ARCADIS Design & Consultancy for natural and built assets

Ms. Mary Siedlecki
North Carolina Department of Environmental Quality
Hazardous Waste Section
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Subject:
Vapor Intrusion Investigation Work Plan
Former Ashland Facility
1415 South Bloodworth Street
Raleigh, North Carolina
EPA ID#: NCD 008 560 032

ENVIRONMENT

Date:
August 27, 2016

Contact:
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Our ref:
OH009000.NC29

ARCADIS G&M of North Carolina, Inc.

NC Engineering License # C-1869
NC Surveying License # C-1869

Dear Ms. Siedlecki:

On behalf of Ashland Inc. (Ashland), Arcadis G&M of North Carolina, Inc. (Arcadis) has prepared this Vapor Intrusion (VI) investigation Work Plan for the former Ashland facility referenced above (the "Site"). A VI investigation at the Site building was requested in the 5-year review letter dated July 27, 2016 prepared by The North Carolina Department of Environmental Quality (NCDEQ) Hazardous Waste Section (Section). The VI investigation was requested because constituents of potential concern (COPC) are present in groundwater and are also likely present in unsaturated soil at the Site.

BACKGROUND

The Site is owned by Southern Commercial Properties, Inc. and is currently vacant. The Site is under contract to be sold to Track Two Properties LLC with a pending closure date of October 30, 2016. The potential buyer is planning to leave the Site vacant for several years with a potential to redevelop it at a later time.

Ashland has been performing groundwater and surface water monitoring events at the Site since 1995 to monitor natural attenuation of constituents of potential concern (COPC) in groundwater related to Ashland's previous operations. Previous active remedies at the Site included groundwater pump and treat and

air sparge/soil vapor extraction to remove COPCs from the source areas and in nearby off-Site locations. In 2012 a Corrective Measures Study report recommended monitored natural attenuation as the remedy for cleanup of the remaining COPCs and was approved by the Section. Monitoring program results indicate that COPCs are present in groundwater at the Site at concentrations greater than the NCDEQ Division of Waste Management Non-Residential Vapor Intrusion Screening Levels (VISL); therefore the NCDEQ has requested a VI investigation be performed at the Site building.

SCOPE OF WORK

The objective of the VI investigation is to evaluate whether COPCs are present within indoor air in the Site building at levels that may result in unacceptable risks to hypothetical Site workers. A screening of the existing groundwater data has shown that tetrachloroethene (PCE), trichloroethene (TCE), and 1,1-dichloroethene (1,1-DCE) concentrations in the groundwater samples collected from monitor wells located within approximately 150 to 180 feet of the Site building (MW-1, MW-5 and MW-7) have exceeded the NCDEQ Division of Waste Management non-residential vapor intrusion screening concentrations for groundwater. Therefore, further evaluation of potential vapor intrustion issues is required based on NCDEQ guidance.

Building Reconnaissance and Air Sampling Activities

Building Reconnaissance Survey

Ashland's former building is constructed of brick foundation walls with a grade-level concrete slab floor. The majority of the Site building consists of open warehouse space that freely exchanges air with the ambient outdoors through bay doors located on the southern side of the building and a large ventilation fan along the eastern wall. There is enclosed office space in the southwestern corner of the building. The concrete slab floor generally appears to be in good condition and therefore likely provides a sufficient barrier that limits the potential for vapor migration.

During the investigation, Arcadis will perform a more in-depth reconnaissance of the building construction. The building reconnaissance survey will attempt to gather and review existing and easily obtained information such as: building layout and construction; floor penetrations (floor drains and utility lines); heating, ventilation and air conditioning [HVAC] system; material safety data sheets (MSDS) for any materials used (or formerly used) that may be associated with COPCs; and any chemicals used in the building.

Entry Point Screening

The building will be inspected for cracks or fissures in the flooring. Potential sub-slab connection points such as trenches, pits, sumps, and machinery anchors will be investigated, noted, and photographed. A portable photoionization detector (PID) or flame ionization detector (FID) will be used to assess the potential for COPC entry points.

Air Sampling

Arcadis will sample indoor air while the building remains completely closed and with the ventilation system turned off to evaluate worst-case indoor air conditions at the Site building. Arcadis will collect four indoor and one outdoor air samples as 8-hour integrated samples in 6-liter Summa canisters. The Site layout along with approximate locations of the proposed sample locations are depicted on **Figure 1**. Air samples will be collected at the following locations within and adjacent to the building:

- One (1) ambient outdoor (upgradient of predominant wind direction, likely west of the building);
- One (1) in the office area;
- Two (2) in the warehouse; and
- One (1) duplicate.

The samples will be analyzed for selected COPCs by TO-15 by a State-certified analytical laboratory. Compounds to be reported will be limited to the groundwater constituents present at concentrations greater than the Non-Residential VISLs, including: tetrachloroethene (PCE), trichloroethene (TCE), and 1,1-dichloroethene (1,1-DCE). Analytical results for indoor air will be tabulated and compared to VISLs for indoor air.

Quality Assurance Program

The overall quality assurance objective is to ensure that data of known and acceptable quality are produced. The analytical data package will include Modified Level II reportable data quality objectives. One field duplicate quality control sample will be collected during this investigation. The duplicate sample will be a field split sample. The field split and the sample will be collected at the same time and in the same container type.

Reporting

Arcadis will submit the results of the VI investigation activities to the Section in a brief letter report format, and will document all sampling methods, reconnaissance survey information, and analytical results. The results of quality control samples will also be included. The data will be compared with the VISLs and presented in the VI report along with a discussion of results and recommendations for further actions at the Site.

Sincerely,

Arcadis G&M of North Carolina, Inc.

Ryan Gerber, PE
Project Engineer

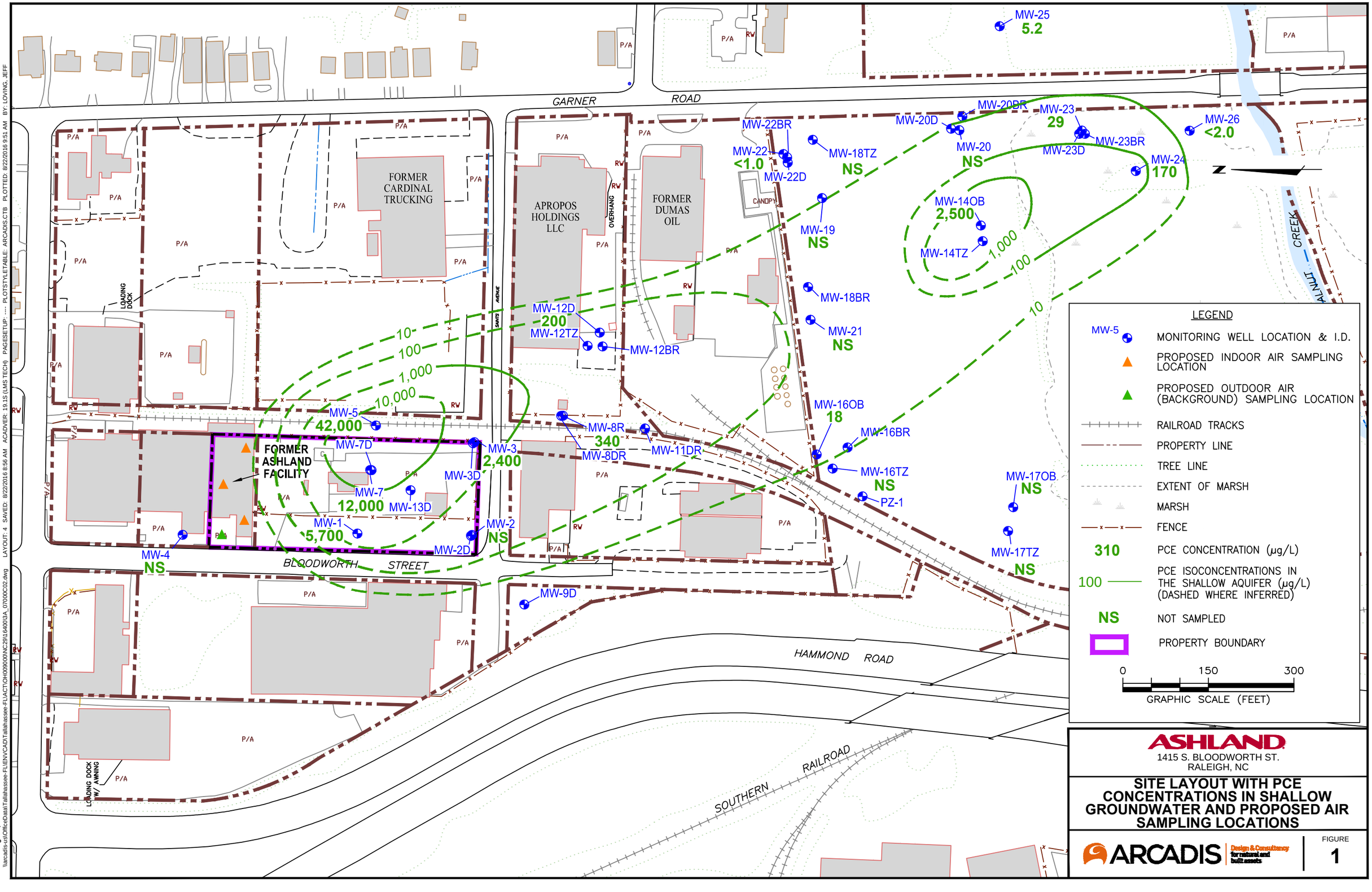
David Wilderman, LG
Project Manager

Copies:
Trey Richardson (Ashland)

Enclosures:

Figures

1 Site Layout Map



ASHLAND
1415 S. BLOODWORTH ST.
RALEIGH, NC

SITE LAYOUT WITH PCE CONCENTRATIONS IN SHALLOW GROUNDWATER AND PROPOSED AIR SAMPLING LOCATIONS

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FIGURE 1

CITY: Augusta, GA DIV/GROUP: ENV DB: A Warren LD: PIC: PM: D Willis TM: G Adams
\\arcadis-us\Office\Data\Tallahassee-FL\ENV\CAD\Tallahassee-FL\ACT\OH09000\NC29\1640\3A_07000C02.dwg LAYOUT: 4 SAVED: 8/22/2016 8:56 AM ACADVER: 19.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: ARCADIS.CTB PLOTTED: 8/22/2016 9:51 AM BY: LOVING, JEFF