

Exhibit P-139



INSTITUTE OF PRAIRIE AND
INDIGENOUS ARCHAEOLOGY

Overview of Technologies for Searching for Human Remains and Unmarked Graves

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In the area of interest near the grounds of the old Royal Victoria Hospital in Montreal, there are several different methods that could be employed to detect potential human remains and unmarked graves. All of these techniques should follow best practices for their use in detecting remains. This list is not exhaustive but indicates some of the technologies that should be considered.

- 1) Lidar
 - a. Lidar is an airborne technique used to create a detailed map of the surface of the ground without any trees or bush, which could help provide additional spatial information about the areas of concern. If there is high-resolution (25 cm or less) Lidar available for the area, it should be provided; if not, it should be collected.
 - b. https://canadianarchaeology.com/caa/sites/default/files/page/uav_v1_sept_16_2021.pdf¹
- 2) Ground-penetrating Radar (GPR)
 - a. GPR is used to detect potential unmarked graves in areas that are clear and open. Some of the areas of the grounds might be suitable to search using GPR if the soils are appropriate (no high clay content), although GPR does not work well in areas that have been paved or in areas with forest cover. GPR is used to detect possible grave shafts, but cannot confirm the presence of human remains.
 - b. https://canadianarchaeology.com/caa/sites/default/files/page/caa_remote_sensing_faq_v1.pdf
 - c. https://canadianarchaeology.com/caa/sites/default/files/page/gpr_data_collection_v2_aug_5.pdf
- 3) Resistivity or Conductivity
 - a. Where GPR is not suitable, electrical resistivity or conductivity may be appropriate to detect potential unmarked graves. Like GPR, this can be used to

¹ All links here are to resources created to support Indigenous communities searching for children who died or went missing at Indian Residential Schools, but they are relevant to this case as well.

detect possible grave shafts, but doesn't confirm the presence of human remains. It does work better within forested environments than GPR

- b. https://canadianarchaeology.com/caa/sites/default/files/page/resistivity_survey_dec_13.pdf
 - c. https://canadianarchaeology.com/caa/sites/default/files/page/conductivity_survey_english_dec_13.pdf
- 4) Historic Human Remains Detection Dogs
- a. Historic Human Remains Detection Dogs (HHRDD's) are dogs specifically trained to locate old human bones and teeth and can detect the much lower scent levels emanating from hundred- or even thousand-year-old graves. These dogs have been used in the United States and in Europe to identify old human remains in archaeological and historic contexts, with studies published on their efficacy and accuracy. An independent, certified dog team should be used to search the area of concern.
 - b. <https://drive.google.com/file/d/17pAf9EfP4qVvSXtF12LC3L0INao8QoBv/view?usp=sharing>
- 5) Other possible techniques
- a. One area that could be explored in the areas of concern is eDNA, a method of sampling soil to test for the presence of human DNA. This method is not as well developed as some of the others mentioned in this document but would be worth exploring for potential application in this context.
 - b. If potential graves are located, there are options for next steps, as discussed in this document: https://caba-acab.net/sites/default/files/capa-acap_irs_unmarked_burials_and_possible_options_for_next_steps_en.pdf