

May 23, 2023

Manitoba Environment and Climate  
Box 38, 14 Fultz Blvd  
Winnipeg, Manitoba R3Y 0L6

Attention: Mr. Warren Rospad  
Assistant Director, Environmental Programs and Remediation

**Re: Remediation Plan – Manitoba Housing  
145 Powers Street, Winnipeg, Manitoba**

On behalf of Manitoba Housing, Kontzamanis Graumann Smith MacMillan Inc. (KGS Group) has prepared this Remediation Plan for the review and approval of Manitoba Environment and Climate (MEC).

## BACKGROUND

The Site is located at 145 Powers Street in Winnipeg Manitoba and is legally described as Lots 19 to 22 of Block 5 in Plan 187, WLTO in RL 36 Parish of St. John. The Site is currently utilized as a 12 storey residential complex, located in a mixed residential and commercial land use neighbourhood in central Winnipeg.

During building upgrades at the Site which commenced in 2022, impacted soils were observed which are likely related to the historical use of the Site as a gas station. Residual petroleum hydrocarbon (PHC) impacts above applicable guidelines were subsequently confirmed through follow-up site assessment activities within the footprint of the building and require management.

KGS Group was retained by Manitoba Housing to complete building upgrades that included crawl space construction within the Site building. As part of the scope of work, the removal of approximately 200 m<sup>3</sup> to 300 m<sup>3</sup> of soil material was required for better access within the crawl space of the building. Impacted soils were first observed during hand excavation activities in February 2022. This was followed by further assessment, by KGS Group, which included the following:

- Initial soil sampling in February 2022 to assess soil quality in the crawl space;
- Supplementary soil sampling conducted in March 2022 for further assessment of soil impacts within the crawl space;
- Completion of a Phase I Environmental Site Assessment (ESA) in March 2022 to determine site history and potential sources of the impacted soils observed;

- Completion of an initial semi-quantitative risk assessment of the soil quality data collected from the initial February/March soil sampling to determine the extent to which risk management measures would be required for the workers in the crawl space at the Site; and,
- Completion of a Phase II ESA in July 2022 to further assess the extent and magnitude of the PHC impacts identified and the areas of potential and actual environmental concern identified in the Phase I ESA.

Based on the laboratory results of the initial and supplementary soil sampling program within the crawl space of 145 Powers Street, Winnipeg, Manitoba, the presence of contaminated soils was confirmed in the north, west and south areas of the crawl space and included PHC Fractions F1-F4, polycyclic aromatic hydrocarbons (PAHs) and volatile organic compounds (VOCs).

The initial semi qualitative risk assessment concluded concentrations of acetone, methylnaphthalene, and 1,1,2-trichloroethane would pose a potential risk to crawl space workers and provided initial direction for worker protection as a part of the construction.

The results of the Phase I ESA completed at the Site indicated that the western majority of the subject property was occupied by two former gas station developments (1927-1960 and 1960-1972) and one suspected aboveground storage tank (AST) (approximately 1962-1972). Historical fuelling activities likely included the presence of additional ASTs and/or underground storage tanks (USTs) and are likely a source for the PHC impacts at the Site.

A Phase II ESA was conducted in July 2022 at the Site to further assess the extent of PHC impacts and subsurface conditions. Eight test holes were advanced with the installation of three monitoring wells as well as the installation of four vapour probes. The results of the Phase II ESA confirmed the presence of PHC soil impacts at the Site. Concentrations of the PHC constituents and distribution detections and type of PHC compounds associated with fuel storage were generally observed in the western portion of the Site, near the former location of the gas stations. Vertical distribution of impacts, based on field soil vapour screening and analytical results indicated that impacted soils were generally between 0.8 m to 3.5 metres below ground surface (m bgs), with the highest concentrations detected southwest of the Site building, where impacts were observed from surface to a depth of 3.8 m bgs. Groundwater concentrations of PHCs were below detection limits in each of the three monitoring wells.

A copy of the Phase II ESA report has been attached for the ministry's records and includes the results of the above noted reports.

## PROPOSED REMEDIATION PLAN

Based on conversations with Manitoba Housing, the Site is to remain as a residential housing complex for the foreseeable future. As such, the remedial strategy for the Site was selected in order to provide for on-going use of the Site and minimize intrusive remediation activities at the Site. Given the results of assessment activities to date, the source of the PHC impacts observed in the crawl space of the Site building as well as in the test holes

near the building are likely a result of the historic fuelling operations and extend within the footprint of the Site building. The selected remedial strategy was to mitigate the potential for migration of PHC vapours from the impacted soils into the Site building and affecting the indoor air quality for the residents. The proposed remediation plan will include the following:

- Excavation of crawl space soils within the existing Site building to the extent warranted for building upgrades, with additional excavations to be conducted to facilitate the installation of a soil vapour management system.
- Installation of required infrastructure upgrades within the crawl space, with protective measures for workers to prevent exposure to adverse air quality outside of acceptable standards.
- Installation of a vapour management system within the building crawl space consisting of a vapour barrier and system of piping to collect accumulated vapours below the vapour barrier and vent them to the outside.
- Development and implementation of a monitoring program to further assess and manage the remedial measures implemented.

## Proposed Remedial Activities

### EXCAVATION ACTIVITIES

It is anticipated that during the initial crawl space excavation as well as during infrastructure upgrades and liner installation, approximately 500 m<sup>3</sup> of PHC impacted soils will be encountered. It is understood that the excavation activities had commenced in February 2022, and were suspended until February 2023, at which time have resumed with provisional acceptance of the remedial methods by MEC. Hand excavation methods will be utilized within the crawl space with removal of the soils from the crawl space via dry vacuuming or manual methods. Workers within the crawl space will be protected from air quality hazards and confined space hazards through contractor training, awareness and a jobsite health and safety plan. This will include personal protective equipment (PPE) for confined space entry and personal respirator use.

Soils generated will be considered impacted and will be disposed of at an approved facility (Mid Canada soil treatment facility in Ile Des Chenes, Manitoba).

### INSTALLATION OF BUILDING UPGRADES

Once the soil excavation is complete, the planned building upgrades to building systems will be completed within the crawl space. The sequencing of these upgrades is to allow for the mechanical work to be conducted prior the vapour mitigation system installation in order to avoid damage to the system by contractor work. It is anticipated that these activities will be conducted within the crawl space with workers utilizing appropriate PPE and safety measures for protection from adverse indoor air quality and confined space hazards.

## **INSTALLATION OF SOIL VAPOUR INTRUSION MANAGEMENT SYSTEM**

Upon completion of the soil excavations and facility upgrades, a soil vapour intrusion management system (SVIMS) will be installed. The purpose of the SVIMS is to mitigate the migration of PHC impacted vapours from the subsurface into the crawl space of the building (and subsequently affecting indoor air within the crawl space and the building itself). Conceptually, the SVIMS will consist of the following main items:

- Installation of a hydrocarbon resistant liner within the crawl space, with appropriate securing and sealing to and around the in place building features.
- Installation of a system of piping below the barrier liner to serve as a vapour collection system for soil vapour accumulated below the liner system.
- Connection of the vapour collection piping to vent stack for passive venting to the building exterior.
- Development of an operation, maintenance and monitoring plan to ensure the effectiveness of system operation.

The conceptual design of the soil vapour system has been provided by MBN Environmental Engineering to facilitate the proposed re-development activities. The conceptual design brief dated February 6, 2023, is attached which provides additional details on the components of the system.

Installation activities are to be undertaken by a qualified contractor and will be monitored to ensure installation is completed according to plan. Monitoring will also include additional soil sampling at the extents of the soil excavations, prior to liner installation. The laboratory analytical results will be compared to the guideline concentrations identified in the Canadian Soil Quality Guidelines for the Protection of Environmental and Human Health of the CCME Canadian Environmental Quality Guidelines (CEQG, 1999, Updated.), as well as the CCME Canada-Wide Standards for Petroleum Hydrocarbons in Soil (CWS, 2001, Updated.).

Upon completion of the installation activities, a summary closure report will be completed, outlining the specifics of the remedial activities completed, summarization of analytical testing, and soil disposal and environmental construction activities.

## **DEVELOPMENT OF A LONG TERM REMEDIATION PLAN**

Upon completion of the construction activities, an updated Remediation Plan will be developed for the Site and submitted to MEC. It is anticipated that the updated Remediation Plan will include a plan for the inspection and maintenance of the SVIMS to ensure the integrity of the liner and piping system, as well a monitoring and sampling plan for the soil vapour and groundwater.



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## Closure

We trust that this Remedial Plan meets your requirements and approval. Should you have any questions or concerns please contact the undersigned.

Prepared By:

Approved By:

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Enclosure: