



**CONESTOGA-ROVERS
& ASSOCIATES**

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October 13, 2005

Reference No. 012559-53

Mr. Thomas Jones
Remedial Section/Voluntary Cleanup Unit
Bureau of Environmental Remediation
Kansas Department of Health & Environment
1000 SW Jackson, Suite 410
Topeka, Kansas 66612

VIA FEDEX & E-MAIL

Dear Mr. Jones:

Re: Supplemental Confirmation Sampling Work Plan
Voluntary Cleanup Investigation
Former GM Fairfax I Plant
Kansas City, Kansas

This letter is in response to the Kansas Department of Health & Environment's (KDHE's) letter of August 17, 2005 to General Motors Corporation (GM). In this letter, KDHE requested that additional soil samples be collected at the former GM Fairfax I Plant Site (Site) in the vicinity of soil boring SB-110 and that additional monitoring wells be installed and the groundwater sampled. In response to the KDHE request that a supplemental investigation be conducted, GM has agreed to perform the monitoring well installation and additional soil and groundwater sampling.

The supplemental investigation work is divided into the following five tasks.

1.0 TASK DESCRIPTIONS

Task 1 - SB-110 Area Investigation

Tetrachloroethene (PCE) was detected at soil boring SB-110 in the sample collected from 10 to 12 feet below ground surface (bgs) during the confirmatory sampling conducted in December 2004. PCE was detected at a concentration of 0.19 milligrams per kilogram (mg/kg), which is slightly in excess of the KDHE standard of 0.18 mg/kg.

In order to characterize the area around soil boring SB-110, additional soil samples will be collected from 10 to 12 feet bgs in the vicinity of SB-110. One soil sample will be collected immediately adjacent to SB-110. Four soil samples will be collected a distance of approximately 20 feet from SB-110, to the north, east, south, and west of SB-110. The five soil samples will be submitted to the project laboratory for PCE analysis.

Information from these five sample locations will determine if any remedial activity is warranted in this area for PCE in soils.



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A licensed surveyor will be retained to survey the locations of soil borings SB-108, SB-109, and SB-110 prior to sample collection and to survey the location of the five newly installed soil borings subsequent to sample collection.

Figure 1 presents proposed soil boring locations.

Task 2 - Upgradient Monitoring Well Installation, Development, and Sampling

Three monitoring well clusters will be installed on the southern portion of the Site along Kindelberger Road to monitor groundwater contamination that is migrating onto the Site. These locations are generally upgradient of the Fairfax I site. Each monitoring well cluster will consist of one shallow monitoring well screened from approximately 20 to 30 feet bgs and one intermediate well screened from approximately 50 to 60 feet bgs. Following installation, the monitoring wells will be developed. Two rounds of groundwater sampling will be conducted. Collected groundwater samples will be analyzed for target compound list (TCL) volatile organic compounds (VOCs).

Information from these new upgradient monitoring well locations will be used to confirm the presence of other off-Site sources of volatile organic compounds (VOCs) in groundwater.

A licensed surveyor will be retained to survey the location and elevation of the newly installed monitoring wells.

Figure 2 presents proposed upgradient monitoring well locations. Actual well locations may be adjusted to avoid obstructions.

Task 3 - Downgradient Monitoring Well Installation, Development, and Sampling

Two monitoring well clusters will be installed in the northeastern (downgradient) portion of the Site to evaluate the quality of groundwater that is migrating off Site. Each monitoring well cluster will consist of one shallow monitoring well screened from approximately 20 to 30 feet bgs and one intermediate well screened from approximately 50 to 60 feet bgs. Following installation, the monitoring wells will be developed. Two rounds of groundwater sampling will be conducted. Collected groundwater samples will be analyzed for TCL VOCs.

Information collected from these downgradient monitoring wells will be used to verify past sampling data and to verify that contamination is not migrating off the Site at concentrations above KDHE RSK standards.

A licensed surveyor will be retained to survey the location and elevation of the newly installed monitoring wells.



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Figure 2 presents proposed downgradient monitoring well locations. Actual well locations may be adjusted to avoid obstructions.

Task 4 – Water Level Collection

One full round of groundwater elevations will be collected from all the available Fairfax I monitoring wells after installation of the new monitoring well clusters.

Task 5 – Data Evaluation and Reporting

Analytical data will be compiled, analyzed, and reported in tabular form. A letter report will be prepared that presents analytical data and presents observations and conclusions.

2.0 FIELD PROTOCOLS

Specific protocols are provided herein for monitoring well installation and development as these were not described in previous submittals to KDHE.

2.1 MONITORING WELL INSTALLATION AND CONSTRUCTION

A CRA geologist will direct drilling and sampling procedures, evaluate the geologic data, and oversee installation and development of the monitoring well. The monitoring well will be installed using 6-inch inside diameter HSA.

The monitoring well will be constructed of nominal 2-inch diameter, polyvinyl chloride (PVC) screens (No. 10-slot), and nominal 2-inch diameter schedule 40 PVC riser pipe. The monitoring well will be installed through the hollow stem of the augers. During monitoring well construction, the riser pipe will be capped temporarily to prevent the entrance of foreign materials into the well.

Silica sand will be placed in the annulus between the augers and the riser pipe to a height of 2 vertical feet above the top of the screen as the augers are withdrawn from the borehole. If bridging of the silica sand occurs, the bridged material will be broken mechanically prior to proceeding with the addition of more silica sand.

A bentonite chip or pellet seal measuring a minimum of 2 vertical feet will be installed above the silica sand, using a tremie pipe if necessary (to ensure that a good seal is formed). In lieu of chips or pellets, pure bentonite slurry may be used for the seal. If chips or pellets are used, sufficient time will be allowed for the bentonite seal to hydrate prior to grouting the remaining annulus.



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The remainder of the annulus will be filled with a cement bentonite mixture to within 2 feet of the ground surface. Once the grout has set, the remaining portion of the unfilled annulus will be filled with concrete, and a protective surface casing will be installed.

At each monitoring well location, an above ground protective steel casing will be installed. Monitoring wells will be secured using a lock on the protective casing. The well casing will be capped with either a screw on cap or with an expandable locking cap.

2.2 MONITORING WELL DEVELOPMENT

The newly installed well will be developed to minimize the presence of fine grained, suspended sediment and to ensure optimum communication between the well and the screened formation. Development will consist of surging and pumping the monitoring well.

During monitoring well development the temperature, pH, and conductivity of the groundwater will be monitored to confirm stabilization of groundwater within the monitoring well with the screened formation. These stabilization parameters will be monitored at selected intervals throughout development depending upon the anticipated volume of water to be removed from the well. In general, these parameters are measured every 2 to 4 well volumes in high yielding wells. However, in lower yielding monitoring wells, stabilization parameters will be monitored for every well volume removed.

Monitoring well development will continue until the turbidity has been minimized and three consecutive and consistent readings of pH, conductivity, and temperature are obtained. The monitoring well will be considered stable if three consecutive conductivity and temperature values are within ten percent of the average value (± 10 percent) and the pH values are within ± 1.0 pH unit of the average values of the last three samples collected. In the event that this cannot be achieved, well development will continue until turbidity is minimized or until a maximum of ten well volumes have been removed.

The volume of standing water will be calculated for a 2-inch diameter monitoring well is calculated as follows:

$$V = 23.5 \cdot r^2 \cdot h$$

where:

V	=	volume of standing water in gallons
r	=	radius of the well in feet (0.0833 for a 2-inch well)
h	=	depth of water in feet



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2.3 SOIL AND GROUNDWATER SAMPLING

The soil sampling and groundwater sampling portion of the supplemental investigation work will be conducted in accordance with the protocols detailed in GM's Pre-Design Investigations Work Plan prepared by Conestoga-Rovers & Associates (CRA) and submitted to KDHE in August 2001.

SUMMARY

Five soil borings will be installed in the vicinity of soil boring SB-110 from the 10 to 12 foot depth interval and analyzed for PCE in order to determine if remedial activity is warranted.

Five monitoring well clusters each consisting of one shallow well screened from 20 to 30 feet bgs and one intermediate monitoring well screened from 50 to 60 feet bgs will be installed, developed, and sampled for VOCs. Three of the monitoring well clusters will be installed in areas generally upgradient of the Site to confirm the presence of off-Site sources of VOCs. Two of the monitoring well clusters will be installed in downgradient areas to verify past sampling data and to verify that contamination is not migrating off Site at above KDHE RSK standards.

A short letter report will be prepared and submitted to the KDHE summarizing the studies completed as part of this supplemental confirmation program.

If you have any questions regarding this Supplemental Investigation Work Plan, please do not hesitate to call me.

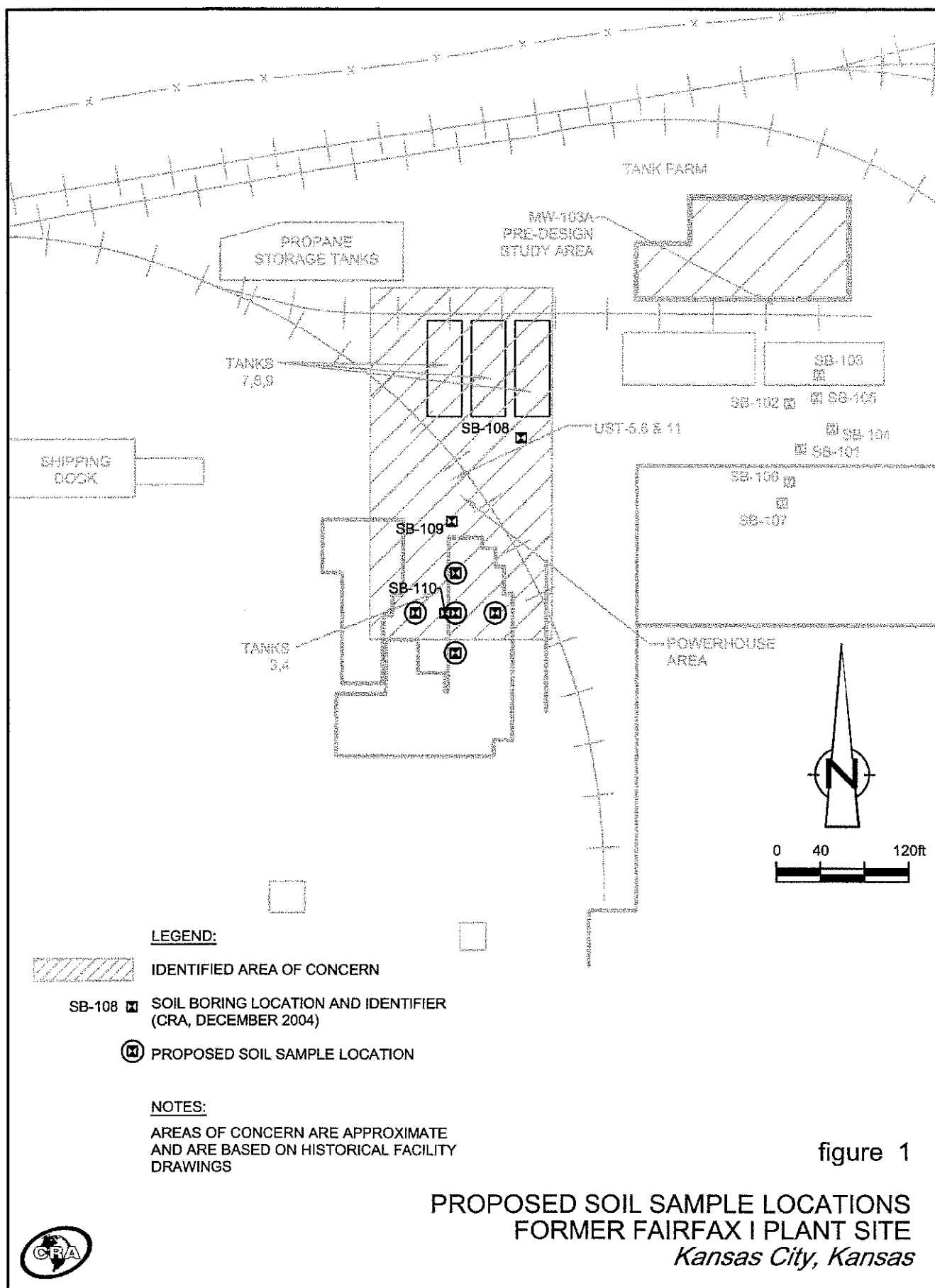
Yours truly,

CONESTOGA-ROVERS & ASSOCIATES


Phil Harvey

PH/ko/5
Attachments

c.c.: Ken Richards, GM
Kevin Brown, GM



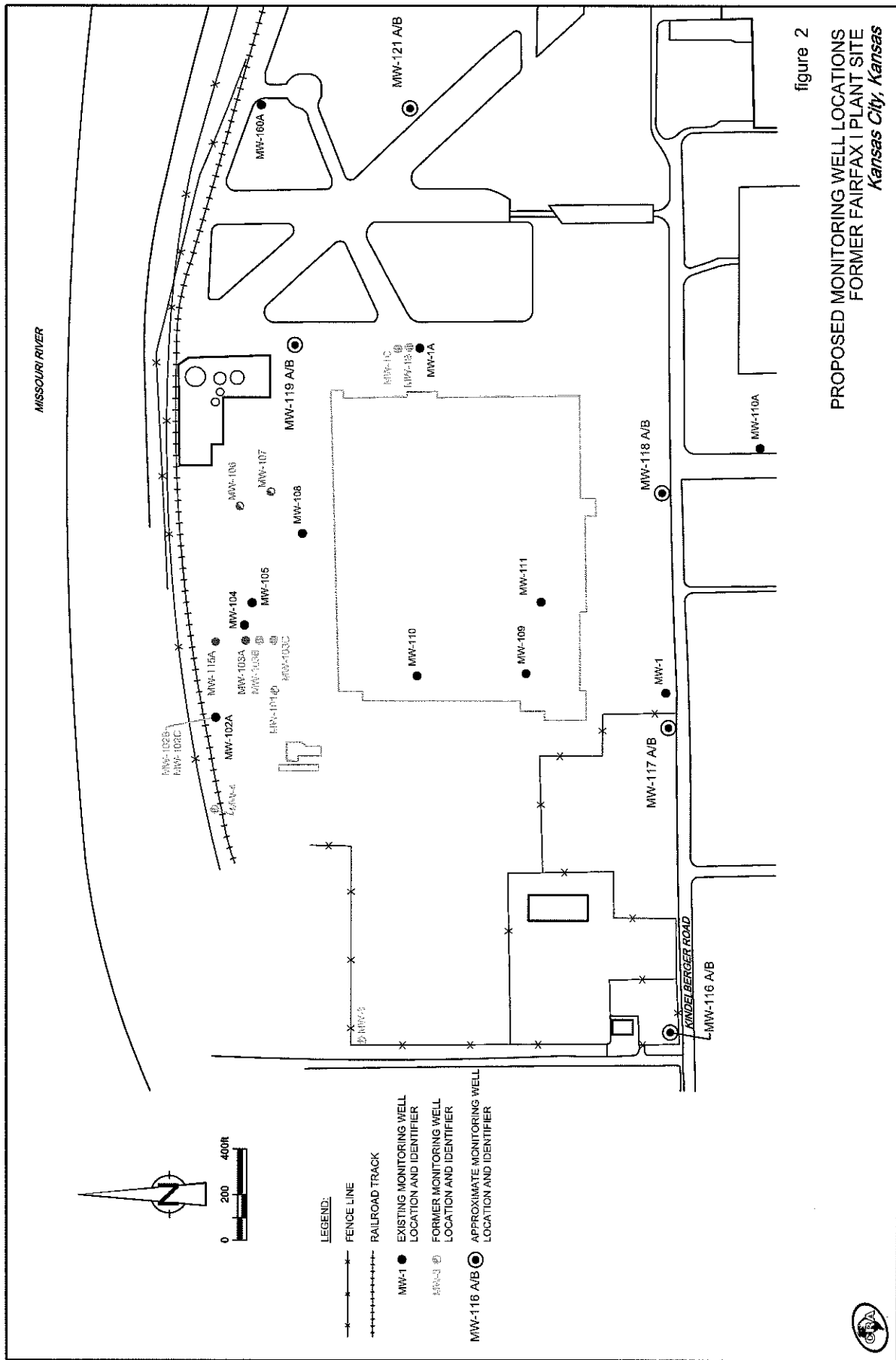


figure 2
PROPOSED MONITORING WELL LOCATIONS
FORMER FAIRFAX I PLANT SITE
Kansas City, Kansas

