



Memorandum

Match 5, 2018

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cc: Dave Favero/RACER

**Subject: DRAFT Groundwater Monitoring Plan
PCC-Validation
Pontiac, Michigan**

1. Introduction

GHD is providing this memorandum on behalf of Revitalizing Auto Communities Environmental Response (RACER) Trust for the former PCC-Validation property in Pontiac, Michigan (Site) (Figure 1). The purpose of this memorandum is to propose an interim groundwater monitoring plan (IGWMP). This IGWMP provides details on monitoring well installation, monitoring well development, analysis, and rationale. This IGWMP amends the Sampling and Analysis (SAP) submitted to the U.S. EPA on July 25, 2014 and Supplemental SAP submitted to the U.S. EPA on January 13, 2015. The Scope of Work below includes monitoring wells to be re-installed, methodology, analysis and rationale for monitoring.

2. Monitoring Well Installation, Development and Sampling

Sixteen (16) monitoring wells will be installed using hollow-stem auger drilling equipment. The deep monitoring well (MW74D-15) may require roto-sonic drilling equipment. See Figure 2 for a Site map with proposed monitoring well locations. See Table 1 for a summary of proposed monitoring wells target monitoring zones, sampling parameters and rationale for installation.

Monitoring wells will be constructed to the target monitoring (saturated) zone dependent on the soil type, field observations (including PID readings) and historic data. The proposed monitoring wells will be constructed using a 2-inch diameter, 5-foot long, machine slotted 0.010-inch, polyvinyl chloride (PVC) well screen threaded to a 2-inch diameter PVC riser extending to just below ground surface. A filter sand pack will be installed adjacent to the screen in the annular space and extend approximately 2 feet below (if necessary) and 2 feet above the top of the screened interval. A sodium bentonite seal will be placed from the bottom of the boring to the bottom of the sand pack (if necessary) and a sodium bentonite seal will be placed above the sand pack to approximately 1 foot below ground surface (bgs). A flush-mount protective casing will be set into concrete to complete the well. Upon completion, the monitoring well will be developed to a generally silt free condition. GHD will complete a location and elevation survey of the new monitoring wells.



A minimum of 2 weeks after development and following methods described in the July 25, 2014 SAP, groundwater samples will be collected from the monitoring wells. Monitoring wells will be sampled using standard low-flow purge (LFP) techniques (as per SAP). If the piezometric water level in the well is greater than 20 feet bgs, a bladder pump will be utilized to collect the groundwater sample instead of the standard peristaltic pump. The groundwater samples will be analyzed for TCL VOCs and/or select metals (including aluminum, lead and vanadium). In addition, groundwater from MW74-08 will be analyzed for 1,4-dioxane during the initial sampling event due to historic detections of 1,1,1-trichloroethane and historic high detection level for 1,4-dioxane.

Groundwater samples will be submitted under chain-of-custody protocols to ALS Environmental, located in Holland, Michigan. Field and laboratory quality control samples were also collected and analyzed. See Table 1 for monitoring well sampling locations, description of sampling rationale and analysis.

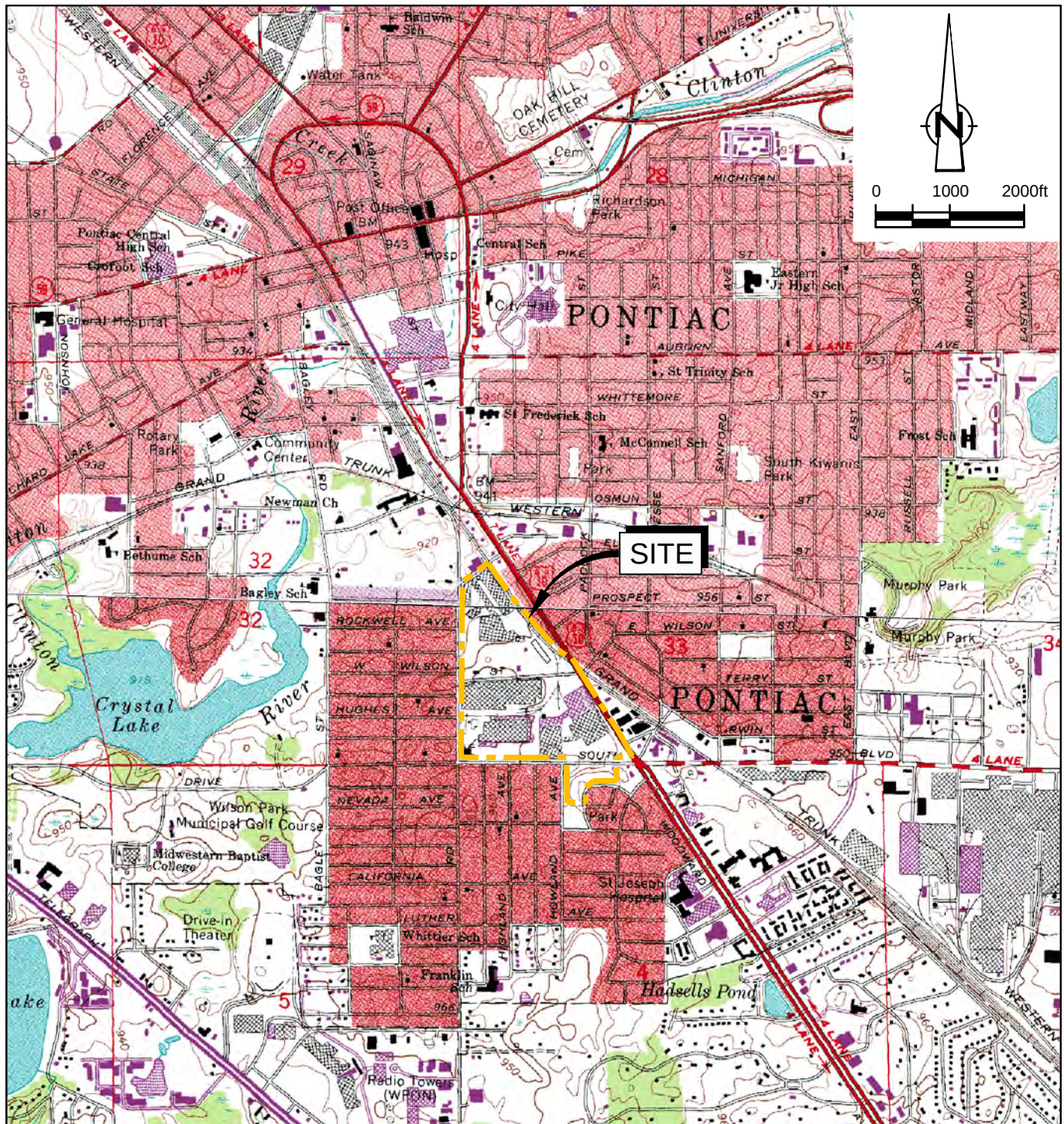
3. Monitoring Schedule

For the initial year monitoring wells will be monitored on a quarterly basis following methods described in the July 25, 2014 SAP. During each monitoring event, groundwater levels will be collected to allow for evaluation of groundwater flow and gradient. Following 1 year of quarterly sampling, the SAP will be reviewed and recommendations to modify the sampling plan will be made as appropriate depending on results. Table 1 includes the wells, sampling parameters and rationale for monitoring for each well.

The following schedule is dependent upon access to the property and subcontractor availability.

<u>Task:</u>	<u>Approximate Timeline:</u>
Monitoring Well Installation, Development and Quarterly Sampling	May 2018
Well Installation and Data Report Submittal	August 2018
Quarterly Groundwater Monitoring	August 2018
Data Report Submittal	November 2018
Quarterly Groundwater Monitoring	November 2018
Data Report Submittal	February 2019
Quarterly Groundwater Monitoring	February 2019
First Annual Monitoring Report Submittal	May 2019

Encl: Figure 1 –Site Location Map
Figure 2 – Site Map with Proposed Monitoring Well Locations
Table 1 – Monitoring Wells to be Installed, Sampled, Parameters and Rationale for Continued Use



SOURCE: USGS QUADRANGLE MAPS;
PONTIAC NORTH AND SOUTH, MICHIGAN; 1968

LEGEND

— — — — — APPROXIMATE SITE BOUNDARY

figure 1



SITE LOCATION
PCC-VALIDATION
Pontiac, Michigan



FIGURE 2
SITE MAP WITH PROPOSED
MONITORING WELL LOCATIONS

TABLE 1

**Monitoring Summary
PCC-Validation
Pontiac, Michigan**

Well ID	Target Monitoring Depths ^A		Target Monitoring Zone	Analytical Parameters	Rationale for Monitoring
	Top (ft bgs)	Bottom (ft bgs)			
MW02-07	10	15	Upper saturated	TCL VOCs	To allow for evaluation of VOC concentration trends near the northwest Site boundary (if groundwater encountered).
MW10-07	4	9	Upper saturated	aluminum, lead, and vanadium	To allow for evaluation of select metal concentration trends along the western boundary.
MW21-07	14.5	19.5	Upper saturated	aluminum, lead, and vanadium	To allow for evaluation of select metal concentration trends along the western boundary.
MW33-07	15	20	Upper saturated	aluminum, lead, and vanadium	To allow for evaluation of select metal concentration trends along the western boundary.
MW38-07	12	17	Upper saturated	aluminum, lead, and vanadium	To allow for evaluation of select metal concentration trends along the western boundary.
MW64-08	11	16	Upper saturated	TCL VOCs	To confirm LNAPL is not the source of dissolved phase VOC impacts, in particular Carbon Tetrachloride, to the northwest of the LNAPL Area.
MW68-08	12	17	Upper saturated	TCL VOCs	To confirm LNAPL is not the source of dissolved phase VOC impacts to the northeast of the LNAPL Area.
MW74-08	12	17	Upper saturated	TCL VOCs & 1,4-Dioxane (initial event only unless detected)	To allow for evaluation of VOC concentration trends in the southern VOC Area.
MW74D-15	20	44	First zone below upper	TCL VOCs	To vertically delineate and allow for evaluation of VOC concentrations trends in the southern VOC Area.
MW79-12	11	16	First zone below upper	TCL VOCs	To vertically delineate and allow for evaluation of VOC concentrations trends near the northwest Site boundary.
MW80-12*	7	12	Upper saturated	TCL VOCs	To delineate VOC impacts northwest of the Site.
MW81-12*	14	19	Upper saturated	TCL VOCs	To delineate VOC impacts northwest of the Site.
MW85-12	3	8	Upper saturated	TCL VOCs	To confirm LNAPL is not the source of dissolved phase VOC impacts to the north of the LNAPL Area.
MW87-12	4	9	Upper saturated	TCL VOCs	To confirm LNAPL is not the source of dissolved phase VOC impacts to the west of the LNAPL Area.
MW88-12	11	16	Upper saturated	TCL VOCs	To allow for evaluation of VOC concentration trends and delineate VOCs in the southern VOC Area.
MW90-12	10	15	Upper saturated	TCL VOCs	To allow for evaluation of VOC concentration trends and delineate VOCs in the southern VOC Area.
MW91-12	16.5	21.5	Upper saturated	TCL VOCs	To allow for evaluation of VOC concentration trends in the southern VOC Area.
MW92s-13*	4.8	9.8	Upper saturated	TCL VOCs	To allow for evaluation of VOC concentration trends northwest of the Site.
MW92i-13*	12	17	First zone below upper	TCL VOCs	To vertically delineate and allow for evaluation of VOC concentrations trends northwest of the Site.
MW93i-13*	12	17	First zone below upper	TCL VOCs	To vertically delineate and allow for evaluation of VOC concentrations trends northwest of the Site.
MW94-15	18	22	Upper saturated	TCL VOCs	To delineate VOCs in the southern VOC Area.

Notes:

* - Indicates monitoring well is in-place and screen depth is fixed.

A - Except where noted depths listed are from prior to site redevelopment and have likely changed.

ft AMSL - Feet Above Mean Sea Level

ft bgs - Feet below ground surface

MW - Monitoring well

N/A - Not applicable

TCL VOCs - Target Compound List Volatile Organic Compounds