



NUCLEAR WASTE SOCIÉTÉ DE GESTION  
MANAGEMENT DES DÉCHETS  
ORGANIZATION NUCLÉAIRES

## Phase 2 Preliminary Assessment

### Potential for Partnership

TOWNSHIPS OF MANITOUWADGE, HORNEPAYNE AND AREA, ONTARIO



**SR-2017-05**

**NOVEMBER 2017**

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*For more information, please contact:*

**Nuclear Waste Management Organization**

22 St. Clair Avenue East, Sixth Floor

Toronto, Ontario M4T 2S3 Canada

Tel 416.934.9814

Toll Free 1.866.249.6966

Email [contactus@nwmo.ca](mailto:contactus@nwmo.ca)

[www.nwmo.ca](http://www.nwmo.ca)



# PHASE 2 PRELIMINARY ASSESSMENT: POTENTIAL FOR PARTNERSHIP - MANITOUWADGE, HORNEPAYNE & AREA

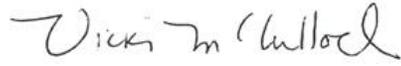
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***SUBMITTED TO:***  
JO-ANN FACELLA  
DIRECTOR OF SOCIAL RESEARCH  
NUCLEAR WASTE MANAGEMENT  
ORGANIZATION

***SUBMITTED BY:***  
DPRA CANADA INC.  
60 ADELAIDE STREET EAST  
SUITE 501  
TORONTO, ON  
M5C 3E4

## QUALITY INFORMATION

**Report Prepared  
By:**



Vicki McCulloch, RPP, Principal, DPRA

**Report Reviewed  
By:**



Marvin Stemeroff, Senior Consultant, AECOM

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## 1.0 INTRODUCTION

The Nuclear Waste Management Organization (NWMO) is responsible for implementing Adaptive Phased Management (APM), Canada's plan for the safe, long-term care of used nuclear fuel. APM involves the development of a large infrastructure project spanning many decades that will include a deep geological repository and Centre of Expertise for technical, environmental and community studies.<sup>1</sup>

The NWMO is currently in the site selection phase of implementing APM (Step 3 - Phase 2 of a 9-Step process). The current plan is to select one community/area to host the APM Project by 2023 which then marks the beginning of the fourth step of APM implementation.<sup>2</sup> This report summarizes the current understanding of the potential for partnership in Manitouwadge, Hornepayne<sup>3</sup> and area and the NWMO. This preliminary report is based on five years of engagement and dialogue in the area. Phase 1 of Step 3 involved documentation of the current socio-economic conditions in the communities and then postulated what might be the possible implications of the APM project on community well-being for each community and the wider area.<sup>4</sup> Leveraging this knowledge, the Phase 2 activities focused on evolving our understanding of the potential for partnership with those communities and in the broader area using key factors that are described in the following sections.

It is important to note the focus of this work was to engage community and area leaders and residents at multiple levels as a means to gather evidence and understanding/knowledge to derive preliminary assessments of the potential for achieving a partnership arrangement in the area with the NWMO to jointly implement APM.

The information and insights presented in this report, although based on extensive in-community/area engagement with community leaders, groups and residents over many years, are qualitative in nature. No surveys or statistical analyses have been performed at this early stage in the siting process. Rather the focus has been on engaging, listening and synthesizing what people have said during these dialogues.

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<sup>1</sup> Nuclear Waste Management Organization (2017), *Implementing Adaptive Phased Management 2018 to 2022*. Page 5.

<sup>2</sup> Nuclear Waste Management Organization (2017), *Triennial Report 2014 to 2016*. Page 77.

<sup>3</sup> In June 2017, the NWMO concluded that White River (the third area community in the siting process) will not be considered a potential host for the Project. However, the community is continuing to play a role as activities continue in the nearby communities of Manitouwadge and Hornepayne.

<sup>4</sup> DPRA Canada (2014), *Preliminary Community Well-Being Assessment – Manitouwadge*; DPRA Canada (2013), *Preliminary Community Well-Being Assessment – Hornepayne*.

The community and area engagement process and Phase 2 studies are ongoing. More is to be learned by both the communities and the NWMO. Therefore this report represents our understanding of the potential for partnership in the area at this point in time.

This report focuses on municipalities and other communities in the area.

## **2.0 APPROACH AND METHODS**

The approach and methods to understanding the potential for partnership in the area was based on an extensive engagement program with multiple levels of leaders and residents. This section summarizes the key indicators relied on for the partner potential assessment, followed by an overview of the engagement program undertaken.

### **2.1 Partnership Assessment Criteria and Indicators**

Over the course of all engagement activities in the area in recent years, the focus was on the following key criteria and indicators:

- A. Support for the project
  - i. Measured at three levels namely the community leadership, community grassroots and the leadership and/or grassroots of neighbouring communities (where appropriate).
  - ii. Confidence in the safety case as measured by the degree to which any or all levels of the community understand the safety case and what is their degree of confidence/acceptance in it.
  - iii. Support for field studies as measured by the degree of social acceptance for test boreholes.
- B. Potential to identify a socially acceptable repository site as measured by the degree to which community members are willing to discuss options and exchange ideas on the topic.
- C. Potential for the APM project to align with community and area aspirations for community well-being and development.

### **2.2 Community Engagement and Other Sources of Information and Insight**

The following is an overview of engagement activities conducted for Step 3, Phase 2 studies in 2015 - 2017 that provided insight in terms of understanding the potential for partnership in the area. In addition to ongoing learning, a key focus of engagement activities was on preparation for field work (2015 and 2016), and input on the social considerations and community preferences for identifying potential borehole drilling locations at or near a potential repository site (2017) in the withdrawal

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**Potential for Partnership – Manitouwadge, Hornepayne & Area**

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areas<sup>5</sup>. The NWMO gathered public comments through a series of one-on-one meetings, meetings with community organizations, attendance at local and area events, Community Liaison Committee (CLC) meetings, and open houses. Activities also extended beyond the communities, to engage in an initial way those having knowledge of/interests in the withdrawal areas (e.g., trappers, camp owners/operators, forestry organizations), and the leadership of municipalities in the surrounding area.

**2.2.1 Ongoing Learning**

There are a number of activities that communities have participated in as part of the Learn More process, as summarized below.

The Community Liaison Committees (CLCs) meet on a monthly basis in Hornepayne and Manitouwadge. The last meeting of the CLC in White River was in May 2017; in June, the NWMO concluded that White River will not be considered a potential host for the Project, citing challenges in sustaining an active and inclusive learning program about the Project within the community. This is considered an important input to ultimate support for the Project and building the partnership needed to implement it. However, the community is continuing to play a role as activities continue in Manitouwadge and Hornepayne.

NWMO's Used Fuel Transportation Package Exhibit was in Manitouwadge annually from 2015 to 2016 (in conjunction with the annual ATV Jamboree event), and in Hornepayne in 2015 and 2017. CLC members, municipal officials/staff, and local residents periodically attend 'Learn More' tours at the dry storage facilities at the Darlington and Pickering generating stations, and participated in a tour of NWMO's Oakville research facility in October 2017. In addition, many one-on-one interviews have been conducted with local residents (in addition to numerous informal discussions via other engagement activities).

NWMO has also engaged with students in the primary and secondary schools in both Manitouwadge and Hornepayne. Students have attended open houses in their communities, and presentations/sessions held at the community offices, at the NWMO offices in Toronto, and via webinar. Topics have related to the APM Project /radiation concepts, careers, and citizen science/the environment.

NWMO has periodic briefings/ meetings with elected officials/senior staff from municipalities and regional organizations in the surrounding area, including:

- Greenstone;
- Marathon;
- Terrace Bay / Schreiber;
- Hearst /Hearst Economic Development Committee /Nord-Aski Regional Economic Development Corporation; and

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<sup>5</sup> The withdrawal areas have been temporarily withdrawn from staking for mineral claims to provide an opportunity for initial field studies to proceed.

- Kapuskasing, Moonbeam, Val Rita-Harty, Fauquier-Strickland, Opatatika.

Both Hornepayne and Manitouwadge are members of the Northeast Superior Mayors Group (NESMG<sup>6</sup>), which is regularly briefed on the NWMO siting process.

NWMO also attended regional municipal conferences and events attended by local and surrounding area municipalities, including:

- Prosperity Northwest Conference: Northwestern Ontario Municipal Association Conference (The Future of Northwestern Ontario)
- Common Voice Northwest Conference
- Thunder Bay District Municipal League Conference
- Association of Municipalities of Ontario annual conferences
- Ontario Good Roads Association annual conferences

Community representatives and NWMO also attended the Canadian Nuclear Society's Conference on Nuclear Waste Management, Decommissioning and Environmental Restoration in Ottawa in September 2016, and the International Conference on Geological Repositories in Paris in December 2016.

In addition, NWMO has an extensive website that is routinely updated with information related to the communities, the siting process, ongoing technical research, and other topics. Written responses to dozens of topical questions from community members are regularly published, provided to the CLCs, and posted on CLC websites. Learn More Community Offices have been established in both Manitouwadge and Hornepayne, and each are staffed by Project Coordinators. The Project Coordinators are municipal staff selected by each municipality, working on their behalf.

NWMO has maintained high visibility in the communities via direct mail and advertising in print and radio media (e.g., open houses, Used Fuel Transportation Package exhibit). This includes newsletters distributed by direct mail and in the Jackfish Journal (Hornepayne's community newspaper). The CLCs also periodically distribute newsletters.

### *2.2.2 Site Selection for Borehole Testing*

The NWMO gathered public comments regarding the social considerations related to the withdrawal areas and Potential Repository Areas (PRAs, or 'ovals') through a series of one-on-one meetings, meetings with community groups, attendance at local and area events, Community Liaison Committee (CLC) meetings, and open houses, as described below. An overview of the engagement is provided below.

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<sup>6</sup> Members of NESMG are the municipalities of Hornepayne, Manitouwadge, White River, Chapleau, Wawa and Dubreuilville.

*I. Initial & Preliminary Engagement Activities Conducted to Solicit Public Comments on the Potential Borehole Drilling Areas*

In 2015, the NWMO began to discuss the plan for geological and environmental fieldwork that helped identify potential social, economic and cultural considerations related to the withdrawal areas. The airborne surveys were discussed at 2015 CLC meetings, March 2015 open houses, and through other engagement activities in the area. At the May, 2016 CLC meetings in Hornepayne, White River and Manitouwadge, CLC members discussed the planned work to observe general geological features and geophysical and environmental mapping.

Open Houses were held in Hornepayne, White River and Manitouwadge in May 2016 to provide an update on the field studies previously completed in the area, and the field work ('walking the land') proposed for 2016 season. NWMO also engaged with local individuals having knowledge of/interests in the withdrawal areas to gain their insights about the local conditions and to discuss their questions and concerns regarding the field work to be conducted in 2016. In addition, many one-on-one interviews were conducted with local residents (as well as many informal discussions via other engagement activities) in all three communities.

The NESMG was periodically briefed on the status of fieldwork in 2015 (April and December) and 2016 (May and November); informal briefings were provided to municipal leadership in the surrounding area.

*II. Formal Presentation of Plans for Borehole Drilling*

CLC meetings in Manitouwadge, Hornepayne and White River in April 2017 introduced the topic of planning for initial borehole drilling and testing. In June, the Manitouwadge and Hornepayne CLCs were presented an 'Overview of Geoscience Assessments and Next Steps in Engagement'. A presentation was given on the borehole drilling process framework. A draft borehole drilling brochure was distributed to CLC members.

NWMO received preliminary feedback from the CLCs and members of the public in attendance at the meetings.

*III. Engagement Activities to Receive Comments on 31 Potential Borehole Locations*

At the June 2017 CLC meetings in Hornepayne and Manitouwadge, an overview of the geoscience assessments was provided, and maps of Potential Repository Areas (PRAs, or 'ovals') within the withdrawal areas were introduced. These maps are included as Figure A1, which shows Potentially Geologically Suitable Areas Based on Early Phase 2 Studies for Manitouwadge; and Figure A2, which shows the same for Hornepayne; both are included in Appendix A. A May 2017 brochure 'Preliminary Assessment of Potential Suitability: Initial Borehole Drilling in Hornepayne and Manitouwadge Area' was distributed, and is included as Appendix B.

In July and early August 2017, engagement in both Manitouwadge and Hornepayne sought detailed feedback on the social considerations and preferences associated with the PRAs (18 in the Manitouwadge area, 13 in the Hornepayne area; see Figures A1 and A2, respectively, in Appendix A).

This was done primarily through:

- July 2017 Open Houses in Hornepayne and Manitouwadge on ‘Geologically Suitable Areas for Potential Initial Borehole Drilling Based on Early Phase 2 Studies’.
- One-on-one mapping exercises or ‘community conversations’ conducted at open houses, and in meetings with groups/individuals.

In September 2017, the NESMG was updated on the siting process, including the geoscience assessments and the engagement process regarding borehole drilling and the PRAs in the Manitouwadge and Hornepayne areas. Informal briefings were provided to municipal leadership in the surrounding area.

The borehole drilling engagement at the CLC meetings, open houses, one-on-one meetings and group meetings focused on three questions:

1. What is important to know about each of the areas identified on the map?
2. What about each area would make it a good site to drill a borehole? What, if any, concerns would you have?
3. Are some of these areas preferred over others for initial boreholes? Which ones? Why?

### **3.0 POTENTIAL FOR PARTNERSHIP – FOUNDATION ASSESSMENT**

#### **3.1 Support for the Project**

Overall support for the APM Project in the communities of Manitouwadge and Hornepayne is strong, and there appears to be support in the neighbouring municipalities. Evidence to support this assertion comes from three perspectives:

1. Support for the project can be demonstrated at multiple levels;
2. There is widespread confidence in the safety case for the Project; and
3. Support for field studies and the potential to identify socially acceptable test borehole sites within the communities .

Discussion of each of these perspectives is provided below.

### *3.1.1 Support for the Project at Multiple Levels*

Three levels of support were examined:

- ‘Leadership’ includes elected leaders (mayors, council members) as well as un-elected leaders active in community organizations (e.g. CLC Chairs, Economic Development Corporations) or otherwise influential in the community.
- ‘Grassroots’ is defined as members of the general public not involved in leadership roles, directing major organizations, or political activities.
- Neighbouring municipalities

The elected leadership in Manitouwadge - Mayor and Council - have publicly stated support for the Project, and participate in engagement activities (e.g., CLC meetings, open houses, etc.); senior administrators (e.g., CAO/Clerk-Treasurer, Fire Chief/Building Inspector/Airport Manager) are also unanimously supportive. The CLC (which includes three Council representatives) is unanimously supportive of the Project and have made public expressions of support. Many members of the Manitouwadge Economic Development Corporation (MEDC) are known to support the Project. Awareness of the Project is high in Manitouwadge. There has been a high level of participation in engagement on the Project by community members in Manitouwadge (e.g., open house / CLC attendance). The community’s mining history has contributed to an enhanced understanding of how the repository would be built and operated. There is no organized opposition or social media, and few individuals are opposed to the APM Project in Manitouwadge.

In Hornepayne, the Mayor and Council have publicly stated support for the Project, and most participate in engagement activities (e.g., CLC meetings, open houses, etc.). Senior administrators (e.g., CAO, Clerk-Treasurer) are also supportive. The CLC (which includes two Council representatives) is unanimously supportive of the project and have made public expressions of support. The Hornepayne Economic Development Corporation (HEDC) is active, and many members are known to support the Project. Awareness of the Project is relatively high in Hornepayne; however, support is somewhat less than Manitouwadge at this point in time. There has been relatively less participation in engagement by community members in Hornepayne (e.g. open house/CLC attendance), although the population of Hornepayne is approximately ½ that of Manitouwadge<sup>7</sup>. While Hornepayne leadership is strongly supportive, there is a small element in the community that has shown opposition. There is an active anti-NWMO social media presence in Hornepayne. However, it appears that interest/support in Hornepayne has improved in 2017.

The leadership in neighbouring municipalities in the area have been periodically briefed on the Project, but this has been limited to date. Engagement with the leadership of Greenstone, Marathon, Hearst and the Nord-Aski Regional Economic Development Corporation has been generally positive and supportive. Up to June 2017, White River had been engaged in the ‘Learn More’ process as a potential

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<sup>7</sup> According to Statistics Canada, the 2016 census population in Hornepayne was 980 (1,050 in 2011) and 1,937 in Manitouwadge (2,105 in 2011).

host community, but will be continuing to play a role as activities continue in Manitouwadge and Hornepayne.

All evidence indicates overall strong support for the APM Project in Manitouwadge, and increasingly strong support in Hornepayne. Interest/support in Hornepayne has improved in 2017. Additional engagement with the leadership and residents in surrounding communities is required to develop and gauge their understanding of/support for the Project.

### *3.1.2 Confidence in the Safety Case*

The communities of Manitouwadge and Hornepayne have little or no nuclear experience. Manitouwadge is a mining community that is also actively involved in forestry. Hornepayne's economic activity is focused on the lumber mill and rail transportation. The leadership and CLCs in both communities have confidence in the safety of the APM Project. Individuals attending dry storage tours are observed to have a relatively greater level of confidence in safety. However, the level of confidence in safety amongst the grassroots is not fully understood in either of the two communities, and may be influenced by social media that is particularly active in Hornepayne; however, grassroots confidence seems to be higher in Manitouwadge. Over the last five years, there has been a noticeable growth in overall confidence for the safety case associated with the Project in both communities. People have listened, asked questions, learned, and have reached a comfort level with Project safety.

As noted above, Manitouwadge's mining history has contributed to an enhanced understanding of how the repository would be built and operated, leading to greater confidence in safety. In Hornepayne, two professionals with experience in the nuclear industry in Canada and internationally have recently become engaged in the siting process and are sharing their knowledge with other community members, which is adding to grassroots appreciation and understanding.

While the neighbouring communities may support the Project, the confidence in the safety case of those not formally in the 'Learn More' process cannot be understood at this time, as with the exception of White River, have not had the opportunity to be fully engaged at either leadership or community levels.

### *3.1.3 Support for Field Studies and Potential to Identify Socially Acceptable Test Borehole Sites*

There is strong support for activities relating to the process for identification of a borehole location in the area, which has rejuvenated interest and optimism for the Project<sup>8</sup>. Residents that have been engaged in discussions on this topic in summer 2017, and the leadership of both Manitouwadge and Hornepayne, are supportive of moving forward with actions that demonstrate progress 'on the ground'. There has been strong grassroots community participation at engagement activities and visits to the Community Offices during the borehole drilling engagement process in 2017. Fieldwork has been part of the conversation for several years, and NWMO staff talked to the CLCs and held open houses about the

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<sup>8</sup> Some community members may also have seen the transitioning of White River as increasing the probability of their community as a potential host for the Project.

geology, the natural environment and borehole drilling in 2016 and 2017. The communities have been supportive about providing information that will facilitate field studies, and the identification of potential locations for boreholes.

There were a few exceptions in Hornepayne. A small number of the participants at a summer 2017 meeting with the West Larkin Lake Cottagers Association to discuss potential borehole locations indicated that they did not support the Project. In both Manitouwadge and Hornepayne, residents expressed clear preferences with respect to potential borehole locations from a social perspective; however, many participants said that they could support a borehole in any of the ovals, if geology was superior, for example.

While leadership in neighbouring municipalities have been briefed on the field studies to date, and the 2017 borehole engagement process, further engagement (with leadership, residents, and regional organizations) will contribute to improved understanding of the larger context in the area and how the Project might be planned and implemented with the host community and its neighbours.

### **3.2 Potential to Identify a Socially Acceptable Repository Site**

There is potential to identify a socially acceptable repository site in Manitouwadge or Hornepayne, based on municipal/community engagement to date (see Section 2.3.3, above) and the support for field studies, as discussed in Section 3.1.3. During engagement, it was made clear to participants that the withdrawal areas - and specifically the potential borehole testing locations within the Potential Repository Areas (PRAs) – being reviewed may be the future repository site. During engagement in the summer of 2017, there was a high degree of consistency in both communities in terms of the types of social considerations that were identified as important when considering a location for initial boreholes, as well as preferences in terms of withdrawal areas and/or PRAs that may be more favoured from a social perspective.

The findings of the borehole engagement have not been presented back to the communities at this time. Feedback from the communities on the results of the summer 2017 borehole engagement, and/or the identification of a preferred PRA for the area, would need to inform decision making regarding the location of initial boreholes/ potential repository sites. Engagement with leadership and residents in both communities indicates that they are optimistic that a socially acceptable repository site could be identified; however, this will be more clearly demonstrated once the results of the borehole engagement are presented for review and further discussion.

### **3.3 Potential Alignment of Project with Community (and Area) Aspirations**

There is strong potential for achieving partnerships with Manitouwadge and Hornepayne to advance the Project in the area. The Project would go far to address many of the common economic development and social priorities for Manitouwadge and Hornepayne (and their neighbours) such as:

- Smoothing out the boom/bust cycles associated with forestry and mining, and changes in the railway industry;
- Retaining/attracting a younger population;
- Economic stability and diversity;
- Improved infrastructure and municipal revenue/capacity; and
- Enhanced access to trades, goods and services, and amenities such as hotels and stores.

The APM Project generally aligns well with the vision, strategic directions and recommendations in the strategic plans of both Manitouwadge (McSweeney & Associates, 2017) and Hornepayne (NORDIK Institute and the Hornepayne Economic Development Corporation, 2017), which were completed in 2017. Manitouwadge's Strategic Plan cites a number of economic development actions related to continuing/strengthening their participation in the NWMO's Learn More process.

The economic modelling presentations and briefings with the leadership of neighbouring communities and regional organizations (i.e., NESMG, Marathon, Greenstone, Hearst/Nord-Aski Regional Economic Development Corporation, Terrace Bay/Schreiber, Kapuskasing/neighbours) have elicited a desire to learn more about the Project. The economic modelling presentations in particular generated interest in the types of economic benefits for both the host community and those in the surrounding area. People are interested in further discussing what this might mean in terms of strategy development, planning and coordination. Regional municipalities and organizations have all expressed interest in further engagement.

Earlier in 2017, Manitouwadge, Hornepayne and White River initiated meeting together as a group to explore how they might work together to realize the APM Project within the region. The regional group has not met since the transition of White River to a 'neighbouring community' in June. During engagement, participants have noted the potential for road access between Manitouwadge and Hornepayne via industrial roads currently used for logging purposes (e.g., Hornepayne Creek Rd. now links through to Manitouwadge), and some have added (particularly in Hornepayne) that a joint or 'linked' Hornepayne/Manitouwadge project may be beneficial (the latter relating to physical connection via a new or upgraded road corridor between the Project and the communities).

There are current and past partnerships amongst the municipalities and with Aboriginal groups in the area, including the NESMG and the Nawiinginiima Forest Management Corporation<sup>9</sup>. There is general acknowledgement by both Manitouwadge and Hornepayne (and their neighbouring municipalities) that the APM Project is a ‘regional’ one in several senses, and will require working together with neighbours during the siting process, detailed characterization/assessment, and implementation.

The communities also have relationships based on economic activity. These include the forestry activities in Hearst, Hornepayne, Manitouwadge, Calstock, White River and Terrace Bay; and the mining activities linking Manitouwadge, Marathon, White River, Dubreuilville, and Wawa. In the summer of 2017, the Wahkohtowin Development LP (the economic development arm of the Northeast Superior Chiefs Forum, including three of the member first nations - Brunswick House, Chapleau Cree, and Missanabie Cree) announced a \$4 million equity investment with Hornepayne Lumber LP for the Hornepayne Sawmill and Cogeneration Facility. “The Pic Moberg First Nation is also moving through the process of making commitments based on the work of the Wahkohtowin Development LP... Wahkohtowin Development LP includes a shareholder structure that supports joint First Nation-municipal partnerships and efforts are ongoing to engage the communities of Wawa, Chapleau and Dubreuilville in related opportunities.”<sup>10</sup> Regardless of the APM Project, the communities realize that they can no longer work in isolation as one-industry towns. They must work together on economic and community development, and the NESMG for example has been doing so for more than a decade. Many planning agencies (e.g. Community Futures Development Corporations, economic development organizations, labour planning groups, emergency services groups), resource management groups, and municipal forums also take a regional approach.

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<sup>9</sup> The Nawiinginiima Forest Management Corporation (NFMC) was established to operate within a defined management area that includes the Ojibways of the Pic River First Nation, Pic Moberg First Nation, Hornepayne Aboriginal community, Manitouwadge, Marathon, Hornepayne, and White River. The area is comprised of four forest management units – Big Pic, Pic River, White River and Nagagami Forests.

<sup>10</sup> August 3, 2017. Wawa News. ‘Wahkohtowin Development LP to Invest \$4 Million in Hornepayne Sawmill & Cogeneration Facility’. <https://wawa-news.com/index.php/2017/08/03/wahkohtowin-development-lp-to-invest-4-million-in-hornepayne-sawmill-cogeneration-facility/>.

## 4.0 SUMMARY

Based on the observations and evidence presented above, it can be concluded that at this time there is strong potential for partnership in Manitouwadge and in Hornepayne. This potential for partnership may also extend to the surrounding area municipalities. In summary, the key evidence is:

- The leadership (Mayors/Councillors, senior administrators, CLCs, EDC members) of both Manitouwadge and Hornepayne have publicly expressed their support.
- Manitouwadge, Hornepayne and White River (mayors, CAOs, CLC chairs, CLC coordinators) met as a group several times in early 2017 to explore how they might work together to realize the APM Project within the region. With the transition of White River to a 'neighbouring community' role, the regional group has put its activities on hold pending further clarity on the direction in the region.
- Several participants have noted the potential road access between Manitouwadge and Hornepayne via industrial roads currently used for logging purposes, and that a joint or 'linked' Hornepayne/Manitouwadge project may be beneficial.
- The 'Confidence in Safety' of neighbouring communities not currently formally engaged in the NWMO 'Learn More' process (Marathon, Greenstone, Hearst) is unknown, although the engagement to date with the leadership has been generally positive and supportive. White River was engaged as a potential host community in the 'Learn More' program until June 2017, and is continuing to play a role as activities continue in Manitouwadge and Hornepayne).
- At the current time there is strong support for activities relating to the process for identification of a borehole location in the area, which has rejuvenated interest in/optimism about the Project. Residents that have been engaged in discussions on this topic in the summer of 2017, and the leadership of both Manitouwadge and Hornepayne, are enthusiastic about moving forward with actions that demonstrate progress 'on the ground'. In both Manitouwadge and Hornepayne, many participants said that they could support a borehole in any of the ovals, if geology was superior, for example.
- The Project would go far to address many of the common economic development /social priorities and aspirations for Manitouwadge and Hornepayne, and they see the opportunities to enhance their well-being. Engagement to date with leadership in municipalities and organizations in the surrounding area has been well received; they recognize the regional implications / opportunities associated with APM Project, and are supportive of continuing to learn more in the future.

Overall, there is strong potential for partnership with NWMO in both communities. While engagement to date with the leadership of neighbouring communities has been generally positive and supportive, additional work is needed to more fully understand their potential for partnership.

More information would be needed if a decision were made to proceed with additional studies in the area. Necessary information includes:

1. Feedback from the communities on the results of the summer 2017 borehole engagement, and/or the identification of a preferred Potential Repository Area (PRA) for the area, will inform decision making regarding the location of initial boreholes.
2. Community perspectives on potential Project configuration/distribution of components, including the Center of Expertise, will provide a meaningful basis for dialogue going forward.
3. There is a proportion of the population in both communities that has not been directly engaged to date; broadening the engagement at the grassroots level will enhance the insight into the potential for partnership.
4. Engagement with the surrounding area communities (leadership and residents) and regional organizations will contribute to further understanding of the regional context in the area and how the Project might be planned and implemented with the host community and its neighbours.
5. Further insight into what is needed to bring required economic development, infrastructure, and to grow the population in the communities will assist in understanding what various partners at a local and regional level may need to do in terms of project planning and implementation.
6. NWMO needs to further understand the specific needs of municipalities in terms of the capacity (including technical expertise) needed to participate effectively and meaningfully in the APM siting process as it becomes more intensive.

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APPENDIX A: FIGURES A1 (MANITOUWADGE) AND A2 (HORNEPAYNE)

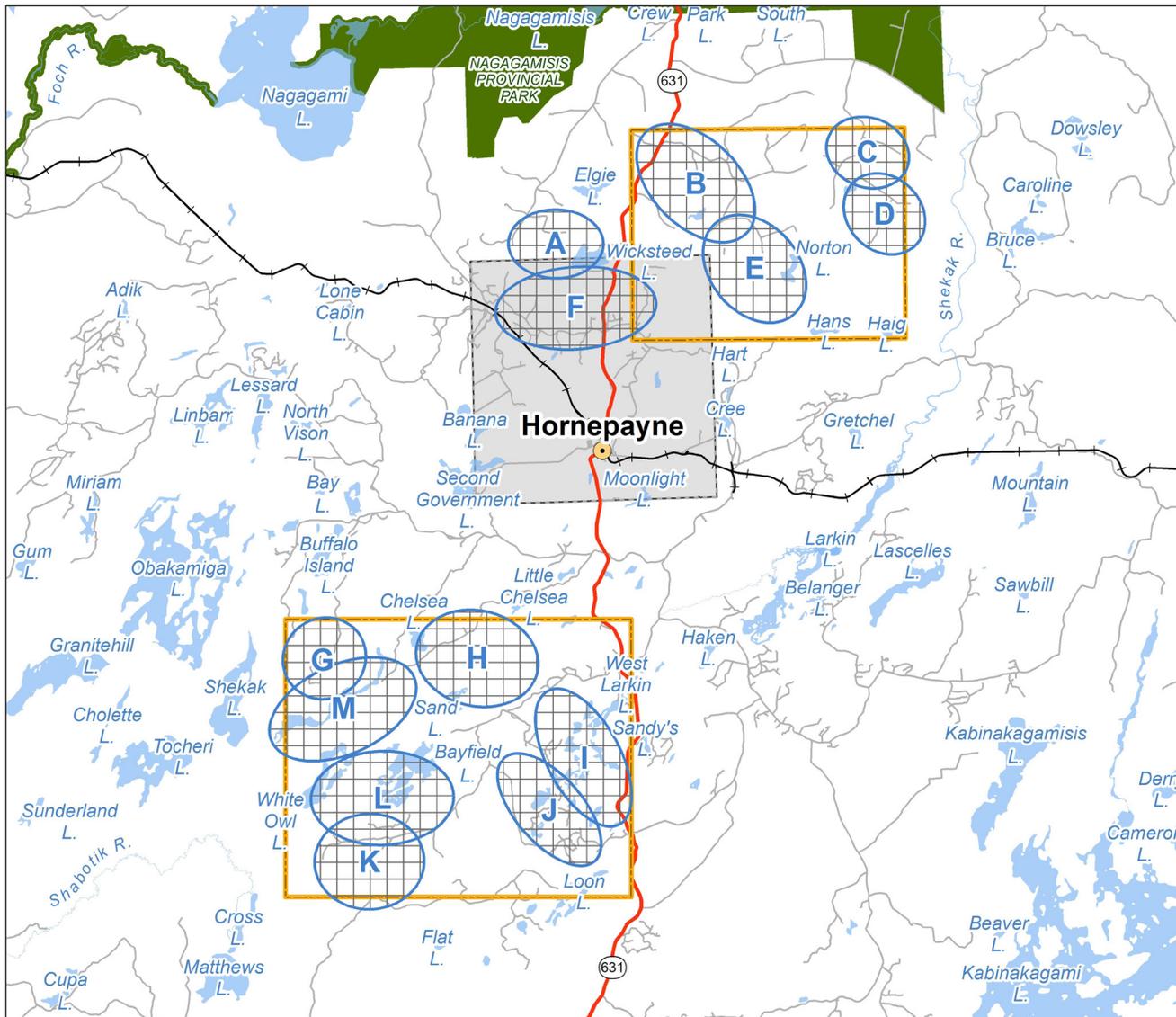


# Figure A2: Potentially Geologically Suitable Areas Based on Early Phase 2 Studies - Hornepayne

## Potentially Geologically Suitable Areas Based on Early Phase 2 Studies

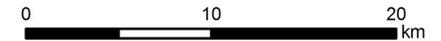
### – For Discussion with People in the Area

The Hornepayne area is one of several that are involved in the site selection process for a deep geological repository for Canada's used nuclear fuel. Based on early studies, potential geologically suitable areas have been identified for discussion with people in the area about where to focus initial borehole drilling.



#### LEGEND

- Potentially Suitable Repository Area Based On Geology For Discussion
- Temporary Withdrawal
- HWY 631
- Road
- Railway
- Municipal Boundary
- Provincial Park
- Waterbody



#### REFERENCES

Base Data - MNR LIO, obtained 2009-2015, CANMAP v2006.4

Projection: Universal Transverse Mercator  
Datum: NAD83 Coordinate System: UTM Zone 16N

#### SCALED REPOSITORY FOOTPRINT FOR REFERENCE

Approx. Surface Facility Footprint (600x550m) Approx. Underground Repository Footprint (3x2km)

04/07/2017

**nwmo**

NUCLEAR WASTE MANAGEMENT ORGANIZATION  
SOCIÉTÉ DE GESTION DES DÉCHETS NUCLÉAIRES

**APPENDIX B: BROCHURE - 'PRELIMINARY ASSESSMENT OF POTENTIAL SUITABILITY:  
INITIAL BOREHOLE DRILLING IN HORNEPAYNE AND MANITOUWADGE AREA'  
(MAY 2017)**

**PRELIMINARY ASSESSMENT  
OF POTENTIAL SUITABILITY****Initial Borehole  
Drilling in the  
Hornepayne and  
Manitouwadge  
Area**

In 2010, the Nuclear Waste Management Organization (NWMO) began technical and social studies in and around a number of communities, including Hornepayne, Manitouwadge and White River, that expressed interest in assessing their suitability for safely hosting a deep geological repository for the long-term management of Canada's used nuclear fuel. These studies have become increasingly more detailed over time and focused on locations that have potential to safely host a repository.

Before selecting a potential repository site, the NWMO needs to be confident that a deep geological repository can be developed with a strong safety case at that location. A safety case brings together all the information that contributes toward understanding whether or not a repository at the site could safely contain and isolate used nuclear fuel. This information includes Indigenous Knowledge, geoscientific assessments, environmental surveys and monitoring, engineering design studies, and safety assessment analyses.

The focus of early geoscientific studies is to determine if there are rock formations in the area that have potential to satisfy the NWMO's safety requirements for a deep geological repository.

The next site evaluation activity in the area involves drilling an initial borehole in a potential repository location to further understand the geology. Depending on findings, additional borehole drilling and testing in one or more locations may be warranted in the future.

## Selecting a Site for the Long-Term Management of Canada's Used Nuclear Fuel

Canada has a comprehensive plan for the safe, long-term management of the used nuclear fuel produced by its nuclear power plants. The plan includes a process to identify an informed and willing host for a deep geological repository that will contain and isolate the material.

Drilling an initial borehole and associated testing will build upon findings of earlier studies. Selecting a location for an initial borehole provides an opportunity for the NWMO, the interested communities, and First Nation and Métis communities in the area to work together and to reflect upon where the project might best fit.

Beyond ensuring safety, the NWMO has committed to communities and the surrounding area that the project will be implemented in a way that fosters long-term well-being as defined by the community.

## Key Steps

**To date**, the NWMO has completed a number of studies to explore potential suitability of the area to meet the robust technical safety requirements to host the project. The NWMO has shared these findings with communities in the area and published reports on its website.

- » Desktop studies, using available information, identified broad areas that have the potential to host a deep geological repository (2013 to 2015). These areas were temporarily withdrawn from staking for mineral claims to provide an opportunity for initial field studies to proceed.
- » Initial field studies, including airborne geophysical surveys and observing general geological features, identified candidate areas for further field studies, such as detailed geological mapping (2015).
- » Detailed geological mapping completed in summer 2016, provide additional information to understand the suitability of geology in the area. These studies help identify smaller areas that have potential to meet technical safety requirements for a deep geological repository. These smaller areas could be the focus of more detailed study, beginning with drilling an initial borehole.

**Next steps** involve the NWMO and people in the area working together to review findings from technical studies completed to date and plan next steps. Together, we will:

1. Review findings from detailed geological mapping and the smaller areas that have been identified as potentially suitable for hosting a deep geological repository;
2. Decide which of these smaller areas should be the focus of further study, beginning with initial borehole drilling at or near a potential repository site, and develop plans for these studies;
3. Seek permits and work authorizations for borehole drilling, as required;
4. Initiate borehole drilling and testing; and
5. Review study findings and decide on next steps.

Should the area proceed beyond these initial studies, the next phase of work would involve additional borehole drilling and testing focused on a preferred potential repository site in the area. We would decide together on a preferred location. Ultimately, any preferred site will need to have the potential to meet the project's robust safety requirements and be in a place where a strong partnership reflecting area support can be developed.



Example of core

### What is borehole drilling?

A borehole is a narrow, deep, circular hole made in the ground using motorized equipment (drilling equipment). The process involves drilling the borehole and retrieving cylinder-shaped rock samples, called core. A wide range of testing is performed on samples of the core and in the borehole to investigate properties of the rock.

### What is the purpose of this initial borehole drilling and testing?

Initial borehole drilling will provide more information about whether the geology in the area could be a safe place for a repository. Borehole drilling and testing will help further assess and understand key geological features and uncertainties identified in previous studies. It will provide information about the depth of geological formations, rock types, and the nature of fractures in the rocks.

Building a better understanding of the geology will help the NWMO as it works with people in the area being studied to identify potential repository sites.

### Where will the initial borehole be drilled?

We need to decide on a possible location for an initial borehole together with people from the area, including the interested communities, and First Nation and Métis communities in the area. In addition to meeting technical objectives, the borehole drilling location will be selected to respect land use, and cultural and spiritual values of people in the area related to siting of the repository.

To get the discussion started, the NWMO will propose possible locations for initial borehole drilling based on findings from the detailed geological mapping. These locations will be in or near areas that may have potential as a repository site. The NWMO will review these potential drilling locations together with people in the area to determine where it should focus initial borehole drilling and testing activities.

The NWMO anticipates drilling one initial borehole. The location of the borehole will be informed by data from detailed geological mapping and the geoscientific information collected in previous studies.

### How will the NWMO interweave Indigenous Knowledge into initial borehole drilling and testing?

The NWMO is committed to interweaving local Indigenous Knowledge in all phases of its work.

The NWMO will work together with Aboriginal peoples in the area to respectfully apply Indigenous Knowledge of the natural environment and traditional lands, and cultural and spiritual values they may wish to share to guide borehole drilling and testing.

The NWMO will ensure Aboriginal intellectual property is protected as agreed to with Aboriginal peoples who choose to share that knowledge.

Aboriginal peoples have a special relationship with the natural environment, and unique stewardship responsibilities that are part of this relationship. The knowledge that comes from this relationship with the land brings special understanding to the broad range of factors that should be considered in field studies, social assessments, and assessing benefits and effects to be managed.

### What permits are required?

The NWMO will require permissions from the Ministry of Natural Resources and Forestry (MNR). We will comply with MNR conditions in order to use Crown lands for borehole drilling.

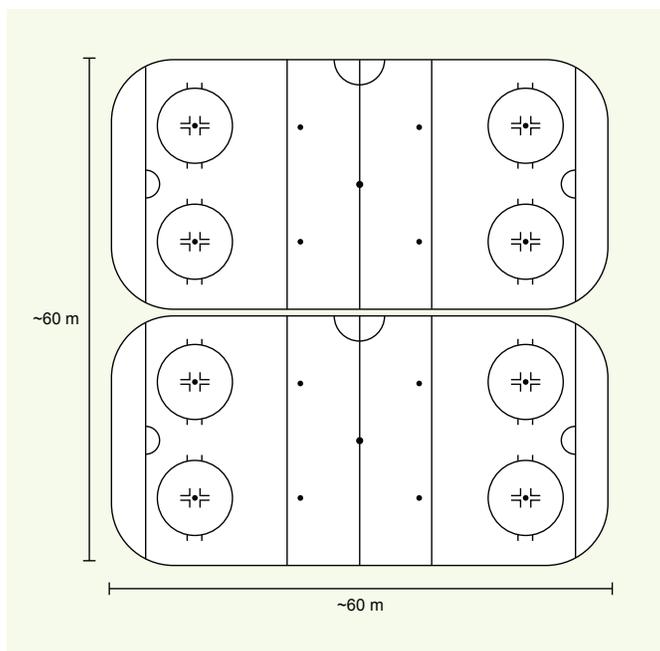
The NWMO will prepare submissions to MNR with the involvement of people in the area. Once a request for permission is submitted, the process will involve the interested communities in the area, and consultation with affected First Nation and Métis communities.

### When will the initial boreholes be drilled?

Scheduling for the first stage of borehole drilling and testing will depend on the time needed to identify preferred locations, collaborate with communities to develop work plans, and obtain work authorizations.

### How much land is needed to drill a borehole?

The footprint required for a drill site is around 60 metres by 60 metres, or about the size of two NHL-sized hockey rinks side by side. The area may be fenced depending on its location.



Footprint required to drill a borehole



Rotary drilling

### What equipment is used?

Boreholes are drilled using a conventional truck-mounted or track-mounted rotary drill rig. The drill site will likely need to be prepared and graded using granular materials, such as sand and gravel.

Trailers will be set up at the site for use as field offices, for on-site equipment storage, and for a small field lab for on-site testing and preserving rock core and water samples. Electricity for these facilities will be supplied by power generators.

Rock core will be stored in a core storage facility in a nearby community. Depending on the location of the borehole, rock core may be stored on a temporary basis at the drill site, and later, moved to the core storage facility.

### Will drilling and testing cause any impact to the environment?

Drilling activities will be managed to minimize impact on the environment. During all stages of fieldwork, the natural environment will be protected.

A source of water and a drill water management system will be required. The NWMO may bring water to the site or source it from a nearby body of water.

Water will be recycled on-site during drilling to minimize

use and release to the environment. Drilling water and cuttings will be managed safely in accordance with provincial regulations. This may involve on-site management or transportation off-site.

During preparation of access routes and use of water, drilling fluids and solids will be managed in accordance with provincial regulations. The NWMO will work with communities in the area to confirm plans, including how it will minimize the impact of these drilling activities on the local environment.

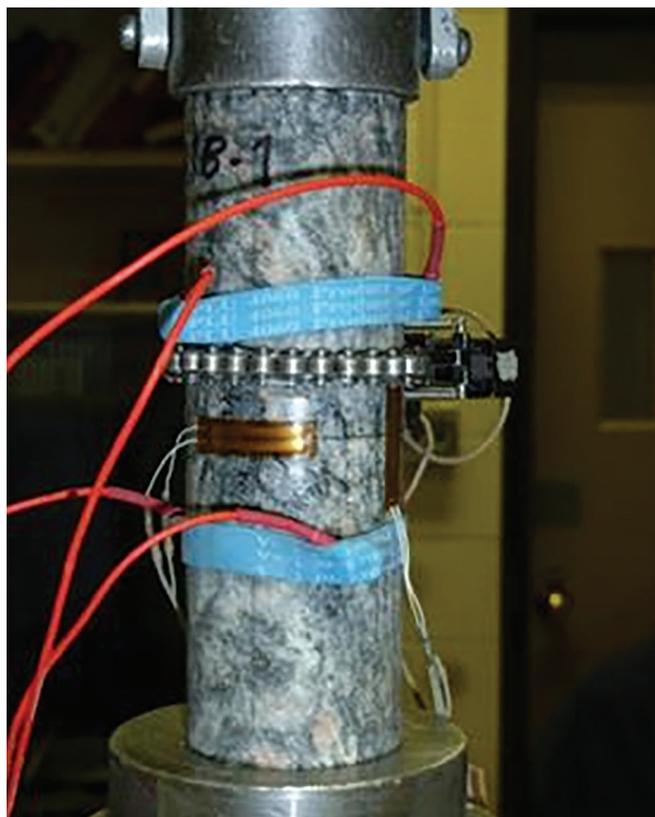
### How deep will the boreholes be?

Boreholes will be drilled and cored to a depth of about one kilometre. It is anticipated that the deep geological repository in the type of geology found in the area (crystalline rock) would be developed at a depth of approximately 500 metres below ground surface. Deep boreholes are required to assess suitability of the host rock at depth.

### What kind of testing is conducted?

Testing will be used to develop a more detailed understanding of the geological suitability of the rock in the area. Testing includes:

- » Logging of the rock core, which involves a geologist inspecting the core to find out the main rock types present, as well as the location and direction of any natural breaks in the core (fractures or faults), and recording this information;
- » Geomechanical measurements, which involve testing rock core samples taken from the borehole to provide information about rock strength;
- » Geophysical measurements made along the length of the borehole to provide information on minerals, fractures and zones of groundwater flow present within the rock;
- » Hydraulic conductivity measurements made at selected locations along the length of the borehole will provide information on groundwater flow conditions at the location being tested; and
- » Chemical and isotopic analyses of groundwater samples collected from within the borehole, to determine the nature of the groundwater (e.g., whether it is fresh or saline) and to begin to understand how the groundwater has changed over time.



Example of geomechanical testing

As field studies progress, the NWMO will work with people in the area to share information and build awareness and understanding.

### How long will it take to complete the borehole drilling and testing?

For a borehole approximately one kilometre deep, the entire process can last about 90 days, depending on the number of shifts worked each day.

Once initial borehole drilling and testing is complete, geoscience, environmental, engineering, and repository safety specialists will need several months to review the data and share the findings with an expert group for peer review. Once that is complete, the NWMO will share findings with the communities. The findings, along with those from earlier studies, will guide the NWMO in working with communities in planning any future study activities.

### What happens to the borehole once drilling and testing is complete?

Upon completion of the planned tests, drilled boreholes will be sealed on a temporary basis using hard rubber plugs.

The NWMO will review findings and reflect on whether or not to continue with further studies with people in the area, including the interested communities, and First Nation and Métis communities.

If the decision is taken not to conduct further studies at a borehole location, the temporary seals will be removed, and the borehole will be permanently sealed along its entire length in accordance with MNR requirements.

If the decision is taken to proceed with further studies in the area, then the temporary plugs could be removed, and the boreholes instrumented.

Instrumentation would be installed in the open borehole to measure and record bedrock properties, such as the water pressures over time frames of months to years. These types of measurements provide additional information about the characteristics of the groundwater systems.

### When will a site be selected for a repository?

Confirming a safe site will take several years of progressively more detailed technical, scientific, social, cultural, and economic studies, as well as engagement of people from the area, including the interested communities, and First Nation and Métis communities. The NWMO is conducting studies to explore suitability to host the project in a number of areas in Ontario, including both crystalline rock sites like those found in the area and sedimentary rock formations such as those found in southern Ontario.

If findings from drilling and testing of the initial borehole provide additional confidence that this location may be potentially suitable to host a repository, the communities and the NWMO may decide together to further advance studies at that location by drilling and testing additional boreholes.

If these additional studies increase confidence that the location may be suitable, and if strong partnerships reflecting area support can be developed, detailed site characterization activities could be conducted and would require several more years. During site characterization, the NWMO would collect additional information and complete analyses required to assemble a safety case for a deep geological repository at that location.

Ultimately, the preferred site will need to meet robust technical requirements focused on safety. The implementation of the project must also foster the well-being of the area as defined by people who live there, and will need to be supported by strong partnerships. The project can only proceed with the involvement of the interested communities, First Nation and Métis communities in the area, and surrounding communities.

# Be Involved

Be involved in this initial borehole drilling phase of work as we select borehole drilling sites, plan, and complete these studies together.

Drop by your local NWMO community office and participate in upcoming community events such as meetings and open houses.

**For more information, please contact:**

## **Manitouwadge Community Learn More Office**

3-12 Huron Walk  
Manitouwadge, ON, P0T 2C0  
807.826.3255

## **Hornepayne Community Learn More Office**

PO BOX 177  
247 Third Avenue, Suite 3  
Hornepayne, ON, P0M 1Z0  
807.868.2186



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## **Nuclear Waste Management Organization**

22 St. Clair Avenue East, Sixth Floor  
Toronto, Ontario M4T 2S3, Canada  
Tel.: 416.934.9814 Toll Free: 1.866.249.6966  
Email: [contactus@nwmto.ca](mailto:contactus@nwmto.ca)  
Website: [www.nwmto.ca](http://www.nwmto.ca)

