AECOM Environment

Prepared for:
City of Kenosha
Kenosha, Wisconsin

Prepared by:
AECOM
Milwaukee, WI
60328684
June 2015

Remedial Design Report (Soil)
Former Kenosha Engine Plant
5555 - 30th Avenue, Kenosha, Wisconsin

WDNR FID 230004500, BRRTS #02-30-000327

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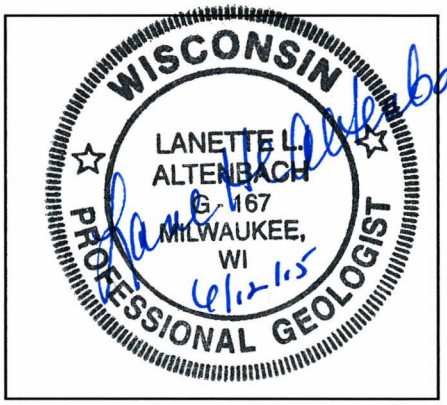
In conformance with NR 712.09 submittal certification requirements:

"I, Lanette Altenbach, hereby certify that I am a hydrogeologist as that term is defined in s. NR 712.03 (1), Wis. Adm. Code, am registered in accordance with the requirements of ch. GHSS 2, Wis. Adm. Code, or licensed in accordance with the requirements of ch. GHSS 3, Wis. Adm. Code, and that, to the best of my knowledge, all of the information contained in this document is correct and the document was prepared in compliance with all applicable requirements in chs. NR 700 to 726, Wis. Adm. Code."



Reviewed By: Lanette Altenbach, P.G.
Senior Hydrogeologist

"I, Kevin Brehm, hereby certify that I am a registered professional engineer in the State of Wisconsin, registered in accordance with the requirements of ch. A-E4, Wis. Adm. Code; that this document has been prepared in accordance with the Rules of Professional Conduct in ch.A-E8, Wis. Adm. Code, and that, to the best of my knowledge, all of the information contained in this document is correct and the document was prepared in compliance with all applicable requirements in chs. NR 700 to 726, Wis. Adm. Code."

Reviewed By: Kevin L. Brehm, P.E.
Principal Engineer

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List of Acronyms

bgs	below ground surface
cm/sec	centimeters/second
COC	contaminants of concern
CS	Chrysler Sites
ERD	Enhanced Reductive Dechlorination
ISCO	In Situ Chemical Oxidation
KEP	Kenosha Engine Plant
LNAPL	Light Non-Aqueous Phase Liquid
mg/kg	milligrams per kilogram
MSL	mean sea level
PAHs	Polycyclic aromatic hydrocarbons-compounds commonly associated with petroleum fluids
PAL	Preventive Action Limit
PCBs	polychlorinated biphenyls
PCE	Tetrachloroethylene
ppm	Part per million
RAOR	Remedial Action Options Report
RCLs	Residual Contaminant Levels
RDR	Remedial Design Report
TCE	trichloroethene (or also trichloroethylene), a common chlorinated volatile organic compound used in the degreasing of metal parts and equipment.
ug/kg	micrograms per kilogram
USEPA	United Stated Environmental Protection Agency
USGS	United States Geological Survey
UST	Underground Storage Tank
VOCs	volatile organic compounds
WAC	Wisconsin Administrative Code
WDNR	Wisconsin Department of Natural Resources
WDOT	Wisconsin Department of Transportation
WPDES	Wisconsin Pollutant Discharge Elimination System
WRAPP	Water Resources Application for Project Permits

1.0 Introduction

AECOM Technical Services, Inc. (AECOM) has prepared a remedial design report for the City of Kenosha to address impacts to soil from automotive manufacturing operations at the former Kenosha Engine Plant (KEP). The remedial design report for groundwater will be submitted separately following completion of pre-design testing activities. This report was prepared to meet Wisconsin Administrative Code (WAC) NR 724 requirements.

1.1 Project Participants

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Region 5
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1.2 Site Location and Description

The KEP is located in southeast ¼ of the southeast ¼ of Section 36, Township 2 North, Range 22 East (Figure 1). The KEP includes approximately 100 acres of land and is located at 5555 - 30th Avenue in the city of Kenosha, Kenosha County, Wisconsin. The property is currently vacant; however, the former building floors were retained to act as a temporary barrier until remediation is conducted. The site is relatively flat with soil berms present on the northern and eastern portions of the site bordering the adjacent roadways. The overall site layout, including the surrounding properties, is shown on Figure 2.

The KEP is divided into 12 separate areas or Chrysler Sites (CS areas), CS1 through CS12, as shown in Figure 3. The purpose of the subdivision is to provide a means to focus on individual areas where current and historic uses provided logical groupings for investigation, remediation and to allow for added flexibility in future redevelopment. For this Remedial Design Report (RDR), the CS areas are used for identification during a phased remediation approach.

The site is relatively level and covered by impervious paving (asphalt and concrete that includes former building floors, loading docks, etc.) over approximately 90% of the site. The former loading docks remain in place, but are planned for removal as remedial activities are conducted. Around the northern and eastern periphery are landscaped berms which have a maximum height of eight feet above the surrounding grade and are composed of fill soils, likely originating from the KEP property. Some of the berm soils are suitable for reuse on-site as fill material for remedial excavations or low points in the topography when the loading docks are removed as will be addressed in this report. The site is enclosed by chain-link fencing.

1.3 Report Organization

The remainder of this Remedial Design Report is organized, as shown below.

- Section 2.0: Background
- Section 3.0: Basis for Soil Remedial Design
- Section 4.0: Soil Corrective Action Design
- Section 5.0: Documentation and Reporting
- Section 6.0: Groundwater Corrective Action Design Status
- Section 7.0: Implementation Plan
- Section 8.0: References

2.0 Background

The KEP buildings were demolished in 2013 and the building floors were retained to act as a temporary cap. Historic operations at the site included complete automobile manufacturing and assembly, while more recent operations were focused on the manufacture of automotive engines.

2.1 Site Investigation and Prior Remedial Actions

Historic environmental impacts resulting from manufacturing operations were reported to the Wisconsin Department of Natural Resource (WDNR) as they were discovered by the site operator at the time of the release. To some extent these impacts were investigated and remedial efforts were conducted. Investigations were conducted in the 1990's prior to demolition of buildings where operations were discontinued. Underground storage tanks (USTs) were upgraded or removed and some remediation was conducted. The remediation generally consisted of soil removal and disposal and the installation of groundwater recovery systems. No USTs are known to remain on the property.

In 2009, the former owner declared bankruptcy and in 2010 operations ceased. Phase I and Phase II Environmental Site Assessments were conducted by the City of Kenosha, prior to the site's abandonment under the bankruptcy court order. Subsequently, a site investigation was completed in 2014 in general conformance with NR 716, Wis. Adm. Code (AECOM, March 2015). This section provides a general description of the site geology, hydrogeology, recent interim remedial actions, and a summary of the site investigation results.

2.1.1 Geology

Fill material covers the entire site; below, the site geology consists of glacio-lacustrine sand and silt that comprises the upper or shallow aquifer unit of the water table. Beneath the sand aquifer is the clay till that acts as an aquitard to the deeper bedrock aquifers due to its low hydraulic conductivity and permeability, moderate thickness, density, and regional extent. This clay till may contain groundwater at some locations, but is not capable of containing or transmitting significant quantities groundwater. A detailed description of the lithology encountered at the sites includes the following:

- The fill layer generally consists of clay, sand, silt, crushed gravel, and in some areas foundry sand, concrete, brick, wood, and demolition debris. The fill ranges in thickness from approximately 1.5 to 18.5 feet deep, with an average thickness of seven to nine feet.
- Silty Clay/Clayey Silt – a discontinuous thin layer of fill material generally consisting of silty clay and clayey silt underlies the above fill unit. This layer is generally described as very dark brown to black, dry to moist, slightly-cohesive, low-plasticity, and soft.
- Sand/Silty Sand – this shallow aquifer generally consists of a brown, dry to wet, loose to dense sands and silts.
- Silt/Clayey Silt – a discontinuous layer of lacustrine silt and/or clay separates the fine sand aquifer from the glacial clay till below. This lacustrine layer is generally described as grayish brown, wet, cohesive, medium plasticity and firm to still.
- Clay till – a glacial till layer, which consists of dark gray, wet, cohesive, plastic, and hard clay with stones.

2.1.2 Hydrogeology

The water table at KEP typically occurs at a depth of 8 to 11 feet below ground surface (bgs). Horizontal groundwater flow is generally towards the northeast, east and southeast across the site, both at the water table and just above the clay-till boundary. The groundwater flow direction is fairly consistent throughout the year with a general eastward flow modified by the effect of the existing groundwater recovery systems. There is little seasonal variation.

Vertical gradients are generally low (less than 0.01 ft/ft to 0.11 ft/ft) and generally downward, although some upward gradients occurred (likely due to recharge events and other natural influences). There are five groundwater recovery systems which, when operating, influence local areas of flow on-site and help to maintain hydraulic containment of impacted groundwater.

The transmissivity (or ability to move water through the subsurface materials) is approximately 10^{-2} centimeters/second (cm/sec) in the sand (water table) portion of the uppermost aquifer and 10^{-3} cm/sec to 10^{-4} cm/sec deeper in the aquifer in silt, just above the clay till interface. Calculated horizontal linear velocities indicate that at the water table, in flow paths to existing groundwater recovery systems, the flow could be as high as 1700 feet per year. Other areas and within the silt portion of the aquifer, the flow rate ranges from a few feet per year to 200 feet per year. The areas with the higher flow rates are generally the pathways toward the groundwater recovery systems.

2.2 Summary of Prior Remedial Actions

Historically, remedial activities conducted at the KEP by Chrysler responded to reported releases to the environment and subsurface conditions encountered during reconstruction of the facility. These remedial activities generally included soil excavation and installation/operation of groundwater recovery systems as documented in prior reports. In many cases the remedial activities were not complete remediation, but were instead implemented as source control measures. The residual impacts remaining after implementation of these historic remedial efforts were treated as impacted areas during the evaluation of the 2014 site investigation data.

In addition to the historic excavation activities conducted by Chrysler, more recent remedial excavations were conducted between 2012 and 2014 by the City of Kenosha. The recent excavation activities focused on select areas within CS3, CS4, CS6, and CS10 as illustrated on Figure 2. Select groundwater recovery systems continue to operate at the KEP to reduce the potential for off-site groundwater migration. Additional details regarding prior remedial actions conducted at the KEP are summarized in the *Remedial Action Options Report* (RAOR; AECOM, April 2015).

2.3 Conceptual Site Model

The KEP site has more than 100-year history of manufacturing. The KEP originated with a bicycle manufacturer who advanced to truck then automotive manufacturing as technology and consumer needs changed. The KEP has been reconfigured many times in its history and some of that history is buried in former building footprints. The following summarizes the conceptual site model that was utilized during the remedial action options evaluation process

2.3.1 Contaminants of Concern

Automotive manufacturing uses many petroleum-based fluids and historically chlorinated solvents were also used to remove the oily petroleum residues from the manufactured product. Uses of the liquids resulted in releases to the environment over the years. As identified by the site investigation the following are the contaminants of concern (COC):

Petroleum VOCs: Benzene, naphthalene and to a lesser extent xylenes.

Chlorinated VOCs: Tetrachloroethylene (PCE, several isolated and limited areas), trichloroethylene (TCE, the primary contaminant) and their dechlorinated breakdown compounds of cis-1,2-dichloroethylene and vinyl chloride.

Metals: Lead, nickel and isolated areas of arsenic greater than 100 milligrams per kilogram (mg/kg).

PCBs: CS4, CS5 and CS10 have small areas identified with PCB concentrations in soil that are between 1 and 27 mg/kg. There will be a separate work plan for PCB remediation. They are covered under the WDNR's agreement with United States Environmental Protection Agency (USEPA) under the "One Memorandum" and USEPA will conduct a concurrent review and approval with WDNR for PCBs at this site. PCBs were generally not a component of the hydraulic fluids or cutting oils used at the KEP. A few isolated areas have identified PCB impact. These areas will be remediated separately from the identified COCs.

2.3.2 Extent of Soil Impacts

Widespread low-level impacts observed over most of the western two-thirds of the site are associated with the use of petroleum fuels, lubricants and metals. The magnitude of the soil impacts in this area varies from low levels just above groundwater pathway RCLs to areas where contaminants occur in higher concentrations that warrant remedial action. The berms surrounding the property primarily have low concentration impacts by metals and PAHs which limits the use of the soil, particularly if not retained on-site.

Chlorinated VOC impacts were identified in CS3 extending northward into CS5 and eastward across the northern part of CS4 into CS8 at concentrations exceeding the groundwater pathway RCLs. Some of the detected concentrations were identified above 1,000 micrograms per kilogram (ug/kg), a value used to identify areas of source soil that may warrant active remediation. Smaller areas of chlorinated VOC impact (with generally lower concentrations) were identified in CS2, CS6, CS7 and CS10.

2.3.3 Extent of Groundwater Impacts

Groundwater impacts are present at the water table as well as deeper in the shallow aquifer, just above the clay till aquitard. The existing groundwater recovery systems are not treating the sources of the groundwater contamination but are primarily controlling groundwater flow and limiting migration of contamination. More active groundwater treatment at the source areas would be necessary to reduce contaminant mass to support stable to receding groundwater plume conditions where site closure could be achieved.

Five deeper source areas of TCE soil and groundwater impact have been identified in CS3-Building 53, CS5-Building 65 and at the northeastern boundary of CS4 extending into CS8. These source areas are degrading as evidenced by the higher concentrations of cis-1,2-dichloroethene and vinyl chloride. The degradation process appears to have stagnated at the vinyl chloride stage of reductive dechlorination.

2.3.4 Extent of NAPL

Isolated areas of light non-aqueous phase liquids (LNAPL) have been detected in water table monitoring wells at CS2 (MW-200 and MW-204), CS3 (MW-350 and MW-351), CS4 (MW-405); CS6 at MW-602 and in CS10 at MW-1006. Free-phase, dense non-aqueous phase liquids (DNAPLs), have not been measureable, the high TCE concentrations in the deeper soil and groundwater indicate that some TCE may be present in the interstitial pores.

2.3.5 Potential Receptors

Potential exposures to receptors include vapor intrusion, direct contact to contaminated soils, and inhalation of contaminated soil/dust. Residential properties located within 0.1 miles west of the site are hydraulically up-gradient of the area of known impact. Direct contact is not currently an exposure pathway of concern

since the site is currently covered with concrete building floors and asphaltic pavement and surrounded by a chain-link fence.

Potential VOC migration pathways include vapor migration through the subsurface vadose zone and groundwater transport. The USEPA conducted a subsurface vapor migration study in September 2011, which was provided to the WDNR. The vapor study collected samples in the areas around both of the specific potential pathways identified, as well as other areas surrounding the KEP. No impacts to the residents were identified during the USEPA study.

Subsurface utilities, such as storm sewer and sanitary sewer lines, are also potential contaminant migration pathways. The storm sewers on the north half of the KEP drain to Pike Creek at 50th Street. Pike Creek flows to the east-southeast and eventually into Lake Michigan. Storm sewers in the southern half of the KEP drain to the main sewer in 60th Street. Specific potential pathways include migration to the 52nd Street right-of-way to the north near CS6 and migration down the utility corridors of 54th Street to the east, near CS7.

The KEP is served by the City of Kenosha municipal water supply and sanitary sewer. The City uses water from Lake Michigan for its potable water supply.

2.4 Selected Remedial Action

A range of alternatives for remediating impacted soil and groundwater at the KEP based on the chemicals present, the nature and extent of the contaminated media, site characteristics, and future redevelopment impacts were evaluated in general accordance with NR 722. The remedial alternatives evaluation process is documented in the RAOR.

Based on this evaluation, Alternative 4 (Soil and Groundwater Source Control) was identified to be the most technically and economically feasible alternative for implementation at the KEP. This remedy includes a combination of excavation, capping, and in-situ treatment using ISCO and/or ERD. The selected approach addresses the remediation goals and objectives for site-wide management of residual soil and groundwater impacts, focusing on protection of human health and the environment while considering potential redeveloped site uses and available funding for remediation.

2.5 Anticipated Post-Remedial Site Conditions

The site is currently zoned M-1 Light Manufacturing and M-2 Heavy Manufacturing. Redevelopment after remediation assumes the following:

- Post-remediation uses are anticipated to be commercial or light manufacturing.
- Residential uses for the site will not be considered.
- The City of Kenosha will require the use of a vapor barrier system for new construction.
- As redevelopment occurs, the buildings, pavement and landscape will provide the final cap, where necessary.
- Until a final cap is in place (through redevelopment) the site may be capped temporarily by vegetated soil.
- Impacted soil and groundwater encountered during site redevelopment activities will require special handling and disposal.
- Institutional controls will be utilized to address residual soil and groundwater impacts that remain after completion of the remedial efforts.

3.0 Basis for Soil Remedial Design

The overall objective for the soil remedial action is to effectively address the direct contact exposure pathway while also reducing source area contaminant mass that could continue to serve as a source for ongoing groundwater impacts. As referenced previously, a separate remedial design report will be prepared to address residual groundwater impacts. Implementation of both the soil and groundwater remedial measures will be implemented in phases based on available funding sources and future site redevelopment plans.

The following criteria were used to identify areas requiring excavation:

- Industrial direct contact RCL exceedances identified from 0 to 4 feet bgs
    - various VOCs
    - multiple PAH industrial direct contact exceedances (individual areas with just benzo(a)pyrene industrial direct contact exceedances are excluded from active remediation)
    - Lead or arsenic with concentrations greater than 100 mg/kg
    - PCBs greater than 1 mg/kg
- Source Soils
    - LNAPL
        - measured LNAPL in wells (greater than 0.5 feet thick in multiple measurement events)
        - high petroleum VOC or PAH concentrations at or near the water table interface that may result in future LNAPL
    - Chlorinated VOCs
        - TCE concentrations in unsaturated soil (0 to 12 feet bgs) that are greater than 1,000 ug/kg and/or soil impact with groundwater ES exceedances in water table monitoring wells.

Saturated-zone areas of high CVOCs impacts will be addressed in the groundwater-focused remedial design report.

The goals and objectives are for site-wide management of impact, focusing on protection of human health and the environments while considering potential redeveloped site uses and available funding for remediation. Although the groundwater migration pathway RCLs were considered, active remediation to these criteria levels may not be technically or economically feasible for KEP given available funding sources and nor warranted in the context of the restricted post-development property use. It is anticipated that the post-remediation development plan will incorporate buildings and paved surfaces which will provide additional protections for this pathway. A temporary vegetated clean soil cap will be provided for those areas with VOC impacts in excess of the migration to groundwater RCL and in areas where multiple PAHs and/or metals exceed the industrial direct contact RCLs but were not excavated.

Portions of this Remedial Design Report have been developed to accompany or append bid construction documents for the planned remedial activities; to be used by contractors and/or consultants in safely implementing the remediation activities; and to provide supporting documentation in accordance with WAC ch. NR 724.

4.0 Soil Corrective Action Design

This section describes applicable requirements and activities related to the design and implementation of the soil corrective action. Based on the size of the project and available funding sources, the soil remediation work will be completed in several phases. Modifications to the design will be made, as necessary, based on work progress, timing, and conditions encountered in the field. The following provides a description of the primary soil remediation elements. Additional details will be included in the project plans and specifications that will be developed as various excavation phases are implemented.

4.1 Pre-Construction Planning and Permit Approvals

4.1.1 Health and Safety Plan

Consistent with the requirements of the Occupational Safety and Health Administration (OSHA) Hazardous Waste Operations and Emergency Response Standard (29 CFR 1910.120), a health and safety plan is to be followed during the construction and implementation of the proposed remedial action. The Health and Safety Plan was developed as part of the site investigation activities and will be updated for use during the remediation work. All remediation contractors will be responsible for their own site-specific Health and Safety Plans. The contractor will have overall operational authority for health and safety during active site remediation activities.

4.1.2 Surface Water Management and Erosion Control

The Wisconsin Pollutant Discharge Elimination System (WPDES) for stormwater runoff is regulated under the authority of s. NR 216, Wis. Adm. Code. As part of the USEPA National Pollutant Discharge Elimination System (NPDES), the WPDES Storm Water Program regulates discharge of storm water in Wisconsin from construction sites, industrial facilities, and selected municipalities. The horizontal extent of the soil remediation area (including the removal of the former building foundations and parking lots) exposing erodible surface soil will exceed one acre; therefore, a Water Resources Application for Project Permits (WRAPP), formerly known as Storm Water Notice of Intent (NOI), will be prepared and submitted to the WDNR. The WRAPP and related attachments will be submitted to the WDNR to obtain coverage under the state Construction Site Storm Water Runoff General Permit No. WI–S067831–4.

As part of completion of the WRAPP, a Storm Water Pollution Prevention and Erosion Control Plan will be prepared that describes WDNR's best management practices that will be used on-site for erosion control. Wisconsin Construction and Post-Construction technical standards will be followed to develop a Construction Site Erosion Control Plan as required under s. NR 216.46(1), Wis. Adm. Code.

Coverage under the general construction permit will remain in effect for three years. If the phased remediation work is not completed within three years, the City will apply for a permit renewal. Once the remediation work is complete and the site has been stabilized, the City will submit a Notice of Termination to the WDNR.

In addition to completion of the WRAPP, the selected excavation contractor will submit a City of Kenosha Application for Erosion Control. The City of Kenosha Erosion Control Permit Application will document that Chapter XXXIII of the Code of General Ordinances of the City of Kenosha regarding erosion control will be implemented as part of the intended remedial actions.

4.1.3 Site Security and Fencing

For purposes of site security, the existing perimeter chain link fence will remain during performance of the remedial actions. In areas where an excavation encroaches upon the existing fencing, temporary or replacement fencing may be utilized. Additionally, temporary fencing measure may also be utilized within the existing fenced area to isolate open excavations and or material stockpiles. It is anticipated that the perimeter fencing will remain throughout implementation of both the soil and groundwater remediation activities and/or until site redevelopment activities are initiated. As phases of remediation are completed portions of the fencing may be removed if appropriate; however, the perimeter around the unremediated areas will remain intact.

4.1.4 Traffic Control Plan

No closures of the public roadways are expected for this work. Truck traffic will enter/exit the primary work area via the gated entrance at 26th Avenue and 52nd Street. Access to CS1 will be via the gated entrance on 60th Street. Details describing the traffic control measures, truck routes, and pedestrian walkway controls/routes, as necessary are will be included in the project plans and specifications that will be developed for the various phases of excavation.

4.1.5 Public Walkway Closures

During implementation of the construction activities, it is anticipated that select sections of sidewalk along 52nd Street, 60th Street, and 30th Avenue may be necessary when concrete removal activities and/or sections of the excavations extend to the property boundary. Concrete traffic barriers may be placed on the sidewalk adjacent to the excavation areas to provide a safety barrier between the excavation and the public roadways.

A temporary sidewalk closure will be needed and a Street Occupancy Permit will be obtained, as appropriate from the City of Kenosha – Department of Public Works and comply with the Code of General Ordinances Chapter 5.04. Barricades and notification signs will be placed within the walkways to alert pedestrians approaching the construction area. Details describing the temporary pedestrian walkway closures, locations of barricades, and required signage will be incorporated into the project plans and specifications that will be developed for the various phases of excavation.

4.1.6 Waste Profiling

Prior to performance of the phased excavation, the required waste profile and disposal agreements will be secured. As needed, representative soil samples will be collected to allow for the material to be characterized for waste disposal purposes. The soils samples will be submitted for various laboratory analyses as required by the landfill and based on the known characteristics of the areas identified for excavation. The laboratory tests may include TCLP of the eight Resource Conservation and Recovery Act metals (arsenic, barium, chromium, copper, lead, mercury, silver, and selenium) and various volatile and semi-volatile organic compounds, PCBs, diesel range organics, gasoline range organics, and general chemistry parameters such as paint filter test, pH, total phenols, total chlorine, and percent moisture.

4.2 Ambient Air Monitoring

During excavation activities and removal of impacted soil from the KEP, perimeter ambient air monitoring will be conducted as appropriate. The perimeter air-monitoring program will be planned to help protect the public from potential exposure to VOCs and particulate matter, evaluate the effectiveness of, and need for, vapor and/or dust suppression control, and to document ambient air quality during the construction activities.

The goal of the monitoring program is to provide warnings of short-term exposure levels during construction activity, and as such, monitoring locations and frequency will be determined in consideration of the proximity of remedial activities to local residents and other sensitive receptors (*e.g.,* businesses, public rights-of-way, etc.) and predominant wind directions. Monitoring will be conducted using portable hand-held devices. Action levels will be established in the site specific health and safety plan referenced in Section 4.1.1.

The measurement of total VOC levels will be accomplished by using calibrated photo ionization detectors (ppb Rae or equivalent). The detection limit is dependent on the compound and conditions but is approximately one part per million by volume (ppmv). The air monitoring equipment will be calibrated using manufacturers guidelines and protocol at the beginning of each work day and the results of each calibration will be documented in a project field log book.

4.3 Excavation

The accessible impacted source soil in the areas identified for removal will be excavated and hauled off-site for disposal at a WDNR-approved solid waste recycling and disposal facility (RDF). Thirty-seven separate areas have been identified within CS1 through CS8 and CS10 for excavation. The excavation effort focuses on those areas were LNAPL is present or soil sample analytical data is indicative of significant concentrations within the unsaturated zone. VOC impacted soil with industrial direct contact RCL exceedances or multiple PAH industrial direct contact exceedances will also be excavated. PCB impacted soil identified CS4, CS5, and CS10 will also be removed, but will be managed as a separate remediation work plan that will be reviewed and approved by both USEPA and the WDNR. The excavation depths will vary by area but are expected to range from 4 to 12 feet below current grade.

The areas identified for excavation are shown on Figure 4 and are labeled as E1 through E37. The excavation areas were numbered for a consistent reference to a specific area because of the potential for the excavations to be conducted in phases; phases that have yet to be defined and will be dependent upon funding availability. Each excavation label also provides a letter used as an indication why the area was selected for excavation. The letter designations are:

- L - The presence of LNAPL or elevated petroleum concentrations (i.e., E5L);
- T - An area where TCE concentrations are above the selected criteria (i.e.,E2T);
- P – Areas with PCBs (i.e., E23P);
- M - An area with metals above the selected criteria (i.e. E19M); and,
- B – Areas where more than one impact is present (i.e., E22B).

Table 1 provides additional information regarding the relative size and anticipated depth of each excavation area and the rationale for the excavation. Actual excavation dimensions and locations may vary depending on subsurface condition encountered and/or additional data that is obtained.

Excavation of the impacted soil will be performed with a backhoe or other earth moving equipment, and the soil will be immediately loaded onto trucks and hauled to the RDF. Staging or stockpiling of the excavated impacted soil, if required, will be kept to a minimum. If staging of soil is required, the material will be placed within the excavation footprint, where possible, and managed accordingly to minimize dust and/or runoff. The sidewalls will be banked and/or sloped sufficiently to provide for stable excavation walls and to allow excavation equipment access and egress into and out of the excavation as it proceeds. In areas where the excavation may abut existing active utilities and or pavement/sidewalk that is to remain, additional protective measures will be employed. Concrete foundations, abandoned piping and other subsurface features

remaining from the historic site operations are expected to be encountered during the excavation work. Where practicable, these subsurface obstructions will be removed to facilitate access to impacted soil. Subsurface obstructions that cannot be reasonably removed during the excavation will be documented using GPS or other means.

4.3.1 Utilities

There are a number of known active and inactive utilities located at the KEP. The primary active utilities at the KEP as shown on Figure 3 include:

- overhead power transmission lines (north to south) on the east side of the KEP,
- overhead power distribution lines that traverse the site from north to south located in the center of the KEP;
- underground electric that extends across the northwest corner of the KEP from 30th Avenue to the north stormwater lift station;
- site-wide storm sewers;
- subsurface piping associated with the groundwater recovery systems; and
- three active sanitary discharge lines associated with the groundwater recovery systems.

Other utilities that served the KEP during its active operations such as potable water, fire-suppression water lines, internal sanitary sewers, internal underground electrical and former subsurface process piping were not removed from the site. Sanitary sewers (except as noted above) and potable water were cut and capped at the property boundary in conformance with City of Kenosha ordinances. As the excavation plans and specifications are developed for the various excavation phases, the specific utilities that may be encountered in a given excavation area will be identified. Active utilities that are to remain will be protected during performance of the excavation activities. Abandoned utilities may be removed, if encountered during the excavation activities, or they may be capped and left in place.

4.3.2 Groundwater Monitoring Well Abandonment

During excavation activities, select water table groundwater monitoring wells and deeper piezometers, if located within the excavation area will be removed. Additional wells located outside the excavation area may also be removed as the existing concrete floors are removed throughout the KEP. The plans and specifications that will be developed for the various phases of excavation will identify the wells to remain and those that need to be protected during the performance of the work. The wells, if abandoned, will be abandoned in accordance with WAC Chapter NR141 and all required WDNR well abandonment forms will be included in the Soil Remedial Action Completion Report submittal, which is discussed further in Section 5.2.

4.3.3 Concrete Building Foundation and Asphalt Parking Lot Removal

As a follow-up to the previously-conducted KEP demolition activities, concrete building foundations and associated paved surfaces will be removed to facilitate access to the excavation areas. Concrete and asphalt surfaces outside of the excavation areas will likely also be removed as the remediation efforts progresses in each CS areas to allow site grading for temporary capping until redevelopment occurs. Concrete thicknesses across the KEP vary from approximately 6 inches to several feet. Any subgrade structures that can't be reasonably removed during the remediation activities will be mapped for future reference during site development.

The removed concrete will be stockpiled on site in an area identified by the City of Kenosha. At some point as part of site development, the City of Kenosha intends to bring in a concrete crusher to crush the concrete for recycling on-site. The crushed concrete will most likely be used on-site for roadways that will dissect the property. Concrete that is heavily stained (based on visual observations) from historical KEP operations will be segregated and disposed as described in Section 4.4.1.

4.4 Waste Management

4.4.1 Site Clearing

Stained concrete that is segregated during the concrete removal activities described in Section 4.3.3 will be stockpiled separately and will not be mixed with concrete that is planned for crushing and future reuse. The stained concrete and other materials will be handled separately from the excavated soils and will be recycled at a local WDNR-approved construction/solid waste recycling facility.

Other segregated waste materials will be accumulated and temporarily stored in a designated area in a manner appropriate for each material type in accordance with applicable federal and state laws and regulations. Potentially contaminated waste materials will be handled in the same manner as materials that are known to be contaminated. Liquids that may be encountered during removal of abandoned piping will be stored in containers on site until the material is characterized and disposed.

4.4.2 Soil Hauling and Disposal

The soil excavated from the KEP will be loaded onto trucks and hauled to a WDNR approved solid waste disposal and/or recycling facility. Either an existing waste profile or a newly established waste profile will be used depending on the excavation location and nature of impacts. The soil hauled off-site for disposal will be covered and absent of any free liquids.

Based on currently available information, it is anticipated that excavated VOC, PAH and metals impacted soil will be transported off-site for treatment/disposal at a Subtitle D landfill. Based on the site investigation, the remedial excavations conducted to-date and the plan to collect waste characterization samples for each of the excavation phases, the generation of hazardous waste is not anticipated.

4.4.3 Excavation Dewatering/Contact Water Management

The excavations are designed to extend to varying depths through the unsaturated soils with select excavations extending to approximately 2 feet into the groundwater table, which consists primarily of fine–grained soils that do not yield a significant volume of water. As such, excavation dewatering will not be conducted; the excavation depth will be limited if groundwater enters the excavation to the degree where the excavated soil would be saturated.

When necessary, the construction contractor will take measures to prevent the drainage of storm water runoff from entering the excavation by constructing temporary soil berms and covering them with plastic sheeting to minimize runoff. If a substantial amount of stormwater enters the excavation from a significant rainfall event, the construction contractor will remove any accumulated water from the excavation and arrange for disposal to the city sanitary sewer system. The water pumped from the excavation may be temporarily stored in a frac/poly tank or plastic totes for sediment filtering and removal prior to discharging to the city sewer system in accordance with the city's discharge permit requirements.

4.5 Soil Remediation Verification Sampling

During the removal of impacted soil and prior to commencing backfilling activities, the soil at the limits of the excavation will be sampled to document mass removal and assess residual soil concentrations. In those

excavations that extend to below the water table, saturated samples will be collected from the base of the excavation to document mass removal.

4.5.1 Sampling Locations and Collection Methods

Samples will be collected approximately every 50 feet from the excavation walls (mid-point) and excavation bottoms. The number of samples will vary based on the size of each individual excavation, with a minimum of 4 sidewall samples and one bottom sample per excavation. The anticipated sample locations will be included in the plans and specifications that will be developed for each phase of the excavation work.

Sampling of the shallow excavation sidewalls may be performed using a decontaminated stainless steel soil core sample, which will be manually advanced into the soil at predetermined locations along the excavation sidewalls. Due to accessibility/site safety issues, samples collected from the deeper excavations will be collected from soil taken from representative locations using the backhoe bucket.

4.5.2 Analytical Parameters

Post-excavation soil samples will be analyzed at a Wisconsin Certified Laboratory using Analytical Method SW846 Method 8260 for VOC analysis and SW846 Method 8270 for PAH compounds. Soil samples collected from excavations conducted for metals or PCBs will be analyzed for PCBs (SW-846 8082) or metals (SW-846 8010 or 8020) depending on the primary impacts in that area of the site.

4.6 Excavation Backfilling

Following excavation, backfill material will be placed into the excavation. Where available, on-site sources will be utilized to provide the backfill material. These sources include the berm soil located in CS1, CS6, CS7, and CS8, cut soils resulting from site grading, and the stockpiled soil currently staged in CS9 from Southport Beach. Additional soil from an off-site source will be necessary. In accordance with WDNR guidance, an assessment will be made of off-site soil proposed for use as backfill.

The backfill material (whether from an off-site or on site source) will be placed in 12-inch lifts and compacted with a vibratory roller after each lift to minimize settlement. The backfill material will be graded to an elevation as designated in the temporary grading plan. Grading details will be included in the plans and specifications that are developed as the various excavation phases are implemented.

4.7 Temporary Capped Areas

Select areas of the site have been identified for temporary capping until the site is redeveloped. The temporary caps will primarily consist of six inches of clean soil and vegetative cover. This temporary cap could later be replaced with pavement and/or buildings depending on future site redevelopment activities. In some instances, the existing paved surface may utilized as a temporary cap until the time of site redevelopment. The areas identified for capping are shown on Figure 4 and are designated as C38 through C45.

4.8 Site Restoration

The primary objective of site restoration will be to restore the KEP surface grade to match surrounding topography and create an acceptable drainage pathway that will not result in soil loss or erosion. The work will be performed in accordance with the pre-development grading plan that is being developed for the KEP. Details regarding the grading plan and site restoration activities will be provided in the project plans and specification that will be developed for each phase of the proposed excavation work. In general, the disturbed areas will be graded and seeded following completion of the source area soil remediation and

pavement removal activities to provide uniform runoff of surface water and prevent erosion of final surface soil. The following specific activities are anticipated to be completed in all areas of newly exposed soil as part of this task:

- Four to six inches of clean topsoil will be placed over the exposed area after final grading is complete.

- Seeding will be conducted in accordance with WDNR Construction Site Erosion & Sediment Control Standard, No. 1059. Seeding in designated areas will be thoroughly combined and evenly distributed.

- Seeding will be completed when weather conditions are suitable, in the periods between April 1 and June 30, or between September 15 and October 30. Seeding outside these timeframes can be conducted as directed and guaranteed by the seed supplier. Common Seed Mix (WDOT No. 40) will be applied at a rate of 2.0 pounds per 1,000 square feet.

- Mulching will be conducted at a rate of 90 pounds per 1,000 square feet per WDNR Construction Site Erosion and Sediment Control Standard No. 1058.

- New seeding will be watered, as needed, to maintain soil moisture for a minimum of two weeks after seeding. The water will be applied at a rate that does not result in soil erosion or runoff.

If weather or other unforeseen delays prevent implementation or completion of the Site restoration activities based on permanent seeding time periods, then the final site restoration activities (seeding and mulching) will be completed at the beginning of the next growing season.

5.0 Documentation and Reporting

5.1 Field Documentation

Remediation activities will be documented in a field logbook or on designated field sheets that will be maintained in the project file. Included in the daily documentation are:

- Procedures for air monitoring and other routine activities associated with the soil corrective action activities;
- Personnel working on the Site;
- Chronological log of site activities;
- Daily tailgate meeting and site safety briefing summaries;
- Site visitors log;
- Log of the excavation area completed on a daily basis and the number of truck loads;
- Any mitigation measures used to control fugitive dust, vapors, and/or odors; and,
- Other pertinent sample collection data and/or field/weather observations.

5.2 Soil Remedial Action Documentation

Upon completion of the source area soil remediation activities, data evaluation, and receipt of the soil remediation verification analytical results, a Soil Remedial Action Documentation Report to WDNR in accordance with NR 724. It is anticipated that separate reports will be prepared for the various phases of the excavation work. The Soil Remedial Action Documentation Report will summarize the on-site cleanup activities and describe the work completed, dates of completion, field observations, results from verification samples, quantities of materials removed, certificates of waste disposal, and well abandonment documentation.

6.0 Implementation Plan

Following is a listing of the primary tasks that will be implemented as part of the soil remedial action. As referenced previously, both the soil and groundwater remedial measures will be implemented in phases based on available funding sources and future site redevelopment plans. Based on the phased implementation of the soil remedial design, the following provides a general implementation plan:

- Identify available funding sources for soil remediation
- Determine excavation phase based on available finding
- Prepare project plans and specifications for identified phase
- Issue public bids
- Receive/evaluate bids
- Select remediation contractor and negotiate contract
- Conduct site preparation, excavation, and site restoration activities
- Prepare and submit phase specific Soil Remedial Action Documentation Report

It is anticipated that the Soil Remedial Action Documentation Report prepared for each phase of the work will be submitted approximately 60 days following receipt of soil excavation confirmation samples. Phase specific project plans and specifications, engineer's estimates, and project timelines will be prepared based on the identification of available funding.

7.0 Reference

AECOM March 2015, *Site Investigation Report*, Former Kenosha Engine Plant

AECOM April 2015, *Remedial Action Options Report*, Former Kenosha Engine Plant

City of Kenosha, 2015, Chapter XXXIII Code of General Ordinances

Wisconsin Department of Natural Resources, June 2003, Mulching for Construction Sites (1058), Conservation Practice Standard

Wisconsin Department of Natural Resources, November 2003, Seeding (1059), Conservation Practice Standard

Wisconsin Department of Transportation, December 2014, Section 630 Seeding, 2015 Standard Specifications

List of Tables

Table 1
KEP Excavation Locations and Rationale for Soil Removal
Kenosha Engine Plant

KEP Excavations													
			GPS Coordinates				Soil Concentration						
CS	Excavation Label	Number	X	Y	Estimated Volume (cy)	Sample Location(s)	TCE (µg/kg)	DRO (mg/kg)	Benzene (µg/kg)	Total PVOCs (µg/kg)	Total PAHs (µg/kg)	Measurable LNAPL (ft)	Groundwater ES Exceedances and General Comments
CS6	E1L	1	2580413.657	221723.0986	307	PZ-609	82.4	Not Tested	No Exceedance	Non Detect	153,470	0	PCE also detected in soil. No ES Exceedances
		2	2580462.156	221723.0986									
		3	2580462.156	221680.6186									
		4	2580413.657	221680.6186									
	E2T	1	2580476.85	221759.9148	11,077	MW-610	Not Tested	Not Tested	Not Tested	Non Detect	Not Tested	0	TCE
		2	2580773.448	221759.9148		PZ-610	42.1	Not Tested	No Exceedance	No Exceedance	1,428	0	PCE also detected in soil. No ES Exceedances
		3	2580773.448	221790.5165		GP-637	6,740. Daughter products present.	Not Tested	No Exceedance	Non Detect	33,677	0	Not Tested. Black staining at 4.5 ft bgs
		4	2580807.579	221790.5165		GP-641	No Exceedance	Not Tested	No Exceedance	No Exceedance	11.2	0	Not Tested
		5	2580807.579	221687.7134		GP-642	No Exceedance	Not Tested	No Exceedance	No Exceedance	Non Detect	0	Not Tested
		6	2580476.85	221687.7134		GP-643	6350	Not Tested	No Exceedance	No Exceedance	Non Detect	0	PCE also detected in soil.
	E3L	1	2580924.414	221750.0272	2,810	MW-650	83.5	Not Tested	No Exceedance	Non Detect	46,045	0	No ES Exceedances
		2	2581004.464	221750.0272									
		3	2581004.464	221671.0608		GP-639	1,920	Not Tested	No Exceedance	Non Detect	1,007,250	0	PCE detected in soil.
		4	2580924.414	221671.0608									
	E4L	1	2581049.31	221793.0172	4,419	MW-651	No Exceedance	Not Tested	477	44,590	79	0	Benzene, Ethylbenzene, total Xylenes. Black staining at 8 and 10 ft bgs and odor
		2	2581172.559	221793.129		MW-602	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	1.17	1,2,4-trimethylbenzene, Benzene, Toluene, Ethylbenzene, Total Xylenes
		3	2581173.88	221695.6651		PZ-602	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	0	No ES Exceedances
		4	2581094.197	221695.6651		MW-652	No Exceedance	Not Tested	786	89,610	Non Detect	0	Benzene, Toluene. Slight to moderate odor from 5 to 10 ft bgs. PID readings
		5	2581050.41	221752.3495									
	E5L	1	2580533.538	221428.1347	51	GP-617	No Exceedance	Not Tested	1,740	186,620	90,321	0	Naphthalene detected in soil.
		2	2580555.779	221428.1347									
		3	2580555.779	221412.7438									
		4	2580533.538	221412.7438									
CS5	E6T	1	2581005.284	221101.2362	769	MW-508	949. Daughter products present.	Not Tested	No Exceedance	No Exceedance	89.5	0	TCE, cis-DCE, VC. Foundry sand at 4 ft bgs and slight odor at 5.5 ft bgs
		2	2581045.449	221101.2362		GP-528	887. Daughter products present.	Not Tested	No Exceedance	No Exceedance	129	0	Not Tested
		3	2581045.449	221058.1429									
		4	2581005.284	221058.1429									
	E7T	1	2580483.632	220990.5232	3,533	MW-504	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	0	TCE
		2	2580591.068	220990.5232		PZ-504	1,110	Not Tested	No Exceedance	No Exceedance	68.2	0	VC
		3	2580591.068	220916.5311		GP-516	1,910. Daughter	Not Tested	No Exceedance	27.8	17,786	0	cis-DCE, VC
		4	2580483.632	220916.5311									
	E8T	1	2580458.995	220851.975	1,835	MW-503	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	0	TCE, cis-DCE
		2	2580533.789	220851.975									
		3	2580533.789	220796.7635		PZ-503	11400	Not Tested	No Exceedance	No Exceedance	46.5	0	VC. PID readings around 27 at 11 ft bgs
		4	2580458.995	220796.7635									
	E9P	1	2580418.838	220650.5066	122	Transformer Pad	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	0	Not Tested
		2	2580490.001	220650.5066									
		3	2580490.001	220638.9443									
		4	2580418.838	220638.9443									
	E10T	1	2580666.158	220653.2452	8,018	MW-554	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	0	TCE, cis-DCE, trans-DCE, VC
		2	2580993.502	220663.728		PZ-554	231000. Daughter products present.	Not Tested	No Exceedance	No Exceedance	Not Tested	0	No ES Exceedances. Foundry sand at 4 ft bgs and PID readings around 25 at 12 ft bgs.
		3	2580993.502	220608.6509		MW-555	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	0	TCE, cis-DCE, trans-DCE
		4	2580666.158	220598.1681		PZ-555	6120. Daughter products present.	Not Tested	No Exceedance	No Exceedance	Not Tested	0	VC. Foundry sand at 4 ft bgs and PID readings around 25 at 12 ft bgs.

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CS7	E11T	1	2581284.908	221059.1091	5,328								
		2	2581425.916	221059.1091									
		3	2581425.916	221099.6505		MW-27B	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	0	TCE
		4	2581504.546	221099.6505		GP-719	1,080	35	No Exceedance	Non Detect	140	0	VC
		5	2581504.542	221019.0448		GP-730	105,000	Not Tested	No Exceedance	Non Detect	Not Tested	0	Not Tested. Tar-like at 1.5 ft bgs with a strong odor. PID readings 3550 at 3 ft bgs.
		6	2581284.908	221019.0496									
	E12T	1	2581589.712	221175.1113	3,357	MW-27E	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	0	TCE, cis-DCE, VC. Moth ball like odor from 2 to 9 ft bgs
		2	2581630.424	221206.6161		P-27	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	0	VC
		3	2581721.544	221091.6196		MW-27A	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	0	No ES Exceedances
		4	2581680.832	221060.1148									
CS8	E13T	1	2581521.817	220834.2636	609	MW-805	851	Not Tested	No Exceedance	Non Detect	Not Tested	0	TCE, VC in GW
		2	2581555.53	220834.2636									
		3	2581555.53	220793.6061									
		4	2581521.817	220793.6061									
	E14L	1	2581497.489	220380.9824	1,447	MW-803	No Exceedance	121	14,400	673,070	150	0	Naphthalene detected in soil. Benzene, Ethylbenzene, Total Xylenes, Naphthalene in GW. PID readings at 1700 from 8 to 10 ft bgs
		2	2581560.144	220380.9824									
		3	2581560.144	220329.0169									
		4	2581497.489	220329.0169									
CS3	E15T	1	2580272.498	220588.2277	239	PZ-315	1,710. Daughter products present.	Not Tested	35	No Exceedance	519	0	TCE, cis-DCE, VC
		2	2580308.367	220588.2277									
		3	2580308.367	220543.2386									
		4	2580272.498	220543.2386									
	E16T	1	2580310.084	220588.0468	909	GP-334	1,430	Not Tested	No Exceedance	No Exceedance	519	0	Not Tested. PID readings around 100 ppm at 12 ft bgs
		2	2580386.668	220588.0468									
		3	2580386.668	220561.327									
		4	2580310.084	220561.327									
	E17T	1	2580440.873	220380.677	5,318	PZ-316	5,590. Daughter products present.	Not Tested	No Exceedance	No Exceedance	8,456	0	No ES Exceedances
		2	2580517.22	220380.677		MW-302	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	0	TCE, cis-DCE, trans-DCE, VC
						PZ-302	242. Daughter products present.	27	No Exceedance	No Exceedance	9,748	0	TCE, cis-DCE, trans-DCE, VC
		3	2580517.22	220223.9712		GP-335	1,130. Daughter products present.	Not Tested	No Exceedance	No Exceedance	79	0	Not Tested. Black staining at 10 ft bgs
		4	2580440.873	220223.9712		GP-336	4,850. Daughter products present.	Not Tested	No Exceedance	No Exceedance	685	0	Not Tested
	E18T	1	2580614.152	220194.6156	815	MW-319	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	0	TCE, cis-DCE, trans-DCE, VC
		2	2580703.883	220194.6156		PZ-319	43.6. Daughter products present.	Not Tested	No Exceedance	1,482	21,121	0	TCE, cis-DCE, trans-DCE VC
		3	2580703.883	220133.3203									
		4	2580614.152	220133.3203									
	E19M	1	2580537.365	220096.6567	194	MW-307	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	0	TCE, cis-DCE, VC
		2	2580574.717	220096.6567		PZ-307	No Exceedance. Daughter products present.	16	No Exceedance	271	843	0	TCE, cis-DCE, trans-DCE, VC
		3	2580574.717	220061.6548									
		4	2580537.365	220061.6548									
	E20B	1	2580650.306	219927.143	2,122	MW-351	1,080. Daughter products present.	Not Tested	No Exceedance	No Exceedance	Not Tested	1.83	VC. Odor from 5 to 10 ft bgs
		2	2580713.645	219927.143									
		3	2580713.645	219851.7738									
		4	2580650.306	219851.7738									

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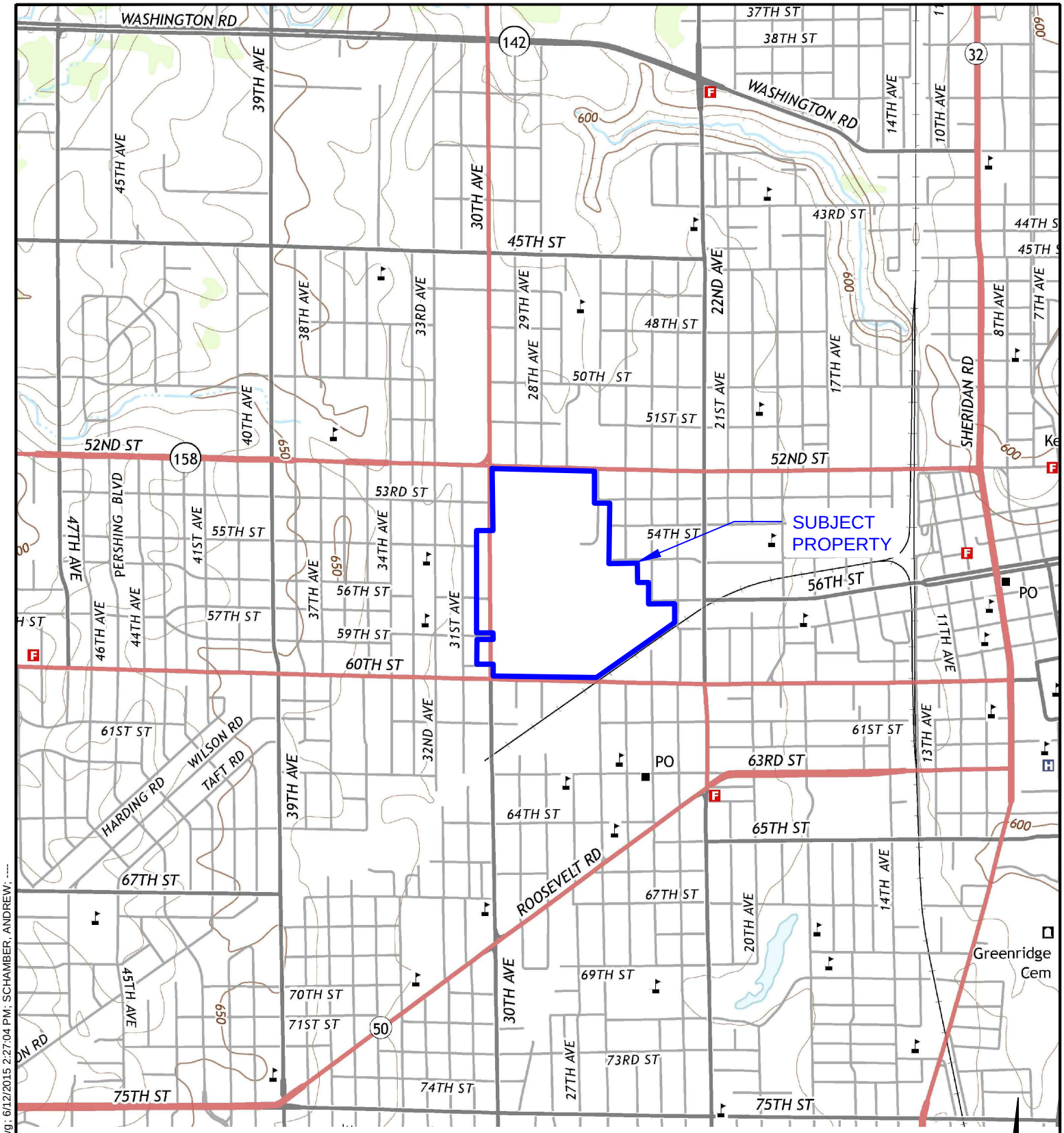
CS3	E21T	1	2580651.421	219663.9309	6,694	MW-311	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	0	VC
		2	2580755.378	219757.6273		PZ-311	523. Daughter products present.	94	No Exceedance	1,477	3,333	0	VC
		3	2580724.376	219793.8015		GP-330	1,190. Daughter products present.	6,020	No Exceedance	No Exceedance	1,490	0	Not Tested
		4	2580774.601	219837.7061		GP-333	1,610. Daughter products present.	781	35	1,992	9	0	Naphthalene detected in soil. PID readings around 20 ppm at 10 ft bgs
		5	2580844.08	219755.7057		GP-340	1,220	Not Tested	No Exceedance	No Exceedance	3073	0	Naphthalene detected in soil.
		6	2580714.845	219640.8544		GP-341	532. Daughter products present.	Not Tested	65	582	No Detects	0	Naphthalene detected in soil. PID readings around 20 ppm at 6 ft bgs
		7	2580670.378	219640.8544									
CS4	E22B	1	2580745.709	220555.2171	4,882								
		2	2580800.109	220555.2172									
		3	2580800.109	220547.3346		GP-322	31800	6380	No Exceedance	128600	7468.3	0	Benzene, cis-DCE, VC. Naphthalene present in soil. PID readings around 450 at 12 ft
		4	2580864.399	220451.8614		MW-350	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	0.71	Benzene, cis-DCE, VC
		5	2580766.526	220547.3346		PZ-350	No Exceedance	Not Tested	730	86070	Not Tested	0	cis-DCE, VC. Moderate odor and staining 10 ft bgs
		6	2580766.526	220451.8614		GP-449	No Exceedance	Not Tested	No Exceedance	No Exceedances	No Exceedances	0	Not Tested
		7	2580766.526	220489.1504									
		8	2580745.709	220489.1504									
	E23P	1	2580805.649	220437.1795	3,485	MW-72	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	0	cis-DCE, trans-DCE, VC
		2	2580870.097	220437.1795		PZ-72	No Exceedance. Daughter products present.	Not Tested	No Exceedance	No Exceedances	358	0	cis-DCE, trans-DCE, VC. Naphthalene present in soil.
		3	2580870.097	220315.5013		MW-413	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	0	cis-DCE, VC
		4	2580805.649	220315.5013		PZ-413	No Exceedance	Not Tested	No Exceedance	4,970	Not Tested	0	cis-DCE, VC. Moderate odor at 9 ft bgs.
						GP-422	444. Daughter products present.	Not Tested	No Exceedance	No Exceedances	92	0	Not Tested
	E24B	1	2581025.598	220428.1495	8,912	MW-419	6,150. Daughter products present.	Not Tested	No Exceedance	No Exceedances	No Exceedances	0	Benzene, TCE, cis-DCE, VC
		2	2581137.898	220428.1495		MW-75	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	0	Benzene, cis-DCE, VC. PID readings around 311 ppm at 10 ft bgs
		3	2581137.898	220510.5917		PZ-75	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	0	VC
		4	2581172.03	220510.5917		MW-406	No Exceedance	Not Tested	926	29,100	2,231	0	Naphthalene present. PID readings around 1450 ppm at 4 ft bgs and around 1900 ppm at 9 ft bgs
		5	2581172.03	220232.989		MW-420	No Exceedance	Not Tested	718	308,820	No Exceedances	0	Naphthalene present in soil. Strong odor throughout with PID readings around 1200 from 5 to 7 ft bgs
		6	2581110.483	220232.989		GP-421	No Exceedance	Not Tested	No Exceedance	No Exceedances	140	0	Not Tested
		7	2581110.483	220366.5887									
		8	2581025.598	220366.5887									
	E25T	1	2580841.676	220141.0307	920	MW-410	1240. Daughter products present	Not Tested	No Exceedance	No Exceedances	Not Tested	0	1,2,4-trimethylbezne, 1,3,5-trimethylbenzene, benzene, ethylbenzene, toluene, total xylenes, MTBE, naphthalene
		2	2580875.39	220141.0307		GP-424	1,680. Daughter products present	Not Tested	No Exceedance	No Exceedances	898	0	Not Tested. PID readings at 18 at 3.5 ft bgs
		3	2580875.39	220079.6494									
		4	2580841.676	220079.6494									
	E26L	1	2581057.49	220148.6918	4,400	MW-416	No Exceedance	Not Tested	No Exceedances	801,100	93,900	0	Naphthalene present in soil. PID readings at 1450 at 11 ft bgs
		2	2581182.705	220148.6918		GP-426	No Exceedance	Not Tested	No Exceedance	33,280	17,101	0	Not Tested. PID readings around 1300 from 4.5 to 8.5 ft bgs
		3	2581057.49	220069.634									
		4	2581182.705	220069.634									
	E27L	1	2580819.56	220006.6246	1,476	MW-417	No Exceedance	Not Tested	No Exceedance	540,500	631	0	VC. Naphthalene present in soil. PID readings at 210 at 7 ft bgs
		2	2580873.396	220006.6246									
		3	2580873.396	219944.9527									
		4	2580819.56	219944.9527									

Table 1
KEP Excavation Locations and Rationale for Soil Removal
Kenosha Engine Plant

KEP Excavations													
			GPS Coordinates				Soil Concentration						
CS	Excavation Label	Number	X	Y	Estimated Volume (cy)	Sample Location(s)	TCE (µg/kg)	DRO (mg/kg)	Benzene (µg/kg)	Total PVOCs (µg/kg)	Total PAHs (µg/kg)	Measurable LNAPL (ft)	Groundwater ES Exceedances and General Comments
CS2	E28L	1	2580783.5737	219636.7028	2,369	PZ-200	No Exceedance. Daughter products present	15,500	No Exceedance	1,687	7,145	0.00	CIS, VC
		2	2580864.2492	219636.7028		MW-200	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	0.28	CIS, VC
		3	2580864.2492	219570.6383									
		4	2580783.5737	219570.6383									
	E29T	1	2580661.8706	219636.7239	540	MW-203	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	0.00	VC
		2	2580741.9130	219636.7239		GP-213	718	2,430	No Exceedance	238	829	0.00	CIS, VC
		3	2580741.9130	219591.1703		GP-235	1,810	Not Tested	304	211	475	0.00	PID readings from 1.3 to 31.8 ppm
		4	2580661.8706	219591.1703									
CS2	E30L	1	2580630.7230	219523.7626	2,804	MW-201	No Exceedance	15,100	105	No Exceedance	28,194	0.00	CIS, VC, Benzene present in May 2014 but not in September 2014
		2	2580711.3986	219523.7626		GP-231	No Exceedance	117	274	No Exceedance	12,206	0.00	Slight odor with PID readings from 2.1 to 56.5 ppm
		3	2580711.3986	219445.5494		GP-232	No Exceedance	874	No Exceedance	No Exceedance	Not Tested	0.00	PID readings from 2.5 to 17.9 ppm
		4	2580630.7230	219445.5494		GP-233	No Exceedance	422	No Exceedance	No Exceedance	Not Tested	0.00	Odor with PID readings from 3.6 to 32.5 ppm
	E31L	1	2580931.2106	219419.3300	1,958	MW-204	No Exceedance. Daughter products present	8	No Exceedance	3,600	86,510	0.31	No ES Exceedances
		2	2580999.7545	219419.3300		GP-223	No Exceedance	9,810	48	386	14,362	0.00	Not Tested
		3	2580999.7545	219355.0618									
		4	2580931.2106	219355.0618									
	E32L	1	2580489.7345	219314.8735	3,229	MW-205	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	0.11	TCE
		2	2580608.7673	219314.8735		PZ-205	No Exceedance. Daughter products present	4,180	No Exceedance	44	8,476	0.00	No ES Exceedances
		3	2580608.7673	219253.8433		GP-227	No Exceedance	26,000	No Exceedance	233	9,182	0.00	No ES Exceedances
		4	2580489.7345	219253.8433									
CS10	E33T	1	2581373.95	219333.603	2,331	MW-63	Not Tested	Not Tested	Not Tested	Not Tested	Not Tested	0	cis-DCE, VC. PID readings around 20 at 12 ft bgs.
		2	2581422.542	219333.603		PZ-63	6,210. Daughter products present.	36	No Exceedance	Non Detect	17	0	Not Tested
		3	2581422.586	219225.6411									
		4	2581373.932	219225.6438									
	E34L	1	2581475.602	219533.0539	681	MW-1006	No Exceedance	Not Tested	No Exceedance	Non Detect	11	0.11	No ES Exceedances. PID readings around 80 from 7 to 9 ft bgs
		2	2581520.613	219533.0539									
		3	2581520.613	219499.0067									
		4	2581475.602	219499.0067									
	E35P	1	2581639.792	219310.8461	889	MW-1005	No Exceedance	4,590	No Exceedance	30	3,376	0	No ES Exceedances. PID readings around 40 at 9 ft bgs
		2	2581713.303	219364.7278									
		3	2581726.277	219347.0271									
		4	2581652.766	219293.1453									
CS1	E36L	1	2581203.254	219157.5852	38	GP-129	No Exceedance	Not Tested	No Exceedance	No Exceedance	14,957	0	Methylene Chloride detected in soil.
		2	2581225.09	219157.5852									
		3	2581225.09	219145.8352									
		4	2581203.254	219145.8352									
	E37L	1	2580926.169	218937.4515	9,418	GP-120	No Exceedance	Not Tested	No Exceedance	No Exceedance	2,278	0	Tetrachloroethane in GW
		2	2581171.284	218937.4515									
		3	2580939.196	218765.7026									

List of Figures



NOTES

1. TOPOGRAPHIC MAP FROM USGS:
   http://store.usgs.gov/b2c_usgs/usgs/maplocator/
   DATED 2013

1000 0 1000 2000
FEET

N

AECOM

1555 RiverCenter Dr
Milwaukee, WI 53212
414.944.6080
www.aecom.com

SITE LOCATION
KENOSHA ENGINE PLANT
CITY OF KENOSHA
KENOSHA, WISCONSIN

Drawn :	SAE	7/15/2014
Checked:	LLA	7/15/2014
Approved:	KWB	7/15/2014
PROJECT NUMBER	60328684	
FIGURE NUMBER	1	

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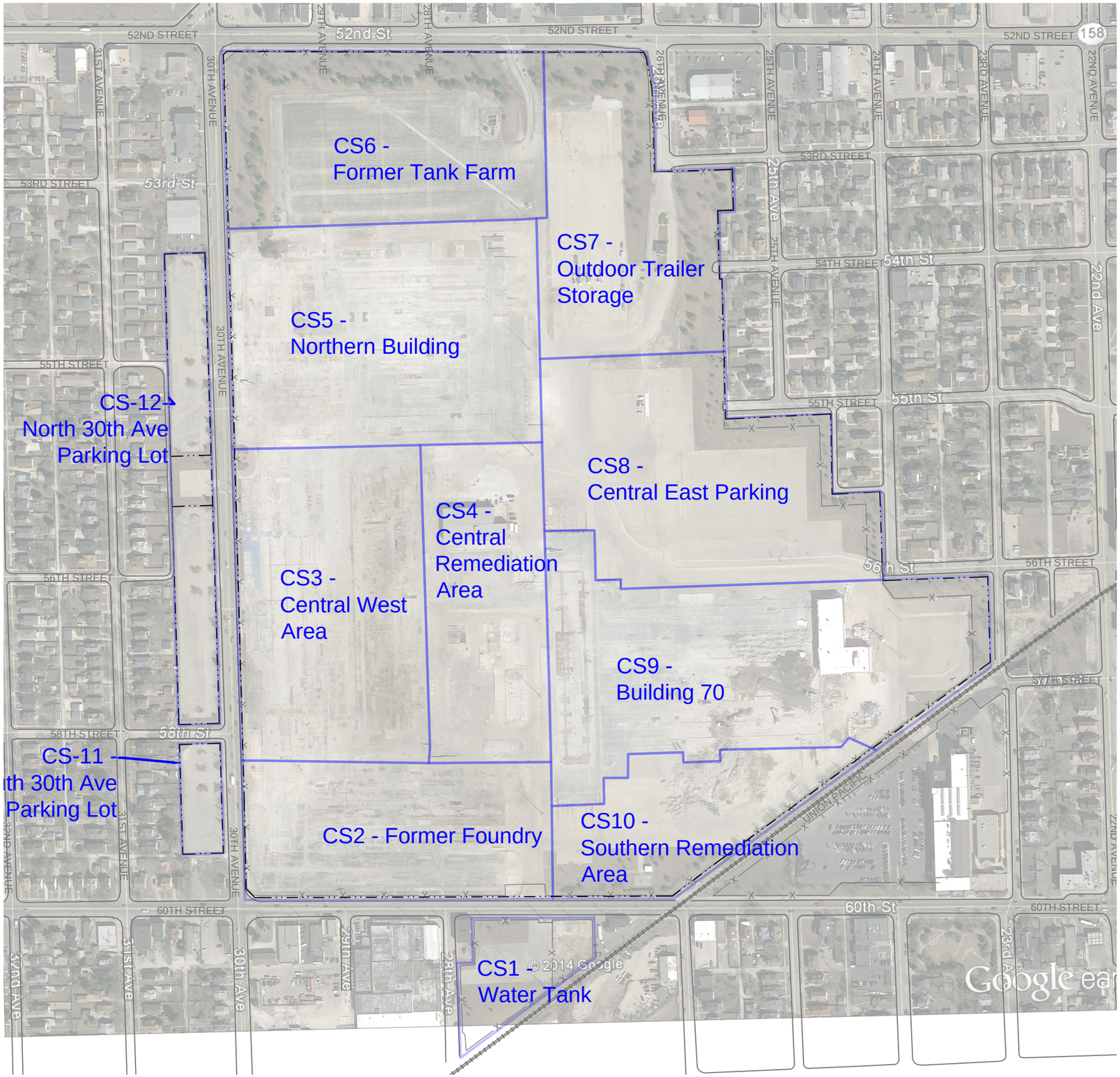

LEGEND

- APPROXIMATE SITE BOUNDARY
- RAILROAD
- EXISTING FENCE
- INVESTIGATION AREA

0' 320' 640'

SCALE

AECOM
1555 RiverCenter Dr
Milwaukee, WI 53212
414.944.6080
www.aecom.com

SITE LAYOUT
KENOSHA ENGINE PLANT
CITY OF KENOSHA
KENOSHA, WISCONSIN

Drawn :	SAE	10/28/2014
Checked:	LLA	10/28/2014
Approved:	KWB	10/28/2014
PROJECT NUMBER	60312487	
FIGURE NUMBER	2	

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LEGEND

- APPROXIMATE SITE BOUNDARY
- RAILROAD
- EXISTING FENCE
- BERMS
- EXISTING BUILDING FLOORS
- PRIOR EXCAVATION AREAS
- SUMP — EXISTING SUMP
- MW-XXX — EXISTING WATER TABLE MONITORING WELL (MW) OR PIEZOMETER (PZ)
- GP-XXX — GEOPROBE BORING
- GP-XXX — TEMPORARY WELL
- UTILITY LINES:
  - OVERHEAD ELECTRIC
  - UNDERGROUND ELECTRIC
  - STORMWATER
  - SUMP LINES

NOTES

1. LOCATION OF UTILITIES ARE APPROXIMATE.

SUMP 9A
SUMP 5
SUMP 4
SUMP 9
SUMP 6
SUMP 23
SUMP 18
SUMP 15
SUMP 17
SUMP 7

CS6 - Former Tank Farm
CS7 - Outdoor Trailer Storage
CS5 - Northern Building
CS8 - Central East Parking
CS4 - Central Remediation Area
CS3 - Central West Area
CS9 - Building 70
CS10 - Southern Remediation Area
CS2 - Former Foundry
CS1 - Water Tank
CS-12 North 30th Ave Parking Lot
CS-11 South 30th Ave Parking Lot

52ND STREET
53RD STREET
54TH STREET
55TH STREET
56TH STREET
57TH STREET
58TH STREET
60TH STREET
25TH AVENUE
28TH AVENUE
30TH AVENUE
31ST AVENUE
UNION PACIFIC

0 100
1" = 100'

CS AREAS
KENOSHA ENGINE PLANT
KENOSHA, WISCONSIN

Drawn :	ARS 5/18/2015
Checked:	LLA 5/18/2015
Approved:	KWB 5/18/2015
PROJECT NUMBER	60328684
FIGURE NUMBER	3

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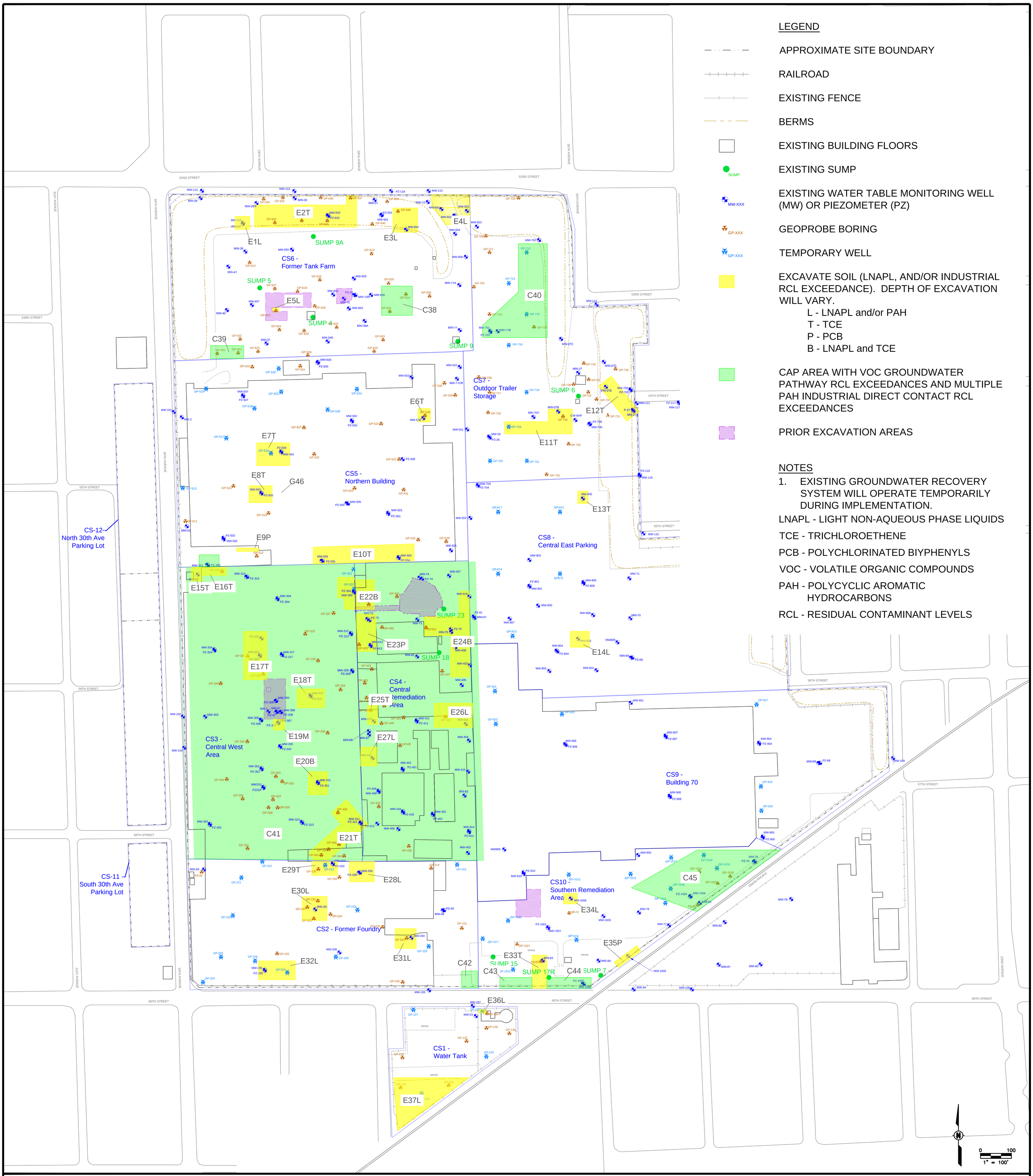

LEGEND

- APPROXIMATE SITE BOUNDARY
- RAILROAD
- EXISTING FENCE
- BERMS
- EXISTING BUILDING FLOORS
- SUMP — EXISTING SUMP
- MW-XXX — EXISTING WATER TABLE MONITORING WELL (MW) OR PIEZOMETER (PZ)
- GP-XXX — GEOPROBE BORING
- GP-XXX — TEMPORARY WELL
- EXCAVATE SOIL (LNAPL, AND/OR INDUSTRIAL RCL EXCEEDANCE). DEPTH OF EXCAVATION WILL VARY.
  - L - LNAPL and/or PAH
  - T - TCE
  - P - PCB
  - B - LNAPL and TCE
- CAP AREA WITH VOC GROUNDWATER PATHWAY RCL EXCEEDANCES AND MULTIPLE PAH INDUSTRIAL DIRECT CONTACT RCL EXCEEDANCES
- PRIOR EXCAVATION AREAS

NOTES

1. EXISTING GROUNDWATER RECOVERY SYSTEM WILL OPERATE TEMPORARILY DURING IMPLEMENTATION.

LNAPL - LIGHT NON-AQUEOUS PHASE LIQUIDS

TCE - TRICHLOROETHENE

PCB - POLYCHLORINATED BIYPHENYLS

VOC - VOLATILE ORGANIC COMPOUNDS

PAH - POLYCYCLIC AROMATIC HYDROCARBONS

RCL - RESIDUAL CONTAMINANT LEVELS

N

0 100
1" = 100'

SOIL REMEDIATION AREA LAYOUT
KENOSHA ENGINE PLANT
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Drawn :	ARS	5/18/2015
Checked:	LLA	5/18/2015
Approved:	KWB	5/18/2015
PROJECT NUMBER	60328684	
FIGURE NUMBER	4	