Stantec Consulting Services Inc.
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May 9, 2022
File: 193703884

**Attention: Mr. Adam McIlheran - Hydrogeologist**
Wisconsin Department of Natural Resources
Southeast Region, Milwaukee Service Center
102 West St. Paul Avenue
Milwaukee, WI 53233

**Reference: Workplan for Additional Investigation Following Remedial Activities: Former Moore Oil Company; 4033 West Custer Avenue, Milwaukee, WI: BRRTS # 02-41-246044 & 02-41-583185: FID #: 241174340**

Dear Mr. McIlheran,

Stantec Consulting Services Inc. (Stantec) prepared this workplan on behalf of Former Moore Oil Company, Inc. (Moore Oil) to conduct additional site investigation activities at the former Moore Oil facility located at 4033 West Custer Avenue; Milwaukee, Wisconsin (the Site). Additional site investigation activities are required to further assess the magnitude and extent of residual contamination at the Site following completed remedial activities. Further detail related to the Site background and the proposed workplan is provided in the following sections.

## BACKGROUND INFORMATION

During June 2020, Stantec Consulting Services Inc. (Stantec) submitted a document entitled *Proposed Remedial Action Plan on behalf of the Former Moore Oil Company, Inc.* to the Wisconsin Department of Natural Resources (WDNR). The remedial action plan (RAP) provided details of previous investigation activities spanning more than twenty years and outlined planned soil excavation and off-site disposal activities to address documented free product and soil contamination present in the eastern and south-central areas of the former Moore Oil facility. Following preliminary review of the RAP, the WDNR requested additional investigation and evaluation of contamination on the east end of the Site. This work was completed and summarized in letter correspondence dated September 22, 2020 and titled *Supplemental Information and Modification to Proposed Remedial Action Plan Former Moore Oil Company, Inc*. In email correspondence dated November 6 and 20, 2020, the WDNR responded with requests for additional information. Stantec responded to the additional information requests of the WNDR in letter correspondence dated November 30, 2020 and titled *Response to Review of Remedial Action Plan and Site Investigation: Former Moore Oil Company, Inc*. The WDNR responded and approved the proposed RAP via letter correspondence dated January 11, 2021 which also requested additional information regarding site investigation activities and the RAP. Stantec responded to the additional information request regarding site investigation activities and the RAP of the WNDR in letter correspondence dated April 2, 2021, and titled *Response to January 11, 2021, WDNR Letter Correspondence: Former Moore Oil Company*.

Lube-Tech initiated remedial action activities at the Site during March 2021. Remedial action activities included removal of the groundwater remediation building and abandonment of system components, excavation and off-site disposal of contaminated soil, collection of soil samples from the base of the

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excavation and the excavation sidewalls for field screening and laboratory analysis, and installation of a passive groundwater recovery trench along the eastern portion of the Site. In addition to these activities, a new storm sewer was installed on the western portion of the Site. Remedial action activities were generally consistent with the proposed Stantec (2020a) RAP and supporting documents and supplemental information approved by WDNR (2021). The remedial action activities are summarized in letter correspondence dated March 1, 2022, and titled *Remedial Action Documentation Report, Former Moore Oil Facility.*

## ADDITIONAL INVESTIGATION REQUESTED

The WDNR's site investigation requests outlined in their correspondences dated November 6 and 20, 2020 and January 11, 2021, that have yet to be completed are detailed in italics below:

<u>WDNR email correspondence dated November 6 and November 20, 2020:</u>

- *Naphthalene concentrations in soil samples collected at B-3 were relatively high (9.5 ppm at 7-9' bgs and 2 ppm at 4-6' bgs). Although this may reflect saturated conditions, how have you assessed, or plan to assess the groundwater impact in this area? It appears the closest wells are rather far away.*
- *How is the extent of impacts in soil defined north of B-3? The figures do not indicate this is an estimated extent, such as by dashed lines. No impediments to sampling inside the building were stated.*
- *On-site utility assessment: underground roof drains and other utilities are mentioned in past reports. A figure should be submitted showing all known on-site utilities. These need to be identified and contaminant migration risk assessed to determine if planned remedial actions are adequate to mitigate the risk. Although two sub-slab vapor samples were collected, it would be hard to assess whether their number or locations are appropriate without additional information provided. This information typically includes indoor layout and use features. One round of vapor samples alone is not adequate to determine vapor risk on-site. I have attached from the DNR file a figure from a past report showing possible roof drain utilities as a beginning. I have also attached information from a 2016 excavation on-site that indicates conditions may be present for contamination through utilities corridors on-site.*
- *If bottom samples from excavations cannot be collected due to groundwater and there is known residual contamination, monitoring wells are generally needed to assess residual impacts to groundwater in those areas. It was not stated in the plan how this would be addressed.*

<u>WDNR letter correspondence dated January 11, 2021:</u>

- *Analytical results from soil boring SB-3 indicate contaminants beneath the building in this area. Additional delineation of the extent of impacts should be conducted north of SB-3 into the warehouse area.*
- *Provide a figure with the interior layout of the remaining building with details such as interior walls, drains, utilities, basements, sumps, floor material, etc. shown. State whether any drains are within the building.*
- *Conduct a second round of sub-slab sampling for the vapor points currently on-site.*

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## WORKPLAN

To address, the additional information/investigation requested by the WDNR, document groundwater quality, and verify contaminant trends in groundwater following remediation, Stantec prepared this workplan which includes:

### Task 1: Additional Site Investigation

The goal of additional investigative is to further evaluate the magnitude and extent of residual soil, groundwater, and vapor contamination remaining at the Site following remedial activities. Further details regarding the investigation activities to be performed is provided below. Sampling will be performed per WDNR regulations and guidance.

Second Round of Sub-Slab Vapor Sampling

The second round of sub-slab vapor sampling will consist of the re-sampling of two previously installed vapor pins, (VP1 and VP2) and the installation of four permanent sub-slab soil vapor monitoring points (VP3 through VP6). The sub-slab vapor points will be constructed using a 5/8-inch diameter VaporPin® kit. A 5/8-inch diameter drill bit will be used to fully penetrate the concrete floor and allow for VaporPin® installation. The VaporPin® will be fitted with a stainless-steel sealable hose barb to allow for sample collection. Following installation, the vapor pins will be sampled using laboratory- supplied summa cannisters. The samples will be shipped under chain-of-custody procedures to a state certified laboratory for analysis for volatile organic compounds (VOCs) using U.S. EPA Method TO-15. The sub-slab sample locations are illustrated on **Figure 1**.

Interior Soil Sampling Near SB3

Soil sampling activities will be conducted near SB3 in the warehouse area to further define the degree and extent of contamination on the northern portion of the Site. Up to three soil boreholes (SB7 to SB9) will be advanced to a minimum depth of 12 feet below grade (fbg) using direct-push Geoprobe® technology. Soil boring locations are illustrated on **Figure 1**. Actual location and depth of the boreholes will depend on site stratigraphy, hydrogeology, and site utility layout.

Soil samples will be collected continuously from each borehole. A portable photoionization detector (PID) will be used to screen the samples for the presence of photoionizable VOCs. Stratigraphic borehole logs will be documented by Stantec personnel in general conformance with the ASTM International Method D-2488. All soil sampling equipment will be washed with a detergent solution and double rinsed with potable water before each soil sample is collected to prevent sample cross-contamination.

Up to two unsaturated soil samples will be collected form each borehole. Soil samples will be selected based on the PID field screening measurement and/or the presence of fill. Soil samples will be placed in laboratory-supplied containers, preserved as appropriate, placed in a sample cooler on ice and shipped under chain-of-custody procedures to a state certified laboratory for analysis of VOCs via Method 8260 and PAHs via Method 8270C.

Soil cuttings produced from the boreholes will be temporarily sealed in a labeled 55-gallon drum. Appropriate disposal of the soil cuttings will be determined after receipt of laboratory analyses.

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Monitoring Well Installation

Monitoring wells GE-MW01RR, GE-MW4R, and the Recovery Well were completely removed during the excavation associated with the remedial activities. Monitoring well abandonment forms were provided in the letter correspondence dated March 1, 2022, and titled Remedial Action Documentation Report, Former Moore Oil Facility.

Six monitoring wells (MW-03, P-03, MW-107R, MW-108, GE-MW02R, and GE-MW03R) are believed to be intact and usable for the purposes of future groundwater sample collection. To re-establish a viable monitoring well network, seven additional monitoring wells (MW-109 through MW-115) will be installed at the Site to maximum depths of 13 fbg or 5 feet below the groundwater table by means of 4.25-inch hollow stem auger over drilling techniques. Upon completing the boreholes, a 0.01-inch slotted 10-foot screened schedule 40 PVC 2-inch-diameter well will be lowered into each borehole. The 10-foot screens will be positioned to intersect the water table. The wells may be protected with a flush mounted steel protective cover. These new wells may be located within the footprint of the current storage tank area (e.g., near SB3), east of planned excavation activities (e.g., in Custer Playfield), and other areas to adequately represent groundwater conditions. Existing and proposed well locations are illustrated on **Figure 1**.

Upon completion of the well installations, Stantec personnel will properly develop the wells. Following well development, the wells will be purged, and groundwater samples will be collected, placed in laboratory supplied containers, preserved as appropriate and placed on ice in a sample cooler. The samples will be shipped under chain-of-custody procedures to a state certified laboratory for analysis of VOCs via Method 8260B and PAHs via Method 8270C.

Soil cuttings and purge water generated during the investigation activities will be containerized in 55-gallon drums and staged onsite. Appropriate disposal of the soil cuttings will be determined after receipt of laboratory analyses.

Detailed Interior Layout of Existing Site Buildings

Based on field activities completed by Stantec and discussions with current Lube-Tech staff, no known utilities are present south of the current building except for stormwater utilities. Water, sanitary, and natural gas utilities only extended from the north-adjoining West Custer Avenue right-of-way to the former office area of the current building (northeast end of the Site). Between November 2, 2021, and November 9, 2021, Veit personnel abandoned the existing on-site storm sewer and installed a new storm sewer system. The new storm sewer system consists of 18-inch diameter high-density polyethylene pipe, pre-cast concrete manholes, and gravel backfill. The new storm sewer system extends from the center of the Site, along its western portion, and connects with the existing West Custer Avenue right-of-way storm sewer north of the Site.

Additional discussion and a figure detailing the interior layout of the remaining building will be provided in a report summarizing post-remedial site investigation activities.

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Summary Report of Additional Site Investigation Activities

The results of field activities will be documented in a report that will include:

- Laboratory analytical reports and chain-of-custody documentation;
- Soil boring logs, well construction logs, and well/borehole decommissioning forms;
- Quality control testing documentation for sub-slab vapor sampling;
- Field PID data;
- Water level measurement data;
- Tables summarizing analytical results for soil, groundwater, and sub-slab vapor samples, and comparing the measured concentrations to applicable WDNR standards and guidance;
- Maps of boring/well locations and utilities; and
- A figure detailing the interior layout of the remaining building(s); and
- Narratives summarizing background information, methods of investigation, findings, and conclusions.

**Task 2: Quarterly Groundwater Monitoring**

Groundwater samples will be collected and analyzed on a quarterly basis for one year to document contaminant trends. The groundwater monitoring well network to be sampled will include existing wells and the seven additional monitoring wells strategically placed to document groundwater quality trends. In addition, the newly installed recovery trench observation sump will be accessed to evaluate the presence of free product.

The wells will be purged, and groundwater samples will be collected, placed in laboratory supplied containers, preserved as appropriate and placed on ice in a sample cooler. The samples will be shipped under chain-of-custody procedures to a state certified laboratory for analysis of VOCs via Method 8260B and PAHs via Method 8270C. The proposed groundwater monitoring plan is detailed in **Table 1.** Monitoring well locations are illustrated on **Figure 1**.

All purge water will be collected in 55-gallon drums or other secure containers. Each drum or container will be sealed, labeled, and stored in an appropriate location pending receipt of laboratory analytical results for the groundwater samples, which will be used to determine what, if any, special measures are necessary for handling and proper disposal of the purge water.

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We intend to initiate this scope of work in April 2022 and will provide a summary of these activities and results as part of the proposed summary report. If you have any questions or require any additional information during the implementation of this proposed scope, please contact us.

Regards,

**Stantec Consulting Services Inc.**

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Attachments:

Figure 1 – Proposed Sample Locations and Site Layout Map
Table 1 – Proposed Groundwater Monitoring Plan

# FIGURES

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Legend

- Property Boundary
- Parcel Boundary
- Abandoned Monitoring Well Location
- Existing Monitoring Well Location
- Existing Vapor Point Location
- Previous Soil Boring Location
- Proposed Monitoring Well Location
- Proposed Vapor Point Location
- Proposed Soil Boring Location

**Notes**

1. Coordinate System: NAD 1983 StatePlane Wisconsin South FIPS 4803 Feet
2. Data Sources Include: Stantec, Lube Tech and Partners, NADS, WDNR
3. Orthophotography: ESRI World Imagery

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Figure No.

**1**

Title

# Proposed Sample Locations and Site Layout Map

Client/Project

Lube Tech and Partners
Moore Oil
Post Remedial Activity Work Plan

Project Location
T8N, R21E, S36,
C. of Milwaukee,
Milwaukee Co., WI

193703884
Prepared by RA on 2021-06-21
Technical Review by SP on 2021-06-21
Independent Review by RK on 2022-03-10

0 25 50 Feet

1:600 (At Original document size of 11x17)

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# TABLES

**Table 1: Proposed Groundwater Monitoring Plan - Former Moore Oil Property, Milwaukee, WI**

| Well ID | Existing/To Be Installed | Groundwater Sampling Events[1,2] | | | | Water Levels |
|---|---|---|---|---|---|---|
| | | 1st Quarterly Event | 2nd Quarterly Event | 3rd Quarterly Event | 4th Quarterly Event | Quarterly |
| MW-03 | existing | X | X | X | X | X |
| P-03 | existing | X | | | X | X |
| MW-107R | existing | X | X | X | X | X |
| MW-108 | existing | X | | | X | X |
| GE-MW02R | existing | X | X | X | X | X |
| GE-MW03R | existing | X | | | X | X |
| MW-109 | to be installed | X | X | X | X | X |
| MW-110 | to be installed | X | X | X | X | X |
| MW-111 | to be installed | X | X | X | X | X |
| MW-112 | to be installed | X | X | X | X | X |
| MW-113 | to be installed | X | X | X | X | X |
| MW-114 | to be installed | X | X | X | X | X |
| MW-115 | to be installed | X | X | X | X | X |
| Recovery Trench Observation Sump | sidegradient/downgradient | | | | | X |

Notes:

1 - laboratory analysis for VOCs and PAHs using EPA Test Methods 8260B and 8270C respectively.

2 - This sampling plan may be modified based on the data collected.