Remedy Implementation Work Plan
Soil and Groundwater Remediation

West Waterfront Redevelopment Project
92 and 100 East Maple Street
Sturgeon Bay, Wisconsin

Revision #2

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Remedy Implementation Work Plan

West Waterfront Redevelopment
92 and 100 E. Maple Street, Sturgeon Bay, Wisconsin

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October 5, 2015
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1.0 Introduction

The City of Sturgeon Bay retained Ayres Associates to perform environmental assessment activities and assist the City in implementing the requirements of a Community Development Block Grant (CDBG) and a Wisconsin Economic Development Corporation Site Assessment Grant (SAG) in December 2012 and February 2013, respectively. A Phase II Site Assessment was conducted at the site in May 2013. Based on results of the Phase II Assessment, an NR 716 Site Investigation was completed in July 2014. Additional NR 716 site investigation was performed, primarily at the 100 E. Maple site, in May 2015. Results of these investigations were submitted to the Department of Natural Resources (WDNR) under separate cover.

A Remedial Action Options Report (RAOR) was prepared in accordance with NR 722 Wisconsin Administrative Code to address environmental impacts detailed in the NR 716 Investigation Report. The RAOR contains an evaluation of a range of technically feasible options for restoration of the environment to comply with state and federal environmental laws to the extent practicable. The preferred remedial action considers the site and contaminant characteristics, surrounding environment, land-use restrictions, potential future uses, costs, and cleanup goals.

This document presents the Remedy Implementation Work Plan (RIWP) for construction of the engineered barrier, soil removal and disposal, and installation of the vapor barrier, as well as implementation of natural attenuation monitoring of the groundwater. This RIWP presents the quality assurance (QA) and quality control (QC) requirements and procedures to be followed during implementation of the remedy. The plan establishes responsibilities and authorities, defines polices and requirements, and provides for the performance and assessment of the work.

Facility History/Background

Refer to the Site History and Background section of the Remedial Action Options Report (June 2015), for detailed facility history and background information.

Project Description

Activities outlined in this document represent the remediation phase of the Brownfield development process for the Door County Coop (DNR BRRTS #03-15-000659), Door County Coop- Fill (DNR BRRTS #02-15-544253), Former Door County Coop – VPLE (DNR BRRTS #06-15-560738), Former US Coast Guard – Above OHWM (DNR BRRTS #02-15-563484), Former US Coast Guard- Above OHWM – VPLE (DNR BRRTS #06-15-563486) and limited portions of the Former US Coast Guard - Below OHWM (DNR BRRTS #02-15-563485) BRRTS cases located at 92 and 100 East Maple Street, Sturgeon Bay, Wisconsin. The initial phases included performing Phase I and Phase II Environmental Site Assessments (ESAs), which were predominantly fact-finding investigations. The Phase I and Phase II investigations were designed to provide the City of Sturgeon Bay, WDNR, and Ayres Associates the data necessary to assess the threat from potential contaminants, estimate costs for site redevelopment, and evaluate remedial options. Details of investigation activities are addressed in the Phase II ESA (Ayres Associates, 2013), the

NR 716 Site Investigation Report (Ayres Associates, 2014), and the NR 716 Investigation Report – Addendum (Ayres Associates, 2015). Remedial alternatives were evaluated in the Remedial Action Options Report (Ayres Associates, 2015).

A map of the redevelopment site located at 92 and 100 E. Maple Street is shown in Figure 1. Note that the hotel will be constructed on the parcel located at 92 E. Maple Street and a portion of the parcel located at 100 E. Maple Street that is above the ordinary high water mark (OHWM). All currently proposed private development activities (i.e. activities not open to public trust lakebed uses) on the 92 and 100 East Maple Street properties will occur above the OHWM (i.e. landward of the bulkhead area). Development activities associated with the Former US Coast Guard – Below OHWM (DNR BRRTS # 02-15-563485) BRRTS case will be handled separately and at a later point in time. The City will improve, but maintain ownership, of the land located below the OHM at 100 E. Maple Street.

In July 2014, subsequent to the completion of the Phase I Environmental Site Assessment, the City of Sturgeon Bay demolished all of the buildings at 92 and 100 East Maple Street with the exception of a grain elevator. The grain elevator was saved for possible redevelopment to highlight the areas' industrial past.

The 92 and 100 E. Maple Street site is being developed with a four-story, 19,420-square-foot hotel in which the building, driveways, and landscaping will all be integrated into a cap which will cover the entire parcel. A rendering of the proposed development showing elements of the proposed engineered cap is shown on Figure 2. The general project approach and sequencing for implementing the remedial alternatives at the site is outlined below:

- Prepare design plans and specification.
- Prepare bid package and let for bid.
- Select contractor and prepare contracts.
- Perform waste characterization and obtain necessary permits.
- Perform underground locate/clearance calls.
- Design and implement an effective dewatering system (if necessary).
- Abandon existing monitoring wells in development area, as necessary
- Mobilize equipment and personnel.
- Install geopiers within building footprint.
- Import structural fill to raise base-grade elevation
- Excavate target soil, as necessary, for utility trenches and pool.
- Relocate potentially impacted soil to designated fill areas (no on-site storage).
- Transport and dispose of excess soil and fill from utility trenches in an off-site landfill.
- Manage groundwater from excavation/boreholes, as necessary.

- Install vapor mitigation system under slab to prevent vapor intrusion.
- Remove dewatering system (if installed).
- Replace monitoring wells removed during development (if necessary)
- Perform post-remediation natural attenuation monitoring and reporting.

Contaminants of Concern and Exposure Routes

The primary contaminants of concern in soil include heavy metals (arsenic) and a subset of the semi-volatile organic compounds (SVOCs) known as polycyclic aromatic hydrocarbons. Barium, cadmium, mercury and trimethylbenzenes were also detected in soil/historic fill above Wis. Admin. § NR 720 (2013) standards but were not found to be primary contaminants of concern. Arsenic was also detected in soil/historic fill but at concentrations below background.

The primary contaminants of concern in groundwater include petroleum volatile organic compounds (benzene) and the polycyclic aromatic hydrocarbons (benzo(a)pyrene, benzo(b)fluoranthene, and chrysene). Arsenic and lead were also detected in groundwater above Wis. Admin. § NR 140 (2015) standards. Cleanup criteria for each of these constituents are outlined in NR 720 and NR 140 Wisconsin Administrative Codes and the clean-up level look-up tables. The contaminants described above were present in soil and groundwater at concentrations exceeding the cleanup levels established for these constituents

Ayres Associates' Phase II Assessment report indicated that methane is being generated in the subsurface through the decomposition of organic matter. Because methane is lighter than air, it typically migrates upward and disperses into the atmosphere or migrates in the unsaturated soil zone above the water table, or within utility trenches. However, methane may accumulate in enclosed spaces with little or no air exchange.

Methane concentrations exceeded the LEL in three of the twelve vapor monitoring implants installed at the site. None of the readings obtained from the Vapor Pins™ installed beneath the concrete floors of the former buildings registered on the meter for the presence of methane. In addition, the presence of methane was not detected in the ambient air inside the buildings.

Based on the location and nature of the contaminants identified above, and considering the anticipated future use for the site and planned remedial excavation work, the *construction worker/trespasser* has been identified as the most likely person to come in contact with the materials. Secondary sources of contamination are also present at the site including contaminated surface and subsurface soils, dissolved phase groundwater contamination, and potential soil gas vapors. The potential routes of exposure to these substances include:

- Inhalation of PVOC-impacted soil particulates and/or PVOCs having volatilized from contaminated soil or groundwater
- Ingestion and dermal contact with PVOC/PAH, and metal impacted soils
- Ingestion, inhalation or dermal contact with groundwater that may contain PVOCs/PAHs during the cleanup
- Explosive hazards due to the accumulation of methane in enclosed spaces

Potential transport mechanisms of site contaminants include:

- Wind and atmospheric dispersion
- Volatilization to enclosed spaces (e.g., indoor air entering future on-site buildings)
- Leaching of contaminants to groundwater

Potential exposure during the remedial work will be managed with a Health and Safety Plan (HASP) and Community Air Monitoring Plan designed to protect site workers and the public. Potential future exposure to residual contamination and vapor transport, if any, will be mitigated using institutional and engineering controls.

Environmental Risk Evaluation

The proposed remediation plan is intended to manage environmental risk and establish a practical and cost effective approach to facilitate property redevelopment. The corrective action plan is based on the following conclusions regarding site conditions and environmental risk.

- The limits of historic fill are adequately defined.
- It is not economically feasible or practical to remove the entire quantity of historic fill present at the site.
- While PAHs and metals were detected in the fill at levels slightly exceeding NR 720 Wisconsin Administrative Code screening levels, the historic fill is not significantly impacting groundwater or surface water quality.
- Groundwater quality is adequately defined for the redevelopment site.
- No significant or continuing sources of groundwater degradation were identified at the redevelopment site.
- No environmental conditions representing an immediate risk to human health or the environment (e.g., open containers, storage tanks, exposed-waste) currently exist at the site.
- Concentrations of public health constituents, although greater than their respective ES, do not represent a significant risk to public health or the environment.
- An engineered cap, consisting of the building, clean fill, parking lots, and landscaping along with institutional controls (i.e., no on-site wells), is the presumptive remedy for this site. This remedial action is consistent with the hotel development and the type, and limited extent of environmental impacts at the site.
- Potential methane accumulation in the proposed hotel building will be managed with engineering controls including a sub-slab vapor venting system. Potential methane migration and accumulation in utility trenches will also be addressed through engineering controls by the engineering consultant installing utilities on behalf of the City. Engineering controls will include clay dams and venting of the trench.

Technology Description

Containment/Engineered Surface Barrier

Engineered barriers or caps can be an effective method to inhibit direct contact with contaminated materials and can also be used to protect groundwater from continued leaching of contaminants through the soil. Capping options may include asphalt, engineered clay cap, multi-layer caps, incorporating geotextiles, or buildings. Impermeable caps associated with site development, such as paved surfaces, require little maintenance. Vegetated soil requires regular maintenance to prevent erosion.

The end use of the property needs to be considered for its potential to implement a cap design. The cap should be incorporated as part of the site development as it will be a permanent feature of, and an improvement to the property. Materials used for cap construction are common and readily available.

The 92 and 100 E. Maple Street site is being developed with a 19,420-square-foot hotel in which the building, driveways, and landscaping will all be integrated into a cap which will cover the entire 92 E. Maple Street parcel and part of the 100 E. Maple Street parcel above the ordinary high water mark. All currently proposed private development activities (i.e. activities not open to public trust lakebed uses) on the 92 and 100 East Maple Street properties will occur above the OHWM (i.e. landward of the bulkhead area). Development activities associated with the Former US Coast Guard – Below OHWM (DNR BRRTS #02-15-563485) BRRTS case will be handled separately and at a later point in time. The City will maintain ownership of the area of 100 E. Maple Street below the ordinary high water mark and will be accessible to the public. Planned improvements to this area have not been finalized but will include park land and concrete or asphalt walkways.

Excavation/Disposal

Contaminated material is removed using conventional earth moving equipment and transported to permitted, off-site, treatment, and/or disposal facilities or reused on-site. Soil excavated and relocated for on-site beneficial reuse at this site during development may include soils from the installation of augered geopiers, utility trenches, and soils excavated to install foundation footings and a pool.

Monitored Natural Attenuation

Natural attenuation is an on-going process in which contaminant concentrations are reduced through naturally occurring mechanisms under favorable conditions without human intervention. This remediation strategy relies on many physical, chemical, and biological processes to naturally reduce mass, toxicity, mobility, or concentration of contaminants in soil or groundwater. Attenuation processes include dilution, chemical and biological transformations, sorption, and volatilization.

Natural attenuation encompasses intrinsic biodegradation. Intrinsic biodegradation is a natural, non-enhanced process of remediation where complex organic compounds are broken down into simpler, less toxic constituents by aerobic or anaerobic microbial processes.

Natural attenuation monitoring alone may not meet groundwater standards in the short-term; however, active extraction and in-situ chemical treatment methods are not feasible as concentrations are too low and desorption from the fine-grained sediments to the groundwater may be diffusion limited. The residual concentrations of contaminants in groundwater do not pose a significant risk to human health and the environment, and will attenuate naturally through sorption and dilution over the long term.

Vapor Intrusion Mitigation

Vapor intrusion is the migration of volatile constituents from contaminated subsurface soil or groundwater into indoor air spaces of overlying buildings or underground routes such as buried utility lines and trenches. Most vapor intrusion occurs when contaminants in the underlying soil, or contaminants at the water table, enter the unsaturated zone above the water table and migrate to the atmosphere, or into the air space of overlying structures or utility trenches. Less frequently, vapors can enter buildings with groundwater seepage into sumps or flooded basements where contaminants partition directly from the groundwater into indoor air.

Vapor-phase contaminant migration (methane) in the unsaturated soil has been measured at this site. Volatile compounds of sufficient concentration can migrate in the vadose zone from impacted soil and passively vent into the atmosphere. While no significant VOC concentrations have been detected in soil at the site, elevated methane concentrations have been measured. Volatilization and migration of methane in groundwater into the vadose zone and overlying structures, at concentrations of concern, is likely given the relatively high concentrations measured at the site.

Mitigation or remediation of potential vapor intrusion risk is implemented to eliminate exposure pathways and will consist of engineering controls or physical modifications to the site.

Project Schedule

A construction project schedule was developed by Bayland Buildings, Inc. (Figure 3). Actual start and completion dates and milestones are contingent on regulatory review schedules, construction plan negotiations, permitting, adverse weather conditions, and the actual scope of work performed. Significant changes in review times or the scope of work outlined in this schedule or adverse weather conditions will necessarily affect the project schedule.

Ayres Associates will provide a groundwater monitoring schedule after construction is complete.

2.0 Project Organization and Responsibility

The purpose of this document is to describe the personnel, procedures, and methods for ensuring the quality of construction services, and accuracy and precision of data collection associated with the remediation project. Following the procedures outlined in this Remedy Implementation Work Plan (RIWP) will help to assure that the finished system adheres to the final design specifications for the proposed systems. The RIWP identifies the procedures to be followed during installation of the engineered barrier, provides guidelines for the excavation and disposal of soil in accordance with state and federal requirements, and provides quality control for performing natural attenuation monitoring.

Project Management

At the direction of the Wisconsin Department of Natural Resources, Ayres Associates has overall responsibility for environmental monitoring during construction of the engineered barrier and post-construction groundwater monitoring. Ayres Associates will provide project management, perform oversight of soil excavation and disposal during construction, and perform post-construction natural attenuation groundwater monitoring. Figure 4 presents the organizational structure for the construction/remediation project. All lines of communication, management activities, and technical direction within this project team will follow this organization arrangement. Any directions or communications from the Department of Environmental Quality will be given to the Ayres Associates project manager.

Responsibilities of key project personnel are outlined below.

Wisconsin Department of Natural Resources (WDNR) Project Manager

The WDNR Project Manager (PM) for this project will be Kristin DuFresne. The PM has the overall responsibility for project oversight. The PM will:

1. Direct review and approval of RIWP
2. Provide regulatory consultation to the Ayres Associates' project manager
3. Review progress reports detailing work accomplished
4. Review and approve all final reports

Project Director

The project director will be Scott Wilson. The project director has overall responsibility for ensuring that the project meets the WDNR's project objectives and Ayres Associates' quality standards. The project director will:

1. Approve all external reports (deliverables) before their submission to the State
2. Ultimately be responsible for the quality of interim and final reports
3. Represent the project team at meetings and public hearings

Project Manager

The project manager will be Jeffrey Steiner. The project manager is responsible for implementing the project, and has the authority to commit the resources necessary to meet project objectives and requirements. The project manager's primary function is to ensure that technical, financial, and scheduling objectives are achieved. The project manager will report directly to the WDNR Project Manager and will provide the major point of contact and control for matters concerning the project. The project manager will:

1. Define project objectives and develop a detailed work plan schedule
2. Establish project policy and procedures to address the specific needs of the project as a whole, as well as the objectives of each task
3. Develop project plans and strategies and review all project deliverables
4. Acquire and apply technical and corporate resources as needed to ensure performance within budget and schedule constraints
5. Orient all field leaders and support staff concerning the project's special considerations
6. Monitor and direct the field leaders
7. Develop and meet ongoing project and/or task staffing requirements, including mechanisms to review and evaluate each task product
8. Review the work performed on each task to ensure its quality, responsiveness, and timeliness
9. Review and analyze overall task performance with respect to planned requirements and authorizations
10. Manage client and Agency communications regarding field activities and project progress

Project Technician

The project manager will be supported by an environmental engineer or technician staffed out of Ayres Associates Green Bay or Madison, Wisconsin offices. The filed technician is responsible for overseeing the day-to-day activities associated with soil removal and disposal. The project technician will report directly to the project manager. Specific field team leader responsibilities include:

1. Provision of day-to-day coordination with the project manager on technical issues in specific areas of expertise
2. Implement mandatory health and safety practices
3. Implementation of field-related work plans, assurance of schedule compliance, and adherence to management-developed study requirements
4. Implementation of QC for design and construction data provided by the field staff
5. Adherence to work schedules provided by the project manager

6. Coordination and oversight of technical efforts of subcontractors assisting the field team
7. Maintain record of all design and construction activities collected during design and construction of the remediation system
8. Identification of problems at the field team level, discussion of resolutions with the project manager, and provision of communication between team and upper management
9. Participation in the preparation of the final report

Bayland Buildings, Inc., Project Manager

The construction Project Manager for Bayland Buildings, Inc. will be Dave Phillips. Bayland Buildings, Inc. is responsible for all project related issues involving the design and construction of the proposed hotel, including:

1. Provision of day-to-day coordination with the project manager on construction issues
2. Establish policy and procedures to address the specific needs of the project concerning the projects special environmental considerations
3. Oversee construction crew and subcontractors concerning environmental objectives
4. Coordinate the removal and disposal of impacted soil and groundwater resulting from construction
5. Manage client and consultant communications regarding field activities and project progress
6. Provide consultant completed waste manifests for off-site disposal of soil

Laboratory Project Manager

The laboratory operations manager for this project will be Dan Milewsky of Pace Laboratories.

1. Coordinates the completion and delivery of the final analytical report
2. Ensures that client DQOs are met
3. Oversees the overall completeness of the final analytical report
4. Directs the laboratory's analytical programs
5. Coordinates projects and associated workloads
6. Executes laboratory administrative functions
7. Ensures compliance with appropriate analytical methods
8. Approves the laboratory QAPP

Laboratory Quality Assurance Officer

The laboratory project manager for this project will be Kate Grams of Pace Laboratories.

1. Oversees laboratory quality assurance
2. Oversees QA/QC documentation
3. Oversees detailed data review
4. Decides laboratory corrective actions, if required
5. Provides technical representation of laboratory QA procedures
6. Prepares laboratory Standard Operation Procedures

The primary responsibility for project quality rests with Ayres Associates' Project Director. Independent quality assurance will be provided by the Laboratory Project Manager, the Laboratory Analysts, the Analytical Group Coordinator, and the QA Officer as required prior to release of all data to Ayres Associates.

Ayres Associates personnel have completed specialized training as mandated by the Occupational Safety and Health Administration (OSHA) Act regulations 29 CFR § 1910.120. All field personnel are properly trained in the procedures for collection, labeling, preserving, packaging, and shipping of solid and liquid samples. Ayres Associates will be required to comply with site safety requirements addressed in the site-specific safety HASP provided under separate cover. WDNR and construction subcontractors will be required to prepare and comply with their own Health & Safety Plans prepared specifically for this project.

3.0 Identification of Applicable or Relevant and Appropriate Requirements (ARARs)

Section 121(d) of CERCLA requires that remedial actions undertaken pursuant to CERCLA comply with Federal and State applicable or relevant and appropriate standards or requirements (ARARs) where compliance is technically practicable. Non-CERCLA response actions do not necessarily require compliance with requirements beyond those contained in Wisconsin Administrative Codes and Statutes. While not legally binding, consideration will be given to statutes, regulations, ordinances, and guidance relating to all aspects of the remedial actions evaluated in this Remedy Implementation Work Plan, including:

- Air, groundwater, surface water quality, and residual soil concentration standards
- Waste handling, storage, transfer, and disposal requirements
- Operating parameters
- Health and safety requirements
- Monitoring requirements

The identification of ARARs depends on the type of media, contaminants of concern, site-specific characteristics, and the technologies employed during remediation. ARARs are those cleanup standards or controls that are promulgated under state or federal law that specifically address a hazardous substance, pollutant or contaminant, action, location, or other situation at a site. A requirement may be “relevant” but may not be “appropriate” to apply for various reasons and, therefore, not well suited for the site. ARARs can be chemical-, action- or location-specific requirements.

The principal ARARs that apply to the development site include:

- Clean Air Act
- Clean Water Act
- Comprehensive Environmental Response, Compensation and Liability Act (CERCLA)
- Resource Conservation and Recovery Act (RCRA)
- Department of Transportation Rules for Hazardous Materials Transport
- Occupational Safety and Health Administration (OSHA)
- State of Wisconsin Statutes Chapter 30
- State of Wisconsin Environmental Protection – Wisconsin Administrative Code Chapter NR 100 rule series
- State of Wisconsin Pollutant Discharge Regulations (WPDES) – Wisconsin Administrative Code Chapter NR 200 rule series
- State of Wisconsin Water Quality Regulations – Wisconsin Administrative Code Chapter NR 300 rule series

- State of Wisconsin Air Pollution Control Regulations – Wisconsin Administrative Code Chapter NR 400 rule series
- State of Wisconsin Solid Waste Management Regulations – Wisconsin Administrative Code Chapter NR 500 rule series and Wisconsin Statute 289.43
- State of Wisconsin Hazardous Waste Management Rules – Wisconsin Administrative Code Chapter NR 600 rule series
- State of Wisconsin Investigation and Remediation of Environmental Contamination –
- Wisconsin Administrative Code Chapter NR 700 rule series
- Wisconsin Statutes 292.15 – Voluntary Party Liability Program

For clarification purposes, the Former Door County Coop – VPLE (DNR BRRTS #06-15-560738) and Former US Coast Guard – Above OHWM – VPLE (DNR BRRTS #06-15-563486) BRRTS cases are enrolled in the VPLE Program and are eligible for a Certificate of Completion (COC) upon meeting VPLE Program requirements. Refer to Figure 1 for information pertaining to the property limits of each BRRTS case. The portion of the 100 East Maple Street property known as the Former US Coast Guard – Below OHWM (DNR BRRTS #02-15-563486) BRRTS case is not currently enrolled in the VPLE Program.

Permitting

Local permits, such as construction and right-of-way permits, dewatering permits, or waste disposal permits may be required by the State, City, or County and will be the responsibility of the contactor.

A generator's waste profile form obtained from the waste disposal facility will be completed prior to remediation. The information is used by the disposal facility to determine if the waste can be treated, stored or disposed in a legal, safe, and environmentally sound manner. The client will receive notification of waste acceptance based on the information submitted.

The contractor will work with the City of Sturgeon Bay Sewerage District to obtain permission or a permit to discharge contaminated or treated water to the sanitary system.

Cleanup Goals and Performance Objectives

Cleanup goals generally consist of either site-specific risk-based levels or regulated concentrations, such as federal maximum contaminant levels (MCLs) or state groundwater standards established for contaminants in groundwater. The risk-based remediation goals usually are calculated based on industrial and/or residential exposure scenarios and derived using standard contaminant partitioning and transport equations.

The City of Sturgeon Bay's objective is to obtain a Certificate of Completion under the Voluntary Party Liability Exemption (VPLE) program from the WDNR for investigation and remediation efforts expended during this redevelopment project for the sites notes above. To obtain closure

it will be necessary to follow state regulatory requirements detailed in Wisconsin Administrative Codes. Contaminated soil should be restored in compliance with the requirements of ch. NR 720 and contaminated groundwater should be restored in compliance with the requirements of ch, NR 140. Soil and groundwater samples collected and analyzed for the purpose of risk analysis, evaluation of remedial alternatives, and compliance with state regulatory requirements will be analyzed in a fixed analytical laboratory using USEPA SW-846 methods.

The following BRRTS cases have been identified as having confirmed Wis. Admin. § NR 140 (2015) enforcement standard exceedances:

Door County Coop

DNR BRRTS #: 03-15-000659

Door County Coop- Fill & Former Door County Coop – VPLE DNR BRRTS #: 02-15-544253 & 06-15-560738

Former US Coast Guard- Above OHWM & Former US Coast Guard – Above OHWM – VPLE DNR BRRTS #: 02-15-563484 & 06-15-563486

Former US Coast Guard – Below OHWM DNR BRRTS #: 02-15-563485

The City is relying on natural attenuation to restore groundwater quality to meet NR 140 Wis. Adm. Code enforcement standards. If groundwater enforcement standards are not met prior to obtaining the COC, the City intends to purchase environmental insurance in accordance with Chapter 754, Wis. Adm. Code.

The performance objectives established for these remedies are as follows:

1. Protect human health by eliminating exposure pathways for metals and PAH remaining in soils. Encapsulation of those metals and PAH will be achieved by constructing new structures and paved areas on the site.
2. Protect groundwater by encapsulation of metals and PAH remaining in soils. Encapsulation of metals and PAH will limit the potential for mobilization of these constituents to groundwater.
3. Protect human health by limiting inhalation exposure pathways and explosion hazards by operation of appropriate vapor mitigation systems beneath site structures.
4. Attain cleanup levels (NR 140 Wis. Adm. Code enforcement standards) for groundwater at the site. Confirm groundwater cleanup levels are met with two consecutive quarters of groundwater monitoring where contaminants of concern (COC) concentrations are below NR 140 Wisconsin Administrative code cleanup levels (enforcement standards).

4.0 Closure Strategy

VPLE Approach and Certificate of Completion

As previously discussed, the redevelopment project consists of two contiguous parcels located at 92 and 100 East Maple Street. Both properties are currently enrolled in the Wisconsin VPLE program and have for the most part been addressed simultaneously. For clarification, the Former Door County Coop- VPLE (DNR BRRTS #06-15-560738) and Former US Coast Guard – Above OHWM – VPLE (DNR BRRTS #06-15-563486) BRRTS cases are enrolled in the VPLE Program and are eligible for a Certificate of Completion (COC) upon meeting VPLE Program requirements. Refer to Figure 1 for information pertaining to the property limits of each BRRTS case. The portion of the 100 East Maple Street property known as the Former US Coast Guard – Below OHWM (DNR BRRTS #02-15-563486) BRRTS case is not currently enrolled in the VPLE Program.

Based on results of the site assessment completed on the two properties, environmental conditions which must be addressed prior to receiving a COC consist of the following:

- Historic fill across the two properties.
- Contaminated soil across the two properties.
- Public health parameters in groundwater at concentrations exceeding their ES.
- The presence, accumulation and migration of methane in the unsaturated soil.

Resolution of groundwater exceedences consists of obtaining a regulatory determination that concentrations of public health parameters exceeding enforcement standards are not a public health concern (NR140.26[2]). If groundwater parameters continue to exceed enforcement standards during subsequent sampling events, and the voluntary party wants to receive a COC prior to compliance with the enforcement standards, they will be required to pay an insurance fee in accordance with Chapter NR 754, Wis. Adm. Code.

Resolution of the historic fill across the two site will require attention throughout site development. Under current conditions the historic fill is not exposed, and the risk to human health and the environment is controlled. During building construction, some areas of the historic fill will be exposed and relocated. Based on the site grading plan, we estimate approximately 120 cubic yards of historic fill from the hotel development will be relocated. All historic fill that is relocated will remain with the within the existing limits of fill determined during the site assessment. The excavated soil/historic fill will be kept within the same BRRTS case property limits from which it was generated (i.e. keep soil/historic fill generated from the 92 East Maple Street BRRTS case within the 92 East Maple Street BRRTS case property limits). At the completion of site grading, the historic fill will once again be covered. The cover will consist of 18 inches of clean imported soil. The imported fill/soil will be obtained from the City's storm water detention pond site located at 1030 North 14th Street, Sturgeon Bay, Wisconsin. The topsoil will be obtained from a commercial supplier and will be sampled and analyzed prior to use.

As indicated previously, portions of the area designated as historic fill, including the 92 East Maple Street property, and portions of the 100 East Maple Street property above the ordinary high water mark, will be privately developed for commercial use. The area of 100 East Maple Street below the ordinary high water mark will be retained by the City of Sturgeon Bay for use as public greenspace. At this time no development activities will occur on the Former US Coast Guard- Below OHWM (DNR BRRTS #02-15-563485) BRRTS case property in the bulkhead area. Site improvements associated with the Former US Coast Guard – Below OHWM (DNR BRRTS #02-15-563485) BRRTS case will be handled at a later date.

We expect the solid waste fill will be disturbed during site redevelopment as building foundations, utilities, and other subgrade features are constructed in areas within the limits of the historic fill. When buildings and other site improvements are completed, the historic fill will once again be covered. At project completion the environmental cap will consist of the following:

- Public areas: 18 inches of clean soil in public greenspace areas. This may include a small area along the northeast property boundary of the hotel development in order to match proposed grades.
- Private commercial development site: Paved parking areas or building floors will be used to establish an engineered cap. Greenspace in private commercial sites located within the limits of historic fill will be completed with 18 inches of clean soil. The area beneath the building footprint and around the foundation will be covered with four and one half feet of clean fill that will be imported to bring the site to grade prior to building construction. The clean fill will be obtained from the water retention pond project located at 1030 North 14th Street, Sturgeon Bay, Wisconsin. The topsoil will be obtained from a commercial supplier and will be sampled and analyzed prior to use.

The imported soil/topsoil will serve as a pervious cap/engineered surface barrier and the paved parking areas and building floor will serve as an impervious cap/engineered surface barrier.

The City will install new sanitary and sewer lines across the property concurrently with site development. The City's engineer estimated that approximately 1,300 cubic yards of soil/fill material will be excavated during utility construction. Excess fill material excavated from the utility trenches cannot be relocated on the hotel development site. Historic fill characterized as solid waste that is suitable for reuse will be used as backfill in the utility trenches. Excavated soil and fill material that is unsuitable for reuse will be removed from the development sites and disposed at a licensed landfill. During this phase of development, any excavated soil/historic fill generated from the Former US Coast Guard – Below OHWM (DNR BRRTS #02-15-563485) BRRTS case property (i.e. from the bulkhead area) will also be landfilled.

During redevelopment activity the historic fill will be managed consistent with requirements of Chapter NR 718, Wisconsin Administrative Code (Management of Contaminated Soil or Solid Wastes Excavated during Response Actions). Included in Appendix A is a Chapter NR 718 Wisconsin Administrative Code Assessment and Low-hazard waste exemption request.

Methane is a colorless, odorless, non-toxic gas which is lighter than air and, at certain concentrations, is flammable. It is a natural by-product of the decomposition of organic material by bacteria in the absence of oxygen. As a result, methane production may occur wherever there is decaying organic matter. The presence of methane is an area-wide occurrence in the riparian zone along the Sturgeon Bay Channel. Therefore, methane accumulation and potential intrusion into the proposed hotel building will be managed using a vapor barrier and an active sub-slab venting system. Details of the vapor mitigation system are presented in the Soil Vapor Management Plan (SVMP) submitted to the WDNR by the developer under separate cover.

Potential methane migration and accumulation in utility trenches will also be addressed through engineering controls by the engineering consultant installing the utilities for the City. Engineering controls will include clay dams and venting of the trench. Each trench, mainline and laterals will have a clay dam constructed at the high end of the trench to prevent methane to mitigate off-site through the excavation. In addition, at Sanitary Sewer Manhole #I00 and Storm Sewer Manhole #200, a perforated PVC pipe will be installed along the manhole to vent the trenches to the atmosphere. Details of the consultants approach will be submitted to the WDNR under separate cover.

5.0 System Design and Construction

Engineered Surface Barrier

Sawyer Hotel Development, LLC, and Bayland Buildings, Inc (general contractor) of Green Bay, Wisconsin, will be constructing a four-story hotel, with approximately a 19,420-square-foot (SF) footprint. The building will be located across portions of the 92 and 100 E. Maple Street sites above the ordinary high water mark shown on Figure 1.

Surface barriers that will be implemented at this site to prevent direct contact with subsurface soil contamination and minimize infiltration include the following:

- The building
- Minimum 4½ feet of structural fill underneath the building
- Concrete or asphalt parking, driveway, sidewalk, and terraces
- Topsoil and vegetation in remaining landscape areas

Surface barriers will prevent direct contact with contaminated soil and groundwater in any area where impacted soil has not been removed by excavation and disposed off-site. Surface barriers will also reduce infiltration minimizing the potential migration of potential contaminants from the unsaturated zone to the saturated zone. Building construction will consist of a concrete slab on poured concrete foundation walls supported on approximately 466, 24-inch diameter, 18 feet deep, aggregate geopiers. Elements of the engineered surface barrier are shown on Figure 2.

Soil and Fill Management

Ex-situ remediation at this site may involve limited excavation of impacted soil from the subsurface with beneficial reuse of the material on-site. Site development will necessarily require some modifications to existing site grades (elevations). However, based upon current grading plans for the project, clean, structural fill will be imported and placed on the existing ground surface beneath the building to raise the elevation a minimum of 4½ feet. Clean imported fill will also be used to backfill around the building foundation. The estimated volume of soil to be placed underneath the building is 2,800 cubic yards. The estimated quantity of soil used to backfill around the foundation is 1,390 cubic yards.

Soil (and fill) at the site, not required for construction, may include excess material from site grading, utility trenching, soil removed during installation of poured concrete foundation walls, installation of 466 drilled aggregate geopiers to a depth of 11 to 18 feet below ground surface, pool excavation, and utility trenches. Limited spoil is anticipated from the geopier installation as a displacement process will be used to advance the borehole and place the aggregate. Where possible, material generated from excavations and trenching will be reused on site and incorporated into the final project design. The locations and estimated quantity of soil spoil requiring on-site relocation and reuse, and areas of clean imported soil,

are shown on Figure 5. A grading plan showing cut areas and the distribution and thickness of imported clean fill is shown on Figure 6.

The quantity of soil spoil requiring on-site relocation (estimated at 120 cubic yards) is contingent on final grading elevations, the method of geopier installation, depth and length of utility trenching, size and depth of pool excavation, and length and depth of foundation structures installed. The excavated soil/historic fill will be kept within the same BRRTS case property limits from which it was generated (i.e. keep soil/historic fill generated from the 92 East Maple Street BRRTS case within the 92 East Maple Street BRRTS case property limits) where possible.

A contractor will be hired to perform the soil excavation and on-site disposal tasks.

The general project approach and sequencing is outlined below:

- Prepare design plans and specification
- Prepare bid package and let for bid
- Select contractor and prepare contracts
- Perform waste characterization and obtain necessary permits
- Perform underground locate/clearance calls
- Abandon monitoring wells in development area, as necessary
- Mobilize equipment and personnel
- Install geopiers within building footprint
- Excavate target soil and manage excavation water
- Relocate soil spoil to designated on-site re-location areas (no on-site storage)
- Collect water entering the excavation and transfer to a poly tank for storage and analysis, pending treatment and final disposal
- Backfill the excavation with clean fill and compact, as necessary for construction
- Replace monitoring wells removed during excavation, if necessary

The City will install new sanitary and sewer lines across the property concurrently with site development. The City's engineer estimated that approximately 1,300 cubic yards of soil/fill material will be excavated during utility construction. Excess fill material excavated from the utility trenches cannot be relocated on the hotel development site. Historic fill characterized as solid waste that is suitable for reuse will be used as backfill in the utility trenches. Excavated soil and fill material that is unsuitable for reuse will be removed from the development sites and disposed at a licensed landfill. During this phase of development, any excavated soil/historic fill generated from excavating the Former US Coast Guard – Below OHWM (DNR BRRTS #02-15-563485) BRRTS case property in the bulkhead area will be landfilled.

New parking lots will be constructed over existing grades at the locations shown in the attached Figure 6. Final designs are not complete but a typical parking lot profile will consist of 8 inches of

crushed stone and 2.5 inches of asphalt. Importation or removal of soil for parking lot construction will be addressed in a separate document at a later date.

Imported Fill

Preliminary grading plans prepared to facilitate redevelopment of the 92 and 100 East Maple Street (Hotel) Property indicate that approximately 5,500 cubic yards of soil will be required to be imported to the site to achieve design grades beneath and around the hotel foundation.

The City of Sturgeon Bay is currently constructing a stormwater detention pond located at 1030 N. 14th Street. Construction of the Egg Harbor stormwater detention pond is expected to generate approximately 9,500 cubic yards of excess soil. Approximately 5,500 CY of the excess soil (silty sand) generated from the construction of the stormwater pond will be imported to the 100 East Maple Street Property and used as general fill underneath and around the building footprint and foundation.

The WNDR recently prepared a guidance document proposing a process to document soil, or other material, imported to a VPLE site. According to the draft guidance document (RR-041) the following factors where considered when evaluating the imported fill:

- Past history of the property-where the soil and other filled materials are generated;
- The volume of soil and other fill materials to be used;
- Zoning restrictions on planned end uses of the receiving property;
- Location on the receiving property where the material will be placed, including the locational criteria in Section NR718.12(1), Wis. Adm. Code; and
- Results of sampling and comparison with RCLs established in accordance with Chapter NR720, Wis. Adm. Code.

The borrow source has historically been the site of a private residence and open field and does not have a history of commercial or industrial use. A Phase I Environmental Site Assessment of the property, prepared by Robert E. Lee and Associates, was submitted to the WDNR under separate cover. Based on the past use of the borrow source property, it is our opinion that laboratory analysis of samples of this fill source is not warranted and the imported fill from the stormwater pond project does not represent an environmental risk.

The City performed sampling and analysis of the imported soil at the request of the WDNR. Twelve samples were collected from the soil stockpiles temporarily stored on the 100 East Maple Street property. The samples were collected from six stockpiles and placed in sealable plastic baggies. The samples were subsequently screened for the presence of volatile organic compounds (VOCs) using a photoionization detector equipped with a 10.7 electron volt lamp. The 12 samples were submitted to Pace Laboratories in Green Bay, Wisconsin, and analyzed for polynuclear aromatic hydrocarbons (PAH) and lead. None of the samples were analyzed for VOCs based on PID screening results and olfactory observations.

The results of the analysis are summarized in Table 1. Laboratory analytical sheets are provided in Appendix B. As expected, low levels of one PAH compound (Benzo(a)pyrene) were detected in 4 of the 12 soil samples collected. PAHs form from incomplete combustion and are common in the environment due to atmospheric deposition, although they can also occur naturally. Benzo(a)pyrene in particular has a very low soil screening level and is the PAH compound that most commonly exceeds EPA screening levels and NR 720 RCLs, which are based on EPA screening levels. It should be noted that EPA soil screening levels, which NR 720 values are based, are not cleanup standards and do not define "unacceptable" levels of contaminants in the soil. These values are based on very conservative assumptions that may or may not be valid for all sites. They are used to facilitate identification of contaminants and exposure areas of potential concern that may warrant further assessment but not necessarily cleanup.

The low levels of benzo(a)pyrene found in the borrow source soils do not represent a significant concern and should not preclude the use of these soils for fill at the development site. The predominant exposure concern for benzo(a)pyrene is ingestion, the reason it has such a low soil screening value. The imported soil is being used at the site for fill underneath the building and around the building foundation, from the existing ground surface to approximately 4.5 feet above the surface, and will be covered by the building. Therefore, there is no potential direct contact exposure from this material. Furthermore, the potential for PAHs to leach from the soil is negligible due to the low solubility and high partition coefficients of PAHs. However, for added protection, the four soil piles with benzo(a)pyrene detections will be placed entirely underneath the building

The literature shows that asphalt-based products contain PAHs. Asphalt pavement and sealants produce particulate matter that can contain concentrations of PAHs in the sub-percent range (100s to 1,000s mg/kg total PAHs) that is transported in stormwater runoff. Some studies show that this can cause soil and sediment contamination with total PAH concentrations in the range of 1 to 10 mg/kg. From a remediation perspective, many site cleanups are conducted to remediate the presence of PAHs to cleanup goals below 1 mg/kg or, in some cases, 0.1 mg/kg or lower. From a total risk perspective, remediating sites to low PAH cleanup goals is unwarranted in light of the risk of transportable PAHs produced from paved parking surfaces. It is unreasonable to conduct a cleanup to remediate low PAH concentrations and then redevelop the area with asphalt pavement.

Temporary Stockpiles

Imported soil obtained from stormwater detention basin project will be temporality stockpiled on the development site's existing asphalt parking lot for approximately two to three weeks pending completion of the geopiers. The soil will then be relocated on top of the geopiers within the building footprint. The location of the temporary stockpiles is shown on Figure 5. The estimated volume of soil to be placed underneath the building is 2,800 cubic yards. The estimated quantity of soil used to backfill around the foundation is 1,390 cubic yards.

Contaminated fill from within the historic fill limits is expected to be excavated and relocated in a continuous effort such that temporarily stockpiling this material will not be necessary.

During this phase of development, any excavated soil/historic fill generated from excavating the Former US Coast Guard-Below OHWM (DNR BRRTS #02-15-563485) BRRTS case property in the bulkhead area will be landfilled. The excavated soil/historic fill will be relocated within the same BRRTS case property limits from which it was generated (i.e. keep soil/historic fill generated from the 92 East Maple Street BRRTS case within the 92 East Maple Street BRRTS case property limits).

Should it be necessary to place excavated fill material in stockpiles, temporary stockpiles will be maintained in general accordance with s. NR 718.05 (3). Conditions for temporary stockpiles include:

- Placing the soil on an impervious base (e.g., concrete, asphalt, or plastic sheeting)
- Covering the soil when it is not being moved with a cover material sufficient to prevent infiltration of precipitation and inhibit volatilization of contaminants (e.g., plastic sheeting)
- Preventing surface water contact with the stockpiled soil using constructed berms, if necessary, to control surface water movement

If stockpiles are maintained for longer than 15 days, requirements under s. NR 718.05(2) would also apply including stockpile inspections at least once every 30 days, immediately repairing or replacing any base, cover, anchoring, or berm materials, and notification to the WDNR if soil is stored for more than 90 days before final disposition.

The proposed soil handling and placement procedures will meet environmental closure requirements of s. NR 726.13(b) and not pose an unacceptable threat to public health, safety, welfare, or the environment. The site will be placed on the WDNR online Geographic Information System Registry (GIS Registry) for sites with residual soil and/or groundwater contamination, and will have an approved cap maintenance plan which describes requirements for annual cap inspection and timely repair of any damaged/deteriorated areas.

Historic Fill Exemption

Historic fill present across the site, as identified in the NR 716 site investigation, includes brick, cinders, concrete and wood debris and will be regulated as an historic fill site. Wisconsin solid waste regulations prohibit the placement of structures or other development on buried waste, including historic fill sites, without an exemption to Section NR 506.085, Wis. Adm. Code.

Provided in Appendix C of this report is WDNR Form 4400-226, Development at Historic Fill Site Exemption Application. This application, that was previously submitted to WDNR under separate cover, has been updated with new information and is being submitted to request approval to proceed with proposed development within the designated historic fill site limits.

Surface Water and Groundwater Management

Groundwater dewatering is not anticipated during construction of the hotel given the starting elevation of the land surface after structural fill is imported. Groundwater that is encountered during Geopier construction or utility excavations that reaches the land surface, or surface water encountered during storm events, will be properly managed. The water will be collected and stored in on-site poly tanks, frac tank, or (upon receiving appropriate approvals) discharged directly to the sanitary sewer.

Groundwater dewatering will be required for utility installation that is being performed concurrently with the hotel development. Plans and permit requests for groundwater dewatering during utility construction will be submitted under separate cover by the engineering firm designing the utilities.

Monitored Natural Attenuation

Natural attenuation is an on-going process in which contaminant concentrations are reduced through naturally occurring mechanisms under favorable conditions without human intervention. This remediation strategy relies on many physical, chemical, and biological processes to naturally reduce mass, toxicity, mobility, or concentration of contaminants in soil or groundwater. Attenuation processes include dilution, chemical and biological transformations, sorption, and volatilization.

Natural attenuation encompasses intrinsic biodegradation. Intrinsic biodegradation is a natural, non-enhanced process of remediation where complex organic compounds are broken down into simpler, less toxic constituents by aerobic or anaerobic microbial processes.

To evaluate the effectiveness of natural attenuation, a complete and accurate assessment of groundwater quality is required. Data on contaminant types, concentrations, and distribution will be evaluated in conjunction with the physical/chemical properties of the constituents to determine their persistence and mobility within the subsurface. Based on information from site investigations, and requirements for natural attenuation evaluation, the groundwater analytical program will be limited to petroleum volatile organic compounds (PVOCs), polycyclic aromatic hydrocarbons (PAH), dissolved arsenic and field parameters. The proposed monitored natural attenuation program is outlined in Section 6.0 of this plan.

Vapor Intrusion and Mitigation

Vapor intrusion is the migration of volatile constituents from contaminated subsurface soil or groundwater into indoor air spaces of overlying buildings or underground routes such as buried utility lines and trenches. Most vapor intrusion occurs when contaminants in the underlying soil, or contaminants at the water table, enter the unsaturated zone above the water table and migrate to the atmosphere, or into the air space of overlying structures or utility trenches. Less frequently, vapors can enter buildings with groundwater seepage into sumps or flooded basements where contaminants partition directly from the groundwater into indoor air.

Vapor-phase contaminant migration (methane) in the unsaturated soil has been measured at this site. Volatile compounds of sufficient concentration can migrate in the vadose zone from impacted soil and passively vent into the atmosphere. While no significant VOC concentrations have been detected in soil at the site, elevated methane concentrations have been measured. Volatilization and migration of methane in soil into the vadose zone and overlying structures, at concentrations of concern, is likely given the relatively high concentrations measured at the site.

Redevelopment often incorporates vapor mitigation solutions into the development as a precautionary measure in lieu of extensive investigation. Mitigation or remediation of potential vapor intrusion risk is implemented to eliminate exposure pathways and can consist of one or more of the following:

- Removal of the source (contaminated soil or groundwater)
- In-situ remediation of the source
- Institutional controls such as deed restrictions
- Engineering controls or physical modifications to a site or facility

Vapor Mitigation Approach

The vapor intrusion mitigation approach for this site will include engineering controls to prevent the entry of vapors into the building by eliminating the vapors beneath the slab and routes of entry. Specific engineering controls incorporated into the construction will consist of the following methods including, 1) an active sub-slab venting system, 2) vapor barrier sheet (geomembrane) installed beneath the slab, and 3) sealing of utility penetrations.

The soil vapor mitigation system (SVMS) design approach utilizes the WDNR-recommended design reference prepared by the United States Navy Alternative Restoration Technology Team titled, *Vapor Intrusion Mitigation in Construction of New Buildings Fact Sheet* (2011), as well as the United States Environmental Protection Agency (USEPA) Engineering Issue *Indoor Air Vapor Intrusion Mitigation Approaches* (2008). The design of the SVMS includes the selection of suitable materials, component sizes, and design configurations for the SVMS components. The components include the subbase, aggregate stone venting/concrete subgrade layer (above the subbase and beneath the plastic vapor barrier), ventilation and discharge piping, vapor barrier (above the aggregate), sub-slab vapor probes, vacuum blower, and associated appurtenances.

The SVMS will be designed to utilize the proposed building's aggregate subgrade for the concrete floor of the lower level, which in the areas of the trench laterals will be designed to consist of an 8-inch thick layer of suitably sized aggregate stone, and a vapor barrier, located between the top of the aggregate layer and the building concrete slab. The aggregate stone will collect and allow potential soil vapors to flow away from the area beneath the building to a discharge point located safely above the building. A vacuum blower will be installed on the discharge lines to increase the effectiveness of the system. The vapor barrier, together with proper seals of floor penetrations, will prevent soil vapors from migrating upward into the building. The observed contaminant concentrations and soil gas pressures present at the site are believed to be very low, and therefore, passive operation of the SVMS is anticipated to provide

sufficient building protection because of the understood environmental site conditions. Per the WDNR guidance documents, a vapor barrier and passive or active venting system, if shown effective at managing subsurface vapors, is allowable for new construction. Active and passive systems have been used in many other locations where methane has been encountered from decomposing materials, and has been shown to be an effective remedy in suitably protecting health and environmental concerns. However, an active SVMS will be installed at this site to provide for additional protectiveness. Details of the SVMS are provided in the Soil Vapor Management Plan, West Waterfront Hotel Development Project – Sturgeon Bay (Ayres Associates, August 2015) submitted under separate cover.

Potential vapor migration within proposed utility trenches installed by others will be addressed in a separate document submitted to the WDNR by the engineer under contract to the City.

6.0 Environmental Monitoring

Construction observation and groundwater monitoring will be performed by a qualified environmental engineer/consultant and will focus on specific remedial objectives. These objectives include documenting that excavated soil leaving the site is properly handled and disposed, groundwater from dewatering, if any, is properly managed, engineered surface barriers are properly placed, and the soil vapor management system is installed as designed.

Construction Observation

Construction observation will be performed during pier and foundation construction to document soil removal, groundwater management, and vapor barrier installation. The following tasks will be performed:

- Observe and document (including photographs) appropriate phases of remediation activities, including equipment and materials, and provide recommendations to the City of Sturgeon Bay for those not meeting specifications or special provisions. Make occasional site visits to ensure contractor is complying with requirements of the approved Remedial Action Plan and obtaining the information necessary for preparation of site closure documentation.
- Keep site visit diaries, logs, photographs, and other pertinent records to prepare a record of the contactor's work related to soil and groundwater management, cap installation, and soil vapor management system construction.

Natural Attenuation Monitoring

Groundwater monitoring will be performed to evaluate the effectiveness of remedial efforts on contaminant levels, and to determine on-going natural attenuation progress. Ayres Associates will implement a groundwater monitoring plan that will be used to document the effectiveness of the engineered barrier and subsequent natural biodegradation to remediate PVOC and PAH contamination in groundwater at the site. Based on information from site investigations, the groundwater analytical program will be limited to petroleum volatile organic compounds (PVOCs), polycyclic aromatic hydrocarbons (PAHs), dissolved arsenic, and field parameters.

A suite of field parameters will be collected on samples collected from select monitoring wells at the site. These data will be used to evaluate the geochemistry of the aquifer, and the type of reactions that may be occurring in the groundwater flow system.

Temperature, pH, specific conductance, and redox potential will be obtained using an In-Situ®, Inc. Troll 9500 multi-parameter water quality monitoring system, or equivalent. Simultaneous temperature, pH, specific conductance, turbidity, dissolved oxygen, and redox readings will be taken continuously during pumping until readings have stabilized. Stabilized readings will be recorded on field sampling forms.

These data will be used to construct a "geochemical model" of conditions at the site to assist in the interpretation and understanding of attenuation and or transformation processes that may be occurring in the aquifer, and the potential fate of the constituents of interest.

Environmental monitoring and reporting will be required to evaluate the potential for and or effectiveness of natural attenuation in removing contamination from the groundwater, and track progress toward meeting cleanup goals or performance standards. Environmental monitoring will be performed according to the following schedule:

- Collect and analyze groundwater samples from select monitoring wells for PVOCs, PAH and dissolved arsenic semi-annually (twice per year)
- Collect groundwater field parameter data including, dissolved oxygen (DO), pH, temperature, specific conductance, turbidity, and oxidation-reduction potential (ORP) (twice per year)
- Prepare semi-annual performance summary report

Specific monitoring parameters, locations, and frequencies are detailed in the monitoring plan shown in Table 2.

Vapor Monitoring

Four sub-slab vapor probes will be installed to monitor the area beneath the slab in the lowest floor level to observe the characteristics of vapors that may form beneath the building and to determine the effectiveness of the SVMS. The vapor probes will include a perforated section of 1-in. schedule 40 PVC pipe (or equivalent pipe screen) installed within the sub-slab aggregate stone layer and beneath the vapor barrier. Solid 1-inch schedule 40 rigid PVC pipe will extend through the vapor barrier and through the slab with appropriate penetration seals. The top of each probe will terminate within suitable, out-of-the-way locations within the enclosed parking garage (bottom floor of the proposed building). The probes will include a valve-top to which monitoring equipment can be attached to measure the sub-slab soil vapor pressure and to sample potential vapors for analyses of potential contaminants. Each probe top will be installed within flush-mounted, metal, valve-boxes for protection.

Each of the new sample probes will be screened for Methane (% LEL and % methane) using a Landtec 2000 or MultiRae Plus 4 gas meter. Approximately one year of quarterly monitoring is believed to be sufficient to determine the operational effectiveness of the SVMS.

Potential vapor migration within proposed utility trenches installed by others will be addressed in a separate document submitted to the WDNR by the engineer under contract to the City.

Well Abandonment

Monitoring wells currently installed at the site that will not be used for compliance monitoring will be abandoned prior to site redevelopment. Monitoring wells proposed for abandonment include WMW-3, WMW-4, WMW-6, WMW-7, WMW-8, WMW-9, WMW-10, WPZ-10, WMW-11, WMW-12, WMW-14, and WMW-16, will be abandoned in accordance with Wisconsin

Administrative Codes NR 812 and NR 141.25. Well abandonment will be performed prior to construction and will proceed in accordance with the following procedure:

- All dedicated tubing, bailers, or other debris will be removed from the wells prior to abandonment.
- Protective casings, will be removed prior to well abandonment (note: flush mount covers will be left in place).
- Bentonite chips no greater than 3/8-inch diameter will be used to abandon the wells as specified in NR 812 and NR 141.25 WAC.
- The well casing will be cut off at least 30-inches below ground surface.
- Well abandonment documentation Form 3300-005 (R4/2015) will be completed and submitted to the DNR within 60 days of abandonment.

Laboratory Program

The proposed analytical program for the remedial investigation includes collection of groundwater samples. All environmental media samples will be collected and analyzed in accordance with SW-846 methods. Bottles/containers utilized for the collection of samples will be provided by the selected project vendor. Bottles provided will be cleaned by the vendor to USEPA specifications. Sample collection activities will conform to Ayres Associates' standard operating procedures. Appropriate preservatives will be added by the bottle vendor prior to shipment to Ayres Associates.

Table 3 summarizes the proposed analytical program for the site. This table provides the field and laboratory parameters, the number of sampling points and sampling rounds, and the total number of investigative samples, field duplicates, and trip blanks to be collected for each sample matrix

Table 4 summarizes the appropriate laboratory glassware, preservatives, and holding times for each sample matrix. Analytical parameters, laboratory methods, and detection limits for groundwater samples are summarized in Table 5.

7.0 Project Meetings

Meetings will be held to achieve a high degree of communication among members of the project team. These meetings will help to minimize errors and promote quality performance and site-safety during the system installation, mixing and injection, and monitoring phases of the project. Key project personnel attending these meetings, as appropriate, will include the Subcontractor's Field Operations and Site Health and Safety Managers, Ayres Associates project and field operations personnel, and representatives from Sawyer Hotel Development, LLC, and Bayland Buildings, Inc.

Pre-construction Meeting

A pre-construction meeting will be held with the key project personnel to ensure that the entire team has a clear understanding of the project objectives, system design specifications, health and safety issues, QAQC requirements, and work procedures. Site-specific requirements and work procedures will be reviewed with all parties. This meeting also will allow the key team members to meet and develop solutions to any potential problems known to the team prior to the initiation of installation activities. Ayres Associates project engineer will document this meeting and provide notes to all meeting participants.

Weekly Progress Meetings

A weekly progress meeting will be held with the key project members and other appropriate parties to discuss progress and planned activities. At a minimum, the key project personnel attending these meetings will include the subcontractor's field supervisor, construction personnel, and Ayres Associates project manager and technicians. Ayres Associates project manager will document these meetings and prepare meeting notes for all parties, as necessary.

Daily Meetings

The field team will meet daily, before work activities begin, during the course of chemical injection to discuss, plan, and coordinate the work, health and safety, and *QAQC* activities to be performed that day. These meetings will be documented in the project field notebook.

Problem Resolution Meetings

Special meetings will be held when and if a problem or work deficiency occurs or may occur that could impact safety, quality, cost, or the project schedule. All parties involved will attend to discuss the problem or deficiency, to review possible solutions, and to implement a plan of action to resolve the problem or deficiency. The project manager or project engineer will document the meeting and provide notes to all meeting participants.

8.0 Quality Control Activities

Adherence to the design specifications and health and safety requirements and procedures will be required during installation and operation of the remediation system. The measures required to verify the quality of work performed and compliance with the specified project requirements include: the inspection of materials, equipment, and workmanship before and during the performance of each task comprising the system installation and operation; and the resolution of all reported deficiencies and nonconformance issues.

Preparatory activities will include the following:

- Verifying that all required submittals have been accepted by the WDNR project manager
- Reviewing the site-specific health and safety plan
- Ensuring that the field team has reviewed and discussed the work procedures that will be followed
- Reviewing procurement specifications, selecting suppliers, and tracking procurements
- Ensuring that materials and equipment are properly received, inspected, tested, inventoried, and stored

Progress monitoring activities will include the following:

- Checking work quality to ensure that contract requirements and design specifications are being met
- Verifying site activities are performed in a safe manner
- Checking that QA provisions are in place and that QC activities are being completed in compliance with QA requirements and procedures
- Checking that daily QC inspections are sufficiently rigorous to ensure continuing compliance with the QA program
- Checking that nonconformance issues are being recorded, tracked, and resolved
- Checking that QC reporting is accurate, timely, complete, and in compliance with QA requirements and procedures

Follow-up and completion activities will include:

- Resolution of all nonconformance reports
- Resolution of all outstanding discrepancies

Environmental Health and Safety

Health and safety procedures and requirements are provided in the project-specific health and safety plan. The site health and safety plan describes the health and safety related QA and QC activities that will be performed during construction observation and groundwater monitoring and provides the roles, responsibilities, and authorities of the various team members. Sub-contractors on the project will be required to submit and adhere to their own site-specific health and safety plans.

9.0 Waste Management

The drilling and sampling activities performed during this assessment are expected to generate solid and liquid "waste." The anticipated waste types and management procedures for each activity are summarized below:

- Soil generated during augered pier installation and excavation for foundation placement will be relocated on-site and covered (see Figure 5).
- Soil cuttings generated during drilling and replacement well installation, if necessary, will be contained in 55-gallon DOT drums and left on-site for subsequent disposal. All solid wastes exclusive of the drill cuttings will be bagged and disposed as solid wastes in a Subtitle D municipal landfill.
- Well Development/Groundwater Sampling – Solid wastes generated during well development and groundwater sampling activities may include tubing and filters, bailer rope, plastic and paper, and disposable protective clothing. All solid wastes generated during these field activities will be bagged and disposed as solid wastes in a Subtitle D municipal landfill.
- Liquid waste generated during well development and groundwater sampling will include purge water. Water obtained from wells that are known to be contaminated, will be collected in 55-gallon DOT drums. Permission will be obtained from the City to discharge this water to the sanitary sewer at the point of generation if acceptable to the publicly-owned treatment works. The decision to discharge the water to the sanitary sewer will be based on the type and concentration of contaminants.

  If permission cannot be obtained to discharge the water to the sanitary sewer, the water will be retained for subsequent off-site disposal. All 55-gallon drums containing solid or liquid wastes will be stored in a single secured location within the project corridor. Solids and liquids will be contained in separate drums. Each drum will be secured and properly labeled as to location, waste type, date, and other pertinent information.

10.0 Documentation

Field Logbook

Ayres Associates oversight personnel will maintain a field logbook. Entries into the logbook will be dated and initialed. In addition to other project requirements, the logbook will contain a diary of daily events and progress and a record of site meetings and visitors. The logbook also will contain any observations of unusual or previously unnoticed site conditions. QAQC activities that will be recorded in the logbook include: inspections of materials, supplies, and equipment; inspections of work quality, notations of possible improvements to QAQC, health and safety, or work quality procedures; and field data and information for which a recording form has not previously been prepared.

Data Forms

Field sample forms or bound project logbooks will be utilized to document the "who, what, when, where, why, and how" of site sampling activities. The field sample forms will be completed in the field at the time of sampling. Each form will be submitted to the field manager at the end of each day. After the field manager has reviewed each record for completeness and legibility, it will be transmitted to the project manager.

As-Built Drawings

The contractor operations manager will be responsible for ensuring that contractor as-built drawings for the piers, vapor barrier, and building foundation are prepared and submitted. The contractor's field operations manager will provide updated as-built drawing to Ayres Associates, as requested. Ayres Associates project manager will be responsible for ensuring the safekeeping, filing, retrieval, and retention of these drawings.

Non Conformance Log

Ayres Associates field operations manager will be responsible for preparing and updating a nonconformance log for those activities assigned to their organization. The log will remain on-site and will identify all nonconformance situations, the nature of the nonconformance, corrective actions necessary to resolve the nonconformance, and the status of the nonconformance.

Progress Reports

Ayres Associates filed technician will be responsible for preparing daily progress reports for the project manager and the client. These reports will contain a summary of work completed during the day, verification that work performed meets contract and design requirements, reporting and updating significant nonconformance situations, projected work activities for the following week, and a comparison of the work completed with respect to the project schedule. These reports also will highlight any potential problems that could compromise safety, work quality, or project schedule.

NR 724 Remedial Action Documentation Report

An NR 724 construction documentation report will be submitted within 60 days after the date that construction of the remedial action is completed. The report will document that the completed final remedial action meets or exceeds the design criteria and the plans and specifications developed in accordance with the requirements of NR 724.15. The report will include the following information:

- The regulatory status of the facility.
- As–built maps, plan sheets, drawings, and cross sections.
- A synopsis of the remedial or interim action and a certification that the design and construction was carried out in accordance with the plans and specifications.
- An explanation of any minor changes to the plans and why these were necessary for the project.
- Results of site monitoring conducted during construction.
- A brief description of the public health and environmental laws applicable to the contamination and the interim or remedial action selected, including the physical location where the environmental laws shall be complied with for all media of concern.
- A revised operations and maintenance plan in accordance with s. NR 724.13 (4), unless the cover letter indicates that there are no revisions to the operations and maintenance plan.

11.0 Procurement

Ayres Associate's project engineer and field technicians will be responsible for QC checks of materials, equipment, and the installation processes used during foundation construction. Ayres Associates project manager will be responsible for ensuring that checks and inspections are done.

Construction Equipment

Construction equipment necessary for system installation activities will be clean when arriving on-site. Construction equipment will be inspected immediately upon delivery to the site and before it is used. The inspection will note the type and model of equipment and determine that it is appropriate for its intended use as defined by the design specifications. A visual examination will be performed to ensure that there are no signs of damage or hazards and incipient failures such as fluid leaks or worn components. If any of these conditions are discovered, they will be corrected before the equipment is put into use. At all times, safe storage, proper positioning, set-up, and use of construction equipment will be enforced and the performance of preventive maintenance will be verified daily.

12.0 Notification and Correction Process

Any problems associated with materials, supplies, equipment, and service suppliers will be documented and corrective actions taken immediately. In those instances where a potential for impact to safety or project success exists, the field technician or project engineer will immediately notify the project manager of nonconformance situations.

All nonconforming shipments, materials, supplies, equipment, or subcontractor services will be documented and reported to Ayres Associates project manager. Documentation will include the date of the inspection, the items inspected, the nature of the nonconformance, any immediate corrective actions taken, and the name of the person performing the inspection. Ayres Associates field technician or project engineer will immediately contact Ayres Associates' project manager of any nonconformance situations that could possibly impact safety, quality, or the success of the project.

Ayres Associates field technicians or project engineer will maintain a log of all nonconformance reports and will document corrective actions through final resolution. Resolved nonconformance reports will be so indicated on the log with a description of the corrective actions and final resolution. Nonconformance resolution will be documented and communicated to all parties.

Ayres Associates field technicians will provide the project manager with a weekly update of this nonconformance log. Nonconforming materials, supplies, and equipment will be immediately tagged as being "out of conformance" and repaired, calibrated, or removed from the site as soon as reasonably possible. The client will be notified immediately if the nature of the nonconformance involves a health and safety violation, or threatens safety or project success.

Figures

Door County Coop - FILL
92 East Maple Street, Sturgeon Bay, Wisconsin
DNR BRRTS #: 02-15-544253 (formerly 09-15-544253)

Former Door County Coop - VPLE
92 East Maple Street, Sturgeon Bay, Wisconsin
DNR BRRTS #: 06-15-560738

Door County Coop
92 East Maple Street, Sturgeon Bay, Wisconsin
DNR BRRTS #: 03-15-000659

NORTH

60 0 60 120FT
SCALE IN FEET

GROUND SURFACE COVER
- GRASS
- SAND & GRAVEL
- ASPHALT/CONCRETE

Former US Coast Guard - Below OHWM
100 East Maple Street, Sturgeon Bay, Wisconsin
DNR BRRTS #: 02-15-563485

Former US Coast Guard - Above OHWM
100 East Maple Street, Sturgeon Bay, Wisconsin
DNR BRRTS #: 02-15-563484

Former US Coast Guard - Above OHWM-VPLE
100 East Maple Street, Sturgeon Bay, Wisconsin
DNR BRRTS #: 06-15-563486

LEGEND

- SAN — SAN — SANITARY SEWER LINE
- W — W — WATER MAIN
- UE — UE — UNDERGROUND ELECTRIC LINE
- FO — FO — UNDERGROUND FIBER OPTIC LINE
- UG — UG — UNDERGROUND GAS LINE
- TEL — TEL — UNDERGROUND TELEPHONE LINE
- FO — FO — UNDERGROUND ELECTRIC & FIBER OPTIC
- ORDINARY HIGH WATER MARK

WMW-5 - MONITORING WELL
WGP-4 - GEOPROBE
WVP-9 - VAPOR PROBE
WPZ-10 - PIEZOMETER
B-5 - MONITORING WELL (BY STS CONSULTANTS 2004)
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NOTES:
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- LOCATION OF ORDINARY HIGH WATER MARK OF STURGEON BAY PER WISCONSIN DEPARTMENT OF NATURAL RESOURCES. BASED ON PLAT OF SURVEY DATED OCTOBER 2, 2014

V:/ENV/CAD/STURGEON BAY/DGN/SITE MAP w Prop Building.DGN

Ayres_pdf.pltcfg
ES_text_sub.tbl
9/9/2015
L:\Sturgeon Bay\DGN\Site Map w Prop Building.dgn

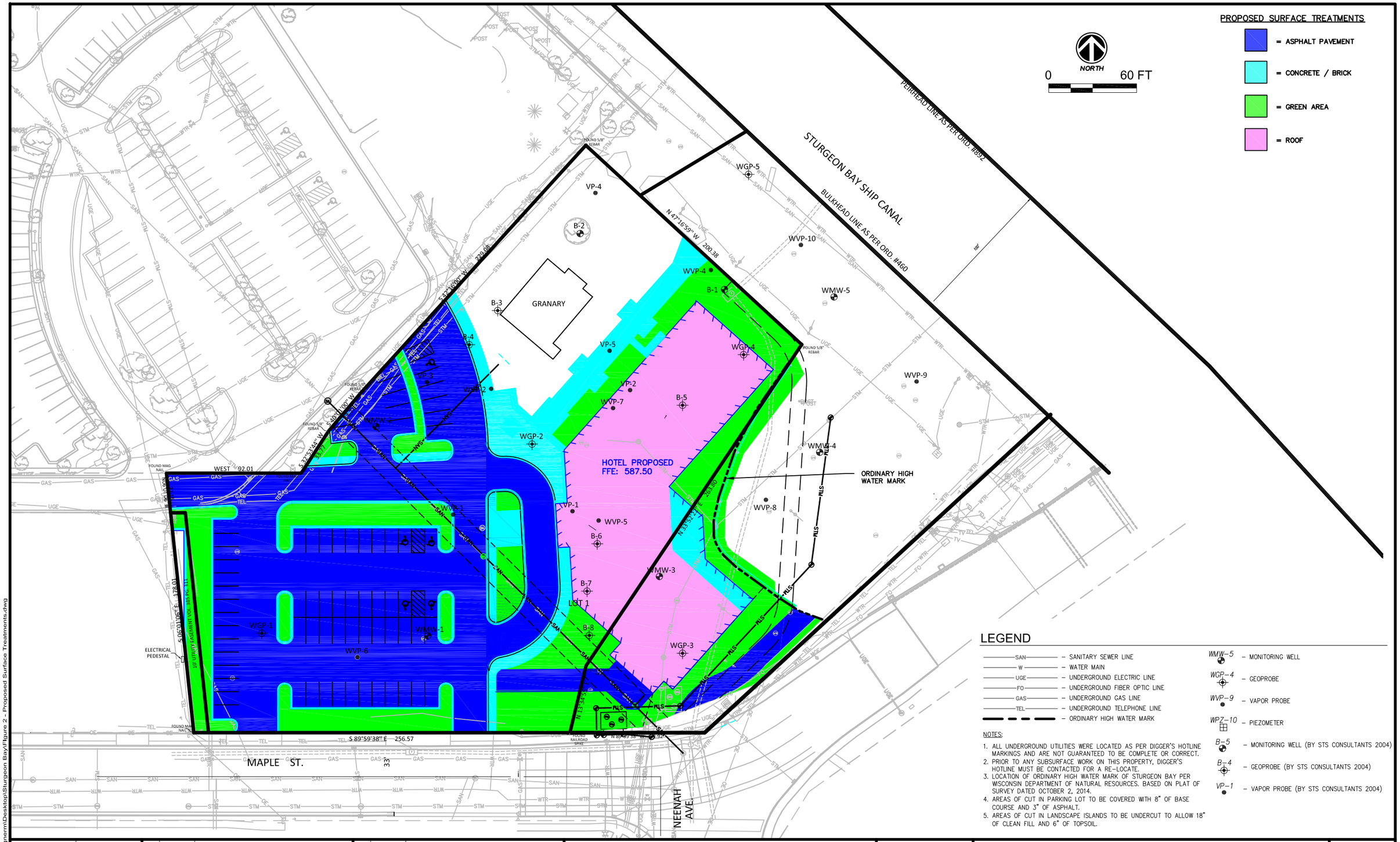
DES BY	J. STEINER	BOOK NO		1	02-11-2015	ADDED ORDINARY HIGH WATER MARK FOR STURGEON BAY			
DR BY	T. SHUPERT	JOB NO	19-0422.20	2	06-11-2015	ADDED WGP-13 - 15, WMW-12 - 16, MVP-13 - 13			
CHK BY	J. STEINER	DATE	JUNE 2015	3	06-26-2015	ADDED GROUND SURFACE COVER INFORMATION			
				NO	DATE	REVISION	NO	DATE	REVISION

WEST WATERFRONT REDEVELOPMENT PROJECT
CITY OF STURGEON BAY
STURGEON BAY, WISCONSIN

AYRES ASSOCIATES
WAUKESHA, WISCONSIN

SITE MAP

DRAWING NO
1



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4. AREAS OF CUT IN PARKING LOT TO BE COVERED WITH 8" OF BASE COURSE AND 3" OF ASPHALT.
5. AREAS OF CUT IN LANDSCAPE ISLANDS TO BE UNDERCUT TO ALLOW 18" OF CLEAN FILL AND 6" OF TOPSOIL.

C:\Users\degnemm\Desktop\Sturgeon Bay\Figure 2 - Proposed Surface Treatments.dwg

DES BY	J. STEINER
DR BY	M. DEGNER
CHK BY	J. STEINER
BOOK NO	
JOB NO	19-0422.00
DATE	SEPTEMBER 2015

NO	DATE	REVISION
1	02-11-2015	ADDED ORDINARY HIGH WATER MARK FOR STURGEON BAY
2	06-11-2015	ADDED WGP-13 - 15, WMW-12 - 16, MVP-11 - 13
3	06-26-2015	ADDED GROUND SURFACE COVER INFORMATION
4	09-27-2015	COMBINED EXHIBITS, ADDED SANITARY & STORM SEWER

WEST WATERFRONT REDEVELOPMENT PROJECT
CITY OF STURGEON BAY
STURGEON BAY, WISCONSIN

AYRES ASSOCIATES
WAUKESHA, WISCONSIN

ELEMENTS OF ENGINEERED CAP

DRAWING NO
2

Sales Rep - Dave Phillips

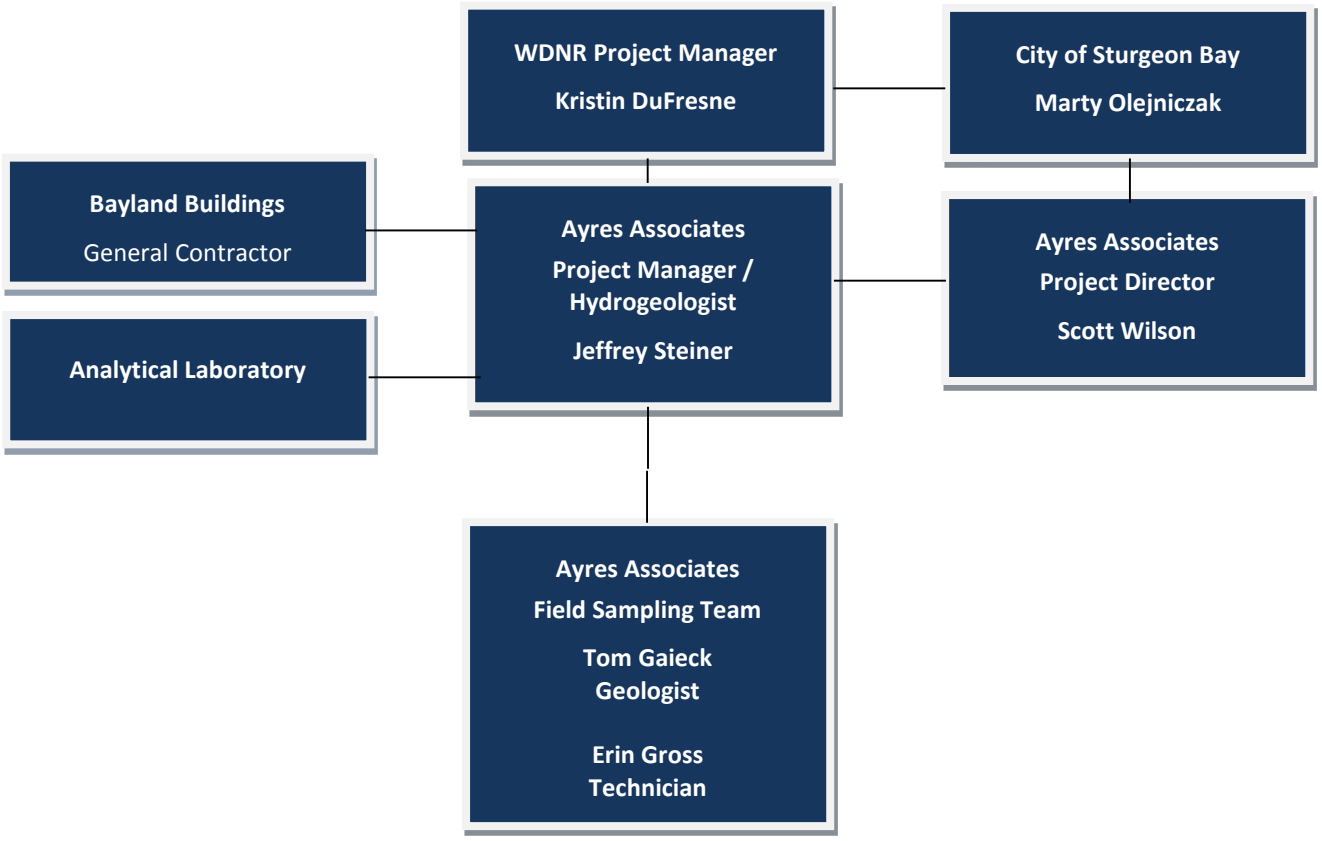
Lindgren Hotel

	Activity Name	Duration (Days)	Start Date	Finish Date
1	Estimating final number	16.00	6/9/15	6/30/15
2	Financing	16.00	6/9/15	6/30/15
3	Present final cost to owner / sign contract	1.00	7/1/15	7/1/15
4	Strip site / install geopiers	10.00	7/6/15	7/17/15
5	Create site utility plan / civil drawings	22.00	7/2/15	7/31/15
6	Geopiers to compact and reach required density	10.00	7/20/15	7/31/15
7	Pour foundations / footings / excavate foundations	11.00	8/3/15	8/17/15
8	Backfill foundations	9.00	8/10/15	8/20/15
9	Underground plumbing / electrical 1st floor	4.00	8/18/15	8/21/15
10	Excavate pool / install pool	6.00	8/21/15	8/28/15
11	Site utilities	6.00	8/21/15	8/28/15
12	Pour mud slab / 1st floor slab	7.00	8/21/15	8/31/15
13	Frame exterior / interior walls / floor trusses / roof trusses / exterior windows / doors	93.00	8/26/15	1/1/16
14	Set masonry elevator shafts / pool area	30.00	8/31/15	10/9/15
15	Set precast concrete for pool roof	3.00	10/12/15	10/14/15
16	Rough in 1st floor / 2nd floor / 3rd floor / 4th floor electrical, plumbing, fire protection / HVAC	62.00	10/22/15	1/15/16
17	Install roofing	15.00	1/4/16	1/22/16
18	Insulate exterior walls / temporary heat	11.00	1/20/16	2/3/16
19	Pour gypcrete floor	10.00	1/25/16	2/5/16
20	Insulate interior walls / ceilings	15.00	1/28/16	2/17/16
21	Drywall / plaster	41.00	2/2/16	3/29/16
22	Paint interior walls	37.00	2/15/16	4/5/16
23	Install electrical lighting and finishes	37.00	2/22/16	4/12/16
24	Install interior doors / cabinets	37.00	2/22/16	4/12/16
25	Install flooring / base / plumbing fixtures	50.00	2/22/16	4/29/16
26	Exterior siding	65.00	1/4/16	4/1/16
27	EIFS Cornice	22.00	4/1/16	5/2/16
28	Landscaping	18.00	5/9/16	6/1/16
29	Install patio railings	23.00	5/2/16	6/1/16
30	Pour exterior concrete / asphalt	5.00	5/2/16	5/6/16
31	Final cleaning / punchlist	22.00	5/2/16	5/31/16
32	Install appliances / FFE	17.00	5/9/16	5/31/16
33	Owner occupy	1.00	6/1/16	6/1/16

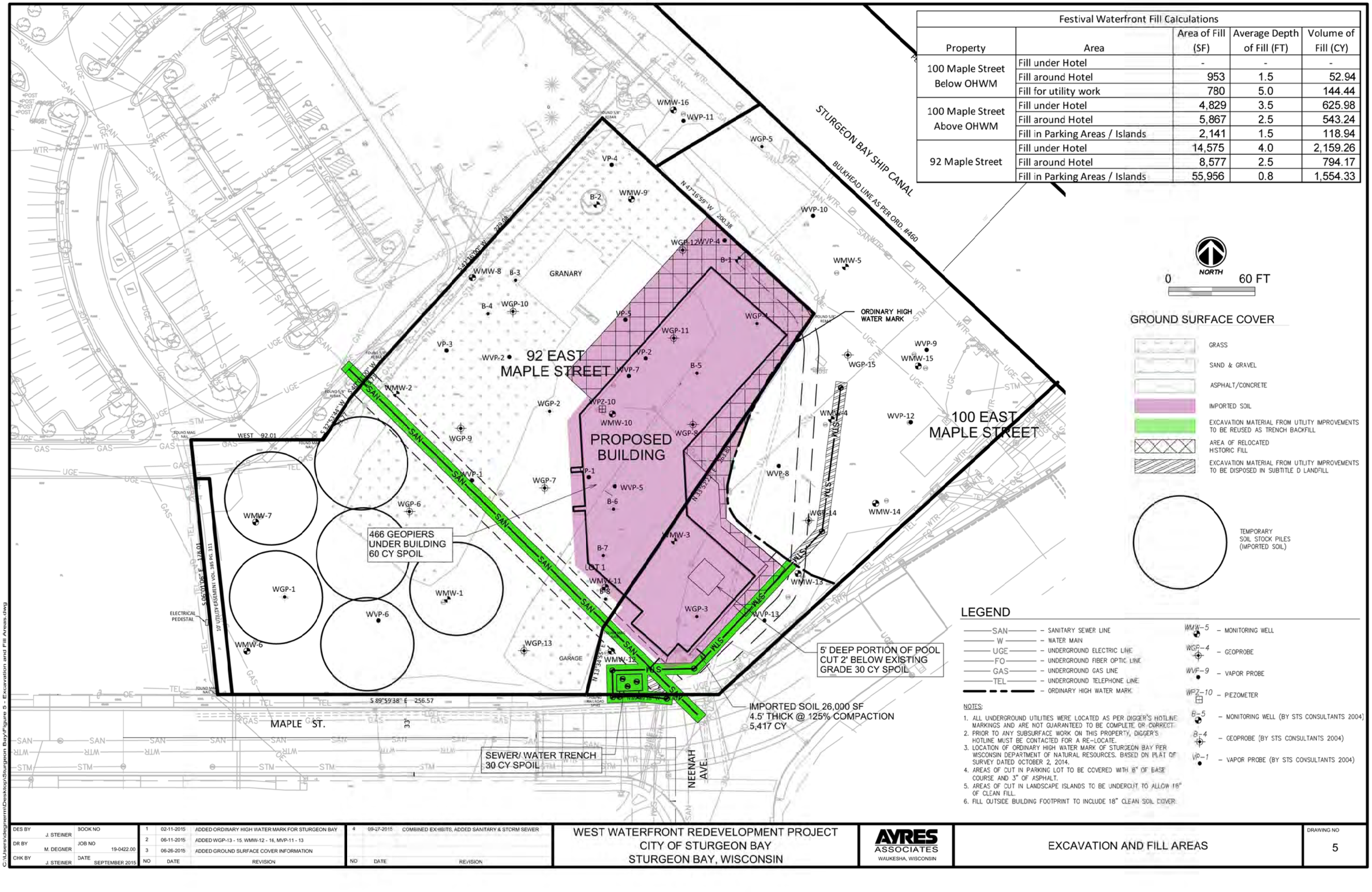
Bayland Buildings, Inc.
PO Box 13571
Green Bay, WI 54307-3571
P: 920.498.9800 F: 920.498.3033

Figure 4 Organization Chart

92 and 100 E. Maple Street
Soil/Groundwater Remediation



Festival Waterfront Fill Calculations				
Property	Area	Area of Fill (SF)	Average Depth of Fill (FT)	Volume of Fill (CY)
100 Maple Street Below OHWM	Fill under Hotel	-	-	-
	Fill around Hotel	953	1.5	52.94
	Fill for utility work	780	5.0	144.44
100 Maple Street Above OHWM	Fill under Hotel	4,829	3.5	625.98
	Fill around Hotel	5,867	2.5	543.24
	Fill in Parking Areas / Islands	2,141	1.5	118.94
92 Maple Street	Fill under Hotel	14,575	4.0	2,159.26
	Fill around Hotel	8,577	2.5	794.17
	Fill in Parking Areas / Islands	55,956	0.8	1,554.33



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4. AREAS OF CUT IN PARKING LOT TO BE COVERED WITH 8" OF BASE COURSE AND 3" OF ASPHALT.
5. AREAS OF CUT IN LANDSCAPE ISLANDS TO BE UNDERCUT TO ALLOW 16" OF CLEAN FILL.
6. FILL OUTSIDE BUILDING FOOTPRINT TO INCLUDE 18" CLEAN SOIL COVER.

DES BY	J. STEINER	BOOK NO	
DR BY	M. DEGNER	JOB NO	19-0422.00
CHK BY	J. STEINER	DATE	SEPTEMBER 2015

NO	DATE	REVISION
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WEST WATERFRONT REDEVELOPMENT PROJECT
CITY OF STURGEON BAY
STURGEON BAY, WISCONSIN

AYRES ASSOCIATES
WAUKESHA, WISCONSIN

EXCAVATION AND FILL AREAS

DRAWING NO 5

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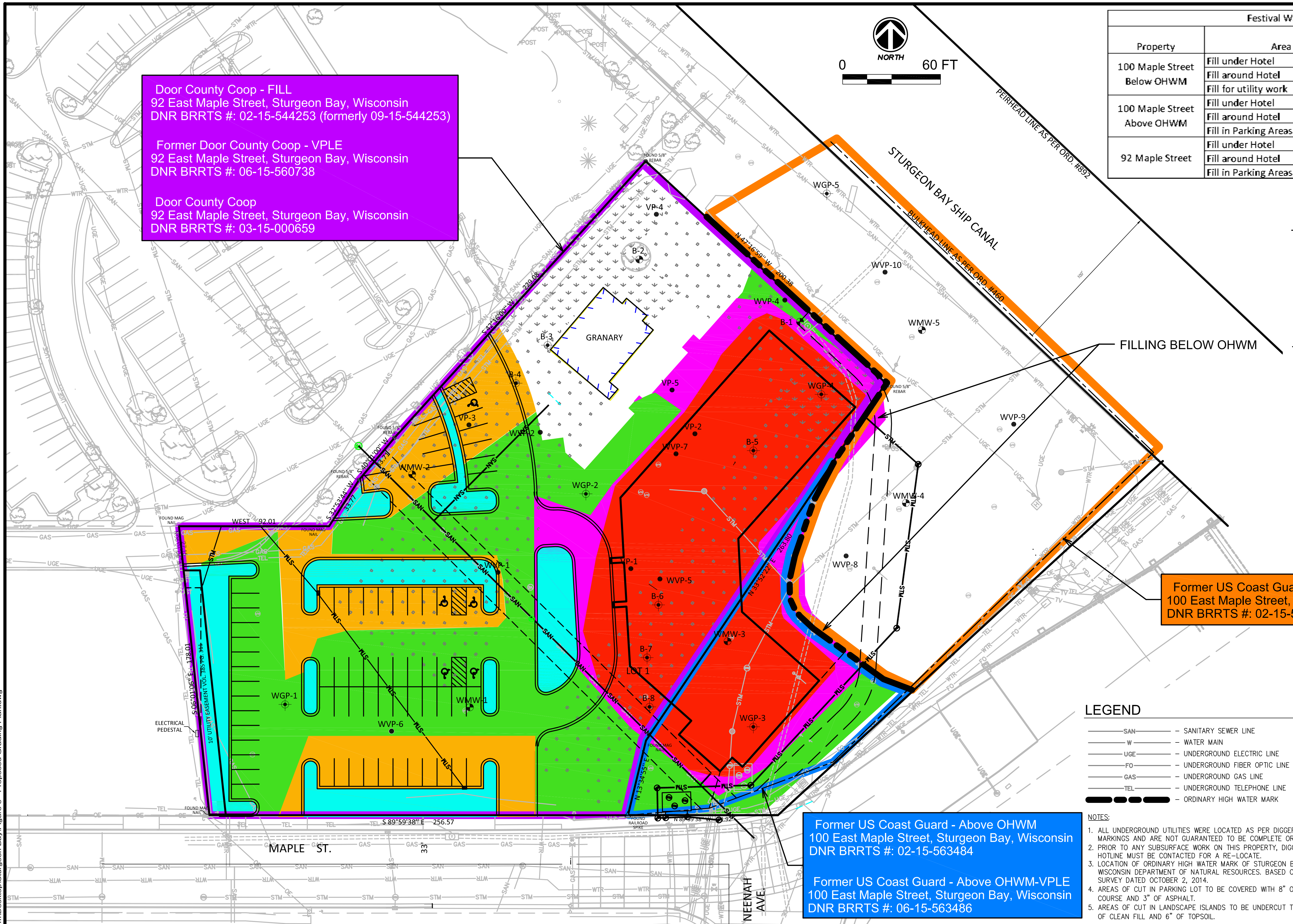

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GROUND SURFACE COVER

- GRASS
- SAND & GRAVEL
- ASPHALT/CONCRETE

FILL AMOUNTS

- AREA OF CUT
- AREA OF 0–12" OF FILL
- AREA OF 12"–18" OF FILL
- AREA OF 18"+ OF FILL
- AREA TO BE UNDERCUT TO ALLOW 18" OF CLEAN FILL AND 6" OF TOP SOIL

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C:\Users\degnerm\Desktop\Sturgeon Bay\Figure 6 - Proposed Grading Plan.dwg

DES BY J. STEINER	BOOK NO			
DR BY M. DEGNER	JOB NO 19-0422.00			
CHK BY J. STEINER	DATE SEPTEMBER 2015			

NO	DATE	REVISION
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CITY OF STURGEON BAY
STURGEON BAY, WISCONSIN

AYRES ASSOCIATES
WAUKESHA, WISCONSIN

PROPOSED GRADING PLAN

DRAWING NO 6

Tables

Table 1
Summary of Soil Sample Laboratory Analytical Results
West Waterfront Redevelopment Project, Sturgeon Bay, Wisconsin
Borrow Source Samples

Sample Number	Analytical Result (mg/Kg)						Soil Standards	
	BP-1-1	BP-1-2	BP-2-1	BP-2-2	BP-3-1	BP-3-2		
Soil Type	SM	SM	SM	SM	SM	SM		
Metals	Analytical Result (mg/Kg)						NR 720 DC RCL[1] Non-Industrial	NR720 GW RCL[2]
Lead	2.7	3.3	3.3	3.0	3.1	3.0	400	27
PAH	Analytical Result (mg/Kg)						NR 720 DC RCL[1] Non-Industrial	NR720 GW RCL[2]
1-Methylnaphthalene	<0.0090	<0.0090	<0.0091	<0.0091	<0.0091	<0.0091	15.6	ns
2-Methylnaphthalene	<0.0090	<0.0090	<0.0091	<0.0091	<0.0091	<0.0091	229	ns
Acenaphthene	<0.0090	<0.0090	<0.0091	<0.0091	<0.0091	<0.0091	3,440	ns
Acenaphthylene	<0.0081	<0.0081	<0.0081	<0.0082	<0.0082	<0.0081	ns	ns
Anthracene	<0.0094	<0.0093	<0.0094	<0.0095	<0.0095	<0.0094	17,200	98.9
Benzo(a)anthracene	<0.0063	0.0063 J	<0.0063	<0.0063	<0.0063	<0.0063	0.148	ns
Benzo(a)pyrene	<0.0064	<0.0064	<0.0065	<0.0065	<0.0065	<0.0065	0.015	0.235
Benzo(b)fluoranthene	<0.0090	<0.0090	<0.0091	<0.0091	<0.0091	<0.0091	0.148	0.2397
Benzo(g,h,i)perylene	<0.0069	<0.0069	<0.0069	<0.0070	<0.0069	<0.0069	ns	ns
Benzo(k)fluoranthene	<0.0100	<0.0100	<0.0100	<0.0101	<0.0101	<0.0100	1.48	ns
Chrysene	<0.0083	0.0111 J	<0.0084	<0.0085	<0.0084	<0.0084	14.8	0.0723
Dibenz(a,h)anthracene	<0.0066	<0.0066	<0.0066	<0.0067	<0.0067	<0.0066	0.015	ns
Fluoranthene	<0.0090	0.0243	0.0097 J	<0.0091	<0.0091	<0.0091	2,290	44.4
Fluorene	<0.0090	<0.0090	<0.0091	<0.0091	<0.0091	<0.0091	2,290	7.4
Indeno(1,2,3-cd)pyrene	<0.0069	<0.0068	<0.0069	<0.0069	<0.0069	<0.0069	0.148	ns
Naphthalene	<0.0090	<0.0090	<0.0091	<0.0091	<0.0091	<0.0091	5.15	0.3291
Phenanthrene	<0.0090	0.0099 J	<0.0091	<0.0091	<0.0091	<0.0091	ns	ns
Pyrene	<0.0090	0.0175 J	<0.0091	<0.0091	<0.0091	<0.0091	1,720	27.1

UNDERLINE	Concentration exceeds NR 720 Wisconsin Administrative Code Residual Contaminant Level (RCL) for protection of groundwater(1/1/2015).
Bold	Concentration exceeds NR 720 Wisconsin Administrative Code Residual Contaminant Level (RCL) for *non-industrial* direct contact(1/1/2015).
( )	Background threshold values are trace element maximum levels in Wisconsin surface soils from the USGS Report at: *http://pubs.usgs.gov/sir/2011/5202*.
ns	No NR 720 Wisconsin Administrative Code Residual Contaminant Level (RCL) established.
--	Not Analyzed
<	Concentration less than laboratory method detection limit.
mg/Kg	Concentration reported as milligrams per kilogram, equivalent to parts per million (ppm).
	[1]NR 720 Wisconsin Administrative Code Residual Contaminant Level (RCL)
	[2]NR 720 Wisconsin Administrative Code Residual Contaminant Level (RCL) for protection of groundwater.
J	Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

Table 1 (continued)
Summary of Soil Sample Laboratory Analytical Results
West Waterfront Redevelopment Project, Sturgeon Bay, Wisconsin
Borrow Source Samples

Sample Number	Analytical Result (mg/Kg)						Soil Standards	
	BP-4-1	BP-4-2	BP-5-1	BP-5-2	BP-6-1	BP-6-2		
Soil Type	SM	SM	SM	SM	SM	SM		
Metals	Analytical Result (mg/Kg)						NR 720 DC RCL[1] Non-Industrial	NR720 GW RCL[2]
Lead	3.5	3.1	3.2	9.5	3.9	3.7	400	27
PAH	Analytical Result (mg/Kg)						NR 720 DC RCL[1] Non-Industrial	NR720 GW RCL[2]
1-Methylnaphthalene	<0.0091	<0.0103	<0.0091	<0.0091	<0.0091	<0.0090	15.6	ns
2-Methylnaphthalene	<0.0091	<0.0103	<0.0091	<0.0091	<0.0091	<0.0090	229	ns
Acenaphthene	<0.0091	<0.0103	<0.0091	<0.0091	<0.0091	<0.0090	3,440	ns
Acenaphthylene	<0.0081	<0.0093	<0.0081	<0.0082	<0.0082	<0.0081	ns	ns
Anthracene	<0.0094	<0.0107	<0.0094	0.0122 J	<0.0095	0.0188	17,200	98.9
Benzo(a)anthracene	0.0135 J	<0.0072	0.0147 J	0.0311	<0.0063	0.0326	0.148	ns
Benzo(a)pyrene	**0.0179**	<0.0074	**0.0178**	**0.0340**	<0.0065	**0.0280**	0.015	0.235
Benzo(b)fluoranthene	0.0151 J	<0.0103	0.0220	0.0308	<0.0091	0.0296	0.148	0.2397
Benzo(g,h,i)perylene	0.0182 J	<0.0079	0.0141 J	0.0294	<0.0070	0.0117 J	ns	ns
Benzo(k)fluoranthene	<0.0101	<0.0114	0.0183	0.0316	<0.0101	0.0318	1.48	ns
Chrysene	0.0190	<0.0096	0.0251	0.0367	<0.0084	0.0418	14.8	0.0723
Dibenz(a,h)anthracene	0.0112 J	<0.0076	<0.0066	0.0079 J	<0.0067	<0.0066	0.015	ns
Fluoranthene	0.0148 J	<0.0103	0.0520	0.0688	<0.0091	0.102	2,290	44.4
Fluorene	<0.0091	<0.0103	<0.0091	<0.0091	<0.0091	<0.0090	2,290	7.4
Indeno(1,2,3-cd)pyrene	0.0101 J	<0.0079	0.0124 J	0.0200	<0.0069	0.0120 J	0.148	ns
Naphthalene	<0.0091	<0.0103	<0.0091	<0.0091	<0.0091	<0.0090	5.15	0.3291
Phenanthrene	<0.0091	<0.0103	0.0285	0.0376	<0.0091	0.0580	ns	ns
Pyrene	0.0123 J	<0.0103	0.0362	0.0544	<0.0091	0.0749	1,720	27.1

UNDERLINE	Concentration exceeds NR 720 Wisconsin Administrative Code Residual Contaminant Level (RCL) for protection of groundwater(1/1/2015).
Bold	Concentration exceeds NR 720 Wisconsin Administrative Code Residual Contaminant Level (RCL) for *non-industrial* direct contact(1/1/2015).
( )	Background threshold values are trace element maximum levels in Wisconsin surface soils from the USGS Report at: *http://pubs.usgs.gov/sir/2011/5202*.
ns	No NR 720 Wisconsin Administrative Code Residual Contaminant Level (RCL) established.
--	Not Analyzed
<	Concentration less than laboratory method detection limit.
mg/Kg	Concentration reported as milligrams per kilogram, equivalent to parts per million (ppm).
	[1]NR 720 Wisconsin Administrative Code Residual Contaminant Level (RCL)
	[2]NR 720 Wisconsin Administrative Code Residual Contaminant Level (RCL) for protection of groundwater.
J	Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

Table 2 Performance and Compliance Monitoring Plan

Summary of Sampling Locations, Parameters and Frequency

Monitoring Wells[1]	Parameters[2]	Frequency[3]
WMW-1 WMW-2 WMW-5 WMW-13 WMW-15	PVOC PAH Arsenic (dissolved) PAH PAH Field Parameters*	Twice per year for 1-year (semi-annual) following construction

[1] If monitoring wells require abandonment during construction, replacement water table observation wells will be installed and monitored.

[2] Parameters:

* = Field Parameters (DO, pH, Temp, ORP, turbidity, conductivity), Depth to water

[3] Frequency of sampling is subject to change based on the analytical data obtained. If two (2) groundwater sampling events (semi-annual) indicate that contaminants of concern are below groundwater cleanup levels, no further monitoring will be required at the site. If cleanup levels for groundwater are not met within the first year of sampling, additional sampling will be discussed with the WDNR.

Table 3 Groundwater Remediation

Analytical Program

			Investigative Samples			*Quality Control Samples*			
Sample Matrix	**Field Parameters**	**Laboratory Parameters**	**Sample Points**	**Sampling Rounds**	**Total Samples[1,2]**	**Field Duplicates**	**Field Blanks**	**Trip Blanks**	**Matrix Total**
Ground water	pH, Temp, Diss. Oxygen Redox Potential Conductivity Turbidity Water Depth	PAH Arsenic (dissolved) PVOC	3 1 1	2 2 2	6 2 2	2 1 1	0 0 0	0 0 2	8 3 5

Table 4 Sample Bottles, Preservatives, and Holding Times

Matrix	Analytes	Bottles	Preservatives	Holding Time
Groundwater	PAH	2 x 100 mL amber glass	Unpreserved, cool 4^{o} C	7/40 days (extraction/analysis)
	Arsenic, (Dissolved)	1 x 250 mL Polyethylene	HNO_3 to pH<2, cool 4^{o} C	6 Months
	PVOC	3 x 40 ml glass vials	HCL to pH<2, cool 4^{o} C	14 days

Table 5 Analytical Parameters, Methods, and Detection Limits

Groundwater Samples

Parameter	EPA Method	Detection Limit (µg/L)
Polycyclic Aromatic Hydrocarbons	8270 SIMs	Analyte specific
Arsenic (dissolved)	6010	6.8
Petroleum Volatile Organic Compounds	8260	Analyte specific

***LOD/LOQs are updated annually.**

Appendix A

NR 718 Assessment and Low Hazard Waste Exemption Request

NR718 Assessment and Low Hazard Waste Exemption Request

West Waterfront Redevelopment Project
92 and 100 East Maple Street
Sturgeon Bay, Wisconsin

Prepared for:

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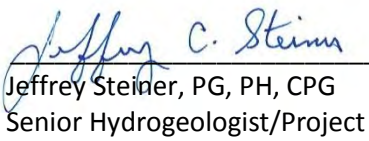
October 2015

HireSmart®

NR718 Assessment and Low Hazard Waste Exemption Request

West Waterfront Redevelopment Project
92 and 100 East Maple Street
Sturgeon Bay, Wisconsin

This report prepared by:



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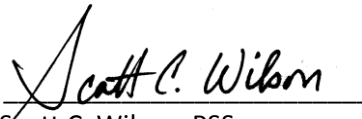

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Introduction

On behalf of the City of Sturgeon Bay, Ayres Associates has completed an evaluation of applicable requirements of Chapter NR 718, Wisconsin Administrative Code (Management of Contaminated Soil or Solid Wastes Excavated during Response Actions) and NR 500 Wis. Adm. Code for the management of soil at the West Waterfront redevelopment site located in Sturgeon Bay, Wisconsin. The purpose of this NR 718 Assessment and low-hazard waste exemption application is to address applicable portions of NR 718, including s. NR 718.05 (Storage of Excavated Contaminated Soil) and s. NR 718.12 (Management of Contaminated Soil).

This document describes on-site management of potentially contaminated historic fill as detailed in the NR 716 Investigation Report – Addendum dated (June 2015) and revised Remedy Implementation Plan dated August 2015. As discussed below, contaminated soil management is intended to proceed in a manner and on a schedule to facilitate construction of a proposed hotel and associated site improvements which will begin in August 2015. A project schedule is provided in the Remedy Implementation Plan.

The project site is located in the northeast ¼ of the northeast ¼ of Section 7, Township 27 North, Range 26 East (NE ¼, NE ¼, Section 7, T27N, R26E), Door County, Wisconsin, (Figure 1). The site (herein referred to as site or property) includes two parcels (Door County Parcel Numbers 2811210080101 and 2812415090101) located at 92 and 100 East Maple Street on the West side of Sturgeon Bay.

Project Contacts

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Project Description

The 92 and 100 E. Maple Street site is being developed with a four-story, 19,420-square-foot hotel in which the building, driveways, and landscaping will all be integrated into a cap which will cover the entire parcel. A map of the redevelopment site is shown in Figure 2. A rendering of the proposed development showing elements of the proposed engineered cap is shown on Figure 3. Note that the hotel will be constructed on the parcel located at 92 E. Maple Street and a portion of the parcel located at 100 E. Maple Street that is above the ordinary high watermark (OHWM). The City will improve, but maintain ownership, of the land located below the OHWM at 100 E. Maple Street.

In July 2014, subsequent to the completion of the Phase I Environmental Site Assessment, the City of Sturgeon Bay demolished all of the buildings at 92 and 100 East Maple Street with the exception of a grain elevator. The grain elevator was saved for possible redevelopment to highlight the areas' industrial past.

Activities outlined in this document represent the remediation phase of the Brownfield development process for 92 and 100 E. Maple Street, Sturgeon Bay, Wisconsin. The initial phases included performing Phase I and Phase II Environmental Site Assessments (ESAs), which were predominantly fact-finding investigations. The Phase I and Phase II investigations were designed to provide the City of Sturgeon Bay, WDNR, and Ayres Associates the data necessary to assess the threat from potential contaminants, estimate costs for site redevelopment, and evaluate remedial options. Details of investigation activities are addressed in the Phase II ESA (Ayres Associates, 2013), the NR 716 Site Investigation Report (Ayres Associates, 2014), and the NR 716 Investigation Report – Addendum (Ayres Associates, 2015). Remedial alternatives were evaluated in the Remedial Action Options Report (Ayres Associates, 2015). Details for implementing the remediation are presented in the Remedy Implementation Work Plan (Ayres Associates, Revised October 2015).

Type of Low-Hazard Exemption Request

On behalf of the City of Sturgeon Bay, Ayres Associates Inc is requesting a low-hazard waste exemption from solid waste program regulatory requirements under ch. 289, Stats., and chs. NR 500 to 538: Specifically:

REMEDIATION ACTION EXEMPTION. The following facilities are exempt from solid waste program regulatory requirements under ch. 289, Stats., and chs. NR 500 to 538:

(a) Facilities for the treatment, storage or disposal of solid waste which is excavated for the primary purpose of conducting a site investigation or implementing an interim or remedial action in compliance with the requirements of chs. NR 700 to 726 and which is returned to the same property from which it was excavated in compliance with the requirements of ch. NR 718; and

(b) Facilities for the treatment, storage or disposal of excavated contaminated soil which are operated in compliance with the requirements of ch. NR 718.

Contaminated fill material that is disturbed or removed, will be managed on-site as a non-hazardous solid waste. The historic fill can remain in place, and development within the area of historic fill can proceed under an exemption to solid waste regulations pursuant to sees. NR 506.085 and NR 500.08(4), Wis. Adm. Code. This request includes an exemption to locational standards for the placement of relocated contaminated fill, as outlined ins. NR718.12(1)(c).

This site is being remediated and redeveloped in accordance with the Voluntary Party Remediation Program (VPLE). The WDNR Remediation and Redevelopment Program requested that a Low-Hazard Waste Exemption be submitted for this project and has not previously denied a request to dispose of the waste in an off-site location.

Beneficial reuse of the fill material on-site is the most cost-effective approach for managing the low volume, lightly impacted, soil that will be disturbed during construction The small quantity of fill that is removed from utility trenches, the pool, and geopier installation will be used along with clean, imported soil to raise the elevation of the grade under the proposed building. Removal of the fill from the subsurface, with on-site relocation, will have the added benefits of increasing the distance between the impacted fill material and the water table and keeping it out of a landfill.

General Hydrogeology

Subsurface information collected during the Phase II Assessment and NR 716 Investigations indicates that the unconsolidated sediments at the site consist of general fill material overlying lacustrine (lake) deposits, to the depth of exploration at 35 feet. The lacustrine, or lake deposits, consist of discontinuous layers of poorly graded sand and gravel, silty sand and gravel, silt, and high plasticity clay of variable thickness. The lacustrine deposits are covered by up to 13 feet of fill material which is generally differentiated from the underlying till by the presence of bricks, cinders, concrete, and wood debris. However, it should be noted that in some instances natural soil materials may have been used as fill. Historical documents indicate that portions of the site area were formerly part of Sturgeon Bay and covered by water prior to filling.

Water level data collected in May 2013 indicate that depth to water ranged from 3.85 feet to 4.99 feet below the top of well casing; readings in August 2013 ranged from 4.22 to 5.07 feet below the top of well casing. Water levels collected during the July 2014 and May 2015 site investigations were slightly higher, ranging from 1.39 to 4.80 feet below the top of well casing.

Waste Description

Results of the environmental assessment indicate the presence of brick, cinders, concrete, and wood debris across the property. This material was historically used to fill in low-lying areas between the Sturgeon Bay Channel bulkhead and the former shoreline. Analysis of samples collected from this general fill material indicated concentrations of polycyclic aromatic hydrocarbons (PAHs) and lead at concentrations slightly exceeding ch. NR 720 Wis. Adm. Code residual contaminant levels (RCLs). If disturbed or removed, the contaminated fill material should be managed as a non-hazardous solid waste. The historic fill can remain in place and development within the area of historic fill can proceed under an exemption to solid waste regulations pursuant to sees. NR 506.085 and NR 500.08{4), Wis. Adm. Code.

Contaminants of Concern and Exposure Routes

The primary contaminants of concern in soil include heavy metals (lead) and polycyclic aromatic hydrocarbons (PAH). The primary contaminants of concern in groundwater include volatile organic compounds (benzene) and the polycyclic aromatic hydrocarbons (benzo(a)pyrene, benzo(b)fluoranthene, and chrysene). Cleanup criteria for each of these constituents are outlined in NR 720 and NR 140 Wisconsin Administrative Codes and the clean-up level look-up tables. The contaminants described above were present in soil and groundwater at concentrations slightly exceeding the cleanup levels established for these constituents

Based on the location and nature of the contaminants identified above, and considering the anticipated future use for the site and planned remedial excavation work, the *construction worker/trespasser* has been identified as the most likely person to come in contact with the materials. Secondary sources of contamination are also present at the site including contaminated surface and subsurface soils, dissolved phase groundwater contamination, and potential soil gas vapors. The potential routes of exposure to these substances include:

- Inhalation of VOC-impacted soil particulates and/or VOCs having volatilized from contaminated soil or groundwater

- Ingestion and dermal contact with VOC/PAH, and metal impacted soils
- Ingestion, inhalation or dermal contact with groundwater that may contain VOCs/PAHs during the cleanup

Potential transport mechanisms of site contaminants include:

- Wind and atmospheric dispersion
- Volatilization to enclosed spaces (e.g., indoor air entering future on-site buildings)
- Leaching of contaminants to groundwater

Potential exposure during the remedial work will be managed with a Health and Safety Plan (HASP) and Community Air Monitoring Plan designed to protect site workers and the public. Potential future exposure to residual contamination and vapor transport, if any, will be mitigated using institutional and engineering controls.

Environmental Risk Evaluation

The proposed remediation plan is intended to manage environmental risk and establish a practical and cost effective approach to facilitate property redevelopment. The corrective action plan is based on the following conclusions regarding site conditions and environmental risk.

- The limits of historic fill are adequately defined.
- It is not economically feasible or practical to remove the entire quantity of historic fill present at the site.
- While PAHs and metals were detected in the fill at levels slightly exceeding NR 720 Wisconsin Administrative Code RCLs, the historic fill is not significantly impacting groundwater or surface water quality.
- Groundwater quality is adequately defined for the redevelopment site.
- No significant or continuing sources of groundwater degradation were identified at the redevelopment site.
- No environmental conditions representing an immediate risk to human health or the environment (e.g., open containers, storage tanks, exposed waste) currently exist at the site.
- Concentrations of public health constituents, although greater than their respective ES, do not represent a significant risk to public health or the environment.
- An engineered cap, consisting of the building, clean fill, parking lots, and landscaping along with institutional controls (i.e., no on-site wells), is the presumptive remedy for this site. This remedial action is consistent with the hotel development and the type, and limited extent of environmental impacts at the site.

Soil/Waste Management Plan

This soil management plan applies to historic fill material disturbed during project redevelopment at the West Waterfront redevelopment site. The historic fill is considered a non-hazardous solid waste. This plan summarizes information required under s. NR 718.12(2)(b) 1 to 8, including responsible party information, the type and volume of impacted soil to be managed, project location, consultant and contractor information, proposed schedule, results of analyses performed on the impacted soil, a description of how the impacted soil will be managed, and information to justify that relocation of impacted soils will meet requirements of s. NR 726.13{1)(b) 1to 5.

Impacted Fill Management

Ex-situ remediation at this site may involve limited excavation of impacted soil from the subsurface with beneficial reuse of the material on-site. Site development will necessarily require some modifications to existing site grades (elevations). However, based upon current grading plans for the project, clean, structural fill will be imported and placed on the existing ground surface beneath the building to raise the elevation a minimum of 4½ feet.

Soil (and fill) at the site may include excess material from site grading, utility trenching, soil removed during installation of poured concrete foundation walls, installation of 500 drilled aggregate geopiers to a depth of 11 to 18 feet below ground surface, pool excavation, and utility trenches. Limited spoil is anticipated from the geopier installation as a displacement process will be used to advance the borehole and place the aggregate. Where possible, material generated from excavations and trenching will be reused on site and incorporated into the final project design. The locations and estimated quantity of soil spoil requiring on-site relocation and reuse, and areas of clean imported soil, are shown on Figure 4.

The quantity of soil spoil requiring on-site relocation (estimated at 120 cubic yards) is contingent on final grading elevations, the method of geopier installation, depth and length of utility trenching, size and depth of pool excavation, and length and depth of foundation structures installed. A contractor will be hired to perform the soil excavation and on-site disposal tasks.

The general project approach and sequencing is outlined below:

- Prepare design plans and specification
- Prepare bid package and let for bid
- Select contractor and prepare contracts
- Perform waste characterization and obtain necessary permits
- Perform underground locate/clearance calls
- Abandon monitoring wells in development area, as necessary
- Mobilize equipment and personnel
- Install geopiers within building footprint
- Excavate target soil and manage excavation water
- Relocate soil spoil to designated on-site re-location areas (no on-site storage)
- Collect water entering the utility trench excavation and transfer to a poly tank for storage and analysis, pending treatment and final disposal
- Backfill the excavation with clean fill and compact, as necessary for construction

- Replace monitoring wells removed during excavation, if necessary

Any historic fill excavated from the site that cannot be used on-site for construction will be transported and disposed at Advanced Disposal landfill located at 428 High Street, Chilton, Wisconsin, approximately 82 miles south of the City.

Asphalt and concrete from existing parking and driveways at the site will be removed with a milling machine or backhoe and transported to the City of Sturgeon Bay's recycling yard. This material will be crushed for reused as road base.

Imported Fill Management

Preliminary grading plans prepared to facilitate redevelopment of the 100 East Maple Street (Hotel) Property indicate that approximately 5,500 cubic yards of soil will be required to be imported to the site to achieve design grades beneath the hotel foundation. The City of Sturgeon Bay is currently constructing a stormwater detention pond located at 1030 N. 14th Street. Construction of the Egg Harbor stormwater detention pond is expected to generate approximately 9,500 cubic yards of excess soil. The excess soil (silty sand) generated from the construction of the stormwater pond will be imported to the East Maple Street Property and used as general fill underneath the building footprint. A grading plan showing the distribution and thickness of imported clean fill is shown on Figure 5.

The WNDR recently prepared a guidance document proposing a process to document soil, or other material, imported to a VPLE site. According to the draft guidance document (RR-041) the following factors where considered when evaluating the imported fill:

- Past history of the property-where the soil and other filled materials are generated
- The volume of soil and other fill materials to be used
- Zoning restrictions on planned end uses of the receiving property
- Location on the receiving property where the material will be placed, including the locational criteria in Section NR718.12(1), Wis. Adm. Code and
- Results of sampling and comparison with RCLs established in accordance with Chapter NR720, Wis. Adm. Code

The borrow source has historically been the site of a private residence and open field and does not have a history of commercial or industrial use. A Phase I Environmental Site Assessment of the property, prepared by Robert E. Lee and Associates, was submitted to the WDNR under separate cover. Based on the past use of the borrow source property, it is our opinion that laboratory analysis of samples of this fill source is not warranted and the imported fill from the stormwater pond project does not represent an environmental risk.

The City performed sampling and analysis of the imported soil at the request of the WDNR. Twelve samples were collected from the soil stockpiles temporarily stored on the 92 East Maple Street property. The samples were collected from six stockpiles and placed in sealable plastic baggies. The samples were subsequently screened for the presence of volatile organic compounds (VOCs) using a photoionization detector equipped with a 10.7 electron-volt lamp. The 12 samples were submitted to Pace Laboratories in Green Bay, Wisconsin, and analyzed for polynuclear aromatic hydrocarbons (PAH) and lead. None of the samples were analyzed for VOCs based on PID screening results and olfactory observations.

The results of the analysis are summarized in Table 1. Laboratory analytical sheets are provided in Appendix A. Low levels of one PAH compound (Benzo(a)pyrene) were detected in 4 of the 12 soil samples collected. PAHs form from incomplete combustion and are common in the environment due to atmospheric deposition, although they can also occur naturally. Benzo(a)pyrene in particular has a very low soil screening level and is the PAH compound that most commonly exceeds EPA screening levels and NR 720 RCLs, which are based on EPA screening levels. It should be noted that EPA soil screening levels, which NR 720 values are based, are not cleanup standards and do not define "unacceptable" levels of contaminants in the soil. These values are based on very conservative assumptions that may or may not be valid for all sites. They are used to facilitate identification of contaminants and exposure areas of potential concern that may warrant further assessment but not necessarily cleanup.

The low levels of benzo(a)pyrene found in the borrow source soils do not represent a significant concern and should not preclude the use of these soils for fill at the development site. The predominant exposure concern for benzo(a)pyrene is ingestion, the reason it has such a low soil screening value. The imported soil is being used at the site for fill underneath the building, from the existing ground surface to approximately 4.5 feet above the surface, and will be covered by the building. Therefore, there is no potential direct contact exposure from this material. Furthermore, the potential for PAHs to leach from the soil is negligible due to the low solubility and high partition coefficients of PAHs.

The literature shows that asphalt-based products contain PAHs. Asphalt pavement and sealants produce particulate matter that can contain concentrations of PAHs in the sub-percent range (100s to 1,000s mg/kg total PAHs) that is transported in stormwater runoff. Some studies show that this can cause soil and sediment contamination with total PAH concentrations in the range of 1 to 10 mg/kg. From a remediation perspective, many site cleanups are conducted to remediate the presence of PAHs to cleanup goals below 1 mg/kg or lower. From a risk perspective, remediating sites to low PAH cleanup goals is unwarranted in light of the risk of transportable PAHs produced from paved parking surfaces. It is unreasonable to conduct a cleanup to remediate low PAH concentrations and then redevelop the area with asphalt pavement.

Locational Standards

Locational standards for the placement of relocated contaminated fill, as outlined in ch. NR718.12(1)(c) consist of the following:

1. Within a floodplain
2. Within 100 feet of any wetland or critical habitat area
3. Within 300 feet of any navigable river, stream, lake, pond, or flowage
4. Within 100 feet of any on-site water supply well or 300 feet of any off-site water supply well
5. Within 3 feet of the high groundwater level
6. At a depth greater than the depth of the original excavation from which the contaminated soil was removed
7. Where the contaminated soil poses a threat to public health, safety, or welfare or the environment

The existing areas of historic fill, and the area of soil relocation, extend within 300 feet of the Sturgeon Bay Ship Canal, a navigable channel and within a floodplain. Accordingly, consistent with ch. NR718.12(1)(d), we are requesting an exemption to the location criteria (1, 3, and 5). Although

concentrations of metals and PAHs from some of the fill samples exceed soil to groundwater pathway RCLS, groundwater monitoring indicates that the historic fill is not impacting groundwater quality and, properly managed, does not represent a risk to human health or the environment.

Portions of the area designated as historic fill will be used by the City of Sturgeon Bay for use as public greenspace while other areas containing historic fill will be privately developed for commercial use. Historic fill will be disturbed as future building foundations, utilities, and other subgrade features are constructed. When encountered, this material will be used as fill within the historic fill limits, as shown on Figure 4, or if necessary, transported off site and disposed at a licensed solid waste landfill.

When buildings and other site improvements are completed, the historic fill will be covered. Following completion of site improvement, the environmental cap will consist of the following:

- Public areas: At least 18 inches of soil covered with at least 6 inches of topsoil in public greenspace areas. Public parking and walkways will also provide an environmental cap over portions of the historic fill.
- Private commercial development sites: Paved parking areas and the hotel building will be used to establish an environmental cap. Greenspace in private commercial sites located within the limits of historic fill will be completed with least 18 inches of soil covered with at least 6 inches of topsoil.

In accordance with s. NR 718.12(1)(e)1, soil samples are required to be collected of relocated contaminated soil at a frequency of one sample per 100 cy of soil for the first 600 cy, followed by one sample for additional 300 cy quantities removed. Due to the extensive testing of the historic fill previously completed, the condition of this material has been well characterized and we request an exemption to the requirement for completing further chemical analysis.

Temporary Stockpiles

Imported soil obtained from City's stormwater detention basin project will be temporality stockpiled on the development site's existing asphalt parking lot for approximately two to three weeks pending completion of the geopiers. The soil will then be relocated on top of the geopiers within the building footprint. The location of the temporary stockpiles is shown on Figure 4.

Contaminated fill from within the historic fill limits is expected to be excavated and relocated in a continuous effort such that temporarily stockpiling this material will not be necessary. However, should it be necessary to place excavated fill material in stockpiles, temporary stockpiles will be maintained in general accordance with s. NR 718.05 (3). Conditions for temporary stockpiles include:

- Placing the soil on an impervious base (e.g. Concrete, asphalt, or plastic sheeting)
- Covering the soil when it is not being moved with a cover material sufficient to prevent infiltration of precipitation and inhibit volatilization of contaminants (e.g., plastic sheeting)
- Preventing surface water contact with the stockpiled soil using constructed berms, if necessary, to control surface water movement

If stockpiles are maintained for longer than 15 days, requirements under s. NR 718.05(2) would also apply including stockpile inspections at least once every 30 days, immediately repairing or replacing any base, cover, anchoring, or berm materials, and notification to the WDNR if soil is stored for more than 90 days before final disposition.

The proposed soil handling and placement procedures meet environmental closure requirements of s. NR 726.13(b) and do not pose an unacceptable threat to public health, safety, welfare, or the environment. The site will be placed on the WDNR online Geographic Information System Registry (GIS Registry) for sites with residual soil and/or groundwater contamination, and will have an approved cap maintenance plan which describes requirements for annual cap inspection and timely repair of any damaged/deteriorated areas.

Figures

PROJECT LOCATION

NOTE: THIS DRAWING WAS PREPARED IN COLOR. REPRODUCTION BY MEANS OTHER THAN EQUIVALENT COLOR COPYING MAY CAUSE SOME DATA TO BE LOST OR MISREPRESENTED.

DR.BY T. SHUPERT CHK.BY J. STEINER DATE JULY 2013	WEST WATERFROND REDEVELOPMENT PROJECT CITY OF STURGEON BAY STURGEON BAY, WISCONSIN	AYRES ASSOCIATES	PROJECT LOCATION	FIGURE NO. 1

7/16/2013
PEN
V:\ENV\CAD\Sturgeon Bay\DGN\Figure 1 - Sturgeon Bay Location Map.dgn

Door County Coop - FILL
92 East Maple Street, Sturgeon Bay, Wisconsin
DNR BRRTS #: 02-15-544253 (formerly 09-15-544253)

Former Door County Coop - VPLE
92 East Maple Street, Sturgeon Bay, Wisconsin
DNR BRRTS #: 06-15-560738

Door County Coop
92 East Maple Street, Sturgeon Bay, Wisconsin
DNR BRRTS #: 03-15-000659

NORTH

60 0 60 120FT
SCALE IN FEET

GROUND SURFACE COVER
- GRASS
- SAND & GRAVEL
- ASPHALT/CONCRETE

STURGEON BAY SHIP CANAL

PIERHEAD LINE AS PER ORD. #892

BULKHEAD LINE AS PER ORD. #460

92 EAST MAPLE STREET

100 EAST MAPLE STREET

PROPOSED BUILDING

FORMER BUILDING

FORMER GARAGE

BUILDING

ASPHALT

ROOF ONLY

LOCUST CT.

MAPLE ST.

NEENAH AVE.

Former US Coast Guard - Below OHWM
100 East Maple Street, Sturgeon Bay, Wisconsin
DNR BRRTS #: 02-15-563485

Former US Coast Guard - Above OHWM
100 East Maple Street, Sturgeon Bay, Wisconsin
DNR BRRTS #: 02-15-563484

Former US Coast Guard - Above OHWM-VPLE
100 East Maple Street, Sturgeon Bay, Wisconsin
DNR BRRTS #: 06-15-563486

LEGEND

- SANITARY SEWER LINE
- WATER MAIN
- UNDERGROUND ELECTRIC LINE
- UNDERGROUND FIBER OPTIC LINE
- UNDERGROUND GAS LINE
- UNDERGROUND TELEPHONE LINE
- UNDERGROUND ELECTRIC & FIBER OPTIC
- ORDINARY HIGH WATER MARK

WMW-5 - MONITORING WELL
WGP-4 - GEOPROBE
WVP-9 - VAPOR PROBE
WPZ-10 - PIEZOMETER
B-5 - MONITORING WELL (BY STS CONSULTANTS 2004)
B-4 - GEOPROBE (BY STS CONSULTANTS 2004)
VP-1 - VAPOR PROBE (BY STS CONSULTANTS 2004)

NOTES:
- ALL UNDERGROUND UTILITIES WERE LOCATED AS PER DIGGER'S HOTLINE MARKINGS AND ARE NOT GUARANTEED TO BE COMPLETE OR CORRECT.
- PRIOR TO ANY SUBSURFACE WORK ON THIS PROPERTY, DIGGER'S HOTLINE MUST BE CONTACTED FOR A RE-LOCATE.
- LOCATION OF ORDINARY HIGH WATER MARK OF STURGEON BAY PER WISCONSIN DEPARTMENT OF NATURAL RESOURCES. BASED ON PLAT OF SURVEY DATED OCTOBER 2, 2014

V:\ENV\CAD\STURGEON BAY\DGN\SITE MAP w Prop Building.DGN

Ayres_pdf.pltcfg
ES_text_sub.tbl
9/9/2015
L:\Sturgeon Bay\DGN\Site Map w Prop Building.dgn

DES BY	BOOK NO.
J. STEINER	
DR BY	JOB NO.
T. SHUPERT	15-0422.20
CHK BY	DATE
J. STEINER	JUNE 2015

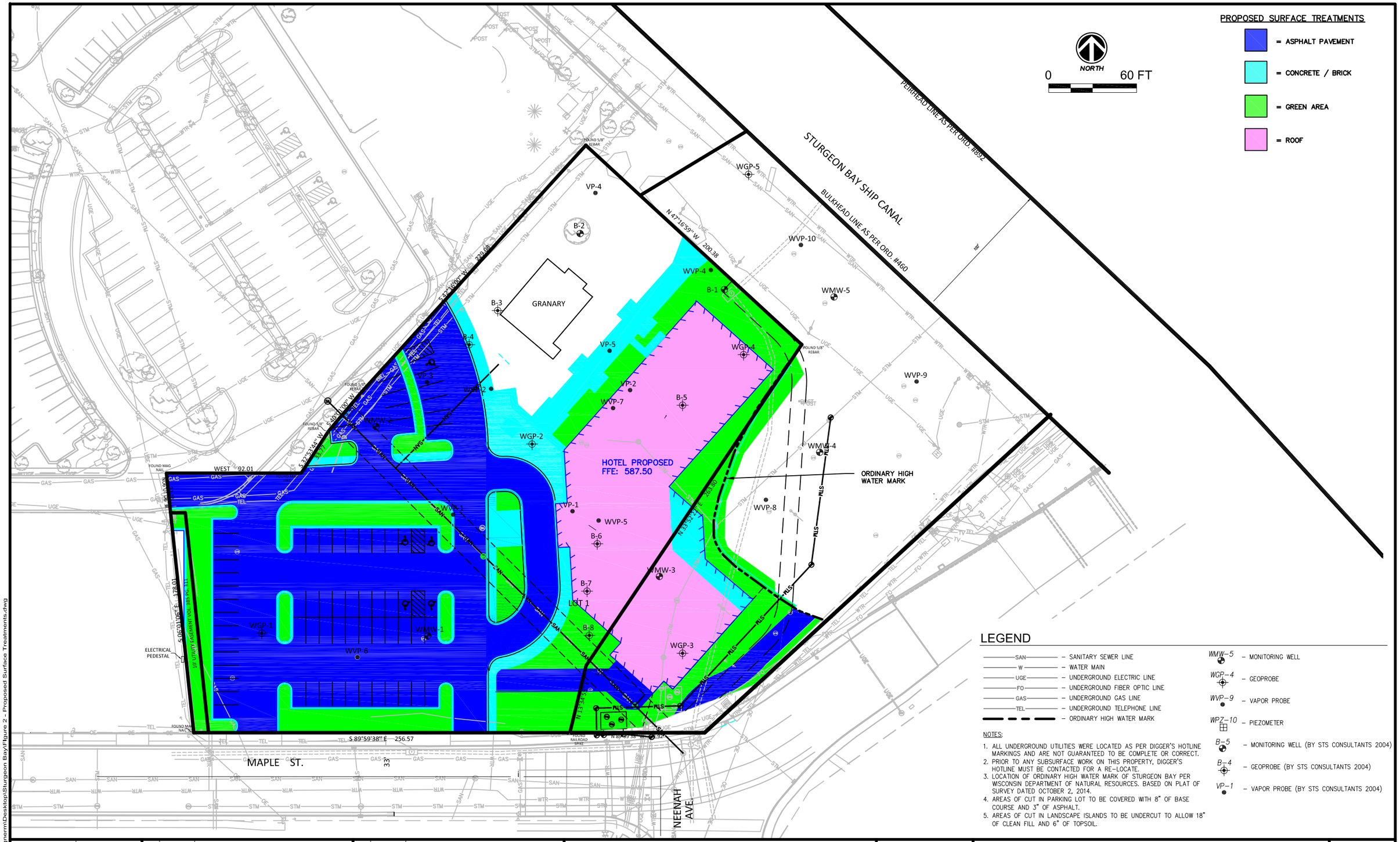
NO	DATE	REVISION
1	02-11-2015	ADDED ORDINARY HIGH WATER MARK FOR STURGEON BAY
2	06-11-2015	ADDED WGP-13 - 15, WMW-12 - 16, MVP-11 - 13
3	08-25-2015	ADDED GROUND SURFACE COVER INFORMATION

WEST WATERFRONT REDEVELOPMENT PROJECT
CITY OF STURGEON BAY
STURGEON BAY, WISCONSIN

AYRES ASSOCIATES
WAUKESHA, WISCONSIN

SITE MAP

DRAWING NO. 2



NOTES:

1. ALL UNDERGROUND UTILITIES WERE LOCATED AS PER DIGGER'S HOTLINE MARKINGS AND ARE NOT GUARANTEED TO BE COMPLETE OR CORRECT.
2. PRIOR TO ANY SUBSURFACE WORK ON THIS PROPERTY, DIGGER'S HOTLINE MUST BE CONTACTED FOR A RE–LOCATE.
3. LOCATION OF ORDINARY HIGH WATER MARK OF STURGEON BAY PER WISCONSIN DEPARTMENT OF NATURAL RESOURCES. BASED ON PLAT OF SURVEY DATED OCTOBER 2, 2014.
4. AREAS OF CUT IN PARKING LOT TO BE COVERED WITH 8" OF BASE COURSE AND 3" OF ASPHALT.
5. AREAS OF CUT IN LANDSCAPE ISLANDS TO BE UNDERCUT TO ALLOW 18" OF CLEAN FILL AND 6" OF TOPSOIL.

C:\Users\degnemm\Desktop\Sturgeon Bay\Figure 2 - Proposed Surface Treatments.dwg

DES BY	J. STEINER	BOOK NO		1	02-11-2015	ADDED ORDINARY HIGH WATER MARK FOR STURGEON BAY	
DR BY	M. DEGNER	JOB NO	19-0422.00	2	06-11-2015	ADDED WGP-13 - 15, WMW-12 - 16, MVP-11 - 13	
CHK BY	J. STEINER	DATE	SEPTEMBER 2015	3	06-26-2015	ADDED GROUND SURFACE COVER INFORMATION	
				NO	DATE	REVISION	

4	09-27-2015	COMBINED EXHIBITS, ADDED SANITARY & STORM SEWER	
NO	DATE	REVISION	

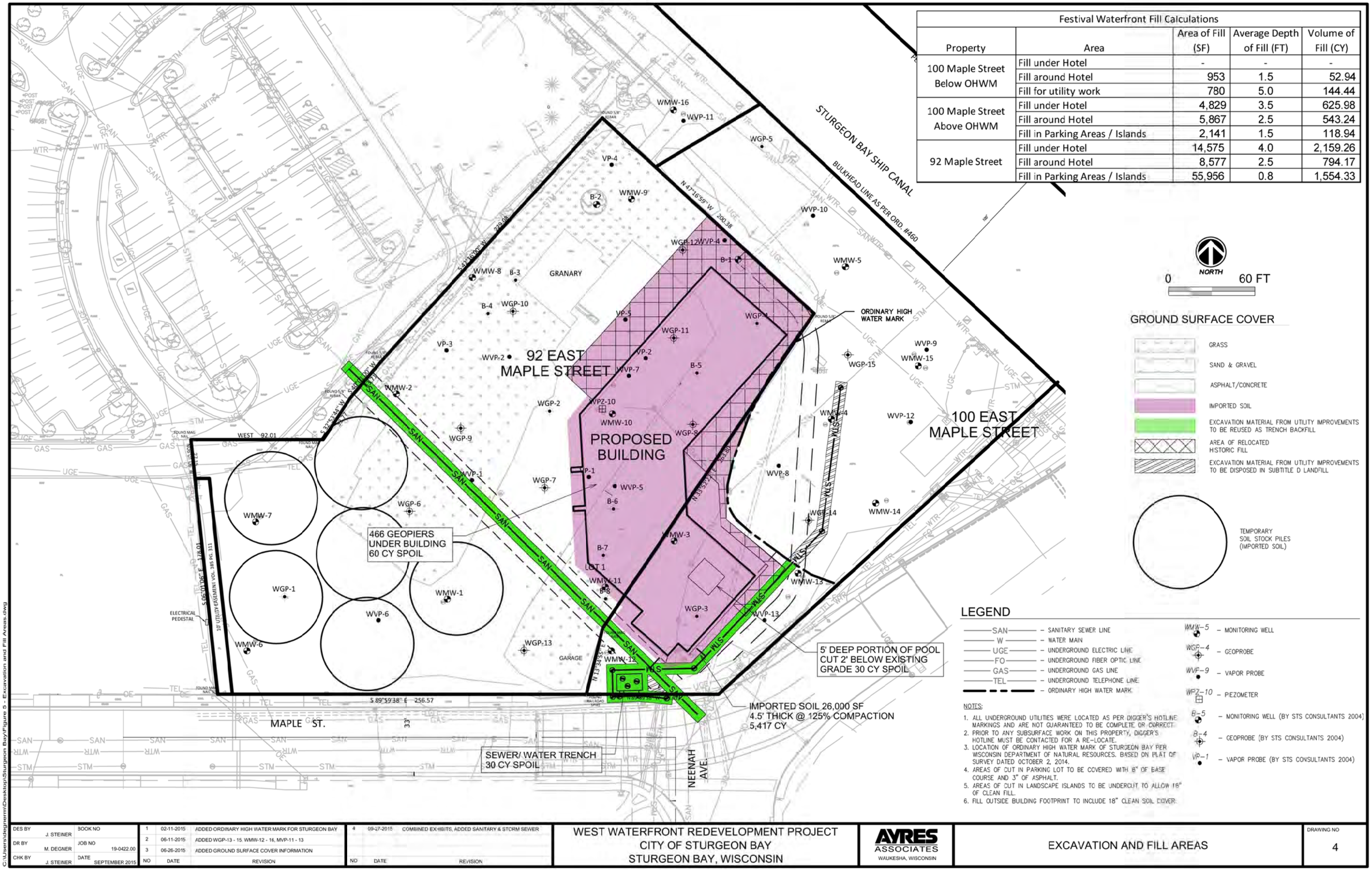
WEST WATERFRONT REDEVELOPMENT PROJECT
CITY OF STURGEON BAY
STURGEON BAY, WISCONSIN

AYRES ASSOCIATES
WAUKESHA, WISCONSIN

ELEMENTS OF ENGINEERED CAP

DRAWING NO
3

Festival Waterfront Fill Calculations				
Property	Area	Area of Fill (SF)	Average Depth of Fill (FT)	Volume of Fill (CY)
100 Maple Street Below OHWM	Fill under Hotel	-	-	-
	Fill around Hotel	953	1.5	52.94
	Fill for utility work	780	5.0	144.44
100 Maple Street Above OHWM	Fill under Hotel	4,829	3.5	625.98
	Fill around Hotel	5,867	2.5	543.24
	Fill in Parking Areas / Islands	2,141	1.5	118.94
92 Maple Street	Fill under Hotel	14,575	4.0	2,159.26
	Fill around Hotel	8,577	2.5	794.17
	Fill in Parking Areas / Islands	55,956	0.8	1,554.33



GROUND SURFACE COVER

- GRASS
- SAND & GRAVEL
- ASPHALT/CONCRETE
- IMPORTED SOIL
- EXCAVATION MATERIAL FROM UTILITY IMPROVEMENTS TO BE REUSED AS TRENCH BACKFILL
- AREA OF RELOCATED HISTORIC FILL
- EXCAVATION MATERIAL FROM UTILITY IMPROVEMENTS TO BE DISPOSED IN SUBTITLE D LANDFILL

TEMPORARY SOIL STOCK PILES (IMPORTED SOIL)

LEGEND

- SAN — SANITARY SEWER LINE
- W — WATER MAIN
- UGE — UNDERGROUND ELECTRIC LINE
- FO — UNDERGROUND FIBER OPTIC LINE
- GAS — UNDERGROUND GAS LINE
- TEL — UNDERGROUND TELEPHONE LINE
- ORDINARY HIGH WATER MARK
- WMW-5 — MONITORING WELL
- WGP-4 — GEOPROBE
- WVP-9 — VAPOR PROBE
- WPZ-10 — PIEZOMETER
- B-5 — MONITORING WELL (BY STS CONSULTANTS 2004)
- B-4 — GEOPROBE (BY STS CONSULTANTS 2004)
- VP-1 — VAPOR PROBE (BY STS CONSULTANTS 2004)

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4. AREAS OF CUT IN PARKING LOT TO BE COVERED WITH 8" OF BASE COURSE AND 3" OF ASPHALT.
5. AREAS OF CUT IN LANDSCAPE ISLANDS TO BE UNDERCUT TO ALLOW 16" OF CLEAN FILL.
6. FILL OUTSIDE BUILDING FOOTPRINT TO INCLUDE 18" CLEAN SOIL COVER.

DES BY	J. STEINER	BOOK NO	
DR BY	M. DEGNER	JOB NO	19-0422.00
CHK BY	J. STEINER	DATE	SEPTEMBER 2015

NO	DATE	REVISION
1	02-11-2015	ADDED ORDINARY HIGH WATER MARK FOR STURGEON BAY
2	06-11-2015	ADDED WGP-13 - 15, WMW-12 - 16, MVP-11 - 13
3	06-26-2015	ADDED GROUND SURFACE COVER INFORMATION
4	09-27-2015	COMBINED EXHIBITS, ADDED SANITARY & STORM SEWER

WEST WATERFRONT REDEVELOPMENT PROJECT
CITY OF STURGEON BAY
STURGEON BAY, WISCONSIN

AYRES ASSOCIATES
WAUKESHA, WISCONSIN

EXCAVATION AND FILL AREAS

DRAWING NO 4

C:\Users\degnermi\Desktop\Sturgeon Bay\Figure 5 - Excavation and Fill Areas.dwg

Door County Coop - FILL
92 East Maple Street, Sturgeon Bay, Wisconsin
DNR BRRTS #: 02-15-544253 (formerly 09-15-544253)

Former Door County Coop - VPLE
92 East Maple Street, Sturgeon Bay, Wisconsin
DNR BRRTS #: 06-15-560738

Door County Coop
92 East Maple Street, Sturgeon Bay, Wisconsin
DNR BRRTS #: 03-15-000659

NORTH
0 60 FT

Festival Waterfront Fill Calculations				
Property	Area	Area of Fill (SF)	Average Depth of Fill (FT)	Volume of Fill (CY)
100 Maple Street Below OHWM	Fill under Hotel	-	-	-
	Fill around Hotel	953	1.5	52.94
	Fill for utility work	780	5.0	144.44
100 Maple Street Above OHWM	Fill under Hotel	4,829	3.5	625.98
	Fill around Hotel	5,867	2.5	543.24
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92 Maple Street	Fill under Hotel	14,575	4.0	2,159.26
	Fill around Hotel	8,577	2.5	794.17
	Fill in Parking Areas / Islands	55,956	0.8	1,554.33

GROUND SURFACE COVER
- GRASS
- SAND & GRAVEL
- ASPHALT — ASPHALT/CONCRETE

FILL AMOUNTS
- AREA OF CUT
- AREA OF 0–12" OF FILL
- AREA OF 12"–18" OF FILL
- AREA OF 18"+ OF FILL
- AREA TO BE UNDERCUT TO ALLOW 18" OF CLEAN FILL AND 6" OF TOP SOIL

FILLING BELOW OHWM

Former US Coast Guard - Below OHWM
100 East Maple Street, Sturgeon Bay, Wisconsin
DNR BRRTS #: 02-15-563485

Former US Coast Guard - Above OHWM
100 East Maple Street, Sturgeon Bay, Wisconsin
DNR BRRTS #: 02-15-563484

Former US Coast Guard - Above OHWM-VPLE
100 East Maple Street, Sturgeon Bay, Wisconsin
DNR BRRTS #: 06-15-563486

LEGEND
- SAN — SANITARY SEWER LINE
- W — WATER MAIN
- UGE — UNDERGROUND ELECTRIC LINE
- FO — UNDERGROUND FIBER OPTIC LINE
- GAS — UNDERGROUND GAS LINE
- TEL — UNDERGROUND TELEPHONE LINE
- ORDINARY HIGH WATER MARK
- WMW–5 — MONITORING WELL
- WGP–4 — GEOPROBE
- WVP–9 — VAPOR PROBE
- WPZ–10 — PIEZOMETER
- B–5 — MONITORING WELL (BY STS CONSULTANTS 2004)
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DES BY	J. STEINER	BOOK NO	
DR BY	M. DEGNER	JOB NO	19-0422.00
CHK BY	J. STEINER	DATE	SEPTEMBER 2015

NO	DATE	REVISION
1	02-11-2015	ADDED ORDINARY HIGH WATER MARK FOR STURGEON BAY
2	06-11-2015	ADDED WGP-13 - 15, WMW-12 - 16, MVP-11 - 13
3	06-26-2015	ADDED GROUND SURFACE COVER INFORMATION
4	09-27-2015	COMBINED EXHIBITS, ADDED SANITARY & STORM SEWER

WEST WATERFRONT REDEVELOPMENT PROJECT
CITY OF STURGEON BAY
STURGEON BAY, WISCONSIN

AYRES ASSOCIATES
WAUKESHA, WISCONSIN

PROPOSED GRADING PLAN

DRAWING NO 5

C:\Users\degnerm\Desktop\Sturgeon Bay\Figure 5 - Proposed Grading Plan.dwg

Tables

Table 1
Summary of Soil Sample Laboratory Analytical Results
West Waterfront Redevelopment Project, Sturgeon Bay, Wisconsin
Borrow Source Samples

Sample Number	Analytical Result (mg/Kg)						Soil Standards	
	BP-1-1	BP-1-2	BP-2-1	BP-2-2	BP-3-1	BP-3-2		
Soil Type	SM	SM	SM	SM	SM	SM		
Metals	Analytical Result (mg/Kg)						NR 720 DC RCL[1] Non-Industrial	NR720 GW RCL[2]
Lead	2.7	3.3	3.3	3.0	3.1	3.0	400	27
PAH	Analytical Result (mg/Kg)						NR 720 DC RCL[1] Non-Industrial	NR720 GW RCL[2]
1-Methylnaphthalene	<0.0090	<0.0090	<0.0091	<0.0091	<0.0091	<0.0091	15.6	ns
2-Methylnaphthalene	<0.0090	<0.0090	<0.0091	<0.0091	<0.0091	<0.0091	229	ns
Acenaphthene	<0.0090	<0.0090	<0.0091	<0.0091	<0.0091	<0.0091	3,440	ns
Acenaphthylene	<0.0081	<0.0081	<0.0081	<0.0082	<0.0082	<0.0081	ns	ns
Anthracene	<0.0094	<0.0093	<0.0094	<0.0095	<0.0095	<0.0094	17,200	98.9
Benzo(a)anthracene	<0.0063	0.0063 J	<0.0063	<0.0063	<0.0063	<0.0063	0.148	ns
Benzo(a)pyrene	<0.0064	<0.0064	<0.0065	<0.0065	<0.0065	<0.0065	0.015	0.235
Benzo(b)fluoranthene	<0.0090	<0.0090	<0.0091	<0.0091	<0.0091	<0.0091	0.148	0.2397
Benzo(g,h,i)perylene	<0.0069	<0.0069	<0.0069	<0.0070	<0.0069	<0.0069	ns	ns
Benzo(k)fluoranthene	<0.0100	<0.0100	<0.0100	<0.0101	<0.0101	<0.0100	1.48	ns
Chrysene	<0.0083	0.0111 J	<0.0084	<0.0085	<0.0084	<0.0084	14.8	0.0723
Dibenz(a,h)anthracene	<0.0066	<0.0066	<0.0066	<0.0067	<0.0067	<0.0066	0.015	ns
Fluoranthene	<0.0090	0.0243	0.0097 J	<0.0091	<0.0091	<0.0091	2,290	44.4
Fluorene	<0.0090	<0.0090	<0.0091	<0.0091	<0.0091	<0.0091	2,290	7.4
Indeno(1,2,3-cd)pyrene	<0.0069	<0.0068	<0.0069	<0.0069	<0.0069	<0.0069	0.148	ns
Naphthalene	<0.0090	<0.0090	<0.0091	<0.0091	<0.0091	<0.0091	5.15	0.3291
Phenanthrene	<0.0090	0.0099 J	<0.0091	<0.0091	<0.0091	<0.0091	ns	ns
Pyrene	<0.0090	0.0175 J	<0.0091	<0.0091	<0.0091	<0.0091	1,720	27.1

UNDERLINE	Concentration exceeds NR 720 Wisconsin Administrative Code Residual Contaminant Level (RCL) for protection of groundwater(1/1/2015).
Bold	Concentration exceeds NR 720 Wisconsin Administrative Code Residual Contaminant Level (RCL) for *non-industrial* direct contact(1/1/2015).
( )	Background threshold values are trace element maximum levels in Wisconsin surface soils from the USGS Report at: *http://pubs.usgs.gov/sir/2011/5202*.
ns	No NR 720 Wisconsin Administrative Code Residual Contaminant Level (RCL) established.
--	Not Analyzed
<	Concentration less than laboratory method detection limit.
mg/Kg	Concentration reported as milligrams per kilogram, equivalent to parts per million (ppm).
	[1]NR 720 Wisconsin Administrative Code Residual Contaminant Level (RCL)
	[2]NR 720 Wisconsin Administrative Code Residual Contaminant Level (RCL) for protection of groundwater.
J	Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

Table 1 (continued)
Summary of Soil Sample Laboratory Analytical Results
West Waterfront Redevelopment Project, Sturgeon Bay, Wisconsin
Borrow Source Samples

Sample Number	Analytical Result (mg/Kg)						Soil Standards	
	BP-4-1	BP-4-2	BP-5-1	BP-5-2	BP-6-1	BP-6-2		
Soil Type	SM	SM	SM	SM	SM	SM		
Metals	Analytical Result (mg/Kg)						NR 720 DC RCL[1] Non-Industrial	NR720 GW RCL[2]
Lead	3.5	3.1	3.2	9.5	3.9	3.7	400	27
PAH	Analytical Result (mg/Kg)						NR 720 DC RCL[1] Non-Industrial	NR720 GW RCL[2]
1-Methylnaphthalene	<0.0091	<0.0103	<0.0091	<0.0091	<0.0091	<0.0090	15.6	ns
2-Methylnaphthalene	<0.0091	<0.0103	<0.0091	<0.0091	<0.0091	<0.0090	229	ns
Acenaphthene	<0.0091	<0.0103	<0.0091	<0.0091	<0.0091	<0.0090	3,440	ns
Acenaphthylene	<0.0081	<0.0093	<0.0081	<0.0082	<0.0082	<0.0081	ns	ns
Anthracene	<0.0094	<0.0107	<0.0094	0.0122 J	<0.0095	0.0188	17,200	98.9
Benzo(a)anthracene	0.0135 J	<0.0072	0.0147 J	0.0311	<0.0063	0.0326	0.148	ns
Benzo(a)pyrene	**0.0179**	<0.0074	**0.0178**	**0.0340**	<0.0065	**0.0280**	0.015	0.235
Benzo(b)fluoranthene	0.0151 J	<0.0103	0.0220	0.0308	<0.0091	0.0296	0.148	0.2397
Benzo(g,h,i)perylene	0.0182 J	<0.0079	0.0141 J	0.0294	<0.0070	0.0117 J	ns	ns
Benzo(k)fluoranthene	<0.0101	<0.0114	0.0183	0.0316	<0.0101	0.0318	1.48	ns
Chrysene	0.0190	<0.0096	0.0251	0.0367	<0.0084	0.0418	14.8	0.0723
Dibenz(a,h)anthracene	0.0112 J	<0.0076	<0.0066	0.0079 J	<0.0067	<0.0066	0.015	ns
Fluoranthene	0.0148 J	<0.0103	0.0520	0.0688	<0.0091	0.102	2,290	44.4
Fluorene	<0.0091	<0.0103	<0.0091	<0.0091	<0.0091	<0.0090	2,290	7.4
Indeno(1,2,3-cd)pyrene	0.0101 J	<0.0079	0.0124 J	0.0200	<0.0069	0.0120 J	0.148	ns
Naphthalene	<0.0091	<0.0103	<0.0091	<0.0091	<0.0091	<0.0090	5.15	0.3291
Phenanthrene	<0.0091	<0.0103	0.0285	0.0376	<0.0091	0.0580	ns	ns
Pyrene	0.0123 J	<0.0103	0.0362	0.0544	<0.0091	0.0749	1,720	27.1

UNDERLINE	Concentration exceeds NR 720 Wisconsin Administrative Code Residual Contaminant Level (RCL) for protection of groundwater(1/1/2015).
Bold	Concentration exceeds NR 720 Wisconsin Administrative Code Residual Contaminant Level (RCL) for *non-industrial* direct contact(1/1/2015).
( )	Background threshold values are trace element maximum levels in Wisconsin surface soils from the USGS Report at: *http://pubs.usgs.gov/sir/2011/5202*.
ns	No NR 720 Wisconsin Administrative Code Residual Contaminant Level (RCL) established.
--	Not Analyzed
<	Concentration less than laboratory method detection limit.
mg/Kg	Concentration reported as milligrams per kilogram, equivalent to parts per million (ppm).
	[1]NR 720 Wisconsin Administrative Code Residual Contaminant Level (RCL)
	[2]NR 720 Wisconsin Administrative Code Residual Contaminant Level (RCL) for protection of groundwater.
J	Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

Appendix A

Laboratory Analytical Data Sheets

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

August 17, 2015

Jeff Steiner
AYRES & ASSOCIATES, INC.
5201 E. Terrace Dr., Suite 200
Madison, WI 53718

RE: Project: 19-0422.20 WEST WATERFRONT
Pace Project No.: 40119126

Dear Jeff Steiner:
Enclosed are the analytical results for sample(s) received by the laboratory on August 04, 2015. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Dan Milewsky
dan.milewsky@pacelabs.com
Project Manager

Enclosures

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

CERTIFICATIONS

Project: 19-0422.20 WEST WATERFRONT
Pace Project No.: 40119126

Green Bay Certification IDs
1241 Bellevue Street, Green Bay, WI 54302
Florida/NELAP Certification #: E87948
Illinois Certification #: 200050
Kentucky Certification #: 82
Louisiana Certification #: 04168
Minnesota Certification #: 055-999-334
North Dakota Certification #: R-150
South Carolina Certification #: 83006001
Texas Certification #: T104704529-14-1
US Dept of Agriculture #: S-76505
Wisconsin Certification #: 405132750

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

SAMPLE SUMMARY

Project: 19-0422.20 WEST WATERFRONT
Pace Project No.: 40119126

Lab ID	Sample ID	Matrix	Date Collected	Date Received
40119126001	**BP-6-1**	Solid	08/04/15 10:08	08/04/15 14:12
40119126002	**BP-6-2**	Solid	08/04/15 10:13	08/04/15 14:12
40119126003	**BP-5-1**	Solid	08/04/15 10:16	08/04/15 14:12
40119126004	**BP-5-2**	Solid	08/04/15 10:20	08/04/15 14:12
40119126005	**BP-3-1**	Solid	08/04/15 10:24	08/04/15 14:12
40119126006	**BP-3-2**	Solid	08/04/15 10:29	08/04/15 14:12
40119126007	**BP-2-1**	Solid	08/04/15 10:33	08/04/15 14:12
40119126008	**BP-2-2**	Solid	08/04/15 10:37	08/04/15 14:12
40119126009	**BP-4-1**	Solid	08/04/15 10:40	08/04/15 14:12
40119126010	**BP-4-2**	Solid	08/04/15 10:44	08/04/15 14:12
40119126011	**BP-1-1**	Solid	08/04/15 10:47	08/04/15 14:12
40119126012	**BP-1-2**	Solid	08/04/15 10:50	08/04/15 14:12

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SAMPLE ANALYTE COUNT

Project: 19-0422.20 WEST WATERFRONT
Pace Project No.: 40119126

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
40119126001	**BP-6-1**	EPA 6010	DLB	1	PASI-G
		EPA 8270 by SIM	ARO	20	PASI-G
		ASTM D2974-87	MAV	1	PASI-G
40119126002	**BP-6-2**	EPA 6010	DLB	1	PASI-G
		EPA 8270 by SIM	ARO	20	PASI-G
		ASTM D2974-87	MAV	1	PASI-G
40119126003	**BP-5-1**	EPA 6010	DLB	1	PASI-G
		EPA 8270 by SIM	ARO	20	PASI-G
		ASTM D2974-87	MAV	1	PASI-G
40119126004	**BP-5-2**	EPA 6010	DLB	1	PASI-G
		EPA 8270 by SIM	ARO	20	PASI-G
		ASTM D2974-87	MAV	1	PASI-G
40119126005	**BP-3-1**	EPA 6010	DLB	1	PASI-G
		EPA 8270 by SIM	ARO	20	PASI-G
		ASTM D2974-87	MAV	1	PASI-G
40119126006	**BP-3-2**	EPA 6010	DLB	1	PASI-G
		EPA 8270 by SIM	ARO	20	PASI-G
		ASTM D2974-87	MAV	1	PASI-G
40119126007	**BP-2-1**	EPA 6010	DLB	1	PASI-G
		EPA 8270 by SIM	ARO	20	PASI-G
		ASTM D2974-87	EMM	1	PASI-G
40119126008	**BP-2-2**	EPA 6010	DLB	1	PASI-G
		EPA 8270 by SIM	ARO	20	PASI-G
		ASTM D2974-87	EMM	1	PASI-G
40119126009	**BP-4-1**	EPA 6010	DLB	1	PASI-G
		EPA 8270 by SIM	ARO	20	PASI-G
		ASTM D2974-87	EMM	1	PASI-G
40119126010	**BP-4-2**	EPA 6010	DLB	1	PASI-G
		EPA 8270 by SIM	ARO	20	PASI-G
		ASTM D2974-87	EMM	1	PASI-G
40119126011	**BP-1-1**	EPA 6010	DLB	1	PASI-G
		EPA 8270 by SIM	ARO	20	PASI-G
		ASTM D2974-87	EMM	1	PASI-G
40119126012	**BP-1-2**	EPA 6010	DLB	1	PASI-G
		EPA 8270 by SIM	ARO	20	PASI-G
		ASTM D2974-87	EMM	1	PASI-G

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SUMMARY OF DETECTION

Project: 19-0422.20 WEST WATERFRONT
Pace Project No.: 40119126

Lab Sample ID / Method	Client Sample ID / Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
40119126001	**BP-6-1**					
EPA 6010	Lead	3.9	mg/kg	1.1	08/13/15 14:55	
ASTM D2974-87	Percent Moisture	8.8	%	0.10	08/14/15 13:53	
40119126002	**BP-6-2**					
EPA 6010	Lead	3.7	mg/kg	0.98	08/13/15 15:02	
EPA 8270 by SIM	Anthracene	18.8	ug/kg	18.1	08/13/15 23:06	
EPA 8270 by SIM	Benzo(a)anthracene	32.6	ug/kg	18.1	08/13/15 23:06	
EPA 8270 by SIM	Benzo(a)pyrene	28.0	ug/kg	18.1	08/13/15 23:06	
EPA 8270 by SIM	Benzo(b)fluoranthene	29.6	ug/kg	18.1	08/13/15 23:06	
EPA 8270 by SIM	Benzo(g,h,i)perylene	11.7J	ug/kg	18.1	08/13/15 23:06	
EPA 8270 by SIM	Benzo(k)fluoranthene	31.8	ug/kg	18.1	08/13/15 23:06	
EPA 8270 by SIM	Chrysene	41.8	ug/kg	18.1	08/13/15 23:06	
EPA 8270 by SIM	Fluoranthene	102	ug/kg	18.1	08/13/15 23:06	
EPA 8270 by SIM	Indeno(1,2,3-cd)pyrene	12.0J	ug/kg	18.1	08/13/15 23:06	
EPA 8270 by SIM	Phenanthrene	58.0	ug/kg	18.1	08/13/15 23:06	
EPA 8270 by SIM	Pyrene	74.9	ug/kg	18.1	08/13/15 23:06	
ASTM D2974-87	Percent Moisture	7.8	%	0.10	08/14/15 13:53	
40119126003	**BP-5-1**					
EPA 6010	Lead	3.2	mg/kg	0.99	08/13/15 15:09	
EPA 8270 by SIM	Benzo(a)anthracene	14.7J	ug/kg	18.1	08/14/15 14:33	
EPA 8270 by SIM	Benzo(a)pyrene	17.8J	ug/kg	18.1	08/14/15 14:33	
EPA 8270 by SIM	Benzo(b)fluoranthene	22.0	ug/kg	18.1	08/14/15 14:33	
EPA 8270 by SIM	Benzo(g,h,i)perylene	14.1J	ug/kg	18.1	08/14/15 14:33	
EPA 8270 by SIM	Benzo(k)fluoranthene	18.3	ug/kg	18.1	08/14/15 14:33	
EPA 8270 by SIM	Chrysene	25.1	ug/kg	18.1	08/14/15 14:33	
EPA 8270 by SIM	Fluoranthene	52.0	ug/kg	18.1	08/14/15 14:33	
EPA 8270 by SIM	Indeno(1,2,3-cd)pyrene	12.4J	ug/kg	18.1	08/14/15 14:33	
EPA 8270 by SIM	Phenanthrene	28.5	ug/kg	18.1	08/14/15 14:33	
EPA 8270 by SIM	Pyrene	36.2	ug/kg	18.1	08/14/15 14:33	
ASTM D2974-87	Percent Moisture	8.0	%	0.10	08/14/15 13:53	
40119126004	**BP-5-2**					
EPA 6010	Lead	9.5	mg/kg	1.0	08/13/15 15:12	
EPA 8270 by SIM	Anthracene	12.2J	ug/kg	18.2	08/13/15 20:14	
EPA 8270 by SIM	Benzo(a)anthracene	31.1	ug/kg	18.2	08/13/15 20:14	
EPA 8270 by SIM	Benzo(a)pyrene	34.0	ug/kg	18.2	08/13/15 20:14	
EPA 8270 by SIM	Benzo(b)fluoranthene	30.8	ug/kg	18.2	08/13/15 20:14	
EPA 8270 by SIM	Benzo(g,h,i)perylene	29.4	ug/kg	18.2	08/13/15 20:14	
EPA 8270 by SIM	Benzo(k)fluoranthene	31.6	ug/kg	18.2	08/13/15 20:14	
EPA 8270 by SIM	Chrysene	36.7	ug/kg	18.2	08/13/15 20:14	
EPA 8270 by SIM	Dibenz(a,h)anthracene	7.9J	ug/kg	18.2	08/13/15 20:14	
EPA 8270 by SIM	Fluoranthene	68.8	ug/kg	18.2	08/13/15 20:14	
EPA 8270 by SIM	Indeno(1,2,3-cd)pyrene	20.0	ug/kg	18.2	08/13/15 20:14	
EPA 8270 by SIM	Phenanthrene	37.6	ug/kg	18.2	08/13/15 20:14	
EPA 8270 by SIM	Pyrene	54.4	ug/kg	18.2	08/13/15 20:14	
ASTM D2974-87	Percent Moisture	8.6	%	0.10	08/14/15 13:53	

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SUMMARY OF DETECTION

Project: 19-0422.20 WEST WATERFRONT
Pace Project No.: 40119126

Lab Sample ID / Method	Client Sample ID / Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
40119126005	**BP-3-1**					
EPA 6010	Lead	3.1	mg/kg	1.0	08/13/15 15:14	
ASTM D2974-87	Percent Moisture	8.6	%	0.10	08/14/15 13:53	
40119126006	**BP-3-2**					
EPA 6010	Lead	3.0	mg/kg	1.0	08/13/15 15:17	
ASTM D2974-87	Percent Moisture	8.0	%	0.10	08/14/15 13:53	
40119126007	**BP-2-1**					
EPA 6010	Lead	3.3	mg/kg	1.0	08/13/15 15:19	
EPA 8270 by SIM	Fluoranthene	9.7J	ug/kg	18.1	08/14/15 13:59	
ASTM D2974-87	Percent Moisture	8.0	%	0.10	08/05/15 12:14	
40119126008	**BP-2-2**					
EPA 6010	Lead	3.0	mg/kg	1.0	08/13/15 15:22	
ASTM D2974-87	Percent Moisture	8.8	%	0.10	08/05/15 12:14	
40119126009	**BP-4-1**					
EPA 6010	Lead	3.5	mg/kg	1.0	08/13/15 15:24	
EPA 8270 by SIM	Benzo(a)anthracene	13.5J	ug/kg	18.2	08/14/15 14:16	
EPA 8270 by SIM	Benzo(a)pyrene	17.9J	ug/kg	18.2	08/14/15 14:16	
EPA 8270 by SIM	Benzo(b)fluoranthene	15.1J	ug/kg	18.2	08/14/15 14:16	
EPA 8270 by SIM	Benzo(g,h,i)perylene	18.2J	ug/kg	18.2	08/14/15 14:16	
EPA 8270 by SIM	Chrysene	19.0	ug/kg	18.2	08/14/15 14:16	
EPA 8270 by SIM	Dibenz(a,h)anthracene	11.2J	ug/kg	18.2	08/14/15 14:16	
EPA 8270 by SIM	Fluoranthene	14.8J	ug/kg	18.2	08/14/15 14:16	
EPA 8270 by SIM	Indeno(1,2,3-cd)pyrene	10.1J	ug/kg	18.2	08/14/15 14:16	
EPA 8270 by SIM	Pyrene	12.3J	ug/kg	18.2	08/14/15 14:16	
ASTM D2974-87	Percent Moisture	8.4	%	0.10	08/05/15 12:14	
40119126010	**BP-4-2**					
EPA 6010	Lead	3.1	mg/kg	1.2	08/13/15 15:27	
ASTM D2974-87	Percent Moisture	19.4	%	0.10	08/05/15 12:14	
40119126011	**BP-1-1**					
EPA 6010	Lead	2.7	mg/kg	1.0	08/13/15 15:29	
ASTM D2974-87	Percent Moisture	7.6	%	0.10	08/05/15 12:14	
40119126012	**BP-1-2**					
EPA 6010	Lead	3.3	mg/kg	1.0	08/13/15 15:33	
EPA 8270 by SIM	Benzo(a)anthracene	6.3J	ug/kg	18.0	08/13/15 22:49	
EPA 8270 by SIM	Chrysene	11.1J	ug/kg	18.0	08/13/15 22:49	
EPA 8270 by SIM	Fluoranthene	24.3	ug/kg	18.0	08/13/15 22:49	
EPA 8270 by SIM	Phenanthrene	9.9J	ug/kg	18.0	08/13/15 22:49	
EPA 8270 by SIM	Pyrene	17.5J	ug/kg	18.0	08/13/15 22:49	
ASTM D2974-87	Percent Moisture	7.4	%	0.10	08/05/15 12:14	

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ANALYTICAL RESULTS

Project: 19-0422.20 WEST WATERFRONT
Pace Project No.: 40119126

Sample: BP-6-1 **Lab ID: 40119126001** Collected: 08/04/15 10:08 Received: 08/04/15 14:12 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Lead	**3.9**	mg/kg	1.1	0.47	1	08/13/15 07:11	08/13/15 14:55	7439-92-1	
8270 MSSV PAH by SIM	Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3546								
Acenaphthene	**<9.1**	ug/kg	18.3	9.1	1	08/12/15 08:57	08/14/15 08:54	83-32-9	
Acenaphthylene	**<8.2**	ug/kg	18.3	8.2	1	08/12/15 08:57	08/14/15 08:54	208-96-8	
Anthracene	**<9.5**	ug/kg	18.3	9.5	1	08/12/15 08:57	08/14/15 08:54	120-12-7	
Benzo(a)anthracene	**<6.3**	ug/kg	18.3	6.3	1	08/12/15 08:57	08/14/15 08:54	56-55-3	
Benzo(a)pyrene	**<6.5**	ug/kg	18.3	6.5	1	08/12/15 08:57	08/14/15 08:54	50-32-8	
Benzo(b)fluoranthene	**<9.1**	ug/kg	18.3	9.1	1	08/12/15 08:57	08/14/15 08:54	205-99-2	
Benzo(g,h,i)perylene	**<7.0**	ug/kg	18.3	7.0	1	08/12/15 08:57	08/14/15 08:54	191-24-2	
Benzo(k)fluoranthene	**<10.1**	ug/kg	18.3	10.1	1	08/12/15 08:57	08/14/15 08:54	207-08-9	
Chrysene	**<8.4**	ug/kg	18.3	8.4	1	08/12/15 08:57	08/14/15 08:54	218-01-9	
Dibenz(a,h)anthracene	**<6.7**	ug/kg	18.3	6.7	1	08/12/15 08:57	08/14/15 08:54	53-70-3	
Fluoranthene	**<9.1**	ug/kg	18.3	9.1	1	08/12/15 08:57	08/14/15 08:54	206-44-0	
Fluorene	**<9.1**	ug/kg	18.3	9.1	1	08/12/15 08:57	08/14/15 08:54	86-73-7	
Indeno(1,2,3-cd)pyrene	**<6.9**	ug/kg	18.3	6.9	1	08/12/15 08:57	08/14/15 08:54	193-39-5	
1-Methylnaphthalene	**<9.1**	ug/kg	18.3	9.1	1	08/12/15 08:57	08/14/15 08:54	90-12-0	
2-Methylnaphthalene	**<9.1**	ug/kg	18.3	9.1	1	08/12/15 08:57	08/14/15 08:54	91-57-6	
Naphthalene	**<9.1**	ug/kg	18.3	9.1	1	08/12/15 08:57	08/14/15 08:54	91-20-3	
Phenanthrene	**<9.1**	ug/kg	18.3	9.1	1	08/12/15 08:57	08/14/15 08:54	85-01-8	
Pyrene	**<9.1**	ug/kg	18.3	9.1	1	08/12/15 08:57	08/14/15 08:54	129-00-0	
Surrogates									
2-Fluorobiphenyl (S)	61	%	39-130		1	08/12/15 08:57	08/14/15 08:54	321-60-8	
Terphenyl-d14 (S)	64	%	37-130		1	08/12/15 08:57	08/14/15 08:54	1718-51-0	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**8.8**	%	0.10	0.10	1		08/14/15 13:53		

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ANALYTICAL RESULTS

Project: 19-0422.20 WEST WATERFRONT
Pace Project No.: 40119126

Sample: BP-6-2 **Lab ID: 40119126002** Collected: 08/04/15 10:13 Received: 08/04/15 14:12 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Lead	**3.7**	mg/kg	0.98	0.42	1	08/13/15 07:11	08/13/15 15:02	7439-92-1	
8270 MSSV PAH by SIM	Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3546								
Acenaphthene	**<9.0**	ug/kg	18.1	9.0	1	08/12/15 08:57	08/13/15 23:06	83-32-9	
Acenaphthylene	**<8.1**	ug/kg	18.1	8.1	1	08/12/15 08:57	08/13/15 23:06	208-96-8	
Anthracene	**18.8**	ug/kg	18.1	9.4	1	08/12/15 08:57	08/13/15 23:06	120-12-7	
Benzo(a)anthracene	**32.6**	ug/kg	18.1	6.3	1	08/12/15 08:57	08/13/15 23:06	56-55-3	
Benzo(a)pyrene	**28.0**	ug/kg	18.1	6.5	1	08/12/15 08:57	08/13/15 23:06	50-32-8	
Benzo(b)fluoranthene	**29.6**	ug/kg	18.1	9.0	1	08/12/15 08:57	08/13/15 23:06	205-99-2	
Benzo(g,h,i)perylene	**11.7J**	ug/kg	18.1	6.9	1	08/12/15 08:57	08/13/15 23:06	191-24-2	
Benzo(k)fluoranthene	**31.8**	ug/kg	18.1	10.0	1	08/12/15 08:57	08/13/15 23:06	207-08-9	
Chrysene	**41.8**	ug/kg	18.1	8.4	1	08/12/15 08:57	08/13/15 23:06	218-01-9	
Dibenz(a,h)anthracene	**<6.6**	ug/kg	18.1	6.6	1	08/12/15 08:57	08/13/15 23:06	53-70-3	
Fluoranthene	**102**	ug/kg	18.1	9.0	1	08/12/15 08:57	08/13/15 23:06	206-44-0	
Fluorene	**<9.0**	ug/kg	18.1	9.0	1	08/12/15 08:57	08/13/15 23:06	86-73-7	
Indeno(1,2,3-cd)pyrene	**12.0J**	ug/kg	18.1	6.9	1	08/12/15 08:57	08/13/15 23:06	193-39-5	
1-Methylnaphthalene	**<9.0**	ug/kg	18.1	9.0	1	08/12/15 08:57	08/13/15 23:06	90-12-0	
2-Methylnaphthalene	**<9.0**	ug/kg	18.1	9.0	1	08/12/15 08:57	08/13/15 23:06	91-57-6	
Naphthalene	**<9.0**	ug/kg	18.1	9.0	1	08/12/15 08:57	08/13/15 23:06	91-20-3	
Phenanthrene	**58.0**	ug/kg	18.1	9.0	1	08/12/15 08:57	08/13/15 23:06	85-01-8	
Pyrene	**74.9**	ug/kg	18.1	9.0	1	08/12/15 08:57	08/13/15 23:06	129-00-0	
Surrogates									
2-Fluorobiphenyl (S)	69	%	39-130		1	08/12/15 08:57	08/13/15 23:06	321-60-8	
Terphenyl-d14 (S)	71	%	37-130		1	08/12/15 08:57	08/13/15 23:06	1718-51-0	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**7.8**	%	0.10	0.10	1		08/14/15 13:53		

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ANALYTICAL RESULTS

Project: 19-0422.20 WEST WATERFRONT
Pace Project No.: 40119126

Sample: BP-5-1 **Lab ID: 40119126003** Collected: 08/04/15 10:16 Received: 08/04/15 14:12 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Lead	**3.2**	mg/kg	0.99	0.43	1	08/13/15 07:11	08/13/15 15:09	7439-92-1	
8270 MSSV PAH by SIM	Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3546								
Acenaphthene	**<9.1**	ug/kg	18.1	9.1	1	08/12/15 08:57	08/14/15 14:33	83-32-9	
Acenaphthylene	**<8.1**	ug/kg	18.1	8.1	1	08/12/15 08:57	08/14/15 14:33	208-96-8	
Anthracene	**<9.4**	ug/kg	18.1	9.4	1	08/12/15 08:57	08/14/15 14:33	120-12-7	
Benzo(a)anthracene	**14.7J**	ug/kg	18.1	6.3	1	08/12/15 08:57	08/14/15 14:33	56-55-3	
Benzo(a)pyrene	**17.8J**	ug/kg	18.1	6.5	1	08/12/15 08:57	08/14/15 14:33	50-32-8	
Benzo(b)fluoranthene	**22.0**	ug/kg	18.1	9.1	1	08/12/15 08:57	08/14/15 14:33	205-99-2	
Benzo(g,h,i)perylene	**14.1J**	ug/kg	18.1	6.9	1	08/12/15 08:57	08/14/15 14:33	191-24-2	
Benzo(k)fluoranthene	**18.3**	ug/kg	18.1	10.0	1	08/12/15 08:57	08/14/15 14:33	207-08-9	
Chrysene	**25.1**	ug/kg	18.1	8.4	1	08/12/15 08:57	08/14/15 14:33	218-01-9	
Dibenz(a,h)anthracene	**<6.6**	ug/kg	18.1	6.6	1	08/12/15 08:57	08/14/15 14:33	53-70-3	
Fluoranthene	**52.0**	ug/kg	18.1	9.1	1	08/12/15 08:57	08/14/15 14:33	206-44-0	
Fluorene	**<9.1**	ug/kg	18.1	9.1	1	08/12/15 08:57	08/14/15 14:33	86-73-7	
Indeno(1,2,3-cd)pyrene	**12.4J**	ug/kg	18.1	6.9	1	08/12/15 08:57	08/14/15 14:33	193-39-5	
1-Methylnaphthalene	**<9.1**	ug/kg	18.1	9.1	1	08/12/15 08:57	08/14/15 14:33	90-12-0	
2-Methylnaphthalene	**<9.1**	ug/kg	18.1	9.1	1	08/12/15 08:57	08/14/15 14:33	91-57-6	
Naphthalene	**<9.1**	ug/kg	18.1	9.1	1	08/12/15 08:57	08/14/15 14:33	91-20-3	
Phenanthrene	**28.5**	ug/kg	18.1	9.1	1	08/12/15 08:57	08/14/15 14:33	85-01-8	
Pyrene	**36.2**	ug/kg	18.1	9.1	1	08/12/15 08:57	08/14/15 14:33	129-00-0	
Surrogates									
2-Fluorobiphenyl (S)	73	%	39-130		1	08/12/15 08:57	08/14/15 14:33	321-60-8	
Terphenyl-d14 (S)	74	%	37-130		1	08/12/15 08:57	08/14/15 14:33	1718-51-0	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**8.0**	%	0.10	0.10	1		08/14/15 13:53		

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ANALYTICAL RESULTS

Project: 19-0422.20 WEST WATERFRONT
Pace Project No.: 40119126

Sample: BP-5-2 **Lab ID: 40119126004** Collected: 08/04/15 10:20 Received: 08/04/15 14:12 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Lead	**9.5**	mg/kg	1.0	0.45	1	08/13/15 07:11	08/13/15 15:12	7439-92-1	
8270 MSSV PAH by SIM	Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3546								
Acenaphthene	**<9.1**	ug/kg	18.2	9.1	1	08/12/15 08:57	08/13/15 20:14	83-32-9	
Acenaphthylene	**<8.2**	ug/kg	18.2	8.2	1	08/12/15 08:57	08/13/15 20:14	208-96-8	
Anthracene	**12.2J**	ug/kg	18.2	9.5	1	08/12/15 08:57	08/13/15 20:14	120-12-7	
Benzo(a)anthracene	**31.1**	ug/kg	18.2	6.3	1	08/12/15 08:57	08/13/15 20:14	56-55-3	
Benzo(a)pyrene	**34.0**	ug/kg	18.2	6.5	1	08/12/15 08:57	08/13/15 20:14	50-32-8	
Benzo(b)fluoranthene	**30.8**	ug/kg	18.2	9.1	1	08/12/15 08:57	08/13/15 20:14	205-99-2	
Benzo(g,h,i)perylene	**29.4**	ug/kg	18.2	6.9	1	08/12/15 08:57	08/13/15 20:14	191-24-2	
Benzo(k)fluoranthene	**31.6**	ug/kg	18.2	10.1	1	08/12/15 08:57	08/13/15 20:14	207-08-9	
Chrysene	**36.7**	ug/kg	18.2	8.4	1	08/12/15 08:57	08/13/15 20:14	218-01-9	
Dibenz(a,h)anthracene	**7.9J**	ug/kg	18.2	6.7	1	08/12/15 08:57	08/13/15 20:14	53-70-3	
Fluoranthene	**68.8**	ug/kg	18.2	9.1	1	08/12/15 08:57	08/13/15 20:14	206-44-0	
Fluorene	**<9.1**	ug/kg	18.2	9.1	1	08/12/15 08:57	08/13/15 20:14	86-73-7	
Indeno(1,2,3-cd)pyrene	**20.0**	ug/kg	18.2	6.9	1	08/12/15 08:57	08/13/15 20:14	193-39-5	
1-Methylnaphthalene	**<9.1**	ug/kg	18.2	9.1	1	08/12/15 08:57	08/13/15 20:14	90-12-0	
2-Methylnaphthalene	**<9.1**	ug/kg	18.2	9.1	1	08/12/15 08:57	08/13/15 20:14	91-57-6	
Naphthalene	**<9.1**	ug/kg	18.2	9.1	1	08/12/15 08:57	08/13/15 20:14	91-20-3	
Phenanthrene	**37.6**	ug/kg	18.2	9.1	1	08/12/15 08:57	08/13/15 20:14	85-01-8	
Pyrene	**54.4**	ug/kg	18.2	9.1	1	08/12/15 08:57	08/13/15 20:14	129-00-0	
Surrogates									
2-Fluorobiphenyl (S)	64	%	39-130		1	08/12/15 08:57	08/13/15 20:14	321-60-8	
Terphenyl-d14 (S)	62	%	37-130		1	08/12/15 08:57	08/13/15 20:14	1718-51-0	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**8.6**	%	0.10	0.10	1		08/14/15 13:53		

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ANALYTICAL RESULTS

Project: 19-0422.20 WEST WATERFRONT
Pace Project No.: 40119126

Sample: BP-3-1 **Lab ID: 40119126005** Collected: 08/04/15 10:24 Received: 08/04/15 14:12 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Lead	**3.1**	mg/kg	1.0	0.44	1	08/13/15 07:11	08/13/15 15:14	7439-92-1	
8270 MSSV PAH by SIM	Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3546								
Acenaphthene	**<9.1**	ug/kg	18.2	9.1	1	08/12/15 08:57	08/13/15 18:12	83-32-9	
Acenaphthylene	**<8.2**	ug/kg	18.2	8.2	1	08/12/15 08:57	08/13/15 18:12	208-96-8	
Anthracene	**<9.5**	ug/kg	18.2	9.5	1	08/12/15 08:57	08/13/15 18:12	120-12-7	
Benzo(a)anthracene	**<6.3**	ug/kg	18.2	6.3	1	08/12/15 08:57	08/13/15 18:12	56-55-3	
Benzo(a)pyrene	**<6.5**	ug/kg	18.2	6.5	1	08/12/15 08:57	08/13/15 18:12	50-32-8	
Benzo(b)fluoranthene	**<9.1**	ug/kg	18.2	9.1	1	08/12/15 08:57	08/13/15 18:12	205-99-2	
Benzo(g,h,i)perylene	**<6.9**	ug/kg	18.2	6.9	1	08/12/15 08:57	08/13/15 18:12	191-24-2	
Benzo(k)fluoranthene	**<10.1**	ug/kg	18.2	10.1	1	08/12/15 08:57	08/13/15 18:12	207-08-9	
Chrysene	**<8.4**	ug/kg	18.2	8.4	1	08/12/15 08:57	08/13/15 18:12	218-01-9	
Dibenz(a,h)anthracene	**<6.7**	ug/kg	18.2	6.7	1	08/12/15 08:57	08/13/15 18:12	53-70-3	
Fluoranthene	**<9.1**	ug/kg	18.2	9.1	1	08/12/15 08:57	08/13/15 18:12	206-44-0	
Fluorene	**<9.1**	ug/kg	18.2	9.1	1	08/12/15 08:57	08/13/15 18:12	86-73-7	
Indeno(1,2,3-cd)pyrene	**<6.9**	ug/kg	18.2	6.9	1	08/12/15 08:57	08/13/15 18:12	193-39-5	
1-Methylnaphthalene	**<9.1**	ug/kg	18.2	9.1	1	08/12/15 08:57	08/13/15 18:12	90-12-0	
2-Methylnaphthalene	**<9.1**	ug/kg	18.2	9.1	1	08/12/15 08:57	08/13/15 18:12	91-57-6	
Naphthalene	**<9.1**	ug/kg	18.2	9.1	1	08/12/15 08:57	08/13/15 18:12	91-20-3	
Phenanthrene	**<9.1**	ug/kg	18.2	9.1	1	08/12/15 08:57	08/13/15 18:12	85-01-8	
Pyrene	**<9.1**	ug/kg	18.2	9.1	1	08/12/15 08:57	08/13/15 18:12	129-00-0	
Surrogates									
2-Fluorobiphenyl (S)	56	%	39-130		1	08/12/15 08:57	08/13/15 18:12	321-60-8	
Terphenyl-d14 (S)	58	%	37-130		1	08/12/15 08:57	08/13/15 18:12	1718-51-0	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**8.6**	%	0.10	0.10	1		08/14/15 13:53		

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ANALYTICAL RESULTS

Project: 19-0422.20 WEST WATERFRONT
Pace Project No.: 40119126

Sample: BP-3-2 **Lab ID: 40119126006** Collected: 08/04/15 10:29 Received: 08/04/15 14:12 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Lead	**3.0**	mg/kg	1.0	0.44	1	08/13/15 07:11	08/13/15 15:17	7439-92-1	
8270 MSSV PAH by SIM	Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3546								
Acenaphthene	**<9.1**	ug/kg	18.1	9.1	1	08/12/15 08:57	08/14/15 10:55	83-32-9	
Acenaphthylene	**<8.1**	ug/kg	18.1	8.1	1	08/12/15 08:57	08/14/15 10:55	208-96-8	
Anthracene	**<9.4**	ug/kg	18.1	9.4	1	08/12/15 08:57	08/14/15 10:55	120-12-7	
Benzo(a)anthracene	**<6.3**	ug/kg	18.1	6.3	1	08/12/15 08:57	08/14/15 10:55	56-55-3	
Benzo(a)pyrene	**<6.5**	ug/kg	18.1	6.5	1	08/12/15 08:57	08/14/15 10:55	50-32-8	
Benzo(b)fluoranthene	**<9.1**	ug/kg	18.1	9.1	1	08/12/15 08:57	08/14/15 10:55	205-99-2	
Benzo(g,h,i)perylene	**<6.9**	ug/kg	18.1	6.9	1	08/12/15 08:57	08/14/15 10:55	191-24-2	
Benzo(k)fluoranthene	**<10.0**	ug/kg	18.1	10.0	1	08/12/15 08:57	08/14/15 10:55	207-08-9	
Chrysene	**<8.4**	ug/kg	18.1	8.4	1	08/12/15 08:57	08/14/15 10:55	218-01-9	
Dibenz(a,h)anthracene	**<6.6**	ug/kg	18.1	6.6	1	08/12/15 08:57	08/14/15 10:55	53-70-3	
Fluoranthene	**<9.1**	ug/kg	18.1	9.1	1	08/12/15 08:57	08/14/15 10:55	206-44-0	
Fluorene	**<9.1**	ug/kg	18.1	9.1	1	08/12/15 08:57	08/14/15 10:55	86-73-7	
Indeno(1,2,3-cd)pyrene	**<6.9**	ug/kg	18.1	6.9	1	08/12/15 08:57	08/14/15 10:55	193-39-5	
1-Methylnaphthalene	**<9.1**	ug/kg	18.1	9.1	1	08/12/15 08:57	08/14/15 10:55	90-12-0	
2-Methylnaphthalene	**<9.1**	ug/kg	18.1	9.1	1	08/12/15 08:57	08/14/15 10:55	91-57-6	
Naphthalene	**<9.1**	ug/kg	18.1	9.1	1	08/12/15 08:57	08/14/15 10:55	91-20-3	
Phenanthrene	**<9.1**	ug/kg	18.1	9.1	1	08/12/15 08:57	08/14/15 10:55	85-01-8	
Pyrene	**<9.1**	ug/kg	18.1	9.1	1	08/12/15 08:57	08/14/15 10:55	129-00-0	
Surrogates									
2-Fluorobiphenyl (S)	75	%	39-130		1	08/12/15 08:57	08/14/15 10:55	321-60-8	
Terphenyl-d14 (S)	79	%	37-130		1	08/12/15 08:57	08/14/15 10:55	1718-51-0	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**8.0**	%	0.10	0.10	1		08/14/15 13:53		

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ANALYTICAL RESULTS

Project: 19-0422.20 WEST WATERFRONT
Pace Project No.: 40119126

Sample: BP-2-1 **Lab ID: 40119126007** Collected: 08/04/15 10:33 Received: 08/04/15 14:12 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Lead	**3.3**	mg/kg	1.0	0.44	1	08/13/15 07:11	08/13/15 15:19	7439-92-1	
8270 MSSV PAH by SIM	Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3546								
Acenaphthene	**<9.1**	ug/kg	18.1	9.1	1	08/12/15 08:57	08/14/15 13:59	83-32-9	
Acenaphthylene	**<8.1**	ug/kg	18.1	8.1	1	08/12/15 08:57	08/14/15 13:59	208-96-8	
Anthracene	**<9.4**	ug/kg	18.1	9.4	1	08/12/15 08:57	08/14/15 13:59	120-12-7	
Benzo(a)anthracene	**<6.3**	ug/kg	18.1	6.3	1	08/12/15 08:57	08/14/15 13:59	56-55-3	
Benzo(a)pyrene	**<6.5**	ug/kg	18.1	6.5	1	08/12/15 08:57	08/14/15 13:59	50-32-8	
Benzo(b)fluoranthene	**<9.1**	ug/kg	18.1	9.1	1	08/12/15 08:57	08/14/15 13:59	205-99-2	
Benzo(g,h,i)perylene	**<6.9**	ug/kg	18.1	6.9	1	08/12/15 08:57	08/14/15 13:59	191-24-2	
Benzo(k)fluoranthene	**<10.0**	ug/kg	18.1	10.0	1	08/12/15 08:57	08/14/15 13:59	207-08-9	
Chrysene	**<8.4**	ug/kg	18.1	8.4	1	08/12/15 08:57	08/14/15 13:59	218-01-9	
Dibenz(a,h)anthracene	**<6.6**	ug/kg	18.1	6.6	1	08/12/15 08:57	08/14/15 13:59	53-70-3	
Fluoranthene	**9.7J**	ug/kg	18.1	9.1	1	08/12/15 08:57	08/14/15 13:59	206-44-0	
Fluorene	**<9.1**	ug/kg	18.1	9.1	1	08/12/15 08:57	08/14/15 13:59	86-73-7	
Indeno(1,2,3-cd)pyrene	**<6.9**	ug/kg	18.1	6.9	1	08/12/15 08:57	08/14/15 13:59	193-39-5	
1-Methylnaphthalene	**<9.1**	ug/kg	18.1	9.1	1	08/12/15 08:57	08/14/15 13:59	90-12-0	
2-Methylnaphthalene	**<9.1**	ug/kg	18.1	9.1	1	08/12/15 08:57	08/14/15 13:59	91-57-6	
Naphthalene	**<9.1**	ug/kg	18.1	9.1	1	08/12/15 08:57	08/14/15 13:59	91-20-3	
Phenanthrene	**<9.1**	ug/kg	18.1	9.1	1	08/12/15 08:57	08/14/15 13:59	85-01-8	
Pyrene	**<9.1**	ug/kg	18.1	9.1	1	08/12/15 08:57	08/14/15 13:59	129-00-0	
Surrogates									
2-Fluorobiphenyl (S)	59	%	39-130		1	08/12/15 08:57	08/14/15 13:59	321-60-8	
Terphenyl-d14 (S)	62	%	37-130		1	08/12/15 08:57	08/14/15 13:59	1718-51-0	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**8.0**	%	0.10	0.10	1		08/05/15 12:14		

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ANALYTICAL RESULTS

Project: 19-0422.20 WEST WATERFRONT
Pace Project No.: 40119126

Sample: BP-2-2 **Lab ID: 40119126008** Collected: 08/04/15 10:37 Received: 08/04/15 14:12 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Lead	**3.0**	mg/kg	1.0	0.45	1	08/13/15 07:11	08/13/15 15:22	7439-92-1	
8270 MSSV PAH by SIM	Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3546								
Acenaphthene	**<9.1**	ug/kg	18.3	9.1	1	08/12/15 08:57	08/14/15 10:03	83-32-9	
Acenaphthylene	**<8.2**	ug/kg	18.3	8.2	1	08/12/15 08:57	08/14/15 10:03	208-96-8	
Anthracene	**<9.5**	ug/kg	18.3	9.5	1	08/12/15 08:57	08/14/15 10:03	120-12-7	
Benzo(a)anthracene	**<6.3**	ug/kg	18.3	6.3	1	08/12/15 08:57	08/14/15 10:03	56-55-3	
Benzo(a)pyrene	**<6.5**	ug/kg	18.3	6.5	1	08/12/15 08:57	08/14/15 10:03	50-32-8	
Benzo(b)fluoranthene	**<9.1**	ug/kg	18.3	9.1	1	08/12/15 08:57	08/14/15 10:03	205-99-2	
Benzo(g,h,i)perylene	**<7.0**	ug/kg	18.3	7.0	1	08/12/15 08:57	08/14/15 10:03	191-24-2	
Benzo(k)fluoranthene	**<10.1**	ug/kg	18.3	10.1	1	08/12/15 08:57	08/14/15 10:03	207-08-9	
Chrysene	**<8.5**	ug/kg	18.3	8.5	1	08/12/15 08:57	08/14/15 10:03	218-01-9	
Dibenz(a,h)anthracene	**<6.7**	ug/kg	18.3	6.7	1	08/12/15 08:57	08/14/15 10:03	53-70-3	
Fluoranthene	**<9.1**	ug/kg	18.3	9.1	1	08/12/15 08:57	08/14/15 10:03	206-44-0	
Fluorene	**<9.1**	ug/kg	18.3	9.1	1	08/12/15 08:57	08/14/15 10:03	86-73-7	
Indeno(1,2,3-cd)pyrene	**<6.9**	ug/kg	18.3	6.9	1	08/12/15 08:57	08/14/15 10:03	193-39-5	
1-Methylnaphthalene	**<9.1**	ug/kg	18.3	9.1	1	08/12/15 08:57	08/14/15 10:03	90-12-0	
2-Methylnaphthalene	**<9.1**	ug/kg	18.3	9.1	1	08/12/15 08:57	08/14/15 10:03	91-57-6	
Naphthalene	**<9.1**	ug/kg	18.3	9.1	1	08/12/15 08:57	08/14/15 10:03	91-20-3	
Phenanthrene	**<9.1**	ug/kg	18.3	9.1	1	08/12/15 08:57	08/14/15 10:03	85-01-8	
Pyrene	**<9.1**	ug/kg	18.3	9.1	1	08/12/15 08:57	08/14/15 10:03	129-00-0	
Surrogates									
2-Fluorobiphenyl (S)	57	%	39-130		1	08/12/15 08:57	08/14/15 10:03	321-60-8	
Terphenyl-d14 (S)	61	%	37-130		1	08/12/15 08:57	08/14/15 10:03	1718-51-0	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**8.8**	%	0.10	0.10	1		08/05/15 12:14		

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ANALYTICAL RESULTS

Project: 19-0422.20 WEST WATERFRONT
Pace Project No.: 40119126

Sample: BP-4-1 **Lab ID: 40119126009** Collected: 08/04/15 10:40 Received: 08/04/15 14:12 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Lead	**3.5**	mg/kg	1.0	0.44	1	08/13/15 07:11	08/13/15 15:24	7439-92-1	
8270 MSSV PAH by SIM	Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3546								
Acenaphthene	**<9.1**	ug/kg	18.2	9.1	1	08/12/15 08:57	08/14/15 14:16	83-32-9	
Acenaphthylene	**<8.1**	ug/kg	18.2	8.1	1	08/12/15 08:57	08/14/15 14:16	208-96-8	
Anthracene	**<9.4**	ug/kg	18.2	9.4	1	08/12/15 08:57	08/14/15 14:16	120-12-7	
Benzo(a)anthracene	**13.5J**	ug/kg	18.2	6.3	1	08/12/15 08:57	08/14/15 14:16	56-55-3	
Benzo(a)pyrene	**17.9J**	ug/kg	18.2	6.5	1	08/12/15 08:57	08/14/15 14:16	50-32-8	
Benzo(b)fluoranthene	**15.1J**	ug/kg	18.2	9.1	1	08/12/15 08:57	08/14/15 14:16	205-99-2	
Benzo(g,h,i)perylene	**18.2J**	ug/kg	18.2	6.9	1	08/12/15 08:57	08/14/15 14:16	191-24-2	
Benzo(k)fluoranthene	**<10.1**	ug/kg	18.2	10.1	1	08/12/15 08:57	08/14/15 14:16	207-08-9	
Chrysene	**19.0**	ug/kg	18.2	8.4	1	08/12/15 08:57	08/14/15 14:16	218-01-9	
Dibenz(a,h)anthracene	**11.2J**	ug/kg	18.2	6.7	1	08/12/15 08:57	08/14/15 14:16	53-70-3	
Fluoranthene	**14.8J**	ug/kg	18.2	9.1	1	08/12/15 08:57	08/14/15 14:16	206-44-0	
Fluorene	**<9.1**	ug/kg	18.2	9.1	1	08/12/15 08:57	08/14/15 14:16	86-73-7	
Indeno(1,2,3-cd)pyrene	**10.1J**	ug/kg	18.2	6.9	1	08/12/15 08:57	08/14/15 14:16	193-39-5	
1-Methylnaphthalene	**<9.1**	ug/kg	18.2	9.1	1	08/12/15 08:57	08/14/15 14:16	90-12-0	
2-Methylnaphthalene	**<9.1**	ug/kg	18.2	9.1	1	08/12/15 08:57	08/14/15 14:16	91-57-6	
Naphthalene	**<9.1**	ug/kg	18.2	9.1	1	08/12/15 08:57	08/14/15 14:16	91-20-3	
Phenanthrene	**<9.1**	ug/kg	18.2	9.1	1	08/12/15 08:57	08/14/15 14:16	85-01-8	
Pyrene	**12.3J**	ug/kg	18.2	9.1	1	08/12/15 08:57	08/14/15 14:16	129-00-0	
Surrogates									
2-Fluorobiphenyl (S)	61	%	39-130		1	08/12/15 08:57	08/14/15 14:16	321-60-8	
Terphenyl-d14 (S)	62	%	37-130		1	08/12/15 08:57	08/14/15 14:16	1718-51-0	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**8.4**	%	0.10	0.10	1		08/05/15 12:14		

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ANALYTICAL RESULTS

Project: 19-0422.20 WEST WATERFRONT
Pace Project No.: 40119126

Sample: BP-4-2 **Lab ID: 40119126010** Collected: 08/04/15 10:44 Received: 08/04/15 14:12 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Lead	**3.1**	mg/kg	1.2	0.51	1	08/13/15 07:11	08/13/15 15:27	7439-92-1	
8270 MSSV PAH by SIM	Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3546								
Acenaphthene	**<10.3**	ug/kg	20.7	10.3	1	08/12/15 08:57	08/13/15 18:30	83-32-9	
Acenaphthylene	**<9.3**	ug/kg	20.7	9.3	1	08/12/15 08:57	08/13/15 18:30	208-96-8	
Anthracene	**<10.7**	ug/kg	20.7	10.7	1	08/12/15 08:57	08/13/15 18:30	120-12-7	
Benzo(a)anthracene	**<7.2**	ug/kg	20.7	7.2	1	08/12/15 08:57	08/13/15 18:30	56-55-3	
Benzo(a)pyrene	**<7.4**	ug/kg	20.7	7.4	1	08/12/15 08:57	08/13/15 18:30	50-32-8	
Benzo(b)fluoranthene	**<10.3**	ug/kg	20.7	10.3	1	08/12/15 08:57	08/13/15 18:30	205-99-2	
Benzo(g,h,i)perylene	**<7.9**	ug/kg	20.7	7.9	1	08/12/15 08:57	08/13/15 18:30	191-24-2	
Benzo(k)fluoranthene	**<11.4**	ug/kg	20.7	11.4	1	08/12/15 08:57	08/13/15 18:30	207-08-9	
Chrysene	**<9.6**	ug/kg	20.7	9.6	1	08/12/15 08:57	08/13/15 18:30	218-01-9	
Dibenz(a,h)anthracene	**<7.6**	ug/kg	20.7	7.6	1	08/12/15 08:57	08/13/15 18:30	53-70-3	
Fluoranthene	**<10.3**	ug/kg	20.7	10.3	1	08/12/15 08:57	08/13/15 18:30	206-44-0	
Fluorene	**<10.3**	ug/kg	20.7	10.3	1	08/12/15 08:57	08/13/15 18:30	86-73-7	
Indeno(1,2,3-cd)pyrene	**<7.9**	ug/kg	20.7	7.9	1	08/12/15 08:57	08/13/15 18:30	193-39-5	
1-Methylnaphthalene	**<10.3**	ug/kg	20.7	10.3	1	08/12/15 08:57	08/13/15 18:30	90-12-0	
2-Methylnaphthalene	**<10.3**	ug/kg	20.7	10.3	1	08/12/15 08:57	08/13/15 18:30	91-57-6	
Naphthalene	**<10.3**	ug/kg	20.7	10.3	1	08/12/15 08:57	08/13/15 18:30	91-20-3	
Phenanthrene	**<10.3**	ug/kg	20.7	10.3	1	08/12/15 08:57	08/13/15 18:30	85-01-8	
Pyrene	**<10.3**	ug/kg	20.7	10.3	1	08/12/15 08:57	08/13/15 18:30	129-00-0	
Surrogates									
2-Fluorobiphenyl (S)	61	%	39-130		1	08/12/15 08:57	08/13/15 18:30	321-60-8	
Terphenyl-d14 (S)	62	%	37-130		1	08/12/15 08:57	08/13/15 18:30	1718-51-0	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**19.4**	%	0.10	0.10	1		08/05/15 12:14		

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ANALYTICAL RESULTS

Project: 19-0422.20 WEST WATERFRONT
Pace Project No.: 40119126

Sample: BP-1-1 **Lab ID: 40119126011** Collected: 08/04/15 10:47 Received: 08/04/15 14:12 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Lead	**2.7**	mg/kg	1.0	0.45	1	08/13/15 07:11	08/13/15 15:29	7439-92-1	
8270 MSSV PAH by SIM	Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3546								
Acenaphthene	**<9.0**	ug/kg	18.0	9.0	1	08/12/15 08:57	08/14/15 09:46	83-32-9	
Acenaphthylene	**<8.1**	ug/kg	18.0	8.1	1	08/12/15 08:57	08/14/15 09:46	208-96-8	
Anthracene	**<9.4**	ug/kg	18.0	9.4	1	08/12/15 08:57	08/14/15 09:46	120-12-7	
Benzo(a)anthracene	**<6.3**	ug/kg	18.0	6.3	1	08/12/15 08:57	08/14/15 09:46	56-55-3	
Benzo(a)pyrene	**<6.4**	ug/kg	18.0	6.4	1	08/12/15 08:57	08/14/15 09:46	50-32-8	
Benzo(b)fluoranthene	**<9.0**	ug/kg	18.0	9.0	1	08/12/15 08:57	08/14/15 09:46	205-99-2	
Benzo(g,h,i)perylene	**<6.9**	ug/kg	18.0	6.9	1	08/12/15 08:57	08/14/15 09:46	191-24-2	
Benzo(k)fluoranthene	**<10**	ug/kg	18.0	10	1	08/12/15 08:57	08/14/15 09:46	207-08-9	
Chrysene	**<8.3**	ug/kg	18.0	8.3	1	08/12/15 08:57	08/14/15 09:46	218-01-9	
Dibenz(a,h)anthracene	**<6.6**	ug/kg	18.0	6.6	1	08/12/15 08:57	08/14/15 09:46	53-70-3	
Fluoranthene	**<9.0**	ug/kg	18.0	9.0	1	08/12/15 08:57	08/14/15 09:46	206-44-0	
Fluorene	**<9.0**	ug/kg	18.0	9.0	1	08/12/15 08:57	08/14/15 09:46	86-73-7	
Indeno(1,2,3-cd)pyrene	**<6.9**	ug/kg	18.0	6.9	1	08/12/15 08:57	08/14/15 09:46	193-39-5	
1-Methylnaphthalene	**<9.0**	ug/kg	18.0	9.0	1	08/12/15 08:57	08/14/15 09:46	90-12-0	
2-Methylnaphthalene	**<9.0**	ug/kg	18.0	9.0	1	08/12/15 08:57	08/14/15 09:46	91-57-6	
Naphthalene	**<9.0**	ug/kg	18.0	9.0	1	08/12/15 08:57	08/14/15 09:46	91-20-3	
Phenanthrene	**<9.0**	ug/kg	18.0	9.0	1	08/12/15 08:57	08/14/15 09:46	85-01-8	
Pyrene	**<9.0**	ug/kg	18.0	9.0	1	08/12/15 08:57	08/14/15 09:46	129-00-0	
Surrogates									
2-Fluorobiphenyl (S)	63	%	39-130		1	08/12/15 08:57	08/14/15 09:46	321-60-8	
Terphenyl-d14 (S)	67	%	37-130		1	08/12/15 08:57	08/14/15 09:46	1718-51-0	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**7.6**	%	0.10	0.10	1		08/05/15 12:14		

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ANALYTICAL RESULTS

Project: 19-0422.20 WEST WATERFRONT
Pace Project No.: 40119126

Sample: BP-1-2 **Lab ID: 40119126012** Collected: 08/04/15 10:50 Received: 08/04/15 14:12 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Lead	**3.3**	mg/kg	1.0	0.44	1	08/13/15 07:11	08/13/15 15:33	7439-92-1	
8270 MSSV PAH by SIM	Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3546								
Acenaphthene	**<9.0**	ug/kg	18.0	9.0	1	08/12/15 08:57	08/13/15 22:49	83-32-9	
Acenaphthylene	**<8.1**	ug/kg	18.0	8.1	1	08/12/15 08:57	08/13/15 22:49	208-96-8	
Anthracene	**<9.3**	ug/kg	18.0	9.3	1	08/12/15 08:57	08/13/15 22:49	120-12-7	
Benzo(a)anthracene	**6.3J**	ug/kg	18.0	6.2	1	08/12/15 08:57	08/13/15 22:49	56-55-3	
Benzo(a)pyrene	**<6.4**	ug/kg	18.0	6.4	1	08/12/15 08:57	08/13/15 22:49	50-32-8	
Benzo(b)fluoranthene	**<9.0**	ug/kg	18.0	9.0	1	08/12/15 08:57	08/13/15 22:49	205-99-2	
Benzo(g,h,i)perylene	**<6.9**	ug/kg	18.0	6.9	1	08/12/15 08:57	08/13/15 22:49	191-24-2	
Benzo(k)fluoranthene	**<10**	ug/kg	18.0	10	1	08/12/15 08:57	08/13/15 22:49	207-08-9	
Chrysene	**11.1J**	ug/kg	18.0	8.3	1	08/12/15 08:57	08/13/15 22:49	218-01-9	
Dibenz(a,h)anthracene	**<6.6**	ug/kg	18.0	6.6	1	08/12/15 08:57	08/13/15 22:49	53-70-3	
Fluoranthene	**24.3**	ug/kg	18.0	9.0	1	08/12/15 08:57	08/13/15 22:49	206-44-0	
Fluorene	**<9.0**	ug/kg	18.0	9.0	1	08/12/15 08:57	08/13/15 22:49	86-73-7	
Indeno(1,2,3-cd)pyrene	**<6.8**	ug/kg	18.0	6.8	1	08/12/15 08:57	08/13/15 22:49	193-39-5	
1-Methylnaphthalene	**<9.0**	ug/kg	18.0	9.0	1	08/12/15 08:57	08/13/15 22:49	90-12-0	
2-Methylnaphthalene	**<9.0**	ug/kg	18.0	9.0	1	08/12/15 08:57	08/13/15 22:49	91-57-6	
Naphthalene	**<9.0**	ug/kg	18.0	9.0	1	08/12/15 08:57	08/13/15 22:49	91-20-3	
Phenanthrene	**9.9J**	ug/kg	18.0	9.0	1	08/12/15 08:57	08/13/15 22:49	85-01-8	
Pyrene	**17.5J**	ug/kg	18.0	9.0	1	08/12/15 08:57	08/13/15 22:49	129-00-0	
Surrogates									
2-Fluorobiphenyl (S)	64	%	39-130		1	08/12/15 08:57	08/13/15 22:49	321-60-8	
Terphenyl-d14 (S)	65	%	37-130		1	08/12/15 08:57	08/13/15 22:49	1718-51-0	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**7.4**	%	0.10	0.10	1		08/05/15 12:14		

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QUALITY CONTROL DATA

Project: 19-0422.20 WEST WATERFRONT
Pace Project No.: 40119126

QC Batch: MPRP/12413 Analysis Method: EPA 6010
QC Batch Method: EPA 3050 Analysis Description: 6010 MET
Associated Lab Samples: 40119126001, 40119126002, 40119126003, 40119126004, 40119126005, 40119126006, 40119126007, 40119126008, 40119126009, 40119126010, 40119126011, 40119126012

METHOD BLANK: 1205824 Matrix: Solid
Associated Lab Samples: 40119126001, 40119126002, 40119126003, 40119126004, 40119126005, 40119126006, 40119126007, 40119126008, 40119126009, 40119126010, 40119126011, 40119126012

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Lead	mg/kg	<0.43	1.0	08/13/15 14:51	

LABORATORY CONTROL SAMPLE: 1205825

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Lead	mg/kg	50	49.3	99	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1205826 1205827

Parameter	Units	40119126001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Lead	mg/kg	3.9	54.7	54.7	54.2	54.8	92	93	75-125	1	20	

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QUALITY CONTROL DATA

Project: 19-0422.20 WEST WATERFRONT
Pace Project No.: 40119126

QC Batch: OEXT/27673 Analysis Method: EPA 8270 by SIM
QC Batch Method: EPA 3546 Analysis Description: 8270/3546 MSSV PAH by SIM
Associated Lab Samples: 40119126001, 40119126002, 40119126003, 40119126004, 40119126005, 40119126006, 40119126007, 40119126008, 40119126009, 40119126010, 40119126011, 40119126012

METHOD BLANK: 1205356 Matrix: Solid
Associated Lab Samples: 40119126001, 40119126002, 40119126003, 40119126004, 40119126005, 40119126006, 40119126007, 40119126008, 40119126009, 40119126010, 40119126011, 40119126012

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1-Methylnaphthalene	ug/kg	<8.3	16.7	08/12/15 12:34	
2-Methylnaphthalene	ug/kg	<8.3	16.7	08/12/15 12:34	
Acenaphthene	ug/kg	<8.3	16.7	08/12/15 12:34	
Acenaphthylene	ug/kg	<7.5	16.7	08/12/15 12:34	
Anthracene	ug/kg	<8.6	16.7	08/12/15 12:34	
Benzo(a)anthracene	ug/kg	<5.8	16.7	08/12/15 12:34	
Benzo(a)pyrene	ug/kg	<6.0	16.7	08/12/15 12:34	
Benzo(b)fluoranthene	ug/kg	<8.3	16.7	08/12/15 12:34	
Benzo(g,h,i)perylene	ug/kg	<6.3	16.7	08/12/15 12:34	
Benzo(k)fluoranthene	ug/kg	<9.2	16.7	08/12/15 12:34	
Chrysene	ug/kg	<7.7	16.7	08/12/15 12:34	
Dibenz(a,h)anthracene	ug/kg	<6.1	16.7	08/12/15 12:34	
Fluoranthene	ug/kg	<8.3	16.7	08/12/15 12:34	
Fluorene	ug/kg	<8.3	16.7	08/12/15 12:34	
Indeno(1,2,3-cd)pyrene	ug/kg	<6.3	16.7	08/12/15 12:34	
Naphthalene	ug/kg	<8.3	16.7	08/12/15 12:34	
Phenanthrene	ug/kg	<8.3	16.7	08/12/15 12:34	
Pyrene	ug/kg	<8.3	16.7	08/12/15 12:34	
2-Fluorobiphenyl (S)	%	74	39-130	08/12/15 12:34	
Terphenyl-d14 (S)	%	80	37-130	08/12/15 12:34	

LABORATORY CONTROL SAMPLE: 1205357

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1-Methylnaphthalene	ug/kg	333	259	78	53-130	
2-Methylnaphthalene	ug/kg	333	270	81	52-130	
Acenaphthene	ug/kg	333	280	84	54-130	
Acenaphthylene	ug/kg	333	287	86	55-130	
Anthracene	ug/kg	333	332	100	64-130	
Benzo(a)anthracene	ug/kg	333	278	83	50-130	
Benzo(a)pyrene	ug/kg	333	281	84	46-130	
Benzo(b)fluoranthene	ug/kg	333	256	77	43-130	
Benzo(g,h,i)perylene	ug/kg	333	263	79	48-130	
Benzo(k)fluoranthene	ug/kg	333	299	90	55-130	
Chrysene	ug/kg	333	292	87	62-130	
Dibenz(a,h)anthracene	ug/kg	333	280	84	49-130	
Fluoranthene	ug/kg	333	284	85	57-130	
Fluorene	ug/kg	333	275	83	57-130	

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QUALITY CONTROL DATA

Project: 19-0422.20 WEST WATERFRONT
Pace Project No.: 40119126

LABORATORY CONTROL SAMPLE: 1205357

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Indeno(1,2,3-cd)pyrene	ug/kg	333	281	84	50-130	
Naphthalene	ug/kg	333	254	76	48-130	
Phenanthrene	ug/kg	333	289	87	51-130	
Pyrene	ug/kg	333	266	80	55-130	
2-Fluorobiphenyl (S)	%			79	39-130	
Terphenyl-d14 (S)	%			77	37-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1205358 1205359

Parameter	Units	40119126001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
1-Methylnaphthalene	ug/kg	<9.1	365	365	273	277	75	75	50-130	1	30	
2-Methylnaphthalene	ug/kg	<9.1	365	365	284	286	77	78	44-130	1	32	
Acenaphthene	ug/kg	<9.1	365	365	295	303	81	83	46-130	3	26	
Acenaphthylene	ug/kg	<8.2	365	365	301	309	82	85	49-130	3	23	
Anthracene	ug/kg	<9.5	365	365	346	360	95	98	52-130	4	28	
Benzo(a)anthracene	ug/kg	<6.3	365	365	292	306	79	83	34-130	5	36	
Benzo(a)pyrene	ug/kg	<6.5	365	365	293	312	79	85	34-130	6	40	
Benzo(b)fluoranthene	ug/kg	<9.1	365	365	287	305	78	83	22-130	6	40	
Benzo(g,h,i)perylene	ug/kg	<7.0	365	365	293	312	80	85	24-130	6	35	
Benzo(k)fluoranthene	ug/kg	<10.1	365	365	301	318	82	86	41-130	6	37	
Chrysene	ug/kg	<8.4	365	365	315	330	85	89	49-130	5	33	
Dibenz(a,h)anthracene	ug/kg	<6.7	365	365	301	319	82	87	27-130	6	31	
Fluoranthene	ug/kg	<9.1	365	365	301	319	81	86	34-130	6	37	
Fluorene	ug/kg	<9.1	365	365	290	300	79	82	45-130	3	25	
Indeno(1,2,3-cd)pyrene	ug/kg	<6.9	365	365	306	327	83	89	30-130	7	34	
Naphthalene	ug/kg	<9.1	365	365	270	274	73	74	38-130	1	30	
Phenanthrene	ug/kg	<9.1	365	365	303	318	82	86	38-130	5	34	
Pyrene	ug/kg	<9.1	365	365	288	303	78	82	35-130	5	35	
2-Fluorobiphenyl (S)	%						73	70	39-130			
Terphenyl-d14 (S)	%						73	73	37-130			

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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(920)469-2436

QUALITY CONTROL DATA

Project: 19-0422.20 WEST WATERFRONT
Pace Project No.: 40119126

QC Batch: PMST/11584 Analysis Method: ASTM D2974-87
QC Batch Method: ASTM D2974-87 Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 40119126007, 40119126008, 40119126009, 40119126010, 40119126011, 40119126012

SAMPLE DUPLICATE: 1202760

Parameter	Units	40119136004 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	5.2	5.0	5	10	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

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QUALITY CONTROL DATA

Project: 19-0422.20 WEST WATERFRONT
Pace Project No.: 40119126

QC Batch: PMST/11625 Analysis Method: ASTM D2974-87
QC Batch Method: ASTM D2974-87 Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 40119126001, 40119126002, 40119126003, 40119126004, 40119126005, 40119126006

SAMPLE DUPLICATE: 1206838

Parameter	Units	40119146006 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	21.6	21.5	0	10	

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QUALIFIERS

Project: 19-0422.20 WEST WATERFRONT
Pace Project No.: 40119126

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above LOD.

J - Estimated concentration at or above the LOD and below the LOQ.

LOD - Limit of Detection adjusted for dilution factor and percent moisture.

LOQ - Limit of Quantitation adjusted for dilution factor and percent moisture.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected at or above the adjusted LOD.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-G Pace Analytical Services - Green Bay

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 19-0422.20 WEST WATERFRONT
Pace Project No.: 40119126

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
40119126001	**BP-6-1**	EPA 3050	MPRP/12413	EPA 6010	ICP/11008
40119126002	**BP-6-2**	EPA 3050	MPRP/12413	EPA 6010	ICP/11008
40119126003	**BP-5-1**	EPA 3050	MPRP/12413	EPA 6010	ICP/11008
40119126004	**BP-5-2**	EPA 3050	MPRP/12413	EPA 6010	ICP/11008
40119126005	**BP-3-1**	EPA 3050	MPRP/12413	EPA 6010	ICP/11008
40119126006	**BP-3-2**	EPA 3050	MPRP/12413	EPA 6010	ICP/11008
40119126007	**BP-2-1**	EPA 3050	MPRP/12413	EPA 6010	ICP/11008
40119126008	**BP-2-2**	EPA 3050	MPRP/12413	EPA 6010	ICP/11008
40119126009	**BP-4-1**	EPA 3050	MPRP/12413	EPA 6010	ICP/11008
40119126010	**BP-4-2**	EPA 3050	MPRP/12413	EPA 6010	ICP/11008
40119126011	**BP-1-1**	EPA 3050	MPRP/12413	EPA 6010	ICP/11008
40119126012	**BP-1-2**	EPA 3050	MPRP/12413	EPA 6010	ICP/11008
40119126001	**BP-6-1**	EPA 3546	OEXT/27673	EPA 8270 by SIM	MSSV/8180
40119126002	**BP-6-2**	EPA 3546	OEXT/27673	EPA 8270 by SIM	MSSV/8180
40119126003	**BP-5-1**	EPA 3546	OEXT/27673	EPA 8270 by SIM	MSSV/8180
40119126004	**BP-5-2**	EPA 3546	OEXT/27673	EPA 8270 by SIM	MSSV/8180
40119126005	**BP-3-1**	EPA 3546	OEXT/27673	EPA 8270 by SIM	MSSV/8180
40119126006	**BP-3-2**	EPA 3546	OEXT/27673	EPA 8270 by SIM	MSSV/8180
40119126007	**BP-2-1**	EPA 3546	OEXT/27673	EPA 8270 by SIM	MSSV/8180
40119126008	**BP-2-2**	EPA 3546	OEXT/27673	EPA 8270 by SIM	MSSV/8180
40119126009	**BP-4-1**	EPA 3546	OEXT/27673	EPA 8270 by SIM	MSSV/8180
40119126010	**BP-4-2**	EPA 3546	OEXT/27673	EPA 8270 by SIM	MSSV/8180
40119126011	**BP-1-1**	EPA 3546	OEXT/27673	EPA 8270 by SIM	MSSV/8180
40119126012	**BP-1-2**	EPA 3546	OEXT/27673	EPA 8270 by SIM	MSSV/8180
40119126001	**BP-6-1**	ASTM D2974-87	PMST/11625		
40119126002	**BP-6-2**	ASTM D2974-87	PMST/11625		
40119126003	**BP-5-1**	ASTM D2974-87	PMST/11625		
40119126004	**BP-5-2**	ASTM D2974-87	PMST/11625		
40119126005	**BP-3-1**	ASTM D2974-87	PMST/11625		
40119126006	**BP-3-2**	ASTM D2974-87	PMST/11625		
40119126007	**BP-2-1**	ASTM D2974-87	PMST/11584		
40119126008	**BP-2-2**	ASTM D2974-87	PMST/11584		
40119126009	**BP-4-1**	ASTM D2974-87	PMST/11584		
40119126010	**BP-4-2**	ASTM D2974-87	PMST/11584		
40119126011	**BP-1-1**	ASTM D2974-87	PMST/11584		
40119126012	**BP-1-2**	ASTM D2974-87	PMST/11584		

REPORT OF LABORATORY ANALYSIS

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UPPER MIDWEST REGION
MN: 612-607-1700 WI: 920-469-2436

Pace Analytical®
www.pacelabs.com

CHAIN OF CUSTODY

CP

40119426

*Preservation Codes
A=None B=HCL C=H2SO4 D=HNO3 E=DI Water F=Methanol G=NaOH
H=Sodium Bisulfate Solution I=Sodium Thiosulfate J=Other

(Please Print Clearly)	
Company Name:	Ayres Associates
Branch/Location:	Madison
Project Contact:	Jeff Steiner
Phone:	608-443-1259
Project Number:	19-0422.20
Project Name:	West Waterfront
Project State:	WI
Sampled By (Print):	Jeff Steiner
Sampled By (Sign):	Jeff Steiner
PO #:	Regulatory Program:

Quote #:	
Mail To Contact:	Jeff Steiner
Mail To Company:	Ayres Associates
Mail To Address:	Madison
Invoice To Contact:	Jeff Steiner
Invoice To Company:	Ayres Associates
Invoice To Address:	Eau Claire
Invoice To Phone:	

Data Package Options (billable)
☐ EPA Level III
☐ EPA Level IV

MS/MSD
☐ On your sample (billable)
☒ NOT needed on your sample

Matrix Codes
A = Air, W = Water, B = Biota, DW = Drinking Water, C = Charcoal, GW = Ground Water, O = Oil, SW = Surface Water, S = Soil, WW = Waste Water, SI = Sludge, WP = Wipe

PACE LAB #	CLIENT FIELD ID	COLLECTION DATE	COLLECTION TIME	MATRIX	FILTERED? (YES/NO) Y/N	PRESERVATION (CODE)* Pick Letter	Analyses Requested: PAH	Analyses Requested: Lead	CLIENT COMMENTS	LAB COMMENTS (Lab Use Only)	Profile #
001	BP-6-1	8/4/15	10:08	S	N	A	X	X	Send EDD	Send EDD 1-4oz AG^A 1-4oz P^A	
002	BP-6-2		10:13	S			X	X		1-4oz AG^A 1-4oz P^A	
003	BP-5-1		10:16	S			X	X			
004	BP-5-2		10:20				X	X			
005	BP-3-1		10:24				Y	Y			
006	BP-3-2		10:29				X	Y			
007	BP-2-1		10:33				Y	Y			
008	BP-2-2		10:37				Y	X			
009	BP-4-1		10:40				X	X			
010	BP-4-2		10:44				X	Y			
011	BP-1-1		10:47				Y	Y			
012	BP-1-2		10:50				Y	X			

Rush Turnaround Time Requested - Prelims
(Rush TAT subject to approval/surcharge)
Date Needed:

Transmit Prelim Rush Results by (complete what you want):
Email #1: steinerj@ayresassociates.com
Email #2:
Telephone:
Fax:

Samples on HOLD are subject to special pricing and release of liability

Relinquished By:	Date/Time:	Received By:	Date/Time:
Jeff Steiner	8-4-15 / 2:12 pm	Cindy Rost	8/4/15 1412

PACE Project No.: 40119426
Receipt Temp = ROI °C
Sample Receipt pH: OK / Adjusted
Cooler Custody Seal: Present / Not Present
Intact / Not Intact

Version 6.0 06/14/06

C019a(27Jun2006)

ORIGINAL

Sample Condition Upon Receipt

Pace Analytical Services, Inc.
1241 Bellevue Street, Suite 9
Green Bay, WI 54302

Pace Analytical™

Client Name: Ayres Associates

Project #: **WO#: 40119126**

40119126

Courier: ☐ Fed Ex ☐ UPS ☒ Client ☐ Pace Other: _____

Tracking #: _____

Custody Seal on Cooler/Box Present: ☐ yes ☒ no Seals intact: ☐ yes ☐ no

Custody Seal on Samples Present: ☐ yes ☒ no Seals intact: ☐ yes ☐ no

Packing Material: ☐ Bubble Wrap ☒ Bubble Bags ☐ None ☐ Other _____

Thermometer Used N/A **Type of Ice:** (Wet) Blue Dry None ☒ Samples on ice, cooling process has begun

Cooler Temperature Uncorr: ROI /Corr: **Biological Tissue is Frozen:** ☐ yes ☐ no

Temp Blank Present: ☐ yes ☒ no

Person examining contents:
Date: 8/4/15
Initials: EP

Temp should be above freezing to 6°C for all sample except Biota.
Frozen Biota Samples should be received ≤ 0°C.

		Comments:
Chain of Custody Present:	☒Yes ☐No ☐N/A	1.
Chain of Custody Filled Out:	☒Yes ☐No ☐N/A	2.
Chain of Custody Relinquished:	☒Yes ☐No ☐N/A	3.
Sampler Name & Signature on COC:	☒Yes ☐No ☐N/A	4.
Samples Arrived within Hold Time:	☒Yes ☐No ☐N/A	5.
- VOA Samples frozen upon receipt	☐Yes ☐No	Date/Time:
Short Hold Time Analysis (<72hr):	☐Yes ☒No ☐N/A	6.
Rush Turn Around Time Requested:	☐Yes ☒No ☐N/A	7.
Sufficient Volume:	☒Yes ☐No ☐N/A	8.
Correct Containers Used:	☒Yes ☐No ☐N/A	9.
-Pace Containers Used:	☒Yes ☐No ☐N/A	
-Pace IR Containers Used:	☐Yes ☒No ☐N/A	
Containers Intact:	☒Yes ☐No ☐N/A	10.
Filtered volume received for Dissolved tests	☐Yes ☐No ☒N/A	11.
Sample Labels match COC:	☒Yes ☐No ☐N/A	12.
-Includes date/time/ID/Analysis Matrix: S		
All containers needing preservation have been checked. (Non-Compliance noted in 13.)	☐Yes ☐No ☒N/A	13. ☐ HNO3 ☐ H2SO4 ☐ NaOH ☐ NaOH +ZnAct
All containers needing preservation are found to be in compliance with EPA recommendation. (HNO3, H2SO4 ≤2; NaOH+ZnAct ≥9, NaOH ≥12)	☐Yes ☐No ☒N/A	
exceptions: VOA, coliform, TOC, TOX, TOH, O&G, WIDROW, Phenolics, OTHER:	☐Yes ☒No	Initial when completed / Lab Std #ID of preservative / Date/ Time:
Headspace in VOA Vials (>6mm):	☐Yes ☐No ☒N/A	14.
Trip Blank Present:	☐Yes ☐No ☒N/A	15.
Trip Blank Custody Seals Present	☐Yes ☐No ☒N/A	
Pace Trip Blank Lot # (if purchased):		

Client Notification/ Resolution: If checked, see attached form for additional comments ☐

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: AMH for DM **Date:** 8/4/15

F-GB-C-031-Rev.03 (9April2015) SCUR Form

Appendix B

Laboratory Data Sheets

Pace Analytical Services, Inc.
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Green Bay, WI 54302
(920)469-2436

August 17, 2015

Jeff Steiner
AYRES & ASSOCIATES, INC.
5201 E. Terrace Dr., Suite 200
Madison, WI 53718

RE: Project: 19-0422.20 WEST WATERFRONT
Pace Project No.: 40119126

Dear Jeff Steiner:
Enclosed are the analytical results for sample(s) received by the laboratory on August 04, 2015. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Dan Milewsky
dan.milewsky@pacelabs.com
Project Manager

Enclosures

REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 19-0422.20 WEST WATERFRONT
Pace Project No.: 40119126

Green Bay Certification IDs
1241 Bellevue Street, Green Bay, WI 54302
Florida/NELAP Certification #: E87948
Illinois Certification #: 200050
Kentucky Certification #: 82
Louisiana Certification #: 04168
Minnesota Certification #: 055-999-334
North Dakota Certification #: R-150
South Carolina Certification #: 83006001
Texas Certification #: T104704529-14-1
US Dept of Agriculture #: S-76505
Wisconsin Certification #: 405132750

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SAMPLE SUMMARY

Project: 19-0422.20 WEST WATERFRONT
Pace Project No.: 40119126

Lab ID	Sample ID	Matrix	Date Collected	Date Received
40119126001	**BP-6-1**	Solid	08/04/15 10:08	08/04/15 14:12
40119126002	**BP-6-2**	Solid	08/04/15 10:13	08/04/15 14:12
40119126003	**BP-5-1**	Solid	08/04/15 10:16	08/04/15 14:12
40119126004	**BP-5-2**	Solid	08/04/15 10:20	08/04/15 14:12
40119126005	**BP-3-1**	Solid	08/04/15 10:24	08/04/15 14:12
40119126006	**BP-3-2**	Solid	08/04/15 10:29	08/04/15 14:12
40119126007	**BP-2-1**	Solid	08/04/15 10:33	08/04/15 14:12
40119126008	**BP-2-2**	Solid	08/04/15 10:37	08/04/15 14:12
40119126009	**BP-4-1**	Solid	08/04/15 10:40	08/04/15 14:12
40119126010	**BP-4-2**	Solid	08/04/15 10:44	08/04/15 14:12
40119126011	**BP-1-1**	Solid	08/04/15 10:47	08/04/15 14:12
40119126012	**BP-1-2**	Solid	08/04/15 10:50	08/04/15 14:12

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SAMPLE ANALYTE COUNT

Project: 19-0422.20 WEST WATERFRONT
Pace Project No.: 40119126

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
40119126001	**BP-6-1**	EPA 6010	DLB	1	PASI-G
		EPA 8270 by SIM	ARO	20	PASI-G
		ASTM D2974-87	MAV	1	PASI-G
40119126002	**BP-6-2**	EPA 6010	DLB	1	PASI-G
		EPA 8270 by SIM	ARO	20	PASI-G
		ASTM D2974-87	MAV	1	PASI-G
40119126003	**BP-5-1**	EPA 6010	DLB	1	PASI-G
		EPA 8270 by SIM	ARO	20	PASI-G
		ASTM D2974-87	MAV	1	PASI-G
40119126004	**BP-5-2**	EPA 6010	DLB	1	PASI-G
		EPA 8270 by SIM	ARO	20	PASI-G
		ASTM D2974-87	MAV	1	PASI-G
40119126005	**BP-3-1**	EPA 6010	DLB	1	PASI-G
		EPA 8270 by SIM	ARO	20	PASI-G
		ASTM D2974-87	MAV	1	PASI-G
40119126006	**BP-3-2**	EPA 6010	DLB	1	PASI-G
		EPA 8270 by SIM	ARO	20	PASI-G
		ASTM D2974-87	MAV	1	PASI-G
40119126007	**BP-2-1**	EPA 6010	DLB	1	PASI-G
		EPA 8270 by SIM	ARO	20	PASI-G
		ASTM D2974-87	EMM	1	PASI-G
40119126008	**BP-2-2**	EPA 6010	DLB	1	PASI-G
		EPA 8270 by SIM	ARO	20	PASI-G
		ASTM D2974-87	EMM	1	PASI-G
40119126009	**BP-4-1**	EPA 6010	DLB	1	PASI-G
		EPA 8270 by SIM	ARO	20	PASI-G
		ASTM D2974-87	EMM	1	PASI-G
40119126010	**BP-4-2**	EPA 6010	DLB	1	PASI-G
		EPA 8270 by SIM	ARO	20	PASI-G
		ASTM D2974-87	EMM	1	PASI-G
40119126011	**BP-1-1**	EPA 6010	DLB	1	PASI-G
		EPA 8270 by SIM	ARO	20	PASI-G
		ASTM D2974-87	EMM	1	PASI-G
40119126012	**BP-1-2**	EPA 6010	DLB	1	PASI-G
		EPA 8270 by SIM	ARO	20	PASI-G
		ASTM D2974-87	EMM	1	PASI-G

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SUMMARY OF DETECTION

Project: 19-0422.20 WEST WATERFRONT
Pace Project No.: 40119126

Lab Sample ID / Method	Client Sample ID / Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
40119126001	**BP-6-1**					
EPA 6010	Lead	3.9	mg/kg	1.1	08/13/15 14:55	
ASTM D2974-87	Percent Moisture	8.8	%	0.10	08/14/15 13:53	
40119126002	**BP-6-2**					
EPA 6010	Lead	3.7	mg/kg	0.98	08/13/15 15:02	
EPA 8270 by SIM	Anthracene	18.8	ug/kg	18.1	08/13/15 23:06	
EPA 8270 by SIM	Benzo(a)anthracene	32.6	ug/kg	18.1	08/13/15 23:06	
EPA 8270 by SIM	Benzo(a)pyrene	28.0	ug/kg	18.1	08/13/15 23:06	
EPA 8270 by SIM	Benzo(b)fluoranthene	29.6	ug/kg	18.1	08/13/15 23:06	
EPA 8270 by SIM	Benzo(g,h,i)perylene	11.7J	ug/kg	18.1	08/13/15 23:06	
EPA 8270 by SIM	Benzo(k)fluoranthene	31.8	ug/kg	18.1	08/13/15 23:06	
EPA 8270 by SIM	Chrysene	41.8	ug/kg	18.1	08/13/15 23:06	
EPA 8270 by SIM	Fluoranthene	102	ug/kg	18.1	08/13/15 23:06	
EPA 8270 by SIM	Indeno(1,2,3-cd)pyrene	12.0J	ug/kg	18.1	08/13/15 23:06	
EPA 8270 by SIM	Phenanthrene	58.0	ug/kg	18.1	08/13/15 23:06	
EPA 8270 by SIM	Pyrene	74.9	ug/kg	18.1	08/13/15 23:06	
ASTM D2974-87	Percent Moisture	7.8	%	0.10	08/14/15 13:53	
40119126003	**BP-5-1**					
EPA 6010	Lead	3.2	mg/kg	0.99	08/13/15 15:09	
EPA 8270 by SIM	Benzo(a)anthracene	14.7J	ug/kg	18.1	08/14/15 14:33	
EPA 8270 by SIM	Benzo(a)pyrene	17.8J	ug/kg	18.1	08/14/15 14:33	
EPA 8270 by SIM	Benzo(b)fluoranthene	22.0	ug/kg	18.1	08/14/15 14:33	
EPA 8270 by SIM	Benzo(g,h,i)perylene	14.1J	ug/kg	18.1	08/14/15 14:33	
EPA 8270 by SIM	Benzo(k)fluoranthene	18.3	ug/kg	18.1	08/14/15 14:33	
EPA 8270 by SIM	Chrysene	25.1	ug/kg	18.1	08/14/15 14:33	
EPA 8270 by SIM	Fluoranthene	52.0	ug/kg	18.1	08/14/15 14:33	
EPA 8270 by SIM	Indeno(1,2,3-cd)pyrene	12.4J	ug/kg	18.1	08/14/15 14:33	
EPA 8270 by SIM	Phenanthrene	28.5	ug/kg	18.1	08/14/15 14:33	
EPA 8270 by SIM	Pyrene	36.2	ug/kg	18.1	08/14/15 14:33	
ASTM D2974-87	Percent Moisture	8.0	%	0.10	08/14/15 13:53	
40119126004	**BP-5-2**					
EPA 6010	Lead	9.5	mg/kg	1.0	08/13/15 15:12	
EPA 8270 by SIM	Anthracene	12.2J	ug/kg	18.2	08/13/15 20:14	
EPA 8270 by SIM	Benzo(a)anthracene	31.1	ug/kg	18.2	08/13/15 20:14	
EPA 8270 by SIM	Benzo(a)pyrene	34.0	ug/kg	18.2	08/13/15 20:14	
EPA 8270 by SIM	Benzo(b)fluoranthene	30.8	ug/kg	18.2	08/13/15 20:14	
EPA 8270 by SIM	Benzo(g,h,i)perylene	29.4	ug/kg	18.2	08/13/15 20:14	
EPA 8270 by SIM	Benzo(k)fluoranthene	31.6	ug/kg	18.2	08/13/15 20:14	
EPA 8270 by SIM	Chrysene	36.7	ug/kg	18.2	08/13/15 20:14	
EPA 8270 by SIM	Dibenz(a,h)anthracene	7.9J	ug/kg	18.2	08/13/15 20:14	
EPA 8270 by SIM	Fluoranthene	68.8	ug/kg	18.2	08/13/15 20:14	
EPA 8270 by SIM	Indeno(1,2,3-cd)pyrene	20.0	ug/kg	18.2	08/13/15 20:14	
EPA 8270 by SIM	Phenanthrene	37.6	ug/kg	18.2	08/13/15 20:14	
EPA 8270 by SIM	Pyrene	54.4	ug/kg	18.2	08/13/15 20:14	
ASTM D2974-87	Percent Moisture	8.6	%	0.10	08/14/15 13:53	

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SUMMARY OF DETECTION

Project: 19-0422.20 WEST WATERFRONT
Pace Project No.: 40119126

Lab Sample ID / Method	Client Sample ID / Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
40119126005	**BP-3-1**					
EPA 6010	Lead	3.1	mg/kg	1.0	08/13/15 15:14	
ASTM D2974-87	Percent Moisture	8.6	%	0.10	08/14/15 13:53	
40119126006	**BP-3-2**					
EPA 6010	Lead	3.0	mg/kg	1.0	08/13/15 15:17	
ASTM D2974-87	Percent Moisture	8.0	%	0.10	08/14/15 13:53	
40119126007	**BP-2-1**					
EPA 6010	Lead	3.3	mg/kg	1.0	08/13/15 15:19	
EPA 8270 by SIM	Fluoranthene	9.7J	ug/kg	18.1	08/14/15 13:59	
ASTM D2974-87	Percent Moisture	8.0	%	0.10	08/05/15 12:14	
40119126008	**BP-2-2**					
EPA 6010	Lead	3.0	mg/kg	1.0	08/13/15 15:22	
ASTM D2974-87	Percent Moisture	8.8	%	0.10	08/05/15 12:14	
40119126009	**BP-4-1**					
EPA 6010	Lead	3.5	mg/kg	1.0	08/13/15 15:24	
EPA 8270 by SIM	Benzo(a)anthracene	13.5J	ug/kg	18.2	08/14/15 14:16	
EPA 8270 by SIM	Benzo(a)pyrene	17.9J	ug/kg	18.2	08/14/15 14:16	
EPA 8270 by SIM	Benzo(b)fluoranthene	15.1J	ug/kg	18.2	08/14/15 14:16	
EPA 8270 by SIM	Benzo(g,h,i)perylene	18.2J	ug/kg	18.2	08/14/15 14:16	
EPA 8270 by SIM	Chrysene	19.0	ug/kg	18.2	08/14/15 14:16	
EPA 8270 by SIM	Dibenz(a,h)anthracene	11.2J	ug/kg	18.2	08/14/15 14:16	
EPA 8270 by SIM	Fluoranthene	14.8J	ug/kg	18.2	08/14/15 14:16	
EPA 8270 by SIM	Indeno(1,2,3-cd)pyrene	10.1J	ug/kg	18.2	08/14/15 14:16	
EPA 8270 by SIM	Pyrene	12.3J	ug/kg	18.2	08/14/15 14:16	
ASTM D2974-87	Percent Moisture	8.4	%	0.10	08/05/15 12:14	
40119126010	**BP-4-2**					
EPA 6010	Lead	3.1	mg/kg	1.2	08/13/15 15:27	
ASTM D2974-87	Percent Moisture	19.4	%	0.10	08/05/15 12:14	
40119126011	**BP-1-1**					
EPA 6010	Lead	2.7	mg/kg	1.0	08/13/15 15:29	
ASTM D2974-87	Percent Moisture	7.6	%	0.10	08/05/15 12:14	
40119126012	**BP-1-2**					
EPA 6010	Lead	3.3	mg/kg	1.0	08/13/15 15:33	
EPA 8270 by SIM	Benzo(a)anthracene	6.3J	ug/kg	18.0	08/13/15 22:49	
EPA 8270 by SIM	Chrysene	11.1J	ug/kg	18.0	08/13/15 22:49	
EPA 8270 by SIM	Fluoranthene	24.3	ug/kg	18.0	08/13/15 22:49	
EPA 8270 by SIM	Phenanthrene	9.9J	ug/kg	18.0	08/13/15 22:49	
EPA 8270 by SIM	Pyrene	17.5J	ug/kg	18.0	08/13/15 22:49	
ASTM D2974-87	Percent Moisture	7.4	%	0.10	08/05/15 12:14	

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ANALYTICAL RESULTS

Project: 19-0422.20 WEST WATERFRONT
Pace Project No.: 40119126

Sample: BP-6-1 **Lab ID: 40119126001** Collected: 08/04/15 10:08 Received: 08/04/15 14:12 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Lead	**3.9**	mg/kg	1.1	0.47	1	08/13/15 07:11	08/13/15 14:55	7439-92-1	
8270 MSSV PAH by SIM	Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3546								
Acenaphthene	**<9.1**	ug/kg	18.3	9.1	1	08/12/15 08:57	08/14/15 08:54	83-32-9	
Acenaphthylene	**<8.2**	ug/kg	18.3	8.2	1	08/12/15 08:57	08/14/15 08:54	208-96-8	
Anthracene	**<9.5**	ug/kg	18.3	9.5	1	08/12/15 08:57	08/14/15 08:54	120-12-7	
Benzo(a)anthracene	**<6.3**	ug/kg	18.3	6.3	1	08/12/15 08:57	08/14/15 08:54	56-55-3	
Benzo(a)pyrene	**<6.5**	ug/kg	18.3	6.5	1	08/12/15 08:57	08/14/15 08:54	50-32-8	
Benzo(b)fluoranthene	**<9.1**	ug/kg	18.3	9.1	1	08/12/15 08:57	08/14/15 08:54	205-99-2	
Benzo(g,h,i)perylene	**<7.0**	ug/kg	18.3	7.0	1	08/12/15 08:57	08/14/15 08:54	191-24-2	
Benzo(k)fluoranthene	**<10.1**	ug/kg	18.3	10.1	1	08/12/15 08:57	08/14/15 08:54	207-08-9	
Chrysene	**<8.4**	ug/kg	18.3	8.4	1	08/12/15 08:57	08/14/15 08:54	218-01-9	
Dibenz(a,h)anthracene	**<6.7**	ug/kg	18.3	6.7	1	08/12/15 08:57	08/14/15 08:54	53-70-3	
Fluoranthene	**<9.1**	ug/kg	18.3	9.1	1	08/12/15 08:57	08/14/15 08:54	206-44-0	
Fluorene	**<9.1**	ug/kg	18.3	9.1	1	08/12/15 08:57	08/14/15 08:54	86-73-7	
Indeno(1,2,3-cd)pyrene	**<6.9**	ug/kg	18.3	6.9	1	08/12/15 08:57	08/14/15 08:54	193-39-5	
1-Methylnaphthalene	**<9.1**	ug/kg	18.3	9.1	1	08/12/15 08:57	08/14/15 08:54	90-12-0	
2-Methylnaphthalene	**<9.1**	ug/kg	18.3	9.1	1	08/12/15 08:57	08/14/15 08:54	91-57-6	
Naphthalene	**<9.1**	ug/kg	18.3	9.1	1	08/12/15 08:57	08/14/15 08:54	91-20-3	
Phenanthrene	**<9.1**	ug/kg	18.3	9.1	1	08/12/15 08:57	08/14/15 08:54	85-01-8	
Pyrene	**<9.1**	ug/kg	18.3	9.1	1	08/12/15 08:57	08/14/15 08:54	129-00-0	
Surrogates									
2-Fluorobiphenyl (S)	61	%	39-130		1	08/12/15 08:57	08/14/15 08:54	321-60-8	
Terphenyl-d14 (S)	64	%	37-130		1	08/12/15 08:57	08/14/15 08:54	1718-51-0	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**8.8**	%	0.10	0.10	1		08/14/15 13:53		

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ANALYTICAL RESULTS

Project: 19-0422.20 WEST WATERFRONT
Pace Project No.: 40119126

Sample: BP-6-2 **Lab ID: 40119126002** Collected: 08/04/15 10:13 Received: 08/04/15 14:12 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Lead	**3.7**	mg/kg	0.98	0.42	1	08/13/15 07:11	08/13/15 15:02	7439-92-1	
8270 MSSV PAH by SIM	Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3546								
Acenaphthene	**<9.0**	ug/kg	18.1	9.0	1	08/12/15 08:57	08/13/15 23:06	83-32-9	
Acenaphthylene	**<8.1**	ug/kg	18.1	8.1	1	08/12/15 08:57	08/13/15 23:06	208-96-8	
Anthracene	**18.8**	ug/kg	18.1	9.4	1	08/12/15 08:57	08/13/15 23:06	120-12-7	
Benzo(a)anthracene	**32.6**	ug/kg	18.1	6.3	1	08/12/15 08:57	08/13/15 23:06	56-55-3	
Benzo(a)pyrene	**28.0**	ug/kg	18.1	6.5	1	08/12/15 08:57	08/13/15 23:06	50-32-8	
Benzo(b)fluoranthene	**29.6**	ug/kg	18.1	9.0	1	08/12/15 08:57	08/13/15 23:06	205-99-2	
Benzo(g,h,i)perylene	**11.7J**	ug/kg	18.1	6.9	1	08/12/15 08:57	08/13/15 23:06	191-24-2	
Benzo(k)fluoranthene	**31.8**	ug/kg	18.1	10.0	1	08/12/15 08:57	08/13/15 23:06	207-08-9	
Chrysene	**41.8**	ug/kg	18.1	8.4	1	08/12/15 08:57	08/13/15 23:06	218-01-9	
Dibenz(a,h)anthracene	**<6.6**	ug/kg	18.1	6.6	1	08/12/15 08:57	08/13/15 23:06	53-70-3	
Fluoranthene	**102**	ug/kg	18.1	9.0	1	08/12/15 08:57	08/13/15 23:06	206-44-0	
Fluorene	**<9.0**	ug/kg	18.1	9.0	1	08/12/15 08:57	08/13/15 23:06	86-73-7	
Indeno(1,2,3-cd)pyrene	**12.0J**	ug/kg	18.1	6.9	1	08/12/15 08:57	08/13/15 23:06	193-39-5	
1-Methylnaphthalene	**<9.0**	ug/kg	18.1	9.0	1	08/12/15 08:57	08/13/15 23:06	90-12-0	
2-Methylnaphthalene	**<9.0**	ug/kg	18.1	9.0	1	08/12/15 08:57	08/13/15 23:06	91-57-6	
Naphthalene	**<9.0**	ug/kg	18.1	9.0	1	08/12/15 08:57	08/13/15 23:06	91-20-3	
Phenanthrene	**58.0**	ug/kg	18.1	9.0	1	08/12/15 08:57	08/13/15 23:06	85-01-8	
Pyrene	**74.9**	ug/kg	18.1	9.0	1	08/12/15 08:57	08/13/15 23:06	129-00-0	
Surrogates									
2-Fluorobiphenyl (S)	69	%	39-130		1	08/12/15 08:57	08/13/15 23:06	321-60-8	
Terphenyl-d14 (S)	71	%	37-130		1	08/12/15 08:57	08/13/15 23:06	1718-51-0	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**7.8**	%	0.10	0.10	1		08/14/15 13:53		

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ANALYTICAL RESULTS

Project: 19-0422.20 WEST WATERFRONT
Pace Project No.: 40119126

Sample: BP-5-1 **Lab ID: 40119126003** Collected: 08/04/15 10:16 Received: 08/04/15 14:12 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Lead	**3.2**	mg/kg	0.99	0.43	1	08/13/15 07:11	08/13/15 15:09	7439-92-1	
8270 MSSV PAH by SIM	Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3546								
Acenaphthene	**<9.1**	ug/kg	18.1	9.1	1	08/12/15 08:57	08/14/15 14:33	83-32-9	
Acenaphthylene	**<8.1**	ug/kg	18.1	8.1	1	08/12/15 08:57	08/14/15 14:33	208-96-8	
Anthracene	**<9.4**	ug/kg	18.1	9.4	1	08/12/15 08:57	08/14/15 14:33	120-12-7	
Benzo(a)anthracene	**14.7J**	ug/kg	18.1	6.3	1	08/12/15 08:57	08/14/15 14:33	56-55-3	
Benzo(a)pyrene	**17.8J**	ug/kg	18.1	6.5	1	08/12/15 08:57	08/14/15 14:33	50-32-8	
Benzo(b)fluoranthene	**22.0**	ug/kg	18.1	9.1	1	08/12/15 08:57	08/14/15 14:33	205-99-2	
Benzo(g,h,i)perylene	**14.1J**	ug/kg	18.1	6.9	1	08/12/15 08:57	08/14/15 14:33	191-24-2	
Benzo(k)fluoranthene	**18.3**	ug/kg	18.1	10.0	1	08/12/15 08:57	08/14/15 14:33	207-08-9	
Chrysene	**25.1**	ug/kg	18.1	8.4	1	08/12/15 08:57	08/14/15 14:33	218-01-9	
Dibenz(a,h)anthracene	**<6.6**	ug/kg	18.1	6.6	1	08/12/15 08:57	08/14/15 14:33	53-70-3	
Fluoranthene	**52.0**	ug/kg	18.1	9.1	1	08/12/15 08:57	08/14/15 14:33	206-44-0	
Fluorene	**<9.1**	ug/kg	18.1	9.1	1	08/12/15 08:57	08/14/15 14:33	86-73-7	
Indeno(1,2,3-cd)pyrene	**12.4J**	ug/kg	18.1	6.9	1	08/12/15 08:57	08/14/15 14:33	193-39-5	
1-Methylnaphthalene	**<9.1**	ug/kg	18.1	9.1	1	08/12/15 08:57	08/14/15 14:33	90-12-0	
2-Methylnaphthalene	**<9.1**	ug/kg	18.1	9.1	1	08/12/15 08:57	08/14/15 14:33	91-57-6	
Naphthalene	**<9.1**	ug/kg	18.1	9.1	1	08/12/15 08:57	08/14/15 14:33	91-20-3	
Phenanthrene	**28.5**	ug/kg	18.1	9.1	1	08/12/15 08:57	08/14/15 14:33	85-01-8	
Pyrene	**36.2**	ug/kg	18.1	9.1	1	08/12/15 08:57	08/14/15 14:33	129-00-0	
Surrogates									
2-Fluorobiphenyl (S)	73	%	39-130		1	08/12/15 08:57	08/14/15 14:33	321-60-8	
Terphenyl-d14 (S)	74	%	37-130		1	08/12/15 08:57	08/14/15 14:33	1718-51-0	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**8.0**	%	0.10	0.10	1		08/14/15 13:53		

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ANALYTICAL RESULTS

Project: 19-0422.20 WEST WATERFRONT
Pace Project No.: 40119126

Sample: BP-5-2 **Lab ID: 40119126004** Collected: 08/04/15 10:20 Received: 08/04/15 14:12 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Lead	**9.5**	mg/kg	1.0	0.45	1	08/13/15 07:11	08/13/15 15:12	7439-92-1	
8270 MSSV PAH by SIM	Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3546								
Acenaphthene	**<9.1**	ug/kg	18.2	9.1	1	08/12/15 08:57	08/13/15 20:14	83-32-9	
Acenaphthylene	**<8.2**	ug/kg	18.2	8.2	1	08/12/15 08:57	08/13/15 20:14	208-96-8	
Anthracene	**12.2J**	ug/kg	18.2	9.5	1	08/12/15 08:57	08/13/15 20:14	120-12-7	
Benzo(a)anthracene	**31.1**	ug/kg	18.2	6.3	1	08/12/15 08:57	08/13/15 20:14	56-55-3	
Benzo(a)pyrene	**34.0**	ug/kg	18.2	6.5	1	08/12/15 08:57	08/13/15 20:14	50-32-8	
Benzo(b)fluoranthene	**30.8**	ug/kg	18.2	9.1	1	08/12/15 08:57	08/13/15 20:14	205-99-2	
Benzo(g,h,i)perylene	**29.4**	ug/kg	18.2	6.9	1	08/12/15 08:57	08/13/15 20:14	191-24-2	
Benzo(k)fluoranthene	**31.6**	ug/kg	18.2	10.1	1	08/12/15 08:57	08/13/15 20:14	207-08-9	
Chrysene	**36.7**	ug/kg	18.2	8.4	1	08/12/15 08:57	08/13/15 20:14	218-01-9	
Dibenz(a,h)anthracene	**7.9J**	ug/kg	18.2	6.7	1	08/12/15 08:57	08/13/15 20:14	53-70-3	
Fluoranthene	**68.8**	ug/kg	18.2	9.1	1	08/12/15 08:57	08/13/15 20:14	206-44-0	
Fluorene	**<9.1**	ug/kg	18.2	9.1	1	08/12/15 08:57	08/13/15 20:14	86-73-7	
Indeno(1,2,3-cd)pyrene	**20.0**	ug/kg	18.2	6.9	1	08/12/15 08:57	08/13/15 20:14	193-39-5	
1-Methylnaphthalene	**<9.1**	ug/kg	18.2	9.1	1	08/12/15 08:57	08/13/15 20:14	90-12-0	
2-Methylnaphthalene	**<9.1**	ug/kg	18.2	9.1	1	08/12/15 08:57	08/13/15 20:14	91-57-6	
Naphthalene	**<9.1**	ug/kg	18.2	9.1	1	08/12/15 08:57	08/13/15 20:14	91-20-3	
Phenanthrene	**37.6**	ug/kg	18.2	9.1	1	08/12/15 08:57	08/13/15 20:14	85-01-8	
Pyrene	**54.4**	ug/kg	18.2	9.1	1	08/12/15 08:57	08/13/15 20:14	129-00-0	
Surrogates									
2-Fluorobiphenyl (S)	64	%	39-130		1	08/12/15 08:57	08/13/15 20:14	321-60-8	
Terphenyl-d14 (S)	62	%	37-130		1	08/12/15 08:57	08/13/15 20:14	1718-51-0	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**8.6**	%	0.10	0.10	1		08/14/15 13:53		

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ANALYTICAL RESULTS

Project: 19-0422.20 WEST WATERFRONT
Pace Project No.: 40119126

Sample: BP-3-1 **Lab ID: 40119126005** Collected: 08/04/15 10:24 Received: 08/04/15 14:12 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Lead	**3.1**	mg/kg	1.0	0.44	1	08/13/15 07:11	08/13/15 15:14	7439-92-1	
8270 MSSV PAH by SIM	Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3546								
Acenaphthene	**<9.1**	ug/kg	18.2	9.1	1	08/12/15 08:57	08/13/15 18:12	83-32-9	
Acenaphthylene	**<8.2**	ug/kg	18.2	8.2	1	08/12/15 08:57	08/13/15 18:12	208-96-8	
Anthracene	**<9.5**	ug/kg	18.2	9.5	1	08/12/15 08:57	08/13/15 18:12	120-12-7	
Benzo(a)anthracene	**<6.3**	ug/kg	18.2	6.3	1	08/12/15 08:57	08/13/15 18:12	56-55-3	
Benzo(a)pyrene	**<6.5**	ug/kg	18.2	6.5	1	08/12/15 08:57	08/13/15 18:12	50-32-8	
Benzo(b)fluoranthene	**<9.1**	ug/kg	18.2	9.1	1	08/12/15 08:57	08/13/15 18:12	205-99-2	
Benzo(g,h,i)perylene	**<6.9**	ug/kg	18.2	6.9	1	08/12/15 08:57	08/13/15 18:12	191-24-2	
Benzo(k)fluoranthene	**<10.1**	ug/kg	18.2	10.1	1	08/12/15 08:57	08/13/15 18:12	207-08-9	
Chrysene	**<8.4**	ug/kg	18.2	8.4	1	08/12/15 08:57	08/13/15 18:12	218-01-9	
Dibenz(a,h)anthracene	**<6.7**	ug/kg	18.2	6.7	1	08/12/15 08:57	08/13/15 18:12	53-70-3	
Fluoranthene	**<9.1**	ug/kg	18.2	9.1	1	08/12/15 08:57	08/13/15 18:12	206-44-0	
Fluorene	**<9.1**	ug/kg	18.2	9.1	1	08/12/15 08:57	08/13/15 18:12	86-73-7	
Indeno(1,2,3-cd)pyrene	**<6.9**	ug/kg	18.2	6.9	1	08/12/15 08:57	08/13/15 18:12	193-39-5	
1-Methylnaphthalene	**<9.1**	ug/kg	18.2	9.1	1	08/12/15 08:57	08/13/15 18:12	90-12-0	
2-Methylnaphthalene	**<9.1**	ug/kg	18.2	9.1	1	08/12/15 08:57	08/13/15 18:12	91-57-6	
Naphthalene	**<9.1**	ug/kg	18.2	9.1	1	08/12/15 08:57	08/13/15 18:12	91-20-3	
Phenanthrene	**<9.1**	ug/kg	18.2	9.1	1	08/12/15 08:57	08/13/15 18:12	85-01-8	
Pyrene	**<9.1**	ug/kg	18.2	9.1	1	08/12/15 08:57	08/13/15 18:12	129-00-0	
Surrogates									
2-Fluorobiphenyl (S)	56	%	39-130		1	08/12/15 08:57	08/13/15 18:12	321-60-8	
Terphenyl-d14 (S)	58	%	37-130		1	08/12/15 08:57	08/13/15 18:12	1718-51-0	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**8.6**	%	0.10	0.10	1		08/14/15 13:53		

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(920)469-2436

ANALYTICAL RESULTS

Project: 19-0422.20 WEST WATERFRONT
Pace Project No.: 40119126

Sample: BP-3-2 **Lab ID: 40119126006** Collected: 08/04/15 10:29 Received: 08/04/15 14:12 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Lead	**3.0**	mg/kg	1.0	0.44	1	08/13/15 07:11	08/13/15 15:17	7439-92-1	
8270 MSSV PAH by SIM	Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3546								
Acenaphthene	**<9.1**	ug/kg	18.1	9.1	1	08/12/15 08:57	08/14/15 10:55	83-32-9	
Acenaphthylene	**<8.1**	ug/kg	18.1	8.1	1	08/12/15 08:57	08/14/15 10:55	208-96-8	
Anthracene	**<9.4**	ug/kg	18.1	9.4	1	08/12/15 08:57	08/14/15 10:55	120-12-7	
Benzo(a)anthracene	**<6.3**	ug/kg	18.1	6.3	1	08/12/15 08:57	08/14/15 10:55	56-55-3	
Benzo(a)pyrene	**<6.5**	ug/kg	18.1	6.5	1	08/12/15 08:57	08/14/15 10:55	50-32-8	
Benzo(b)fluoranthene	**<9.1**	ug/kg	18.1	9.1	1	08/12/15 08:57	08/14/15 10:55	205-99-2	
Benzo(g,h,i)perylene	**<6.9**	ug/kg	18.1	6.9	1	08/12/15 08:57	08/14/15 10:55	191-24-2	
Benzo(k)fluoranthene	**<10.0**	ug/kg	18.1	10.0	1	08/12/15 08:57	08/14/15 10:55	207-08-9	
Chrysene	**<8.4**	ug/kg	18.1	8.4	1	08/12/15 08:57	08/14/15 10:55	218-01-9	
Dibenz(a,h)anthracene	**<6.6**	ug/kg	18.1	6.6	1	08/12/15 08:57	08/14/15 10:55	53-70-3	
Fluoranthene	**<9.1**	ug/kg	18.1	9.1	1	08/12/15 08:57	08/14/15 10:55	206-44-0	
Fluorene	**<9.1**	ug/kg	18.1	9.1	1	08/12/15 08:57	08/14/15 10:55	86-73-7	
Indeno(1,2,3-cd)pyrene	**<6.9**	ug/kg	18.1	6.9	1	08/12/15 08:57	08/14/15 10:55	193-39-5	
1-Methylnaphthalene	**<9.1**	ug/kg	18.1	9.1	1	08/12/15 08:57	08/14/15 10:55	90-12-0	
2-Methylnaphthalene	**<9.1**	ug/kg	18.1	9.1	1	08/12/15 08:57	08/14/15 10:55	91-57-6	
Naphthalene	**<9.1**	ug/kg	18.1	9.1	1	08/12/15 08:57	08/14/15 10:55	91-20-3	
Phenanthrene	**<9.1**	ug/kg	18.1	9.1	1	08/12/15 08:57	08/14/15 10:55	85-01-8	
Pyrene	**<9.1**	ug/kg	18.1	9.1	1	08/12/15 08:57	08/14/15 10:55	129-00-0	
Surrogates									
2-Fluorobiphenyl (S)	75	%	39-130		1	08/12/15 08:57	08/14/15 10:55	321-60-8	
Terphenyl-d14 (S)	79	%	37-130		1	08/12/15 08:57	08/14/15 10:55	1718-51-0	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**8.0**	%	0.10	0.10	1		08/14/15 13:53		

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ANALYTICAL RESULTS

Project: 19-0422.20 WEST WATERFRONT
Pace Project No.: 40119126

Sample: BP-2-1 **Lab ID: 40119126007** Collected: 08/04/15 10:33 Received: 08/04/15 14:12 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Lead	**3.3**	mg/kg	1.0	0.44	1	08/13/15 07:11	08/13/15 15:19	7439-92-1	
8270 MSSV PAH by SIM	Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3546								
Acenaphthene	**<9.1**	ug/kg	18.1	9.1	1	08/12/15 08:57	08/14/15 13:59	83-32-9	
Acenaphthylene	**<8.1**	ug/kg	18.1	8.1	1	08/12/15 08:57	08/14/15 13:59	208-96-8	
Anthracene	**<9.4**	ug/kg	18.1	9.4	1	08/12/15 08:57	08/14/15 13:59	120-12-7	
Benzo(a)anthracene	**<6.3**	ug/kg	18.1	6.3	1	08/12/15 08:57	08/14/15 13:59	56-55-3	
Benzo(a)pyrene	**<6.5**	ug/kg	18.1	6.5	1	08/12/15 08:57	08/14/15 13:59	50-32-8	
Benzo(b)fluoranthene	**<9.1**	ug/kg	18.1	9.1	1	08/12/15 08:57	08/14/15 13:59	205-99-2	
Benzo(g,h,i)perylene	**<6.9**	ug/kg	18.1	6.9	1	08/12/15 08:57	08/14/15 13:59	191-24-2	
Benzo(k)fluoranthene	**<10.0**	ug/kg	18.1	10.0	1	08/12/15 08:57	08/14/15 13:59	207-08-9	
Chrysene	**<8.4**	ug/kg	18.1	8.4	1	08/12/15 08:57	08/14/15 13:59	218-01-9	
Dibenz(a,h)anthracene	**<6.6**	ug/kg	18.1	6.6	1	08/12/15 08:57	08/14/15 13:59	53-70-3	
Fluoranthene	**9.7J**	ug/kg	18.1	9.1	1	08/12/15 08:57	08/14/15 13:59	206-44-0	
Fluorene	**<9.1**	ug/kg	18.1	9.1	1	08/12/15 08:57	08/14/15 13:59	86-73-7	
Indeno(1,2,3-cd)pyrene	**<6.9**	ug/kg	18.1	6.9	1	08/12/15 08:57	08/14/15 13:59	193-39-5	
1-Methylnaphthalene	**<9.1**	ug/kg	18.1	9.1	1	08/12/15 08:57	08/14/15 13:59	90-12-0	
2-Methylnaphthalene	**<9.1**	ug/kg	18.1	9.1	1	08/12/15 08:57	08/14/15 13:59	91-57-6	
Naphthalene	**<9.1**	ug/kg	18.1	9.1	1	08/12/15 08:57	08/14/15 13:59	91-20-3	
Phenanthrene	**<9.1**	ug/kg	18.1	9.1	1	08/12/15 08:57	08/14/15 13:59	85-01-8	
Pyrene	**<9.1**	ug/kg	18.1	9.1	1	08/12/15 08:57	08/14/15 13:59	129-00-0	
Surrogates									
2-Fluorobiphenyl (S)	59	%	39-130		1	08/12/15 08:57	08/14/15 13:59	321-60-8	
Terphenyl-d14 (S)	62	%	37-130		1	08/12/15 08:57	08/14/15 13:59	1718-51-0	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**8.0**	%	0.10	0.10	1		08/05/15 12:14		

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ANALYTICAL RESULTS

Project: 19-0422.20 WEST WATERFRONT
Pace Project No.: 40119126

Sample: BP-2-2 **Lab ID: 40119126008** Collected: 08/04/15 10:37 Received: 08/04/15 14:12 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Lead	**3.0**	mg/kg	1.0	0.45	1	08/13/15 07:11	08/13/15 15:22	7439-92-1	
8270 MSSV PAH by SIM	Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3546								
Acenaphthene	**<9.1**	ug/kg	18.3	9.1	1	08/12/15 08:57	08/14/15 10:03	83-32-9	
Acenaphthylene	**<8.2**	ug/kg	18.3	8.2	1	08/12/15 08:57	08/14/15 10:03	208-96-8	
Anthracene	**<9.5**	ug/kg	18.3	9.5	1	08/12/15 08:57	08/14/15 10:03	120-12-7	
Benzo(a)anthracene	**<6.3**	ug/kg	18.3	6.3	1	08/12/15 08:57	08/14/15 10:03	56-55-3	
Benzo(a)pyrene	**<6.5**	ug/kg	18.3	6.5	1	08/12/15 08:57	08/14/15 10:03	50-32-8	
Benzo(b)fluoranthene	**<9.1**	ug/kg	18.3	9.1	1	08/12/15 08:57	08/14/15 10:03	205-99-2	
Benzo(g,h,i)perylene	**<7.0**	ug/kg	18.3	7.0	1	08/12/15 08:57	08/14/15 10:03	191-24-2	
Benzo(k)fluoranthene	**<10.1**	ug/kg	18.3	10.1	1	08/12/15 08:57	08/14/15 10:03	207-08-9	
Chrysene	**<8.5**	ug/kg	18.3	8.5	1	08/12/15 08:57	08/14/15 10:03	218-01-9	
Dibenz(a,h)anthracene	**<6.7**	ug/kg	18.3	6.7	1	08/12/15 08:57	08/14/15 10:03	53-70-3	
Fluoranthene	**<9.1**	ug/kg	18.3	9.1	1	08/12/15 08:57	08/14/15 10:03	206-44-0	
Fluorene	**<9.1**	ug/kg	18.3	9.1	1	08/12/15 08:57	08/14/15 10:03	86-73-7	
Indeno(1,2,3-cd)pyrene	**<6.9**	ug/kg	18.3	6.9	1	08/12/15 08:57	08/14/15 10:03	193-39-5	
1-Methylnaphthalene	**<9.1**	ug/kg	18.3	9.1	1	08/12/15 08:57	08/14/15 10:03	90-12-0	
2-Methylnaphthalene	**<9.1**	ug/kg	18.3	9.1	1	08/12/15 08:57	08/14/15 10:03	91-57-6	
Naphthalene	**<9.1**	ug/kg	18.3	9.1	1	08/12/15 08:57	08/14/15 10:03	91-20-3	
Phenanthrene	**<9.1**	ug/kg	18.3	9.1	1	08/12/15 08:57	08/14/15 10:03	85-01-8	
Pyrene	**<9.1**	ug/kg	18.3	9.1	1	08/12/15 08:57	08/14/15 10:03	129-00-0	
Surrogates									
2-Fluorobiphenyl (S)	57	%	39-130		1	08/12/15 08:57	08/14/15 10:03	321-60-8	
Terphenyl-d14 (S)	61	%	37-130		1	08/12/15 08:57	08/14/15 10:03	1718-51-0	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**8.8**	%	0.10	0.10	1		08/05/15 12:14		

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ANALYTICAL RESULTS

Project: 19-0422.20 WEST WATERFRONT
Pace Project No.: 40119126

Sample: BP-4-1 **Lab ID: 40119126009** Collected: 08/04/15 10:40 Received: 08/04/15 14:12 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Lead	**3.5**	mg/kg	1.0	0.44	1	08/13/15 07:11	08/13/15 15:24	7439-92-1	
8270 MSSV PAH by SIM	Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3546								
Acenaphthene	**<9.1**	ug/kg	18.2	9.1	1	08/12/15 08:57	08/14/15 14:16	83-32-9	
Acenaphthylene	**<8.1**	ug/kg	18.2	8.1	1	08/12/15 08:57	08/14/15 14:16	208-96-8	
Anthracene	**<9.4**	ug/kg	18.2	9.4	1	08/12/15 08:57	08/14/15 14:16	120-12-7	
Benzo(a)anthracene	**13.5J**	ug/kg	18.2	6.3	1	08/12/15 08:57	08/14/15 14:16	56-55-3	
Benzo(a)pyrene	**17.9J**	ug/kg	18.2	6.5	1	08/12/15 08:57	08/14/15 14:16	50-32-8	
Benzo(b)fluoranthene	**15.1J**	ug/kg	18.2	9.1	1	08/12/15 08:57	08/14/15 14:16	205-99-2	
Benzo(g,h,i)perylene	**18.2J**	ug/kg	18.2	6.9	1	08/12/15 08:57	08/14/15 14:16	191-24-2	
Benzo(k)fluoranthene	**<10.1**	ug/kg	18.2	10.1	1	08/12/15 08:57	08/14/15 14:16	207-08-9	
Chrysene	**19.0**	ug/kg	18.2	8.4	1	08/12/15 08:57	08/14/15 14:16	218-01-9	
Dibenz(a,h)anthracene	**11.2J**	ug/kg	18.2	6.7	1	08/12/15 08:57	08/14/15 14:16	53-70-3	
Fluoranthene	**14.8J**	ug/kg	18.2	9.1	1	08/12/15 08:57	08/14/15 14:16	206-44-0	
Fluorene	**<9.1**	ug/kg	18.2	9.1	1	08/12/15 08:57	08/14/15 14:16	86-73-7	
Indeno(1,2,3-cd)pyrene	**10.1J**	ug/kg	18.2	6.9	1	08/12/15 08:57	08/14/15 14:16	193-39-5	
1-Methylnaphthalene	**<9.1**	ug/kg	18.2	9.1	1	08/12/15 08:57	08/14/15 14:16	90-12-0	
2-Methylnaphthalene	**<9.1**	ug/kg	18.2	9.1	1	08/12/15 08:57	08/14/15 14:16	91-57-6	
Naphthalene	**<9.1**	ug/kg	18.2	9.1	1	08/12/15 08:57	08/14/15 14:16	91-20-3	
Phenanthrene	**<9.1**	ug/kg	18.2	9.1	1	08/12/15 08:57	08/14/15 14:16	85-01-8	
Pyrene	**12.3J**	ug/kg	18.2	9.1	1	08/12/15 08:57	08/14/15 14:16	129-00-0	
Surrogates									
2-Fluorobiphenyl (S)	61	%	39-130		1	08/12/15 08:57	08/14/15 14:16	321-60-8	
Terphenyl-d14 (S)	62	%	37-130		1	08/12/15 08:57	08/14/15 14:16	1718-51-0	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**8.4**	%	0.10	0.10	1		08/05/15 12:14		

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ANALYTICAL RESULTS

Project: 19-0422.20 WEST WATERFRONT
Pace Project No.: 40119126

Sample: BP-4-2 **Lab ID: 40119126010** Collected: 08/04/15 10:44 Received: 08/04/15 14:12 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Lead	**3.1**	mg/kg	1.2	0.51	1	08/13/15 07:11	08/13/15 15:27	7439-92-1	
8270 MSSV PAH by SIM	Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3546								
Acenaphthene	**<10.3**	ug/kg	20.7	10.3	1	08/12/15 08:57	08/13/15 18:30	83-32-9	
Acenaphthylene	**<9.3**	ug/kg	20.7	9.3	1	08/12/15 08:57	08/13/15 18:30	208-96-8	
Anthracene	**<10.7**	ug/kg	20.7	10.7	1	08/12/15 08:57	08/13/15 18:30	120-12-7	
Benzo(a)anthracene	**<7.2**	ug/kg	20.7	7.2	1	08/12/15 08:57	08/13/15 18:30	56-55-3	
Benzo(a)pyrene	**<7.4**	ug/kg	20.7	7.4	1	08/12/15 08:57	08/13/15 18:30	50-32-8	
Benzo(b)fluoranthene	**<10.3**	ug/kg	20.7	10.3	1	08/12/15 08:57	08/13/15 18:30	205-99-2	
Benzo(g,h,i)perylene	**<7.9**	ug/kg	20.7	7.9	1	08/12/15 08:57	08/13/15 18:30	191-24-2	
Benzo(k)fluoranthene	**<11.4**	ug/kg	20.7	11.4	1	08/12/15 08:57	08/13/15 18:30	207-08-9	
Chrysene	**<9.6**	ug/kg	20.7	9.6	1	08/12/15 08:57	08/13/15 18:30	218-01-9	
Dibenz(a,h)anthracene	**<7.6**	ug/kg	20.7	7.6	1	08/12/15 08:57	08/13/15 18:30	53-70-3	
Fluoranthene	**<10.3**	ug/kg	20.7	10.3	1	08/12/15 08:57	08/13/15 18:30	206-44-0	
Fluorene	**<10.3**	ug/kg	20.7	10.3	1	08/12/15 08:57	08/13/15 18:30	86-73-7	
Indeno(1,2,3-cd)pyrene	**<7.9**	ug/kg	20.7	7.9	1	08/12/15 08:57	08/13/15 18:30	193-39-5	
1-Methylnaphthalene	**<10.3**	ug/kg	20.7	10.3	1	08/12/15 08:57	08/13/15 18:30	90-12-0	
2-Methylnaphthalene	**<10.3**	ug/kg	20.7	10.3	1	08/12/15 08:57	08/13/15 18:30	91-57-6	
Naphthalene	**<10.3**	ug/kg	20.7	10.3	1	08/12/15 08:57	08/13/15 18:30	91-20-3	
Phenanthrene	**<10.3**	ug/kg	20.7	10.3	1	08/12/15 08:57	08/13/15 18:30	85-01-8	
Pyrene	**<10.3**	ug/kg	20.7	10.3	1	08/12/15 08:57	08/13/15 18:30	129-00-0	
Surrogates									
2-Fluorobiphenyl (S)	61	%	39-130		1	08/12/15 08:57	08/13/15 18:30	321-60-8	
Terphenyl-d14 (S)	62	%	37-130		1	08/12/15 08:57	08/13/15 18:30	1718-51-0	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**19.4**	%	0.10	0.10	1		08/05/15 12:14		

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ANALYTICAL RESULTS

Project: 19-0422.20 WEST WATERFRONT
Pace Project No.: 40119126

Sample: BP-1-1 **Lab ID: 40119126011** Collected: 08/04/15 10:47 Received: 08/04/15 14:12 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Lead	**2.7**	mg/kg	1.0	0.45	1	08/13/15 07:11	08/13/15 15:29	7439-92-1	
8270 MSSV PAH by SIM	Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3546								
Acenaphthene	**<9.0**	ug/kg	18.0	9.0	1	08/12/15 08:57	08/14/15 09:46	83-32-9	
Acenaphthylene	**<8.1**	ug/kg	18.0	8.1	1	08/12/15 08:57	08/14/15 09:46	208-96-8	
Anthracene	**<9.4**	ug/kg	18.0	9.4	1	08/12/15 08:57	08/14/15 09:46	120-12-7	
Benzo(a)anthracene	**<6.3**	ug/kg	18.0	6.3	1	08/12/15 08:57	08/14/15 09:46	56-55-3	
Benzo(a)pyrene	**<6.4**	ug/kg	18.0	6.4	1	08/12/15 08:57	08/14/15 09:46	50-32-8	
Benzo(b)fluoranthene	**<9.0**	ug/kg	18.0	9.0	1	08/12/15 08:57	08/14/15 09:46	205-99-2	
Benzo(g,h,i)perylene	**<6.9**	ug/kg	18.0	6.9	1	08/12/15 08:57	08/14/15 09:46	191-24-2	
Benzo(k)fluoranthene	**<10**	ug/kg	18.0	10	1	08/12/15 08:57	08/14/15 09:46	207-08-9	
Chrysene	**<8.3**	ug/kg	18.0	8.3	1	08/12/15 08:57	08/14/15 09:46	218-01-9	
Dibenz(a,h)anthracene	**<6.6**	ug/kg	18.0	6.6	1	08/12/15 08:57	08/14/15 09:46	53-70-3	
Fluoranthene	**<9.0**	ug/kg	18.0	9.0	1	08/12/15 08:57	08/14/15 09:46	206-44-0	
Fluorene	**<9.0**	ug/kg	18.0	9.0	1	08/12/15 08:57	08/14/15 09:46	86-73-7	
Indeno(1,2,3-cd)pyrene	**<6.9**	ug/kg	18.0	6.9	1	08/12/15 08:57	08/14/15 09:46	193-39-5	
1-Methylnaphthalene	**<9.0**	ug/kg	18.0	9.0	1	08/12/15 08:57	08/14/15 09:46	90-12-0	
2-Methylnaphthalene	**<9.0**	ug/kg	18.0	9.0	1	08/12/15 08:57	08/14/15 09:46	91-57-6	
Naphthalene	**<9.0**	ug/kg	18.0	9.0	1	08/12/15 08:57	08/14/15 09:46	91-20-3	
Phenanthrene	**<9.0**	ug/kg	18.0	9.0	1	08/12/15 08:57	08/14/15 09:46	85-01-8	
Pyrene	**<9.0**	ug/kg	18.0	9.0	1	08/12/15 08:57	08/14/15 09:46	129-00-0	
Surrogates									
2-Fluorobiphenyl (S)	63	%	39-130		1	08/12/15 08:57	08/14/15 09:46	321-60-8	
Terphenyl-d14 (S)	67	%	37-130		1	08/12/15 08:57	08/14/15 09:46	1718-51-0	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**7.6**	%	0.10	0.10	1		08/05/15 12:14		

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ANALYTICAL RESULTS

Project: 19-0422.20 WEST WATERFRONT
Pace Project No.: 40119126

Sample: BP-1-2 **Lab ID: 40119126012** Collected: 08/04/15 10:50 Received: 08/04/15 14:12 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Lead	**3.3**	mg/kg	1.0	0.44	1	08/13/15 07:11	08/13/15 15:33	7439-92-1	
8270 MSSV PAH by SIM	Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3546								
Acenaphthene	**<9.0**	ug/kg	18.0	9.0	1	08/12/15 08:57	08/13/15 22:49	83-32-9	
Acenaphthylene	**<8.1**	ug/kg	18.0	8.1	1	08/12/15 08:57	08/13/15 22:49	208-96-8	
Anthracene	**<9.3**	ug/kg	18.0	9.3	1	08/12/15 08:57	08/13/15 22:49	120-12-7	
Benzo(a)anthracene	**6.3J**	ug/kg	18.0	6.2	1	08/12/15 08:57	08/13/15 22:49	56-55-3	
Benzo(a)pyrene	**<6.4**	ug/kg	18.0	6.4	1	08/12/15 08:57	08/13/15 22:49	50-32-8	
Benzo(b)fluoranthene	**<9.0**	ug/kg	18.0	9.0	1	08/12/15 08:57	08/13/15 22:49	205-99-2	
Benzo(g,h,i)perylene	**<6.9**	ug/kg	18.0	6.9	1	08/12/15 08:57	08/13/15 22:49	191-24-2	
Benzo(k)fluoranthene	**<10**	ug/kg	18.0	10	1	08/12/15 08:57	08/13/15 22:49	207-08-9	
Chrysene	**11.1J**	ug/kg	18.0	8.3	1	08/12/15 08:57	08/13/15 22:49	218-01-9	
Dibenz(a,h)anthracene	**<6.6**	ug/kg	18.0	6.6	1	08/12/15 08:57	08/13/15 22:49	53-70-3	
Fluoranthene	**24.3**	ug/kg	18.0	9.0	1	08/12/15 08:57	08/13/15 22:49	206-44-0	
Fluorene	**<9.0**	ug/kg	18.0	9.0	1	08/12/15 08:57	08/13/15 22:49	86-73-7	
Indeno(1,2,3-cd)pyrene	**<6.8**	ug/kg	18.0	6.8	1	08/12/15 08:57	08/13/15 22:49	193-39-5	
1-Methylnaphthalene	**<9.0**	ug/kg	18.0	9.0	1	08/12/15 08:57	08/13/15 22:49	90-12-0	
2-Methylnaphthalene	**<9.0**	ug/kg	18.0	9.0	1	08/12/15 08:57	08/13/15 22:49	91-57-6	
Naphthalene	**<9.0**	ug/kg	18.0	9.0	1	08/12/15 08:57	08/13/15 22:49	91-20-3	
Phenanthrene	**9.9J**	ug/kg	18.0	9.0	1	08/12/15 08:57	08/13/15 22:49	85-01-8	
Pyrene	**17.5J**	ug/kg	18.0	9.0	1	08/12/15 08:57	08/13/15 22:49	129-00-0	
Surrogates									
2-Fluorobiphenyl (S)	64	%	39-130		1	08/12/15 08:57	08/13/15 22:49	321-60-8	
Terphenyl-d14 (S)	65	%	37-130		1	08/12/15 08:57	08/13/15 22:49	1718-51-0	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**7.4**	%	0.10	0.10	1		08/05/15 12:14		

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QUALITY CONTROL DATA

Project: 19-0422.20 WEST WATERFRONT
Pace Project No.: 40119126

QC Batch: MPRP/12413 Analysis Method: EPA 6010
QC Batch Method: EPA 3050 Analysis Description: 6010 MET
Associated Lab Samples: 40119126001, 40119126002, 40119126003, 40119126004, 40119126005, 40119126006, 40119126007, 40119126008, 40119126009, 40119126010, 40119126011, 40119126012

METHOD BLANK: 1205824 Matrix: Solid
Associated Lab Samples: 40119126001, 40119126002, 40119126003, 40119126004, 40119126005, 40119126006, 40119126007, 40119126008, 40119126009, 40119126010, 40119126011, 40119126012

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Lead	mg/kg	<0.43	1.0	08/13/15 14:51	

LABORATORY CONTROL SAMPLE: 1205825

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Lead	mg/kg	50	49.3	99	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1205826 1205827

Parameter	Units	40119126001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Lead	mg/kg	3.9	54.7	54.7	54.2	54.8	92	93	75-125	1	20	

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QUALITY CONTROL DATA

Project: 19-0422.20 WEST WATERFRONT
Pace Project No.: 40119126

QC Batch: OEXT/27673 Analysis Method: EPA 8270 by SIM
QC Batch Method: EPA 3546 Analysis Description: 8270/3546 MSSV PAH by SIM
Associated Lab Samples: 40119126001, 40119126002, 40119126003, 40119126004, 40119126005, 40119126006, 40119126007, 40119126008, 40119126009, 40119126010, 40119126011, 40119126012

METHOD BLANK: 1205356 Matrix: Solid
Associated Lab Samples: 40119126001, 40119126002, 40119126003, 40119126004, 40119126005, 40119126006, 40119126007, 40119126008, 40119126009, 40119126010, 40119126011, 40119126012

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1-Methylnaphthalene	ug/kg	<8.3	16.7	08/12/15 12:34	
2-Methylnaphthalene	ug/kg	<8.3	16.7	08/12/15 12:34	
Acenaphthene	ug/kg	<8.3	16.7	08/12/15 12:34	
Acenaphthylene	ug/kg	<7.5	16.7	08/12/15 12:34	
Anthracene	ug/kg	<8.6	16.7	08/12/15 12:34	
Benzo(a)anthracene	ug/kg	<5.8	16.7	08/12/15 12:34	
Benzo(a)pyrene	ug/kg	<6.0	16.7	08/12/15 12:34	
Benzo(b)fluoranthene	ug/kg	<8.3	16.7	08/12/15 12:34	
Benzo(g,h,i)perylene	ug/kg	<6.3	16.7	08/12/15 12:34	
Benzo(k)fluoranthene	ug/kg	<9.2	16.7	08/12/15 12:34	
Chrysene	ug/kg	<7.7	16.7	08/12/15 12:34	
Dibenz(a,h)anthracene	ug/kg	<6.1	16.7	08/12/15 12:34	
Fluoranthene	ug/kg	<8.3	16.7	08/12/15 12:34	
Fluorene	ug/kg	<8.3	16.7	08/12/15 12:34	
Indeno(1,2,3-cd)pyrene	ug/kg	<6.3	16.7	08/12/15 12:34	
Naphthalene	ug/kg	<8.3	16.7	08/12/15 12:34	
Phenanthrene	ug/kg	<8.3	16.7	08/12/15 12:34	
Pyrene	ug/kg	<8.3	16.7	08/12/15 12:34	
2-Fluorobiphenyl (S)	%	74	39-130	08/12/15 12:34	
Terphenyl-d14 (S)	%	80	37-130	08/12/15 12:34	

LABORATORY CONTROL SAMPLE: 1205357

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1-Methylnaphthalene	ug/kg	333	259	78	53-130	
2-Methylnaphthalene	ug/kg	333	270	81	52-130	
Acenaphthene	ug/kg	333	280	84	54-130	
Acenaphthylene	ug/kg	333	287	86	55-130	
Anthracene	ug/kg	333	332	100	64-130	
Benzo(a)anthracene	ug/kg	333	278	83	50-130	
Benzo(a)pyrene	ug/kg	333	281	84	46-130	
Benzo(b)fluoranthene	ug/kg	333	256	77	43-130	
Benzo(g,h,i)perylene	ug/kg	333	263	79	48-130	
Benzo(k)fluoranthene	ug/kg	333	299	90	55-130	
Chrysene	ug/kg	333	292	87	62-130	
Dibenz(a,h)anthracene	ug/kg	333	280	84	49-130	
Fluoranthene	ug/kg	333	284	85	57-130	
Fluorene	ug/kg	333	275	83	57-130	

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QUALITY CONTROL DATA

Project: 19-0422.20 WEST WATERFRONT
Pace Project No.: 40119126

LABORATORY CONTROL SAMPLE: 1205357

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Indeno(1,2,3-cd)pyrene	ug/kg	333	281	84	50-130	
Naphthalene	ug/kg	333	254	76	48-130	
Phenanthrene	ug/kg	333	289	87	51-130	
Pyrene	ug/kg	333	266	80	55-130	
2-Fluorobiphenyl (S)	%			79	39-130	
Terphenyl-d14 (S)	%			77	37-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1205358 1205359

Parameter	Units	40119126001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
1-Methylnaphthalene	ug/kg	<9.1	365	365	273	277	75	75	50-130	1	30	
2-Methylnaphthalene	ug/kg	<9.1	365	365	284	286	77	78	44-130	1	32	
Acenaphthene	ug/kg	<9.1	365	365	295	303	81	83	46-130	3	26	
Acenaphthylene	ug/kg	<8.2	365	365	301	309	82	85	49-130	3	23	
Anthracene	ug/kg	<9.5	365	365	346	360	95	98	52-130	4	28	
Benzo(a)anthracene	ug/kg	<6.3	365	365	292	306	79	83	34-130	5	36	
Benzo(a)pyrene	ug/kg	<6.5	365	365	293	312	79	85	34-130	6	40	
Benzo(b)fluoranthene	ug/kg	<9.1	365	365	287	305	78	83	22-130	6	40	
Benzo(g,h,i)perylene	ug/kg	<7.0	365	365	293	312	80	85	24-130	6	35	
Benzo(k)fluoranthene	ug/kg	<10.1	365	365	301	318	82	86	41-130	6	37	
Chrysene	ug/kg	<8.4	365	365	315	330	85	89	49-130	5	33	
Dibenz(a,h)anthracene	ug/kg	<6.7	365	365	301	319	82	87	27-130	6	31	
Fluoranthene	ug/kg	<9.1	365	365	301	319	81	86	34-130	6	37	
Fluorene	ug/kg	<9.1	365	365	290	300	79	82	45-130	3	25	
Indeno(1,2,3-cd)pyrene	ug/kg	<6.9	365	365	306	327	83	89	30-130	7	34	
Naphthalene	ug/kg	<9.1	365	365	270	274	73	74	38-130	1	30	
Phenanthrene	ug/kg	<9.1	365	365	303	318	82	86	38-130	5	34	
Pyrene	ug/kg	<9.1	365	365	288	303	78	82	35-130	5	35	
2-Fluorobiphenyl (S)	%						73	70	39-130			
Terphenyl-d14 (S)	%						73	73	37-130			

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QUALITY CONTROL DATA

Project: 19-0422.20 WEST WATERFRONT
Pace Project No.: 40119126

QC Batch: PMST/11584 Analysis Method: ASTM D2974-87
QC Batch Method: ASTM D2974-87 Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 40119126007, 40119126008, 40119126009, 40119126010, 40119126011, 40119126012

SAMPLE DUPLICATE: 1202760

Parameter	Units	40119136004 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	5.2	5.0	5	10	

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QUALITY CONTROL DATA

Project: 19-0422.20 WEST WATERFRONT
Pace Project No.: 40119126

QC Batch: PMST/11625 Analysis Method: ASTM D2974-87
QC Batch Method: ASTM D2974-87 Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 40119126001, 40119126002, 40119126003, 40119126004, 40119126005, 40119126006

SAMPLE DUPLICATE: 1206838

Parameter	Units	40119146006 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	21.6	21.5	0	10	

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QUALIFIERS

Project: 19-0422.20 WEST WATERFRONT
Pace Project No.: 40119126

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above LOD.

J - Estimated concentration at or above the LOD and below the LOQ.

LOD - Limit of Detection adjusted for dilution factor and percent moisture.

LOQ - Limit of Quantitation adjusted for dilution factor and percent moisture.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected at or above the adjusted LOD.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

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TNI - The NELAC Institute.

LABORATORIES

PASI-G Pace Analytical Services - Green Bay

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 19-0422.20 WEST WATERFRONT
Pace Project No.: 40119126

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
40119126001	**BP-6-1**	EPA 3050	MPRP/12413	EPA 6010	ICP/11008
40119126002	**BP-6-2**	EPA 3050	MPRP/12413	EPA 6010	ICP/11008
40119126003	**BP-5-1**	EPA 3050	MPRP/12413	EPA 6010	ICP/11008
40119126004	**BP-5-2**	EPA 3050	MPRP/12413	EPA 6010	ICP/11008
40119126005	**BP-3-1**	EPA 3050	MPRP/12413	EPA 6010	ICP/11008
40119126006	**BP-3-2**	EPA 3050	MPRP/12413	EPA 6010	ICP/11008
40119126007	**BP-2-1**	EPA 3050	MPRP/12413	EPA 6010	ICP/11008
40119126008	**BP-2-2**	EPA 3050	MPRP/12413	EPA 6010	ICP/11008
40119126009	**BP-4-1**	EPA 3050	MPRP/12413	EPA 6010	ICP/11008
40119126010	**BP-4-2**	EPA 3050	MPRP/12413	EPA 6010	ICP/11008
40119126011	**BP-1-1**	EPA 3050	MPRP/12413	EPA 6010	ICP/11008
40119126012	**BP-1-2**	EPA 3050	MPRP/12413	EPA 6010	ICP/11008
40119126001	**BP-6-1**	EPA 3546	OEXT/27673	EPA 8270 by SIM	MSSV/8180
40119126002	**BP-6-2**	EPA 3546	OEXT/27673	EPA 8270 by SIM	MSSV/8180
40119126003	**BP-5-1**	EPA 3546	OEXT/27673	EPA 8270 by SIM	MSSV/8180
40119126004	**BP-5-2**	EPA 3546	OEXT/27673	EPA 8270 by SIM	MSSV/8180
40119126005	**BP-3-1**	EPA 3546	OEXT/27673	EPA 8270 by SIM	MSSV/8180
40119126006	**BP-3-2**	EPA 3546	OEXT/27673	EPA 8270 by SIM	MSSV/8180
40119126007	**BP-2-1**	EPA 3546	OEXT/27673	EPA 8270 by SIM	MSSV/8180
40119126008	**BP-2-2**	EPA 3546	OEXT/27673	EPA 8270 by SIM	MSSV/8180
40119126009	**BP-4-1**	EPA 3546	OEXT/27673	EPA 8270 by SIM	MSSV/8180
40119126010	**BP-4-2**	EPA 3546	OEXT/27673	EPA 8270 by SIM	MSSV/8180
40119126011	**BP-1-1**	EPA 3546	OEXT/27673	EPA 8270 by SIM	MSSV/8180
40119126012	**BP-1-2**	EPA 3546	OEXT/27673	EPA 8270 by SIM	MSSV/8180
40119126001	**BP-6-1**	ASTM D2974-87	PMST/11625		
40119126002	**BP-6-2**	ASTM D2974-87	PMST/11625		
40119126003	**BP-5-1**	ASTM D2974-87	PMST/11625		
40119126004	**BP-5-2**	ASTM D2974-87	PMST/11625		
40119126005	**BP-3-1**	ASTM D2974-87	PMST/11625		
40119126006	**BP-3-2**	ASTM D2974-87	PMST/11625		
40119126007	**BP-2-1**	ASTM D2974-87	PMST/11584		
40119126008	**BP-2-2**	ASTM D2974-87	PMST/11584		
40119126009	**BP-4-1**	ASTM D2974-87	PMST/11584		
40119126010	**BP-4-2**	ASTM D2974-87	PMST/11584		
40119126011	**BP-1-1**	ASTM D2974-87	PMST/11584		
40119126012	**BP-1-2**	ASTM D2974-87	PMST/11584		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

UPPER MIDWEST REGION
MN: 612-607-1700 WI: 920-469-2436

Pace Analytical®
www.pacelabs.com

CHAIN OF CUSTODY

CP

40119426

*Preservation Codes
A=None B=HCL C=H2SO4 D=HNO3 E=DI Water F=Methanol G=NaOH
H=Sodium Bisulfate Solution I=Sodium Thiosulfate J=Other

(Please Print Clearly)	
Company Name:	Ayres Associates
Branch/Location:	Madison
Project Contact:	Jeff Steiner
Phone:	608-443-1259
Project Number:	19-0422.20
Project Name:	West Waterfront
Project State:	WI
Sampled By (Print):	Jeff Steiner
Sampled By (Sign):	Jeff Steiner
PO #:	Regulatory Program:

Quote #:	
Mail To Contact:	Jeff Steiner
Mail To Company:	Ayres Associates
Mail To Address:	Madison
Invoice To Contact:	Jeff Steiner
Invoice To Company:	Ayres Associates
Invoice To Address:	Eau Claire
Invoice To Phone:	

Data Package Options (billable)
☐ EPA Level III
☐ EPA Level IV

MS/MSD
☐ On your sample (billable)
☒ NOT needed on your sample

Matrix Codes
A = Air, W = Water, B = Biota, DW = Drinking Water, C = Charcoal, GW = Ground Water, O = Oil, SW = Surface Water, S = Soil, WW = Waste Water, SI = Sludge, WP = Wipe

PACE LAB #	CLIENT FIELD ID	COLLECTION DATE	COLLECTION TIME	MATRIX	FILTERED? (YES/NO) Y/N	PRESERVATION (CODE)* Pick Letter	Analyses Requested: PAH	Analyses Requested: Lead	CLIENT COMMENTS	LAB COMMENTS (Lab Use Only)	Profile #
001	BP-6-1	8/4/15	10:08	S	N	A	X	X	Send EDD	Send EDD 1-4oz AG^A 1-4oz P^A	
002	BP-6-2		10:13	S			X	X		1-4oz AG^A 1-4oz P^A	
003	BP-5-1		10:16	S			X	X			
004	BP-5-2		10:20				X	X			
005	BP-3-1		10:24				Y	Y			
006	BP-3-2		10:29				X	Y			
007	BP-2-1		10:33				Y	Y			
008	BP-2-2		10:37				Y	X			
009	BP-4-1		10:40				X	X			
010	BP-4-2		10:44				X	Y			
011	BP-1-1		10:47				Y	Y			
012	BP-1-2		10:50				Y	X			

Rush Turnaround Time Requested - Prelims
(Rush TAT subject to approval/surcharge)
Date Needed:

Transmit Prelim Rush Results by (complete what you want):
Email #1: steinerj@ayresassociates.com
Email #2:
Telephone:
Fax:

Samples on HOLD are subject to special pricing and release of liability

Relinquished By:	Date/Time:	Received By:	Date/Time:
Jeff Steiner	8-4-15 / 2:12 pm	Cindy Rost	8/4/15 1412

PACE Project No.: 40119426
Receipt Temp = ROI °C
Sample Receipt pH: OK / Adjusted
Cooler Custody Seal: Present / Not Present
Intact / Not Intact

Version 6.0 06/14/06

C019a(27Jun2006)

ORIGINAL

Sample Condition Upon Receipt

Pace Analytical Services, Inc.
1241 Bellevue Street, Suite 9
Green Bay, WI 54302

Pace Analytical™

Client Name: Ayres Associates

Project #: **WO#: 40119126**

40119126

Courier: ☐ Fed Ex ☐ UPS ☒ Client ☐ Pace Other: _____

Tracking #: _____

Custody Seal on Cooler/Box Present: ☐ yes ☒ no Seals intact: ☐ yes ☐ no

Custody Seal on Samples Present: ☐ yes ☒ no Seals intact: ☐ yes ☐ no

Packing Material: ☐ Bubble Wrap ☒ Bubble Bags ☐ None ☐ Other _____

Thermometer Used N/A **Type of Ice:** (Wet) Blue Dry None ☒ Samples on ice, cooling process has begun

Cooler Temperature Uncorr: ROI /Corr: **Biological Tissue is Frozen:** ☐ yes ☐ no

Temp Blank Present: ☐ yes ☒ no

Person examining contents:
Date: 8/4/15
Initials: EP

Temp should be above freezing to 6°C for all sample except Biota.
Frozen Biota Samples should be received ≤ 0°C.

		Comments:
Chain of Custody Present:	☒Yes ☐No ☐N/A	1.
Chain of Custody Filled Out:	☒Yes ☐No ☐N/A	2.
Chain of Custody Relinquished:	☒Yes ☐No ☐N/A	3.
Sampler Name & Signature on COC:	☒Yes ☐No ☐N/A	4.
Samples Arrived within Hold Time:	☒Yes ☐No ☐N/A	5.
- VOA Samples frozen upon receipt	☐Yes ☐No	Date/Time:
Short Hold Time Analysis (<72hr):	☐Yes ☒No ☐N/A	6.
Rush Turn Around Time Requested:	☐Yes ☒No ☐N/A	7.
Sufficient Volume:	☒Yes ☐No ☐N/A	8.
Correct Containers Used:	☒Yes ☐No ☐N/A	9.
-Pace Containers Used:	☒Yes ☐No ☐N/A	
-Pace IR Containers Used:	☐Yes ☒No ☐N/A	
Containers Intact:	☒Yes ☐No ☐N/A	10.
Filtered volume received for Dissolved tests	☐Yes ☐No ☒N/A	11.
Sample Labels match COC:	☒Yes ☐No ☐N/A	12.
-Includes date/time/ID/Analysis Matrix: S		
All containers needing preservation have been checked. (Non-Compliance noted in 13.)	☐Yes ☐No ☒N/A	13. ☐ HNO3 ☐ H2SO4 ☐ NaOH ☐ NaOH +ZnAct
All containers needing preservation are found to be in compliance with EPA recommendation. (HNO3, H2SO4 ≤2; NaOH+ZnAct ≥9, NaOH ≥12)	☐Yes ☐No ☒N/A	
exceptions: VOA, coliform, TOC, TOX, TOH, O&G, WIDROW, Phenolics, OTHER:	☐Yes ☒No	Initial when completed / Lab Std #ID of preservative / Date/ Time:
Headspace in VOA Vials (>6mm):	☐Yes ☐No ☒N/A	14.
Trip Blank Present:	☐Yes ☐No ☒N/A	15.
Trip Blank Custody Seals Present	☐Yes ☐No ☒N/A	
Pace Trip Blank Lot # (if purchased):		

Client Notification/ Resolution: If checked, see attached form for additional comments ☐

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: AMH for DM **Date:** 8/4/15

F-GB-C-031-Rev.03 (9April2015) SCUR Form

Appendix C

Development at Historic Fill Site

Exemption Application

State of Wisconsin
Department of Natural Resources
PO Box 7921, Madison WI 53707-7921
dnr.wi.gov

Development at Historic Fill Site or Licensed Landfill Exemption Application

Form 4400-226 (R 9/14)

Notice: Use of this form is required by the DNR for any application to develop at a historic fill site or licensed landfill pursuant to secs. NR 506.085 and NR 500.08(4), Wis. Adm. Code. The Department will not consider your application unless you provide complete information requested. Personally identifiable information collected will be used to process your application and will also be accessible by request under Wisconsin's Open Records law [ss.19.31 - 19.39, Wis. Stats.]

Instructions: See *Development at Historic Fill Sites and Licensed Landfills: What you need to know* (PUB-RR-683, November 2013) for detailed instructions.

- All Exemption Application materials should be sent to the region where the site is located, as listed on page 6.
- Include $700 fee payment with this application unless a fee was already paid for the review of the remedial design report under the NR 700 process. If the site is a licensed landfill and the Waste and Materials Management program is doing the review, submit no fee now. You will be sent an invoice upon receipt of this application.
- Determine the appropriate exemption type for the site and check appropriate box below.
- Provide complete information requested for each type of exemption. Include the following attachments:
  Required: Summary of Existing and Potential Impacts described in Section V as an attachment, under the seal of a professional engineer or geologist registered to practice in Wisconsin.
  Optional: Site Visit Summary Comments (Section IX) including any photos, sketches or site visit notes.

Exemption Type

☒ **Remediation and Redevelopment Program NR 700 Rule Series Process Exemption:** Site with remedial actions conducted in accordance with NR 700 series
Required: Sections I - VI ***Optional:*** Sections VII - X

☐ **Case-by-Case Evaluation:** Sites with anticipated environmental impacts or wastes of special concerns
Required: Sections I - VI ***Optional:*** Sections VII - X

☐ **Expedited Exemption:** Site with no expected environmental impact
Required: Sections I - VI **and** Form 4400-226A Expedited Exemption Application ***Optional:*** Sections VII - X

I. Applicant Information

Owner - Last Name	First	MI	Phone Number (include area code)
Olejniczak	Martin		

Contact Name (if different)
City of Sturgeon Bay

Street Address	City	State	ZIP Code
421 Michigan Street	Sturgeon Bay	WI	53718

Developer - Last Name	First	MI	Phone Number (include area code)

Street Address	City	State	ZIP Code

II. Site Name and Location

Site Name	Location / Address
West Waterfront Redevelopment	92 and 100 E. Maple Street
Is the site known by another name(s)? ◉ Yes ○ No ○ Unknown If yes, provide name: Door County Coop	◉ City ○ Town ○ Village of Sturgeon Bay
Does the site have a license number? ○ Yes ◉ No ○ Unknown If yes, License Number:	State: WI; ZIP Code: 54235; County: Door

A. Attach a map with site location and limits of fill/waste disposal area.

B. Global Positioning System Coordinates

Describe method for collecting GPS Coordinates: WDNR BRRTS on the Web

Latitude	DEG	MIN	SEC	Longitude	DEG	MIN	SEC
	44	49	46.4800 N		87	22	57.8300 W

Program Lead, Fee Status and Regulatory ID Numbers *(This area for DNR use only)*

○ **Waste Management Bureau**
○ **Remediation and Redevelopment Bureau - Exemption is part of remedy under NR 700 program**
  ○ Fee already paid for review of remedial design report.
  ○ Review of remedial design report not requested and payment is attached.

☐ Payment Attached
Amount: $

Hazardous Waste Facility License ID #:(5 digits)	DNR FID #: (9 digits)	USEPA ID #:(used for both RCRA & CERCLIS #s) (WI+Alpha+9 digits)

Region	Project Manager	Telephone Number

III. Site Ownership History

Previous Owner - Last Name	First	MI	Telephone Number
Freedom Bank			

Street Address	City	State	ZIP Code
500 E. Leclair Road	Eldridge	IA	52748

Responsible Municipal / Private Operator - Last Name (if applicable)	First	MI	Telephone Number

Street Address	City	State	ZIP Code

IV. Evaluation of Existing and Potential Impacts. See Development at Historic Fill Sites and Licensed Landfill: Guidance for Investigation and Development at Historic Fill Sites and Licensed Landfill: Potential Problems and Considerations.

A. Analytical data for the following media have been collected and/or examined before completing this application:

1. Groundwater: (●) Yes ( ) No
2. Soil: (●) Yes ( ) No
3. Surface water / sediment: ( ) Yes (●) No
4. Air: (●) Yes ( ) No
5. Methane or other explosive gases: (●) Yes ( ) No

B. Based on known or suspected sources and wastes, their physical characteristics, containment and geologic environment, do you suspect a release of pollutants to the environment?

(●) Yes: [☒] Groundwater [☒] Soil [☐] Surface Water / Sediment [☒] Methane or Other Explosive Gases
( ) No

C. If there is NOT a likelihood of a release of pollutants or evidence of a release, would the impact of the proposed development be likely to cause a release to the environment?

( ) Yes: **If yes, be sure to summarize actions to be taken to prevent adverse environmental impacts in V. Part C below.**
(●) No

V. Summary of Existing and Potential Impacts. See Development at Historic Fill Sites and Licensed Landfill: Guidance for Investigation and Development at Historic Fill Sites and Licensed Landfill: Potential Problems and Considerations.

Describe the following in an attached narrative under the signature of a qualified professional. Organize, label and package as listed below.

A. Existing Site Conditions

1. existing site conditions including waste types,
2. potential for impacts, and
3. evaluation of existing impacts.

B. Proposed Development Summary. Include explanation for overall site decision.

C. Summary of actions to be taken and engineering controls that will prevent or minimize adverse environmental impacts and potential threats to human health and welfare, including worker safety.

VI. Certification of Application Information

I certify that information in this application and all its attachments is true and correct and in conformity with applicable Wis. statutes.

Print / Type Name of Applicant: Martin Olejniczak, Community Development Director, City of Sturgeon Bay

Applicant Signature: Martin Olejniczak Date Signed: 6/30/15

Sections VII - IX are optional for all Applicants.

VII. Current and Historic Type of Waste Disposal Site (Check all that apply)

- ☐ Licensed Landfill
- ☐ Non-approved {See s.289.01(3)}, Wis Stats.
- ☐ Approved
- ☐ One-time Disposal
- ☐ Construction / Demolition
- ☐ Historic Fill Site

Liner

- ☐ Unlined
- ☐ Lined
- ☐ Composite Liner
- ☐ Other Liner (Describe): _____
- ☐ Clay Liner
- ☐ Unengineered

Total Landfill Volume

- ◯ < 50,000 yd ³
- ◯ 50,000-500,000 yd
- ◯ > 500,000 yd ³

Does the landfill have a closure plan? ◯ Yes ◯ No ◯ Unknown

Does the landfill have a groundwater monitoring plan? ◯ Yes ◯ No ◯ Unknown

Have groundwater monitoring wells been installed? ◯ Yes ◯ No ◯ Unknown

Was a cover installed? ◯ Yes: ◯ No **If no, go to Past Land Uses.**

- ☐ Composite cap
- ☐ Layered soil cap with clay barrier
- ☐ Clay cap
- ☐ Soil cap - not recompacted clay
- ☐ Other cover
- ☐ Unknown

What is the thickness of the cover? ◯ < 6 in ◯ 6-12 in ◯ 12-24 in ◯ > 24 in ◯ Unknown

Past Land Uses. (Check all that apply)

- ☐ Agricultural co-op
- ☐ Brush pile
- ☐ Bulk plant
- ☐ Coal gas manufacturer
- ☐ Deer pit
- ☐ Dry cleaner
- ☐ Electroplater
- ☐ Lagoon
- ☐ Manufacturing Type: _____
- ☐ Old burn pit
- ☐ Pipeline
- ☐ RCRA generator
- ☐ Salvage yard
- ☐ Service Station
- ☐ Tannery
- ☐ Unknown
- ☐ Other: _____

Date(s) of Site Operation

From: _____ To: _____ No. of Years _____ ☐ Unknown

VIII. Waste Information & Geologic Environment. See Development at Historic Fill Sites and Licensed Landfills: Guidance for Investigation

A. Known or Suspected Sources/Wastes. (Check all that apply)

- ☐ Abandoned containers
- ☐ Above ground pipeline or tank
- ☐ Animal carcasses
- ☐ Buried drums
- ☐ Burning of materials
- ☐ Foundry sand
- ☐ Industrial accident
- ☐ Known or suspected hazardous materials
- ☐ Municipal waste
- ☐ Paper mill sludge
- ☐ Transformer
- ☐ Trees/brush
- ☐ Surface spills
- ☐ Fly ash
- ☐ Demolition/construction waste
- ☐ Surface impoundment/lagoons
- ☐ Underground pipeline or tank
- ☐ Exempted fill [NR 500.08(1) and (2)]
- ☐ Unknown
- ☐ Other: _____

B. Physical Characteristics of Sources/Wastes

◯ Liquid ◯ Solid ◯ Liquid & Solid ◯ Unknown

VIII. Waste Information & Geologic Environment *(continued)*

C. Waste Containment ◯ Liner ◯ Unknown ◯ Not applicable

☐ Engineered cover
◯ Maintained ◯ Not maintained

☐ Functioning leachate collection & removal system
☐ Functioning & maintained run-off management system
☐ Functioning groundwater monitoring system

D. Soil Type: Estimate distances or determinations based on regional or site specific information.

◯ Regional ◯ Site specific

Clay, silt or other fine grained soils present? (lacustrine, tills, etc.) ◯ Yes ◯ No

At surface? ◯ Yes ◯ No At depth? ◯ Yes ◯ No _____feet

Sand & gravel, coarse grained soils present? ◯ Yes ◯ No

At surface? ◯ Yes ◯ No At depth? ◯ Yes ◯ No _____feet

E. Depth to Groundwater

◯ Regional ◯ Site specific _____feet

F. Direction of Groundwater Flow

◯ Regional ◯ Site specific _____direction

G. Depth to Bedrock

◯ Regional ◯ Site specific _____direction

H. Bedrock Type

◯ Regional ◯ Site specific ☐ Sandstone ☐ Limestone/Dolomite ☐ Metamorphic/Igneous

IX. Site Visit

Conduct a site visit to complete site screening and determine general site conditions, on-site activities and adjacent land use encroachment issues. As appropriate to document the site, take photos, sketch the site and prepare a Site Visit Report.

On-site visit conducted? ◯ Yes ◯ No

General site conditions: Document any observed releases and note whether or not you were able to walk the site. Examples of things to be aware of include the following:

- leachate seeps or evidence of seeps such as stained soil/vegetation
- stressed vegetation as a sign of gas migration to the surface or of leachate seeps;
- quality and coverage of vegetation on the cap;
- odors which may indicate gas migration to the atmosphere;
- erosion of the cap;
- maintenance of positive drainage over the capped area;
- visual desiccation cracks in the cap.

Attach the following to your application:

☐ Photographs, regular or digital ☐ Site sketch ☐ Site Visit Report

Name(s) of Person(s) Conducting Site Visit	Date of Site Visit

IX. Site Visit *(continued)*

A. Adjacent Land Uses. Indicate all directions. (Check all that apply)

☐ Agricultural	☐ N	☐ S	☐ E	☐ W	☐ NE	☐ NW	☐ SE	☐ SW
☐ Industrial	☐ N	☐ S	☐ E	☐ W	☐ NE	☐ NW	☐ SE	☐ SW
☐ Recreational	☐ N	☐ S	☐ E	☐ W	☐ NE	☐ NW	☐ SE	☐ SW
☐ Residential	☐ N	☐ S	☐ E	☐ W	☐ NE	☐ NW	☐ SE	☐ SW
☐ Undeveloped	☐ N	☐ S	☐ E	☐ W	☐ NE	☐ NW	☐ SE	☐ SW
☐ Commercial	☐ N	☐ S	☐ E	☐ W	☐ NE	☐ NW	☐ SE	☐ SW
☐ Other:	☐ N	☐ S	☐ E	☐ W	☐ NE	☐ NW	☐ SE	☐ SW

B. Potential Groundwater Receptors. Estimate distances. (1 mile = 5,280 ft)

Distance to and direction of nearest municipal well: _____ feet ☐ > ½ mile from the waste _____ direction

Distance to and direction of nearest other-than-municipal well: _____ feet ☐ > ½ mile from the waste _____ direction

Distance to and direction of nearest non-community well: _____ feet ☐ > ½ mile from the waste _____ direction

Distance to and direction of nearest private well: _____ feet ☐ > ½ mile from the waste _____ direction

Distance to and direction of nearest private well: _____ feet ☐ > ½ mile from the waste _____ direction

C. Potential For Gas Migration

_____ No. of homes within 300 feet of waste (gas migration potential)

_____ No. of homes between 300 & 1,000 ft to waste (gas migration potential)

Distance to and direction of nearest building: feet ☐ > ½ mile from the waste _____ direction

Type of building: ☐ On-site building ☐ Municipal ☐ Residential ☐ Commercial ☐ Industrial ☐ Unknown

D. Potential Surface Water Receptors. Estimate distances.

◯ Creek _____ feet ◯ Drainage ditch: _____ feet ◯ Intermittent stream: _____ feet

◯ River _____ feet ◯ Lake _____ feet ◯ Wetland: _____ feet

E. Based on the site visit, did you visually observe...

1. a release to a surface water body? ◯ Yes ◯ No ◯ Unknown
2. a leachate seep? ◯ Yes ◯ No ◯ Unknown
3. a release to soils? ◯ Yes ◯ No ◯ Unknown

X. Comments: Use this section to provide comments on any aspect of the site visit. Attach any information or explanations labeled with the appropriate section number to which the material applies.

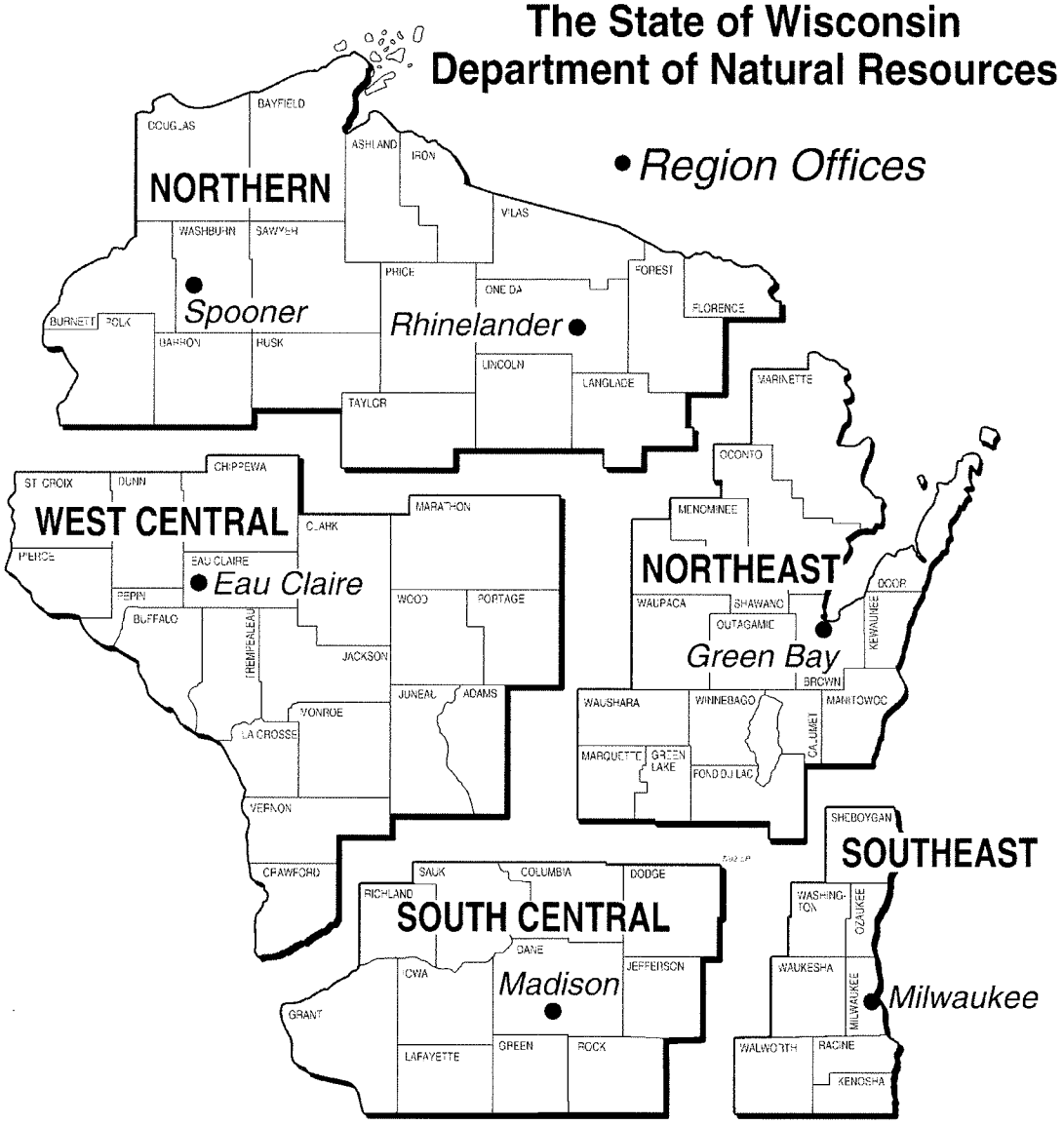
Region Map

NORTHERN REGION
Remediation & Redevelopment
Team Supervisor
Department of Natural Resources
107 Sutliff Avenue
Rhinelander, WI 54501
(715) 365-8976
OR
Regional Waste Program Manager
Department of Natural Resources
107 Sutliff Avenue
Rhinelander WI 54501
(715) 365-8946

NORTHEAST REGION
Remediation & Redevelopment
Team Supervisor
Department of Natural Resources
2984 Shawano Avenue
Green Bay, WI 54313-6727
(920) 662-5160
OR
Regional Waste Program Manager
Department of Natural Resources
2984 Shawano Avenue
Green Bay, WI 54313-6727
(920) 662-5120

SOUTHEAST REGION
Remediation & Redevelopment
Team Supervisor
Department of Natural Resources
P.O. Box 12436
Milwaukee, WI 53212-0436
(414) 263-8561 or (414) 263-8714
OR
Regional Waste Program Manager
Department of Natural Resources
P.O. Box 12436
Milwaukee, WI 53212-0436
(414) 263-8694 or (414) 263-8697

WEST CENTRAL REGION
Remediation & Redevelopment
Team Supervisor
Department of Natural Resources
1300 West Clairemont Avenue
Eau Claire, WI 54701
(715) 839-3710
OR
Regional Waste Program Manager
Department of Natural Resources
1300 West Clairemont Avenue
Eau Claire, WI 54701
(715) 839-3708



SOUTH CENTRAL REGION
Remediation & Redevelopment
Team Supervisor
Department of Natural Resources
3911 Fish Hatchery Road
Fitchburg, WI 53711
(608) 275-3241

OR Regional Waste Program Manager
Department of Natural Resources
3911 Fish Hatchery Road
Fitchburg, WI 53711
(608) 275-3466

V. Summary of Existing and Potential Impacts

A. Existing Site Conditions

1. Existing Site Conditions Including Waste Types

Activities outlined in this document represent the remediation phase of the Brownfield development process for the Door County Coop (DNR BRRTS # 03-15-000659), Door County Coop- Fill (DNR BRRTS # 02-15-544253), Former Door County Coop- VPLE (DNR BRRTS # 06-15-560738), Former US Coast Guard- Above OHWM (DNR BRRTS # 02-15-563484), Former US Coast Guard- Above OHWM- VPLE (DNR BRRTS # 06-15-563486) and limited portions of the Former US Coast Guard- Below OHWM (DNR BRRTS #: 02-15-563485) BRRTS cases located at 92 and 100 East Maple Street, Sturgeon Bay, Wisconsin

The property proposed for the West Waterfront Redevelopment, 92 and 100 East Maple Street, Sturgeon Bay was historically developed for industrial and municipal use since at least 1885. Development began on the western portion of the site and later progressed eastward as the shoreline of Sturgeon Bay was filled in. The site was occupied over the years by a dock, grain elevator, seed warehouse, lumberyard planning mill, cement storage and agricultural cooperative. The agricultural cooperative, which was the most recent occupant of the property, ceased operations in 2007. The site has since been vacant and idle. On site structures were demolished in July 2014.

Previous environmental activities conducted on the property have documented the storage of petroleum products in aboveground and underground storage tanks as well as mixing and storage of fertilizer. Fill material placed on the site was reported to contain wood chips, charred wood and concrete. The presence of organic matter in the fill material has the potential to the generate methane gas.

In anticipation of proposed mixed use redevelopment of the site, environmental assessment activities were conducted on the property between May 2013 and May 2015 to assess possible soil and groundwater contamination resulting from past use of the site and placement waste fill material. A methane gas assessment was also conducted.

Results of these recent assessment activities indicate that the property is underlain by up to 13 feet of fill material containing bricks, cinders, concrete, and wood debris. Unconsolidated sediments beneath the fill are lacustrine deposits consisting of discontinuous layers of sand and gravel, silty sand and clay to the total depth of exploration at 35 feet bls.

Contaminants of concern in soil/fill at this site are polycyclic aromatic hydrocarbons (PAH) detected above direct contact and groundwater pathway residual contaminant levels (RCL), and heavy metals detected above the groundwater pathway RCL. The elevated PAH and heavy metals concentrations were detected in the fill material beneath the site and are likely the result of the composition of the fill. Groundwater, encountered within five feet of ground surface, indicated isolated areas of PAH, benzene, lead and arsenic concentrations slightly above enforcement standards.

Vapor assessment activities indicate that methane is being generated at this site through the decomposition of organic matter in the fill material. Methane concentrations greater

than the lower explosive limit (LEL) were detected in three of the nine shallow soil vapor probes advanced at the site.

The nature and extent of contamination at this site are described in the NR 716 Site Assessment Report – Addendum for the West Waterfront Redevelopment dated July 2015. Contaminants at this site warranting remediation are as follows:

Soil

- PAH – Concentrations of PAH above NR 720 direct contact and groundwater pathway RCL were detected in fill material across the site. The industrial direct contact RCL was exceeded, primarily for benzo(a)pyrene, in samples of fill material collected.
- Heavy Metals – Concentrations of arsenic and lead were detected above the NR 720 groundwater pathway residual contaminant level (RCL) in fill material across the majority of the site. Barium was detected above the NR 720 groundwater pathway RCL in a single sample collected from probe WGP-1 advanced in the southwest portion of the site. Arsenic was detected below the background threshold value and within the range of naturally occurring concentrations of arsenic for the region. None of the other heavy metals were detected above NR 720 direct contact RCL

Groundwater

- Isolated areas of PAH, benzene, lead and arsenic were detected at concentrations slightly above their respective enforcement standard. These isolated low level detections do not warrant remediation. However, additional groundwater monitoring is recommended to confirm the presence and trend in concentration of these compounds in groundwater.

Vapor

- Vapor assessment activities indicate that methane gas is being generated beneath the site. Measures should be taken to mitigate accumulation of methane gas in any buildings or underground utilities constructed on site.

2. Potential for Impacts

Contamination at this site consists primarily of PAH at concentrations above direct contact RCL. The proposed redevelopment of the site includes a hotel and public space and, therefore, there is a potential for human health impacts due to direct contact with the soil exposure route. PAH were also detected above the groundwater pathway RCL. However, PAH are relatively immobile due to their low solubility and affinity for adsorption and their potential for impact on groundwater and surface water is low. This is supported by the low levels of PAH detected in groundwater beneath the site.

Arsenic, lead and barium were detected at concentrations above the groundwater pathway RCL. However, groundwater analysis only detected low levels of these metals indicating that the concentrations in soil are having a negligible impact on groundwater. Concentrations of heavy metals in groundwater do not warrant remediation.

Methane gas generation beneath the site has the potential to accumulate within indoor air space or along utility corridors causing an explosion hazard. Currently the site is vacant and methane gas is venting directly through the ground surface and into the atmosphere. However, when buildings are constructed or subsurface utilities installed during site redevelopment, engineered controls should be implemented to mitigate vapor migration and accumulation into enclosed spaces.

3. Evaluation of Existing Impacts

Soil assessment activities including characterization and laboratory analysis of soil samples collected from 15 soil probes and 17 monitoring well boreholes indicates that up to 13 feet of fill comprised of variable amounts of sand, wood, brick, cinders and concrete is present across the majority of the site. The presence of wood waste creates the potential for methane gas generation. Site redevelopment should include construction of an engineered system to mitigate potential accumulation and migration of methane gas.

Existing impacts that affect redevelopment are primarily the elevated concentrations of PAH. PAH impacts will require remediation to eliminate the potential direct contact pathway for the proposed redevelopment of the site. Remediation of the site should also consider protection of the groundwater pathway from PAH and low levels of arsenic, lead and barium. Figure 1 shows the PAH, arsenic, lead and barium impacts requiring remediation.

Groundwater samples collected from 17 monitoring wells, indicated low levels of PAH, benzene, arsenic and lead slightly above enforcement standard. These isolated detections do not warrant remediation. Additional groundwater monitoring is recommended to evaluate contaminant concentrations following site redevelopment and remediation.

Door County Coop - FILL
92 East Maple Street, Sturgeon Bay, Wisconsin
DNR BRRTS #: 02-15-544253 (formerly 09-15-544253)

Former Door County Coop - VPLE
92 East Maple Street, Sturgeon Bay, Wisconsin
DNR BRRTS #: 06-15-560738

Door County Coop
92 East Maple Street, Sturgeon Bay, Wisconsin
DNR BRRTS #: 03-15-000659

NORTH

60 0 60 120FT
SCALE IN FEET

GROUND SURFACE COVER
- GRASS
- SAND & GRAVEL
- ASPHALT/CONCRETE

Former US Coast Guard - Below OHWM
100 East Maple Street, Sturgeon Bay, Wisconsin
DNR BRRTS #: 02-15-563485

Former US Coast Guard - Above OHWM
100 East Maple Street, Sturgeon Bay, Wisconsin
DNR BRRTS #: 02-15-563484

Former US Coast Guard - Above OHWM-VPLE
100 East Maple Street, Sturgeon Bay, Wisconsin
DNR BRRTS #: 06-15-563486

LEGEND

- SAN — SAN — SANITARY SEWER LINE
- W — W — WATER MAIN
- UE — UE — UNDERGROUND ELECTRIC LINE
- FO — FO — UNDERGROUND FIBER OPTIC LINE
- UG — UG — UNDERGROUND GAS LINE
- TEL — TEL — UNDERGROUND TELEPHONE LINE
- FO — FO — UNDERGROUND ELECTRIC & FIBER OPTIC
- ORDINARY HIGH WATER MARK

WMW-5 - MONITORING WELL
WGP-4 - GEOPROBE
WVP-9 - VAPOR PROBE
WPZ-10 - PIEZOMETER
B-5 - MONITORING WELL (BY STS CONSULTANTS 2004)
B-4 - GEOPROBE (BY STS CONSULTANTS 2004)
VP-1 - VAPOR PROBE (BY STS CONSULTANTS 2004)

NOTES:
- ALL UNDERGROUND UTILITIES WERE LOCATED AS PER DIGGER'S HOTLINE MARKINGS AND ARE NOT GUARANTEED TO BE COMPLETE OR CORRECT.
- PRIOR TO ANY SUBSURFACE WORK ON THIS PROPERTY, DIGGER'S HOTLINE MUST BE CONTACTED FOR A RE-LOCATE.
- LOCATION OF ORDINARY HIGH WATER MARK OF STURGEON BAY PER WISCONSIN DEPARTMENT OF NATURAL RESOURCES. BASED ON PLAT OF SURVEY DATED OCTOBER 2, 2014

V:/ENV/CAD/STURGEON BAY/DGN/SITE MAP w Prop Building.DGN

Ayres_pdf.pltcfg
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9/9/2015
L:\Sturgeon Bay\DGN\Site Map w Prop Building.dgn

DES BY	J. STEINER	BOOK NO		1	02-11-2015	ADDED ORDINARY HIGH WATER MARK FOR STURGEON BAY			
DR BY	T. SHUPERT	JOB NO	19-0422.20	2	06-11-2015	ADDED WGP-13 - 15, WMW-12 - 16, MVP-13 - 13			
CHK BY	J. STEINER	DATE	JUNE 2015	3	06-26-2015	ADDED GROUND SURFACE COVER INFORMATION			
				NO	DATE	REVISION	NO	DATE	REVISION

WEST WATERFRONT REDEVELOPMENT PROJECT
CITY OF STURGEON BAY
STURGEON BAY, WISCONSIN

AYRES ASSOCIATES
WAUKESHA, WISCONSIN

SITE MAP

DRAWING NO
1

B. Proposed Development Summary

Sawyer Hotel Development, LLC, and Bayland Buildings, Inc (general contractor) of Green Bay, Wisconsin will be constructing a 4-story hotel, with approximately a 19,420-quare-foot (SF) footprint. The building will be located across portions of the 92 and 100 E. Maple Street sites above the ordinary high water mark shown on Figure 2. All currently proposed private development activities (i.e. activities not open to public trust lakebed uses) on the 92 and 100 East Maple Street properties will occur above the OHWM (i.e. landward of the bulkhead area). Development activities associated with the Former US Coast Guard- Below OHWM (DNR BRRTS # 02-15-563485) BRRTS case will be handled separately and at a later point in time. Portions of the development below the ordinary high water mark will be completed with lawn, landscaping, a concrete or asphalt river walk and other appurtenances at a later date.

Based upon current grading plans for the project, clean, structural fill will be imported and placed on the existing ground surface to raise the elevation of the site 4½ feet. The estimated volume of soil to be placed underneath the building is 2,800 cubic yards. The estimated quantity of soil used to backfill around the foundation is 1,390 cubic yards.

Building construction will consist of a concrete slab on poured concrete foundation walls supported on approximately 466, 24-inch diameter aggregate geopiers. It is anticipated that minimal amount of soil will be disturbed during construction and that the majority of soil will remain in place beneath future site structures.

The remedial action objectives for the West Waterfront Redevelopment include preventing direct contact risk to patrons and workers at the proposed hotel and restaurant posed by contamination in near surface fill. This will be accomplished by capping the affected fill beneath four feet of clean fill, impervious concrete building slabs, asphalt parking lots and driveways. Elements of the engineered cap are shown on Figure 3.

There may be some contaminated fill material generated from excavation of foundations or footings that may require removal and on-site relocation. The excavated soil/historic fill will be relocated within the same BRRTS case property limits from which it was generated (i.e. keep soil/historic fill generated from the 92 East Maple Street BRRTS case within the 92 East Maple Street BRRTS case property limits). Contaminated fill that cannot be used on site will be disposed off-site as a solid waste.

The City will also install new sanitary and sewer lines across the property concurrently with site development. The City's engineer estimated that approximately 1,300 cubic yards of soil/fill material will be excavated during utility construction. Excess fill material excavated from the utility trenches cannot be relocated on the hotel development site. Historic fill characterized as solid waste that is suitable for reuse will be used as backfill in the utility trenches. Excavated soil and fill material that is unsuitable for reuse will be removed from the development sites and disposed at a licensed landfill. During this phase of development, any excavated soil/historic fill generated from the Former US Coast Guard- Below OHWM (DNR BRRTS # 02-15-563485) BRRTS case property (i.e. from the bulkhead area) will also be landfilled.

C. Actions to Minimize Impacts

Remedial actions including engineering controls will be implemented during redevelopment activities to minimize adverse environmental impacts and potential threats to human health. The objectivities of the remedial actions include the following:

- Prevent direct human contact risk posed by contaminated near-surface fill;
- Minimize exposure to contaminated fill by patrons and workers at the proposed hotel and restaurant and the general public using the proposed public greenspace, and
- Mitigate migration and accumulation of methane gas in enclosed building spaces.

These objectives will be accomplished by capping the site with an estimated four feet of clean fill, and subsequent construction of proposed buildings, paved surfaces and landscaped greenspace. Remedial activities will result in the entire site being capped to eliminate the direct contact risk. Placement of compacted fill along with construction of impervious surface associated with the proposed hotel and restaurant will minimize infiltration of water through the waste and into the underlying groundwater.

Because site grades are being raised with the placement of four feet of clean fill, it is anticipated that only approximately 120 cubic yards of contaminated fill currently situated on the site will be excavated during site redevelopment. The waste will be relocated on-site and covered as discussed in the Environmental Management Plan below. The excavated soil/historic fill will be relocated within the same BRRTS case property limits from which it was generated (i.e. keep soil/historic fill generated from the 92 East Maple Street BRRTS case within the 92 East Maple Street BRRTS case property limits).

Accumulation of methane gas within proposed buildings will be prevented by installing sub slab active vapor mitigation systems. Details of vapor mitigation are discussed below and are included in the Soil Vapor Management Plan, West Waterfront Hotel Development Project – Sturgeon Bay (Ayres Associates, August 2015) submitted under separate cover.

Potential methane migration and accumulation in utility trenches will also be addressed through engineering controls by the engineering consultant installing the utilities for the City. Enginering controls will include clay dams and venting of the trench. Each trench, mainline and laterals will have a clay dam constructed at the high end of the trench to prevent methane to mitigate off-site through the excavation. In addition, at Sanitary Sewer Manhole#100 and Storm Sewer Manhole# 200, a perforated PVC pipe will be installed along the manhole to vent the trenches to the atmosphere. Details of the consultants approach will be submitted to the WDNR under separate cover.

Groundwater dewatering is not anticipated during construction of the hotel given the starting elevation of the land surface after structural fill is imported. Groundwater that is encountered during pier construction, or excavation of the pool that reaches the land surface, or surface water encountered during storm events, will be collected and stored in on-site poly tanks or frac tank. The water will subsequently be analyzed, treated, and discharged to the storm sewer or transferred to the wastewater treatment plant for disposal.

Groundwater dewatering will be required for utility installation that is being performed by the City concurrently with the hotel development. Plans and permit requests for groundwater dewatering during utility construction will be submitted under separate cover by the engineering firm designing the utilities.

Environmental Management Plan

Environmental management will be performed to achieve a technically sound and environmentally acceptable approach to site redevelopment. Environmental management functions include providing independent review and guidance on environmental issues during site redevelopment, monitoring environmental conditions during construction activities, and performing environmental sampling and analysis for waste characterization and disposal, as needed.

The following environmental management activities or practices will be applied to natural soil materials, construction debris, and wastes known to exist at the site. These guidance or management procedures are based upon information obtained from previous investigations and are subject to change as additional information becomes available.

Fill Material Management

Ex-situ remediation at this site may involve limited excavation of impacted soil from the subsurface with beneficial reuse of the material on-site. Site development will necessarily require some modifications to existing site grades (elevations). However, based upon current grading plans for the project, clean, structural fill will be imported and placed on the existing ground surface beneath the building to raise the elevation a minimum of four and one-half (4½) feet. The estimated volume of soil to be placed underneath the building is 2,800 CY. The estimated quantity of soil used to backfill around the foundation is 1,390 CY.

Soil (and fill) at the site, not required for construction, may include excess material from site grading, utility trenching, soil removed during installation of poured concrete foundation walls, installation of 466 drilled aggregate geopiers to a depth of 11 to 18 feet below ground surface, pool excavation, and utility trenches. Limited spoil is anticipated from the geopier installation as a displacement process will be used to advance the borehole and place the aggregate. Material generated from excavations and trenching will be reused on site and incorporated into the final project design. All historic fill that is relocated will remain with the within the existing limits of fill determined during the site assessment. The excavated soil/historic fill will be kept within the same BRRTS case property limits from which it was generated (i.e. keep soil/historic fill generated from the 92 East Maple Street BRRTS case within the 92 East Maple Street BRRTS case property limits). Any historical fill that is reused on site will be covered with 18-inches of clean soil. The locations and estimated quantity of soil spoil requiring on-site relocation and reuse, and areas of clean imported soil, are shown on Figure 4.

The quantity of soil spoil requiring on-site relocation (estimated at 120 cubic yards) is contingent on final grading elevations, the method of geopier installation, depth and length of utility trenching, size and depth of pool excavation, and length and depth of foundation

structures installed. A contractor will be hired to perform the soil excavation and on-site disposal tasks.

The general project approach and sequencing is outlined below:

- Prepare design plans and specification
- Prepare bid package and let for bid
- Select contractor and prepare contracts
- Perform waste characterization and obtain necessary permits
- Perform underground locate/clearance calls
- Abandon monitoring wells in development area, as necessary
- Mobilize equipment and personnel
- Install geopiers within building footprint
- Excavate target soil and manage excavation water
- Relocate soil spoil to designated on-site re-location areas (no on-site storage)
- Collect water entering the excavation and transfer to a poly tank for storage and analysis, pending treatment and final disposal
- Backfill the excavation with clean fill and compact, as necessary for construction
- Install vapor barrier underneath building footprint prior to pouring foundation slab
- Replace monitoring wells removed during excavation, if necessary

Any historic fill excavated from the site that cannot be used on-site for construction will be transported and disposed at Advanced Disposal landfill located at 428 High Street, Chilton, Wisconsin, approximately 82 miles south of the City.

New parking lots will be constructed over existing grades at the locations shown in the attached Figure 5. Final designs are not complete but a typical parking lot profile will consist of 8-inches of crushed stone and 2.5-inches of asphalt. Importation or removal of soil for parking lot construction will be addressed in a separate document at a later date.

Imported Fill

Preliminary grading plans prepared to facilitate redevelopment of the 100 East Maple Street (Hotel) Property indicate that approximately 5,000 cubic yards of soil will be required to be imported to the site to achieve design grades beneath and around the hotel foundation. The estimated volume of soil to be placed underneath the building is 2,800 CY. The estimated quantity of soil used to backfill around the foundation is 1,390 CY. A grading plan showing cut areas and the distribution and thickness of imported clean fill is shown on Figure 5.

The City of Sturgeon Bay is currently constructing a storm water detention pond located at 1030 N. 14th Street. Construction of the Egg Harbor stormwater detention pond is expected to generate approximately 9,500 cubic yards of excess soil. Approximately 5,500 cubic yards of

the excess soil (silty sand) generated from the construction of the storm water pond will be imported to the 100 East Maple Street Property and used as general fill underneath the building footprint and as backfill around the foundation.

The WNDR recently prepared a guidance document proposing a process to document soil, or other material, imported to a VPLE site. According to the draft guidance document (RR-041) the following factors where considered when evaluating the imported fill:

- Past history of the property-where the soil and other filled materials are generated;
- The volume of soil and other fill materials to be used;
- Zoning restrictions on planned end uses of the receiving property;
- Location on the receiving property where the material will be placed, including the locational criteria in Section NR718.12(1), Wis. Adm. Code; and
- Results of sampling and comparison with RCLs established in accordance with Chapter NR720, Wis. Adm. Code.

The borrow source has historically been the site of a private residence and open field and does not have a history of commercial or industrial use. A Phase I Environmental Site Assessment of the property, prepared by Robert E. Lee and Associates, was submitted to the WDNR under separate cover. Based on the past use of the borrow source property, it is our opinion that laboratory analysis of samples of this fill source is not warranted and the imported fill from the storm water pond project does not represent an environmental risk.

The City performed sampling and analysis of the imported soil at the request of the WDNR. Twelve samples were collected from the soil stockpiles temporarily stored on the East Maple Street property. The samples were collected from six stockpiles and placed in sealable plastic baggies. The samples were subsequently screened for the presence of volatile organic compounds (VOCs) using a photoionization detector equipped with a 10.7 electron volt lamp. The 12 samples were submitted to Pace Laboratories in Green Bay, Wisconsin and analyzed for polynuclear aromatic hydrocarbons (PAH) and lead. None of the samples were analyzed for VOCs based on PID screening results and olfactory observations.

The results of the analysis are summarized in Table 1. Laboratory analytical sheets are provided in Appendix B. As expected, low levels of one PAH compound (Benzo(a)pyrene) were detected in four of the twelve soil samples collected. PAHs form from incomplete combustion and are common in the environment due to atmospheric deposition, although they can also occur naturally. Benzo(a)pyrene in particular has a very low soil screening level and is the PAH compound that most commonly exceeds EPA screening levels and NR 720 RCLs, which are based on EPA screening levels. It should be noted that EPA soil screening levels, which NR 720 values are based, are not cleanup standards and do not define “unacceptable” levels of contaminants in the soil. These values are based on very conservative assumptions that may or may not be valid for all sites. They are used to facilitate identification of contaminants and exposure areas of potential concern that may warrant further assessment but not necessarily cleanup.

The low levels of benzo(a)pyrene found in the borrow source soils do not represent a significant concern and should not preclude the use of these soils for fill at the development

site. The predominant exposure concern for benzo(a)pyrene is ingestion, the reason it has such a low soil screening value. The imported soil is being used at the site for fill underneath the building, from the existing ground surface to approximately 4.5 feet above the surface, and will be covered by the building. Therefore, there is no potential direct contact exposure from this material. Furthermore, the potential for PAHs to leach from the soil is negligible due to the low solubility and high partition coefficients of PAHs.

The literature shows that asphalt-based products contain PAHs. Asphalt pavement and sealants produce particulate matter that can contain concentrations of PAHs in the sub-percent range (100s to 1,000s mg/kg total PAHs) that is transported in stormwater runoff. Some studies show that this can cause soil and sediment contamination with total PAH concentrations in the range of 1 to 10 mg/kg. From a remediation perspective, many site cleanups are conducted to remediate the presence of PAHs to cleanup goals below 1 mg/kg or lower. From a risk perspective, remediating sites to low PAH cleanup goals is unwarranted in light of the risk of transportable PAHs produced from paved parking surfaces. It is unreasonable to conduct a cleanup to remediate low PAH concentrations and then redevelop the area with asphalt pavement.

Temporary Stockpiles

Imported soil obtained from storm water detention basin project will be temporality stockpiled on the development site's existing asphalt parking lot for approximately two to three weeks pending completion of the geopiers. The soil will then be relocated on top of the geopiers within the building footprint. The location of the temporary stockpiles is shown on Figure 4.

Contaminated fill from within the historic fill limits is expected to be excavated and relocated in a continuous effort such that temporarily stockpiling this material will not be necessary. However, should it be necessary to place excavated fill material in stockpiles, temporary stockpiles will be maintained in general accordance with s. NR 718.05 (3). Conditions for temporary stockpiles include:

- Placing the soil on an impervious base (e.g., concrete, asphalt, or plastic sheeting)
- Covering the soil when it is not being moved with a cover material sufficient to prevent infiltration of precipitation and inhibit volatilization of contaminants (e.g., plastic sheeting)
- Preventing surface water contact with the stockpiled soil using constructed berms, if necessary, to control surface water movement

If stockpiles are maintained for longer than 15 days, requirements under s. NR 718.05(2) would also apply including stockpile inspections at least once every 30 days, immediately repairing or replacing any base, cover, anchoring, or berm materials, and notification to the WDNR if soil is stored for more than 90 days before final disposition.

The proposed soil handling and placement procedures will meet environmental closure requirements of s. NR 726.13(b) and not pose an unacceptable threat to public health, safety, welfare, or the environment. The site will be placed on the WDNR online Geographic Information System Registry (GIS Registry) for sites with residual soil and/or groundwater

contamination, and will have an approved cap maintenance plan which describes requirements for annual cap inspection and timely repair of any damaged/deteriorated areas.

Water Management

Groundwater dewatering is not anticipated during construction of the hotel given the starting elevation of the land surface after structural fill is imported. Groundwater that is encountered during Geopier construction or utility excavations that reaches the land surface, or surface water encountered during storm events, will be properly managed. The water will be collected and stored in on-site poly tanks, frac tank, or (upon receiving appropriate approvals) discharged directly to the sanitary sewer.

Groundwater dewatering will be required for utility installation that is being performed by the City concurrently with the hotel development. Plans and permit requests for groundwater dewatering during utility construction will be submitted under separate cover by the engineering firm designing the utilities.

Vapor Mitigation

The vapor intrusion mitigation approach for this site will include engineering controls to prevent the entry of vapors into the building by eliminating the vapors beneath the slab and routes of entry. Specific engineering controls incorporated into the construction will consist of the following methods including, 1) an active sub-slab venting system, 2) vapor barrier sheet (geomembrane) installed beneath the slab, and 3) sealing of utility penetrations.

The soil vapor mitigation system (SVMS) design approach utilizes the WDNR-recommended design reference prepared by the United States Navy Alternative Restoration Technology Team titled, *Vapor Intrusion Mitigation in Construction of New Buildings Fact Sheet* (2011); as well as the United States Environmental Protection Agency (USEPA) Engineering Issue *Indoor Air Vapor Intrusion Mitigation Approaches* (2008). The design of the SVMS includes the selection of suitable materials, component sizes, and design configurations for the SVMS components. The components include the subbase, aggregate stone venting/concrete subgrade layer (above the subbase and beneath the plastic vapor barrier), ventilation and discharge piping, vapor barrier (above the aggregate), vacuum pump, sub-slab vapor probes, and associated appurtenances.

The SVMS will be designed to utilize the proposed building's aggregate subgrade for the concrete floor of the lower level, which in the areas of the trench laterals will be designed to consist of an 8-inch thick layer of suitably sized aggregate stone, and a vapor barrier, located between the top of the aggregate layer and the building concrete slab. The aggregate stone will collect and allow potential soil vapors to flow away from the area beneath the building to a discharge point located safely above the building. The vapor barrier, together with proper seals of floor penetrations, will prevent soil vapors from migrating upward into the building. Per the WDNR guidance documents, a vapor barrier and passive venting system, if shown effective at managing subsurface vapors, is allowable for new construction. Active and passive systems have been used in many other locations where methane has been encountered from decomposing materials, and has been shown to be an effective remedy in suitably protecting health and environmental concerns. However, an active system will be installed at this site to

provide for additional protection. Details of the SVMS are provided in the Soil Vapor Management Plan, West Waterfront Hotel Development Project – Sturgeon Bay (Ayres Associates, August 2015) submitted under separate cover.

Potential methane migration and accumulation in utility trenches will also be addressed through engineering controls by the engineering consultant installing the utilities for the City. Engineering controls will include clay dams and venting of the trench. Each trench, mainline and laterals will have a clay dam constructed at the high end of the trench to prevent methane to mitigate off-site through the excavation. In addition, at Sanitary Sewer Manhole# I 00 and Storm Sewer Manhole #200, a perforated PVC pipe will be installed along the manhole to vent the trenches to the atmosphere. Details of the consultants approach will be submitted to the WDNR under separate cover.

Data Analysis and Reporting

An NR 724 construction documentation report will be submitted within 60 days after the date that construction of the remedial action is completed. The report will document that the completed final remedial action meets or exceeds the design criteria and the plans and specifications developed in accordance with the requirements of NR 724.15. The report will include the following information:

- The regulatory status of the facility.
- As–built maps, plan sheets, drawings, and cross sections.
- A synopsis of the remedial or interim action and a certification that the design and construction was carried out in accordance with the plans and specifications.
- An explanation of any minor changes to the plans and why these were necessary for the project.
- Results of site monitoring conducted during construction.
- A brief description of the public health and environmental laws applicable to the contamination and the interim or remedial action selected, including the physical location where the environmental laws shall be complied with for all media of concern.
- A revised operations and maintenance plan in accordance with s. NR 724.13 (4), unless the cover letter indicates that there are no revisions to the operations and maintenance plan.
- A Cap Maintenance Plan will be prepared for the site in accordance with WDNR guidelines.