

As discussed during the meeting on 1 December 2015, the following preliminary scope of work (SOW) is provided to further investigate volatile organic compound (VOC) and hydrocarbon detections in shallow groundwater within areas of historic fill at the Leeds Northern Parcel.

Upon MDNR's concurrence with this preliminary SOW, Haley & Aldrich will proceed with preparing a work plan that will provide greater detail on how the work will be conducted, methods and procedures that will be used during field investigation activities, and a proposed schedule for completing the work and reporting to MDNR.

### **Proposed Supplemental Investigation Efforts**

#### Soil Vapor Sampling:

- A review of the soil vapor data collected in October 2013 shows that several VOC constituents were detected that would account for a portion of the reported total APH concentrations. For example, sample SV-02 (5 feet) concentrations of cyclohexane (9,500 ug/m<sup>3</sup>) and hexane (1,300 ug/m<sup>3</sup>) are C6 aliphatic hydrocarbons that are included in the 30,000 ug/m<sup>3</sup> concentration reported for the C5-C6 aliphatics range. The soil vapor results for the sampling conducted in October 2013 are consistent with the presence of residual hydrocarbons.
- To further evaluate the residual hydrocarbons, temporary/permanent soil vapor wells are proposed so that additional soil vapor data can be collected. The soil vapor wells will be co-located with the three proposed new shallow groundwater monitoring wells discussed below (see *Shallow Groundwater*). Each of the three locations will have soil vapor wells installed to depths of 5 feet below ground surface (bgs) and 10 feet bgs (i.e., two separate boreholes/wells for each screened depth at each of the three separate locations). Once the wells have been installed and allowed to equilibrate, field screening measurements for biodegradation parameters such as oxygen, carbon dioxide, lower explosive limit (LEL), and methane will be collected. Soil vapor samples for analytical laboratory testing will also be collected from each soil vapor well and analyzed for VOCs with top 10 tentatively identified compounds (TICs) (TO-15) and APHs (Massachusetts DEP method). Pending field screening measurements, samples may also be analyzed at the laboratory for methane. This information will provide additional data to characterize the hydrocarbon types present and will allow RACER and MDNR to assess whether constituents in soil vapor are potentially combustible or flammable.
- Collection of soil vapor data simultaneously with shallow groundwater data may also serve to identify whether there is a correlation between constituents identified in vapor with constituents that may be detected in groundwater in the areas of historic fill operations.

#### Shallow Groundwater:

- To further assess the nature and extent of groundwater contamination within/below the areas of historic fill operations, three new shallow groundwater monitoring wells will be installed. As shown on the attached Figure, each well is proposed in an area that coincides with elevated VOC and air-phase hydrocarbon (APH) soil vapor data from prior sampling activities (near former trench pits TP-18, TP-16, and TP-14/15). Each groundwater monitoring well will be installed to a depth of approximately 25 feet bgs (pending depth of natural soils encountered during drilling) and sampled for VOCs with top 10 TICs, semi-volatile organic compounds (SVOCs), metals, and volatile petroleum hydrocarbons (VPHs; Massachusetts DEP method).
- Natural attenuation data collected in November 2013 indicated that the overall environmental conditions in groundwater were conducive to reductive dechlorination (see Section 3.2.1 of the Supplemental Site Investigation Report, dated 20 January 2014). To gather similar data for shallow groundwater in the areas of historic fill, the newly installed monitoring wells will also be sampled for natural attenuation parameters.
- To obtain a complete round of data, groundwater samples will also be collected from all existing shallow

and deep groundwater monitoring wells at the Site once the new groundwater monitoring wells have been installed and developed. Samples from existing groundwater monitoring wells will be submitted to the laboratory for analysis of the same constituents identified above for the newly installed groundwater monitoring wells.

Data and Documentation Research:

- Haley & Aldrich will research information from surrounding areas to understand the regional groundwater flow and determine where deep groundwater from the Site may ultimately discharge.
- Haley & Aldrich and RACER Trust will re-review historic files to determine if there is 1) information available from the former General Motors Plant that may shed light on potential sources of VOCs in groundwater currently observed at the Northern Parcel and 2) additional groundwater data available for the deep groundwater zone that could be used to better understand the extent of the plume and if the plume is stable and/or declining.
- MDNR will provide an EDR Phase II database search for State sites within a 1 mile radius of the Northern Parcel.
- A determination is yet to be made on whether another EDR Phase II database search will be requested for Federal Sites within a 1 mile radius of the Northern Parcel.

**Figure 1: Proposed Co-Located Soil Vapor and Shallow Groundwater Monitoring Well Locations**

Proposed co-located soil vapor and shallow groundwater monitoring wells installed at locations consistent with visual & olfactory observations & analytical data from prior activities to assess nature & extent of contamination within/below the areas of historic fill operations.

