

**POST-MITIGATION SAMPLING WORKPLAN
EAST HENNEPIN AVENUE SITE
MINNEAPOLIS, MINNESOTA**

by

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for
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1. INTRODUCTION

This Post-Mitigation Sampling Workplan identifies the post-mitigation sampling program for identified residential buildings near 2010 East Hennepin Avenue (the Site) in Minneapolis, the location of a former General Mills research center. This work is planned as part of ongoing work being conducted by General Mills to assess potential vapor intrusion (VI) in the vicinity of the Site.

The objective of the Workplan activities is to confirm sub-slab depressurization system/vapor mitigation system effectiveness by conducting post-mitigation remedial verification sampling of indoor air as well as other mitigation system data collection to the extent appropriate for supporting multiple lines of evidence (MLE) evaluation of the data.

2. SCOPE OF WORK

In consideration of the Minnesota Pollution Control Agency (MPCA) Vapor Intrusion Technical Support Document, dated August 2010, remedial verification, monitoring, and closure criteria vary depending on site specific conditions and program-specific requirements. For residences with detected TCE concentrations in sub-slab soil gas greater than 2,000 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$), this post-mitigation sampling program will consist of the following:

- Conducting an interior building survey;
- Indoor air sampling; and as appropriate,
- Mitigation system diagnostic data collection.

Incorporation of potential additional data collection in the post-mitigation sampling program, such as outdoor air sampling, may also be included based on data review, information from the interior building survey, and other factors.

2.1 Interior Building Survey

MPCA recommends completion of an Interior Building Survey which includes recording physical building observations (e.g., building use, construction, condition, occupancy, potential vapor entry locations, and other building features) and an indoor air quality survey (e.g., identification of potential background sources). Field instrument readings such as photoionization detector (PID) or field gas chromatograph/mass spectrometry (GC/MS) may also be included as determined by field conditions.

An Interior Building Survey form that includes at a minimum the information provided in the MPCA Interior Building Survey form will be completed before indoor air samples are collected in order to identify potential background sources and to select sampling locations. For post-mitigation sampling, removal of potential background sources identified, if any, is not planned prior to indoor air sampling. A copy of Appendix I of the MPCA VI Guidance, Instructions for Occupants, will be handed out and explained during the Interior Building Survey.

2.2 Indoor Air Sampling

The post-mitigation sampling program will include collection of indoor air samples. Samples will be collected using Summa[®] or analogous fused silica-lined canisters fitted with 24-hour flow controllers. Both the canisters and flow controllers will be individually certified by the laboratory. It is anticipated that one (1) indoor air sample will be collected in buildings of 1,500 square feet (ft^2) or less and one (1) to two (2) indoor air samples will be collected in buildings of 1,500 ft^2 to 5,000 ft^2 (NJDEP, 2013). Indoor air sampling events will be accompanied by the collection of a concurrent outdoor air sample. The actual sampling density will be determined based on the Interior Building Survey and other factors.

Indoor air samples will be collected in the basement (or if no basement, the lowest living space level) at the breathing height of three to five feet above the floor. Basement indoor air samples may also be

biased toward potential preferential pathways or other routes of entry, if identified, or as determined in the field. In accordance with the MPCA Vapor Intrusion Technical Support Document, indoor air vapor sampling will be conducted at least two weeks after a mitigation system is operational to verify system performance and effectiveness.

For each sampling location, the following information will be recorded: the initial and final dates and times of sample collection, canister serial number and flow controller serial number, canister field vacuum prior to and immediately following sample collection, a building layout sketch with depiction of the sample location and measurement ties to prominent building features, and potential external sources of VOCs. Weather data (temperature, moisture conditions, and whether regional barometric pressure is rising or falling) will be obtained. Field instrument readings such as PID or GC/MS may be included as determined by field conditions.

2.3 Mitigation System Diagnostic Data Collection

Once the indoor air sampling is completed, system performance verification will be conducted such as collection of follow-up pressure measurements from system ports and/or U-tube manometer verification. If permanent sub-slab monitoring points remain in the identified buildings, a digital micromanometer may also be used for differential pressure measurements. If floor and/or wall sealing was included in mitigation for identified buildings, observations will also be recorded for the visual integrity of the improvements. Post-mitigation sub-slab vapor sampling is not planned as part of this Post-Mitigation Sampling Workplan.

2.4 Analytical Testing

The indoor air samples will be shipped at ambient temperature under chain-of-custody to a laboratory certified for Environmental Protection Agency (EPA) Method TO-15 through the Minnesota Department of Health (MDH) Laboratory Certification Program. A data package consistent with the MPCA required laboratory quality assurance and quality control criteria will be provided by the analytical laboratory. No amendments to the TO-15/MPCA target list are proposed.

2.5 Quality Control Samples

Field duplicate samples may be collected for indoor air samples. Field duplicates can provide a measure of (field) sampling and (laboratory) analytical precision in a measurement system. Consistent with USEPA Functional Guidelines documentation for data validation, field duplicates will be evaluated by calculating the relative percent difference (RPD) between measured Method TO-15 results for duplicate pairs. Results for field duplicates wherein RPD is in excess of 35 percent will be evaluated and, if necessary, qualified accordingly. For duplicate pair results that are less than or equal to five times the reporting limit, RPD will not be calculated and precision will not be evaluated.

3. DATA EVALUATION

Results that are above TCE indoor air screening values after the consideration of background sources may require mitigation system modifications or considerations of other response actions. MPCA recommends that MLE be considered in assessment of VI data. These might include review of spatial and temporal data trends, information obtained during interior building surveys, background contaminant sources, and other information. In the event that basement indoor air monitoring results exceed applicable TCE screening levels, General Mills will evaluate the data and Site information and determine whether collection of confirmatory soil gas and additional indoor air samples or other actions are required.

4. SCHEDULE

Pending MPCA approval, it is anticipated the field work will be scheduled at least two weeks after a mitigation system is operational to verify system performance and effectiveness. MPCA will be notified of the specific schedule one week prior to conducting the field work. The samples will be submitted for expedited laboratory turn-around time.

5. REPORTS

A report will be submitted to MPCA that includes a summary of multiple lines of evidence evaluations, field records, analytical reports, copies of interior building surveys with indoor air sample locations, location selection rationale and data, a description of any mitigation system improvements completed, and conclusions or recommendations made. A report for each property evaluated under this Work Plan will be submitted within 60 days of completion of each mitigation system performance verification review.