon partition coefficients and very low solubility, benzo(ghi)perylene is dominantly associated with particulate matter, soil, and sediment. Therefore in water benzo(ghi)perylene will primarily absorb to sediment and suspended solids in water column. In soil benzo(ghi)perylene has very low mobility and will not leach to groundwater. With its low value of vapor pressure, organic carbon partition coefficients is not likely to volatize from water and soil to atmosphere and soil vapor.

5.6.16 Benzo(k)fluoranthene

Benzo(k)fluoranthene is immobile in soil since it has great tendency to adsorbed strongly and consequently it will be biodegraded very slowly. In water, benzo(k)fluoranthene is more likely to sorb to sediment and suspended solids in the water column while there is also possibility that benzo(k)fluoranthene will be slowly desorbed causing its short periods of time remaining in water phase.

Since it has a strong affinity to sediments, it is believed that migration with sediments would be the predominant transport process for benzo(k)fluoranthene. (TOXNET, April 2010a).

5.6.17 Chrysene

Chrysene will be immobile in soil and will not leach to groundwater due to its large value of Kow. Its firm attachment to soil particles impedes its biodegradation process by microorganism with the half-life of biodegradation ranging from 77 to 387 days. In water chrysene will primarily absorb to sediment and suspended solids in water column. Its low vapor pressure of 6.2×10^{6} mm Hg indicates that volatilization process of chrysene from soil and surface water to atmosphere and soil vapor can be negligible. (TOXNET, 2005)

5.6.18 Dibenz(a,h)anthracene

Review of the data presented in Table 32, the high value of Koc of Dibenz(a,h)anthracene, which is 3.8×10^{6}, indicates that it will be very immobile in soil and will not to leach to groundwater. Once in water, Dibenz(a,h)anthracene tends to attach to suspended solids or sediments. It is reported that the half-life of 750 days at 20 °C after incubation with unacclimated soil microcosms indicates that the biodegradation of Dibenz(a,h)anthracene is not a primary process in soil. With very low value of vapor pressure and Henry's Law constant, Dibenz(a,h)anthracene will not volatize from surface water or soil to atmosphere or soil vapor. (U.S. National Library of Medicine).

5.6.19 Fluoranthene

Based on its relatively high organic carbon partition coefficients and Kow, fluoranthene expresses moderate absorption in soil and sediment. In soil it tends to sorb to particles rather than leach to groundwater and in water it tends to associate with suspended solids or attach to sediment. With its low vapor pressure and Henry's Law constant fluoranthene will not volatize from soil or surface water to soil vapor or atmosphere.

5.6.20 Fluorene

The relatively high value of Koc of fluorene indicates that it will be moderately immobile in soil and will not to leach to groundwater. Once in water, fluorene tends to attach to suspended solids or sediments. It is reported that the half-life of fluorene in soil ranges from 2 to 64 days showing that the biodegradation is not a primary process in soil. Fluorene in water will be likely to absorb to benthic sediment causing its immobility in surface water. Giving its vapor pressure of 6×10^{-4} mm Hg and Henry's Law constant of

2.61×10^{-3}, fluorene will volatize from surface water or soil to atmosphere or soil vapor to some extent. (TOXNET, August 2001).

5.6.21 Indeno(1,2,3-cd)pyrene

Based on its very low water solubility and greatly high organic carbon partition coefficients and Kow Indeno(1,2,3-cd)pyrene has great tendency to be absorbed in soil and sediment. In soil it tends to sorb to particles rather than leach to groundwater and in water it tends to associate with suspended solids or attach to sediment. With its low vapor pressure and Henry's Law constant indeno(1,2,3-cd)pyrene will not volatize from soil or surface water to soil vapor or atmosphere.

5.6.22 1-Methylnaphthalene and 2-Methylnaphthalene

Review of the data presented in Table 32 indicates respective vapor pressures, water solubilities, Henry's law constants Kow and Koc for 1-Methylnaphthalene and 2-Methylnaphthalene are of similar magnitude to these properties for naphthalene. Thus it is likely that the transport and fate of these two chemicals in environment follow the similar rules with naphthalene.

5.6.23 Naphthalene

Wet or dry deposition can bring naphthalene from atmosphere to surface water or soil. Based on its vapor pressure of 0.085 mm Hg at 25 °C, naphthalene in dry soil tends to volatilize to atmosphere or soil vapor causing its loss from soil. Also with log octanol/water partition coefficients (Kow) for naphthalene of 3.3, only a small fraction of naphthalene is expected to be associated with particulate matter and benthic sediments while most fraction of naphthalene will be retained in solution phase. The half-life of naphthalene in surface water and soil is short since it tends to volatilize and be biodegraded. Similar with what happening in surface water, naphthalene in soil tends to volatize to soil vapor or atmosphere and a moderate fraction of naphthalene will be adsorbed by solid, which depends on the organic carbon content of the soil. Because of it low value of Kow, passage of naphthalene through groundwater will be relatively obvious. (ATSDR, August 2005)

5.6.24 Phenanthrene

Phenanthrene expresses moderate absorption in soil and sediment giving its low water solubility and relatively high organic carbon partition coefficients. In soil it tends to sorb to particles rather than leach to groundwater and in water it tends to associate with suspended solids or attach to sediment. With its low

vapor pressure and Henry's Law constant phenanthrene will not volatize from soil or surface water to soil vapor or atmosphere. (USAHPPM, January 2006).

5.6.25 Pyrene

Review of the data presented in Table 32 indicates pyrene will be moderately absorbed in soil and sediment giving its low water solubility and relatively high organic carbon partition coefficients and Kow. In soil it tends to sorb to particles rather than leach to groundwater and in water it tends to associate with suspended solids or attach to sediment. With its low vapor pressure pyrene will not volatize from soil or surface water to soil vapor or atmosphere.

5.6.26 Metals: Copper, Lead, Manganese, and Zinc

Advection, dispersion, matrix diffusion, and retardation are the four primary processes governing the environmental fate and transport of metals in the subsurface. Advection and dispersion depends on system rather than on the contaminant while matrix diffusion relies on contaminants but only contributes minor to the transports and fate of the contaminants. Retardation includes various processes including sorption, speciation, precipitation, colloid formation, biofixation and interactions with natural organic matter and factors such as pH, oxidation potential, salinity, concentration of competing ions, the nature of sorbent phases and their surface areas, and surface site densities may affect retardation. (USEPA, March 2007).

The valence states of copper complexes may be +1, +2, +3, and +4, among which, copper (III) and (IV) complexes are rare and unstable in water and copper (II) complexes are main soluble complexes for copper in aquatic environments. Copper will be stable over a wide range of geochemical conditions in the solid phase of soils and sediment materials according to its solubility and sorption behavior. Copper in groundwater is expected to be associated with colloids that appear to be organic in nature. (USEPA, October 2007).

In aquatic system, lead is likely to form stable aqueous complexes with OH^-, Cl^-, $CO3^{2-}$, $SO4^{2-}$, and HS^-. The monitoring wells at the site in the plume areas shows that the pH of the groundwater in the plume area is around 8, under which condition, carbonate complexation is most important. Some studies showed that as pH increased, lead mobility decreased but lead adsorption caused decreases in pH which increased lead mobility. It is also found that lead can be adsorbed onto soil very fast and the process is reversible. (USEPA, October 2007).

In aquatic system under alkaline condition, manganese tends to exist in its oxidized forms while in water with pH ranging from 4-7, the most common form of manganese is Mn (II). Solubility of the specific chemical form present, pH, oxidation-reduction potential, and the characteristics of the available anions determine the transport and partitioning of manganese in water. In rivers manganese is more likely to attach on suspended solids and consequently settle into sediment. In soil and groundwater, the cation exchange capacity and the organic composition of the soil determine the tendency of soluble manganese compounds to adsorb to soils. In soil and sediment microbial activity will alter the oxidation state of manganese thus changing the mobility in soil and sediment. (ATSDR, September 2012).

Zn (II) is the predominant oxidation state of zinc in the environment. In natural water, zinc has the tendency to partition into sediment through sorption onto hydrous iron and manganese oxides, clay minerals, and organic materials, during which process pH, concentrations of the substance, oxidation-reduction potential, salinity, and cation exchange capacity may play important roles. In general zinc tends to be more soluble and mobile under acid condition while tends to be insoluble and immobile under alkaline condition. Although zinc is an essential nutrient for all organisms, biodegradation of zinc seems less significant in soil and sediment than in water phase. (ATSDR, August 2005).

5.6.27 Other Inorganics: Arsenic, Dissolved, Cyanide, total, Selenium, Total, and Vanadium, Total

In both oxidizing and reducing groundwater, oxyanions or thiooxyanions are the two major forms of inorganic arsenic. Arsenic may coprecipitate with other common soil/sediment minerals such as iron oxides and iron sulfides in groundwater with iron oxides playing an important role in oxidizing environments and sulfides in reducing environments. In aqueous systems, arsenic mobility can be altered by microbial interactions resulting in the conversion of inorganic arsenic between its oxidized or reduced oxyanionic forms and methylation-demethylation of arsenic. (USEPA, October 2007).

Cyanide is found at the site in soil and sediment. Cyanide concentrations, pH, temperature, metal content, concentration of microbes, availability of nutrients, and acclimation of microbes may all affect the fate of cyanides in soil. Cyanide may present as hydrogen cyanide, alkali metal salts or as immobile metallocyanide complexes. In soil under aerobic conditions, cyanide would biodegrade with the initial formation of ammonia while under anaerobic conditions, the cyanides ion will denitrify to gaseous nitrogen. (ATSDR, July 2006).

Ambient conditions especially pH, pE, and biological activity can affect the transport and fate of selenium in the environment by altering the oxidation state of it. Selenium is found in sediment at the site. The microorganisms were found in various studies to cause the transformation of elemental, inorganic and

organic selenium in sediment into volatile selenium compounds through methylation process, during which temperature serves as an important affecting factor. (ATSDR, September 2003).

Vanadium may present in environment in the +3, +4, or +5 oxidation states, with the +5 oxidation state being the most prevalent. Various ligands in the environment may complex vanadium but it is not a significant pathway for vanadium neither the biotransformation process. The most significant transformation of vanadium occurs between inorganic compounds. In soil or sediment, pH, redox potential, and the presence of particulate are the major factors that affecting the transport and partitioning of vanadium. (ATSDR, September 2006).

5.7 Biodegradation and MNA Evaluation

Biodegradation of the contaminants replies on the geologic and chemical characteristics of the site. Groundwater samples were analyzed for several monitored natural attenuation (MNA) indicators including: dissolved iron, manganese, nitrate/nitrite, sulfate, dissolved oxygen (DO), methane, oxidation reduction potential (ORP) and alkalinity. The results can be found in Appendix J7 Table 2 and summarized in Table 23. Groundwater results of inorganics and MNA parameters were also discussed in Section 4.2.2.6.

All the geologic and chemical indicators are grouped into three categories for discussion to access the biodegradation of the contaminants.

5.7.1 Electron Acceptors

Electron acceptors include dissolved oxygen, nitrate, and sulfates. These compounds are utilized by microbes during biodegradation process and contaminants such VOCs and PAH provide a demand for electron acceptor (WDNR, January 2014). Therefore, increasing trends of oxygen, nitrate and/or sulfate can relate to the occurring of biodegradation process within the dissolved plume. The lower the oxidation reduction potential indicates the greater the potential for a reducing and anaerobic environment. When the parameters regarding electron acceptors from up gradient wells and plume wells are evaluated and compared with each other to identify positive indications for microbial activity and biodegradation within the plume. It is found that DO, nitrate, sulfate, and ORP values are all lower within the plume indicating biodegradation is occurring under reducing environment with anaerobic degradation.

5.7.2 Metabolic Byproducts

Dissolved manganese (Mn2+), dissolved iron (Fe2+), and methane are byproducts of microbial metabolism and may increase within the dissolved plume due to biodegradation process of microbes (WDNR, January 2014). If iron and manganese are reduced, their concentrations in groundwater will increase, as the reduced forms of these compounds have greater solubility than do the oxidized forms. Methane concentrations will increase as methanogenesis occurs. After the evaluation and comparison of the dissolved manganese and dissolved iron in up gradient wells and plumes wells, it is found that iron, manganese and methane values are all higher within the plume suggesting that biodegradation is occurring through methanogenesis within the plume.

5.7.3 Alkalinity

Alkalinity will increase with increased CO2 released during biodegradation as the end production. Alkalinity is expected to increase within the plume when biodegradation occurs. The results of alkalinity values in up gradient wells and plume wells shows that alkalinity is higher within the plume than in the up gradient wells which indicates biodegradation is occurring within the plume.

5.7.4 Conclusion

Review of MNA parameters (Appendix J7 Table 2 and summarized in Table 23) suggests a reducing environment is present with anaerobic degradation occurring through methanogenesis within the plume. Chemically, the process of anaerobic respiration involves (in order): 1) denitrification; 2) sulfate reduction; 3) iron reduction; 4) manganese reduction, and 5) methanogenesis.

6 SUMMARY AND CONCLUSIONS

6.1 Summary

The results of the RI met the objectives of the SSWP (NRT, 2008) and subsequent work plans and technical memoranda summarized in Section 1 and provide adequate information to assess the nature and extent of affected media to support the BLRA and FS. The BLRA, using previously collected soil data and RI data, has identified the following media of concern:

Soil:

- Surface soils on both the WPSC and Winter Properties were associated with estimated risks above the risk management range under a hypothetical future residential scenario.
- Total soils on the WPSC properties do not currently pose a risk to human receptors, because they are not available for contact. However, under the assumption of potential future exposure to these soils, estimated risks are above the risk management range under a hypothetical future residential scenario.
- Total soils on the Winter Property do not currently pose a risk to human receptors because they are not available for contact, but estimated potential risks would be above the risk management range if future construction disturbed the soil sufficiently to allow exposure similar to either a residential or a generic industrial worker scenario.
- For a construction worker, the presence of MGP residuals in MW14 or soil borings below 2 feet on both properties indicates that potential risks to a future construction worker would likely exceed the risk management range.

Groundwater:

- Groundwater at the Site is not a drinking water source. Groundwater is not usable as a drinking water source as a result of numerous exceedances of the drinking-water standards in addition to the presence of NAPL. Additionally, if future construction in the area entails workers having direct physical contact with groundwater or associated vapors in excavations at or below the water table, there would be some potential for risks above the risk management range.

Sediment:

- Under current conditions, the Manitowoc River surface sediments are expected to pose a risk to benthic invertebrate populations in a specific portion of the turning basin where total PAH (13) concentrations exceed levels representative of an elevated risk zone. Sediments in the elevated risk zone may be toxic to sensitive benthic invertebrate species based on the results of Site-specific sediment toxicity test results. The current surface sediment elevated risk zone is generally co-located with the extent of MGP residuals observed in sediments.
- Near-surface and deeper subsurface sediments are generally inaccessible to ecological receptors and thus the PAHs detected in these sediments do not presently pose an ecological concern. However, near-surface and deeper subsurface sediment are at risk for exposure due to river and vessel scour or channel maintenance activities.

- Near-surface and subsurface sediment PAH concentrations over a large portion of the turning basin are representative of concentrations that could potentially be toxic to sensitive benthic invertebrate species (i.e., inconsistent risk zone and elevated risk zone). The actual effect, if any, on the benthic invertebrate community of the sediments in these zones would be dependent on the spatial extent of these near-surface or subsurface sediments that are exposed in the future. This, along with any potential gaps in the vertical distribution of contaminant concentrations that will need to be considered for any potential future remedial option that would consider exposing the underlying sediments. This would likely require confirmation sampling during such remedial efforts to ensure concentrations achieve the established target..

Soil Vapor

- For soil vapor underneath the WPSC building, sub-slab samples were associated with risks within the risk management range under an industrial scenario, but above the risk management range for a hypothetical future residential scenario. For deeper samples, risks were estimated to be above the risk management range for both an industrial and a hypothetical future residential scenario.

- For subsurface exterior soil vapor samples near the WPSC building, including utility corridors, and samples near the Fallier automotive building, estimated risks under an industrial scenario were within the risk management range, but were above the range for a hypothetical future residential scenario.

- For subsurface exterior soil vapor samples near the Winter Building, risks were estimated to exceed the risk management range under either an industrial or a hypothetical future residential scenario.

Indoor Air:

- An evaluation of the indoor air of the Winter Building provided evidence that subsurface soil vapors are not intruding into the indoor air of the existing building, so the vapor intrusion pathway is not complete at the present time.

6.2 Conclusions

The FS can proceed without additional assessment. Groundwater sampling will continue on a semi-annual basis (May and November) of each year until a Record of Decision (ROD) has been issued for the site.

6.3 Preliminary Remedial Action Objectives

The remedial action objectives (RAOs) will be developed for the media of concern (subsurface soil, groundwater, sediments, and potentially sub-surface soil vapor) and receptors identified in the FS. The FS RAOs will be developed to protect public health, welfare and/or the environment from site contaminants that may pose an unacceptable risk and be protective of future uses, as appropriate.

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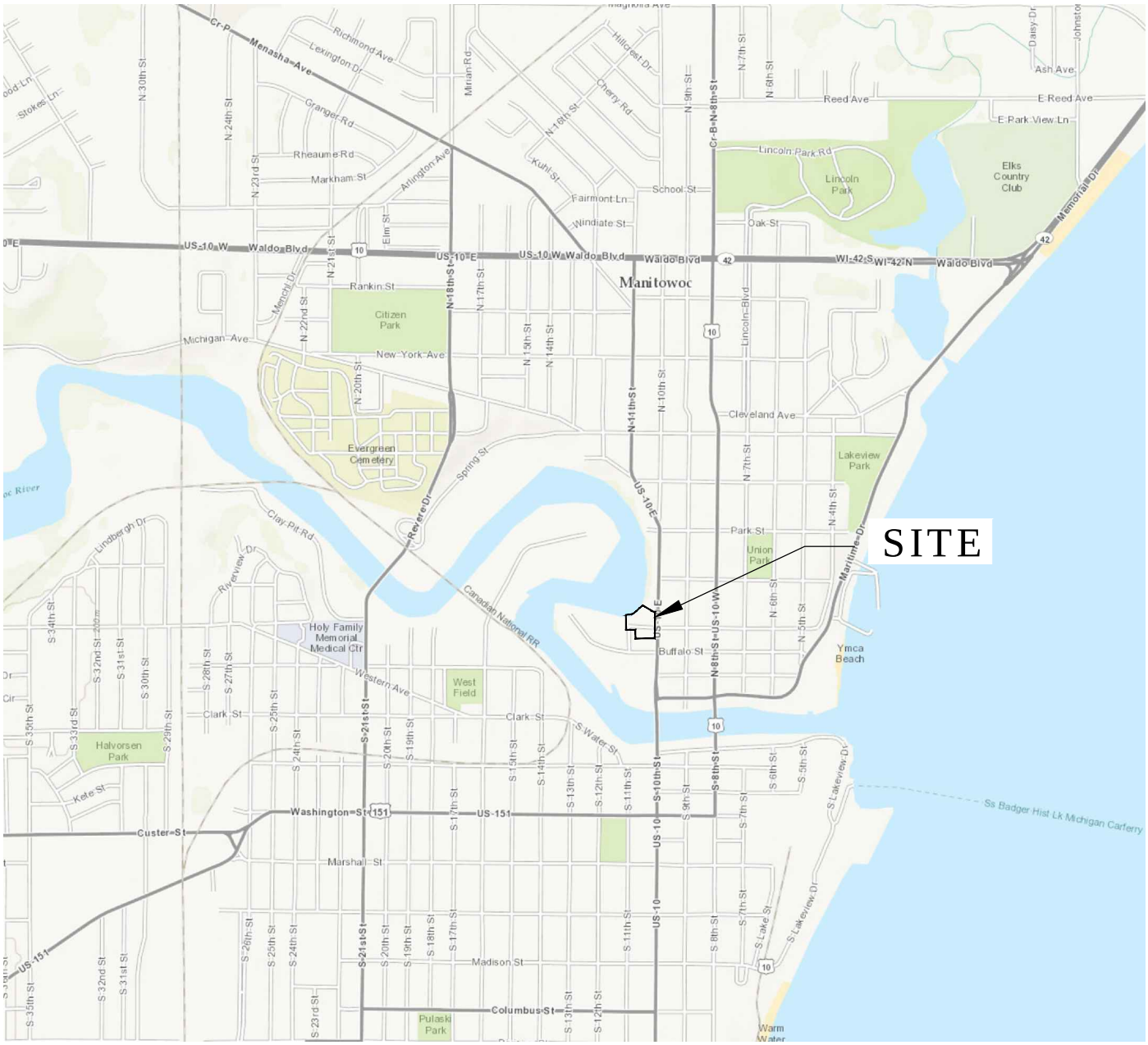
FIGURES



SOURCES: ESRI, DELORME, NAVTEQ, TOMTOM, INTERMAP, IPC, USGS, FAO, NPS, NRCAN, GEOBASE, IGN, KADASTER NL, ORDNANCE SURVEY, ESRI JAPAN, ESRI CHINA (HONG KONG), AND THE GIS USER COMMUNITY.

SITE LOCATION MAP

NATURAL RESOURCE TECHNOLOGY

FORMER MANITOWOC MGP SITE
WISCONSIN PUBLIC SERVICE CORPORATION
MANITOWOC, WISCONSIN

PROJECT NO. 1530

DRAWING NO. 1530-A01C

FIGURE NO. 1

DRAWN: RLH DATE: 10/23/14 CHK'D: BGH DATE: 10/23/14 APP'D: BGH DATE: 10/23/14

WPSC OFF PROPERTY

RIVER

MANITOWOC

CITY OF MANITOWOC

32'

000-120-080
City of Manitowoc

WISCONSIN CENTRAL PROPERTY

BRAUN BUILDING CENTER PROPERTY

BRAUN BUILDING

WPSC PROPERTY

NORTH WING OF MAIN BUILDING

NORTH 10th STREET

WPSC "MAIN" BUILDING

WPSC Parcel

000-120-070

10'
35'
10'
35'
12'
12'
40'

3G0081
3G0086
3G0085
3G0091

TIE-IN TO EXISTING SANITARY SEWER

CHICAGO STREET

CITY OF MANITOWOC

WPSC STORAGE BUILDING

WPSC PROPERTY

KITZEROW BUILDING

KITZEROW PROPERTY

NORTH 11th STREET

306 N. 10TH STREET PROPERTY

000-153-030

WINTER PROPERTY

WINTER BUILDING

000-153-010

000-153-010
Winter

306 10TH ST. LLC BUILDING

FALLIER AUTOMOTIVE BUILDING

SOURCE NOTES:
THIS DRAWING WAS DEVELOPED FROM A DRAWING BY HORIZON ENVIRONMENTAL, PROJECT NUMBER: WFL-0110, DATED: APRIL 2001.
CARBON ABSORPTION PRETREATMENT LOCATION DEVELOPED FROM A DRAWING BY HORIZON ENVIRONMENTAL, PROJECT NUMBER: WFL-0107, DATED DECEMBER 1997.
ALL LOCATIONS ARE APPROXIMATE.
REMEDIATION AREA TAKEN FROM EARTH TECH DRAWING DATED MARCH 1995.
SURVEY COORDINATES FOR SG-1 WERE PROVIDED BY WPSC, MAY 25, 2005.
PROPERTY BOUNDARY 2001 TAKEN FROM A DRAWING BY SCHINDEL SURVEYING LLC, JOB NAME: WPSMAN1, DATED SEPTEMBER 3, 2001.
PROPERTY BOUNDARY 2002 AND RIVER BANK TAKEN FROM A DRAWING FROM BAY LAKES REGIONAL PLANNING COMMISSION, GREEN BAY, WI, DATED OCTOBER 30, 2002.
RIGHT OF WAYS AND CURBS APPROXIMATED FROM A DRAWING FROM BAY LAKES REGIONAL PLANNING COMMISSION, GREEN BAY, WI, DATED OCTOBER 30, 2002.
DRAWING FROM INTEGRYS BUSINESS SUPPORT, llc TOPOGRAPHIC SURVEY, DATED 01-19-10..

- PARCEL BOUNDARY
- WPSC OFF-PROPERTY
- WPSC PROPERTY
- WINTER PROPERTY
- 306 N. 10TH STREET PROPERTY
- KITZEROW PROPERTY
- BRAUN BUILDING CENTER PROPERTY
- WISCONSIN CENTRAL PROPERTY
- EXISTING BUILDING
- APPROXIMATE EXTENT OF UPLAND SITE
- E — ELECTRIC LINE
- G — GAS LINE
- W — WATER MAIN
- SAN — SANITARY SEWER
- ST — STORM SEWER
- OE — OVERHEAD POWERLINE
- UTILITY POLE
- HYDRANT
- MANHOLE
- SA — SANITARY MANHOLE
- S — STORM MANHOLE
- SG1 — STAFF GUAGE
- 32' — SOIL STABILIZED TO 32 FEET bgs (1993 AND 1994)
- 35' — SOIL STABILIZED TO 35 FEET bgs (1993)
- 40' — SOIL STABILIZED TO 40 FEET bgs (1993)
- 12' — JANUARY 1994 EXCAVATION AND DEPTH (FT)

N

0 25 50
SCALE IN FEET

DRAWN BY:	RLH	DATE: 10/23/14
CHECKED BY:	BGH	DATE: 10/23/14
APPROVED BY:	BGH	DATE: 10/23/14

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REFERENCE: .

SITE LAYOUT AND EXISTING STRUCTURES

REMEDIAL INVESTIGATION REPORT - REVISION 1
FORMER MANITOWOC MGP SITE
WISCONSIN PUBLIC SERVICE CORPORATION
MANITOWOC, WISCONSIN

NATURAL RESOURCE TECHNOLOGY

PROJECT NO.
1530/18.4

FIGURE NO.
2

Oct 23, 2014 3:09pm PLOTTED BY: rhopkins SAVED BY: rhopkins
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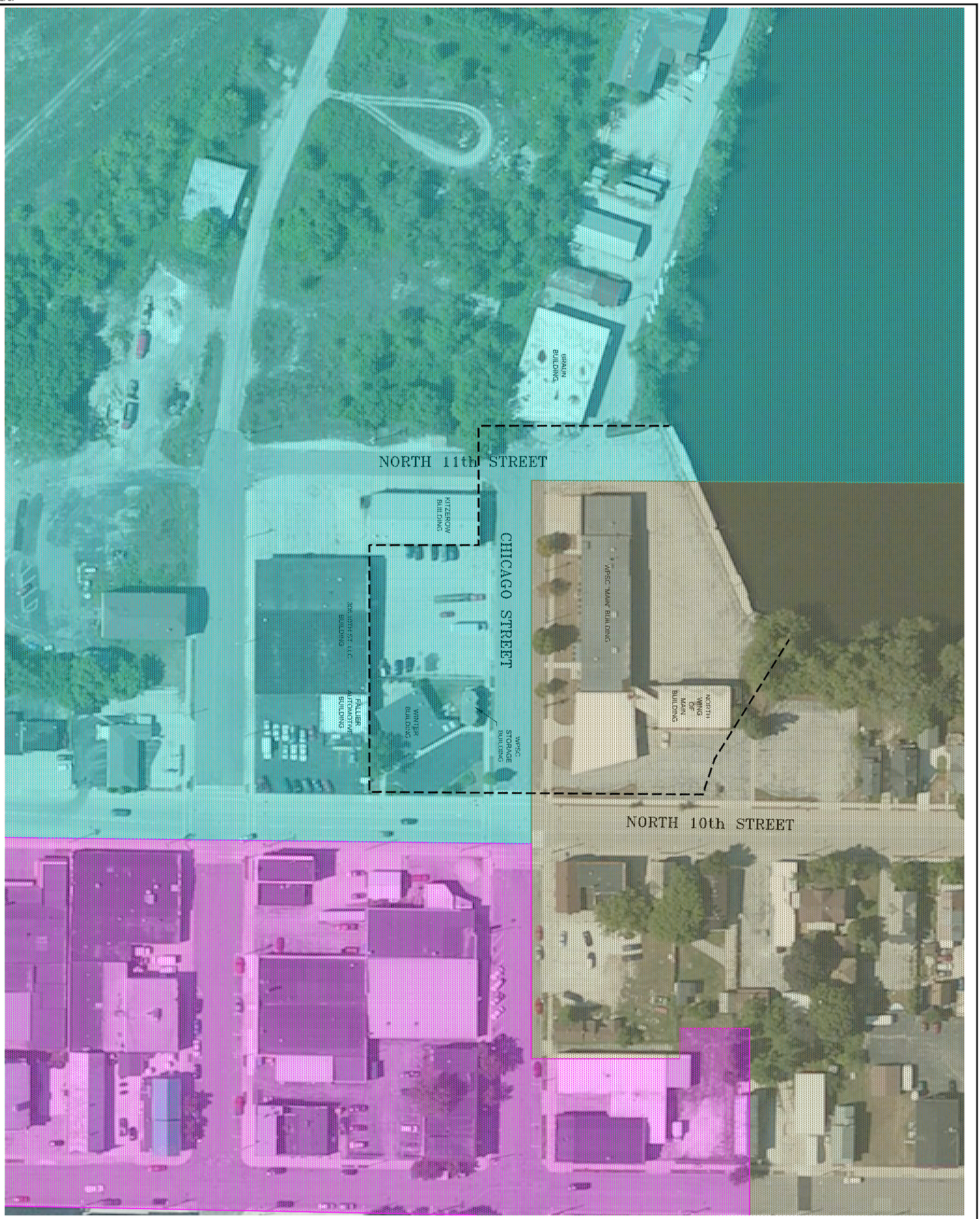

SOURCE NOTES:
AERIAL PHOTO FROM ESRI, I-CUBED, USDA, USGS, AEX, GEOEYE, GETMAPPING, AEROGRID, IGN, IGP, AND THE GIS USER COMMUNITY.
ZONING AREAS FROM MANITOWOC COUNTY GIS WEBSITE: www.manitowocmaps.info

SCALE IN FEET
0
50
100

N

- APPROXIMATE EXTENT OF UPLAND SITE
- B-3 GENERAL BUSINESS DISTRICT
- C-1 COMMERCIAL DISTRICT (HEAVY SERVICE INDUSTRIES)
- I-2 HEAVY INDUSTRIAL DISTRICT (HEAVY MANUFACTURING AND INDUSTRIAL DEVELOPMENT)

NATURAL RESOURCE TECHNOLOGY

PROJECT NO. 1530/18.4

FIGURE NO. 3

ZONING LAYOUT

REMEDIAL INVESTIGATION REPORT -REVISION 1
FORMER MANITOWOC MGP SITE
WISCONSIN PUBLIC SERVICE CORPORATION
MANITOWOC, WISCONSIN

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DRAWING NO: 1530-184-B03
REFERENCE:

HISTORIC SITE LAYOUT AND POTENTIAL NON-MGP SOURCES

REMEDIAL INVESTIGATION REPORT - REVISION 1
FORMER MANITOWOC MGP SITE
WISCONSIN PUBLIC SERVICE CORPORATION
MANITOWOC, WISCONSIN

DRAWN BY:	RLH	DATE:	10/02/14
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APPROVED BY:	BGH	DATE:	10/23/14
DRAWING NO: 1530-184-B04			
REFERENCE:			

NATURAL RESOURCE TECHNOLOGY

PROJECT NO.
1530/18.4

FIGURE NO.
4

TCE CORNER OF N. 11TH ST. & HURON ST. (APPROX. 2200 FEET NORTH

COAL SHED
COAL SHED
COAL SCREEN
COAL SHED
PLANNED COAL DOCK
WISCONSIN CENTRAL PROPERTY
SHELL OIL CO. INC.
SINCLAIR REFINING CO.
STANDARD OIL CO.
NORTHERN ELEVATOR CO.
ROUND HOUSE
JUNK YARD
JUNK, FUR AND HIDES
FILLING STATION
BUFFALO STREET
CHICAGO STREET
NORTH 11TH STREET
NORTH 10TH STREET
EXISTING BUILDING
30,000 GAL. TANK
30,000 GAL. TANK
SURGE TANK
RETORTS
CONDENSER
PURIFIER
FORMER 100,000 CF GAS HOLDER
PURIFYING BOXES
FORMER WATER GAS PLANT
STORAGE
FORMER 300,000 CF GAS HOLDER
WINTER BUILDING
PW-1
TCE
A1
L1
L2
E1

APPROXIMATE EXTENT OF UPLAND SITE
ESTIMATED EXTENT OF PETROLEUM IMPACTED SOIL (11/04)
ESTIMATED EXTENT OF PETROLEUM IMPACTED GROUNDWATER (11/04)
PW-1 PUMPING WELL
RAILROAD
FENCE
SHORELINE
SHEET PILE WALL
RIGHT OF WAY
WTR WATER MAIN
SAN SANITARY SEWER
STM STORM SEWER
DEL OVERHEAD POWERLINE
UTILITY POLE
HYDRANT
MANHOLE
FORMER MGP STRUCTURES
HISTORIC STRUCTURES

IMPACTED SITES

L1 WISCONSIN CENTRAL LEAKING UNDERGROUND STORAGE TANK
L2 METZ BAKING LEAKING UNDERGROUND STORAGE TANK
A1 WISCONSIN CENTRAL LEAKING ABOVE GROUND TANK
E1 SOO LINE & CANADIAN NATIONAL ENVIRONMENTAL RESPONSE PROGRAM
TCE TRICHLOROETHENE (TCE) HAS BEEN OBSERVED IN THE PUMPING WELL (PW-1). TCE HAS BEEN OBSERVED IN GROUNDWATER AT TWO OTHER WDNR SITES WITHIN 2200 FEET OF THIS SITE.

NOTES:
1. IMPACTED SITE SYMBOLS WERE LOCATED BASED ON STREET ADDRESS AND MAY NOT REFLECT THE LOCATION OF IMPACTS.
2. IMPACTED SITES ARE SHOWN WITH LISTED RESPONSIBLE PARTY.

N

0 40 80
SCALE IN FEET

SOURCE NOTES:
THIS DRAWING WAS DEVELOPED FROM A DRAWING BY HORIZON ENVIRONMENTAL, PROJECT NUMBER: WFL-0110, DATED: APRIL 2001.
PROPERTY BOUNDARY 2001 TAKEN FROM A DRAWING BY SCHINDEL SURVEYING LLC, JOB NAME: WPSMAN1, DATED SEPTEMBER 3, 2001.
PROPERTY BOUNDARY 2002 AND RIVER BANK TAKEN FROM A DRAWING FROM BAY LAKES REGIONAL PLANNING COMMISSION, GREEN BAY, WI, DATED OCTOBER 30, 2002.
RIGHT OF WAYS AND CURBS APPROXIMATED FROM A DRAWING FROM BAY LAKES REGIONAL PLANNING COMMISSION, GREEN BAY, WI, DATED OCTOBER 30, 2002.
ESTIMATED EXTENT OF PETROLEUM IMPACATED SOIL TAKEN FROM A DRAWING BY NORTHERN ENVIRONMENTAL, PROJECT NUMBER: WCL03-2200-1351, FIGURE NUMBER 3, DATED NOVEMBER 16, 2004.
ESTIMATED EXTENT OF PETROLEUM IMPACTED GROUNDWATER TAKEN FROM A DRAWING BY NORTHERN ENVIROMENTAL, PROJECT NUMBER: WCL03-2200-1351, FIGURE NUMBER 4, DATED NOVEMBER 14, 2004.

Oct 23, 2014 3:08pm PLOTTED BY: rhopkins SAVED BY: rhopkins Layout1
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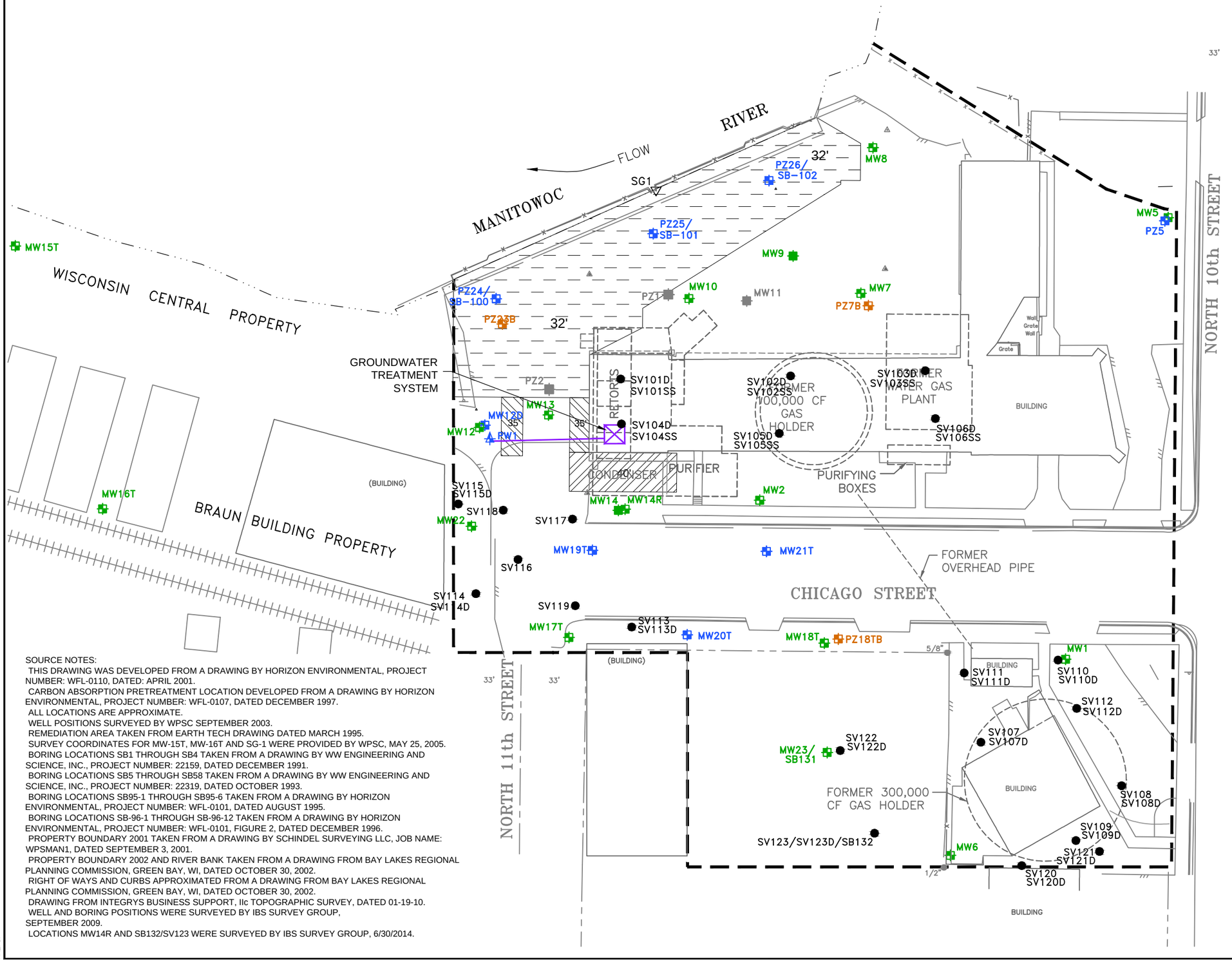
XREFS:



NOTES:

1, SHALLOW SAND WELL LOCATIONS (SCREENS ~580 MSL) ARE SHOWN IN GREEN
2, DEEP SAND WELL LOCATIONS (SCREENS ~555 MSL) ARE SHOWN IN BLUE
3, BEDROCK WELL LOCATIONS (SCREENS ~525 MSL) SHOWN IN ORANGE

SOURCE NOTES:

THIS DRAWING WAS DEVELOPED FROM A DRAWING BY HORIZON ENVIRONMENTAL, PROJECT NUMBER: WFL-0110, DATED: APRIL 2001.
CARBON ABSORPTION PRETREATMENT LOCATION DEVELOPED FROM A DRAWING BY HORIZON ENVIRONMENTAL, PROJECT NUMBER: WFL-0107, DATED DECEMBER 1997.
ALL LOCATIONS ARE APPROXIMATE.
WELL POSITIONS SURVEYED BY WPSC SEPTEMBER 2003.
REMEDIATION AREA TAKEN FROM EARTH TECH DRAWING DATED MARCH 1995.
SURVEY COORDINATES FOR MW-15T, MW-16T AND SG-1 WERE PROVIDED BY WPSC, MAY 25, 2005.
BORING LOCATIONS SB1 THROUGH SB4 TAKEN FROM A DRAWING BY WW ENGINEERING AND SCIENCE, INC., PROJECT NUMBER: 22159, DATED DECEMBER 1991.
BORING LOCATIONS SB5 THROUGH SB58 TAKEN FROM A DRAWING BY WW ENGINEERING AND SCIENCE, INC., PROJECT NUMBER: 22319, DATED OCTOBER 1993.
BORING LOCATIONS SB95-1 THROUGH SB95-6 TAKEN FROM A DRAWING BY HORIZON ENVIRONMENTAL, PROJECT NUMBER: WFL-0101, DATED AUGUST 1995.
BORING LOCATIONS SB-96-1 THROUGH SB-96-12 TAKEN FROM A DRAWING BY HORIZON ENVIRONMENTAL, PROJECT NUMBER: WFL-0101, FIGURE 2, DATED DECEMBER 1996.
PROPERTY BOUNDARY 2001 TAKEN FROM A DRAWING BY SCHINDEL SURVEYING LLC, JOB NAME: WPSMAN1, DATED SEPTEMBER 3, 2001.
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RIGHT OF WAYS AND CURBS APPROXIMATED FROM A DRAWING FROM BAY LAKES REGIONAL PLANNING COMMISSION, GREEN BAY, WI, DATED OCTOBER 30, 2002.
DRAWING FROM INTEGRYS BUSINESS SUPPORT, IIc TOPOGRAPHIC SURVEY, DATED 01-19-10.
WELL AND BORING POSITIONS WERE SURVEYED BY IBS SURVEY GROUP, SEPTEMBER 2009.
LOCATIONS MW14R AND SB132/SV123 WERE SURVEYED BY IBS SURVEY GROUP, 6/30/2014.

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DRAWING NO: 1530-184-B06C
REFERENCE:

MONITORING WELLS AND SOIL VAPOR SAMPLING LOCATIONS

REMEDIAL INVESTIGATION REPORT - REVISION 1
FORMER MANITOWOC MGP SITE
WISCONSIN PUBLIC SERVICE CORPORATION
MANITOWOC, WISCONSIN

NATURAL RESOURCE TECHNOLOGY

PROJECT NO.
1530/18.4

FIGURE NO.
5

Oct 23, 2014 2:56pm PLOTTED BY: rhopkins SAVED BY: rhopkins Layout1
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IMAGES:
XREFS:

SOIL SAMPLING LOCATIONS (NORTH)

REMEDIAL INVESTIGATION REPORT - REVISION 1
FORMER MANITOWOC MGP SITE
WISCONSIN PUBLIC SERVICE CORPORATION
MANITOWOC, WISCONSIN

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APPROVED BY:	BGH	DATE: 10/23/14
DRAWING NO: 1530-184-B05		
REFERENCE: .		

NATURAL RESOURCE TECHNOLOGY

PROJECT NO. 1530/18.4

FIGURE NO. 6A

SV107 SOIL VAPOR PROBE
MW7 MONITORING WELL
PZ24 PIEZOMETER
MW11 ABANDONED MONITORING WELL
PW1 PUMPING WELL
ES-1 EXCAVATION SAMPLE
TP101B TEST PIT
SB9 SOIL BORING
GB-5 GEOPROBE SOIL BORING
EXISTING BUILDING
APPROXIMATE EXTENT OF UPLAND SITE
FENCE
SHORELINE
FORMER MGP STRUCTURES
SG1 STAFF GUAGE

NOTE:
SAMPLING LOCATIONS IN BLUE WERE COMPLETED AS PART OF REMEDIAL INVESTIGATION ACTIVITIES BETWEEN 2009 AND 2014.

SOURCE NOTES:
THIS DRAWING WAS DEVELOPED FROM A DRAWING BY HORIZON ENVIRONMENTAL, PROJECT NUMBER: WFL-0110, DATED: APRIL 2001.
CARBON ABSORPTION PRETREATMENT LOCATION DEVELOPED FROM A DRAWING BY HORIZON ENVIRONMENTAL, PROJECT NUMBER: WFL-0107, DATED DECEMBER 1997.
ALL LOCATIONS ARE APPROXIMATE.
WELL POSITIONS SURVEYED BY WPSC SEPTEMBER 2003.
REMEDIATION AREA TAKEN FROM EARTH TECH DRAWING DATED MARCH 1995.
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BORING LOCATIONS SB-96-1 THROUGH SB-96-12 TAKEN FROM A DRAWING BY HORIZON ENVIRONMENTAL, PROJECT NUMBER: WFL-0101, FIGURE 2, DATED DECEMBER 1996.
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DRAWING FROM INTEGRYS BUSINESS SUPPORT, IIc TOPOGRAPHIC SURVEY, DATED 01-19-10.
WELL AND BORING POSITIONS WERE SURVEYED BY IBS SURVEY GROUP, SEPTEMBER 2009.
LOCATIONS MW14R AND SB132/SV123 WERE SURVEYED BY IBS SURVEY GROUP, 6/30/2014.

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SCALE IN FEET

Oct 23, 2014 3:01pm PLOTTED BY: rhopkins SAVED BY: rhopkins
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SOIL SAMPLING LOCATIONS (SOUTH)

REMEDIAL INVESTIGATION REPORT - REVISION 1
FORMER MANITOWOC MGP SITE
WISCONSIN PUBLIC SERVICE CORPORATION
MANITOWOC, WISCONSIN

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APPROVED BY:	BGH	DATE: 10/23/14
DRAWING NO: 1530-184-B05		
REFERENCE: .		

NATURAL RESOURCE TECHNOLOGY

PROJECT NO.
1530/18.4

FIGURE NO.
6B

SV107 SOIL VAPOR PROBE
MW7 MONITORING WELL
PZ24 PIEZOMETER
MW11 ABANDONED MONITORING WELL
PW1 PUMPING WELL
ES-1 EXCAVATION SAMPLE
TP101B TEST PIT
SB9 SOIL BORING
GB-5 GEOPROBE SOIL BORING
EXISTING BUILDING
APPROXIMATE EXTENT OF UPLAND SITE
FENCE
SHORELINE
FORMER MGP STRUCTURES
SG1 STAFF GUAGE

NOTE:
SAMPLING LOCATIONS IN BLUE WERE COMPLETED AS PART OF REMEDIAL INVESTIGATION ACTIVITIES BETWEEN 2009 AND 2014.

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WELL AND BORING POSITIONS WERE SURVEYED BY IBS SURVEY GROUP, SEPTEMBER 2009.
LOCATIONS MW14R AND SB132/SV123 WERE SURVEYED BY IBS SURVEY GROUP, 6/30/2014.

N
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SCALE IN FEET

Oct 23, 2014 3:04pm PLOTTED BY: rhopkins SAVED BY: rhopkins
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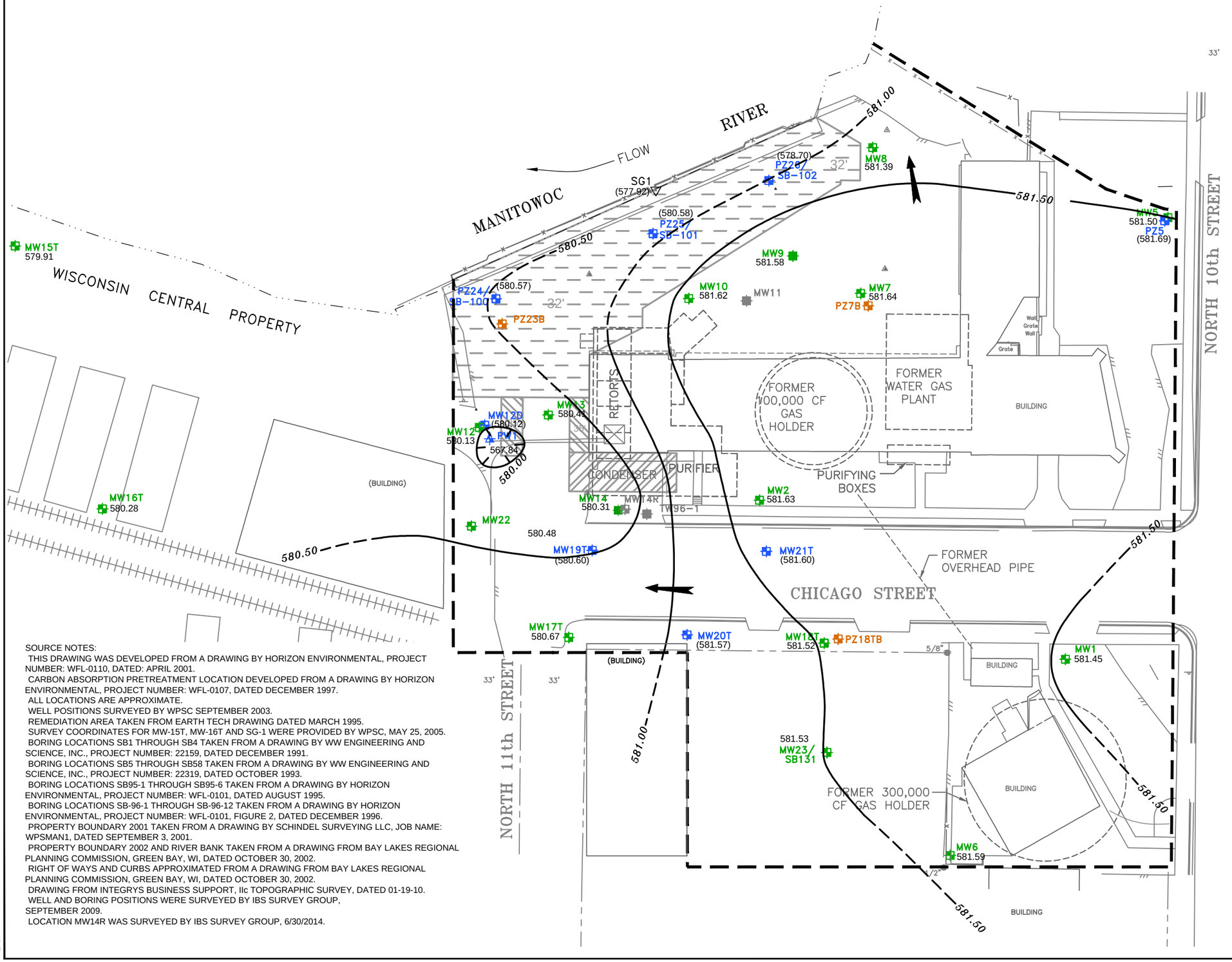

SOURCE NOTES:
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BORING LOCATIONS SB5 THROUGH SB58 TAKEN FROM A DRAWING BY WW ENGINEERING AND SCIENCE, INC., PROJECT NUMBER: 22319, DATED OCTOBER 1993.
BORING LOCATIONS SB95-1 THROUGH SB95-6 TAKEN FROM A DRAWING BY HORIZON ENVIRONMENTAL, PROJECT NUMBER: WFL-0101, DATED AUGUST 1995.
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DRAWING FROM INTEGRYS BUSINESS SUPPORT, IIc TOPOGRAPHIC SURVEY, DATED 01-19-10.
WELL AND BORING POSITIONS WERE SURVEYED BY IBS SURVEY GROUP, SEPTEMBER 2009.
LOCATION MW14R WAS SURVEYED BY IBS SURVEY GROUP, 6/30/2014.

- 581.00 — WATER TABLE ELEVATION CONTOUR, DASHED WHERE INFERRED (FT. NAVD)
- GROUNDWATER FLOW DIRECTION
- MW7 581.64 — MONITORING WELL AND WATER TABLE ELEVATION (FT. NAVD)
- PZ24 (580.57) — PIEZOMETER AND WATER TABLE ELEVATION (FT. NAVD)
- MW11 — ABANDONED MONITORING WELL
- ABANDONED PIEZOMETER
- PW1 567.84 — PUMPING WELL AND WATER TABLE ELEVATION (FT. NAVD)
- EXISTING BUILDING
- APPROXIMATE EXTENT OF UPLAND SITE
- FENCE
- SHORELINE
- FORMER MGP STRUCTURES
- SG1 (577.92) — STAFF GUAGE AND WATER ELEVATION (FT. NAVD)
- 32' — SOIL STABILIZED TO 32 FEET bgs (1993 AND 1994)
- 35' — SOIL STABILIZED TO 35 FEET bgs (1993)
- 40' — SOIL STABILIZED TO 40 FEET bgs (1993)

NOTES:

1. SHALLOW SAND WELL LOCATIONS (SCREENS ~580 MSL) ARE SHOWN IN GREEN.
2. DEEP SAND WELL LOCATIONS (SCREENS ~555 MSL) ARE SHOWN IN BLUE.
3. BEDROCK WELL LOCATIONS (SCREENS ~525 MSL) SHOWN IN ORANGE.
4. GROUNDWATER ELEVATIONS IN PARENTHESIS WERE NOT USED TO DEVELOP THE GROUNDWATER FLOW CONTOURS.

N

0 25 50

SCALE IN FEET

DRAWN BY: RLH DATE: 10/21/14
CHECKED BY: BGH DATE: 10/21/14
APPROVED BY: BGH DATE: 10/23/14
DRAWING NO: 1530-184-B12
REFERENCE: .

GROUNDWATER ELEVATION CONTOURS AUGUST 2012

REMEDIAL INVESTIGATION REPORT - REVISION 1
FORMER MANITOWOC MGP SITE
WISCONSIN PUBLIC SERVICE CORPORATION
MANITOWOC, WISCONSIN

NATURAL RESOURCE TECHNOLOGY

PROJECT NO.
1530/18.4

FIGURE NO.
7

Oct 23, 2014 3:27pm PLOTTED BY: rhopkins SAVED BY: rhopkins Layout1
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IMAGES:
XREFS:

Location ID	Total Depth (ft bgs)	Interval (ft. bgs)	Saturated or Unsaturated	Well Screen Interval (ft. bgs)	Residual Description
PZ25	40	24 - 28 ft.	sat	35 - 40	stained with trace (<3%) tar globules (viscous), strong odor
SB103	20	8.5 - 14.5 ft.	sat	no well	black oil coating 8.5-11 ft., staining from 11-14.5 ft.
SB106	8	7.5 - 8 ft.	sat	no well	oil wetted, refusal at 8 ft.
GP2	16	14 - 16 ft.	sat	no well	visible black tarry product (oil coated to oil wetted), strong odor
MW14R	19	15.0 - 16.5 ft.	sat	9-19	black oil-wetted and oil coated material from 15 to 16.5, MGP-like odor
MW14	18	0 - 18 ft.	sat	13 - 18	no visible product in the boring log, but product has been found in this well
GP12	18	16.5 - 18 ft.	sat	no well	visible tarry product (oil coated to oil wetted) and strong odor
GP13	18	16.5 - 17 ft.	sat	no well	stained soil and free product (oil coated to oil wetted) with odor
SV105	6	1.5 - 6 ft.	unsat	no well	material stained black, oil wetted from 5.5 to 6.0 ft., refusal at 6 ft.
SB114	17	16 - 17 ft.	sat	no well	oil wetted, sheen, odor, refusal at 17 ft.
SB3	17	16 - 17 ft.	sat	no well	black w/ very strong odors, coal tars (oil wetted), refusal at 17 ft.
SB-96-2	48	28 - 48 ft.	sat	no well	oily substance on drilling equipment below 28 ft, none in samples
SB-96-4	51	17 - 38 ft.	sat	no well	black staining with odor 18.5 - 38 ft., oily (oil coated to oil wetted) 28.5 - 30 ft.
SB-96-7	48	36 - 39.3 ft.	sat	no well	1/4" oily layer (oil wetted) at 36.3 ft., oily subtance (oil wetted) 38.9-39.3 ft.
SB-96-6	50.5	32 - 39 ft.	sat	no well	black oily appearance (oil coated to oil wetted) 32-32.5, staining and odor at 39 ft.
SB-96-8	51	33.3 - 34.4 ft.	sat	no well	oily (oil wetted) layers from 33.3-33.8 ft. and 34.2-34.4 ft.
SV112	6	2.8 - 6 ft.	unsat	no well	MGP-like odor, stained black from 4.5 - 6.0 ft., base of holder
SB122	45	7.75 - 15 ft.	unsat	no well	black stained, platy grains, strong odors, dry, elevated analytical results 12-14 ft.
SB123	7.5	6 - 7.5 ft.	unsat	no well	strong odor, staining, refusal at 7.5 ft.
SV108	6	5 - 6 ft.	unsat	no well	few oil wetted millimeter sized droplets of residual NAPL, base of holder

- SOIL BORING LOCATION REMOVED OR DISTURBED DURING REMEDIAL CONSTRUCTION
- SV107 SOIL VAPOR PROBE (JULY 2012)
- SB126 SOIL BORING (JULY 2012)
- MW23 MONITORING WELL (JULY 2012)
- PZ5 PIEZOMETER (JULY 2012)
- PZ24 PIEZOMETER
- PZ23B BEDROCK PIEZOMETER
- MW7 MONITORING WELL
- MW11 ABANDONED MONITORING WELL
- PW1 PUMPING WELL
- TP101B TEST PIT (2009 RI)
- SB103 SOIL BORING
- SB-96-12 SOIL BORING (1996)
- SB95-3 SOIL BORING (1995)
- GB-5 GEOPROBE SOIL BORING (1995)
- PROPERTY BOUNDARY
- EXISTING BUILDING
- APPROXIMATE EXTENT OF UPLAND SITE
- FENCE
- SHORELINE
- FORMER MGP STRUCTURES
- SG1 STAFF GUAGE
- 32' SOIL STABILIZED TO 32 FEET bgs (1993 AND 1994)
- 35' SOIL STABILIZED TO 35 FEET bgs (1993)
- 40' SOIL STABILIZED TO 40 FEET bgs (1993)
- 12" JANUARY 1994 EXCAVATION AND DEPTH (FT)

NOTES:
1. BORING LOCATIONS TB-7, SB50, AND SB51 HAVE SOIL BORING INFORMATION BELOW REMEDIAL ACTION, TO DEPTHS OF 42, 41 AND 30 FEET RESPECTIVELY.
2. LOCATIONS WITH OBSERVATIONS OF MGP RESIDUALS ARE IN MAGENTA.

SOURCE NOTES:
THIS DRAWING WAS DEVELOPED FROM A DRAWING BY HORIZON ENVIRONMENTAL, PROJECT NUMBER: WFL-0110, DATED: APRIL 2001.
CARBON ABSORPTION PRETREATMENT LOCATION DEVELOPED FROM A DRAWING BY HORIZON ENVIRONMENTAL, PROJECT NUMBER: WFL-0107, DATED DECEMBER 1997.
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BORING LOCATIONS SB1 THROUGH SB4 TAKEN FROM A DRAWING BY WW ENGINEERING AND SCIENCE, INC., PROJECT NUMBER: 22159, DATED DECEMBER 1991.
BORING LOCATIONS SB5 THROUGH SB58, AND TB-1 THROUGH TB-4 AND TB-7 TAKEN FROM A DRAWING BY WW ENGINEERING AND SCIENCE, INC., PROJECT NUMBER: 22319, DATED OCTOBER 1993.
BORING LOCATIONS SB95-1 THROUGH SB95-6 TAKEN FROM A DRAWING BY HORIZON ENVIRONMENTAL, PROJECT NUMBER: WFL-0101, DATED AUGUST 1995.
BORING LOCATIONS SB-96-1 THROUGH SB-96-12 TAKEN FROM A DRAWING BY HORIZON ENVIRONMENTAL, PROJECT NUMBER: WFL-0101, FIGURE 2, DATED DECEMBER 1996.
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WELL AND BORING POSITIONS WERE SURVEYED BY IBS SURVEY GROUP, SEPTEMBER 2009.
LOCATIONS MW14R AND SB132/SV123 WERE SURVEYED BY IBS SURVEY GROUP, 6/30/2014.

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APPROVED BY: BGH DATE: 10/23/14
DRAWING NO: 1530-184-B07
REFERENCE: .

MGP RESIDUAL OBSERVATIONS IN SOIL

REMEDIAL INVESTIGATION REPORT - REVISION 1
FORMER MANITOWOC MGP SITE
WISCONSIN PUBLIC SERVICE CORPORATION
MANITOWOC, WISCONSIN

NATURAL RESOURCE TECHNOLOGY

PROJECT NO. 1530/18.4

FIGURE NO. 8

SB101	TOTAL DEPTH	SAMPLE DEPTH	BaA	BaP	DahANTH	NAPH
09/15/09	40	26-28	299	257	33.4	3,280
09/15/09		34-36	0.0409	0.038	< 0.006	1.0

SB107	TOTAL DEPTH	SAMPLE DEPTH	BaA	BaP	DahANTH	NAPH
09/14/09	20	4-6	0.246	0.427	0.105	0.415

SB103	TOTAL DEPTH	SAMPLE DEPTH	BaA	BaP	DahANTH	NAPH
09/14/09	20	4-6	0.035	0.035	0.008	0.210
09/14/09		10-12	12.2	8.9	< 2.6	179
09/14/09		16-18	0.012	0.007	< 0.006	0.076

SB111	TOTAL DEPTH	SAMPLE DEPTH	BaA	BaP	DahANTH	NAPH
09/15/09	20	0-2	0.92	1.9	0.368	0.192
09/15/09		12-14	< 0.020	< 0.009	< 0.011	0.046
09/15/09		16-18	< 0.010	< 0.004	< 0.006	0.015

SB106	TOTAL DEPTH	SAMPLE DEPTH	BaA	BaP	DahANTH	NAPH
09/15/09	8	4-8	124	91.2	14.1	34.7

SB95-3	TOTAL DEPTH	SAMPLE DEPTH	BaA	BaP	DahANTH	NAPH
05/18/95	42	3-5	62.0	43	< 2.0	19.0

SB110	TOTAL DEPTH	SAMPLE DEPTH	BaA	BaP	DahANTH	NAPH
09/15/09	6.5	0-2	0.020	0.017	< 0.005	0.019
09/15/09		4-6.5	< 0.009	0.006	< 0.005	0.015

SB51	TOTAL DEPTH	SAMPLE DEPTH	BaA	BaP	DahANTH	NAPH
04/13/93	30	13-15	3.7	< 0.330	< 0.330	23.0
04/13/93		18-20	< 0.33	< 0.330	< 0.330	1.5

SB4	TOTAL DEPTH	SAMPLE DEPTH	BaA	BaP	DahANTH	NAPH
08/25/88	21.5	7.5-9	< 0.50	0.640	< 1.0	0.500

SB68	TOTAL DEPTH	SAMPLE DEPTH	BaA	BaP	DahANTH	NAPH
09/01/93	35	13-15	55.0	--	< 33.0	--

SB114	TOTAL DEPTH	SAMPLE DEPTH	BaA	BaP	DahANTH	NAPH
09/14/09	17	0-2	0.08	0.090	< 0.039	2.9
09/14/09		8-10	1.8	3.0	0.459	0.953
09/14/09		16-17	444	474	51.3	4,470

SB117	TOTAL DEPTH	SAMPLE DEPTH	BaA	BaP	DahANTH	NAPH
09/14/09	34	0-2	0.368	0.467	0.115	0.674
09/14/09		12-14	0.090	0.181	0.024	0.210
09/14/09		20-22	3.4	3.2	0.345	0.957
09/14/09		30-32	< 0.010	< 0.004	< 0.006	0.148

SAMPLE LOCATION	SAMPLE DEPTH	BaA	BaP	DahANTH	NAPH
SAMPLE DATE	FEET BELOW GROUND SURFACE	Benzo(a)anthracene (mg/kg)	Benzo(a)pyrene (mg/kg)	Dibenz(a,h)anthracene (mg/kg)	Naphthalene (PAH) (mg/kg)
WI Residential Screening Levels					
--	--	0.15	0.015	0.015	3.8

SLs used on this table are the most current USEPA Regional Screening Level (RSL) as presented in the Multi-Site Risk Assessment Framework Addendum Revision 3 (Exponent, July 2014).

Bold and magenta values exceed screening levels.

Bold and brown results below the MDL but still exceeding the Residental Soil SL in WI/IBS

SB104	TOTAL DEPTH	SAMPLE DEPTH	BaA	BaP	DahANTH	NAPH
09/14/09	20	4-6	0.952	1.1	0.207	0.260
09/14/09		10-12	< 0.010	< 0.004	< 0.006	0.014
09/14/09		18-20	< 0.010	< 0.004	< 0.006	0.016

SB108	TOTAL DEPTH	SAMPLE DEPTH	BaA	BaP	DahANTH	NAPH
09/15/09	6	0-2	5.6	4.8	0.518	27.5
09/15/09		4-6	13.0	11.2	1.3	100

SB125	TOTAL DEPTH	SAMPLE DEPTH	BaA	BaP	DahANTH	NAPH
09/15/09	20	0-2	0.195	0.436	0.081	0.422
09/15/09		10-12	< 0.010	< 0.004	< 0.005	0.230
09/15/09		18-20	< 0.010	< 0.004	< 0.006	0.311

SB113	TOTAL DEPTH	SAMPLE DEPTH	BaA	BaP	DahANTH	NAPH
09/15/09	20	0-2	11.3	9.6	1.74	2.0
09/15/09		2-4	0.019	0.017	< 0.006	0.096
09/15/09		8-10	< 0.010	< 0.004	< 0.006	0.031

SB116	TOTAL DEPTH	SAMPLE DEPTH	BaA	BaP	DahANTH	NAPH
09/14/09	25	0-2	0.094	0.115	0.023	0.049
09/14/09		10-12	< 0.009	< 0.004	< 0.005	0.025
09/14/09		18-20	< 0.009	< 0.004	< 0.005	0.042

SB118	TOTAL DEPTH	SAMPLE DEPTH	BaA	BaP	DahANTH	NAPH
09/14/09	25	0-2	0.288	0.538	0.135	0.270
09/14/09		6-8	< 0.009	< 0.004	< 0.005	0.060
09/14/09		18-20	< 0.009	< 0.004	< 0.005	0.031

SB3	TOTAL DEPTH	SAMPLE DEPTH	BaA	BaP	DahANTH	NAPH
08/25/88	17	16-17	82.0	110	< 50.0	730

MW16T — MONITORING WELL
SB132 — SOIL BORING
TP101A — TEST PIT
EXISTING BUILDING
APPROXIMATE EXTENT OF UPLAND SITE
FENCE
SHORELINE
FORMER MGP STRUCTURES
SG1 — STAFF GUAGE
ANALYTICAL DATA DISPLAYED IN THIS AREA

NOTES:
1. LOCATIONS WITH ANALYTICAL EXCEEDANCES ARE SHOWN IN MAGENTA.

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SCALE IN FEET

SOURCE NOTES:
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WELL POSITIONS SURVEYED BY WPSC SEPTEMBER 2003.
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BORING LOCATIONS SB5 THROUGH SB58 TAKEN FROM A DRAWING BY WW ENGINEERING AND SCIENCE, INC., PROJECT NUMBER: 22319, DATED OCTOBER 1993.
BORING LOCATIONS SB95-1 THROUGH SB95-6 TAKEN FROM A DRAWING BY HORIZON ENVIRONMENTAL, PROJECT NUMBER: WFL-0101, DATED AUGUST 1995.
BORING LOCATIONS SB-96-1 THROUGH SB-96-12 TAKEN FROM A DRAWING BY HORIZON ENVIRONMENTAL, PROJECT NUMBER: WFL-0101, FIGURE 2, DATED DECEMBER 1996.
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LOCATIONS MW14R AND SB132/SV123 WERE SURVEYED BY IBS SURVEY GROUP, 6/30/2014.

DRAWN BY: RLH/DMD DATE: 10/21/14
CHECKED BY: BGH DATE: 10/21/14
APPROVED BY: BGH DATE: 10/23/14
DRAWING NO: 1530-184-B08
REFERENCE: .

PAHs EXCEEDING SOIL RESIDENTIAL SLs (NORTH)

REMEDIAL INVESTIGATION REPORT - REVISION 1
FORMER MANITOWOC MGP SITE
WISCONSIN PUBLIC SERVICE CORPORATION
MANITOWOC, WISCONSIN

NATURAL RESOURCE TECHNOLOGY

PROJECT NO. 1530/18.4

FIGURE NO. 9A

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SAMPLE LOCATION	AMPLE DEPT	BaA	BaP	DahANTH	NAPH
SAMPLE DATE	FEET BELOW GROUND SURFACE	Benzo(a)anthracene (mg/kg)	Benzo(a)pyrene (mg/kg)	Dibenz(a,h)anthracene (mg/kg)	Naphthalene (PAH) (mg/kg)
WI Residential Screening Levels					
--	--	0.15	0.015	0.015	3.8

SLs used on this table are the most current USEPA Regional Screening Level (RSL) as presented in the Multi-Site Risk Assessment Framework Addendum Revision 3 (Exponent, July 2014).

Bold and magenta values exceed screening levels.

Bold and brown results below the MDL but still exceeding the Residental Soil SL in WI/IBS

TP101B	TOTAL DEPTH	SAMPLE DEPTH	BaA	BaP	DahANTH	NAPH
9/22/2009	13.5	13.5-13.5	0.017	0.025	0.006	0.002

MW14R	TOTAL DEPTH	SAMPLE DEPTH	BaA	BaP	DahANTH	NAPH
06/23/14	20	15-16	< 169	< 174	< 178	7,370
06/23/14		18-20	< 0.148	< 0.152	< 0.156	4.3

SB96-6	TOTAL DEPTH	SAMPLE DEPTH	BaA	BaP	DahANTH	NAPH
06/05/96	50.5	17-19	< 83.0	< 83.0	< 83.0	360
06/05/96		31-33	< 170	< 170	< 170	570

SB96-12	TOTAL DEPTH	SAMPLE DEPTH	BaA	BaP	DahANTH	NAPH
06/09/96	50	25-27	< 0.33	< 0.330	< 0.330	4.6

SB96-11	TOTAL DEPTH	SAMPLE DEPTH	BaA	BaP	DahANTH	NAPH
06/09/96	52.1	13-15	< 1.6	< 1.6	< 1.6	8.7

SB96-8	TOTAL DEPTH	SAMPLE DEPTH	BaA	BaP	DahANTH	NAPH
06/06/96	51	33-35	< 170	< 170	< 170	1,300

SB96-4	TOTAL DEPTH	SAMPLE DEPTH	BaA	BaP	DahANTH	NAPH
06/04/96	51	28-30	< 83.0	< 83.0	< 83.0	1,000

SB96-7	TOTAL DEPTH	SAMPLE DEPTH	BaA	BaP	DahANTH	NAPH
06/06/96	48	15-17	< 170	< 170	< 170	1,100
06/06/96		39-41	< 17.0	< 17.0	< 17.0	130

SB116	TOTAL DEPTH	SAMPLE DEPTH	BaA	BaP	DahANTH	NAPH
09/14/09	30	0-2	4.8	5.4	1.0	1.5
09/14/09		20-22	0.105	0.104	0.015	0.049
09/14/09		26-28	< 0.009	< 0.004	< 0.006	0.058

SB128	TOTAL DEPTH	SAMPLE DEPTH	BaA	BaP	DahANTH	NAPH
07/31/12	40	9-10	< 0.009	0.022	0.009	0.014
07/31/12		10-11	< 19.5	< 19.5	< 19.5	757
07/31/12		17-17	0.260	< 0.258	< 0.258	11.3

SB119	TOTAL DEPTH	SAMPLE DEPTH	BaA	BaP	DahANTH	NAPH
09/14/09	20	0-2	0.783	0.722	< 0.192	17.8
09/14/09		8-10	< 0.009	< 0.004	< 0.005	0.290
09/14/09		18-20	< 0.010	0.004	< 0.005	0.032

SB122	TOTAL DEPTH	SAMPLE DEPTH	BaA	BaP	DahANTH	NAPH
09/14/09	45	0-2	< 0.642	< 0.279	< 0.358	26.4
09/14/09		2-6	1.7	1.4	< 0.659	52.2
09/14/09		12-14	< 369,000	< 160,000	< 206,000	4,830,000
09/14/09		28-30	< 0.904	< 0.393	< 0.504	48.2
09/14/09		38-40	< 0.181	< 0.079	< 0.101	10.0
09/14/09		42-44	< 0.114	< 0.050	< 0.064	4.0

SB120	TOTAL DEPTH	SAMPLE DEPTH	BaA	BaP	DahANTH	NAPH
09/14/09	30	0-2	18.7	17.0	3.2	9.7
09/14/09		10-14	< 0.009	< 0.004	< 0.004	0.323
09/14/09		24-28	< 0.009	< 0.004	< 0.005	0.072

SB1	TOTAL DEPTH	SAMPLE DEPTH	BaA	BaP	DahANTH	NAPH
08/25/88	7.5	7-7.5	< 25.0	< 25.0	< 50.0	1,700

SB123	TOTAL DEPTH	SAMPLE DEPTH	BaA	BaP	DahANTH	NAPH
09/15/09	7.5	6-7.5	< 69.3	< 30.1	< 38.7	1,860

SB126	TOTAL DEPTH	SAMPLE DEPTH	BaA	BaP	DahANTH	NAPH
08/01/12	35	15-16	< 64.9	< 64.9	< 64.9	3,540
08/01/12		20-21	< 0.050	< 0.050	< 0.050	1.8

SB127	TOTAL DEPTH	SAMPLE DEPTH	BaA	BaP	DahANTH	NAPH
08/01/12	30	19-20	< 1.2	< 1.2	< 1.22	47.3
08/01/12		28-29	< 0.010	< 0.010	< 0.010	0.15

SB124	TOTAL DEPTH	SAMPLE DEPTH	BaA	BaP	DahANTH	NAPH
09/15/09	7.8	0-2	< 0.180	0.091	< 0.100	6.8
09/15/09		2-4	0.439	0.738	0.235	2.9
09/15/09		6-7.8	< 1.97	< 0.855	< 1.1	120

SB121	TOTAL DEPTH	SAMPLE DEPTH	BaA	BaP	DahANTH	NAPH
09/14/09	25	0-2	0.854	0.972	0.204	3.9
09/14/09		8-10	< 0.009	< 0.004	< 0.005	0.570
09/14/09		20-24	< 0.009	< 0.004	< 0.005	0.749

MW16T — MONITORING WELL
SB132 — SOIL BORING
TP101A — TEST PIT
EXISTING BUILDING
APPROXIMATE EXTENT OF UPLAND SITE
FENCE
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SG1 — STAFF GUAGE
ANALYTICAL DATA DISPLAYED IN THIS AREA

NOTES:
1. LOCATIONS WITH ANALYTICAL EXCEEDANCES ARE SHOWN IN MAGENTA.

N

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SCALE IN FEET

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WELL AND BORING POSITIONS WERE SURVEYED BY IBS SURVEY GROUP, SEPTEMBER 2009.
LOCATIONS MW14R AND SB132/SV123 WERE SURVEYED BY IBS SURVEY GROUP, 6/30/2014.

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PAHs EXCEEDING SOIL RESIDENTIAL SLs (SOUTH)

REMEDIAL INVESTIGATION REPORT - REVISION 1
FORMER MANITOWOC MGP SITE
WISCONSIN PUBLIC SERVICE CORPORATION
MANITOWOC, WISCONSIN

NATURAL RESOURCE TECHNOLOGY

PROJECT NO.
1530/18.4

FIGURE NO.
9B

SB101	TOTAL DEPTH	SAMPLE DEPTH	BaA	BaP	DahANTH	NAPH
9/15/2009	40	26-28	299	257	33.4	3,280
9/15/2009		34-36	0.041	0.038	< 0.006	1.0

SB107	TOTAL DEPTH	SAMPLE DEPTH	BaA	BaP	DahANTH	NAPH
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SB103	TOTAL DEPTH	SAMPLE DEPTH	BaA	BaP	DahANTH	NAPH
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9/14/2009		16-18	0.012	0.007	< 0.006	0.076

SB106	TOTAL DEPTH	SAMPLE DEPTH	BaA	BaP	DahANTH	NAPH
9/15/2009	8	4-8	124	91.2	14.1	34.7

SB95-3	TOTAL DEPTH	SAMPLE DEPTH	BaA	BaP	DahANTH	NAPH
5/18/1995	42	3-5	52.0	43.0	< 2.0	19.0

SB51	TOTAL DEPTH	SAMPLE DEPTH	BaA	BaP	DahANTH	NAPH
4/13/1993	30	13-15	3.7	< 0.330	< 0.330	23.0
4/13/1993		18-20	< 0.330	< 0.330	< 0.330	1.5

SB111	TOTAL DEPTH	SAMPLE DEPTH	BaA	BaP	DahANTH	NAPH
9/15/2009	20	0-2	0.919	1.9	0.368	0.192
9/15/2009		12-14	< 0.020	< 0.009	< 0.011	0.046
9/15/2009		16-18	< 0.010	< 0.004	< 0.006	0.015

SB4	TOTAL DEPTH	SAMPLE DEPTH	BaA	BaP	DahANTH	NAPH
8/25/1988	21.5	7.5-9	< 0.500	0.640	< 1.0	0.500

SB114	TOTAL DEPTH	SAMPLE DEPTH	BaA	BaP	DahANTH	NAPH
9/14/2009	17	8-10	1.8	3.0	0.459	0.953
9/14/2009		12-14	0.011	0.010	< 0.006	0.522
9/14/2009		16-17	444	474	51.3	4,470

SB117	TOTAL DEPTH	SAMPLE DEPTH	BaA	BaP	DahANTH	NAPH
9/14/2009	34	0-2	0.368	0.467	0.115	0.674
9/14/2009		20-22	3.4	3.2	0.345	0.957
9/14/2009		30-32	< 0.010	< 0.004	< 0.006	0.148

SAMPLE LOCATION	SAMPLE DEPTH	BaA	BaP	DahANTH	NAPH
SAMPLE DATE	FEET BELOW GROUND SURFACE	Benzo(a)anthracene (mg/kg)	Benzo(a)pyrene (mg/kg)	Dibenz(a,h)anthracene (mg/kg)	Naphthalene (PAH) (mg/kg)
WI Industrial Screening Levels					
–	–	2.9	0.29	0.29	17

SLs used on this table are the most current USEPA Regional Screening Level (RSL) as presented in the Multi-Site Risk Assessment Framework Addendum Revision 3 (Exponent, July 2014).

Bold and magenta values exceed screening levels.

Bold and brown results below the MDL but still exceeding the Residental Soil SL in WI/IBS

SB104	TOTAL DEPTH	SAMPLE DEPTH	BaA	BaP	DahANTH	NAPH
9/14/2009	20	4-6	0.952	1.1	0.207	0.260
9/14/2009		10-12	< 0.010	< 0.004	< 0.006	0.014
9/14/2009		18-20	< 0.010	< 0.005	< 0.006	0.016

SB108	TOTAL DEPTH	SAMPLE DEPTH	BaA	BaP	DahANTH	NAPH
9/15/2009	6	0-2	5.6	4.8	0.518	27.5
9/15/2009		4-6	13.0	11.2	1.3	100

SB125	TOTAL DEPTH	SAMPLE DEPTH	BaA	BaP	DahANTH	NAPH
9/15/2009	20	0-2	0.195	0.436	0.081	0.422
9/15/2009		10-12	< 0.010	< 0.004	< 0.005	0.230
9/15/2009		18-20	< 0.010	< 0.004	< 0.006	0.311

SB113	TOTAL DEPTH	SAMPLE DEPTH	BaA	BaP	DahANTH	NAPH
9/15/2009	20	0-2	11.3	9.5	1.7	2.0
9/15/2009		2-4	0.019	0.017	< 0.006	0.096
9/15/2009		8-10	< 0.010	< 0.004	< 0.006	0.031

SB118	TOTAL DEPTH	SAMPLE DEPTH	BaA	BaP	DahANTH	NAPH
9/14/2009	25	0-2	0.288	0.538	0.135	0.270
9/14/2009		6-8	< 0.009	< 0.004	< 0.005	0.060
9/14/2009		18-20	< 0.009	< 0.004	< 0.005	0.031

SB3	TOTAL DEPTH	SAMPLE DEPTH	BaA	BaP	DahANTH	NAPH
8/25/1988	17	16-17	82.0	110	< 50.0	730

MW16T MONITORING WELL
SB132 SOIL BORING
TP101A TEST PIT
EXISTING BUILDING
APPROXIMATE EXTENT OF UPLAND SITE
FENCE
SHORELINE
FORMER MGP STRUCTURES
SG1 STAFF GUAGE
ANALYTICAL DATA DISPLAYED IN THIS AREA

NOTES:
1. LOCATIONS WITH ANALYTICAL EXCEEDANCES ARE SHOWN IN MAGENTA.

N
0 25 50
SCALE IN FEET

SOURCE NOTES:
THIS DRAWING WAS DEVELOPED FROM A DRAWING BY HORIZON ENVIRONMENTAL, PROJECT NUMBER: WFL-0110, DATED: APRIL 2001.
CARBON ABSORPTION PRETREATMENT LOCATION DEVELOPED FROM A DRAWING BY HORIZON ENVIRONMENTAL, PROJECT NUMBER: WFL-0107, DATED DECEMBER 1997.
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BORING LOCATIONS SB1 THROUGH SB4 TAKEN FROM A DRAWING BY WW ENGINEERING AND SCIENCE, INC., PROJECT NUMBER: 22159, DATED DECEMBER 1991.
BORING LOCATIONS SB5 THROUGH SB58 TAKEN FROM A DRAWING BY WW ENGINEERING AND SCIENCE, INC., PROJECT NUMBER: 22319, DATED OCTOBER 1993.
BORING LOCATIONS SB95-1 THROUGH SB95-6 TAKEN FROM A DRAWING BY HORIZON ENVIRONMENTAL, PROJECT NUMBER: WFL-0101, DATED AUGUST 1995.
BORING LOCATIONS SB-96-1 THROUGH SB-96-12 TAKEN FROM A DRAWING BY HORIZON ENVIRONMENTAL, PROJECT NUMBER: WFL-0101, FIGURE 2, DATED DECEMBER 1996.
PROPERTY BOUNDARY 2001 TAKEN FROM A DRAWING BY SCHINDEL SURVEYING LLC, JOB NAME: WPSMAN1, DATED SEPTEMBER 3, 2001.
PROPERTY BOUNDARY 2002 AND RIVER BANK TAKEN FROM A DRAWING FROM BAY LAKES REGIONAL PLANNING COMMISSION, GREEN BAY, WI, DATED OCTOBER 30, 2002.
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DRAWING FROM INTEGRYS BUSINESS SUPPORT, llc TOPOGRAPHIC SURVEY, DATED 01-19-10.
WELL AND BORING POSITIONS WERE SURVEYED BY IBS SURVEY GROUP, SEPTEMBER 2009.
LOCATIONS MW14R AND SV123 WERE SURVEYED BY IBS SURVEY GROUP, 6/30/2014.

DRAWN BY: RLH/DMD DATE: 10/21/14
CHECKED BY: BGH DATE: 10/21/14
APPROVED BY: BGH DATE: 10/23/14
DRAWING NO: 1530-184-B09
REFERENCE: .

PAHs EXCEEDING SOIL INDUSTRIAL SLs (NORTH)

REMEDIAL INVESTIGATION REPORT - REVISION 1
FORMER MANITOWOC MGP SITE
WISCONSIN PUBLIC SERVICE CORPORATION
MANITOWOC, WISCONSIN

NATURAL RESOURCE TECHNOLOGY

PROJECT NO.
1530/18.4

FIGURE NO.
10A

Oct 24, 2014 10:18am PLOTTED BY: rhopkins SAVED BY: rhopkins
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IMAGES:
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SAMPLE LOCATION	SAMPLE DEPTH	BaA	BaP	DahANTH	NAPH
SAMPLE DATE	FEET BELOW GROUND SURFACE	Benzo(a)anthracene (mg/kg)	Benzo(a)pyrene (mg/kg)	Dibenz(a,h)anthracene (mg/kg)	Naphthalene (PAH) (mg/kg)
WI Industrial Screening Levels					
--	--	2.9	0.29	0.29	17

SLs used on this table are the most current USEPA Regional Screening Level (RSL) as presented in the Multi-Site Risk Assessment Framework Addendum Revision 3 (Exponent, July 2014).

Bold and magenta values exceed screening levels

Bold and brown results below the MDL but still exceeding the Residental Soil SL in WI/IBS

SB96-5	TOTAL DEPTH	SAMPLE DEPTH	BaA	BaP	DahANTH	NAPH
6/5/1996	50.5	17-19	< 83.0	< 83.0	< 83.0	360
6/5/1996		31-33	< 170	< 170	< 170	570

SB96-12	TOTAL DEPTH	SAMPLE DEPTH	BaA	BaP	DahANTH	NAPH
6/9/1996	50	25-27	< 0.330	< 0.330	< 0.330	4.6

SB96-11	TOTAL DEPTH	SAMPLE DEPTH	BaA	BaP	DahANTH	NAPH
6/9/1996	52.1	13-15	< 1.6	< 1.6	< 1.6	8.7

SB96-8	TOTAL DEPTH	SAMPLE DEPTH	BaA	BaP	DahANTH	NAPH
6/6/1996	51	33-35	< 170	< 170	< 170	1,300

SB96-4	TOTAL DEPTH	SAMPLE DEPTH	BaA	BaP	DahANTH	NAPH
6/4/1996	51	28-30	< 83.0	< 83.0	< 83.0	1,000

SB116	TOTAL DEPTH	SAMPLE DEPTH	BaA	BaP	DahANTH	NAPH
9/14/2009	30	0-2	4.8	5.4	1.0	1.5
9/14/2009		20-22	0.105	0.104	0.015	0.049
9/14/2009		26-28	< 0.010	< 0.004	< 0.005	0.058

SB96-7	TOTAL DEPTH	SAMPLE DEPTH	BaA	BaP	DahANTH	NAPH
6/8/1996	48	15-17	< 170	< 170	< 170	1,100
6/6/1996		39-41	< 17.0	< 17.0	< 17.0	130

SB128	TOTAL DEPTH	SAMPLE DEPTH	BaA	BaP	DahANTH	NAPH
7/31/2012	40	10-11	< 19.5	< 19.5	< 19.5	757
7/31/2012		17-17	0.260	< 0.258	< 0.258	11.3

SB119	TOTAL DEPTH	SAMPLE DEPTH	BaA	BaP	DahANTH	NAPH
9/14/2009	20	0-2	0.783	0.722	< 0.192	17.8
9/14/2009		8-10	< 0.009	< 0.004	< 0.005	0.290
9/14/2009		18-20	< 0.009	0.004	< 0.005	0.032

SB120	TOTAL DEPTH	SAMPLE DEPTH	BaA	BaP	DahANTH	NAPH
9/14/2009	30	0-2	18.7	17.0	3.2	9.7
9/14/2009		10-14	< 0.009	< 0.0037	< 0.005	0.323
9/14/2009		24-28	< 0.009	< 0.004	< 0.005	0.072

SB122	TOTAL DEPTH	SAMPLE DEPTH	BaA	BaP	DahANTH	NAPH
9/14/2009	45	0-2	< 0.642	< 0.279	< 0.358	26.4
9/14/2009		2-6	1.7	1.4	< 0.659	52.2
9/14/2009		12-14	< 369,000	< 160,000	< 206,000	4,830,000
9/14/2009		28-30	< 0.904	< 0.393	< 0.504	48.2
9/14/2009		38-40	< 0.181	< 0.079	< 0.101	10.0
9/14/2009		42-44	< 0.114	< 0.049	< 0.064	4.0

SB126	TOTAL DEPTH	SAMPLE DEPTH	BaA	BaP	DahANTH	NAPH
8/1/2012	35	15-16	< 64.9	< 64.9	< 64.9	3,540
8/1/2012		20-21	< 0.050	< 0.050	< 0.050	1.8

SB127	TOTAL DEPTH	SAMPLE DEPTH	BaA	BaP	DahANTH	NAPH
8/1/2012	30	19-20	< 1.2	< 1.2	< 1.2	47.3
8/1/2012		28-29	< 0.010	< 0.010	< 0.010	0.149

SB124	TOTAL DEPTH	SAMPLE DEPTH	BaA	BaP	DahANTH	NAPH
9/15/2009	7.8	2-4	0.439	0.738	0.235	2.9
9/15/2009		6-7.8	< 1.97	< 0.855	< 1.1	120

SB1	TOTAL DEPTH	SAMPLE DEPTH	BaA	BaP	DahANTH	NAPH
8/25/1988	7.5	7-7.5	< 25.0	< 25.0	< 50.0	1,700

SB123	TOTAL DEPTH	SAMPLE DEPTH	BaA	BaP	DahANTH	NAPH
9/15/2009	7.5	6-7.5	< 69.3	< 30.1	< 38.7	1,860

SB121	TOTAL DEPTH	SAMPLE DEPTH	BaA	BaP	DahANTH	NAPH
9/14/2009	25	0-2	0.854	0.972	0.204	3.9
9/14/2009		8-10	< 0.009	< 0.0037	< 0.005	0.570
9/14/2009		20-24	< 0.009	< 0.004	< 0.005	0.749

MW16T MONITORING WELL
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SG1 STAFF GUAGE
ANALYTICAL DATA DISPLAYED IN THIS AREA

NOTES:
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N

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SCALE IN FEET

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LOCATIONS MW14R AND SV123 WERE SURVEYED BY IBS SURVEY GROUP, 6/30/2014.

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DRAWING NO: 1530-184-B09
REFERENCE: .

PAHs EXCEEDING SOIL INDUSTRIAL SLs (SOUTH)

REMEDIAL INVESTIGATION REPORT - REVISION 1
FORMER MANITOWOC MGP SITE
WISCONSIN PUBLIC SERVICE CORPORATION
MANITOWOC, WISCONSIN

NATURAL RESOURCE TECHNOLOGY

PROJECT NO. 1530/18.4

FIGURE NO. 10B

Oct 23, 2014 3:52pm PLOTTED BY: rhopkins SAVED BY: rhopkins
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SB101	TOTAL DEPTH	SAMPLE DEPTH	1,2,4 TMB	BENZ	ETH	XYL
9/15/2009	40	26-28	66.3	44.9	47.9	148 [1]
9/15/2009		34-36	< 0.03	0.08	< 0.03	0.03 [1]

SB103	TOTAL DEPTH	SAMPLE DEPTH	1,2,4 TMB	BENZ	ETH	XYL
9/14/2009	17	10-12	6.5	4.2	11.0	15.3 [1]
9/14/2009		16-18	< 0.03	< 0.03	< 0.03	--

MW14R	TOTAL DEPTH	SAMPLE DEPTH	1,2,4 TMB	BENZ	ETH	XYL
6/23/2014	19	15-16	312	< 6.4	66.9	1,128 [1]
6/23/2014		18-20	0.46	< 0.03	0.10	1.4 [1]

SB96-4	TOTAL DEPTH	SAMPLE DEPTH	1,2,4 TMB	BENZ	ETH	XYL
6/4/1996	51	28-30	250	14.0	560	510

SB96-6	TOTAL DEPTH	SAMPLE DEPTH	1,2,4 TMB	BENZ	ETH	XYL
6/5/1996	50.5	17-19	210	0.10	11.0	530
6/5/1996		31-33	170	1.9	180	250

SB96-8	TOTAL DEPTH	SAMPLE DEPTH	1,2,4 TMB	BENZ	ETH	XYL
6/6/1996	51	33-35	100	10.0	73.0	250

SB96-7	TOTAL DEPTH	SAMPLE DEPTH	1,2,4 TMB	BENZ	ETH	XYL
6/6/1996	48	15-17	320	1.8	38.0	800
6/6/1996		39-41	25.0	1.1	8.6	81.0

SB126	TOTAL DEPTH	SAMPLE DEPTH	1,2,4 TMB	BENZ	ETH	XYL
8/1/2012	35	15-16	1,030	< 12.5	148	1,795 [1]
8/1/2012		20-21	0.80	0.30	0.30	2.6 [1]

SB122	TOTAL DEPTH	SAMPLE DEPTH	1,2,4 TMB	BENZ	ETH	XYL
9/14/2009	45	12-14	5,570	< 133	< 133	--
9/14/2009		28-30	0.17	< 0.03	0.04	0.32 [1]
9/14/2009		38-40	0.05	< 0.03	< 0.03	0.08 [1]

SB128	TOTAL DEPTH	SAMPLE DEPTH	1,2,4 TMB	BENZ	ETH	XYL
7/31/2012	40	10-11	1,340	< 10.0	115	2,408 [1]
7/31/2012		17-17	0.61	< 0.20	< 0.20	--

SB114	TOTAL DEPTH	SAMPLE DEPTH	1,2,4 TMB	BENZ	ETH	XYL
9/14/2009	17	16-17	122	144	88.4	496 [1]

SB3	TOTAL DEPTH	SAMPLE DEPTH	1,2,4 TMB	BENZ	ETH	XYL
8/25/1988	17	16-17	--	32.0	22.0	--

SB1	TOTAL DEPTH	SAMPLE DEPTH	1,2,4 TMB	BENZ	ETH	XYL
8/25/1988	7.5	7-7.5	--	9.0	8.6	--

SB123	TOTAL DEPTH	SAMPLE DEPTH	1,2,4 TMB	BENZ	ETH	XYL
9/15/2009	7.5	6-7.5	231	82.8	55.2	455 [1]

SAMPLE LOCATION	SAMPLE DEPTH	1,2,4 TMB	BENZ	ETH	XYL
SAMPLE DATE	FEET BELOW GROUND SURFACE	1,2,4-TRIMETHYLBENZENE (mg/kg)	BENZENE (mg/kg)	ETHYLBENZENE (mg/kg)	XYLENES, TOTAL (mg/kg)
WI Residential Screening Levels					
--	--	58	1.2	5.8	580

SLs used on this table are the most current USEPA Regional Screening Level (RSL) as presented in the Multi-Site Risk Assessment Framework Addendum Revision 3 (Exponent, July 2014).

Bold and magenta values exceed screening levels.

Bold and brown results below the MDL but still exceeding the Residental Soil SL in WI/IBS

[1] Total Xylene calculated from the sum of detected xylene-o and xylene-m+p results reported by the laboratory.

MW16T MONITORING WELL
SB132 SOIL BORING
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NOTES:
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LOCATIONS MW14R AND SV123 WERE SURVEYED BY IBS SURVEY GROUP, 6/30/2014.

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SCALE IN FEET

DRAWN BY: RLH/DMD DATE: 10/23/14
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DRAWING NO: 1530-184-B10
REFERENCE: .

BTEX EXCEEDING SOIL RESIDENTIAL SLs

REMEDIAL INVESTIGATION REPORT - REVISION 1
FORMER MANITOWOC MGP SITE
WISCONSIN PUBLIC SERVICE CORPORATION
MANITOWOC, WISCONSIN

NATURAL RESOURCE TECHNOLOGY

PROJECT NO. 1530/18.4

FIGURE NO. 11

Oct 23, 2014 6:01pm PLOTTED BY: rhopkins SAVED BY: rhopkins
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IMAGES:
XREFS:

SAMPLE LOCATION	SAMPLE DEPTH	1,2,4 TMB	BENZ	ETH	XYL
SAMPLE DATE	FEET BELOW GROUND SURFACE	1,2,4-TRIMETHYLBENZENE (mg/kg)	BENZENE (mg/kg)	ETHYLBENZENE (mg/kg)	XYLENES, TOTAL (mg/kg)
WI Industrial Screening Levels					
–	--	240	5.1	25	2,500

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Bold and magenta values exceed screening levels.

Bold and brown results below the MDL but still exceeding the Residental Soil SL in WI/IBS

[1] Total Xylene calculated from the sum of detected xylene-o and xylene-m+p results reported by the laboratory.

SB101	TOTAL DEPTH	SAMPLE DEPTH	1,2,4 TMB	BENZ	ETH	XYL
9/15/2009	40	26-28	66.3	44.9	47.9	148 [1]
9/15/2009		34-36	< 0.03	0.08	< 0.03	0.03 [1]

MW14R	TOTAL DEPTH	SAMPLE DEPTH	1,2,4 TMB	BENZ	ETH	XYL
6/23/2014	20	15-16	312	< 6.4	66.9	1,128 [1]
6/23/2014		18-20	0.46	< 0.03	0.10	1.4 [1]

SB3	TOTAL DEPTH	SAMPLE DEPTH	1,2,4 TMB	BENZ	ETH	XYL
8/25/1988	17	16-17	--	32.0	22.0	--

SB114	TOTAL DEPTH	SAMPLE DEPTH	1,2,4 TMB	BENZ	ETH	XYL
9/14/2009	17	16-17	122	144	88.4	496 [1]

SB128	TOTAL DEPTH	SAMPLE DEPTH	1,2,4 TMB	BENZ	ETH	XYL
7/31/2012	40	10-11	1,340	< 10.0	115	2,408 [1]
7/31/2012		17-17	0.61	< 0.20	< 0.20	--

SB1	TOTAL DEPTH	SAMPLE DEPTH	1,2,4 TMB	BENZ	ETH	XYL
8/25/1988	7.5	7-7.5	--	9.0	8.6	--

SB96-4	TOTAL DEPTH	SAMPLE DEPTH	1,2,4 TMB	BENZ	ETH	XYL
6/4/1996	51	28-30	250	14.0	560	510

SB96-6	TOTAL DEPTH	SAMPLE DEPTH	1,2,4 TMB	BENZ	ETH	XYL
6/5/1996	50.5	31-33	170	1.9	180	250

SB96-8	TOTAL DEPTH	SAMPLE DEPTH	1,2,4 TMB	BENZ	ETH	XYL
6/6/1996	51	33-35	100	10.0	73.0	250

SB96-7	TOTAL DEPTH	SAMPLE DEPTH	1,2,4 TMB	BENZ	ETH	XYL
6/6/1996	48	15-17	320	1.8	38.0	800
6/6/1996		39-41	25.0	1.1	8.6	81.0

SB122	TOTAL DEPTH	SAMPLE DEPTH	1,2,4 TMB	BENZ	ETH	XYL
9/14/2009	45	12-14	5,570	< 133	< 133	--
9/14/2009		28-30	0.17	< 0.03	0.04	0.32 [1]
9/14/2009		38-40	0.05	< 0.03	< 0.03	0.08 [1]

SB126	TOTAL DEPTH	SAMPLE DEPTH	1,2,4 TMB	BENZ	ETH	XYL
8/1/2012	35	15-16	1,030	< 12.5	148	1,795 [1]
8/1/2012		20-21	0.80	0.30	0.30	2.6 [1]

SB123	TOTAL DEPTH	SAMPLE DEPTH	1,2,4 TMB	BENZ	ETH	XYL
9/15/2009	7.5	6-7.5	231	82.8	55.2	455 [1]

MW16T MONITORING WELL
SB132 SOIL BORING
TP101A TEST PIT
EXISTING BUILDING
APPROXIMATE EXTENT OF UPLAND SITE
FENCE
SHORELINE
FORMER MGP STRUCTURES
SG1 STAFF GUAGE

NOTES:
1. LOCATIONS WITH ANALYTICAL EXCEEDANCES ARE SHOWN IN MAGENTA.

SOURCE NOTES:
THIS DRAWING WAS DEVELOPED FROM A DRAWING BY HORIZON ENVIRONMENTAL, PROJECT NUMBER: WFL-0110, DATED: APRIL 2001.
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BORING LOCATIONS SB5 THROUGH SB58 TAKEN FROM A DRAWING BY WW ENGINEERING AND SCIENCE, INC., PROJECT NUMBER: 22319, DATED OCTOBER 1993.
BORING LOCATIONS SB95-1 THROUGH SB95-6 TAKEN FROM A DRAWING BY HORIZON ENVIRONMENTAL, PROJECT NUMBER: WFL-0101, DATED AUGUST 1995.
BORING LOCATIONS SB-96-1 THROUGH SB-96-12 TAKEN FROM A DRAWING BY HORIZON ENVIRONMENTAL, PROJECT NUMBER: WFL-0101, FIGURE 2, DATED DECEMBER 1996.
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DRAWING FROM INTEGRYS BUSINESS SUPPORT, llc TOPOGRAPHIC SURVEY, DATED 01-19-10.
WELL AND BORING POSITIONS WERE SURVEYED BY IBS SURVEY GROUP, SEPTEMBER 2009.
LOCATIONS MW14R AND SB132/SV123 WERE SURVEYED BY IBS SURVEY GROUP, 6/30/2014.

Oct 23, 2014 6:04pm PLOTTED BY: rhopkins SAVED BY: rhopkins
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DRAWN BY: RLH DATE: 10/23/14
CHECKED BY: BGH DATE: 10/23/14
APPROVED BY: BGH DATE: 10/23/14
DRAWING NO: 1530-184-B11
REFERENCE: .

BTEX EXCEEDING SOIL INDUSTRIAL SLs

REMEDIAL INVESTIGATION REPORT - REVISION 1
FORMER MANITOWOC MGP SITE
WISCONSIN PUBLIC SERVICE CORPORATION
MANITOWOC, WISCONSIN

NATURAL RESOURCE TECHNOLOGY

PROJECT NO. 1530/18.4

FIGURE NO. 12

N
0 25 50
SCALE IN FEET

GROUNDWATER ELEVATION CONTOURS NOVEMBER 2012

REMEDIAL INVESTIGATION REPORT - REVISION 1
FORMER MANITOWOC MGP SITE
WISCONSIN PUBLIC SERVICE CORPORATION
MANITOWOC, WISCONSIN

DRAWN BY:	RLH	DATE: 10/21/14
CHECKED BY:	BGH	DATE: 10/21/14
APPROVED BY:	BGH	DATE: 10/23/14
DRAWING NO: 1530-184-B13		
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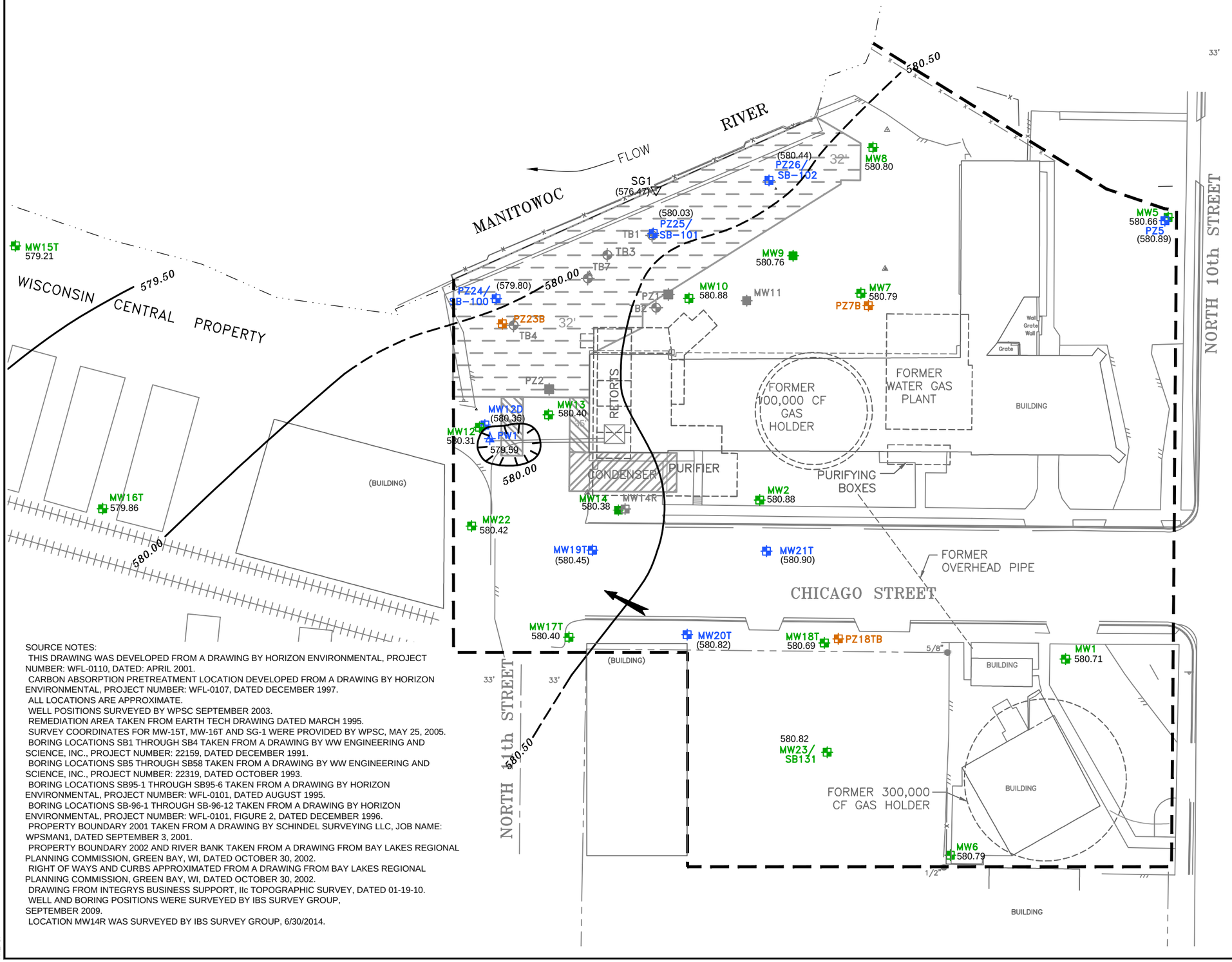

WATER TABLE ELEVATION CONTOUR, DASHED WHERE INFERRED (FT. NAVD)

GROUNDWATER FLOW DIRECTION

MW7 580.79 — MONITORING WELL AND WATER TABLE ELEVATION (FT. NAVD)

PZ24 (579.80) — PIEZOMETER AND WATER TABLE ELEVATION (FT. NAVD)

MW11 — ABANDONED MONITORING WELL

PZ2 — ABANDONED PIEZOMETER

PW1 579.59 — PUMPING WELL AND WATER TABLE ELEVATION (FT. NAVD)

EXISTING BUILDING

APPROXIMATE EXTENT OF UPLAND SITE

FENCE

SHORELINE

FORMER MGP STRUCTURES

SG1 (576.47) — STAFF GUAGE AND WATER ELEVATION (FT. NAVD)

32' — SOIL STABILIZED TO 32 FEET bgs (1993 AND 1994)

35' — SOIL STABILIZED TO 35 FEET bgs (1993)

40' — SOIL STABILIZED TO 40 FEET bgs (1993)

NOTES:

1. SHALLOW SAND WELL LOCATIONS (SCREENS ~580 MSL) ARE SHOWN IN GREEN.
2. DEEP SAND WELL LOCATIONS (SCREENS ~555 MSL) ARE SHOWN IN BLUE.
3. BEDROCK WELL LOCATIONS (SCREENS ~525 MSL) SHOWN IN ORANGE.
4. GROUNDWATER ELEVATIONS IN PARENTHESIS WERE NOT USED TO DEVELOP THE GROUNDWATER FLOW CONTOURS.

SOURCE NOTES:

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BORING LOCATIONS SB95-1 THROUGH SB95-6 TAKEN FROM A DRAWING BY HORIZON ENVIRONMENTAL, PROJECT NUMBER: WFL-0101, DATED AUGUST 1995.
BORING LOCATIONS SB-96-1 THROUGH SB-96-12 TAKEN FROM A DRAWING BY HORIZON ENVIRONMENTAL, PROJECT NUMBER: WFL-0101, FIGURE 2, DATED DECEMBER 1996.
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WELL AND BORING POSITIONS WERE SURVEYED BY IBS SURVEY GROUP, SEPTEMBER 2009.
LOCATION MW14R WAS SURVEYED BY IBS SURVEY GROUP, 6/30/2014.

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0 25 50

SCALE IN FEET

NATURAL RESOURCE TECHNOLOGY

PROJECT NO. 1530/18.4

FIGURE NO. 13

Oct 23, 2014 6:08pm PLOTTED BY: rhopkins SAVED BY: rhopkins Layout1
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XREFS:

GROUNDWATER ELEVATION CONTOURS FEBRUARY 2013

REMEDIAL INVESTIGATION REPORT - REVISION 1
FORMER MANITOWOC MGP SITE
WISCONSIN PUBLIC SERVICE CORPORATION
MANITOWOC, WISCONSIN

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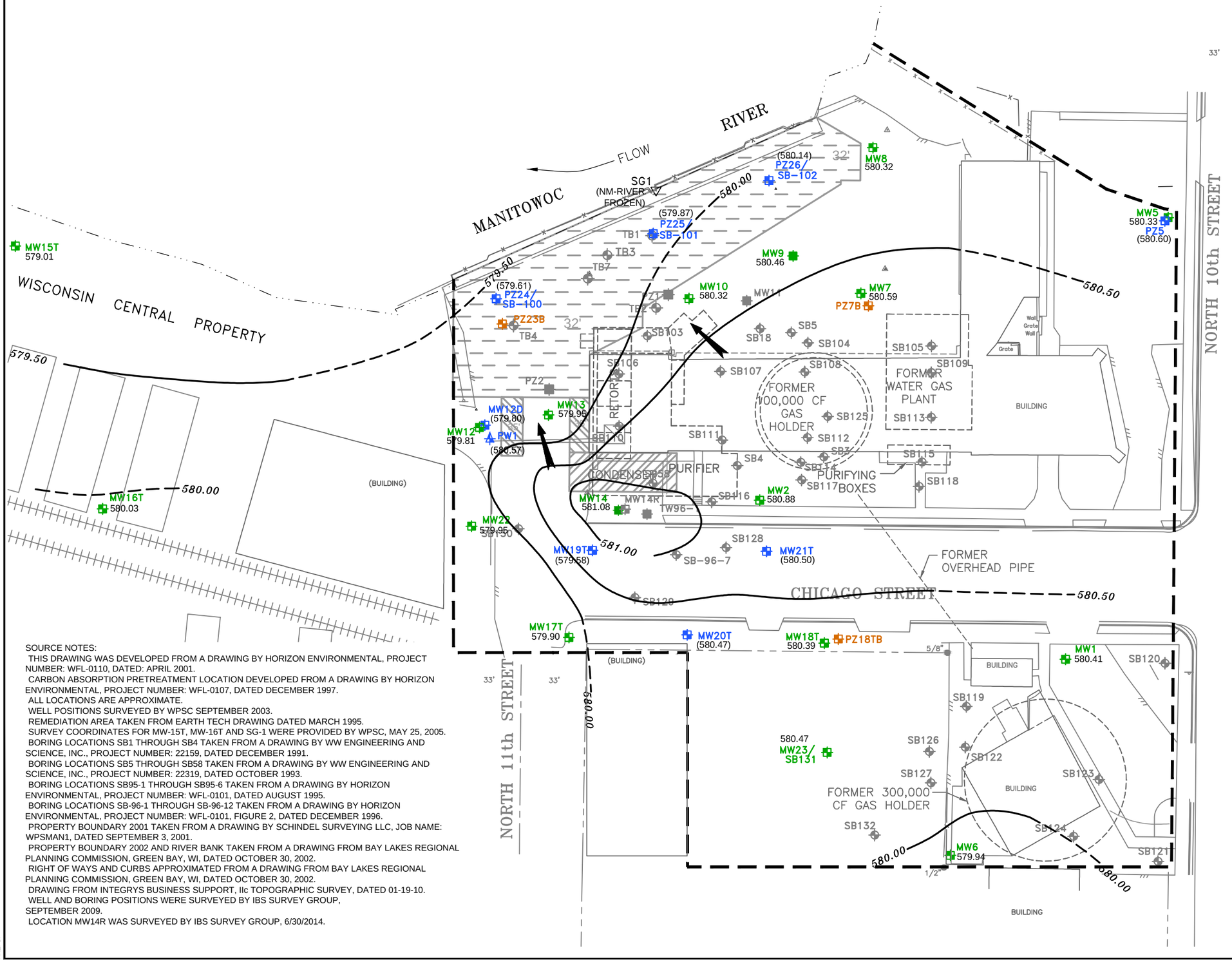
CHECKED BY:	BGH	DATE: 10/21/14
APPROVED BY:	BGH	DATE: 10/23/14
DRAWING NO: 1530-184-B14		
REFERENCE: .		



WATER TABLE ELEVATION CONTOUR, DASHED WHERE INFERRED (FT. NAVD)

GROUNDWATER FLOW DIRECTION

MW7 580.59 — MONITORING WELL AND WATER TABLE ELEVATION (FT. NAVD)

PZ24 (579.61) — PIEZOMETER AND WATER TABLE ELEVATION (FT. NAVD)

MW11 — ABANDONED MONITORING WELL

PZ2 — ABANDONED PIEZOMETER

PW1 (580.57) — PUMPING WELL AND WATER TABLE ELEVATION (FT. NAVD)

EXISTING BUILDING

APPROXIMATE EXTENT OF UPLAND SITE

FENCE

SHORELINE

FORMER MGP STRUCTURES

SG1 (576.47) — STAFF GUAGE AND WATER ELEVATION (FT. NAVD)

SOIL STABILIZED TO 32 FEET bgs (1993 AND 1994)

SOIL STABILIZED TO 35 FEET bgs (1993)

SOIL STABILIZED TO 40 FEET bgs (1993)

NOTES:

1. SHALLOW SAND WELL LOCATIONS (SCREENS ~580 MSL) ARE SHOWN IN GREEN.
2. DEEP SAND WELL LOCATIONS (SCREENS ~555 MSL) ARE SHOWN IN BLUE.
3. BEDROCK WELL LOCATIONS (SCREENS ~525 MSL) SHOWN IN ORANGE.
4. GROUNDWATER ELEVATIONS IN PARENTHESIS WERE NOT USED TO DEVELOP THE GROUNDWATER ELEVATION CONTOURS.
5. WELL PW1 WAS NOT IN OPERATION AT TIME OF SAMPLING AND THEREFORE WAS NOT USED FOR CONTOURING.

SOURCE NOTES:

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LOCATION MW14R WAS SURVEYED BY IBS SURVEY GROUP, 6/30/2014.

NATURAL RESOURCE TECHNOLOGY

PROJECT NO. 1530/18.4

FIGURE NO. 14

Oct 23, 2014 6:01pm PLOTTED BY: rhopkins SAVED BY: rhopkins Layout1
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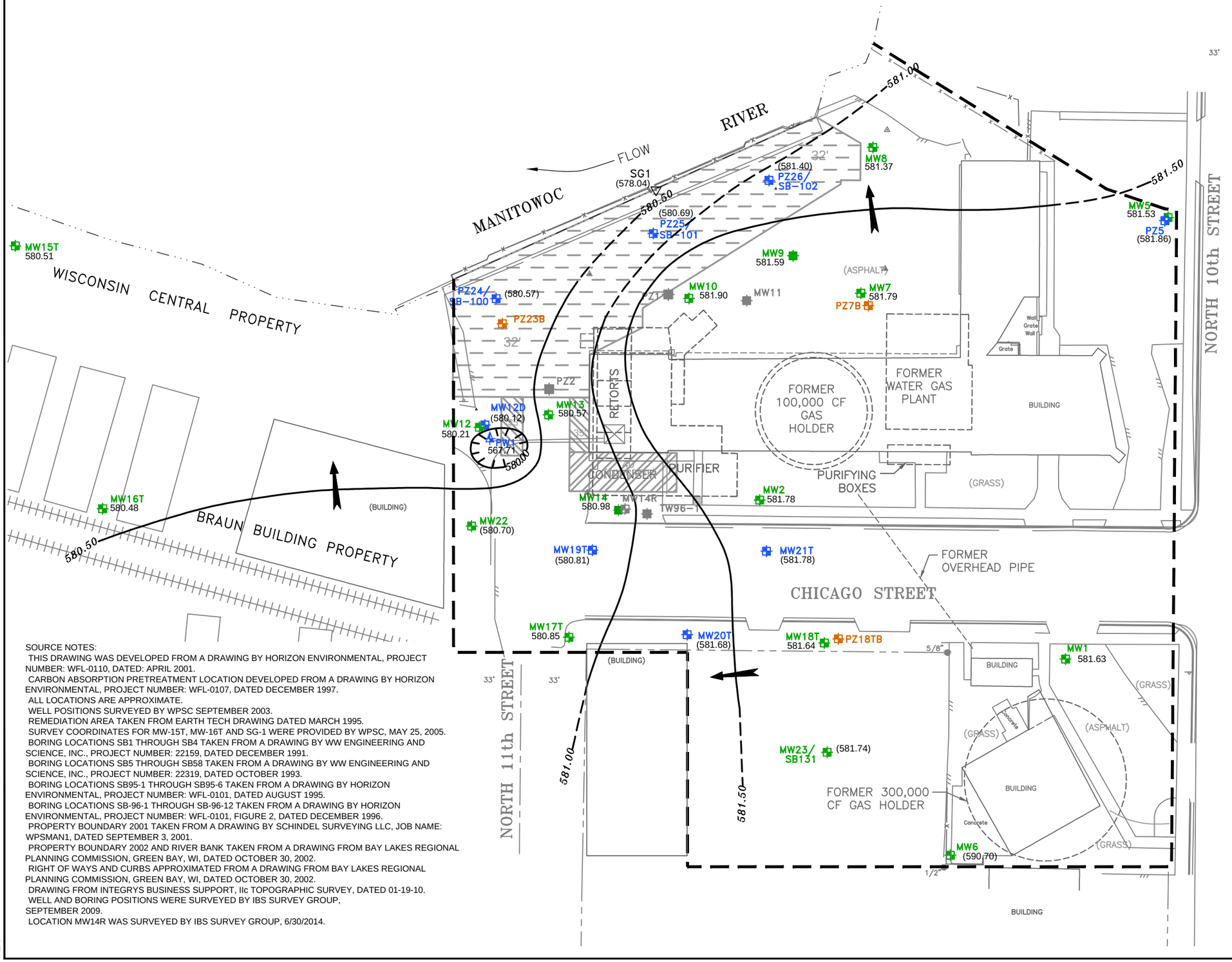

WATER TABLE ELEVATION CONTOUR, DASHED WHERE INFERRED (FT. NAVD)

GROUNDWATER FLOW DIRECTION

MW7 581.79 — MONITORING WELL AND WATER TABLE ELEVATION (FT. NAVD)

PZ24 (580.57) — PIEZOMETER AND WATER TABLE ELEVATION (FT. NAVD)

MW11 — ABANDONED MONITORING WELL

PZ2 — ABANDONED PIEZOMETER

PW1 567.71 — PUMPING WELL AND WATER TABLE ELEVATION (FT. NAVD)

EXISTING BUILDING

APPROXIMATE EXTENT OF UPLAND SITE

FENCE

SHORELINE

FORMER MGP STRUCTURES

SG1 (578.04) — STAFF GUAGE AND WATER ELEVATION (FT. NAVD)

32' — SOIL STABILIZED TO 32 FEET bgs (1993 AND 1994)

35' — SOIL STABILIZED TO 35 FEET bgs (1993)

40' — SOIL STABILIZED TO 40 FEET bgs (1993)

NOTES:
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LOCATION MW14R WAS SURVEYED BY IBS SURVEY GROUP, 6/30/2014.

GROUNDWATER ELEVATION CONTOURS MAY 2013

REMEDIAL INVESTIGATION REPORT - REVISION 1
FORMER MANITOWOC MGP SITE
WISCONSIN PUBLIC SERVICE CORPORATION
MANITOWOC, WISCONSIN

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DRAWING NO: 1530-184-B15		
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NATURAL RESOURCE TECHNOLOGY

PROJECT NO.
1530/18.4

FIGURE NO.
15

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GROUNDWATER ELEVATION CONTOURS NOVEMBER 2013

REMEDIAL INVESTIGATION REPORT - REVISION 1
FORMER MANITOWOC MGP SITE
WISCONSIN PUBLIC SERVICE CORPORATION
MANITOWOC, WISCONSIN

DRAWN BY:	RLH	DATE: 10/22/14
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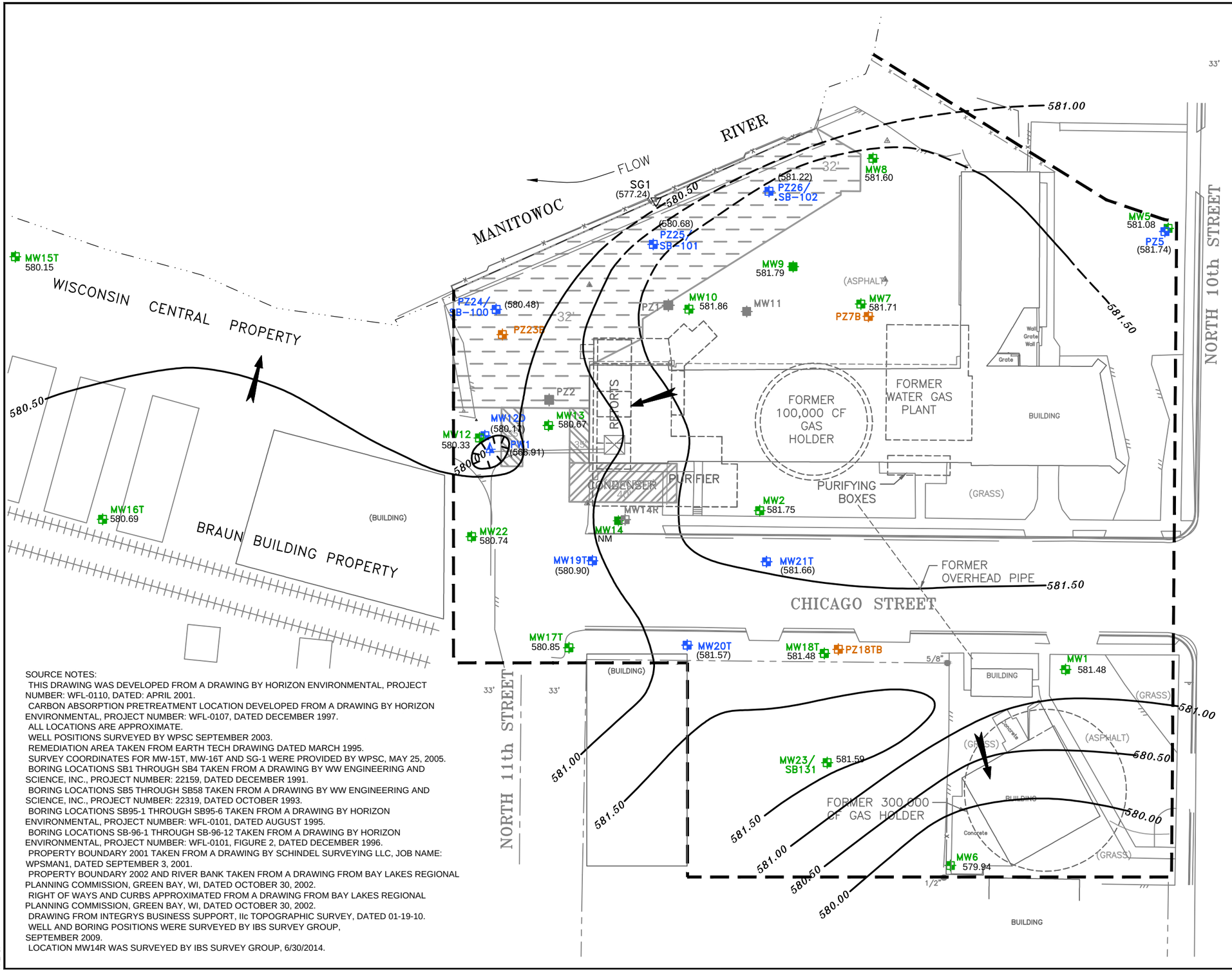

WATER TABLE ELEVATION CONTOUR, DASHED WHERE INFERRED (FT. NAVD)

GROUNDWATER FLOW DIRECTION

MW7 581.71 — MONITORING WELL AND WATER TABLE ELEVATION (FT. NAVD)

PZ24 (580.48) — PIEZOMETER AND WATER TABLE ELEVATION (FT. NAVD)

MW11 — ABANDONED MONITORING WELL

PZ2 — ABANDONED PIEZOMETER

PW1 566.91 — PUMPING WELL AND WATER TABLE ELEVATION (FT. NAVD)

EXISTING BUILDING

APPROXIMATE EXTENT OF UPLAND SITE

FENCE

SHORELINE

FORMER MGP STRUCTURES

SG1 (577.24) — STAFF GUAGE AND WATER ELEVATION (FT. NAVD)

NM — NOT MEASURED

32' — SOIL STABILIZED TO 32 FEET bgs (1993 AND 1994)

35' — SOIL STABILIZED TO 35 FEET bgs (1993)

40' — SOIL STABILIZED TO 40 FEET bgs (1993)

NOTES:
1. SHALLOW SAND WELL LOCATIONS (SCREENS ~580 MSL) ARE SHOWN IN GREEN.
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LOCATION MW14R WAS SURVEYED BY IBS SURVEY GROUP, 6/30/2014.

NATURAL RESOURCE TECHNOLOGY

PROJECT NO. 1530/18.4

FIGURE NO. 16

Oct 23, 2014 5:03pm PLOTTED BY: rhopkins SAVED BY: rhopkins Layout1
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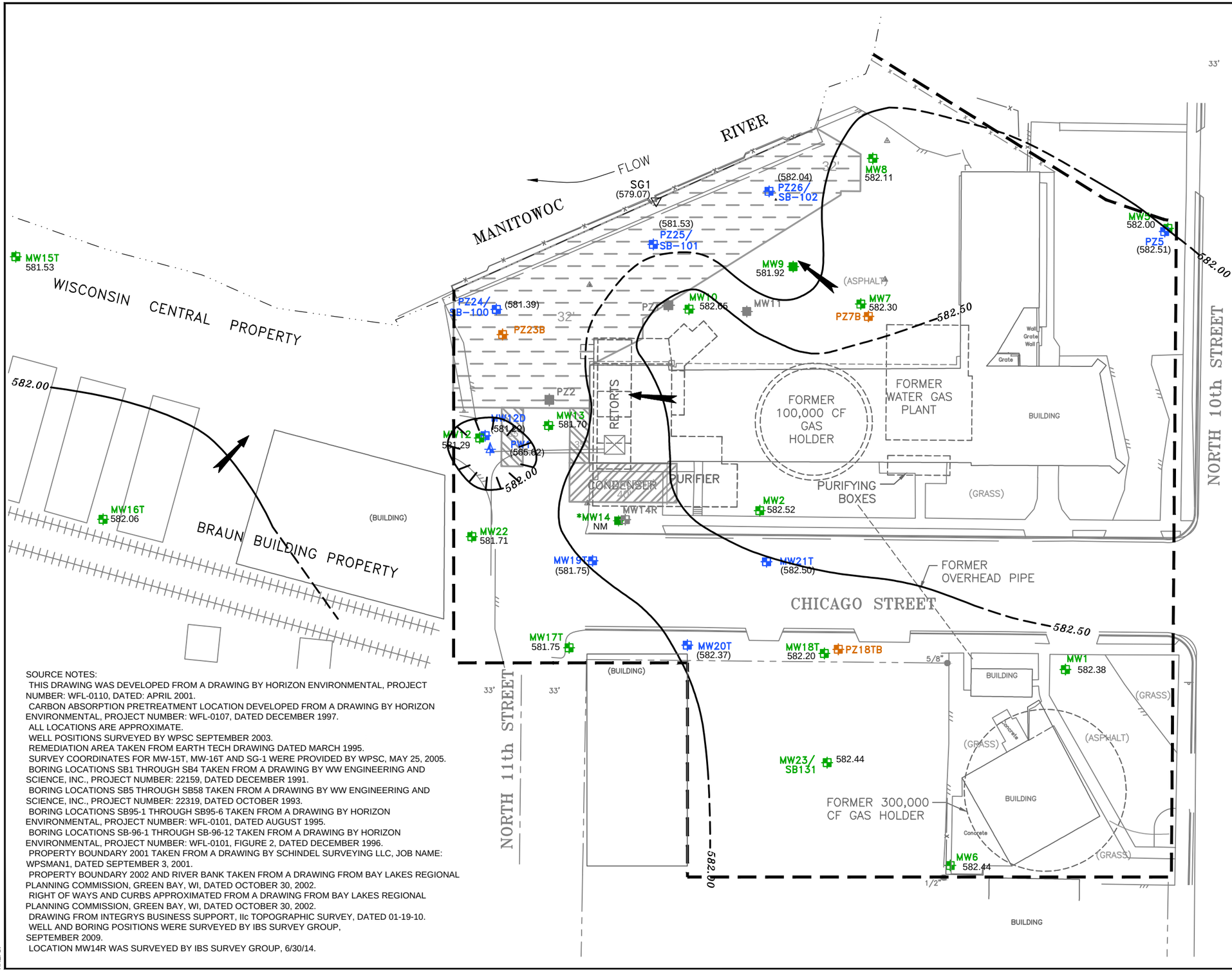

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WELL AND BORING POSITIONS WERE SURVEYED BY IBS SURVEY GROUP, SEPTEMBER 2009.
LOCATION MW14R WAS SURVEYED BY IBS SURVEY GROUP, 6/30/14.

582.00 WATER TABLE ELEVATION CONTOUR, DASHED WHERE INFERRED (FT. NAVD)
GROUNDWATER FLOW DIRECTION
MW7 582.30 MONITORING WELL AND WATER TABLE ELEVATION (FT. NAVD)
PZ24 (581.39) PIEZOMETER AND WATER TABLE ELEVATION (FT. NAVD)
MW11 ABANDONED MONITORING WELL
PZ2 ABANDONED PIEZOMETER
PW1 (565.62) PUMPING WELL AND WATER TABLE ELEVATION (FT. NAVD)
EXISTING BUILDING
APPROXIMATE EXTENT OF UPLAND SITE
FENCE
SHORELINE
FORMER MGP STRUCTURES
SG1 (579.07) STAFF GUAGE AND WATER ELEVATION (FT. NAVD)
NM NOT MEASURED
32' SOIL STABILIZED TO 32 FEET bgs (1993 AND 1994)
35' SOIL STABILIZED TO 35 FEET bgs (1993)
40' SOIL STABILIZED TO 40 FEET bgs (1993)

NOTES:
1. SHALLOW SAND WELL LOCATIONS (SCREENS ~580 MSL) ARE SHOWN IN GREEN.
2. DEEP SAND WELL LOCATIONS (SCREENS ~555 MSL) ARE SHOWN IN BLUE.
3. BEDROCK WELL LOCATIONS (SCREENS ~525 MSL) SHOWN IN ORANGE.
4. GROUNDWATER ELEVATIONS IN PARENTHESIS WERE NOT USED TO DEVELOP THE GROUNDWATER CONTOURS.

*NOTE:
WELL LOCATION MW14 WAS DAMAGED AND NOT MEASURED DURING THE MAY 2014 SAMPLING EVENT.

N
0 25 50
SCALE IN FEET

DRAWN BY: RLH DATE: 10/22/14
CHECKED BY: BGH DATE: 10/22/14
APPROVED BY: BGH DATE: 10/23/14
DRAWING NO: 1530-184-B17
REFERENCE: .

GROUNDWATER ELEVATION CONTOURS MAY 2014

REMEDIAL INVESTIGATION REPORT - REVISION 1
FORMER MANITOWOC MGP SITE
WISCONSIN PUBLIC SERVICE CORPORATION
MANITOWOC, WISCONSIN

NATURAL RESOURCE TECHNOLOGY

PROJECT NO.
1530/18.4

FIGURE NO.
17

Oct 23, 2014 5:05pm PLOTTED BY: rhopkins SAVED BY: rhopkins Layout1
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BEDROCK PIEZOMETRIC SURFACE CONTOURS MAY 2014

REMEDIAL INVESTIGATION REPORT - REVISION 1
FORMER MANITOWOC MGP SITE
WISCONSIN PUBLIC SERVICE CORPORATION
MANITOWOC, WISCONSIN

DRAWN BY:	RLH	DATE: 10/23/14
CHECKED BY:	BGH	DATE: 10/23/14
APPROVED BY:	BGH	DATE: 10/23/14
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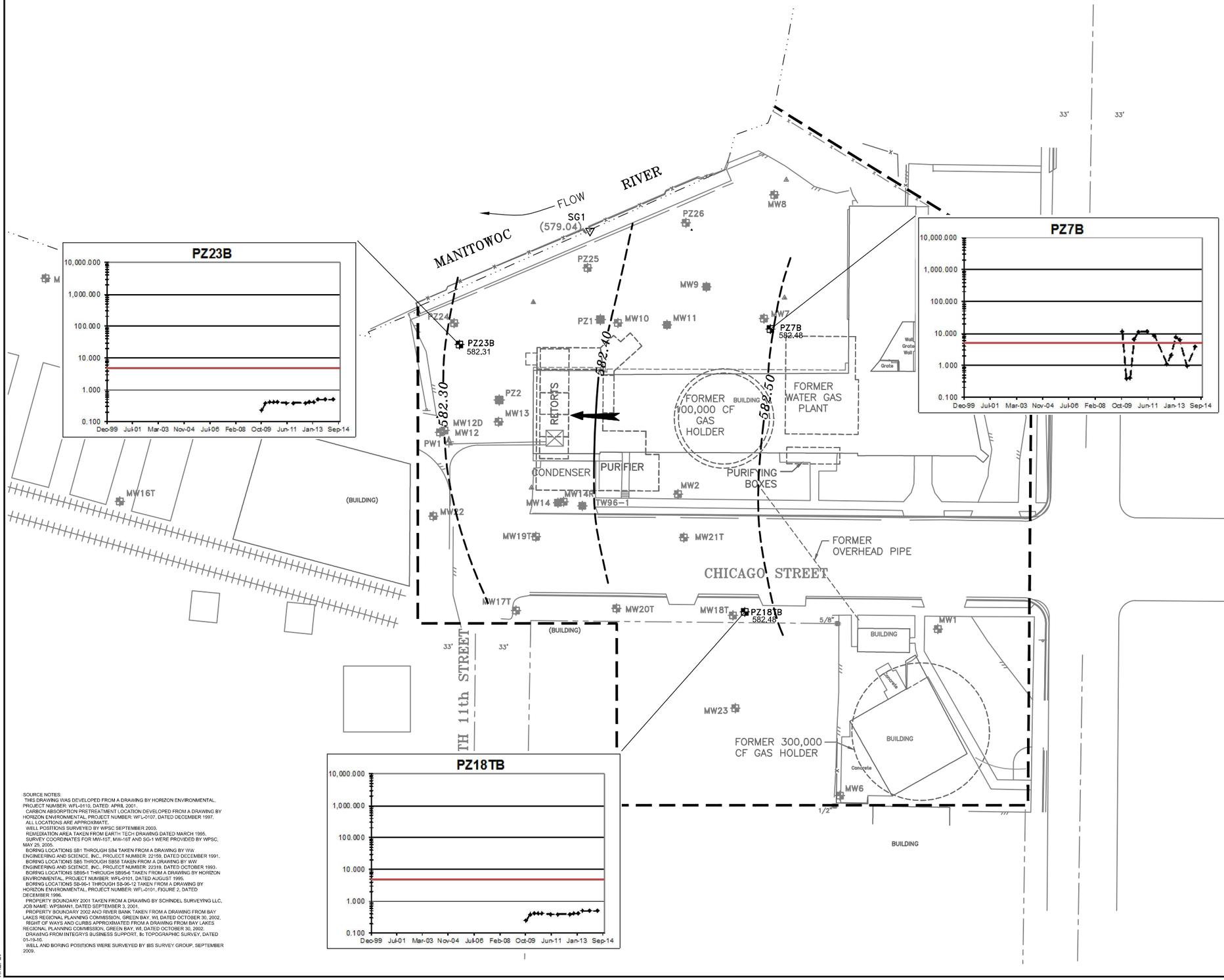

SOURCE NOTES:
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CARBON ABSORPTION PRETREATMENT LOCATION DEVELOPED FROM A DRAWING BY HORIZON ENVIRONMENTAL, PROJECT NUMBER: WFL-0107, DATED DECEMBER 1997.
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BORING LOCATIONS SB5 THROUGH SB58 TAKEN FROM A DRAWING BY WW ENGINEERING AND SCIENCE, INC., PROJECT NUMBER: 22319, DATED OCTOBER 1993.
BORING LOCATIONS SB95-1 THROUGH SB95-6 TAKEN FROM A DRAWING BY HORIZON ENVIRONMENTAL, PROJECT NUMBER: WFL-0101, DATED AUGUST 1995.
BORING LOCATIONS SB-96-1 THROUGH SB-96-12 TAKEN FROM A DRAWING BY HORIZON ENVIRONMENTAL, PROJECT NUMBER: WFL-0101, FIGURE 2, DATED DECEMBER 1996.
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WELL AND BORING POSITIONS WERE SURVEYED BY IBS SURVEY GROUP, SEPTEMBER 2009.

NATURAL RESOURCE TECHNOLOGY

PROJECT NO.
1530/18.4

FIGURE NO.
18

Oct 24, 2014 11:25am PLOTTED BY: rhopkins SAVED BY: rhopkins
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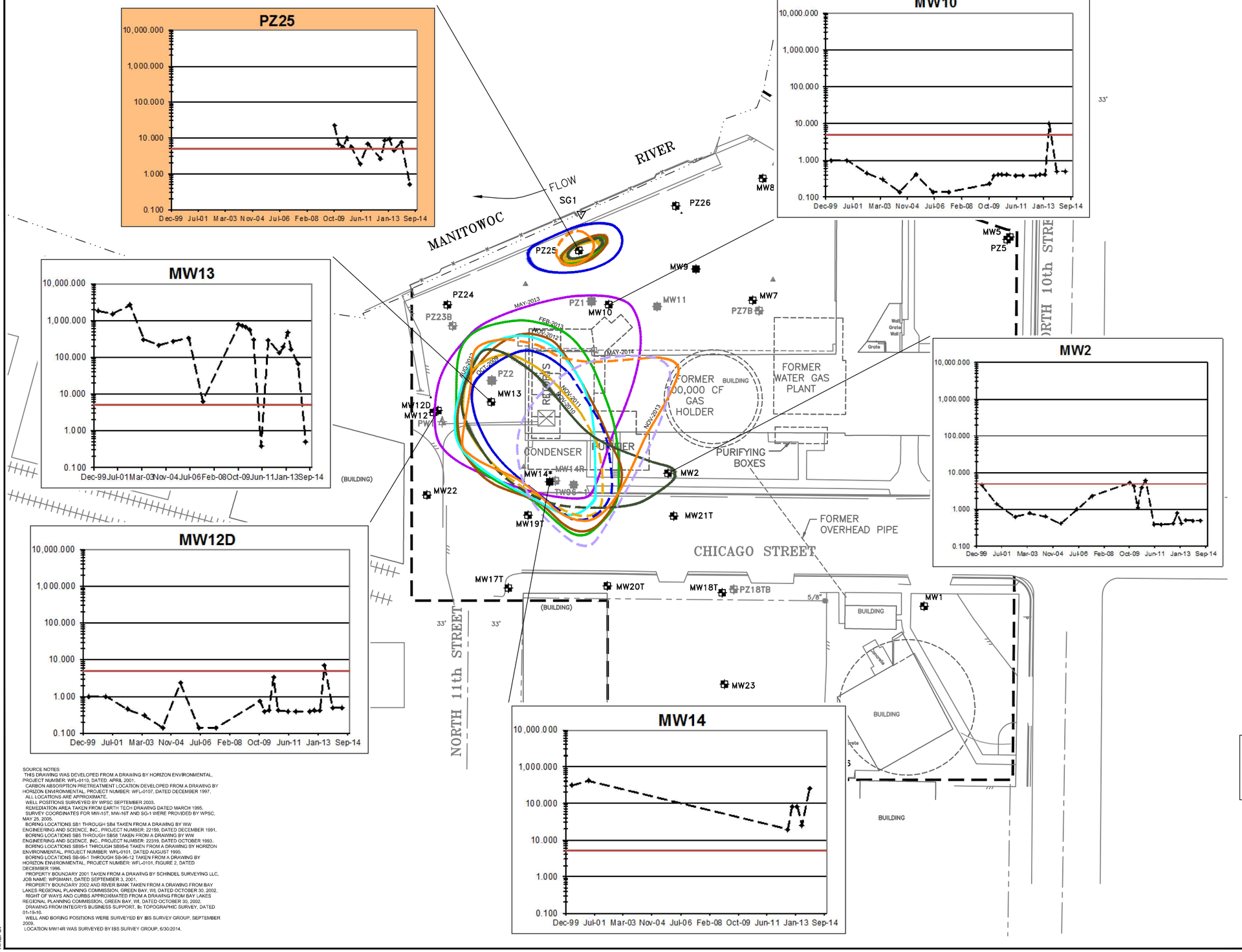

SOURCE NOTES:
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BORING LOCATIONS SB5 THROUGH SB56 TAKEN FROM A DRAWING BY WW ENGINEERING AND SCIENCE, INC., PROJECT NUMBER: 22319, DATED OCTOBER 1993.
BORING LOCATIONS SB95-1 THROUGH SB95-6 TAKEN FROM A DRAWING BY HORIZON ENVIRONMENTAL, PROJECT NUMBER: WFL-0101, DATED AUGUST 1995.
BORING LOCATIONS SB-96-1 THROUGH SB-96-12 TAKEN FROM A DRAWING BY HORIZON ENVIRONMENTAL, PROJECT NUMBER: WFL-0101, FIGURE 2, DATED DECEMBER 1996.
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WELL AND BORING POSITIONS WERE SURVEYED BY IBS SURVEY GROUP, SEPTEMBER 2009.
LOCATION MW14R WAS SURVEYED BY IBS SURVEY GROUP, 6/30/2014.

ESTIMATED EXTENT OF BENZENE, **OCTOBER 2009**, DASHED WHERE INFERRED
ESTIMATED EXTENT OF BENZENE, **NOVEMBER 2010**, DASHED WHERE INFERRED
ESTIMATED EXTENT OF BENZENE, **NOVEMBER 2011**, DASHED WHERE INFERRED
ESTIMATED EXTENT OF BENZENE, **AUGUST 2012**
ESTIMATED EXTENT OF BENZENE, **NOVEMBER 2012**
ESTIMATED EXTENT OF BENZENE, **FEBRUARY 2013**
ESTIMATED EXTENT OF BENZENE, **MAY 2013**
ESTIMATED EXTENT OF BENZENE, **NOVEMBER 2013**, DASHED WHERE INFERRED
ESTIMATED EXTENT OF BENZENE, **MAY 2014**, DASHED WHERE INFERRED
MW7 MONITORING WELL
PZ24 PIEZOMETER
PZ27B BEDROCK PIEZOMETER
MW11 ABANDONED MONITORING WELL
PZ2 ABANDONED PIEZOMETER
PW1 PUMPING WELL
EXISTING BUILDING
APPROXIMATE EXTENT OF UPLAND SITE
FENCE
SHORELINE
FORMER MGP STRUCTURES
SG1 STAFF GUAGE

NOTES:
1. SHALLOW AND DEEP SAND WELLS WERE USED TO DEVELOP ISOCONCENTRATION CONTOURS.
2. 2009 SAMPLES WERE COLLECTED USING BAILER METHODS.

* MW14 WAS OBSTRUCTED WITH BENTONITE IN MAY 2014, THE ANALYTICAL RESULT FROM THE PREVIOUS ROUND WAS USED TO ESTIMATE ISOCONCENTRATION LINES FOR MAY 2014.

DUE TO LOCATION WITHIN THE ISS MONOLITH AND FIELD OBSERVATIONS, THE PZ25 PARAMETER RESULTS WERE NOT COMBINED WITH OTHER LOCATIONS WHERE PARAMETERS EXCEEDED THE SLs.

BENZENE µg/L NON-DETECTS WERE PLOTTED USING THE FULL REPORTING LIMIT
BENZENE WI SL = 5 µg/L

N
0 30 60
SCALE IN FEET

DRAWN BY: RLH DATE: 10/22/14
CHECKED BY: BGH DATE: 10/22/14
APPROVED BY: BGH DATE: 10/23/14
DRAWING NO: 1530-184-B19
REFERENCE: .

BENZENE EXCEEDANCES IN NON-BEDROCK GROUNDWATER - COMPOSITE

REMEDIAL INVESTIGATION REPORT - REVISION 1
FORMER MANITOWOC MGP SITE
WISCONSIN PUBLIC SERVICE CORPORATION
MANITOWOC, WISCONSIN

NATURAL RESOURCE TECHNOLOGY

PROJECT NO.
1530/18.4

FIGURE NO.
19

Oct 23, 2014 5:09pm PLOTTED BY: rhopkins SAVED BY: rhopkins Layout1
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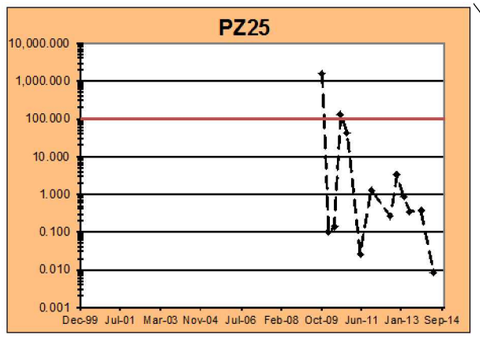

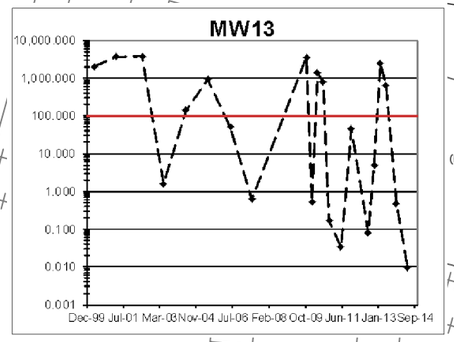

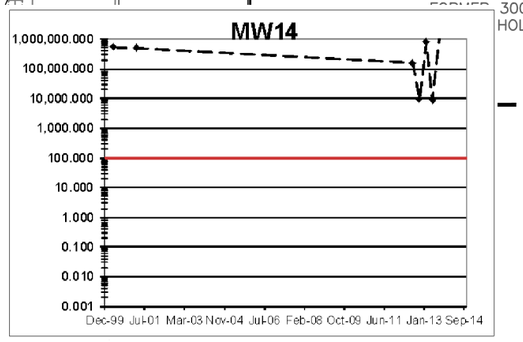

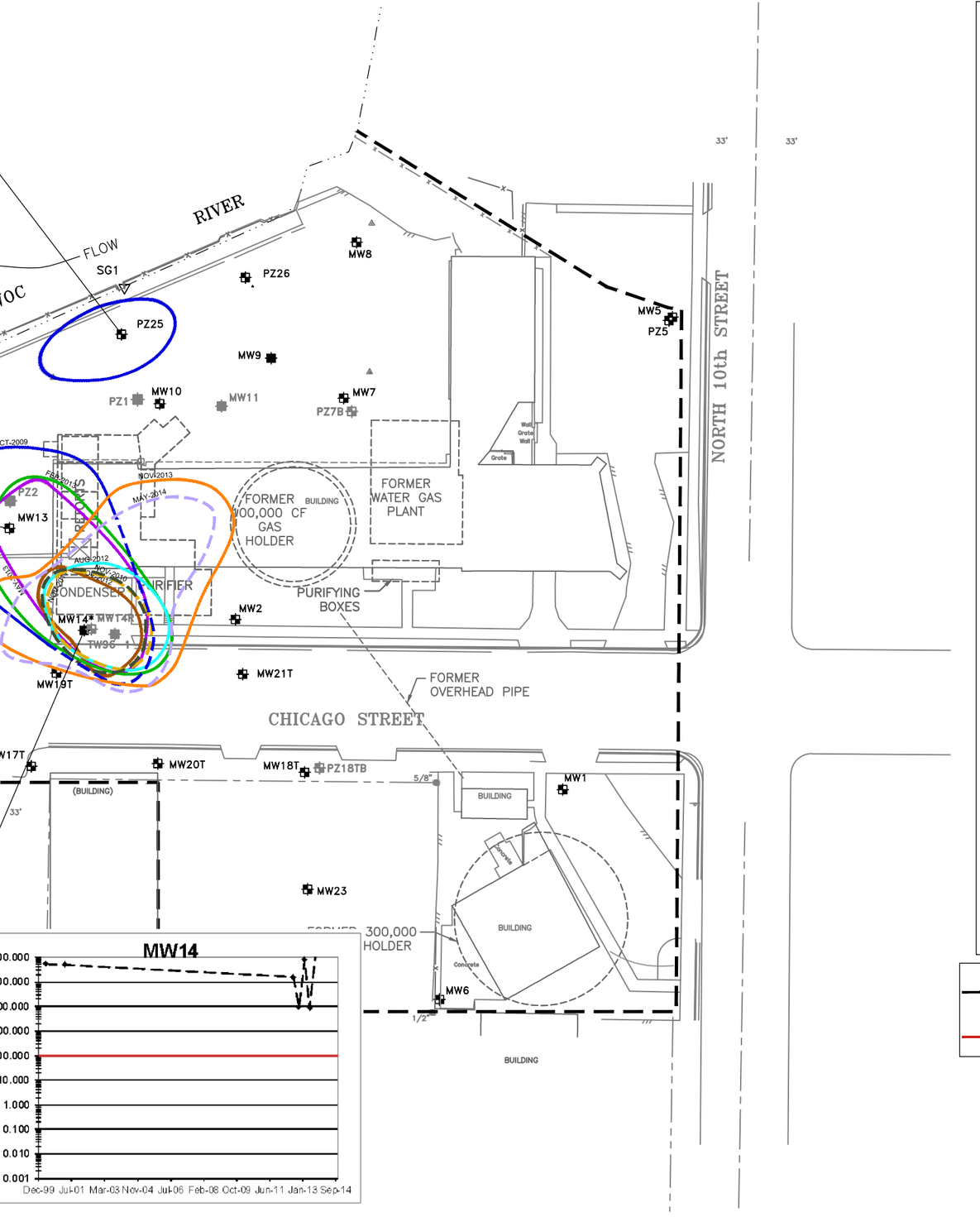

ESTIMATED EXTENT OF NAPHTHALENE, **OCTOBER 2009**

ESTIMATED EXTENT OF NAPHTHALENE, **NOVEMBER 2010**

ESTIMATED EXTENT OF NAPHTHALENE, **NOVEMBER 2011**

ESTIMATED EXTENT OF NAPHTHALENE, **AUGUST 2012**

ESTIMATED EXTENT OF NAPHTHALENE, **NOVEMBER 2012**

ESTIMATED EXTENT OF NAPHTHALENE, **FEBRUARY 2013**

ESTIMATED EXTENT OF NAPHTHALENE, **MAY 2013**

ESTIMATED EXTENT OF NAPHTHALENE, **NOVEMBER 2013**

ESTIMATED EXTENT OF NAPHTHALENE, **MAY 2014,** DASHED WHERE INFERRED

MW7 — MONITORING WELL

PZ27B — BEDROCK PIEZOMETER

PZ24 — PIEZOMETER

MW11 — ABANDONED MONITORING WELL

PZ2 — ABANDONED PIEZOMETER

PW1 — PUMPING WELL

EXISTING BUILDING

APPROXIMATE EXTENT OF UPLAND SITE

FENCE

SHORELINE

FORMER MGP STRUCTURES

SG1 — STAFF GUAGE

NOTES:
1. SHALLOW AND DEEP SAND WELLS WERE USED TO DEVELOP ISOCONCENTRATION CONTOURS.
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DUE TO LOCATION WITHIN THE ISS MONOLITH AND FIELD OBSERVATIONS, THE PZ25 PARAMETER RESULTS WERE NOT COMBINED WITH OTHER LOCATIONS WHERE PARAMETERS EXCEEDED THE SLs.

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NAPHTHALENE µg/L NON-DETECTS WERE PLOTTED USING THE FULL REPORTING LIMIT

NAPHTHALENE WI SL = 100 µg/L

N

0 30 60

SCALE IN FEET

SOURCE NOTES:
THIS DRAWING WAS DEVELOPED FROM A DRAWING BY HORIZON ENVIRONMENTAL, PROJECT NUMBER: WFL-0110, DATED: APRIL 2001.
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LOCATION MW14R WAS SURVEYED BY IBS SURVEY GROUP, 6/30/2014.

Oct 23, 2014 5:22pm PLOTTED BY: rhopkins SAVED BY: rhopkins
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CHECKED BY:	BGH	DATE: 10/22/14
APPROVED BY:	BGH	DATE: 10/23/14
DRAWING NO: 1530-184-B20		
REFERENCE:		

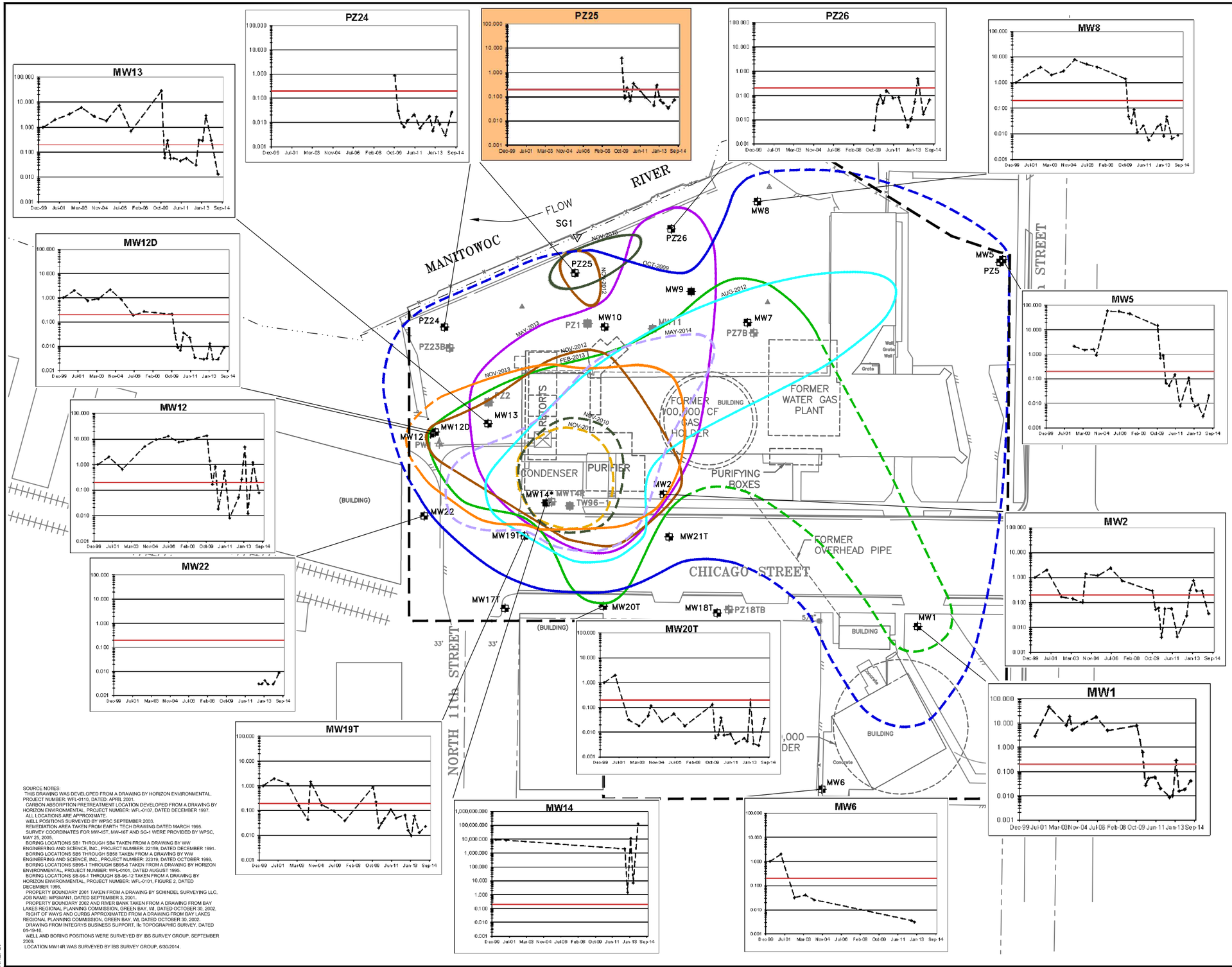
NAPHTHALENE EXCEEDANCES IN NON-BEDROCK GROUNDWATER - COMPOSITE

REMEDIAL INVESTIGATION REPORT - REVISION 1
FORMER MANITOWOC MGP SITE
WISCONSIN PUBLIC SERVICE CORPORATION
MANITOWOC, WISCONSIN

NATURAL RESOURCE TECHNOLOGY

PROJECT NO.
1530/18.4

FIGURE NO.
20



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BENZO(a)PYRENE EXCEEDANCES IN NON-BEDROCK GROUNDWATER - COMPOSITE

REMEDIAL INVESTIGATION REPORT - REVISION 1
FORMER MANITOWOC MGP SITE
WISCONSIN PUBLIC SERVICE CORPORATION
MANITOWOC, WISCONSIN

DRAWN BY:	RLH	DATE: 10/22/14
CHECKED BY:	BGH	DATE: 10/22/14
APPROVED BY:	BGH	DATE: 10/23/14
DRAWING NO: 1530-184-B21		
REFERENCE:		

NATURAL RESOURCE TECHNOLOGY

PROJECT NO.
1530/18.4

FIGURE NO.
21

Oct 23, 2014 5:28pm PLOTTED BY: rhopkins SAVED BY: rhopkins
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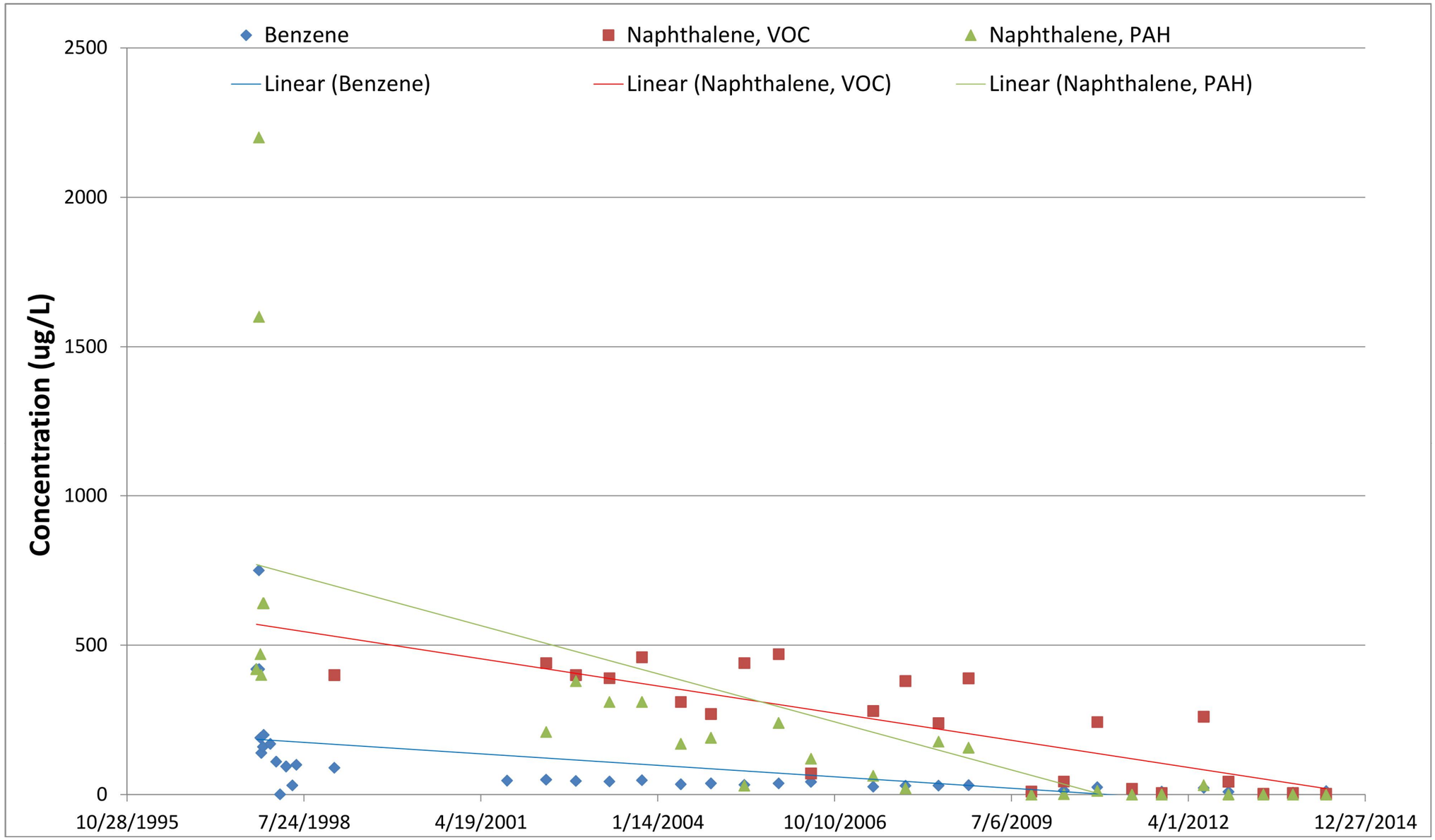

BENZENE AND NAPHTHALENE TRENDS IN GROUNDWATER TREATMENT SYSTEM INFLUENT

REMEDIAL INVESTIGATION REPORT - REVISION 1
FORMER MANITOWOC MGP SITE
WISCONSIN PUBLIC SERVICE CORPORATION
MANITOWOC, WISCONSIN

DRAWN BY:	RLH	DATE: 10/22/14
CHECKED BY:	BGH	DATE: 10/22/14
APPROVED BY:	BGH	DATE: 10/23/14

DRAWING NO: 1530-184-B22
REFERENCE:

NATURAL RESOURCE TECHNOLOGY

PROJECT NO.
1530/18.4

FIGURE NO.
22

Oct 23, 2014 5:33pm PLOTTED BY: rhopkins SAVED BY: rhopkins
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IMAGES:
XREFS:

SAMPLE LOCATION	SAMPLE DEPTH	BENZ	NAPH
SAMPLE DATE	FEET BELOW GROUND SURFACE	BENZENE (ug/m3)	NAPH-THALENE (ug/m3)
WI Industrial Soil Gas Screening Levels			
Cancer risk 10^{-5}		16	3.6
Cancer risk 10^{-4}		1300	130

Results above CR 10^{-5} are bold and Magenta

Results above CR 10^{-4} are bold and Magenta and highlighted

SLs used on this table are the most current USEPA Regional Screening Level (RSL) as presented in the Multi-Site Risk Assessment Framework Addendum Revision 3 (Exponent, July 2014).

SV103D	TOTAL DEPTH	SAMPLE DEPTH	BENZ	NAPH
8/9/2012	7	4-4.5	19	10
6/13/2013		4-4.5	< 1.1	< 1.9

SV102D	TOTAL DEPTH	SAMPLE DEPTH	BENZ	NAPH
6/13/2013	4	3-3.5	2.2	19
SV102SS	**TOTAL DEPTH**	**SAMPLE DEPTH**	**BENZ**	**NAPH**
8/9/2012	4	s ubs lab	< 1.2	56
6/13/2013		s ubs lab	< 1.1	< 1.9

SV105D	TOTAL DEPTH	SAMPLE DEPTH	BENZ	NAPH
8/9/2012	6	2.5-3	100,000	39,000

SV106D	TOTAL DEPTH	SAMPLE DEPTH	BENZ	NAPH
8/10/2012	7	6-6.5	4.2	12
6/13/2013		6-6.5	< 1.2	< 2

SV104D	TOTAL DEPTH	SAMPLE DEPTH	BENZ	NAPH
8/9/2012	7	5-5.5	< 1.1	4
6/13/2013		5-5.5	< 1.1	< 1.9

SV118	TOTAL DEPTH	SAMPLE DEPTH	BENZ	NAPH
6/12/2013	6.2	5.5-6	< 1.2	3.8

SV117	TOTAL DEPTH	SAMPLE DEPTH	BENZ	NAPH
8/8/2012	4.2	3-3.5	3.1	68
6/12/2013		3-3.5	< 1.2	3.8

SV116	TOTAL DEPTH	SAMPLE DEPTH	BENZ	NAPH
8/8/2012	7.8	6.5-7	4.6	8
6/12/2013		6.5-7	1.3	6.7

SV114D	TOTAL DEPTH	SAMPLE DEPTH	BENZ	NAPH
8/8/2012	8.5	7.5-8	5.2	10
6/12/2013		7.5-8	1.3	< 1.9

SV119	TOTAL DEPTH	SAMPLE DEPTH	BENZ	NAPH
8/8/2012	4	3-3.5	< 1.2	6.3
6/12/2013		3-3.5	< 1.1	< 1.9

SV113	TOTAL DEPTH	SAMPLE DEPTH	BENZ	NAPH
8/8/2012	8.5	2.5-3	1.5	4.1
6/12/2013		2.5-3	1.4	< 1.8
SV113D	**TOTAL DEPTH**	**SAMPLE DEPTH**	**BENZ**	**NAPH**
8/8/2012	8.5	7.5-8	2.9	4.4
6/12/2013		7.5-8	3.6	< 1.9

SV107	TOTAL DEPTH	SAMPLE DEPTH	BENZ	NAPH
8/22/2012	6.2	3.3-3.8	< 1.2	14
6/13/2013		3.3-3.8	< 1.2	< 1.9
3/8/2014		3.3-3.8	< 1.1	0.28

SV109	TOTAL DEPTH	SAMPLE DEPTH	BENZ	NAPH
8/9/2012	6	4-4.5	14	21
6/14/2013		4-4.5	< 1.2	< 1.9
3/8/2014		4-4.5	< 1	0.18

SV110	TOTAL DEPTH	SAMPLE DEPTH	BENZ	NAPH
6/14/2013	8	4-4.5	< 1.1	4.7

SV112	TOTAL DEPTH	SAMPLE DEPTH	BENZ	NAPH
3/8/2014	6	2.5-3	< 1.1	1.2
SV112D	**TOTAL DEPTH**	**SAMPLE DEPTH**	**BENZ**	**NAPH**
8/8/2012	6	5.5-6	1,600,000	120,000

SV108	TOTAL DEPTH	SAMPLE DEPTH	BENZ	NAPH
8/8/2012	6	2.5-3	1,400	50,000
6/14/2013		2.5-3	< 1.2	19
3/8/2014		2.5-3	340	0.31
SV108D	**TOTAL DEPTH**	**SAMPLE DEPTH**	**BENZ**	**NAPH**
8/8/2012	6	5.5-6	140,000	110,000

SV120	TOTAL DEPTH	SAMPLE DEPTH	BENZ	NAPH
8/9/2012	8	4.5-5	1.6	28
6/13/2013		4.5-5	< 1.1	< 1.9
SV120D	**TOTAL DEPTH**	**SAMPLE DEPTH**	**BENZ**	**NAPH**
8/9/2012	8	7.5-8	< 1.1	10
6/13/2013		7.5-8	< 1.1	< 1.8

SV121	TOTAL DEPTH	SAMPLE DEPTH	BENZ	NAPH
8/8/2012	7.5	4-4.5	< 1	76
8/22/2012		4-4.5	< 1.1	2.7
6/13/2013		4-4.5	< 1.1	< 1.9

SOURCE NOTES:
THIS DRAWING WAS DEVELOPED FROM A DRAWING BY HORIZON ENVIRONMENTAL, PROJECT NUMBER: WFL-0110, DATED: APRIL 2001.
CARBON ABSORPTION PRETREATMENT LOCATION DEVELOPED FROM A DRAWING BY HORIZON ENVIRONMENTAL, PROJECT NUMBER: WFL-0107, DATED DECEMBER 1997.
ALL LOCATIONS ARE APPROXIMATE.
WELL POSITIONS SURVEYED BY WPSC SEPTEMBER 2003.
REMEDIATION AREA TAKEN FROM EARTH TECH DRAWING DATED MARCH 1995.
SURVEY COORDINATES FOR MW-15T, MW-16T AND SG-1 WERE PROVIDED BY WPSC, MAY 25, 2005.
BORING LOCATIONS SB1 THROUGH SB4 TAKEN FROM A DRAWING BY WW ENGINEERING AND SCIENCE, INC., PROJECT NUMBER: 22159, DATED DECEMBER 1991.
BORING LOCATIONS SB5 THROUGH SB58 TAKEN FROM A DRAWING BY WW ENGINEERING AND SCIENCE, INC., PROJECT NUMBER: 22319, DATED OCTOBER 1993.
BORING LOCATIONS SB95-1 THROUGH SB95-6 TAKEN FROM A DRAWING BY HORIZON ENVIRONMENTAL, PROJECT NUMBER: WFL-0101, DATED AUGUST 1995.
BORING LOCATIONS SB-96-1 THROUGH SB-96-12 TAKEN FROM A DRAWING BY HORIZON ENVIRONMENTAL, PROJECT NUMBER: WFL-0101, FIGURE 2, DATED DECEMBER 1996.
PROPERTY BOUNDARY 2001 TAKEN FROM A DRAWING BY SCHINDEL SURVEYING LLC, JOB NAME: WPSMAN1, DATED SEPTEMBER 3, 2001.
PROPERTY BOUNDARY 2002 AND RIVER BANK TAKEN FROM A DRAWING FROM BAY LAKES REGIONAL PLANNING COMMISSION, GREEN BAY, WI, DATED OCTOBER 30, 2002.
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DRAWING FROM INTEGRYS BUSINESS SUPPORT, llc TOPOGRAPHIC SURVEY, DATED 01-19-10.
WELL AND BORING POSITIONS WERE SURVEYED BY IBS SURVEY GROUP, SEPTEMBER 2009.
LOCATION SV123 WAS SURVEYED BY IBS SURVEY GROUP, 6/30/2014.

SV107 SOIL VAPOR PROBE
IA126 INDOOR AIR SAMPLING LOCATION
AMB–1 AMBIENT SAMPLING LOCATION
SG1 STAFF GUAGE
EXISTING BUILDING
APPROXIMATE EXTENT OF UPLAND SITE
FENCE
SHORELINE
ELECTRIC LINE
GAS LINE
WATER MAIN
SANITARY SEWER
STORM SEWER
OVERHEAD POWERLINE
SHEET PILE WALL
UTILITY POLE
HYDRANT
MANHOLE
SANITARY MANHOLE
STORM MANHOLE
FORMER MGP STRUCTURES

SCALE IN FEET: 0 25 50

DRAWN BY: RLH DATE: 10/22/14
CHECKED BY: BGH DATE: 10/22/14
APPROVED BY: BGH DATE: 10/23/14
DRAWING NO: 1530-184-B23
REFERENCE: .

SOIL VAPOR - NAPHTHALENE AND BENZENE RESULTS

REMEDIAL INVESTIGATION REPORT - REVISION 1
FORMER MANITOWOC MGP SITE
WISCONSIN PUBLIC SERVICE CORPORATION
MANITOWOC, WISCONSIN

NATURAL RESOURCE TECHNOLOGY

PROJECT NO. 1530/18.4

FIGURE NO. 23

Oct 23, 2014 5:00pm PLOTTED BY: rhopkins SAVED BY: rhopkins Layout1
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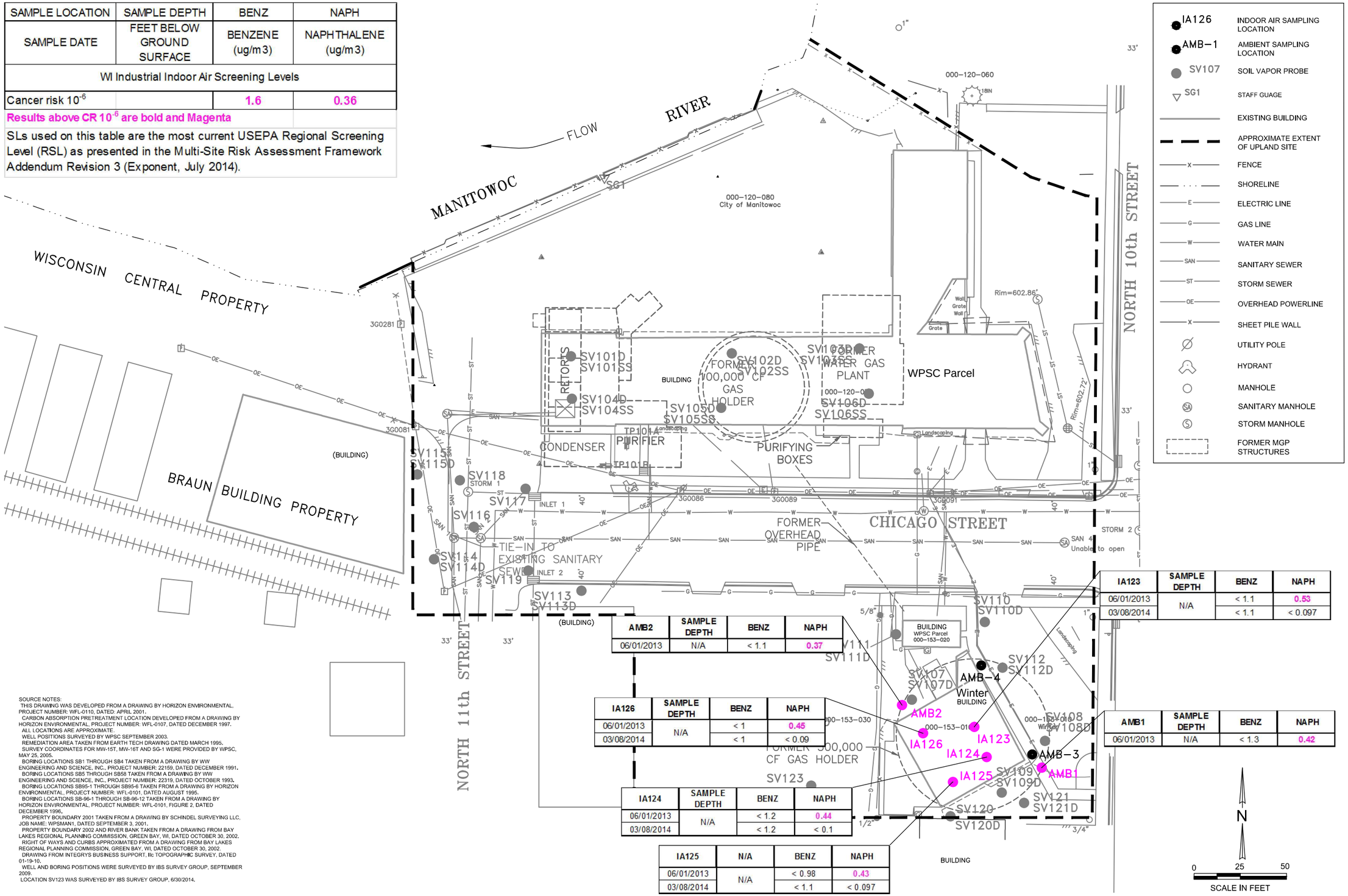
IMAGES:
XREFS:

SAMPLE LOCATION	SAMPLE DEPTH	BENZ	NAPH
SAMPLE DATE	FEET BELOW GROUND SURFACE	BENZENE (ug/m3)	NAPHTHALENE (ug/m3)
WI Industrial Indoor Air Screening Levels			
Cancer risk 10^{-6}		**1.6**	**0.36**

Results above CR 10^{-6} are bold and Magenta

SLs used on this table are the most current USEPA Regional Screening Level (RSL) as presented in the Multi-Site Risk Assessment Framework Addendum Revision 3 (Exponent, July 2014).



AMB2	SAMPLE DEPTH	BENZ	NAPH
06/01/2013	N/A	< 1.1	**0.37**

IA126	SAMPLE DEPTH	BENZ	NAPH
06/01/2013	N/A	< 1	**0.45**
03/08/2014		< 1	< 0.09

IA124	SAMPLE DEPTH	BENZ	NAPH
06/01/2013	N/A	< 1.2	**0.44**
03/08/2014		< 1.2	< 0.1

IA125	N/A	BENZ	NAPH
06/01/2013	N/A	< 0.98	**0.43**
03/08/2014		< 1.1	< 0.097

IA123	SAMPLE DEPTH	BENZ	NAPH
06/01/2013	N/A	< 1.1	**0.53**
03/08/2014		< 1.1	< 0.097

AMB1	SAMPLE DEPTH	BENZ	NAPH
06/01/2013	N/A	< 1.3	**0.42**

IA126 INDOOR AIR SAMPLING LOCATION
AMB-1 AMBIENT SAMPLING LOCATION
SV107 SOIL VAPOR PROBE
SG1 STAFF GUAGE
EXISTING BUILDING
APPROXIMATE EXTENT OF UPLAND SITE
FENCE
SHORELINE
ELECTRIC LINE
GAS LINE
WATER MAIN
SANITARY SEWER
STORM SEWER
OVERHEAD POWERLINE
SHEET PILE WALL
UTILITY POLE
HYDRANT
MANHOLE
SANITARY MANHOLE
STORM MANHOLE
FORMER MGP STRUCTURES

N

0 25 50
SCALE IN FEET

SOURCE NOTES:
THIS DRAWING WAS DEVELOPED FROM A DRAWING BY HORIZON ENVIRONMENTAL, PROJECT NUMBER: WFL-0110, DATED: APRIL 2001.
CARBON ABSORPTION PRETREATMENT LOCATION DEVELOPED FROM A DRAWING BY HORIZON ENVIRONMENTAL, PROJECT NUMBER: WFL-0107, DATED DECEMBER 1997.
ALL LOCATIONS ARE APPROXIMATE.
WELL POSITIONS SURVEYED BY WPSC SEPTEMBER 2003.
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SURVEY COORDINATES FOR MW-15T, MW-16T AND SG-1 WERE PROVIDED BY WPSC, MAY 25, 2005.
BORING LOCATIONS SB1 THROUGH SB4 TAKEN FROM A DRAWING BY WW ENGINEERING AND SCIENCE, INC., PROJECT NUMBER: 22159, DATED DECEMBER 1991.
BORING LOCATIONS SB5 THROUGH SB58 TAKEN FROM A DRAWING BY WW ENGINEERING AND SCIENCE, INC., PROJECT NUMBER: 22319, DATED OCTOBER 1993.
BORING LOCATIONS SB95-1 THROUGH SB95-6 TAKEN FROM A DRAWING BY HORIZON ENVIRONMENTAL, PROJECT NUMBER: WFL-0101, DATED AUGUST 1995.
BORING LOCATIONS SB-96-1 THROUGH SB-96-12 TAKEN FROM A DRAWING BY HORIZON ENVIRONMENTAL, PROJECT NUMBER: WFL-0101, FIGURE 2, DATED DECEMBER 1996.
PROPERTY BOUNDARY 2001 TAKEN FROM A DRAWING BY SCHINDEL SURVEYING LLC, JOB NAME: WPSMAN1, DATED SEPTEMBER 3, 2001.
PROPERTY BOUNDARY 2002 AND RIVER BANK TAKEN FROM A DRAWING FROM BAY LAKES REGIONAL PLANNING COMMISSION, GREEN BAY, WI, DATED OCTOBER 30, 2002.
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DRAWING FROM INTEGRYS BUSINESS SUPPORT, llc TOPOGRAPHIC SURVEY, DATED 01-19-10.
WELL AND BORING POSITIONS WERE SURVEYED BY IBS SURVEY GROUP, SEPTEMBER 2009.
LOCATION SV123 WAS SURVEYED BY IBS SURVEY GROUP, 6/30/2014.

Oct 23, 2014 5:56pm PLOTTED BY: rhopkins SAVED BY: rhopkins Layout1
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IMAGES:
XREFS:

DRAWN BY: RLH DATE: 10/22/14
CHECKED BY: BGH DATE: 10/22/14
APPROVED BY: BGH DATE: 10/23/14
DRAWING NO: 1530-184-B24
REFERENCE: .

INDOOR AIR - NAPHTHALENE AND BENZENE RESULTS

REMEDIAL INVESTIGATION REPORT - REVISION 1
FORMER MANITOWOC MGP SITE
WISCONSIN PUBLIC SERVICE CORPORATION
MANITOWOC, WISCONSIN

NATURAL RESOURCE TECHNOLOGY

PROJECT NO.
1530/18.4

FIGURE NO.
24

SAMPLE LOCATION	SAMPLE DEPTH	BENZ	NAPH
SAMPLE DATE	FEET BELOW GROUND SURFACE	BENZENE (ug/m3)	NAPH-THALENE (ug/m3)
WI Industrial Soil Gas Screening Levels			
Cancer risk 10^{-5}		16	3.6
Cancer risk 10^{-4}		1300	130

Results above CR 10^{-5} are bold and Magenta

Results above CR 10^{-4} are bold and Magenta and highlighted

SLs used on this table are the most current USEPA Regional Screening Level (RSL) as presented in the Multi-Site Risk Assessment Framework Addendum Revision 3 (Exponent, July 2014).

SV102D	TOTAL DEPTH	SAMPLE DEPTH	BENZ	NAPH
6/13/2013	4	3-3.5	2.2	19
SV102SS	**TOTAL DEPTH**	**SAMPLE DEPTH**	**BENZ**	**NAPH**
8/9/2012	4	subslab	< 1.2	56
6/13/2013		subslab	< 1.1	< 1.9

SV103D	TOTAL DEPTH	SAMPLE DEPTH	BENZ	NAPH
8/9/2012	7	4-4.5	19	10
6/13/2013		4-4.5	< 1.1	< 1.9

SV105D	TOTAL DEPTH	SAMPLE DEPTH	BENZ	NAPH
8/9/2012	6	2.5-3	100,000	39,000

SV104D	TOTAL DEPTH	SAMPLE DEPTH	BENZ	NAPH
8/9/2012	7	5-5.5	< 1.1	4
6/13/2013		5-5.5	< 1.1	< 1.9

SV106D	TOTAL DEPTH	SAMPLE DEPTH	BENZ	NAPH
8/10/2012	7	6-6.5	4.2	12
6/13/2013		6-6.5	< 1.2	< 2

SV118	TOTAL DEPTH	SAMPLE DEPTH	BENZ	NAPH
6/12/2013	6.2	5.5-6	< 1.2	3.8

SV117	TOTAL DEPTH	SAMPLE DEPTH	BENZ	NAPH
8/8/2012	4.2	3-3.5	3.1	68
6/12/2013		3-3.5	< 1.2	3.8

SV116	TOTAL DEPTH	SAMPLE DEPTH	BENZ	NAPH
8/8/2012	7.8	6.5-7	4.6	8
6/12/2013		6.5-7	1.3	6.7

SV114D	TOTAL DEPTH	SAMPLE DEPTH	BENZ	NAPH
8/8/2012	8.5	7.5-8	5.2	10
6/12/2013		7.5-8	1.3	< 1.9

SV119	TOTAL DEPTH	SAMPLE DEPTH	BENZ	NAPH
8/8/2012	4	3-3.5	< 1.2	6.3
6/12/2013		3-3.5	< 1.1	< 1.9

SV113	TOTAL DEPTH	SAMPLE DEPTH	BENZ	NAPH
8/8/2012	8.5	2.5-3	1.5	4.1
6/12/2013		2.5-3	1.4	< 1.8
SV113D	**TOTAL DEPTH**	**SAMPLE DEPTH**	**BENZ**	**NAPH**
8/8/2012	8.5	7.5-8	2.9	4.4
6/12/2013		7.5-8	3.6	< 1.9

SV107	TOTAL DEPTH	SAMPLE DEPTH	BENZ	NAPH
8/22/2012	6.2	3.3-3.8	< 1.2	14
6/13/2013		3.3-3.8	< 1.2	< 1.9
3/8/2014		3.3-3.8	< 1.1	0.28

SV109	TOTAL DEPTH	SAMPLE DEPTH	BENZ	NAPH
8/9/2012	6	4-4.5	14	21
6/14/2013		4-4.5	< 1.2	< 1.9
3/8/2014		4-4.5	< 1	0.18

SV120	TOTAL DEPTH	SAMPLE DEPTH	BENZ	NAPH
8/9/2012	8	4.5-5	1.6	28
6/13/2013		4.5-5	< 1.1	< 1.9
SV120D	**TOTAL DEPTH**	**SAMPLE DEPTH**	**BENZ**	**NAPH**
8/9/2012	8	7.5-8	< 1.1	10
6/13/2013		7.5-8	< 1.1	< 1.8

SV121	TOTAL DEPTH	SAMPLE DEPTH	BENZ	NAPH
8/8/2012	7.5	4-4.5	< 1	76
8/22/2012		4-4.5	< 1.1	2.7
6/13/2013		4-4.5	< 1.1	< 1.9

SV112	TOTAL DEPTH	SAMPLE DEPTH	BENZ	NAPH
3/8/2014	6	2.5-3	< 1.1	1.2
SV112D	**TOTAL DEPTH**	**SAMPLE DEPTH**	**BENZ**	**NAPH**
8/8/2012	6	5.5-6	1,600,000	120,000

SV110	TOTAL DEPTH	SAMPLE DEPTH	BENZ	NAPH
6/14/2013	8	4-4.5	< 1.1	4.7

Unable to open

SV108	TOTAL DEPTH	SAMPLE DEPTH	BENZ	NAPH
8/8/2012	6	2.5-3	1,400	50,000
6/14/2013		2.5-3	< 1.2	19
3/8/2014		2.5-3	340	0.31
SV108D	**TOTAL DEPTH**	**SAMPLE DEPTH**	**BENZ**	**NAPH**
8/8/2012	6	5.5-6	140,000	110,000

SOURCE NOTES:
THIS DRAWING WAS DEVELOPED FROM A DRAWING BY HORIZON ENVIRONMENTAL, PROJECT NUMBER: WFL-0110, DATED: APRIL 2001,
CARBON ABSORPTION PRETREATMENT LOCATION DEVELOPED FROM A DRAWING BY HORIZON ENVIRONMENTAL, PROJECT NUMBER: WFL-0107, DATED DECEMBER 1997.
ALL LOCATIONS ARE APPROXIMATE.
WELL POSITIONS SURVEYED BY WPSC SEPTEMBER 2003.
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SURVEY COORDINATES FOR MW-15T, MW-16T AND SG-1 WERE PROVIDED BY WPSC, MAY 25, 2005,
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BORING LOCATIONS SB5 THROUGH SB58 TAKEN FROM A DRAWING BY WW ENGINEERING AND SCIENCE, INC., PROJECT NUMBER: 22319, DATED OCTOBER 1993,
BORING LOCATIONS SB95-1 THROUGH SB95-8 TAKEN FROM A DRAWING BY HORIZON ENVIRONMENTAL, PROJECT NUMBER: WFL-0101, DATED AUGUST 1995,
BORING LOCATIONS SB-96-1 THROUGH SB-96-12 TAKEN FROM A DRAWING BY HORIZON ENVIRONMENTAL, PROJECT NUMBER: WFL-0101, FIGURE 2, DATED DECEMBER 1996,
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PROPERTY BOUNDARY 2002 AND RIVER BANK TAKEN FROM A DRAWING FROM BAY LAKES REGIONAL PLANNING COMMISSION, GREEN BAY, WI, DATED OCTOBER 30, 2002.
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DRAWING FROM INTEGRYS BUSINESS SUPPORT, llc TOPOGRAPHIC SURVEY, DATED 01-19-10,
WELL AND BORING POSITIONS WERE SURVEYED BY IBS SURVEY GROUP, SEPTEMBER 2009.
LOCATIONS MW14R AND SV123 WERE SURVEYED BY IBS SURVEY GROUP, 6/30/2014.

NOTES:
1. 35-FOOT BOUNDARY FOR POTENTIAL SOIL GAS IMPACTS.
2. SHALLOW GROUNDWATER RESULTS WERE SELECTED AT NESTED WELL LOCATIONS.

- ESTIMATED EXTENT OF BENZENE CONCENTRATIONS EXCEEDING SCREENING LEVEL (1.6 µg/L)
- 35-FOOT BOUNDARY (SEE NOTE 1)
- MW7 <0.5 — MONITORING WELL AND BENZENE CONCENTRATION (µg/L)
- PZ24 — PIEZOMETER
- PZ23B <0.5 — BEDROCK PIEZOMETER
- MW14 — ABANDONED MONITORING WELL
- PW1 — PUMPING WELL
- SV107 — SOIL VAPOR PROBE
- IA126 — INDOOR AIR SAMPLING LOCATION
- AMB–1 — AMBIENT SAMPLING LOCATION
- NM — NOT MEASURED
- SG1 — STAFF GUAGE
- EXISTING BUILDING
- APPROXIMATE EXTENT OF UPLAND SITE
- FENCE
- SHORELINE
- ELECTRIC LINE
- GAS LINE
- WATER MAIN
- SANITARY SEWER
- STORM SEWER
- OVERHEAD POWERLINE
- SHEET PILE WALL
- UTILITY POLE
- HYDRANT
- MANHOLE
- SANITARY MANHOLE
- STORM MANHOLE
- FORMER MGP STRUCTURES

N

0 25 50

SCALE IN FEET

DRAWN BY: RLH DATE: 10/22/14
CHECKED BY: BGH DATE: 10/22/14
APPROVED BY: BGH DATE: 10/23/14
DRAWING NO: 1530-184-B25
REFERENCE:

MAY 2014 GROUNDWATER SCREENING LEVEL FOR PROTECTION OF RESIDENTIAL INDOOR AIR-BENZENE (10^{-6} CANCER RISK OF 10^{-5})

REMEDIAL INVESTIGATION REPORT - REVISION 1
FORMER MANITOWOC MGP SITE
WISCONSIN PUBLIC SERVICE CORPORATION
MANITOWOC, WISCONSIN

NATURAL RESOURCE TECHNOLOGY

PROJECT NO. 1530/18.4

FIGURE NO. 25

Oct 23, 2014 5:38pm PLOTTED BY: rhopkins SAVED BY: rhopkins Layout1
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IMAGES:
XREFS:

SAMPLE LOCATION	SAMPLE DEPTH	BENZ	NAPH
SAMPLE DATE	FEET BELOW GROUND SURFACE	BENZENE (ug/m3)	NAPH-THALENE (ug/m3)
WI Industrial Soil Gas Screening Levels			
Cancer risk 10^{-5}		16	3.6
Cancer risk 10^{-4}		1300	130

Results above CR 10^{-5} are bold and Magenta

Results above CR 10^{-4} are bold and Magenta and highlighted

SLs used on this table are the most current USEPA Regional Screening Level (RSL) as presented in the Multi-Site Risk Assessment Framework Addendum Revision 3 (Exponent, July 2014).

SV102D	TOTAL DEPTH	SAMPLE DEPTH	BENZ	NAPH
6/13/2013	4	3-3.5	2.2	19
SV102SS	TOTAL DEPTH	SAMPLE DEPTH	BENZ	NAPH
8/9/2012	4	subslab	< 1.2	56
6/13/2013		subslab	< 1.1	< 1.9

SV103D	TOTAL DEPTH	SAMPLE DEPTH	BENZ	NAPH
8/9/2012	7	4-4.5	19	10
6/13/2013		4-4.5	< 1.1	< 1.9

SV105D	TOTAL DEPTH	SAMPLE DEPTH	BENZ	NAPH
8/9/2012	6	2.5-3	100,000	39,000

SV104D	TOTAL DEPTH	SAMPLE DEPTH	BENZ	NAPH
8/9/2012	7	5-5.5	< 1.1	4
6/13/2013		5-5.5	< 1.1	< 1.9

SV106D	TOTAL DEPTH	SAMPLE DEPTH	BENZ	NAPH
8/10/2012	7	6-6.5	4.2	12
6/13/2013		6-6.5	< 1.2	< 2

SV118	TOTAL DEPTH	SAMPLE DEPTH	BENZ	NAPH
6/12/2013	6.2	5.5-6	< 1.2	3.8

SV117	TOTAL DEPTH	SAMPLE DEPTH	BENZ	NAPH
8/8/2012	4.2	3-3.5	3.1	68
6/12/2013		3-3.5	< 1.2	3.8

SV116	TOTAL DEPTH	SAMPLE DEPTH	BENZ	NAPH
8/8/2012	7.8	6.5-7	4.6	8
6/12/2013		6.5-7	1.3	6.7

SV114D	TOTAL DEPTH	SAMPLE DEPTH	BENZ	NAPH
8/8/2012	8.5	7.5-8	5.2	10
6/12/2013		7.5-8	1.3	< 1.9

SV119	TOTAL DEPTH	SAMPLE DEPTH	BENZ	NAPH
8/8/2012	4	3-3.5	< 1.2	6.3
6/12/2013		3-3.5	< 1.1	< 1.9

SV113	TOTAL DEPTH	SAMPLE DEPTH	BENZ	NAPH
8/8/2012	8.5	2.5-3	1.5	4.1
6/12/2013		2.5-3	1.4	< 1.8
SV113D	TOTAL DEPTH	SAMPLE DEPTH	BENZ	NAPH
8/8/2012	8.5	7.5-8	2.9	4.4
6/12/2013		7.5-8	3.6	< 1.9

SV107	TOTAL DEPTH	SAMPLE DEPTH	BENZ	NAPH
8/22/2012	6.2	3.3-3.8	< 1.2	14
6/13/2013		3.3-3.8	< 1.2	< 1.9
3/8/2014		3.3-3.8	< 1.1	0.28

SV109	TOTAL DEPTH	SAMPLE DEPTH	BENZ	NAPH
8/9/2012	6	4-4.5	14	21
6/14/2013		4-4.5	< 1.2	< 1.9
3/8/2014		4-4.5	< 1	0.18

SV120	TOTAL DEPTH	SAMPLE DEPTH	BENZ	NAPH
8/9/2012	8	4.5-5	1.6	28
6/13/2013		4.5-5	< 1.1	< 1.9
SV120D	TOTAL DEPTH	SAMPLE DEPTH	BENZ	NAPH
8/9/2012	8	7.5-8	< 1.1	10
6/13/2013		7.5-8	< 1.1	< 1.8

SV112	TOTAL DEPTH	SAMPLE DEPTH	BENZ	NAPH
3/8/2014	6	2.5-3	< 1.1	1.2
SV112D	TOTAL DEPTH	SAMPLE DEPTH	BENZ	NAPH
8/8/2012	6	5.5-6	1,600,000	120,000

SV110	TOTAL DEPTH	SAMPLE DEPTH	BENZ	NAPH
6/14/2013	8	4-4.5	< 1.1	4.7

Unable to open

SV121	TOTAL DEPTH	SAMPLE DEPTH	BENZ	NAPH
8/8/2012	7.5	4-4.5	< 1	76
8/22/2012		4-4.5	< 1.1	2.7
6/13/2013		4-4.5	< 1.1	< 1.9

SV108	TOTAL DEPTH	SAMPLE DEPTH	BENZ	NAPH
8/8/2012	6	2.5-3	1,400	50,000
6/14/2013		2.5-3	< 1.2	19
3/8/2014		2.5-3	340	0.31
SV108D	TOTAL DEPTH	SAMPLE DEPTH	BENZ	NAPH
8/8/2012	6	5.5-6	140,000	110,000

SOURCE NOTES:
THIS DRAWING WAS DEVELOPED FROM A DRAWING BY HORIZON ENVIRONMENTAL, PROJECT NUMBER: WFL-0110, DATED: APRIL 2001.
CARBON ABSORPTION PRETREATMENT LOCATION DEVELOPED FROM A DRAWING BY HORIZON ENVIRONMENTAL, PROJECT NUMBER: WFL-0107, DATED DECEMBER 1997.
ALL LOCATIONS ARE APPROXIMATE.
WELL POSITIONS SURVEYED BY WPSC SEPTEMBER 2003.
REMEDIATION AREA TAKEN FROM EARTH TECH DRAWING DATED MARCH 1995.
SURVEY COORDINATES FOR MW-15T, MW-16T AND SG-1 WERE PROVIDED BY WPSC, MAY 25, 2005.
BORING LOCATIONS SB1 THROUGH SB4 TAKEN FROM A DRAWING BY WW ENGINEERING AND SCIENCE, INC., PROJECT NUMBER: 22159, DATED DECEMBER 1991.
BORING LOCATIONS SB5 THROUGH SB58 TAKEN FROM A DRAWING BY WW ENGINEERING AND SCIENCE, INC., PROJECT NUMBER: 22319, DATED OCTOBER 1993.
BORING LOCATIONS SB95-1 THROUGH SB95-6 TAKEN FROM A DRAWING BY HORIZON ENVIRONMENTAL, PROJECT NUMBER: WFL-0101, DATED AUGUST 1995.
BORING LOCATIONS SB-96-1 THROUGH SB-96-12 TAKEN FROM A DRAWING BY HORIZON ENVIRONMENTAL, PROJECT NUMBER: WFL-0101, FIGURE 2, DATED DECEMBER 1996.
PROPERTY BOUNDARY 2001 TAKEN FROM A DRAWING BY SCHINDEL SURVEYING LLC, JOB NAME: WPSMAN1, DATED SEPTEMBER 3, 2001.
PROPERTY BOUNDARY 2002 AND RIVER BANK TAKEN FROM A DRAWING FROM BAY LAKES REGIONAL PLANNING COMMISSION, GREEN BAY, WI, DATED OCTOBER 30, 2002.
RIGHT OF WAYS AND CURBS APPROXIMATED FROM A DRAWING FROM BAY LAKES REGIONAL PLANNING COMMISSION, GREEN BAY, WI, DATED OCTOBER 30, 2002.
DRAWING FROM INTEGRYS BUSINESS SUPPORT, llc TOPOGRAPHIC SURVEY, DATED 01-19-10.
WELL AND BORING POSITIONS WERE SURVEYED BY IBS SURVEY GROUP, SEPTEMBER 2009.
LOCATIONS MW14R AND SV123 WERE SURVEYED BY IBS SURVEY GROUP, 6/30/2014.

NOTES:
1. 35-FOOT BOUNDARY FOR POTENTIAL SOIL GAS IMPACTS.
2. SHALLOW GROUNDWATER RESULTS WERE SELECTED AT NESTED WELL LOCATIONS.

- ESTIMATED EXTENT OF NAPHTHALENE CONCENTRATIONS EXCEEDING SCREENING LEVEL (4.6 µg/L)
- 35-FOOT BOUNDARY (SEE NOTE 1)
- MW7 0.013 — MONITORING WELL AND NAPHTHALENE CONCENTRATION (µg/L)
- PZ24 — PIEZOMETER
- PZ23B — BEDROCK PIEZOMETER
- MW14 — ABANDONED MONITORING WELL
- PW1 — PUMPING WELL
- SV107 — SOIL VAPOR PROBE
- IA126 — INDOOR AIR SAMPLING LOCATION
- AMB–1 — AMBIENT SAMPLING LOCATION
- NM — NOT MEASURED
- SG1 — STAFF GUAGE
- EXISTING BUILDING
- APPROXIMATE EXTENT OF UPLAND SITE
- FENCE
- SHORELINE
- ELECTRIC LINE
- GAS LINE
- WATER MAIN
- SANITARY SEWER
- STORM SEWER
- OVERHEAD POWERLINE
- SHEET PILE WALL
- UTILITY POLE
- HYDRANT
- MANHOLE
- SANITARY MANHOLE
- STORM MANHOLE
- FORMER MGP STRUCTURES

N

0 25 50

SCALE IN FEET

DRAWN BY: RLH DATE: 10/22/14
CHECKED BY: BGH DATE: 10/22/14
APPROVED BY: BGH DATE: 10/23/14
DRAWING NO: 1530-184-B26
REFERENCE:

MAY 2014 GROUNDWATER SCREENING LEVEL FOR PROTECTION OF RESIDENTIAL INDOOR AIR-NAPHTHALENE (CANCER RISK OF 10^{-6})

REMEDIAL INVESTIGATION REPORT - REVISION 1
FORMER MANITOWOC MGP SITE
WISCONSIN PUBLIC SERVICE CORPORATION
MANITOWOC, WISCONSIN

NATURAL RESOURCE TECHNOLOGY

PROJECT NO.
1530/18.4

FIGURE NO.
26

Oct 23, 2014 5:35pm PLOTTED BY: rhopkins SAVED BY: rhopkins
Y:\ACAData\Projects\15\1530 Manitowoc\18-4_RI_Report_Rev1\1530-184-B26.dwg Layout1
IMAGES:
XREFS:

CONCENTRATION EXCEEDING 103 mg/Kg AT END-OF-BORING
SEDIMENT SAMPLE LOCATIONS - AUG-SEPT 2012

REMEDIAL INVESTIGATION REPORT - REVISION 1
FORMER MANITOWOC MGP SITE
WISCONSIN PUBLIC SERVICE CORPORATION
MANITOWOC, WISCONSIN

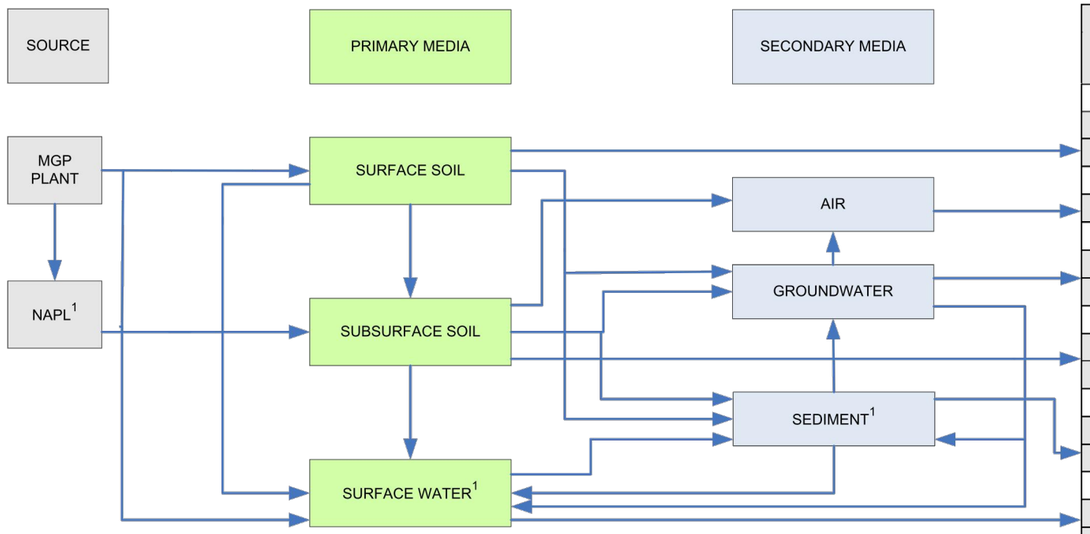
DRAWN BY/DATE:
TDC 10/14/14
REVIEWED BY/DATE:
BGH 10/14/14
APPROVED BY/DATE:
BGH 10/22/14

PROJECT NO: 1530

FIGURE NO: 27

NATURAL RESOURCE TECHNOLOGY

Y:\GIS\Projects\15\1530\MXD\Sediment_Investigation\NRT Sediment Sample Locations_2012.mxd Author: toushman Date/Time: 10/23/2014, 8:32:50 AM



EXPOSURE ROUTE	HUMAN RECEPTORS				ECOLOGICAL RECEPTORS			
	INDUSTRIAL/ COMMERCIAL WORKER	CONSTRUCTION WORKER	RESIDENTIAL	RECREATIONAL	BIRDS	MAMMALS	FISH	BENTHIC INVERTEBRATES
INGESTION	▲	▲	●	○	○	○	NA	NA
DERMAL	▲	▲	●	○	○	○	NA	NA
INHALATION	▲[a]	▲[b]	●[a]	○	○	○	NA	NA
INGESTION	●	▲	●	○	○	○	NA	NA
DERMAL	●	▲	●	○	○	○	NA	NA
INGESTION	●	▲	●	○	○	○	NA	NA
DERMAL	●	▲	●	○	○	○	NA	NA
INGESTION	○	○	○	○	▲	○	▲	▲
DERMAL	○	○	○	○	▲	○	▲	▲
INGESTION	○	○	○	○	○	○	○	○
DERMAL	○	○	○	○	○	○	○	○

PATHWAY LEGEND:
- ▲ Pathway potentially complete and warrants further evaluation within the Baseline Risk Assessment.
- ● Pathway incomplete or considered insignificant under current land use condition, but potentially complete under hypothetical future land use scenario.
- ○ Pathway not complete or considered insignificant; no further evaluation is recommended.

NA - Not applicable
NAPL - Nonaqueous-phase liquid

[a] This pathway includes vapor intrusion into indoor air from subsurface sources.
[b] This pathway includes the potential migration of soil vapors into excavations created as part of construction activities.

GENERAL NOTES:
This Site-specific Conceptual Site Model was developed based on the Generalized Conceptual Site Model Revision 0 and1) Site-specific conditions observed during the Site reconnaissance carried out in January 2007 and October 2008, 2) information gathered during the Step I and Step II sediment investigations and upland RI, and 3) the results of the Step I Risk Assessment Technical Memorandum.

[1] Sheens related to tar-saturated sediments have been observed on the surface of the river water adjacent to the Site due to gas or air bubbles rising from the sediment layer (i.e., ebullition). These sheens are transitory in nature, and because of this, the exposure and associated risks of these sheens to human or ecological receptors was not quantified as part of the BLRA. Refer to the text of the BLRA for further discussion of this condition.

Figure 1	**SITE SPECIFIC CONCEPTUAL SITE MODEL FOR MANITOWOC FORMER MGP SITE BASELINE RISK ASSESSMENT**	Drawn By:	RK
Revision 1		Checked By:	MWK
Date 10/22/2014	WISCONSIN PUBLIC SERVICE CORPORATION	Approved By:	CC

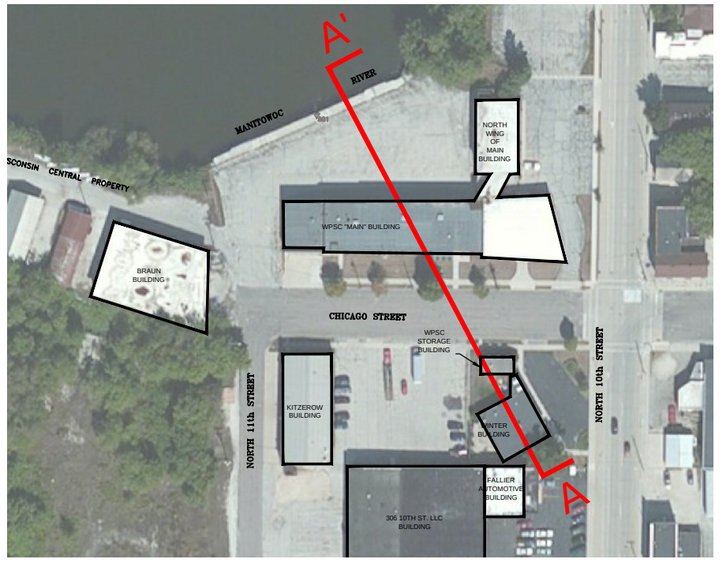
DRAWN BY: RLH DATE: 10/22/14
CHECKED BY: BGH DATE: 10/22/14
APPROVED BY: BGH DATE: 10/23/14
DRAWING NO: 1530-173-B26
REFERENCE: .

COPY OF SITE SPECIFIC CONCEPTUAL SITE MODEL
(FIGURE 1 OF BLRA, APPENDIX R)
REMEDIAL INVESTIGATION REPORT - REVISION 1
FORMER MANITOWOC MGP SITE
WISCONSIN PUBLIC SERVICE CORPORATION
MANITOWOC, WISCONSIN

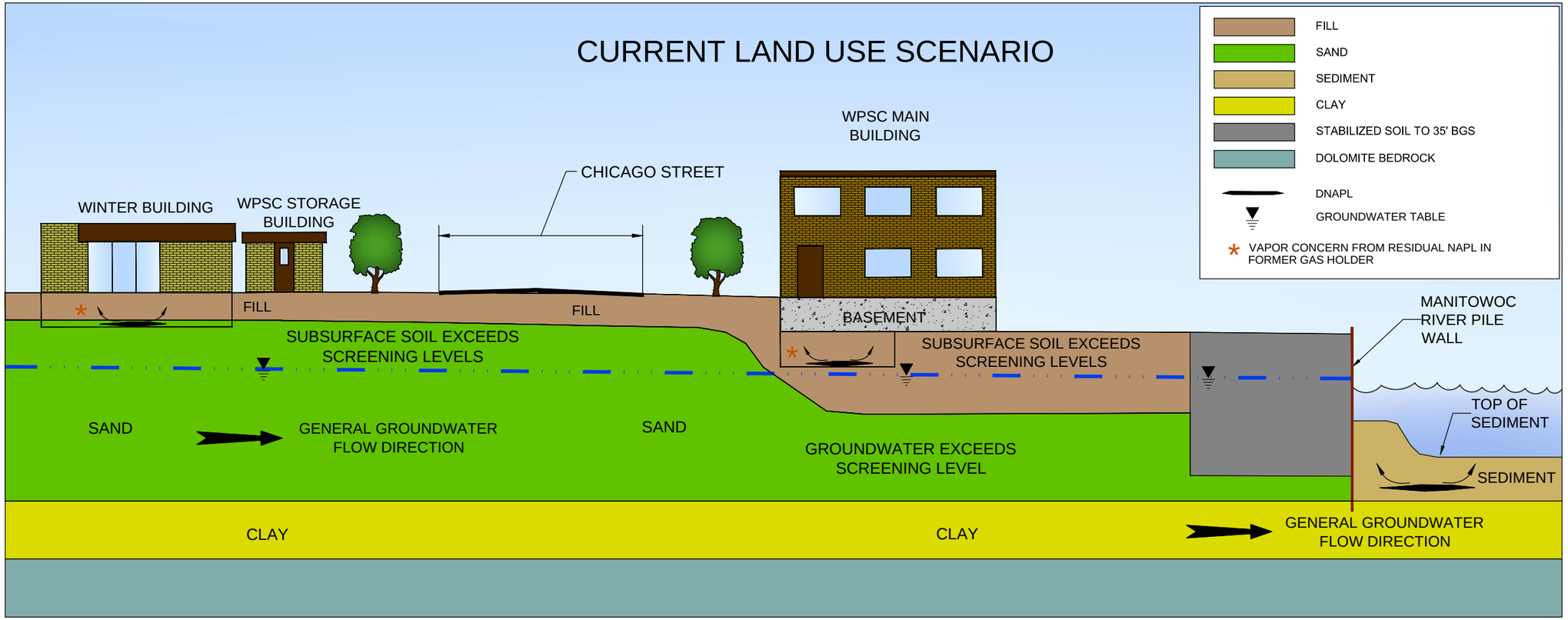
NATURAL RESOURCE TECHNOLOGY

PROJECT NO. 1530/17.3

FIGURE NO. 28



CURRENT LAND USE SCENARIO



NOT TO SCALE

SECTION A-A'

DRAWN BY:	DMD	DATE: 10/23/14
CHECKED BY:	BJH	DATE: 10/23/14
APPROVED BY:	BJH	DATE: 10/23/14
DRAWING NO: 1530-184-B29.DWG		
REFERENCE: .		

GRAPHICAL CONCEPTUAL SITE MODEL

REMEDIAL INVESTIGATION REPORT - REVISION 1
FORMER MANITOWOC MGP SITE
WISCONSIN PUBLIC SERVICE CORPORATION
MANITOWOC, WISCONSIN

NATURAL RESOURCE TECHNOLOGY

PROJECT NO.
1530/18.4

FIGURE NO.
29

TABLES

Table 1. Well Construction and Groundwater Elevation Data

Wisconsin Public Service Corporation, Manitowoc - Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

Sample Location	Date	TOC Elevation[1] (NAVD 88)	Ground Surface Elevation (NAVD 88)	Total Well Depth from TOC (feet)	Well Screen Length (feet)	Top of Screen Elevation[1] (NAVD 88)	Bottom of Screen Elevation[1] (NAVD 88)	Predominant Soil unit within well screen	well screen location within lithology	Depth to Water from TOC (feet)	Groundwater Elevation[1] (NAVD 88)
MW1	03/22/1999	601.06	na	23.71	3	580.35	577.35	Well Graded Sand with Gravel	Shallow Sand	19.53	581.53
	04/10/2000									Dry	<577.35
	03/26/2001									20.65	580.41
	10/25/2001									19.89	581.17
	01/31/2002									inaccessible snow/ice	
	03/03/2002									19.45	581.61
	06/05/2002									19.32	581.74
	05/15/2003									dry	dry
	08/26/2003									dry	dry
	11/19/2003									20.62	580.44
	02/25/2004									20.67	580.39
	05/24/2004									~23.70	~577.4
	11/10/2004									19.29	581.77
	05/18/2005									19.32 G	581.74
	11/28/2005									20.04	581.02
	05/30/2006									19.68	581.38
	11/14/2006	Well network resurvey 5/16/2007								19.91	581.15
	05/16/2007	600.81	597.81	23.71	3	580.10	577.1			19.42	581.39
	10/26/2009	600.81	597.81	23.71	3	580.10	577.1			19.30	581.51
	01/27/2010	Well resurveyed following Upland RI Activities in September 2009								nm	nm
	04/27/2010									21.80	579.01
	07/26/2010									18.43	582.38
	11/02/2010									19.26	581.55
	05/17/2011									18.85	581.96
	11/01/2011									18.70	582.11
	08/08/2012									19.36	581.45
	11/13/2012									20.10	580.71
	02/25/2013									20.40	580.41
	05/29/2013									19.18	581.63
	11/13/2013									19.33	581.48
	05/19/2014									18.43	582.38
MW2	03/22/1999	597.18	na	23.75	3	576.43	573.43	Poorly Graded Sand	Shallow Sand	15.57	581.61
	04/10/2000									16.61	580.57
	03/26/2001									16.56	580.62
	10/25/2001									15.95	581.23
	01/31/2002									16.23	580.95
	03/03/2002									inaccessible - snow/ice	
	06/05/2002									15.39	581.79
	05/15/2003									16.35	580.83
	08/26/2003									16.34	580.84
	11/19/2003									16.74	580.44
	02/25/2004									16.81	580.37
	05/24/2004									15.64	581.54
	11/10/2004									15.36	581.82
	05/18/2005									15.43	581.75
	11/28/2005									16.13	581.05
	05/30/2006									15.75	581.43
	11/14/2006	Well network resurvey 5/16/2007								15.93	581.25
	05/16/2007	597.08	597.81	23.75	3	576.33	573.33			15.59	581.49
	10/26/2009									14.53	582.55
	01/27/2010									15.24	581.84
	04/27/2010									15.2	581.88
	07/26/2010									14.72	582.36
	11/02/2010									15.41	581.67
	05/17/2011									14.95	582.13
	11/01/2011									14.79	582.29
	08/07/2012									15.45	581.63
	11/13/2012									16.20	580.88
	02/26/2013									16.20	580.88
	05/29/2013									15.30	581.78
	11/12/2013									15.33	581.75
	05/19/2014									14.56	582.52

Table 1. Well Construction and Groundwater Elevation Data

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Sample Location	Date	TOC Elevation[1] (NAVD 88)	Ground Surface Elevation (NAVD 88)	Total Well Depth from TOC (feet)	Well Screen Length (feet)	Top of Screen Elevation[1] (NAVD 88)	Bottom of Screen Elevation[1] (NAVD 88)	Predominant Soil unit within well screen	well screen location within lithology	Depth to Water from TOC (feet)	Groundwater Elevation[1] (NAVD 88)
MW5	03/22/1999	605.24	na	29.2	3	579.04	576.04	Poorly Graded Gravel with Sand	Shallow Sand	23.48	581.76
	04/10/2000									24.51	580.73
	03/26/2001									24.63	580.61
	10/25/2001									23.86	581.38
	01/31/2002									24.15	581.09
	03/03/2002									inaccessible - snow/ice	
	06/05/2002									23.33	581.91
	05/15/2003									24.31	580.93
	08/26/2003									24.29	580.95
	11/19/2003									24.86	580.38
	02/25/2004									24.76	580.48
	05/24/2004									23.70	581.54
	11/10/2004									23.31	581.93
	05/18/2005									22.98 G	582.26
	11/28/2005									24.12	581.12
	05/30/2006									23.75	581.49
	11/14/2006	Well network resurvey 5/16/2007								25.40	579.84
	05/16/2007	605.03	605.30	29.2	3	578.83	575.83			23.62	581.41
	10/26/2009									23.65	581.38
	01/27/2010									23.58	581.45
	04/27/2010									23.50	581.53
	07/26/2010									22.78	582.25
	11/02/2010									23.51	581.52
	05/17/2011									23.13	581.90
	11/01/2011									22.95	582.08
	08/07/2012									23.53	581.50
	11/13/2012									24.37	580.66
	02/26/2013									24.70	580.33
	05/29/2013									23.50	581.53
	11/12/2013									23.95	581.08
	05/19/2014									22.95	582.08
PZ5	08/08/2012	605.19	605.46	55.3	5	554.89	549.89	Poorly Graded Sand with Gravel	Deep Sand	23.50	581.69
	11/13/2012									24.30	580.89
	02/26/2013									24.59	580.60
	05/29/2013									23.33	581.86
	11/12/2013									23.45	581.74
	05/19/2014									22.68	582.51
MW6	03/22/1999	601.85	na	30.55	10	581.30	571.30	Poorly Graded Sand with Silt	Shallow Sand	20.18	581.67
	04/10/2000									21.23	580.62
	03/26/2001									21.34	580.51
	10/25/2001									20.56	581.29
	01/31/2002									inaccessible - snow/ice	
	03/03/2002									inaccessible - snow/ice	
	06/05/2002									20.03	581.82
	05/15/2003									20.91	580.94
	08/26/2003									20.98	580.87
	11/19/2003									21.39	580.46
	02/25/2004									21.43	580.42
	05/24/2004									20.25	581.60
	11/10/2004									19.9	581.95
	05/18/2005									20.06	581.79
	11/28/2005									20.83	581.02
	05/30/2006									20.33	581.52
	11/14/2006	Well network resurvey 5/16/2007								20.61	581.24
	05/16/2007	601.64	601.95	30.55	10	581.09	571.09			20.22	581.42
	10/26/2009									19.4	582.24
	01/27/2010									19.84	581.80
	04/27/2010									19.85	581.79
	07/26/2010									19.20	582.44
	11/02/2010									19.98	581.66
	05/17/2011									19.58	582.06
	11/01/2011									19.29	582.35

Table 1. Well Construction and Groundwater Elevation Data

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USEPA# : WIN000509949

Sample Location	Date	TOC Elevation[1] (NAVD 88)	Ground Surface Elevation (NAVD 88)	Total Well Depth from TOC (feet)	Well Screen Length (feet)	Top of Screen Elevation[1] (NAVD 88)	Bottom of Screen Elevation[1] (NAVD 88)	Predominant Soil unit within well screen	well screen location within lithology	Depth to Water from TOC (feet)	Groundwater Elevation[1] (NAVD 88)
(MW6 cont.)	08/08/2012							Poorly Graded Sand with Silt	Shallow Sand	20.05	581.59
	11/14/2012									20.85	580.79
	02/26/2013									21.70	579.94
	05/29/2013									10.94	590.70
	11/13/2013									21.70	579.94
	05/19/2014									19.20	582.44
MW7	03/22/1999	588.93	na	10.63	5	583.30	578.30	Poorly Graded Sand with Silt	Shallow Sand	7.30	581.63
	04/10/2000									8.32	580.61
	03/26/2001									8.43	580.50
	10/25/2001									7.66	581.27
	01/31/2002									nm	nm
	03/03/2002									7.94	580.99
	06/05/2002									7.14	581.79
	05/15/2003									8.10	580.83
	08/26/2003									8.07	580.86
	11/19/2003									8.18	580.75
	02/25/2004									8.52	580.41
	05/24/2004									7.36	581.57
	11/10/2004									7.08	581.85
	05/18/2005									7.19	581.74
	11/28/2005									7.88	581.05
	05/30/2006									7.47	581.46
	11/14/2006	Well network resurvey 5/16/2007								7.73	581.20
	05/16/2007	588.69	589.13	10.63	5	583.06	578.06			7.36	581.33
	10/26/2009	588.69	589.13	10.63	5	583.06	578.06			6.30	582.39
	01/27/2010	Well resurveyed following Upland RI Activities in September 2009								6.91	581.78
	04/27/2010									6.85	581.84
	07/26/2010									6.28	582.41
	11/02/2010									6.99	581.70
	05/17/2011									6.63	582.06
	11/01/2011									6.32	582.37
	08/08/2012									7.05	581.64
	11/14/2012									7.90	580.79
	02/27/2013									8.10	580.59
	05/30/2013									6.90	581.79
	11/13/2013									6.98	581.71
	05/19/2014									6.39	582.30
PZ7B	10/26/2009	588.76	589.26	63.46	5	530.30	525.30	Niagra Dolomite	Bedrock	6.43	582.33
	01/27/2010									6.98	581.78
	04/27/2010									6.38	582.38
	07/26/2010									6.28	582.48
	11/02/2010									7.11	581.65
	05/17/2011									6.67	582.09
	11/01/2011									6.47	582.29
	08/08/2012									7.12	581.64
	11/14/2012									7.90	580.86
	02/27/2013									8.12	580.64
	05/30/2013									6.95	581.81
	11/13/2013									7.08	581.68
	05/19/2014									6.28	582.48
MW8	03/22/1999	588.13	na	10.53	5	582.60	577.60	Poorly Graded Sand with Silt	Shallow Sand	6.58	581.55
	04/10/2000									7.59	580.54
	03/26/2001									7.70	580.43
	10/25/2001									6.94	581.19
	01/31/2002									nm	nm
	03/03/2002									inaccessible - snow/ice	
	06/05/2002									6.75	581.38
	05/15/2003									7.35	580.78
	08/26/2003									7.32	580.81
	11/19/2003									7.70	580.43
	02/25/2004									inaccessible - snow/ice	
	05/24/2004									6.72	581.41
	11/10/2004									5.16	582.97
	05/18/2005									6.46	581.67

Table 1. Well Construction and Groundwater Elevation Data

Wisconsin Public Service Corporation, Manitowoc - Former Manufactured Gas Plant Site
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USEPA# : WIN000509949

Sample Location	Date	TOC Elevation[1] (NAVD 88)	Ground Surface Elevation (NAVD 88)	Total Well Depth from TOC (feet)	Well Screen Length (feet)	Top of Screen Elevation[1] (NAVD 88)	Bottom of Screen Elevation[1] (NAVD 88)	Predominant Soil unit within well screen	well screen location within lithology	Depth to Water from TOC (feet)	Groundwater Elevation[1] (NAVD 88)
(MW8 cont.)	11/28/2005							Poorly Graded Sand with Silt	Shallow Sand	7.03	581.10
	05/30/2006									7.72	580.41
	11/14/2006	Well network resurvey 5/16/2007								7.03	581.10
	05/16/2007	588.02	588.41	10.53	5	582.49	577.49			7.10	580.92
	10/26/2009									5.93	582.09
	01/27/2010									6.43	581.59
	04/27/2010									6.38	581.64
	07/26/2010									5.94	582.08
	11/02/2010									6.36	581.66
	05/17/2011									7.00	581.02
	11/01/2011									6.06	581.96
	08/08/2012									6.63	581.39
	11/13/2012									7.22	580.80
	02/26/2013									7.70	580.32
	05/30/2013									6.65	581.37
	11/12/2013									6.42	581.60
	05/19/2014	TOC trimmed in June 2014 and resurveyed on 6/30/2014								5.91	582.11
	06/30/2014	588.41	588.57	10.53	5	582.88	577.88			--	--
MW9	03/22/1999	588.60	na	10.6	5	583.00	578.00	Poorly Graded Sand with Silt	Shallow Sand	6.99	581.61
	04/10/2000									8.04	580.56
	03/26/2001									8.14	580.46
	10/25/2001									7.36	581.24
	01/31/2002									7.65	580.95
	02/15/2002									nm	nm
	02/15/2002									nm	nm
	02/15/2002									nm	nm
	03/03/2002									7.66	580.94
	06/05/2002									6.91	581.69
	05/15/2003									7.83	580.77
	08/26/2003									7.84	580.76
	11/19/2003									8.46	580.14
	02/25/2004									8.22	580.38
	05/24/2004									7.10	581.50
	11/10/2004									6.87	581.73
	05/18/2005									6.92	581.68
	11/28/2005									7.61	580.99
	05/30/2006									7.25	581.35
	06/20/2006									nm	nm
	11/14/2006	Well network resurvey 5/16/2007								7.47	581.13
	05/16/2007	588.44	588.83	10.6	5	582.84	577.84			7.08	581.36
	10/26/2009									6.57	581.87
	01/27/2010									6.66	581.78
	04/27/2010									6.62	581.82
	07/26/2010									6.02	582.42
	11/02/2010									6.74	581.70
	05/17/2011									6.38	582.06
	11/01/2011									6.28	582.16
	08/08/2012									6.86	581.58
	11/14/2012									7.68	580.76
	02/26/2013									7.98	580.46
	05/29/2013									6.85	581.59
	11/13/2013									6.65	581.79
	05/20/2014									6.52	581.92
MW10	03/22/1999	588.81	na	14.51	5	579.30	574.30	Poorly Graded Sand with Silt	Shallow Sand	7.22	581.59
	04/10/2000									8.27	580.54
	03/26/2001									8.39	580.42
	10/25/2001									7.66	581.15
	01/31/2002									7.87	580.94
	02/15/2002									7.94	580.87
	02/15/2002									7.97	580.84
	02/15/2002									7.97	580.84
	03/03/2002									7.89	580.92
	06/05/2002									7.09	581.72

Table 1. Well Construction and Groundwater Elevation Data

Wisconsin Public Service Corporation, Manitowoc - Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

Sample Location	Date	TOC Elevation[1] (NAVD 88)	Ground Surface Elevation (NAVD 88)	Total Well Depth from TOC (feet)	Well Screen Length (feet)	Top of Screen Elevation[1] (NAVD 88)	Bottom of Screen Elevation[1] (NAVD 88)	Predominant Soil unit within well screen	well screen location within lithology	Depth to Water from TOC (feet)	Groundwater Elevation[1] (NAVD 88)
(MW10 cont.)	05/15/2003									7.95	580.86
	08/26/2003									7.96	580.85
	11/19/2003									8.37	580.44
	02/25/2004									8.50	580.31
	05/24/2004									7.31	581.50
	11/10/2004									6.95	581.86
	05/18/2005									7.07	581.74
	11/28/2005									7.68	581.13
	05/30/2006									7.31	581.50
	06/20/2006									nm	nm
	11/14/2006	Well network resurvey 5/16/2007								7.51	581.30
	05/16/2007	588.63	589.07	14.51	5	579.12	574.12	Poorly Graded Sand with Silt	Shallow Sand	7.19	581.44
	10/26/2009									6.38	582.25
	01/27/2010									6.93	581.70
	04/27/2010									6.75	581.88
	07/26/2010									6.23	582.40
	11/02/2010									7.01	581.62
	05/17/2011									6.95	581.68
	11/01/2011									6.41	582.22
	08/08/2012									7.01	581.62
	11/13/2012									7.75	580.88
	02/27/2013									8.31	580.32
	05/30/2013									6.73	581.90
	11/13/2013									6.77	581.86
	05/20/2014									4.8	583.83
MW12	03/22/1999	590.40	na	13.6	5	581.80	576.80			10.35	580.05
	04/10/2000									11.43	578.97
	03/26/2001									11.72	578.68
	10/25/2001									10.63	579.77
	01/31/2002									10.51	579.89
	02/15/2002									9.87	580.53
	02/15/2002									11.25	579.15
	02/15/2002									10.91	579.49
	03/03/2002									10.20	580.20
	06/05/2002									8.80	581.60
	05/15/2003									inaccessible (covered with asphalt)	
	08/26/2003									10.10	580.30
	11/19/2003									11.31	579.09
	02/25/2004									11.51	578.89
	05/24/2004									9.42	580.98
	11/10/2004									9.00	581.40
	05/18/2005							Poorly Graded Sand with Silt	Shallow Sand	10.39	580.01
	11/28/2005									10.1	580.30
	05/30/2006									nm	nm
	06/20/2006									9.85	580.55
	11/14/2006	Well network resurvey 5/16/2007								9.46	580.94
	05/16/2007	590.11	590.45	13.6	5	581.51	576.51			10.28	579.83
	10/26/2009									9.01	581.10
	01/27/2010									9.55	580.56
	04/27/2010									9.35	580.76
	07/26/2010									8.53	581.58
	11/02/2010									10.05	580.06
	05/17/2011									9.46	580.65
	11/01/2011									8.50	581.61
	08/08/2012									9.98	580.13
	11/14/2012									9.80	580.31
	02/26/2013									10.30	579.81
	05/29/2013									9.90	580.21
	11/12/2013									9.78	580.33
	05/19/2014									8.82	581.29

Table 1. Well Construction and Groundwater Elevation Data

Wisconsin Public Service Corporation, Manitowoc - Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

Sample Location	Date	TOC Elevation[1] (NAVD 88)	Ground Surface Elevation (NAVD 88)	Total Well Depth from TOC (feet)	Well Screen Length (feet)	Top of Screen Elevation[1] (NAVD 88)	Bottom of Screen Elevation[1] (NAVD 88)	Predominant Soil unit within well screen	well screen location within lithology	Depth to Water from TOC (feet)	Groundwater Elevation[1] (NAVD 88)
MW12D	03/22/1999	590.62	na	35.02	15	570.60	555.60	Well Graded Sand	Deep Sand	10.81	579.81
	04/10/2000									11.82	578.80
	03/26/2001									12.10	578.52
	10/25/2001									10.94	579.68
	01/31/2002									10.79	579.83
	02/15/2002									10.10	580.52
	02/15/2002									11.89	578.73
	02/15/2002									11.40	579.22
	03/03/2002									10.43	580.19
	06/05/2002									9.06	581.56
	05/15/2003									11.26	579.36
	08/26/2003									10.38	580.24
	11/19/2003									11.66	578.96
	02/25/2004									inaccessible - well under melt	
	05/24/2004									9.81	580.81
	11/10/2004									9.35	581.27
	05/18/2005									10.74	579.88
	11/28/2005									10.55	580.07
	05/30/2006									9.23	581.39
	06/20/2006									nm	nm
	11/14/2006	Well network resurvey 5/16/2007								9.61	581.01
	05/16/2007	590.32	590.67	32.05	15	573.27	558.27			11.60	578.72
	10/26/2009									8.14	582.18
	01/27/2010									9.76	580.56
	04/27/2010									9.62	580.70
	07/26/2010									8.87	581.45
	11/02/2010									10.33	579.99
	05/17/2011									9.75	580.57
	11/01/2011									8.58	581.74
	08/08/2012									10.2	580.12
	11/14/2012									9.97	580.35
	02/26/2013									10.52	579.80
	05/29/2013									10.2	580.12
	11/12/2013									10.15	580.17
	05/19/2014									9.03	581.29
MW13	03/22/1999	590.93	na	12.53	5	583.40	578.40	Poorly Graded Sand with Silt	Shallow Sand	10.48	580.45
	04/10/2000									11.60	579.33
	03/26/2001									11.84	579.09
	10/25/2001									10.85	580.08
	01/31/2002									10.85	580.08
	02/15/2002									10.33	580.60
	02/15/2002									10.99	579.94
	02/15/2002									10.93	580.00
	03/03/2002									10.70	580.23
	06/05/2002									9.39	581.54
	05/15/2003									10.96	579.97
	08/26/2003									10.66	580.27
	11/19/2003									> 8.53	na
	02/25/2004									> 8.53	na
	05/24/2004									9.74	581.19
	11/10/2004									9.60	581.33
	05/18/2005									10.51	580.42
	11/28/2005									10.46	580.47
	05/30/2006									9.53	581.40
	11/14/2006	Well network resurvey 5/16/2007								9.86	581.07
	05/16/2007	590.80	591.10	12.53	5	583.27	578.27			11.45	579.35
	10/26/2009									9.22	581.58
	01/27/2010									10.00	580.80
	04/27/2010									9.72	581.08
	07/26/2010									9.23	581.57
	11/02/2010									10.44	580.36

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Wisconsin Public Service Corporation, Manitowoc - Former Manufactured Gas Plant Site
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BRRTS# : 02-36-000219
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Sample Location	Date	TOC Elevation[1] (NAVD 88)	Ground Surface Elevation (NAVD 88)	Total Well Depth from TOC (feet)	Well Screen Length (feet)	Top of Screen Elevation[1] (NAVD 88)	Bottom of Screen Elevation[1] (NAVD 88)	Predominant Soil unit within well screen	well screen location within lithology	Depth to Water from TOC (feet)	Groundwater Elevation[1] (NAVD 88)
(MW13 cont.)	05/17/2011							Poorly Graded Sand with Silt	Shallow Sand	9.77	581.03
	11/01/2011									9.14	581.66
	08/08/2012									10.39	580.41
	11/13/2012									10.40	580.40
	02/26/2013									10.85	579.95
	05/30/2013									10.23	580.57
	11/12/2013									10.13	580.67
	05/19/2014									9.10	581.70
MW14	03/22/1999	594.87	na	17.57	5	582.30	577.30	Poorly Graded Sand with Silt	Shallow Sand	13.69	581.18
	04/10/2000									14.74	580.13
	03/26/2001									14.87	580.00
	10/25/2001									14.06	580.81
	01/31/2002 P									14.26	580.61
	02/15/2002 P									14.08	580.79
	02/15/2002 P									14.26	580.61
	02/15/2002 P									14.29	580.58
	03/03/2002 P									14.19	580.68
	06/05/2002 P									nm, P	nm
	05/15/2003 P									14.5	580.37
	08/26/2003 P									nm P	nm
	11/19/2003 P									15.32	579.55
	02/25/2004 P									14.83	580.04
	05/24/2004 P									13.1	581.77
	11/10/2004									nm	nm
	05/18/2005 P									nm, P	nm
	11/28/2005 P									14.04	580.83
	05/30/2006 P									13.45	581.42
	11/14/2006 P	Well network resurvey 5/16/2007								13.5	581.37
	05/16/2007 P	594.68	595.13	17.57	5	582.11	577.11			13.8	580.88
	10/26/2009 P									nm, P	nm
	01/27/2010 P									14.02	580.66
	04/27/2010 P									13.25	581.43
	07/26/2010 P									12.60	582.08
	11/02/2010 P									nm, P2	nm
	05/17/2011 P									12.75	581.93
	11/01/2011 P									12.50	582.18
	08/08/2012 T									14.37	580.31
	11/14/2012 T									14.30	580.38
	02/26/2013 T									13.60	581.08
	05/30/2013 T									13.70	580.98
	11/13/2013									nm	nm
	05/20/2014									nm	nm
	06/25/2014	Monitoring Well Abandoned - benitonite found in well and replaced with MW14R									
MW14R	06/25/2014	594.84	na	594.84	10	585.80	575.80	Silty Clay and Poorly Graded Sand	Shallow Sand		
	na	Monitoring well Installed in June 2014- First Sample collection 10/2014								na	nad
MW15T	11/19/2003	586.75	na	20	15	581.75	566.75	Poorly Graded Sand	Shallow Sand	nm	nm
	02/25/2004									nm	nm
	05/24/2004									nm	nm
	11/10/2004									nm	nm
	05/18/2005									6.73	580.02
	11/28/2005									7.02	579.73
	05/30/2006									6.17	580.58
	11/14/2006	Well network resurvey 5/16/2007								6.85	579.90
	05/16/2007	586.91	587.14	20	15	581.91	566.91			6.57	580.34
	10/26/2009									5.45	581.46
	01/27/2010									6.35	580.56
	04/27/2010									5.78	581.13
	07/26/2010									5.38	581.53
	11/02/2010									7.07	579.84
	05/17/2011									6.30	580.61
	11/01/2011									6.54	580.37
	08/08/2012									7.00	579.91
	11/14/2012									7.70	579.21
	02/25/2013									7.90	579.01
	05/29/2013									6.40	580.51
	11/13/2013									6.76	580.15
	05/20/2014									5.38	581.53

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Wisconsin Public Service Corporation, Manitowoc - Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
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Sample Location	Date	TOC Elevation[1] (NAVD 88)	Ground Surface Elevation (NAVD 88)	Total Well Depth from TOC (feet)	Well Screen Length (feet)	Top of Screen Elevation[1] (NAVD 88)	Bottom of Screen Elevation[1] (NAVD 88)	Predominant Soil unit within well screen	well screen location within lithology	Depth to Water from TOC (feet)	Groundwater Elevation[1] (NAVD 88)
MW16T	11/19/2003	586.74	na	17.5	15	584.24	569.24			6.89	579.85
	02/25/2004									7.48	579.26
	05/24/2004									4.26	582.48
	11/10/2004									5.93	580.81
	05/18/2005									6.16	580.58
	11/28/2005									6.08	580.66
	05/30/2006									nm	nm
	11/14/2006	Well network resurvey 5/16/2007								5.93	580.81
	05/16/2007	586.68	586.93	17.5	15	584.18	569.18			5.88	580.80
	10/26/2009									4.63	582.05
	01/27/2010							Well Graded Sand	Shallow Sand	5.52	581.16
	04/27/2010									4.90	581.78
	07/26/2010									4.55	582.13
	11/02/2010									6.36	580.32
	05/17/2011									5.61	581.07
	11/01/2011									5.64	581.04
	08/08/2012									6.40	580.28
	11/14/2012									6.82	579.86
	02/25/2013									6.65	580.03
	05/29/2013									6.20	580.48
	11/13/2013									5.99	580.69
	05/20/2014									4.62	582.06
MW17T	03/22/1999	594.81	na	23.96	15	585.85	570.85			14.09	580.72
	04/10/2000									15.24	579.57
	03/26/2001									na	na
	10/25/2001									14.54	580.27
	01/31/2002									14.65	580.16
	02/15/2002									14.29	580.52
	02/15/2002									14.91	579.90
	02/15/2002									14.81	580.00
	03/03/2002									inaccessible - snow/ice	
	06/05/2002									13.14	581.67
	05/15/2003									14.74	580.07
	08/26/2003									14.54	580.27
	11/19/2003									15.27	579.54
	02/25/2004									15.40	579.41
	05/24/2004									13.48	581.33
	11/10/2004									13.49	581.32
	05/18/2005							Well Graded Sand	Shallow Sand	14.23	580.58
	11/28/2005									14.35	580.46
	05/30/2006									13.54	581.27
	11/14/2006	Well network resurvey 5/16/2007								13.91	580.90
	05/16/2007	594.70	595.00	23.96	15	585.74	570.74			14.20	580.50
	10/26/2009									12.97	581.73
	01/27/2010									13.55	581.15
	04/27/2010									13.43	581.27
	07/26/2010									12.73	581.97
	11/02/2010									14.14	580.56
	05/17/2011									13.48	581.22
	11/01/2011									12.98	581.72
	08/08/2012									14.03	580.67
	11/13/2012									14.30	580.40
	02/26/2013									14.80	579.90
	05/29/2013									13.85	580.85
	11/12/2013									13.85	580.85
	05/19/2014									12.95	581.75
MW18T	03/22/1999	597.85	na	26.56	15	586.29	571.29			16.28	581.57
	04/10/2000									17.30	580.55
	03/26/2001									17.44	580.41
	10/25/2001									16.66	581.19
	01/31/2002									nm	nm
	02/15/2002									nm	nm

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Wisconsin Public Service Corporation, Manitowoc - Former Manufactured Gas Plant Site
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BRRTS# : 02-36-000219
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Sample Location	Date	TOC Elevation[1] (NAVD 88)	Ground Surface Elevation (NAVD 88)	Total Well Depth from TOC (feet)	Well Screen Length (feet)	Top of Screen Elevation[1] (NAVD 88)	Bottom of Screen Elevation[1] (NAVD 88)	Predominant Soil unit within well screen	well screen location within lithology	Depth to Water from TOC (feet)	Groundwater Elevation[1] (NAVD 88)
(MW18T cont.)	02/15/2002							Well Graded Sand	Shallow Sand	nm	nm
	02/15/2002									nm	nm
	03/03/2002									16.92	580.93
	06/05/2002									16.08	581.77
	05/15/2003									16.96	580.89
	08/26/2003									17.05	580.80
	11/19/2003									17.47	580.38
	02/25/2004									17.98	579.87
	05/24/2004									16.34	581.51
	11/10/2004									16.13	581.72
	05/18/2005									16.20	581.65
	11/28/2005									16.88	580.97
	05/30/2006									16.50	581.35
	11/14/2006	Well network resurvey 5/16/2007								16.69	581.16
	05/16/2007	598.05	594.72	26.56	15	586.49	571.49			16.36	581.69
	10/26/2009	597.59	598.07	26.56	15	586.03	571.03			15.35	582.24
	01/27/2010	Well resurveyed following Upland RI Activities in September 2009								15.86	581.73
	04/27/2010									15.80	581.79
	07/26/2010									15.20	582.39
	11/02/2010									16.02	581.57
	05/17/2011									15.60	581.99
	11/01/2011									15.48	582.11
	08/07/2012									16.07	581.52
	11/13/2012									16.90	580.69
	02/26/2013									17.20	580.39
	05/29/2013									15.95	581.64
	11/12/2013									16.11	581.48
	05/19/2014									15.39	582.20
PZ18TB	10/26/2009	597.89	598.26	74.59	5	528.30	523.30	Niagra Dolomite	Bedrock	15.45	582.44
	01/27/2010									16.03	581.86
	04/27/2010									16.02	581.87
	07/26/2010									15.44	582.45
	11/02/2010									16.17	581.72
	05/17/2011									16.32	581.57
	11/01/2011									17.92	579.97
	08/08/2012									16.30	581.59
	11/13/2012									16.90	580.99
	02/26/2013									17.31	580.58
	05/29/2013									16.08	581.81
	11/12/2013									16.28	581.61
	05/19/2014									15.41	582.48
MW19T	03/22/1999	594.50	na	40	15	569.5	554.5	Silty Sand	Deep Sand	13.90	580.60
	04/10/2000									15.03	579.47
	03/26/2001									15.22	579.28
	10/25/2001									14.28	580.22
	01/31/2002									inaccessible - snow/ice	
	02/15/2002									13.91	580.59
	02/15/2002									14.74	579.76
	02/15/2002									14.58	579.92
	03/03/2002									14.14	580.36
	06/05/2002									12.79	581.71
	05/15/2003									14.46	580.04
	08/26/2003									14.11	580.39
	11/19/2003									14.95	579.55
	02/25/2004									14.98	579.52
	05/24/2004									12.23	582.27
	11/10/2004									nm	nm
	05/18/2005									13.90	580.60

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Sample Location	Date	TOC Elevation[1] (NAVD 88)	Ground Surface Elevation (NAVD 88)	Total Well Depth from TOC (feet)	Well Screen Length (feet)	Top of Screen Elevation[1] (NAVD 88)	Bottom of Screen Elevation[1] (NAVD 88)	Predominant Soil unit within well screen	well screen location within lithology	Depth to Water from TOC (feet)	Groundwater Elevation[1] (NAVD 88)
(MW19T cont.)	11/28/2005									14.35	580.15
	05/30/2006									13.06	581.44
	11/14/2006	Well network resurvey 5/16/2007								13.43	581.07
	05/16/2007	594.40	594.72	40	15	569.40	554.40			13.83	580.57
	10/26/2009									26.20	568.20
	01/27/2010									13.28	581.12
	04/27/2010									13.17	581.23
	07/26/2010									12.42	581.98
	11/02/2010							Silty Sand	Deep Sand	13.88	580.52
	05/17/2011									12.80	581.60
	11/01/2011									12.60	581.80
	08/08/2012									13.80	580.60
	11/13/2012									13.95	580.45
	02/25/2013									14.82	579.58
	05/29/2013									13.59	580.81
	11/13/2013									13.50	580.90
	05/19/2014									12.65	581.75
MW20T	03/22/1999	596.13	na	39.72	15	571.41	556.41			14.73	581.40
	04/10/2000									15.74	580.39
	03/26/2001									15.95	580.18
	10/25/2001									15.10	581.03
	01/31/2002									nm	nm
	01/31/2002									nm	nm
	02/15/2002									nm	nm
	02/15/2002									nm	nm
	02/15/2002									nm	nm
	03/03/2002									15.32	580.81
	06/05/2002									14.39	581.74
	05/15/2003									15.47	580.66
	08/26/2003									15.49	580.64
	11/19/2003									15.84	580.29
	02/25/2004									15.95	580.18
	05/24/2004									14.63	581.50
	11/10/2004									14.48	581.65
	05/18/2005							Silty Sand	Deep Sand	14.58	581.55
	11/28/2005									15.20	580.93
	05/30/2006									20.73	575.40
	11/14/2006	Well network resurvey 5/16/2007								14.95	581.18
	05/16/2007	596.07	596.45	39.72	15	571.35	556.35			14.68	581.39
	10/26/2009									13.86	582.21
	01/27/2010									14.28	581.79
	04/27/2010									24.70	571.37
	07/26/2010									13.65	582.42
	11/02/2010									14.54	581.53
	05/17/2011									14.02	582.05
	11/01/2011									13.58	582.49
	08/08/2012									14.50	581.57
	11/13/2012									15.25	580.82
	02/26/2013									15.60	580.47
	05/29/2013									14.39	581.68
	11/12/2013									14.50	581.57
	05/19/2014									13.70	582.37
MW21T	03/22/1999	596.99	na	40	15	571.99	556.99			15.44	581.55
	04/10/2000									16.48	580.51
	03/26/2001									16.57	580.42
	10/25/2001									15.84	581.15
	01/31/2002									nm	nm
	01/31/2002									16.10	580.89
	02/15/2002							Silty Sand	Deep Sand	nm	nm
	02/15/2002									nm	nm
	02/15/2002									nm	nm
	03/03/2002									16.08	580.91
	06/05/2002									15.25	581.74
	05/15/2003									16.22	580.77

Table 1. Well Construction and Groundwater Elevation Data

Wisconsin Public Service Corporation, Manitowoc - Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

Sample Location	Date	TOC Elevation[1] (NAVD 88)	Ground Surface Elevation (NAVD 88)	Total Well Depth from TOC (feet)	Well Screen Length (feet)	Top of Screen Elevation[1] (NAVD 88)	Bottom of Screen Elevation[1] (NAVD 88)	Predominant Soil unit within well screen	well screen location within lithology	Depth to Water from TOC (feet)	Groundwater Elevation[1] (NAVD 88)
(MW21T cont.)	08/26/2003									16.26	580.73
	11/19/2003									16.57	580.42
	02/25/2004									16.68	580.31
	05/24/2004									15.50	581.49
	11/10/2004									15.21	581.78
	05/18/2005									15.31	581.68
	11/28/2005									13.93	583.06
	05/30/2006									15.60	581.39
	11/14/2006	Well network resurvey 5/16/2007								24.75	572.24
	05/16/2007	596.80	597.13	40	15	571.80	556.80			24.80/ 15.33#	572.19/ 581.66
	10/26/2009									25.55	571.25
	01/27/2010							Silty Sand	Deep Sand	14.98	581.82
	04/27/2010									14.70	582.10
	07/26/2010									14.41	582.39
	11/02/2010									24.63/ 15.20#	572.36/ 581.79
	05/17/2011									14.80	582.00
	11/01/2011									24.18	572.62
	08/08/2012									15.20	581.60
	11/13/2012									15.90	580.90
	02/25/2013									16.30	580.50
	05/29/2013									15.02	581.78
	11/13/2013									15.14	581.66
	05/19/2014									14.30	582.50
MW22	08/08/2012	593.69	594.07	19.5	10	584.19	574.19			13.21	580.48
	11/13/2012									13.27	580.42
	02/26/2013							Poorly Graded Sand	Shallow Sand	13.74	579.95
	05/29/2013									12.99	580.70
	11/12/2013									12.95	580.74
	05/19/2014									11.98	581.71
MW23	08/08/2012	598.22	598.56	24	10	584.22	574.22			16.69	581.53
	11/13/2012									17.40	580.82
	02/26/2013							Poorly Graded Sand	Shallow Sand	17.75	580.47
	05/29/2013									16.48	581.74
	11/12/2013									16.63	581.59
	05/19/2014									15.78	582.44
PZ23B	10/26/2009	588.14	588.56	66.04	5	527.10	522.10			5.85	582.29
	01/27/2010									6.29	581.85
	04/27/2010									6.3	581.84
	07/26/2010									5.6	582.54
	11/02/2010									14.9	573.24
	05/17/2011									6.10	582.04
	11/01/2011							Niagra Dolomite	Bedrock	5.90	582.24
	08/08/2012									6.50	581.64
	11/14/2012									7.27	580.87
	02/26/2013									8.00	580.14
	05/30/2013									6.54	581.60
	11/13/2013									6.61	581.53
	05/19/2014									5.83	582.31
PZ24	10/26/2009	587.07	587.41	44.17	5	547.90	542.90			5.8	581.27
	01/27/2010									6.36	580.71
	04/27/2010									6.3	580.77
	07/26/2010									5.65	581.42
	11/02/2010									6.75	580.32
	05/17/2011									5.95	581.12
	11/01/2011							Lean Clay	Deep Sand	5.90	581.17
	08/08/2012									6.50	580.57
	11/14/2012									7.27	579.80
	02/26/2013									7.46	579.61
	05/30/2013									6.50	580.57
	11/13/2013									6.59	580.48
	05/19/2014									5.68	581.39

Table 1. Well Construction and Groundwater Elevation Data

Wisconsin Public Service Corporation, Manitowoc - Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

Sample Location	Date	TOC Elevation[1] (NAVD 88)	Ground Surface Elevation (NAVD 88)	Total Well Depth from TOC (feet)	Well Screen Length (feet)	Top of Screen Elevation[1] (NAVD 88)	Bottom of Screen Elevation[1] (NAVD 88)	Predominant Soil unit within well screen	well screen location within lithology	Depth to Water from TOC (feet)	Groundwater Elevation[1] (NAVD 88)
PZ25	10/26/2009	587.08	587.50	39.58	5	552.50	547.50	Poorly Graded Sand	Deep Sand	5.69	581.39
	01/27/2010									6.22	580.86
	04/27/2010									6.10	580.98
	07/26/2010									5.50	581.58
	11/02/2010									6.52	580.56
	05/17/2011									5.80	581.28
	11/01/2011									5.68	581.40
	08/08/2012									6.50	580.58
	11/14/2012									7.05	580.03
	02/27/2013									7.21	579.87
	05/30/2013									6.39	580.69
	11/13/2013									6.40	580.68
	05/20/2014									5.55	581.53
PZ26	10/26/2009	586.84	587.34	39.54	5	552.30	547.30	Well Graded Sand	Deep Sand	4.92	581.92
	01/27/2010									5.61	581.23
	04/27/2010									5.40	581.44
	07/26/2010									4.80	582.04
	11/02/2010									5.61	581.23
	05/17/2011									5.18	581.66
	11/01/2011									4.97	581.87
	08/08/2012									8.14	578.70
	11/14/2012									6.40	580.44
	02/27/2013									6.70	580.14
	05/30/2013									5.44	581.40
	11/13/2013									5.62	581.22
	05/20/2014									4.80	582.04
PW1	04/13/1998	590.40	na	35	15	570.40	555.40	Poorly Graded Gravel with Silt and Sand	Deep Sand	15.05	575.35
	03/22/1999									15.00	575.40
	04/10/2000									16.76	573.64
	03/26/2001									19.38	571.02
	10/25/2001									16.41	573.99
	01/31/2002									10.21	580.19
	01/31/2002									14.05	576.35
	02/15/2002									9.90	580.50
	02/15/2002									26.93	563.47
	02/15/2002									19.52	570.88
	03/03/2002									10.19	580.21
	06/05/2002									18.52	571.88
	05/15/2003									inaccessible (covered with asphalt)	
	08/26/2003									inaccessible (covered with asphalt)	
	11/19/2003									18.25	572.15
	02/25/2004									20.81	569.59
	05/24/2004									16.25	574.15
	11/10/2004									nm	nm
	05/18/2005									nm	nm
	11/28/2005									13.54	576.86
	05/30/2006									9.04	581.36
	06/20/2006									nm	nm
	11/14/2006	Well network resurvey 5/16/2007								9.50	580.90
	05/16/2007	589.54	nm	35	15	569.54	554.54			16.32	573.22
	10/26/2009									16.7	572.84
	01/27/2010									16.55	572.99
	04/27/2010									17.60	571.94
	07/26/2010									15.00	574.54
	11/02/2010									18.86	570.68
	05/17/2011									19.80	569.74
	11/01/2011									8.64	580.90
	08/08/2012									21.70	567.84
	11/14/2012									9.95	579.59
	02/26/2013									8.97	580.57
	05/29/2013									21.83	567.71
	11/13/2013									22.63	566.91
	05/20/2014									23.92	565.62

Table 1. Well Construction and Groundwater Elevation Data

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402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
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Sample Location	Date	TOC Elevation[1] (NAVD 88)	Ground Surface Elevation (NAVD 88)	Total Well Depth from TOC (feet)	Well Screen Length (feet)	Top of Screen Elevation[1] (NAVD 88)	Bottom of Screen Elevation[1] (NAVD 88)	Predominant Soil unit within well screen	well screen location within lithology	Depth to Water from TOC (feet)	Groundwater Elevation[1] (NAVD 88)
SG	04/13/1998	585.88								4.70	581.18
	03/22/1999									7.28	578.60
	04/10/2000									8.41	577.47
	03/26/2001									8.35 D	577.53
	10/25/2001									nm	nm
	01/31/2002									nm	nm
	01/31/2002									nm	nm
	02/15/2002									nm	nm
	02/15/2002									nm	nm
	02/15/2002									nm	nm
	03/03/2002									nm	nm
	06/05/2002									nm	nm
	05/15/2003									nm	nm
	08/26/2003									nm	nm
	11/19/2003									nm	nm
	02/25/2004									nm	nm
	05/24/2004									nm	nm
	11/10/2004									nm	nm
	05/24/2005	585.33	Staff gauge resurveyed 5/24/2005					NA	NA	6.72	578.61
	11/28/2005									7.34	577.99
	05/30/2006									6.83	578.50
	06/20/2006									7.19	578.14
	11/14/2006	Well network resurvey 5/16/2007								7.40	577.93
	05/16/2007	585.22								7.05	578.17
	10/26/2009									6.29	578.93
	01/27/2010									6.44	578.78
	04/27/2010									6.85	578.37
	07/26/2010									6.35	578.87
	11/02/2010									7.22	578.00
	05/17/2011									6.90	578.32
	11/01/2011									8.05	577.17
	08/07/2012									7.30	577.92
	11/14/2012									8.75	576.47
	02/27/2013									nm, River was Frozen	
	05/29/2013									7.18	578.04
	11/12/2013									7.98	577.24
	05/20/2014									6.15	579.07

[C-ECB, 6/13,checked- SGW 6/13, GFF 7/13, U-PMH 8/15/13, C-BGH 9/5/13 U-NDK/ECK-8/14 C-KLT-8/18/2014]

Notes:

1 Elevations prior to May 16, 2007 were calculated using survey conducted by Horizon Environmental. Elevations after resurvey of the well network on May 16, 2007 are in NAVD 88

2 nm = not measured

3 na = not available

D River was covered with 6-12 inches of ice.

G Bailer had to be removed to obtain water level

P Product (DNAPL) present in well.

T Trace LNAPL and/or DNAPL product (approx. 0.05 ft. to not detectable) in well

TOC Top of Casing

Initial and final depth to water are provided as evidence of a large change in groundwater level observed during sampling; cause currently being evaluated.

Table 2. Horizontal Hydraulic Gradients and Groundwater Flow Velocity

Wisconsin Public Service Corporation, Manitowoc - Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

Shallow Sand Horizontal Hydraulic Gradients and Groundwater Flow Velocity

$V = K\,i\,/\,n_e$ V = Groundwater Velocity i = Hydraulic Gradient (unitless value)
K = Hydraulic Conductivity n_e = Effective Porosity

Shallow Sand

K = 3212 ft/yr.
i = ***0.0073***
n_e = 30 %

$$V = \frac{3212 * 0.0073}{0.30}$$

Date	Elevation Change (ft)		Distance Change (ft)	
Aug-12	0.5	/	72	0.007
Nov-12	0.5	/	140	0.004
Feb-13	0.5	/	130	0.004
May-13	0.5	/	65	0.008
Nov-13	0.5	/	41.38	0.012
May-14	0.5	/	51.72	0.010

V = 78 feet/year ***AVE Gradient 0.0073***

* Hydraulic Gradient measurements were made from piezometric surface contour maps between MW17T and MW18T because these wells are located upgradient of the purge well and outside of the stabilized soils

** The hydraulic conductivity value "K" is the average value determined through slug testing and reported by Horizon Environmental in the June 1997 Groundwater Control Investigation Report.

Horizon reported a horizontal gradient of 0.002 and used a porosity of 30%.
Horizon also increased the estimated "K" value to 53.3 ft/day to be conservative in estimating pumping rates for the purge well.
Horizon estimated a horizontal flow velocity of 130 feet/year using the above assumptions.

[O:BGH C:NDK 4/14 U:KLT 10/22/2014]

Table 3 - Vertical Gradient Tables

Wisconsin Public Service Corporation, Manitowoc - Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

Shallow Sand to Bedrock						
Date	**MW-7 Groundwater Elevation (ft.)**	**PZ-7 Groundwater Elevation (ft.)**	**Head Change (dH)**	**Dist. Change (dL)**	**Vertical Hydraulic Gradient (dH/dL)***	
10/26/2009	582.39	582.33	0.06	1.83	3.3E-02	down
01/27/2010	581.78	581.78	0.00	1.22	0E+00	flat
04/27/2010	581.84	582.38	-0.54	1.28	-4.2E-01	up
07/26/2010	582.41	582.48	-0.07	1.85	-3.8E-02	up
11/02/2010	581.70	581.65	0.05	1.14	4.4E-02	down
05/17/2011	582.06	582.09	-0.03	1.50	-2.0E-02	up
11/01/2011	582.37	582.29	0.08	1.81	4.4E-02	down
08/08/2012	581.64	581.64	0.00	1.08	0.0E+00	flat
11/14/2012	580.79	580.86	-0.07	0.23	-3.0E-01	up
02/27/2013	580.59	580.64	-0.05	0.03	-1.7E+00	up
05/30/2013	581.79	581.81	-0.02	1.23	-1.6E-02	up
11/13/2013	581.71	581.68	0.03	1.15	2.6E-02	down
05/19/2014	582.30	582.48	-0.18	1.74	-1.0E-01	up
			Middle of screen elevation (MW-7)			580.8
			Middle of screen elevation (PZ-7)			580.6

Shallow Sand to Bedrock						
Date	**MW-18T Groundwater Elevation (ft.)**	**PZ-18TB Groundwater Elevation (ft.)**	**Head Change (dH)**	**Dist. Change (dL)**	**Vertical Hydraulic Gradient (dH/dL)***	
10/26/2009	582.24	582.44	-0.20	56.44	-3.5E-03	up
01/27/2010	581.73	581.86	-0.13	55.93	-2.3E-03	up
04/27/2010	581.79	581.87	-0.08	55.99	-1.4E-03	flat
07/26/2010	582.39	582.45	-0.06	56.59	-1.1E-03	flat
11/02/2010	581.57	581.72	-0.15	55.77	-2.7E-03	up
05/17/2011	581.99	581.57	0.42	56.19	7.5E-03	down
11/01/2011	582.11	579.97	2.14	56.31	3.8E-02	down
08/08/2012	581.52	581.59	-0.07	55.72	-1.3E-03	flat
11/13/2012	580.69	580.99	-0.30	54.89	-5.5E-03	up
02/26/2013	580.39	580.58	-0.19	54.59	-3.5E-03	up
05/29/2013	581.64	581.81	-0.17	55.84	-3.0E-03	up
11/12/2013	581.48	581.61	-0.13	55.68	-2.3E-03	up
05/19/2014	582.20	582.48	-0.28	56.40	-5.0E-03	up
			Middle of screen elevation (MW-18T)			578.5
			Middle of screen elevation (PZ-18TB)			525.8

Table 3 - Vertical Gradient Tables

Wisconsin Public Service Corporation, Manitowoc - Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

Deep Sand to Bedrock						
Date	**PZ-24 Groundwater Elevation (ft.)**	**PZ-23B Groundwater Elevation (ft.)**	**Head Change (dH)**	**Dist. Change (dL)**	**Vertical Hydraulic Gradient (dH/dL)***	
10/26/2009	581.27	582.29	-1.02	56.67	-1.8E-02	up
01/27/2010	580.71	581.85	-1.14	56.11	-2.0E-02	up
04/27/2010	580.77	581.84	-1.07	56.17	-1.9E-02	up
07/26/2010	581.42	582.54	-1.12	56.82	-2.0E-02	up
11/02/2010	580.32	573.24 A	7.08	55.72	1.3E-01	down
05/17/2011	581.12	582.04	-0.92	56.52	-1.6E-02	up
11/01/2011	581.17	582.24	-1.07	56.57	-1.9E-02	up
08/08/2012	580.57	581.64	-1.07	55.97	-1.9E-02	up
11/14/2012	579.80	580.87	-1.07	55.20	-1.9E-02	up
02/26/2013	579.61	580.14	-0.53	55.01	-9.6E-03	up
05/30/2013	580.57	581.60	-1.03	55.97	-1.8E-02	up
11/13/2013	580.48	581.53	-1.05	55.88	-1.9E-02	up
05/19/2014	581.39	582.31	-0.92	56.79	-1.6E-02	up
			Middle of screen elevation (PZ-24)			545.4
			Middle of screen elevation (PZ-23B)			524.6

Shallow Sand to Deep Sand						
Date	**MW-5 Groundwater Elevation (ft.)**	**PZ-5 Groundwater Elevation (ft.)**	**Head Change (dH)**	**Dist. Change (dL)**	**Vertical Hydraulic Gradient (dH/dL)***	
08/08/2012	581.50	581.69	-0.19	29.11	-6.5E-03	up
11/13/2012	580.66	580.89	-0.23	28.27	-8.1E-03	up
02/26/2013	580.33	580.60	-0.27	27.94	-9.7E-03	up
05/29/2013	581.53	581.86	-0.33	29.14	-1.1E-02	up
11/12/2013	581.08	580.68	0.40	28.69	1.4E-02	down
05/19/2014	582.08	581.53	0.55	29.69	1.9E-02	down
			Middle of screen elevation (MW-5)			577.3
			Middle of screen elevation (PZ-5)			552.4

[O:BGH C:NDK 4/14][U:ECK 8/14]

Notes:

1. Distance between wells was calculated from the water table elevation to the mid-point of the screen on the piezometer.

*: Vertical gradients less than ±0.0015 are considered flat, and they typically have less than 0.02 foot difference between wells.

A: Atypcial reading from this well.

Table 04. 2009 - 2010 Groundwater Sampling Summary Table

Wisconsin Public Service Corporation, Manitowoc - Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

Quarterly Sampling 2009-2010	1st Qtr (Oct 2009)	2nd Qtr (Jan 2010)	3rd Qtr (Apr 2010)	4th Qtr (Jul 2010)
Existing Wells (2009)				
MW1, MW2, MW5, MW7, MW8, MW10, MW12, MW12D, MW13, MW17T,MW18T, MW19T, MW20T, MW21T	PVOCs, PAHs, NA indicators[1], metals, cyanide[2]			PVOCs, PAHs, NA indicators[1]
MW6	Water Level only			
MW9	PVOCs, PAHs, NA indicators[1], metals, cyanide[2]			Note 3
MW14	Water/Product Level only			
MW15T,MW16T	Water Level only			Note 4
Staff Gauge	Water Level only			
PW1	Water Level only			
Proposed Wells (2009)				
MW22 *(could not be completed as scoped in 2009, completed in 2012)*	na			na
PZ7B, PZ18TB, PZ23B	PVOCs, PAHs, NA indicators[1], metals, cyanide[2]			PVOCs, PAHs, NA indicators[1]
PZ24, PZ25, PZ26	PVOCs, PAHs, NA indicators[1], metals, cyanide[2]			PVOCs, PAHs, NA indicators[1]

Notes:

Changes between this summary table and the summary table presented in the SSWP are *italics and underlined*.

1. *NA indicators (Natural Attenuation indicator parameters) include: dissolved iron, dissolved managanese, sulfate, nitrate, and methane. Methane is only collected annually*.
2. If concentrations from first quarterly round for metals (aluminum, iron, manganese and vanadium) and available cyanide (OIA-1677) are below screening levels, these parameters will be discontinued from further analysis. *Aluminum, vanadium and cyanide were sampled during the first 3 quarters and then discontinued. Iron and manganese continue to be sampled with other geochemical indicator parameters for Natural Attenuation.*
3. If concentrations from first quarterly round indicate MW7 and MW9 have similar groundwater quality, MW9 (located only 40 ft from MW7) will be discontinued from further sampling. Water level only to be measured at MW9. *Concentrations were similar so MW9 was reduced to water level only after 1st quarterly event*.
4. If groundwater concentrations at MW22 (on Wisconsin Central Railroad property) are above screening levels during the first quarterly round, wells MW15T and MW16T will be sampled in the subsequent rounds to define the western extent of contamination. *Concentrations in other wells near the western edge of the site were below screening levels so sampling at MW15T and MW16T was not initiated.*

NATURAL RESOURCE TECHNOLOGY

Table 05. 2010 - 2011 Groundwater Sampling Summary Table

Wisconsin Public Service Corporation, Manitowoc - Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

Semiannual Sampling 2010-2011	Nov 2010	May 2011	Nov 2011	--
Existing Wells (2010)				
MW1, MW2, MW5, MW7, MW8, MW10, MW12, MW12D, MW13, MW17T,MW18T, MW19T, MW20T, MW21T, PZ24, PZ25, PZ26, PZ7B, PZ18TB, PZ23B	PVOCs, PAHs, NA indicators[1]			--
MW6, MW9, MW15T, MW16T	Water Level only			--
MW9	PVOCs, PAHs, metals, cyanide			--
MW14	Water/Product Level only			--
MW15T,MW16T	Water Level only			--
Staff Gauge	Water Level only			--
PW1	Water Level only			--

Notes:
Groundwater sampling returned to a semiannual schedule between upland RI activities in 2009 and 2012.
1. NA indicators (Natural Attenuation indicator parameters) include: dissolved iron, dissolved managanese, sulfate, nitrate, and methane. Methane is only collected annually.

Table 06. 2012 - 2013 Groundwater Sampling Summary Table

Wisconsin Public Service Corporation, Manitowoc - Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

Quarterly Sampling 2012-2013	1st Qtr (Aug 2012)	2nd Qtr (Nov 2012)	3rd Qtr (Feb 2013)	4th Qtr (May 2013)[3]
Existing Wells (2012)				
MW1, MW2, MW5, MW7, MW8, MW10, MW12, MW12D, MW13, MW17T,MW18T, MW19T, MW20T, MW21T, PZ7B, PZ18TB, PZ23B, PZ24, PZ25, PZ26	PVOCs, PAHs, NA indicators[1]			
MW6, MW9	Water Level only			
MW9	PVOCs, PAHs, NA indicators[1], metals, cyanide[2]			Note 3
MW14	Initiated sample collection due to minimal observations of product in well			
MW15T, MW16T	Water Level only[2]			
Staff Gauge	Water Level only			
PW1	Water Level only			
Proposed Wells (2012)				
MW22 *(Completed the well in the City right-of-way)*	PVOCs, PAHs, NA indicators[1]			
MW23, PZ5	PVOCs, PAHs, NA indicators[1]			

Notes:

Changes between this summary table and the summary table presented in the SSWP are *italics and underlined*.

1. *NA indicators (Natural Attenuation indicator parameters) include: dissolved iron, dissolved managanese, sulfate, nitrate, and methane. Methane is only collected annually.*
2. If groundwater concentrations at MW22 (in the City of Manitowoc right-of-way) are above screening levels during the first quarterly round, wells MW15T and MW16T will be sampled in the subsequent rounds to define the western extent of contamination. *Concentrations at MW22 were below screening levels so sampling at MW15T and MW16T was not initiated.*
3. Arsenic and cadmium were inadvertantly added to the metals list in May 2013. Arsenic was detected above the screening level and will continue to be collected for further evaluation.

NATURAL RESOURCE TECHNOLOGY

Table 7. 2013 Groundwater and Treatment System Sampling Summary Table

Wisconsin Public Service Corporation, Manitowoc - Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

Semiannual Sampling 2013 and Future Sampling Events	Nov 2013	May 2014	Nov 2014	Future Events[1]
Existing Wells (2013)				
MW1, MW2, MW5, MW7, MW8, MW10, MW12, MW12D, MW13, MW17T,MW18T, MW19T, MW20T, MW21T, MW22, MW23, PZ5, PZ24, PZ25, PZ26, PZ7B, PZ18TB, PZ23B	PVOCs, PAHs, NA indicators[2] and Arsenic[3]			
MW6, MW9, MW15T, MW16T	Water Level only			
MW9	PVOCs, PAHs, metals, cyanide			--
MW14	PVOCs, PAHs, NA indicators[2] and Arsenic[3]			
MW15T,MW16T	Water Level only			--
Staff Gauge	Water Level only			
PW1	Water Level only			

Notes:
Groundwater sampling returned to a semiannual schedule in November 2013.
1. Groundwater sampling will continue semiannually as summarized in this table until futher notice.
2. NA indicators (Natural Attenuation indicator parameters) include: dissolved iron, dissolved managanese, sulfate, nitrate, and methane. Methane only collected annually (May).
3. Arsenic and cadmium were inadvertantly added to the metals list in May 2013. Arsenic was detected above the screening level and will continue to be collected for further evaluation.

Treatment System (2008-2013) and Future Sampling Events	
Influent	VOCs, PAHs - Semiannually in May/Nov
Intermediate (Between Carbon)	BTEX - Bimonthly
Effluent	VOC, SVOCs, pH - Semiannually in May/Nov

Notes:
The treatment system sampling did not change during any RI activities.

Table 8. Soil Summary Statistics - Samples Exceeding Residential and Industrial SLs

Wisconsin Public Service Corporation, Manitowoc - Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

Parameter (µg/kg)	Samples Analyzed	Samples Exceeding the MDL	Minimum (mg/kg)	Maximum (mg/kg)	Residential Soil SL (mg/kg)	Samples Exceeding Residential SL	Non-detected Samples Exceeding Residential SL	Industrial Soil SL (mg/kg)	Samples Exceeding Industrial SL	Non-detected Samples Exceeding Industrial SL
Volatile Organic Compounds (VOCs)										
1,2,4-Trimethylbenzene	110	45	0.0287	5,570	58	12	12	240	6	6
Benzene	132	41	0.016	144	1	10	10	5	7	7
Ethylbenzene	132	49	0.017	560	6	15	15	25	10	10
Xylene, o	86	36	0.0299	7,150	650	4	4	2,800	1	1
Xylenes, m + p	86	25	0.0698	1,690	550	2	2	2,400	0	0
Total Xylenes	41	20	0.047	800	580	1	1	2,500	0	0
Polynuclear Aromatic Hydrocarbons (PAHs)										
Benzo(a)anthracene	132	37	0.011	444	0	26	26	3	14	14
Benzo(a)pyrene	129	40	0.0042	474	0	35	35	0	24	24
Benzo(b)fluoranthene	132	37	0.0086	243	0	26	26	3	12	12
Benzo(k)fluoranthene	132	37	0.0096	300	2	16	16	29	6	6
Chrysene	132	41	0.0053	449	15	7	7	290	1	1
Dibenz(a,h)anthracene	132	24	0.0056	51	0	20	20	0	11	11
Indeno(1,2,3-cd)pyrene	132	34	0.0073	193	0	23	23	3	9	9
Naphthalene	129	103	0.0017	4,830,000	4	36	36	17	27	27
1-Methylnaphthalene	86	64	0.0021	1,210	17	9	9	73	4	4
2-Methylnaphthalene	113	71	0.0019	1,790	230	6	6	3,000	0	0
Inorganic Compounds										
Cyanide, total	132	61	0.14	1790	78	1	1	1,200	1	1
Lead, total	108	87	1	2,240	400	2	2	800	1	1

[O:ECB 6/21/13 C: PMH 7/3/13][U: BGH9/11/13]9/11/13][U:ECK 10/3/14

Notes:
mg/kg = milligrams per kilogram
MDL = Method Detection Limit
SL = Screening Level
SLs used on this table were presented in the Multi-Site Risk Assessment Framework Addendum Revision 3 (Exponent, July 2014).

Table 9. Soil SVOCs Analytical Results Exceeding the Residental and Industrial SLs
Wisconsin Public Service Corporation, Manitowoc
Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc, Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

				PAH									
Sample Code	Sample Location	Sample Depth (Ft)	Sample Date	1-Methylnaphthalene (mg/kg)	2-Methylnaphthalene (mg/kg)	Benzo(a)anthracene (mg/kg)	Benzo(a)pyrene (mg/kg)	Benzo(b)fluoranthene (mg/kg)	Benzo(k)fluoranthene (mg/kg)	Chrysene (mg/kg)	Dibenz(a,h)anthracene (mg/kg)	Indeno(1,2,3-cd)pyrene (mg/kg)	Naphthalene (PAH) (mg/kg)
			Residential Soil SL in WI/IBS	*17*	*230*	*0.15*	*0.015*	*0.15*	*1.5*	*15*	*0.015*	*0.15*	*3.8*
			Industrial Soil SL in WI/IBS	**73**	**3,000**	**2.9**	**0.29**	**2.9**	**29**	**290**	**0.29**	**2.9**	**17**
	Value exceeds Residential or Industrial SL												
	Detected below SL												
	Not detected above reported limit												
	Not analyzed												
082588001	SB1	7-7.5	08/25/1988	--	--	< 25	< 25	< 25	< 25	< 25	< 50	< 50	**1,700**
082588002	SB2	20-21.5	08/25/1988	--	--	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 1	< 1	< 0.1
082588003	SB3	16-17	08/25/1988	--	--	**82**	**110**	< 25	**150**	*120*	< 50	**65**	**730**
082588004	SB4	7.5-9	08/25/1988	--	--	< 0.5	**0.64**	< 0.5	1.2	< 0.5	< 1	< 1	0.5
082588005	SB5	15-16.5	08/25/1988	--	--	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 1	< 1	< 0.1
	SB16	5.5-7.5	11/06/1991	--	--	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	SB16	22-24	11/06/1991	--	--	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	SB18	5.5-7.5	11/06/1991	--	--	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	SB18	22-24	11/07/1991	--	--	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	SB20	4-6	10/28/1991	--	--	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	SB36	5.5-7.5	11/08/1991	--	--	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	SB36	22-24	11/08/1991	--	--	< 0.5	< 0.5	**5**	*5*	< 0.5	< 0.5	< 0.5	3.3
	SB45	18-20	04/14/1993	--	--	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
	SB47	22-24	04/14/1993	--	--	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
	SB50	22-24	04/13/1993	--	--	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33	1.3
	SB51	13-15	04/13/1993	--	--	**3.7**	< 0.33	**4.8**	*4.8*	4.1	< 0.33	< 0.33	**23**
	SB51	18-20	04/13/1993	--	--	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33	1.5
	SB52	13-15	04/13/1993	--	--	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
	SB52	22-24	04/13/1993	--	--	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
	SB54	18-20	08/31/1993	--	0.43	< 0.33	--	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33	--
	SB57	18-20	09/01/1993	--	0.68	< 0.33	--	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33	--
	SB58	13-15	09/01/1993	--	*970*	**55**	--	**65**	**65**	*53*	< 33	< 33	--
	MW15T	5-6	05/15/1995	--	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
	MW16T	3-4	05/16/1995	--	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
	MW17T	10-11	05/17/1995	--	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
	MW18T	13-14.5	05/17/1995	--	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
	SB95-1	4-6	05/15/1995	--	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
	SB95-2	3-4.8	05/16/1995	--	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
	SB95-3	3-5	05/18/1995	--	12	**52**	**43**	**36**	**40**	*47*	< 2	**15**	**19**
	SB95-4	5.5-6	05/18/1995	--	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
	SB95-5	7-8.5	05/16/1995	--	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
	SB95-6	25-27	05/18/1995	--	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
	SB96-1	18-20	06/03/1996	--	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33	1.7
	SB96-2	18-20	06/03/1996	--	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33	1.2
	SB96-3	25-27	06/04/1996	--	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33	1.8
	SB96-4	28-30	06/04/1996	--	*330*	< 83	< 83	< 83	< 83	< 83	< 83	< 83	**1,000**
	SB96-5	25-27	06/05/1996	--	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33	1

Table 9. Soil SVOCs Analytical Results Exceeding the Residental and Industrial SLs
Wisconsin Public Service Corporation, Manitowoc
Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc, Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

				PAH									
Sample Code	Sample Location	Sample Depth (Ft)	Sample Date	1-Methylnaphthalene (mg/kg)	2-Methylnaphthalene (mg/kg)	Benzo(a)anthracene (mg/kg)	Benzo(a)pyrene (mg/kg)	Benzo(b)fluoranthene (mg/kg)	Benzo(k)fluoranthene (mg/kg)	Chrysene (mg/kg)	Dibenz(a,h)anthracene (mg/kg)	Indeno(1,2,3-cd)pyrene (mg/kg)	Naphthalene (PAH) (mg/kg)
			Residential Soil SL in WI/IBS	*17*	*230*	*0.15*	*0.015*	*0.15*	*1.5*	*15*	*0.015*	*0.15*	*3.8*
			Industrial Soil SL in WI/IBS	**73**	**3,000**	**2.9**	**0.29**	**2.9**	**29**	**290**	**0.29**	**2.9**	**17**
	Value exceeds Residential or Industrial SL												
	Detected below SL												
	Not detected above reported limit												
	Not analyzed												
	SB96-6	17-19	06/05/1996	--	< 83	< 83	< 83	< 83	< 83	< 83	< 83	< 83	**360**
	SB96-6	31-33	06/05/1996	--	170	< 170	< 170	< 170	< 170	< 170	< 170	< 170	**570**
	SB96-7	15-17	06/06/1996	--	< 170	< 170	< 170	< 170	< 170	< 170	< 170	< 170	**1,100**
	SB96-7	39-41	06/06/1996	--	41	< 17	< 17	< 17	< 17	< 17	< 17	< 17	**130**
	SB96-8	33-35	06/06/1996	--	*370*	< 170	< 170	< 170	< 170	< 170	< 170	< 170	**1,300**
	SB96-9	39-41	06/08/1996	--	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
	SB96-10	33-35	06/08/1996	--	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
	SB96-11	13-15	06/09/1996	--	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6	*8.7*
	SB96-12	25-27	06/09/1996	--	1	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33	*4.6*
091709074	SB101	26-28	09/15/2009	**315**	*604*	**299**	**257**	**194**	**197**	*275*	**33.4**	**113**	**3,280**
091709075	SB101	34-36	09/15/2009	0.0868	0.151	0.0409	*0.0381*	0.0318	0.0324	0.042	< 0.0058	0.0211	1.02
091609007	SB103	4-6	09/14/2009	0.0559	0.0544	0.0345	*0.0354*	0.0321	0.0357	0.0362	0.0075	0.0252	0.21
091609005	SB103	10-12	09/14/2009	*58.9*	79.9	**12.2**	**8.92**	**3.9**	*5.62*	11.4	< 2.63	*2.68*	**179**
091609006	SB103	16-18	09/14/2009	0.0475	0.0487	0.0124	0.0071	< 0.0069	< 0.0076	0.01	< 0.0057	< 0.0051	0.0755
091609010	SB104	4-6	09/14/2009	0.0755	0.0989	*0.952*	**1.09**	*0.878*	0.838	0.907	*0.207*	*0.629*	0.26
091609008	SB104	10-12	09/14/2009	0.0499	< 0.0022	< 0.0099	< 0.0043	< 0.0067	< 0.0073	< 0.0041	< 0.0055	< 0.005	0.0136
091609009	SB104	18-20	09/14/2009	0.0026	< 0.0022	< 0.01	< 0.0044	< 0.0068	< 0.0075	< 0.0041	< 0.0056	< 0.005	0.0164
091609022	SB105	6-8	09/14/2009	< 0.0022	< 0.0022	< 0.0098	< 0.0043	< 0.0067	< 0.0073	< 0.004	< 0.0055	< 0.0049	0.0017
091609011	SB106	4-8	09/15/2009	*35.9*	27.3	**124**	**91.2**	**60.9**	**69.6**	*127*	**14.1**	**37.6**	**34.7**
091609023	SB107	4-6	09/14/2009	0.0414	0.0537	*0.246*	**0.427**	*0.373*	0.192	0.451	*0.105*	*0.404*	0.415
091609013	SB108	0-2	09/15/2009	12.1	17.2	**5.56**	**4.77**	*2.38*	*3.09*	5.34	**0.518**	*1.72*	**27.5**
091609024	SB108	4-6	09/15/2009	*38.9*	56.9	**13**	**11.2**	**5.59**	*7*	12.3	**1.29**	**4.08**	**100**
091609025	SB109	8-10	09/15/2009	< 0.0022	< 0.0022	< 0.0098	< 0.0042	< 0.0066	< 0.0073	< 0.004	< 0.0055	< 0.0049	0.0211
091609012	SB110	0-2	09/15/2009	0.0046	0.0042	0.0202	*0.0165*	0.0086	0.0126	0.0192	< 0.0048	0.0073	0.0193
091609026	SB110	4-6.5	09/15/2009	< 0.002	< 0.002	< 0.0089	0.0057	< 0.006	< 0.0066	0.0059	< 0.005	< 0.0045	0.0153
091609014	SB111	0-2	09/15/2009	0.0319	0.0752	*0.919*	**1.86**	*1.34*	0.875	0.976	**0.368**	*1.19*	0.192
091709071	SB111	6-8	09/15/2009	0.0023	< 0.002	< 0.0092	< 0.004	< 0.0062	< 0.0068	< 0.0038	< 0.0051	< 0.0046	0.0275
091609016	SB111	12-14	09/15/2009	0.118	< 0.0045	< 0.0201	< 0.0087	< 0.0137	< 0.015	< 0.0083	< 0.0112	< 0.0101	0.0459
091609017	SB111	16-18	09/15/2009	0.0519	< 0.0022	< 0.01	< 0.0043	< 0.0068	< 0.0074	< 0.0041	< 0.0056	< 0.005	0.0154
091609019	SB112	4-6	09/15/2009	< 0.0022	< 0.0022	< 0.0098	< 0.0043	< 0.0067	< 0.0073	< 0.004	< 0.0055	< 0.0049	0.0116
091609020	SB112	8-10	09/15/2009	0.0612	0.0062	< 0.0096	< 0.0042	< 0.0065	< 0.0071	< 0.004	< 0.0054	< 0.0048	0.169
091609018	SB112	12-14	09/15/2009	0.0521	0.0024	< 0.0098	< 0.0043	< 0.0067	< 0.0073	< 0.004	< 0.0055	< 0.0049	0.0194
091609027	SB113	0-2	09/15/2009	0.195	0.394	**11.3**	**9.47**	**9.3**	*9.18*	10.9	**1.74**	**5.76**	1.97
091609028	SB113	2-4	09/15/2009	0.0037	0.0076	0.019	*0.0173*	0.01	0.0122	0.0192	< 0.0056	0.0079	0.0964
091709072	SB113	8-10	09/15/2009	< 0.0022	0.0022	< 0.0099	< 0.0043	< 0.0067	< 0.0073	< 0.0041	< 0.0055	< 0.005	0.031
091609029	SB114	0-2	09/14/2009	0.505	0.85	0.0807	*0.0898*	0.0783	0.082	0.0893	< 0.0387	0.0591	2.87
091709073	SB114	8-10	09/14/2009	0.121	0.292	*1.76*	**3.01**	*1.86*	*1.78*	1.94	**0.459**	*1.56*	0.953
091609030	SB114	12-14	09/14/2009	0.0427	0.0569	0.011	0.0098	< 0.0067	< 0.0073	0.0103	< 0.0055	< 0.0049	0.522
091609031	SB114	16-17	09/14/2009	**1,210**	*1,790*	**444**	**474**	**243**	**300**	**449**	**51.3**	**193**	**4,470**

Table 9. Soil SVOCs Analytical Results Exceeding the Residental and Industrial SLs

Wisconsin Public Service Corporation, Manitowoc
Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc, Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

				PAH									
Sample Code	Sample Location	Sample Depth (Ft)	Sample Date	1-Methylnaphthalene (mg/kg)	2-Methylnaphthalene (mg/kg)	Benzo(a)anthracene (mg/kg)	Benzo(a)pyrene (mg/kg)	Benzo(b)fluoranthene (mg/kg)	Benzo(k)fluoranthene (mg/kg)	Chrysene (mg/kg)	Dibenz(a,h)anthracene (mg/kg)	Indeno(1,2,3-cd)pyrene (mg/kg)	Naphthalene (PAH) (mg/kg)
			Residential Soil SL in WI/IBS	*17*	*230*	*0.15*	*0.015*	*0.15*	*1.5*	*15*	*0.015*	*0.15*	*3.8*
			Industrial Soil SL in WI/IBS	**73**	**3,000**	**2.9**	**0.29**	**2.9**	**29**	**290**	**0.29**	**2.9**	**17**
	Value exceeds Residential or Industrial SL												
	Detected below SL												
	Not detected above reported limit												
	Not analyzed												
091709032	SB115	0-2	09/14/2009	0.0164	0.0235	0.0942	*0.115*	0.11	0.0991	0.102	*0.0229*	0.0769	0.0492
091709033	SB115	10-12	09/14/2009	< 0.002	< 0.0021	< 0.0093	< 0.004	< 0.0063	< 0.0069	< 0.0038	< 0.0052	< 0.0047	0.0248
091709039	SB115	18-20	09/14/2009	< 0.0021	< 0.0021	< 0.0096	< 0.0042	< 0.0065	< 0.0072	< 0.004	< 0.0054	< 0.0049	0.0419
091709035	SB116	0-2	09/14/2009	0.313	0.561	**4.79**	**5.37**	**4.98**	*4.44*	4.58	**1.01**	**3.3**	1.54
091709036	SB116	14-16	09/14/2009	0.0027	0.0038	< 0.0096	< 0.0041	< 0.0065	< 0.0071	< 0.0039	< 0.0053	< 0.0048	0.0227
091709037	SB116	20-22	09/14/2009	0.0492	0.0054	0.105	*0.104*	0.0866	0.083	0.102	0.0149	0.0515	0.0487
091709038	SB116	26-28	09/14/2009	0.143	0.0081	< 0.0098	< 0.0043	< 0.0067	< 0.0073	< 0.004	< 0.0055	< 0.0049	0.0582
091709040	SB117	0-2	09/14/2009	0.0305	0.0635	*0.368*	**0.467**	*0.473*	0.406	0.385	*0.115*	*0.369*	0.674
091709041	SB117	12-14	09/14/2009	0.0046	0.0143	0.0899	*0.181*	0.114	0.102	0.0745	*0.024*	0.0726	0.21
091709042	SB117	20-22	09/14/2009	0.445	0.0512	**3.36**	**3.24**	*1.66*	*2.19*	2.96	**0.345**	*1.11*	0.957
091709043	SB117	30-32	09/14/2009	0.0035	0.0031	< 0.0101	< 0.0044	< 0.0068	< 0.0075	< 0.0041	< 0.0056	< 0.0051	0.148
091709044	SB118	0-2	09/14/2009	0.0372	0.0826	*0.288*	**0.538**	*0.499*	0.355	0.324	*0.135*	*0.426*	0.27
091709046	SB118	6-8	09/14/2009	< 0.002	< 0.002	< 0.009	< 0.0039	< 0.0061	< 0.0067	< 0.0037	< 0.005	< 0.0045	0.0595
091709045	SB118	18-20	09/14/2009	< 0.002	< 0.002	< 0.0089	< 0.0039	< 0.0061	< 0.0066	< 0.0037	< 0.005	< 0.0045	0.0313
091709047	SB119	0-2	09/14/2009	0.101	0.159	*0.783*	**0.722**	*0.49*	0.662	0.778	< 0.192	*0.361*	**17.8**
092209078	SB119	8-10	09/14/2009	0.0044	0.008	< 0.0089	< 0.0039	< 0.006	< 0.0066	< 0.0037	< 0.005	< 0.0045	0.29
091709048	SB119	18-20	09/14/2009	0.0051	0.0051	< 0.0096	0.0042	< 0.0065	< 0.0071	< 0.0039	< 0.0053	< 0.0048	0.0321
091709049	SB120	0-2	09/14/2009	1.03	1.48	**18.7**	**17**	**13.3**	*13.5*	*18.7*	**3.15**	**8.02**	*9.66*
091709050	SB120	10-14	09/14/2009	0.0021	0.0046	< 0.0086	< 0.0037	< 0.0058	< 0.0064	< 0.0035	< 0.0048	< 0.0043	0.323
091709051	SB120	24-28	09/14/2009	< 0.002	< 0.002	< 0.009	< 0.0039	< 0.0061	< 0.0067	< 0.0037	< 0.005	< 0.0045	0.072
091709052	SB121	0-2	09/14/2009	0.108	0.163	*0.854*	**0.972**	*1.03*	0.955	1.13	*0.204*	*0.597*	*3.93*
091709054	SB121	8-10	09/14/2009	0.0051	0.0108	< 0.0086	< 0.0037	< 0.0059	< 0.0064	< 0.0036	< 0.0048	< 0.0043	0.57
091709053	SB121	20-24	09/14/2009	< 0.002	< 0.002	< 0.009	< 0.0039	< 0.0061	< 0.0067	< 0.0037	< 0.005	< 0.0045	0.749
091709055	SB122	0-2	09/14/2009	0.581	1.15	< 0.642	< 0.279	< 0.435	< 0.477	< 0.264	< 0.358	< 0.323	**26.4**
091709057	SB122	2-6	09/14/2009	< 0.261	0.333	*1.67*	**1.41**	*0.901*	1.37	1.59	< 0.659	*0.638*	**52.2**
091709056	SB122	12-14	09/14/2009	< 81500	< 82000	< 369000	< 160000	< 250000	< 274000	< 152000	< 206000	< 186000	**4,830,000**
091709059	SB122	28-30	09/14/2009	< 0.2	< 0.201	< 0.904	< 0.393	< 0.613	< 0.671	< 0.372	< 0.504	< 0.455	**48.2**
091709060	SB122	38-40	09/14/2009	0.0483	0.09	< 0.181	< 0.0787	< 0.123	< 0.135	< 0.0746	< 0.101	< 0.0912	*9.96*
091709061	SB122	42-44	09/14/2009	0.0551	0.0988	< 0.114	< 0.0494	< 0.0772	< 0.0845	< 0.0469	< 0.0635	< 0.0573	*4.03*
091709062	SB123	0-2	09/15/2009	0.0641	0.145	< 0.0897	< 0.039	< 0.0608	< 0.0666	< 0.0369	< 0.05	< 0.0451	3.3
091709063	SB123	6-7.5	09/15/2009	*39*	81	< 69.3	< 30.1	< 47	< 51.5	< 28.5	< 38.7	< 34.9	**1,860**
091709064	SB124	0-2	09/15/2009	0.143	0.308	< 0.18	*0.0909*	< 0.122	< 0.134	0.109	< 0.1	< 0.0905	*6.76*
091709065	SB124	2-4	09/15/2009	0.11	0.23	*0.439*	**0.738**	*0.664*	0.529	0.413	*0.235*	*0.782*	2.92
091709070	SB124	6-7.8	09/15/2009	4.72	9.96	< 1.97	< 0.855	< 1.33	< 1.46	< 0.81	< 1.1	< 0.99	**120**
091709066	SB125	0-2	09/15/2009	0.0234	0.0568	*0.195*	**0.436**	*0.327*	0.216	0.217	*0.0811*	*0.241*	0.422
091709069	SB125	6-8	09/15/2009	0.0545	0.0033	< 0.01	< 0.0043	< 0.0068	< 0.0074	< 0.0041	< 0.0056	< 0.005	0.11
091709067	SB125	10-12	09/15/2009	0.0701	0.0069	< 0.0097	< 0.0042	< 0.0066	< 0.0072	< 0.004	< 0.0054	< 0.0049	0.23
091709068	SB125	18-20	09/15/2009	0.0351	0.0615	< 0.0099	< 0.0043	< 0.0067	< 0.0074	< 0.0041	< 0.0055	< 0.005	0.311

Table 9. Soil SVOCs Analytical Results Exceeding the Residental and Industrial SLs
Wisconsin Public Service Corporation, Manitowoc
Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc, Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

				PAH									
Sample Code	Sample Location	Sample Depth (Ft)	Sample Date	1-Methylnaphthalene (mg/kg)	2-Methylnaphthalene (mg/kg)	Benzo(a)anthracene (mg/kg)	Benzo(a)pyrene (mg/kg)	Benzo(b)fluoranthene (mg/kg)	Benzo(k)fluoranthene (mg/kg)	Chrysene (mg/kg)	Dibenz(a,h)anthracene (mg/kg)	Indeno(1,2,3-cd)pyrene (mg/kg)	Naphthalene (PAH) (mg/kg)
			Residential Soil SL in WI/IBS	*17*	*230*	*0.15*	*0.015*	*0.15*	*1.5*	*15*	*0.015*	*0.15*	*3.8*
			Industrial Soil SL in WI/IBS	**73**	**3,000**	**2.9**	**0.29**	**2.9**	**29**	**290**	**0.29**	**2.9**	**17**
	Value exceeds Residential or Industrial SL												
	Detected below SL												
	Not detected above reported limit												
	Not analyzed												
092209076	TP101A	17-17	09/22/2009	< 0.0024	< 0.0024	< 0.011	< 0.0048	< 0.0075	< 0.0082	< 0.0045	< 0.0061	< 0.0055	0.0052
092209077	TP101B	13.5-13.5	09/22/2009	< 0.0019	0.0019	0.0171	*0.0254*	0.0178	0.0192	0.0166	0.0056	0.0149	0.002
080112009	SB126	5-6	08/01/2012	< 0.0092	< 0.0019	< 0.01	< 0.01	< 0.0029	< 0.01	< 0.0023	< 0.01	< 0.01	0.0151
080112006	SB126	15-16	08/01/2012	**79.9**	146	< 64.9	< 64.9	< 18.7	< 64.9	< 14.7	< 64.9	< 64.9	**3,540**
080112008	SB126	20-21	08/01/2012	0.13	0.221	< 0.0501	< 0.0501	< 0.0144	< 0.0501	< 0.0114	< 0.0501	< 0.0501	1.82
080112010	SB127	13-14	08/01/2012	< 0.0089	< 0.0018	< 0.0098	< 0.0098	< 0.0028	< 0.0098	< 0.0022	< 0.0098	< 0.0098	0.0083
080112011	SB127	19-20	08/01/2012	3.51	6.51	< 1.22	< 1.22	< 0.353	< 1.22	< 0.278	< 1.22	< 1.22	**47.3**
080112012	SB127	28-29	08/01/2012	0.38	0.0042	< 0.0098	< 0.0098	< 0.0028	< 0.0098	< 0.0022	< 0.0098	< 0.0098	0.149
073112005	SB128	9-10	07/31/2012	< 0.008	0.0019	< 0.0088	*0.0224*	0.0173	0.0096	0.0053	0.0094	0.0732	0.0142
073112003	SB128	10-11	07/31/2012	*21.3*	41.6	< 19.5	< 19.5	< 5.62	< 19.5	< 4.42	< 19.5	< 19.5	**757**
073112004	SB128	17-17	07/31/2012	2.76	0.11	*0.26*	< 0.258	*0.231*	< 0.258	0.38	< 0.258	< 0.258	*11.3*
073112002	SB129	7-8	07/31/2012	< 0.0091	< 0.0019	< 0.01	< 0.01	< 0.0029	< 0.01	< 0.0023	< 0.01	< 0.01	< 0.0038
073112001	SB130	8-9	07/31/2012	< 0.0178	< 0.0037	< 0.0195	< 0.0195	< 0.0056	< 0.0195	< 0.0044	< 0.0195	< 0.0195	< 0.0074
062314003	MW14R	0-2	06/23/2014	0.0113	0.0185	< 0.0063	0.0107	0.0093	< 0.0101	0.009	< 0.0067	0.0083	0.0899
062314004	MW14R	15-16	06/23/2014	**847**	*825*	< 169	< 174	< 243	< 269	< 225	< 178	< 185	**7,370**
062314005	MW14R	18-20	06/23/2014	0.908	0.671	< 0.148	< 0.152	< 0.213	< 0.236	< 0.197	< 0.156	< 0.162	*4.25*
062314001	SB132	0-2	06/23/2014	< 0.0092	< 0.0092	< 0.0063	< 0.0065	< 0.0092	< 0.0101	< 0.0085	< 0.0067	< 0.007	< 0.0092
062314002	SB132	32-34	06/23/2014	0.0522	< 0.0095	< 0.0066	< 0.0068	< 0.0095	< 0.0105	< 0.0088	< 0.007	< 0.0072	0.0477
			Total Number of Samples Analyzed:	86	113	132	129	132	132	132	132	132	129
			Number of Detections:	64	71	37	40	37	37	41	24	34	103
			Min:	0.0021	0.0019	0.011	0.0042	0.0086	0.0096	0.0053	0.0056	0.0073	0.0017
			Max:	1,210	1,790	444	474	243	300	449	51.3	193	4,830,000
			Residential Soil SL in WI/IBS	17	230	0.15	0.015	0.15	1.5	15	0.015	0.15	3.8
			Number of Samples that Exceed Residential SL:	***9***	***6***	***26***	***35***	***26***	***16***	***7***	***20***	***23***	***36***
			Industrial Soil SL in WI/IBS	73	3,000	2.9	0.29	2.9	29	290	0.29	2.9	17
			Number of Samples that Exceed Industrial SL:	**4**	0	**14**	**24**	**12**	**6**	**1**	**11**	**9**	**27**

[O:ECK 8/12/14; C:JTB 8/22/14]

NOTES:
Italic *Value exceeds Residential SL*
BOLD **Value exceeds Industrial SL**
< Concentration is less than Reported Limit
-- Analysis not performed
NS No Standard
SL Screening Level
SLs used on this table were presented in the Multi-Site Risk Assessment Framework Addendum Revision 3 (Exponent, July 2014).

Table 10: Soil VOCs and Inorganics Analytical Results Exceeding the Residential and Industrial SLs

Wisconsin Public Service Corporation, Manitowoc
Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc, Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

				BTEX			VOC	Metals	Inorganic
Sample Code	Sample Location	Sample Depth (Ft)	Sample Date	Benzene (mg/kg)	Ethylbenzene (mg/kg)	Xylene, o (mg/kg)	1,2,4-trimethylbenzene (mg/kg)	Lead, Total (mg/kg)	Cyanide, Total (mg/kg)
			Residential Soil SL in WI/IBS	*1.2*	*5.8*	*650*	*58*	*400*	*78*
			Industrial Soil SL in WI/IBS	**5.1**	**25**	**2,800**	**240**	**800**	**1,200**
	Value exceeds Residential or Industrial SL								
	Detected below SL								
	Not detected above reported limit								
	Not analyzed								
082588001	SB1	7-7.5	08/25/1988	**9**	*8.6*	--	--	*490*	< 40
082588002	SB2	20-21.5	08/25/1988	< 0.025	< 0.025	--	--	< 1	< 10
082588003	SB3	16-17	08/25/1988	**32**	*22*	--	--	41	< 10
082588004	SB4	7.5-9	08/25/1988	< 0.025	0.026	--	--	10	10
082588005	SB5	15-16.5	08/25/1988	< 0.025	< 0.025	--	--	< 1	< 10
	SB16	5.5-7.5	11/06/1991	< 0.01	< 0.01	--	--	< 2	< 0.5
	SB16	22-24	11/06/1991	< 0.01	< 0.01	--	--	< 2	< 0.5
	SB18	5.5-7.5	11/06/1991	< 0.01	< 0.01	--	--	< 2	< 0.6
	SB18	22-24	11/07/1991	< 0.01	< 0.01	--	--	< 2	< 0.5
	SB20	4-6	10/28/1991	< 0.01	0.057	--	--	1.1	< 0.5
	SB36	5.5-7.5	11/08/1991	< 0.01	< 0.01	--	--	3.4	< 0.5
	SB36	22-24	11/08/1991	0.034	0.13	--	--	3	0.64
	SB45	18-20	04/14/1993	< 0.01	< 0.01	--	--	< 1	< 0.11
	SB47	22-24	04/14/1993	< 0.02	< 0.02	--	--	< 1	< 0.14
	SB50	22-24	04/13/1993	0.016	0.076	--	--	< 1	0.32
	SB51	13-15	04/13/1993	0.051	0.017	--	--	2.4	4.1
	SB51	18-20	04/13/1993	< 0.01	0.032	--	--	< 1	3.9
	SB52	13-15	04/13/1993	< 0.01	< 0.01	--	--	< 1	< 0.15
	SB52	22-24	04/13/1993	< 0.01	< 0.01	--	--	< 1	0.22
	SB54	18-20	08/31/1993	< 0.01	0.028	--	--	< 1	0.17
	SB57	18-20	09/01/1993	0.43	< 0.1	--	--	< 1	0.35
	SB58	13-15	09/01/1993	< 0.05	0.08	--	--	< 1	5.1
	MW15T	5-6	05/15/1995	< 0.005	< 0.005	--	< 0.005	--	3.2
	MW16T	3-4	05/16/1995	< 0.005	< 0.005	--	< 0.005	--	< 0.3
	MW17T	10-11	05/17/1995	< 0.005	< 0.005	--	< 0.005	--	< 0.3
	MW18T	13-14.5	05/17/1995	< 0.005	< 0.005	--	< 0.005	--	< 0.3
	SB95-1	4-6	05/15/1995	< 0.005	< 0.005	--	< 0.005	--	1.4
	SB95-2	3-4.8	05/16/1995	< 0.005	< 0.005	--	< 0.005	--	< 0.3
	SB95-3	3-5	05/18/1995	< 0.005	< 0.005	--	< 0.005	--	< 0.3
	SB95-4	5.5-6	05/18/1995	< 0.005	< 0.005	--	< 0.005	--	< 0.3
	SB95-5	7-8.5	05/16/1995	< 0.005	< 0.005	--	< 0.005	--	< 0.3
	SB95-6	25-27	05/18/1995	< 0.005	< 0.005	--	< 0.005	--	< 0.3
	SB96-1	18-20	06/03/1996	0.37	0.54	--	0.75	--	< 0.2
	SB96-2	18-20	06/03/1996	0.065	0.15	--	0.11	--	< 0.2
	SB96-3	25-27	06/04/1996	0.46	1.8	--	0.38	--	< 0.2

Table 10: Soil VOCs and Inorganics Analytical Results Exceeding the Residential and Industrial SLs

Wisconsin Public Service Corporation, Manitowoc
Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc, Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

				BTEX			VOC	Metals	Inorganic
Sample Code	Sample Location	Sample Depth (Ft)	Sample Date	Benzene (mg/kg)	Ethylbenzene (mg/kg)	Xylene, o (mg/kg)	1,2,4-trimethylbenzene (mg/kg)	Lead, Total (mg/kg)	Cyanide, Total (mg/kg)
			Residential Soil SL in WI/IBS	*1.2*	*5.8*	*650*	*58*	*400*	*78*
			Industrial Soil SL in WI/IBS	**5.1**	**25**	**2,800**	**240**	**800**	**1,200**
	Value exceeds Residential or Industrial SL								
	Detected below SL								
	Not detected above reported limit								
	Not analyzed								
	SB96-4	28-30	06/04/1996	**14**	**560**	--	**250**	--	< 0.2
	SB96-5	25-27	06/05/1996	0.24	0.16	--	0.12	--	< 0.2
	SB96-6	17-19	06/05/1996	0.1	*11*	--	*210*	--	< 0.2
	SB96-6	31-33	06/05/1996	*1.9*	**180**	--	*170*	--	0.2
	SB96-7	15-17	06/06/1996	*1.8*	**38**	--	**320**	--	< 0.2
	SB96-7	39-41	06/06/1996	1.1	*8.6*	--	25	--	< 0.2
	SB96-8	33-35	06/06/1996	**10**	**73**	--	*100*	--	< 0.2
	SB96-9	39-41	06/08/1996	< 0.025	< 0.025	--	< 0.025	--	< 0.2
	SB96-10	33-35	06/08/1996	0.069	0.14	--	< 0.025	--	0.3
	SB96-11	13-15	06/09/1996	< 0.025	0.37	--	1.7	--	0.6
	SB96-12	25-27	06/09/1996	0.47	0.58	--	2.4	--	0.6
091709074	SB101	26-28	09/15/2009	**44.9**	**47.9**	54	*66.3*	97.3	18.9
091709075	SB101	34-36	09/15/2009	0.0823	< 0.025	0.0314	< 0.025	1.4	0.28
091609007	SB103	4-6	09/14/2009	< 0.025	< 0.025	< 0.025	< 0.025	16.7	3
091609005	SB103	10-12	09/14/2009	*4.17*	*11*	5.27	6.54	3.6	< 0.75
091609006	SB103	16-18	09/14/2009	< 0.025	< 0.025	< 0.025	< 0.025	< 1.2	< 0.078
091609010	SB104	4-6	09/14/2009	< 0.025	< 0.025	< 0.025	< 0.025	20.8	0.63
091609008	SB104	10-12	09/14/2009	< 0.025	< 0.025	< 0.025	< 0.025	1.1	< 0.55
091609009	SB104	18-20	09/14/2009	< 0.025	< 0.025	< 0.025	< 0.025	< 1.2	0.69
091609022	SB105	6-8	09/14/2009	< 0.025	< 0.025	< 0.025	< 0.025	1.2	0.42
091609011	SB106	4-8	09/15/2009	0.217	1.28	1.74	2.02	34.1	6.9
091609023	SB107	4-6	09/14/2009	0.158	0.099	0.119	0.086	6.6	1.1
091609013	SB108	0-2	09/15/2009	0.17	0.238	1.01	0.755	8.6	1
091609024	SB108	4-6	09/15/2009	0.42	0.103	1.22	0.793	12.1	1
091609025	SB109	8-10	09/15/2009	< 0.025	< 0.025	< 0.025	< 0.025	1.1	< 0.52
091609012	SB110	0-2	09/15/2009	< 0.025	< 0.025	< 0.025	< 0.025	1.2	< 0.075
091609026	SB110	4-6.5	09/15/2009	< 0.025	< 0.025	< 0.025	< 0.025	1.2	< 0.64
091609014	SB111	0-2	09/15/2009	< 0.025	< 0.025	< 0.025	< 0.025	6.2	1.2
091709071	SB111	6-8	09/15/2009	< 0.025	< 0.025	< 0.025	< 0.025	1	1.2
091609016	SB111	12-14	09/15/2009	< 0.025	< 0.025	< 0.025	< 0.025	< 1.2	1.7
091609017	SB111	16-18	09/15/2009	< 0.025	< 0.025	< 0.025	< 0.025	1.1	< 0.75
091609019	SB112	4-6	09/15/2009	< 0.025	< 0.025	< 0.025	< 0.025	1.2	< 0.47
091609020	SB112	8-10	09/15/2009	< 0.025	< 0.025	< 0.025	< 0.025	< 1.2	< 0.63
091609018	SB112	12-14	09/15/2009	< 0.025	< 0.025	< 0.025	< 0.025	< 1.2	< 0.094
091609027	SB113	0-2	09/15/2009	< 0.025	< 0.025	0.0331	< 0.025	21.2	1.2
091609028	SB113	2-4	09/15/2009	< 0.025	< 0.025	< 0.025	< 0.025	2.7	0.41
091709072	SB113	8-10	09/15/2009	< 0.025	< 0.025	< 0.025	< 0.025	1.4	0.48

Table 10: Soil VOCs and Inorganics Analytical Results Exceeding the Residential and Industrial SLs

Wisconsin Public Service Corporation, Manitowoc
Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc, Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

				BTEX			VOC	Metals	Inorganic
Sample Code	Sample Location	Sample Depth (Ft)	Sample Date	Benzene (mg/kg)	Ethylbenzene (mg/kg)	Xylene, o (mg/kg)	1,2,4-trimethylbenzene (mg/kg)	Lead, Total (mg/kg)	Cyanide, Total (mg/kg)
			Residential Soil SL in WI/IBS	*1.2*	*5.8*	*650*	*58*	*400*	*78*
			Industrial Soil SL in WI/IBS	**5.1**	**25**	**2,800**	**240**	**800**	**1,200**
	Value exceeds Residential or Industrial SL								
	Detected below SL								
	Not detected above reported limit								
	Not analyzed								
091609029	SB114	0-2	09/14/2009	0.0533	0.0357	0.178	0.0743	38.5	< 0.5
091709073	SB114	8-10	09/14/2009	0.0445	< 0.025	0.0736	< 0.025	14.4	< 0.56
091609030	SB114	12-14	09/14/2009	< 0.025	< 0.025	0.0299	< 0.025	9	0.45
091609031	SB114	16-17	09/14/2009	**144**	**88.4**	324	*122*	131	13.2
091709032	SB115	0-2	09/14/2009	< 0.025	< 0.025	< 0.025	< 0.025	31.9	< 0.8
091709033	SB115	10-12	09/14/2009	< 0.025	< 0.025	< 0.025	< 0.025	1.6	< 0.74
091709039	SB115	18-20	09/14/2009	< 0.025	< 0.025	< 0.025	< 0.025	1.1	< 0.45
091709035	SB116	0-2	09/14/2009	0.0385	0.0354	0.106	0.0811	117	10.7
091709036	SB116	14-16	09/14/2009	< 0.025	< 0.025	< 0.025	< 0.025	1.2	1.8
091709037	SB116	20-22	09/14/2009	< 0.025	< 0.025	< 0.025	< 0.025	1.3	0.87
091709038	SB116	26-28	09/14/2009	< 0.025	< 0.025	< 0.025	< 0.025	1.4	< 0.59
091709040	SB117	0-2	09/14/2009	< 0.025	< 0.025	0.0336	< 0.025	42.7	1.1
091709041	SB117	12-14	09/14/2009	< 0.025	< 0.025	< 0.025	< 0.025	1.3	< 0.56
091709042	SB117	20-22	09/14/2009	< 0.025	0.0304	0.148	0.0843	1.3	0.8
091709043	SB117	30-32	09/14/2009	< 0.025	< 0.025	< 0.025	< 0.025	1.4	< 0.47
091709044	SB118	0-2	09/14/2009	< 0.025	< 0.025	< 0.025	< 0.025	60.7	1.8
091709046	SB118	6-8	09/14/2009	< 0.025	< 0.025	< 0.025	< 0.025	1.5	1.3
091709045	SB118	18-20	09/14/2009	< 0.025	< 0.025	< 0.025	< 0.025	1.3	< 0.58
091709047	SB119	0-2	09/14/2009	0.0415	0.0545	0.235	0.101	109	< 0.77
092209078	SB119	8-10	09/14/2009	< 0.025	< 0.025	< 0.025	< 0.025	1.8	< 0.61
091709048	SB119	18-20	09/14/2009	< 0.025	< 0.025	< 0.025	0.0287	1.3	0.16
091709049	SB120	0-2	09/14/2009	< 0.025	0.0372	0.175	0.0789	73.9	< 0.64
091709050	SB120	10-14	09/14/2009	< 0.025	< 0.025	< 0.025	< 0.025	2.1	1.4
091709051	SB120	24-28	09/14/2009	< 0.025	< 0.025	< 0.025	< 0.025	2.1	2.8
091709052	SB121	0-2	09/14/2009	< 0.025	0.0323	0.134	0.0471	40.2	< 0.83
091709054	SB121	8-10	09/14/2009	< 0.025	< 0.025	< 0.025	< 0.025	2.3	6.8
091709053	SB121	20-24	09/14/2009	< 0.025	< 0.025	< 0.025	< 0.025	2.3	4
091709055	SB122	0-2	09/14/2009	0.0449	0.293	1.81	1.19	56.4	< 0.81
091709057	SB122	2-6	09/14/2009	< 1.25	< 1.25	< 1.25	< 1.25	101	0.14
091709056	SB122	12-14	09/14/2009	< 133	< 133	**7,150**	**5,570**	**2,240**	**1,790**
091709059	SB122	28-30	09/14/2009	< 0.025	0.0366	0.23	0.17	1.4	5
091709060	SB122	38-40	09/14/2009	< 0.025	< 0.025	0.079	0.0491	1.8	2.6
091709061	SB122	42-44	09/14/2009	< 0.025	< 0.025	0.072	0.0395	1.8	5.4
091709062	SB123	0-2	09/15/2009	0.0435	0.0319	0.134	0.146	59.3	< 0.68
091709063	SB123	6-7.5	09/15/2009	**82.8**	**55.2**	144	*231*	224	3.4
091709064	SB124	0-2	09/15/2009	0.0593	0.0707	0.349	0.197	81.6	< 7.2
091709065	SB124	2-4	09/15/2009	0.126	0.157	0.551	0.348	121	9.7
091709070	SB124	6-7.8	09/15/2009	0.147	0.0449	0.103	0.0691	291	2

Table 10: Soil VOCs and Inorganics Analytical Results Exceeding the Residential and Industrial SLs

Wisconsin Public Service Corporation, Manitowoc
Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc, Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

				BTEX			VOC	Metals	Inorganic
Sample Code	Sample Location	Sample Depth (Ft)	Sample Date	Benzene (mg/kg)	Ethylbenzene (mg/kg)	Xylene, o (mg/kg)	1,2,4-trimethylbenzene (mg/kg)	Lead, Total (mg/kg)	Cyanide, Total (mg/kg)
			Residential Soil SL in WI/IBS	*1.2*	*5.8*	*650*	*58*	*400*	*78*
			Industrial Soil SL in WI/IBS	**5.1**	**25**	**2,800**	**240**	**800**	**1,200**
	Value exceeds Residential or Industrial SL								
	Detected below SL								
	Not detected above reported limit								
	Not analyzed								
091709066	SB125	0-2	09/15/2009	0.0421	< 0.025	0.0364	< 0.025	14	2.6
091709069	SB125	6-8	09/15/2009	0.064	< 0.025	< 0.025	< 0.025	1.4	0.73
091709067	SB125	10-12	09/15/2009	0.0426	< 0.025	< 0.025	0.032	1.1	0.34
091709068	SB125	18-20	09/15/2009	0.0538	< 0.025	< 0.025	< 0.025	< 1.2	0.21
092209076	TP101A	17-17	09/22/2009	< 0.025	< 0.025	< 0.025	< 0.025	1.5	0.6
092209077	TP101B	13.5-13.5	09/22/2009	< 0.025	< 0.025	< 0.025	< 0.025	2	0.14
080112009	SB126	5-6	08/01/2012	< 0.025	< 0.025	< 0.025	< 0.025	3.6	< 0.31
080112006	SB126	15-16	08/01/2012	< 12.5	**148**	*675*	**1,030**	1.6	< 0.56
080112008	SB126	20-21	08/01/2012	0.297	0.301	0.9	0.797	1.2	< 0.26
080112010	SB127	13-14	08/01/2012	< 0.025	< 0.025	< 0.025	< 0.025	2.2	< 0.22
080112011	SB127	19-20	08/01/2012	< 1	2.5	8.17	24.4	1.6	< 0.25
080112012	SB127	28-29	08/01/2012	< 0.025	< 0.025	< 0.025	0.0752	1.1	< 0.22
073112005	SB128	9-10	07/31/2012	< 0.025	< 0.025	< 0.025	< 0.025	1.6	< 0.26
073112003	SB128	10-11	07/31/2012	< 10	**115**	*718*	**1,340**	1.6	< 0.67
073112004	SB128	17-17	07/31/2012	< 0.2	< 0.2	< 0.2	0.611	1.5	4.2
073112002	SB129	7-8	07/31/2012	< 0.025	< 0.025	< 0.025	< 0.025	2.2	< 0.42
073112001	SB130	8-9	07/31/2012	< 0.025	< 0.025	< 0.025	< 0.025	1.8	< 0.19
062314003	MW14R	0-2	06/23/2014	< 0.025	< 0.025	< 0.025	< 0.025	1.2	< 0.00045
062314004	MW14R	15-16	06/23/2014	< 6.44	**66.9**	*734*	**312**	1.4	18.9
062314005	MW14R	18-20	06/23/2014	< 0.026	0.103	0.883	0.455	4.2	< 0.00046
062314001	SB132	0-2	06/23/2014	< 0.0255	< 0.0255	< 0.0255	< 0.0255	2.2	< 0.00041
062314002	SB132	32-34	06/23/2014	< 0.025	< 0.025	0.0416	< 0.025	1.2	< 0.00033
			Total Number of Samples Analyzed:	132	132	86	110	108	132
			Number of Detections:	41	49	36	45	87	61
			Min:	0.016	0.017	0.0299	0.0287	1	0.14
			Max:	144	560	7,150	5,570	2,240	1,790
			Residential Soil SL in WI/IBS	1.2	5.8	650	58	400	78
			Number of Samples that Exceed Residential SL:	***10***	***15***	***4***	***12***	***2***	***1***
			Industrial Soil SL in WI/IBS	5.1	25	2,800	240	800	1,200
			Number of Samples that Exceed Industrial SL:	**7**	**10**	**1**	**6**	**1**	**1**

[O:ECK 8/12/14; C:JTB 8/22/14][U:ECK 10/7/14]

NOTES:
Italic *Value exceeds Residential SL*
BOLD **Value exceeds Industrial SL**
< Concentration is less than Reported Limit
-- Analysis not performed
NS No Standard
SL Screening Level
SLs used on this table were presented in the Multi-Site Risk Assessment Framework Addendum Revision 3 (Exponent, July 2014).

Table 11: Soil VOCs and Inorganics Analytical Results Exceeding the CSAT Screening Levels

Wisconsin Public Service Corporation, Manitowoc
Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc, Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

				BTEX				VOC	VOC
Sample Code	Sample Location	Sample Depth (Ft)	Sample Date	Ethylbenzene (mg/kg)	Xylene, o (mg/kg)	Xylenes, m + p (mg/kg)	Xylenes, Total (mg/kg)	1,2,4-trimethylbenzene (mg/kg)	1,3,5-trimethylbenzene (mg/kg)
Csat/Ceiling SL for WI/IBS				**480**	**434**	**388**	**258**	**219**	**182**
	Value exceeds SL								
	Detected below SL								
	Not detected above reported limit								
	Not analyzed								
062314003	MW14R	0-2	06/23/2014	< 0.025	< 0.025	< 0.05	--	< 0.025	< 0.025
062314004	MW14R	15-16	06/23/2014	66.9	**734**	**394**	--	**312**	103
062314005	MW14R	18-20	06/23/2014	0.103	0.883	0.495	--	0.455	0.154
	MW15T	5-6	05/15/1995	< 0.005	--	--	< 0.015	< 0.005	< 0.005
	MW16T	3-4	05/16/1995	< 0.005	--	--	< 0.015	< 0.005	< 0.005
	MW17T	10-11	05/17/1995	< 0.005	--	--	< 0.015	< 0.005	< 0.005
	MW18T	13-14.5	05/17/1995	< 0.005	--	--	< 0.015	< 0.005	< 0.005
082588001	SB1	7-7.5	08/25/1988	8.6	--	--	--	--	--
082588002	SB2	20-21.5	08/25/1988	< 0.025	--	--	--	--	--
082588003	SB3	16-17	08/25/1988	22	--	--	--	--	--
082588004	SB4	7.5-9	08/25/1988	0.026	--	--	--	--	--
082588005	SB5	15-16.5	08/25/1988	< 0.025	--	--	--	--	--
	SB16	5.5-7.5	11/06/1991	< 0.01	--	--	< 0.01	--	--
	SB16	22-24	11/06/1991	< 0.01	--	--	< 0.01	--	--
	SB18	5.5-7.5	11/06/1991	< 0.01	--	--	< 0.01	--	--
	SB18	22-24	11/07/1991	< 0.01	--	--	< 0.01	--	--
	SB20	4-6	10/28/1991	0.057	--	--	< 0.01	--	--
	SB36	5.5-7.5	11/08/1991	< 0.01	--	--	< 0.01	--	--
	SB36	22-24	11/08/1991	0.13	--	--	0.32	--	--
	SB45	18-20	04/14/1993	< 0.01	--	--	< 0.03	--	--
	SB47	22-24	04/14/1993	< 0.02	--	--	< 0.06	--	--
	SB50	22-24	04/13/1993	0.076	--	--	0.085	--	--
	SB51	13-15	04/13/1993	0.017	--	--	0.047	--	--
	SB51	18-20	04/13/1993	0.032	--	--	0.058	--	--
	SB52	13-15	04/13/1993	< 0.01	--	--	< 0.03	--	--
	SB52	22-24	04/13/1993	< 0.01	--	--	< 0.03	--	--
	SB54	18-20	08/31/1993	0.028	--	--	0.048	--	--
	SB57	18-20	09/01/1993	< 0.1	--	--	1	--	--
	SB58	13-15	09/01/1993	0.08	--	--	1	--	--
	SB95-1	4-6	05/15/1995	< 0.005	--	--	< 0.015	< 0.005	< 0.005
	SB95-2	3-4.8	05/16/1995	< 0.005	--	--	< 0.015	< 0.005	< 0.005
	SB95-3	3-5	05/18/1995	< 0.005	--	--	< 0.015	< 0.005	< 0.005
	SB95-4	5.5-6	05/18/1995	< 0.005	--	--	< 0.015	< 0.005	< 0.005
	SB95-5	7-8.5	05/16/1995	< 0.005	--	--	< 0.015	< 0.005	< 0.005
	SB95-6	25-27	05/18/1995	< 0.005	--	--	< 0.015	< 0.005	< 0.005
	SB96-1	18-20	06/03/1996	0.54	--	--	5.3	0.75	0.29
	SB96-2	18-20	06/03/1996	0.15	--	--	0.31	0.11	0.025
	SB96-3	25-27	06/04/1996	1.8	--	--	1.2	0.38	0.15

Table 11: Soil VOCs and Inorganics Analytical Results Exceeding the CSAT Screening Levels

Wisconsin Public Service Corporation, Manitowoc
Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc, Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

				BTEX				VOC	VOC
Sample Code	Sample Location	Sample Depth (Ft)	Sample Date	Ethylbenzene (mg/kg)	Xylene, o (mg/kg)	Xylenes, m + p (mg/kg)	Xylenes, Total (mg/kg)	1,2,4-trimethylbenzene (mg/kg)	1,3,5-trimethylbenzene (mg/kg)
Csat/Ceiling SL for WI/IBS				**480**	**434**	**388**	**258**	**219**	**182**
	Value exceeds SL								
	Detected below SL								
	Not detected above reported limit								
	Not analyzed								
	SB96-4	28-30	06/04/1996	**560**	--	--	**510**	**250**	74
	SB96-5	25-27	06/05/1996	0.16	--	--	0.72	0.12	0.064
	SB96-6	17-19	06/05/1996	11	--	--	**530**	210	73
	SB96-6	31-33	06/05/1996	180	--	--	250	170	54
	SB96-7	15-17	06/06/1996	38	--	--	**800**	**320**	150
	SB96-7	39-41	06/06/1996	8.6	--	--	81	25	7.7
	SB96-8	33-35	06/06/1996	73	--	--	250	100	29
	SB96-9	39-41	06/08/1996	< 0.025	--	--	< 0.075	< 0.025	< 0.025
	SB96-10	33-35	06/08/1996	0.14	--	--	0.15	< 0.025	< 0.025
	SB96-11	13-15	06/09/1996	0.37	--	--	1.1	1.7	2.6
	SB96-12	25-27	06/09/1996	0.58	--	--	8.1	2.4	0.39
091709074	SB101	26-28	09/15/2009	47.9	54	94.3	--	66.3	28.2
091709075	SB101	34-36	09/15/2009	< 0.025	0.0314	< 0.05	--	< 0.025	< 0.025
091609007	SB103	4-6	09/14/2009	< 0.025	< 0.025	< 0.05	--	< 0.025	< 0.025
091609005	SB103	10-12	09/14/2009	11	5.27	10	--	6.54	1.93
091609006	SB103	16-18	09/14/2009	< 0.025	< 0.025	< 0.05	--	< 0.025	< 0.025
091609010	SB104	4-6	09/14/2009	< 0.025	< 0.025	< 0.05	--	< 0.025	< 0.025
091609008	SB104	10-12	09/14/2009	< 0.025	< 0.025	< 0.05	--	< 0.025	< 0.025
091609009	SB104	18-20	09/14/2009	< 0.025	< 0.025	< 0.05	--	< 0.025	< 0.025
091609022	SB105	6-8	09/14/2009	< 0.025	< 0.025	< 0.05	--	< 0.025	< 0.025
091609011	SB106	4-8	09/15/2009	1.28	1.74	1.87	--	2.02	1.22
091609023	SB107	4-6	09/14/2009	0.099	0.119	0.206	--	0.086	0.0363
091609013	SB108	0-2	09/15/2009	0.238	1.01	0.54	--	0.755	0.334
091609024	SB108	4-6	09/15/2009	0.103	1.22	0.431	--	0.793	0.242
091609025	SB109	8-10	09/15/2009	< 0.025	< 0.025	< 0.05	--	< 0.025	< 0.025
091609012	SB110	0-2	09/15/2009	< 0.025	< 0.025	< 0.05	--	< 0.025	< 0.025
091609026	SB110	4-6.5	09/15/2009	< 0.025	< 0.025	< 0.05	--	< 0.025	< 0.025
091609014	SB111	0-2	09/15/2009	< 0.025	< 0.025	< 0.05	--	< 0.025	< 0.025
091709071	SB111	6-8	09/15/2009	< 0.025	< 0.025	< 0.05	--	< 0.025	< 0.025
091609016	SB111	12-14	09/15/2009	< 0.025	< 0.025	< 0.05	--	< 0.025	< 0.025
091609017	SB111	16-18	09/15/2009	< 0.025	< 0.025	< 0.05	--	< 0.025	< 0.025
091609019	SB112	4-6	09/15/2009	< 0.025	< 0.025	< 0.05	--	< 0.025	< 0.025
091609020	SB112	8-10	09/15/2009	< 0.025	< 0.025	< 0.05	--	< 0.025	< 0.025
091609018	SB112	12-14	09/15/2009	< 0.025	< 0.025	< 0.05	--	< 0.025	< 0.025
091609027	SB113	0-2	09/15/2009	< 0.025	0.0331	< 0.05	--	< 0.025	< 0.025
091609028	SB113	2-4	09/15/2009	< 0.025	< 0.025	< 0.05	--	< 0.025	< 0.025
091709072	SB113	8-10	09/15/2009	< 0.025	< 0.025	< 0.05	--	< 0.025	< 0.025

Table 11: Soil VOCs and Inorganics Analytical Results Exceeding the CSAT Screening Levels

Wisconsin Public Service Corporation, Manitowoc
Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc, Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

				BTEX				VOC	VOC
Sample Code	Sample Location	Sample Depth (Ft)	Sample Date	Ethylbenzene (mg/kg)	Xylene, o (mg/kg)	Xylenes, m + p (mg/kg)	Xylenes, Total (mg/kg)	1,2,4-trimethylbenzene (mg/kg)	1,3,5-trimethylbenzene (mg/kg)
Csat/Ceiling SL for WI/IBS				**480**	**434**	**388**	**258**	**219**	**182**
	Value exceeds SL								
	Detected below SL								
	Not detected above reported limit								
	Not analyzed								
091609029	SB114	0-2	09/14/2009	0.0357	0.178	0.0698	--	0.0743	< 0.025
091709073	SB114	8-10	09/14/2009	< 0.025	0.0736	< 0.05	--	< 0.025	< 0.025
091609030	SB114	12-14	09/14/2009	< 0.025	0.0299	< 0.05	--	< 0.025	< 0.025
091609031	SB114	16-17	09/14/2009	88.4	324	172	--	122	31.9
091709032	SB115	0-2	09/14/2009	< 0.025	< 0.025	< 0.05	--	< 0.025	< 0.025
091709033	SB115	10-12	09/14/2009	< 0.025	< 0.025	< 0.05	--	< 0.025	< 0.025
091709039	SB115	18-20	09/14/2009	< 0.025	< 0.025	< 0.05	--	< 0.025	< 0.025
091709035	SB116	0-2	09/14/2009	0.0354	0.106	0.153	--	0.0811	0.0491
091709036	SB116	14-16	09/14/2009	< 0.025	< 0.025	< 0.05	--	< 0.025	< 0.025
091709037	SB116	20-22	09/14/2009	< 0.025	< 0.025	< 0.05	--	< 0.025	< 0.025
091709038	SB116	26-28	09/14/2009	< 0.025	< 0.025	< 0.05	--	< 0.025	< 0.025
091709040	SB117	0-2	09/14/2009	< 0.025	0.0336	< 0.05	--	< 0.025	< 0.025
091709041	SB117	12-14	09/14/2009	< 0.025	< 0.025	< 0.05	--	< 0.025	< 0.025
091709042	SB117	20-22	09/14/2009	0.0304	0.148	< 0.05	--	0.0843	0.0311
091709043	SB117	30-32	09/14/2009	< 0.025	< 0.025	< 0.05	--	< 0.025	< 0.025
091709044	SB118	0-2	09/14/2009	< 0.025	< 0.025	< 0.05	--	< 0.025	< 0.025
091709046	SB118	6-8	09/14/2009	< 0.025	< 0.025	< 0.05	--	< 0.025	< 0.025
091709045	SB118	18-20	09/14/2009	< 0.025	< 0.025	< 0.05	--	< 0.025	< 0.025
091709047	SB119	0-2	09/14/2009	0.0545	0.235	0.146	--	0.101	0.0311
092209078	SB119	8-10	09/14/2009	< 0.025	< 0.025	< 0.05	--	< 0.025	< 0.025
091709048	SB119	18-20	09/14/2009	< 0.025	< 0.025	< 0.05	--	0.0287	< 0.025
091709049	SB120	0-2	09/14/2009	0.0372	0.175	0.112	--	0.0789	0.0273
091709050	SB120	10-14	09/14/2009	< 0.025	< 0.025	< 0.05	--	< 0.025	< 0.025
091709051	SB120	24-28	09/14/2009	< 0.025	< 0.025	< 0.05	--	< 0.025	< 0.025
091709052	SB121	0-2	09/14/2009	0.0323	0.134	0.0765	--	0.0471	< 0.025
091709054	SB121	8-10	09/14/2009	< 0.025	< 0.025	< 0.05	--	< 0.025	< 0.025
091709053	SB121	20-24	09/14/2009	< 0.025	< 0.025	< 0.05	--	< 0.025	< 0.025
091709055	SB122	0-2	09/14/2009	0.293	1.81	0.706	--	1.19	0.391
091709057	SB122	2-6	09/14/2009	< 1.25	< 1.25	< 2.5	--	< 1.25	< 1.25
091709056	SB122	12-14	09/14/2009	< 133	**7,150**	< 267	--	**5,570**	< 133
091709059	SB122	28-30	09/14/2009	0.0366	0.23	0.086	--	0.17	0.0694
091709060	SB122	38-40	09/14/2009	< 0.025	0.079	< 0.05	--	0.0491	< 0.025
091709061	SB122	42-44	09/14/2009	< 0.025	0.072	< 0.05	--	0.0395	< 0.025
091709062	SB123	0-2	09/15/2009	0.0319	0.134	0.143	--	0.146	0.0519
091709063	SB123	6-7.5	09/15/2009	55.2	144	311	--	**231**	86.7
091709064	SB124	0-2	09/15/2009	0.0707	0.349	0.218	--	0.197	0.0728
091709065	SB124	2-4	09/15/2009	0.157	0.551	0.474	--	0.348	0.146
091709070	SB124	6-7.8	09/15/2009	0.0449	0.103	0.121	--	0.0691	< 0.025

Table 11: Soil VOCs and Inorganics Analytical Results Exceeding the CSAT Screening Levels

Wisconsin Public Service Corporation, Manitowoc
Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc, Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

				BTEX				VOC	VOC
Sample Code	Sample Location	Sample Depth (Ft)	Sample Date	Ethylbenzene (mg/kg)	Xylene, o (mg/kg)	Xylenes, m + p (mg/kg)	Xylenes, Total (mg/kg)	1,2,4-trimethylbenzene (mg/kg)	1,3,5-trimethylbenzene (mg/kg)
Csat/Ceiling SL for WI/IBS				**480**	**434**	**388**	**258**	**219**	**182**
	Value exceeds SL								
	Detected below SL								
	Not detected above reported limit								
	Not analyzed								
091709066	SB125	0-2	09/15/2009	< 0.025	0.0364	< 0.05	--	< 0.025	< 0.025
091709069	SB125	6-8	09/15/2009	< 0.025	< 0.025	< 0.05	--	< 0.025	< 0.025
091709067	SB125	10-12	09/15/2009	< 0.025	< 0.025	< 0.05	--	0.032	< 0.025
091709068	SB125	18-20	09/15/2009	< 0.025	< 0.025	< 0.05	--	< 0.025	< 0.025
080112009	SB126	5-6	08/01/2012	< 0.025	< 0.025	< 0.05	--	< 0.025	< 0.025
080112006	SB126	15-16	08/01/2012	148	**675**	**1,120**	--	**1,030**	**306**
080112008	SB126	20-21	08/01/2012	0.301	0.9	1.73	--	0.797	0.256
080112010	SB127	13-14	08/01/2012	< 0.025	< 0.025	< 0.05	--	< 0.025	< 0.025
080112011	SB127	19-20	08/01/2012	2.5	8.17	16.4	--	24.4	8.34
080112012	SB127	28-29	08/01/2012	< 0.025	< 0.025	< 0.05	--	0.0752	< 0.025
073112005	SB128	9-10	07/31/2012	< 0.025	< 0.025	< 0.05	--	< 0.025	< 0.025
073112003	SB128	10-11	07/31/2012	115	**718**	**1,690**	--	**1,340**	**576**
073112004	SB128	17-17	07/31/2012	< 0.2	< 0.2	< 0.4	--	0.611	0.606
073112002	SB129	7-8	07/31/2012	< 0.025	< 0.025	< 0.05	--	< 0.025	< 0.025
073112001	SB130	8-9	07/31/2012	< 0.025	< 0.025	< 0.05	--	< 0.025	< 0.025
062314001	SB132	0-2	06/23/2014	< 0.0255	< 0.0255	< 0.051	--	< 0.0255	< 0.0255
062314002	SB132	32-34	06/23/2014	< 0.025	0.0416	< 0.05	--	< 0.025	< 0.025
092209076	TP101A	17-17	09/22/2009	< 0.025	< 0.025	< 0.05	--	< 0.025	< 0.025
092209077	TP101B	13.5-13.5	09/22/2009	< 0.025	< 0.025	< 0.05	--	< 0.025	< 0.025
			Total Number of Samples Analyzed:	132	86	86	41	110	110
			Number of Detections:	49	36	25	20	45	36
			Min:	0.017	0.0299	0.0698	0.047	0.0287	0.025
			Max:	560	7,150	1,690	800	5,570	576
			Csat/Ceiling SL for WI/IBS	480	434	388	258	219	182
			Number of Samples that Exceed Csat/Ceiling SL:	**1**	**4**	**3**	**3**	**7**	**2**

[O:ECK 8/12/14; C:JTB 8/22/14][U:ECK 10/7/14]

NOTES:
BOLD Value exceeds SL
< Concentration is less than stated level
-- Analysis not performed
NS No Standard
SL Screening Level
SLs used on this table were presented in the Multi-Site Risk Assessment Framework Addendum Revision 3 (Exponent, July 2014).

Table 12. Pumping Well PW1 Discharge Records - 2012 through 2014

Wisconsin Public Service Corporation, Manitowoc
Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

Letter Date	Reading Date	Meter Total (gallons)	Period Discharge (gallons)
01/05/12	12/31/11	64,360,080	--
02/09/12	01/27/12	64,702,930	342,850
03/09/12	01/27/12	65,115,700	412,770
04/04/12	03/30/12	65,443,290	327,590
05/09/12	04/27/12	65,736,390	293,100
06/05/12	05/31/12	66,136,540	400,150
07/03/12	06/28/12	66,455,280	318,740
07/30/12	07/25/12	66,768,320	313,040
09/04/12	08/30/12	67,181,340	413,020
10/09/12	09/28/12	67,475,500	294,160
11/07/12	10/31/12	67,846,470	370,970
12/11/12	11/29/12	68,102,460	255,990
01/08/13	12/28/12	68,508,030	405,570
02/13/13	01/31/13	68,936,950	428,920
03/06/13	01/31/13	69,266,810	329,860
	04/02/13	69,682,280	415,470
05/10/13	04/30/13	70,057,190	374,910
06/03/13	05/29/13	70,444,160	386,970
07/10/13	06/28/13	70,830,060	385,900
08/05/13	07/31/13	71,276,570	446,510
09/06/13	08/30/13	71,642,090	365,520
10/03/13	09/27/13	71,960,060	317,970
11/05/13	10/31/13	72,329,000	368,940
12/10/13	11/28/13	72,658,470	329,470
01/10/14	12/27/13	72,886,220	227,750
02/10/14	01/28/14	73,106,290	220,070
	02/04/14 [1]	*73,118,580*	*12,290*
04/08/14	*03/31/14* [1]	*73,118,580*	*0*
05/07/14	04/30/14	73,382,750	264,170
06/02/14	05/30/14	73,768,960	386,210
07/08/14	06/25/14	74,118,940	349,980
08/08/14	07/31/14	74,592,950	474,010
09/04/14	08/29/14	74,872,180	279,230
10/07/14	09/27/14	75,175,630	303,450
Total Well Discharge		**10,815,550**	**10,815,550**

[O:EPK 10/14/14]

Note:

[1] Water line was frozen, so no water was discharged betweenFebruary 4 and April 8, 2014.

Table 13. Groundwater Summary Statistics (non-bedrock) - Samples Exceeding SLs

Wisconsin Public Service Corporation, Manitowoc - Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

Parameter	Samples Analyzed	Samples Detected Above the MDL	Minimum detection	Maximum detection	Residential Groundwater SL	Samples Exceeding the Groundwater SL	All Sampling Events		2014 Sampling Events	
							Wells Sampled	Wells Exceeding the Groundwater SL	Wells Sampled	Wells Exceeding the Groundwater SL
Volatile Organic Compounds (VOCs) (µg/L)										
Benzene	371	76	0.17	2,600	5	35	24	7	20	0
Ethylbenzene	371	54	0.55	5,800	700	15	24	2	20	0
Toluene	371	44	0.37	4,200	800	6	24	2	20	0
Xylene, O	237	30	0.48	1,190	190	12	23	2	20	0
Xylenes, M + P	237	25	0.77	2,210	190	11	23	2	20	0
Total Xylenes	232	36	0.48	5,450	2,000	6	24	2	0	0
1,2,4-Trimethylbenzene	254	47	0.58	766	15	18	23	4	20	0
1,3,5-Trimethylbenzene	254	19	0.53	194	120	2	27	1	20	0
Polynuclear Aromatic Hydrocarbons (PAHs) (µg/L)										
Acenaphthene	383	168	0.0049	123,000	530	5	24	1	20	0
Acenaphthylene	383	264	0.0038	1,340,000	530	5	24	1	20	0
Anthracene	383	225	0.0057	597,000	3,000	5	24	1	20	0
Benzo(a)anthracene	383	267	0.0038	118,000	0.034	151	24	20	20	2
Benzo(a)pyrene	383	282	0.0032	130,000	0.2	103	24	18	20	0
Benzo(b)fluoranthene	383	291	0.0037	124,000	0.2	114	24	19	20	0
Benzo(ghi)perylene	383	271	0.0038	9,200	250	3	24	1	20	0
Benzo(k)fluoranthene	383	278	0.0045	170,000	0.34	88	24	18	20	0
Chrysene	383	298	0.0035	366,000	0.2	104	24	19	20	0
Dibenz(a,h)anthracene	383	210	0.0032	2,030	0.0034	209	24	23	20	9
Fluoranthene	383	294	0.0044	688,000	400	5	24	1	20	0
Fluorene	383	148	0.0051	465,000	400	5	24	1	20	0
Indeno(1,2,3-cd)pyrene	383	258	0.0052	4,000	0.034	169	24	21	20	6
Naphthalene	383	264	0.0052	12,600,000	100	19	24	3	20	0
Phenanthrene	383	239	0.0085	1,160,000	3,000	5	24	1	20	0
Pyrene	383	289	0.0048	704,000	250	5	24	1	20	0
1-Methylnaphthalene	350	172	0.0052	2,360,000	1.1	45	24	5	20	1
2-Methylnaphthalene	383	226	0.0039	3,700,000	36	15	24	3	20	0
Metals (mg/L)										
Arsenic, Dissolved (mg/kg)	32	23	0.31	35.7	10	4	21	2	5	0
Manganese, Dissolved (mg/kg)	248	245	0.0002	1.8	0.3	30	23	6	20	1

[U-GFF 7/10/2013][U-RKS C-BGH 9/4/2013] [U:ECK 10/16/14]

Notes:
MDL = Method Detection Limit
SL = Screening Level
SLs used on this table were presented in the Multi-Site Risk Assessment Framework Addendum Revision 3 (Exponent, July 2014). The groundwater SL presented is the more conservative of the State and MCL values presented in the RAF Addendum Revision 3. In the absence of a State or MCL value, the Tap Water value was selected.

Table 14. Groundwater Summary Statistics (bedrock) - Samples Exceeding SLs

Wisconsin Public Service Corporation, Manitowoc - Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

Parameter	Samples Analyzed	Samples Detected Above the MDL	Minimum detection	Maximum detection	Residential Groundwater SL	Samples Exceeding the Groundwater SL	All Sampling Events		2014 Sampling Events	
							Wells Sampled	Wells Exceeding the Groundwater SL	Wells Sampled	Wells Exceeding the Groundwater SL
Volatile Organic Compounds (VOCs) (µg/L)										
Benzene	39	12	0.25	11.6	5	7	3	1	3	0
Polynuclear Aromatic Hydrocarbons (PAHs) (µg/L)										
Benzo(a)anthracene	39	30	0.0037	0.15	0.034	4	3	1	3	0
Benzo(a)pyrene	39	33	0.0033	0.21	0.2	1	3	1	3	0
Benzo(b)fluoranthene	39	33	0.005	0.29	0.2	2	3	2	3	0
Chrysene	39	35	0.0042	0.23	0.2	1	3	0	3	0
Dibenz(a,h)anthracene	39	21	0.0034	0.043	0.0034	20	3	0	3	0
Indeno(1,2,3-cd)pyrene	39	28	0.0066	0.17	0.034	9	3	0	3	0
Metals (mg/L)										
Arsenic, Dissolved (mg/kg)	5	4	0.15	13.1	10	1	0	0	3	0
Manganese, Dissolved (mg/kg)	39	38	0.00061	0.877	0.3	4	0	0	3	0

[U-GFF 7/10/2013][U-RKS C-BGH 9/4/2013][U:ECK 10/16/14]

Notes:
Bedrock Wells are PZ7B, PZ18TB, PZ23B
MDL = Method Detection Limit
SL = Screening Level
SLs used on this table were presented in the Multi-Site Risk Assessment Framework Addendum Revision 3 (Exponent, July 2014). The groundwater SL presented is the more conservative of the State and MCL values presented in the RAF Addendum Revision 3. In the absence of a State or MCL value, the Tap Water value was selected.

Table 15. Groundwater Analytical Results - PAHs/SVOCs Exceeding Screening Levels
Wisconsin Public Service Corporation, Manitowoc
Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

		PAH																	
Sample Location	Sample Date	1-Methylnaphthalene (µg/l)	2-methylnaphthalene (µg/l)	Acenaphthene (µg/l)	Acenaphthylene (µg/l)	Anthracene (µg/l)	Benzo(a)anthracene (µg/l)	Benzo(a)pyrene (µg/l)	Benzo(b)fluoranthene (µg/l)	Benzo(ghi)perylene (µg/l)	Benzo(k)fluoranthene (µg/l)	Chrysene (µg/l)	Dibenz(a,h)anthracene (µg/l)	Fluoranthene (µg/l)	Fluorene (µg/l)	Indeno(1,2,3-cd)pyrene (µg/l)	Naphthalene (PAH) (µg/l)	Phenanthrene (µg/l)	Pyrene (µg/l)
	Groundwater SL for WI / IBS	**1.1**	**36**	**530**	**530**	**3,000**	**0.034**	**0.2**	**0.2**	**250**	**0.34**	**0.2**	**0.0034**	**400**	**400**	**0.034**	**100**	**3,000**	**250**
	Value exceeds SL																		
	Detected below SL																		
	Not detected above reported limit																		
	Not analyzed																		
MW1	03/27/2001	--	< 5	< 5	< 5	< 5	**2.4**	**3**	**5.8**	< 5	< 5	< 5	< 2	7.7	< 5	**2.3**	< 5	< 5	6
MW1	06/05/2002	< 0.54	< 0.56	2.7	0.48	< 8	**29**	**46**	**55**	40	**43**	**48**	**11**	100	4.5	**34**	< 0.54	53	86
MW1	11/19/2003	< 0.36	< 0.34	< 0.36	< 0.38	0.7	**5.2**	**8.2**	**8.6**	6.9	**6.5**	**6.6**	**2**	14	< 0.34	**6.1**	< 0.48	4.6	9.1
MW1	02/25/2004	< 0.34	< 0.32	0.99	0.43	4	**13**	**19**	**16**	14	**17**	**19**	**4.3**	45	1.6	**12**	2.3	21	32
MW1	05/24/2004	< 0.34	< 0.32	< 0.34	< 0.36	0.58	**3.7**	**5.3**	**5**	4.3	**4.4**	**4.5**	**1.3**	8.1	< 0.32	**3.9**	< 0.45	3	6
MW1	05/18/2005	< 0.8	< 0.9	< 0.78	< 0.77	0.75	**4.4**	**10**	**11**	9.8	**10**	**8.9**	**2.1**	13	< 0.87	**7.8**	< 0.89	4.7	9.5
MW1	11/28/2005	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW1	05/30/2006	< 1	< 1.1	< 0.82	< 0.81	2.4	**11**	**18**	**20**	16	**18**	**17**	**3.5**	32	< 0.91	**13**	< 1.2	9.2	23
MW1	05/16/2007	0.95	1.5	< 0.16	0.27	0.77	**2.2**	**4.9**	**6.2**	5.3	**4.3**	**4.2**	**1.2**	7.4	0.25	**4.5**	1.7	2.6	5.5
MW1	11/15/2007	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW1	10/27/2009	< 0.1	< 0.077	0.1	0.22	0.76	**3.8**	**7.8**	**10.7**	6.8	**6.8**	**6.6**	**1.4**	12	0.18	**5.8**	< 0.097	3.1	9.2
MW1	04/27/2010	0.0062	0.004	0.006	0.022	0.061	**0.27**	**0.61**	**0.9**	0.87	**0.77**	**0.62**	**0.17**	1.1	0.01	**0.68**	0.0096	0.23	0.8
MW1	07/27/2010	0.035	0.026	0.025	0.018	0.0099	0.012	0.027	0.045	0.034	0.035	0.033	**0.0061**	0.045	0.017	0.024	0.22	0.036	0.037
MW1	11/03/2010	0.0063	0.011	< 0.0045	0.0051	0.0088	0.02	0.053	0.063	0.065	0.07	0.057	**0.014**	0.068	< 0.0048	**0.047**	0.041	0.02	0.063
MW1	05/18/2011	0.0052	0.0096	< 0.0045	0.0076	0.0067	0.03	0.058	0.088	0.075	0.063	0.052	**0.017**	0.073	0.0052	**0.061**	0.021	0.024	0.064
MW1	11/02/2011	< 0.005	0.0069	< 0.0045	< 0.0036	< 0.0057	0.011	0.02	0.029	0.027	0.026	0.027	**0.0073**	0.025	< 0.0048	0.02	0.036	0.01	0.024
MW1	08/08/2012	< 0.0053	0.0046	< 0.0048	< 0.0038	< 0.0061	0.0041	0.0088	0.015	0.015	0.011	0.0098	< 0.0034	< 0.05	< 0.0051	0.01	0.011	< 0.0086	< 0.05
MW1	11/13/2012	< 0.0054	0.0093	< 0.0048	< 0.0039	< 0.0061	0.0043	0.0099	0.016	0.017	0.013	0.011	< 0.0034	0.018	< 0.0051	0.011	0.017	0.0099	0.014
MW1	02/25/2013	0.012	0.019	0.0074	0.047	0.02	**0.11**	**0.29**	**0.38**	0.41	0.29	**0.26**	**0.098**	0.28	0.014	**0.32**	0.061	0.074	0.26
MW1	05/29/2013	< 0.047	0.013	0.0052	< 0.0036	< 0.0057	0.0059	0.016	0.015	0.021	0.02	0.018	< 0.0032	0.019	< 0.0048	0.014	0.15	< 0.0081	0.021
MW1	11/13/2013	< 0.005	< 0.0039	< 0.0045	< 0.0036	< 0.0057	0.0057	0.018	0.024	0.029	0.021	0.019	**0.0047**	0.019	< 0.0048	0.02	0.011	< 0.0081	0.022
MW1	05/19/2014	< 0.0063	< 0.0065	< 0.0069	< 0.0064	0.0068	0.019	0.042	0.058	0.069	0.053	0.041	**0.011**	0.057	< 0.0066	**0.047**	0.014	0.012	0.051
MW2	04/11/2000	--	< 1	1.7	1.8	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 5
MW2	03/27/2001	--	8.6	< 5	< 5	< 5	< 2	< 2	< 2	< 5	< 5	< 5	< 2	< 5	< 5	< 2	< 5	< 5	< 5
MW2	06/05/2002	**14**	0.035	5.4	4	0.067	**0.15**	0.17	0.16	0.12	0.11	0.12	**0.046**	0.28	0.94	**0.12**	0.18	0.21	0.25
MW2	05/15/2003	**9.2**	0.023	3.8	2.3	0.055	**0.12**	0.14	0.14	0.11	0.1	0.12	**0.033**	0.23	0.65	**0.1**	0.19	0.13	0.22
MW2	02/25/2004	**11**	0.025	4.9	2.8	0.04	**0.083**	0.1	0.1	0.091	0.09	0.088	**0.024**	0.17	0.81	**0.079**	0.2	0.13	0.17
MW2	05/24/2004	**10**	0.019	4.8	2.8	0.42	**1.5**	**1.4**	**1.1**	0.86	**1.1**	**1.4**	**0.28**	3.3	0.87	**0.76**	0.19	1.4	2.7
MW2	05/18/2005	**11**	< 0.45	4.2	2.7	< 0.35	**1.1**	**1.2**	**1.1**	0.94	**1.1**	**1.1**	< 0.44	2.3	0.52	**0.77**	0.71	0.74	2
MW2	11/28/2005	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW2	05/30/2006	**10**	< 0.46	5.6	3.5	0.7	**2.4**	**2.4**	**2.2**	1.4	**2.1**	**2.3**	< 0.77	5.5	0.77	**1.3**	< 0.5	1.6	4.4
MW2	05/16/2007	**2.8**	< 0.056	1.7	0.95	0.18	**0.66**	**0.74**	**0.67**	0.5	**0.61**	**0.6**	**0.15**	1.5	0.32	**0.49**	0.12	0.58	1.2
MW2	11/15/2007	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW2	10/27/2009	**20.9**	< 0.39	9.7	5.5	< 0.57	< 0.36	< 0.29	< 0.34	< 0.48	< 0.44	< 0.35	< 0.32	< 0.44	1	< 0.47	< 0.48	< 0.81	< 0.47
MW2	01/27/2010	**5.7**	0.075	2.5	1.4	0.055	**0.043**	0.052	0.064	0.056	0.054	0.055	**0.012**	0.16	0.28	**0.045**	0.59	0.056	0.14
MW2	04/27/2010	**3.5**	0.0085	1.4	0.69	0.016	**0.039**	0.06	0.06	0.064	0.08	0.066	**0.014**	0.11	0.11	**0.049**	0.052	0.039	0.091
MW2	07/26/2010	**2.8**	0.0085	3.3	1.7	0.023	< 0.0036	0.004	0.0057	< 0.0048	< 0.0044	0.0048	< 0.0032	0.0074	0.026	< 0.0047	0.11	< 0.0081	0.02
MW2	11/03/2010	**13.2**	< 0.077	5.2	2.8	< 0.11	< 0.072	< 0.057	< 0.068	< 0.096	< 0.087	< 0.07	< 0.064	< 0.088	0.52	< 0.094	0.29	< 0.16	< 0.095
MW2	05/18/2011	**4.2**	4.2	1.6	0.82	< 0.11	< 0.072	< 0.057	< 0.068	< 0.096	< 0.087	< 0.07	< 0.064	< 0.088	0.12	< 0.094	0.17	< 0.16	< 0.095
MW2	11/02/2011	**2.9**	0.0095	0.85	0.52	0.015	0.0046	0.0042	0.0052	< 0.0048	0.0045	0.0073	< 0.0032	0.011	0.069	< 0.0047	0.15	0.011	0.011
MW2	08/07/2012	**7.3**	< 0.041	2.1	1.2	< 0.061	< 0.038	< 0.03	< 0.036	< 0.051	< 0.046	< 0.037	< 0.034	< 0.047	0.2	< 0.05	0.067	< 0.086	< 0.05
MW2	11/13/2012	**18.3**	< 0.41	5.7	2.7	< 0.61	< 0.38	< 0.3	< 0.36	< 0.51	< 0.46	< 0.37	< 0.34	< 0.47	0.51	< 0.5	< 0.51	< 0.86	< 0.5
MW2	02/26/2013	0.053	0.011	0.057	0.33	0.16	**0.67**	**0.75**	**0.78**	0.64	**0.6**	**0.71**	**0.17**	1.2	0.012	**0.55**	0.053	0.26	1.3
MW2	05/29/2013	**15.3**	< 0.39	5.1	2.4	< 0.57	< 0.36	< 0.29	< 0.34	< 0.48	< 0.44	< 0.35	< 0.32	< 0.44	0.49	< 0.47	< 0.48	< 0.81	< 0.47
MW2	11/12/2013	**12**	< 0.39	5.3	1.9	< 0.57	< 0.36	< 0.29	< 0.34	< 0.48	< 0.44	< 0.35	< 0.32	< 0.44	< 0.48	< 0.47	< 0.48	< 0.81	< 0.47
MW2	05/19/2014	**1.4**	< 0.026	1.2	0.45	< 0.027	< 0.021	< 0.035	< 0.025	< 0.015	< 0.011	< 0.012	< 0.024	< 0.029	0.049	< 0.02	0.037	< 0.033	< 0.031

Table 15. Groundwater Analytical Results - PAHs/SVOCs Exceeding Screening Levels
Wisconsin Public Service Corporation, Manitowoc
Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

		PAH																	
Sample Location	Sample Date	1-Methylnaphthalene (µg/l)	2-methylnaphthalene (µg/l)	Acenaphthene (µg/l)	Acenaphthylene (µg/l)	Anthracene (µg/l)	Benzo(a)anthracene (µg/l)	Benzo(a)pyrene (µg/l)	Benzo(b)fluoranthene (µg/l)	Benzo(ghi)perylene (µg/l)	Benzo(k)fluoranthene (µg/l)	Chrysene (µg/l)	Dibenz(a,h)anthracene (µg/l)	Fluoranthene (µg/l)	Fluorene (µg/l)	Indeno(1,2,3-cd)pyrene (µg/l)	Naphthalene (PAH) (µg/l)	Phenanthrene (µg/l)	Pyrene (µg/l)
Groundwater SL for WI / IBS		**1.1**	**36**	**530**	**530**	**3,000**	**0.034**	**0.2**	**0.2**	**250**	**0.34**	**0.2**	**0.0034**	**400**	**400**	**0.034**	**100**	**3,000**	**250**
MW5	06/05/2002	< 0.4	< 0.42	< 0.27	< 0.34	< 0.3	**1.7**	**2.1**	**2.5**	1.9	**1.6**	**1.8**	**0.56**	4.1	< 0.32	**1.6**	< 0.4	1.5	3.1
MW5	05/15/2003	0.033	0.035	0.2	0.053	0.26	**1.1**	**1.5**	**2.3**	1.5	**1.9**	**2.3**	**0.49**	5.1	0.24	**1.1**	0.072	2.8	3.6
MW5	02/25/2004	< 0.17	< 0.16	< 0.17	< 0.18	< 0.19	**1**	**1.6**	**1.6**	1.4	**1.6**	**1.6**	**0.39**	3	< 0.16	**1.2**	0.28	0.87	2.1
MW5	05/24/2004	< 0.017	0.017	0.068	0.022	0.11	**0.62**	**0.89**	**1.2**	0.83	**0.95**	**1.1**	**0.23**	2.2	0.075	**0.72**	0.03	0.92	1.6
MW5	05/18/2005	< 8.5	< 9.6	< 8.2	< 8.2	< 7.5	**25**	**58**	**110**	75	**98**	**110**	**18**	190	< 9.2	**60**	< 9.5	48	120
MW5	11/28/2005	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW5	05/30/2006	< 5.1	< 5.6	< 4.1	< 4.1	6.7	**29**	**56**	**99**	62	**73**	**84**	**12**	160	< 4.5	**51**	< 6.2	40	110
MW5	05/16/2007	< 5.1	< 5.6	< 4.1	< 4.1	8.6	**17**	**45**	**60**	46	**56**	**58**	**10**	96	< 4.5	**38**	< 6.2	28	66
MW5	11/15/2007	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW5	10/27/2009	< 0.5	< 0.39	< 0.45	< 0.36	1.3	**6.9**	**14.8**	**21.2**	14.1	**13**	**15.4**	**2.7**	26.7	< 0.48	**12**	< 0.48	7.2	19.3
MW5	01/27/2010	< 0.005	0.0054	0.011	0.023	0.061	**0.37**	**0.7**	**1**	0.79	**0.84**	**0.86**	**0.22**	1.5	0.018	**0.77**	< 0.047	0.34	1.2
MW5	04/27/2010	< 0.005	0.005	0.013	0.029	0.12	**0.5**	**0.9**	**1.4**	1.3	**1.2**	**1.1**	**0.27**	1.9	0.018	**0.95**	0.019	0.42	1.5
MW5	07/26/2010	0.006	0.0059	0.0054	0.0079	0.01	**0.044**	0.067	0.097	0.072	0.071	0.077	**0.017**	0.12	< 0.0048	**0.058**	0.017	0.038	0.09
MW5	11/03/2010	0.0091	0.016	< 0.0045	< 0.0036	< 0.0057	0.021	0.052	0.089	0.068	0.062	0.07	**0.014**	0.078	< 0.0048	**0.049**	0.031	0.019	0.066
MW5	05/18/2011	0.0068	0.011	0.0068	0.0058	0.014	**0.077**	0.15	**0.28**	0.21	0.19	0.19	**0.044**	0.29	0.0079	**0.17**	0.031	0.083	0.23
MW5	11/02/2011	< 0.005	0.0064	< 0.0045	< 0.0036	< 0.0057	0.0049	0.0076	0.012	0.0085	0.01	0.012	< 0.0032	0.014	< 0.0048	0.0064	0.019	< 0.0081	0.011
MW5	08/07/2012	0.0056	0.0056	< 0.0048	0.0046	0.017	**0.057**	0.11	0.2	0.15	0.14	0.13	**0.028**	0.21	0.0063	**0.11**	0.033	0.067	0.16
MW5	11/13/2012	< 0.0054	0.0092	< 0.0048	< 0.0039	< 0.0061	0.0073	0.015	0.031	0.024	0.019	0.02	**0.004**	0.032	< 0.0051	0.017	0.02	0.013	0.023
MW5	02/26/2013	0.022	0.038	< 0.0045	0.0043	< 0.0057	0.0048	0.0073	0.012	0.011	0.011	0.011	**0.004**	0.012	< 0.0048	0.0088	0.24	< 0.0081	0.0099
MW5	05/29/2013	< 0.0053	0.0081	< 0.0048	< 0.0038	< 0.0061	0.005	0.0086	0.012	0.0092	0.014	0.016	< 0.0034	0.018	< 0.0051	0.0067	0.024	< 0.0086	0.017
MW5	11/12/2013	< 0.005	0.004	< 0.0045	< 0.0036	< 0.0057	< 0.0036	< 0.0029	< 0.0034	< 0.0048	< 0.0044	0.0054	< 0.0032	0.0064	< 0.0048	< 0.0047	0.011	< 0.0081	0.0056
MW5	05/19/2014	< 0.0063	0.0074	< 0.0069	< 0.0064	< 0.0068	0.0091	0.021	0.032	0.027	0.03	0.029	< 0.0059	0.041	< 0.0066	0.018	0.026	0.019	0.03
MW6	04/11/2000	--	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 5
MW6	03/27/2001	--	< 5	< 5	< 5	< 5	< 2	< 2	< 2	< 5	< 5	< 5	< 2	< 5	< 5	< 2	< 5	< 5	< 5
MW6	10/25/2001	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW6	06/05/2002	< 0.027	< 0.028	< 0.018	0.04	< 0.02	0.032	0.032	0.029	0.047	0.023	0.027	< 0.017	0.069	< 0.021	0.02	< 0.027	0.033	0.059
MW6	05/15/2003	< 0.018	< 0.017	< 0.018	0.043	< 0.02	0.032	0.041	0.042	0.032	0.033	0.034	< 0.016	0.058	< 0.017	0.027	0.051	0.029	0.056
MW6	02/25/2004	0.018	0.026	< 0.017	0.067	< 0.019	0.023	0.026	0.024	0.021	0.019	0.022	< 0.015	0.045	< 0.016	< 0.02	0.09	0.029	0.04
MW6	08/08/2012	< 0.0053	0.0069	< 0.0048	< 0.0038	< 0.0061	< 0.0038	0.0036	0.006	0.0064	0.0068	0.0061	< 0.0034	< 0.05	< 0.0051	< 0.005	0.016	< 0.0086	< 0.05
MW6	11/14/2012	< 0.0054	0.0077	< 0.0048	< 0.0039	< 0.0061	< 0.0039	< 0.0031	< 0.0036	< 0.0052	< 0.0047	< 0.0037	< 0.0034	< 0.0047	< 0.0051	< 0.005	< 0.051	< 0.0087	< 0.0051
MW6	02/26/2013	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW6	05/29/2013	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW6	11/13/2013	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Table 15. Groundwater Analytical Results - PAHs/SVOCs Exceeding Screening Levels
Wisconsin Public Service Corporation, Manitowoc
Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

		PAH																	
Sample Location	Sample Date	1-Methylnaphthalene (µg/l)	2-methylnaphthalene (µg/l)	Acenaphthene (µg/l)	Acenaphthylene (µg/l)	Anthracene (µg/l)	Benzo(a)anthracene (µg/l)	Benzo(a)pyrene (µg/l)	Benzo(b)fluoranthene (µg/l)	Benzo(ghi)perylene (µg/l)	Benzo(k)fluoranthene (µg/l)	Chrysene (µg/l)	Dibenz(a,h)anthracene (µg/l)	Fluoranthene (µg/l)	Fluorene (µg/l)	Indeno(1,2,3-cd)pyrene (µg/l)	Naphthalene (PAH) (µg/l)	Phenanthrene (µg/l)	Pyrene (µg/l)
Groundwater SL for WI / IBS		**1.1**	**36**	**530**	**530**	**3,000**	**0.034**	**0.2**	**0.2**	**250**	**0.34**	**0.2**	**0.0034**	**400**	**400**	**0.034**	**100**	**3,000**	**250**
MW7	04/11/2000	--	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 5
MW7	03/27/2001	--	< 5	< 5	< 5	< 5	< 2	< 2	< 2	< 5	< 5	< 5	< 2	< 5	< 5	< 2	< 5	< 5	< 5
MW7	06/05/2002	< 0.027	< 0.028	< 0.018	0.3	0.13	**0.39**	**0.53**	**0.41**	0.43	0.32	**0.31**	**0.14**	0.4	< 0.021	**0.36**	0.029	0.097	0.53
MW7	05/15/2003	< 0.018	< 0.017	< 0.018	0.11	0.13	**0.22**	**0.44**	**0.67**	0.54	**0.44**	**0.54**	**0.12**	0.87	< 0.017	**0.43**	0.026	0.2	0.69
MW7	02/25/2004	< 0.017	0.022	0.037	0.24	0.26	**1.5**	**3**	**4.7**	3.4	**3.3**	**4.2**	**0.65**	9.2	0.059	**2.8**	0.097	2	6
MW7	05/24/2004	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW7	05/18/2005	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW7	11/28/2005	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW7	05/30/2006	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW7	05/16/2007	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW7	11/15/2007	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW7	10/26/2009	< 0.1	< 0.077	< 0.091	0.6	0.8	**3**	**8.8**	**12**	10.7	**8.9**	**8**	**1.7**	12.2	0.11	**8.5**	< 0.17	1.9	9.4
MW7	01/27/2010	0.029	0.0073	0.0076	0.032	0.072	0.026	0.058	0.095	0.1	0.075	0.071	**0.024**	0.081	< 0.0049	**0.079**	< 0.049	0.013	0.073
MW7	01/27/2010	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW7	04/27/2010	0.0071	0.0073	0.01	0.015	0.024	**0.07**	0.17	**0.33**	0.27	0.24	**0.23**	**0.053**	0.3	0.0072	**0.2**	0.017	0.051	0.24
MW7	07/26/2010	< 0.005	0.0042	< 0.0045	0.043	0.077	**0.06**	0.14	**0.23**	0.22	0.17	0.15	**0.059**	0.18	< 0.0048	**0.16**	0.011	0.028	0.15
MW7	11/02/2010	< 0.005	0.0052	< 0.0045	0.024	0.046	0.0063	0.015	0.023	0.019	0.019	0.018	< 0.0032	0.023	< 0.0048	0.014	0.01	< 0.0081	0.023
MW7	05/17/2011	< 0.005	0.004	< 0.0045	0.032	0.038	**0.035**	0.069	0.12	0.11	0.095	0.079	**0.021**	0.1	< 0.0048	**0.078**	0.013	0.018	0.088
MW7	11/01/2011	0.0094	0.0095	< 0.0045	0.059	0.092	0.021	0.055	0.091	0.093	0.067	0.063	**0.019**	0.086	0.0054	**0.065**	0.021	0.016	0.082
MW7	08/08/2012	< 0.0053	0.0047	0.0062	0.11	0.14	**0.22**	**0.44**	**0.76**	0.71	**0.5**	**0.43**	**0.16**	0.71	0.012	**0.54**	< 0.05	0.12	0.58
MW7	11/14/2012	< 0.0053	0.0066	< 0.0048	0.048	0.078	< 0.0038	0.0054	0.011	0.0093	0.008	0.0073	< 0.0034	0.011	< 0.0051	0.0063	< 0.05	< 0.0086	0.0076
MW7	02/27/2013	< 0.01	0.0093	< 0.0091	0.041	0.067	**0.21**	**0.49**	**0.65**	0.76	**0.63**	**0.54**	**0.16**	0.69	< 0.0095	**0.57**	0.042	0.12	0.62
MW7	05/30/2013	< 0.047	0.012	0.0064	0.038	0.057	0.03	0.087	0.11	0.12	0.12	0.11	**0.023**	0.11	0.0053	**0.086**	0.041	0.021	0.089
MW7	11/13/2013	< 0.005	0.0055	< 0.0046	0.058	0.086	0.0065	0.018	0.022	0.029	0.029	0.024	**0.0046**	0.024	< 0.0048	0.019	0.013	< 0.0082	0.028
MW7	05/20/2014	< 0.0063	< 0.0065	< 0.0069	0.032	0.041	0.016	0.032	0.049	0.055	0.041	0.035	**0.0096**	0.049	< 0.0066	**0.038**	< 0.0082	0.011	0.041
MW8	04/11/2000	--	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 5
MW8	03/27/2001	--	< 5	< 5	< 5	< 5	< 2	< 2	< 2	< 5	< 5	< 5	< 2	< 5	< 5	< 2	< 5	< 5	< 5
MW8	06/05/2002	< 0.67	< 0.7	< 0.45	1	1	**3.7**	**4**	**3**	2.5	**2.5**	**2.7**	**0.73**	7	< 0.53	**2.4**	< 0.67	2	5.9
MW8	05/15/2003	< 0.18	< 0.17	< 0.18	0.61	0.43	**1.5**	**2**	**1.6**	1.5	**1.4**	**1.4**	**0.34**	2.7	< 0.17	**1.3**	< 0.24	0.7	2.6
MW8	05/24/2004	< 0.34	< 0.32	< 0.34	1	0.68	**2.3**	**2.8**	**2.3**	2	**1.8**	**2**	**0.56**	4.4	< 0.32	**1.8**	< 0.45	1.2	3.9
MW8	05/18/2005	< 0.8	< 0.91	< 0.78	2	1.8	**5.5**	**7.8**	**6.2**	5.6	**6.6**	**6.3**	**1.2**	13	< 0.87	**4.5**	< 0.89	3.7	12
MW8	11/28/2005	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW8	05/30/2006	< 0.41	< 0.46	< 0.33	1.6	1.6	**4.4**	**5.2**	**4.6**	3.4	**3.6**	**3.9**	**0.81**	9.5	< 0.37	**2.9**	< 0.5	2.8	8
MW8	05/16/2007	0.023	0.044	0.042	1	0.66	**2.5**	**4**	**3**	2.7	**3.2**	**2.7**	**0.56**	5.4	0.081	**2.4**	0.071	1.2	4.8
MW8	11/15/2007	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW8	10/26/2009	< 0.047	< 0.047	0.026	0.33	0.34	**0.98**	**1.4**	**1.4**	0.91	**0.81**	**0.98**	**0.19**	1.9	0.058	**0.8**	0.57	0.4	1.8
MW8	01/27/2010	0.014	0.0063	< 0.0045	0.016	0.045	0.031	0.047	0.065	0.059	0.053	0.05	**0.014**	0.062	< 0.0048	**0.049**	< 0.047	0.014	0.061
MW8	04/27/2010	< 0.005	0.0084	< 0.0045	0.016	0.057	0.014	0.026	0.031	0.034	0.035	0.029	**0.005**	0.047	< 0.0048	0.025	0.015	0.0099	0.045
MW8	07/26/2010	< 0.005	0.0064	0.006	0.033	0.1	**0.073**	0.087	0.11	0.092	0.089	0.089	**0.029**	0.15	0.01	**0.074**	0.012	0.036	0.14
MW8	11/02/2010	< 0.005	0.0042	< 0.0045	0.01	0.024	0.0077	0.011	0.0092	0.011	0.014	0.012	< 0.0032	0.017	< 0.0048	0.0083	0.012	< 0.0081	0.02
MW8	05/17/2011	< 0.005	< 0.0039	< 0.0045	0.012	0.037	0.017	0.021	0.027	0.024	0.023	0.02	**0.0057**	0.035	< 0.0048	0.018	0.0081	0.0092	0.031
MW8	11/01/2011	< 0.005	0.0058	< 0.0045	0.019	0.069	0.0056	0.0055	0.0082	0.0072	0.0063	0.0065	< 0.0032	0.017	< 0.0048	0.0055	0.022	< 0.0081	0.017
MW8	08/08/2012	0.0068	0.0065	< 0.0045	0.027	0.076	0.017	0.019	0.02	0.024	0.024	0.018	**0.0037**	< 0.047	< 0.0048	0.017	0.014	0.013	0.052
MW8	11/13/2012	0.012	0.0044	< 0.0048	0.017	0.042	0.016	0.023	0.028	0.029	0.028	0.023	**0.0049**	0.045	< 0.0051	0.02	< 0.05	0.013	0.039
MW8	02/26/2013	0.0081	0.009	< 0.0045	0.0092	0.022	0.025	0.045	0.063	0.061	0.047	0.044	**0.013**	0.059	< 0.0048	**0.048**	0.1	0.012	0.053
MW8	05/30/2013	< 0.047	0.0081	< 0.0045	0.014	0.056	0.014	0.029	0.033	0.032	0.033	0.034	**0.0055**	0.038	< 0.0048	0.023	0.039	0.0087	0.032
MW8	11/12/2013	< 0.005	< 0.0039	< 0.0045	0.02	0.057	0.0046	0.0064	0.0075	0.0088	0.0089	0.0078	< 0.0032	0.015	< 0.0048	0.0067	0.008	< 0.0081	0.017
MW8	05/20/2014	< 0.0063	< 0.0065	< 0.0069	0.0087	0.026	< 0.0054	< 0.0088	0.0086	0.011	0.012	0.012	< 0.0059	0.011	< 0.0066	0.0074	< 0.0082	< 0.0084	0.01

Table 15. Groundwater Analytical Results - PAHs/SVOCs Exceeding Screening Levels
Wisconsin Public Service Corporation, Manitowoc
Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

		PAH																	
Sample Location	Sample Date	1-Methylnaphthalene (µg/l)	2-methylnaphthalene (µg/l)	Acenaphthene (µg/l)	Acenaphthylene (µg/l)	Anthracene (µg/l)	Benzo(a)anthracene (µg/l)	Benzo(a)pyrene (µg/l)	Benzo(b)fluoranthene (µg/l)	Benzo(ghi)perylene (µg/l)	Benzo(k)fluoranthene (µg/l)	Chrysene (µg/l)	Dibenz(a,h)anthracene (µg/l)	Fluoranthene (µg/l)	Fluorene (µg/l)	Indeno(1,2,3-cd)pyrene (µg/l)	Naphthalene (PAH) (µg/l)	Phenanthrene (µg/l)	Pyrene (µg/l)
Groundwater SL for WI / IBS		**1.1**	**36**	**530**	**530**	**3,000**	**0.034**	**0.2**	**0.2**	**250**	**0.34**	**0.2**	**0.0034**	**400**	**400**	**0.034**	**100**	**3,000**	**250**
MW9	04/11/2000	--	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 5
MW9	03/27/2001	--	< 5	< 5	< 5	< 5	< 2	< 2	< 2	< 5	< 5	< 5	< 2	< 5	< 5	< 2	< 5	< 5	< 5
MW9	06/05/2002	0.039	< 0.028	0.14	0.21	0.22	**0.87**	**0.96**	**0.97**	0.75	**0.6**	**0.75**	**0.31**	2.1	0.041	**0.65**	0.12	0.41	1.8
MW9	05/15/2003	< 1.8	< 1.7	< 1.8	< 1.9	2.2	**10**	**12**	**12**	9.5	**11**	**13**	**2.4**	29	< 1.7	**7.7**	< 2.4	10	23
MW9	02/25/2004	< 0.091	< 0.086	< 0.091	< 0.096	< 0.1	**0.21**	**0.44**	**0.72**	0.54	**0.48**	**0.59**	**0.098**	1.3	< 0.086	**0.45**	< 0.12	0.25	0.94
MW9	05/24/2004	0.11	0.046	0.19	0.29	0.38	**1.5**	**2.6**	**3.4**	2.6	**2.6**	**2.9**	**0.66**	5.5	0.086	**2.2**	0.35	1	4.1
MW9	05/18/2005	< 0.16	< 0.18	< 0.16	0.19	0.29	**0.94**	**1.9**	**2.5**	2.2	**2**	**1.9**	**0.45**	3.1	< 0.17	**1.7**	< 0.18	0.58	2.4
MW9	11/28/2005	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW9	05/30/2006	< 0.2	< 0.22	< 0.16	0.18	0.28	**1.3**	**2.9**	**4.6**	3.3	**3.1**	**3.4**	**0.63**	5.6	< 0.18	**2.6**	0.38	0.91	3.8
MW9	05/16/2007	0.14	< 0.11	0.2	0.26	0.29	**0.42**	**0.78**	**1.1**	0.9	**0.92**	**0.79**	**0.2**	1.8	0.14	**0.79**	0.25	0.66	1.4
MW9	11/15/2007	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW9	10/26/2009	< 0.38	< 0.031	0.13	0.19	0.23	**0.42**	**1**	**1.3**	1.1	**1.1**	**0.92**	**0.22**	1.5	< 0.038	**0.91**	< 0.17	0.21	1.2
MW9	01/27/2010	0.0059	0.0051	0.05	0.039	0.091	**0.052**	0.1	0.16	0.15	0.13	0.11	**0.036**	0.15	< 0.0048	**0.12**	< 0.047	0.019	0.12
MW9	04/27/2010	< 0.005	0.0051	0.011	0.037	0.078	0.0085	0.017	0.029	0.024	0.028	0.024	**0.0037**	0.045	< 0.0048	0.017	0.0089	< 0.0081	0.036
MW9	07/26/2010	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW9	11/02/2010	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW9	05/17/2011	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW9	08/09/2012	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW9	11/14/2012	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW9	02/26/2013	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW9	05/29/2013	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW9	11/13/2013	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW9	05/20/2014	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW10	04/11/2000	--	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 5
MW10	03/27/2001	--	< 5	< 5	< 5	< 5	< 2	< 2	< 2	< 5	< 5	< 5	< 2	< 5	< 5	< 2	< 5	< 5	< 5
MW10	06/05/2002	< 0.09	< 0.093	0.85	0.38	0.29	**0.42**	**0.43**	**0.32**	0.34	0.23	**0.27**	**0.095**	1	0.64	**0.28**	0.09	0.16	1
MW10	05/15/2003	0.28	< 0.085	0.86	0.38	0.32	**0.65**	**0.8**	**0.83**	0.68	**0.64**	**0.73**	**0.18**	1.3	0.47	**0.56**	0.28	0.33	1.4
MW10	02/25/2004	0.14	0.17	0.55	0.43	0.29	**0.93**	**1.4**	**1.7**	1.4	**1.3**	**1.5**	**0.33**	3.1	0.43	**1.1**	0.39	0.75	2.4
MW10	05/24/2004	0.21	0.04	0.77	0.29	0.26	**0.71**	**1.2**	**1.4**	1.2	**1.3**	**1.4**	**0.31**	2.8	0.37	**0.96**	0.47	0.57	2.2
MW10	05/18/2005	0.45	< 0.23	0.66	0.7	0.49	**1.2**	**2**	**2.3**	2.1	**2**	**2.1**	**0.39**	3.8	0.31	**1.6**	0.25	0.84	3.2
MW10	11/28/2005	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW10	05/30/2006	0.17	< 0.056	0.81	0.38	0.3	**0.67**	**1.1**	**1.2**	1	**1**	**1**	**0.2**	2.1	0.34	**0.79**	0.087	0.37	1.7
MW10	05/16/2007	0.82	0.13	0.63	0.17	0.17	**0.33**	**0.58**	**0.71**	0.64	**0.6**	**0.51**	**0.15**	1	0.16	**0.54**	0.13	0.24	0.77
MW10	11/15/2007	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW10	10/26/2009	0.67	0.13	0.93	0.39	0.55	**1.9**	**4.4**	**6.3**	4.7	**3.5**	**3.9**	**0.9**	5.8	0.39	**3.9**	< 0.17	1.1	5.1
MW10	01/27/2010	0.24	0.041	0.3	0.028	0.12	**0.12**	**0.23**	**0.35**	0.32	0.3	**0.28**	**0.085**	0.42	0.062	**0.27**	0.071	0.069	0.36
MW10	04/27/2010	0.87	0.1	0.45	0.033	0.077	**0.042**	0.081	0.11	0.12	0.13	0.1	**0.024**	0.17	0.052	**0.082**	0.46	0.052	0.15
MW10	07/26/2010	0.97	0.1	0.46	0.054	0.21	**0.085**	0.15	**0.26**	0.21	0.2	0.2	**0.04**	0.3	0.059	**0.15**	0.14	0.088	0.27
MW10	11/02/2010	0.54	0.064	0.39	0.03	0.13	0.014	0.014	0.018	0.016	0.021	0.024	< 0.0032	0.11	0.054	0.011	0.11	0.053	0.11
MW10	05/17/2011	0.49	0.046	0.29	0.026	0.049	0.013	0.013	0.023	0.017	0.017	0.017	**0.0047**	0.052	0.029	0.013	0.038	0.026	0.051
MW10	11/01/2011	0.64	0.073	0.47	0.044	0.13	0.02	0.027	0.037	0.033	0.03	0.034	**0.0071**	0.13	0.083	0.025	0.12	0.076	0.14
MW10	08/09/2012	0.85	0.074	0.46	0.055	0.12	**0.042**	0.068	0.11	0.11	0.086	0.07	**0.026**	0.16	0.048	**0.083**	0.12	0.067	0.14
MW10	11/13/2012	0.096	0.013	0.21	0.051	0.12	**0.092**	0.16	**0.32**	0.26	0.19	0.18	**0.058**	0.28	0.029	**0.19**	< 0.051	0.056	0.24
MW10	02/27/2013	0.44	0.088	0.27	0.023	0.047	0.01	0.013	0.022	0.02	0.016	0.018	**0.0065**	0.036	0.022	0.016	0.31	0.016	0.052
MW10	05/30/2013	0.72	0.059	0.46	0.052	0.1	**0.16**	**0.32**	**0.35**	0.33	0.34	**0.35**	**0.095**	0.38	0.035	**0.26**	0.071	0.054	0.36
MW10	11/13/2013	**1.2**	0.086	0.55	0.063	0.16	0.0089	0.014	0.017	0.02	0.022	0.026	< 0.0065	0.076	0.043	0.012	0.17	0.051	0.085
MW10	05/20/2014	0.49	0.033	0.24	0.02	0.034	< 0.0053	< 0.0087	0.0062	0.0072	0.0071	0.0083	< 0.0059	0.025	0.017	< 0.0049	0.051	0.02	0.025

Table 15. Groundwater Analytical Results - PAHs/SVOCs Exceeding Screening Levels
Wisconsin Public Service Corporation, Manitowoc
Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

		PAH																	
Sample Location	Sample Date	1-Methylnaphthalene (µg/l)	2-methylnaphthalene (µg/l)	Acenaphthene (µg/l)	Acenaphthylene (µg/l)	Anthracene (µg/l)	Benzo(a)anthracene (µg/l)	Benzo(a)pyrene (µg/l)	Benzo(b)fluoranthene (µg/l)	Benzo(ghi)perylene (µg/l)	Benzo(k)fluoranthene (µg/l)	Chrysene (µg/l)	Dibenz(a,h)anthracene (µg/l)	Fluoranthene (µg/l)	Fluorene (µg/l)	Indeno(1,2,3-cd)pyrene (µg/l)	Naphthalene (PAH) (µg/l)	Phenanthrene (µg/l)	Pyrene (µg/l)
Groundwater SL for WI / IBS		**1.1**	**36**	**530**	**530**	**3,000**	**0.034**	**0.2**	**0.2**	**250**	**0.34**	**0.2**	**0.0034**	**400**	**400**	**0.034**	**100**	**3,000**	**250**
MW11	04/11/2000	--	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 5
MW11	03/27/2001	--	< 5	< 5	< 5	< 5	< 2	< 2	< 2	< 5	< 5	< 5	< 2	< 5	< 5	< 2	< 5	< 5	< 5
MW11	06/05/2002	0.25	< 0.028	0.16	0.32	0.11	**0.18**	0.2	0.16	0.16	0.12	0.15	**0.047**	0.39	0.05	**0.13**	0.048	0.09	0.45
MW11	05/15/2003	0.28	0.026	0.35	0.25	0.13	**0.39**	**0.53**	**0.64**	0.52	**0.49**	**0.49**	**0.14**	0.89	0.12	**0.46**	0.046	0.17	0.8
MW11	02/25/2004	0.047	0.035	0.096	0.23	0.069	**0.1**	0.14	0.15	0.14	0.12	0.13	**0.035**	0.3	0.1	**0.11**	0.087	0.11	0.26
MW11	05/24/2004	0.1	0.019	0.23	0.27	0.14	**0.26**	**0.42**	**0.46**	0.45	**0.35**	**0.4**	**0.12**	0.72	0.15	**0.38**	0.033	0.15	0.64
MW11	05/18/2005	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW11	11/28/2005	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW11	05/30/2006	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW12	04/11/2000	--	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 5
MW12	03/27/2001	--	< 5	< 5	< 5	< 5	< 2	< 2	< 2	< 5	< 5	< 5	< 2	< 5	< 5	< 2	< 5	< 5	< 5
MW12	06/05/2002	< 0.027	< 0.028	< 0.018	0.025	0.053	**0.61**	**0.65**	**0.8**	0.59	**0.48**	**0.53**	**0.21**	1	< 0.021	**0.49**	0.056	0.23	1.1
MW12	05/15/2003	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW12	02/25/2004	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW12	05/24/2004	< 0.34	< 0.32	< 0.34	< 0.36	< 0.38	**2.7**	**5.2**	**6.2**	5.3	**4.7**	**4.7**	**1.4**	7.7	< 0.32	**4.6**	< 0.45	1.6	5.8
MW12	05/18/2005	< 0.8	< 0.91	< 0.78	< 0.77	< 0.71	**4.5**	**9.5**	**11**	11	**10**	**8.9**	**2.2**	13	< 0.87	**8.3**	< 0.89	2.5	10
MW12	11/28/2005	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW12	05/30/2006	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW12	06/20/2006	< 0.81	< 0.9	< 0.65	< 0.65	1.8	**5.6**	**13**	**16**	20	**13**	**12**	**3.9**	19	< 0.72	**15**	< 0.99	3.4	15
MW12	05/16/2007	< 0.2	< 0.22	< 0.16	0.22	0.47	**3.1**	**7.4**	**9.4**	5	**6.6**	**5.7**	**1.8**	9	< 0.18	**7.9**	< 0.25	1.7	6.8
MW12	11/15/2007	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW12	10/27/2009	< 0.2	< 0.15	< 0.18	0.44	0.89	**5.7**	**13.7**	**15.3**	17.7	**11.3**	**10.3**	**2.8**	16.4	< 0.19	**12.9**	< 1.9	3.1	13
MW12	01/26/2010	0.01	0.012	0.0092	0.064	0.17	**0.65**	**1.4**	**1.7**	2.5	**1.6**	**1.4**	**0.47**	2.1	0.02	**1.7**	< 0.047	0.37	1.8
MW12	04/27/2010	0.012	0.0078	0.0051	0.0089	0.077	**0.08**	0.17	**0.24**	0.3	0.17	0.16	**0.05**	0.25	< 0.0048	**0.2**	0.067	0.042	0.2
MW12	07/27/2010	< 0.02	< 0.015	< 0.018	0.023	0.095	**0.37**	**0.83**	**1**	0.96	**0.77**	**0.71**	**0.17**	0.89	< 0.019	**0.7**	< 0.019	0.12	0.72
MW12	11/03/2010	0.02	0.037	< 0.0045	0.0048	0.052	0.0091	0.018	0.027	0.03	0.028	0.026	**0.0054**	0.027	< 0.0048	0.021	0.11	< 0.0081	0.024
MW12	05/17/2011	< 0.005	0.0049	0.0077	0.015	0.057	**0.3**	**0.55**	**0.76**	0.77	**0.54**	**0.44**	**0.18**	0.68	0.0094	**0.59**	0.013	0.14	0.56
MW12	11/01/2011	0.18	0.051	0.063	0.0039	0.017	0.0043	0.0081	0.011	0.012	0.0087	0.009	< 0.0032	0.01	0.0087	0.0079	0.085	< 0.0081	0.0092
MW12	08/08/2012	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW12	11/14/2012	< 0.0053	0.0053	< 0.0048	0.016	0.04	**0.13**	**0.26**	**0.32**	0.54	0.26	**0.22**	**0.088**	0.38	< 0.0051	**0.31**	< 0.05	0.062	0.28
MW12	02/26/2013	< 0.1	< 0.077	< 0.091	0.12	0.28	**2.3**	**5**	**6.1**	7	**4.1**	**4.1**	**1.2**	6.2	< 0.095	**5.1**	< 0.097	1.1	5.2
MW12	05/29/2013	< 0.005	< 0.0039	< 0.0045	< 0.0036	0.022	0.0051	0.012	0.012	0.018	0.015	0.014	< 0.0032	0.017	< 0.0048	0.011	0.024	< 0.0081	0.017
MW12	11/12/2013	< 0.04	< 0.031	< 0.036	0.068	0.17	**0.42**	**1.2**	**0.96**	1.6	**1.4**	**1**	**0.28**	1.7	< 0.038	**1**	< 0.039	0.28	1.2
MW12	05/19/2014	< 0.0063	< 0.0065	< 0.0069	0.011	0.032	**0.044**	0.078	0.076	0.11	0.091	0.082	**0.022**	0.11	< 0.0066	**0.073**	0.0091	0.025	0.092

Table 15. Groundwater Analytical Results - PAHs/SVOCs Exceeding Screening Levels
Wisconsin Public Service Corporation, Manitowoc
Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

		PAH																	
Sample Location	Sample Date	1-Methylnaphthalene (µg/l)	2-methylnaphthalene (µg/l)	Acenaphthene (µg/l)	Acenaphthylene (µg/l)	Anthracene (µg/l)	Benzo(a)anthracene (µg/l)	Benzo(a)pyrene (µg/l)	Benzo(b)fluoranthene (µg/l)	Benzo(ghi)perylene (µg/l)	Benzo(k)fluoranthene (µg/l)	Chrysene (µg/l)	Dibenz(a,h)anthracene (µg/l)	Fluoranthene (µg/l)	Fluorene (µg/l)	Indeno(1,2,3-cd)pyrene (µg/l)	Naphthalene (PAH) (µg/l)	Phenanthrene (µg/l)	Pyrene (µg/l)
Groundwater SL for WI / IBS		**1.1**	**36**	**530**	**530**	**3,000**	**0.034**	**0.2**	**0.2**	**250**	**0.34**	**0.2**	**0.0034**	**400**	**400**	**0.034**	**100**	**3,000**	**250**
MW12D	04/11/2000	--	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 5
MW12D	03/27/2001	--	< 5	< 5	< 5	< 5	< 2	< 2	< 2	< 5	< 5	< 5	< 2	< 5	< 5	< 2	< 5	< 5	< 5
MW12D	06/05/2002	< 0.16	< 0.17	< 0.11	< 0.14	< 0.12	**0.67**	**0.76**	**0.96**	0.61	**0.63**	**0.68**	**0.16**	1.9	< 0.13	**0.59**	< 0.16	0.55	1.5
MW12D	05/15/2003	< 0.018	< 0.017	< 0.018	0.059	0.051	**0.52**	**0.92**	**1.2**	0.93	**1.1**	**1.1**	**0.28**	1.6	< 0.017	**0.73**	0.065	0.34	1.2
MW12D	02/25/2004	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW12D	05/24/2004	< 0.34	< 0.32	< 0.34	< 0.36	< 0.38	**0.95**	**2.2**	**2.9**	2.6	**2.1**	**2**	**0.64**	3.2	< 0.32	**2.2**	< 0.45	0.67	2.5
MW12D	05/18/2005	0.1	< 0.091	< 0.078	0.11	< 0.071	**0.45**	**0.84**	**1.2**	1	**0.88**	**0.8**	**0.22**	1.1	< 0.087	**0.8**	0.5	0.21	0.8
MW12D	11/28/2005	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW12D	05/30/2006	< 0.01	< 0.011	< 0.0082	0.016	0.014	**0.086**	0.19	**0.24**	0.24	0.2	0.16	**0.047**	0.21	< 0.0091	**0.18**	0.024	0.041	0.18
MW12D	05/16/2007	0.025	0.014	0.014	0.036	0.024	**0.095**	**0.27**	**0.34**	0.32	0.24	0.17	**0.059**	0.23	< 0.0091	**0.26**	0.17	0.046	0.18
MW12D	11/15/2007	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW12D	10/26/2009	< 0.047	0.053	0.0079	0.044	0.044	**0.12**	**0.21**	**0.33**	0.2	0.13	0.19	**0.04**	0.23	< 0.0048	**0.17**	< 0.17	0.051	0.19
MW12D	01/26/2010	0.0076	0.016	< 0.0045	0.012	0.0084	0.018	0.034	0.047	0.047	0.039	0.035	**0.012**	0.044	< 0.0048	**0.038**	0.092	0.013	0.041
MW12D	04/27/2010	0.016	0.018	< 0.0045	0.0051	0.012	0.0042	0.0091	0.013	0.016	0.014	0.01	< 0.0032	0.015	< 0.0048	0.011	0.17	< 0.0081	0.011
MW12D	07/27/2010	0.016	0.023	0.0075	0.0046	0.028	0.0042	0.0068	0.011	0.0098	0.0096	0.0086	< 0.0032	0.017	< 0.0048	0.0073	0.073	0.017	0.011
MW12D	11/03/2010	< 0.005	0.0044	< 0.0045	0.0058	0.011	0.012	0.036	0.041	0.055	0.048	0.037	**0.011**	0.04	< 0.0048	**0.038**	0.019	0.0095	0.035
MW12D	05/17/2011	< 0.005	0.0085	< 0.0045	0.0038	0.01	0.012	0.023	0.038	0.04	0.028	0.023	**0.007**	0.037	< 0.0048	0.028	0.019	0.012	0.031
MW12D	11/01/2011	0.018	0.0071	0.0067	< 0.0036	0.0063	< 0.0036	0.0034	0.0053	0.0062	< 0.0044	0.0043	< 0.0032	0.0051	< 0.0048	< 0.0047	0.015	< 0.0081	< 0.0047
MW12D	08/08/2012	< 0.005	< 0.0039	< 0.0045	< 0.0036	0.0083	< 0.0036	< 0.0029	< 0.0034	< 0.0048	< 0.0044	< 0.0035	< 0.0032	< 0.0044	< 0.0048	< 0.0047	0.0089	< 0.0081	< 0.0047
MW12D	11/14/2012	0.0055	0.0095	< 0.0048	< 0.0039	< 0.0061	< 0.0039	< 0.0031	< 0.0036	< 0.0052	< 0.0047	< 0.0037	< 0.0034	< 0.0047	< 0.0051	< 0.005	< 0.051	< 0.0087	< 0.0051
MW12D	02/26/2013	< 0.005	0.0089	< 0.0045	< 0.0036	< 0.0057	0.0093	0.013	0.018	0.021	0.014	0.015	**0.005**	0.019	< 0.0048	0.016	0.016	0.0085	0.017
MW12D	05/29/2013	0.062	0.044	0.013	0.0052	0.025	< 0.0036	< 0.0029	0.006	0.0058	0.0068	0.0076	< 0.0032	0.0063	< 0.0048	< 0.0047	0.38	< 0.0081	0.0053
MW12D	11/12/2013	< 0.005	0.0068	< 0.0045	< 0.0036	0.013	< 0.0036	< 0.0029	< 0.0034	< 0.0048	< 0.0044	< 0.0035	< 0.0032	< 0.0044	< 0.0048	< 0.0047	0.012	< 0.0081	< 0.0047
MW12D	05/19/2014	< 0.0063	< 0.0065	< 0.0069	< 0.0064	< 0.0068	< 0.0054	< 0.0088	0.0069	0.0068	0.0077	0.0066	< 0.0059	0.0079	< 0.0066	< 0.0049	0.28	< 0.0084	< 0.0077
MW13	04/11/2000	--	**90**	29	3.8	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	2	< 1	**2,000**	< 1	< 5
MW13	03/27/2001	--	**210**	72	< 5	< 5	< 2	< 2	< 2	< 5	< 5	< 5	< 2	< 5	< 5	< 2	**3,700**	< 5	< 5
MW13	06/05/2002	< 430	< 450	< 290	2.9	0.88	**2.4**	**3.4**	**4.1**	2.9	**2.6**	**2.5**	**0.63**	6.6	5.3	**2.5**	**3,800**	3.7	5.8
MW13	05/15/2003	**30**	0.77	18	1.2	1.2	**4.4**	**6.2**	**6**	5.7	**5**	**5.1**	**1.4**	12	2.1	**4.5**	1.6	4.3	9.7
MW13	02/25/2004	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW13	05/24/2004	**55**	24	17	2	< 0.38	**1.4**	**2.7**	**2.7**	2.7	**1.9**	**1.8**	**0.72**	3.3	2.3	**2.3**	**140**	1.5	2.7
MW13	05/18/2005	**190**	**66**	51	4.5	< 1.8	< 2	< 1.8	< 1.8	< 2.1	< 1.9	< 1.6	< 2.2	2	3.5	< 1.7	**920**	< 2	< 1.6
MW13	11/28/2005	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW13	05/30/2006	**99**	22	37	4	< 4.7	< 6.4	< 7.5	< 6.4	< 7.9	< 7.9	< 7.7	< 7.7	< 6.3	< 3.7	< 7.7	51	< 4.6	< 5.9
MW13	05/16/2007	0.49	0.16	1.8	0.25	0.091	**0.35**	**0.69**	**0.69**	0.69	**0.64**	**0.48**	**0.17**	0.84	0.066	**0.59**	0.62	0.22	0.62
MW13	11/15/2007	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW13	10/26/2009	< 472	< 472	171	< 36	< 57.4	< 36.2	< 28.6	< 34	< 48.1	< 43.7	< 34.8	< 32	< 44.1	< 47.7	< 46.8	**3,540**	< 80.9	< 47.5
MW13	01/26/2010	**104**	15.4	32.3	1.1	0.37	< 0.073	< 0.058	0.076	< 0.097	< 0.088	< 0.07	< 0.065	< 0.089	3.1	< 0.094	< 0.95	< 0.16	< 0.096
MW13	04/27/2010	**237**	**119**	83	2.8	< 0.57	< 0.36	< 0.29	< 0.34	< 0.48	< 0.44	< 0.35	< 0.32	< 0.44	6.8	< 0.47	**1,400**	< 0.81	< 0.47
MW13	07/26/2010	**117**	**74.3**	48.3	1.6	0.31	< 0.072	< 0.057	0.077	< 0.096	< 0.087	< 0.07	< 0.064	< 0.088	6.6	< 0.094	**791**	1.6	< 0.095
MW13	11/02/2010	**4.7**	< 0.077	3.3	0.36	0.21	< 0.072	< 0.057	< 0.068	< 0.096	< 0.087	< 0.07	< 0.064	< 0.088	0.13	< 0.094	0.17	< 0.16	< 0.095
MW13	05/17/2011	0.011	0.011	0.01	0.034	0.033	0.032	0.045	0.081	0.063	0.046	0.049	**0.014**	0.078	0.0055	**0.049**	0.033	0.03	0.071
MW13	11/01/2011	**119**	33.5	45.2	1.4	0.23	< 0.072	< 0.057	< 0.068	< 0.096	< 0.087	< 0.07	< 0.064	< 0.088	6.5	< 0.094	45.1	1.2	< 0.095
MW13	08/08/2012	**5.1**	0.046	11.4	0.73	0.12	< 0.038	< 0.03	< 0.036	< 0.051	< 0.046	< 0.037	< 0.034	< 0.047	0.1	< 0.05	0.079	0.088	< 0.05
MW13	11/13/2012	**115**	14	37.1	1.4	< 0.61	< 0.38	< 0.3	< 0.36	< 0.51	< 0.46	< 0.37	< 0.34	< 0.47	0.94	< 0.5	< 5	2.8	< 0.5
MW13	02/26/2013	**225**	**151**	70	4.9	< 0.57	< 0.36	< 0.29	< 0.34	< 0.48	< 0.44	< 0.35	< 0.32	< 0.44	6.1	< 0.47	**2,430**	4.1	< 0.47
MW13	05/30/2013	**90**	**46.4**	24.5	< 3.6	< 5.7	< 3.6	< 2.9	< 3.4	< 4.8	< 4.4	< 3.5	< 3.2	< 4.4	< 4.8	< 4.7	**622**	< 8.1	< 4.7
MW13	11/12/2013	**5.4**	< 0.39	13.3	3.3	< 0.57	< 0.36	**0.29**	**0.58**	1.9	**0.95**	**0.35**	**2.4**	< 0.44	1.3	**2.5**	< 0.48	1.8	< 0.47
MW13	05/19/2014	< 0.0062	< 0.0064	0.0071	0.053	0.062	0.0082	0.013	0.028	0.02	0.016	0.016	< 0.0059	0.021	< 0.0066	0.015	0.0095	< 0.0083	0.016

Table 15. Groundwater Analytical Results - PAHs/SVOCs Exceeding Screening Levels
Wisconsin Public Service Corporation, Manitowoc
Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

		PAH																	
Sample Location	Sample Date	1-Methylnaphthalene (µg/l)	2-methylnaphthalene (µg/l)	Acenaphthene (µg/l)	Acenaphthylene (µg/l)	Anthracene (µg/l)	Benzo(a)anthracene (µg/l)	Benzo(a)pyrene (µg/l)	Benzo(b)fluoranthene (µg/l)	Benzo(ghi)perylene (µg/l)	Benzo(k)fluoranthene (µg/l)	Chrysene (µg/l)	Dibenz(a,h)anthracene (µg/l)	Fluoranthene (µg/l)	Fluorene (µg/l)	Indeno(1,2,3-cd)pyrene (µg/l)	Naphthalene (PAH) (µg/l)	Phenanthrene (µg/l)	Pyrene (µg/l)
Groundwater SL for WI / IBS		**1.1**	**36**	**530**	**530**	**3,000**	**0.034**	**0.2**	**0.2**	**250**	**0.34**	**0.2**	**0.0034**	**400**	**400**	**0.034**	**100**	**3,000**	**250**
MW14	04/11/2000	--	**140,000**	**3,300**	**36,000**	**13,000**	**9,500**	**8,600**	**6,700**	**4,500**	**7,700**	**8,800**	**1,200**	**27,000**	**18,000**	**4,000**	**540,000**	**45,000**	**23,000**
MW14	03/27/2001	--	**140,000**	**3,300**	**45,000**	**13,000**	**10,000**	**8,400**	**8,300**	**3,300**	< 4	**7,400**	**1,100**	**28,000**	**15,000**	**3,800**	**510,000**	**50,000**	**24,000**
MW14	08/09/2012	**27,700**	**44,700**	**779**	**16,400**	**4,690**	**2,660**	**2,050**	**1,690**	< 2040	**2,230**	**3,520**	**303**	**8,780**	**5,060**	< 1980	**159,000**	**16,900**	**7,350**
MW14	11/14/2012	**488**	**757**	11.1	273	12.1	**2**	**1.5**	< 1.8	< 2.6	< 2.3	**2.6**	< 1.7	8.9	28.5	< 2.5	**9,440**	39.9	8
MW14	02/27/2013	**150,000**	**245,000**	**5,150**	**79,400**	**30,500**	**14,300**	**11,300**	**10,900**	**9,200**	**13,000**	**21,100**	**2,030**	**45,200**	**27,000**	< 7950	**799,000**	**84,600**	**47,400**
MW14	05/30/2013	**446**	**672**	9.7	242	15.6	**6**	**7.3**	**4.1**	4.5	**5.2**	**6.9**	**0.69**	19.8	33.1	**3.5**	**8,670**	46.5	16.6
MW14	11/13/2013	**2,360,000**	**3,700,000**	**123,000**	**1,340,000**	**597,000**	**118,000**	**130,000**	**124,000**	< 120000	**170,000**	**366,000**	< 80000	**688,000**	**465,000**	< 117000	**12,600,000**	**1,160,000**	**704,000**
MW14	05/19/2014	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW17T	04/11/2000	--	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 5
MW17T	03/27/2001	--	< 5	< 5	< 5	< 5	< 2	< 2	< 2	< 5	< 5	< 5	< 2	< 5	< 5	< 2	< 5	< 5	< 5
MW17T	06/05/2002	0.041	0.045	< 0.018	< 0.023	< 0.02	< 0.019	< 0.012	< 0.014	< 0.015	< 0.013	< 0.018	< 0.017	< 0.028	< 0.021	< 0.014	0.49	< 0.019	< 0.02
MW17T	05/15/2003	< 0.02	< 0.019	< 0.02	< 0.021	0.022	< 0.013	< 0.016	< 0.015	< 0.018	< 0.021	< 0.016	< 0.018	< 0.015	< 0.019	< 0.024	< 0.027	< 0.018	< 0.019
MW17T	02/25/2004	0.021	0.037	< 0.017	0.036	0.053	**0.39**	**0.7**	**1**	0.9	**0.7**	**0.73**	**0.21**	1.2	0.022	**0.73**	0.56	0.28	0.88
MW17T	05/24/2004	< 0.017	< 0.016	< 0.017	< 0.018	< 0.019	< 0.011	< 0.013	< 0.012	< 0.015	< 0.018	< 0.013	< 0.015	< 0.012	< 0.016	< 0.02	< 0.023	< 0.015	< 0.016
MW17T	05/18/2005	< 0.02	< 0.023	< 0.019	< 0.019	< 0.018	< 0.02	0.03	0.032	0.031	0.03	0.026	< 0.022	0.037	< 0.022	0.024	0.046	< 0.02	0.033
MW17T	11/28/2005	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW17T	05/30/2006	0.012	0.017	< 0.0082	< 0.0081	< 0.012	< 0.016	< 0.018	0.019	< 0.019	< 0.019	< 0.019	< 0.019	0.025	< 0.0091	< 0.019	0.013	0.014	0.02
MW17T	05/16/2007	< 0.01	< 0.011	< 0.0082	< 0.0081	< 0.012	< 0.016	< 0.018	< 0.016	< 0.019	< 0.019	< 0.019	< 0.019	0.02	< 0.0091	< 0.019	< 0.012	< 0.011	0.016
MW17T	11/15/2007	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW17T	10/26/2009	< 0.047	< 0.047	< 0.0045	0.0086	0.0069	0.031	0.045	0.043	0.035	0.034	0.036	**0.0075**	0.053	< 0.0048	0.029	< 0.17	0.015	0.047
MW17T	01/26/2010	< 0.005	0.0046	< 0.0045	0.0065	0.0094	**0.054**	0.11	0.11	0.11	0.097	0.074	**0.023**	0.056	< 0.0048	**0.09**	< 0.047	0.017	0.054
MW17T	04/28/2010	0.074	0.07	0.013	< 0.0036	< 0.0057	< 0.0036	< 0.0029	< 0.0034	< 0.0048	< 0.0044	< 0.0035	< 0.0032	< 0.0044	< 0.0048	< 0.0047	0.75	< 0.0081	< 0.0047
MW17T	07/26/2010	0.013	0.0045	0.0049	0.005	< 0.0057	< 0.0036	0.0034	0.0051	< 0.0048	0.0045	0.0048	< 0.0032	0.006	< 0.0048	< 0.0047	0.018	< 0.0081	0.0052
MW17T	11/02/2010	< 0.005	0.0058	< 0.0045	0.0045	0.0064	0.0078	0.016	0.018	0.018	0.02	0.017	< 0.0032	0.019	< 0.0048	0.013	0.013	< 0.0081	0.017
MW17T	05/17/2011	< 0.005	0.0068	< 0.0045	0.0054	< 0.0057	0.0088	0.01	0.015	0.012	0.012	0.012	*0.0035*	0.017	< 0.0048	0.0094	0.026	0.0088	0.016
MW17T	11/01/2011	0.015	0.015	0.0074	0.0046	0.0065	0.013	0.015	0.018	0.011	0.015	0.02	< 0.0032	0.024	< 0.0048	0.0093	0.073	0.01	0.022
MW17T	08/08/2012	< 0.0053	< 0.0041	< 0.0048	< 0.0038	0.0061	< 0.0038	< 0.003	< 0.0036	< 0.0051	< 0.0046	< 0.0037	< 0.0034	< 0.0047	< 0.0051	< 0.005	0.0063	< 0.0086	< 0.005
MW17T	11/13/2012	0.0075	0.013	< 0.0048	< 0.0038	< 0.0061	< 0.0038	< 0.003	< 0.0036	< 0.0051	< 0.0046	< 0.0037	< 0.0034	< 0.0047	< 0.0051	< 0.005	< 0.05	< 0.0086	< 0.005
MW17T	02/26/2013	< 0.005	< 0.0039	< 0.0045	< 0.0036	< 0.0057	0.0042	< 0.0029	0.0084	0.0083	0.011	0.01	**0.0078**	0.0044	< 0.0048	0.0099	0.013	< 0.0081	< 0.0047
MW17T	05/29/2013	< 0.005	< 0.0039	< 0.0045	0.005	< 0.0057	< 0.0036	< 0.0029	< 0.0034	< 0.0048	< 0.0044	< 0.0035	< 0.0032	< 0.0044	< 0.0048	< 0.0047	0.0085	< 0.0081	< 0.0047
MW17T	11/12/2013	< 0.005	< 0.0039	< 0.0045	< 0.0036	< 0.0057	< 0.0036	< 0.0029	< 0.0034	< 0.0048	< 0.0044	< 0.0035	< 0.0032	< 0.0044	< 0.0048	< 0.0047	0.011	< 0.0081	< 0.0047
MW17T	05/19/2014	< 0.0062	< 0.0064	< 0.0068	0.009	0.0074	0.0079	< 0.0087	< 0.0062	0.0038	0.0083	0.011	< 0.0059	0.016	< 0.0066	< 0.0049	0.014	0.02	0.016

Table 15. Groundwater Analytical Results - PAHs/SVOCs Exceeding Screening Levels
Wisconsin Public Service Corporation, Manitowoc
Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

		PAH																	
Sample Location	Sample Date	1-Methylnaphthalene (µg/l)	2-methylnaphthalene (µg/l)	Acenaphthene (µg/l)	Acenaphthylene (µg/l)	Anthracene (µg/l)	Benzo(a)anthracene (µg/l)	Benzo(a)pyrene (µg/l)	Benzo(b)fluoranthene (µg/l)	Benzo(ghi)perylene (µg/l)	Benzo(k)fluoranthene (µg/l)	Chrysene (µg/l)	Dibenz(a,h)anthracene (µg/l)	Fluoranthene (µg/l)	Fluorene (µg/l)	Indeno(1,2,3-cd)pyrene (µg/l)	Naphthalene (PAH) (µg/l)	Phenanthrene (µg/l)	Pyrene (µg/l)
Groundwater SL for WI / IBS		**1.1**	**36**	**530**	**530**	**3,000**	**0.034**	**0.2**	**0.2**	**250**	**0.34**	**0.2**	**0.0034**	**400**	**400**	**0.034**	**100**	**3,000**	**250**
MW18T	04/11/2000	--	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 5
MW18T	03/27/2001	--	< 5	< 5	< 5	< 5	< 2	< 2	< 2	< 5	< 5	< 5	< 2	< 5	< 5	< 2	< 5	< 5	< 5
MW18T	06/05/2002	< 0.027	< 0.028	< 0.018	< 0.023	< 0.02	< 0.019	< 0.012	< 0.014	< 0.015	< 0.013	< 0.018	< 0.017	< 0.028	< 0.021	< 0.014	0.12	< 0.019	< 0.02
MW18T	05/15/2003	< 0.018	< 0.017	< 0.018	< 0.019	< 0.02	< 0.012	< 0.014	< 0.013	< 0.016	< 0.019	< 0.014	< 0.016	< 0.013	< 0.017	< 0.021	0.1	< 0.016	< 0.017
MW18T	02/25/2004	< 0.017	< 0.016	< 0.017	< 0.018	< 0.019	< 0.011	< 0.013	< 0.012	< 0.015	< 0.018	< 0.013	< 0.015	< 0.012	< 0.016	< 0.02	0.028	< 0.015	< 0.016
MW18T	05/24/2004	< 0.017	< 0.016	< 0.017	< 0.018	< 0.019	< 0.011	< 0.013	< 0.012	< 0.015	< 0.018	< 0.013	< 0.015	0.013	< 0.016	< 0.02	< 0.023	< 0.015	< 0.016
MW18T	05/18/2005	< 0.02	< 0.023	< 0.019	< 0.019	< 0.018	< 0.02	0.019	0.022	< 0.021	< 0.019	0.019	< 0.022	0.03	< 0.022	< 0.017	< 0.022	< 0.02	0.025
MW18T	11/28/2005	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW18T	05/30/2006	0.036	0.013	0.009	< 0.0081	< 0.012	< 0.016	< 0.018	< 0.016	< 0.019	< 0.019	< 0.019	< 0.019	< 0.015	< 0.0091	< 0.019	0.029	< 0.011	< 0.015
MW18T	05/16/2007	< 0.01	< 0.011	< 0.0082	< 0.0081	< 0.012	< 0.016	< 0.018	< 0.016	< 0.019	< 0.019	< 0.019	< 0.019	< 0.015	< 0.0091	< 0.019	< 0.012	< 0.011	< 0.015
MW18T	11/15/2007	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW18T	10/26/2009	< 0.005	< 0.0039	< 0.0045	0.011	< 0.0057	0.0069	0.0079	0.012	0.009	0.0069	0.0099	< 0.0032	0.013	< 0.0048	0.0063	< 0.17	< 0.0081	0.012
MW18T	01/27/2010	0.012	0.011	0.0077	0.019	0.0057	0.0071	0.0082	0.01	0.0086	0.0094	0.011	< 0.0032	0.029	0.0069	0.0068	0.056	0.016	0.024
MW18T	04/27/2010	< 0.005	0.0054	< 0.0045	0.012	< 0.0057	< 0.0036	< 0.0029	< 0.0034	< 0.0048	< 0.0044	< 0.0035	< 0.0032	0.007	< 0.0048	< 0.0047	0.017	0.012	0.0048
MW18T	07/26/2010	< 0.005	0.0042	< 0.0045	0.012	< 0.0057	< 0.0036	< 0.0029	< 0.0034	< 0.0048	< 0.0044	< 0.0035	< 0.0032	< 0.0044	< 0.0048	< 0.0047	0.0088	< 0.0081	< 0.0047
MW18T	11/03/2010	0.0075	0.0071	< 0.0045	0.012	0.0059	0.0085	0.011	0.014	0.013	0.019	0.02	< 0.0032	0.02	< 0.0048	0.0097	0.037	0.0092	0.021
MW18T	05/17/2011	< 0.005	0.0086	< 0.0045	0.012	< 0.0057	0.0057	0.0058	0.0083	0.0062	0.0058	0.0078	< 0.0032	0.0098	< 0.0048	< 0.0047	0.019	< 0.0081	0.0093
MW18T	11/01/2011	0.0073	0.0057	< 0.0045	0.011	< 0.0057	< 0.0036	0.0033	0.0042	< 0.0048	< 0.0044	0.0037	< 0.0032	0.0047	< 0.0048	< 0.0047	0.016	< 0.0081	< 0.0047
MW18T	08/07/2012	0.0085	0.013	< 0.0048	0.004	< 0.0061	< 0.0038	< 0.003	0.0037	< 0.0051	< 0.0046	< 0.0037	< 0.0034	< 0.05	< 0.0051	< 0.005	0.043	< 0.0086	< 0.005
MW18T	11/13/2012	< 0.0054	0.007	< 0.0048	0.0061	< 0.0061	0.0087	0.033	0.033	0.04	0.033	0.018	**0.0073**	0.016	< 0.0051	0.029	0.016	< 0.0087	0.014
MW18T	02/26/2013	< 0.005	0.01	< 0.0045	0.0096	< 0.0057	< 0.0036	< 0.0029	< 0.0034	< 0.0048	< 0.0044	< 0.0035	< 0.0032	< 0.0044	< 0.0048	< 0.0047	0.019	< 0.0081	< 0.0047
MW18T	05/29/2013	< 0.005	0.004	< 0.0045	0.013	< 0.0057	< 0.0036	< 0.0029	< 0.0034	< 0.0048	< 0.0044	0.0035	< 0.0032	< 0.0044	< 0.0048	< 0.0047	0.013	< 0.0081	< 0.0047
MW18T	11/12/2013	< 0.005	0.0048	< 0.0045	0.011	< 0.0057	< 0.0036	< 0.0029	< 0.0034	< 0.0048	< 0.0044	< 0.0035	< 0.0032	< 0.0044	< 0.0048	< 0.0047	0.013	< 0.0081	< 0.0047
MW18T	05/19/2014	< 0.0063	< 0.0065	< 0.0069	0.019	0.0089	0.0076	< 0.0088	0.007	0.0078	0.01	0.011	< 0.0059	0.019	< 0.0066	0.0052	0.02	0.016	0.018
MW19T	04/11/2000	--	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 5
MW19T	03/27/2001	--	< 5	< 5	< 5	< 5	< 2	< 2	< 2	< 5	< 5	< 5	< 2	< 5	< 5	< 2	< 5	< 5	< 5
MW19T	06/05/2002	< 0.16	< 0.17	< 0.11	0.3	0.19	**0.86**	**1.2**	**1.1**	0.92	**0.71**	**0.69**	**0.29**	1.7	< 0.13	**0.91**	0.44	0.44	1.4
MW19T	05/15/2003	< 0.018	< 0.017	< 0.018	0.031	0.022	**0.092**	0.16	0.17	0.15	0.12	0.12	**0.038**	0.19	< 0.017	**0.13**	0.032	0.06	0.18
MW19T	02/25/2004	< 0.017	0.016	< 0.017	< 0.018	< 0.019	0.023	0.043	0.059	0.054	0.044	0.044	< 0.015	0.07	< 0.016	**0.043**	0.12	0.02	0.053
MW19T	05/24/2004	0.019	0.026	< 0.017	0.068	0.093	**0.66**	**1.5**	**2.1**	1.8	**1.4**	**1.5**	**0.42**	2.2	0.024	**1.5**	0.045	0.54	1.7
MW19T	05/18/2005	< 0.02	< 0.023	< 0.019	0.04	0.026	**0.1**	0.17	**0.21**	0.2	0.16	0.14	**0.041**	0.24	< 0.022	**0.16**	0.069	0.075	0.2
MW19T	11/28/2005	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW19T	05/30/2006	0.018	0.02	< 0.0082	0.029	0.017	**0.054**	0.098	0.12	0.11	0.088	0.075	**0.023**	0.13	< 0.0091	**0.086**	0.25	0.039	0.11
MW19T	05/16/2007	< 0.01	0.014	< 0.0082	0.016	< 0.012	0.019	0.039	0.038	0.042	0.033	0.028	< 0.019	0.056	< 0.0091	0.029	0.034	0.024	0.046
MW19T	11/15/2007	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW19T	10/26/2009	< 0.047	< 0.047	0.011	0.12	0.11	**0.44**	**0.91**	**1.5**	0.9	**0.64**	**0.85**	**0.2**	1.1	0.033	**0.73**	< 0.17	0.25	1
MW19T	01/26/2010	< 0.005	0.0062	< 0.0045	0.033	0.036	**0.099**	**0.22**	**0.29**	0.3	0.25	**0.23**	**0.064**	0.28	< 0.0048	**0.23**	< 0.047	0.064	0.27
MW19T	04/28/2010	0.035	0.039	0.16	0.11	0.13	0.024	0.02	0.027	0.028	0.023	0.043	**0.0053**	0.21	0.14	0.019	0.36	0.2	0.2
MW19T	07/26/2010	0.039	0.0046	0.017	0.014	0.0077	0.016	0.031	0.05	0.046	0.037	0.036	**0.014**	0.035	< 0.0048	**0.037**	0.014	0.011	0.032
MW19T	11/02/2010	0.0078	0.012	< 0.0045	0.012	0.013	0.018	0.048	0.059	0.063	0.058	0.047	**0.012**	0.051	0.0051	**0.044**	0.027	0.012	0.053
MW19T	05/18/2011	< 0.005	0.0065	< 0.0045	0.018	0.013	**0.056**	0.11	0.18	0.16	0.12	0.1	**0.034**	0.14	< 0.0048	**0.12**	0.019	0.032	0.14
MW19T	11/02/2011	< 0.005	0.0082	< 0.0045	0.017	0.011	0.023	0.05	0.069	0.073	0.05	0.05	**0.014**	0.06	< 0.0048	**0.055**	0.017	0.016	0.061
MW19T	08/08/2012	< 0.0053	0.0052	< 0.0048	0.017	0.013	0.032	0.067	0.096	0.098	0.063	0.057	**0.019**	0.088	< 0.0051	**0.071**	0.016	0.026	0.078
MW19T	11/13/2012	< 0.0054	0.0074	< 0.0048	0.0092	< 0.0061	0.0085	0.016	0.02	0.026	0.019	0.017	**0.0061**	0.021	< 0.0051	0.019	0.016	< 0.0087	0.018
MW19T	02/25/2013	< 0.005	0.0046	< 0.0045	0.0049	< 0.0057	< 0.047	0.0098	< 0.047	< 0.047	< 0.047	< 0.047	< 0.0032	0.017	< 0.0048	< 0.047	0.0098	< 0.0081	0.015
MW19T	05/29/2013	< 0.005	0.0056	< 0.0045	0.012	< 0.0057	**0.065**	0.062	0.076	0.097	0.12	0.13	**0.067**	0.022	< 0.0048	**0.081**	0.017	< 0.0081	0.022
MW19T	11/13/2013	< 0.005	0.0057	< 0.0045	0.0066	< 0.0057	0.0046	0.013	0.015	0.021	0.017	0.014	**0.0036**	0.014	< 0.0048	0.015	0.016	< 0.0081	0.013
MW19T	05/19/2014	< 0.0063	< 0.0065	< 0.0069	0.0075	0.0071	0.012	0.023	0.029	0.03	0.024	0.023	< 0.0059	0.034	< 0.0066	0.021	0.012	0.011	0.029

Table 15. Groundwater Analytical Results - PAHs/SVOCs Exceeding Screening Levels
Wisconsin Public Service Corporation, Manitowoc
Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

		PAH																	
Sample Location	Sample Date	1-Methylnaphthalene (µg/l)	2-methylnaphthalene (µg/l)	Acenaphthene (µg/l)	Acenaphthylene (µg/l)	Anthracene (µg/l)	Benzo(a)anthracene (µg/l)	Benzo(a)pyrene (µg/l)	Benzo(b)fluoranthene (µg/l)	Benzo(ghi)perylene (µg/l)	Benzo(k)fluoranthene (µg/l)	Chrysene (µg/l)	Dibenz(a,h)anthracene (µg/l)	Fluoranthene (µg/l)	Fluorene (µg/l)	Indeno(1,2,3-cd)pyrene (µg/l)	Naphthalene (PAH) (µg/l)	Phenanthrene (µg/l)	Pyrene (µg/l)
Groundwater SL for WI / IBS		**1.1**	**36**	**530**	**530**	**3,000**	**0.034**	**0.2**	**0.2**	**250**	**0.34**	**0.2**	**0.0034**	**400**	**400**	**0.034**	**100**	**3,000**	**250**
MW20T	04/11/2000	--	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 5
MW20T	03/27/2001	--	< 5	< 5	< 5	< 5	< 2	< 2	< 2	< 5	< 5	< 5	< 2	< 5	< 5	< 2	< 5	< 5	< 5
MW20T	06/05/2002	< 0.027	< 0.028	< 0.018	< 0.023	< 0.02	0.022	0.031	0.033	0.029	0.024	0.025	< 0.017	0.061	< 0.021	0.026	< 0.027	0.027	0.063
MW20T	05/15/2003	0.053	0.035	< 0.018	< 0.019	< 0.02	< 0.012	0.018	0.025	0.023	< 0.019	0.02	< 0.016	0.032	< 0.017	< 0.021	0.33	0.018	0.028
MW20T	02/25/2004	0.02	0.03	< 0.017	0.042	< 0.019	**0.039**	0.046	0.048	0.04	0.037	0.049	< 0.015	0.1	< 0.016	0.032	0.096	0.065	0.079
MW20T	05/24/2004	< 0.017	< 0.016	< 0.017	0.019	< 0.019	**0.078**	0.12	0.14	0.12	0.1	0.11	**0.031**	0.21	< 0.016	**0.1**	< 0.023	0.078	0.18
MW20T	05/25/2004	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW20T	05/18/2005	< 0.02	< 0.023	< 0.019	< 0.019	< 0.018	< 0.02	0.027	0.035	0.029	0.027	0.029	< 0.022	0.046	< 0.022	0.022	0.039	0.023	0.037
MW20T	11/28/2005	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW20T	05/30/2006	< 0.01	0.015	< 0.0082	< 0.0081	< 0.012	0.032	0.055	0.053	0.051	0.041	0.044	< 0.019	0.084	< 0.0091	**0.037**	< 0.012	0.032	0.064
MW20T	05/16/2007	< 0.01	< 0.011	< 0.0082	< 0.0081	< 0.012	< 0.016	< 0.018	0.023	< 0.019	0.02	0.019	< 0.019	0.037	< 0.0091	< 0.019	< 0.012	0.021	0.026
MW20T	11/15/2007	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW20T	10/26/2009	< 0.047	< 0.047	< 0.0045	0.016	0.015	**0.074**	0.13	0.17	0.12	0.095	0.11	**0.03**	0.17	0.0063	**0.096**	< 0.17	0.044	0.14
MW20T	01/26/2010	< 0.005	< 0.0039	< 0.0045	0.0042	< 0.0057	0.0061	0.0057	0.0084	0.0069	0.0068	0.011	< 0.0032	0.018	< 0.0048	0.0053	< 0.047	< 0.0081	0.022
MW20T	04/28/2010	0.0055	0.0071	< 0.0045	0.0042	< 0.0057	0.0051	0.0078	0.0097	0.0086	0.01	0.012	< 0.0032	0.015	< 0.0048	0.0064	0.04	< 0.0081	0.012
MW20T	07/26/2010	0.0097	0.0084	< 0.0045	0.0058	< 0.0057	0.022	0.039	0.056	0.04	0.047	0.05	**0.0073**	0.062	< 0.0048	0.03	0.067	0.012	0.047
MW20T	11/02/2010	< 0.005	0.0039	< 0.0045	< 0.0036	< 0.0057	0.0053	0.0087	0.009	0.0091	0.011	0.013	< 0.0032	0.012	< 0.0048	0.0065	0.011	< 0.0081	0.012
MW20T	05/18/2011	0.006	0.01	< 0.0045	0.0046	< 0.0057	0.0054	0.0083	0.014	0.011	0.0084	0.0081	**0.0036**	0.012	< 0.0048	0.0079	0.024	< 0.0081	0.0096
MW20T	11/01/2011	< 0.005	0.0054	< 0.0045	0.0047	< 0.0057	0.0056	0.0036	0.0064	< 0.0048	0.0058	0.0061	< 0.0032	< 0.0044	< 0.0048	< 0.0047	0.016	< 0.0081	< 0.0047
MW20T	08/08/2012	< 0.0053	< 0.0041	0.0097	0.0052	0.0064	0.0045	0.0056	0.0076	0.0071	0.0071	0.0065	< 0.0034	< 0.05	< 0.0051	0.0053	0.0052	< 0.0086	< 0.05
MW20T	11/13/2012	0.0057	0.01	< 0.0048	0.0044	< 0.0061	< 0.0039	0.0042	0.0045	< 0.0052	0.0062	0.0052	< 0.0034	0.0083	< 0.0051	< 0.005	0.021	< 0.0087	0.0066
MW20T	02/26/2013	0.0072	0.012	0.0062	0.018	0.024	**0.12**	0.2	**0.27**	0.23	0.2	**0.23**	**0.059**	0.34	0.0079	**0.18**	0.024	0.12	0.29
MW20T	05/29/2013	< 0.005	< 0.0039	< 0.0045	0.0063	< 0.0057	< 0.0036	0.0035	0.0054	0.005	0.0077	0.0079	< 0.0032	0.0091	< 0.0048	< 0.0047	0.0091	< 0.0081	0.008
MW20T	11/12/2013	< 0.005	< 0.0039	0.0067	0.0054	< 0.0057	< 0.0036	< 0.0029	< 0.0034	< 0.0048	0.0048	0.0052	< 0.0032	0.005	< 0.0048	< 0.0047	0.011	< 0.0081	0.0052
MW20T	05/19/2014	< 0.0063	0.0068	< 0.0069	< 0.0064	< 0.0068	0.025	0.035	0.051	0.041	0.038	0.042	**0.0072**	0.069	< 0.0066	0.03	0.012	0.031	0.064
MW21T	04/11/2000	--	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 5
MW21T	03/27/2001	--	< 5	< 5	< 5	< 5	< 2	< 2	< 2	< 5	< 5	< 5	< 2	< 5	< 5	< 2	< 5	< 5	< 5
MW21T	06/05/2002	0.058	< 0.028	0.36	1.8	< 0.02	0.027	0.1	0.073	0.15	< 0.047	0.02	**0.037**	0.031	0.18	**0.12**	0.042	0.035	0.034
MW21T	05/15/2003	0.037	0.027	0.082	0.47	< 0.02	0.021	0.072	0.066	0.11	0.046	0.03	**0.02**	0.046	0.037	**0.081**	0.18	0.022	0.042
MW21T	02/25/2004	0.032	0.031	0.25	1.1	< 0.019	0.024	0.055	0.053	0.068	0.047	0.037	< 0.015	0.059	0.081	**0.052**	0.76	0.034	0.05
MW21T	05/24/2004	0.018	0.022	0.025	0.066	0.053	**0.37**	**0.58**	**0.72**	0.63	**0.59**	**0.6**	**0.17**	1	0.026	**0.54**	0.038	0.35	0.82
MW21T	05/18/2005	0.03	< 0.023	0.18	0.75	< 0.018	**0.049**	0.11	0.12	0.15	0.11	0.092	**0.031**	0.15	0.068	**0.11**	0.049	0.059	0.11
MW21T	11/28/2005	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW21T	05/30/2006	< 0.026	< 0.029	< 0.021	0.097	0.039	**0.14**	**0.32**	**0.56**	0.44	**0.35**	**0.38**	**0.078**	0.51	< 0.023	**0.34**	< 0.032	0.14	0.41
MW21T	05/16/2007	0.01	0.013	0.011	0.1	0.016	**0.053**	0.13	**0.21**	0.18	0.14	0.13	**0.027**	0.18	0.012	**0.16**	0.013	0.054	0.15
MW21T	11/15/2007	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW21T	10/26/2009	< 0.02	< 0.19	0.019	0.19	0.043	**0.18**	**0.41**	**0.73**	0.47	**0.46**	**0.53**	**0.088**	0.7	0.023	**0.4**	< 0.17	0.15	0.55
MW21T	01/27/2010	0.026	0.018	0.023	0.061	0.034	**0.048**	0.1	0.17	0.15	0.15	0.15	**0.032**	0.23	0.014	**0.12**	0.11	0.066	0.19
MW21T	04/27/2010	0.017	0.0086	0.012	0.11	0.037	**0.12**	**0.26**	**0.53**	0.36	0.33	**0.36**	**0.075**	0.57	0.02	**0.28**	0.035	0.2	0.46
MW21T	07/26/2010	0.019	0.0065	0.031	0.48	0.014	0.0075	0.016	0.03	0.021	0.021	0.023	**0.0045**	0.038	0.026	0.016	0.028	0.015	0.031
MW21T	11/03/2010	0.0056	0.0053	0.016	0.12	0.014	0.014	0.033	0.063	0.056	0.046	0.055	**0.01**	0.072	0.01	**0.04**	0.022	0.018	0.066
MW21T	05/18/2011	0.0067	0.01	0.0049	0.017	0.013	0.034	0.061	0.12	0.087	0.086	0.085	**0.02**	0.11	< 0.0048	**0.069**	0.028	0.036	0.11
MW21T	11/02/2011	0.014	0.013	0.034	0.59	0.025	**0.046**	0.093	0.15	0.13	0.12	0.13	**0.027**	0.17	0.049	**0.096**	0.041	0.07	0.17
MW21T	08/08/2012	0.01	0.0074	0.037	0.62	0.015	0.019	0.032	0.065	0.045	0.037	0.042	**0.01**	0.063	0.036	0.034	0.024	0.023	0.059
MW21T	11/13/2012	0.0096	0.0089	0.047	0.67	0.0094	0.0058	0.009	0.015	0.013	0.012	0.013	< 0.0034	0.019	0.03	0.0095	0.019	0.014	0.018
MW21T	02/25/2013	0.012	0.0091	0.078	0.86	< 0.011	< 0.094	0.014	< 0.094	< 0.094	< 0.094	< 0.094	< 0.0064	0.028	0.042	< 0.094	0.034	0.02	0.029
MW21T	05/29/2013	< 0.047	0.0081	0.036	0.55	0.014	0.0051	0.015	0.02	0.017	0.016	0.02	0.0032	0.021	0.016	0.012	0.048	0.0089	0.019
MW21T	11/13/2013	0.011	0.0084	0.044	0.92	0.011	< 0.0036	< 0.0029	< 0.0034	< 0.0048	< 0.0044	0.0035	< 0.0032	< 0.0044	0.013	< 0.0047	0.024	< 0.0081	< 0.0047
MW21T	05/19/2014	< 0.0062	< 0.0064	< 0.0068	0.031	0.011	0.017	0.037	0.081	0.065	0.044	0.05	**0.013**	0.063	< 0.0066	**0.046**	< 0.0081	0.013	0.051

Table 15. Groundwater Analytical Results - PAHs/SVOCs Exceeding Screening Levels
Wisconsin Public Service Corporation, Manitowoc
Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

		PAH																	
Sample Location	Sample Date	1-Methylnaphthalene (µg/l)	2-methylnaphthalene (µg/l)	Acenaphthene (µg/l)	Acenaphthylene (µg/l)	Anthracene (µg/l)	Benzo(a)anthracene (µg/l)	Benzo(a)pyrene (µg/l)	Benzo(b)fluoranthene (µg/l)	Benzo(ghi)perylene (µg/l)	Benzo(k)fluoranthene (µg/l)	Chrysene (µg/l)	Dibenz(a,h)anthracene (µg/l)	Fluoranthene (µg/l)	Fluorene (µg/l)	Indeno(1,2,3-cd)pyrene (µg/l)	Naphthalene (PAH) (µg/l)	Phenanthrene (µg/l)	Pyrene (µg/l)
Groundwater SL for WI / IBS		**1.1**	**36**	**530**	**530**	**3,000**	**0.034**	**0.2**	**0.2**	**250**	**0.34**	**0.2**	**0.0034**	**400**	**400**	**0.034**	**100**	**3,000**	**250**
MW22	08/08/2012	< 0.0053	< 0.0041	< 0.0048	< 0.0038	< 0.0061	< 0.0038	< 0.003	< 0.0036	< 0.0051	< 0.0046	< 0.0037	< 0.0034	< 0.0047	< 0.0051	< 0.005	< 0.0051	< 0.0086	< 0.005
MW22	11/13/2012	0.0057	0.0066	< 0.0048	< 0.0038	< 0.0061	< 0.0038	< 0.003	< 0.0036	< 0.0051	< 0.0046	< 0.0037	< 0.0034	< 0.0047	< 0.0051	< 0.005	< 0.05	< 0.0086	< 0.005
MW22	02/26/2013	0.0061	0.0078	< 0.0045	< 0.0036	< 0.0057	0.0061	0.0042	0.01	0.0083	0.0083	0.0082	**0.0053**	< 0.0044	< 0.0048	0.0087	0.071	< 0.0081	< 0.0047
MW22	05/29/2013	< 0.0051	0.0044	< 0.0046	< 0.0037	< 0.0058	< 0.0037	< 0.0029	< 0.0035	< 0.0049	< 0.0045	0.0042	< 0.0033	< 0.0045	< 0.0049	< 0.0048	0.012	< 0.0082	< 0.0048
MW22	11/12/2013	< 0.005	< 0.0039	< 0.0045	< 0.0036	< 0.0057	< 0.0036	< 0.0029	< 0.0034	< 0.0048	< 0.0044	< 0.0035	< 0.0032	< 0.0044	< 0.0048	< 0.0047	0.0085	< 0.0081	< 0.0047
MW22	05/19/2014	< 0.0064	< 0.0065	< 0.007	< 0.0064	< 0.0068	< 0.0054	< 0.0088	< 0.0063	< 0.0038	< 0.0028	< 0.0031	< 0.006	< 0.0073	< 0.0067	< 0.005	< 0.0082	< 0.0084	< 0.0077
MW23	08/08/2012	< 0.0053	0.0051	< 0.0048	< 0.0038	0.0061	< 0.0038	< 0.003	< 0.0036	< 0.0051	< 0.0046	0.0038	< 0.0034	< 0.05	< 0.0051	< 0.005	0.0069	< 0.0086	< 0.05
MW23	11/13/2012	< 0.0054	< 0.0042	< 0.0049	< 0.0039	< 0.0062	< 0.0039	< 0.0031	< 0.0037	< 0.0052	< 0.0047	< 0.0038	< 0.0035	< 0.0048	< 0.0052	< 0.0051	0.008	< 0.0088	< 0.0051
MW23	02/26/2013	< 0.005	0.0041	< 0.0045	< 0.0036	< 0.0057	**0.079**	0.024	0.08	0.051	0.06	0.066	**0.032**	0.027	< 0.0048	**0.06**	0.0087	< 0.0081	0.028
MW23	05/29/2013	< 0.0051	< 0.004	< 0.0047	< 0.0037	< 0.0059	< 0.0037	< 0.0029	< 0.0035	< 0.005	< 0.0045	0.004	< 0.0033	< 0.0045	< 0.0049	< 0.0048	< 0.005	< 0.0083	< 0.0049
MW23	11/12/2013	< 0.005	< 0.0039	< 0.0045	< 0.0036	< 0.0057	< 0.0036	< 0.0029	< 0.0034	< 0.0048	< 0.0044	0.0042	< 0.0032	< 0.0044	< 0.0048	< 0.0047	< 0.0048	< 0.0081	0.0053
MW23	05/19/2014	< 0.0063	< 0.0065	< 0.0069	< 0.0064	< 0.0068	< 0.0054	< 0.0088	< 0.0062	0.0047	0.0048	0.0051	< 0.0059	< 0.0072	< 0.0066	< 0.0049	0.013	< 0.0084	< 0.0077
PZ5	08/09/2012	< 0.0053	0.007	< 0.0048	< 0.0038	< 0.0061	< 0.0038	0.0032	0.0065	< 0.0051	< 0.0046	0.005	< 0.0034	0.0079	< 0.0051	< 0.005	< 0.05	< 0.0086	0.0062
PZ5	11/13/2012	< 0.0054	0.0085	< 0.0048	< 0.0039	< 0.0061	< 0.0039	< 0.0031	< 0.0036	< 0.0052	< 0.0047	< 0.0037	< 0.0034	0.0082	< 0.0051	< 0.005	0.017	< 0.0087	0.0071
PZ5	02/26/2013	< 0.005	0.01	< 0.0046	< 0.0036	< 0.0058	< 0.0037	< 0.0029	0.0041	< 0.0049	< 0.0044	0.0039	< 0.0032	0.0053	< 0.0048	< 0.0047	0.02	< 0.0082	< 0.0048
PZ5	05/29/2013	< 0.047	0.018	< 0.0045	< 0.0036	< 0.0057	< 0.0036	0.0049	0.0046	< 0.0048	0.0076	0.0087	< 0.0032	0.01	< 0.0048	< 0.0047	0.059	< 0.0081	0.0096
PZ5	11/12/2013	0.0052	0.0086	< 0.0045	< 0.0036	< 0.0057	< 0.0036	0.0035	0.0042	0.0054	0.0072	0.0078	< 0.0032	0.013	< 0.0048	< 0.0047	0.024	< 0.0081	0.012
PZ5	05/19/2014	< 0.0062	0.0096	< 0.0068	< 0.0063	0.0071	0.027	0.049	0.085	0.057	0.061	0.064	**0.011**	0.087	< 0.0066	**0.041**	0.027	0.036	0.068
PZ7B	10/26/2009	< 0.047	< 0.047	0.035	0.15	0.027	**0.048**	0.09	0.13	0.095	0.089	0.08	**0.018**	0.1	0.0086	**0.078**	< 0.17	0.03	0.089
PZ7B	01/27/2010	0.006	0.0089	0.0061	< 0.0036	0.0075	0.01	0.011	0.018	0.016	0.015	0.015	< 0.0032	0.015	< 0.0048	0.012	< 0.047	< 0.0081	0.017
PZ7B	04/27/2010	< 0.005	0.0058	< 0.0045	0.036	0.072	**0.15**	**0.21**	**0.29**	0.21	0.21	**0.23**	**0.042**	0.42	0.0067	**0.17**	0.011	0.073	0.35
PZ7B	07/26/2010	0.025	0.029	0.035	0.045	0.043	**0.035**	0.073	0.14	0.12	0.097	0.098	**0.023**	0.13	0.023	**0.085**	0.085	0.055	0.11
PZ7B	11/02/2010	0.025	0.012	0.018	0.058	0.019	0.0051	0.0053	0.0093	0.007	0.0092	0.01	< 0.0032	0.028	0.0092	< 0.0047	0.035	0.022	0.021
PZ7B	05/17/2011	0.033	0.016	0.015	0.07	0.019	0.025	0.035	0.07	0.044	0.039	0.044	**0.011**	0.079	0.0075	0.033	0.036	0.028	0.063
PZ7B	11/01/2011	0.026	0.017	0.022	0.064	0.018	0.014	0.026	0.041	0.033	0.03	0.029	**0.0073**	0.03	0.013	0.026	0.05	0.015	0.027
PZ7B	08/08/2012	< 0.005	0.0049	< 0.0045	0.019	0.018	0.0077	0.013	0.024	0.019	0.017	0.015	**0.0051**	< 0.047	< 0.0048	0.014	0.0086	0.0097	< 0.047
PZ7B	11/14/2012	0.0095	0.014	0.012	0.04	0.016	< 0.0038	0.004	0.0081	0.0061	0.0053	0.0063	< 0.0034	0.0099	0.0093	< 0.005	< 0.05	< 0.0086	0.01
PZ7B	02/27/2013	0.014	0.0077	0.014	0.042	0.0071	0.004	0.0046	0.01	0.008	0.007	0.0084	< 0.0032	0.012	0.0064	0.0066	0.042	< 0.0081	0.012
PZ7B	05/30/2013	< 0.047	0.0095	0.012	0.048	0.015	0.0067	0.013	0.015	0.012	0.019	0.021	< 0.0032	0.029	< 0.0048	0.0085	0.028	0.012	0.023
PZ7B	11/13/2013	< 0.005	0.0045	< 0.0045	0.012	0.014	< 0.0036	0.0033	0.0059	0.0054	0.0054	0.0072	< 0.0032	0.0066	< 0.0048	< 0.0047	0.011	< 0.0081	0.0057
PZ7B	05/20/2014	< 0.0063	< 0.0065	< 0.0069	0.027	0.012	0.0072	0.015	0.017	0.02	0.022	0.017	< 0.0059	0.022	< 0.0066	0.014	0.011	< 0.0084	0.028

Table 15. Groundwater Analytical Results - PAHs/SVOCs Exceeding Screening Levels
Wisconsin Public Service Corporation, Manitowoc
Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

		PAH																	
Sample Location	Sample Date	1-Methylnaphthalene (µg/l)	2-methylnaphthalene (µg/l)	Acenaphthene (µg/l)	Acenaphthylene (µg/l)	Anthracene (µg/l)	Benzo(a)anthracene (µg/l)	Benzo(a)pyrene (µg/l)	Benzo(b)fluoranthene (µg/l)	Benzo(ghi)perylene (µg/l)	Benzo(k)fluoranthene (µg/l)	Chrysene (µg/l)	Dibenz(a,h)anthracene (µg/l)	Fluoranthene (µg/l)	Fluorene (µg/l)	Indeno(1,2,3-cd)pyrene (µg/l)	Naphthalene (PAH) (µg/l)	Phenanthrene (µg/l)	Pyrene (µg/l)
Groundwater SL for WI / IBS		**1.1**	**36**	**530**	**530**	**3,000**	**0.034**	**0.2**	**0.2**	**250**	**0.34**	**0.2**	**0.0034**	**400**	**400**	**0.034**	**100**	**3,000**	**250**
PZ18TB	10/26/2009	< 0.047	< 0.047	0.041	0.018	0.025	0.032	0.03	0.035	0.026	0.03	0.037	**0.0086**	0.1	0.031	0.022	< 0.17	0.043	0.095
PZ18TB	01/27/2010	0.015	0.016	0.019	0.0057	< 0.0057	0.0057	0.0087	0.011	0.01	0.01	0.0097	< 0.0032	0.025	0.013	0.0086	0.099	0.02	0.021
PZ18TB	04/27/2010	< 0.0051	0.0072	0.0071	0.0041	< 0.0058	0.0037	0.0051	0.0064	0.0055	0.0055	0.0059	< 0.0033	0.013	0.0078	< 0.0048	0.017	0.016	0.014
PZ18TB	07/26/2010	< 0.005	0.0065	< 0.0045	< 0.0036	< 0.0057	< 0.0036	< 0.0029	< 0.0034	< 0.0048	< 0.0044	< 0.0035	< 0.0032	< 0.0044	< 0.0048	< 0.0047	0.0093	< 0.0081	< 0.0047
PZ18TB	11/03/2010	0.05	0.014	0.0092	< 0.0036	< 0.0057	0.0046	0.0042	0.005	< 0.0048	0.0062	0.0076	< 0.0032	0.015	0.0074	< 0.0047	0.059	0.014	0.013
PZ18TB	05/17/2011	0.016	0.018	0.018	< 0.0036	< 0.0057	< 0.0036	< 0.0029	< 0.0034	< 0.0048	< 0.0044	0.0042	< 0.0032	0.014	0.011	< 0.0047	0.023	0.025	0.012
PZ18TB	11/01/2011	< 0.005	< 0.0039	< 0.0045	< 0.0036	< 0.0057	< 0.0036	< 0.0029	< 0.0034	< 0.0048	< 0.0044	< 0.0035	< 0.0032	< 0.0044	< 0.0048	< 0.0047	0.0098	< 0.0081	< 0.0047
PZ18TB	08/07/2012	< 0.0053	0.0049	< 0.0048	0.0048	< 0.0061	0.019	0.014	0.019	0.014	0.017	0.02	**0.0095**	< 0.05	< 0.0051	0.013	0.009	< 0.0086	< 0.05
PZ18TB	11/13/2012	< 0.0054	0.0077	0.0057	< 0.0039	< 0.0061	< 0.0039	< 0.0031	< 0.0036	0.0063	0.0057	0.0057	**0.0038**	< 0.0047	< 0.0051	< 0.005	0.015	< 0.0087	< 0.0051
PZ18TB	02/26/2013	< 0.005	0.005	< 0.0045	< 0.0036	< 0.0057	0.0081	0.0094	0.012	0.009	0.01	0.012	0.0034	0.022	< 0.0048	0.0075	0.0072	0.0098	0.018
PZ18TB	05/29/2013	< 0.0052	0.0067	< 0.0048	< 0.0038	< 0.006	< 0.0038	< 0.003	< 0.0036	< 0.005	< 0.0046	< 0.0037	< 0.0034	0.0061	< 0.005	< 0.0049	0.016	< 0.0085	0.0056
PZ18TB	11/12/2013	< 0.005	0.0064	< 0.0045	< 0.0036	< 0.0057	< 0.0036	< 0.0029	< 0.0034	< 0.0048	< 0.0044	< 0.0035	< 0.0032	< 0.0044	< 0.0048	< 0.0047	0.022	< 0.0081	< 0.0047
PZ18TB	05/19/2014	< 0.0065	< 0.0067	< 0.0071	< 0.0066	< 0.007	0.014	0.026	0.037	0.03	0.034	0.036	< 0.0061	0.047	< 0.0068	0.021	0.023	0.02	0.037
PZ23B	10/27/2009	< 0.047	< 0.047	0.0077	0.0099	< 0.0057	0.025	0.044	0.059	0.044	0.037	0.043	**0.012**	0.059	0.005	**0.036**	0.15	0.017	0.046
PZ23B	01/26/2010	< 0.005	0.0068	0.005	< 0.0036	0.0073	0.02	0.031	0.042	0.04	0.042	0.036	**0.012**	0.045	< 0.0048	0.033	< 0.047	0.012	0.039
PZ23B	04/28/2010	< 0.005	0.0057	< 0.0046	< 0.0036	< 0.0058	0.0056	0.012	0.018	0.018	0.017	0.013	*0.0035*	0.019	< 0.0048	0.013	0.015	0.0083	0.015
PZ23B	07/27/2010	0.01	0.016	0.0061	0.0068	< 0.0057	0.0092	0.021	0.041	0.031	0.028	0.03	**0.0051**	0.034	0.0049	0.022	0.047	0.013	0.029
PZ23B	11/03/2010	0.03	0.013	0.011	0.006	< 0.0057	0.0072	0.021	0.029	0.026	0.032	0.027	**0.0052**	0.028	< 0.0048	0.018	0.033	0.011	0.025
PZ23B	05/18/2011	< 0.005	0.009	0.0048	0.0071	0.0058	0.022	0.051	0.098	0.083	0.076	0.058	**0.017**	0.067	< 0.0048	**0.063**	0.017	0.014	0.054
PZ23B	11/02/2011	< 0.005	0.0055	0.0068	0.0068	< 0.0057	0.0044	0.0095	0.018	0.014	0.011	0.013	< 0.0032	0.013	< 0.0048	0.011	0.015	< 0.0081	0.011
PZ23B	08/09/2012	< 0.005	< 0.0039	< 0.0045	0.0055	0.0093	0.024	0.07	0.16	0.13	0.11	0.084	**0.027**	0.095	< 0.0048	**0.1**	< 0.047	0.014	0.082
PZ23B	11/14/2012	< 0.0053	0.0062	< 0.0048	< 0.0038	< 0.0061	< 0.0038	0.0055	0.013	0.01	0.0094	0.0089	< 0.0034	0.007	< 0.0051	0.007	< 0.05	< 0.0086	0.0054
PZ23B	02/26/2013	0.0059	0.0057	< 0.0045	0.0061	0.0079	**0.035**	0.11	**0.23**	0.19	0.14	0.15	**0.043**	0.17	< 0.0048	**0.15**	0.079	0.027	0.14
PZ23B	05/30/2013	< 0.0051	< 0.0039	< 0.0046	< 0.0037	< 0.0058	0.0085	0.034	0.056	0.054	0.047	0.047	**0.0092**	0.043	< 0.0049	**0.039**	0.01	< 0.0082	0.037
PZ23B	11/13/2013	< 0.005	< 0.0039	< 0.0045	< 0.0036	< 0.0057	0.0041	0.018	0.032	0.033	0.028	0.026	**0.0056**	0.02	< 0.0048	0.024	0.011	< 0.0081	0.018
PZ23B	05/19/2014	< 0.0062	< 0.0064	< 0.0068	< 0.0063	0.0081	0.024	0.064	0.097	0.1	0.092	0.072	**0.016**	0.092	< 0.0066	**0.07**	0.0096	0.022	0.07
PZ24	10/27/2009	0.68	1	0.74	0.97	1.3	**0.78**	**0.85**	**0.83**	0.55	**0.49**	**0.76**	**0.14**	2	0.97	**0.46**	7.7	3.1	1.7
PZ24	01/26/2010	0.21	0.35	0.25	0.24	0.21	**0.054**	0.03	0.034	0.028	0.028	0.055	**0.0064**	0.34	0.26	0.022	2.5	0.59	0.3
PZ24	04/28/2010	0.0061	0.0079	< 0.0045	< 0.0036	< 0.0057	0.0039	0.01	0.014	0.012	0.013	0.014	< 0.0032	0.022	< 0.0048	0.0083	0.074	0.012	0.016
PZ24	07/27/2010	0.016	0.015	0.013	0.016	0.028	0.011	0.0066	0.011	0.0084	0.0091	0.015	< 0.0032	0.064	0.026	0.0058	0.12	0.047	0.055
PZ24	11/03/2010	0.0095	0.0095	0.0073	0.0093	0.037	0.015	0.012	0.013	0.014	0.02	0.029	**0.0047**	0.088	0.026	0.011	0.049	0.044	0.078
PZ24	05/18/2011	< 0.005	0.0065	< 0.0045	< 0.0036	0.019	0.018	0.021	0.029	0.032	0.022	0.023	**0.0076**	0.085	0.019	0.023	0.018	0.014	0.076
PZ24	11/02/2011	< 0.005	0.0049	0.0071	0.0063	0.014	0.0087	0.0058	0.008	0.009	0.0068	0.013	< 0.0032	0.048	0.017	0.006	0.017	< 0.0081	0.045
PZ24	08/09/2012	< 0.0053	0.0046	< 0.0048	0.0078	0.0073	0.011	0.018	0.027	0.026	0.023	0.018	**0.0057**	0.023	< 0.0051	0.019	< 0.05	0.0093	0.024
PZ24	11/14/2012	0.015	0.0084	0.012	0.0046	< 0.0061	< 0.0038	0.0046	0.0061	0.0064	0.0065	0.0062	< 0.0034	0.0077	< 0.0051	< 0.005	0.089	< 0.0086	0.0061
PZ24	02/26/2013	0.031	0.023	0.012	0.0058	< 0.0057	0.0098	0.017	0.034	0.033	0.029	0.027	**0.016**	0.018	< 0.0048	0.029	0.41	< 0.0081	0.015
PZ24	05/30/2013	0.0062	0.0097	< 0.0045	< 0.0036	0.009	0.0075	0.0085	0.011	0.012	0.013	0.019	< 0.0032	0.035	0.0059	0.0079	0.051	< 0.0081	0.033
PZ24	11/13/2013	< 0.005	0.0047	< 0.0045	< 0.0036	0.006	0.0041	< 0.0029	0.0038	< 0.0048	0.0049	0.01	< 0.0032	0.024	< 0.0048	< 0.0047	0.024	< 0.0081	0.023
PZ24	05/19/2014	< 0.0062	< 0.0064	< 0.0068	< 0.0063	0.007	0.012	0.027	0.039	0.037	0.039	0.032	**0.0062**	0.042	< 0.0066	0.024	< 0.0081	0.013	0.036

Table 15. Groundwater Analytical Results - PAHs/SVOCs Exceeding Screening Levels
Wisconsin Public Service Corporation, Manitowoc
Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

		PAH																	
Sample Location	Sample Date	1-Methylnaphthalene (µg/l)	2-methylnaphthalene (µg/l)	Acenaphthene (µg/l)	Acenaphthylene (µg/l)	Anthracene (µg/l)	Benzo(a)anthracene (µg/l)	Benzo(a)pyrene (µg/l)	Benzo(b)fluoranthene (µg/l)	Benzo(ghi)perylene (µg/l)	Benzo(k)fluoranthene (µg/l)	Chrysene (µg/l)	Dibenz(a,h)anthracene (µg/l)	Fluoranthene (µg/l)	Fluorene (µg/l)	Indeno(1,2,3-cd)pyrene (µg/l)	Naphthalene (PAH) (µg/l)	Phenanthrene (µg/l)	Pyrene (µg/l)
Groundwater SL for WI / IBS		**1.1**	**36**	**530**	**530**	**3,000**	**0.034**	**0.2**	**0.2**	**250**	**0.34**	**0.2**	**0.0034**	**400**	**400**	**0.034**	**100**	**3,000**	**250**
PZ25	10/27/2009	**132**	**185**	138	55.9	25.5	**8.8**	**3.9**	**4.3**	< 4.8	< 4.4	**6**	**0.48**	39.3	87.6	< 4.7	**1,570**	120	28.1
PZ25	01/27/2010	< 0.1	< 0.077	6.3	4.4	1.1	**0.26**	0.089	0.1	< 0.096	< 0.087	**0.21**	< 0.064	7.3	< 0.095	< 0.094	< 0.94	< 0.16	4.7
PZ25	04/28/2010	0.057	< 0.039	1.6	0.7	0.58	**0.21**	**0.23**	**0.29**	0.068	0.23	**0.29**	< 0.032	2.8	0.092	**0.058**	0.14	< 0.081	4.8
PZ25	07/27/2010	**16.2**	13.1	14.1	17.5	7.4	**0.36**	0.066	0.062	0.022	0.083	0.2	**0.0042**	5.6	15.3	0.018	**131**	26.1	4.3
PZ25	11/03/2010	**7**	1.4	7.1	6.5	3	**0.59**	**0.35**	**0.28**	0.16	**0.38**	**0.56**	< 0.064	4	6.2	**0.12**	43.1	10.4	3
PZ25	05/18/2011	0.012	0.0092	0.0084	0.13	0.14	**0.14**	0.19	**0.25**	0.1	0.12	0.17	**0.03**	0.2	0.018	**0.088**	0.026	0.088	0.16
PZ25	11/02/2011	1	< 0.0039	12.2	10.2	0.85	**0.3**	0.1	0.11	0.032	0.087	0.2	**0.01**	5.3	4.8	0.028	1.3	0.058	3.9
PZ25	08/09/2012	0.064	0.054	4.6	3.6	0.91	**0.2**	0.043	0.054	0.015	0.044	0.13	**0.0046**	3.5	3.7	0.012	0.26	0.44	2.3
PZ25	11/14/2012	**15.5**	< 0.41	18.8	8.8	10	< 0.38	< 0.3	< 0.36	< 0.51	< 0.46	< 0.37	< 0.34	11.3	16.1	< 0.5	< 5	45	7.9
PZ25	02/27/2013	**16.1**	0.016	20.7	9.6	7.1	**0.35**	0.071	0.069	0.018	0.1	**0.29**	**0.0084**	10.4	18.5	0.02	0.86	32.5	7.2
PZ25	05/30/2013	0.62	0.022	4.6	0.65	0.26	**0.065**	0.055	0.059	0.024	0.041	0.085	**0.0052**	1.1	1.3	0.02	0.35	0.091	0.63
PZ25	11/13/2013	**2.7**	< 0.039	7	1.1	1.3	**0.12**	0.034	< 0.034	< 0.048	0.053	0.16	< 0.032	2.9	4.3	< 0.047	0.36	3	2.1
PZ25	05/20/2014	< 0.0063	< 0.0065	< 0.0069	0.05	0.056	**0.035**	0.074	0.071	0.045	0.053	0.069	**0.011**	0.078	< 0.0066	< 0.0082	< 0.0082	0.025	0.057
PZ26	10/27/2009	< 0.047	< 0.047	0.48	0.37	0.014	0.0063	0.0037	0.005	< 0.0048	< 0.0044	0.0065	< 0.0032	0.028	0.051	< 0.0047	0.67	0.044	0.023
PZ26	01/27/2010	0.17	0.21	0.38	0.099	0.067	0.029	0.043	0.054	0.047	0.05	0.051	**0.0098**	0.088	0.22	**0.038**	1.4	0.28	0.084
PZ26	04/28/2010	0.024	0.028	0.23	0.08	0.011	**0.037**	0.1	0.19	0.16	0.13	0.13	**0.029**	0.18	0.012	**0.12**	0.44	0.019	0.15
PZ26	07/27/2010	0.009	0.0043	0.27	0.17	0.01	0.019	0.049	0.087	0.07	0.063	0.059	**0.013**	0.056	0.021	**0.05**	0.027	0.015	0.044
PZ26	11/03/2010	0.021	0.011	0.24	0.16	0.029	**0.06**	0.16	**0.27**	0.22	0.2	0.18	**0.045**	0.21	0.019	**0.16**	0.12	0.053	0.18
PZ26	05/18/2011	0.013	0.015	0.27	0.18	0.0091	0.024	0.079	0.11	0.12	0.13	0.092	**0.024**	0.12	0.024	**0.082**	0.037	0.021	0.089
PZ26	11/02/2011	< 0.005	0.007	0.0058	0.011	0.013	0.031	0.083	0.14	0.13	0.1	0.094	**0.027**	0.093	< 0.0048	**0.095**	0.019	0.015	0.083
PZ26	08/09/2012	0.0055	< 0.0039	0.17	0.13	< 0.0057	0.0038	0.005	0.0099	0.0088	0.0079	0.0064	< 0.0032	0.012	0.017	0.0062	< 0.047	< 0.0081	0.0091
PZ26	11/14/2012	0.098	0.11	0.19	0.17	0.0071	0.005	0.011	0.018	0.019	0.018	0.012	**0.0036**	0.017	0.029	0.012	1.5	0.016	0.013
PZ26	02/27/2013	0.0061	0.004	0.2	0.19	0.0065	0.021	0.054	0.092	0.087	0.058	0.061	**0.018**	0.065	0.01	**0.066**	0.02	0.011	0.055
PZ26	05/30/2013	0.0055	0.0052	0.16	0.15	0.032	**0.16**	**0.49**	**0.84**	0.74	**0.66**	**0.6**	**0.16**	0.7	0.013	**0.57**	0.021	0.076	0.54
PZ26	11/13/2013	< 0.005	0.0047	0.075	0.06	< 0.0057	0.0054	0.017	0.031	0.03	0.025	0.025	**0.0045**	0.024	< 0.0048	0.02	0.014	< 0.0081	0.021
PZ26	05/20/2014	< 0.0062	< 0.0064	< 0.0068	< 0.0063	< 0.0067	0.02	0.066	0.11	0.11	0.09	0.073	**0.02**	0.077	< 0.0066	**0.077**	< 0.0081	0.01	0.062
Total Number of Samples Analyzed:		389	422	422	422	422	422	422	422	422	422	422	422	422	422	422	422	422	422
Number of Samples with Detections above Reported Limit:		185	255	189	287	244	297	315	324	304	312	333	231	327	163	286	296	263	322
Min:		0.0052	0.0039	0.0048	0.0038	0.0057	0.0037	0.0032	0.0037	0.0038	0.0045	0.0035	0.0032	0.0044	0.0049	0.0052	0.0052	0.0083	0.0048
Max:		2,360,000	3,700,000	123,000	1,340,000	597,000	118,000	130,000	124,000	9,200	170,000	366,000	2,030	688,000	465,000	4,000	12,600,000	1,160,000	704,000
Groundwater SL for WI / IBS		1.1	36	530	530	3,000	0.034	0.2	0.2	250	0.34	0.2	0.0034	400	400	0.034	100	3,000	250
Number of Samples that Exceed SL:		**45**	**15**	**5**	**5**	**5**	**155**	**104**	**116**	**3**	**88**	**105**	**229**	**5**	**5**	**178**	**19**	**5**	**5**

[O:ECK 8/13/14]

NOTES:
BOLD Value exceeds SL
< Concentration is less than reported level
-- Analysis not performed
NS No Standard
SL Screening Level
µg/L microgram per liter
SLs used on this table were presented in the Multi-Site Risk Assessment Framework Addendum Revision 3 (Exponent, July 2014). The groundwater SL presented is the more conservative of the State and MCL values presented in the RAF Addendum Revision 3. In the absence of a State or MCL value, the Tap Water value was selected.
* MW14 was damaged and not sampled; however, based on previous sampling events, the analytical groundwater results would be similar to the most recent sampling event (November 2013).

Table 16. Groundwater Analytical Results – PAHs Exceeding Tap Water SLs

Wisconsin Public Service Corporation, Manitowoc
Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

		PAH																	
Sample Location	Sample Date	1-Methylnaphthalene (µg/l)	2-methylnaphthalene (µg/l)	Acenaphthene (µg/l)	Acenaphthylene (µg/l)	Anthracene (µg/l)	Benzo(a)anthracene (µg/l)	Benzo(a)pyrene (µg/l)	Benzo(b)fluoranthene (µg/l)	Benzo(ghi)perylene (µg/l)	Benzo(k)fluoranthene (µg/l)	Chrysene (µg/l)	Dibenz(a,h)anthracene (µg/l)	Fluoranthene (µg/l)	Fluorene (µg/l)	Indeno(1,2,3-cd)pyrene (µg/l)	Naphthalene (PAH) (µg/l)	Phenanthrene (µg/l)	Pyrene (µg/l)
	Tap Water SL for WI / IBS	**1.1**	**36**	**530**	**530**	**1,800**	**0.034**	**0.0034**	**0.034**	**120**	**0.34**	**3.4**	**0.0034**	**800**	**290**	**0.034**	**0.17**	**1,800**	**120**
	Value exceeds SL																		
	Detected below SL																		
	Not detected above reported limit																		
	Not analyzed																		
MW1	03/27/2001	--	< 5	< 5	< 5	< 5	**2.4**	**3**	**5.8**	< 5	< 5	< 5	< 2	7.7	< 5	**2.3**	< 5	< 5	6
MW1	06/05/2002	< 0.54	< 0.56	2.7	0.48	< 8	**29**	**46**	**55**	40	**43**	**48**	**11**	100	4.5	**34**	< 0.54	53	86
MW1	11/19/2003	< 0.36	< 0.34	< 0.36	< 0.38	0.7	**5.2**	**8.2**	**8.6**	6.9	**6.5**	**6.6**	**2**	14	< 0.34	**6.1**	< 0.48	4.6	9.1
MW1	02/25/2004	< 0.34	< 0.32	0.99	0.43	4	**13**	**19**	**16**	14	**17**	**19**	**4.3**	45	1.6	**12**	**2.3**	21	32
MW1	05/24/2004	< 0.34	< 0.32	< 0.34	< 0.36	0.58	**3.7**	**5.3**	**5**	4.3	**4.4**	**4.5**	**1.3**	8.1	< 0.32	**3.9**	< 0.45	3	6
MW1	05/18/2005	< 0.8	< 0.9	< 0.78	< 0.77	0.75	**4.4**	**10**	**11**	9.8	**10**	**8.9**	**2.1**	13	< 0.87	**7.8**	< 0.89	4.7	9.5
MW1	11/28/2005	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW1	05/30/2006	< 1	< 1.1	< 0.82	< 0.81	2.4	**11**	**18**	**20**	16	**18**	**17**	**3.5**	32	< 0.91	**13**	< 1.2	9.2	23
MW1	05/16/2007	0.95	1.5	< 0.16	0.27	0.77	**2.2**	**4.9**	**6.2**	5.3	**4.3**	**4.2**	**1.2**	7.4	0.25	**4.5**	**1.7**	2.6	5.5
MW1	11/15/2007	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW1	10/27/2009	< 0.1	< 0.077	0.1	0.22	0.76	**3.8**	**7.8**	**10.7**	6.8	**6.8**	**6.6**	**1.4**	12	0.18	**5.8**	< 0.097	3.1	9.2
MW1	04/27/2010	0.0062	0.004	0.006	0.022	0.061	**0.27**	**0.61**	**0.9**	0.87	**0.77**	0.62	**0.17**	1.1	0.01	**0.68**	0.0096	0.23	0.8
MW1	07/27/2010	0.035	0.026	0.025	0.018	0.0099	0.012	**0.027**	**0.045**	0.034	0.035	0.033	**0.0061**	0.045	0.017	0.024	**0.22**	0.036	0.037
MW1	11/03/2010	0.0063	0.011	< 0.0045	0.0051	0.0088	0.02	**0.053**	**0.063**	0.065	0.07	0.057	**0.014**	0.068	< 0.0048	**0.047**	0.041	0.02	0.063
MW1	05/18/2011	0.0052	0.0096	< 0.0045	0.0076	0.0067	0.03	**0.058**	**0.088**	0.075	0.063	0.052	**0.017**	0.073	0.0052	**0.061**	0.021	0.024	0.064
MW1	11/02/2011	< 0.005	0.0069	< 0.0045	< 0.0036	< 0.0057	0.011	**0.02**	0.029	0.027	0.026	0.027	**0.0073**	0.025	< 0.0048	0.02	0.036	0.01	0.024
MW1	08/08/2012	< 0.0053	0.0046	< 0.0048	< 0.0038	< 0.0061	0.0041	**0.0088**	0.015	0.015	0.011	0.0098	< 0.0034	< 0.05	< 0.0051	0.01	0.011	< 0.0086	< 0.05
MW1	11/13/2012	< 0.0054	0.0093	< 0.0048	< 0.0039	< 0.0061	0.0043	**0.0099**	0.016	0.017	0.013	0.011	< 0.0034	0.018	< 0.0051	0.011	0.017	0.0099	0.014
MW1	02/25/2013	0.012	0.019	0.0074	0.047	0.02	**0.11**	**0.29**	**0.38**	0.41	0.29	0.26	**0.098**	0.28	0.014	**0.32**	0.061	0.074	0.26
MW1	05/29/2013	< 0.047	0.013	0.0052	< 0.0036	< 0.0057	0.0059	**0.016**	0.015	0.021	0.02	0.018	< 0.0032	0.019	< 0.0048	0.014	0.15	< 0.0081	0.021
MW1	11/13/2013	< 0.005	< 0.0039	< 0.0045	< 0.0036	< 0.0057	0.0057	**0.018**	0.024	0.029	0.021	0.019	**0.0047**	0.019	< 0.0048	0.02	0.011	< 0.0081	0.022
MW1	05/19/2014	< 0.0063	< 0.0065	< 0.0069	< 0.0064	0.0068	0.019	**0.042**	**0.058**	0.069	0.053	0.041	**0.011**	0.057	< 0.0066	**0.047**	0.014	0.012	0.051
MW2	04/11/2000	--	< 1	1.7	1.8	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 5
MW2	03/27/2001	--	8.6	< 5	< 5	< 5	< 2	< 2	< 2	< 5	< 5	< 5	< 2	< 5	< 5	< 2	< 5	< 5	< 5
MW2	06/05/2002	**14**	0.035	5.4	4	0.067	**0.15**	**0.17**	**0.16**	0.12	0.11	0.12	**0.046**	0.28	0.94	**0.12**	**0.18**	0.21	0.25
MW2	05/15/2003	**9.2**	0.023	3.8	2.3	0.055	**0.12**	**0.14**	**0.14**	0.11	0.1	0.12	**0.033**	0.23	0.65	**0.1**	**0.19**	0.13	0.22
MW2	02/25/2004	**11**	0.025	4.9	2.8	0.04	**0.083**	**0.1**	**0.1**	0.091	0.09	0.088	**0.024**	0.17	0.81	**0.079**	**0.2**	0.13	0.17
MW2	05/24/2004	**10**	0.019	4.8	2.8	0.42	**1.5**	**1.4**	**1.1**	0.86	**1.1**	1.4	**0.28**	3.3	0.87	**0.76**	**0.19**	1.4	2.7
MW2	05/18/2005	**11**	< 0.45	4.2	2.7	< 0.35	**1.1**	**1.2**	**1.1**	0.94	**1.1**	1.1	< 0.44	2.3	0.52	**0.77**	**0.71**	0.74	2
MW2	11/28/2005	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW2	05/30/2006	**10**	< 0.46	5.6	3.5	0.7	**2.4**	**2.4**	**2.2**	1.4	**2.1**	2.3	< 0.77	5.5	0.77	**1.3**	< 0.5	1.6	4.4
MW2	05/16/2007	**2.8**	< 0.056	1.7	0.95	0.18	**0.66**	**0.74**	**0.67**	0.5	**0.61**	0.6	**0.15**	1.5	0.32	**0.49**	0.12	0.58	1.2
MW2	11/15/2007	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW2	10/27/2009	**20.9**	< 0.39	9.7	5.5	< 0.57	< 0.36	< 0.29	< 0.34	< 0.48	< 0.44	< 0.35	< 0.32	< 0.44	1	< 0.47	< 0.48	< 0.81	< 0.47
MW2	01/27/2010	**5.7**	0.075	2.5	1.4	0.055	**0.043**	**0.052**	**0.064**	0.056	0.054	0.055	**0.012**	0.16	0.28	**0.045**	**0.59**	0.056	0.14
MW2	04/27/2010	**3.5**	0.0085	1.4	0.69	0.016	**0.039**	**0.06**	**0.06**	0.064	0.08	0.066	**0.014**	0.11	0.11	**0.049**	0.052	0.039	0.091
MW2	07/26/2010	**2.8**	0.0085	3.3	1.7	0.023	< 0.0036	**0.004**	0.0057	< 0.0048	< 0.0044	0.0048	< 0.0032	0.0074	0.026	< 0.0047	0.11	< 0.0081	0.02
MW2	11/03/2010	**13.2**	< 0.077	5.2	2.8	< 0.11	< 0.072	< 0.057	< 0.068	< 0.096	< 0.087	< 0.07	< 0.064	< 0.088	0.52	< 0.094	**0.29**	< 0.16	< 0.095
MW2	05/18/2011	**4.2**	4.2	1.6	0.82	< 0.11	< 0.072	< 0.057	< 0.068	< 0.096	< 0.087	< 0.07	< 0.064	< 0.088	0.12	< 0.094	0.17	< 0.16	< 0.095
MW2	11/02/2011	**2.9**	0.0095	0.85	0.52	0.015	0.0046	**0.0042**	0.0052	< 0.0048	0.0045	0.0073	< 0.0032	0.011	0.069	< 0.0047	0.15	0.011	0.011
MW2	08/07/2012	**7.3**	< 0.041	2.1	1.2	< 0.061	< 0.038	< 0.03	< 0.036	< 0.051	< 0.046	< 0.037	< 0.034	< 0.047	0.2	< 0.05	0.067	< 0.086	< 0.05
MW2	11/13/2012	**18.3**	< 0.41	5.7	2.7	< 0.61	< 0.38	< 0.3	< 0.36	< 0.51	< 0.46	< 0.37	< 0.34	< 0.47	0.51	< 0.5	< 0.51	< 0.86	< 0.5
MW2	02/26/2013	0.053	0.011	0.057	0.33	0.16	**0.67**	**0.75**	**0.78**	0.64	**0.6**	0.71	**0.17**	1.2	0.012	**0.55**	0.053	0.26	1.3
MW2	05/29/2013	**15.3**	< 0.39	5.1	2.4	< 0.57	< 0.36	< 0.29	< 0.34	< 0.48	< 0.44	< 0.35	< 0.32	< 0.44	0.49	< 0.47	< 0.48	< 0.81	< 0.47
MW2	11/12/2013	**12**	< 0.39	5.3	1.9	< 0.57	< 0.36	< 0.29	< 0.34	< 0.48	< 0.44	< 0.35	< 0.32	< 0.44	< 0.48	< 0.47	< 0.48	< 0.81	< 0.47
MW2	05/19/2014	**1.4**	< 0.026	1.2	0.45	< 0.027	< 0.021	< 0.035	< 0.025	< 0.015	< 0.011	< 0.012	< 0.024	< 0.029	0.049	< 0.02	0.037	< 0.033	< 0.031

Table 16. Groundwater Analytical Results – PAHs Exceeding Tap Water SLs
Wisconsin Public Service Corporation, Manitowoc
Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

		PAH																	
Sample Location	Sample Date	1-Methylnaphthalene (µg/l)	2-methylnaphthalene (µg/l)	Acenaphthene (µg/l)	Acenaphthylene (µg/l)	Anthracene (µg/l)	Benzo(a)anthracene (µg/l)	Benzo(a)pyrene (µg/l)	Benzo(b)fluoranthene (µg/l)	Benzo(ghi)perylene (µg/l)	Benzo(k)fluoranthene (µg/l)	Chrysene (µg/l)	Dibenz(a,h)anthracene (µg/l)	Fluoranthene (µg/l)	Fluorene (µg/l)	Indeno(1,2,3-cd)pyrene (µg/l)	Naphthalene (PAH) (µg/l)	Phenanthrene (µg/l)	Pyrene (µg/l)
	Tap Water SL for WI / IBS	**1.1**	**36**	**530**	**530**	**1,800**	**0.034**	**0.0034**	**0.034**	**120**	**0.34**	**3.4**	**0.0034**	**800**	**290**	**0.034**	**0.17**	**1,800**	**120**
MW5	06/05/2002	< 0.4	< 0.42	< 0.27	< 0.34	< 0.3	**1.7**	**2.1**	**2.5**	1.9	**1.6**	1.8	**0.56**	4.1	< 0.32	**1.6**	< 0.4	1.5	3.1
MW5	05/15/2003	0.033	0.035	0.2	0.053	0.26	**1.1**	**1.5**	**2.3**	1.5	**1.9**	2.3	**0.49**	5.1	0.24	**1.1**	0.072	2.8	3.6
MW5	02/25/2004	< 0.17	< 0.16	< 0.17	< 0.18	< 0.19	**1**	**1.6**	**1.6**	1.4	**1.6**	1.6	**0.39**	3	< 0.16	**1.2**	**0.28**	0.87	2.1
MW5	05/24/2004	< 0.017	0.017	0.068	0.022	0.11	**0.62**	**0.89**	**1.2**	0.83	**0.95**	1.1	**0.23**	2.2	0.075	**0.72**	0.03	0.92	1.6
MW5	05/18/2005	< 8.5	< 9.6	< 8.2	< 8.2	< 7.5	**25**	**58**	**110**	75	**98**	**110**	**18**	190	< 9.2	**60**	< 9.5	48	120
MW5	11/28/2005	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW5	05/30/2006	< 5.1	< 5.6	< 4.1	< 4.1	6.7	**29**	**56**	**99**	62	**73**	**84**	**12**	160	< 4.5	**51**	< 6.2	40	110
MW5	05/16/2007	< 5.1	< 5.6	< 4.1	< 4.1	8.6	**17**	**45**	**60**	46	**56**	**58**	**10**	96	< 4.5	**38**	< 6.2	28	66
MW5	11/15/2007	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW5	10/27/2009	< 0.5	< 0.39	< 0.45	< 0.36	1.3	**6.9**	**14.8**	**21.2**	14.1	**13**	**15.4**	**2.7**	26.7	< 0.48	**12**	< 0.48	7.2	19.3
MW5	01/27/2010	< 0.005	0.0054	0.011	0.023	0.061	**0.37**	**0.7**	**1**	0.79	**0.84**	0.86	**0.22**	1.5	0.018	**0.77**	< 0.047	0.34	1.2
MW5	04/27/2010	< 0.005	0.005	0.013	0.029	0.12	**0.5**	**0.9**	**1.4**	1.3	**1.2**	1.1	**0.27**	1.9	0.018	**0.95**	0.019	0.42	1.5
MW5	07/26/2010	0.006	0.0059	0.0054	0.0079	0.01	**0.044**	**0.067**	**0.097**	0.072	0.071	0.077	**0.017**	0.12	< 0.0048	**0.058**	0.017	0.038	0.09
MW5	11/03/2010	0.0091	0.016	< 0.0045	< 0.0036	< 0.0057	0.021	**0.052**	**0.089**	0.068	0.062	0.07	**0.014**	0.078	< 0.0048	**0.049**	0.031	0.019	0.066
MW5	05/18/2011	0.0068	0.011	0.0068	0.0058	0.014	**0.077**	**0.15**	**0.28**	0.21	0.19	0.19	**0.044**	0.29	0.0079	**0.17**	0.031	0.083	0.23
MW5	11/02/2011	< 0.005	0.0064	< 0.0045	< 0.0036	< 0.0057	0.0049	**0.0076**	0.012	0.0085	0.01	0.012	< 0.0032	0.014	< 0.0048	0.0064	0.019	< 0.0081	0.011
MW5	08/07/2012	0.0056	0.0056	< 0.0048	0.0046	0.017	**0.057**	**0.11**	**0.2**	0.15	0.14	0.13	**0.028**	0.21	0.0063	**0.11**	0.033	0.067	0.16
MW5	11/13/2012	< 0.0054	0.0092	< 0.0048	< 0.0039	< 0.0061	0.0073	**0.015**	0.031	0.024	0.019	0.02	**0.004**	0.032	< 0.0051	0.017	0.02	0.013	0.023
MW5	02/26/2013	0.022	0.038	< 0.0045	0.0043	< 0.0057	0.0048	**0.0073**	0.012	0.011	0.011	0.011	**0.004**	0.012	< 0.0048	0.0088	**0.24**	< 0.0081	0.0099
MW5	05/29/2013	< 0.0053	0.0081	< 0.0048	< 0.0038	< 0.0061	0.005	**0.0086**	0.012	0.0092	0.014	0.016	< 0.0034	0.018	< 0.0051	0.0067	0.024	< 0.0086	0.017
MW5	11/12/2013	< 0.005	0.004	< 0.0045	< 0.0036	< 0.0057	< 0.0036	< 0.0029	< 0.0034	< 0.0048	< 0.0044	0.0054	< 0.0032	0.0064	< 0.0048	< 0.0047	0.011	< 0.0081	0.0056
MW5	05/19/2014	< 0.0063	0.0074	< 0.0069	< 0.0064	< 0.0068	0.0091	**0.021**	0.032	0.027	0.03	0.029	< 0.0059	0.041	< 0.0066	0.018	0.026	0.019	0.03
MW6	04/11/2000	--	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 5
MW6	03/27/2001	--	< 5	< 5	< 5	< 5	< 2	< 2	< 2	< 5	< 5	< 5	< 2	< 5	< 5	< 2	< 5	< 5	< 5
MW6	10/25/2001	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW6	06/05/2002	< 0.027	< 0.028	< 0.018	0.04	< 0.02	0.032	**0.032**	0.029	0.047	0.023	0.027	< 0.017	0.069	< 0.021	0.02	< 0.027	0.033	0.059
MW6	05/15/2003	< 0.018	< 0.017	< 0.018	0.043	< 0.02	0.032	**0.041**	**0.042**	0.032	0.033	0.034	< 0.016	0.058	< 0.017	0.027	0.051	0.029	0.056
MW6	02/25/2004	0.018	0.026	< 0.017	0.067	< 0.019	0.023	**0.026**	0.024	0.021	0.019	0.022	< 0.015	0.045	< 0.016	< 0.02	0.09	0.029	0.04
MW6	08/08/2012	< 0.0053	0.0069	< 0.0048	< 0.0038	< 0.0061	< 0.0038	**0.0036**	0.006	0.0064	0.0068	0.0061	< 0.0034	< 0.05	< 0.0051	< 0.005	0.016	< 0.0086	< 0.05
MW6	11/14/2012	< 0.0054	0.0077	< 0.0048	< 0.0039	< 0.0061	< 0.0039	< 0.0031	< 0.0036	< 0.0052	< 0.0047	< 0.0037	< 0.0034	< 0.0047	< 0.0051	< 0.005	< 0.051	< 0.0087	< 0.0051
MW6	02/26/2013	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW6	05/29/2013	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW6	11/13/2013	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Table 16. Groundwater Analytical Results – PAHs Exceeding Tap Water SLs
Wisconsin Public Service Corporation, Manitowoc
Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

		PAH																	
Sample Location	Sample Date	1-Methylnaphthalene (µg/l)	2-methylnaphthalene (µg/l)	Acenaphthene (µg/l)	Acenaphthylene (µg/l)	Anthracene (µg/l)	Benzo(a)anthracene (µg/l)	Benzo(a)pyrene (µg/l)	Benzo(b)fluoranthene (µg/l)	Benzo(ghi)perylene (µg/l)	Benzo(k)fluoranthene (µg/l)	Chrysene (µg/l)	Dibenz(a,h)anthracene (µg/l)	Fluoranthene (µg/l)	Fluorene (µg/l)	Indeno(1,2,3-cd)pyrene (µg/l)	Naphthalene (PAH) (µg/l)	Phenanthrene (µg/l)	Pyrene (µg/l)
Tap Water SL for WI / IBS		**1.1**	**36**	**530**	**530**	**1,800**	**0.034**	**0.0034**	**0.034**	**120**	**0.34**	**3.4**	**0.0034**	**800**	**290**	**0.034**	**0.17**	**1,800**	**120**
MW7	04/11/2000	--	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 5
MW7	03/27/2001	--	< 5	< 5	< 5	< 5	< 2	< 2	< 2	< 5	< 5	< 5	< 2	< 5	< 5	< 2	< 5	< 5	< 5
MW7	06/05/2002	< 0.027	< 0.028	< 0.018	0.3	0.13	**0.39**	**0.53**	**0.41**	0.43	0.32	0.31	**0.14**	0.4	< 0.021	**0.36**	0.029	0.097	0.53
MW7	05/15/2003	< 0.018	< 0.017	< 0.018	0.11	0.13	**0.22**	**0.44**	**0.67**	0.54	**0.44**	0.54	**0.12**	0.87	< 0.017	**0.43**	0.026	0.2	0.69
MW7	02/25/2004	< 0.017	0.022	0.037	0.24	0.26	**1.5**	**3**	**4.7**	3.4	**3.3**	**4.2**	**0.65**	9.2	0.059	**2.8**	0.097	2	6
MW7	05/24/2004	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW7	05/18/2005	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW7	11/28/2005	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW7	05/30/2006	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW7	05/16/2007	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW7	11/15/2007	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW7	10/26/2009	< 0.1	< 0.077	< 0.091	0.6	0.8	**3**	**8.8**	**12**	10.7	**8.9**	**8**	**1.7**	12.2	0.11	**8.5**	< 0.17	1.9	9.4
MW7	01/27/2010	0.029	0.0073	0.0076	0.032	0.072	0.026	**0.058**	**0.095**	0.1	0.075	0.071	**0.024**	0.081	< 0.0049	**0.079**	< 0.049	0.013	0.073
MW7	01/27/2010	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW7	04/27/2010	0.0071	0.0073	0.01	0.015	0.024	**0.07**	**0.17**	**0.33**	0.27	0.24	0.23	**0.053**	0.3	0.0072	**0.2**	0.017	0.051	0.24
MW7	07/26/2010	< 0.005	0.0042	< 0.0045	0.043	0.077	**0.06**	**0.14**	**0.23**	0.22	0.17	0.15	**0.059**	0.18	< 0.0048	**0.16**	0.011	0.028	0.15
MW7	11/02/2010	< 0.005	0.0052	< 0.0045	0.024	0.046	0.0063	**0.015**	0.023	0.019	0.019	0.018	< 0.0032	0.023	< 0.0048	0.014	0.01	< 0.0081	0.023
MW7	05/17/2011	< 0.005	0.004	< 0.0045	0.032	0.038	**0.035**	**0.069**	**0.12**	0.11	0.095	0.079	**0.021**	0.1	< 0.0048	**0.078**	0.013	0.018	0.088
MW7	11/01/2011	0.0094	0.0095	< 0.0045	0.059	0.092	0.021	**0.055**	**0.091**	0.093	0.067	0.063	**0.019**	0.086	0.0054	**0.065**	0.021	0.016	0.082
MW7	08/08/2012	< 0.0053	0.0047	0.0062	0.11	0.14	**0.22**	**0.44**	**0.76**	0.71	**0.5**	0.43	**0.16**	0.71	0.012	**0.54**	< 0.05	0.12	0.58
MW7	11/14/2012	< 0.0053	0.0066	< 0.0048	0.048	0.078	< 0.0038	**0.0054**	0.011	0.0093	0.008	0.0073	< 0.0034	0.011	< 0.0051	0.0063	< 0.05	< 0.0086	0.0076
MW7	02/27/2013	< 0.01	0.0093	< 0.0091	0.041	0.067	**0.21**	**0.49**	**0.65**	0.76	**0.63**	0.54	**0.16**	0.69	< 0.0095	**0.57**	0.042	0.12	0.62
MW7	05/30/2013	< 0.047	0.012	0.0064	0.038	0.057	0.03	**0.087**	**0.11**	0.12	0.12	0.11	**0.023**	0.11	0.0053	**0.086**	0.041	0.021	0.089
MW7	11/13/2013	< 0.005	0.0055	< 0.0046	0.058	0.086	0.0065	**0.018**	0.022	0.029	0.029	0.024	**0.0046**	0.024	< 0.0048	0.019	0.013	< 0.0082	0.028
MW7	05/20/2014	< 0.0063	< 0.0065	< 0.0069	0.032	0.041	0.016	**0.032**	**0.049**	0.055	0.041	0.035	**0.0096**	0.049	< 0.0066	**0.038**	< 0.0082	0.011	0.041
MW8	04/11/2000	--	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 5
MW8	03/27/2001	--	< 5	< 5	< 5	< 5	< 2	< 2	< 2	< 5	< 5	< 5	< 2	< 5	< 5	< 2	< 5	< 5	< 5
MW8	06/05/2002	< 0.67	< 0.7	< 0.45	1	1	**3.7**	**4**	**3**	2.5	**2.5**	2.7	**0.73**	7	< 0.53	**2.4**	< 0.67	2	5.9
MW8	05/15/2003	< 0.18	< 0.17	< 0.18	0.61	0.43	**1.5**	**2**	**1.6**	1.5	**1.4**	1.4	**0.34**	2.7	< 0.17	**1.3**	< 0.24	0.7	2.6
MW8	05/24/2004	< 0.34	< 0.32	< 0.34	1	0.68	**2.3**	**2.8**	**2.3**	2	**1.8**	2	**0.56**	4.4	< 0.32	**1.8**	< 0.45	1.2	3.9
MW8	05/18/2005	< 0.8	< 0.91	< 0.78	2	1.8	**5.5**	**7.8**	**6.2**	5.6	**6.6**	**6.3**	**1.2**	13	< 0.87	**4.5**	< 0.89	3.7	12
MW8	11/28/2005	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW8	05/30/2006	< 0.41	< 0.46	< 0.33	1.6	1.6	**4.4**	**5.2**	**4.6**	3.4	**3.6**	**3.9**	**0.81**	9.5	< 0.37	**2.9**	< 0.5	2.8	8
MW8	05/16/2007	0.023	0.044	0.042	1	0.66	**2.5**	**4**	**3**	2.7	**3.2**	2.7	**0.56**	5.4	0.081	**2.4**	0.071	1.2	4.8
MW8	11/15/2007	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW8	10/26/2009	< 0.047	< 0.047	0.026	0.33	0.34	**0.98**	**1.4**	**1.4**	0.91	**0.81**	0.98	**0.19**	1.9	0.058	**0.8**	**0.57**	0.4	1.8
MW8	01/27/2010	0.014	0.0063	< 0.0045	0.016	0.045	0.031	**0.047**	**0.065**	0.059	0.053	0.05	**0.014**	0.062	< 0.0048	**0.049**	< 0.047	0.014	0.061
MW8	04/27/2010	< 0.005	0.0084	< 0.0045	0.016	0.057	0.014	**0.026**	0.031	0.034	0.035	0.029	**0.005**	0.047	< 0.0048	0.025	0.015	0.0099	0.045
MW8	07/26/2010	< 0.005	0.0064	0.006	0.033	0.1	**0.073**	**0.087**	**0.11**	0.092	0.089	0.089	**0.029**	0.15	0.01	**0.074**	0.012	0.036	0.14
MW8	11/02/2010	< 0.005	0.0042	< 0.0045	0.01	0.024	0.0077	**0.011**	0.0092	0.011	0.014	0.012	< 0.0032	0.017	< 0.0048	0.0083	0.012	< 0.0081	0.02
MW8	05/17/2011	< 0.005	< 0.0039	< 0.0045	0.012	0.037	0.017	**0.021**	0.027	0.024	0.023	0.02	**0.0057**	0.035	< 0.0048	0.018	0.0081	0.0092	0.031
MW8	11/01/2011	< 0.005	0.0058	< 0.0045	0.019	0.069	0.0056	**0.0055**	0.0082	0.0072	0.0063	0.0065	< 0.0032	0.017	< 0.0048	0.0055	0.022	< 0.0081	0.017
MW8	08/08/2012	0.0068	0.0065	< 0.0045	0.027	0.076	0.017	**0.019**	0.02	0.024	0.024	0.018	**0.0037**	< 0.047	< 0.0048	0.017	0.014	0.013	0.052
MW8	11/13/2012	0.012	0.0044	< 0.0048	0.017	0.042	0.016	**0.023**	0.028	0.029	0.028	0.023	**0.0049**	0.045	< 0.0051	0.02	< 0.05	0.013	0.039
MW8	02/26/2013	0.0081	0.009	< 0.0045	0.0092	0.022	0.025	**0.045**	**0.063**	0.061	0.047	0.044	**0.013**	0.059	< 0.0048	**0.048**	0.1	0.012	0.053
MW8	05/30/2013	< 0.047	0.0081	< 0.0045	0.014	0.056	0.014	**0.029**	0.033	0.032	0.033	0.034	**0.0055**	0.038	< 0.0048	0.023	0.039	0.0087	0.032
MW8	11/12/2013	< 0.005	< 0.0039	< 0.0045	0.02	0.057	0.0046	**0.0064**	0.0075	0.0088	0.0089	0.0078	< 0.0032	0.015	< 0.0048	0.0067	0.008	< 0.0081	0.017
MW8	05/20/2014	< 0.0063	< 0.0065	< 0.0069	0.0087	0.026	< 0.0054	< 0.0088	0.0086	0.011	0.012	0.012	< 0.0059	0.011	< 0.0066	0.0074	< 0.0082	< 0.0084	0.01

Table 16. Groundwater Analytical Results – PAHs Exceeding Tap Water SLs

Wisconsin Public Service Corporation, Manitowoc
Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

		PAH																	
Sample Location	Sample Date	1-Methylnaphthalene (µg/l)	2-methylnaphthalene (µg/l)	Acenaphthene (µg/l)	Acenaphthylene (µg/l)	Anthracene (µg/l)	Benzo(a)anthracene (µg/l)	Benzo(a)pyrene (µg/l)	Benzo(b)fluoranthene (µg/l)	Benzo(ghi)perylene (µg/l)	Benzo(k)fluoranthene (µg/l)	Chrysene (µg/l)	Dibenz(a,h)anthracene (µg/l)	Fluoranthene (µg/l)	Fluorene (µg/l)	Indeno(1,2,3-cd)pyrene (µg/l)	Naphthalene (PAH) (µg/l)	Phenanthrene (µg/l)	Pyrene (µg/l)
	Tap Water SL for WI / IBS	**1.1**	**36**	**530**	**530**	**1,800**	**0.034**	**0.0034**	**0.034**	**120**	**0.34**	**3.4**	**0.0034**	**800**	**290**	**0.034**	**0.17**	**1,800**	**120**
MW9	04/11/2000	--	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 5
MW9	03/27/2001	--	< 5	< 5	< 5	< 5	< 2	< 2	< 2	< 5	< 5	< 5	< 2	< 5	< 5	< 2	< 5	< 5	< 5
MW9	06/05/2002	0.039	< 0.028	0.14	0.21	0.22	**0.87**	**0.96**	**0.97**	0.75	**0.6**	0.75	**0.31**	2.1	0.041	**0.65**	0.12	0.41	1.8
MW9	05/15/2003	< 1.8	< 1.7	< 1.8	< 1.9	2.2	**10**	**12**	**12**	9.5	**11**	**13**	**2.4**	29	< 1.7	**7.7**	< 2.4	10	23
MW9	02/25/2004	< 0.091	< 0.086	< 0.091	< 0.096	< 0.1	**0.21**	**0.44**	**0.72**	0.54	**0.48**	0.59	**0.098**	1.3	< 0.086	**0.45**	< 0.12	0.25	0.94
MW9	05/24/2004	0.11	0.046	0.19	0.29	0.38	**1.5**	**2.6**	**3.4**	2.6	**2.6**	2.9	**0.66**	5.5	0.086	**2.2**	**0.35**	1	4.1
MW9	05/18/2005	< 0.16	< 0.18	< 0.16	0.19	0.29	**0.94**	**1.9**	**2.5**	2.2	**2**	1.9	**0.45**	3.1	< 0.17	**1.7**	< 0.18	0.58	2.4
MW9	11/28/2005	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW9	05/30/2006	< 0.2	< 0.22	< 0.16	0.18	0.28	**1.3**	**2.9**	**4.6**	3.3	**3.1**	3.4	**0.63**	5.6	< 0.18	**2.6**	**0.38**	0.91	3.8
MW9	05/16/2007	0.14	< 0.11	0.2	0.26	0.29	**0.42**	**0.78**	**1.1**	0.9	**0.92**	0.79	**0.2**	1.8	0.14	**0.79**	**0.25**	0.66	1.4
MW9	11/15/2007	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW9	10/26/2009	< 0.38	< 0.031	0.13	0.19	0.23	**0.42**	**1**	**1.3**	1.1	**1.1**	0.92	**0.22**	1.5	< 0.038	**0.91**	< 0.17	0.21	1.2
MW9	01/27/2010	0.0059	0.0051	0.05	0.039	0.091	**0.052**	**0.1**	**0.16**	0.15	0.13	0.11	**0.036**	0.15	< 0.0048	**0.12**	< 0.047	0.019	0.12
MW9	04/27/2010	< 0.005	0.0051	0.011	0.037	0.078	0.0085	**0.017**	0.029	0.024	0.028	0.024	**0.0037**	0.045	< 0.0048	0.017	0.0089	< 0.0081	0.036
MW9	05/20/2014	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW10	04/11/2000	--	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 5
MW10	03/27/2001	--	< 5	< 5	< 5	< 5	< 2	< 2	< 2	< 5	< 5	< 5	< 2	< 5	< 5	< 2	< 5	< 5	< 5
MW10	06/05/2002	< 0.09	< 0.093	0.85	0.38	0.29	**0.42**	**0.43**	**0.32**	0.34	0.23	0.27	**0.095**	1	0.64	**0.28**	0.09	0.16	1
MW10	05/15/2003	0.28	< 0.085	0.86	0.38	0.32	**0.65**	**0.8**	**0.83**	0.68	**0.64**	0.73	**0.18**	1.3	0.47	**0.56**	**0.28**	0.33	1.4
MW10	02/25/2004	0.14	0.17	0.55	0.43	0.29	**0.93**	**1.4**	**1.7**	1.4	**1.3**	1.5	**0.33**	3.1	0.43	**1.1**	**0.39**	0.75	2.4
MW10	05/24/2004	0.21	0.04	0.77	0.29	0.26	**0.71**	**1.2**	**1.4**	1.2	**1.3**	1.4	**0.31**	2.8	0.37	**0.96**	**0.47**	0.57	2.2
MW10	05/18/2005	0.45	< 0.23	0.66	0.7	0.49	**1.2**	**2**	**2.3**	2.1	**2**	2.1	**0.39**	3.8	0.31	**1.6**	**0.25**	0.84	3.2
MW10	11/28/2005	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW10	05/30/2006	0.17	< 0.056	0.81	0.38	0.3	**0.67**	**1.1**	**1.2**	1	**1**	1	**0.2**	2.1	0.34	**0.79**	0.087	0.37	1.7
MW10	05/16/2007	0.82	0.13	0.63	0.17	0.17	**0.33**	**0.58**	**0.71**	0.64	**0.6**	0.51	**0.15**	1	0.16	**0.54**	0.13	0.24	0.77
MW10	11/15/2007	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW10	10/26/2009	0.67	0.13	0.93	0.39	0.55	**1.9**	**4.4**	**6.3**	4.7	**3.5**	**3.9**	**0.9**	5.8	0.39	**3.9**	< 0.17	1.1	5.1
MW10	01/27/2010	0.24	0.041	0.3	0.028	0.12	**0.12**	**0.23**	**0.35**	0.32	0.3	0.28	**0.085**	0.42	0.062	**0.27**	0.071	0.069	0.36
MW10	04/27/2010	0.87	0.1	0.45	0.033	0.077	**0.042**	**0.081**	**0.11**	0.12	0.13	0.1	**0.024**	0.17	0.052	**0.082**	**0.46**	0.052	0.15
MW10	07/26/2010	0.97	0.1	0.46	0.054	0.21	**0.085**	**0.15**	**0.26**	0.21	0.2	0.2	**0.04**	0.3	0.059	**0.15**	0.14	0.088	0.27
MW10	11/02/2010	0.54	0.064	0.39	0.03	0.13	0.014	**0.014**	0.018	0.016	0.021	0.024	< 0.0032	0.11	0.054	0.011	0.11	0.053	0.11
MW10	05/17/2011	0.49	0.046	0.29	0.026	0.049	0.013	**0.013**	0.023	0.017	0.017	0.017	**0.0047**	0.052	0.029	0.013	0.038	0.026	0.051
MW10	11/01/2011	0.64	0.073	0.47	0.044	0.13	0.02	**0.027**	**0.037**	0.033	0.03	0.034	**0.0071**	0.13	0.083	0.025	0.12	0.076	0.14
MW10	08/09/2012	0.85	0.074	0.46	0.055	0.12	**0.042**	**0.068**	**0.11**	0.11	0.086	0.07	**0.026**	0.16	0.048	**0.083**	0.12	0.067	0.14
MW10	11/13/2012	0.096	0.013	0.21	0.051	0.12	**0.092**	**0.16**	**0.32**	0.26	0.19	0.18	**0.058**	0.28	0.029	**0.19**	< 0.051	0.056	0.24
MW10	02/27/2013	0.44	0.088	0.27	0.023	0.047	0.01	**0.013**	0.022	0.02	0.016	0.018	**0.0065**	0.036	0.022	0.016	**0.31**	0.016	0.052
MW10	05/30/2013	0.72	0.059	0.46	0.052	0.1	**0.16**	**0.32**	**0.35**	0.33	0.34	0.35	**0.095**	0.38	0.035	**0.26**	0.071	0.054	0.36
MW10	11/13/2013	**1.2**	0.086	0.55	0.063	0.16	0.0089	**0.014**	0.017	0.02	0.022	0.026	< 0.0065	0.076	0.043	0.012	0.17	0.051	0.085
MW10	05/20/2014	0.49	0.033	0.24	0.02	0.034	< 0.0053	< 0.0087	0.0062	0.0072	0.0071	0.0083	< 0.0059	0.025	0.017	< 0.0049	0.051	0.02	0.025

Table 16. Groundwater Analytical Results – PAHs Exceeding Tap Water SLs
Wisconsin Public Service Corporation, Manitowoc
Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

		PAH																	
Sample Location	Sample Date	1-Methylnaphthalene (µg/l)	2-methylnaphthalene (µg/l)	Acenaphthene (µg/l)	Acenaphthylene (µg/l)	Anthracene (µg/l)	Benzo(a)anthracene (µg/l)	Benzo(a)pyrene (µg/l)	Benzo(b)fluoranthene (µg/l)	Benzo(ghi)perylene (µg/l)	Benzo(k)fluoranthene (µg/l)	Chrysene (µg/l)	Dibenz(a,h)anthracene (µg/l)	Fluoranthene (µg/l)	Fluorene (µg/l)	Indeno(1,2,3-cd)pyrene (µg/l)	Naphthalene (PAH) (µg/l)	Phenanthrene (µg/l)	Pyrene (µg/l)
	Tap Water SL for WI / IBS	**1.1**	**36**	**530**	**530**	**1,800**	**0.034**	**0.0034**	**0.034**	**120**	**0.34**	**3.4**	**0.0034**	**800**	**290**	**0.034**	**0.17**	**1,800**	**120**
MW11	04/11/2000	--	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 5
MW11	03/27/2001	--	< 5	< 5	< 5	< 5	< 2	< 2	< 2	< 5	< 5	< 5	< 2	< 5	< 5	< 2	< 5	< 5	< 5
MW11	06/05/2002	0.25	< 0.028	0.16	0.32	0.11	**0.18**	**0.2**	**0.16**	0.16	0.12	0.15	**0.047**	0.39	0.05	**0.13**	0.048	0.09	0.45
MW11	05/15/2003	0.28	0.026	0.35	0.25	0.13	**0.39**	**0.53**	**0.64**	0.52	**0.49**	0.49	**0.14**	0.89	0.12	**0.46**	0.046	0.17	0.8
MW11	02/25/2004	0.047	0.035	0.096	0.23	0.069	**0.1**	**0.14**	**0.15**	0.14	0.12	0.13	**0.035**	0.3	0.1	**0.11**	0.087	0.11	0.26
MW11	05/24/2004	0.1	0.019	0.23	0.27	0.14	**0.26**	**0.42**	**0.46**	0.45	**0.35**	0.4	**0.12**	0.72	0.15	**0.38**	0.033	0.15	0.64
MW11	05/18/2005	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW11	11/28/2005	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW11	05/30/2006	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW12	04/11/2000	--	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 5
MW12	03/27/2001	--	< 5	< 5	< 5	< 5	< 2	< 2	< 2	< 5	< 5	< 5	< 2	< 5	< 5	< 2	< 5	< 5	< 5
MW12	06/05/2002	< 0.027	< 0.028	< 0.018	0.025	0.053	**0.61**	**0.65**	**0.8**	0.59	**0.48**	0.53	**0.21**	1	< 0.021	**0.49**	0.056	0.23	1.1
MW12	05/15/2003	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW12	02/25/2004	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW12	05/24/2004	< 0.34	< 0.32	< 0.34	< 0.36	< 0.38	**2.7**	**5.2**	**6.2**	5.3	**4.7**	**4.7**	**1.4**	7.7	< 0.32	**4.6**	< 0.45	1.6	5.8
MW12	05/18/2005	< 0.8	< 0.91	< 0.78	< 0.77	< 0.71	**4.5**	**9.5**	**11**	11	**10**	**8.9**	**2.2**	13	< 0.87	**8.3**	< 0.89	2.5	10
MW12	11/28/2005	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW12	05/30/2006	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW12	06/20/2006	< 0.81	< 0.9	< 0.65	< 0.65	1.8	**5.6**	**13**	**16**	20	**13**	**12**	**3.9**	19	< 0.72	**15**	< 0.99	3.4	15
MW12	05/16/2007	< 0.2	< 0.22	< 0.16	0.22	0.47	**3.1**	**7.4**	**9.4**	5	**6.6**	**5.7**	**1.8**	9	< 0.18	**7.9**	< 0.25	1.7	6.8
MW12	11/15/2007	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW12	10/27/2009	< 0.2	< 0.15	< 0.18	0.44	0.89	**5.7**	**13.7**	**15.3**	17.7	**11.3**	**10.3**	**2.8**	16.4	< 0.19	**12.9**	< 1.9	3.1	13
MW12	01/26/2010	0.01	0.012	0.0092	0.064	0.17	**0.65**	**1.4**	**1.7**	2.5	**1.6**	1.4	**0.47**	2.1	0.02	**1.7**	< 0.047	0.37	1.8
MW12	04/27/2010	0.012	0.0078	0.0051	0.0089	0.077	**0.08**	**0.17**	**0.24**	0.3	0.17	0.16	**0.05**	0.25	< 0.0048	**0.2**	0.067	0.042	0.2
MW12	07/27/2010	< 0.02	< 0.015	< 0.018	0.023	0.095	**0.37**	**0.83**	**1**	0.96	**0.77**	0.71	**0.17**	0.89	< 0.019	**0.7**	< 0.019	0.12	0.72
MW12	11/03/2010	0.02	0.037	< 0.0045	0.0048	0.052	0.0091	**0.018**	0.027	0.03	0.028	0.026	**0.0054**	0.027	< 0.0048	0.021	0.11	< 0.0081	0.024
MW12	05/17/2011	< 0.005	0.0049	0.0077	0.015	0.057	**0.3**	**0.55**	**0.76**	0.77	**0.54**	0.44	**0.18**	0.68	0.0094	**0.59**	0.013	0.14	0.56
MW12	11/01/2011	0.18	0.051	0.063	0.0039	0.017	0.0043	**0.0081**	0.011	0.012	0.0087	0.009	< 0.0032	0.01	0.0087	0.0079	0.085	< 0.0081	0.0092
MW12	08/08/2012	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW12	11/14/2012	< 0.0053	0.0053	< 0.0048	0.016	0.04	**0.13**	**0.26**	**0.32**	0.54	0.26	0.22	**0.088**	0.38	< 0.0051	**0.31**	< 0.05	0.062	0.28
MW12	02/26/2013	< 0.1	< 0.077	< 0.091	0.12	0.28	**2.3**	**5**	**6.1**	7	**4.1**	**4.1**	**1.2**	6.2	< 0.095	**5.1**	< 0.097	1.1	5.2
MW12	05/29/2013	< 0.005	< 0.0039	< 0.0045	< 0.0036	0.022	0.0051	**0.012**	0.012	0.018	0.015	0.014	< 0.0032	0.017	< 0.0048	0.011	0.024	< 0.0081	0.017
MW12	11/12/2013	< 0.04	< 0.031	< 0.036	0.068	0.17	**0.42**	**1.2**	**0.96**	1.6	**1.4**	1	**0.28**	1.7	< 0.038	**1**	< 0.039	0.28	1.2
MW12	05/19/2014	< 0.0063	< 0.0065	< 0.0069	0.011	0.032	**0.044**	**0.078**	**0.076**	0.11	0.091	0.082	**0.022**	0.11	< 0.0066	**0.073**	0.0091	0.025	0.092

Table 16. Groundwater Analytical Results – PAHs Exceeding Tap Water SLs
Wisconsin Public Service Corporation, Manitowoc
Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

		PAH																	
Sample Location	Sample Date	1-Methylnaphthalene (µg/l)	2-methylnaphthalene (µg/l)	Acenaphthene (µg/l)	Acenaphthylene (µg/l)	Anthracene (µg/l)	Benzo(a)anthracene (µg/l)	Benzo(a)pyrene (µg/l)	Benzo(b)fluoranthene (µg/l)	Benzo(ghi)perylene (µg/l)	Benzo(k)fluoranthene (µg/l)	Chrysene (µg/l)	Dibenz(a,h)anthracene (µg/l)	Fluoranthene (µg/l)	Fluorene (µg/l)	Indeno(1,2,3-cd)pyrene (µg/l)	Naphthalene (PAH) (µg/l)	Phenanthrene (µg/l)	Pyrene (µg/l)
	Tap Water SL for WI / IBS	**1.1**	**36**	**530**	**530**	**1,800**	**0.034**	**0.0034**	**0.034**	**120**	**0.34**	**3.4**	**0.0034**	**800**	**290**	**0.034**	**0.17**	**1,800**	**120**
MW12D	04/11/2000	--	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 5
MW12D	03/27/2001	--	< 5	< 5	< 5	< 5	< 2	< 2	< 2	< 5	< 5	< 5	< 2	< 5	< 5	< 2	< 5	< 5	< 5
MW12D	06/05/2002	< 0.16	< 0.17	< 0.11	< 0.14	< 0.12	**0.67**	**0.76**	**0.96**	0.61	**0.63**	0.68	**0.16**	1.9	< 0.13	**0.59**	< 0.16	0.55	1.5
MW12D	05/15/2003	< 0.018	< 0.017	< 0.018	0.059	0.051	**0.52**	**0.92**	**1.2**	0.93	**1.1**	1.1	**0.28**	1.6	< 0.017	**0.73**	0.065	0.34	1.2
MW12D	02/25/2004	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW12D	05/24/2004	< 0.34	< 0.32	< 0.34	< 0.36	< 0.38	**0.95**	**2.2**	**2.9**	2.6	**2.1**	2	**0.64**	3.2	< 0.32	**2.2**	< 0.45	0.67	2.5
MW12D	05/18/2005	0.1	< 0.091	< 0.078	0.11	< 0.071	**0.45**	**0.84**	**1.2**	1	**0.88**	0.8	**0.22**	1.1	< 0.087	**0.8**	**0.5**	0.21	0.8
MW12D	11/28/2005	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW12D	05/30/2006	< 0.01	< 0.011	< 0.0082	0.016	0.014	**0.086**	**0.19**	**0.24**	0.24	0.2	0.16	**0.047**	0.21	< 0.0091	**0.18**	0.024	0.041	0.18
MW12D	05/16/2007	0.025	0.014	0.014	0.036	0.024	**0.095**	**0.27**	**0.34**	0.32	0.24	0.17	**0.059**	0.23	< 0.0091	**0.26**	0.17	0.046	0.18
MW12D	11/15/2007	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW12D	10/26/2009	< 0.047	0.053	0.0079	0.044	0.044	**0.12**	**0.21**	**0.33**	0.2	0.13	0.19	**0.04**	0.23	< 0.0048	**0.17**	< 0.17	0.051	0.19
MW12D	01/26/2010	0.0076	0.016	< 0.0045	0.012	0.0084	0.018	**0.034**	**0.047**	0.047	0.039	0.035	**0.012**	0.044	< 0.0048	**0.038**	0.092	0.013	0.041
MW12D	04/27/2010	0.016	0.018	< 0.0045	0.0051	0.012	0.0042	**0.0091**	0.013	0.016	0.014	0.01	< 0.0032	0.015	< 0.0048	0.011	0.17	< 0.0081	0.011
MW12D	07/27/2010	0.016	0.023	0.0075	0.0046	0.028	0.0042	**0.0068**	0.011	0.0098	0.0096	0.0086	< 0.0032	0.017	< 0.0048	0.0073	0.073	0.017	0.011
MW12D	11/03/2010	< 0.005	0.0044	< 0.0045	0.0058	0.011	0.012	**0.036**	**0.041**	0.055	0.048	0.037	**0.011**	0.04	< 0.0048	**0.038**	0.019	0.0095	0.035
MW12D	05/17/2011	< 0.005	0.0085	< 0.0045	0.0038	0.01	0.012	**0.023**	**0.038**	0.04	0.028	0.023	**0.007**	0.037	< 0.0048	0.028	0.019	0.012	0.031
MW12D	11/01/2011	0.018	0.0071	0.0067	< 0.0036	0.0063	< 0.0036	0.0034	0.0053	0.0062	< 0.0044	0.0043	< 0.0032	0.0051	< 0.0048	< 0.0047	0.015	< 0.0081	< 0.0047
MW12D	08/08/2012	< 0.005	< 0.0039	< 0.0045	< 0.0036	0.0083	< 0.0036	< 0.0029	< 0.0034	< 0.0048	< 0.0044	< 0.0035	< 0.0032	< 0.0044	< 0.0048	< 0.0047	0.0089	< 0.0081	< 0.0047
MW12D	11/14/2012	0.0055	0.0095	< 0.0048	< 0.0039	< 0.0061	< 0.0039	< 0.0031	< 0.0036	< 0.0052	< 0.0047	< 0.0037	< 0.0034	< 0.0047	< 0.0051	< 0.005	< 0.051	< 0.0087	< 0.0051
MW12D	02/26/2013	< 0.005	0.0089	< 0.0045	< 0.0036	< 0.0057	0.0093	**0.013**	0.018	0.021	0.014	0.015	**0.005**	0.019	< 0.0048	0.016	0.016	0.0085	0.017
MW12D	05/29/2013	0.062	0.044	0.013	0.0052	0.025	< 0.0036	< 0.0029	0.006	0.0058	0.0068	0.0076	< 0.0032	0.0063	< 0.0048	< 0.0047	**0.38**	< 0.0081	0.0053
MW12D	11/12/2013	< 0.005	0.0068	< 0.0045	< 0.0036	0.013	< 0.0036	< 0.0029	< 0.0034	< 0.0048	< 0.0044	< 0.0035	< 0.0032	< 0.0044	< 0.0048	< 0.0047	0.012	< 0.0081	< 0.0047
MW12D	05/19/2014	< 0.0063	< 0.0065	< 0.0069	< 0.0064	< 0.0068	< 0.0054	< 0.0088	0.0069	0.0068	0.0077	0.0066	< 0.0059	0.0079	< 0.0066	< 0.0049	**0.28**	< 0.0084	< 0.0077
MW13	04/11/2000	--	**90**	29	3.8	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	2	< 1	**2,000**	< 1	< 5
MW13	03/27/2001	--	**210**	72	< 5	< 5	< 2	< 2	< 2	< 5	< 5	< 5	< 2	< 5	< 5	< 2	**3,700**	< 5	< 5
MW13	06/05/2002	< 430	< 450	< 290	2.9	0.88	**2.4**	**3.4**	**4.1**	2.9	**2.6**	2.5	**0.63**	6.6	5.3	**2.5**	**3,800**	3.7	5.8
MW13	05/15/2003	**30**	0.77	18	1.2	1.2	**4.4**	**6.2**	**6**	5.7	**5**	**5.1**	**1.4**	12	2.1	**4.5**	**1.6**	4.3	9.7
MW13	02/25/2004	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW13	05/24/2004	**55**	24	17	2	< 0.38	**1.4**	**2.7**	**2.7**	2.7	**1.9**	1.8	**0.72**	3.3	2.3	**2.3**	**140**	1.5	2.7
MW13	05/18/2005	**190**	**66**	51	4.5	< 1.8	< 2	< 1.8	< 1.8	< 2.1	< 1.9	< 1.6	< 2.2	2	3.5	< 1.7	**920**	< 2	< 1.6
MW13	11/28/2005	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW13	05/30/2006	**99**	22	37	4	< 4.7	< 6.4	< 7.5	< 6.4	< 7.9	< 7.9	< 7.7	< 7.7	< 6.3	< 3.7	< 7.7	**51**	< 4.6	< 5.9
MW13	05/16/2007	0.49	0.16	1.8	0.25	0.091	**0.35**	**0.69**	**0.69**	0.69	**0.64**	0.48	**0.17**	0.84	0.066	**0.59**	**0.62**	0.22	0.62
MW13	11/15/2007	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW13	10/26/2009	< 472	< 472	171	< 36	< 57.4	< 36.2	< 28.6	< 34	< 48.1	< 43.7	< 34.8	< 32	< 44.1	< 47.7	< 46.8	**3,540**	< 80.9	< 47.5
MW13	01/26/2010	**104**	15.4	32.3	1.1	0.37	< 0.073	< 0.058	**0.076**	< 0.097	< 0.088	< 0.07	< 0.065	< 0.089	3.1	< 0.094	< 0.95	< 0.16	< 0.096
MW13	04/27/2010	**237**	**119**	83	2.8	< 0.57	< 0.36	< 0.29	< 0.34	< 0.48	< 0.44	< 0.35	< 0.32	< 0.44	6.8	< 0.47	**1,400**	< 0.81	< 0.47
MW13	07/26/2010	**117**	**74.3**	48.3	1.6	0.31	< 0.072	< 0.057	**0.077**	< 0.096	< 0.087	< 0.07	< 0.064	< 0.088	6.6	< 0.094	**791**	1.6	< 0.095
MW13	11/02/2010	**4.7**	< 0.077	3.3	0.36	0.21	< 0.072	< 0.057	< 0.068	< 0.096	< 0.087	< 0.07	< 0.064	< 0.088	0.13	< 0.094	0.17	< 0.16	< 0.095
MW13	05/17/2011	0.011	0.011	0.01	0.034	0.033	0.032	**0.045**	**0.081**	0.063	0.046	0.049	**0.014**	0.078	0.0055	**0.049**	0.033	0.03	0.071
MW13	11/01/2011	**119**	33.5	45.2	1.4	0.23	< 0.072	< 0.057	< 0.068	< 0.096	< 0.087	< 0.07	< 0.064	< 0.088	6.5	< 0.094	**45.1**	1.2	< 0.095
MW13	08/08/2012	**5.1**	0.046	11.4	0.73	0.12	< 0.038	< 0.03	< 0.036	< 0.051	< 0.046	< 0.037	< 0.034	< 0.047	0.1	< 0.05	0.079	0.088	< 0.05
MW13	11/13/2012	**115**	14	37.1	1.4	< 0.61	< 0.38	< 0.3	< 0.36	< 0.51	< 0.46	< 0.37	< 0.34	< 0.47	0.94	< 0.5	< 5	2.8	< 0.5
MW13	02/26/2013	**225**	**151**	70	4.9	< 0.57	< 0.36	< 0.29	< 0.34	< 0.48	< 0.44	< 0.35	< 0.32	< 0.44	6.1	< 0.47	**2,430**	4.1	< 0.47
MW13	05/30/2013	**90**	**46.4**	24.5	< 3.6	< 5.7	< 3.6	< 2.9	< 3.4	< 4.8	< 4.4	< 3.5	< 3.2	< 4.4	< 4.8	< 4.7	**622**	< 8.1	< 4.7
MW13	11/12/2013	**5.4**	< 0.39	13.3	3.3	< 0.57	< 0.36	**0.29**	**0.58**	1.9	**0.95**	0.35	**2.4**	< 0.44	1.3	**2.5**	< 0.48	1.8	< 0.47
MW13	05/19/2014	< 0.0062	< 0.0064	0.0071	0.053	0.062	0.0082	**0.013**	0.028	0.02	0.016	0.016	< 0.0059	0.021	< 0.0066	0.015	0.0095	< 0.0083	0.016

Table 16. Groundwater Analytical Results – PAHs Exceeding Tap Water SLs
Wisconsin Public Service Corporation, Manitowoc
Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

		PAH																	
Sample Location	Sample Date	1-Methylnaphthalene (µg/l)	2-methylnaphthalene (µg/l)	Acenaphthene (µg/l)	Acenaphthylene (µg/l)	Anthracene (µg/l)	Benzo(a)anthracene (µg/l)	Benzo(a)pyrene (µg/l)	Benzo(b)fluoranthene (µg/l)	Benzo(ghi)perylene (µg/l)	Benzo(k)fluoranthene (µg/l)	Chrysene (µg/l)	Dibenz(a,h)anthracene (µg/l)	Fluoranthene (µg/l)	Fluorene (µg/l)	Indeno(1,2,3-cd)pyrene (µg/l)	Naphthalene (PAH) (µg/l)	Phenanthrene (µg/l)	Pyrene (µg/l)
	Tap Water SL for WI / IBS	**1.1**	**36**	**530**	**530**	**1,800**	**0.034**	**0.0034**	**0.034**	**120**	**0.34**	**3.4**	**0.0034**	**800**	**290**	**0.034**	**0.17**	**1,800**	**120**
MW14	04/11/2000	--	**140,000**	**3,300**	**36,000**	**13,000**	**9,500**	**8,600**	**6,700**	**4,500**	**7,700**	**8,800**	**1,200**	**27,000**	**18,000**	**4,000**	**540,000**	**45,000**	**23,000**
MW14	03/27/2001	--	**140,000**	**3,300**	**45,000**	**13,000**	**10,000**	**8,400**	**8,300**	**3,300**	< 4	**7,400**	**1,100**	**28,000**	**15,000**	**3,800**	**510,000**	**50,000**	**24,000**
MW14	08/09/2012	**27,700**	**44,700**	**779**	**16,400**	**4,690**	**2,660**	**2,050**	**1,690**	< 2040	**2,230**	**3,520**	**303**	**8,780**	**5,060**	< 1980	**159,000**	**16,900**	**7,350**
MW14	11/14/2012	**488**	**757**	11.1	273	12.1	**2**	**1.5**	< 1.8	< 2.6	< 2.3	2.6	< 1.7	8.9	28.5	< 2.5	**9,440**	39.9	8
MW14	02/27/2013	**150,000**	**245,000**	**5,150**	**79,400**	**30,500**	**14,300**	**11,300**	**10,900**	**9,200**	**13,000**	**21,100**	**2,030**	**45,200**	**27,000**	< 7950	**799,000**	**84,600**	**47,400**
MW14	05/30/2013	**446**	**672**	9.7	242	15.6	**6**	**7.3**	**4.1**	4.5	**5.2**	**6.9**	**0.69**	19.8	33.1	**3.5**	**8,670**	46.5	16.6
MW14	11/13/2013	**2,360,000**	**3,700,000**	**123,000**	**1,340,000**	**597,000**	**118,000**	**130,000**	**124,000**	< 120000	**170,000**	**366,000**	< 80000	**688,000**	**465,000**	< 117000	**12,600,000**	**1,160,000**	**704,000**
MW14	05/19/2014	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW17T	04/11/2000	--	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 5
MW17T	03/27/2001	--	< 5	< 5	< 5	< 5	< 2	< 2	< 2	< 5	< 5	< 5	< 2	< 5	< 5	< 2	< 5	< 5	< 5
MW17T	06/05/2002	0.041	0.045	< 0.018	< 0.023	< 0.02	< 0.019	< 0.012	< 0.014	< 0.015	< 0.013	< 0.018	< 0.017	< 0.028	< 0.021	< 0.014	**0.49**	< 0.019	< 0.02
MW17T	05/15/2003	< 0.02	< 0.019	< 0.02	< 0.021	0.022	< 0.013	< 0.016	< 0.015	< 0.018	< 0.021	< 0.016	< 0.018	< 0.015	< 0.019	< 0.024	< 0.027	< 0.018	< 0.019
MW17T	02/25/2004	0.021	0.037	< 0.017	0.036	0.053	**0.39**	**0.7**	**1**	0.9	**0.7**	0.73	**0.21**	1.2	0.022	**0.73**	**0.56**	0.28	0.88
MW17T	05/24/2004	< 0.017	< 0.016	< 0.017	< 0.018	< 0.019	< 0.011	< 0.013	< 0.012	< 0.015	< 0.018	< 0.013	< 0.015	< 0.012	< 0.016	< 0.02	< 0.023	< 0.015	< 0.016
MW17T	05/18/2005	< 0.02	< 0.023	< 0.019	< 0.019	< 0.018	< 0.02	**0.03**	0.032	0.031	0.03	0.026	< 0.022	0.037	< 0.022	0.024	0.046	< 0.02	0.033
MW17T	11/28/2005	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW17T	05/30/2006	0.012	0.017	< 0.0082	< 0.0081	< 0.012	< 0.016	< 0.018	0.019	< 0.019	< 0.019	< 0.019	< 0.019	0.025	< 0.0091	< 0.019	0.013	0.014	0.02
MW17T	05/16/2007	< 0.01	< 0.011	< 0.0082	< 0.0081	< 0.012	< 0.016	< 0.018	< 0.016	< 0.019	< 0.019	< 0.019	< 0.019	0.02	< 0.0091	< 0.019	< 0.012	< 0.011	0.016
MW17T	11/15/2007	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW17T	10/26/2009	< 0.047	< 0.047	< 0.0045	0.0086	0.0069	0.031	**0.045**	**0.043**	0.035	0.034	0.036	**0.0075**	0.053	< 0.0048	0.029	< 0.17	0.015	0.047
MW17T	01/26/2010	< 0.005	0.0046	< 0.0045	0.0065	0.0094	**0.054**	**0.11**	**0.11**	0.11	0.097	0.074	**0.023**	0.056	< 0.0048	**0.09**	< 0.047	0.017	0.054
MW17T	04/28/2010	0.074	0.07	0.013	< 0.0036	< 0.0057	< 0.0036	< 0.0029	< 0.0034	< 0.0048	< 0.0044	< 0.0035	< 0.0032	< 0.0044	< 0.0048	< 0.0047	**0.75**	< 0.0081	< 0.0047
MW17T	07/26/2010	0.013	0.0045	0.0049	0.005	< 0.0057	< 0.0036	0.0034	0.0051	< 0.0048	0.0045	0.0048	< 0.0032	0.006	< 0.0048	< 0.0047	0.018	< 0.0081	0.0052
MW17T	11/02/2010	< 0.005	0.0058	< 0.0045	0.0045	0.0064	0.0078	**0.016**	0.018	0.018	0.02	0.017	< 0.0032	0.019	< 0.0048	0.013	0.013	< 0.0081	0.017
MW17T	05/17/2011	< 0.005	0.0068	< 0.0045	0.0054	< 0.0057	0.0088	**0.01**	0.015	0.012	0.012	0.012	*0.0035*	0.017	< 0.0048	0.0094	0.026	0.0088	0.016
MW17T	11/01/2011	0.015	0.015	0.0074	0.0046	0.0065	0.013	**0.015**	0.018	0.011	0.015	0.02	< 0.0032	0.024	< 0.0048	0.0093	0.073	0.01	0.022
MW17T	08/08/2012	< 0.0053	< 0.0041	< 0.0048	< 0.0038	0.0061	< 0.0038	< 0.003	< 0.0036	< 0.0051	< 0.0046	< 0.0037	< 0.0034	< 0.0047	< 0.0051	< 0.005	0.0063	< 0.0086	< 0.005
MW17T	11/13/2012	0.0075	0.013	< 0.0048	< 0.0038	< 0.0061	< 0.0038	< 0.003	< 0.0036	< 0.0051	< 0.0046	< 0.0037	< 0.0034	< 0.0047	< 0.0051	< 0.005	< 0.05	< 0.0086	< 0.005
MW17T	02/26/2013	< 0.005	< 0.0039	< 0.0045	< 0.0036	< 0.0057	0.0042	< 0.0029	0.0084	0.0083	0.011	0.01	**0.0078**	0.0044	< 0.0048	0.0099	0.013	< 0.0081	< 0.0047
MW17T	05/29/2013	< 0.005	< 0.0039	< 0.0045	0.005	< 0.0057	< 0.0036	< 0.0029	< 0.0034	< 0.0048	< 0.0044	< 0.0035	< 0.0032	< 0.0044	< 0.0048	< 0.0047	0.0085	< 0.0081	< 0.0047
MW17T	11/12/2013	< 0.005	< 0.0039	< 0.0045	< 0.0036	< 0.0057	< 0.0036	< 0.0029	< 0.0034	< 0.0048	< 0.0044	< 0.0035	< 0.0032	< 0.0044	< 0.0048	< 0.0047	0.011	< 0.0081	< 0.0047
MW17T	05/19/2014	< 0.0062	< 0.0064	< 0.0068	0.009	0.0074	0.0079	< 0.0087	< 0.0062	0.0038	0.0083	0.011	< 0.0059	0.016	< 0.0066	< 0.0049	0.014	0.02	0.016

Table 16. Groundwater Analytical Results – PAHs Exceeding Tap Water SLs
Wisconsin Public Service Corporation, Manitowoc
Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

		PAH																	
Sample Location	Sample Date	1-Methylnaphthalene (µg/l)	2-methylnaphthalene (µg/l)	Acenaphthene (µg/l)	Acenaphthylene (µg/l)	Anthracene (µg/l)	Benzo(a)anthracene (µg/l)	Benzo(a)pyrene (µg/l)	Benzo(b)fluoranthene (µg/l)	Benzo(ghi)perylene (µg/l)	Benzo(k)fluoranthene (µg/l)	Chrysene (µg/l)	Dibenz(a,h)anthracene (µg/l)	Fluoranthene (µg/l)	Fluorene (µg/l)	Indeno(1,2,3-cd)pyrene (µg/l)	Naphthalene (PAH) (µg/l)	Phenanthrene (µg/l)	Pyrene (µg/l)
	Tap Water SL for WI / IBS	**1.1**	**36**	**530**	**530**	**1,800**	**0.034**	**0.0034**	**0.034**	**120**	**0.34**	**3.4**	**0.0034**	**800**	**290**	**0.034**	**0.17**	**1,800**	**120**
MW18T	04/11/2000	--	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 5
MW18T	03/27/2001	--	< 5	< 5	< 5	< 5	< 2	< 2	< 2	< 5	< 5	< 5	< 2	< 5	< 5	< 2	< 5	< 5	< 5
MW18T	06/05/2002	< 0.027	< 0.028	< 0.018	< 0.023	< 0.02	< 0.019	< 0.012	< 0.014	< 0.015	< 0.013	< 0.018	< 0.017	< 0.028	< 0.021	< 0.014	0.12	< 0.019	< 0.02
MW18T	05/15/2003	< 0.018	< 0.017	< 0.018	< 0.019	< 0.02	< 0.012	< 0.014	< 0.013	< 0.016	< 0.019	< 0.014	< 0.016	< 0.013	< 0.017	< 0.021	0.1	< 0.016	< 0.017
MW18T	02/25/2004	< 0.017	< 0.016	< 0.017	< 0.018	< 0.019	< 0.011	< 0.013	< 0.012	< 0.015	< 0.018	< 0.013	< 0.015	< 0.012	< 0.016	< 0.02	0.028	< 0.015	< 0.016
MW18T	05/24/2004	< 0.017	< 0.016	< 0.017	< 0.018	< 0.019	< 0.011	< 0.013	< 0.012	< 0.015	< 0.018	< 0.013	< 0.015	0.013	< 0.016	< 0.02	< 0.023	< 0.015	< 0.016
MW18T	05/18/2005	< 0.02	< 0.023	< 0.019	< 0.019	< 0.018	< 0.02	**0.019**	0.022	< 0.021	< 0.019	0.019	< 0.022	0.03	< 0.022	< 0.017	< 0.022	< 0.02	0.025
MW18T	11/28/2005	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW18T	05/30/2006	0.036	0.013	0.009	< 0.0081	< 0.012	< 0.016	< 0.018	< 0.016	< 0.019	< 0.019	< 0.019	< 0.019	< 0.015	< 0.0091	< 0.019	0.029	< 0.011	< 0.015
MW18T	05/16/2007	< 0.01	< 0.011	< 0.0082	< 0.0081	< 0.012	< 0.016	< 0.018	< 0.016	< 0.019	< 0.019	< 0.019	< 0.019	< 0.015	< 0.0091	< 0.019	< 0.012	< 0.011	< 0.015
MW18T	11/15/2007	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW18T	10/26/2009	< 0.005	< 0.0039	< 0.0045	0.011	< 0.0057	0.0069	**0.0079**	0.012	0.009	0.0069	0.0099	< 0.0032	0.013	< 0.0048	0.0063	< 0.17	< 0.0081	0.012
MW18T	01/27/2010	0.012	0.011	0.0077	0.019	0.0057	0.0071	**0.0082**	0.01	0.0086	0.0094	0.011	< 0.0032	0.029	0.0069	0.0068	0.056	0.016	0.024
MW18T	04/27/2010	< 0.005	0.0054	< 0.0045	0.012	< 0.0057	< 0.0036	< 0.0029	< 0.0034	< 0.0048	< 0.0044	< 0.0035	< 0.0032	0.007	< 0.0048	< 0.0047	0.017	0.012	0.0048
MW18T	07/26/2010	< 0.005	0.0042	< 0.0045	0.012	< 0.0057	< 0.0036	< 0.0029	< 0.0034	< 0.0048	< 0.0044	< 0.0035	< 0.0032	< 0.0044	< 0.0048	< 0.0047	0.0088	< 0.0081	< 0.0047
MW18T	11/03/2010	0.0075	0.0071	< 0.0045	0.012	0.0059	0.0085	**0.011**	0.014	0.013	0.019	0.02	< 0.0032	0.02	< 0.0048	0.0097	0.037	0.0092	0.021
MW18T	05/17/2011	< 0.005	0.0086	< 0.0045	0.012	< 0.0057	0.0057	**0.0058**	0.0083	0.0062	0.0058	0.0078	< 0.0032	0.0098	< 0.0048	< 0.0047	0.019	< 0.0081	0.0093
MW18T	11/01/2011	0.0073	0.0057	< 0.0045	0.011	< 0.0057	< 0.0036	0.0033	0.0042	< 0.0048	< 0.0044	0.0037	< 0.0032	0.0047	< 0.0048	< 0.0047	0.016	< 0.0081	< 0.0047
MW18T	08/07/2012	0.0085	0.013	< 0.0048	0.004	< 0.0061	< 0.0038	< 0.003	0.0037	< 0.0051	< 0.0046	< 0.0037	< 0.0034	< 0.05	< 0.0051	< 0.005	0.043	< 0.0086	< 0.005
MW18T	11/13/2012	< 0.0054	0.007	< 0.0048	0.0061	< 0.0061	0.0087	**0.033**	0.033	0.04	0.033	0.018	**0.0073**	0.016	< 0.0051	0.029	0.016	< 0.0087	0.014
MW18T	02/26/2013	< 0.005	0.01	< 0.0045	0.0096	< 0.0057	< 0.0036	< 0.0029	< 0.0034	< 0.0048	< 0.0044	< 0.0035	< 0.0032	< 0.0044	< 0.0048	< 0.0047	0.019	< 0.0081	< 0.0047
MW18T	05/29/2013	< 0.005	0.004	< 0.0045	0.013	< 0.0057	< 0.0036	< 0.0029	< 0.0034	< 0.0048	< 0.0044	0.0035	< 0.0032	< 0.0044	< 0.0048	< 0.0047	0.013	< 0.0081	< 0.0047
MW18T	11/12/2013	< 0.005	0.0048	< 0.0045	0.011	< 0.0057	< 0.0036	< 0.0029	< 0.0034	< 0.0048	< 0.0044	< 0.0035	< 0.0032	< 0.0044	< 0.0048	< 0.0047	0.013	< 0.0081	< 0.0047
MW18T	05/19/2014	< 0.0063	< 0.0065	< 0.0069	0.019	0.0089	0.0076	< 0.0088	0.007	0.0078	0.01	0.011	< 0.0059	0.019	< 0.0066	0.0052	0.02	0.016	0.018
MW19T	04/11/2000	--	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 5
MW19T	03/27/2001	--	< 5	< 5	< 5	< 5	< 2	< 2	< 2	< 5	< 5	< 5	< 2	< 5	< 5	< 2	< 5	< 5	< 5
MW19T	06/05/2002	< 0.16	< 0.17	< 0.11	0.3	0.19	**0.86**	**1.2**	**1.1**	0.92	**0.71**	0.69	**0.29**	1.7	< 0.13	**0.91**	**0.44**	0.44	1.4
MW19T	05/15/2003	< 0.018	< 0.017	< 0.018	0.031	0.022	**0.092**	**0.16**	**0.17**	0.15	0.12	0.12	**0.038**	0.19	< 0.017	**0.13**	0.032	0.06	0.18
MW19T	02/25/2004	< 0.017	0.016	< 0.017	< 0.018	< 0.019	0.023	**0.043**	**0.059**	0.054	0.044	0.044	< 0.015	0.07	< 0.016	**0.043**	0.12	0.02	0.053
MW19T	05/24/2004	0.019	0.026	< 0.017	0.068	0.093	**0.66**	**1.5**	**2.1**	1.8	**1.4**	1.5	**0.42**	2.2	0.024	**1.5**	0.045	0.54	1.7
MW19T	05/18/2005	< 0.02	< 0.023	< 0.019	0.04	0.026	**0.1**	**0.17**	**0.21**	0.2	0.16	0.14	**0.041**	0.24	< 0.022	**0.16**	0.069	0.075	0.2
MW19T	11/28/2005	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW19T	05/30/2006	0.018	0.02	< 0.0082	0.029	0.017	**0.054**	**0.098**	**0.12**	0.11	0.088	0.075	**0.023**	0.13	< 0.0091	**0.086**	**0.25**	0.039	0.11
MW19T	05/16/2007	< 0.01	0.014	< 0.0082	0.016	< 0.012	0.019	**0.039**	**0.038**	0.042	0.033	0.028	< 0.019	0.056	< 0.0091	0.029	0.034	0.024	0.046
MW19T	11/15/2007	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW19T	10/26/2009	< 0.047	< 0.047	0.011	0.12	0.11	**0.44**	**0.91**	**1.5**	0.9	**0.64**	0.85	**0.2**	1.1	0.033	**0.73**	< 0.17	0.25	1
MW19T	01/26/2010	< 0.005	0.0062	< 0.0045	0.033	0.036	**0.099**	**0.22**	**0.29**	0.3	0.25	0.23	**0.064**	0.28	< 0.0048	**0.23**	< 0.047	0.064	0.27
MW19T	04/28/2010	0.035	0.039	0.16	0.11	0.13	0.024	**0.02**	0.027	0.028	0.023	0.043	**0.0053**	0.21	0.14	0.019	**0.36**	0.2	0.2
MW19T	07/26/2010	0.039	0.0046	0.017	0.014	0.0077	0.016	**0.031**	**0.05**	0.046	0.037	0.036	**0.014**	0.035	< 0.0048	**0.037**	0.014	0.011	0.032
MW19T	11/02/2010	0.0078	0.012	< 0.0045	0.012	0.013	0.018	**0.048**	**0.059**	0.063	0.058	0.047	**0.012**	0.051	0.0051	**0.044**	0.027	0.012	0.053
MW19T	05/18/2011	< 0.005	0.0065	< 0.0045	0.018	0.013	**0.056**	**0.11**	**0.18**	0.16	0.12	0.1	**0.034**	0.14	< 0.0048	**0.12**	0.019	0.032	0.14
MW19T	11/02/2011	< 0.005	0.0082	< 0.0045	0.017	0.011	0.023	**0.05**	**0.069**	0.073	0.05	0.05	**0.014**	0.06	< 0.0048	**0.055**	0.017	0.016	0.061
MW19T	08/08/2012	< 0.0053	0.0052	< 0.0048	0.017	0.013	0.032	**0.067**	**0.096**	0.098	0.063	0.057	**0.019**	0.088	< 0.0051	**0.071**	0.016	0.026	0.078
MW19T	11/13/2012	< 0.0054	0.0074	< 0.0048	0.0092	< 0.0061	0.0085	**0.016**	0.02	0.026	0.019	0.017	**0.0061**	0.021	< 0.0051	0.019	0.016	< 0.0087	0.018
MW19T	02/25/2013	< 0.005	0.0046	< 0.0045	0.0049	< 0.0057	< 0.047	**0.0098**	< 0.047	< 0.047	< 0.047	< 0.047	< 0.0032	0.017	< 0.0048	< 0.047	0.0098	< 0.0081	0.015
MW19T	05/29/2013	< 0.005	0.0056	< 0.0045	0.012	< 0.0057	**0.065**	**0.062**	**0.076**	0.097	0.12	0.13	**0.067**	0.022	< 0.0048	**0.081**	0.017	< 0.0081	0.022
MW19T	11/13/2013	< 0.005	0.0057	< 0.0045	0.0066	< 0.0057	0.0046	**0.013**	0.015	0.021	0.017	0.014	**0.0036**	0.014	< 0.0048	0.015	0.016	< 0.0081	0.013
MW19T	05/19/2014	< 0.0063	< 0.0065	< 0.0069	0.0075	0.0071	0.012	**0.023**	0.029	0.03	0.024	0.023	< 0.0059	0.034	< 0.0066	0.021	0.012	0.011	0.029

Table 16. Groundwater Analytical Results – PAHs Exceeding Tap Water SLs
Wisconsin Public Service Corporation, Manitowoc
Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

		PAH																	
Sample Location	Sample Date	1-Methylnaphthalene (µg/l)	2-methylnaphthalene (µg/l)	Acenaphthene (µg/l)	Acenaphthylene (µg/l)	Anthracene (µg/l)	Benzo(a)anthracene (µg/l)	Benzo(a)pyrene (µg/l)	Benzo(b)fluoranthene (µg/l)	Benzo(ghi)perylene (µg/l)	Benzo(k)fluoranthene (µg/l)	Chrysene (µg/l)	Dibenz(a,h)anthracene (µg/l)	Fluoranthene (µg/l)	Fluorene (µg/l)	Indeno(1,2,3-cd)pyrene (µg/l)	Naphthalene (PAH) (µg/l)	Phenanthrene (µg/l)	Pyrene (µg/l)
	Tap Water SL for WI / IBS	**1.1**	**36**	**530**	**530**	**1,800**	**0.034**	**0.0034**	**0.034**	**120**	**0.34**	**3.4**	**0.0034**	**800**	**290**	**0.034**	**0.17**	**1,800**	**120**
MW20T	04/11/2000	--	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 5
MW20T	03/27/2001	--	< 5	< 5	< 5	< 5	< 2	< 2	< 2	< 5	< 5	< 5	< 2	< 5	< 5	< 2	< 5	< 5	< 5
MW20T	06/05/2002	< 0.027	< 0.028	< 0.018	< 0.023	< 0.02	0.022	**0.031**	0.033	0.029	0.024	0.025	< 0.017	0.061	< 0.021	0.026	< 0.027	0.027	0.063
MW20T	05/15/2003	0.053	0.035	< 0.018	< 0.019	< 0.02	< 0.012	**0.018**	0.025	0.023	< 0.019	0.02	< 0.016	0.032	< 0.017	< 0.021	**0.33**	0.018	0.028
MW20T	02/25/2004	0.02	0.03	< 0.017	0.042	< 0.019	**0.039**	**0.046**	**0.048**	0.04	0.037	0.049	< 0.015	0.1	< 0.016	0.032	0.096	0.065	0.079
MW20T	05/24/2004	< 0.017	< 0.016	< 0.017	0.019	< 0.019	**0.078**	**0.12**	**0.14**	0.12	0.1	0.11	**0.031**	0.21	< 0.016	**0.1**	< 0.023	0.078	0.18
MW20T	05/25/2004	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW20T	05/18/2005	< 0.02	< 0.023	< 0.019	< 0.019	< 0.018	< 0.02	**0.027**	**0.035**	0.029	0.027	0.029	< 0.022	0.046	< 0.022	0.022	0.039	0.023	0.037
MW20T	11/28/2005	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW20T	05/30/2006	< 0.01	0.015	< 0.0082	< 0.0081	< 0.012	0.032	**0.055**	**0.053**	0.051	0.041	0.044	< 0.019	0.084	< 0.0091	**0.037**	< 0.012	0.032	0.064
MW20T	05/16/2007	< 0.01	< 0.011	< 0.0082	< 0.0081	< 0.012	< 0.016	< 0.018	0.023	< 0.019	0.02	0.019	< 0.019	0.037	< 0.0091	< 0.019	< 0.012	0.021	0.026
MW20T	11/15/2007	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW20T	10/26/2009	< 0.047	< 0.047	< 0.0045	0.016	0.015	**0.074**	**0.13**	**0.17**	0.12	0.095	0.11	**0.03**	0.17	0.0063	**0.096**	< 0.17	0.044	0.14
MW20T	01/26/2010	< 0.005	< 0.0039	< 0.0045	0.0042	< 0.0057	0.0061	**0.0057**	0.0084	0.0069	0.0068	0.011	< 0.0032	0.018	< 0.0048	0.0053	< 0.047	< 0.0081	0.022
MW20T	04/28/2010	0.0055	0.0071	< 0.0045	0.0042	< 0.0057	0.0051	**0.0078**	0.0097	0.0086	0.01	0.012	< 0.0032	0.015	< 0.0048	0.0064	0.04	< 0.0081	0.012
MW20T	07/26/2010	0.0097	0.0084	< 0.0045	0.0058	< 0.0057	0.022	**0.039**	**0.056**	0.04	0.047	0.05	**0.0073**	0.062	< 0.0048	0.03	0.067	0.012	0.047
MW20T	11/02/2010	< 0.005	0.0039	< 0.0045	< 0.0036	< 0.0057	0.0053	**0.0087**	0.009	0.0091	0.011	0.013	< 0.0032	0.012	< 0.0048	0.0065	0.011	< 0.0081	0.012
MW20T	05/18/2011	0.006	0.01	< 0.0045	0.0046	< 0.0057	0.0054	**0.0083**	0.014	0.011	0.0084	0.0081	**0.0036**	0.012	< 0.0048	0.0079	0.024	< 0.0081	0.0096
MW20T	11/01/2011	< 0.005	0.0054	< 0.0045	0.0047	< 0.0057	0.0056	**0.0036**	0.0064	< 0.0048	0.0058	0.0061	< 0.0032	< 0.0044	< 0.0048	< 0.0047	0.016	< 0.0081	< 0.0047
MW20T	08/08/2012	< 0.0053	< 0.0041	0.0097	0.0052	0.0064	0.0045	**0.0056**	0.0076	0.0071	0.0071	0.0065	< 0.0034	< 0.05	< 0.0051	0.0053	0.0052	< 0.0086	< 0.05
MW20T	11/13/2012	0.0057	0.01	< 0.0048	0.0044	< 0.0061	< 0.0039	**0.0042**	0.0045	< 0.0052	0.0062	0.0052	< 0.0034	0.0083	< 0.0051	< 0.005	0.021	< 0.0087	0.0066
MW20T	02/26/2013	0.0072	0.012	0.0062	0.018	0.024	**0.12**	**0.2**	**0.27**	0.23	0.2	0.23	**0.059**	0.34	0.0079	**0.18**	0.024	0.12	0.29
MW20T	05/29/2013	< 0.005	< 0.0039	< 0.0045	0.0063	< 0.0057	< 0.0036	*0.0035*	0.0054	0.005	0.0077	0.0079	< 0.0032	0.0091	< 0.0048	< 0.0047	0.0091	< 0.0081	0.008
MW20T	11/12/2013	< 0.005	< 0.0039	0.0067	0.0054	< 0.0057	< 0.0036	< 0.0029	< 0.0034	< 0.0048	0.0048	0.0052	< 0.0032	0.005	< 0.0048	< 0.0047	0.011	< 0.0081	0.0052
MW20T	05/19/2014	< 0.0063	0.0068	< 0.0069	< 0.0064	< 0.0068	0.025	**0.035**	**0.051**	0.041	0.038	0.042	**0.0072**	0.069	< 0.0066	0.03	0.012	0.031	0.064
MW21T	04/11/2000	--	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 5
MW21T	03/27/2001	--	< 5	< 5	< 5	< 5	< 2	< 2	< 2	< 5	< 5	< 5	< 2	< 5	< 5	< 2	< 5	< 5	< 5
MW21T	06/05/2002	0.058	< 0.028	0.36	1.8	< 0.02	0.027	**0.1**	**0.073**	0.15	< 0.047	0.02	**0.037**	0.031	0.18	**0.12**	0.042	0.035	0.034
MW21T	05/15/2003	0.037	0.027	0.082	0.47	< 0.02	0.021	**0.072**	**0.066**	0.11	0.046	0.03	**0.02**	0.046	0.037	**0.081**	**0.18**	0.022	0.042
MW21T	02/25/2004	0.032	0.031	0.25	1.1	< 0.019	0.024	**0.055**	**0.053**	0.068	0.047	0.037	< 0.015	0.059	0.081	**0.052**	**0.76**	0.034	0.05
MW21T	05/24/2004	0.018	0.022	0.025	0.066	0.053	**0.37**	**0.58**	**0.72**	0.63	**0.59**	0.6	**0.17**	1	0.026	**0.54**	0.038	0.35	0.82
MW21T	05/18/2005	0.03	< 0.023	0.18	0.75	< 0.018	**0.049**	**0.11**	**0.12**	0.15	0.11	0.092	**0.031**	0.15	0.068	**0.11**	0.049	0.059	0.11
MW21T	11/28/2005	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW21T	05/30/2006	< 0.026	< 0.029	< 0.021	0.097	0.039	**0.14**	**0.32**	**0.56**	0.44	**0.35**	0.38	**0.078**	0.51	< 0.023	**0.34**	< 0.032	0.14	0.41
MW21T	05/16/2007	0.01	0.013	0.011	0.1	0.016	**0.053**	**0.13**	**0.21**	0.18	0.14	0.13	**0.027**	0.18	0.012	**0.16**	0.013	0.054	0.15
MW21T	11/15/2007	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW21T	10/26/2009	< 0.02	< 0.19	0.019	0.19	0.043	**0.18**	**0.41**	**0.73**	0.47	**0.46**	0.53	**0.088**	0.7	0.023	**0.4**	< 0.17	0.15	0.55
MW21T	01/27/2010	0.026	0.018	0.023	0.061	0.034	**0.048**	**0.1**	**0.17**	0.15	0.15	0.15	**0.032**	0.23	0.014	**0.12**	0.11	0.066	0.19
MW21T	04/27/2010	0.017	0.0086	0.012	0.11	0.037	**0.12**	**0.26**	**0.53**	0.36	0.33	0.36	**0.075**	0.57	0.02	**0.28**	0.035	0.2	0.46
MW21T	07/26/2010	0.019	0.0065	0.031	0.48	0.014	0.0075	**0.016**	0.03	0.021	0.021	0.023	**0.0045**	0.038	0.026	0.016	0.028	0.015	0.031
MW21T	11/03/2010	0.0056	0.0053	0.016	0.12	0.014	0.014	**0.033**	**0.063**	0.056	0.046	0.055	**0.01**	0.072	0.01	**0.04**	0.022	0.018	0.066
MW21T	05/18/2011	0.0067	0.01	0.0049	0.017	0.013	0.034	**0.061**	**0.12**	0.087	0.086	0.085	**0.02**	0.11	< 0.0048	**0.069**	0.028	0.036	0.11
MW21T	11/02/2011	0.014	0.013	0.034	0.59	0.025	**0.046**	**0.093**	**0.15**	0.13	0.12	0.13	**0.027**	0.17	0.049	**0.096**	0.041	0.07	0.17
MW21T	08/08/2012	0.01	0.0074	0.037	0.62	0.015	0.019	**0.032**	**0.065**	0.045	0.037	0.042	**0.01**	0.063	0.036	0.034	0.024	0.023	0.059
MW21T	11/13/2012	0.0096	0.0089	0.047	0.67	0.0094	0.0058	**0.009**	0.015	0.013	0.012	0.013	< 0.0034	0.019	0.03	0.0095	0.019	0.014	0.018
MW21T	02/25/2013	0.012	0.0091	0.078	0.86	< 0.011	< 0.094	**0.014**	< 0.094	< 0.094	< 0.094	< 0.094	< 0.0064	0.028	0.042	< 0.094	0.034	0.02	0.029
MW21T	05/29/2013	< 0.047	0.0081	0.036	0.55	0.014	0.0051	**0.015**	0.02	0.017	0.016	0.02	0.0032	0.021	0.016	0.012	0.048	0.0089	0.019
MW21T	11/13/2013	0.011	0.0084	0.044	0.92	0.011	< 0.0036	< 0.0029	< 0.0034	< 0.0048	< 0.0044	0.0035	< 0.0032	< 0.0044	0.013	< 0.0047	0.024	< 0.0081	< 0.0047
MW21T	05/19/2014	< 0.0062	< 0.0064	< 0.0068	0.031	0.011	0.017	**0.037**	**0.081**	0.065	0.044	0.05	**0.013**	0.063	< 0.0066	**0.046**	< 0.0081	0.013	0.051

Table 16. Groundwater Analytical Results – PAHs Exceeding Tap Water SLs
Wisconsin Public Service Corporation, Manitowoc
Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

		PAH																	
Sample Location	Sample Date	1-Methylnaphthalene (µg/l)	2-methylnaphthalene (µg/l)	Acenaphthene (µg/l)	Acenaphthylene (µg/l)	Anthracene (µg/l)	Benzo(a)anthracene (µg/l)	Benzo(a)pyrene (µg/l)	Benzo(b)fluoranthene (µg/l)	Benzo(ghi)perylene (µg/l)	Benzo(k)fluoranthene (µg/l)	Chrysene (µg/l)	Dibenz(a,h)anthracene (µg/l)	Fluoranthene (µg/l)	Fluorene (µg/l)	Indeno(1,2,3-cd)pyrene (µg/l)	Naphthalene (PAH) (µg/l)	Phenanthrene (µg/l)	Pyrene (µg/l)
	Tap Water SL for WI / IBS	**1.1**	**36**	**530**	**530**	**1,800**	**0.034**	**0.0034**	**0.034**	**120**	**0.34**	**3.4**	**0.0034**	**800**	**290**	**0.034**	**0.17**	**1,800**	**120**
MW22	08/08/2012	< 0.0053	< 0.0041	< 0.0048	< 0.0038	< 0.0061	< 0.0038	< 0.003	< 0.0036	< 0.0051	< 0.0046	< 0.0037	< 0.0034	< 0.0047	< 0.0051	< 0.005	< 0.0051	< 0.0086	< 0.005
MW22	11/13/2012	0.0057	0.0066	< 0.0048	< 0.0038	< 0.0061	< 0.0038	< 0.003	< 0.0036	< 0.0051	< 0.0046	< 0.0037	< 0.0034	< 0.0047	< 0.0051	< 0.005	< 0.05	< 0.0086	< 0.005
MW22	02/26/2013	0.0061	0.0078	< 0.0045	< 0.0036	< 0.0057	0.0061	**0.0042**	0.01	0.0083	0.0083	0.0082	**0.0053**	< 0.0044	< 0.0048	0.0087	0.071	< 0.0081	< 0.0047
MW22	05/29/2013	< 0.0051	0.0044	< 0.0046	< 0.0037	< 0.0058	< 0.0037	< 0.0029	< 0.0035	< 0.0049	< 0.0045	0.0042	< 0.0033	< 0.0045	< 0.0049	< 0.0048	0.012	< 0.0082	< 0.0048
MW22	11/12/2013	< 0.005	< 0.0039	< 0.0045	< 0.0036	< 0.0057	< 0.0036	< 0.0029	< 0.0034	< 0.0048	< 0.0044	< 0.0035	< 0.0032	< 0.0044	< 0.0048	< 0.0047	0.0085	< 0.0081	< 0.0047
MW22	05/19/2014	< 0.0064	< 0.0065	< 0.007	< 0.0064	< 0.0068	< 0.0054	< 0.0088	< 0.0063	< 0.0038	< 0.0028	< 0.0031	< 0.006	< 0.0073	< 0.0067	< 0.005	< 0.0082	< 0.0084	< 0.0077
MW23	08/08/2012	< 0.0053	0.0051	< 0.0048	< 0.0038	0.0061	< 0.0038	< 0.003	< 0.0036	< 0.0051	< 0.0046	0.0038	< 0.0034	< 0.05	< 0.0051	< 0.005	0.0069	< 0.0086	< 0.05
MW23	11/13/2012	< 0.0054	< 0.0042	< 0.0049	< 0.0039	< 0.0062	< 0.0039	< 0.0031	< 0.0037	< 0.0052	< 0.0047	< 0.0038	< 0.0035	< 0.0048	< 0.0052	< 0.0051	0.008	< 0.0088	< 0.0051
MW23	02/26/2013	< 0.005	0.0041	< 0.0045	< 0.0036	< 0.0057	**0.079**	**0.024**	**0.08**	0.051	0.06	0.066	**0.032**	0.027	< 0.0048	**0.06**	0.0087	< 0.0081	0.028
MW23	05/29/2013	< 0.0051	< 0.004	< 0.0047	< 0.0037	< 0.0059	< 0.0037	< 0.0029	< 0.0035	< 0.005	< 0.0045	0.004	< 0.0033	< 0.0045	< 0.0049	< 0.0048	< 0.005	< 0.0083	< 0.0049
MW23	11/12/2013	< 0.005	< 0.0039	< 0.0045	< 0.0036	< 0.0057	< 0.0036	< 0.0029	< 0.0034	< 0.0048	< 0.0044	0.0042	< 0.0032	< 0.0044	< 0.0048	< 0.0047	< 0.0048	< 0.0081	0.0053
MW23	05/19/2014	< 0.0063	< 0.0065	< 0.0069	< 0.0064	< 0.0068	< 0.0054	< 0.0088	< 0.0062	0.0047	0.0048	0.0051	< 0.0059	< 0.0072	< 0.0066	< 0.0049	0.013	< 0.0084	< 0.0077
PZ5	08/09/2012	< 0.0053	0.007	< 0.0048	< 0.0038	< 0.0061	< 0.0038	0.0032	0.0065	< 0.0051	< 0.0046	0.005	< 0.0034	0.0079	< 0.0051	< 0.005	< 0.05	< 0.0086	0.0062
PZ5	11/13/2012	< 0.0054	0.0085	< 0.0048	< 0.0039	< 0.0061	< 0.0039	< 0.0031	< 0.0036	< 0.0052	< 0.0047	< 0.0037	< 0.0034	0.0082	< 0.0051	< 0.005	0.017	< 0.0087	0.0071
PZ5	02/26/2013	< 0.005	0.01	< 0.0046	< 0.0036	< 0.0058	< 0.0037	< 0.0029	0.0041	< 0.0049	< 0.0044	0.0039	< 0.0032	0.0053	< 0.0048	< 0.0047	0.02	< 0.0082	< 0.0048
PZ5	05/29/2013	< 0.047	0.018	< 0.0045	< 0.0036	< 0.0057	< 0.0036	**0.0049**	0.0046	< 0.0048	0.0076	0.0087	< 0.0032	0.01	< 0.0048	< 0.0047	0.059	< 0.0081	0.0096
PZ5	11/12/2013	0.0052	0.0086	< 0.0045	< 0.0036	< 0.0057	< 0.0036	*0.0035*	0.0042	0.0054	0.0072	0.0078	< 0.0032	0.013	< 0.0048	< 0.0047	0.024	< 0.0081	0.012
PZ5	05/19/2014	< 0.0062	0.0096	< 0.0068	< 0.0063	0.0071	0.027	**0.049**	**0.085**	0.057	0.061	0.064	**0.011**	0.087	< 0.0066	**0.041**	0.027	0.036	0.068
PZ7B	10/26/2009	< 0.047	< 0.047	0.035	0.15	0.027	**0.048**	**0.09**	**0.13**	0.095	0.089	0.08	**0.018**	0.1	0.0086	**0.078**	< 0.17	0.03	0.089
PZ7B	01/27/2010	0.006	0.0089	0.0061	< 0.0036	0.0075	0.01	**0.011**	0.018	0.016	0.015	0.015	< 0.0032	0.015	< 0.0048	0.012	< 0.047	< 0.0081	0.017
PZ7B	04/27/2010	< 0.005	0.0058	< 0.0045	0.036	0.072	**0.15**	**0.21**	**0.29**	0.21	0.21	0.23	**0.042**	0.42	0.0067	**0.17**	0.011	0.073	0.35
PZ7B	07/26/2010	0.025	0.029	0.035	0.045	0.043	**0.035**	**0.073**	**0.14**	0.12	0.097	0.098	**0.023**	0.13	0.023	**0.085**	0.085	0.055	0.11
PZ7B	11/02/2010	0.025	0.012	0.018	0.058	0.019	0.0051	**0.0053**	0.0093	0.007	0.0092	0.01	< 0.0032	0.028	0.0092	< 0.0047	0.035	0.022	0.021
PZ7B	05/17/2011	0.033	0.016	0.015	0.07	0.019	0.025	**0.035**	**0.07**	0.044	0.039	0.044	**0.011**	0.079	0.0075	0.033	0.036	0.028	0.063
PZ7B	11/01/2011	0.026	0.017	0.022	0.064	0.018	0.014	**0.026**	**0.041**	0.033	0.03	0.029	**0.0073**	0.03	0.013	0.026	0.05	0.015	0.027
PZ7B	08/08/2012	< 0.005	0.0049	< 0.0045	0.019	0.018	0.0077	**0.013**	0.024	0.019	0.017	0.015	**0.0051**	< 0.047	< 0.0048	0.014	0.0086	0.0097	< 0.047
PZ7B	11/14/2012	0.0095	0.014	0.012	0.04	0.016	< 0.0038	**0.004**	0.0081	0.0061	0.0053	0.0063	< 0.0034	0.0099	0.0093	< 0.005	< 0.05	< 0.0086	0.01
PZ7B	02/27/2013	0.014	0.0077	0.014	0.042	0.0071	0.004	**0.0046**	0.01	0.008	0.007	0.0084	< 0.0032	0.012	0.0064	0.0066	0.042	< 0.0081	0.012
PZ7B	05/30/2013	< 0.047	0.0095	0.012	0.048	0.015	0.0067	**0.013**	0.015	0.012	0.019	0.021	< 0.0032	0.029	< 0.0048	0.0085	0.028	0.012	0.023
PZ7B	11/13/2013	< 0.005	0.0045	< 0.0045	0.012	0.014	< 0.0036	0.0033	0.0059	0.0054	0.0054	0.0072	< 0.0032	0.0066	< 0.0048	< 0.0047	0.011	< 0.0081	0.0057
PZ7B	05/20/2014	< 0.0063	< 0.0065	< 0.0069	0.027	0.012	0.0072	**0.015**	0.017	0.02	0.022	0.017	< 0.0059	0.022	< 0.0066	0.014	0.011	< 0.0084	0.028

Table 16. Groundwater Analytical Results – PAHs Exceeding Tap Water SLs
Wisconsin Public Service Corporation, Manitowoc
Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

		PAH																	
Sample Location	Sample Date	1-Methylnaphthalene (µg/l)	2-methylnaphthalene (µg/l)	Acenaphthene (µg/l)	Acenaphthylene (µg/l)	Anthracene (µg/l)	Benzo(a)anthracene (µg/l)	Benzo(a)pyrene (µg/l)	Benzo(b)fluoranthene (µg/l)	Benzo(ghi)perylene (µg/l)	Benzo(k)fluoranthene (µg/l)	Chrysene (µg/l)	Dibenz(a,h)anthracene (µg/l)	Fluoranthene (µg/l)	Fluorene (µg/l)	Indeno(1,2,3-cd)pyrene (µg/l)	Naphthalene (PAH) (µg/l)	Phenanthrene (µg/l)	Pyrene (µg/l)
	Tap Water SL for WI / IBS	**1.1**	**36**	**530**	**530**	**1,800**	**0.034**	**0.0034**	**0.034**	**120**	**0.34**	**3.4**	**0.0034**	**800**	**290**	**0.034**	**0.17**	**1,800**	**120**
PZ18TB	10/26/2009	< 0.047	< 0.047	0.041	0.018	0.025	0.032	**0.03**	**0.035**	0.026	0.03	0.037	**0.0086**	0.1	0.031	0.022	< 0.17	0.043	0.095
PZ18TB	01/27/2010	0.015	0.016	0.019	0.0057	< 0.0057	0.0057	**0.0087**	0.011	0.01	0.01	0.0097	< 0.0032	0.025	0.013	0.0086	0.099	0.02	0.021
PZ18TB	04/27/2010	< 0.0051	0.0072	0.0071	0.0041	< 0.0058	0.0037	**0.0051**	0.0064	0.0055	0.0055	0.0059	< 0.0033	0.013	0.0078	< 0.0048	0.017	0.016	0.014
PZ18TB	07/26/2010	< 0.005	0.0065	< 0.0045	< 0.0036	< 0.0057	< 0.0036	< 0.0029	< 0.0034	< 0.0048	< 0.0044	< 0.0035	< 0.0032	< 0.0044	< 0.0048	< 0.0047	0.0093	< 0.0081	< 0.0047
PZ18TB	11/03/2010	0.05	0.014	0.0092	< 0.0036	< 0.0057	0.0046	**0.0042**	0.005	< 0.0048	0.0062	0.0076	< 0.0032	0.015	0.0074	< 0.0047	0.059	0.014	0.013
PZ18TB	05/17/2011	0.016	0.018	0.018	< 0.0036	< 0.0057	< 0.0036	< 0.0029	< 0.0034	< 0.0048	< 0.0044	0.0042	< 0.0032	0.014	0.011	< 0.0047	0.023	0.025	0.012
PZ18TB	11/01/2011	< 0.005	< 0.0039	< 0.0045	< 0.0036	< 0.0057	< 0.0036	< 0.0029	< 0.0034	< 0.0048	< 0.0044	< 0.0035	< 0.0032	< 0.0044	< 0.0048	< 0.0047	0.0098	< 0.0081	< 0.0047
PZ18TB	08/07/2012	< 0.0053	0.0049	< 0.0048	0.0048	< 0.0061	0.019	**0.014**	0.019	0.014	0.017	0.02	**0.0095**	< 0.05	< 0.0051	0.013	0.009	< 0.0086	< 0.05
PZ18TB	11/13/2012	< 0.0054	0.0077	0.0057	< 0.0039	< 0.0061	< 0.0039	< 0.0031	< 0.0036	0.0063	0.0057	0.0057	**0.0038**	< 0.0047	< 0.0051	< 0.005	0.015	< 0.0087	< 0.0051
PZ18TB	02/26/2013	< 0.005	0.005	< 0.0045	< 0.0036	< 0.0057	0.0081	**0.0094**	0.012	0.009	0.01	0.012	0.0034	0.022	< 0.0048	0.0075	0.0072	0.0098	0.018
PZ18TB	05/29/2013	< 0.0052	0.0067	< 0.0048	< 0.0038	< 0.006	< 0.0038	< 0.003	< 0.0036	< 0.005	< 0.0046	< 0.0037	< 0.0034	0.0061	< 0.005	< 0.0049	0.016	< 0.0085	0.0056
PZ18TB	11/12/2013	< 0.005	0.0064	< 0.0045	< 0.0036	< 0.0057	< 0.0036	< 0.0029	< 0.0034	< 0.0048	< 0.0044	< 0.0035	< 0.0032	< 0.0044	< 0.0048	< 0.0047	0.022	< 0.0081	< 0.0047
PZ18TB	05/19/2014	< 0.0065	< 0.0067	< 0.0071	< 0.0066	< 0.007	0.014	**0.026**	**0.037**	0.03	0.034	0.036	< 0.0061	0.047	< 0.0068	0.021	0.023	0.02	0.037
PZ23B	10/27/2009	< 0.047	< 0.047	0.0077	0.0099	< 0.0057	0.025	**0.044**	**0.059**	0.044	0.037	0.043	**0.012**	0.059	0.005	**0.036**	0.15	0.017	0.046
PZ23B	01/26/2010	< 0.005	0.0068	0.005	< 0.0036	0.0073	0.02	**0.031**	**0.042**	0.04	0.042	0.036	**0.012**	0.045	< 0.0048	0.033	< 0.047	0.012	0.039
PZ23B	04/28/2010	< 0.005	0.0057	< 0.0046	< 0.0036	< 0.0058	0.0056	**0.012**	0.018	0.018	0.017	0.013	*0.0035*	0.019	< 0.0048	0.013	0.015	0.0083	0.015
PZ23B	07/27/2010	0.01	0.016	0.0061	0.0068	< 0.0057	0.0092	**0.021**	**0.041**	0.031	0.028	0.03	**0.0051**	0.034	0.0049	0.022	0.047	0.013	0.029
PZ23B	11/03/2010	0.03	0.013	0.011	0.006	< 0.0057	0.0072	**0.021**	0.029	0.026	0.032	0.027	**0.0052**	0.028	< 0.0048	0.018	0.033	0.011	0.025
PZ23B	05/18/2011	< 0.005	0.009	0.0048	0.0071	0.0058	0.022	**0.051**	**0.098**	0.083	0.076	0.058	**0.017**	0.067	< 0.0048	**0.063**	0.017	0.014	0.054
PZ23B	11/02/2011	< 0.005	0.0055	0.0068	0.0068	< 0.0057	0.0044	**0.0095**	0.018	0.014	0.011	0.013	< 0.0032	0.013	< 0.0048	0.011	0.015	< 0.0081	0.011
PZ23B	08/09/2012	< 0.005	< 0.0039	< 0.0045	0.0055	0.0093	0.024	**0.07**	**0.16**	0.13	0.11	0.084	**0.027**	0.095	< 0.0048	**0.1**	< 0.047	0.014	0.082
PZ23B	11/14/2012	< 0.0053	0.0062	< 0.0048	< 0.0038	< 0.0061	< 0.0038	**0.0055**	0.013	0.01	0.0094	0.0089	< 0.0034	0.007	< 0.0051	0.007	< 0.05	< 0.0086	0.0054
PZ23B	02/26/2013	0.0059	0.0057	< 0.0045	0.0061	0.0079	**0.035**	**0.11**	**0.23**	0.19	0.14	0.15	**0.043**	0.17	< 0.0048	**0.15**	0.079	0.027	0.14
PZ23B	05/30/2013	< 0.0051	< 0.0039	< 0.0046	< 0.0037	< 0.0058	0.0085	**0.034**	**0.056**	0.054	0.047	0.047	**0.0092**	0.043	< 0.0049	**0.039**	0.01	< 0.0082	0.037
PZ23B	11/13/2013	< 0.005	< 0.0039	< 0.0045	< 0.0036	< 0.0057	0.0041	**0.018**	0.032	0.033	0.028	0.026	**0.0056**	0.02	< 0.0048	0.024	0.011	< 0.0081	0.018
PZ23B	05/19/2014	< 0.0062	< 0.0064	< 0.0068	< 0.0063	0.0081	0.024	**0.064**	**0.097**	0.1	0.092	0.072	**0.016**	0.092	< 0.0066	**0.07**	0.0096	0.022	0.07
PZ24	10/27/2009	0.68	1	0.74	0.97	1.3	**0.78**	**0.85**	**0.83**	0.55	**0.49**	0.76	**0.14**	2	0.97	**0.46**	**7.7**	3.1	1.7
PZ24	01/26/2010	0.21	0.35	0.25	0.24	0.21	**0.054**	**0.03**	0.034	0.028	0.028	0.055	**0.0064**	0.34	0.26	0.022	**2.5**	0.59	0.3
PZ24	04/28/2010	0.0061	0.0079	< 0.0045	< 0.0036	< 0.0057	0.0039	**0.01**	0.014	0.012	0.013	0.014	< 0.0032	0.022	< 0.0048	0.0083	0.074	0.012	0.016
PZ24	07/27/2010	0.016	0.015	0.013	0.016	0.028	0.011	**0.0066**	0.011	0.0084	0.0091	0.015	< 0.0032	0.064	0.026	0.0058	0.12	0.047	0.055
PZ24	11/03/2010	0.0095	0.0095	0.0073	0.0093	0.037	0.015	**0.012**	0.013	0.014	0.02	0.029	**0.0047**	0.088	0.026	0.011	0.049	0.044	0.078
PZ24	05/18/2011	< 0.005	0.0065	< 0.0045	< 0.0036	0.019	0.018	**0.021**	0.029	0.032	0.022	0.023	**0.0076**	0.085	0.019	0.023	0.018	0.014	0.076
PZ24	11/02/2011	< 0.005	0.0049	0.0071	0.0063	0.014	0.0087	**0.0058**	0.008	0.009	0.0068	0.013	< 0.0032	0.048	0.017	0.006	0.017	< 0.0081	0.045
PZ24	08/09/2012	< 0.0053	0.0046	< 0.0048	0.0078	0.0073	0.011	**0.018**	0.027	0.026	0.023	0.018	**0.0057**	0.023	< 0.0051	0.019	< 0.05	0.0093	0.024
PZ24	11/14/2012	0.015	0.0084	0.012	0.0046	< 0.0061	< 0.0038	**0.0046**	0.0061	0.0064	0.0065	0.0062	< 0.0034	0.0077	< 0.0051	< 0.005	0.089	< 0.0086	0.0061
PZ24	02/26/2013	0.031	0.023	0.012	0.0058	< 0.0057	0.0098	**0.017**	0.034	0.033	0.029	0.027	**0.016**	0.018	< 0.0048	0.029	**0.41**	< 0.0081	0.015
PZ24	05/30/2013	0.0062	0.0097	< 0.0045	< 0.0036	0.009	0.0075	**0.0085**	0.011	0.012	0.013	0.019	< 0.0032	0.035	0.0059	0.0079	0.051	< 0.0081	0.033
PZ24	11/13/2013	< 0.005	0.0047	< 0.0045	< 0.0036	0.006	0.0041	< 0.0029	0.0038	< 0.0048	0.0049	0.01	< 0.0032	0.024	< 0.0048	< 0.0047	0.024	< 0.0081	0.023
PZ24	05/19/2014	< 0.0062	< 0.0064	< 0.0068	< 0.0063	0.007	0.012	**0.027**	**0.039**	0.037	0.039	0.032	**0.0062**	0.042	< 0.0066	0.024	< 0.0081	0.013	0.036

Table 16. Groundwater Analytical Results – PAHs Exceeding Tap Water SLs
Wisconsin Public Service Corporation, Manitowoc
Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

		PAH																	
Sample Location	Sample Date	1-Methylnaphthalene (µg/l)	2-methylnaphthalene (µg/l)	Acenaphthene (µg/l)	Acenaphthylene (µg/l)	Anthracene (µg/l)	Benzo(a)anthracene (µg/l)	Benzo(a)pyrene (µg/l)	Benzo(b)fluoranthene (µg/l)	Benzo(ghi)perylene (µg/l)	Benzo(k)fluoranthene (µg/l)	Chrysene (µg/l)	Dibenz(a,h)anthracene (µg/l)	Fluoranthene (µg/l)	Fluorene (µg/l)	Indeno(1,2,3-cd)pyrene (µg/l)	Naphthalene (PAH) (µg/l)	Phenanthrene (µg/l)	Pyrene (µg/l)
	Tap Water SL for WI / IBS	**1.1**	**36**	**530**	**530**	**1,800**	**0.034**	**0.0034**	**0.034**	**120**	**0.34**	**3.4**	**0.0034**	**800**	**290**	**0.034**	**0.17**	**1,800**	**120**
PZ25	10/27/2009	**132**	**185**	138	55.9	25.5	**8.8**	**3.9**	**4.3**	< 4.8	< 4.4	**6**	**0.48**	39.3	87.6	< 4.7	**1,570**	120	28.1
PZ25	01/27/2010	< 0.1	< 0.077	6.3	4.4	1.1	**0.26**	**0.089**	**0.1**	< 0.096	< 0.087	0.21	< 0.064	7.3	< 0.095	< 0.094	< 0.94	< 0.16	4.7
PZ25	04/28/2010	0.057	< 0.039	1.6	0.7	0.58	**0.21**	**0.23**	**0.29**	0.068	0.23	0.29	< 0.032	2.8	0.092	**0.058**	0.14	< 0.081	4.8
PZ25	07/27/2010	**16.2**	13.1	14.1	17.5	7.4	**0.36**	**0.066**	**0.062**	0.022	0.083	0.2	**0.0042**	5.6	15.3	0.018	**131**	26.1	4.3
PZ25	11/03/2010	**7**	1.4	7.1	6.5	3	**0.59**	**0.35**	**0.28**	0.16	**0.38**	0.56	< 0.064	4	6.2	**0.12**	**43.1**	10.4	3
PZ25	05/18/2011	0.012	0.0092	0.0084	0.13	0.14	**0.14**	**0.19**	**0.25**	0.1	0.12	0.17	**0.03**	0.2	0.018	**0.088**	0.026	0.088	0.16
PZ25	11/02/2011	1	< 0.0039	12.2	10.2	0.85	**0.3**	**0.1**	**0.11**	0.032	0.087	0.2	**0.01**	5.3	4.8	0.028	**1.3**	0.058	3.9
PZ25	08/09/2012	0.064	0.054	4.6	3.6	0.91	**0.2**	**0.043**	**0.054**	0.015	0.044	0.13	**0.0046**	3.5	3.7	0.012	**0.26**	0.44	2.3
PZ25	11/14/2012	**15.5**	< 0.41	18.8	8.8	10	< 0.38	< 0.3	< 0.36	< 0.51	< 0.46	< 0.37	< 0.34	11.3	16.1	< 0.5	< 5	45	7.9
PZ25	02/27/2013	**16.1**	0.016	20.7	9.6	7.1	**0.35**	**0.071**	**0.069**	0.018	0.1	0.29	**0.0084**	10.4	18.5	0.02	**0.86**	32.5	7.2
PZ25	05/30/2013	0.62	0.022	4.6	0.65	0.26	**0.065**	**0.055**	**0.059**	0.024	0.041	0.085	**0.0052**	1.1	1.3	0.02	**0.35**	0.091	0.63
PZ25	11/13/2013	**2.7**	< 0.039	7	1.1	1.3	**0.12**	**0.034**	< 0.034	< 0.048	0.053	0.16	< 0.032	2.9	4.3	< 0.047	**0.36**	3	2.1
PZ25	05/20/2014	< 0.0063	< 0.0065	< 0.0069	0.05	0.056	**0.035**	**0.074**	**0.071**	0.045	0.053	0.069	**0.011**	0.078	< 0.0066	0.034	< 0.0082	0.025	0.057
PZ26	10/27/2009	< 0.047	< 0.047	0.48	0.37	0.014	0.0063	**0.0037**	0.005	< 0.0048	< 0.0044	0.0065	< 0.0032	0.028	0.051	< 0.0047	**0.67**	0.044	0.023
PZ26	01/27/2010	0.17	0.21	0.38	0.099	0.067	0.029	**0.043**	**0.054**	0.047	0.05	0.051	**0.0098**	0.088	0.22	**0.038**	**1.4**	0.28	0.084
PZ26	04/28/2010	0.024	0.028	0.23	0.08	0.011	**0.037**	**0.1**	**0.19**	0.16	0.13	0.13	**0.029**	0.18	0.012	**0.12**	**0.44**	0.019	0.15
PZ26	07/27/2010	0.009	0.0043	0.27	0.17	0.01	0.019	**0.049**	**0.087**	0.07	0.063	0.059	**0.013**	0.056	0.021	**0.05**	0.027	0.015	0.044
PZ26	11/03/2010	0.021	0.011	0.24	0.16	0.029	**0.06**	**0.16**	**0.27**	0.22	0.2	0.18	**0.045**	0.21	0.019	**0.16**	0.12	0.053	0.18
PZ26	05/18/2011	0.013	0.015	0.27	0.18	0.0091	0.024	**0.079**	**0.11**	0.12	0.13	0.092	**0.024**	0.12	0.024	**0.082**	0.037	0.021	0.089
PZ26	11/02/2011	< 0.005	0.007	0.0058	0.011	0.013	0.031	**0.083**	**0.14**	0.13	0.1	0.094	**0.027**	0.093	< 0.0048	**0.095**	0.019	0.015	0.083
PZ26	08/09/2012	0.0055	< 0.0039	0.17	0.13	< 0.0057	0.0038	**0.005**	0.0099	0.0088	0.0079	0.0064	< 0.0032	0.012	0.017	0.0062	< 0.047	< 0.0081	0.0091
PZ26	11/14/2012	0.098	0.11	0.19	0.17	0.0071	0.005	**0.011**	0.018	0.019	0.018	0.012	**0.0036**	0.017	0.029	0.012	**1.5**	0.016	0.013
PZ26	02/27/2013	0.0061	0.004	0.2	0.19	0.0065	0.021	**0.054**	**0.092**	0.087	0.058	0.061	**0.018**	0.065	0.01	**0.066**	0.02	0.011	0.055
PZ26	05/30/2013	0.0055	0.0052	0.16	0.15	0.032	**0.16**	**0.49**	**0.84**	0.74	**0.66**	0.6	**0.16**	0.7	0.013	**0.57**	0.021	0.076	0.54
PZ26	11/13/2013	< 0.005	0.0047	0.075	0.06	< 0.0057	0.0054	**0.017**	0.031	0.03	0.025	0.025	**0.0045**	0.024	< 0.0048	0.02	0.014	< 0.0081	0.021
PZ26	05/20/2014	< 0.0062	< 0.0064	< 0.0068	< 0.0063	< 0.0067	0.02	**0.066**	**0.11**	0.11	0.09	0.073	**0.02**	0.077	< 0.0066	**0.077**	< 0.0081	0.01	0.062
	Total Number of Samples Analyzed:	389	422	422	422	422	422	422	422	422	422	422	422	422	422	422	422	422	422
	Number of Samples with Detections above reported limit:	185	255	189	287	244	297	315	324	304	312	333	231	327	163	286	296	263	322
	Min:	0.0052	0.0039	0.0048	0.0038	0.0057	0.0037	0.0032	0.0037	0.0038	0.0045	0.0035	0.0032	0.0044	0.0049	0.0052	0.0052	0.0083	0.0048
	Max:	2,360,000	3,700,000	123,000	1,340,000	597,000	118,000	130,000	124,000	9,200	170,000	366,000	2,030	688,000	465,000	4,000	12,600,000	1,160,000	704,000
	Tap Water SL for WI / IBS	1.1	36	530	530	1,800	0.034	0.0034	0.034	120	0.34	3.4	0.0034	800	290	0.034	0.17	1,800	120
	Number of Samples that Exceed SL:	**45**	**15**	**5**	**5**	**5**	**155**	**310**	**209**	**3**	**88**	**32**	**229**	**5**	**5**	**178**	**70**	**5**	**5**

[O:ECK 8/13/14]

NOTES:
BOLD Value exceeds Tap Water SL
< Concentration is less than reported level
-- Analysis not performed
NS No Standard
SL Screening Level
µg/L microgram per liter
SLs used on this table were presented in the Multi-Site Risk Assessment Framework Addendum Revision 3 (Exponent, July 2014).
* MW14 was damaged and not sampled; however, based on previous sampling events, the analytical groundwater results would be similar to the most recent sampling event (November 2013).

Table 17. Groundwater Analytical Results Exceeding GW Vapor SLs
Wisconsin Public Service Corporation, Manitowoc
Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

		VOC							PAH
Sample Location	Sample Date	1,2,4-Trimethylbenzene (µg/l)	1,3,5-Trimethylbenzene (µg/l)	Benzene (µg/l)	Ethylbenzene (µg/l)	Xylene, o (µg/l)	Xylenes, m + p (µg/l)	Xylenes, Total (µg/l)	Naphthalene (PAH) (µg/l)
	Residential GW Vapor SL for WI / IBS	*29*	*20*	*1.6*	*3.5*	*490*	*360*	*490*	*4.6*
	Industrial GW Vapor SL for WI / IBS	**120**	**86**	**6.9**	**15**	**2,100**	**1,500**	**2,100**	**20**
	Value exceeds Residential or Industrial SL								
	Detected below SL								
	Not detected above reported limit								
	Not analyzed								
MW1	03/27/2001	--	--	< 1	< 1	--	--	< 3	< 5
MW1	06/05/2002	--	--	< 0.45	< 0.82	--	--	< 0.77	< 0.54
MW1	11/19/2003	--	--	--	--	--	--	--	< 0.48
MW1	02/25/2004	--	--	--	--	--	--	--	2.3
MW1	05/24/2004	--	--	< 0.14	< 0.4	--	--	< 0.74	< 0.45
MW1	05/18/2005	--	--	< 0.41	< 0.54	--	--	< 1.8	< 0.89
MW1	11/28/2005	--	--	--	--	--	--	--	--
MW1	05/30/2006	< 0.39	< 0.4	0.21	< 0.4	< 0.36	< 0.74	< 0.74	< 1.2
MW1	05/16/2007	3.1	0.64	*4.7*	1.3	2.8	4.4	7.2	1.7
MW1	11/15/2007	--	--	--	--	--	--	--	--
MW1	10/27/2009	< 0.39	< 0.4	< 0.23	< 0.4	< 0.36	< 0.74	< 0.74	< 0.097
MW1	04/27/2010	< 0.97	< 0.83	< 0.41	< 0.54	< 0.83	< 1.8	< 2.6	0.0096
MW1	07/27/2010	< 0.97	< 0.83	< 0.41	< 0.54	< 0.83	< 1.8	< 1.8	0.22
MW1	11/03/2010	< 0.97	< 0.83	< 0.41	< 0.54	< 0.83	< 1.8	--	0.041
MW1	05/18/2011	< 0.43	< 0.4	< 0.39	< 0.41	< 0.38	< 0.87	--	0.021
MW1	11/02/2011	< 0.43	< 0.4	< 0.39	< 0.41	--	--	< 1.3	0.036
MW1	08/08/2012	--	--	< 0.39	< 0.41	--	--	< 1.3	0.011
MW1	11/13/2012	< 0.97	< 0.83	< 0.41	< 0.54	< 0.83	< 1.8	--	0.017
MW1	02/25/2013	< 0.97	< 0.83	< 0.41	< 0.54	< 0.83	< 1.8	--	0.061
MW1	05/29/2013	< 0.57	< 2.5	< 0.5	< 0.5	< 0.5	< 0.82	--	0.15
MW1	11/13/2013	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.82	--	0.011
MW1	05/19/2014	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 1	--	0.014
MW2	04/11/2000	--	--	*4.6*	*5.5*	--	--	< 3	< 1
MW2	03/27/2001	--	--	1.4	**40**	--	--	3.6	< 5
MW2	06/05/2002	--	--	0.63	**18**	--	--	1.6	0.18
MW2	05/15/2003	--	--	0.79	**19**	--	--	5.2	0.19
MW2	02/25/2004	--	--	--	--	--	--	--	0.2
MW2	05/24/2004	--	--	0.64	**40**	--	--	7.3	0.19
MW2	05/18/2005	--	--	< 0.41	**38**	--	--	2.6	0.71
MW2	11/28/2005	--	--	--	--	--	--	--	--
MW2	05/30/2006	5.3	< 0.4	1	*7.8*	2	1.3	2.3	< 0.5
MW2	05/16/2007	1.2	< 0.4	*2.3*	*4.8*	1.2	0.77	1.79	0.12
MW2	11/15/2007	--	--	--	--	--	--	--	--
MW2	10/27/2009	1.3	< 0.4	*5.3*	*4.8*	2	1.7	3.7	< 0.48
MW2	01/27/2010	0.82	< 0.4	*4.3*	3.4	1.2	1.2	2.4	0.59
MW2	04/27/2010	< 0.97	< 0.83	1.1	0.55	< 0.83	< 1.8	< 2.6	0.052
MW2	07/26/2010	< 0.97	< 0.83	*4*	2.4	1	< 1.8	< 1.8	0.11
MW2	11/03/2010	2.2	< 0.83	*6.2*	*4.4*	2.8	3.2	--	0.29
MW2	05/18/2011	< 0.43	< 0.4	< 0.39	< 0.41	< 0.38	< 0.87	--	0.17
MW2	11/02/2011	< 0.43	< 0.4	< 0.39	< 0.41	--	--	< 1.3	0.15
MW2	08/07/2012	--	--	0.41	< 0.41	--	--	< 1.3	0.067
MW2	11/13/2012	< 0.97	< 0.83	0.78	0.63	< 0.83	< 1.8	--	< 0.51
MW2	02/26/2013	< 0.97	< 0.83	< 0.41	< 0.54	< 0.83	< 1.8	--	0.053
MW2	05/29/2013	< 0.57	< 2.5	0.51	0.62	0.94	0.94	--	< 0.48
MW2	11/12/2013	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.82	--	< 0.48
MW2	05/19/2014	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 1	--	0.037

Table 17. Groundwater Analytical Results Exceeding GW Vapor SLs
Wisconsin Public Service Corporation, Manitowoc
Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

		VOC							PAH
Sample Location	Sample Date	1,2,4-Trimethylbenzene (µg/l)	1,3,5-Trimethylbenzene (µg/l)	Benzene (µg/l)	Ethylbenzene (µg/l)	Xylene, o (µg/l)	Xylenes, m + p (µg/l)	Xylenes, Total (µg/l)	Naphthalene (PAH) (µg/l)
	Residential GW Vapor SL for WI / IBS	*29*	*20*	*1.6*	*3.5*	*490*	*360*	*490*	*4.6*
	Industrial GW Vapor SL for WI / IBS	**120**	**86**	**6.9**	**15**	**2,100**	**1,500**	**2,100**	**20**
MW5	06/05/2002	--	--	< 0.45	< 0.82	--	--	< 0.77	< 0.4
MW5	05/15/2003	--	--	< 0.3	< 0.6	--	--	< 1.2	0.072
MW5	02/25/2004	--	--	--	--	--	--	--	0.28
MW5	05/24/2004	--	--	< 0.14	< 0.4	--	--	< 0.74	0.03
MW5	05/18/2005	--	--	< 0.41	< 0.54	--	--	< 1.8	< 9.5
MW5	11/28/2005	--	--	--	--	--	--	--	--
MW5	05/30/2006	< 0.39	< 0.4	0.44	< 0.4	< 0.36	< 0.74	< 0.74	< 6.2
MW5	05/16/2007	< 0.39	< 0.4	< 0.14	< 0.4	< 0.36	< 0.74	< 0.74	< 6.2
MW5	11/15/2007	--	--	--	--	--	--	--	--
MW5	10/27/2009	< 0.39	< 0.4	< 0.23	< 0.4	< 0.36	< 0.74	< 0.74	< 0.48
MW5	01/27/2010	< 0.43	< 0.4	< 0.39	< 0.41	< 0.38	< 0.87	< 0.87	< 0.047
MW5	04/27/2010	< 0.97	< 0.83	< 0.41	< 0.54	< 0.83	< 1.8	< 2.6	0.019
MW5	07/26/2010	< 0.97	< 0.83	< 0.41	< 0.54	< 0.83	< 1.8	< 1.8	0.017
MW5	11/03/2010	< 0.97	< 0.83	< 0.41	< 0.54	< 0.83	< 1.8	--	0.031
MW5	05/18/2011	< 0.43	< 0.4	< 0.39	< 0.41	< 0.38	< 0.87	--	0.031
MW5	11/02/2011	< 0.43	< 0.4	< 0.39	< 0.41	--	--	< 1.3	0.019
MW5	08/07/2012	--	--	< 0.39	< 0.41	--	--	< 1.3	0.033
MW5	11/13/2012	< 0.97	< 0.83	< 0.41	< 0.54	< 0.83	< 1.8	--	0.02
MW5	02/26/2013	< 0.97	< 0.83	< 0.41	< 0.54	< 0.83	< 1.8	--	0.24
MW5	05/29/2013	< 0.57	< 2.5	< 0.5	< 0.5	< 0.5	< 0.82	--	0.024
MW5	11/12/2013	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.82	--	0.011
MW5	05/19/2014	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 1	--	0.026
MW6	04/11/2000	--	--	< 1	< 1	--	--	< 3	< 1
MW6	03/27/2001	--	--	< 1	*4.1*	--	--	9.9	< 5
MW6	10/25/2001	--	--	< 1	< 1	--	--	< 3	--
MW6	06/05/2002	--	--	< 0.45	< 0.82	--	--	< 0.77	< 0.027
MW6	05/15/2003	--	--	< 0.3	< 0.6	--	--	< 1.2	0.051
MW6	02/25/2004	--	--	--	--	--	--	--	0.09
MW6	08/08/2012	--	--	< 0.39	< 0.41	--	--	< 1.3	0.016
MW6	11/14/2012	< 0.97	< 0.83	< 0.41	< 0.54	< 0.83	< 1.8	--	< 0.051
MW6	02/26/2013	--	--	--	--	--	--	--	--
MW6	05/29/2013	--	--	--	--	--	--	--	--
MW6	11/13/2013	--	--	--	--	--	--	--	--
MW7	04/11/2000	--	--	< 1	< 1	--	--	< 3	< 1
MW7	03/27/2001	--	--	< 1	< 1	--	--	< 3	< 5
MW7	06/05/2002	--	--	< 0.45	< 0.82	--	--	< 0.77	0.029
MW7	05/15/2003	--	--	< 0.3	< 0.6	--	--	< 1.2	0.026
MW7	10/26/2009	< 0.39	< 0.4	< 0.23	< 0.4	< 0.36	< 0.74	< 0.74	< 0.17
MW7	01/27/2010	< 0.43	< 0.4	< 0.39	< 0.41	< 0.38	< 0.87	< 0.87	< 0.049
MW7	01/27/2010	--	--	--	--	--	--	--	--
MW7	04/27/2010	< 0.97	< 0.83	< 0.41	< 0.54	< 0.83	< 1.8	< 2.6	0.017
MW7	07/26/2010	< 0.97	< 0.83	< 0.41	< 0.54	< 0.83	< 1.8	< 1.8	0.011
MW7	11/02/2010	< 0.97	< 0.83	< 0.41	< 0.54	< 0.83	< 1.8	--	0.01
MW7	05/17/2011	< 0.43	< 0.4	< 0.39	< 0.41	< 0.38	< 0.87	--	0.013
MW7	11/01/2011	< 0.43	< 0.4	< 0.39	< 0.41	--	--	< 1.3	0.021
MW7	08/08/2012	--	--	< 0.39	< 0.41	--	--	< 1.3	< 0.05
MW7	11/14/2012	< 0.97	< 0.83	< 0.41	< 0.54	< 0.83	< 1.8	--	< 0.05
MW7	02/27/2013	< 0.97	< 0.83	< 0.41	< 0.54	< 0.83	< 1.8	--	0.042
MW7	05/30/2013	< 0.57	< 2.5	< 0.5	< 0.5	< 0.5	< 0.82	--	0.041
MW7	11/13/2013	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.82	--	0.013
MW7	05/20/2014	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 1	--	< 0.0082

Table 17. Groundwater Analytical Results Exceeding GW Vapor SLs
Wisconsin Public Service Corporation, Manitowoc
Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

		VOC							PAH
Sample Location	Sample Date	1,2,4-Trimethylbenzene (µg/l)	1,3,5-Trimethylbenzene (µg/l)	Benzene (µg/l)	Ethylbenzene (µg/l)	Xylene, o (µg/l)	Xylenes, m + p (µg/l)	Xylenes, Total (µg/l)	Naphthalene (PAH) (µg/l)
	Residential GW Vapor SL for WI / IBS	*29*	*20*	*1.6*	*3.5*	*490*	*360*	*490*	*4.6*
	Industrial GW Vapor SL for WI / IBS	**120**	**86**	**6.9**	**15**	**2,100**	**1,500**	**2,100**	**20**
MW8	04/11/2000	--	--	< 1	< 1	--	--	< 3	< 1
MW8	03/27/2001	--	--	< 1	< 1	--	--	< 3	< 5
MW8	06/05/2002	--	--	< 0.45	< 0.82	--	--	< 0.77	< 0.67
MW8	05/15/2003	--	--	< 0.3	< 0.6	--	--	< 1.2	< 0.24
MW8	05/24/2004	--	--	< 0.14	< 0.4	--	--	< 0.74	< 0.45
MW8	05/18/2005	--	--	< 0.41	< 0.54	--	--	< 1.8	< 0.89
MW8	11/28/2005	--	--	--	--	--	--	--	--
MW8	05/30/2006	< 0.39	< 0.4	< 0.14	< 0.4	< 0.36	< 0.74	< 0.74	< 0.5
MW8	05/16/2007	< 0.39	< 0.4	< 0.14	< 0.4	< 0.36	< 0.74	< 0.74	0.071
MW8	11/15/2007	--	--	--	--	--	--	--	--
MW8	10/26/2009	< 0.39	< 0.4	< 0.23	< 0.4	< 0.36	< 0.74	< 0.74	0.57
MW8	01/27/2010	< 0.43	< 0.4	< 0.39	< 0.41	< 0.38	< 0.87	< 0.87	< 0.047
MW8	04/27/2010	< 0.97	< 0.83	< 0.41	< 0.54	< 0.83	< 1.8	< 2.6	0.015
MW8	07/26/2010	< 0.97	< 0.83	< 0.41	< 0.54	< 0.83	< 1.8	< 1.8	0.012
MW8	11/02/2010	< 0.97	< 0.83	< 0.41	< 0.54	< 0.83	< 1.8	--	0.012
MW8	05/17/2011	< 0.43	< 0.4	< 0.39	< 0.41	< 0.38	< 0.87	--	0.0081
MW8	11/01/2011	< 0.43	< 0.4	< 0.39	< 0.41	--	--	< 1.3	0.022
MW8	08/08/2012	--	--	< 0.39	< 0.41	--	--	< 1.3	0.014
MW8	11/13/2012	< 0.97	< 0.83	< 0.41	< 0.54	< 0.83	< 1.8	--	< 0.05
MW8	02/26/2013	< 0.97	< 0.83	< 0.41	< 0.54	< 0.83	< 1.8	--	0.1
MW8	05/30/2013	< 0.57	< 2.5	< 0.5	< 0.5	< 0.5	< 0.82	--	0.039
MW8	11/12/2013	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.82	--	0.008
MW8	05/20/2014	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 1	--	< 0.0082
MW9	04/11/2000	--	--	*3.1*	< 1	--	--	< 3	< 1
MW9	03/27/2001	--	--	**8.8**	< 1	--	--	< 3	< 5
MW9	06/05/2002	--	--	0.94	< 0.82	--	--	< 0.77	0.12
MW9	05/15/2003	--	--	1.3	< 0.6	--	--	< 1.2	< 2.4
MW9	02/25/2004	--	--	--	--	--	--	--	< 0.12
MW9	05/24/2004	--	--	0.3	< 0.4	--	--	< 0.74	0.35
MW9	05/18/2005	--	--	< 0.41	< 0.54	--	--	< 1.8	< 0.18
MW9	11/28/2005	--	--	--	--	--	--	--	--
MW9	05/30/2006	< 0.39	< 0.4	< 0.14	< 0.4	< 0.36	< 0.74	< 0.74	0.38
MW9	05/16/2007	0.65	< 0.4	< 0.14	< 0.4	< 0.36	< 0.74	< 0.74	0.25
MW9	11/15/2007	--	--	--	--	--	--	--	--
MW9	10/26/2009	0.58	< 0.4	< 0.23	< 0.4	< 0.36	< 0.74	< 0.74	< 0.17
MW9	01/27/2010	< 0.43	< 0.4	< 0.39	< 0.41	< 0.38	< 0.87	< 0.87	< 0.047
MW9	04/27/2010	< 0.97	< 0.83	< 0.41	< 0.54	< 0.83	< 1.8	< 2.6	0.0089
MW9	05/20/2014	--	--	--	--	--	--	--	--

Table 17. Groundwater Analytical Results Exceeding GW Vapor SLs
Wisconsin Public Service Corporation, Manitowoc
Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

		VOC							PAH
Sample Location	Sample Date	1,2,4-Trimethylbenzene (µg/l)	1,3,5-Trimethylbenzene (µg/l)	Benzene (µg/l)	Ethylbenzene (µg/l)	Xylene, o (µg/l)	Xylenes, m + p (µg/l)	Xylenes, Total (µg/l)	Naphthalene (PAH) (µg/l)
	Residential GW Vapor SL for WI / IBS	*29*	*20*	*1.6*	*3.5*	*490*	*360*	*490*	*4.6*
	Industrial GW Vapor SL for WI / IBS	**120**	**86**	**6.9**	**15**	**2,100**	**1,500**	**2,100**	**20**
MW10	04/11/2000	--	--	< 1	< 1	--	--	< 3	< 1
MW10	03/27/2001	--	--	< 1	< 1	--	--	< 3	< 5
MW10	06/05/2002	--	--	< 0.45	< 0.82	--	--	< 0.77	0.09
MW10	05/15/2003	--	--	< 0.3	< 0.6	--	--	< 1.2	0.28
MW10	02/25/2004	--	--	--	--	--	--	--	0.39
MW10	05/24/2004	--	--	< 0.14	< 0.4	--	--	< 0.74	0.47
MW10	05/18/2005	--	--	< 0.41	< 0.54	--	--	< 1.8	0.25
MW10	11/28/2005	--	--	--	--	--	--	--	--
MW10	05/30/2006	1.3	< 0.4	< 0.14	< 0.4	< 0.36	< 0.74	< 0.74	0.087
MW10	05/16/2007	17	< 0.4	< 0.14	< 0.4	0.49	< 0.74	0.49	0.13
MW10	11/15/2007	--	--	--	--	--	--	--	--
MW10	10/26/2009	10.8	< 0.4	< 0.23	< 0.4	0.48	< 0.74	0.48	< 0.17
MW10	01/27/2010	5	< 0.4	< 0.39	< 0.41	< 0.38	< 0.87	< 0.87	0.071
MW10	04/27/2010	21	< 0.83	< 0.41	< 0.54	< 0.83	< 1.8	< 2.6	0.46
MW10	07/26/2010	22.9	< 0.83	< 0.41	< 0.54	< 0.83	< 1.8	< 1.8	0.14
MW10	11/02/2010	14.1	< 0.83	< 0.41	< 0.54	< 0.83	< 1.8	--	0.11
MW10	05/17/2011	10	< 0.4	< 0.39	< 0.41	< 0.38	< 0.87	--	0.038
MW10	11/01/2011	9.6	< 0.4	< 0.39	< 0.41	--	--	< 1.3	0.12
MW10	08/09/2012	--	--	< 0.39	< 0.41	--	--	< 1.3	0.12
MW10	11/13/2012	4.6	< 0.83	< 0.41	< 0.54	< 0.83	< 1.8	--	< 0.051
MW10	02/27/2013	5.7	< 0.83	< 0.41	< 0.54	< 0.83	< 1.8	--	0.31
MW10	05/30/2013	4.7	< 2.5	**9.8**	< 0.5	< 0.5	< 0.82	--	0.071
MW10	11/13/2013	13.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.82	--	0.17
MW10	05/20/2014	14.7	< 0.5	< 0.5	< 0.5	< 0.5	< 1	--	0.051
MW11	04/11/2000	--	--	< 1	< 1	--	--	< 3	< 1
MW11	03/27/2001	--	--	< 1	< 1	--	--	< 3	< 5
MW11	06/05/2002	--	--	< 0.45	< 0.82	--	--	< 0.77	0.048
MW11	05/15/2003	--	--	< 0.3	< 0.6	--	--	< 1.2	0.046
MW11	02/25/2004	--	--	--	--	--	--	--	0.087
MW11	05/24/2004	--	--	< 0.14	< 0.4	--	--	< 0.74	0.033
MW11	05/18/2005	--	--	--	--	--	--	--	--
MW11	11/28/2005	--	--	--	--	--	--	--	--
MW11	05/30/2006	--	--	--	--	--	--	--	--
MW12	04/11/2000	--	--	< 1	< 1	--	--	< 3	< 1
MW12	03/27/2001	--	--	< 1	< 1	--	--	< 3	< 5
MW12	06/05/2002	--	--	< 0.45	< 0.82	--	--	< 0.77	0.056
MW12	05/15/2003	--	--	--	--	--	--	--	--
MW12	02/25/2004	--	--	--	--	--	--	--	--
MW12	05/24/2004	--	--	< 0.14	< 0.4	--	--	< 0.74	< 0.45
MW12	05/18/2005	--	--	< 0.41	< 0.54	--	--	< 1.8	< 0.89
MW12	11/28/2005	--	--	--	--	--	--	--	--
MW12	05/30/2006	--	--	--	--	--	--	--	--
MW12	06/20/2006	< 0.39	< 0.4	< 0.14	< 0.4	< 0.36	< 0.74	< 0.74	< 0.99
MW12	05/16/2007	< 0.39	< 0.4	< 0.14	< 0.4	< 0.36	< 0.74	< 0.74	< 0.25
MW12	11/15/2007	--	--	--	--	--	--	--	--
MW12	10/27/2009	< 0.39	< 0.4	< 0.23	< 0.4	< 0.36	< 0.74	< 0.74	< 1.9
MW12	01/26/2010	< 0.43	< 0.4	< 0.39	< 0.41	< 0.38	< 0.87	< 0.87	< 0.047
MW12	04/27/2010	< 0.97	< 0.83	< 0.41	< 0.54	< 0.83	< 1.8	< 2.6	0.067
MW12	07/27/2010	< 0.97	< 0.83	< 0.41	< 0.54	< 0.83	< 1.8	< 1.8	< 0.019
MW12	11/03/2010	< 0.97	< 0.83	< 0.41	< 0.54	< 0.83	< 1.8	--	0.11
MW12	05/17/2011	< 0.43	< 0.4	< 0.39	< 0.41	< 0.38	< 0.87	--	0.013
MW12	11/01/2011	< 0.43	< 0.4	< 0.39	< 0.41	--	--	< 1.3	0.085
MW12	08/08/2012	--	--	< 0.39	< 0.41	--	--	< 1.3	--
MW12	11/14/2012	< 0.97	< 0.83	< 0.41	< 0.54	< 0.83	< 1.8	--	< 0.05
MW12	02/26/2013	< 0.97	< 0.83	< 0.41	< 0.54	< 0.83	< 1.8	--	< 0.097
MW12	05/29/2013	< 0.57	< 2.5	< 0.5	< 0.5	< 0.5	< 0.82	--	0.024
MW12	11/12/2013	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.82	--	< 0.039
MW12	05/19/2014	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 1	--	0.0091

Table 17. Groundwater Analytical Results Exceeding GW Vapor SLs
Wisconsin Public Service Corporation, Manitowoc
Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

		VOC							PAH
Sample Location	Sample Date	1,2,4-Trimethylbenzene (µg/l)	1,3,5-Trimethylbenzene (µg/l)	Benzene (µg/l)	Ethylbenzene (µg/l)	Xylene, o (µg/l)	Xylenes, m + p (µg/l)	Xylenes, Total (µg/l)	Naphthalene (PAH) (µg/l)
	Residential GW Vapor SL for WI / IBS	*29*	*20*	*1.6*	*3.5*	*490*	*360*	*490*	*4.6*
	Industrial GW Vapor SL for WI / IBS	**120**	**86**	**6.9**	**15**	**2,100**	**1,500**	**2,100**	**20**
MW12D	04/11/2000	--	--	< 1	< 1	--	--	< 3	< 1
MW12D	03/27/2001	--	--	< 1	< 1	--	--	< 3	< 5
MW12D	06/05/2002	--	--	< 0.45	< 0.82	--	--	< 0.77	< 0.16
MW12D	05/15/2003	--	--	< 0.3	< 0.6	--	--	< 1.2	0.065
MW12D	02/25/2004	--	--	--	--	--	--	--	--
MW12D	05/24/2004	--	--	< 0.14	< 0.4	--	--	< 0.74	< 0.45
MW12D	05/18/2005	--	--	*2.3*	< 0.54	--	--	< 1.8	0.5
MW12D	11/28/2005	--	--	--	--	--	--	--	--
MW12D	05/30/2006	< 0.39	< 0.4	< 0.14	< 0.4	< 0.36	< 0.74	< 0.74	0.024
MW12D	05/16/2007	< 0.39	< 0.4	< 0.14	< 0.4	< 0.36	< 0.74	< 0.74	0.17
MW12D	11/15/2007	--	--	--	--	--	--	--	--
MW12D	10/26/2009	< 0.39	< 0.4	0.75	< 0.4	< 0.36	< 0.74	< 0.74	< 0.17
MW12D	01/26/2010	< 0.43	< 0.4	< 0.39	< 0.41	< 0.38	< 0.87	< 0.87	0.092
MW12D	04/27/2010	< 0.97	< 0.83	< 0.41	< 0.54	< 0.83	< 1.8	< 2.6	0.17
MW12D	07/27/2010	< 0.97	< 0.83	*3.3*	< 0.54	< 0.83	< 1.8	< 1.8	0.073
MW12D	11/03/2010	< 0.97	< 0.83	< 0.41	< 0.54	< 0.83	< 1.8	--	0.019
MW12D	05/17/2011	< 0.43	< 0.4	< 0.39	< 0.41	< 0.38	< 0.87	--	0.019
MW12D	11/01/2011	< 0.43	< 0.4	< 0.39	< 0.41	--	--	< 1.3	0.015
MW12D	08/08/2012	--	--	< 0.39	< 0.41	--	--	< 1.3	0.0089
MW12D	11/14/2012	< 0.97	< 0.83	< 0.41	< 0.54	< 0.83	< 1.8	--	< 0.051
MW12D	02/26/2013	< 0.97	< 0.83	< 0.41	< 0.54	< 0.83	< 1.8	--	0.016
MW12D	05/29/2013	< 0.57	< 2.5	**7**	< 0.5	< 0.5	< 0.82	--	0.38
MW12D	11/12/2013	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.82	--	0.012
MW12D	05/19/2014	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 1	--	0.28
MW13	04/11/2000	--	--	**1,800**	**5,800**	--	--	**3,800**	**2,000**
MW13	03/27/2001	--	--	**1,500**	**3,300**	--	--	**2,700**	**3,700**
MW13	06/05/2002	--	--	**2,600**	**4,800**	--	--	**4,300**	**3,800**
MW13	05/15/2003	--	--	**300**	**200**	--	--	*670*	1.6
MW13	02/25/2004	--	--	--	--	--	--	--	--
MW13	05/24/2004	--	--	**210**	**29**	--	--	400	**140**
MW13	05/18/2005	--	--	**270**	**670**	--	--	*530*	**920**
MW13	11/28/2005	--	--	--	--	--	--	--	--
MW13	05/30/2006	**180**	*60*	**330**	**640**	410	240	*650*	**51**
MW13	05/16/2007	1.9	1	*6.4*	1	5.9	0.84	6.74	0.62
MW13	11/15/2007	--	--	--	--	--	--	--	--
MW13	10/26/2009	**281**	*86*	**764**	**1,640**	*550*	*652*	*1,202*	**3,540**
MW13	01/26/2010	**313**	**95.5**	**696**	**1,650**	*586*	*417*	*1,003*	< 0.95
MW13	04/27/2010	**262**	*85.5*	**658**	**1,610**	*535*	*663*	*1,200*	**1,400**
MW13	07/26/2010	**190**	*57*	**557**	**1,430**	467	*481*	*948*	**791**
MW13	11/02/2010	13.6	< 2.1	**305**	**59.4**	10.5	< 4.5	--	0.17
MW13	05/17/2011	< 0.43	< 0.4	< 0.39	< 0.41	< 0.38	< 0.87	--	0.033
MW13	11/01/2011	*111*	*34.9*	**290**	**555**	--	--	408	**45.1**
MW13	08/08/2012	--	--	**130**	**222**	--	--	63.3	0.079
MW13	11/13/2012	*114*	*37.1*	**190**	**728**	238	176	--	< 5
MW13	02/26/2013	**356**	**105**	**470**	**1,650**	*569*	*827*	--	**2,430**
MW13	05/30/2013	**142**	*49.5*	**161**	**580**	277	331	--	**622**
MW13	11/12/2013	*43.3*	4.2	**66**	**188**	72.5	10.2	--	< 0.48
MW13	05/19/2014	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 1	--	0.0095
MW14	04/11/2000	--	--	**310**	**600**	--	--	**4,100**	**540,000**
MW14	03/27/2001	--	--	**410**	**810**	--	--	**4,200**	**510,000**
MW14	08/09/2012	--	--	< 19.4	**1,050**	--	--	**5,450**	**159,000**
MW14	11/14/2012	**351**	< 166	< 82	**1,070**	*885*	**1,890**	--	**9,440**
MW14	02/27/2013	**607**	**179**	< 82	**1,350**	*868*	**1,750**	--	**799,000**
MW14	05/30/2013	**675**	**194**	< 25	**1,380**	*1,190*	**2,210**	--	**8,670**
MW14	11/13/2013	**766**	< 250	< 250	**1,370**	*720*	**1,550**	--	**12,600,000**
MW14	05/19/2014	--	--	--	--	--	--	--	--

Table 17. Groundwater Analytical Results Exceeding GW Vapor SLs
Wisconsin Public Service Corporation, Manitowoc
Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

		VOC							PAH
Sample Location	Sample Date	1,2,4-Trimethylbenzene (µg/l)	1,3,5-Trimethylbenzene (µg/l)	Benzene (µg/l)	Ethylbenzene (µg/l)	Xylene, o (µg/l)	Xylenes, m + p (µg/l)	Xylenes, Total (µg/l)	Naphthalene (PAH) (µg/l)
	Residential GW Vapor SL for WI / IBS	*29*	*20*	*1.6*	*3.5*	*490*	*360*	*490*	*4.6*
	Industrial GW Vapor SL for WI / IBS	**120**	**86**	**6.9**	**15**	**2,100**	**1,500**	**2,100**	**20**
MW17T	04/11/2000	--	--	< 1	< 1	--	--	< 3	< 1
MW17T	03/27/2001	--	--	< 1	< 1	--	--	< 3	< 5
MW17T	06/05/2002	--	--	< 0.45	< 0.82	--	--	< 0.77	0.49
MW17T	05/15/2003	--	--	< 0.3	< 0.6	--	--	< 1.2	< 0.027
MW17T	02/25/2004	--	--	--	--	--	--	--	0.56
MW17T	05/24/2004	--	--	< 0.14	< 0.4	--	--	< 0.74	< 0.023
MW17T	05/18/2005	--	--	< 0.41	< 0.54	--	--	< 1.8	0.046
MW17T	11/28/2005	--	--	--	--	--	--	--	--
MW17T	05/30/2006	< 0.39	< 0.4	< 0.14	< 0.4	< 0.36	< 0.74	< 0.74	0.013
MW17T	05/16/2007	< 0.39	< 0.4	< 0.14	< 0.4	< 0.36	< 0.74	< 0.74	< 0.012
MW17T	11/15/2007	--	--	--	--	--	--	--	--
MW17T	10/26/2009	< 0.39	< 0.4	< 0.23	< 0.4	< 0.36	< 0.74	< 0.74	< 0.17
MW17T	01/26/2010	< 0.43	< 0.4	< 0.39	< 0.41	< 0.38	< 0.87	< 0.87	< 0.047
MW17T	04/28/2010	< 0.97	< 0.83	< 0.41	< 0.54	< 0.83	< 1.8	< 2.6	0.75
MW17T	07/26/2010	< 0.97	< 0.83	< 0.41	< 0.54	< 0.83	< 1.8	< 1.8	0.018
MW17T	11/02/2010	< 0.97	< 0.83	< 0.41	< 0.54	< 0.83	< 1.8	--	0.013
MW17T	05/17/2011	< 0.43	< 0.4	< 0.39	< 0.41	< 0.38	< 0.87	--	0.026
MW17T	11/01/2011	< 0.43	< 0.4	< 0.39	< 0.41	--	--	< 1.3	0.073
MW17T	08/08/2012	--	--	< 0.39	< 0.41	--	--	< 1.3	0.0063
MW17T	11/13/2012	< 0.97	< 0.83	< 0.41	< 0.54	< 0.83	< 1.8	--	< 0.05
MW17T	02/26/2013	< 0.97	< 0.83	< 0.41	< 0.54	< 0.83	< 1.8	--	0.013
MW17T	05/29/2013	< 0.57	< 2.5	< 0.5	< 0.5	< 0.5	< 0.82	--	0.0085
MW17T	11/12/2013	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.82	--	0.011
MW17T	05/19/2014	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 1	--	0.014
MW18T	04/11/2000	--	--	< 1	< 1	--	--	< 3	< 1
MW18T	03/27/2001	--	--	< 1	< 1	--	--	< 3	< 5
MW18T	06/05/2002	--	--	< 0.45	< 0.82	--	--	< 0.77	0.12
MW18T	05/15/2003	--	--	< 0.3	< 0.6	--	--	< 1.2	0.1
MW18T	02/25/2004	--	--	--	--	--	--	--	0.028
MW18T	05/24/2004	--	--	< 0.14	< 0.4	--	--	< 0.74	< 0.023
MW18T	05/18/2005	--	--	< 0.41	< 0.54	--	--	< 1.8	< 0.022
MW18T	11/28/2005	--	--	--	--	--	--	--	--
MW18T	05/30/2006	< 0.39	< 0.4	< 0.14	< 0.4	< 0.36	< 0.74	< 0.74	0.029
MW18T	05/16/2007	< 0.39	< 0.4	< 0.14	< 0.4	< 0.36	< 0.74	< 0.74	< 0.012
MW18T	11/15/2007	--	--	--	--	--	--	--	--
MW18T	10/26/2009	< 0.39	< 0.4	< 0.23	< 0.4	< 0.36	< 0.74	< 0.74	< 0.17
MW18T	01/27/2010	< 0.43	< 0.4	< 0.39	< 0.41	< 0.38	< 0.87	< 0.87	0.056
MW18T	04/27/2010	< 0.97	< 0.83	< 0.41	< 0.54	< 0.83	< 1.8	< 2.6	0.017
MW18T	07/26/2010	< 0.97	< 0.83	< 0.41	< 0.54	< 0.83	< 1.8	< 1.8	0.0088
MW18T	11/03/2010	< 0.97	< 0.83	< 0.41	< 0.54	< 0.83	< 1.8	--	0.037
MW18T	05/17/2011	< 0.43	< 0.4	< 0.39	< 0.41	< 0.38	< 0.87	--	0.019
MW18T	11/01/2011	< 0.43	< 0.4	< 0.39	< 0.41	--	--	< 1.3	0.016
MW18T	08/07/2012	--	--	< 0.39	< 0.41	--	--	< 1.3	0.043
MW18T	11/13/2012	< 0.97	< 0.83	< 0.41	< 0.54	< 0.83	< 1.8	--	0.016
MW18T	02/26/2013	< 0.97	< 0.83	< 0.41	< 0.54	< 0.83	< 1.8	--	0.019
MW18T	05/29/2013	< 0.57	< 2.5	< 0.5	< 0.5	< 0.5	< 0.82	--	0.013
MW18T	11/12/2013	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.82	--	0.013
MW18T	05/19/2014	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 1	--	0.02

Table 17. Groundwater Analytical Results Exceeding GW Vapor SLs
Wisconsin Public Service Corporation, Manitowoc
Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

		VOC							PAH
Sample Location	Sample Date	1,2,4-Trimethylbenzene (µg/l)	1,3,5-Trimethylbenzene (µg/l)	Benzene (µg/l)	Ethylbenzene (µg/l)	Xylene, o (µg/l)	Xylenes, m + p (µg/l)	Xylenes, Total (µg/l)	Naphthalene (PAH) (µg/l)
	Residential GW Vapor SL for WI / IBS	*29*	*20*	*1.6*	*3.5*	*490*	*360*	*490*	*4.6*
	Industrial GW Vapor SL for WI / IBS	**120**	**86**	**6.9**	**15**	**2,100**	**1,500**	**2,100**	**20**
MW19T	04/11/2000	--	--	< 1	< 1	--	--	< 3	< 1
MW19T	03/27/2001	--	--	< 1	1.7	--	--	< 3	< 5
MW19T	06/05/2002	--	--	*2.4*	< 0.82	--	--	0.94	0.44
MW19T	05/15/2003	--	--	< 0.3	< 0.6	--	--	< 1.2	0.032
MW19T	02/25/2004	--	--	--	--	--	--	--	0.12
MW19T	05/24/2004	--	--	1.1	< 0.4	--	--	0.76	0.045
MW19T	05/18/2005	--	--	< 0.41	< 0.54	--	--	< 1.8	0.069
MW19T	11/28/2005	--	--	--	--	--	--	--	--
MW19T	05/30/2006	< 0.39	< 0.4	0.17	< 0.4	< 0.36	< 0.74	< 0.74	0.25
MW19T	05/16/2007	< 0.39	< 0.4	0.31	< 0.4	< 0.36	< 0.74	< 0.74	0.034
MW19T	11/15/2007	--	--	--	--	--	--	--	--
MW19T	10/26/2009	< 0.39	< 0.4	< 0.23	< 0.4	< 0.36	< 0.74	< 0.74	< 0.17
MW19T	01/26/2010	< 0.43	< 0.4	< 0.39	< 0.41	< 0.38	< 0.87	< 0.87	< 0.047
MW19T	04/28/2010	< 0.97	< 0.83	0.99	< 0.54	< 0.83	< 1.8	< 2.6	0.36
MW19T	07/26/2010	< 0.97	< 0.83	< 0.41	< 0.54	< 0.83	< 1.8	< 1.8	0.014
MW19T	11/02/2010	< 0.97	< 0.83	< 0.41	< 0.54	< 0.83	< 1.8	--	0.027
MW19T	05/18/2011	< 0.43	< 0.4	< 0.39	< 0.41	< 0.38	< 0.87	--	0.019
MW19T	11/02/2011	< 0.43	< 0.4	< 0.39	< 0.41	--	--	< 1.3	0.017
MW19T	08/08/2012	--	--	< 0.39	< 0.41	--	--	< 1.3	0.016
MW19T	11/13/2012	< 0.97	< 0.83	< 0.41	< 0.54	< 0.83	< 1.8	--	0.016
MW19T	02/25/2013	< 0.97	< 0.83	< 0.41	< 0.54	< 0.83	< 1.8	--	0.0098
MW19T	05/29/2013	< 0.57	< 2.5	< 0.5	< 0.5	< 0.5	< 0.82	--	0.017
MW19T	11/13/2013	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.82	--	0.016
MW19T	05/19/2014	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 1	--	0.012
MW20T	04/11/2000	--	--	< 1	< 1	--	--	< 3	< 1
MW20T	03/27/2001	--	--	< 1	< 1	--	--	< 3	< 5
MW20T	06/05/2002	--	--	< 0.45	< 0.82	--	--	< 0.77	< 0.027
MW20T	05/15/2003	--	--	< 0.3	< 0.6	--	--	< 1.2	0.33
MW20T	02/25/2004	--	--	--	--	--	--	--	0.096
MW20T	05/24/2004	--	--	--	--	--	--	--	< 0.023
MW20T	05/25/2004	--	--	< 0.14	< 0.4	--	--	< 0.74	--
MW20T	05/18/2005	--	--	< 0.41	< 0.54	--	--	< 1.8	0.039
MW20T	11/28/2005	--	--	--	--	--	--	--	--
MW20T	05/30/2006	< 0.39	< 0.4	0.22	< 0.4	< 0.36	< 0.74	< 0.74	< 0.012
MW20T	05/16/2007	< 0.39	< 0.4	0.19	< 0.4	< 0.36	< 0.74	< 0.74	< 0.012
MW20T	11/15/2007	--	--	--	--	--	--	--	--
MW20T	10/26/2009	< 0.39	< 0.4	< 0.23	< 0.4	< 0.36	< 0.74	< 0.74	< 0.17
MW20T	01/26/2010	< 0.43	< 0.4	< 0.39	< 0.41	< 0.38	< 0.87	< 0.87	< 0.047
MW20T	04/28/2010	< 0.97	< 0.83	< 0.41	< 0.54	< 0.83	< 1.8	< 2.6	0.04
MW20T	07/26/2010	< 0.97	< 0.83	< 0.41	< 0.54	< 0.83	< 1.8	< 1.8	0.067
MW20T	11/02/2010	< 0.97	< 0.83	< 0.41	< 0.54	< 0.83	< 1.8	--	0.011
MW20T	05/18/2011	< 0.43	< 0.4	< 0.39	< 0.41	< 0.38	< 0.87	--	0.024
MW20T	11/01/2011	< 0.43	< 0.4	< 0.39	< 0.41	--	--	< 1.3	0.016
MW20T	08/08/2012	--	--	< 0.39	< 0.41	--	--	< 1.3	0.0052
MW20T	11/13/2012	< 0.97	< 0.83	< 0.41	< 0.54	< 0.83	< 1.8	--	0.021
MW20T	02/26/2013	< 0.97	< 0.83	< 0.41	< 0.54	< 0.83	< 1.8	--	0.024
MW20T	05/29/2013	< 0.57	< 2.5	< 0.5	< 0.5	< 0.5	< 0.82	--	0.0091
MW20T	11/12/2013	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.82	--	0.011
MW20T	05/19/2014	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 1	--	0.012

Table 17. Groundwater Analytical Results Exceeding GW Vapor SLs
Wisconsin Public Service Corporation, Manitowoc
Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

		VOC							PAH
Sample Location	Sample Date	1,2,4-Trimethylbenzene (µg/l)	1,3,5-Trimethylbenzene (µg/l)	Benzene (µg/l)	Ethylbenzene (µg/l)	Xylene, o (µg/l)	Xylenes, m + p (µg/l)	Xylenes, Total (µg/l)	Naphthalene (PAH) (µg/l)
	Residential GW Vapor SL for WI / IBS	*29*	*20*	*1.6*	*3.5*	*490*	*360*	*490*	*4.6*
	Industrial GW Vapor SL for WI / IBS	**120**	**86**	**6.9**	**15**	**2,100**	**1,500**	**2,100**	**20**
MW21T	04/11/2000	--	--	< 1	< 1	--	--	< 3	< 1
MW21T	03/27/2001	--	--	< 1	< 1	--	--	< 3	< 5
MW21T	06/05/2002	--	--	< 0.45	< 0.82	--	--	< 0.77	0.042
MW21T	05/15/2003	--	--	0.31	< 0.6	--	--	< 1.2	0.18
MW21T	02/25/2004	--	--	--	--	--	--	--	0.76
MW21T	05/24/2004	--	--	< 0.14	< 0.4	--	--	< 0.74	0.038
MW21T	05/18/2005	--	--	< 0.41	< 0.54	--	--	< 1.8	0.049
MW21T	11/28/2005	--	--	--	--	--	--	--	--
MW21T	05/30/2006	< 0.39	< 0.4	< 0.14	< 0.4	< 0.36	< 0.74	< 0.74	< 0.032
MW21T	05/16/2007	< 0.39	< 0.4	0.19	< 0.4	< 0.36	< 0.74	< 0.74	0.013
MW21T	11/15/2007	--	--	--	--	--	--	--	--
MW21T	10/26/2009	< 0.39	< 0.4	< 0.23	< 0.4	< 0.36	< 0.74	< 0.74	< 0.17
MW21T	01/27/2010	< 0.43	< 0.4	< 0.39	< 0.41	< 0.38	< 0.87	< 0.87	0.11
MW21T	04/27/2010	< 0.97	< 0.83	< 0.41	< 0.54	< 0.83	< 1.8	< 2.6	0.035
MW21T	07/26/2010	< 0.97	< 0.83	< 0.41	< 0.54	< 0.83	< 1.8	< 1.8	0.028
MW21T	11/03/2010	< 0.97	< 0.83	< 0.41	< 0.54	< 0.83	< 1.8	--	0.022
MW21T	05/18/2011	< 0.43	< 0.4	< 0.39	< 0.41	< 0.38	< 0.87	--	0.028
MW21T	11/02/2011	< 0.43	< 0.4	0.48	< 0.41	--	--	< 1.3	0.041
MW21T	08/08/2012	--	--	0.47	< 0.41	--	--	< 1.3	0.024
MW21T	11/13/2012	< 0.97	< 0.83	< 0.41	< 0.54	< 0.83	< 1.8	--	0.019
MW21T	02/25/2013	< 0.97	< 0.83	< 0.41	< 0.54	< 0.83	< 1.8	--	0.034
MW21T	05/29/2013	< 0.57	< 2.5	< 0.5	< 0.5	< 0.5	< 0.82	--	0.048
MW21T	11/13/2013	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.82	--	0.024
MW21T	05/19/2014	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 1	--	< 0.0081
MW22	08/08/2012	--	--	< 0.39	< 0.41	--	--	< 1.3	< 0.0051
MW22	11/13/2012	< 0.97	< 0.83	< 0.41	< 0.54	< 0.83	< 1.8	--	< 0.05
MW22	02/26/2013	< 0.97	< 0.83	< 0.41	< 0.54	< 0.83	< 1.8	--	0.071
MW22	05/29/2013	< 0.57	< 2.5	< 0.5	< 0.5	< 0.5	< 0.82	--	0.012
MW22	11/12/2013	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.82	--	0.0085
MW22	05/19/2014	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 1	--	< 0.0082
MW23	08/08/2012	--	--	< 0.39	< 0.41	--	--	< 1.3	0.0069
MW23	11/13/2012	< 0.97	< 0.83	< 0.41	< 0.54	< 0.83	< 1.8	--	0.008
MW23	02/26/2013	< 0.97	< 0.83	< 0.41	< 0.54	0.9	< 1.8	--	0.0087
MW23	05/29/2013	< 0.57	< 2.5	< 0.5	< 0.5	< 0.5	< 0.82	--	< 0.005
MW23	11/12/2013	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.82	--	< 0.0048
MW23	05/19/2014	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 1	--	0.013
PZ5	08/09/2012	--	--	< 0.39	< 0.41	--	--	< 1.3	< 0.05
PZ5	11/13/2012	< 0.97	< 0.83	< 0.41	< 0.54	< 0.83	< 1.8	--	0.017
PZ5	02/26/2013	< 0.97	< 0.83	< 0.41	< 0.54	< 0.83	< 1.8	--	0.02
PZ5	05/29/2013	< 0.57	< 2.5	< 0.5	< 0.5	< 0.5	< 0.82	--	0.059
PZ5	11/12/2013	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.82	--	0.024
PZ5	05/19/2014	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 1	--	0.027
PZ7B	10/26/2009	< 0.39	< 0.4	**11.6**	< 0.4	< 0.36	< 0.74	< 0.74	< 0.17
PZ7B	01/27/2010	< 0.43	< 0.4	< 0.39	< 0.41	< 0.38	< 0.87	< 0.87	< 0.047
PZ7B	04/27/2010	< 0.97	< 0.83	< 0.41	< 0.54	< 0.83	< 1.8	< 2.6	0.011
PZ7B	07/26/2010	< 0.97	< 0.83	*6.6*	< 0.54	< 0.83	< 1.8	< 1.8	0.085
PZ7B	11/02/2010	< 0.97	< 0.83	**11.3**	< 0.54	< 0.83	< 1.8	--	0.035
PZ7B	05/17/2011	< 0.43	< 0.4	**11.4**	< 0.41	< 0.38	< 0.87	--	0.036
PZ7B	11/01/2011	< 0.43	< 0.4	**8.5**	< 0.41	--	--	< 1.3	0.05
PZ7B	08/08/2012	--	--	1.1	< 0.41	--	--	< 1.3	0.0086
PZ7B	11/14/2012	< 0.97	< 0.83	*2.1*	< 0.54	< 0.83	< 1.8	--	< 0.05
PZ7B	02/27/2013	< 0.97	< 0.83	**7.6**	< 0.54	< 0.83	< 1.8	--	0.042
PZ7B	05/30/2013	< 0.57	< 2.5	*6.3*	< 0.5	< 0.5	< 0.82	--	0.028
PZ7B	11/13/2013	< 0.5	< 0.5	0.94	< 0.5	< 0.5	< 0.82	--	0.011
PZ7B	05/20/2014	< 0.5	< 0.5	*3.9*	< 0.5	< 0.5	< 1	--	0.011

Table 17. Groundwater Analytical Results Exceeding GW Vapor SLs
Wisconsin Public Service Corporation, Manitowoc
Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

		VOC							PAH
Sample Location	Sample Date	1,2,4-Trimethylbenzene (µg/l)	1,3,5-Trimethylbenzene (µg/l)	Benzene (µg/l)	Ethylbenzene (µg/l)	Xylene, o (µg/l)	Xylenes, m + p (µg/l)	Xylenes, Total (µg/l)	Naphthalene (PAH) (µg/l)
	Residential GW Vapor SL for WI / IBS	*29*	*20*	*1.6*	*3.5*	*490*	*360*	*490*	*4.6*
	Industrial GW Vapor SL for WI / IBS	**120**	**86**	**6.9**	**15**	**2,100**	**1,500**	**2,100**	**20**
PZ18TB	10/26/2009	< 0.39	< 0.4	0.25	< 0.4	< 0.36	< 0.74	< 0.74	< 0.17
PZ18TB	01/27/2010	< 0.43	< 0.4	< 0.39	< 0.41	< 0.38	< 0.87	< 0.87	0.099
PZ18TB	04/27/2010	< 0.97	< 0.83	< 0.41	< 0.54	< 0.83	< 1.8	< 2.6	0.017
PZ18TB	07/26/2010	< 0.97	< 0.83	< 0.41	< 0.54	< 0.83	< 1.8	< 1.8	0.0093
PZ18TB	11/03/2010	< 0.97	< 0.83	< 0.41	< 0.54	< 0.83	< 1.8	--	0.059
PZ18TB	05/17/2011	< 0.43	< 0.4	< 0.39	< 0.41	< 0.38	< 0.87	--	0.023
PZ18TB	11/01/2011	< 0.43	< 0.4	< 0.39	< 0.41	--	--	< 1.3	0.0098
PZ18TB	08/07/2012	--	--	< 0.39	< 0.41	--	--	< 1.3	0.009
PZ18TB	11/13/2012	< 0.97	< 0.83	< 0.41	< 0.54	< 0.83	< 1.8	--	0.015
PZ18TB	02/26/2013	< 0.97	< 0.83	< 0.41	< 0.54	< 0.83	< 1.8	--	0.0072
PZ18TB	05/29/2013	< 0.57	< 2.5	< 0.5	< 0.5	< 0.5	< 0.82	--	0.016
PZ18TB	11/12/2013	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.82	--	0.022
PZ18TB	05/19/2014	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 1	--	0.023
PZ23B	10/27/2009	< 0.39	< 0.4	< 0.23	< 0.4	< 0.36	< 0.74	< 0.74	0.15
PZ23B	01/26/2010	< 0.43	< 0.4	< 0.39	< 0.41	< 0.38	< 0.87	< 0.87	< 0.047
PZ23B	04/28/2010	< 0.97	< 0.83	< 0.41	< 0.54	< 0.83	< 1.8	< 2.6	0.015
PZ23B	07/27/2010	< 0.97	< 0.83	< 0.41	< 0.54	< 0.83	< 1.8	< 1.8	0.047
PZ23B	11/03/2010	< 0.97	< 0.83	< 0.41	< 0.54	< 0.83	< 1.8	--	0.033
PZ23B	05/18/2011	< 0.43	< 0.4	< 0.39	< 0.41	< 0.38	< 0.87	--	0.017
PZ23B	11/02/2011	< 0.43	< 0.4	< 0.39	< 0.41	--	--	< 1.3	0.015
PZ23B	08/09/2012	--	--	< 0.39	< 0.41	--	--	< 1.3	< 0.047
PZ23B	11/14/2012	< 0.97	< 0.83	< 0.41	< 0.54	< 0.83	< 1.8	--	< 0.05
PZ23B	02/26/2013	< 0.97	< 0.83	< 0.41	< 0.54	< 0.83	< 1.8	--	0.079
PZ23B	05/30/2013	< 0.57	< 2.5	< 0.5	< 0.5	< 0.5	< 0.82	--	0.01
PZ23B	11/13/2013	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.82	--	0.011
PZ23B	05/19/2014	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 1	--	0.0096
PZ24	10/27/2009	< 0.39	< 0.4	0.41	< 0.4	< 0.36	< 0.74	< 0.74	*7.7*
PZ24	01/26/2010	< 0.43	< 0.4	0.41	< 0.41	< 0.38	< 0.87	< 0.87	2.5
PZ24	04/28/2010	< 0.97	< 0.83	< 0.41	< 0.54	< 0.83	< 1.8	< 2.6	0.074
PZ24	07/27/2010	< 0.97	< 0.83	< 0.41	< 0.54	< 0.83	< 1.8	< 1.8	0.12
PZ24	11/03/2010	< 0.97	< 0.83	< 0.41	< 0.54	< 0.83	< 1.8	--	0.049
PZ24	05/18/2011	< 0.43	< 0.4	< 0.39	< 0.41	< 0.38	< 0.87	--	0.018
PZ24	11/02/2011	< 0.43	< 0.4	< 0.39	< 0.41	--	--	< 1.3	0.017
PZ24	08/09/2012	--	--	< 0.39	< 0.41	--	--	< 1.3	< 0.05
PZ24	11/14/2012	< 0.97	< 0.83	< 0.41	< 0.54	< 0.83	< 1.8	--	0.089
PZ24	02/26/2013	< 0.97	< 0.83	< 0.41	< 0.54	< 0.83	< 1.8	--	0.41
PZ24	05/30/2013	< 0.57	< 2.5	< 0.5	< 0.5	< 0.5	< 0.82	--	0.051
PZ24	11/13/2013	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.82	--	0.024
PZ24	05/19/2014	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 1	--	< 0.0081
PZ25	10/27/2009	*31*	11.6	**21.8**	**28.3**	24.8	46.6	70.4	**1,570**
PZ25	01/27/2010	9.5	3.8	*6.8*	*10.3*	8.7	13.4	22.1	< 0.94
PZ25	04/28/2010	8.9	3.5	*5.6*	*10.9*	7.9	12.3	20.2	0.14
PZ25	07/27/2010	10.8	< 8.3	**10**	*9.8*	< 8.3	< 18	< 8.3	**131**
PZ25	11/03/2010	2	< 0.83	*5.6*	2.6	< 0.83	< 1.8	--	**43.1**
PZ25	05/18/2011	1.2	0.53	*1.9*	1.3	0.84	0.96	--	0.026
PZ25	11/02/2011	4	1.3	*6.8*	< 0.41	--	--	4.4	1.3
PZ25	08/09/2012	--	--	*2.6*	< 0.41	--	--	< 1.3	0.26
PZ25	11/14/2012	1.4	< 0.83	**8.4**	*4.2*	< 0.83	< 1.8	--	< 5
PZ25	02/27/2013	2.2	< 0.83	**9.1**	*4.1*	< 0.83	< 1.8	--	0.86
PZ25	05/30/2013	< 0.57	< 2.5	*4.6*	1	< 0.5	< 0.82	--	0.35
PZ25	11/13/2013	< 0.5	< 0.5	**7.5**	2	< 0.5	< 0.82	--	0.36
PZ25	05/20/2014	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 1	--	< 0.0082

Table 17. Groundwater Analytical Results Exceeding GW Vapor SLs
Wisconsin Public Service Corporation, Manitowoc
Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

		VOC							PAH
Sample Location	Sample Date	1,2,4-Trimethylbenzene (µg/l)	1,3,5-Trimethylbenzene (µg/l)	Benzene (µg/l)	Ethylbenzene (µg/l)	Xylene, o (µg/l)	Xylenes, m + p (µg/l)	Xylenes, Total (µg/l)	Naphthalene (PAH) (µg/l)
	Residential GW Vapor SL for WI / IBS	*29*	*20*	*1.6*	*3.5*	*490*	*360*	*490*	*4.6*
	Industrial GW Vapor SL for WI / IBS	**120**	**86**	**6.9**	**15**	**2,100**	**1,500**	**2,100**	**20**
PZ26	10/27/2009	< 0.39	< 0.4	0.26	< 0.4	< 0.36	< 0.74	< 0.74	0.67
PZ26	01/27/2010	< 0.43	< 0.4	0.62	< 0.41	< 0.38	< 0.87	< 0.87	1.4
PZ26	04/28/2010	< 0.97	< 0.83	< 0.41	< 0.54	< 0.83	< 1.8	< 2.6	0.44
PZ26	07/27/2010	< 0.97	< 0.83	< 0.41	< 0.54	< 0.83	< 1.8	< 1.8	0.027
PZ26	11/03/2010	< 0.97	< 0.83	< 0.41	< 0.54	< 0.83	< 1.8	--	0.12
PZ26	05/18/2011	< 0.43	< 0.4	< 0.39	< 0.41	< 0.38	< 0.87	--	0.037
PZ26	11/02/2011	< 0.43	< 0.4	< 0.39	< 0.41	--	--	< 1.3	0.019
PZ26	08/09/2012	--	--	< 0.39	< 0.41	--	--	< 1.3	< 0.047
PZ26	11/14/2012	< 0.97	< 0.83	< 0.41	< 0.54	< 0.83	< 1.8	--	1.5
PZ26	02/27/2013	< 0.97	< 0.83	< 0.41	< 0.54	< 0.83	< 1.8	--	0.02
PZ26	05/30/2013	< 0.57	< 2.5	< 0.5	< 0.5	< 0.5	< 0.82	--	0.021
PZ26	11/13/2013	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.82	--	0.014
PZ26	05/20/2014	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 1	--	< 0.0081
	Total Number of Samples Analyzed:	290	290	410	410	270	270	250	422
	Number of Samples with Detections above Reported Limit:	47	19	88	54	30	25	36	296
	Min:	0.58	0.53	0.17	0.55	0.48	0.77	0.48	0.0052
	Max:	766	194	2,600	5,800	1,190	2,210	5,450	12,600,000
	Residential GW Vapor SL for WI / IBS	29	20	1.6	3.5	490	360	490	4.6
	Number of Samples that Exceed Residential SL:	*15*	*11*	*56*	*42*	*8*	*9*	*13*	*23*
	Industrial GW Vapor SL for WI / IBS	120	86	6.9	15	2,100	1,500	2,100	20
	Number of Samples that Exceed Industrial SL:	**11**	**4**	**33**	**31**	0	**4**	**6**	**22**

[O:ECK 8/13/14]

NOTES:
Italic Value exceeds Residential SL
BOLD Value exceeds Industrial SL
< Concentration is less than reported level
-- Analysis not performed
NS No Standard
SL Screening Level
µg/L microgram per liter
SLs used on this table are the most current USEPA Regional Screening Level (RSL) as presented in the Multi-Site Risk Assessment Framework Addendum Revision 3 (Exponent, July 2014).
* MW14 was damaged and not sampled; however, based on previous sampling events, the analytical groundwater results would be similar to the most recent sampling event (November 2013).

Table 18. Groundwater Analytical Results – PVOCs Exceeding SLs
Wisconsin Public Service Corporation, Manitowoc
Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

		VOC								
Sample Location	Sample Date	1,2,4-Trimethylbenzene (µg/l)	1,3,5-Trimethylbenzene (µg/l)	Trimethylbenzenes, Total (µg/l)	Benzene (µg/l)	Ethylbenzene (µg/l)	Toluene (µg/l)	Xylene, o (µg/l)	Xylenes, m + p (µg/l)	Xylenes, Total (µg/l)
Groundwater SL for WI / IBS		**15**	**120**	**480**	**5**	**700**	**800**	**190**	**190**	**2,000**
	Value exceeds SL									
	Detected below SL									
	Not detected above reported limit									
	Not analyzed									
MW1	03/27/2001	--	--	< 1	< 1	< 1	< 1	--	--	< 3
MW1	06/05/2002	--	--	< 0.92	< 0.45	< 0.82	< 0.68	--	--	< 0.77
MW1	11/19/2003	--	--	--	--	--	--	--	--	--
MW1	02/25/2004	--	--	--	--	--	--	--	--	--
MW1	05/24/2004	--	--	< 0.4	< 0.14	< 0.4	< 0.36	--	--	< 0.74
MW1	05/18/2005	--	--	< 0.97	< 0.41	< 0.54	< 0.67	--	--	< 1.8
MW1	11/28/2005	--	--	--	--	--	--	--	--	--
MW1	05/30/2006	< 0.39	< 0.4	< 0.4	0.21	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74
MW1	05/16/2007	3.1	0.64	3.74	4.7	1.3	7	2.8	4.4	7.2
MW1	11/15/2007	--	--	--	--	--	--	--	--	--
MW1	10/27/2009	< 0.39	< 0.4	< 0.4	< 0.23	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74
MW1	04/27/2010	< 0.97	< 0.83	< 0.97	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	< 2.6
MW1	07/27/2010	< 0.97	< 0.83	< 0.97	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	< 1.8
MW1	11/03/2010	< 0.97	< 0.83	--	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
MW1	05/18/2011	< 0.43	< 0.4	--	< 0.39	< 0.41	< 0.42	< 0.38	< 0.87	--
MW1	11/02/2011	< 0.43	< 0.4	--	< 0.39	< 0.41	< 0.42	--	--	< 1.3
MW1	08/08/2012	--	--	--	< 0.39	< 0.41	< 0.42	--	--	< 1.3
MW1	11/13/2012	< 0.97	< 0.83	--	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
MW1	02/25/2013	< 0.97	< 0.83	--	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
MW1	05/29/2013	< 0.57	< 2.5	--	< 0.5	< 0.5	< 0.44	< 0.5	< 0.82	--
MW1	11/13/2013	< 0.5	< 0.5	--	< 0.5	< 0.5	< 0.44	< 0.5	< 0.82	--
MW1	05/19/2014	< 0.5	< 0.5	--	< 0.5	< 0.5	< 0.5	< 0.5	< 1	--
MW2	04/11/2000	--	--	< 1	4.6	5.5	3.3	--	--	< 3
MW2	03/27/2001	--	--	2.8	1.4	40	1.4	--	--	3.6
MW2	06/05/2002	--	--	1.6	0.63	18	0.85	--	--	1.6
MW2	05/15/2003	--	--	1.1	0.79	19	2.9	--	--	5.2
MW2	02/25/2004	--	--	--	--	--	--	--	--	--
MW2	05/24/2004	--	--	1.9	0.64	40	3.2	--	--	7.3
MW2	05/18/2005	--	--	4.4	< 0.41	38	0.94	--	--	2.6
MW2	11/28/2005	--	--	--	--	--	--	--	--	--
MW2	05/30/2006	5.3	< 0.4	5.3	1	7.8	< 0.36	2	1.3	2.3
MW2	05/16/2007	1.2	< 0.4	1.2	2.3	4.8	< 0.36	1.2	0.77	1.79
MW2	11/15/2007	--	--	--	--	--	--	--	--	--
MW2	10/27/2009	1.3	< 0.4	1.3	**5.3**	4.8	< 0.36	2	1.7	3.7
MW2	01/27/2010	0.82	< 0.4	0.82	4.3	3.4	0.45	1.2	1.2	2.4
MW2	04/27/2010	< 0.97	< 0.83	< 0.97	1.1	0.55	< 0.67	< 0.83	< 1.8	< 2.6
MW2	07/26/2010	< 0.97	< 0.83	< 0.97	4	2.4	< 0.67	1	< 1.8	< 1.8
MW2	11/03/2010	2.2	< 0.83	--	**6.2**	4.4	0.84	2.8	3.2	--
MW2	05/18/2011	< 0.43	< 0.4	--	< 0.39	< 0.41	< 0.42	< 0.38	< 0.87	--
MW2	11/02/2011	< 0.43	< 0.4	--	< 0.39	< 0.41	< 0.42	--	--	< 1.3
MW2	08/07/2012	--	--	--	0.41	< 0.41	< 0.42	--	--	< 1.3
MW2	11/13/2012	< 0.97	< 0.83	--	0.78	0.63	< 0.67	< 0.83	< 1.8	--
MW2	02/26/2013	< 0.97	< 0.83	--	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
MW2	05/29/2013	< 0.57	< 2.5	--	0.51	0.62	< 0.44	0.94	0.94	--
MW2	11/12/2013	< 0.5	< 0.5	--	< 0.5	< 0.5	< 0.44	< 0.5	< 0.82	--
MW2	05/19/2014	< 0.5	< 0.5	--	< 0.5	< 0.5	< 0.5	< 0.5	< 1	--

Table 18. Groundwater Analytical Results – PVOCs Exceeding SLs
Wisconsin Public Service Corporation, Manitowoc
Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

		VOC								
Sample Location	Sample Date	1,2,4-Trimethylbenzene (µg/l)	1,3,5-Trimethylbenzene (µg/l)	Trimethylbenzenes, Total (µg/l)	Benzene (µg/l)	Ethylbenzene (µg/l)	Toluene (µg/l)	Xylene, o (µg/l)	Xylenes, m + p (µg/l)	Xylenes, Total (µg/l)
Groundwater SL for WI / IBS		**15**	**120**	**480**	**5**	**700**	**800**	**190**	**190**	**2,000**
MW5	06/05/2002	--	--	< 0.92	< 0.45	< 0.82	< 0.68	--	--	< 0.77
MW5	05/15/2003	--	--	< 0.66	< 0.3	< 0.6	< 0.58	--	--	< 1.2
MW5	02/25/2004	--	--	--	--	--	--	--	--	--
MW5	05/24/2004	--	--	< 0.4	< 0.14	< 0.4	< 0.36	--	--	< 0.74
MW5	05/18/2005	--	--	< 0.97	< 0.41	< 0.54	< 0.67	--	--	< 1.8
MW5	11/28/2005	--	--	--	--	--	--	--	--	--
MW5	05/30/2006	< 0.39	< 0.4	< 0.4	0.44	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74
MW5	05/16/2007	< 0.39	< 0.4	< 0.4	< 0.14	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74
MW5	11/15/2007	--	--	--	--	--	--	--	--	--
MW5	10/27/2009	< 0.39	< 0.4	< 0.4	< 0.23	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74
MW5	01/27/2010	< 0.43	< 0.4	< 0.43	< 0.39	< 0.41	< 0.42	< 0.38	< 0.87	< 0.87
MW5	04/27/2010	< 0.97	< 0.83	< 0.97	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	< 2.6
MW5	07/26/2010	< 0.97	< 0.83	< 0.97	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	< 1.8
MW5	11/03/2010	< 0.97	< 0.83	--	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
MW5	05/18/2011	< 0.43	< 0.4	--	< 0.39	< 0.41	< 0.42	< 0.38	< 0.87	--
MW5	11/02/2011	< 0.43	< 0.4	--	< 0.39	< 0.41	< 0.42	--	--	< 1.3
MW5	08/07/2012	--	--	--	< 0.39	< 0.41	< 0.42	--	--	< 1.3
MW5	11/13/2012	< 0.97	< 0.83	--	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
MW5	02/26/2013	< 0.97	< 0.83	--	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
MW5	05/29/2013	< 0.57	< 2.5	--	< 0.5	< 0.5	< 0.44	< 0.5	< 0.82	--
MW5	11/12/2013	< 0.5	< 0.5	--	< 0.5	< 0.5	< 0.44	< 0.5	< 0.82	--
MW5	05/19/2014	< 0.5	< 0.5	--	< 0.5	< 0.5	< 0.5	< 0.5	< 1	--
MW6	04/11/2000	--	--	< 1	< 1	< 1	< 1	--	--	< 3
MW6	03/27/2001	--	--	< 1	< 1	4.1	< 1	--	--	9.9
MW6	10/25/2001	--	--	< 1	< 1	< 1	< 1	--	--	< 3
MW6	06/05/2002	--	--	< 0.92	< 0.45	< 0.82	< 0.68	--	--	< 0.77
MW6	05/15/2003	--	--	< 0.66	< 0.3	< 0.6	< 0.58	--	--	< 1.2
MW6	08/08/2012	--	--	--	< 0.39	< 0.41	< 0.42	--	--	< 1.3
MW6	11/14/2012	< 0.97	< 0.83	--	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
MW6	02/26/2013	--	--	--	--	--	--	--	--	--
MW6	05/29/2013	--	--	--	--	--	--	--	--	--
MW6	11/13/2013	--	--	--	--	--	--	--	--	--
MW7	04/11/2000	--	--	< 1	< 1	< 1	< 1	--	--	< 3
MW7	03/27/2001	--	--	< 1	< 1	< 1	< 1	--	--	< 3
MW7	06/05/2002	--	--	< 0.92	< 0.45	< 0.82	< 0.68	--	--	< 0.77
MW7	05/15/2003	--	--	< 0.66	< 0.3	< 0.6	< 0.58	--	--	< 1.2
MW7	10/26/2009	< 0.39	< 0.4	< 0.4	< 0.23	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74
MW7	01/27/2010	< 0.43	< 0.4	< 0.43	< 0.39	< 0.41	< 0.42	< 0.38	< 0.87	< 0.87
MW7	01/27/2010	--	--	--	--	--	--	--	--	--
MW7	04/27/2010	< 0.97	< 0.83	< 0.97	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	< 2.6
MW7	07/26/2010	< 0.97	< 0.83	< 0.97	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	< 1.8
MW7	11/02/2010	< 0.97	< 0.83	--	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
MW7	05/17/2011	< 0.43	< 0.4	--	< 0.39	< 0.41	< 0.42	< 0.38	< 0.87	--
MW7	11/01/2011	< 0.43	< 0.4	--	< 0.39	< 0.41	< 0.42	--	--	< 1.3
MW7	08/08/2012	--	--	--	< 0.39	< 0.41	< 0.42	--	--	< 1.3
MW7	11/14/2012	< 0.97	< 0.83	--	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
MW7	02/27/2013	< 0.97	< 0.83	--	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
MW7	05/30/2013	< 0.57	< 2.5	--	< 0.5	< 0.5	< 0.44	< 0.5	< 0.82	--
MW7	11/13/2013	< 0.5	< 0.5	--	< 0.5	< 0.5	< 0.44	< 0.5	< 0.82	--
MW7	05/20/2014	< 0.5	< 0.5	--	< 0.5	< 0.5	< 0.5	< 0.5	< 1	--

Table 18. Groundwater Analytical Results – PVOCs Exceeding SLs
Wisconsin Public Service Corporation, Manitowoc
Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

		VOC								
Sample Location	Sample Date	1,2,4-Trimethylbenzene (µg/l)	1,3,5-Trimethylbenzene (µg/l)	Trimethylbenzenes, Total (µg/l)	Benzene (µg/l)	Ethylbenzene (µg/l)	Toluene (µg/l)	Xylene, o (µg/l)	Xylenes, m + p (µg/l)	Xylenes, Total (µg/l)
Groundwater SL for WI / IBS		**15**	**120**	**480**	**5**	**700**	**800**	**190**	**190**	**2,000**
MW8	04/11/2000	--	--	< 1	< 1	< 1	< 1	--	--	< 3
MW8	03/27/2001	--	--	< 1	< 1	< 1	< 1	--	--	< 3
MW8	06/05/2002	--	--	< 0.92	< 0.45	< 0.82	< 0.68	--	--	< 0.77
MW8	05/15/2003	--	--	< 0.66	< 0.3	< 0.6	< 0.58	--	--	< 1.2
MW8	05/24/2004	--	--	< 0.4	< 0.14	< 0.4	< 0.36	--	--	< 0.74
MW8	05/18/2005	--	--	< 0.97	< 0.41	< 0.54	< 0.67	--	--	< 1.8
MW8	11/28/2005	--	--	--	--	--	--	--	--	--
MW8	05/30/2006	< 0.39	< 0.4	< 0.4	< 0.14	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74
MW8	05/16/2007	< 0.39	< 0.4	< 0.4	< 0.14	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74
MW8	11/15/2007	--	--	--	--	--	--	--	--	--
MW8	10/26/2009	< 0.39	< 0.4	< 0.4	< 0.23	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74
MW8	01/27/2010	< 0.43	< 0.4	< 0.43	< 0.39	< 0.41	< 0.42	< 0.38	< 0.87	< 0.87
MW8	04/27/2010	< 0.97	< 0.83	< 0.97	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	< 2.6
MW8	07/26/2010	< 0.97	< 0.83	< 0.97	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	< 1.8
MW8	11/02/2010	< 0.97	< 0.83	--	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
MW8	05/17/2011	< 0.43	< 0.4	--	< 0.39	< 0.41	< 0.42	< 0.38	< 0.87	--
MW8	11/01/2011	< 0.43	< 0.4	--	< 0.39	< 0.41	< 0.42	--	--	< 1.3
MW8	08/08/2012	--	--	--	< 0.39	< 0.41	< 0.42	--	--	< 1.3
MW8	11/13/2012	< 0.97	< 0.83	--	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
MW8	02/26/2013	< 0.97	< 0.83	--	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
MW8	05/30/2013	< 0.57	< 2.5	--	< 0.5	< 0.5	< 0.44	< 0.5	< 0.82	--
MW8	11/12/2013	< 0.5	< 0.5	--	< 0.5	< 0.5	< 0.44	< 0.5	< 0.82	--
MW8	05/20/2014	< 0.5	< 0.5	--	< 0.5	< 0.5	< 0.5	< 0.5	< 1	--
MW9	04/11/2000	--	--	< 1	3.1	< 1	< 1	--	--	< 3
MW9	03/27/2001	--	--	< 1	**8.8**	< 1	< 1	--	--	< 3
MW9	06/05/2002	--	--	< 0.92	0.94	< 0.82	< 0.68	--	--	< 0.77
MW9	05/15/2003	--	--	< 0.66	1.3	< 0.6	< 0.58	--	--	< 1.2
MW9	02/25/2004	--	--	--	--	--	--	--	--	--
MW9	05/24/2004	--	--	< 0.4	0.3	< 0.4	< 0.36	--	--	< 0.74
MW9	05/18/2005	--	--	< 0.97	< 0.41	< 0.54	< 0.67	--	--	< 1.8
MW9	11/28/2005	--	--	--	--	--	--	--	--	--
MW9	05/30/2006	< 0.39	< 0.4	< 0.4	< 0.14	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74
MW9	05/16/2007	0.65	< 0.4	0.65	< 0.14	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74
MW9	11/15/2007	--	--	--	--	--	--	--	--	--
MW9	10/26/2009	0.58	< 0.4	0.58	< 0.23	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74
MW9	01/27/2010	< 0.43	< 0.4	< 0.43	< 0.39	< 0.41	< 0.42	< 0.38	< 0.87	< 0.87
MW9	04/27/2010	< 0.97	< 0.83	< 0.97	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	< 2.6
MW9	07/26/2010	--	--	--	--	--	--	--	--	--
MW9	11/02/2010	--	--	--	--	--	--	--	--	--
MW9	05/17/2011	--	--	--	--	--	--	--	--	--
MW9	08/09/2012	--	--	--	--	--	--	--	--	--
MW9	11/14/2012	--	--	--	--	--	--	--	--	--
MW9	02/26/2013	--	--	--	--	--	--	--	--	--
MW9	05/29/2013	--	--	--	--	--	--	--	--	--
MW9	11/13/2013	--	--	--	--	--	--	--	--	--
MW9	05/20/2014	--	--	--	--	--	--	--	--	--

Table 18. Groundwater Analytical Results – PVOCs Exceeding SLs
Wisconsin Public Service Corporation, Manitowoc
Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

		VOC								
Sample Location	Sample Date	1,2,4-Trimethylbenzene (µg/l)	1,3,5-Trimethylbenzene (µg/l)	Trimethylbenzenes, Total (µg/l)	Benzene (µg/l)	Ethylbenzene (µg/l)	Toluene (µg/l)	Xylene, o (µg/l)	Xylenes, m + p (µg/l)	Xylenes, Total (µg/l)
Groundwater SL for WI / IBS		**15**	**120**	**480**	**5**	**700**	**800**	**190**	**190**	**2,000**
MW10	04/11/2000	--	--	9	< 1	< 1	< 1	--	--	< 3
MW10	03/27/2001	--	--	< 1	< 1	< 1	< 1	--	--	< 3
MW10	06/05/2002	--	--	< 0.92	< 0.45	< 0.82	< 0.68	--	--	< 0.77
MW10	05/15/2003	--	--	13	< 0.3	< 0.6	< 0.58	--	--	< 1.2
MW10	02/25/2004	--	--	--	--	--	--	--	--	--
MW10	05/24/2004	--	--	3.8	< 0.14	< 0.4	< 0.36	--	--	< 0.74
MW10	05/18/2005	--	--	7.5	< 0.41	< 0.54	< 0.67	--	--	< 1.8
MW10	11/28/2005	--	--	--	--	--	--	--	--	--
MW10	05/30/2006	1.3	< 0.4	1.3	< 0.14	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74
MW10	05/16/2007	**17**	< 0.4	17	< 0.14	< 0.4	< 0.36	0.49	< 0.74	0.49
MW10	11/15/2007	--	--	--	--	--	--	--	--	--
MW10	10/26/2009	10.8	< 0.4	10.8	< 0.23	< 0.4	< 0.36	0.48	< 0.74	0.48
MW10	01/27/2010	5	< 0.4	5	< 0.39	< 0.41	< 0.42	< 0.38	< 0.87	< 0.87
MW10	04/27/2010	**21**	< 0.83	< 0.97	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	< 2.6
MW10	07/26/2010	**22.9**	< 0.83	22.9	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	< 1.8
MW10	11/02/2010	14.1	< 0.83	--	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
MW10	05/17/2011	10	< 0.4	--	< 0.39	< 0.41	< 0.42	< 0.38	< 0.87	--
MW10	11/01/2011	9.6	< 0.4	--	< 0.39	< 0.41	< 0.42	--	--	< 1.3
MW10	08/09/2012	--	--	--	< 0.39	< 0.41	< 0.42	--	--	< 1.3
MW10	11/13/2012	4.6	< 0.83	--	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
MW10	02/27/2013	5.7	< 0.83	--	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
MW10	05/30/2013	4.7	< 2.5	--	**9.8**	< 0.5	< 0.44	< 0.5	< 0.82	--
MW10	11/13/2013	13.5	< 0.5	--	< 0.5	< 0.5	< 0.44	< 0.5	< 0.82	--
MW10	05/20/2014	14.7	< 0.5	--	< 0.5	< 0.5	< 0.5	< 0.5	< 1	--
MW11	04/11/2000	--	--	< 1	< 1	< 1	< 1	--	--	< 3
MW11	03/27/2001	--	--	< 1	< 1	< 1	< 1	--	--	< 3
MW11	06/05/2002	--	--	< 0.92	< 0.45	< 0.82	< 0.68	--	--	< 0.77
MW11	05/15/2003	--	--	< 0.66	< 0.3	< 0.6	< 0.58	--	--	< 1.2
MW11	02/25/2004	--	--	--	--	--	--	--	--	--
MW11	05/24/2004	--	--	< 0.4	< 0.14	< 0.4	< 0.36	--	--	< 0.74
MW11	05/18/2005	--	--	--	--	--	--	--	--	--
MW11	11/28/2005	--	--	--	--	--	--	--	--	--
MW11	05/30/2006	--	--	--	--	--	--	--	--	--
MW12	04/11/2000	--	--	< 1	< 1	< 1	< 1	--	--	< 3
MW12	03/27/2001	--	--	< 1	< 1	< 1	< 1	--	--	< 3
MW12	06/05/2002	--	--	< 0.92	< 0.45	< 0.82	< 0.68	--	--	< 0.77
MW12	05/15/2003	--	--	--	--	--	--	--	--	--
MW12	02/25/2004	--	--	--	--	--	--	--	--	--
MW12	05/24/2004	--	--	< 0.4	< 0.14	< 0.4	< 0.36	--	--	< 0.74
MW12	05/18/2005	--	--	< 0.97	< 0.41	< 0.54	< 0.67	--	--	< 1.8
MW12	11/28/2005	--	--	--	--	--	--	--	--	--
MW12	05/30/2006	--	--	--	--	--	--	--	--	--
MW12	06/20/2006	< 0.39	< 0.4	< 0.4	< 0.14	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74
MW12	05/16/2007	< 0.39	< 0.4	< 0.4	< 0.14	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74
MW12	11/15/2007	--	--	--	--	--	--	--	--	--
MW12	10/27/2009	< 0.39	< 0.4	< 0.4	< 0.23	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74
MW12	01/26/2010	< 0.43	< 0.4	< 0.43	< 0.39	< 0.41	< 0.42	< 0.38	< 0.87	< 0.87
MW12	04/27/2010	< 0.97	< 0.83	< 0.97	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	< 2.6
MW12	07/27/2010	< 0.97	< 0.83	< 0.97	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	< 1.8
MW12	11/03/2010	< 0.97	< 0.83	--	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
MW12	05/17/2011	< 0.43	< 0.4	--	< 0.39	< 0.41	< 0.42	< 0.38	< 0.87	--
MW12	11/01/2011	< 0.43	< 0.4	--	< 0.39	< 0.41	< 0.42	--	--	< 1.3
MW12	08/08/2012	--	--	--	< 0.39	< 0.41	< 0.42	--	--	< 1.3
MW12	11/14/2012	< 0.97	< 0.83	--	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
MW12	02/26/2013	< 0.97	< 0.83	--	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
MW12	05/29/2013	< 0.57	< 2.5	--	< 0.5	< 0.5	< 0.44	< 0.5	< 0.82	--
MW12	11/12/2013	< 0.5	< 0.5	--	< 0.5	< 0.5	< 0.44	< 0.5	< 0.82	--
MW12	05/19/2014	< 0.5	< 0.5	--	< 0.5	< 0.5	< 0.5	< 0.5	< 1	--

Table 18. Groundwater Analytical Results – PVOCs Exceeding SLs
Wisconsin Public Service Corporation, Manitowoc
Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

		VOC								
Sample Location	Sample Date	1,2,4-Trimethylbenzene (µg/l)	1,3,5-Trimethylbenzene (µg/l)	Trimethylbenzenes, Total (µg/l)	Benzene (µg/l)	Ethylbenzene (µg/l)	Toluene (µg/l)	Xylene, o (µg/l)	Xylenes, m + p (µg/l)	Xylenes, Total (µg/l)
Groundwater SL for WI / IBS		**15**	**120**	**480**	**5**	**700**	**800**	**190**	**190**	**2,000**
MW12D	04/11/2000	--	--	< 1	< 1	< 1	< 1	--	--	< 3
MW12D	03/27/2001	--	--	< 1	< 1	< 1	< 1	--	--	< 3
MW12D	06/05/2002	--	--	< 0.92	< 0.45	< 0.82	< 0.68	--	--	< 0.77
MW12D	05/15/2003	--	--	< 0.66	< 0.3	< 0.6	< 0.58	--	--	< 1.2
MW12D	02/25/2004	--	--	--	--	--	--	--	--	--
MW12D	05/24/2004	--	--	< 0.4	< 0.14	< 0.4	< 0.36	--	--	< 0.74
MW12D	05/18/2005	--	--	< 0.97	2.3	< 0.54	< 0.67	--	--	< 1.8
MW12D	11/28/2005	--	--	--	--	--	--	--	--	--
MW12D	05/30/2006	< 0.39	< 0.4	< 0.4	< 0.14	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74
MW12D	05/16/2007	< 0.39	< 0.4	< 0.4	< 0.14	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74
MW12D	11/15/2007	--	--	--	--	--	--	--	--	--
MW12D	10/26/2009	< 0.39	< 0.4	< 0.4	0.75	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74
MW12D	01/26/2010	< 0.43	< 0.4	< 0.43	< 0.39	< 0.41	< 0.42	< 0.38	< 0.87	< 0.87
MW12D	04/27/2010	< 0.97	< 0.83	< 0.97	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	< 2.6
MW12D	07/27/2010	< 0.97	< 0.83	< 0.97	3.3	< 0.54	< 0.67	< 0.83	< 1.8	< 1.8
MW12D	11/03/2010	< 0.97	< 0.83	--	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
MW12D	05/17/2011	< 0.43	< 0.4	--	< 0.39	< 0.41	< 0.42	< 0.38	< 0.87	--
MW12D	11/01/2011	< 0.43	< 0.4	--	< 0.39	< 0.41	< 0.42	--	--	< 1.3
MW12D	08/08/2012	--	--	--	< 0.39	< 0.41	< 0.42	--	--	< 1.3
MW12D	11/14/2012	< 0.97	< 0.83	--	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
MW12D	02/26/2013	< 0.97	< 0.83	--	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
MW12D	05/29/2013	< 0.57	< 2.5	--	**7**	< 0.5	< 0.44	< 0.5	< 0.82	--
MW12D	11/12/2013	< 0.5	< 0.5	--	< 0.5	< 0.5	< 0.44	< 0.5	< 0.82	--
MW12D	05/19/2014	< 0.5	< 0.5	--	< 0.5	< 0.5	< 0.5	< 0.5	< 1	--
MW13	04/11/2000	--	--	**720**	**1,800**	**5,800**	470	--	--	**3,800**
MW13	03/27/2001	--	--	**760**	**1,500**	**3,300**	100	--	--	**2,700**
MW13	06/05/2002	--	--	**790**	**2,600**	**4,800**	**1,800**	--	--	**4,300**
MW13	05/15/2003	--	--	129	**300**	200	21	--	--	670
MW13	02/25/2004	--	--	--	--	--	--	--	--	--
MW13	05/24/2004	--	--	94	**210**	29	6.3	--	--	400
MW13	05/18/2005	--	--	138	**270**	670	17	--	--	530
MW13	11/28/2005	--	--	--	--	--	--	--	--	--
MW13	05/30/2006	**180**	60	240	**330**	640	29	**410**	**240**	650
MW13	05/16/2007	1.9	1	2.9	**6.4**	1	< 0.36	5.9	0.84	6.74
MW13	11/15/2007	--	--	--	--	--	--	--	--	--
MW13	10/26/2009	**281**	86	367	**764**	**1,640**	37	**550**	**652**	1,202
MW13	01/26/2010	**313**	95.5	408.5	**696**	**1,650**	50	**586**	**417**	1,003
MW13	04/27/2010	**262**	85.5	347.5	**658**	**1,610**	44	**535**	**663**	1,200
MW13	07/26/2010	**190**	57	247	**557**	**1,430**	28.3	**467**	**481**	948
MW13	11/02/2010	13.6	< 2.1	--	**305**	59.4	4.4	10.5	< 4.5	--
MW13	05/17/2011	< 0.43	< 0.4	--	< 0.39	< 0.41	< 0.42	< 0.38	< 0.87	--
MW13	11/01/2011	**111**	34.9	--	**290**	555	14.6	--	--	408
MW13	08/08/2012	--	--	--	**130**	222	1.6	--	--	63.3
MW13	11/13/2012	**114**	37.1	--	**190**	**728**	35.9	**238**	176	--
MW13	02/26/2013	**356**	105	--	**470**	**1,650**	83.5	**569**	**827**	--
MW13	05/30/2013	**142**	49.5	--	**161**	580	33.4	**277**	**331**	--
MW13	11/12/2013	**43.3**	4.2	--	**66**	188	2.1	72.5	10.2	--
MW13	05/19/2014	< 0.5	< 0.5	--	< 0.5	< 0.5	< 0.5	< 0.5	< 1	--
MW14	04/11/2000	--	--	**950**	**310**	600	**4,000**	--	--	**4,100**
MW14	03/27/2001	--	--	**1,110**	**410**	**810**	**4,200**	--	--	**4,200**
MW14	08/09/2012	--	--	--	< 19.4	**1,050**	**1,370**	--	--	**5,450**
MW14	11/14/2012	**351**	< 166	--	< 82	**1,070**	**1,360**	**885**	**1,890**	--
MW14	02/27/2013	**607**	**179**	--	< 82	**1,350**	715	**868**	**1,750**	--
MW14	05/30/2013	**675**	**194**	--	< 25	**1,380**	**1,240**	**1,190**	**2,210**	--
MW14	11/13/2013	**766**	< 250	--	< 250	**1,370**	365	**720**	**1,550**	--
MW14	05/19/2014	--	--	--	--	--	--	--	--	--

Table 18. Groundwater Analytical Results – PVOCs Exceeding SLs
Wisconsin Public Service Corporation, Manitowoc
Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

		VOC								
Sample Location	Sample Date	1,2,4-Trimethylbenzene (µg/l)	1,3,5-Trimethylbenzene (µg/l)	Trimethylbenzenes, Total (µg/l)	Benzene (µg/l)	Ethylbenzene (µg/l)	Toluene (µg/l)	Xylene, o (µg/l)	Xylenes, m + p (µg/l)	Xylenes, Total (µg/l)
Groundwater SL for WI / IBS		**15**	**120**	**480**	**5**	**700**	**800**	**190**	**190**	**2,000**
MW17T	04/11/2000	--	--	< 1	< 1	< 1	< 1	--	--	< 3
MW17T	03/27/2001	--	--	< 1	< 1	< 1	< 1	--	--	< 3
MW17T	06/05/2002	--	--	< 0.92	< 0.45	< 0.82	< 0.68	--	--	< 0.77
MW17T	05/15/2003	--	--	< 0.66	< 0.3	< 0.6	< 0.58	--	--	< 1.2
MW17T	02/25/2004	--	--	--	--	--	--	--	--	--
MW17T	05/24/2004	--	--	< 0.4	< 0.14	< 0.4	< 0.36	--	--	< 0.74
MW17T	05/18/2005	--	--	< 0.97	< 0.41	< 0.54	< 0.67	--	--	< 1.8
MW17T	11/28/2005	--	--	--	--	--	--	--	--	--
MW17T	05/30/2006	< 0.39	< 0.4	< 0.4	< 0.14	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74
MW17T	05/16/2007	< 0.39	< 0.4	< 0.4	< 0.14	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74
MW17T	11/15/2007	--	--	--	--	--	--	--	--	--
MW17T	10/26/2009	< 0.39	< 0.4	< 0.4	< 0.23	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74
MW17T	01/26/2010	< 0.43	< 0.4	< 0.43	< 0.39	< 0.41	< 0.42	< 0.38	< 0.87	< 0.87
MW17T	04/28/2010	< 0.97	< 0.83	< 0.97	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	< 2.6
MW17T	07/26/2010	< 0.97	< 0.83	< 0.97	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	< 1.8
MW17T	11/02/2010	< 0.97	< 0.83	--	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
MW17T	05/17/2011	< 0.43	< 0.4	--	< 0.39	< 0.41	< 0.42	< 0.38	< 0.87	--
MW17T	11/01/2011	< 0.43	< 0.4	--	< 0.39	< 0.41	< 0.42	--	--	< 1.3
MW17T	08/08/2012	--	--	--	< 0.39	< 0.41	< 0.42	--	--	< 1.3
MW17T	11/13/2012	< 0.97	< 0.83	--	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
MW17T	02/26/2013	< 0.97	< 0.83	--	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
MW17T	05/29/2013	< 0.57	< 2.5	--	< 0.5	< 0.5	< 0.44	< 0.5	< 0.82	--
MW17T	11/12/2013	< 0.5	< 0.5	--	< 0.5	< 0.5	< 0.44	< 0.5	< 0.82	--
MW17T	05/19/2014	< 0.5	< 0.5	--	< 0.5	< 0.5	< 0.5	< 0.5	< 1	--
MW18T	04/11/2000	--	--	< 1	< 1	< 1	< 1	--	--	< 3
MW18T	03/27/2001	--	--	< 1	< 1	< 1	< 1	--	--	< 3
MW18T	06/05/2002	--	--	< 0.92	< 0.45	< 0.82	< 0.68	--	--	< 0.77
MW18T	05/15/2003	--	--	< 0.66	< 0.3	< 0.6	< 0.58	--	--	< 1.2
MW18T	02/25/2004	--	--	--	--	--	--	--	--	--
MW18T	05/24/2004	--	--	< 0.4	< 0.14	< 0.4	< 0.36	--	--	< 0.74
MW18T	05/18/2005	--	--	< 0.97	< 0.41	< 0.54	< 0.67	--	--	< 1.8
MW18T	11/28/2005	--	--	--	--	--	--	--	--	--
MW18T	05/30/2006	< 0.39	< 0.4	< 0.4	< 0.14	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74
MW18T	05/16/2007	< 0.39	< 0.4	< 0.4	< 0.14	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74
MW18T	11/15/2007	--	--	--	--	--	--	--	--	--
MW18T	10/26/2009	< 0.39	< 0.4	< 0.4	< 0.23	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74
MW18T	01/27/2010	< 0.43	< 0.4	< 0.43	< 0.39	< 0.41	< 0.42	< 0.38	< 0.87	< 0.87
MW18T	04/27/2010	< 0.97	< 0.83	< 0.97	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	< 2.6
MW18T	07/26/2010	< 0.97	< 0.83	< 0.97	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	< 1.8
MW18T	11/03/2010	< 0.97	< 0.83	--	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
MW18T	05/17/2011	< 0.43	< 0.4	--	< 0.39	< 0.41	< 0.42	< 0.38	< 0.87	--
MW18T	11/01/2011	< 0.43	< 0.4	--	< 0.39	< 0.41	< 0.42	--	--	< 1.3
MW18T	08/07/2012	--	--	--	< 0.39	< 0.41	< 0.42	--	--	< 1.3
MW18T	11/13/2012	< 0.97	< 0.83	--	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
MW18T	02/26/2013	< 0.97	< 0.83	--	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
MW18T	05/29/2013	< 0.57	< 2.5	--	< 0.5	< 0.5	< 0.44	< 0.5	< 0.82	--
MW18T	11/12/2013	< 0.5	< 0.5	--	< 0.5	< 0.5	< 0.44	< 0.5	< 0.82	--
MW18T	05/19/2014	< 0.5	< 0.5	--	< 0.5	< 0.5	< 0.5	< 0.5	< 1	--

Table 18. Groundwater Analytical Results – PVOCs Exceeding SLs
Wisconsin Public Service Corporation, Manitowoc
Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

		VOC								
Sample Location	Sample Date	1,2,4-Trimethylbenzene (µg/l)	1,3,5-Trimethylbenzene (µg/l)	Trimethylbenzenes, Total (µg/l)	Benzene (µg/l)	Ethylbenzene (µg/l)	Toluene (µg/l)	Xylene, o (µg/l)	Xylenes, m + p (µg/l)	Xylenes, Total (µg/l)
Groundwater SL for WI / IBS		**15**	**120**	**480**	**5**	**700**	**800**	**190**	**190**	**2,000**
MW19T	04/11/2000	--	--	< 1	< 1	< 1	< 1	--	--	< 3
MW19T	03/27/2001	--	--	< 1	< 1	1.7	< 1	--	--	< 3
MW19T	06/05/2002	--	--	< 0.92	2.4	< 0.82	< 0.68	--	--	0.94
MW19T	05/15/2003	--	--	< 0.66	< 0.3	< 0.6	< 0.58	--	--	< 1.2
MW19T	02/25/2004	--	--	--	--	--	--	--	--	--
MW19T	05/24/2004	--	--	< 0.4	1.1	< 0.4	< 0.36	--	--	0.76
MW19T	05/18/2005	--	--	< 0.97	< 0.41	< 0.54	< 0.67	--	--	< 1.8
MW19T	11/28/2005	--	--	--	--	--	--	--	--	--
MW19T	05/30/2006	< 0.39	< 0.4	< 0.4	0.17	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74
MW19T	05/16/2007	< 0.39	< 0.4	< 0.4	0.31	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74
MW19T	11/15/2007	--	--	--	--	--	--	--	--	--
MW19T	10/26/2009	< 0.39	< 0.4	< 0.4	< 0.23	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74
MW19T	01/26/2010	< 0.43	< 0.4	< 0.43	< 0.39	< 0.41	< 0.42	< 0.38	< 0.87	< 0.87
MW19T	04/28/2010	< 0.97	< 0.83	< 0.97	0.99	< 0.54	< 0.67	< 0.83	< 1.8	< 2.6
MW19T	07/26/2010	< 0.97	< 0.83	< 0.97	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	< 1.8
MW19T	11/02/2010	< 0.97	< 0.83	--	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
MW19T	05/18/2011	< 0.43	< 0.4	--	< 0.39	< 0.41	< 0.42	< 0.38	< 0.87	--
MW19T	11/02/2011	< 0.43	< 0.4	--	< 0.39	< 0.41	< 0.42	--	--	< 1.3
MW19T	08/08/2012	--	--	--	< 0.39	< 0.41	< 0.42	--	--	< 1.3
MW19T	11/13/2012	< 0.97	< 0.83	--	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
MW19T	02/25/2013	< 0.97	< 0.83	--	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
MW19T	05/29/2013	< 0.57	< 2.5	--	< 0.5	< 0.5	< 0.44	< 0.5	< 0.82	--
MW19T	11/13/2013	< 0.5	< 0.5	--	< 0.5	< 0.5	< 0.44	< 0.5	< 0.82	--
MW19T	05/19/2014	< 0.5	< 0.5	--	< 0.5	< 0.5	< 0.5	< 0.5	< 1	--
MW20T	04/11/2000	--	--	< 1	< 1	< 1	< 1	--	--	< 3
MW20T	03/27/2001	--	--	< 1	< 1	< 1	< 1	--	--	< 3
MW20T	06/05/2002	--	--	< 0.92	< 0.45	< 0.82	< 0.68	--	--	< 0.77
MW20T	05/15/2003	--	--	< 0.66	< 0.3	< 0.6	< 0.58	--	--	< 1.2
MW20T	02/25/2004	--	--	--	--	--	--	--	--	--
MW20T	05/24/2004	--	--	--	--	--	--	--	--	--
MW20T	05/25/2004	--	--	< 0.4	< 0.14	< 0.4	< 0.36	--	--	< 0.74
MW20T	05/18/2005	--	--	< 0.97	< 0.41	< 0.54	< 0.67	--	--	< 1.8
MW20T	11/28/2005	--	--	--	--	--	--	--	--	--
MW20T	05/30/2006	< 0.39	< 0.4	< 0.4	0.22	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74
MW20T	05/16/2007	< 0.39	< 0.4	< 0.4	0.19	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74
MW20T	11/15/2007	--	--	--	--	--	--	--	--	--
MW20T	10/26/2009	< 0.39	< 0.4	< 0.4	< 0.23	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74
MW20T	01/26/2010	< 0.43	< 0.4	< 0.43	< 0.39	< 0.41	< 0.42	< 0.38	< 0.87	< 0.87
MW20T	04/28/2010	< 0.97	< 0.83	< 0.97	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	< 2.6
MW20T	07/26/2010	< 0.97	< 0.83	< 0.97	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	< 1.8
MW20T	11/02/2010	< 0.97	< 0.83	--	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
MW20T	05/18/2011	< 0.43	< 0.4	--	< 0.39	< 0.41	< 0.42	< 0.38	< 0.87	--
MW20T	11/01/2011	< 0.43	< 0.4	--	< 0.39	< 0.41	< 0.42	--	--	< 1.3
MW20T	08/08/2012	--	--	--	< 0.39	< 0.41	< 0.42	--	--	< 1.3
MW20T	11/13/2012	< 0.97	< 0.83	--	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
MW20T	02/26/2013	< 0.97	< 0.83	--	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
MW20T	05/29/2013	< 0.57	< 2.5	--	< 0.5	< 0.5	< 0.44	< 0.5	< 0.82	--
MW20T	11/12/2013	< 0.5	< 0.5	--	< 0.5	< 0.5	< 0.44	< 0.5	< 0.82	--
MW20T	05/19/2014	< 0.5	< 0.5	--	< 0.5	< 0.5	< 0.5	< 0.5	< 1	--

Table 18. Groundwater Analytical Results – PVOCs Exceeding SLs
Wisconsin Public Service Corporation, Manitowoc
Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

		VOC								
Sample Location	Sample Date	1,2,4-Trimethylbenzene (µg/l)	1,3,5-Trimethylbenzene (µg/l)	Trimethylbenzenes, Total (µg/l)	Benzene (µg/l)	Ethylbenzene (µg/l)	Toluene (µg/l)	Xylene, o (µg/l)	Xylenes, m + p (µg/l)	Xylenes, Total (µg/l)
Groundwater SL for WI / IBS		**15**	**120**	**480**	**5**	**700**	**800**	**190**	**190**	**2,000**
MW21T	04/11/2000	--	--	< 1	< 1	< 1	< 1	--	--	< 3
MW21T	03/27/2001	--	--	< 1	< 1	< 1	< 1	--	--	< 3
MW21T	06/05/2002	--	--	< 0.92	< 0.45	< 0.82	< 0.68	--	--	< 0.77
MW21T	05/15/2003	--	--	< 0.66	0.31	< 0.6	< 0.58	--	--	< 1.2
MW21T	02/25/2004	--	--	--	--	--	--	--	--	--
MW21T	05/24/2004	--	--	< 0.4	< 0.14	< 0.4	< 0.36	--	--	< 0.74
MW21T	05/18/2005	--	--	< 0.97	< 0.41	< 0.54	< 0.67	--	--	< 1.8
MW21T	11/28/2005	--	--	--	--	--	--	--	--	--
MW21T	05/30/2006	< 0.39	< 0.4	< 0.4	< 0.14	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74
MW21T	05/16/2007	< 0.39	< 0.4	< 0.4	0.19	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74
MW21T	11/15/2007	--	--	--	--	--	--	--	--	--
MW21T	10/26/2009	< 0.39	< 0.4	< 0.4	< 0.23	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74
MW21T	01/27/2010	< 0.43	< 0.4	< 0.43	< 0.39	< 0.41	< 0.42	< 0.38	< 0.87	< 0.87
MW21T	04/27/2010	< 0.97	< 0.83	< 0.97	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	< 2.6
MW21T	07/26/2010	< 0.97	< 0.83	< 0.97	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	< 1.8
MW21T	11/03/2010	< 0.97	< 0.83	--	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
MW21T	05/18/2011	< 0.43	< 0.4	--	< 0.39	< 0.41	< 0.42	< 0.38	< 0.87	--
MW21T	11/02/2011	< 0.43	< 0.4	--	0.48	< 0.41	< 0.42	--	--	< 1.3
MW21T	08/08/2012	--	--	--	0.47	< 0.41	< 0.42	--	--	< 1.3
MW21T	11/13/2012	< 0.97	< 0.83	--	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
MW21T	02/25/2013	< 0.97	< 0.83	--	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
MW21T	05/29/2013	< 0.57	< 2.5	--	< 0.5	< 0.5	< 0.44	< 0.5	< 0.82	--
MW21T	11/13/2013	< 0.5	< 0.5	--	< 0.5	< 0.5	< 0.44	< 0.5	< 0.82	--
MW21T	05/19/2014	< 0.5	< 0.5	--	< 0.5	< 0.5	< 0.5	< 0.5	< 1	--
MW22	08/08/2012	--	--	--	< 0.39	< 0.41	< 0.42	--	--	< 1.3
MW22	11/13/2012	< 0.97	< 0.83	--	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
MW22	02/26/2013	< 0.97	< 0.83	--	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
MW22	05/29/2013	< 0.57	< 2.5	--	< 0.5	< 0.5	< 0.44	< 0.5	< 0.82	--
MW22	11/12/2013	< 0.5	< 0.5	--	< 0.5	< 0.5	< 0.44	< 0.5	< 0.82	--
MW22	05/19/2014	< 0.5	< 0.5	--	< 0.5	< 0.5	< 0.5	< 0.5	< 1	--
MW23	08/08/2012	--	--	--	< 0.39	< 0.41	< 0.42	--	--	< 1.3
MW23	11/13/2012	< 0.97	< 0.83	--	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
MW23	02/26/2013	< 0.97	< 0.83	--	< 0.41	< 0.54	< 0.67	0.9	< 1.8	--
MW23	05/29/2013	< 0.57	< 2.5	--	< 0.5	< 0.5	< 0.44	< 0.5	< 0.82	--
MW23	11/12/2013	< 0.5	< 0.5	--	< 0.5	< 0.5	< 0.44	< 0.5	< 0.82	--
MW23	05/19/2014	< 0.5	< 0.5	--	< 0.5	< 0.5	< 0.5	< 0.5	< 1	--
PZ5	08/09/2012	--	--	--	< 0.39	< 0.41	< 0.42	--	--	< 1.3
PZ5	11/13/2012	< 0.97	< 0.83	--	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
PZ5	02/26/2013	< 0.97	< 0.83	--	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
PZ5	05/29/2013	< 0.57	< 2.5	--	< 0.5	< 0.5	< 0.44	< 0.5	< 0.82	--
PZ5	11/12/2013	< 0.5	< 0.5	--	< 0.5	< 0.5	< 0.44	< 0.5	< 0.82	--
PZ5	05/19/2014	< 0.5	< 0.5	--	< 0.5	< 0.5	< 0.5	< 0.5	< 1	--
PZ7B	10/26/2009	< 0.39	< 0.4	< 0.4	**11.6**	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74
PZ7B	01/27/2010	< 0.43	< 0.4	< 0.43	< 0.39	< 0.41	< 0.42	< 0.38	< 0.87	< 0.87
PZ7B	04/27/2010	< 0.97	< 0.83	< 0.97	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	< 2.6
PZ7B	07/26/2010	< 0.97	< 0.83	< 0.97	**6.6**	< 0.54	< 0.67	< 0.83	< 1.8	< 1.8
PZ7B	11/02/2010	< 0.97	< 0.83	--	**11.3**	< 0.54	< 0.67	< 0.83	< 1.8	--
PZ7B	05/17/2011	< 0.43	< 0.4	--	**11.4**	< 0.41	< 0.42	< 0.38	< 0.87	--
PZ7B	11/01/2011	< 0.43	< 0.4	--	**8.5**	< 0.41	< 0.42	--	--	< 1.3
PZ7B	08/08/2012	--	--	--	1.1	< 0.41	< 0.42	--	--	< 1.3
PZ7B	11/14/2012	< 0.97	< 0.83	--	2.1	< 0.54	< 0.67	< 0.83	< 1.8	--
PZ7B	02/27/2013	< 0.97	< 0.83	--	**7.6**	< 0.54	< 0.67	< 0.83	< 1.8	--
PZ7B	05/30/2013	< 0.57	< 2.5	--	**6.3**	< 0.5	< 0.44	< 0.5	< 0.82	--
PZ7B	11/13/2013	< 0.5	< 0.5	--	0.94	< 0.5	< 0.44	< 0.5	< 0.82	--
PZ7B	05/20/2014	< 0.5	< 0.5	--	3.9	< 0.5	< 0.5	< 0.5	< 1	--

Table 18. Groundwater Analytical Results – PVOCs Exceeding SLs
Wisconsin Public Service Corporation, Manitowoc
Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

		VOC								
Sample Location	Sample Date	1,2,4-Trimethylbenzene (µg/l)	1,3,5-Trimethylbenzene (µg/l)	Trimethylbenzenes, Total (µg/l)	Benzene (µg/l)	Ethylbenzene (µg/l)	Toluene (µg/l)	Xylene, o (µg/l)	Xylenes, m + p (µg/l)	Xylenes, Total (µg/l)
Groundwater SL for WI / IBS		**15**	**120**	**480**	**5**	**700**	**800**	**190**	**190**	**2,000**
PZ18TB	10/26/2009	< 0.39	< 0.4	< 0.4	0.25	< 0.4	0.58	< 0.36	< 0.74	< 0.74
PZ18TB	01/27/2010	< 0.43	< 0.4	< 0.43	< 0.39	< 0.41	< 0.42	< 0.38	< 0.87	< 0.87
PZ18TB	04/27/2010	< 0.97	< 0.83	< 0.97	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	< 2.6
PZ18TB	07/26/2010	< 0.97	< 0.83	< 0.97	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	< 1.8
PZ18TB	11/03/2010	< 0.97	< 0.83	--	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
PZ18TB	05/17/2011	< 0.43	< 0.4	--	< 0.39	< 0.41	< 0.42	< 0.38	< 0.87	--
PZ18TB	11/01/2011	< 0.43	< 0.4	--	< 0.39	< 0.41	< 0.42	--	--	< 1.3
PZ18TB	08/07/2012	--	--	--	< 0.39	< 0.41	< 0.42	--	--	< 1.3
PZ18TB	11/13/2012	< 0.97	< 0.83	--	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
PZ18TB	02/26/2013	< 0.97	< 0.83	--	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
PZ18TB	05/29/2013	< 0.57	< 2.5	--	< 0.5	< 0.5	< 0.44	< 0.5	< 0.82	--
PZ18TB	11/12/2013	< 0.5	< 0.5	--	< 0.5	< 0.5	< 0.44	< 0.5	< 0.82	--
PZ18TB	05/19/2014	< 0.5	< 0.5	--	< 0.5	< 0.5	< 0.5	< 0.5	< 1	--
PZ23B	10/27/2009	< 0.39	< 0.4	< 0.4	< 0.23	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74
PZ23B	01/26/2010	< 0.43	< 0.4	< 0.43	< 0.39	< 0.41	< 0.42	< 0.38	< 0.87	< 0.87
PZ23B	04/28/2010	< 0.97	< 0.83	< 0.97	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	< 2.6
PZ23B	07/27/2010	< 0.97	< 0.83	< 0.97	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	< 1.8
PZ23B	11/03/2010	< 0.97	< 0.83	--	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
PZ23B	05/18/2011	< 0.43	< 0.4	--	< 0.39	< 0.41	< 0.42	< 0.38	< 0.87	--
PZ23B	11/02/2011	< 0.43	< 0.4	--	< 0.39	< 0.41	< 0.42	--	--	< 1.3
PZ23B	08/09/2012	--	--	--	< 0.39	< 0.41	< 0.42	--	--	< 1.3
PZ23B	11/14/2012	< 0.97	< 0.83	--	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
PZ23B	02/26/2013	< 0.97	< 0.83	--	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
PZ23B	05/30/2013	< 0.57	< 2.5	--	< 0.5	< 0.5	< 0.44	< 0.5	< 0.82	--
PZ23B	11/13/2013	< 0.5	< 0.5	--	< 0.5	< 0.5	< 0.44	< 0.5	< 0.82	--
PZ23B	05/19/2014	< 0.5	< 0.5	--	< 0.5	< 0.5	< 0.5	< 0.5	< 1	--
PZ24	10/27/2009	< 0.39	< 0.4	< 0.4	0.41	< 0.4	0.37	< 0.36	< 0.74	< 0.74
PZ24	01/26/2010	< 0.43	< 0.4	< 0.43	0.41	< 0.41	< 0.42	< 0.38	< 0.87	< 0.87
PZ24	04/28/2010	< 0.97	< 0.83	< 0.97	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	< 2.6
PZ24	07/27/2010	< 0.97	< 0.83	< 0.97	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	< 1.8
PZ24	11/03/2010	< 0.97	< 0.83	--	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
PZ24	05/18/2011	< 0.43	< 0.4	--	< 0.39	< 0.41	< 0.42	< 0.38	< 0.87	--
PZ24	11/02/2011	< 0.43	< 0.4	--	< 0.39	< 0.41	< 0.42	--	--	< 1.3
PZ24	08/09/2012	--	--	--	< 0.39	< 0.41	< 0.42	--	--	< 1.3
PZ24	11/14/2012	< 0.97	< 0.83	--	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
PZ24	02/26/2013	< 0.97	< 0.83	--	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
PZ24	05/30/2013	< 0.57	< 2.5	--	< 0.5	< 0.5	< 0.44	< 0.5	< 0.82	--
PZ24	11/13/2013	< 0.5	< 0.5	--	< 0.5	< 0.5	< 0.44	< 0.5	< 0.82	--
PZ24	05/19/2014	< 0.5	< 0.5	--	< 0.5	< 0.5	< 0.5	< 0.5	< 1	--
PZ25	10/27/2009	**31**	11.6	42.6	**21.8**	28.3	28.3	24.8	46.6	70.4
PZ25	01/27/2010	9.5	3.8	13.3	**6.8**	10.3	6.2	8.7	13.4	22.1
PZ25	04/28/2010	8.9	3.5	12.4	**5.6**	10.9	4.2	7.9	12.3	20.2
PZ25	07/27/2010	10.8	< 8.3	10.8	**10**	9.8	< 6.7	< 8.3	< 18	< 8.3
PZ25	11/03/2010	2	< 0.83	--	**5.6**	2.6	0.96	< 0.83	< 1.8	--
PZ25	05/18/2011	1.2	0.53	--	1.9	1.3	0.73	0.84	0.96	--
PZ25	11/02/2011	4	1.3	--	**6.8**	< 0.41	< 0.42	--	--	4.4
PZ25	08/09/2012	--	--	--	2.6	< 0.41	< 0.42	--	--	< 1.3
PZ25	11/14/2012	1.4	< 0.83	--	**8.4**	4.2	1.4	< 0.83	< 1.8	--
PZ25	02/27/2013	2.2	< 0.83	--	**9.1**	4.1	1.1	< 0.83	< 1.8	--
PZ25	05/30/2013	< 0.57	< 2.5	--	4.6	1	< 0.44	< 0.5	< 0.82	--
PZ25	11/13/2013	< 0.5	< 0.5	--	**7.5**	2	0.67	< 0.5	< 0.82	--
PZ25	05/20/2014	< 0.5	< 0.5	--	< 0.5	< 0.5	< 0.5	< 0.5	< 1	--

Table 18. Groundwater Analytical Results – PVOCs Exceeding SLs
Wisconsin Public Service Corporation, Manitowoc
Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

		VOC								
Sample Location	Sample Date	1,2,4-Trimethylbenzene (µg/l)	1,3,5-Trimethylbenzene (µg/l)	Trimethylbenzenes, Total (µg/l)	Benzene (µg/l)	Ethylbenzene (µg/l)	Toluene (µg/l)	Xylene, o (µg/l)	Xylenes, m + p (µg/l)	Xylenes, Total (µg/l)
Groundwater SL for WI / IBS		**15**	**120**	**480**	**5**	**700**	**800**	**190**	**190**	**2,000**
PZ26	10/27/2009	< 0.39	< 0.4	< 0.4	0.26	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74
PZ26	01/27/2010	< 0.43	< 0.4	< 0.43	0.62	< 0.41	0.55	< 0.38	< 0.87	< 0.87
PZ26	04/28/2010	< 0.97	< 0.83	< 0.97	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	< 2.6
PZ26	07/27/2010	< 0.97	< 0.83	< 0.97	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	< 1.8
PZ26	11/03/2010	< 0.97	< 0.83	--	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
PZ26	05/18/2011	< 0.43	< 0.4	--	< 0.39	< 0.41	< 0.42	< 0.38	< 0.87	--
PZ26	11/02/2011	< 0.43	< 0.4	--	< 0.39	< 0.41	< 0.42	--	--	< 1.3
PZ26	08/09/2012	--	--	--	< 0.39	< 0.41	< 0.42	--	--	< 1.3
PZ26	11/14/2012	< 0.97	< 0.83	--	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
PZ26	02/27/2013	< 0.97	< 0.83	--	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
PZ26	05/30/2013	< 0.57	< 2.5	--	< 0.5	< 0.5	< 0.44	< 0.5	< 0.82	--
PZ26	11/13/2013	< 0.5	< 0.5	--	< 0.5	< 0.5	< 0.44	< 0.5	< 0.82	--
PZ26	05/20/2014	< 0.5	< 0.5	--	< 0.5	< 0.5	< 0.5	< 0.5	< 1	--
Total Number of Samples Analyzed:		290	290	205	410	410	410	270	270	250
es with Detections above Reported Limit:		47	19	39	88	54	45	30	25	36
Min:		0.58	0.53	0.58	0.17	0.55	0.37	0.48	0.77	0.48
Max:		766	194	1,110	2,600	5,800	4,200	1,190	2,210	5,450
Groundwater SL for WI / IBS		15	120	480	5	700	800	190	190	2,000
Number of Samples that Exceed SL:		**18**	**2**	**5**	**42**	**15**	**6**	**12**	**11**	**6**

[O:ECK 8/13/14]

NOTES:
BOLD Value exceeds SL
< Concentration is less than reported level
-- Analysis not performed
NS No Standard
SL Screening Level
µg/L microgram per liter

SLs used on this table were presented in the Multi-Site Risk Assessment Framework Addendum Revision 3 (Exponent, July 2014). The groundwater SL presented is the more conservative of the State and MCL values presented in the RAF Addendum Revision 3. In the absence of a State or MCL value, the Tap Water value was selected.

* MW14 was damaged and not sampled; however, based on previous sampling events, the analytical groundwater results would be similar to the most recent sampling event (Noven

Table 19. Groundwater Analytical Results – PVOCs Exceeding Tap Water SLs
Wisconsin Public Service Corporation, Manitowoc
Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

		VOC							
Sample Location	Sample Date	1,2,4-Trimethylbenzene (µg/l)	1,3,5-Trimethylbenzene (µg/l)	Benzene (µg/l)	Ethylbenzene (µg/l)	Toluene (µg/l)	Xylene, o (µg/l)	Xylenes, m + p (µg/l)	Xylenes, Total (µg/l)
	Tap Water SL for WI / IBS	**15**	**120**	**0.45**	**1.5**	**1,100**	**190**	**190**	**190**
	Value exceeds SL								
	Detected below SL								
	Not detected above reported limit								
	Not analyzed								
MW1	03/27/2001	--	--	< 1	< 1	< 1	--	--	< 3
MW1	06/05/2002	--	--	< 0.45	< 0.82	< 0.68	--	--	< 0.77
MW1	11/19/2003	--	--	--	--	--	--	--	--
MW1	02/25/2004	--	--	--	--	--	--	--	--
MW1	05/24/2004	--	--	< 0.14	< 0.4	< 0.36	--	--	< 0.74
MW1	05/18/2005	--	--	< 0.41	< 0.54	< 0.67	--	--	< 1.8
MW1	11/28/2005	--	--	--	--	--	--	--	--
MW1	05/30/2006	< 0.39	< 0.4	0.21	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74
MW1	05/16/2007	3.1	0.64	**4.7**	1.3	7	2.8	4.4	7.2
MW1	11/15/2007	--	--	--	--	--	--	--	--
MW1	10/27/2009	< 0.39	< 0.4	< 0.23	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74
MW1	04/27/2010	< 0.97	< 0.83	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	< 2.6
MW1	07/27/2010	< 0.97	< 0.83	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	< 1.8
MW1	11/03/2010	< 0.97	< 0.83	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
MW1	05/18/2011	< 0.43	< 0.4	< 0.39	< 0.41	< 0.42	< 0.38	< 0.87	--
MW1	11/02/2011	< 0.43	< 0.4	< 0.39	< 0.41	< 0.42	--	--	< 1.3
MW1	08/08/2012	--	--	< 0.39	< 0.41	< 0.42	--	--	< 1.3
MW1	11/13/2012	< 0.97	< 0.83	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
MW1	02/25/2013	< 0.97	< 0.83	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
MW1	05/29/2013	< 0.57	< 2.5	< 0.5	< 0.5	< 0.44	< 0.5	< 0.82	--
MW1	11/13/2013	< 0.5	< 0.5	< 0.5	< 0.5	< 0.44	< 0.5	< 0.82	--
MW1	05/19/2014	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 1	--
MW2	04/11/2000	--	--	**4.6**	**5.5**	3.3	--	--	< 3
MW2	03/27/2001	--	--	**1.4**	**40**	1.4	--	--	3.6
MW2	06/05/2002	--	--	**0.63**	**18**	0.85	--	--	1.6
MW2	05/15/2003	--	--	**0.79**	**19**	2.9	--	--	5.2
MW2	02/25/2004	--	--	--	--	--	--	--	--
MW2	05/24/2004	--	--	**0.64**	**40**	3.2	--	--	7.3
MW2	05/18/2005	--	--	< 0.41	**38**	0.94	--	--	2.6
MW2	11/28/2005	--	--	--	--	--	--	--	--
MW2	05/30/2006	5.3	< 0.4	**1**	**7.8**	< 0.36	2	1.3	2.3
MW2	05/16/2007	1.2	< 0.4	**2.3**	**4.8**	< 0.36	1.2	0.77	1.79
MW2	11/15/2007	--	--	--	--	--	--	--	--
MW2	10/27/2009	1.3	< 0.4	**5.3**	**4.8**	< 0.36	2	1.7	3.7
MW2	01/27/2010	0.82	< 0.4	**4.3**	**3.4**	0.45	1.2	1.2	2.4
MW2	04/27/2010	< 0.97	< 0.83	**1.1**	0.55	< 0.67	< 0.83	< 1.8	< 2.6
MW2	07/26/2010	< 0.97	< 0.83	**4**	**2.4**	< 0.67	1	< 1.8	< 1.8
MW2	11/03/2010	2.2	< 0.83	**6.2**	**4.4**	0.84	2.8	3.2	--
MW2	05/18/2011	< 0.43	< 0.4	< 0.39	< 0.41	< 0.42	< 0.38	< 0.87	--
MW2	11/02/2011	< 0.43	< 0.4	< 0.39	< 0.41	< 0.42	--	--	< 1.3
MW2	08/07/2012	--	--	0.41	< 0.41	< 0.42	--	--	< 1.3
MW2	11/13/2012	< 0.97	< 0.83	**0.78**	0.63	< 0.67	< 0.83	< 1.8	--
MW2	02/26/2013	< 0.97	< 0.83	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
MW2	05/29/2013	< 0.57	< 2.5	**0.51**	0.62	< 0.44	0.94	0.94	--
MW2	11/12/2013	< 0.5	< 0.5	< 0.5	< 0.5	< 0.44	< 0.5	< 0.82	--
MW2	05/19/2014	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 1	--

Table 19. Groundwater Analytical Results – PVOCs Exceeding Tap Water SLs
Wisconsin Public Service Corporation, Manitowoc
Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

		VOC							
Sample Location	Sample Date	1,2,4-Trimethylbenzene (µg/l)	1,3,5-Trimethylbenzene (µg/l)	Benzene (µg/l)	Ethylbenzene (µg/l)	Toluene (µg/l)	Xylene, o (µg/l)	Xylenes, m + p (µg/l)	Xylenes, Total (µg/l)
Tap Water SL for WI / IBS		**15**	**120**	**0.45**	**1.5**	**1,100**	**190**	**190**	**190**
MW5	06/05/2002	--	--	< 0.45	< 0.82	< 0.68	--	--	< 0.77
MW5	05/15/2003	--	--	< 0.3	< 0.6	< 0.58	--	--	< 1.2
MW5	02/25/2004	--	--	--	--	--	--	--	--
MW5	05/24/2004	--	--	< 0.14	< 0.4	< 0.36	--	--	< 0.74
MW5	05/18/2005	--	--	< 0.41	< 0.54	< 0.67	--	--	< 1.8
MW5	11/28/2005	--	--	--	--	--	--	--	--
MW5	05/30/2006	< 0.39	< 0.4	0.44	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74
MW5	05/16/2007	< 0.39	< 0.4	< 0.14	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74
MW5	11/15/2007	--	--	--	--	--	--	--	--
MW5	10/27/2009	< 0.39	< 0.4	< 0.23	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74
MW5	01/27/2010	< 0.43	< 0.4	< 0.39	< 0.41	< 0.42	< 0.38	< 0.87	< 0.87
MW5	04/27/2010	< 0.97	< 0.83	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	< 2.6
MW5	07/26/2010	< 0.97	< 0.83	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	< 1.8
MW5	11/03/2010	< 0.97	< 0.83	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
MW5	05/18/2011	< 0.43	< 0.4	< 0.39	< 0.41	< 0.42	< 0.38	< 0.87	--
MW5	11/02/2011	< 0.43	< 0.4	< 0.39	< 0.41	< 0.42	--	--	< 1.3
MW5	08/07/2012	--	--	< 0.39	< 0.41	< 0.42	--	--	< 1.3
MW5	11/13/2012	< 0.97	< 0.83	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
MW5	02/26/2013	< 0.97	< 0.83	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
MW5	05/29/2013	< 0.57	< 2.5	< 0.5	< 0.5	< 0.44	< 0.5	< 0.82	--
MW5	11/12/2013	< 0.5	< 0.5	< 0.5	< 0.5	< 0.44	< 0.5	< 0.82	--
MW5	05/19/2014	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 1	--
MW6	04/11/2000	--	--	< 1	< 1	< 1	--	--	< 3
MW6	03/27/2001	--	--	< 1	**4.1**	< 1	--	--	9.9
MW6	10/25/2001	--	--	< 1	< 1	< 1	--	--	< 3
MW6	06/05/2002	--	--	< 0.45	< 0.82	< 0.68	--	--	< 0.77
MW6	05/15/2003	--	--	< 0.3	< 0.6	< 0.58	--	--	< 1.2
MW6	02/25/2004	--	--	--	--	--	--	--	--
MW6	08/08/2012	--	--	< 0.39	< 0.41	< 0.42	--	--	< 1.3
MW6	11/14/2012	< 0.97	< 0.83	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
MW6	02/26/2013	--	--	--	--	--	--	--	--
MW6	05/29/2013	--	--	--	--	--	--	--	--
MW6	11/13/2013	--	--	--	--	--	--	--	--
MW7	04/11/2000	--	--	< 1	< 1	< 1	--	--	< 3
MW7	03/27/2001	--	--	< 1	< 1	< 1	--	--	< 3
MW7	06/05/2002	--	--	< 0.45	< 0.82	< 0.68	--	--	< 0.77
MW7	05/15/2003	--	--	< 0.3	< 0.6	< 0.58	--	--	< 1.2
MW7	10/26/2009	< 0.39	< 0.4	< 0.23	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74
MW7	01/27/2010	< 0.43	< 0.4	< 0.39	< 0.41	< 0.42	< 0.38	< 0.87	< 0.87
MW7	01/27/2010	--	--	--	--	--	--	--	--
MW7	04/27/2010	< 0.97	< 0.83	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	< 2.6
MW7	07/26/2010	< 0.97	< 0.83	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	< 1.8
MW7	11/02/2010	< 0.97	< 0.83	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
MW7	05/17/2011	< 0.43	< 0.4	< 0.39	< 0.41	< 0.42	< 0.38	< 0.87	--
MW7	11/01/2011	< 0.43	< 0.4	< 0.39	< 0.41	< 0.42	--	--	< 1.3
MW7	08/08/2012	--	--	< 0.39	< 0.41	< 0.42	--	--	< 1.3
MW7	11/14/2012	< 0.97	< 0.83	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
MW7	02/27/2013	< 0.97	< 0.83	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
MW7	05/30/2013	< 0.57	< 2.5	< 0.5	< 0.5	< 0.44	< 0.5	< 0.82	--
MW7	11/13/2013	< 0.5	< 0.5	< 0.5	< 0.5	< 0.44	< 0.5	< 0.82	--
MW7	05/20/2014	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 1	--

Table 19. Groundwater Analytical Results – PVOCs Exceeding Tap Water SLs
Wisconsin Public Service Corporation, Manitowoc
Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

		VOC							
Sample Location	Sample Date	1,2,4-Trimethylbenzene (µg/l)	1,3,5-Trimethylbenzene (µg/l)	Benzene (µg/l)	Ethylbenzene (µg/l)	Toluene (µg/l)	Xylene, o (µg/l)	Xylenes, m + p (µg/l)	Xylenes, Total (µg/l)
	Tap Water SL for WI / IBS	**15**	**120**	**0.45**	**1.5**	**1,100**	**190**	**190**	**190**
MW8	04/11/2000	--	--	< 1	< 1	< 1	--	--	< 3
MW8	03/27/2001	--	--	< 1	< 1	< 1	--	--	< 3
MW8	06/05/2002	--	--	< 0.45	< 0.82	< 0.68	--	--	< 0.77
MW8	05/15/2003	--	--	< 0.3	< 0.6	< 0.58	--	--	< 1.2
MW8	05/24/2004	--	--	< 0.14	< 0.4	< 0.36	--	--	< 0.74
MW8	05/18/2005	--	--	< 0.41	< 0.54	< 0.67	--	--	< 1.8
MW8	11/28/2005	--	--	--	--	--	--	--	--
MW8	05/30/2006	< 0.39	< 0.4	< 0.14	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74
MW8	05/16/2007	< 0.39	< 0.4	< 0.14	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74
MW8	11/15/2007	--	--	--	--	--	--	--	--
MW8	10/26/2009	< 0.39	< 0.4	< 0.23	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74
MW8	01/27/2010	< 0.43	< 0.4	< 0.39	< 0.41	< 0.42	< 0.38	< 0.87	< 0.87
MW8	04/27/2010	< 0.97	< 0.83	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	< 2.6
MW8	07/26/2010	< 0.97	< 0.83	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	< 1.8
MW8	11/02/2010	< 0.97	< 0.83	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
MW8	05/17/2011	< 0.43	< 0.4	< 0.39	< 0.41	< 0.42	< 0.38	< 0.87	--
MW8	11/01/2011	< 0.43	< 0.4	< 0.39	< 0.41	< 0.42	--	--	< 1.3
MW8	08/08/2012	--	--	< 0.39	< 0.41	< 0.42	--	--	< 1.3
MW8	11/13/2012	< 0.97	< 0.83	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
MW8	02/26/2013	< 0.97	< 0.83	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
MW8	05/30/2013	< 0.57	< 2.5	< 0.5	< 0.5	< 0.44	< 0.5	< 0.82	--
MW8	11/12/2013	< 0.5	< 0.5	< 0.5	< 0.5	< 0.44	< 0.5	< 0.82	--
MW8	05/20/2014	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 1	--
MW9	04/11/2000	--	--	**3.1**	< 1	< 1	--	--	< 3
MW9	03/27/2001	--	--	**8.8**	< 1	< 1	--	--	< 3
MW9	06/05/2002	--	--	**0.94**	< 0.82	< 0.68	--	--	< 0.77
MW9	05/15/2003	--	--	**1.3**	< 0.6	< 0.58	--	--	< 1.2
MW9	02/25/2004	--	--	--	--	--	--	--	--
MW9	05/24/2004	--	--	0.3	< 0.4	< 0.36	--	--	< 0.74
MW9	05/18/2005	--	--	< 0.41	< 0.54	< 0.67	--	--	< 1.8
MW9	11/28/2005	--	--	--	--	--	--	--	--
MW9	05/30/2006	< 0.39	< 0.4	< 0.14	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74
MW9	05/16/2007	0.65	< 0.4	< 0.14	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74
MW9	11/15/2007	--	--	--	--	--	--	--	--
MW9	10/26/2009	0.58	< 0.4	< 0.23	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74
MW9	01/27/2010	< 0.43	< 0.4	< 0.39	< 0.41	< 0.42	< 0.38	< 0.87	< 0.87
MW9	04/27/2010	< 0.97	< 0.83	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	< 2.6
MW9	05/20/2014	--	--	--	--	--	--	--	--
MW10	04/11/2000	--	--	< 1	< 1	< 1	--	--	< 3
MW10	03/27/2001	--	--	< 1	< 1	< 1	--	--	< 3
MW10	06/05/2002	--	--	< 0.45	< 0.82	< 0.68	--	--	< 0.77
MW10	05/15/2003	--	--	< 0.3	< 0.6	< 0.58	--	--	< 1.2
MW10	02/25/2004	--	--	--	--	--	--	--	--
MW10	05/24/2004	--	--	< 0.14	< 0.4	< 0.36	--	--	< 0.74
MW10	05/18/2005	--	--	< 0.41	< 0.54	< 0.67	--	--	< 1.8
MW10	11/28/2005	--	--	--	--	--	--	--	--
MW10	05/30/2006	1.3	< 0.4	< 0.14	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74
MW10	05/16/2007	**17**	< 0.4	< 0.14	< 0.4	< 0.36	0.49	< 0.74	0.49
MW10	11/15/2007	--	--	--	--	--	--	--	--
MW10	10/26/2009	10.8	< 0.4	< 0.23	< 0.4	< 0.36	0.48	< 0.74	0.48
MW10	01/27/2010	5	< 0.4	< 0.39	< 0.41	< 0.42	< 0.38	< 0.87	< 0.87
MW10	04/27/2010	**21**	< 0.83	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	< 2.6
MW10	07/26/2010	**22.9**	< 0.83	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	< 1.8
MW10	11/02/2010	14.1	< 0.83	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
MW10	05/17/2011	10	< 0.4	< 0.39	< 0.41	< 0.42	< 0.38	< 0.87	--
MW10	11/01/2011	9.6	< 0.4	< 0.39	< 0.41	< 0.42	--	--	< 1.3
MW10	08/09/2012	--	--	< 0.39	< 0.41	< 0.42	--	--	< 1.3
MW10	11/13/2012	4.6	< 0.83	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
MW10	02/27/2013	5.7	< 0.83	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
MW10	05/30/2013	4.7	< 2.5	**9.8**	< 0.5	< 0.44	< 0.5	< 0.82	--
MW10	11/13/2013	13.5	< 0.5	< 0.5	< 0.5	< 0.44	< 0.5	< 0.82	--
MW10	05/20/2014	14.7	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 1	--

Table 19. Groundwater Analytical Results – PVOCs Exceeding Tap Water SLs
Wisconsin Public Service Corporation, Manitowoc
Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

		VOC							
Sample Location	Sample Date	1,2,4-Trimethylbenzene (µg/l)	1,3,5-Trimethylbenzene (µg/l)	Benzene (µg/l)	Ethylbenzene (µg/l)	Toluene (µg/l)	Xylene, o (µg/l)	Xylenes, m + p (µg/l)	Xylenes, Total (µg/l)
Tap Water SL for WI / IBS		**15**	**120**	**0.45**	**1.5**	**1,100**	**190**	**190**	**190**
MW11	04/11/2000	--	--	< 1	< 1	< 1	--	--	< 3
MW11	03/27/2001	--	--	< 1	< 1	< 1	--	--	< 3
MW11	06/05/2002	--	--	< 0.45	< 0.82	< 0.68	--	--	< 0.77
MW11	05/15/2003	--	--	< 0.3	< 0.6	< 0.58	--	--	< 1.2
MW11	02/25/2004	--	--	--	--	--	--	--	--
MW11	05/24/2004	--	--	< 0.14	< 0.4	< 0.36	--	--	< 0.74
MW11	05/18/2005	--	--	--	--	--	--	--	--
MW11	11/28/2005	--	--	--	--	--	--	--	--
MW11	05/30/2006	--	--	--	--	--	--	--	--
MW12	04/11/2000	--	--	< 1	< 1	< 1	--	--	< 3
MW12	03/27/2001	--	--	< 1	< 1	< 1	--	--	< 3
MW12	06/05/2002	--	--	< 0.45	< 0.82	< 0.68	--	--	< 0.77
MW12	05/15/2003	--	--	--	--	--	--	--	--
MW12	02/25/2004	--	--	--	--	--	--	--	--
MW12	05/24/2004	--	--	< 0.14	< 0.4	< 0.36	--	--	< 0.74
MW12	05/18/2005	--	--	< 0.41	< 0.54	< 0.67	--	--	< 1.8
MW12	11/28/2005	--	--	--	--	--	--	--	--
MW12	05/30/2006	--	--	--	--	--	--	--	--
MW12	06/20/2006	< 0.39	< 0.4	< 0.14	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74
MW12	05/16/2007	< 0.39	< 0.4	< 0.14	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74
MW12	11/15/2007	--	--	--	--	--	--	--	--
MW12	10/27/2009	< 0.39	< 0.4	< 0.23	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74
MW12	01/26/2010	< 0.43	< 0.4	< 0.39	< 0.41	< 0.42	< 0.38	< 0.87	< 0.87
MW12	04/27/2010	< 0.97	< 0.83	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	< 2.6
MW12	07/27/2010	< 0.97	< 0.83	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	< 1.8
MW12	11/03/2010	< 0.97	< 0.83	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
MW12	05/17/2011	< 0.43	< 0.4	< 0.39	< 0.41	< 0.42	< 0.38	< 0.87	--
MW12	11/01/2011	< 0.43	< 0.4	< 0.39	< 0.41	< 0.42	--	--	< 1.3
MW12	08/08/2012	--	--	< 0.39	< 0.41	< 0.42	--	--	< 1.3
MW12	11/14/2012	< 0.97	< 0.83	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
MW12	02/26/2013	< 0.97	< 0.83	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
MW12	05/29/2013	< 0.57	< 2.5	< 0.5	< 0.5	< 0.44	< 0.5	< 0.82	--
MW12	11/12/2013	< 0.5	< 0.5	< 0.5	< 0.5	< 0.44	< 0.5	< 0.82	--
MW12	05/19/2014	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 1	--
MW12D	04/11/2000	--	--	< 1	< 1	< 1	--	--	< 3
MW12D	03/27/2001	--	--	< 1	< 1	< 1	--	--	< 3
MW12D	06/05/2002	--	--	< 0.45	< 0.82	< 0.68	--	--	< 0.77
MW12D	05/15/2003	--	--	< 0.3	< 0.6	< 0.58	--	--	< 1.2
MW12D	02/25/2004	--	--	--	--	--	--	--	--
MW12D	05/24/2004	--	--	< 0.14	< 0.4	< 0.36	--	--	< 0.74
MW12D	05/18/2005	--	--	**2.3**	< 0.54	< 0.67	--	--	< 1.8
MW12D	11/28/2005	--	--	--	--	--	--	--	--
MW12D	05/30/2006	< 0.39	< 0.4	< 0.14	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74
MW12D	05/16/2007	< 0.39	< 0.4	< 0.14	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74
MW12D	11/15/2007	--	--	--	--	--	--	--	--
MW12D	10/26/2009	< 0.39	< 0.4	**0.75**	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74
MW12D	01/26/2010	< 0.43	< 0.4	< 0.39	< 0.41	< 0.42	< 0.38	< 0.87	< 0.87
MW12D	04/27/2010	< 0.97	< 0.83	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	< 2.6
MW12D	07/27/2010	< 0.97	< 0.83	**3.3**	< 0.54	< 0.67	< 0.83	< 1.8	< 1.8
MW12D	11/03/2010	< 0.97	< 0.83	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
MW12D	05/17/2011	< 0.43	< 0.4	< 0.39	< 0.41	< 0.42	< 0.38	< 0.87	--
MW12D	11/01/2011	< 0.43	< 0.4	< 0.39	< 0.41	< 0.42	--	--	< 1.3
MW12D	08/08/2012	--	--	< 0.39	< 0.41	< 0.42	--	--	< 1.3
MW12D	11/14/2012	< 0.97	< 0.83	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
MW12D	02/26/2013	< 0.97	< 0.83	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
MW12D	05/29/2013	< 0.57	< 2.5	**7**	< 0.5	< 0.44	< 0.5	< 0.82	--
MW12D	11/12/2013	< 0.5	< 0.5	< 0.5	< 0.5	< 0.44	< 0.5	< 0.82	--
MW12D	05/19/2014	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 1	--

Table 19. Groundwater Analytical Results – PVOCs Exceeding Tap Water SLs
Wisconsin Public Service Corporation, Manitowoc
Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

		VOC							
Sample Location	Sample Date	1,2,4-Trimethylbenzene (µg/l)	1,3,5-Trimethylbenzene (µg/l)	Benzene (µg/l)	Ethylbenzene (µg/l)	Toluene (µg/l)	Xylene, o (µg/l)	Xylenes, m + p (µg/l)	Xylenes, Total (µg/l)
Tap Water SL for WI / IBS		**15**	**120**	**0.45**	**1.5**	**1,100**	**190**	**190**	**190**
MW13	04/11/2000	--	--	**1,800**	**5,800**	470	--	--	**3,800**
MW13	03/27/2001	--	--	**1,500**	**3,300**	100	--	--	**2,700**
MW13	06/05/2002	--	--	**2,600**	**4,800**	**1,800**	--	--	**4,300**
MW13	05/15/2003	--	--	**300**	**200**	21	--	--	**670**
MW13	02/25/2004	--	--	--	--	--	--	--	--
MW13	05/24/2004	--	--	**210**	**29**	6.3	--	--	**400**
MW13	05/18/2005	--	--	**270**	**670**	17	--	--	**530**
MW13	11/28/2005	--	--	--	--	--	--	--	--
MW13	05/30/2006	**180**	60	**330**	**640**	29	**410**	**240**	**650**
MW13	05/16/2007	1.9	1	**6.4**	1	< 0.36	5.9	0.84	6.74
MW13	11/15/2007	--	--	--	--	--	--	--	--
MW13	10/26/2009	**281**	86	**764**	**1,640**	37	**550**	**652**	**1,202**
MW13	01/26/2010	**313**	95.5	**696**	**1,650**	50	**586**	**417**	**1,003**
MW13	04/27/2010	**262**	85.5	**658**	**1,610**	44	**535**	**663**	**1,200**
MW13	07/26/2010	**190**	57	**557**	**1,430**	28.3	**467**	**481**	**948**
MW13	11/02/2010	13.6	< 2.1	**305**	**59.4**	4.4	10.5	< 4.5	--
MW13	05/17/2011	< 0.43	< 0.4	< 0.39	< 0.41	< 0.42	< 0.38	< 0.87	--
MW13	11/01/2011	**111**	34.9	**290**	**555**	14.6	--	--	**408**
MW13	08/08/2012	--	--	**130**	**222**	1.6	--	--	63.3
MW13	11/13/2012	**114**	37.1	**190**	**728**	35.9	**238**	176	--
MW13	02/26/2013	**356**	105	**470**	**1,650**	83.5	**569**	**827**	--
MW13	05/30/2013	**142**	49.5	**161**	**580**	33.4	**277**	**331**	--
MW13	11/12/2013	**43.3**	4.2	**66**	**188**	2.1	72.5	10.2	--
MW13	05/19/2014	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 1	--
MW14	04/11/2000	--	--	**310**	**600**	**4,000**	--	--	**4,100**
MW14	03/27/2001	--	--	**410**	**810**	**4,200**	--	--	**4,200**
MW14	08/09/2012	--	--	< 19.4	**1,050**	**1,370**	--	--	**5,450**
MW14	11/14/2012	**351**	< 166	< 82	**1,070**	**1,360**	**885**	**1,890**	--
MW14	02/27/2013	**607**	**179**	< 82	**1,350**	715	**868**	**1,750**	--
MW14	05/30/2013	**675**	**194**	< 25	**1,380**	**1,240**	**1,190**	**2,210**	--
MW14	11/13/2013	**766**	< 250	< 250	**1,370**	365	**720**	**1,550**	--
MW14	05/19/2014	--	--	--	--	--	--	--	--
MW17T	04/11/2000	--	--	< 1	< 1	< 1	--	--	< 3
MW17T	03/27/2001	--	--	< 1	< 1	< 1	--	--	< 3
MW17T	06/05/2002	--	--	< 0.45	< 0.82	< 0.68	--	--	< 0.77
MW17T	05/15/2003	--	--	< 0.3	< 0.6	< 0.58	--	--	< 1.2
MW17T	02/25/2004	--	--	--	--	--	--	--	--
MW17T	05/24/2004	--	--	< 0.14	< 0.4	< 0.36	--	--	< 0.74
MW17T	05/18/2005	--	--	< 0.41	< 0.54	< 0.67	--	--	< 1.8
MW17T	11/28/2005	--	--	--	--	--	--	--	--
MW17T	05/30/2006	< 0.39	< 0.4	< 0.14	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74
MW17T	05/16/2007	< 0.39	< 0.4	< 0.14	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74
MW17T	11/15/2007	--	--	--	--	--	--	--	--
MW17T	10/26/2009	< 0.39	< 0.4	< 0.23	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74
MW17T	01/26/2010	< 0.43	< 0.4	< 0.39	< 0.41	< 0.42	< 0.38	< 0.87	< 0.87
MW17T	04/28/2010	< 0.97	< 0.83	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	< 2.6
MW17T	07/26/2010	< 0.97	< 0.83	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	< 1.8
MW17T	11/02/2010	< 0.97	< 0.83	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
MW17T	05/17/2011	< 0.43	< 0.4	< 0.39	< 0.41	< 0.42	< 0.38	< 0.87	--
MW17T	11/01/2011	< 0.43	< 0.4	< 0.39	< 0.41	< 0.42	--	--	< 1.3
MW17T	08/08/2012	--	--	< 0.39	< 0.41	< 0.42	--	--	< 1.3
MW17T	11/13/2012	< 0.97	< 0.83	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
MW17T	02/26/2013	< 0.97	< 0.83	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
MW17T	05/29/2013	< 0.57	< 2.5	< 0.5	< 0.5	< 0.44	< 0.5	< 0.82	--
MW17T	11/12/2013	< 0.5	< 0.5	< 0.5	< 0.5	< 0.44	< 0.5	< 0.82	--
MW17T	05/19/2014	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 1	--

Table 19. Groundwater Analytical Results – PVOCs Exceeding Tap Water SLs
Wisconsin Public Service Corporation, Manitowoc
Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

		VOC							
Sample Location	Sample Date	1,2,4-Trimethylbenzene (µg/l)	1,3,5-Trimethylbenzene (µg/l)	Benzene (µg/l)	Ethylbenzene (µg/l)	Toluene (µg/l)	Xylene, o (µg/l)	Xylenes, m + p (µg/l)	Xylenes, Total (µg/l)
Tap Water SL for WI / IBS		**15**	**120**	**0.45**	**1.5**	**1,100**	**190**	**190**	**190**
MW18T	04/11/2000	--	--	< 1	< 1	< 1	--	--	< 3
MW18T	03/27/2001	--	--	< 1	< 1	< 1	--	--	< 3
MW18T	06/05/2002	--	--	< 0.45	< 0.82	< 0.68	--	--	< 0.77
MW18T	05/15/2003	--	--	< 0.3	< 0.6	< 0.58	--	--	< 1.2
MW18T	02/25/2004	--	--	--	--	--	--	--	--
MW18T	05/24/2004	--	--	< 0.14	< 0.4	< 0.36	--	--	< 0.74
MW18T	05/18/2005	--	--	< 0.41	< 0.54	< 0.67	--	--	< 1.8
MW18T	11/28/2005	--	--	--	--	--	--	--	--
MW18T	05/30/2006	< 0.39	< 0.4	< 0.14	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74
MW18T	05/16/2007	< 0.39	< 0.4	< 0.14	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74
MW18T	11/15/2007	--	--	--	--	--	--	--	--
MW18T	10/26/2009	< 0.39	< 0.4	< 0.23	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74
MW18T	01/27/2010	< 0.43	< 0.4	< 0.39	< 0.41	< 0.42	< 0.38	< 0.87	< 0.87
MW18T	04/27/2010	< 0.97	< 0.83	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	< 2.6
MW18T	07/26/2010	< 0.97	< 0.83	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	< 1.8
MW18T	11/03/2010	< 0.97	< 0.83	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
MW18T	05/17/2011	< 0.43	< 0.4	< 0.39	< 0.41	< 0.42	< 0.38	< 0.87	--
MW18T	11/01/2011	< 0.43	< 0.4	< 0.39	< 0.41	< 0.42	--	--	< 1.3
MW18T	08/07/2012	--	--	< 0.39	< 0.41	< 0.42	--	--	< 1.3
MW18T	11/13/2012	< 0.97	< 0.83	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
MW18T	02/26/2013	< 0.97	< 0.83	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
MW18T	05/29/2013	< 0.57	< 2.5	< 0.5	< 0.5	< 0.44	< 0.5	< 0.82	--
MW18T	11/12/2013	< 0.5	< 0.5	< 0.5	< 0.5	< 0.44	< 0.5	< 0.82	--
MW18T	05/19/2014	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 1	--
MW19T	04/11/2000	--	--	< 1	< 1	< 1	--	--	< 3
MW19T	03/27/2001	--	--	< 1	**1.7**	< 1	--	--	< 3
MW19T	06/05/2002	--	--	**2.4**	< 0.82	< 0.68	--	--	0.94
MW19T	05/15/2003	--	--	< 0.3	< 0.6	< 0.58	--	--	< 1.2
MW19T	02/25/2004	--	--	--	--	--	--	--	--
MW19T	05/24/2004	--	--	**1.1**	< 0.4	< 0.36	--	--	0.76
MW19T	05/18/2005	--	--	< 0.41	< 0.54	< 0.67	--	--	< 1.8
MW19T	11/28/2005	--	--	--	--	--	--	--	--
MW19T	05/30/2006	< 0.39	< 0.4	0.17	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74
MW19T	05/16/2007	< 0.39	< 0.4	0.31	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74
MW19T	11/15/2007	--	--	--	--	--	--	--	--
MW19T	10/26/2009	< 0.39	< 0.4	< 0.23	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74
MW19T	01/26/2010	< 0.43	< 0.4	< 0.39	< 0.41	< 0.42	< 0.38	< 0.87	< 0.87
MW19T	04/28/2010	< 0.97	< 0.83	**0.99**	< 0.54	< 0.67	< 0.83	< 1.8	< 2.6
MW19T	07/26/2010	< 0.97	< 0.83	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	< 1.8
MW19T	11/02/2010	< 0.97	< 0.83	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
MW19T	05/18/2011	< 0.43	< 0.4	< 0.39	< 0.41	< 0.42	< 0.38	< 0.87	--
MW19T	11/02/2011	< 0.43	< 0.4	< 0.39	< 0.41	< 0.42	--	--	< 1.3
MW19T	08/08/2012	--	--	< 0.39	< 0.41	< 0.42	--	--	< 1.3
MW19T	11/13/2012	< 0.97	< 0.83	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
MW19T	02/25/2013	< 0.97	< 0.83	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
MW19T	05/29/2013	< 0.57	< 2.5	< 0.5	< 0.5	< 0.44	< 0.5	< 0.82	--
MW19T	11/13/2013	< 0.5	< 0.5	< 0.5	< 0.5	< 0.44	< 0.5	< 0.82	--
MW19T	05/19/2014	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 1	--

Table 19. Groundwater Analytical Results – PVOCs Exceeding Tap Water SLs
Wisconsin Public Service Corporation, Manitowoc
Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

		VOC							
Sample Location	Sample Date	1,2,4-Trimethylbenzene (µg/l)	1,3,5-Trimethylbenzene (µg/l)	Benzene (µg/l)	Ethylbenzene (µg/l)	Toluene (µg/l)	Xylene, o (µg/l)	Xylenes, m + p (µg/l)	Xylenes, Total (µg/l)
Tap Water SL for WI / IBS		**15**	**120**	**0.45**	**1.5**	**1,100**	**190**	**190**	**190**
MW20T	04/11/2000	--	--	< 1	< 1	< 1	--	--	< 3
MW20T	03/27/2001	--	--	< 1	< 1	< 1	--	--	< 3
MW20T	06/05/2002	--	--	< 0.45	< 0.82	< 0.68	--	--	< 0.77
MW20T	05/15/2003	--	--	< 0.3	< 0.6	< 0.58	--	--	< 1.2
MW20T	02/25/2004	--	--	--	--	--	--	--	--
MW20T	05/24/2004	--	--	--	--	--	--	--	--
MW20T	05/25/2004	--	--	< 0.14	< 0.4	< 0.36	--	--	< 0.74
MW20T	05/18/2005	--	--	< 0.41	< 0.54	< 0.67	--	--	< 1.8
MW20T	11/28/2005	--	--	--	--	--	--	--	--
MW20T	05/30/2006	< 0.39	< 0.4	0.22	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74
MW20T	05/16/2007	< 0.39	< 0.4	0.19	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74
MW20T	11/15/2007	--	--	--	--	--	--	--	--
MW20T	10/26/2009	< 0.39	< 0.4	< 0.23	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74
MW20T	01/26/2010	< 0.43	< 0.4	< 0.39	< 0.41	< 0.42	< 0.38	< 0.87	< 0.87
MW20T	04/28/2010	< 0.97	< 0.83	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	< 2.6
MW20T	07/26/2010	< 0.97	< 0.83	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	< 1.8
MW20T	11/02/2010	< 0.97	< 0.83	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
MW20T	05/18/2011	< 0.43	< 0.4	< 0.39	< 0.41	< 0.42	< 0.38	< 0.87	--
MW20T	11/01/2011	< 0.43	< 0.4	< 0.39	< 0.41	< 0.42	--	--	< 1.3
MW20T	08/08/2012	--	--	< 0.39	< 0.41	< 0.42	--	--	< 1.3
MW20T	11/13/2012	< 0.97	< 0.83	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
MW20T	02/26/2013	< 0.97	< 0.83	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
MW20T	05/29/2013	< 0.57	< 2.5	< 0.5	< 0.5	< 0.44	< 0.5	< 0.82	--
MW20T	11/12/2013	< 0.5	< 0.5	< 0.5	< 0.5	< 0.44	< 0.5	< 0.82	--
MW20T	05/19/2014	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 1	--
MW21T	04/11/2000	--	--	< 1	< 1	< 1	--	--	< 3
MW21T	03/27/2001	--	--	< 1	< 1	< 1	--	--	< 3
MW21T	06/05/2002	--	--	< 0.45	< 0.82	< 0.68	--	--	< 0.77
MW21T	05/15/2003	--	--	0.31	< 0.6	< 0.58	--	--	< 1.2
MW21T	02/25/2004	--	--	--	--	--	--	--	--
MW21T	05/24/2004	--	--	< 0.14	< 0.4	< 0.36	--	--	< 0.74
MW21T	05/18/2005	--	--	< 0.41	< 0.54	< 0.67	--	--	< 1.8
MW21T	11/28/2005	--	--	--	--	--	--	--	--
MW21T	05/30/2006	< 0.39	< 0.4	< 0.14	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74
MW21T	05/16/2007	< 0.39	< 0.4	0.19	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74
MW21T	11/15/2007	--	--	--	--	--	--	--	--
MW21T	10/26/2009	< 0.39	< 0.4	< 0.23	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74
MW21T	01/27/2010	< 0.43	< 0.4	< 0.39	< 0.41	< 0.42	< 0.38	< 0.87	< 0.87
MW21T	04/27/2010	< 0.97	< 0.83	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	< 2.6
MW21T	07/26/2010	< 0.97	< 0.83	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	< 1.8
MW21T	11/03/2010	< 0.97	< 0.83	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
MW21T	05/18/2011	< 0.43	< 0.4	< 0.39	< 0.41	< 0.42	< 0.38	< 0.87	--
MW21T	11/02/2011	< 0.43	< 0.4	**0.48**	< 0.41	< 0.42	--	--	< 1.3
MW21T	08/08/2012	--	--	**0.47**	< 0.41	< 0.42	--	--	< 1.3
MW21T	11/13/2012	< 0.97	< 0.83	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
MW21T	02/25/2013	< 0.97	< 0.83	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
MW21T	05/29/2013	< 0.57	< 2.5	< 0.5	< 0.5	< 0.44	< 0.5	< 0.82	--
MW21T	11/13/2013	< 0.5	< 0.5	< 0.5	< 0.5	< 0.44	< 0.5	< 0.82	--
MW21T	05/19/2014	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 1	--
MW22	08/08/2012	--	--	< 0.39	< 0.41	< 0.42	--	--	< 1.3
MW22	11/13/2012	< 0.97	< 0.83	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
MW22	02/26/2013	< 0.97	< 0.83	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
MW22	05/29/2013	< 0.57	< 2.5	< 0.5	< 0.5	< 0.44	< 0.5	< 0.82	--
MW22	11/12/2013	< 0.5	< 0.5	< 0.5	< 0.5	< 0.44	< 0.5	< 0.82	--
MW22	05/19/2014	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 1	--
MW23	08/08/2012	--	--	< 0.39	< 0.41	< 0.42	--	--	< 1.3
MW23	11/13/2012	< 0.97	< 0.83	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
MW23	02/26/2013	< 0.97	< 0.83	< 0.41	< 0.54	< 0.67	0.9	< 1.8	--
MW23	05/29/2013	< 0.57	< 2.5	< 0.5	< 0.5	< 0.44	< 0.5	< 0.82	--
MW23	11/12/2013	< 0.5	< 0.5	< 0.5	< 0.5	< 0.44	< 0.5	< 0.82	--
MW23	05/19/2014	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 1	--

Table 19. Groundwater Analytical Results – PVOCs Exceeding Tap Water SLs
Wisconsin Public Service Corporation, Manitowoc
Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

		VOC							
Sample Location	Sample Date	1,2,4-Trimethylbenzene (µg/l)	1,3,5-Trimethylbenzene (µg/l)	Benzene (µg/l)	Ethylbenzene (µg/l)	Toluene (µg/l)	Xylene, o (µg/l)	Xylenes, m + p (µg/l)	Xylenes, Total (µg/l)
Tap Water SL for WI / IBS		**15**	**120**	**0.45**	**1.5**	**1,100**	**190**	**190**	**190**
PZ5	08/09/2012	--	--	< 0.39	< 0.41	< 0.42	--	--	< 1.3
PZ5	11/13/2012	< 0.97	< 0.83	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
PZ5	02/26/2013	< 0.97	< 0.83	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
PZ5	05/29/2013	< 0.57	< 2.5	< 0.5	< 0.5	< 0.44	< 0.5	< 0.82	--
PZ5	11/12/2013	< 0.5	< 0.5	< 0.5	< 0.5	< 0.44	< 0.5	< 0.82	--
PZ5	05/19/2014	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 1	--
PZ7B	10/26/2009	< 0.39	< 0.4	**11.6**	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74
PZ7B	01/27/2010	< 0.43	< 0.4	< 0.39	< 0.41	< 0.42	< 0.38	< 0.87	< 0.87
PZ7B	04/27/2010	< 0.97	< 0.83	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	< 2.6
PZ7B	07/26/2010	< 0.97	< 0.83	**6.6**	< 0.54	< 0.67	< 0.83	< 1.8	< 1.8
PZ7B	11/02/2010	< 0.97	< 0.83	**11.3**	< 0.54	< 0.67	< 0.83	< 1.8	--
PZ7B	05/17/2011	< 0.43	< 0.4	**11.4**	< 0.41	< 0.42	< 0.38	< 0.87	--
PZ7B	11/01/2011	< 0.43	< 0.4	**8.5**	< 0.41	< 0.42	--	--	< 1.3
PZ7B	08/08/2012	--	--	**1.1**	< 0.41	< 0.42	--	--	< 1.3
PZ7B	11/14/2012	< 0.97	< 0.83	**2.1**	< 0.54	< 0.67	< 0.83	< 1.8	--
PZ7B	02/27/2013	< 0.97	< 0.83	**7.6**	< 0.54	< 0.67	< 0.83	< 1.8	--
PZ7B	05/30/2013	< 0.57	< 2.5	**6.3**	< 0.5	< 0.44	< 0.5	< 0.82	--
PZ7B	11/13/2013	< 0.5	< 0.5	**0.94**	< 0.5	< 0.44	< 0.5	< 0.82	--
PZ7B	05/20/2014	< 0.5	< 0.5	**3.9**	< 0.5	< 0.5	< 0.5	< 1	--
PZ18TB	10/26/2009	< 0.39	< 0.4	0.25	< 0.4	0.58	< 0.36	< 0.74	< 0.74
PZ18TB	01/27/2010	< 0.43	< 0.4	< 0.39	< 0.41	< 0.42	< 0.38	< 0.87	< 0.87
PZ18TB	04/27/2010	< 0.97	< 0.83	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	< 2.6
PZ18TB	07/26/2010	< 0.97	< 0.83	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	< 1.8
PZ18TB	11/03/2010	< 0.97	< 0.83	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
PZ18TB	05/17/2011	< 0.43	< 0.4	< 0.39	< 0.41	< 0.42	< 0.38	< 0.87	--
PZ18TB	11/01/2011	< 0.43	< 0.4	< 0.39	< 0.41	< 0.42	--	--	< 1.3
PZ18TB	08/07/2012	--	--	< 0.39	< 0.41	< 0.42	--	--	< 1.3
PZ18TB	11/13/2012	< 0.97	< 0.83	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
PZ18TB	02/26/2013	< 0.97	< 0.83	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
PZ18TB	05/29/2013	< 0.57	< 2.5	< 0.5	< 0.5	< 0.44	< 0.5	< 0.82	--
PZ18TB	11/12/2013	< 0.5	< 0.5	< 0.5	< 0.5	< 0.44	< 0.5	< 0.82	--
PZ18TB	05/19/2014	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 1	--
PZ23B	10/27/2009	< 0.39	< 0.4	< 0.23	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74
PZ23B	01/26/2010	< 0.43	< 0.4	< 0.39	< 0.41	< 0.42	< 0.38	< 0.87	< 0.87
PZ23B	04/28/2010	< 0.97	< 0.83	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	< 2.6
PZ23B	07/27/2010	< 0.97	< 0.83	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	< 1.8
PZ23B	11/03/2010	< 0.97	< 0.83	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
PZ23B	05/18/2011	< 0.43	< 0.4	< 0.39	< 0.41	< 0.42	< 0.38	< 0.87	--
PZ23B	11/02/2011	< 0.43	< 0.4	< 0.39	< 0.41	< 0.42	--	--	< 1.3
PZ23B	08/09/2012	--	--	< 0.39	< 0.41	< 0.42	--	--	< 1.3
PZ23B	11/14/2012	< 0.97	< 0.83	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
PZ23B	02/26/2013	< 0.97	< 0.83	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
PZ23B	05/30/2013	< 0.57	< 2.5	< 0.5	< 0.5	< 0.44	< 0.5	< 0.82	--
PZ23B	11/13/2013	< 0.5	< 0.5	< 0.5	< 0.5	< 0.44	< 0.5	< 0.82	--
PZ23B	05/19/2014	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 1	--

Table 19. Groundwater Analytical Results – PVOCs Exceeding Tap Water SLs
Wisconsin Public Service Corporation, Manitowoc
Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

		VOC							
Sample Location	Sample Date	1,2,4-Trimethylbenzene (µg/l)	1,3,5-Trimethylbenzene (µg/l)	Benzene (µg/l)	Ethylbenzene (µg/l)	Toluene (µg/l)	Xylene, o (µg/l)	Xylenes, m + p (µg/l)	Xylenes, Total (µg/l)
Tap Water SL for WI / IBS		**15**	**120**	**0.45**	**1.5**	**1,100**	**190**	**190**	**190**
PZ24	10/27/2009	< 0.39	< 0.4	0.41	< 0.4	0.37	< 0.36	< 0.74	< 0.74
PZ24	01/26/2010	< 0.43	< 0.4	0.41	< 0.41	< 0.42	< 0.38	< 0.87	< 0.87
PZ24	04/28/2010	< 0.97	< 0.83	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	< 2.6
PZ24	07/27/2010	< 0.97	< 0.83	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	< 1.8
PZ24	11/03/2010	< 0.97	< 0.83	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
PZ24	05/18/2011	< 0.43	< 0.4	< 0.39	< 0.41	< 0.42	< 0.38	< 0.87	--
PZ24	11/02/2011	< 0.43	< 0.4	< 0.39	< 0.41	< 0.42	--	--	< 1.3
PZ24	08/09/2012	--	--	< 0.39	< 0.41	< 0.42	--	--	< 1.3
PZ24	11/14/2012	< 0.97	< 0.83	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
PZ24	02/26/2013	< 0.97	< 0.83	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
PZ24	05/30/2013	< 0.57	< 2.5	< 0.5	< 0.5	< 0.44	< 0.5	< 0.82	--
PZ24	11/13/2013	< 0.5	< 0.5	< 0.5	< 0.5	< 0.44	< 0.5	< 0.82	--
PZ24	05/19/2014	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 1	--
PZ25	10/27/2009	**31**	11.6	**21.8**	**28.3**	28.3	24.8	46.6	70.4
PZ25	01/27/2010	9.5	3.8	**6.8**	**10.3**	6.2	8.7	13.4	22.1
PZ25	04/28/2010	8.9	3.5	**5.6**	**10.9**	4.2	7.9	12.3	20.2
PZ25	07/27/2010	10.8	< 8.3	**10**	**9.8**	< 6.7	< 8.3	< 18	< 8.3
PZ25	11/03/2010	2	< 0.83	**5.6**	**2.6**	0.96	< 0.83	< 1.8	--
PZ25	05/18/2011	1.2	0.53	**1.9**	1.3	0.73	0.84	0.96	--
PZ25	11/02/2011	4	1.3	**6.8**	< 0.41	< 0.42	--	--	4.4
PZ25	08/09/2012	--	--	**2.6**	< 0.41	< 0.42	--	--	< 1.3
PZ25	11/14/2012	1.4	< 0.83	**8.4**	**4.2**	1.4	< 0.83	< 1.8	--
PZ25	02/27/2013	2.2	< 0.83	**9.1**	**4.1**	1.1	< 0.83	< 1.8	--
PZ25	05/30/2013	< 0.57	< 2.5	**4.6**	1	< 0.44	< 0.5	< 0.82	--
PZ25	11/13/2013	< 0.5	< 0.5	**7.5**	**2**	0.67	< 0.5	< 0.82	--
PZ25	05/20/2014	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 1	--
PZ26	10/27/2009	< 0.39	< 0.4	0.26	< 0.4	< 0.36	< 0.36	< 0.74	< 0.74
PZ26	01/27/2010	< 0.43	< 0.4	**0.62**	< 0.41	0.55	< 0.38	< 0.87	< 0.87
PZ26	04/28/2010	< 0.97	< 0.83	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	< 2.6
PZ26	07/27/2010	< 0.97	< 0.83	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	< 1.8
PZ26	11/03/2010	< 0.97	< 0.83	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
PZ26	05/18/2011	< 0.43	< 0.4	< 0.39	< 0.41	< 0.42	< 0.38	< 0.87	--
PZ26	11/02/2011	< 0.43	< 0.4	< 0.39	< 0.41	< 0.42	--	--	< 1.3
PZ26	08/09/2012	--	--	< 0.39	< 0.41	< 0.42	--	--	< 1.3
PZ26	11/14/2012	< 0.97	< 0.83	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
PZ26	02/27/2013	< 0.97	< 0.83	< 0.41	< 0.54	< 0.67	< 0.83	< 1.8	--
PZ26	05/30/2013	< 0.57	< 2.5	< 0.5	< 0.5	< 0.44	< 0.5	< 0.82	--
PZ26	11/13/2013	< 0.5	< 0.5	< 0.5	< 0.5	< 0.44	< 0.5	< 0.82	--
PZ26	05/20/2014	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 1	--
Total Number of Samples Analyzed:		290	290	410	410	410	270	270	250
Number of Samples with Detections above Reported Limit:		47	19	88	54	45	30	25	36
Min:		0.58	0.53	0.17	0.55	0.37	0.48	0.77	0.48
Max:		766	194	2,600	5,800	4,200	1,190	2,210	5,450
Tap Water SL for WI / IBS		15	120	0.45	1.5	1,100	190	190	190
Number of Samples that Exceed SL:		**18**	**2**	**74**	**47**	**6**	**12**	**11**	**15**

[O:ECK 8/13/14]

NOTES:
BOLD Value exceeds Tap Water SL
< Concentration is less than reported level
-- Analysis not performed
NS No Standard
SL Screening Level
µg/L microgram per liter

SLs used on this table were presented in the Multi-Site Risk Assessment Framework Addendum Revision 3 (Exponent, July 2014).

* MW14 was damaged and not sampled; however, based on previous sampling events, the analytical groundwater results would be similar to the most recent sampling event (November 2013).

Table 20. Groundwater Concentration Trend Summary - Benzene, Naphthalene, and Benzo(a)pyrene

Wisconsin Public Service Corporation, Manitowoc - Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

Well	Benzene vs. Time		Naphthalene vs. Time		Benzo(a)pyrene vs. Time		Benzene vs. Groundwater Elevation	Napthalene vs. Groundwater Elevation	Benzo(a)pyrene vs. Groundwater Elevation
	R^2 (coefficient of determination)	General Trend*	R^2 (coefficient of determination)	General Trend	R^2 (coefficient of determination)	General Trend	R^2	R^2	R^2
MW01	0.0057	Flat	0.7234	Decreasing	0.7339	Decreasing	0.0243	0.0691	0.1109
MW02	0.0618	Flat	0.2243	Flat	0.2332	Decreasing	0.0001	0.1338	0.2811
MW05	0.2021	Flat	0.3027	Decreasing	0.5510	Decreasing	0.0115	0.0001	0.0216
MW06	0.3679	Decreasing	0.5140	Decreasing	0.7339	Decreasing	0.1668	0.3665	0.2249
MW07	0.2160	Flat	0.4691	Decreasing	0.3852	Decreasing	0.2516	0.2802	0.0807
MW08	0.0027	Flat	0.7278	Decreasing	0.6976	Decreasing	0.0026	0.1798	0.0765
MW09	0.5452	Decreasing	0.5840	Decreasing	0.3521	Decreasing	0.5759	0.4905	0.1408
MW10	0.0202	Flat	0.4159	Decreasing	0.4691	Decreasing	0.0007	0.2854	0.0206
MW12	0.0072	Flat	0.5249	Decreasing	0.2193	Decreasing	0.1496	0.2281	0.0384
MW12D	0.0091	Flat	0.3969	Decreasing	0.8479	Decreasing	0.0010	0.1056	0.0929
MW13	0.2091	Decreasing	0.2147	Decreasing	0.3064	Decreasing	0.0188	0.0020	0.0042
MW14[A]	0.4609	Decreasing	0.0331	Decreasing	0.0916	Decreasing	0.3210	0.0662	0.0638
MW17T	0.0027	Flat	0.4268	Decreasing	0.5283	Decreasing	0.0618	0.0158	0.1711
MW18T	0.0027	Flat	0.4478	Decreasing	0.5164	Decreasing	0.1014	0.1594	0.2725
MW19T	0.1814	Flat	0.5597	Decreasing	0.5551	Decreasing	0.0827	0.0510	0.0876
MW20T	0.0100	Flat	0.5223	Decreasing	0.4278	Decreasing	0.0012	0.0153	0.0030
MW21T	0.0015	Flat	0.4790	Decreasing	0.5297	Decreasing	0.0054	0.0530	0.0610
MW22+	0.7517	Increasing	0.0316	Decreasing	0.4621	Increasing	0.4658	0.3744	0.4653
MW23+	0.7517	Increasing	0.0688	Increasing	0.0399	Increasing	0.4765	0.0167	0.0956

[U:PMH 10/13 C:BGH 10/13]
[updated: NDK 4/14, C: KLT 10/21/2014]

Notes:
*If the trendline slope is < 0.0001 general trend considered flat
[A] Sampling was limited due to the impacts in monitoring well
+ Monitoring Wells installed in 2012 contain a limited number of samples and trends are driven by low concentrations near the detection limits.
Refer to Appendix K (RI) for the trend plots

NATURAL RESOURCE TECHNOLOGY

Table 21. Groundwater Analytical Results - MNA and Inorganics Exceeding SLs
Wisconsin Public Service Corporation, Manitowoc
Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

		Inorganics		MNA
Sample Location	Sample Date	Aluminum, Dissolved (µg/l)	Arsenic, Dissolved (µg/l)	Manganese, Dissolved (mg/l)
	Groundwater SL in WI / IBS	**200**	**10**	**0.3**
	Value exceeds SL			
	Detected below SL			
	Not detected above reported limit			
	Not analyzed			
MW1	10/27/2009	< 6	--	0.0102
MW1	04/27/2010	14.4	--	0.0067
MW1	07/27/2010	--	--	0.207
MW1	11/03/2010	--	--	0.0064
MW1	05/18/2011	--	--	0.0071
MW1	11/02/2011	--	--	0.0032
MW1	08/08/2012	--	--	0.0087
MW1	11/13/2012	--	--	0.0057
MW1	02/25/2013	--	--	0.0249
MW1	05/29/2013	--	< 1	0.004
MW1	11/13/2013	--	--	0.0105
MW1	05/19/2014	--	--	0.0206
MW2	10/27/2009	< 250	--	0.112
MW2	01/27/2010	< 250	--	0.0852
MW2	04/27/2010	4.5	--	0.035
MW2	07/26/2010	--	--	0.0774
MW2	11/03/2010	--	--	0.108
MW2	05/18/2011	--	--	0.0654
MW2	11/02/2011	--	--	0.0633
MW2	08/07/2012	--	--	0.0846
MW2	11/13/2012	--	--	0.103
MW2	02/26/2013	--	--	**0.417**
MW2	05/29/2013	--	6	0.128
MW2	11/12/2013	--	2.3	0.109
MW2	05/19/2014	--	0.39	0.0347
MW5	10/27/2009	< 6	--	0.013
MW5	01/27/2010	< 6	--	0.0227
MW5	04/27/2010	3.5	--	0.0226
MW5	07/26/2010	--	--	0.0248
MW5	11/03/2010	--	--	0.0066
MW5	05/18/2011	--	--	0.0045
MW5	11/02/2011	--	--	0.0026
MW5	08/07/2012	--	--	0.0088
MW5	11/13/2012	--	--	0.0017
MW5	02/26/2013	--	--	0.0051
MW5	05/29/2013	--	< 1	0.0038
MW5	11/12/2013	--	--	0.0026
MW5	05/19/2014	--	--	0.0039
MW6	08/08/2012	--	--	0.00091
MW6	11/14/2012	--	--	0.0057

Table 21. Groundwater Analytical Results - MNA and Inorganics Exceeding SLs
Wisconsin Public Service Corporation, Manitowoc
Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

		Inorganics		MNA
Sample Location	Sample Date	Aluminum, Dissolved (µg/l)	Arsenic, Dissolved (µg/l)	Manganese, Dissolved (mg/l)
	Groundwater SL in WI / IBS	**200**	**10**	**0.3**
MW7	10/26/2009	< 250	--	0.0307
MW7	01/27/2010	**250**	--	0.0018
MW7	04/27/2010	5.4	--	0.00094
MW7	07/26/2010	--	--	0.0123
MW7	11/02/2010	--	--	0.0468
MW7	05/17/2011	--	--	0.064
MW7	11/01/2011	--	--	0.0245
MW7	08/08/2012	--	--	0.0918
MW7	11/14/2012	--	--	0.075
MW7	02/27/2013	--	--	0.0019
MW7	05/30/2013	--	0.34	0.0146
MW7	11/13/2013	--	--	0.0373
MW7	05/20/2014	--	--	0.0175
MW8	10/26/2009	< 250	--	0.202
MW8	01/27/2010	< 6	--	0.0518
MW8	04/27/2010	3.4	--	0.154
MW8	07/26/2010	--	--	0.136
MW8	11/02/2010	--	--	0.098
MW8	05/17/2011	--	--	0.0176
MW8	11/01/2011	--	--	0.0138
MW8	08/08/2012	--	--	0.118
MW8	11/13/2012	--	--	0.0394
MW8	02/26/2013	--	--	0.0057
MW8	05/30/2013	--	0.64	0.0106
MW8	11/12/2013	--	--	0.194
MW8	05/20/2014	--	--	0.0258
MW9	10/26/2009	< 250	--	**0.641**
MW9	01/27/2010	< 6	--	**0.63**
MW9	04/27/2010	4.2	--	0.281
MW10	10/26/2009	< 250	--	**0.916**
MW10	01/27/2010	< 6	--	**0.746**
MW10	04/27/2010	5.7	--	**0.787**
MW10	07/26/2010	--	--	**0.775**
MW10	11/02/2010	--	--	**0.77**
MW10	05/17/2011	--	--	**0.817**
MW10	11/01/2011	--	--	**0.771**
MW10	08/09/2012	--	--	**0.683**
MW10	11/13/2012	--	--	**0.672**
MW10	02/27/2013	--	--	**0.755**
MW10	05/30/2013	--	0.31	**0.767**
MW10	11/13/2013	--	--	**0.807**
MW10	05/20/2014	--	--	**0.827**

Table 21. Groundwater Analytical Results - MNA and Inorganics Exceeding SLs
Wisconsin Public Service Corporation, Manitowoc
Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

		Inorganics		MNA
Sample Location	Sample Date	Aluminum, Dissolved (µg/l)	Arsenic, Dissolved (µg/l)	Manganese, Dissolved (mg/l)
	Groundwater SL in WI / IBS	**200**	**10**	**0.3**
MW12	10/27/2009	< 6	--	0.00073
MW12	01/26/2010	< 250	--	0.0077
MW12	04/27/2010	3.6	--	0.0034
MW12	07/27/2010	--	--	**1.8**
MW12	11/03/2010	--	--	0.0014
MW12	05/17/2011	--	--	0.0024
MW12	11/01/2011	--	--	< 0.00032
MW12	08/08/2012	--	--	0.00067
MW12	11/14/2012	--	--	0.0044
MW12	02/26/2013	--	--	0.0238
MW12	05/29/2013	--	0.34	< 0.001
MW12	11/12/2013	--	--	0.0039
MW12	05/19/2014	--	--	0.0005
MW12D	10/26/2009	< 250	--	**0.453**
MW12D	01/26/2010	< 6	--	**0.342**
MW12D	04/27/2010	2.5	--	**0.357**
MW12D	07/27/2010	--	--	0.0033
MW12D	11/03/2010	--	--	**0.611**
MW12D	05/17/2011	--	--	**0.373**
MW12D	11/01/2011	--	--	**0.328**
MW12D	08/08/2012	--	--	0.283
MW12D	11/14/2012	--	--	**0.312**
MW12D	02/26/2013	--	--	**0.428**
MW12D	05/29/2013	--	0.53	**0.448**
MW12D	11/12/2013	--	--	**0.509**
MW12D	05/19/2014	--	--	0.234
MW13	10/26/2009	< 250	--	0.0652
MW13	01/26/2010	< 6	--	0.0346
MW13	04/27/2010	3.8	--	0.0363
MW13	07/26/2010	--	--	0.046
MW13	11/02/2010	--	--	0.0537
MW13	05/17/2011	--	--	0.0042
MW13	11/01/2011	--	--	0.0296
MW13	08/08/2012	--	--	0.038
MW13	11/13/2012	--	--	0.0428
MW13	02/26/2013	--	--	0.0472
MW13	05/30/2013	--	1.1	0.0982
MW13	11/12/2013	--	5.1	0.0723
MW13	05/19/2014	--	0.64	0.003
MW14	08/09/2012	--	--	0.225
MW14	11/14/2012	--	--	0.22
MW14	02/27/2013	--	--	0.266
MW14	05/30/2013	--	3.3	**0.66**
MW14	11/13/2013	--	5	**0.423**

Table 21. Groundwater Analytical Results - MNA and Inorganics Exceeding SLs
Wisconsin Public Service Corporation, Manitowoc
Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

		Inorganics		MNA
Sample Location	Sample Date	Aluminum, Dissolved (µg/l)	Arsenic, Dissolved (µg/l)	Manganese, Dissolved (mg/l)
	Groundwater SL in WI / IBS	**200**	**10**	**0.3**
MW17T	10/26/2009	< 6	--	0.0486
MW17T	01/26/2010	< 250	--	0.234
MW17T	04/28/2010	2.9	--	0.0192
MW17T	07/26/2010	--	--	0.176
MW17T	11/02/2010	--	--	0.25
MW17T	05/17/2011	--	--	0.191
MW17T	11/01/2011	--	--	0.239
MW17T	08/08/2012	--	--	0.122
MW17T	11/13/2012	--	--	0.152
MW17T	02/26/2013	--	--	0.0634
MW17T	05/29/2013	--	< 1	0.0822
MW17T	11/12/2013	--	--	0.254
MW17T	05/19/2014	--	--	0.0298
MW18T	10/26/2009	< 250	--	0.0812
MW18T	01/27/2010	< 250	--	0.0862
MW18T	04/27/2010	2.7	--	0.102
MW18T	07/26/2010	--	--	0.0824
MW18T	11/03/2010	--	--	0.102
MW18T	05/17/2011	--	--	0.152
MW18T	11/01/2011	--	--	0.0099
MW18T	08/07/2012	--	--	0.0388
MW18T	11/13/2012	--	--	0.0039
MW18T	02/26/2013	--	--	0.0777
MW18T	05/29/2013	--	< 1	0.012
MW18T	11/12/2013	--	--	0.0038
MW18T	05/19/2014	--	--	0.0139
MW19T	10/26/2009	< 250	--	0.121
MW19T	01/26/2010	< 250	--	0.0634
MW19T	04/28/2010	4.6	--	0.0351
MW19T	07/26/2010	--	--	0.0427
MW19T	11/02/2010	--	--	0.0225
MW19T	05/18/2011	--	--	0.0296
MW19T	11/02/2011	--	--	**0.315**
MW19T	08/08/2012	--	--	0.0934
MW19T	11/13/2012	--	--	0.114
MW19T	02/25/2013	--	--	0.0509
MW19T	05/29/2013	--	< 1	0.0307
MW19T	11/13/2013	--	--	0.0884
MW19T	05/19/2014	--	--	0.0824

Table 21. Groundwater Analytical Results - MNA and Inorganics Exceeding SLs
Wisconsin Public Service Corporation, Manitowoc
Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

		Inorganics		MNA
Sample Location	Sample Date	Aluminum, Dissolved (µg/l)	Arsenic, Dissolved (µg/l)	Manganese, Dissolved (mg/l)
	Groundwater SL in WI / IBS	**200**	**10**	**0.3**
MW20T	10/26/2009	< 6	--	0.216
MW20T	01/26/2010	< 6	--	0.0339
MW20T	04/28/2010	3.4	--	0.108
MW20T	07/26/2010	--	--	0.225
MW20T	05/18/2011	--	--	0.277
MW20T	11/01/2011	--	--	0.244
MW20T	08/08/2012	--	--	0.213
MW20T	11/13/2012	--	--	0.197
MW20T	02/26/2013	--	--	0.0703
MW20T	05/29/2013	--	< 1	0.194
MW20T	11/12/2013	--	--	0.217
MW20T	05/19/2014	--	--	0.257
MW21T	10/26/2009	< 250	--	0.3
MW21T	01/27/2010	**250**	--	0.295
MW21T	04/27/2010	4.6	--	0.212
MW21T	07/26/2010	--	--	0.107
MW21T	11/03/2010	--	--	0.161
MW21T	05/18/2011	--	--	0.194
MW21T	11/02/2011	--	--	0.153
MW21T	08/08/2012	--	--	0.085
MW21T	11/13/2012	--	--	0.121
MW21T	02/25/2013	--	--	0.0673
MW21T	05/29/2013	--	**16.6**	0.137
MW21T	11/13/2013	--	**35.7**	0.084
MW21T	05/19/2014	--	3.6	0.0782
MW22	08/08/2012	--	--	0.0061
MW22	11/13/2012	--	--	0.0005
MW22	02/26/2013	--	--	0.0007
MW22	05/29/2013	--	< 1	0.00084
MW22	11/12/2013	--	--	0.00038
MW22	05/19/2014	--	--	0.0017
MW23	08/08/2012	--	--	0.0545
MW23	11/13/2012	--	--	0.0028
MW23	02/26/2013	--	--	0.00096
MW23	05/29/2013	--	< 1	0.0011
MW23	11/12/2013	--	--	0.00082
MW23	05/19/2014	--	--	0.00055
PZ5	08/09/2012	--	--	0.112
PZ5	11/13/2012	--	--	0.0418
PZ5	02/26/2013	--	--	0.124
PZ5	05/29/2013	--	0.68	0.128
PZ5	11/12/2013	--	--	0.123
PZ5	05/19/2014	--	--	0.131

Table 21. Groundwater Analytical Results - MNA and Inorganics Exceeding SLs
Wisconsin Public Service Corporation, Manitowoc
Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

		Inorganics		MNA
Sample Location	Sample Date	Aluminum, Dissolved (µg/l)	Arsenic, Dissolved (µg/l)	Manganese, Dissolved (mg/l)
	Groundwater SL in WI / IBS	**200**	**10**	**0.3**
PZ7B	10/26/2009	< 250	--	0.0578
PZ7B	01/27/2010	< 250	--	0.0029
PZ7B	04/27/2010	3.9	--	0.00087
PZ7B	07/26/2010	--	--	0.0671
PZ7B	11/02/2010	--	--	0.0927
PZ7B	05/17/2011	--	--	0.0756
PZ7B	11/01/2011	--	--	0.0684
PZ7B	08/08/2012	--	--	0.0658
PZ7B	11/14/2012	--	--	0.0654
PZ7B	02/27/2013	--	--	0.0562
PZ7B	05/30/2013	--	**13.1**	0.0614
PZ7B	11/13/2013	--	1.7	0.0527
PZ7B	05/20/2014	--	1.5	0.0508
PZ18TB	10/26/2009	< 250	--	0.0736
PZ18TB	01/27/2010	< 6	--	0.202
PZ18TB	04/27/2010	5.7	--	0.0913
PZ18TB	07/26/2010	--	--	0.099
PZ18TB	11/03/2010	--	--	**0.349**
PZ18TB	05/17/2011	--	--	**0.356**
PZ18TB	11/01/2011	--	--	0.00061
PZ18TB	08/07/2012	--	--	0.0037
PZ18TB	11/13/2012	--	--	0.286
PZ18TB	02/26/2013	--	--	0.192
PZ18TB	05/29/2013	--	< 1	0.219
PZ18TB	11/12/2013	--	--	0.199
PZ18TB	05/19/2014	--	--	0.0134
PZ23B	10/27/2009	< 250	--	0.0492
PZ23B	01/26/2010	< 6	--	0.0836
PZ23B	04/28/2010	3.9	--	**0.877**
PZ23B	07/27/2010	--	--	0.0603
PZ23B	11/03/2010	--	--	0.0099
PZ23B	05/18/2011	--	--	0.0193
PZ23B	11/02/2011	--	--	0.0046
PZ23B	08/09/2012	--	--	0.0053
PZ23B	11/14/2012	--	--	< 0.001
PZ23B	02/26/2013	--	--	0.0201
PZ23B	05/30/2013	--	0.15	**0.413**
PZ23B	11/13/2013	--	--	0.007
PZ23B	05/19/2014	--	--	0.0017
PZ24	10/27/2009	< 250	--	0.0479
PZ24	01/26/2010	< 6	--	0.0483
PZ24	04/28/2010	3.1	--	0.0669
PZ24	07/27/2010	--	--	0.187
PZ24	11/03/2010	--	--	0.0422
PZ24	05/18/2011	--	--	0.0416
PZ24	11/02/2011	--	--	0.0396
PZ24	08/09/2012	--	--	0.0291
PZ24	11/14/2012	--	--	< 0.001
PZ24	02/26/2013	--	--	0.0013
PZ24	05/30/2013	--	0.33	0.0382
PZ24	11/13/2013	--	--	0.0372
PZ24	05/19/2014	--	--	0.0038

Table 21. Groundwater Analytical Results - MNA and Inorganics Exceeding SLs
Wisconsin Public Service Corporation, Manitowoc
Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

		Inorganics		MNA
Sample Location	Sample Date	Aluminum, Dissolved (µg/l)	Arsenic, Dissolved (µg/l)	Manganese, Dissolved (mg/l)
Groundwater SL in WI / IBS		**200**	**10**	**0.3**
PZ25	10/27/2009	< 250	--	0.149
PZ25	01/27/2010	< 250	--	0.0844
PZ25	04/28/2010	6.8	--	0.0956
PZ25	07/27/2010	--	--	0.0442
PZ25	11/03/2010	--	--	0.0736
PZ25	05/18/2011	--	--	0.0515
PZ25	11/02/2011	--	--	0.073
PZ25	08/09/2012	--	--	0.0551
PZ25	11/14/2012	--	--	0.0705
PZ25	02/27/2013	--	--	0.0642
PZ25	05/30/2013	--	**19.5**	0.0725
PZ25	11/13/2013	--	**18.7**	0.0746
PZ25	05/20/2014	--	7.7	0.0646
PZ26	10/27/2009	< 6	--	0.174
PZ26	01/27/2010	< 6	--	0.2
PZ26	04/28/2010	4.4	--	0.212
PZ26	07/27/2010	--	--	0.0002
PZ26	11/03/2010	--	--	0.208
PZ26	05/18/2011	--	--	0.201
PZ26	11/02/2011	--	--	0.0244
PZ26	08/09/2012	--	--	0.147
PZ26	11/14/2012	--	--	0.198
PZ26	02/27/2013	--	--	0.186
PZ26	05/30/2013	--	1.1	0.203
PZ26	11/13/2013	--	0.32	0.109
PZ26	05/20/2014	--	< 0.099	0.0146
Total Number of Samples Analyzed:		62	37	287
Number of Samples with Detections above Reported Limit:		23	27	283
Min:		2.5	0.15	0.0002
Max:		250	35.7	1.8
Groundwater SL for WI / IBS		200	10	0.3
Number of Samples that Exceed SL:		**2**	**5**	**34**

[O:ECK 8/13/14]

NOTES:
BOLD Value exceeds SL
< Concentration is less than reported level
-- Analysis not performed
NS No Standard
SL Screening Level
µg/L microgram per liter
mg/L milligram per liter
July 2014 data is not validated.

SLs used on this table were presented in the Multi-Site Risk Assessment Framework Addendum Revision 3 (Exponent, July 2014). The groundwater SL presented is the more conservative of the State and MCL values presented in the RAF Addendum Revision 3. In the absence of a State or MCL value, the Tap Water value was selected.

* MW14 was damaged and not sampled; however, based on previous sampling events, the analytical groundwater results would be similar to the most recent sampling event (November 2013).

Table 22. Groundwater Analytical Results - MNA and Inorganics Exceeding Tap Water SLs

Wisconsin Public Service Corporation, Manitowoc
Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

		Inorganics	MNA
Sample Location	Sample Date	Arsenic, Dissolved (µg/l)	Manganese, Dissolved (mg/l)
	Tap Water SL for WI / IBS	**0.052**	**0.3**
	Value exceeds SL		
	Detected below SL		
	Not detected above reported limit		
	Not analyzed		
MW1	10/27/2009	--	0.0102
MW1	04/27/2010	--	0.0067
MW1	07/27/2010	--	0.207
MW1	11/03/2010	--	0.0064
MW1	05/18/2011	--	0.0071
MW1	11/02/2011	--	0.0032
MW1	08/08/2012	--	0.0087
MW1	11/13/2012	--	0.0057
MW1	02/25/2013	--	0.0249
MW1	05/29/2013	< 1	0.004
MW1	11/13/2013	--	0.0105
MW1	05/19/2014	--	0.0206
MW2	10/27/2009	--	0.112
MW2	01/27/2010	--	0.0852
MW2	04/27/2010	--	0.035
MW2	07/26/2010	--	0.0774
MW2	11/03/2010	--	0.108
MW2	05/18/2011	--	0.0654
MW2	11/02/2011	--	0.0633
MW2	08/07/2012	--	0.0846
MW2	11/13/2012	--	0.103
MW2	02/26/2013	--	**0.417**
MW2	05/29/2013	**6**	0.128
MW2	11/12/2013	**2.3**	0.109
MW2	05/19/2014	**0.39**	0.0347
MW5	10/27/2009	--	0.013
MW5	01/27/2010	--	0.0227
MW5	04/27/2010	--	0.0226
MW5	07/26/2010	--	0.0248
MW5	11/03/2010	--	0.0066
MW5	05/18/2011	--	0.0045
MW5	11/02/2011	--	0.0026
MW5	08/07/2012	--	0.0088
MW5	11/13/2012	--	0.0017
MW5	02/26/2013	--	0.0051
MW5	05/29/2013	< 1	0.0038
MW5	11/12/2013	--	0.0026
MW5	05/19/2014	--	0.0039

Table 22. Groundwater Analytical Results - MNA and Inorganics Exceeding Tap Water SLs

Wisconsin Public Service Corporation, Manitowoc
Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

		Inorganics	MNA
Sample Location	Sample Date	Arsenic, Dissolved (µg/l)	Manganese, Dissolved (mg/l)
	Tap Water SL for WI / IBS	**0.052**	**0.3**
MW6	08/08/2012	--	0.00091
MW6	11/14/2012	--	0.0057
MW7	10/26/2009	--	0.0307
MW7	01/27/2010	--	0.0018
MW7	04/27/2010	--	0.00094
MW7	07/26/2010	--	0.0123
MW7	11/02/2010	--	0.0468
MW7	05/17/2011	--	0.064
MW7	11/01/2011	--	0.0245
MW7	08/08/2012	--	0.0918
MW7	11/14/2012	--	0.075
MW7	02/27/2013	--	0.0019
MW7	05/30/2013	**0.34**	0.0146
MW7	11/13/2013	--	0.0373
MW7	05/20/2014	--	0.0175
MW8	01/27/2010	--	0.0518
MW8	04/27/2010	--	0.154
MW8	07/26/2010	--	0.136
MW8	11/02/2010	--	0.098
MW8	05/17/2011	--	0.0176
MW8	11/01/2011	--	0.0138
MW8	08/08/2012	--	0.118
MW8	11/13/2012	--	0.0394
MW8	02/26/2013	--	0.0057
MW8	05/30/2013	**0.64**	0.0106
MW8	11/12/2013	--	0.194
MW8	05/20/2014	--	0.0258
MW9	10/26/2009	--	**0.641**
MW9	01/27/2010	--	**0.63**
MW9	04/27/2010	--	0.281
MW10	10/26/2009	--	**0.916**
MW10	01/27/2010	--	**0.746**
MW10	04/27/2010	--	**0.787**
MW10	07/26/2010	--	**0.775**
MW10	11/02/2010	--	**0.77**
MW10	05/17/2011	--	**0.817**
MW10	11/01/2011	--	**0.771**
MW10	08/09/2012	--	**0.683**
MW10	11/13/2012	--	**0.672**
MW10	02/27/2013	--	**0.755**
MW10	05/30/2013	**0.31**	**0.767**
MW10	11/13/2013	--	**0.807**
MW10	05/20/2014	--	**0.827**

Table 22. Groundwater Analytical Results - MNA and Inorganics Exceeding Tap Water SLs

Wisconsin Public Service Corporation, Manitowoc
Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

		Inorganics	MNA
Sample Location	Sample Date	Arsenic, Dissolved (µg/l)	Manganese, Dissolved (mg/l)
Tap Water SL for WI / IBS		**0.052**	**0.3**
MW12	10/27/2009	--	0.00073
MW12	01/26/2010	--	0.0077
MW12	04/27/2010	--	0.0034
MW12	07/27/2010	--	**1.8**
MW12	11/03/2010	--	0.0014
MW12	05/17/2011	--	0.0024
MW12	11/01/2011	--	< 0.00032
MW12	08/08/2012	--	0.00067
MW12	11/14/2012	--	0.0044
MW12	02/26/2013	--	0.0238
MW12	05/29/2013	**0.34**	< 0.001
MW12	11/12/2013	--	0.0039
MW12	05/19/2014	--	0.0005
MW12D	10/26/2009	--	**0.453**
MW12D	01/26/2010	--	**0.342**
MW12D	04/27/2010	--	**0.357**
MW12D	07/27/2010	--	0.0033
MW12D	11/03/2010	--	**0.611**
MW12D	05/17/2011	--	**0.373**
MW12D	11/01/2011	--	**0.328**
MW12D	08/08/2012	--	0.283
MW12D	11/14/2012	--	**0.312**
MW12D	02/26/2013	--	**0.428**
MW12D	05/29/2013	**0.53**	**0.448**
MW12D	11/12/2013	--	**0.509**
MW12D	05/19/2014	--	0.234
MW13	10/26/2009	--	0.0652
MW13	01/26/2010	--	0.0346
MW13	04/27/2010	--	0.0363
MW13	07/26/2010	--	0.046
MW13	11/02/2010	--	0.0537
MW13	05/17/2011	--	0.0042
MW13	11/01/2011	--	0.0296
MW13	08/08/2012	--	0.038
MW13	11/13/2012	--	0.0428
MW13	02/26/2013	--	0.0472
MW13	05/30/2013	**1.1**	0.0982
MW13	11/12/2013	**5.1**	0.0723
MW13	05/19/2014	**0.64**	0.003
MW14	08/09/2012	--	0.225
MW14	11/14/2012	--	0.22
MW14	02/27/2013	--	0.266
MW14	05/30/2013	**3.3**	**0.66**
MW14	11/13/2013	**5**	**0.423**

Table 22. Groundwater Analytical Results - MNA and Inorganics Exceeding Tap Water SLs

Wisconsin Public Service Corporation, Manitowoc
Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

		Inorganics	MNA
Sample Location	Sample Date	Arsenic, Dissolved (µg/l)	Manganese, Dissolved (mg/l)
	Tap Water SL for WI / IBS	**0.052**	**0.3**
MW17T	10/26/2009	--	0.0486
MW17T	01/26/2010	--	0.234
MW17T	04/28/2010	--	0.0192
MW17T	07/26/2010	--	0.176
MW17T	11/02/2010	--	0.25
MW17T	05/17/2011	--	0.191
MW17T	11/01/2011	--	0.239
MW17T	08/08/2012	--	0.122
MW17T	11/13/2012	--	0.152
MW17T	02/26/2013	--	0.0634
MW17T	05/29/2013	< 1	0.0822
MW17T	11/12/2013	--	0.254
MW17T	05/19/2014	--	0.0298
MW18T	01/27/2010	--	0.0862
MW18T	04/27/2010	--	0.102
MW18T	07/26/2010	--	0.0824
MW18T	11/03/2010	--	0.102
MW18T	05/17/2011	--	0.152
MW18T	11/01/2011	--	0.0099
MW18T	08/07/2012	--	0.0388
MW18T	11/13/2012	--	0.0039
MW18T	02/26/2013	--	0.0777
MW18T	05/29/2013	< 1	0.012
MW18T	11/12/2013	--	0.0038
MW18T	05/19/2014	--	0.0139
MW19T	10/26/2009	--	0.121
MW19T	01/26/2010	--	0.0634
MW19T	04/28/2010	--	0.0351
MW19T	07/26/2010	--	0.0427
MW19T	11/02/2010	--	0.0225
MW19T	05/18/2011	--	0.0296
MW19T	11/02/2011	--	**0.315**
MW19T	08/08/2012	--	0.0934
MW19T	11/13/2012	--	0.114
MW19T	02/25/2013	--	0.0509
MW19T	05/29/2013	< 1	0.0307
MW19T	11/13/2013	--	0.0884
MW19T	05/19/2014	--	0.0824
MW20T	10/26/2009	--	0.216
MW20T	01/26/2010	--	0.0339
MW20T	04/28/2010	--	0.108
MW20T	07/26/2010	--	0.225
MW20T	11/02/2010	--	0.257
MW20T	05/18/2011	--	0.277
MW20T	11/01/2011	--	0.244
MW20T	08/08/2012	--	0.213
MW20T	11/13/2012	--	0.197
MW20T	02/26/2013	--	0.0703
MW20T	05/29/2013	< 1	0.194
MW20T	11/12/2013	--	0.217
MW20T	05/19/2014	--	0.257

Table 22. Groundwater Analytical Results - MNA and Inorganics Exceeding Tap Water SLs

Wisconsin Public Service Corporation, Manitowoc
Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

		Inorganics	MNA
Sample Location	Sample Date	Arsenic, Dissolved (µg/l)	Manganese, Dissolved (mg/l)
	Tap Water SL for WI / IBS	**0.052**	**0.3**
MW21T	01/27/2010	--	0.295
MW21T	04/27/2010	--	0.212
MW21T	07/26/2010	--	0.107
MW21T	11/03/2010	--	0.161
MW21T	05/18/2011	--	0.194
MW21T	11/02/2011	--	0.153
MW21T	08/08/2012	--	0.085
MW21T	11/13/2012	--	0.121
MW21T	02/25/2013	--	0.0673
MW21T	05/29/2013	**16.6**	0.137
MW21T	11/13/2013	**35.7**	0.084
MW21T	05/19/2014	**3.6**	0.0782
MW22	08/08/2012	--	0.0061
MW22	11/13/2012	--	0.0005
MW22	02/26/2013	--	0.0007
MW22	05/29/2013	< 1	0.00084
MW22	11/12/2013	--	0.00038
MW22	05/19/2014	--	0.0017
MW23	08/08/2012	--	0.0545
MW23	11/13/2012	--	0.0028
MW23	02/26/2013	--	0.00096
MW23	05/29/2013	< 1	0.0011
MW23	11/12/2013	--	0.00082
MW23	05/19/2014	--	0.00055
PZ5	08/09/2012	--	0.112
PZ5	11/13/2012	--	0.0418
PZ5	02/26/2013	--	0.124
PZ5	05/29/2013	**0.68**	0.128
PZ5	11/12/2013	--	0.123
PZ5	05/19/2014	--	0.131
PZ7B	10/26/2009	--	0.0578
PZ7B	01/27/2010	--	0.0029
PZ7B	04/27/2010	--	0.00087
PZ7B	07/26/2010	--	0.0671
PZ7B	11/02/2010	--	0.0927
PZ7B	05/17/2011	--	0.0756
PZ7B	11/01/2011	--	0.0684
PZ7B	08/08/2012	--	0.0658
PZ7B	11/14/2012	--	0.0654
PZ7B	02/27/2013	--	0.0562
PZ7B	05/30/2013	**13.1**	0.0614
PZ7B	11/13/2013	**1.7**	0.0527
PZ7B	05/20/2014	**1.5**	0.0508

Table 22. Groundwater Analytical Results - MNA and Inorganics Exceeding Tap Water SLs

Wisconsin Public Service Corporation, Manitowoc
Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

		Inorganics	MNA
Sample Location	Sample Date	Arsenic, Dissolved (µg/l)	Manganese, Dissolved (mg/l)
	Tap Water SL for WI / IBS	**0.052**	**0.3**
PZ18TB	10/26/2009	--	0.0736
PZ18TB	01/27/2010	--	0.202
PZ18TB	04/27/2010	--	0.0913
PZ18TB	07/26/2010	--	0.099
PZ18TB	11/03/2010	--	**0.349**
PZ18TB	05/17/2011	--	**0.356**
PZ18TB	11/01/2011	--	0.00061
PZ18TB	08/07/2012	--	0.0037
PZ18TB	11/13/2012	--	0.286
PZ18TB	02/26/2013	--	0.192
PZ18TB	05/29/2013	< 1	0.219
PZ18TB	11/12/2013	--	0.199
PZ18TB	05/19/2014	--	0.0134
PZ23B	10/27/2009	--	0.0492
PZ23B	01/26/2010	--	0.0836
PZ23B	04/28/2010	--	**0.877**
PZ23B	07/27/2010	--	0.0603
PZ23B	11/03/2010	--	0.0099
PZ23B	05/18/2011	--	0.0193
PZ23B	11/02/2011	--	0.0046
PZ23B	08/09/2012	--	0.0053
PZ23B	11/14/2012	--	< 0.001
PZ23B	02/26/2013	--	0.0201
PZ23B	05/30/2013	**0.15**	**0.413**
PZ23B	11/13/2013	--	0.007
PZ23B	05/19/2014	--	0.0017
PZ24	10/27/2009	--	0.0479
PZ24	01/26/2010	--	0.0483
PZ24	04/28/2010	--	0.0669
PZ24	07/27/2010	--	0.187
PZ24	11/03/2010	--	0.0422
PZ24	05/18/2011	--	0.0416
PZ24	11/02/2011	--	0.0396
PZ24	08/09/2012	--	0.0291
PZ24	11/14/2012	--	< 0.001
PZ24	02/26/2013	--	0.0013
PZ24	05/30/2013	**0.33**	0.0382
PZ24	11/13/2013	--	0.0372
PZ24	05/19/2014	--	0.0038

Table 22. Groundwater Analytical Results - MNA and Inorganics Exceeding Tap Water SLs
Wisconsin Public Service Corporation, Manitowoc
Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

		Inorganics	MNA
Sample Location	Sample Date	Arsenic, Dissolved (µg/l)	Manganese, Dissolved (mg/l)
Tap Water SL for WI / IBS		**0.052**	**0.3**
PZ25	10/27/2009	--	0.149
PZ25	01/27/2010	--	0.0844
PZ25	04/28/2010	--	0.0956
PZ25	07/27/2010	--	0.0442
PZ25	11/03/2010	--	0.0736
PZ25	05/18/2011	--	0.0515
PZ25	11/02/2011	--	0.073
PZ25	08/09/2012	--	0.0551
PZ25	11/14/2012	--	0.0705
PZ25	02/27/2013	--	0.0642
PZ25	05/30/2013	**19.5**	0.0725
PZ25	11/13/2013	**18.7**	0.0746
PZ25	05/20/2014	**7.7**	0.0646
PZ26	10/27/2009	--	0.174
PZ26	01/27/2010	--	0.2
PZ26	04/28/2010	--	0.212
PZ26	07/27/2010	--	0.0002
PZ26	11/03/2010	--	0.208
PZ26	05/18/2011	--	0.201
PZ26	11/02/2011	--	0.0244
PZ26	08/09/2012	--	0.147
PZ26	11/14/2012	--	0.198
PZ26	02/27/2013	--	0.186
PZ26	05/30/2013	**1.1**	0.203
PZ26	11/13/2013	**0.32**	0.109
PZ26	05/20/2014	< 0.099	0.0146
Total Number of Samples Analyzed:		37	287
Number of Samples with Detections above Reported Limit:		27	283
Min:		0.15	0.0002
Max:		35.7	1.8
Tap Water SL for WI / IBS		0.052	0.3
Number of Samples that Exceed SL:		**27**	**34**

[O:ECK 8/13/14]

NOTES:
BOLD Value exceeds Tap Water SL
< Concentration is less than reported level
-- Analysis not performed
NS No Standard
SL Screening Level
µg/L microgram per liter
mg/L milligram per liter

SLs used on this table were presented in the Multi-Site Risk Assessment Framework Addendum Revision 3 (Exponent, July 2014).

* MW14 was damaged and not sampled; however, based on previous sampling events, the analytical groundwater results would be similar to the most recent sampling event (November 2013).

Table 23. Comparison of MNA parameters from selected Up Gradient, Plume, and Down Gradient Wells

Wisconsin Public Service Corporation, Manitowoc - Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin

BRRTS# : 02-36-000219
USEPA# : WIN000509949

	Alkalinity, Total (mg/l)	Iron, Dissolved (µg/l)	Manganese, Dissolved (µg/l)	Methane (µg/l)	Nitrogen, N02 + N03, Total (mg/l)	Sulfate, Total (mg/l)	Dissolved Oxygen (mg/l)	Oxidation Reduction Potential (millivolts)	PH, Field (Standard Units) (pH Units)	Specific Conductance, Field (umhos/cm)	Temperature, Water (Degrees Centigrade)	Turbidity, Quantitative (NTU)
Up Gradient Wells (MW5, PZ5, MW18T, MW21T)												
Min	175.0	0.0	0.0	0.0	0.2	38.4	0.2	-204.0	6.7	0.4	1.4	0.0
Max	435.0	5.3	0.3	0.0	7.4	106.0	11.0	248.8	7.8	1240.0	15.5	774.0
Average	363.9	1.1	0.1	0.0	3.3	70.8	2.0	-3.3	7.3	79.2	11.5	58.6
Plume Wells (MW13, MW14, and PZ25)												
Min	**190.0**	0.0	0.0	0.0	**0.1**	**13.7**	**0.2**	**-224.0**	6.8	0.5	5.2	0.0
Max	**606.0**	**10.2**	**0.7**	**1.7**	**3.9**	**91.5**	**6.4**	276.0	8.4	1007.0	19.2	138.2
Average	317.8	**1.7**	0.1	**0.3**	**1.5**	**49.3**	**1.6**	**-24.9**	7.6	88.3	11.7	22.1
Down Gradient Wells (MW12, MW12D, MW19T, MW22,PZ24)												
Min	87.7	0.0	0.0	0.0	0.1	25.5	0.2	-172.0	6.7	0.6	6.9	0.0
Max	**493.0**	2.6	**1.8**	0.6	5.4	131.0	13.0	372.0	7.9	1250.0	18.3	364.0
Average	**365.4**	0.2	0.1	0.2	2.5	64.3	2.9	121.0	7.3	48.8	11.2	27.7

[o-BGH 5/14,c-NDK 5/14][U:ECK 10/17/14 NDK 10/22/2014]

Notes:

Observations from the Plume Wells were compared to Up Gradient Wells

Values that are **bold and underlined** are positive indicators for microbial activity and biodegradation within the plume.

Observations from Down Gradient Wells show some indications of microbal activity, however some parameters such as ORP are heavily influenced by MW12 which is in close proximity to pumping well PW-1.

Typically, if reducing conditions are present beneath a site, the following is observed as positive indicators of microbial activity and biodegradation:

1. DO will typically be less than 0.5 mg or lower than DO readings in unaffected groundwater.
2. Nitrate and sulfate concentrations will be lower than areas of unaffected groundwater.
3. Iron and manganese are reduced and concentrations in groundwater will increase, as the reduced forms of these compounds have greater solubility than do the oxidized forms.
4. Methane concentrations will increase as methanogenesis occurs.
5. Alkalinity will increase with increased CO_2 released during biodegradation.
6. ORP of groundwater generally ranges from about 800 millivolts to -400 millivolts; the lower the redox potential, the greater the potential for a reducing and anaerobic environment.

Table 24. Soil Vapor Summary Statistics - Samples Exceeding Residental and Industrial SLs

Wisconsin Public Service Corporation, Manitowoc - Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

Parameter ($\mu g/m^3$)	Samples Analyzed	Samples Exceeding the MDL	Minimum ($\mu g/m^3$)	Maximum ($\mu g/m^3$)	Residential Soil Gas SL ($\mu g/m^3$)	Samples Exceeding Residential SL	Industrial Soil Gas SL ($\mu g/m^3$)	Samples Exceeding Industrial SL
Volatile Organic Compounds (VOCs)								
1,2,4-Trimethylbenzene	79	43	1.9	32,000	73.0	5	310	3
Benzene	79	26	1.3	1,600,000	3.6	11	16	6
Ethylbenzene	79	41	1.9	230,000	11.0	16	49	4
Toluene	79	65	1.8	93,000	52,000	1	220,000	0
Xylene, o	39	24	1.8	38	1,000	0	4400	0
Xylene, m + p	39	25	3.5	130	1,000	0	4400	0
Total Xylenes	44	30	5.5	170,000	1,000	3	4400	3
Polynuclear Aromatic Hydrocarbons (PAHs)								
Naphthalene	79	43	0.18	120,000	0.83	40	3.60	25

[O:ECK 10/20/14]

Notes:
$\mu g/m^3$ = micrograms per cubic meter.
MDL Method Detection Limit
SL Screening Level
-- Not Applicable
SLs used on this table were presented in the Multi-Site Risk Assessment Framework Addendum Revision 3 (Exponent, July 2014).

Table 25. Soil Vapor Results - Samples Exceeding Residential and Industrial SLs

Wisconsin Public Service Corporation, Manitowoc - Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

			BTEX				VOC	
Sample Location	Sample Depth (ft)	Sample Date	Benzene (ug/m3)	Ethylbenzene (ug/m3)	Toluene (ug/m3)	Xylenes, Total (ug/m3)	1,2,4-Trimethylbenzene (ug/m3)	Naphthalene (ug/m3)
		Residential Soil Gas SL for WI / IBS	*3.6*	*11*	*52,000*	*1,000*	*73*	*0.83*
		Industrial Soil Gas SL for WI / IBS	**16**	**49**	**220,000**	**4,400**	**310**	**3.6**
		Value exceeds Residential or Industrial SLs						
		Detected below SL						
		Not detected above reported limit						
		Not analyzed						
SV101D	-	08/09/2012	< 1.2	< 1.8	1.8	< 5.1	< 2	< 2
SV101D	4.5-5	06/12/2013	< 1.1	2.1	8.2	--	3.7	< 1.9
SV101SS	-	08/09/2012	< 1.1	3.6	4.2	15	< 1.8	< 1.8
SV101SS	-	06/13/2013	< 1.1	< 1.6	3.3	--	3.1	< 1.8
SV102D	-	08/09/2012	< 1	6.5	7.1	33	< 1.9	< 1.7
SV102D	3-3.5	06/13/2013	2.2	< 1.7	2.6	--	4.6	**19**
SV102SS	-	08/09/2012	< 1.2	< 1.8	< 1.6	< 5.1	< 2	**56**
SV102SS	-	06/13/2013	< 1.1	< 1.7	2.6	--	2.7	< 1.9
SV103D	-	08/09/2012	**19**	9	22	47	22	**10**
SV103D	4-4.5	06/13/2013	< 1.1	< 1.7	< 1.5	--	3	< 1.9
SV103SS	-	08/09/2012	< 1.2	< 1.8	< 1.6	< 5.1	< 2	*3*
SV103SS	-	06/13/2013	< 1.2	< 1.7	1.8	--	4.5	< 1.9
SV104D	-	08/09/2012	< 1.1	< 1.7	1.9	< 4.8	< 1.8	**4**
SV104D	5-5.5	06/13/2013	< 1.1	< 1.7	3	--	3.3	< 1.9
SV104SS	-	08/09/2012	< 1.1	6.1	11	26	< 1.9	*2.8*
SV104SS	-	06/13/2013	< 1.2	< 1.8	2.1	--	< 2	< 2
SV105D	2.5-3	08/09/2012	**100,000**	**25,000**	*93,000*	**47,000**	**7,800**	**39,000**
SV105SS	-	08/09/2012	*7.5*	< 1.7	21	< 4.9	< 1.9	< 1.9
SV105SS	-	06/13/2013	< 1.1	< 1.7	4.3	--	5.4	< 1.9
SV106D	-	08/10/2012	*4.2*	2.4	25	10	3.2	**12**
SV106D	6-6.5	06/13/2013	< 1.2	< 1.8	3.8	--	3.1	< 2
SV106SS	-	08/10/2012	< 1.1	< 1.7	2.3	< 4.9	< 1.9	< 1.9
SV106SS	-	06/13/2013	< 1.2	< 1.7	4	--	5.2	< 1.9
SV107	-	08/22/2012	< 1.2	*13*	1,600	50	6.1	**14**
SV107	3.3-3.8	06/13/2013	< 1.2	< 1.7	< 1.5	--	< 1.9	< 1.9
SV107	-	03/08/2014	< 1.1	1.9	8.4	11	21	0.28
SV108	-	08/08/2012	**1,400**	**750**	67	160	*160*	**50,000**
SV108	2.5-3	06/14/2013	< 1.2	< 1.7	< 1.5	--	< 1.9	**19**
SV108	-	03/08/2014	**340**	*40*	6.3	6.2	< 2	0.31
SV108D	5.5-6	08/08/2012	**140,000**	**32,000**	11,000	**40,000**	**6,700**	**110,000**

Table 25. Soil Vapor Results - Samples Exceeding Residential and Industrial SLs

Wisconsin Public Service Corporation, Manitowoc - Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

			BTEX				VOC	
Sample Location	Sample Depth (ft)	Sample Date	Benzene (ug/m3)	Ethylbenzene (ug/m3)	Toluene (ug/m3)	Xylenes, Total (ug/m3)	1,2,4-Trimethylbenzene (ug/m3)	Naphthalene (ug/m3)
Residential Soil Gas SL for WI / IBS			*3.6*	*11*	*52,000*	*1,000*	*73*	*0.83*
Industrial Soil Gas SL for WI / IBS			**16**	**49**	**220,000**	**4,400**	**310**	**3.6**
SV109	-	08/09/2012	*14*	*36*	51	110	17	**21**
SV109	4-4.5	06/14/2013	< 1.2	< 1.7	< 1.5	--	< 1.9	< 1.9
SV109	-	03/08/2014	< 1	< 1.5	< 1.3	< 4.4	< 1.7	0.18
SV109D	5.5-6	08/09/2012	2.2	11	5	58	2.4	*2.7*
SV110	-	08/08/2012	< 1	3.9	6.6	15	5.1	*3.6*
SV110	4-4.5	06/14/2013	< 1.1	< 1.7	2.8	--	3.6	**4.7**
SV110D	-	08/08/2012	< 1.2	3.5	8.6	14	4.2	*3.2*
SV110D	7-7.5	06/14/2013	< 1.1	< 1.7	< 1.5	--	< 1.8	< 1.8
SV111	-	08/09/2012	1.3	< 1.7	7.1	< 5	< 1.9	*2*
SV111	4-4.5	06/12/2013	< 1.2	< 1.7	1.9	--	< 1.9	< 1.9
SV111D	-	08/09/2012	< 1.1	< 1.7	4	< 4.8	< 1.9	*2.7*
SV111D	7-7.5	06/12/2013	< 1.1	< 1.7	< 1.5	--	< 1.9	< 1.9
SV112	-	08/08/2012	1.6	< 2	3.8	< 5.7	< 2.2	< 2.2
SV112	2.5-3	06/14/2013	3.5	6.4	4.7	--	< 2	< 2
SV112	-	03/08/2014	< 1.1	2.1	7.6	23	24	*1.2*
SV112D	5.5-6	08/08/2012	**1,600,000**	**230,000**	32,000	**170,000**	**32,000**	**120,000**
SV113	-	08/08/2012	1.5	*25*	18	130	6.1	**4.1**
SV113	2.5-3	06/12/2013	1.4	3.2	9.9	--	4	< 1.8
SV113D	-	08/08/2012	2.9	*14*	31	34	9.2	**4.4**
SV113D	7.5-8	06/12/2013	3.6	9.9	30	--	14	< 1.9
SV114	-	08/08/2012	< 1.2	< 1.7	3.2	5.5	< 1.9	*3.2*
SV114	2.5-3	06/12/2013	< 1.2	2.4	8.6	--	4.9	< 2
SV114D	-	08/08/2012	*5.2*	*29*	140	120	18	**10**
SV114D	7.5-8	06/12/2013	1.3	4.2	16	--	5.2	< 1.9
SV115	-	08/08/2012	< 1.1	< 1.6	2.6	< 4.8	< 1.8	< 1.8
SV115	2.5-3	06/12/2013	< 1.1	*28*	23	--	8.1	*2.4*
SV115D	-	08/08/2012	1.8	< 1.7	2	< 4.8	< 1.9	< 1.9
SV115D	7.5-8	06/12/2013	< 1.1	*14*	7.3	--	2.9	< 1.9
SV116	-	08/08/2012	*4.6*	*12*	33	51	15	**8**
SV116	6.5-7	06/12/2013	1.3	2	5	--	8	**6.7**
SV117	-	08/08/2012	3.1	8	11	450	*160*	**68**
SV117	3-3.5	06/12/2013	< 1.2	5.1	4.7	--	5.8	**3.8**
SV118	-	08/08/2012	< 1.1	< 1.7	5.3	< 4.8	1.9	*3*
SV118	5.5-6	06/12/2013	< 1.2	2.9	3.6	--	8.9	**3.8**

Table 25. Soil Vapor Results - Samples Exceeding Residential and Industrial SLs

Wisconsin Public Service Corporation, Manitowoc - Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

			BTEX				VOC	
Sample Location	Sample Depth (ft)	Sample Date	Benzene (ug/m3)	Ethylbenzene (ug/m3)	Toluene (ug/m3)	Xylenes, Total (ug/m3)	1,2,4-Trimethylbenzene (ug/m3)	Naphthalene (ug/m3)
Residential Soil Gas SL for WI / IBS			*3.6*	*11*	*52,000*	*1,000*	*73*	*0.83*
Industrial Soil Gas SL for WI / IBS			**16**	**49**	**220,000**	**4,400**	**310**	**3.6**
SV119	-	08/08/2012	< 1.2	*15*	2.6	84	2.1	**6.3**
SV119	3-3.5	06/12/2013	< 1.1	2.5	3.5	--	< 1.9	< 1.9
SV120	-	08/09/2012	1.6	*43*	23	160	11	**28**
SV120	4.5-5	06/13/2013	< 1.1	< 1.7	16	--	< 1.9	< 1.9
SV120D	-	08/09/2012	< 1.1	*18*	10	59	5.7	**10**
SV120D	7.5-8	06/13/2013	< 1.1	< 1.6	< 1.5	--	< 1.8	< 1.8
SV121	-	08/08/2012	< 1	4.6	4	24	< 1.7	**76**
SV121	4-4.5	08/22/2012	< 1.1	2.2	220	10	< 1.9	*2.7*
SV121	4-4.5	06/13/2013	< 1.1	< 1.7	< 1.5	--	< 1.9	< 1.9
SV121D	-	08/08/2012	< 1.1	< 1.7	4	5.7	< 1.9	*3.4*
SV121D	7-7.5	06/13/2013	< 1.1	< 1.7	< 1.5	--	< 1.9	< 1.9
SV122	-	08/09/2012	< 1.2	< 1.7	< 1.5	< 5	< 1.9	*3.6*
SV122	4.5-5	06/12/2013	< 1.2	3.7	3.9	--	3.3	< 1.9
SV122D	-	08/09/2012	1.4	7.9	11	46	< 1.9	*2.1*
SV122D	15-15.5	06/12/2013	< 1.1	< 1.6	< 1.5	--	< 1.8	< 1.8
QC01 SV123	4.5-5	08/04/2014	< 1.2 U	< 1.6 U	3.1	< 4.8 U	3.8	*1.2*
SV123D	14.0-14.5	08/04/2014	1.5	< 1.6	13	< 4.8	< 1.8	*2.8*
Total Number of Samples Analyzed:			81	81	81	46	81	81
Number of Samples with Detections above MDL:			27	41	67	30	44	45
Min:			1.3	1.9	1.8	5.5	1.9	0.18
Max:			1,600,000	230,000	93,000	170,000	32,000	120,000
Residential Soil Gas SL for WI / IBS			3.6	11	52,000	1,000	73	0.83
Number of Samples that Exceed Residential SL:			*11*	*16*	*1*	*3*	*5*	*42*
Industrial Soil Gas SL for WI / IBS			16	49	220,000	4,400	310	3.6
Number of Samples that Exceed Industrial SL:			**6**	**4**	**0**	**3**	**3**	**25**

[O:ECK 08/19/14, Chkdby:AJS 08/21/14][U:ECK 10/23/14]

NOTES:
Italic *Value exceeds Residential SL*
BOLD **Value exceeds Industrial SL**
< Concentration is less than stated level
-- Analysis not performed
NS No Standard
R Data Rejected by the validator
SL Screening Level
Screening Levels (SL) used on this table were presented in the Multi-Site Risk Assessment Framework Addendum Revision 3 (Exponent, July 2014).

Table 26. Indoor Air Summary Statistics – Samples Exceeding Residential and Industrial SLs

Wisconsin Public Service Corporation, Manitowoc - Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

Parameter (µg/m^3)	Samples Analyzed	Samples Exceeding the MDL	Minimum (µg/m^3)	Maximum (µg/m^3)	Residential Indoor Air SL (µg/m^3)	Samples Exceeding Residential SL	Industrial Indoor Air SL (µg/m^3)	Samples Exceeding Industrial SL
Volatile Organic Compounds (VOCs)								
1,2,4-Trimethylbenzene	12	0	0.00	0.00	7.30	0	31	0
Benzene	12	0	0.00	0.00	0.36	0	1.60	0
Ethylbenzene	12	0	0.00	0.00	1.10	0	4.90	0
Toluene	12	5	2.20	7.10	5200	0	22000	0
Xylene, o	12	0	0.00	0.00	100	0	440	0
Xylene, m + p	12	0	0.00	0.00	100	0	440	0
Xylenes, Total	6	0	0.00	0.00	100	0	440	0
Polynuclear Aromatic Hydrocarbons (PAHs)								
Naphthalene	12	6	0.37	0.53	0.08	6	0.36	6

[O-ECK 10/20/14]

Notes:
µg/m^3 = micrograms per cubic meter.
MDL Method Detection Limit
SL Screening Level
-- Not Applicable
SLs used on this table were presented in the Multi-Site Risk Assessment Framework Addendum Revision 3 (Exponent, July 2014).

Table 27. Indoor Air Results – Samples Exceeding Residential and Industrial SLs

Wisconsin Public Service Corporation, Manitowoc - Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

			VOC
Sample Location	Sample Depth (ft)	Sample Date	Naphthalene (µg/m3)
		Residential Indoor Air SL for WI / IBS	*0.083*
		Industrial Indoor Air SL for WI / IBS	**0.36**
		Value exceeds Residential or Industrial SL	
		Not detected above reported limit	
		Detected below SL	
		Not analyzed	
Amb1	-	06/01/2013	**0.42**
Amb2	-	06/01/2013	**0.37**
Amb3	-	03/08/2014	< 0.089
Amb4	-	03/08/2014	< 0.088
IA123	-	06/01/2013	**0.53**
IA123	-	03/08/2014	< 0.097
IA124	-	06/01/2013	**0.44**
IA124	-	03/08/2014	< 0.1
IA125	-	06/01/2013	**0.43**
IA125	-	03/08/2014	< 0.097
IA126	-	06/01/2013	**0.45**
IA126	-	03/08/2014	< 0.09
		Total Number of Samples Analyzed:	12
		Number of Samples with Detections above MDL:	6
		Min:	0.37
		Max:	0.53
		Residential Indoor Air SL for WI / IBS	0.083
		Number of Samples that Exceed Residential SL:	*6*
		Industrial Indoor Air SL for WI / IBS	0.36
		Number of Samples that Exceed Industrial SL:	**6**

[O:ECK 08/19/14, Chkdby:AJS 08/21/14]

NOTES:
Italic *Value exceeds Residential SL*
BOLD **Value exceeds Industrial SL**
< Concentration is less than stated level
-- Analysis not performed
NS No Standard
SL Screening Level

Screening Levels (SL) used on this table were presented in the Multi-Site Risk Assessment Framework Addendum Revision 3 (Exponent, July 2014).

Table 28. Sediment Summary Statistics - Samples Exceeding SLs

Wisconsin Public Service Corporation, Manitowoc - Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

Parameter (µg/kg)	Samples Analyzed	Samples Exceeding the MDL	Minimum (mg/kg)	Maximum (mg/kg)	Ecological Soil SL (mg/kg)	Samples Exceeding Industrial Soil SL	Samples Exceeding Toxicity Risk Level Total PAH (13) (103 mg/kg)
Volatile Organic Compounds (VOCs)							
Benzene	46	22	0.0611	211	5	5	n/a
Ethylbenzene	46	28	0.0777	103	25	2	n/a
Polynuclear Aromatic Hydrocarbons (PAHs)							
1-Methylnaphthalene	46	46	0.0078	233	73	6	0
Benzo(a)anthracene	407	394	0.0265	714	3	233	0
Benzo(a)pyrene	407	396	0.0252	638	0	354	0
Benzo(b)fluoranthene	407	393	0.019	458	3	212	0
Benzo(k)fluoranthene	407	393	0.0172	487	29	41	0
Chrysene	407	392	0.016	653	290	4	0
Dibenz(a,h)anthracene	407	376	0.0149	101	0	270	0
Indeno(1,2,3-cd)pyrene	407	393	0.0152	420	3	198	0
Naphthalene (PAH)	407	370	0.0117	4,810	17	59	0
PAH, Total	361	361	0.273	17,300	NS	0	133
Alkylinated Polynuclear Aromatic Hydrocarbons (Alk PAHs)							
Benzo(a)anthracene	33	33	0.22	151	3	28	0
Benzo(a)pyrene	33	33	0.255	148	0	32	0
Benzo(b)fluoranthene	33	33	0.237	110	3	28	0
Benzo(k)fluoranthene	23	23	0.219	108	29	7	0
Dibenz(a,h)anthracene	33	33	0.044	22	0	28	0
Indeno(1,2,3-cd)pyrene	33	33	0.17	82	3	28	0
Naphthalene (PAH)	33	33	0.331	830	17	15	0
Inorganic Compounds							
Lead, Total	23	23	13	25,900	800	1	n/a

[O-ECK 10/17/14]

Notes:
mg/kg milligrams per kilogram.
MDL Method Detection Limit
SL Screening Level
-- Not Applicable
Industrial Soil SLs used on this table were presented in the Multi-Site Risk Assessment Framework Addendum Revision 3 (Exponent, July 2014).

Table 29. Sediment Analytical Results – Exceeding Human Health Soil Industrial SLs and Ecological Risk Site Specific SL

Wisconsin Public Service Corporation, Manitowoc
Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

			BTEX		PAH										Alk PAH							Inorganic
Sample Location	Sample Depth (ft)	Sample Date	Benzene (mg/kg)	Ethylbenzene (mg/kg)	Total PAH (13) (mg/kg)	1-Methylnaphthalene (mg/kg)	Benzo(a)anthracene (mg/kg)	Benzo(a)pyrene (mg/kg)	Benzo(b)fluoranthene (mg/kg)	Benzo(k)fluoranthene (mg/kg)	Chrysene (mg/kg)	Dibenz(a,h)anthracene (mg/kg)	Indeno(1,2,3-cd)pyrene (mg/kg)	Naphthalene (PAH) (mg/kg)	Benzo(a)anthracene (mg/kg)	Benzo(a)pyrene (mg/kg)	Benzo(b)fluoranthene (mg/kg)	Benzo(k)fluoranthene (mg/kg)	Dibenz(a,h)anthracene (mg/kg)	Indeno(1,2,3-cd)pyrene (mg/kg)	Naphthalene (PAH) (mg/kg)	Lead, Total (mg/kg)
Eco-Risk Site-Specific			*NS*	*NS*	*103*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*
Soil Industrial for WI / IBS			**5.1**	**25**	**NS**	**73**	**2.9**	**0.29**	**2.9**	**29**	**290**	**0.29**	**2.9**	**17**	**2.9**	**0.29**	**2.9**	**29**	**0.29**	**2.9**	**17**	**800**
Value exceeds SL																						
Detected below SL																						
Not detected above reported limit																						
Not analyzed																						
HH1	0-0.33	11/5/2008	0.68	1.67	--	**86.5**	**123**	**146**	**104**	**112**	111	**21.7**	**78.3**	**338**	--	--	--	--	--	--	--	--
HH2	0-2	11/5/2008	< 0.25	2.87	--	18.5	**14.5**	**18**	**13.7**	13.3	14.1	**2.8**	**10.2**	**55**	--	--	--	--	--	--	--	--
HH3	0-2	11/5/2008	< 0.025	< 0.025	--	1.75	**11.5**	**13.1**	**9.14**	11.5	10.5	**2.25**	**7.07**	9.71	--	--	--	--	--	--	--	--
SED1	0-0.33	11/3/2008	< 0.0258	< 0.0258	--	1.04	1.83	**2.26**	1.56	2.29	1.69	**0.399**	1.28	2.74	--	--	--	--	--	--	--	--
SED2	0-0.33	11/3/2008	1.22	1.67	--	72.8	**93.7**	**97.7**	**72.5**	**81.1**	108	**14.9**	**48**	**554**	**9.35**	**9.53**	**6.67**	7.13	**1.39**	**5.12**	**39.1**	33.8
SED3	0-0.33	11/3/2008	0.131	0.157	--	46.4	**78.2**	**86.8**	**60.1**	**74.4**	68.2	**13.2**	**42.5**	**164**	**40.5**	**36.5**	**26.9**	26.4	**4.86**	**19.3**	**48.9**	31.5
SED4	0-0.33	11/3/2008	2.01	2.2	--	21.7	**36.3**	**39.2**	**26.7**	**35.2**	34.2	**6.03**	**19.3**	**189**	**37.2**	**38.3**	**28**	29	**5.07**	**20.3**	**132**	16.9
SED5	0-0.33	11/3/2008	0.798	1.86	--	37.5	**47.1**	**51.6**	**35.3**	**45.1**	43.8	**7.61**	**25.5**	**323**	**62.4**	**59**	**43.1**	**44**	**8.54**	**31.1**	**278**	20.6
SED6	0-0.33	11/3/2008	0.153	0.545	--	14.4	**12.1**	**12**	**7.81**	11.4	10.9	< 1.92	**5.76**	**113**	**20**	**18**	**12.7**	13.9	**2.34**	**8.98**	**46.3**	16.5
SED7	0-0.33	11/3/2008	0.441	0.885	--	**97**	**109**	**124**	**82.6**	**110**	101	**18**	**59.7**	**827**	**70.8**	**69.9**	**52.9**	**49.7**	**10**	**38**	**298**	**25,900**
SED8	0-0.33	11/4/2008	< 0.025	0.246	--	1.72	**4.38**	**5.24**	**3.75**	4.45	3.62	**0.861**	2.67	8.82	**15.2**	**15.5**	**11.7**	10.7	**2.53**	**8.41**	13.7	16.5
SED9	0-0.33	11/4/2008	< 0.025	< 0.025	--	0.577	1.09	**1.23**	0.866	1.05	1	0.182	0.631	5.68	--	--	--	--	--	--	--	--
SED10	0-0.33	11/4/2008	< 0.025	< 0.025	--	1.18	1.51	**1.99**	1.37	1.66	1.4	**0.304**	1.05	7.29	--	--	--	--	--	--	--	--
SED11	0-0.33	11/4/2008	< 0.025	< 0.025	--	0.42	1.1	**1.43**	1.11	1.07	0.927	0.216	0.71	3.25	--	--	--	--	--	--	--	--
SED12	0-0.33	11/4/2008	< 0.025	< 0.025	--	0.398	1.36	**1.68**	1.19	1.33	1.02	0.275	0.914	1.36	2.09	**2.06**	1.51	1.61	0.278	1.12	1.61	13.2
SED13	0-0.33	11/4/2008	0.0611	0.281	--	1.05	**3.35**	**4.31**	**3.26**	3.6	2.85	**0.5**	1.8	7.69	**8.51**	**9.19**	**6.75**	6.69	**1.41**	**5.14**	14.6	24.5
SED14	0-0.33	11/4/2008	0.0955	0.0777	--	3.67	**11.3**	**14.9**	**12.5**	11.7	8.92	**1.95**	**6.51**	**21.7**	**51.1**	**53.8**	**36**	**39.5**	**7.76**	**30**	**43.3**	22.3
SED15	0-0.33	11/4/2008	< 0.025	< 0.025	--	0.281	0.984	**1.22**	0.817	1.04	0.781	0.211	0.678	1.91	--	--	--	--	--	--	--	--
SED16	0-0.33	11/4/2008	< 0.0278	< 0.0278	--	0.0328	0.142	0.194	0.141	0.149	0.125	0.0308	0.114	0.27	--	--	--	--	--	--	--	--
SED17	0-0.33	11/4/2008	< 0.025	< 0.025	--	1.41	**4.25**	**5.25**	**4.28**	4.31	3.87	**0.613**	2.19	4.02	--	--	--	--	--	--	--	--
SED18	0-0.33	11/4/2008	< 0.0255	< 0.0255	--	1.24	**6.59**	**7.81**	**6.32**	6.94	5.48	**0.943**	**3.23**	2.87	**4.82**	**5.17**	**3.66**	3.95	**0.789**	2.9	2.05	22.3
SED19	0-0.33	11/4/2008	< 0.025	< 0.025	--	1.56	**4.56**	**5.92**	**5.04**	4.98	3.89	**0.758**	2.59	5.26	**15.9**	**17.6**	**12.2**	13.1	**2.46**	**9.68**	8.86	45.4
SED20	0-1	11/4/2008	< 0.2	2.68	--	45.2	**59.4**	**69.2**	**49.3**	**53.1**	52	**10.3**	**37.7**	**186**	--	--	--	--	--	--	--	--
SED21	0-0.33	11/4/2008	< 0.025	0.0881	--	0.288	0.444	**0.567**	0.42	0.452	0.379	0.096	0.333	3.07	**18.4**	**16.7**	**12.9**	12.7	**3.19**	**8.58**	16.3	16.3
SED22	0-0.33	11/4/2008	< 0.025	< 0.025	--	0.0078	0.0265	0.0297	0.0269	0.024	0.0286	< 0.0135	0.0185	0.0509	--	--	--	--	--	--	--	--
SED23	0-0.33	11/5/2008	< 0.025	< 0.025	--	0.0275	0.431	**0.532**	0.366	0.433	0.459	0.0832	0.31	0.199	0.326	**0.361**	0.305	0.282	0.06	0.229	0.372	15.5
SED24	0-0.33	11/5/2008	< 0.025	< 0.025	--	0.195	0.173	0.189	0.134	0.164	0.161	0.0283	0.105	1.14	0.22	0.255	0.237	0.219	0.044	0.17	0.717	16.6
SED25	0-2	11/5/2008	**10**	23.1	--	**76.6**	**85.6**	**94.8**	**69**	**77**	77	**14.7**	**51.1**	**781**	--	--	--	--	--	--	--	--
SED26	0-2	11/5/2008	0.179	0.441	--	10.8	**11.4**	**13.4**	**8.41**	11.6	10	**1.99**	**7.26**	**28.2**	**27.8**	**28.1**	**20.2**	20	**4.43**	**14.5**	**32.2**	46.8
SED27	0-2	11/5/2008	**28**	**29.7**	--	**85.1**	**75.4**	**75.3**	**53.1**	**64.7**	69.8	**11.5**	**39.4**	**1,010**	--	--	--	--	--	--	--	--
SED28	0.5-2	11/5/2008	3.06	8.61	--	**82.2**	**88.7**	**101**	**65.9**	**88.7**	87.7	**15.3**	**55.2**	**704**	--	--	--	--	--	--	--	--
SED29	0-1	11/5/2008	**211**	**103**	--	**233**	**184**	**171**	**115**	**162**	162	< 35.2	**86.2**	**2,990**	--	--	--	--	--	--	--	--
SED30	0-0.33	11/7/2008	< 0.025	< 0.025	--	0.22	**3.98**	**5.01**	**3.92**	2.17	1.95	**0.354**	1.22	1.08	**5.01**	**5.37**	**3.96**	3.83	0.272	**2.99**	3.39	21.7
SED31	0-0.33	11/7/2008	< 0.0301	< 0.0301	--	0.0727	0.276	**0.349**	0.249	0.293	0.249	0.0583	0.197	0.429	--	--	--	--	--	--	--	--

Table 29. Sediment Analytical Results – Exceeding Human Health Soil Industrial SLs and Ecological Risk Site Specific SL

Wisconsin Public Service Corporation, Manitowoc
Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

			BTEX		PAH										Alk PAH							Inorganic
Sample Location	Sample Depth (ft)	Sample Date	Benzene (mg/kg)	Ethylbenzene (mg/kg)	Total PAH (13) (mg/kg)	1-Methylnaphthalene (mg/kg)	Benzo(a)anthracene (mg/kg)	Benzo(a)pyrene (mg/kg)	Benzo(b)fluoranthene (mg/kg)	Benzo(k)fluoranthene (mg/kg)	Chrysene (mg/kg)	Dibenz(a,h)anthracene (mg/kg)	Indeno(1,2,3-cd)pyrene (mg/kg)	Naphthalene (PAH) (mg/kg)	Benzo(a)anthracene (mg/kg)	Benzo(a)pyrene (mg/kg)	Benzo(b)fluoranthene (mg/kg)	Benzo(k)fluoranthene (mg/kg)	Dibenz(a,h)anthracene (mg/kg)	Indeno(1,2,3-cd)pyrene (mg/kg)	Naphthalene (PAH) (mg/kg)	Lead, Total (mg/kg)
Eco-Risk Site-Specific			*NS*	*NS*	*103*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*
Soil Industrial for WI / IBS			**5.1**	**25**	**NS**	**73**	**2.9**	**0.29**	**2.9**	**29**	**290**	**0.29**	**2.9**	**17**	**2.9**	**0.29**	**2.9**	**29**	**0.29**	**2.9**	**17**	**800**
SED32	0-0.33	11/7/2008	< 0.025	< 0.025	--	0.0425	0.0741	0.0893	0.0734	0.0802	0.0743	0.0174	0.056	0.179	0.391	**0.435**	0.39	0.328	0.065	0.27	0.449	15.9
SED33	0-0.33	11/7/2008	< 0.025	< 0.025	--	0.0726	0.775	**1**	0.813	0.713	0.669	0.161	0.519	0.358	--	--	--	--	--	--	--	--
SED35	0-0.33	11/13/2008	2.74	3.52	--	6.16	**10.7**	**9.91**	**7.22**	8.04	7.79	**1.46**	**5.15**	**96**	--	--	--	--	--	--	--	--
SED36	0-0.33	11/13/2008	**7.77**	6.3	--	8.55	**13**	**11.3**	**8.12**	9.67	9.11	**1.61**	**5.79**	**118**	**60.2**	**54.5**	**39.8**	**41.8**	**7.84**	**28.4**	**444**	14.3
SED37	0-0.33	11/13/2008	**6.48**	2.27	--	11.6	**15.6**	**12.6**	**8.8**	10.9	10.6	< 3.11	**6.46**	**217**	**151**	**148**	**110**	**108**	**22.4**	**82.4**	**830**	27
SED38	0-0.33	11/13/2008	< 0.025	0.0822	--	0.731	**4.08**	**4.34**	**3.35**	3.32	2.96	**0.687**	2.35	4.9	--	--	--	--	--	--	--	--
SED39	0-0.33	11/13/2008	0.124	0.254	--	2.82	**7.82**	**7.91**	**5.92**	6.08	5.01	**1.21**	**4.24**	**20.4**	--	--	--	--	--	--	--	--
SED40	0-0.33	11/13/2008	0.191	0.688	--	9.66	**21.5**	**19.1**	**12.9**	16.7	14.7	**2.86**	**9.75**	**76.5**	**14.9**	**15.8**	**11.2**	11.5	**2.09**	**8.47**	**50.7**	16.7
SED41	0-0.33	11/13/2008	< 0.025	0.133	--	1.86	**4.57**	**4.53**	**3.33**	3.69	3.36	**0.715**	2.42	**17.3**	--	--	--	--	--	--	--	--
SED42	0-0.33	11/13/2008	0.167	0.0901	--	2.58	**7.73**	**7.95**	**5.83**	6.19	5.16	**1.22**	**4.25**	4.4	**36.5**	**37.1**	**26.3**	26.8	**5.04**	**19.7**	**29.8**	21.7
SED43	0-0.33	11/13/2008	0.143	0.662	--	4.71	**10.9**	**10.8**	**8.25**	8.29	7.62	**1.61**	**5.6**	**26.6**	**49.2**	**49.7**	**36**	**36.2**	**6.79**	**27**	**96.7**	31.9
SED44	0-0.33	11/13/2008	0.165	0.358	--	1.06	**3.4**	**3.47**	2.48	2.73	2.42	**0.539**	1.88	10.2	--	--	--	--	--	--	--	--
TS2-10A-SD002	0-0.5	8/30/2012	--	--	55.7	--	**4.96**	**5.97**	**4.34**	4.11	4.61	**0.677**	**4.13**	0.704	--	--	--	--	--	--	--	--
TS2-10A-SD002	0.5-1.6	8/30/2012	--	--	36.9	--	**3.14**	**3.44**	2.68	2.23	2.75	**0.467**	2.43	0.552	--	--	--	--	--	--	--	--
TS2-10-SD001	0-0.5	8/28/2012	--	--	85.7	--	**7.86**	**7.74**	**5.94**	4.99	7.19	**0.968**	**5.26**	0.583	--	--	--	--	--	--	--	--
TS2-10-SD001	0.5-0.9	8/28/2012	--	--	118	--	**10.4**	**10.1**	**7.04**	6.57	9.42	**1.36**	**7.08**	0.878	--	--	--	--	--	--	--	--
TS2-10-SD003	0-0.8	8/28/2012	--	--	74.1	--	**6.5**	**5.95**	**4.78**	4.04	6.34	**0.834**	**4.13**	0.884	--	--	--	--	--	--	--	--
TS2-11-SD001	0-0.5	8/28/2012	--	--	30.7	--	**2.95**	**2.89**	2.3	2.18	2.95	**0.52**	2.14	0.383	--	--	--	--	--	--	--	--
TS2-11-SD001	0.5-1.5	8/28/2012	--	--	78.2	--	**7.5**	**7.24**	**5.18**	5.65	7.1	**1.28**	**5.33**	1.07	--	--	--	--	--	--	--	--
TS2-11-SD001	1.5-2.5	8/28/2012	--	--	114	--	**11.4**	**11.1**	**7.48**	8.21	10	**1.78**	**8.08**	1.12	--	--	--	--	--	--	--	--
TS2-11-SD001	2.5-3.5	8/28/2012	--	--	102	--	**9.55**	**8.92**	**6.64**	6.35	8.5	**1.48**	**6.54**	1.09	--	--	--	--	--	--	--	--
TS2-11-SD001	3.5-4.5	8/28/2012	--	--	*136*	--	**12.6**	**11.6**	**8.37**	8.49	11.4	**1.51**	**8.21**	1.58	--	--	--	--	--	--	--	--
TS2-11-SD001	4.5-5.5	8/28/2012	--	--	124	--	**12.1**	**11.4**	**8.21**	7.71	10.9	**1.5**	**8.03**	1.37	--	--	--	--	--	--	--	--
TS2-11-SD001	5.5-5.9	8/28/2012	--	--	*153*	--	**14.2**	**13.5**	**10.1**	9.16	12.8	**1.67**	**9.6**	1.82	--	--	--	--	--	--	--	--
TS2-11-SD002	0-0.5	8/28/2012	--	--	20.2	--	1.96	**1.83**	1.41	1.35	1.96	0.254	1.3	0.229	--	--	--	--	--	--	--	--
TS2-11-SD002	0.5-1.5	8/28/2012	--	--	19.7	--	1.7	**1.95**	1.62	1.31	1.77	0.266	1.32	0.25	--	--	--	--	--	--	--	--
TS2-11-SD002	1.5-2.5	8/28/2012	--	--	15	--	1.3	**1.45**	1.2	1	1.24	0.219	1	0.149	--	--	--	--	--	--	--	--
TS2-11-SD002	2.5-3.5	8/28/2012	--	--	26.1	--	2.29	**2.43**	1.87	1.65	2.14	**0.34**	1.62	0.276	--	--	--	--	--	--	--	--
TS2-11-SD002	3.5-4.5	8/28/2012	--	--	1.39	--	0.114	0.132	0.0986	0.0973	0.116	0.032	0.0914	< 0.0119	--	--	--	--	--	--	--	--
TS2-11-SD002	4.5-5.1	8/28/2012	--	--	0.316	--	< 0.0121	< 0.0121	< 0.0121	< 0.0121	< 0.0121	< 0.0121	< 0.0121	< 0.0121	--	--	--	--	--	--	--	--
TS2-11-SD003	0-1	8/28/2012	--	--	8.74	--	0.802	**0.751**	0.582	0.566	0.761	0.14	0.589	0.13	--	--	--	--	--	--	--	--
TS2-11-SD004	0-0.5	8/29/2012	--	--	78.1	--	**7.07**	**6.43**	**4.74**	4.41	6.47	**0.824**	**4.45**	1.07	--	--	--	--	--	--	--	--
TS2-11-SD004	0.5-1.5	8/29/2012	--	--	36.3	--	**3.42**	**3.47**	2.59	2.49	3.11	**0.433**	2.4	0.492	--	--	--	--	--	--	--	--
TS2-11-SD004	1.5-2.7	8/29/2012	--	--	1.11	--	0.0939	0.0966	0.0806	0.0737	0.0901	0.0393	0.0782	0.0117	--	--	--	--	--	--	--	--

Table 29. Sediment Analytical Results – Exceeding Human Health Soil Industrial SLs and Ecological Risk Site Specific SL

Wisconsin Public Service Corporation, Manitowoc
Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

			BTEX		PAH										Alk PAH							Inorganic
Sample Location	Sample Depth (ft)	Sample Date	Benzene (mg/kg)	Ethylbenzene (mg/kg)	Total PAH (13) (mg/kg)	1-Methylnaphthalene (mg/kg)	Benzo(a)anthracene (mg/kg)	Benzo(a)pyrene (mg/kg)	Benzo(b)fluoranthene (mg/kg)	Benzo(k)fluoranthene (mg/kg)	Chrysene (mg/kg)	Dibenz(a,h)anthracene (mg/kg)	Indeno(1,2,3-cd)pyrene (mg/kg)	Naphthalene (PAH) (mg/kg)	Benzo(a)anthracene (mg/kg)	Benzo(a)pyrene (mg/kg)	Benzo(b)fluoranthene (mg/kg)	Benzo(k)fluoranthene (mg/kg)	Dibenz(a,h)anthracene (mg/kg)	Indeno(1,2,3-cd)pyrene (mg/kg)	Naphthalene (PAH) (mg/kg)	Lead, Total (mg/kg)
		Eco-Risk Site-Specific	*NS*	*NS*	*103*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*
		Soil Industrial for WI / IBS	**5.1**	**25**	**NS**	**73**	**2.9**	**0.29**	**2.9**	**29**	**290**	**0.29**	**2.9**	**17**	**2.9**	**0.29**	**2.9**	**29**	**0.29**	**2.9**	**17**	**800**
TS2-12-SD001	0-0.5	8/30/2012	--	--	89.7	--	**8.14**	**8.03**	**6.44**	5.64	8.21	**1.31**	**5.45**	1.17	--	--	--	--	--	--	--	--
TS2-12-SD001	0.5-1.5	8/30/2012	--	--	102	--	**9.54**	**9.64**	**7.08**	6.62	9.2	**1.41**	**6.75**	1.37	--	--	--	--	--	--	--	--
TS2-12-SD001	1.5-2.5	8/30/2012	--	--	49.7	--	**4.63**	**4.85**	**4.02**	3.05	4.57	**0.743**	**3.57**	0.883	--	--	--	--	--	--	--	--
TS2-12-SD001	2.5-3.5	8/30/2012	--	--	45.1	--	**4.36**	**4.26**	**3.21**	3.13	3.98	**0.633**	**3.23**	1.49	--	--	--	--	--	--	--	--
TS2-12-SD001	3.5-4.5	8/30/2012	--	--	81.6	--	**7.2**	**7**	**4.83**	4.94	6.13	**1.1**	**5.19**	2.15	--	--	--	--	--	--	--	--
TS2-12-SD001	4.5-5.5	8/30/2012	--	--	102	--	**9.72**	**9.71**	**6.95**	6.48	8.47	**1.43**	**6.97**	3.81	--	--	--	--	--	--	--	--
TS2-1A-SD001	0-0.5	8/24/2012	--	--	6.76	--	0.635	**0.649**	0.635	0.51	0.669	0.102	0.599	0.0359	--	--	--	--	--	--	--	--
TS2-1A-SD001	0.5-1.5	8/24/2012	--	--	3.77	--	0.364	**0.327**	0.386	0.302	0.356	0.0495	0.334	0.0417	--	--	--	--	--	--	--	--
TS2-1A-SD001	1.5-2.5	8/24/2012	--	--	4.23	--	0.42	**0.419**	0.47	0.443	0.453	0.0573	0.483	0.0278	--	--	--	--	--	--	--	--
TS2-1A-SD001	2.5-3.7	8/24/2012	--	--	1.02	--	0.118	0.108	0.0992	0.101	0.127	< 0.0168	0.0909	< 0.0168	--	--	--	--	--	--	--	--
TS2-1A-SD002	0-0.5	8/24/2012	--	--	17.1	--	1.44	**1.26**	1.01	0.896	1.27	0.109	0.848	0.135	--	--	--	--	--	--	--	--
TS2-1A-SD002	0.5-1.5	8/24/2012	--	--	8.2	--	0.58	**0.577**	0.537	0.432	0.6	0.0661	0.433	0.0694	--	--	--	--	--	--	--	--
TS2-1A-SD002	1.5-2.5	8/24/2012	--	--	8.58	--	0.609	**0.687**	0.583	0.493	0.637	0.0795	0.524	0.058	--	--	--	--	--	--	--	--
TS2-1A-SD002	2.5-3.5	8/24/2012	--	--	20.8	--	1.6	**1.9**	1.44	1.27	1.46	0.16	1.3	0.17	--	--	--	--	--	--	--	--
TS2-1A-SD002	3.5-4.5	8/24/2012	--	--	61.1	--	**4.81**	**5.43**	**4.12**	3.76	4.33	**0.491**	**3.72**	0.486	--	--	--	--	--	--	--	--
TS2-1A-SD002	4.5-5.9	8/24/2012	--	--	*171*	--	**13.2**	**15.2**	**11**	10.8	12.1	**2.07**	**10.3**	2.17	--	--	--	--	--	--	--	--
TS2-1A-SD002	5.9-6.7	8/24/2012	--	--	1.76	--	0.111	0.137	0.0954	0.0934	0.122	0.026	0.09	0.0188	--	--	--	--	--	--	--	--
TS2-1A-SD003	0-0.5	8/31/2012	--	--	6.32	--	0.528	**0.577**	0.453	0.43	0.512	0.165	0.451	0.0981	--	--	--	--	--	--	--	--
TS2-1A-SD003	0.5-1.5	8/31/2012	--	--	11	--	0.876	**0.885**	0.734	0.607	0.84	0.19	0.688	0.263	--	--	--	--	--	--	--	--
TS2-1A-SD003	1.5-2.5	8/31/2012	--	--	11.8	--	0.933	**0.897**	0.742	0.602	0.902	0.198	0.703	0.294	--	--	--	--	--	--	--	--
TS2-1A-SD003	2.5-3.5	8/31/2012	--	--	16.3	--	1.38	**1.28**	0.897	0.949	1.24	0.265	0.949	0.39	--	--	--	--	--	--	--	--
TS2-1A-SD003	3.5-4.5	8/31/2012	--	--	15.8	--	1.18	**1.17**	0.83	0.992	1.04	0.231	0.846	0.272	--	--	--	--	--	--	--	--
TS2-1A-SD003	4.5-5.5	8/31/2012	--	--	8.36	--	0.65	**0.633**	0.546	0.522	0.663	0.167	0.522	0.188	--	--	--	--	--	--	--	--
TS2-1A-SD003	5.5-6.5	8/31/2012	--	--	13.1	--	0.914	**0.983**	0.796	0.646	0.875	0.149	0.745	0.151	--	--	--	--	--	--	--	--
TS2-1A-SD003	6.5-7.5	8/31/2012	--	--	9.31	--	0.754	**0.784**	0.633	0.508	0.661	0.131	0.582	0.0846	--	--	--	--	--	--	--	--
TS2-1A-SD003	7.5-8.5	8/31/2012	--	--	16.6	--	1.34	**1.39**	1.08	0.856	1.2	0.205	0.993	0.197	--	--	--	--	--	--	--	--
TS2-1A-SD003	8.5-9.3	8/31/2012	--	--	45.1	--	**3.56**	**3.51**	2.61	2.26	3.07	**0.494**	2.49	0.486	--	--	--	--	--	--	--	--
TS2-1B-SD001	0-0.5	8/28/2012	--	--	7.71	--	0.755	**0.8**	0.604	0.527	0.704	0.118	0.534	0.0645	--	--	--	--	--	--	--	--
TS2-1B-SD001	0.5-1.5	8/28/2012	--	--	21.5	--	2.13	**2.11**	1.64	1.35	1.92	**0.293**	1.4	0.229	--	--	--	--	--	--	--	--
TS2-1B-SD001	1.5-2	8/28/2012	--	--	50.1	--	**4.83**	**4.67**	**3.62**	3.05	4.09	**0.602**	**3.09**	0.298	--	--	--	--	--	--	--	--
TS2-1B-SD002	0-0.5	8/28/2012	--	--	2.91	--	0.22	0.256	0.239	0.194	0.25	< 0.0253	0.204	< 0.0253	--	--	--	--	--	--	--	--
TS2-1B-SD002	0.5-1.5	8/28/2012	--	--	9.22	--	0.588	**0.622**	0.515	0.46	0.664	0.111	0.447	0.101	--	--	--	--	--	--	--	--
TS2-1B-SD002	1.5-2.5	8/28/2012	--	--	27.9	--	1.87	**1.92**	1.47	1.33	1.74	0.28	1.32	0.213	--	--	--	--	--	--	--	--
TS2-1B-SD002	2.5-3.5	8/28/2012	--	--	131	--	**10.5**	**10.4**	**7.58**	6.99	9.62	**1.37**	**6.82**	1.08	--	--	--	--	--	--	--	--
TS2-1B-SD002	3.5-4.1	8/28/2012	--	--	114	--	**9.26**	**9.61**	**7.07**	6.28	8.41	**1.24**	**6.41**	1.28	--	--	--	--	--	--	--	--

Table 29. Sediment Analytical Results – Exceeding Human Health Soil Industrial SLs and Ecological Risk Site Specific SL

Wisconsin Public Service Corporation, Manitowoc
Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

			BTEX		PAH										Alk PAH							Inorganic
Sample Location	Sample Depth (ft)	Sample Date	Benzene (mg/kg)	Ethylbenzene (mg/kg)	Total PAH (13) (mg/kg)	1-Methylnaphthalene (mg/kg)	Benzo(a)anthracene (mg/kg)	Benzo(a)pyrene (mg/kg)	Benzo(b)fluoranthene (mg/kg)	Benzo(k)fluoranthene (mg/kg)	Chrysene (mg/kg)	Dibenz(a,h)anthracene (mg/kg)	Indeno(1,2,3-cd)pyrene (mg/kg)	Naphthalene (PAH) (mg/kg)	Benzo(a)anthracene (mg/kg)	Benzo(a)pyrene (mg/kg)	Benzo(b)fluoranthene (mg/kg)	Benzo(k)fluoranthene (mg/kg)	Dibenz(a,h)anthracene (mg/kg)	Indeno(1,2,3-cd)pyrene (mg/kg)	Naphthalene (PAH) (mg/kg)	Lead, Total (mg/kg)
Eco-Risk Site-Specific			*NS*	*NS*	*103*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*
Soil Industrial for WI / IBS			**5.1**	**25**	**NS**	**73**	**2.9**	**0.29**	**2.9**	**29**	**290**	**0.29**	**2.9**	**17**	**2.9**	**0.29**	**2.9**	**29**	**0.29**	**2.9**	**17**	**800**
TS2-1B-SD003	0-0.5	8/28/2012	--	--	6.56	--	0.508	**0.57**	0.496	0.411	0.568	0.0847	0.434	0.0987	--	--	--	--	--	--	--	--
TS2-1B-SD003	0.5-1.5	8/28/2012	--	--	12.8	--	0.947	**0.946**	0.798	0.626	1.02	0.122	0.701	0.116	--	--	--	--	--	--	--	--
TS2-1B-SD003	1.5-2.5	8/28/2012	--	--	46.9	--	**3.66**	**3.57**	2.66	2.48	3.46	**0.444**	2.47	0.413	--	--	--	--	--	--	--	--
TS2-1B-SD003	2.5-3.5	8/28/2012	--	--	74.6	--	**5.97**	**5.65**	**4.45**	3.68	5.46	**0.726**	**3.93**	0.712	--	--	--	--	--	--	--	--
TS2-1B-SD003	3.5-4.5	8/28/2012	--	--	*268*	--	**19.7**	**17**	**12.4**	12.1	17.8	**2.15**	**11.5**	2.53	--	--	--	--	--	--	--	--
TS2-1B-SD003	4.5-5.5	8/28/2012	--	--	*550*	--	**44.4**	**40.1**	**29**	27.7	39.7	**4.71**	**27.1**	3.85	--	--	--	--	--	--	--	--
TS2-1B-SD003	5.5-6.5	8/28/2012	--	--	*292*	--	**22.1**	**18.3**	**13.5**	12.1	20.2	**2.15**	**11.7**	10.3	--	--	--	--	--	--	--	--
TS2-1B-SD003	6.5-7.5	8/28/2012	--	--	*539*	--	**39.2**	**32.3**	**24.2**	22	35.3	**3.78**	**22**	**32.8**	--	--	--	--	--	--	--	--
TS2-1B-SD003	7.5-8.5	8/28/2012	--	--	*400*	--	**27.6**	**26.6**	**20.4**	17.5	24.8	**3.68**	**17.8**	15.8	--	--	--	--	--	--	--	--
TS2-1B-SD003	8.5-9.5	8/28/2012	--	--	*655*	--	**46.1**	**45.3**	**34.2**	**29.3**	41.9	**5.6**	**30.1**	**26.2**	--	--	--	--	--	--	--	--
TS2-1B-SD003	9.5-10.2	8/28/2012	--	--	*450*	--	**27**	**25**	**18.9**	16.8	24.2	**3.31**	**16.4**	**32**	--	--	--	--	--	--	--	--
TS2-1B-SD003N	10-12	9/5/2012	--	--	*443*	--	**30.9**	**27.5**	**21.6**	18.1	26.4	**3.97**	**18.9**	**29.6**	--	--	--	--	--	--	--	--
TS2-1B-SD003N	12-14	9/5/2012	--	--	*264*	--	**18.9**	**17.2**	**14.2**	12.3	16.3	**2.7**	**12.6**	**21.7**	--	--	--	--	--	--	--	--
TS2-1B-SD003N	14-16	9/5/2012	--	--	54	--	**4**	**3.65**	2.82	2.46	3.49	**0.527**	2.59	1.96	--	--	--	--	--	--	--	--
TS2-1B-SD003N	16-18	9/5/2012	--	--	0.769	--	0.0693	0.058	0.0398	0.0394	0.049	0.0238	0.0463	0.0421	--	--	--	--	--	--	--	--
TS2-1B-SD003N	18-19	9/5/2012	--	--	0.873	--	0.0742	0.0723	0.0538	0.042	0.0596	0.0253	0.0586	0.0199	--	--	--	--	--	--	--	--
TS2-1C-SD001	0-0.5	8/29/2012	--	--	2.43	--	0.198	0.228	0.223	0.176	0.247	0.0888	0.202	< 0.0238	--	--	--	--	--	--	--	--
TS2-1C-SD001	0.5-1.5	8/29/2012	--	--	4.67	--	0.436	**0.473**	0.391	0.398	0.428	0.115	0.364	0.0444	--	--	--	--	--	--	--	--
TS2-1C-SD001	1.5-2.5	8/29/2012	--	--	6.33	--	0.688	**0.725**	0.621	0.523	0.693	0.146	0.533	0.105	--	--	--	--	--	--	--	--
TS2-1C-SD001	2.5-3.6	8/29/2012	--	--	20	--	2.34	**2.25**	1.78	1.54	2.09	**0.303**	1.61	0.277	--	--	--	--	--	--	--	--
TS2-1C-SD002	0-0.5	8/29/2012	--	--	1.69	--	0.0737	0.137	0.151	0.127	0.132	< 0.0262	0.131	< 0.0262	--	--	--	--	--	--	--	--
TS2-1C-SD002	0.5-1.5	8/29/2012	--	--	34.3	--	2.73	**3.06**	2.41	2.05	2.38	**0.396**	2.2	0.41	--	--	--	--	--	--	--	--
TS2-1C-SD002	1.5-2.1	8/29/2012	--	--	17.9	--	1.41	**1.56**	1.27	1.04	1.28	0.229	1.12	0.233	--	--	--	--	--	--	--	--
TS2-1C-SD003	0-0.5	8/29/2012	--	--	4.71	--	0.413	**0.476**	0.418	0.373	0.44	0.111	0.389	0.056	--	--	--	--	--	--	--	--
TS2-1C-SD003	0.5-1.5	8/29/2012	--	--	11.2	--	1.03	**1.05**	0.847	0.812	0.938	0.208	0.74	0.0833	--	--	--	--	--	--	--	--
TS2-1C-SD003	1.5-2.5	8/29/2012	--	--	30	--	2.63	**2.75**	2.18	1.89	2.38	**0.42**	1.85	0.356	--	--	--	--	--	--	--	--
TS2-1C-SD003	2.5-3.5	8/29/2012	--	--	74.2	--	**4.79**	**5**	**3.48**	3.53	4.15	**0.598**	**3.48**	0.685	--	--	--	--	--	--	--	--
TS2-1C-SD003	3.5-4.5	8/29/2012	--	--	55.2	--	**4.56**	**4.72**	**3.39**	3.23	4.03	**0.812**	**3.32**	0.65	--	--	--	--	--	--	--	--
TS2-1C-SD003	4.5-5.1	8/29/2012	--	--	10.5	--	0.76	**0.814**	0.615	0.607	0.685	0.223	0.593	0.132	--	--	--	--	--	--	--	--

Table 29. Sediment Analytical Results – Exceeding Human Health Soil Industrial SLs and Ecological Risk Site Specific SL

Wisconsin Public Service Corporation, Manitowoc
Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

			BTEX		PAH										Alk PAH							Inorganic
Sample Location	Sample Depth (ft)	Sample Date	Benzene (mg/kg)	Ethylbenzene (mg/kg)	Total PAH (13) (mg/kg)	1-Methylnaphthalene (mg/kg)	Benzo(a)anthracene (mg/kg)	Benzo(a)pyrene (mg/kg)	Benzo(b)fluoranthene (mg/kg)	Benzo(k)fluoranthene (mg/kg)	Chrysene (mg/kg)	Dibenz(a,h)anthracene (mg/kg)	Indeno(1,2,3-cd)pyrene (mg/kg)	Naphthalene (PAH) (mg/kg)	Benzo(a)anthracene (mg/kg)	Benzo(a)pyrene (mg/kg)	Benzo(b)fluoranthene (mg/kg)	Benzo(k)fluoranthene (mg/kg)	Dibenz(a,h)anthracene (mg/kg)	Indeno(1,2,3-cd)pyrene (mg/kg)	Naphthalene (PAH) (mg/kg)	Lead, Total (mg/kg)
		Eco-Risk Site-Specific	*NS*	*NS*	*103*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*
		Soil Industrial for WI / IBS	**5.1**	**25**	**NS**	**73**	**2.9**	**0.29**	**2.9**	**29**	**290**	**0.29**	**2.9**	**17**	**2.9**	**0.29**	**2.9**	**29**	**0.29**	**2.9**	**17**	**800**
TS2-1D-SD001	0-0.5	8/29/2012	--	--	25	--	2.05	**2.48**	2.02	1.7	2	**0.445**	1.83	0.475	--	--	--	--	--	--	--	--
TS2-1D-SD001	0.5-1.5	8/29/2012	--	--	21.2	--	1.54	**1.78**	1.4	1.29	1.44	0.254	1.3	0.234	--	--	--	--	--	--	--	--
TS2-1D-SD001	1.5-2.5	8/29/2012	--	--	32.1	--	2.85	**2.99**	2.33	2.04	2.76	0.288	2.09	0.384	--	--	--	--	--	--	--	--
TS2-1D-SD001	2.5-3.5	8/29/2012	--	--	20.9	--	1.5	**1.64**	1.4	1.25	1.7	0.245	1.26	0.231	--	--	--	--	--	--	--	--
TS2-1D-SD001	3.5-4.5	8/29/2012	--	--	36.2	--	2.63	**3.33**	**3.21**	2.25	2.8	**0.698**	2.57	0.317	--	--	--	--	--	--	--	--
TS2-1D-SD001	4.5-5.5	8/29/2012	--	--	23.4	--	1.81	**1.95**	1.61	1.35	1.72	**0.317**	1.47	0.271	--	--	--	--	--	--	--	--
TS2-1D-SD001	5.5-6.5	8/29/2012	--	--	35.3	--	2.82	**2.98**	2.35	1.98	2.7	**0.439**	2.13	0.392	--	--	--	--	--	--	--	--
TS2-1D-SD001	6.5-7.5	8/29/2012	--	--	*1,980*	--	**27.4**	**25.3**	**17.5**	15.8	25.1	**3.55**	**17.5**	**40.5**	--	--	--	--	--	--	--	--
TS2-1D-SD001	7.5-8	8/29/2012	--	--	*1,120*	--	**54.9**	**49.7**	**37.2**	**33.7**	49.1	**6.78**	**32.3**	**172**	--	--	--	--	--	--	--	--
TS2-1D-SD001N	8-10	9/11/2012	--	--	*227*	--	**16.8**	**16.8**	**12.3**	11.2	14.1	**2.29**	**12.7**	2.27	--	--	--	--	--	--	--	--
TS2-1D-SD001N	10-12	9/11/2012	--	--	*392*	--	**21.2**	**19.5**	**13.8**	11.8	17.5	**2.71**	**13.9**	**43.4**	--	--	--	--	--	--	--	--
TS2-1D-SD001N	12-14	9/11/2012	--	--	83.5	--	**6.18**	**5.73**	**3.98**	4.07	4.95	**0.769**	**4.1**	3.33	--	--	--	--	--	--	--	--
TS2-1D-SD001N	14-16	9/11/2012	--	--	0.51	--	0.0339	0.0406	0.0316	0.0266	< 0.0123	< 0.0123	0.0366	< 0.0123	--	--	--	--	--	--	--	--
TS2-1D-SD001N	16-18	9/11/2012	--	--	0.307	--	< 0.0118	< 0.0118	< 0.0118	< 0.0118	< 0.0118	< 0.0118	< 0.0118	< 0.0118	--	--	--	--	--	--	--	--
TS2-1D-SD002	0-0.5	8/30/2012	--	--	7.88	--	0.555	**0.713**	0.56	0.519	0.595	0.105	0.549	0.338	--	--	--	--	--	--	--	--
TS2-1D-SD002	0.5-1.6	8/30/2012	--	--	111	--	**6.97**	**6.57**	**4.67**	4.38	6.39	**0.972**	**4.44**	0.912	--	--	--	--	--	--	--	--
TS2-1E-SD001	0-0.5	8/31/2012	--	--	51.8	--	**4.95**	**4.76**	**3.82**	2.96	3.54	**0.707**	**3.24**	0.134	--	--	--	--	--	--	--	--
TS2-1E-SD001	0.5-1.5	8/31/2012	--	--	16.7	--	1.55	**1.75**	1.19	1.05	1.33	0.25	1.29	0.216	--	--	--	--	--	--	--	--
TS2-1E-SD001	1.5-2.4	8/31/2012	--	--	27.2	--	2.51	**2.73**	1.89	1.6	2.18	**0.393**	1.98	0.295	--	--	--	--	--	--	--	--
TS2-1F-SD001	0-0.5	8/31/2012	--	--	8.08	--	0.604	**0.645**	0.505	0.416	0.59	0.123	0.511	0.0723	--	--	--	--	--	--	--	--
TS2-1F-SD001	0.5-1.5	8/31/2012	--	--	47.8	--	**3.5**	**3.3**	2.47	2.3	3.04	**0.479**	2.27	0.758	--	--	--	--	--	--	--	--
TS2-1F-SD001	1.5-2.5	8/31/2012	--	--	48.9	--	**3.42**	**3.56**	2.69	2.34	2.95	**0.501**	2.57	0.494	--	--	--	--	--	--	--	--
TS2-1F-SD001	2.5-3.5	8/31/2012	--	--	*230*	--	**16.5**	**16.5**	**11.9**	9.23	14.1	**2.12**	**11.6**	4.34	--	--	--	--	--	--	--	--
TS2-1F-SD001	3.5-4.5	8/31/2012	--	--	88.7	--	**6.73**	**6.74**	**4.76**	4.5	5.72	**0.902**	**4.77**	0.836	--	--	--	--	--	--	--	--
TS2-1F-SD001	4.5-5.4	8/31/2012	--	--	*204*	--	**14.2**	**14.1**	**10.6**	9.09	11.9	**1.89**	**9.88**	3.7	--	--	--	--	--	--	--	--
TS2-1G-SD001	0-0.5	8/31/2012	--	--	25.2	--	2.15	**2.32**	1.74	1.56	1.79	**0.338**	1.75	0.296	--	--	--	--	--	--	--	--
TS2-1G-SD001	0.5-1.5	8/31/2012	--	--	25.4	--	2.19	**2.45**	1.89	1.57	1.93	**0.368**	1.84	0.276	--	--	--	--	--	--	--	--
TS2-1G-SD001	1.5-2.5	8/31/2012	--	--	10.8	--	0.917	**1.02**	0.787	0.689	0.821	0.171	0.804	0.104	--	--	--	--	--	--	--	--
TS2-1G-SD001	2.5-3.5	8/31/2012	--	--	14.9	--	1.38	**1.65**	1.16	0.921	1.33	0.247	1.22	0.123	--	--	--	--	--	--	--	--
TS2-1G-SD001	3.5-4.5	8/31/2012	--	--	29	--	2.4	**2.56**	1.86	1.72	2.14	**0.362**	1.93	0.335	--	--	--	--	--	--	--	--
TS2-1G-SD001	4.5-5.5	8/31/2012	--	--	41.1	--	**3.6**	**3.64**	2.61	2.52	3.2	**0.505**	2.67	0.484	--	--	--	--	--	--	--	--
TS2-1G-SD001	5.5-6.5	8/31/2012	--	--	34.4	--	**3.55**	**3.67**	**2.98**	2.24	2.98	**0.57**	2.78	0.409	--	--	--	--	--	--	--	--
TS2-1G-SD001	6.5-7.6	8/31/2012	--	--	0.382	--	< 0.0147	< 0.0147	< 0.0147	< 0.0147	< 0.0147	< 0.0147	< 0.0147	< 0.0147	--	--	--	--	--	--	--	--

Table 29. Sediment Analytical Results – Exceeding Human Health Soil Industrial SLs and Ecological Risk Site Specific SL

Wisconsin Public Service Corporation, Manitowoc
Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

			BTEX		PAH										Alk PAH							Inorganic
Sample Location	Sample Depth (ft)	Sample Date	Benzene (mg/kg)	Ethylbenzene (mg/kg)	Total PAH (13) (mg/kg)	1-Methylnaphthalene (mg/kg)	Benzo(a)anthracene (mg/kg)	Benzo(a)pyrene (mg/kg)	Benzo(b)fluoranthene (mg/kg)	Benzo(k)fluoranthene (mg/kg)	Chrysene (mg/kg)	Dibenz(a,h)anthracene (mg/kg)	Indeno(1,2,3-cd)pyrene (mg/kg)	Naphthalene (PAH) (mg/kg)	Benzo(a)anthracene (mg/kg)	Benzo(a)pyrene (mg/kg)	Benzo(b)fluoranthene (mg/kg)	Benzo(k)fluoranthene (mg/kg)	Dibenz(a,h)anthracene (mg/kg)	Indeno(1,2,3-cd)pyrene (mg/kg)	Naphthalene (PAH) (mg/kg)	Lead, Total (mg/kg)
Eco-Risk Site-Specific			*NS*	*NS*	*103*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*
Soil Industrial for WI / IBS			**5.1**	**25**	**NS**	**73**	**2.9**	**0.29**	**2.9**	**29**	**290**	**0.29**	**2.9**	**17**	**2.9**	**0.29**	**2.9**	**29**	**0.29**	**2.9**	**17**	**800**
TS2-1-SD001	0-0.5	8/23/2012	--	--	4.53	--	0.225	**0.327**	0.274	0.302	0.263	0.207	0.198	< 0.0988	--	--	--	--	--	--	--	--
TS2-1-SD001	0.5-1.5	8/23/2012	--	--	6.76	--	0.556	**0.506**	0.414	0.404	0.486	0.196	0.342	< 0.0847	--	--	--	--	--	--	--	--
TS2-1-SD001	1.5-2.5	8/23/2012	--	--	9.88	--	0.845	**0.767**	0.73	0.61	0.776	0.284	0.579	< 0.086	--	--	--	--	--	--	--	--
TS2-1-SD001	2.5-3.6	8/23/2012	--	--	106	--	**9.05**	**8.87**	**6.86**	7.13	7.86	**1.49**	**6.28**	0.793	--	--	--	--	--	--	--	--
TS2-1-SD002	0-0.5	8/23/2012	--	--	4.76	--	< 0.106	**0.294**	0.256	0.321	0.264	0.22	0.176	< 0.106	--	--	--	--	--	--	--	--
TS2-1-SD002	0.5-1.5	8/23/2012	--	--	22.3	--	1.51	**1.38**	1.2	1.1	1.42	**0.39**	0.954	0.143	--	--	--	--	--	--	--	--
TS2-1-SD002	1.5-2.5	8/23/2012	--	--	6.79	--	0.585	**0.492**	0.425	0.361	0.519	0.184	0.311	< 0.0675	--	--	--	--	--	--	--	--
TS2-1-SD002	2.5-3.6	8/23/2012	--	--	63.9	--	**5.92**	**5.18**	**4.07**	3.89	5.36	**0.948**	**3.39**	0.472	--	--	--	--	--	--	--	--
TS2-1-SD003	0-0.5	8/23/2012	--	--	17	--	1.65	**1.62**	1.22	1.47	1.47	**0.473**	1.18	< 0.091	--	--	--	--	--	--	--	--
TS2-1-SD003	0.5-1.5	8/23/2012	--	--	36	--	**3.04**	**2.88**	2.22	1.98	2.77	**0.445**	1.84	0.717	--	--	--	--	--	--	--	--
TS2-1-SD003	1.5-2.2	8/23/2012	--	--	115	--	**9.31**	**8.57**	**6.2**	6.01	8.3	**1.51**	**5.56**	1.91	--	--	--	--	--	--	--	--
TS2-1-SD003N	2-4	9/11/2012	--	--	25.3	--	1.99	**1.85**	1.35	1.32	1.7	**0.324**	1.4	0.203	--	--	--	--	--	--	--	--
TS2-1-SD003N	4-6	9/11/2012	--	--	0.488	--	0.0265	0.0328	0.0252	0.0231	< 0.0113	< 0.0113	0.0265	< 0.0113	--	--	--	--	--	--	--	--
TS2-1-SD003N	6-8	9/11/2012	--	--	0.616	--	0.0598	0.0431	0.0361	0.0335	0.0325	< 0.0109	0.0368	< 0.0109	--	--	--	--	--	--	--	--
TS2-1-SD003N	10-12	9/11/2012	--	--	0.3	--	< 0.0114	0.0252	< 0.0114	< 0.0114	< 0.0114	< 0.0114	< 0.0114	< 0.0114	--	--	--	--	--	--	--	--
TS2-1-SD003N	12-14	9/11/2012	--	--	0.285	--	< 0.0109	< 0.0109	< 0.0109	< 0.0109	< 0.0109	< 0.0109	< 0.0109	< 0.0109	--	--	--	--	--	--	--	--
TS2-2-SD001	0-0.5	8/22/2012	--	--	133	--	**7.9**	**7.13**	**6.03**	5.77	7.42	**1.52**	**5.21**	1.48	--	--	--	--	--	--	--	--
TS2-2-SD001	0.5-1.5	8/22/2012	--	--	*677*	--	**44.7**	**41.4**	**29.8**	**29.2**	42.5	**8.6**	**29.8**	7.16	--	--	--	--	--	--	--	--
TS2-2-SD001	1.5-2.5	8/22/2012	--	--	*378*	--	**21.8**	**19.6**	**15.5**	13.2	18.4	**4.24**	**13.7**	8.02	--	--	--	--	--	--	--	--
TS2-2-SD001	2.5-3.5	8/22/2012	--	--	*732*	--	**45.6**	**38.9**	**28.9**	**29.9**	39.5	**8.5**	**28.5**	12.1	--	--	--	--	--	--	--	--
TS2-2-SD001	3.5-4.7	8/22/2012	--	--	36.5	--	1.9	**1.6**	1.38	1.19	1.69	**0.491**	1.07	0.616	--	--	--	--	--	--	--	--
TS2-2-SD001	0-0.5	8/29/2012	--	--	--	--	--	--	--	--	--	--	--	--	**11.9**	**14**	**9.33**	--	**2.44**	**8.46**	1.86	--
TS2-2-SD001S	0-0.5	8/27/2012	--	--	*811*	--	**18.3**	**18.2**	**13**	13.3	14.8	**2.83**	**12.7**	2.06	--	--	--	--	--	--	--	--
TS2-2-SD002	0-0.5	8/22/2012	--	--	23.1	--	1.97	**1.8**	1.47	1.62	1.88	**0.759**	1.15	< 0.238	--	--	--	--	--	--	--	--
TS2-2-SD002	0.5-1.5	8/22/2012	--	--	18.4	--	1.7	**1.51**	1.18	1.35	1.46	**0.645**	0.949	< 0.24	--	--	--	--	--	--	--	--
TS2-2-SD002	1.5-2.5	8/22/2012	--	--	109	--	**8.65**	**8.04**	**5.63**	6.79	7.52	**1.66**	**5.49**	0.609	--	--	--	--	--	--	--	--
TS2-2-SD002	2.5-3.5	8/22/2012	--	--	*181*	--	**11.4**	**10.8**	**8.03**	7.23	9.87	**1.82**	**7.48**	1.66	--	--	--	--	--	--	--	--
TS2-2-SD002	3.5-4.5	8/22/2012	--	--	*380*	--	**22.4**	**21.1**	**16.6**	13.6	20.2	**2.79**	**14.1**	3.61	--	--	--	--	--	--	--	--
TS2-2-SD002	4.5-5.5	8/22/2012	--	--	*472*	--	**26.5**	**24.1**	**17.1**	17.1	24.2	**2.96**	**15.2**	4.53	--	--	--	--	--	--	--	--
TS2-2-SD002	5.5-6	8/22/2012	--	--	*860*	--	**48.3**	**44.3**	**30.9**	**30.8**	45	**5.16**	**28.5**	8.78	--	--	--	--	--	--	--	--

Natural Resource Technology

Table 29. Sediment Analytical Results – Exceeding Human Health Soil Industrial SLs and Ecological Risk Site Specific SL

Wisconsin Public Service Corporation, Manitowoc
Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

			BTEX		PAH										Alk PAH							Inorganic
Sample Location	Sample Depth (ft)	Sample Date	Benzene (mg/kg)	Ethylbenzene (mg/kg)	Total PAH (13) (mg/kg)	1-Methylnaphthalene (mg/kg)	Benzo(a)anthracene (mg/kg)	Benzo(a)pyrene (mg/kg)	Benzo(b)fluoranthene (mg/kg)	Benzo(k)fluoranthene (mg/kg)	Chrysene (mg/kg)	Dibenz(a,h)anthracene (mg/kg)	Indeno(1,2,3-cd)pyrene (mg/kg)	Naphthalene (PAH) (mg/kg)	Benzo(a)anthracene (mg/kg)	Benzo(a)pyrene (mg/kg)	Benzo(b)fluoranthene (mg/kg)	Benzo(k)fluoranthene (mg/kg)	Dibenz(a,h)anthracene (mg/kg)	Indeno(1,2,3-cd)pyrene (mg/kg)	Naphthalene (PAH) (mg/kg)	Lead, Total (mg/kg)
Eco-Risk Site-Specific			*NS*	*NS*	*103*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*
Soil Industrial for WI / IBS			**5.1**	**25**	**NS**	**73**	**2.9**	**0.29**	**2.9**	**29**	**290**	**0.29**	**2.9**	**17**	**2.9**	**0.29**	**2.9**	**29**	**0.29**	**2.9**	**17**	**800**
TS2-2-SD003	0-0.5	8/23/2012	--	--	28.4	--	1.89	**1.8**	1.54	1.22	1.89	**0.304**	1.18	0.462	--	--	--	--	--	--	--	--
TS2-2-SD003	0.5-1.5	8/23/2012	--	--	27.1	--	2.28	**2.28**	1.82	1.56	1.99	**0.388**	1.5	0.354	--	--	--	--	--	--	--	--
TS2-2-SD003	1.5-2.5	8/23/2012	--	--	103	--	**7.33**	**6.96**	**5.15**	4.58	6.47	**1.17**	**4.52**	1.56	--	--	--	--	--	--	--	--
TS2-2-SD003	2.5-3.5	8/23/2012	--	--	*173*	--	**13.3**	**12.1**	**8.93**	8.73	11.9	**2.29**	**8.11**	2.49	--	--	--	--	--	--	--	--
TS2-2-SD003	3.5-4.5	8/23/2012	--	--	92.9	--	**8.14**	**7.93**	**5.5**	5.94	7.1	**1.4**	**5.23**	1.33	--	--	--	--	--	--	--	--
TS2-2-SD003	4.5-5.5	8/23/2012	--	--	79.1	--	**6.35**	**5.89**	**4.27**	4.29	5.72	**1.1**	**4.11**	1.2	--	--	--	--	--	--	--	--
TS2-2-SD003	5.5-6.5	8/23/2012	--	--	*273*	--	**20.2**	**19.5**	**13.7**	13.9	18.5	**3.58**	**13.1**	9.57	--	--	--	--	--	--	--	--
TS2-2-SD003	6.5-7.1	8/23/2012	--	--	*464*	--	**31.3**	**28.4**	**19.2**	20.1	26.9	**4.7**	**17.7**	**36.8**	--	--	--	--	--	--	--	--
TS2-2-SD003N	7-9	9/12/2012	--	--	*247*	--	**12.9**	**11.9**	**8.98**	7.81	10.7	**1.55**	**8.82**	**20.4**	--	--	--	--	--	--	--	--
TS2-2-SD003N	9-11	9/12/2012	--	--	51.5	--	**3.48**	**3.37**	2.48	2.24	2.89	**0.426**	2.48	3.04	--	--	--	--	--	--	--	--
TS2-2-SD003N	11-13	9/12/2012	--	--	29.2	--	1.99	**1.8**	1.39	1.23	1.64	0.235	1.3	2.26	--	--	--	--	--	--	--	--
TS2-2-SD003N	13-15	9/12/2012	--	--	0.663	--	0.064	0.0607	0.0423	0.0369	0.0425	< 0.0117	0.0484	0.0336	--	--	--	--	--	--	--	--
TS2-2-SD004	0-0.5	8/24/2012	--	--	7.47	--	0.513	**0.547**	0.478	0.42	0.551	0.153	0.407	0.0882	--	--	--	--	--	--	--	--
TS2-2-SD004	0.5-1.5	8/24/2012	--	--	*882*	--	**18.5**	**18.3**	**13.8**	13.2	18	**2.59**	**13.6**	1.85	--	--	--	--	--	--	--	--
TS2-2-SD004	1.5-2.8	8/24/2012	--	--	19.4	--	1.32	**1.3**	0.971	0.967	1.19	0.27	0.882	0.168	--	--	--	--	--	--	--	--
TS2-2-SD004N	2-4	9/11/2012	--	--	*236*	--	**19.8**	**17.2**	**12.4**	11.8	16.6	**2**	**12.4**	1.74	--	--	--	--	--	--	--	--
TS2-2-SD004N	4-6	9/11/2012	--	--	123	--	**10.3**	**8.9**	**6.32**	6.33	8.45	**1.1**	**6.4**	0.911	--	--	--	--	--	--	--	--
TS2-2-SD004N	6-8	9/11/2012	--	--	1.01	--	0.0811	0.0595	0.0504	0.04	0.0479	< 0.0116	0.0478	< 0.0116	--	--	--	--	--	--	--	--
TS2-2-SD004N	8-10	9/11/2012	--	--	0.294	--	< 0.0113	< 0.0113	< 0.0113	< 0.0113	< 0.0113	< 0.0113	< 0.0113	< 0.0113	--	--	--	--	--	--	--	--
TS2-2-SD005	0-0.5	8/30/2012	--	--	5.19	--	0.359	**0.391**	0.311	0.318	0.412	0.0969	0.319	0.0633	--	--	--	--	--	--	--	--
TS2-2-SD005	0.5-1.5	8/30/2012	--	--	17.1	--	1.26	**1.37**	1.14	0.937	1.29	0.223	1	0.375	--	--	--	--	--	--	--	--
TS2-2-SD005	1.5-2.5	8/30/2012	--	--	16.7	--	1.1	**1.24**	0.917	0.866	1.18	0.193	0.897	0.281	--	--	--	--	--	--	--	--
TS2-2-SD005	2.5-3.5	8/30/2012	--	--	13.1	--	0.852	**0.862**	0.85	0.577	0.922	0.116	0.636	0.138	--	--	--	--	--	--	--	--
TS2-2-SD005	3.5-4.5	8/30/2012	--	--	19.1	--	1.45	**1.46**	1.19	1.02	1.43	0.159	1.05	0.225	--	--	--	--	--	--	--	--
TS2-2-SD005	4.5-5.5	8/30/2012	--	--	7.63	--	0.533	**0.554**	0.492	0.349	0.552	0.071	0.384	0.0826	--	--	--	--	--	--	--	--
TS2-2-SD005	5.5-6.5	8/30/2012	--	--	29.9	--	2.38	**2.51**	1.78	1.45	2.14	**0.371**	1.75	0.365	--	--	--	--	--	--	--	--
TS2-3-SD001	0-0.5	8/21/2012	--	--	*17,300*	--	**714**	**638**	**458**	**487**	**653**	**101**	**420**	**4,810**	--	--	--	--	--	--	--	--
TS2-3-SD001	0-0.5	8/27/2012	--	--	*885*	--	**51.5**	**45.3**	**34.5**	**30.9**	46.5	**5.7**	**30.1**	**54.9**	--	--	--	--	--	--	--	--
TS2-3-SD001	1.5-2.1	8/21/2012	--	--	*1,460*	--	**76.7**	**67.1**	**54.6**	**45.5**	67	**11.7**	**44.9**	**183**	--	--	--	--	--	--	--	--
TS2-3-SD002	0-0.5	8/21/2012	--	--	50.2	--	**3.28**	**3.27**	2.54	2.32	2.81	**0.58**	2.16	2.24	--	--	--	--	--	--	--	--
TS2-3-SD002	0.5-1.5	8/21/2012	--	--	*1,160*	--	**52.6**	**45.6**	**61.8**	**81.5**	45	**11.9**	**32.9**	**218**	--	--	--	--	--	--	--	--
TS2-3-SD002	1.5-2.5	8/21/2012	--	--	*7,010*	--	**287**	**251**	**179**	**176**	250	**38.1**	**162**	**1,890**	--	--	--	--	--	--	--	--
TS2-3-SD002	2.5-3.6	8/21/2012	--	--	*138*	--	**5.9**	**5.84**	**4.2**	4.08	5.36	**1.02**	**3.65**	8.55	--	--	--	--	--	--	--	--

Table 29. Sediment Analytical Results – Exceeding Human Health Soil Industrial SLs and Ecological Risk Site Specific SL

Wisconsin Public Service Corporation, Manitowoc
Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

			BTEX		PAH										Alk PAH							Inorganic
Sample Location	Sample Depth (ft)	Sample Date	Benzene (mg/kg)	Ethylbenzene (mg/kg)	Total PAH (13) (mg/kg)	1-Methylnaphthalene (mg/kg)	Benzo(a)anthracene (mg/kg)	Benzo(a)pyrene (mg/kg)	Benzo(b)fluoranthene (mg/kg)	Benzo(k)fluoranthene (mg/kg)	Chrysene (mg/kg)	Dibenz(a,h)anthracene (mg/kg)	Indeno(1,2,3-cd)pyrene (mg/kg)	Naphthalene (PAH) (mg/kg)	Benzo(a)anthracene (mg/kg)	Benzo(a)pyrene (mg/kg)	Benzo(b)fluoranthene (mg/kg)	Benzo(k)fluoranthene (mg/kg)	Dibenz(a,h)anthracene (mg/kg)	Indeno(1,2,3-cd)pyrene (mg/kg)	Naphthalene (PAH) (mg/kg)	Lead, Total (mg/kg)
Eco-Risk Site-Specific			*NS*	*NS*	*103*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*
Soil Industrial for WI / IBS			**5.1**	**25**	**NS**	**73**	**2.9**	**0.29**	**2.9**	**29**	**290**	**0.29**	**2.9**	**17**	**2.9**	**0.29**	**2.9**	**29**	**0.29**	**2.9**	**17**	**800**
TS2-3-SD003	0-0.5	8/21/2012	--	--	90	--	**6.71**	**7.24**	**5.4**	4.82	6.15	**1.17**	**4.68**	2.39	--	--	--	--	--	--	--	--
TS2-3-SD003	0-0.5	8/29/2012	--	--	--	--	--	--	--	--	--	--	--	--	**5.07**	**5.32**	**3.46**	--	**0.956**	**3.14**	1.37	--
TS2-3-SD003	0.5-1.5	8/21/2012	--	--	42.8	--	2.82	**2.42**	1.79	1.68	2.29	**0.51**	1.68	0.999	--	--	--	--	--	--	--	--
TS2-3-SD003	1.5-2.5	8/21/2012	--	--	125	--	**7.05**	**6.66**	**4.84**	4.89	6.58	**1.01**	**4.45**	2.31	--	--	--	--	--	--	--	--
TS2-3-SD003	2.5-3.5	8/21/2012	--	--	15.2	--	1.13	**1.13**	0.866	0.943	1.11	**0.346**	0.829	0.447	--	--	--	--	--	--	--	--
TS2-3-SD003	3.5-4.5	8/21/2012	--	--	67.6	--	**4.91**	**4.49**	**3.4**	3.07	4.17	**0.73**	**2.95**	1.05	--	--	--	--	--	--	--	--
TS2-3-SD003	4.5-5.5	8/21/2012	--	--	79.4	--	**5.08**	**4.55**	**3.61**	3.08	4.39	**0.556**	**3.05**	1.04	--	--	--	--	--	--	--	--
TS2-3-SD003	5.5-6.5	8/21/2012	--	--	*332*	--	**18.2**	**16.6**	**12.6**	12.7	16.6	**3.21**	**11**	4.24	--	--	--	--	--	--	--	--
TS2-3-SD003	6.5-7.5	8/21/2012	--	--	73.7	--	**5.18**	**4.86**	**4.02**	3.8	4.74	**1.06**	**3.21**	0.897	--	--	--	--	--	--	--	--
TS2-3-SD003	7.5-8	8/21/2012	--	--	*535*	--	**32**	**29.7**	**22.2**	20.6	28.2	**4.5**	**19.5**	6.51	--	--	--	--	--	--	--	--
TS2-3-SD003N	9-11	9/12/2012	--	--	*1,060*	--	**58.6**	**53.8**	**40.2**	**32.9**	48.9	**7.64**	**37.8**	16.2	--	--	--	--	--	--	--	--
TS2-3-SD003N	11-13	9/12/2012	--	--	*452*	--	**31.2**	**29.6**	**21.8**	18.8	25.4	**3.91**	**20.4**	8.03	--	--	--	--	--	--	--	--
TS2-3-SD003N	13-15	9/12/2012	--	--	30.8	--	2.31	**2.15**	1.69	1.57	1.95	0.263	1.54	0.718	--	--	--	--	--	--	--	--
TS2-3-SD003N	15-17	9/12/2012	--	--	0.273	--	< 0.0105	< 0.0105	< 0.0105	< 0.0105	< 0.0105	< 0.0105	< 0.0105	< 0.0105	--	--	--	--	--	--	--	--
TS2-3-SD004	0-0.5	8/22/2012	--	--	12.6	--	1.18	**1.12**	0.899	0.924	1.08	**0.358**	0.753	< 0.107	--	--	--	--	--	--	--	--
TS2-3-SD004	0.5-1.5	8/22/2012	--	--	27.8	--	2.44	**2.41**	1.92	1.84	1.98	**0.629**	1.62	0.328	--	--	--	--	--	--	--	--
TS2-3-SD004	1.5-2.5	8/22/2012	--	--	86.9	--	**7.32**	**7.32**	**6.04**	5.4	6.49	**1.36**	**5.3**	1.11	--	--	--	--	--	--	--	--
TS2-3-SD004	2.5-3.6	8/22/2012	--	--	128	--	**9.61**	**9.37**	**6.61**	6.93	8.62	**1.7**	**6.53**	1.61	--	--	--	--	--	--	--	--
TS2-3-SD005	0-0.5	8/24/2012	--	--	7.64	--	0.513	**0.656**	0.504	0.42	0.543	0.146	0.484	0.316	--	--	--	--	--	--	--	--
TS2-3-SD005	0.5-1.5	8/24/2012	--	--	14.4	--	1.05	**1.21**	0.891	0.932	1.09	0.217	0.871	0.209	--	--	--	--	--	--	--	--
TS2-3-SD005	1.5-2.5	8/24/2012	--	--	25	--	1.87	**2.02**	1.52	1.23	1.69	0.228	1.39	0.263	--	--	--	--	--	--	--	--
TS2-3-SD005N	0-2	9/6/2012	--	--	*1,250*	--	**54.1**	**47**	**34**	**32.8**	46.6	**5.73**	**32.8**	**230**	--	--	--	--	--	--	--	--
TS2-3-SD005N	2-4	9/6/2012	--	--	4.12	--	0.256	0.224	0.175	0.13	0.185	0.0434	0.174	0.325	--	--	--	--	--	--	--	--
TS2-3-SD005N	4-6	9/6/2012	--	--	0.738	--	0.0529	0.053	0.0312	0.0297	0.0308	< 0.0109	0.0341	0.0243	--	--	--	--	--	--	--	--
TS2-3-SD005N	6-8	9/6/2012	--	--	0.385	--	0.0337	0.0372	< 0.0107	< 0.0107	0.016	< 0.0107	< 0.0107	< 0.0107	--	--	--	--	--	--	--	--
TS2-3-SD005N	8-10	9/6/2012	--	--	0.292	--	0.0274	0.0307	< 0.0105	< 0.0105	< 0.0105	< 0.0105	< 0.0105	< 0.0105	--	--	--	--	--	--	--	--
TS2-3-SD006	0-0.5	8/31/2012	--	--	52.2	--	**4.54**	**4.46**	**3.25**	3.01	3.51	**0.609**	**3.15**	0.474	--	--	--	--	--	--	--	--
TS2-3-SD006	0.5-1.5	8/31/2012	--	--	32.9	--	2.78	**2.92**	2.26	1.9	2.53	**0.414**	2.1	0.402	--	--	--	--	--	--	--	--
TS2-3-SD006	1.5-2.5	8/31/2012	--	--	25.8	--	1.94	**1.93**	1.55	1.23	1.76	0.283	1.38	0.313	--	--	--	--	--	--	--	--
TS2-3-SD006	2.5-3.5	8/31/2012	--	--	27.5	--	2.33	**2.32**	1.85	1.44	1.85	**0.336**	1.62	0.19	--	--	--	--	--	--	--	--
TS2-3-SD006	3.5-4.8	8/31/2012	--	--	59.8	--	**5.4**	**5.34**	**3.62**	3.13	4.63	**0.714**	**3.65**	0.686	--	--	--	--	--	--	--	--
TS2-3-SPT001	10-12	9/7/2012	--	--	3.91	--	0.213	0.158	0.134	0.158	0.204	< 0.0115	0.101	0.273	--	--	--	--	--	--	--	--
TS2-3-SPT001	12-14	9/7/2012	--	--	1.67	--	0.0975	0.0747	0.0596	0.0711	0.0823	< 0.0119	0.0407	0.196	--	--	--	--	--	--	--	--
TS2-4-SD001	0-0.5	8/21/2012	--	--	*10,000*	--	**354**	**288**	**239**	**229**	**375**	**48**	**186**	**3,640**	--	--	--	--	--	--	--	--

Natural Resource Technology

Table 29. Sediment Analytical Results – Exceeding Human Health Soil Industrial SLs and Ecological Risk Site Specific SL

Wisconsin Public Service Corporation, Manitowoc
Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

			BTEX		PAH										Alk PAH							Inorganic
Sample Location	Sample Depth (ft)	Sample Date	Benzene (mg/kg)	Ethylbenzene (mg/kg)	Total PAH (13) (mg/kg)	1-Methylnaphthalene (mg/kg)	Benzo(a)anthracene (mg/kg)	Benzo(a)pyrene (mg/kg)	Benzo(b)fluoranthene (mg/kg)	Benzo(k)fluoranthene (mg/kg)	Chrysene (mg/kg)	Dibenz(a,h)anthracene (mg/kg)	Indeno(1,2,3-cd)pyrene (mg/kg)	Naphthalene (PAH) (mg/kg)	Benzo(a)anthracene (mg/kg)	Benzo(a)pyrene (mg/kg)	Benzo(b)fluoranthene (mg/kg)	Benzo(k)fluoranthene (mg/kg)	Dibenz(a,h)anthracene (mg/kg)	Indeno(1,2,3-cd)pyrene (mg/kg)	Naphthalene (PAH) (mg/kg)	Lead, Total (mg/kg)
		Eco-Risk Site-Specific	*NS*	*NS*	*103*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*
		Soil Industrial for WI / IBS	**5.1**	**25**	**NS**	**73**	**2.9**	**0.29**	**2.9**	**29**	**290**	**0.29**	**2.9**	**17**	**2.9**	**0.29**	**2.9**	**29**	**0.29**	**2.9**	**17**	**800**
TS2-4-SD002	0-0.5	8/21/2012	--	--	38.4	--	2.49	**2.36**	1.97	1.65	2.22	**0.489**	1.66	0.916	--	--	--	--	--	--	--	--
TS2-4-SD002	0.5-1.5	8/21/2012	--	--	25.9	--	2.02	**1.97**	1.61	1.36	1.85	**0.516**	1.37	0.826	--	--	--	--	--	--	--	--
TS2-4-SD002	1.5-2	8/21/2012	--	--	3.83	--	0.259	**0.322**	0.289	0.238	0.357	0.15	0.269	0.223	--	--	--	--	--	--	--	--
TS2-4-SD003	0-0.5	8/21/2012	--	--	21	--	1.64	**1.54**	1.32	1.13	1.41	**0.399**	1.16	0.6	--	--	--	--	--	--	--	--
TS2-4-SD003	4.5-5	8/21/2012	--	--	*234*	--	**13.4**	**14.3**	**10.1**	9.93	12.6	**2.01**	**9.21**	2.81	--	--	--	--	--	--	--	--
TS2-4-SD004	0-0.5	9/4/2012	--	--	21.6	--	1.51	**1.5**	1.12	1.06	1.34	0.228	1.12	0.391	--	--	--	--	--	--	--	--
TS2-4-SD004	0.5-1.5	9/4/2012	--	--	*447*	--	**26.3**	**24.9**	**19**	15.3	22.4	**3.24**	**17.2**	4.16	--	--	--	--	--	--	--	--
TS2-4-SD004	1.5-2.8	9/4/2012	--	--	*621*	--	**39**	**36.2**	**27.9**	22.2	32.9	**4.88**	**25.2**	8.67	--	--	--	--	--	--	--	--
TS2-4-SPT001	10-12	9/7/2012	--	--	65.9	--	**2.97**	**2.64**	2.21	1.81	2.75	**0.312**	1.83	12.1	--	--	--	--	--	--	--	--
TS2-4-SPT001	14-16	9/7/2012	--	--	9.41	--	0.429	**0.349**	0.305	0.311	0.413	0.0537	0.243	1.17	--	--	--	--	--	--	--	--
TS2-5-SD001	0-0.5	8/21/2012	--	--	*5,050*	--	**282**	**255**	**200**	**208**	265	**47.3**	**144**	**828**	--	--	--	--	--	--	--	--
TS2-5-SD001	0-0.5	8/27/2012	--	--	*2,270*	--	**139**	**122**	**90.6**	**84.3**	117	**15.7**	**81.6**	**183**	--	--	--	--	--	--	--	--
TS2-5-SD001	0.5-1.5	8/21/2012	--	--	*2,790*	--	**155**	**152**	**110**	**124**	144	**38.1**	**94.4**	**260**	--	--	--	--	--	--	--	--
TS2-5-SD001	1.5-2.1	8/21/2012	--	--	*1,790*	--	**108**	**99.4**	**83.9**	**93.7**	89.1	**20**	**50.8**	**41.8**	--	--	--	--	--	--	--	--
TS2-5-SD002	0-0.5	8/21/2012	--	--	*1,810*	--	**107**	**94.7**	**81.3**	**75.4**	83	**19.4**	**55.2**	**146**	--	--	--	--	--	--	--	--
TS2-5-SD002	0.5-1.7	8/21/2012	--	--	*797*	--	**47**	**47.5**	**36.1**	**38.1**	39.2	**9.09**	**28.6**	**44.1**	--	--	--	--	--	--	--	--
TS2-5-SD003	0-0.5	8/21/2012	--	--	*158*	--	**6.25**	**6.12**	**4.74**	4.41	5.33	**1.31**	**4.06**	11.8	--	--	--	--	--	--	--	--
TS2-5-SD003	0.5-1.5	8/21/2012	--	--	*450*	--	**23.8**	**23.4**	**17.1**	16.1	20.5	**3.99**	**14.3**	11.2	--	--	--	--	--	--	--	--
TS2-5-SD003	1.5-2.5	8/21/2012	--	--	*236*	--	**16.6**	**17.6**	**13**	12	14.5	**2.2**	**11.4**	4.01	--	--	--	--	--	--	--	--
TS2-5-SD003	2.5-3.5	8/21/2012	--	--	*257*	--	**17.8**	**17.9**	**13.6**	12.3	20.5	**2.1**	**11.2**	9.17	--	--	--	--	--	--	--	--
TS2-5-SD003	3.5-4.8	8/21/2012	--	--	58.9	--	**5.26**	**5.13**	**3.85**	3.57	4.73	**0.596**	**3.22**	0.984	--	--	--	--	--	--	--	--
TS2-5-SD003	0-0.5	8/27/2012	--	--	*666*	--	**38.2**	**33.9**	**26.5**	22.1	32.6	**4.22**	**22.2**	**45.2**	--	--	--	--	--	--	--	--
TS2-5-SD003	0-0.5	8/29/2012	--	--	--	--	--	--	--	--	--	--	--	--	**44**	**45.4**	**28.5**	--	**7.39**	**26.4**	**66.9**	--
TS2-5-SD004	0-0.5	8/21/2012	--	--	21.3	--	1.82	**1.65**	1.23	1.3	1.59	**0.419**	1.19	0.697	--	--	--	--	--	--	--	--
TS2-5-SD004	3.5-4.5	8/21/2012	--	--	69.2	--	**3.63**	**3.68**	2.88	2.48	3.19	**0.547**	2.57	1.15	--	--	--	--	--	--	--	--
TS2-5-SD004	5.5-6.5	8/21/2012	--	--	*575*	--	**38.6**	**34.5**	**24**	25.6	32.2	**4.32**	**25.1**	5.17	--	--	--	--	--	--	--	--
TS2-5-SD004	6.5-7.5	8/21/2012	--	--	*467*	--	**30**	**26.5**	**19.3**	18	24.8	**3.4**	**19.5**	4.19	--	--	--	--	--	--	--	--
TS2-5-SD004	7.5-8.1	8/21/2012	--	--	*628*	--	**35**	**31.1**	**21.9**	24.2	29.6	**6.1**	**20.4**	8.16	--	--	--	--	--	--	--	--
TS2-5-SD004N	8-10	9/10/2012	--	--	1.35	--	0.107	0.0813	0.0527	0.0727	0.0787	< 0.0114	0.0679	< 0.0114	--	--	--	--	--	--	--	--
TS2-5-SD004N	10-12	9/10/2012	--	--	0.297	--	< 0.0114	< 0.0114	< 0.0114	< 0.0114	< 0.0114	< 0.0114	< 0.0114	< 0.0114	--	--	--	--	--	--	--	--
TS2-5-SD004N	12-14	9/10/2012	--	--	0.295	--	< 0.0114	< 0.0114	< 0.0114	< 0.0114	< 0.0114	< 0.0114	< 0.0114	< 0.0114	--	--	--	--	--	--	--	--
TS2-5-SD005	0-0.5	8/24/2012	--	--	9.2	--	0.605	**0.689**	0.582	0.469	0.638	0.0848	0.487	0.117	--	--	--	--	--	--	--	--
TS2-5-SD005	0.5-1.5	8/24/2012	--	--	8.81	--	0.58	**0.532**	0.456	0.359	0.592	0.085	0.384	0.122	--	--	--	--	--	--	--	--
TS2-5-SD005	1.5-2.5	8/24/2012	--	--	67.9	--	**5.08**	**4.28**	**3.16**	2.62	4.26	**0.563**	2.85	0.322	--	--	--	--	--	--	--	--
TS2-5-SD005	2.5-3.6	8/24/2012	--	--	0.359	--	< 0.0111	< 0.0111	< 0.0111	< 0.0111	< 0.0111	< 0.0111	< 0.0111	< 0.0111	--	--	--	--	--	--	--	--

Table 29. Sediment Analytical Results – Exceeding Human Health Soil Industrial SLs and Ecological Risk Site Specific SL

Wisconsin Public Service Corporation, Manitowoc
Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

			BTEX		PAH										Alk PAH							Inorganic
Sample Location	Sample Depth (ft)	Sample Date	Benzene (mg/kg)	Ethylbenzene (mg/kg)	Total PAH (13) (mg/kg)	1-Methylnaphthalene (mg/kg)	Benzo(a)anthracene (mg/kg)	Benzo(a)pyrene (mg/kg)	Benzo(b)fluoranthene (mg/kg)	Benzo(k)fluoranthene (mg/kg)	Chrysene (mg/kg)	Dibenz(a,h)anthracene (mg/kg)	Indeno(1,2,3-cd)pyrene (mg/kg)	Naphthalene (PAH) (mg/kg)	Benzo(a)anthracene (mg/kg)	Benzo(a)pyrene (mg/kg)	Benzo(b)fluoranthene (mg/kg)	Benzo(k)fluoranthene (mg/kg)	Dibenz(a,h)anthracene (mg/kg)	Indeno(1,2,3-cd)pyrene (mg/kg)	Naphthalene (PAH) (mg/kg)	Lead, Total (mg/kg)
		Eco-Risk Site-Specific	*NS*	*NS*	*103*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*
		Soil Industrial for WI / IBS	**5.1**	**25**	**NS**	**73**	**2.9**	**0.29**	**2.9**	**29**	**290**	**0.29**	**2.9**	**17**	**2.9**	**0.29**	**2.9**	**29**	**0.29**	**2.9**	**17**	**800**
TS2-5-SPT001	14-16	9/12/2012	--	--	2.32	--	0.139	0.117	0.0871	0.0919	0.113	0.0399	0.0843	0.173	--	--	--	--	--	--	--	--
TS2-5-SPT001	16-18	9/12/2012	--	--	0.804	--	0.053	0.059	0.0371	0.031	0.0475	0.0243	0.0366	0.0475	--	--	--	--	--	--	--	--
TS2-5-SPT001	18-20	9/12/2012	--	--	1.19	--	0.0781	0.0691	0.0469	0.0428	0.0626	0.0244	0.0484	0.135	--	--	--	--	--	--	--	--
TS2-6-SD001	0-0.5	8/20/2012	--	--	*2,270*	--	**114**	**108**	**80.6**	**81.5**	101	**15.5**	**60.6**	**275**	--	--	--	--	--	--	--	--
TS2-6-SD001	0.5-1.5	8/20/2012	--	--	*10,300*	--	**405**	**389**	**309**	**328**	**373**	**46.4**	**224**	**2,670**	--	--	--	--	--	--	--	--
TS2-6-SD001	1.5-2.5	8/20/2012	--	--	*2,760*	--	**105**	**96.4**	**73.1**	**72.3**	91.2	**13.7**	**49.5**	**674**	--	--	--	--	--	--	--	--
TS2-6-SD001	2.5-3.5	8/20/2012	--	--	*9,230*	--	**339**	**331**	**251**	**300**	**308**	**37**	**194**	**2,470**	--	--	--	--	--	--	--	--
TS2-6-SD001	3.5-4.8	8/20/2012	--	--	*6,870*	--	**277**	**249**	**216**	**219**	240	**23.1**	**102**	**1,820**	--	--	--	--	--	--	--	--
TS2-6-SD001	0-0.5	8/29/2012	--	--	--	--	--	--	--	--	--	--	--	--	**74.3**	**77.3**	**47.9**	--	**12.5**	**44.9**	**150**	--
TS2-6-SD001	0-2.5	9/10/2012	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TS2-6-SD001	2.5-4.8	9/10/2012	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TS2-6-SD001N	5-7	9/12/2012	--	--	*3,090*	--	**123**	**112**	**83.9**	**73**	101	**15**	**76**	**779**	--	--	--	--	--	--	--	--
TS2-6-SD001N	7-9	9/12/2012	--	--	35.9	--	1.85	**1.7**	1.18	1.07	1.42	0.233	1.23	6.08	--	--	--	--	--	--	--	--
TS2-6-SD001N	11-13	9/12/2012	--	--	1.65	--	0.111	0.0841	0.062	0.0634	0.0835	0.0238	0.0697	0.103	--	--	--	--	--	--	--	--
TS2-6-SD001N	13-15	9/12/2012	--	--	0.956	--	0.0669	0.048	0.038	0.0316	0.0373	0.018	0.0363	0.129	--	--	--	--	--	--	--	--
TS2-6-SD001N	15-17	9/12/2012	--	--	2.64	--	0.131	0.103	0.0778	0.0772	0.098	0.0229	0.0769	0.533	--	--	--	--	--	--	--	--
TS2-6-SD002	0-0.5	8/21/2012	--	--	38.6	--	**3.21**	**3.52**	**3.02**	2.98	2.78	**0.321**	1.44	0.896	--	--	--	--	--	--	--	--
TS2-6-SD002	0.5-1.5	8/21/2012	--	--	87.5	--	**5.65**	**5.72**	**5.15**	4.96	4.95	**0.408**	2.19	1.17	--	--	--	--	--	--	--	--
TS2-6-SD002	1.5-2.5	8/21/2012	--	--	63.7	--	**3.6**	**3.46**	**3.04**	3.18	3.17	0.28	1.29	0.982	--	--	--	--	--	--	--	--
TS2-6-SD002	2.5-2.9	8/21/2012	--	--	17.7	--	1.48	**1.53**	1.45	1.34	1.4	0.113	0.569	0.272	--	--	--	--	--	--	--	--
TS2-6-SD003	0-0.5	8/22/2012	--	--	25.2	--	2.02	**1.79**	1.46	1.32	1.74	**0.358**	1.38	0.944	--	--	--	--	--	--	--	--
TS2-6-SD003	0.5-1.5	8/22/2012	--	--	*144*	--	**8.56**	**7.6**	**6.44**	5.67	6.85	**1.38**	**5.34**	1.35	--	--	--	--	--	--	--	--
TS2-6-SD003	1.5-2.5	8/22/2012	--	--	63.5	--	**4.43**	**4.27**	**2.95**	2.83	3.84	**0.557**	**2.94**	1.71	--	--	--	--	--	--	--	--
TS2-6-SD003	2.5-3.5	8/22/2012	--	--	51	--	**3.42**	**3.23**	2.43	2.47	3.18	**0.637**	2.28	0.476	--	--	--	--	--	--	--	--
TS2-6-SD003	3.5-4.5	8/22/2012	--	--	*284*	--	**21.4**	**20.3**	**13.8**	14.6	19	**2.67**	**13.4**	2.22	--	--	--	--	--	--	--	--
TS2-6-SD003	4.5-5.8	8/22/2012	--	--	58.4	--	**4.13**	**3.86**	2.59	2.93	3.32	**0.478**	2.65	0.549	--	--	--	--	--	--	--	--
TS2-7A-SD001	0-0.5	8/30/2012	--	--	46	--	**3.71**	**3.83**	2.81	2.85	3.47	**0.643**	2.78	1.05	--	--	--	--	--	--	--	--
TS2-7A-SD001	0.5-1.5	8/30/2012	--	--	45	--	**3.91**	**4.04**	**3**	2.64	3.27	**0.603**	**2.99**	1.28	--	--	--	--	--	--	--	--
TS2-7A-SD001	1.5-2.5	8/30/2012	--	--	*146*	--	**13.6**	**13.4**	**9.32**	8.97	11.2	**1.75**	**8.64**	3.59	--	--	--	--	--	--	--	--
TS2-7A-SD001	2.5-3.5	8/30/2012	--	--	*196*	--	**16**	**15.3**	**10.9**	10.3	14.3	**2.61**	**11**	5.63	--	--	--	--	--	--	--	--
TS2-7A-SD001	3.5-4.5	8/30/2012	--	--	*134*	--	**10.5**	**9.91**	**7.18**	6.8	8.5	**1.28**	**6.81**	3.43	--	--	--	--	--	--	--	--
TS2-7A-SD001	4.5-5.1	8/30/2012	--	--	3.5	--	0.148	0.156	0.116	0.114	0.132	0.0565	0.121	0.0583	--	--	--	--	--	--	--	--
TS2-7A-SD002	0-0.5	8/31/2012	--	--	*226*	--	**19.1**	**19.5**	**14.9**	12.5	16.3	**2.43**	**13.8**	1.86	--	--	--	--	--	--	--	--
TS2-7A-SD002	0.5-1.5	8/31/2012	--	--	*410*	--	**31.8**	**30.4**	**21.7**	21.2	27.4	**4.36**	**21.1**	2.99	--	--	--	--	--	--	--	--
TS2-7A-SD002	1.5-1.9	8/31/2012	--	--	*638*	--	**41.9**	**37.1**	**26.5**	22.2	36.4	**4.75**	**24.4**	6.51	--	--	--	--	--	--	--	--
TS2-7A-SD002	0-1.9	9/10/2012	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Table 29. Sediment Analytical Results – Exceeding Human Health Soil Industrial SLs and Ecological Risk Site Specific SL

Wisconsin Public Service Corporation, Manitowoc
Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

			BTEX		PAH										Alk PAH							Inorganic
Sample Location	Sample Depth (ft)	Sample Date	Benzene (mg/kg)	Ethylbenzene (mg/kg)	Total PAH (13) (mg/kg)	1-Methylnaphthalene (mg/kg)	Benzo(a)anthracene (mg/kg)	Benzo(a)pyrene (mg/kg)	Benzo(b)fluoranthene (mg/kg)	Benzo(k)fluoranthene (mg/kg)	Chrysene (mg/kg)	Dibenz(a,h)anthracene (mg/kg)	Indeno(1,2,3-cd)pyrene (mg/kg)	Naphthalene (PAH) (mg/kg)	Benzo(a)anthracene (mg/kg)	Benzo(a)pyrene (mg/kg)	Benzo(b)fluoranthene (mg/kg)	Benzo(k)fluoranthene (mg/kg)	Dibenz(a,h)anthracene (mg/kg)	Indeno(1,2,3-cd)pyrene (mg/kg)	Naphthalene (PAH) (mg/kg)	Lead, Total (mg/kg)
Eco-Risk Site-Specific			*NS*	*NS*	*103*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*
Soil Industrial for WI / IBS			**5.1**	**25**	**NS**	**73**	**2.9**	**0.29**	**2.9**	**29**	**290**	**0.29**	**2.9**	**17**	**2.9**	**0.29**	**2.9**	**29**	**0.29**	**2.9**	**17**	**800**
TS2-7A-SD003	0-0.5	9/4/2012	--	--	76.5	--	**6.63**	**7**	**5.31**	4.75	5.33	**1.01**	**5.21**	1.66	--	--	--	--	--	--	--	--
TS2-7A-SD003	0.5-1.5	9/4/2012	--	--	*1,270*	--	**86.2**	**78.2**	**55.4**	**53.7**	74.5	**10.4**	**54.9**	**36**	--	--	--	--	--	--	--	--
TS2-7A-SD003	1.5-2.5	9/4/2012	--	--	*1,160*	--	**66.6**	**59.4**	**41.3**	**40.8**	56.3	**7.93**	**40.7**	**131**	--	--	--	--	--	--	--	--
TS2-7A-SD003	2.5-3.5	9/4/2012	--	--	*381*	--	**23.9**	**21.1**	**15.7**	13.6	20.7	**3.28**	**15.4**	**45.6**	--	--	--	--	--	--	--	--
TS2-7A-SD003	3.5-4.4	9/4/2012	--	--	22.6	--	1.26	**1.27**	0.897	0.854	1.09	0.2	0.916	4.86	--	--	--	--	--	--	--	--
TS2-7-SD001	0-0.5	8/20/2012	--	--	*847*	--	**52.3**	**52.6**	**40**	**37.6**	49.7	**6.4**	**34.1**	6.72	--	--	--	--	--	--	--	--
TS2-7-SD001	0-0.5	8/27/2012	--	--	46.4	--	**3.56**	**3.42**	2.48	2.39	4.02	**0.311**	2.33	0.668	--	--	--	--	--	--	--	--
TS2-7-SD001	0-0.5	8/29/2012	--	--	--	--	--	--	--	--	--	--	--	--	1.57	**1.82**	1.16	--	**0.312**	1.12	0.331	--
TS2-7-SD001	0.5-1.5	8/20/2012	--	--	*367*	--	**21**	**20.1**	**14.8**	14	18.6	**3.44**	**13.1**	3.66	--	--	--	--	--	--	--	--
TS2-7-SD001	1.5-1.9	8/20/2012	--	--	*380*	--	**25.6**	**25.6**	**18.3**	16.2	23.4	**4.55**	**17**	3.99	--	--	--	--	--	--	--	--
TS2-7-SD002	0-0.5	8/20/2012	--	--	*425*	--	**33.5**	**34.7**	**27.5**	22.7	29.8	**5.73**	**22.7**	4.99	--	--	--	--	--	--	--	--
TS2-7-SD002	0-0.5	8/27/2012	--	--	*690*	--	**51.8**	**50.7**	**39**	**33.3**	44.8	**6.46**	**33.8**	**17.6**	--	--	--	--	--	--	--	--
TS2-7-SD002	0-0.5	8/29/2012	--	--	--	--	--	--	--	--	--	--	--	--	**38.5**	**43.3**	**27.6**	--	**7.3**	**25.7**	7.31	--
TS2-7-SD002	0.5-1.5	8/20/2012	--	--	*1,400*	--	**85.9**	**76.5**	**53.9**	**49.2**	78.2	**13**	**43.8**	12.1	--	--	--	--	--	--	--	--
TS2-7-SD002	1.5-2	8/20/2012	--	--	*367*	--	**18.6**	**17**	**13.6**	11.5	16.6	**2.84**	**10.4**	7.45	--	--	--	--	--	--	--	--
TS2-7-SD003	0-0.5	8/20/2012	--	--	*535*	--	**41.4**	**39.8**	**31.7**	27.9	37.4	**6.28**	**24.4**	4.28	--	--	--	--	--	--	--	--
TS2-7-SD003	0.5-1.5	8/20/2012	--	--	*189*	--	**13.3**	**13.6**	**10.5**	9.16	11.7	**2.03**	**8.04**	3.72	--	--	--	--	--	--	--	--
TS2-7-SD003	1.5-2.5	8/20/2012	--	--	*313*	--	**27.3**	**27.7**	**21**	19.6	24.8	**4.1**	**15.8**	4.31	--	--	--	--	--	--	--	--
TS2-7-SD003	2.5-3.6	8/20/2012	--	--	27.2	--	1.96	**1.91**	1.53	1.44	1.83	**0.317**	1.12	0.619	--	--	--	--	--	--	--	--
TS2-7-SD004	0-0.5	8/22/2012	--	--	84.2	--	**6.66**	**6.31**	**4.66**	4.27	6.04	**0.778**	**4.29**	0.698	--	--	--	--	--	--	--	--
TS2-7-SD004	0.5-1.8	8/22/2012	--	--	*542*	--	**34.3**	**31.9**	**22**	22.4	30.4	**4.01**	**20.8**	6.36	--	--	--	--	--	--	--	--
TS2-7-SD004N	2-4	9/6/2012	--	--	*375*	--	**26.1**	**24.3**	**16.5**	18	22.6	**3.13**	**17.5**	3.53	--	--	--	--	--	--	--	--
TS2-7-SD004N	4-6	9/6/2012	--	--	*202*	--	**14.1**	**13.2**	**9.31**	9.39	12.1	**1.85**	**9.42**	1.71	--	--	--	--	--	--	--	--
TS2-7-SD004N	6-8	9/6/2012	--	--	8.6	--	0.625	**0.623**	0.484	0.429	0.548	0.103	0.479	0.0696	--	--	--	--	--	--	--	--
TS2-7-SD004N	8-10	9/6/2012	--	--	2.83	--	0.227	0.235	0.171	0.167	0.2	0.0547	0.191	< 0.0123	--	--	--	--	--	--	--	--
TS2-7-SD005	0-0.5	8/22/2012	--	--	73.4	--	**5.82**	**5.55**	**4.5**	4.42	5.1	**1.21**	**3.93**	1.11	--	--	--	--	--	--	--	--
TS2-7-SD005	0.5-1.5	8/22/2012	--	--	113	--	**9.85**	**9.72**	**7.1**	7.14	8.22	**1.71**	**6.63**	1.12	--	--	--	--	--	--	--	--
TS2-7-SD005	1.5-2.5	8/22/2012	--	--	*512*	--	**38.4**	**34.5**	**25.7**	24.6	33.7	**5.97**	**23.7**	5.3	--	--	--	--	--	--	--	--
TS2-7-SD005	2.7-3	8/22/2012	--	--	26.8	--	0.986	**0.907**	0.688	0.684	0.922	0.137	0.565	0.135	--	--	--	--	--	--	--	--
TS2-8A-SD001	0-0.5	8/27/2012	--	--	43.9	--	**4.14**	**4.48**	**3.47**	3.03	3.52	**0.785**	**3.09**	0.826	--	--	--	--	--	--	--	--
TS2-8A-SD001	0.5-1.5	8/27/2012	--	--	70.2	--	**6.58**	**6.84**	**5.1**	4.97	5.63	**0.91**	**4.54**	0.708	--	--	--	--	--	--	--	--
TS2-8A-SD001	1.5-2.5	8/27/2012	--	--	45.4	--	**3.33**	**3.01**	2.3	2.02	2.85	**0.378**	1.84	0.454	--	--	--	--	--	--	--	--
TS2-8A-SD001	2.5-3.5	8/27/2012	--	--	9.97	--	0.9	**0.902**	0.691	0.67	0.789	0.118	0.578	0.0591	--	--	--	--	--	--	--	--
TS2-8A-SD001	3.5-4.5	8/27/2012	--	--	0.479	--	0.0277	0.0323	0.0218	0.0442	0.0284	0.0251	0.0152	< 0.0121	--	--	--	--	--	--	--	--
TS2-8A-SD001	4.5-5.1	8/27/2012	--	--	0.303	--	< 0.0116	< 0.0116	< 0.0116	< 0.0116	< 0.0116	< 0.0116	< 0.0116	< 0.0116	--	--	--	--	--	--	--	--
TS2-8A-SD002	0-0.5	8/30/2012	--	--	34.5	--	2.84	**2.99**	2.36	1.94	2.55	**0.443**	2.09	0.489	--	--	--	--	--	--	--	--
TS2-8A-SD002	0.5-1.6	8/30/2012	--	--	*170*	--	**15.1**	**15.2**	**10.8**	8.61	13.9	**2.15**	**10.3**	1.84	--	--	--	--	--	--	--	--

Table 29. Sediment Analytical Results – Exceeding Human Health Soil Industrial SLs and Ecological Risk Site Specific SL

Wisconsin Public Service Corporation, Manitowoc
Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

			BTEX		PAH										Alk PAH							Inorganic
Sample Location	Sample Depth (ft)	Sample Date	Benzene (mg/kg)	Ethylbenzene (mg/kg)	Total PAH (13) (mg/kg)	1-Methylnaphthalene (mg/kg)	Benzo(a)anthracene (mg/kg)	Benzo(a)pyrene (mg/kg)	Benzo(b)fluoranthene (mg/kg)	Benzo(k)fluoranthene (mg/kg)	Chrysene (mg/kg)	Dibenz(a,h)anthracene (mg/kg)	Indeno(1,2,3-cd)pyrene (mg/kg)	Naphthalene (PAH) (mg/kg)	Benzo(a)anthracene (mg/kg)	Benzo(a)pyrene (mg/kg)	Benzo(b)fluoranthene (mg/kg)	Benzo(k)fluoranthene (mg/kg)	Dibenz(a,h)anthracene (mg/kg)	Indeno(1,2,3-cd)pyrene (mg/kg)	Naphthalene (PAH) (mg/kg)	Lead, Total (mg/kg)
Eco-Risk Site-Specific			*NS*	*NS*	*103*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*
Soil Industrial for WI / IBS			**5.1**	**25**	**NS**	**73**	**2.9**	**0.29**	**2.9**	**29**	**290**	**0.29**	**2.9**	**17**	**2.9**	**0.29**	**2.9**	**29**	**0.29**	**2.9**	**17**	**800**
TS2-8A-SD002N	1-3	9/5/2012	--	--	*174*	--	**14**	**13.7**	**10.4**	8.77	11.7	**1.95**	**9.83**	1.8	--	--	--	--	--	--	--	--
TS2-8A-SD002N	3-5	9/5/2012	--	--	0.424	--	0.0367	0.0309	0.019	0.0172	0.0247	0.0225	0.0274	0.0496	--	--	--	--	--	--	--	--
TS2-8A-SD002N	3-9	9/10/2012	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TS2-8A-SD002N	5-7	9/5/2012	--	--	0.432	--	0.042	0.0379	0.0247	0.0241	0.0303	0.0264	0.0327	< 0.0127	--	--	--	--	--	--	--	--
TS2-8A-SD002N	7-9	9/5/2012	--	--	0.329	--	< 0.0127	< 0.0127	< 0.0127	< 0.0127	< 0.0127	< 0.0127	< 0.0127	< 0.0127	--	--	--	--	--	--	--	--
TS2-8-SD002	0-0.5	8/22/2012	--	--	*146*	--	**11.2**	**10.6**	**7.89**	8.49	10	**2.11**	**7.64**	2.02	--	--	--	--	--	--	--	--
TS2-8-SD002	0-0.5	8/27/2012	--	--	*146*	--	**11.1**	**10.2**	**7.93**	6.87	9.9	**1.3**	**7.52**	1.36	--	--	--	--	--	--	--	--
TS2-8-SD002	0-0.5	8/29/2012	--	--	--	--	--	--	--	--	--	--	--	--	**9.68**	**10.9**	**6.95**	--	**1.82**	**6.39**	3.33	--
TS2-8-SD002	0-2.5	9/10/2012	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TS2-8-SD002	0.5-1.5	8/22/2012	--	--	*481*	--	**34**	**29.2**	**23**	24.6	31.5	**4.79**	**19.3**	9.8	--	--	--	--	--	--	--	--
TS2-8-SD002	1.5-2.5	8/22/2012	--	--	*293*	--	**21**	**18.5**	**14.9**	13.9	18.5	**3.57**	**12.7**	2.65	--	--	--	--	--	--	--	--
TS2-8-SD002	2.5-3.5	8/22/2012	--	--	70.6	--	**4.98**	**4.51**	**3.8**	3.64	4.75	**1.01**	**2.99**	0.763	--	--	--	--	--	--	--	--
TS2-8-SD002	2.5-4	9/10/2012	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TS2-8-SD002	3.5-4	8/22/2012	--	--	38	--	2.52	**2.46**	2.18	2.11	2.7	**0.78**	1.74	1.12	--	--	--	--	--	--	--	--
TS2-8-SD002N	2-4	9/10/2012	--	--	9.33	--	0.713	**0.68**	0.572	0.47	0.635	0.0935	0.537	0.221	--	--	--	--	--	--	--	--
TS2-8-SD002N	4-6	9/10/2012	--	--	2.46	--	0.177	0.134	0.111	0.12	0.154	0.0286	0.108	0.128	--	--	--	--	--	--	--	--
TS2-8-SD002N	6-8	9/10/2012	--	--	2.24	--	0.13	0.088	0.0721	0.0755	0.0889	0.0252	0.0759	0.253	--	--	--	--	--	--	--	--
TS2-8-SD002N	8-10	9/10/2012	--	--	0.769	--	0.0431	0.0408	0.0326	0.0334	0.0405	< 0.011	0.033	0.0959	--	--	--	--	--	--	--	--
TS2-8-SD003	0-0.5	8/22/2012	--	--	*152*	--	**13**	**13**	**10.7**	10.5	11	**2.51**	**9.08**	2.22	--	--	--	--	--	--	--	--
TS2-8-SD003	0.5-1.5	8/22/2012	--	--	*549*	--	**38.2**	**35.8**	**25.8**	27.1	33.9	**6.6**	**24.6**	12.8	--	--	--	--	--	--	--	--
TS2-8-SD003	1.5-2.5	8/22/2012	--	--	*532*	--	**33**	**31.6**	**22.4**	24.6	29.5	**6.15**	**21.4**	**47.6**	--	--	--	--	--	--	--	--
TS2-8-SD003	2.5-3.5	8/22/2012	--	--	*565*	--	**37.6**	**34**	**25.7**	23.5	33.3	**7.01**	**24.3**	**42.6**	--	--	--	--	--	--	--	--
TS2-8-SD003	3.5-4.1	8/22/2012	--	--	*439*	--	**27.8**	**24.7**	**17.2**	18.9	25	**4.68**	**17.2**	**32.6**	--	--	--	--	--	--	--	--
TS2-8-SD004	0-0.5	8/23/2012	--	--	32.7	--	2.83	**2.73**	2.3	1.83	2.37	**0.419**	2	0.354	--	--	--	--	--	--	--	--
TS2-8-SD004	0.5-1.5	8/23/2012	--	--	41.8	--	**3.72**	**3.71**	2.79	2.75	3.24	**0.603**	2.57	0.49	--	--	--	--	--	--	--	--
TS2-8-SD004	1.5-2.5	8/23/2012	--	--	53.2	--	**4.71**	**4.46**	**3.12**	3.04	4.25	**0.714**	2.87	0.524	--	--	--	--	--	--	--	--
TS2-8-SD004	2.5-3.5	8/23/2012	--	--	*203*	--	**16.5**	**16.7**	**12**	11.7	14.5	**2.13**	**10.7**	1.96	--	--	--	--	--	--	--	--
TS2-8-SD004	3.5-4.7	8/23/2012	--	--	*249*	--	**19.4**	**18.9**	**13**	13.7	16.9	**3.19**	**12.1**	3.58	--	--	--	--	--	--	--	--
TS2-8-SD005	0-0.5	8/30/2012	--	--	44.3	--	**3.51**	**3.56**	2.8	2.3	3.21	**0.479**	2.46	0.549	--	--	--	--	--	--	--	--
TS2-8-SD005	0.5-1.5	8/30/2012	--	--	50.3	--	**4.31**	**4.57**	**3.6**	2.88	4	**0.672**	**3.2**	0.66	--	--	--	--	--	--	--	--
TS2-8-SD005	1.5-2.5	8/30/2012	--	--	*141*	--	**11.7**	**11.1**	**8.42**	7.21	10.8	**1.72**	**7.62**	1.67	--	--	--	--	--	--	--	--
TS2-8-SD005	2.5-3.1	8/30/2012	--	--	*138*	--	**10.9**	**10.3**	**7.03**	6.4	10	**1.46**	**6.96**	1.79	--	--	--	--	--	--	--	--
TS2-9-SD001	0-0.5	8/22/2012	--	--	4.96	--	0.426	**0.471**	0.313	0.348	0.41	**0.317**	0.267	0.389	--	--	--	--	--	--	--	--

Table 29. Sediment Analytical Results – Exceeding Human Health Soil Industrial SLs and Ecological Risk Site Specific SL

Wisconsin Public Service Corporation, Manitowoc
Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

			BTEX		PAH										Alk PAH							Inorganic
Sample Location	Sample Depth (ft)	Sample Date	Benzene (mg/kg)	Ethylbenzene (mg/kg)	Total PAH (13) (mg/kg)	1-Methylnaphthalene (mg/kg)	Benzo(a)anthracene (mg/kg)	Benzo(a)pyrene (mg/kg)	Benzo(b)fluoranthene (mg/kg)	Benzo(k)fluoranthene (mg/kg)	Chrysene (mg/kg)	Dibenz(a,h)anthracene (mg/kg)	Indeno(1,2,3-cd)pyrene (mg/kg)	Naphthalene (PAH) (mg/kg)	Benzo(a)anthracene (mg/kg)	Benzo(a)pyrene (mg/kg)	Benzo(b)fluoranthene (mg/kg)	Benzo(k)fluoranthene (mg/kg)	Dibenz(a,h)anthracene (mg/kg)	Indeno(1,2,3-cd)pyrene (mg/kg)	Naphthalene (PAH) (mg/kg)	Lead, Total (mg/kg)
		Eco-Risk Site-Specific	*NS*	*NS*	*103*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*
		Soil Industrial for WI / IBS	**5.1**	**25**	**NS**	**73**	**2.9**	**0.29**	**2.9**	**29**	**290**	**0.29**	**2.9**	**17**	**2.9**	**0.29**	**2.9**	**29**	**0.29**	**2.9**	**17**	**800**
TS2-9-SD002	0-0.5	8/23/2012	--	--	14	--	1.21	**1.24**	1.08	0.827	1.12	0.193	0.839	0.338	--	--	--	--	--	--	--	--
TS2-9-SD002	0.5-1.5	8/23/2012	--	--	94.1	--	**7.47**	**7.51**	**5.24**	5.37	6.54	**1.01**	**5.08**	1.2	--	--	--	--	--	--	--	--
TS2-9-SD002	1.5-2.5	8/23/2012	--	--	*183*	--	**14.3**	**14.8**	**10.2**	10.3	12.7	**1.85**	**9.98**	2.06	--	--	--	--	--	--	--	--
TS2-9-SD002	2.5-3.5	8/23/2012	--	--	33.7	--	2.71	**2.77**	2.01	1.91	2.27	**0.483**	1.83	0.689	--	--	--	--	--	--	--	--
TS2-9-SD002	3.5-4.5	8/23/2012	--	--	3.27	--	0.241	0.261	0.195	0.177	0.262	0.0416	0.182	0.0294	--	--	--	--	--	--	--	--
TS2-9-SD002	4.5-5.9	8/23/2012	--	--	0.821	--	0.0465	0.0464	0.0346	0.0357	0.0447	0.0149	0.0338	< 0.0119	--	--	--	--	--	--	--	--
TS2-9-SD003	0-0.5	8/23/2012	--	--	*205*	--	**15.1**	**14.9**	**10.7**	10.7	13.7	**1.37**	**9.55**	2.95	--	--	--	--	--	--	--	--
TS2-9-SD003	0-1.5	8/27/2012	--	--	*367*	--	**36.8**	**37.6**	**24.7**	27.6	33.8	**5.01**	**25.1**	3.03	--	--	--	--	--	--	--	--
TS2-9-SD003	0-1.5	8/29/2012	--	--	--	--	--	--	--	--	--	--	--	--	**11.7**	**12.4**	**7.94**	--	**2.02**	**7.19**	3.69	--
TS2-9-SD003	0.5-1.5	8/23/2012	--	--	*171*	--	**13.9**	**14.3**	**9.89**	9.05	12.9	**1.78**	**9.01**	1.94	--	--	--	--	--	--	--	--
TS2-9-SD003	1.5-2.5	8/23/2012	--	--	*258*	--	**19.6**	**20.1**	**14.2**	13.1	18.1	**2.38**	**12.7**	3.3	--	--	--	--	--	--	--	--
TS2-9-SD003	1.5-3.5	8/27/2012	--	--	*327*	--	**30**	**28.6**	**20.9**	20.9	28.1	**4.25**	**19.1**	4.49	--	--	--	--	--	--	--	--
TS2-9-SD003	2.5-3.5	8/23/2012	--	--	*295*	--	**21.8**	**21.9**	**16**	14.1	19.4	**2.64**	**14.3**	3.38	--	--	--	--	--	--	--	--
TS2-9-SD003	3.5-4.5	8/23/2012	--	--	*295*	--	**22.3**	**22.5**	**15.9**	15.8	20.4	**2.76**	**14.4**	2.88	--	--	--	--	--	--	--	--
TS2-9-SD003	4.5-5.5	8/23/2012	--	--	*186*	--	**13.1**	**12.8**	**8.86**	9.24	12	**1.59**	**8.26**	1.92	--	--	--	--	--	--	--	--
TS2-9-SD003	6-6.4	8/23/2012	--	--	20.6	--	1.29	**1.24**	0.883	0.882	1.18	0.143	0.764	0.168	--	--	--	--	--	--	--	--
Composite1	-	8/27/2012	--	--	124	--	**9.26**	**8.91**	**6.35**	6.62	7.93	**1.31**	**6.13**	1.47	--	--	--	--	--	--	--	--
Composite2	-	8/27/2012	--	--	*281*	--	**22**	**21.2**	**15.5**	14.9	19.7	**2.89**	**14**	5.1	--	--	--	--	--	--	--	--
Composite3	-	8/29/2012	--	--	--	--	--	--	--	--	--	--	--	--	**23.7**	**26.2**	**16.8**	--	**4.3**	**15.4**	4.63	--
Composite4	-	8/29/2012	--	--	--	--	--	--	--	--	--	--	--	--	**8.32**	**8.62**	**5.63**	--	**1.42**	**5.04**	3.01	--
		Total Number of Samples Analyzed:	46	46	361	46	407	407	407	407	407	407	407	407	33	33	33	23	33	33	33	23
		Number of Detections:	22	28	361	46	394	396	393	393	392	376	393	370	33	33	33	23	33	33	33	23
		Min:	0.0611	0.0777	0.273	0.0078	0.0265	0.0252	0.019	0.0172	0.016	0.0149	0.0152	0.0117	0.22	0.255	0.237	0.219	0.044	0.17	0.331	13.2
		Max:	211	103	17,300	233	714	638	458	487	653	101	420	4,810	151	148	110	108	22.4	82.4	830	25,900
		Eco-Risk Site-Specific SL	NS	NS	103	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
		Number of Samples that Exceed Site-Specific SL:	*0*	*0*	*133*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
		Wisconsin Soil Industrial SL:	5.1	25	NS	73	2.9	0.29	2.9	29	290	0.29	2.9	17	2.9	0.29	2.9	29	0.29	2.9	17	800
		Number of Samples that Exceed Industrial SL:	**5**	**2**	**0**	**6**	**233**	**354**	**212**	**41**	**4**	**270**	**198**	**59**	**28**	**32**	**28**	**7**	**28**	**28**	**15**	**1**

[O:ECK 10/17/14]

NOTES:
Italic *Value exceeds Site-specific SL*
BOLD **Value exceeds Industrial SL**
< Concentration is less than reported limit
-- Analysis not performed
NS No Standard
SL Screening Level
Industrial Soil SLs used on this table were presented in the Multi-Site Risk Assessment Framework Addendum Revision 3 (Exponent, July 2014).

Table 30. Sediment Porewater Results

Wisconsin Public Service Corporation, Manitowoc - Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

			PAH																
Sample Location	Depth (ft)	Sample Date	1-Methylnaphthalene (ug/l)	2-Methylnaphthalene (ug/l)	Acenaphthene (ug/l)	Acenaphthylene (ug/l)	Anthracene (ug/l)	Benzo(a)anthracene (ug/l)	Benzo(a)pyrene (ug/l)	Benzo(b)fluoranthene (ug/l)	Benzo(e)pyrene (ug/l)	Benzo(ghi)perylene (ug/l)	Benzo(k)fluoranthene (ug/l)	C1-Benzo(a)anthracene/Chrysenes (ug/l)	C1-Fluoranthenes/Pyrenes (ug/l)	C1-Fluorenes (ug/l)	C1-Phenanthrenes/Anthracenes (ug/l)	C2-Benzo(a)anthracenes/Chrysenes (ug/l)	C2-Fluorenes (ug/l)	C2-Naphthalenes (ug/l)
	Not detected above reported limit																			
082912263W TS2-6-SD001	0-0.5	08/29/12	370	563	479	37	36.7	0.898	0.0876	0.0954	0.0597	< 0.024	0.078	0.246	7.17	48.1	61.5	< 0.0138	29.4	201
082912264W TS2-5-SD003	0-0.5	08/29/12	320	442	463	30.5	24.8	0.428	0.0514	0.059	0.0422	< 0.024	0.0296	0.117	3.79	33.8	38.8	< 0.0138	17.4	97
082912265W TS2-7-SD001	0-0.5	08/29/12	7.15	12.2	52.5	3.98	8.68	0.197	< 0.024	< 0.024	< 0.024	< 0.024	< 0.024	0.061	1.9	10	15.3	< 0.0138	6.04	10.5
082912266W TS2-2-SD001	0-0.5	08/29/12	1.32	< 0.4	17.8	1.43	2.39	0.0649	< 0.024	< 0.024	< 0.024	< 0.024	< 0.024	< 0.00645	0.458	2.91	3.69	< 0.0138	< 0.203	3.99
082912267W TS2-3-SD003	0-0.5	08/29/12	4.32	4.54	7.96	0.723	1.57	0.0208	< 0.024	< 0.024	< 0.024	< 0.024	< 0.024	< 0.00645	< 0.0784	< 0.164	< 0.21	< 0.0138	< 0.203	2.48
082912268W TS2-9-SD003	0-1.5	08/29/12	23.2	< 0.4	70.8	6.96	12	0.356	< 0.024	0.053	< 0.0344	< 0.024	0.0381	< 0.00645	3.66	18	26.8	< 0.0138	13.7	36.5
082912269W Composite03	NA	08/29/12	17	6.32	64	5.21	7.71	0.155	< 0.024	< 0.024	< 0.024	< 0.024	< 0.024	< 0.00645	1.44	9.98	12.7	< 0.0138	7.52	17.3
082912270W TS2-8-SD002	0-0.5	08/29/12	2.13	< 0.4	75.1	8.36	15.2	1.84	0.422	0.448	0.387	0.173	0.53	1.27	11.4	17	37.8	< 0.0138	< 15	26.8
082912271W Composite04	NA	08/29/12	20	13	46.5	3.74	3.46	0.132	< 0.024	< 0.024	< 0.024	< 0.024	< 0.024	< 0.00645	1.27	7.14	5.63	< 0.0138	5.9	8.53
082912272W TS2-7-SD002	0-0.5	08/29/12	63	12	132	10.8	15.6	0.404	0.0444	0.0366	0.036	< 0.024	0.033	< 0.00645	3.36	18.7	25.7	< 0.0138	11.8	59
Total Number of Samples Analyzed:			10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Number of Samples with Detections above MDL:			10	7	10	10	10	10	4	5	4	1	5	4	9	9	9	0	7	10
Min:			1.32	4.54	7.96	0.723	1.57	0.0208	0.0444	0.0366	0.036	0.173	0.0296	0.061	0.458	2.91	3.69	0	5.9	2.48
Max:			370	563	479	37	36.7	1.84	0.422	0.448	0.387	0.173	0.53	1.27	11.4	48.1	61.5	0	29.4	201

Notes:
< : Parameter not detected above the Limit of Detection indicated.
NA = Not applicable

NATURAL RESOURCE TECHNOLOGY

Table 30. Sediment Porewater Results

Wisconsin Public Service Corporation, Manitowoc - Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

			PAH															
Sample Location	Depth (ft)	Sample Date	C2-Phenanthrenes/Anthracenes (ug/l)	C3-Benzo(a)anthracenes/Chrysenes (ug/l)	C3-Fluorenes (ug/l)	C3-Naphthalenes (ug/l)	C3-Phenanthrenes/Anthracenes (ug/l)	C4-Benzo(a)anthracenes/Chrysenes (ug/l)	C4-Naphthalenes (ug/l)	C4-Phenanthrenes/Anthracenes (ug/l)	Chrysene (ug/l)	Dibenz(a,h)anthracene (ug/l)	Fluoranthene (ug/l)	Fluorene (ug/l)	Indeno(1,2,3-cd)pyrene (ug/l)	Naphthalene (PAH) (ug/l)	Perylene (ug/l)	Phenanthrene (ug/l)	Pyrene (ug/l)
	Not detected above reported limit																		
082912263W TS2-6-SD001	0-0.5	08/29/12	24.4	< 0.0174	< 0.343	104	6.32	< 0.0235	25.4	< 1	0.735	< 0.024	29.6	133	< 0.024	2420	0.0291	218	20.8
082912264W TS2-5-SD003	0-0.5	08/29/12	16.2	< 0.0174	< 0.343	51.8	3.84	< 0.0235	11.4	< 1	0.372	< 0.024	16.4	110	< 0.024	1600	< 0.024	141	10.2
082912265W TS2-7-SD001	0-0.5	08/29/12	7.54	< 0.0174	< 0.343	10.8	2.1	< 0.0235	3.4	< 1	0.182	< 0.024	7.18	18.2	< 0.024	44.4	< 0.024	36.8	4.83
082912266W TS2-2-SD001	0-0.5	08/29/12	3.52	< 0.0174	< 0.343	4.3	< 0.414	< 0.0235	1.38	< 1	0.0646	< 0.024	1.59	5.38	< 0.024	1.23	< 0.024	6.74	1.05
082912267W TS2-3-SD003	0-0.5	08/29/12	< 0.375	< 0.0174	< 0.343	2.09	< 0.414	< 0.0235	< 1.13	< 1	0.0219	< 0.024	0.581	2.84	< 0.024	10.6	< 0.024	4.2	0.368
082912268W TS2-9-SD003	0-1.5	08/29/12	17.8	< 0.0174	< 0.343	32.6	5.48	< 0.0235	12	< 1	0.382	< 0.024	8.74	24.6	< 0.024	10.6	< 0.024	43.6	6.66
082912269W Composite03	NA	08/29/12	7.9	< 0.0174	< 0.343	13.2	2	< 0.0235	3.76	< 1	0.152	< 0.024	4.92	25	< 0.024	18.9	< 0.024	33.6	3.57
082912270W TS2-8-SD002	0-0.5	08/29/12	33.8	< 0.0174	< 0.343	35.5	15.7	< 0.0235	18.5	< 1	1.45	0.055	19.8	25.4	0.12	2.89	0.175	60.6	16.9
082912271W Composite04	NA	08/29/12	5.94	< 0.0174	< 0.343	8.32	1.77	< 0.0235	3.04	< 1	0.132	< 0.024	4.56	12.8	< 0.024	29.4	< 0.024	13.6	3.44
082912272W TS2-7-SD002	0-0.5	08/29/12	13.2	< 0.0174	< 0.343	46.4	3.16	< 0.0235	12.7	< 1	0.418	< 0.024	12.2	45.1	< 0.024	18.8	< 0.024	73	9
Total Number of Samples Analyzed:			10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Number of Samples with Detections above MDL:			9	0	0	10	8	0	9	0	10	1	10	10	1	10	2	10	10
Min:			3.52	0	0	2.09	1.77	0	1.38	0	0.0219	0.055	0.581	2.84	0.12	1.23	0.0291	4.2	0.368
Max:			33.8	0	0	104	15.7	0	25.4	0	1.45	0.055	29.6	133	0.12	2420	0.175	218	20.8

[O: NDK 5/2014 Rev: AJS & C:ECK 8/2014]

Notes:
< : Parameter not detected above the Limit of Detection indicated.
NA = Not applicable

Natural Resource Technology

Table 31. Surface Water Results

Wisconsin Public Service Corporation, Manitowoc - Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc, Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

			VOC									PAH												
Sample ID	Sample Location	Date	Benzene (µg/l)	Ethylbenzene (µg/l)	Methyl-tert-butyl-ether (µg/l)	Toluene (µg/l)	1,2,4-Trimethylbenzene (µg/l)	1,3,5-Trimethylbenzene (µg/l)	Xylene, o (µg/l)	Xylenes, m + p (µg/l)	Xylenes, Total (µg/l)	1-Methylnaphthalene (µg/l)	2-Methylnaphthalene (µg/l)	Acenaphthene (µg/l)	Acenaphthylene (µg/l)	Anthracene (µg/l)	Benzo(a)anthracene (µg/l)	Benzo(a)pyrene (µg/l)	Benzo(b)fluoranthene (µg/l)	Benzo(ghi)perylene (µg/l)	Benzo(k)fluoranthene (µg/l)	Chrysene (µg/l)	Dibenz(a,h)anthracene (µg/l)	Fluoranthene (µg/l)	Fluorene (µg/l)
	Not detected above reported limit																							
81106001	TSW01A	11/06/08	< 0.23	< 0.40	< 0.36	< 0.36	< 0.39	< 0.40	< 0.74	< 0.36	< 0.74	0.068	0.096	< 0.0079	< 0.005	< 0.0066	0.0047	< 0.0055	< 0.0052	< 0.0063	< 0.0078 ,	< 0.0071	< 0.0043	0.016	< 0.0063
81106002	TSW01B	11/06/08	< 0.23	< 0.40	< 0.36	< 0.36	< 0.39	< 0.40	< 0.74	< 0.36	< 0.74	< 0.0095	< 0.011	0.012	< 0.005	0.0071	0.0056	< 0.0054	0.0053	< 0.0062	< 0.0078	< 0.0070	< 0.0043	0.023	0.0067
81106003	TSW01C	11/06/08	< 0.23	< 0.40	< 0.36	< 0.36	< 0.39	< 0.40	< 0.74	< 0.36	< 0.74	< 0.0095	< 0.011	0.01	0.0056	0.012	0.018	0.015	0.013	0.0095	0.014	0.016	< 0.0043	0.049	< 0.0063
81106004	TSW02A	11/06/08	< 0.23	< 0.40	< 0.36	< 0.36	< 0.39	< 0.40	< 0.74	< 0.36	< 0.74	< 0.0095	< 0.011	0.01	< 0.005	< 0.0065	0.004	< 0.0054	< 0.0051	< 0.0062	< 0.0078	< 0.0070	< 0.0043	0.022	< 0.0063
81106006	TSW02B	11/06/08	< 0.23	< 0.40	< 0.36	< 0.36	< 0.39	< 0.40	< 0.74	< 0.36	< 0.74	< 0.0095	< 0.011	0.02	< 0.005	< 0.0065	< 0.0035	< 0.0054	< 0.0051	< 0.0062	< 0.0078	< 0.0070	< 0.0043	0.021	0.0069
81106007	TSW02C	11/06/08	< 0.23	< 0.40	< 0.36	< 0.36	< 0.39	< 0.40	< 0.74	< 0.36	< 0.74	< 0.0095	0.011	0.032	0.0052	< 0.0065	< 0.0035	< 0.0054	< 0.0051	< 0.0062	< 0.0078	< 0.0070	< 0.0043	0.020	0.012
81106008	TSW03A	11/06/08	< 0.23	< 0.40	< 0.36	< 0.36	< 0.39	< 0.40	< 0.74	< 0.36	< 0.74	< 0.0095	< 0.011	0.009	< 0.005	< 0.0065	0.0052	< 0.0054	< 0.0051	< 0.0062	< 0.0078	< 0.0070	< 0.0043	0.022	< 0.0063
81106009	TSW03B	11/06/08	< 0.23	< 0.40	< 0.36	< 0.36	< 0.39	< 0.40	< 0.74	< 0.36	< 0.74	< 0.0095	< 0.011	0.021	< 0.005	< 0.0065	0.0044	< 0.0054	< 0.0051	< 0.0062	< 0.0078	< 0.0070	< 0.0043	0.028	0.0075
81106010	TSW03C	11/06/08	< 0.23	< 0.40	< 0.36	< 0.36	< 0.39	< 0.40	< 0.74	< 0.36	< 0.74	< 0.0095	< 0.011	0.01	< 0.005	< 0.0065	0.0043	< 0.0054	< 0.0051	< 0.0062	< 0.0078	< 0.0070	< 0.0043	0.021	< 0.0063
Total Number of Samples Analyzed:			9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
Number of Samples with Detections above Reported Limit:			0	0	0	0	0	0	0	0	0	1	2	8	2	2	7	1	2	1	1	1	0	9	4
Min:			0	0	0	0	0	0	0	0	0	0.068	0.011	0.009	0.0052	0.0071	0.004	0.015	0.0053	0.0095	0.014	0.016	0	0.016	0.0067
Max:			0	0	0	0	0	0	0	0	0	0.068	0.096	0.032	0.0056	0.012	0.018	0.015	0.013	0.0095	0.014	0.016	0	0.049	0.012

Notes:
< Concentration is less than reported limit

Table 31. Surface Water Results

Wisconsin Public Service Corporation, Manitowoc - Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc, Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

			PAH				Phenol				Metals															Inorganic
Sample ID	Sample Location	Date	Indeno(1,2,3-cd)pyrene (µg/l)	Naphthalene (PAH) (µg/l)	Phenanthrene (µg/l)	Pyrene (µg/l)	2,4-Dimethylphenol (µg/l)	2-Methylphenol (µg/l)	3 & 4-Methylphenol (µg/l)	Phenol (µg/l)	Aluminum, Total (µg/l)	Antimony, Total (µg/l)	Arsenic, Total (µg/l)	Barium, Total (µg/l)	Cadmium, Total (µg/l)	Chromium, Total (µg/l)	Copper, Total (µg/l)	Iron, Total (µg/l)	Lead, Total (µg/l)	Manganese, Total (µg/l)	Mercury, Total (µg/l)	Nickel, Total (µg/l)	Selenium, Total (µg/l)	Silver, Total (µg/l)	Vanadium, Total (µg/l)	Zinc, Total (µg/l)	Cyanide, Available (mg/l)
	Not detected above reported limit																										
81106001	TSW01A	11/06/08	< 0.0036	0.29	< 0.0075	0.018 ,	< 1.1	< 0.92	< 0.72	< 0.98	676	< 1	1	31.3	< 0.087	1.5	1.8	677	0.85	76.7	< 0.1	1.6	0.37	< 0.25	2.0	6.4	< 0.002
81106002	TSW01B	11/06/08	< 0.0036	0.023	0.014	0.018	< 1.1	< 0.92	< 0.72	< 0.98	346	< 1	0.87	29.7	< 0.087	0.59	1.4	389	0.53	65.2	< 0.1	1.3	0.28	< 0.25	1.4	< 5	< 0.002
81106003	TSW01C	11/06/08	0.0081	< 0.016	0.03	0.046	< 1.1	< 0.92	< 0.72	< 0.98	303	< 1	0.85	28.4	< 0.087	0.96	1.4	315	< 0.5	46.5	< 0.1	1.3	0.33	< 0.25	1.2	< 5	< 0.002
81106004	TSW02A	11/06/08	< 0.0036	< 0.016	0.0075	0.018	< 1.1	< 0.92	< 0.72	< 0.98	322	< 1	0.88	30.8	< 0.087	0.63	1.5	402	0.72	71.4	< 0.1	1.8	< 0.25	< 0.25	1.3	< 5	< 0.002
81106006	TSW02B	11/06/08	< 0.0036	0.032	0.011	0.015	< 1.1	< 0.92	< 0.72	< 0.98	436	< 1	0.8	30.4	< 0.087	0.73	1.5	448	0.56	69.9	< 0.1	1.2	< 0.25	< 0.25	1.5	< 5	< 0.002
81106007	TSW02C	11/06/08	< 0.0036	0.069	0.012	0.014	< 1.1	< 0.92	< 0.72	< 0.98	444	< 0.071	0.8	31.1	< 0.087	0.74	1.6	462	0.66	79.3	< 0.1	1.4	< 0.25	< 0.25	1.7	5.0	< 0.002
81106008	TSW03A	11/06/08	< 0.0036	< 0.016	< 0.0075	0.02	< 1.1	< 0.92	< 0.72	< 0.98	485	< 1	0.77	28.8	< 0.087	0.81	1.4	495	0.5	66.9	< 0.1	1.2	0.28	< 0.25	1.6	< 5	< 0.002
81106009	TSW03B	11/06/08	< 0.0036	0.025	0.011	0.021	< 1.1	< 0.92	< 0.72	< 0.98	498	< 1	0.86	30.6	< 0.087	0.79	1.5	539	0.62	84.1	< 0.1	1.4	< 0.25	< 0.25	1.6	< 5	< 0.002
81106010	TSW03C	11/06/08	< 0.0036	< 0.016	0.0082	0.017	< 1.1	< 0.92	< 0.72	< 0.98	366	< 1	0.82	28.2	< 0.087	1.1	1.3	387	1.3	56.5	< 0.1	1.3	< 0.25	< 0.25	1.0	< 5	< 0.002
Total Number of Samples Analyzed:			9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
Number of Samples with Detections above Reported Limit:			1	5	7	8	0	0	0	0	9	0	8	9	0	9	9	9	8	9	0	9	4	0	9	2	0
Min:			0.0081	0.023	0.0075	0.014	0	0	0	0	303	0	0.77	28.2	0	0.59	1.3	315	0.5	46.5	0	1.2	0.28	0	1	5	0
Max:			0.0081	0.29	0.03	0.046	0	0	0	0	676	0	0.88	31.3	0	1.5	1.8	677	1.3	84.1	0	1.8	0.37	0	2	6.4	0

[O: JTB 6/13, C-ECB 6/13][R:ECK 8/14]

Notes:
< : Parameter not detected above the Limit of Detection indicated.

Table 32. Summary of Physiochemical Properties

Wisconsin Public Service Corporation, Manitowoc - Former Manufactured Gas Plant Site
402 North 10th Street, Manitowoc Wisconsin
BRRTS# : 02-36-000219
USEPA# : WIN000509949

	Formula	Environmental Media[2]				Physiochemical Factors (a)							
		Soil	GW	Soil Vapor	Sediment	Density (g/cm3)	Water Solubility (mg/L)	Koc (L/kg)	lgKow	Vapor Pressure (mmHg)	Molecular Weight (g/mole)	Henry's Law Constant (unitless)	Henry's Law Constant (atm-m3/mole)
VOC													
Benzene	C6H6	x	x	x	x	0.88(@15C)	1.80E+03	9.80E+01	2.10E+00	1.00E+02	7.81E+01	2.27E-01	5.30E-03
2,4-Dimethylphenol	C8H10O				x	1.0 (@14C)	7.87E+03	4.92E+02	2.30E+00	1.00E-01	1.22E+02	3.89E-05	9.51E-07
Ethylbenzene	C8H10	x	x	x	x	0.86	1.69E+02	4.46E+02	3.10E+00	9.60E+00	1.06E+02	3.22E-01	7.88E-03
Toluene	C7H8		x	x	x	0.86	5.20E+02	1.82E+02	2.70E+00	2.80E+01	9.21E+01	2.72E-01	6.60E-03
1,2,4-Trimethylbenzene	C9H12	x	x	x		0.88	5.70E+01	6.14E+02	3.90E+00	2.03E+00	1.20E+02	2.53E-01 [1]	6.16E-03
1,3,5-Trimethylbenzene	*		x			0.86	4.82E+01	6.02E+02	*	*	1.20E+02	3.59E-01	8.77E-03
Xylene, o	C8H10	x	x	x		0.88	1.78E+02	3.83E+02	3.10E+00	6.60E+00	1.06E+02	2.12E-01	5.18E-03
Xylene, m	C8H10	x	x	x		0.85	1.60E+02	3.75E+02	3.20E+00	8.20E+00	1.06E+02	2.94E-01	7.10E-03
Xylene, p	C8H10					0.85	1.60E+02	3.75E+02	3.10E+00	8.80E+00	1.06E+02	2.82E-01	6.90E-03
Total Xylenes	C8H10	x	x	x		NA	1.06E+02	3.83E+02	3.10E+00	7.90E+00	1.06E+02	2.12E-01	6.60E-03
Xylenes, m + p	C8H10	x	x	x		NA	NA	NA	NA	NA	NA	NA	NA
PAH													
Acenaphthene	C12H10		x		x	1.2 (@20C)	3.90E+00	7.08E+03	3.90E+00	2.10E-03	1.50E+02	6.36E-03	1.80E-04
Acenaphthylene	C12H8		x		x	0.89 (@16C)	1.60E+01	3.46E+03	3.90E+00	6.60E-03	1.50E+02	4.51E-03 [1]	1.10E-04
Anthracene	C14H10		x		x	1.2	4.34E-02	2.95E+04	4.40E+00	6.50E-06	1.78E+02	2.67E-03	5.50E-05
Benzo(a)anthracene	C18H12	x	x		x	1.3	9.40E-03	3.98E+05	5.70E+00	2.10E-07	2.20E+02	1.37E-04	1.20E-05
Benzo(a)pyrene	C20H12	x	x		x	GAS	1.62E-03	1.02E+06	6.10E+00	5.40E-09	2.50E+02	4.63E-05	4.50E-07
Benzo(b)fluoranthene	C20H12	x	x		x	***	1.50E-03	1.23E+06	6.60E+00	5.00E-7@20C	2.52E+02	4.55E-03	1.11E-04 [1]
Benzo(e)pyrene	**				x	**	**	**	**	**	**	**	**
Benzo(ghi)perylene	C22H12		x		x	PARTICULATE	2.60E-04	3.86E+06	6.60E+00	1.00E-10	2.70E+02	1.35E-05 [1]	3.30E-07
Benzo(k)fluoranthene	C20H12	x	x		x	PARTICULATE	8.00E-04	1.23E+06	6.10E+00	9.60E-10	2.50E+02	3.40E-05	5.80E-07
Chrysene	C18H12	x	x		x	1.2 (@20C)	1.60E-03	3.98E+05	5.80E+00	6.20E-09	2.20E+02	3.88E-03	5.20E-06
Dibenz(a,h)anthracene	C22H14	x	x		x	PARTICULATE	2.49E-03	3.80E+06	6.50E+00	9.50E-10	2.70E+02	6.03E-07	1.40E-07
Fluoranthene	C16H10		x		x	1.2 (@0C)	2.06E-01	1.07E+05	5.10E+00	9.20E-06	2.00E+02	6.60E-04	8.80E-06
Fluorene	C13H10		x		x	1.2 (@0C)	1.98E+00	1.38E+04	4.10E+00	6.00E-04	1.60E+02	2.61E-03	9.60E-05
Indeno(1,2,3-cd)pyrene	C22H12	x	x		x	PARTICULATE	2.20E-05	3.47E+06	6.70E+00	1.20E-10	2.70E+02	6.56E-05	3.40E-07
1-Methylnaphthalene	C11H10	x	x		x	1.02E+00	2.58E+01	2.53E+03	3.87E+00	5.40E-02	1.42E+02	2.10E-02	5.14E-04
2-Methylnaphthalene	C11H10	x	x		x	1.0 (@20C)	2.40E+01	6.82E+03	3.80E+00	5.50E-02	1.40E+02	2.09E-02 [1]	5.10E-04
Naphthalene	C10H8	x	x	x	x	1.0 (@20c)	3.10E+01	1.50E+03	3.30E+00	8.50E-02	1.28E+02	1.98E-02	4.40E-04
PAH, Total (13)	NA				x	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	C14H10		x		x	0.98 (@4C)	1.15E+00	8.30E+03	4.40E+00	1.20E-04	1.78E+02	1.73E-03	4.23E-05
Pyrene	C16H10		x		x	1.2 (@23C)	1.35E-01	1.05E+05	4.80E+00	4.50E-06	2.00E+02	4.51E-04	1.10E-05
Inorganics													
Arsenic, Dissolved	As		x			NA	NA	NA	NA	NA	NA	NA	NA
Copper, Total	Cu				x	NA	NA	NA	NA	NA	NA	NA	NA
Cyanide, total	CN	x			x	NA	NA	NA	NA	NA	NA	NA	NA
Lead, total	Pb	x			x	NA	NA	NA	NA	NA	NA	NA	NA
Manganese, Dissolved	Mn		x		x	NA	NA	NA	NA	NA	NA	NA	NA
Selenium, Total	Se				x	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium, Total	V				x	NA	NA	NA	NA	NA	NA	NA	NA
Zinc, Total	Zn				x	NA	NA	NA	NA	NA	NA	NA	NA

[O:YFZ 10/20/14]
[C:DLB 10/20/14]

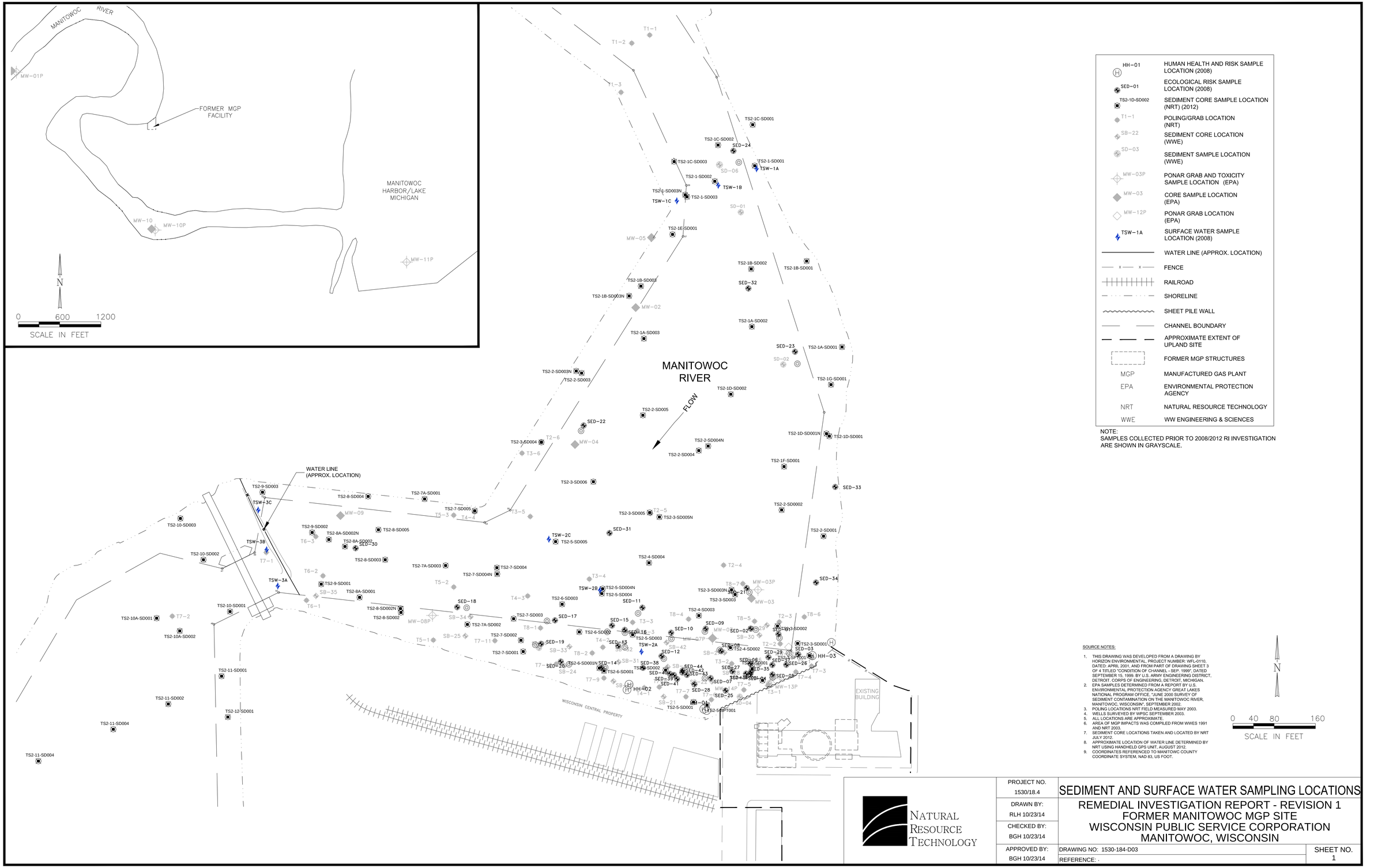
Notes:
* - Refer to physiochemical properties of 1,2,4-Trimethylbenzene.
** - Refer to physiochemical properties of Benzo(a)pyrene
*** - Refer to physiochemical properties of Benzo(k)fluoranthene
(a) - If it is not mentioned, physiochemical factors of chemicals are given under a temperature of 25 degree C.
NA - Not Applicable
[1] No reference source, calculated number: H unitless = HHLC *41
[2] Compounds were included in an environmental media if the compound was ever detected above the RAF SL (the list of compounds will match the statistical summary tables)

References:
Technical Factsheet on: Benzene, National Primary Drinking Water Regulations (http://www.epa.gov/ogwdw/pdfs/factsheets/voc/tech/benzene.pdf)
http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/Generic_Tables/docs/params_sl_table_01run_MAY2014.pdf
http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/documents/SSG_nonrad_supplemental.pdf
http://www.epa.gov/opptintr/rsei/pubs/technical_appendix_b_pchem_v2_3_2.pdf
http://www.epa.gov/superfund/sites/npl/hrsres/tools/app_a_1.pdf
(http://www.epa.gov/superfund/sites/npl/hrsres/tools/method_2.pdf)
(http://www.epa.gov/superfund/sites/npl/hrsres/tools/scdm.htm)
http://www.michigan.gov/documents/deq/deq-rrd-Rules-Table4ToxicologicalChemicalPhysicalData_447077_7.pdf
http://www.epa.gov/chemfact/s_trimet.txt
http://www.atsdr.cdc.gov/toxprofiles/tp67.pdf
http://toxnet.nlm.nih.gov/cgi-bin/sis/search2/f?./temp/~pcjbQy:1

APPENDICES

(INCLUDED ON CD)

SHEETS



HUMAN HEALTH AND RISK SAMPLE LOCATION (2008)

ECOLOGICAL RISK SAMPLE LOCATION (2008)

SEDIMENT CORE SAMPLE LOCATION (NRT) (2012)

POLING/GRAB LOCATION (NRT)

SEDIMENT CORE LOCATION (WWE)

SEDIMENT SAMPLE LOCATION (WWE)

PONAR GRAB AND TOXICITY SAMPLE LOCATION (EPA)

CORE SAMPLE LOCATION (EPA)

PONAR GRAB LOCATION (EPA)

SURFACE WATER SAMPLE LOCATION (2008)

WATER LINE (APPROX. LOCATION)

FENCE

RAILROAD

SHORELINE

SHEET PILE WALL

CHANNEL BOUNDARY

APPROXIMATE EXTENT OF UPLAND SITE

FORMER MGP STRUCTURES

MGP — MANUFACTURED GAS PLANT

EPA — ENVIRONMENTAL PROTECTION AGENCY

NRT — NATURAL RESOURCE TECHNOLOGY

WWE — WW ENGINEERING & SCIENCES

NOTE:
SAMPLES COLLECTED PRIOR TO 2008/2012 RI INVESTIGATION ARE SHOWN IN GRAYSCALE.

SOURCE NOTES:

1. THIS DRAWING WAS DEVELOPED FROM A DRAWING BY HORIZON ENVIRONMENTAL PROJECT NUMBER: WFL-0110, DATED: APRIL 2001, AND FROM PART OF DRAWING SHEET 3 OF 4 TITLED "CONDITION OF CHANNEL - SEP. 1999", DATED SEPTEMBER 15, 1999. BY U.S. ARMY ENGINEERING DISTRICT, DETROIT, CORPS OF ENGINEERING, DETROIT, MICHIGAN.
2. EPA SAMPLES DETERMINED FROM A REPORT BY U.S. ENVIRONMENTAL PROTECTION AGENCY GREAT LAKES NATIONAL PROGRAM OFFICE, "JUNE 2000 SURVEY OF SEDIMENT CONTAMINATION ON THE MANITOWOC RIVER, MANITOWOC, WISCONSIN", SEPTEMBER 2002.
3. POLING LOCATIONS NRT FIELD MEASURED MAY 2003.
4. WELLS SURVEYED BY WPSC SEPTEMBER 2003.
5. ALL LOCATIONS ARE APPROXIMATE.
6. AREA OF MGP IMPACTS WAS COMPILED FROM WWES 1991 AND NRT 2003.
7. SEDIMENT CORE LOCATIONS TAKEN AND LOCATED BY NRT JULY 2012.
8. APPROXIMATE LOCATION OF WATER LINE DETERMINED BY NRT USING HANDHELD GPS UNIT, AUGUST 2012.
9. COORDINATES REFERENCED TO MANITOWC COUNTY COORDINATE SYSTEM, NAD 83, US FOOT.

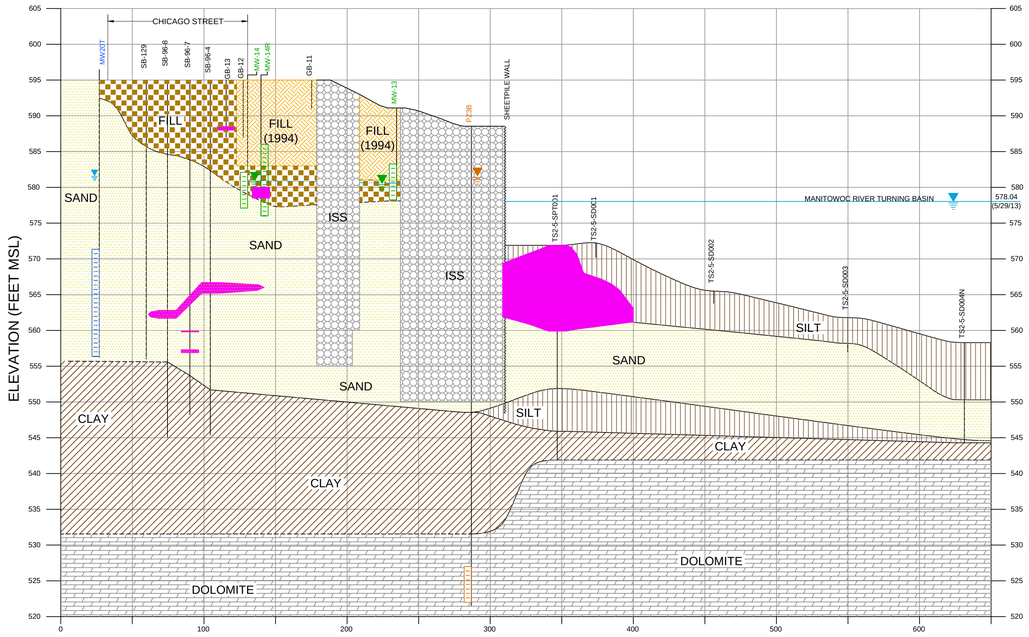
N

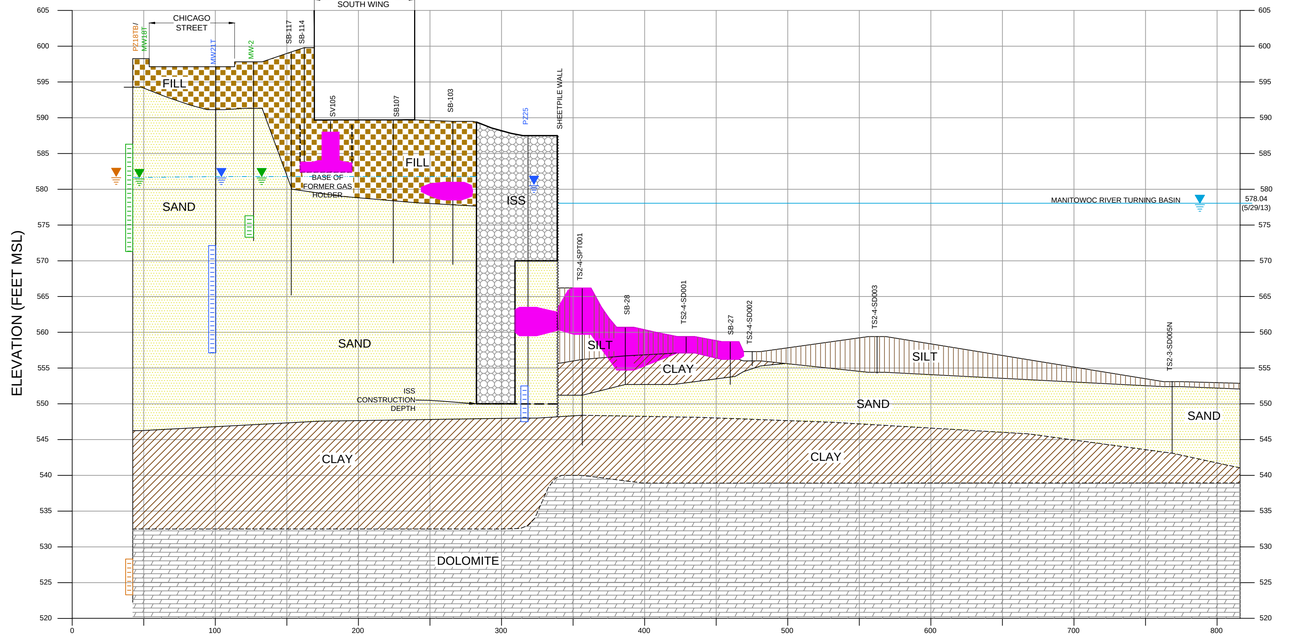
0 40 80 160

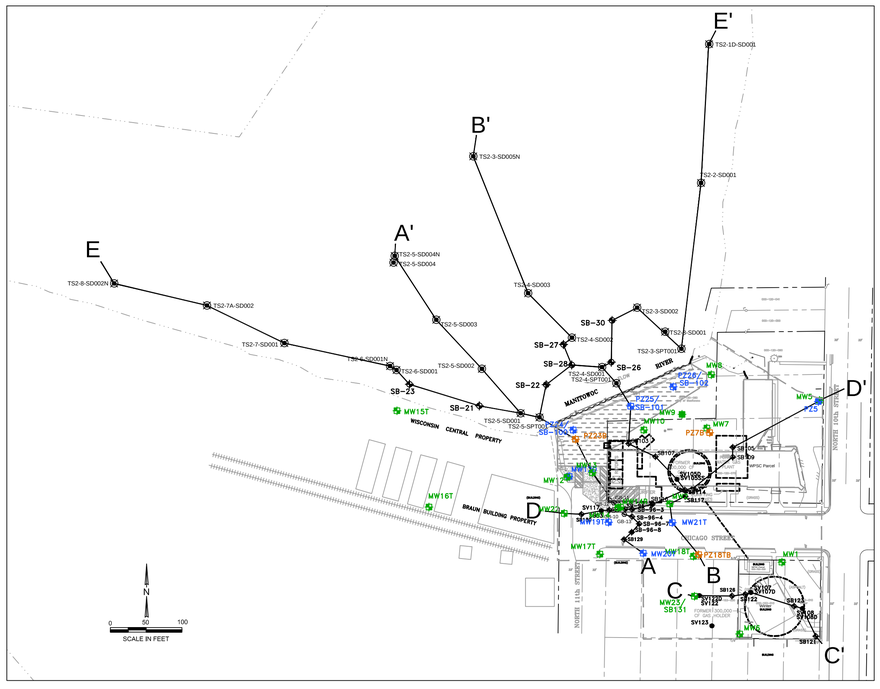
SCALE IN FEET

NATURAL RESOURCE TECHNOLOGY

PROJECT NO. 1530/18.4	SEDIMENT AND SURFACE WATER SAMPLING LOCATIONS
DRAWN BY: RLH 10/23/14	REMEDIAL INVESTIGATION REPORT - REVISION 1 FORMER MANITOWOC MGP SITE WISCONSIN PUBLIC SERVICE CORPORATION MANITOWOC, WISCONSIN
CHECKED BY: BGH 10/23/14	
APPROVED BY: BGH 10/23/14	DRAWING NO: 1530-184-D03 — SHEET NO. 1
	REFERENCE: ·





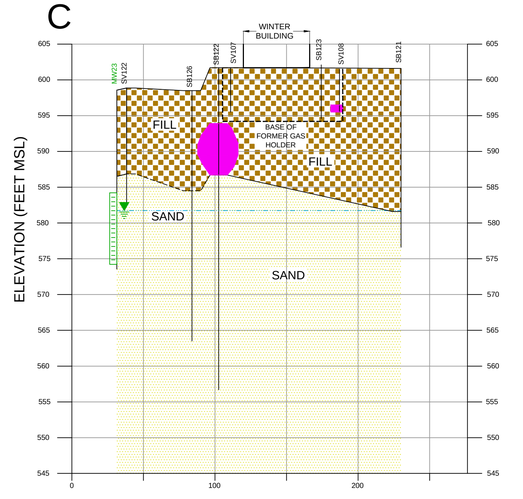


SAND
SILT
LEAN CLAY
DOLOMITE
STABILIZED SOIL (ISS)
FILL (1994)
FILL

SHALLOW SAND WELL SCREENED INTERVAL
SHALLOW SAND WELL HEAD ELEVATION ON 5/29/13
DEEP SAND WELL SCREENED INTERVAL
DEEP SAND WELL ELEVATION ON 5/29/13
BEDROCK WELL SCREENED INTERVAL
BEDROCK WELL HEAD ELEVATION ON 5/29/13
OIL COATED/OIL WETTED MGP RESIDUALS OBSERVED
FORMER MGP FACILITY STRUCTURES

VERTICAL SCALE IN FEET: 10
HORIZONTAL SCALE IN FEET: 50

VERTICAL EXAGGERATION =10
HORIZONTAL EXAGGERATION =2



NATURAL RESOURCE TECHNOLOGY

PROJECT NO. 1530/18.4	CROSS SECTIONS A-A' THRU C-C'
DRAWN BY: RLH 10/23/14	REMEDIAL INVESTIGATION REPORT - REVISION 1 FORMER MANITOWOC MGP SITE WISCONSIN PUBLIC SERVICE CORPORATION MANITOWOC, WISCONSIN
CHECKED BY: BGH 10/23/14	
APPROVED BY: BGH 10/23/14	DRAWING NO: 1530-173-D01
	REFERENCE: .
	SHEET NO. 2

Oct 23, 2014 5:50pm PLOTTED BY: rhopkins SAVED BY: rhopkins
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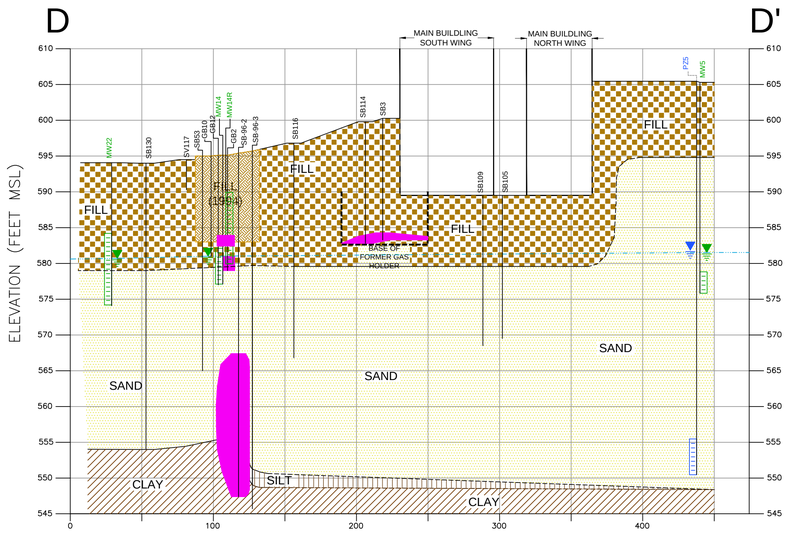

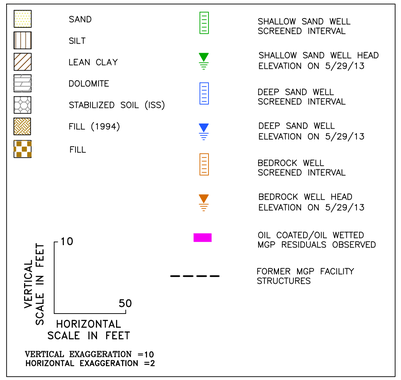

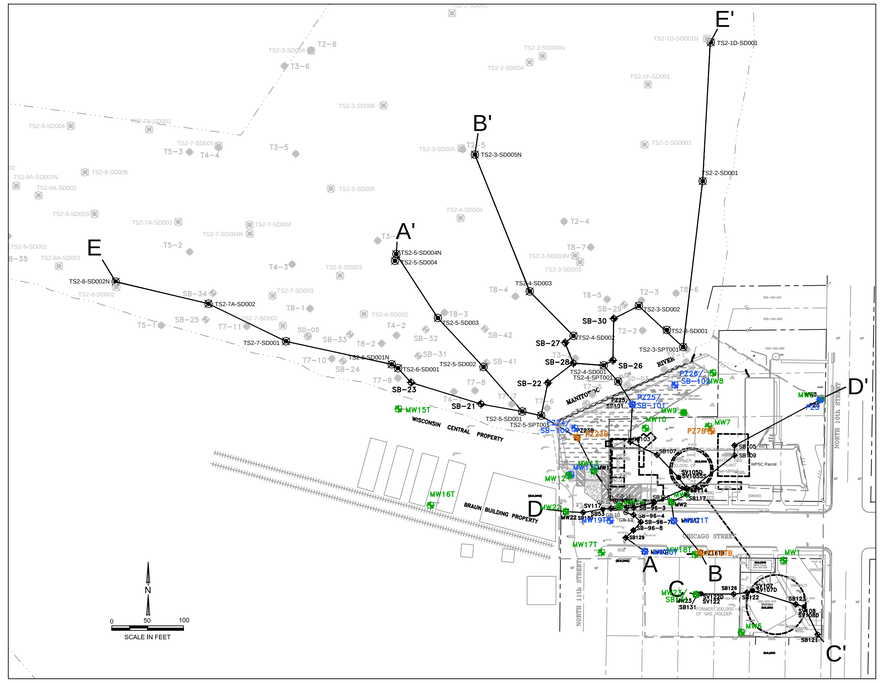

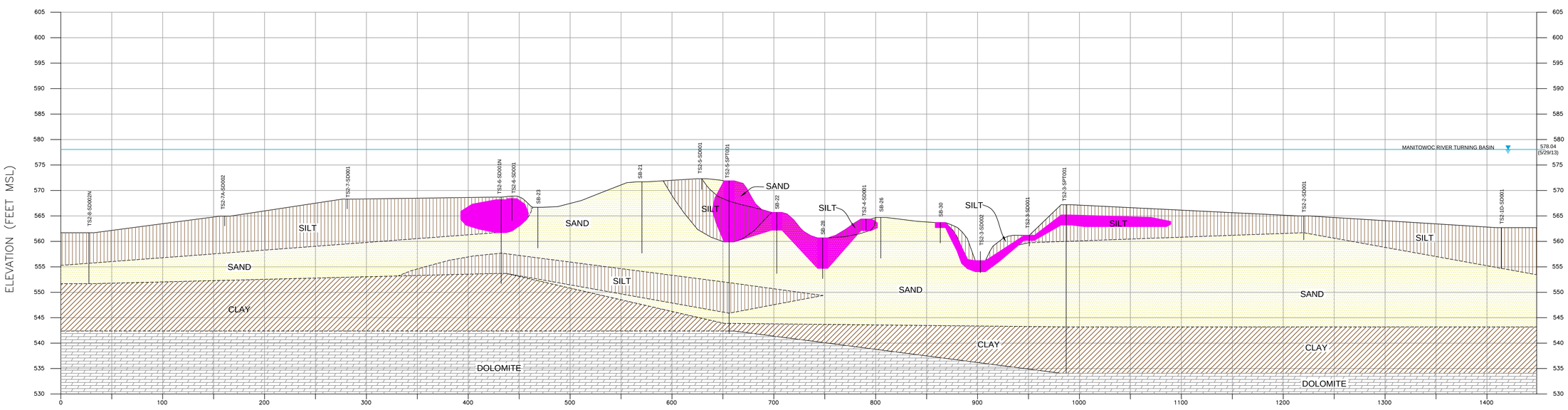

NATURAL RESOURCE TECHNOLOGY	PROJECT NO. 1530/18.4	CROSS SECTIONS D-D' AND E-E'
	DRAWN BY: RLH 10/23/14	REMEDIAL INVESTIGATION REPORT - REVISION 1 FORMER MANITOWOC MGP SITE WISCONSIN PUBLIC SERVICE CORPORATION MANITOWOC, WISCONSIN
	CHECKED BY: BGH 10/23/14	
	APPROVED BY: BGH 10/23/14	DRAWING NO: 1530-184-D02 / REFERENCE: . / SHEET NO. 3

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IMAGES:
XREFS:

HH-01 — HUMAN HEALTH AND RISK SAMPLE LOCATION (2008)

SED-01 — ECOLOGICAL RISK SAMPLE LOCATION (2008)

TS2-1D-SD002 — SEDIMENT CORE SAMPLE LOCATION (NRT) (2012)

T1-1 — POLING/GRAB LOCATION (NRT)

SB-22 — SEDIMENT CORE LOCATION (WWE)

SD-03 — SEDIMENT SAMPLE LOCATION (WWE)

MW-03P — PONAR GRAB AND TOXICITY SAMPLE LOCATION (EPA)

MW-03 — CORE SAMPLE LOCATION (EPA)

MW-12P — PONAR GRAB LOCATION (EPA)

FENCE

RAILROAD

SHORELINE

SHEET PILE WALL

CHANNEL BOUNDARY

APPROXIMATE EXTENT OF UPLAND SITE

WATER UTILITY LINE (APPROX. LOCATION)

AREA OF MGP RESIDUAL OBSERVATIONS IN SEDIMENT

FORMER MGP STRUCTURES

MGP — MANUFACTURED GAS PLANT

EPA — ENVIRONMENTAL PROTECTION AGENCY

NRT — NATURAL RESOURCE TECHNOLOGY

WWE — WW ENGINEERING & SCIENCES

NOTES:
1. MAGENTA COLORED LOCATIONS COMBINE ONE OR MORE SAMPLE INTERVALS THAT EXCEED THE SITE SPECIFIC SCREENING LEVEL.
2. SAMPLES COLLECTED PRIOR TO 2008/2012 RI INVESTIGATION ARE SHOWN IN GRAYSCALE.

Location ID	Total Depth (ft)	Interval (ft)	Residual Description
	feet, below mudline	feet, below mudline	

MANITOWOC RIVER

FLOW

WISCONSIN CENTRAL PROPERTY

WATER UTILITY LINE (APPROX. LOCATION)

TS2-6-SD001N	17	5.0-7.0	trace oil wetted (droplets)
TS2-6-SD001	4.8	0.5-4.8	oil coated (weathered and tacky)
SB-22	12	0.0-3.5	oil wetted material
TS2-5-SPT001	30	0.0-12.0	0-4.0 ft oil wetted (droplets), 4.0-12.0 ft oil coated with sheen
SB-27	6	0.0-4.4	0-2.5 ft 1-inch seams of oil wetted material, 2.5-4.4 ft thin black seams of staining
SB-30	4	0.0-1.0	thin seams of oil wetted material
TS2-3-SD002	3.6	1.2-3.4	1.2-2.8 ft oil coated with sheen, 3.2-3.4 ft trace oil wetted (droplets)
TS2-3-SD001	2.1	0.0-1.0	oil wetted with sheen
TS2-3-SPT001	33.1	2.0-4.0	oil wetted
TS2-4-SD001	2.3	0.0-2.3	oil wetted with sheen
SD-03	1.2	0.0-1.2	oil wetted material in 2-3" layers with strong odor
TS2-4-SPT001	22	0.0-6.5	oil wetted with sheen
SD-04	2.5	0.0-2.5	oil droplets on exterior of sampler, no oil wetted material in sample
SB-28	8	0.0-6.0	0-6.0 ft oil wetted material in thin seams, 5.0-5.4 ft oil wetted

N

0 40 80 160

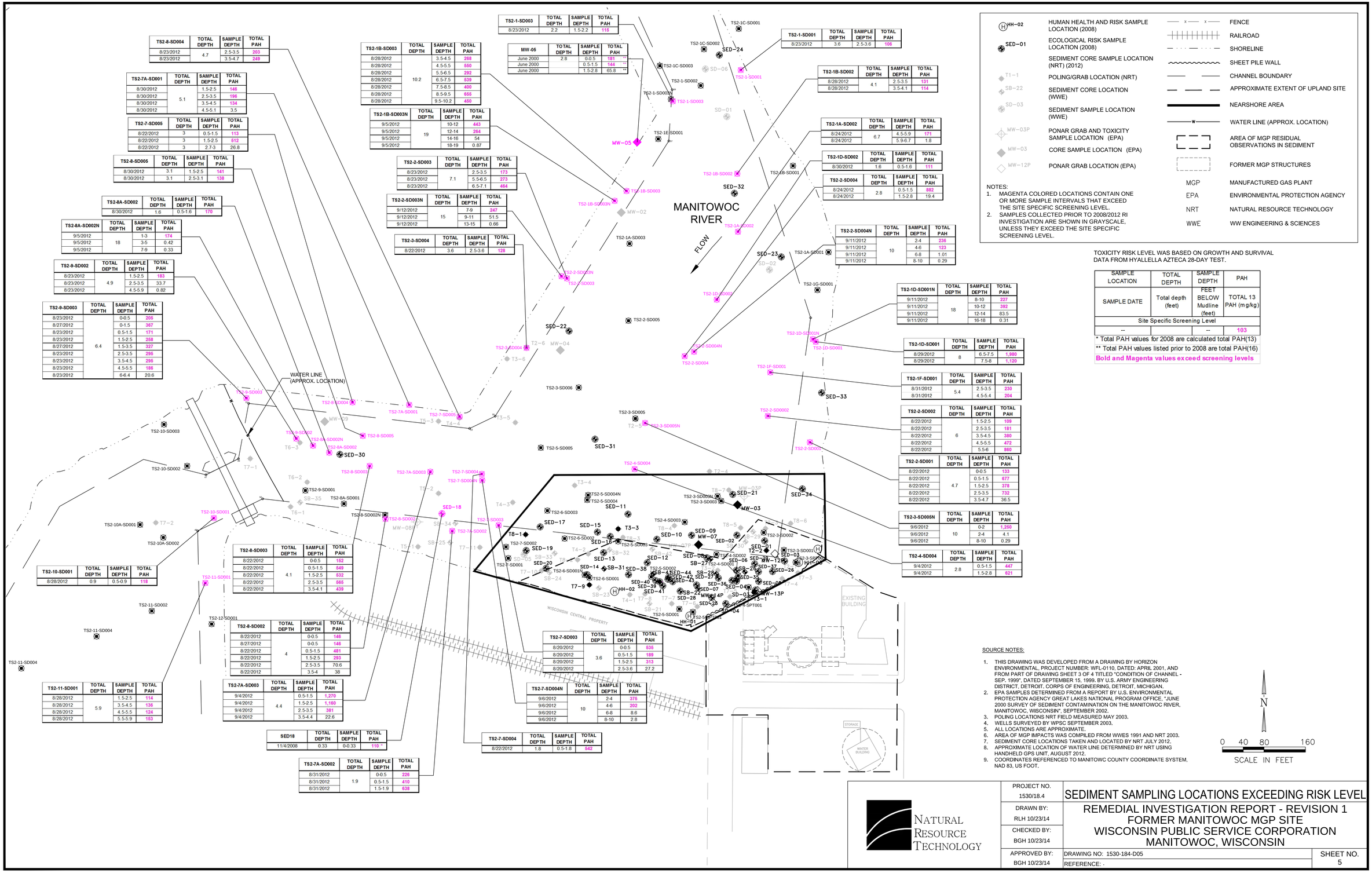
SCALE IN FEET

SOURCE NOTES:

1. THIS DRAWING WAS DEVELOPED FROM A DRAWING BY HORIZON ENVIRONMENTAL, PROJECT NUMBER: WFL-0110, DATED: APRIL 2001, AND FROM PART OF DRAWING SHEET 3 OF 4 TITLED "CONDITION OF CHANNEL - SEP, 1999", DATED SEPTEMBER 15, 1999, BY U.S. ARMY ENGINEERING DISTRICT, DETROIT. CORPS OF ENGINEERING, DETROIT, MICHIGAN.
2. EPA SAMPLES DETERMINED FROM A REPORT BY U.S. ENVIRONMENTAL PROTECTION AGENCY GREAT LAKES NATIONAL PROGRAM OFFICE, "JUNE 2000 SURVEY OF SEDIMENT CONTAMINATION ON THE MANITOWOC RIVER, MANITOWOC, WISCONSIN", SEPTEMBER 2002.
3. POLING LOCATIONS NRT FIELD MEASURED MAY 2003.
4. WELLS SURVEYED BY WPSC SEPTEMBER 2003.
5. ALL LOCATIONS ARE APPROXIMATE.
6. AREA OF MGP IMPACTS WAS COMPILED FROM WWES 1991 AND NRT 2003.
7. SEDIMENT CORE LOCATIONS TAKEN AND LOCATED BY NRT JULY 2012.
8. APPROXIMATE LOCATION OF WATER LINE DETERMINED BY NRT USING HANDHELD GPS UNIT, AUGUST 2012.
9. COORDINATES REFERENCED TO MANITOWC COUNTY COORDINATE SYSTEM, NAD 83, US FOOT.

NATURAL RESOURCE TECHNOLOGY

PROJECT NO. 1530/18.4	MGP RESIDUAL OBSERVATIONS IN SEDIMENT
DRAWN BY: RLH 10/22/14	REMEDIAL INVESTIGATION REPORT - REVISION 1
CHECKED BY: BGH 10/23/14	FORMER MANITOWOC MGP SITE
APPROVED BY: BGH 10/23/14	WISCONSIN PUBLIC SERVICE CORPORATION
DRAWING NO: 1530-173-D04	MANITOWOC, WISCONSIN
REFERENCE: .	SHEET NO. 4



TS2-8-SD004	TOTAL DEPTH	SAMPLE DEPTH	TOTAL PAH
8/23/2012	4.7	2.5-3.5	203
8/23/2012		3.5-4.7	249

TS2-7A-SD001	TOTAL DEPTH	SAMPLE DEPTH	TOTAL PAH
8/30/2012	5.1	1.5-2.5	146
8/30/2012		2.5-3.5	196
8/30/2012		3.5-4.5	134
8/30/2012		4.5-5.1	3.5

TS2-7-SD005	TOTAL DEPTH	SAMPLE DEPTH	TOTAL PAH
8/22/2012	3	0.5-1.5	113
8/22/2012	3	1.5-2.5	512
8/22/2012	3	2.7-3	26.8

TS2-8-SD005	TOTAL DEPTH	SAMPLE DEPTH	TOTAL PAH
8/30/2012	3.1	1.5-2.5	141
8/30/2012	3.1	2.5-3.1	138

TS2-8A-SD002	TOTAL DEPTH	SAMPLE DEPTH	TOTAL PAH
8/30/2012	1.6	0.5-1.6	170

TS2-8A-SD002N	TOTAL DEPTH	SAMPLE DEPTH	TOTAL PAH
9/5/2012	18	1-3	174
9/5/2012		3-5	0.42
9/5/2012		7-9	0.33

TS2-9-SD002	TOTAL DEPTH	SAMPLE DEPTH	TOTAL PAH
8/23/2012	4.9	1.5-2.5	183
8/23/2012		2.5-3.5	33.7
8/23/2012		4.5-5.9	0.82

TS2-9-SD003	TOTAL DEPTH	SAMPLE DEPTH	TOTAL PAH
8/23/2012	6.4	0-0.5	205
8/27/2012		0-1.5	367
8/23/2012		0.5-1.5	171
8/23/2012		1.5-2.5	268
8/27/2012		1.5-3.5	327
8/23/2012		2.5-3.5	295
8/23/2012		3.5-4.5	295
8/23/2012		4.5-5.5	186
8/23/2012		6-6.4	20.6

TS2-10-SD001	TOTAL DEPTH	SAMPLE DEPTH	TOTAL PAH
8/28/2012	0.9	0.5-0.9	118

TS2-11-SD001	TOTAL DEPTH	SAMPLE DEPTH	TOTAL PAH
8/28/2012	5.9	1.5-2.5	114
8/28/2012		3.5-4.5	136
8/28/2012		4.5-5.5	124
8/28/2012		5.5-5.9	163

TS2-1B-SD003	TOTAL DEPTH	SAMPLE DEPTH	TOTAL PAH
8/28/2012	10.2	3.5-4.5	268
8/28/2012		4.5-5.5	550
8/28/2012		5.5-6.5	292
8/28/2012		6.5-7.5	539
8/28/2012		7.5-8.5	400
8/28/2012		8.5-9.5	655
8/28/2012		9.5-10.2	460

TS2-1B-SD003N	TOTAL DEPTH	SAMPLE DEPTH	TOTAL PAH
9/5/2012	19	10-12	443
9/5/2012		12-14	264
9/5/2012		14-16	54
9/5/2012		18-19	0.87

TS2-2-SD003	TOTAL DEPTH	SAMPLE DEPTH	TOTAL PAH
8/23/2012	7.1	2.5-3.5	173
8/23/2012		5.5-6.5	273
8/23/2012		6.5-7.1	484

TS2-2-SD003N	TOTAL DEPTH	SAMPLE DEPTH	TOTAL PAH
9/12/2012	15	7-9	247
9/12/2012		9-11	51.5
9/12/2012		13-15	0.66

TS2-3-SD004	TOTAL DEPTH	SAMPLE DEPTH	TOTAL PAH
8/22/2012	3.6	2.5-3.6	128

TS2-8-SD003	TOTAL DEPTH	SAMPLE DEPTH	TOTAL PAH
8/22/2012	4.1	0-0.5	162
8/22/2012		0.5-1.5	549
8/22/2012		1.5-2.5	532
8/22/2012		2.5-3.5	565
8/22/2012		3.5-4.1	439

TS2-8-SD002	TOTAL DEPTH	SAMPLE DEPTH	TOTAL PAH
8/22/2012	4	0-0.5	146
8/27/2012		0-0.5	146
8/22/2012		0.5-1.5	481
8/22/2012		1.5-2.5	293
8/22/2012		2.5-3.5	70.6
8/22/2012		3.5-4	38

TS2-7A-SD003	TOTAL DEPTH	SAMPLE DEPTH	TOTAL PAH
9/4/2012	4.4	0.5-1.5	1,270
9/4/2012		1.5-2.5	1,160
9/4/2012		2.5-3.5	381
9/4/2012		3.5-4.4	22.6

SED18	TOTAL DEPTH	SAMPLE DEPTH	TOTAL PAH
11/4/2008	0.33	0-0.33	110 *

TS2-7A-SD002	TOTAL DEPTH	SAMPLE DEPTH	TOTAL PAH
8/31/2012	1.9	0-0.5	226
8/31/2012		0.5-1.5	410
8/31/2012		1.5-1.9	638

TS2-1-SD003	TOTAL DEPTH	SAMPLE DEPTH	TOTAL PAH
8/23/2012	2.2	1.5-2.2	115

MW-05	TOTAL DEPTH	SAMPLE DEPTH	TOTAL PAH
June 2000	2.8	0-0.5	181 **
June 2000		0.5-1.5	144 **
June 2000		1.5-2.8	65.8 **

TS2-1-SD001	TOTAL DEPTH	SAMPLE DEPTH	TOTAL PAH
8/23/2012	3.6	2.5-3.6	106

TS2-1B-SD002	TOTAL DEPTH	SAMPLE DEPTH	TOTAL PAH
8/28/2012	4.1	2.5-3.5	131
8/28/2012		3.5-4.1	114

TS2-1A-SD002	TOTAL DEPTH	SAMPLE DEPTH	TOTAL PAH
8/24/2012	6.7	4.5-5.9	171
8/24/2012		5.9-6.7	1.8

TS2-1D-SD002	TOTAL DEPTH	SAMPLE DEPTH	TOTAL PAH
8/30/2012	1.6	0.5-1.6	111

TS2-2-SD004	TOTAL DEPTH	SAMPLE DEPTH	TOTAL PAH
8/24/2012	2.8	0.5-1.5	882
8/24/2012		1.5-2.8	19.4

TS2-2-SD004N	TOTAL DEPTH	SAMPLE DEPTH	TOTAL PAH
9/11/2012	10	2-4	236
9/11/2012		4-6	123
9/11/2012		6-8	1.01
9/11/2012		8-10	0.29

TS2-1D-SD001N	TOTAL DEPTH	SAMPLE DEPTH	TOTAL PAH
9/11/2012	18	8-10	227
9/11/2012		10-12	392
9/11/2012		12-14	83.5
9/11/2012		16-18	0.31

TS2-1D-SD001	TOTAL DEPTH	SAMPLE DEPTH	TOTAL PAH
8/29/2012	8	6.5-7.5	1,980
8/29/2012		7.5-8	1,120

TS2-1F-SD001	TOTAL DEPTH	SAMPLE DEPTH	TOTAL PAH
8/31/2012	5.4	2.5-3.5	230
8/31/2012		4.5-5.4	204

TS2-2-SD002	TOTAL DEPTH	SAMPLE DEPTH	TOTAL PAH
8/22/2012	6	1.5-2.5	109
8/22/2012		2.5-3.5	181
8/22/2012		3.5-4.5	380
8/22/2012		4.5-5.5	472
8/22/2012		5.5-6	860

TS2-2-SD001	TOTAL DEPTH	SAMPLE DEPTH	TOTAL PAH
8/22/2012	4.7	0-0.5	133
8/22/2012		0.5-1.5	677
8/22/2012		1.5-2.5	378
8/22/2012		2.5-3.5	732
8/22/2012		3.5-4.7	36.5

TS2-3-SD005N	TOTAL DEPTH	SAMPLE DEPTH	TOTAL PAH
9/6/2012	10	0-2	1,260
9/6/2012		2-4	4.1
9/6/2012		8-10	0.29

TS2-4-SD004	TOTAL DEPTH	SAMPLE DEPTH	TOTAL PAH
9/4/2012	2.8	0.5-1.5	447
9/4/2012		1.5-2.8	621

TS2-7-SD003	TOTAL DEPTH	SAMPLE DEPTH	TOTAL PAH
8/20/2012	3.6	0-0.5	535
8/20/2012		0.5-1.5	189
8/20/2012		1.5-2.5	313
8/20/2012		2.5-3.6	27.2

TS2-7-SD004N	TOTAL DEPTH	SAMPLE DEPTH	TOTAL PAH
9/6/2012	10	2-4	375
9/6/2012		4-6	202
9/6/2012		6-8	8.6
9/6/2012		8-10	2.8

TS2-7-SD004	TOTAL DEPTH	SAMPLE DEPTH	TOTAL PAH
8/22/2012	1.8	0.5-1.8	642

HH-02 HUMAN HEALTH AND RISK SAMPLE LOCATION (2008)
SED-01 ECOLOGICAL RISK SAMPLE LOCATION (2008)
SEDIMENT CORE SAMPLE LOCATION (NRT) (2012)
T1-1 POLING/GRAB LOCATION (NRT)
SB-22 SEDIMENT CORE LOCATION (WWE)
SD-03 SEDIMENT SAMPLE LOCATION (WWE)
MW-03P PONAR GRAB AND TOXICITY SAMPLE LOCATION (EPA)
MW-03 CORE SAMPLE LOCATION (EPA)
MW-12P PONAR GRAB LOCATION (EPA)

FENCE
RAILROAD
SHORELINE
SHEET PILE WALL
CHANNEL BOUNDARY
APPROXIMATE EXTENT OF UPLAND SITE
NEARSHORE AREA
WATER LINE (APPROX. LOCATION)
AREA OF MGP RESIDUAL OBSERVATIONS IN SEDIMENT
FORMER MGP STRUCTURES

MGP MANUFACTURED GAS PLANT
EPA ENVIRONMENTAL PROTECTION AGENCY
NRT NATURAL RESOURCE TECHNOLOGY
WWE WW ENGINEERING & SCIENCES

NOTES:
1. MAGENTA COLORED LOCATIONS CONTAIN ONE OR MORE SAMPLE INTERVALS THAT EXCEED THE SITE SPECIFIC SCREENING LEVEL.
2. SAMPLES COLLECTED PRIOR TO 2008/2012 RI INVESTIGATION ARE SHOWN IN GRAYSCALE, UNLESS THEY EXCEED THE SITE SPECIFIC SCREENING LEVEL.

TOXICITY RISK LEVEL WAS BASED ON GROWTH AND SURVIVAL DATA FROM HYALLELLA AZTECA 28-DAY TEST.

SAMPLE LOCATION	TOTAL DEPTH	SAMPLE DEPTH	PAH
SAMPLE DATE	Total depth (feet)	FEET BELOW Mudline (feet)	TOTAL 13 PAH (mg/kg)
Site Specific Screening Level			
--		--	103

* Total PAH values for 2008 are calculated total PAH(13)
** Total PAH values listed prior to 2008 are total PAH(16)
Bold and Magenta values exceed screening levels

SOURCE NOTES:

1. THIS DRAWING WAS DEVELOPED FROM A DRAWING BY HORIZON ENVIRONMENTAL, PROJECT NUMBER: WFL-0110, DATED: APRIL 2001, AND FROM PART OF DRAWING SHEET 3 OF 4 TITLED "CONDITION OF CHANNEL - SEP. 1999", DATED SEPTEMBER 15, 1999. BY U.S. ARMY ENGINEERING DISTRICT, DETROIT, CORPS OF ENGINEERING, DETROIT, MICHIGAN.
2. EPA SAMPLES DETERMINED FROM A REPORT BY U.S. ENVIRONMENTAL PROTECTION AGENCY GREAT LAKES NATIONAL PROGRAM OFFICE, "JUNE 2000 SURVEY OF SEDIMENT CONTAMINATION ON THE MANITOWOC RIVER, MANITOWOC, WISCONSIN", SEPTEMBER 2002.
3. POLING LOCATIONS NRT FIELD MEASURED MAY 2003.
4. WELLS SURVEYED BY WPSC SEPTEMBER 2003.
5. ALL LOCATIONS ARE APPROXIMATE.
6. AREA OF MGP IMPACTS WAS COMPILED FROM WWES 1991 AND NRT 2003.
7. SEDIMENT CORE LOCATIONS TAKEN AND LOCATED BY NRT JULY 2012.
8. APPROXIMATE LOCATION OF WATER LINE DETERMINED BY NRT USING HANDHELD GPS UNIT, AUGUST 2012.
9. COORDINATES REFERENCED TO MANITOWC COUNTY COORDINATE SYSTEM, NAD 83, US FOOT.

N

0 40 80 160
SCALE IN FEET

NATURAL RESOURCE TECHNOLOGY

PROJECT NO. 1530/18.4	SEDIMENT SAMPLING LOCATIONS EXCEEDING RISK LEVEL
DRAWN BY: RLH 10/23/14	REMEDIAL INVESTIGATION REPORT - REVISION 1
CHECKED BY: BGH 10/23/14	FORMER MANITOWOC MGP SITE
APPROVED BY: BGH 10/23/14	WISCONSIN PUBLIC SERVICE CORPORATION
DRAWING NO: 1530-184-D05	MANITOWOC, WISCONSIN
REFERENCE: -	SHEET NO. 5

HUMAN HEALTH AND RISK SAMPLE LOCATION (2008) — HH-01
ECOLOGICAL RISK SAMPLE LOCATION (2008) — SED-01
SEDIMENT CORE SAMPLE LOCATION (NRT) (2012)
POLING/GRAB LOCATION (NRT) — T1-1
SEDIMENT CORE LOCATION (WWE) — SB-22
SEDIMENT SAMPLE LOCATION (WWE) — SD-03
PONAR GRAB AND TOXICITY SAMPLE LOCATION (EPA) — MW-03P
CORE SAMPLE LOCATION (EPA) — MW-03
PONAR GRAB LOCATION (EPA) — MW-12P

FENCE
RAILROAD
SHORELINE
SHEET PILE WALL
CHANNEL BOUNDARY
APPROXIMATE EXTENT OF UPLAND SITE
WATER LINE (APPROX. LOCATION)
AREA OF MGP RESIDUAL OBSERVATIONS IN SEDIMENT
FORMER MGP STRUCTURES

MGP MANUFACTURED GAS PLANT
EPA ENVIRONMENTAL PROTECTION AGENCY
NRT NATURAL RESOURCE TECHNOLOGY
WWE WW ENGINEERING & SCIENCES

NOTES:
1. MAGENTA COLORED LOCATIONS CONTAIN ONE OR MORE SAMPLE INTERVALS THAT EXCEED THE SITE SPECIFIC SCREENING LEVEL.
2. SAMPLES COLLECTED PRIOR TO 2008/2012 RI INVESTIGATION ARE SHOWN IN GRAYSCALE, UNLESS THEY EXCEED THE SITE SPECIFIC SCREENING LEVEL.

TOXICITY RISK LEVEL WAS BASED ON GROWTH AND SURVIVAL DATA FROM HYALLELLA AZTECA 28-DAY TEST.

SAMPLE LOCATION	TOTAL DEPTH	SAMPLE DEPTH	PAH
SAMPLE DATE	Total depth (feet)	FEET BELOW Mudline (feet)	TOTAL 13 PAH (mg/kg)
Site Specific Screening Level			
--		--	**103**

* Total PAH values for 2008 are calculated total PAH(13)
** Total PAH values listed prior to 2008 are total PAH(16)
Bold and Magenta values exceed screening levels

SB-41	TOTAL DEPTH	SAMPLE DEPTH	TOTAL PAH
11/13/92	2	0-2	877 **

T3-3	TOTAL DEPTH	SAMPLE DEPTH	TOTAL PAH
06/03/03	Grab	Grab	119 **

TS2-5-SD003	TOTAL DEPTH	SAMPLE DEPTH	TOTAL PAH
8/21/2012	4.8	0-0.5	158
8/27/2012		0-0.5	666
8/21/2012		0.5-1.5	450
8/21/2012		1.5-2.5	236
8/21/2012		2.5-3.5	257
8/21/2012		3.5-4.8	58.9

TS2-5-SD004	TOTAL DEPTH	SAMPLE DEPTH	TOTAL PAH
8/21/2012	8.1	5.5-6.5	575
8/21/2012		6.5-7.5	467
8/21/2012		7.5-8.1	628

TS2-6-SD003	TOTAL DEPTH	SAMPLE DEPTH	TOTAL PAH
8/22/2012	5.8	0.5-1.5	144
8/22/2012		3.5-4.5	284
8/22/2012		4.5-5.8	58.4

T8-1	TOTAL DEPTH	SAMPLE DEPTH	TOTAL PAH
06/03/03	Grab	Grab	1,045 **

TS2-7-SD002	TOTAL DEPTH	SAMPLE DEPTH	TOTAL PAH
8/20/2012	2	0-0.5	426
8/27/2012		0-0.5	690
8/20/2012		0.5-1.5	1,400
8/20/2012		1.5-2	367

TS2-7-SD001	TOTAL DEPTH	SAMPLE DEPTH	TOTAL PAH
8/20/2012	1.9	0-0.5	847
8/20/2012		0.5-1.5	367
8/20/2012		1.5-1.9	380

SB-31	TOTAL DEPTH	SAMPLE DEPTH	TOTAL PAH
11/01/91	8	0-2	459 **

SED14	TOTAL DEPTH	SAMPLE DEPTH	TOTAL PAH
11/4/2008	0.33	0-0.33	187 *

SED20	TOTAL DEPTH	SAMPLE DEPTH	TOTAL PAH
11/4/2008	1	0-1	1,318 *

TS2-6-SD001N	TOTAL DEPTH	SAMPLE DEPTH	TOTAL PAH
9/12/2012	17	5-7	3,090
9/12/2012		7-9	35.9
9/12/2012		15-17	2.6

TS2-5-SD002	TOTAL DEPTH	SAMPLE DEPTH	TOTAL PAH
8/21/2012	1.7	0-0.5	1,810
8/21/2012		0.5-1.7	797

TS2-6-SD001	TOTAL DEPTH	SAMPLE DEPTH	TOTAL PAH
8/20/2012	4.8	0-0.5	2,270
8/20/2012		0.5-1.5	10,300
8/20/2012		1.5-2.5	2,760
8/20/2012		2.5-3.5	9,230
8/20/2012		3.5-4.8	6,870

T7-9	TOTAL DEPTH	SAMPLE DEPTH	TOTAL PAH
06/03/03	Grab	Grab	246 **

HH2	TOTAL DEPTH	SAMPLE DEPTH	TOTAL PAH
11/05/08	2	0-2	339 *

SED40	TOTAL DEPTH	SAMPLE DEPTH	TOTAL PAH
11/13/2008	0.33	0-0.33	370 *

SED39	TOTAL DEPTH	SAMPLE DEPTH	TOTAL PAH
11/13/2008	0.33	0-0.33	121 *

TS2-6-SD001	TOTAL DEPTH	SAMPLE DEPTH	TOTAL PAH
8/21/2012	2.1	0-0.5	5,060
8/27/2012		0-0.5	2,270
8/21/2012		0.5-1.5	2,790
8/21/2012		1.5-2.1	1,790

HH1	TOTAL DEPTH	SAMPLE DEPTH	TOTAL PAH
11/5/2008	0.33	0-0.33	2,810 *

SED7	TOTAL DEPTH	SAMPLE DEPTH	TOTAL PAH
11/3/2008	0.33	0-0.33	3,046 *

SB-22	TOTAL DEPTH	SAMPLE DEPTH	TOTAL PAH
10/30/91	12	0-2	7,970 **
10/30/91		4-6	3,910 **
10/30/91		10-12	82.9 **

SED25	TOTAL DEPTH	SAMPLE DEPTH	TOTAL PAH
11/5/2008	2	0-2	2,478 *

MW-14P	TOTAL DEPTH	SAMPLE DEPTH	TOTAL PAH
June 2000	Grab	Grab	3,360 **

SED27	TOTAL DEPTH	SAMPLE DEPTH	TOTAL PAH
11/5/2008	2	0-2	2,602 *

SED43	TOTAL DEPTH	SAMPLE DEPTH	TOTAL PAH
11/13/2008	0.33	0-0.33	174 *

SED28	TOTAL DEPTH	SAMPLE DEPTH	TOTAL PAH
11/5/2008	2	0.5-2	2,497 *

TS2-4-SD003	TOTAL DEPTH	SAMPLE DEPTH	TOTAL PAH
8/21/2012	5	4.5-5	234

MW-07	TOTAL DEPTH	SAMPLE DEPTH	TOTAL PAH
June 2000	2.8	0-0.5	109 **
June 2000		0.5-1.5	79.5 **
June 2000		1.5	43.5 **

SB-27	TOTAL DEPTH	SAMPLE DEPTH	TOTAL PAH
10/31/91	6	0-2	1,074 **
10/31/91		4-6	23.7 **

TS2-4-SD001	TOTAL DEPTH	SAMPLE DEPTH	TOTAL PAH
8/21/2012	2.3	0-0.5	10,000

SB-26	TOTAL DEPTH	SAMPLE DEPTH	TOTAL PAH
10/30/91	8	4-6	648 **
10/30/91		6-8	< 0.50 **

SED35	TOTAL DEPTH	SAMPLE DEPTH	TOTAL PAH
11/13/2008	0.33	0-0.33	251 *

SED4	TOTAL DEPTH	SAMPLE DEPTH	TOTAL PAH
11/3/2008	0.33	0-0.33	844 *

SED36	TOTAL DEPTH	SAMPLE DEPTH	TOTAL PAH
11/13/2008	0.33	0-0.33	316 *

SD04	TOTAL DEPTH	SAMPLE DEPTH	TOTAL PAH
10/03/91	2.5	0-2.5	1,241 **

SB-28	TOTAL DEPTH	SAMPLE DEPTH	TOTAL PAH
10/31/91	8	0-2	10,890 **

TS2-3-SD003N	TOTAL DEPTH	SAMPLE DEPTH	TOTAL PAH
9/12/2012	17	9-11	1,000
9/12/2012		11-13	452
9/12/2012		13-15	30.8
9/12/2012		15-17	0.27

TS2-3-SD003	TOTAL DEPTH	SAMPLE DEPTH	TOTAL PAH
8/21/2012	8	1.5-2.5	125
8/21/2012		5.5-6.5	332
8/21/2012		7.5-8	636

MW-03	TOTAL DEPTH	SAMPLE DEPTH	TOTAL PAH
June 2000	3.2	0-0.5	13.5 **
June 2000		0.5-1.5	77.2 **
June 2000		1.5-3.2	277 **

TS2-3-SD002	TOTAL DEPTH	SAMPLE DEPTH	TOTAL PAH
8/21/2012	3.6	0.5-1.5	1,160
8/21/2012		1.5-2.5	7,010
8/21/2012		2.5-3.6	138

SED2	TOTAL DEPTH	SAMPLE DEPTH	TOTAL PAH
11/3/2008	0.33	0-0.33	2,515 *

TS2-3-SD001	TOTAL DEPTH	SAMPLE DEPTH	TOTAL PAH
8/21/2012	2.1	0-0.5	17,300
8/27/2012		0-0.5	885
8/21/2012		1.5-2.1	1,460

T2-2	TOTAL DEPTH	SAMPLE DEPTH	TOTAL PAH
06/03/03	Grab	Grab	989 **

SED3	TOTAL DEPTH	SAMPLE DEPTH	TOTAL PAH
11/3/2008	0.33	0-0.33	1,609 *

HH3	TOTAL DEPTH	SAMPLE DEPTH	TOTAL PAH
11/5/2008	2	0-2	174 *

SED29	TOTAL DEPTH	SAMPLE DEPTH	TOTAL PAH
11/5/2008	1	0-1	6,790 *

SED6	TOTAL DEPTH	SAMPLE DEPTH	TOTAL PAH
11/3/2008	0.33	0-0.33	363 *

SED26	TOTAL DEPTH	SAMPLE DEPTH	TOTAL PAH
11/5/2008	2	0-2	269 *

SED37	TOTAL DEPTH	SAMPLE DEPTH	TOTAL PAH
11/13/2008	0.33	0-0.33	468 *

SED5	TOTAL DEPTH	SAMPLE DEPTH	TOTAL PAH
11/3/2008	0.33	0-0.33	1,248 *

SD03	TOTAL DEPTH	SAMPLE DEPTH	TOTAL PAH
10/03/91	1.2	0-1.2	7,127 **

T3-1	TOTAL DEPTH	SAMPLE DEPTH	TOTAL PAH
06/03/03	Grab	Grab	138 **

SOURCE NOTES:

1. THIS DRAWING WAS DEVELOPED FROM A DRAWING BY HORIZON ENVIRONMENTAL, PROJECT NUMBER: WFL-0110, DATED: APRIL 2001, AND FROM PART OF DRAWING SHEET 3 OF 4 TITLED "CONDITION OF CHANNEL - SEP, 1999", DATED SEPTEMBER 15, 1999, BY U.S. ARMY ENGINEERING DISTRICT, DETROIT, CORPS OF ENGINEERING, DETROIT, MICHIGAN.
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3. POLING LOCATIONS NRT FIELD MEASURED MAY 2003.
4. WELLS SURVEYED BY WPSC SEPTEMBER 2003,
5. ALL LOCATIONS ARE APPROXIMATE.
6. AREA OF MGP IMPACTS WAS COMPILED FROM WWES 1991 AND NRT 2003.
7. SEDIMENT CORE LOCATIONS TAKEN AND LOCATED BY NRT JULY 2012.
8. APPROXIMATE LOCATION OF WATER LINE DETERMINED BY NRT USING HANDHELD GPS UNIT, AUGUST 2012.
9. COORDINATES REFERENCED TO MANITOWC COUNTY COORDINATE SYSTEM, NAD 83, US FOOT.

MANITOWOC RIVER
FLOW
WISCONSIN CENTRAL PROPERTY
EXISTING SIGNAL

0 40 80 160
SCALE IN FEET

NATURAL RESOURCE TECHNOLOGY

PROJECT NO. 1530/18.4	SEDIMENT SAMPLING LOCATIONS EXCEEDING RISK LEVEL (NEAR SHORE)
DRAWN BY: RLH 10/23/14	REMEDIAL INVESTIGATION REPORT - REVISION 1
CHECKED BY: BGH 10/23/14	FORMER MANITOWOC MGP SITE
APPROVED BY: BGH 10/23/14	WISCONSIN PUBLIC SERVICE CORPORATION
DRAWING NO: 1530-184-D06	MANITOWOC, WISCONSIN
REFERENCE: -	SHEET NO. 6