



# Preliminary Assessment of Potential Suitability – Feasibility Studies



November 2011

**nwmo**

NUCLEAR WASTE  
MANAGEMENT  
ORGANIZATION

SOCIÉTÉ DE GESTION  
DES DÉCHETS  
NUCLÉAIRES

# Agenda

1. What is the status/progress to date in implementing the NWMO site selection process?
2. What has been the community's involvement in the site selection process to date, and what has been learned about the potential suitability of the community for this project?
3. What is the next step in the site selection process, and what do feasibility studies involve?
4. How does a community initiate the process, and what are next steps?



# Status of the Site Selection Process

# Where Are We in the Site Selection Process?

## Step 1

Becoming aware & informed

## Steps 2, 3 & 4

Assessing interest & suitability

- Community visioning
- Screening
- Feasibility
- Detailed assessment
- Regional study & involvement
- Centres of expertise launched

## Step 5

Community assesses & demonstrates willingness

## Step 6

Preferred site identified

- Collaborative agreement established

## Step 7

Regulatory review & approvals

- Site is selected

## Step 8

National centre of expertise established & construction of underground demonstration facility

## Step 9

Construction begins...

# Status of Site Selection Process – Step 2 Activities to Date



## Step 2 Objectives

- » Communities learn more about the project, used nuclear fuel and steps in the site selection process
- » The NWMO performs initial screening to assess whether there are any obvious conditions that would exclude a community from the NWMO site selection process based on readily available information

## Status

- » Ten communities expressed interest in learning more about the NWMO site selection process and requested an initial screening
- » Nine initial screenings completed

## Results

- » Eight communities passed the initial screening stage
- » One community did not meet the screening criteria
- » One screening underway

# Status of Site Selection Process – Communities Interested in Learning More



Interested Communities in Canada



# Review of the Community's Involvement in the Site Selection Process to Date

# Community's Involvement in the Process to Date (1/2)

## 1. Understanding Safety

### Discussions with the NWMO

- » NWMO briefing in Toronto and visit to used nuclear fuel interim storage facility

### Discussions with Others

- » Met with the Canadian Nuclear Safety Commission, with Swedish community representatives (June 2011), with participants in Canadian Nuclear Society conference (September 2011)

### Initial Screening

- » Successfully completed initial screening

## 2. Exploring Community Well-Being

- » Consider vision for community's future through strategic plan exercise



# Community's Involvement in the Process to Date (2/2)

## 3. Engagement

### Citizens

- » Communication on website and in newspaper, information available through kiosks and document stands in the community
- » Meet the NWMO open house, establishment of community liaison committee

## 4. NWMO Resources to Support Involvement

- » Funding to cover: travel expenses to participate in meetings; strategic planning review; administrative support
- » Expertise to support communication about the project



# Feasibility Studies – The Next Step in the Site Selection Process

# What is the Next Step in the Site Selection Process?



Preliminary Assessment of Potential Suitability – Feasibility Studies are an opportunity for both the community and the NWMO to explore four key questions

1. Safety, security and protection of people and the environment are central to the siting process. *Is there the potential to find a safe site?*
2. The project will be implemented in a way that will foster the long-term well-being of the community. *Is there the potential to foster the well-being of the community through the implementation of the project, and what might need to be put in place (e.g. infrastructure, resources, planning initiatives) to ensure this outcome?*
3. At a later step in the process, the community must demonstrate it is informed and willing to host the project. *Is there the potential for citizens in the community to continue to be interested in exploring this project through subsequent steps in the site selection process?*
4. The project will be implemented in a way that will foster the long-term well-being of the surrounding area. *Is there the potential to foster the well-being of the surrounding area and to establish the foundation to move forward with the project?*

## What Must Be Shown in Order to Be Considered for Subsequent Steps?

In order for a community and associated siting area(s) to be considered for subsequent steps in the site selection process, at a minimum the feasibility study findings must show:

1. Identified siting areas have the potential to satisfy six safety functions.
2. Potential for a net positive benefit to both the community and the surrounding area. The total resources required to support the implementation of the project at the site and the well-being of the community and surrounding area will also be considered.
3. Potential for sustained interest among citizens in the community.
4. Potential for sustained interest in the surrounding area.

## The Two Phases of Feasibility Studies (1/2)

- » Work will be conducted in two phases
- » Opportunity for stock-taking by both the community and the NWMO at the end of each phase
- » **Phase One Activities – Desktop Studies and Engagement**
  - Are expected to take a year or more to complete
  - Will focus on desktop studies and engagement of the community
  - Begin formal engagement with surrounding communities
  - Build on earlier work completed as part of the site selection process
- » **Phase Two Activities – Field Investigations and Regional Engagement**
  - Are expected to take a year or more to complete
  - Will focus on field studies in the community
  - Expand regional engagement with launch of a regional study
  - Build on work completed during Phase One feasibility studies

## The Two Phases of Feasibility Studies (2/2)

- » By the end of Phase One, communities with relatively low potential to be suitable for the project may be screened out of the site selection process
- » By end of Phase Two, one or two of the communities may be selected for the next step of the site selection process: detailed studies over a five-year period (Step 4)
- » Communities selected for Step 4 detailed studies will be those that hold the most potential for successful implementation of the project based on work that the NWMO and community complete together to explore the key questions

## Phase One Activities – Beginning 2012

Phase One activities build on earlier work completed as part of Step 2 of the site selection process. One year or more may be required.

1. **Agreement:** Made between the NWMO and accountable authorities on how work will proceed.
2. **Safety:** Further scientific and technical studies are conducted to explore potential suitability of the geology in the area and identify potentially suitable siting areas. Involves desktop studies conducted by the NWMO.
3. **Community Well-Being:** Further study of potential effects of the project on the long-term well-being of the community are conducted through desktop studies and engagement of community residents. The NWMO and accountable authorities complete this work together.
4. **Regional Picture:** Accountable authorities in the surrounding area and region, including Aboriginal communities, are engaged to identify questions and concerns to be addressed. The NWMO and community complete this work together.
5. **Stock-Taking:** The NWMO and the community take stock of work to date and findings about the potential suitability of the community.

## Phase Two Activities – Beginning 2013 (Earliest)

Phase Two activities build on work completed during Phase One through field studies, regional engagement and launch of a regional study. One year or more may be required.

1. **Confirmation:** The NWMO and community confirm the plan for Phase Two activities, and more formal community and regional engagement.
2. **Safety:** Further scientific and technical studies are conducted to explore potential suitability of the geology of siting areas. Involves field studies conducted by the NWMO.
3. **Community Well-Being:** Further study of potential effects of project on the long-term well-being of the community and engagement of community residents. Involves collection of primary source Community Well-Being information by the NWMO and accountable authorities working together.
4. **Refining Siting Areas:** Citizens in the community are engaged by the NWMO, and accountable authorities working together to help refine the list of potentially suitable siting areas.



## Phase Two Activities (continued)

5. **Regional Picture:** Accountable authorities and opinion leaders in surrounding area and region, including Aboriginal communities, are engaged in order to explore and assess potential effects on the well-being of the broader region as well as potential interest in the project. The NWMO and community work together to conduct this engagement. A regional study is initiated.
6. **Third-Party Review:** The potential suitability of geology in the siting area(s) is reviewed by a Third-Party Review Group to ensure safety and potential to foster community well-being. Members of this group are selected by the NWMO and accountable authorities in communities in the site selection process working together.
7. **Stock-Taking:** The NWMO and the community take stock of work to date and findings about the potential suitability of the community and siting area.
8. **Decision:** The NWMO identifies which communities and associated sites are eligible to proceed to Step 4 for Detailed Evaluations. Eligible communities decide if they wish to proceed.



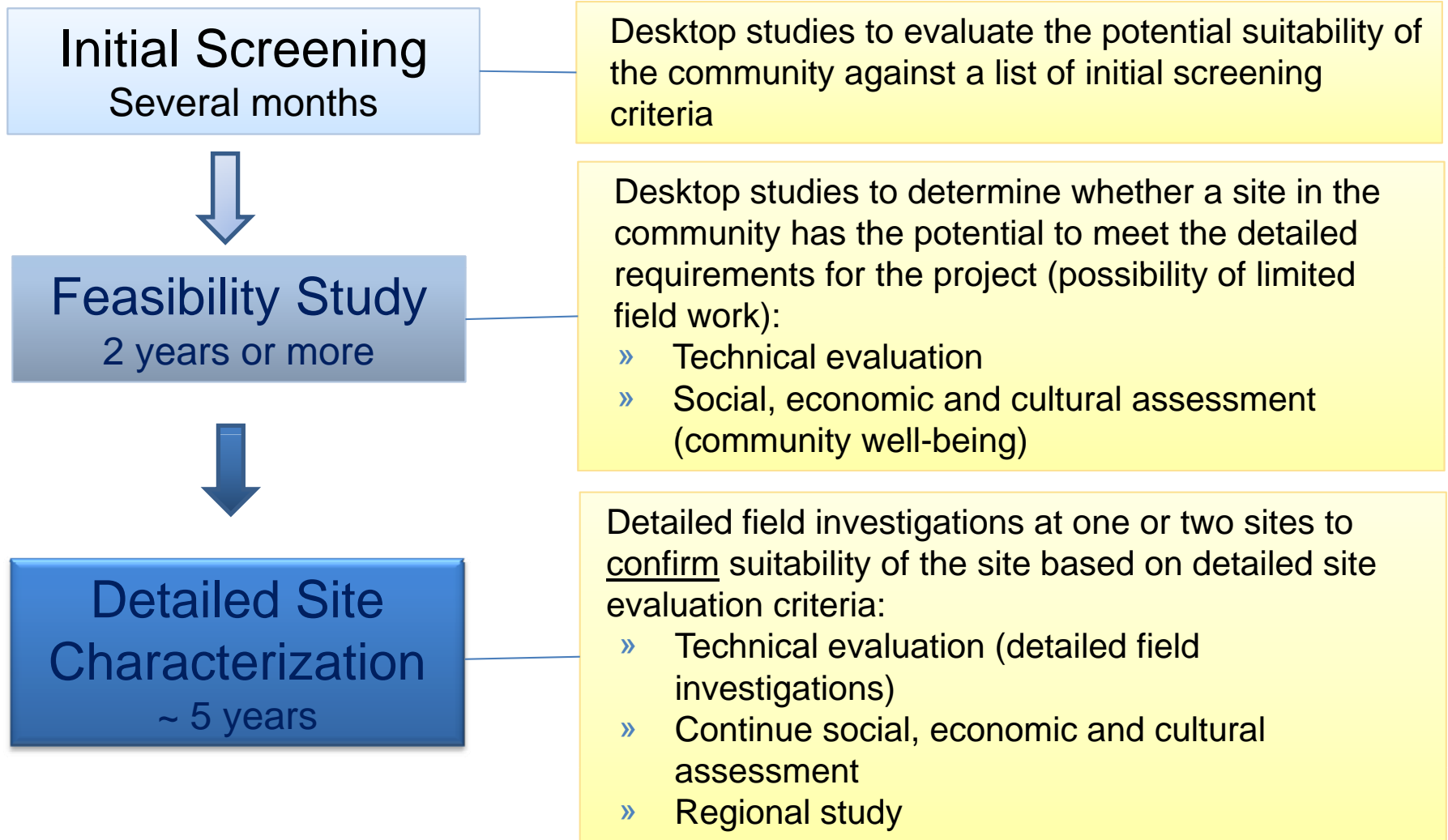
# Questions on Feasibility Studies?



# Focus on Safety: Technical Site Evaluation Process

# Main Site Evaluation Stages in Brief

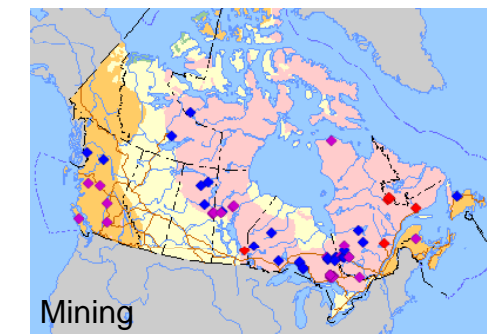
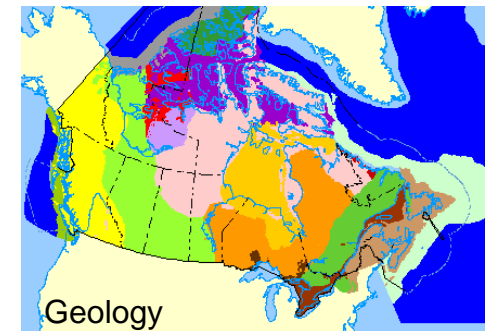
Site evaluation process is driven by community's interest to participate.



## Building on Initial Screenings

**Objective of initial screening was** to assess whether there are any obvious conditions that would exclude a community from the NWMO site selection process based on readily available information concerning:

- » Enough land to accommodate surface and underground facilities
- » Outside protected areas, heritage sites, provincial/national parks
- » Land must not contain groundwater resources at repository depth
- » Land must not contain known economically exploitable natural resources
- » Land must not be located in areas with known geological and hydrogeological features that prevent site from being safe



## Review of Initial Screening Results

GEOLOGICAL MAP OF THE REGION

# Learning to Date on Potential Suitability of the Community



## Results of the Initial Screening

- » Based on readily available information and five screening criteria, no obvious conditions identified that would exclude the community from further consideration in the site selection process
- » There are areas within the boundaries and within the periphery of the community that are potentially suitable for hosting a deep geological repository
- » Community is eligible for preliminary assessment against both technical and social factors – feasibility studies

## Next Step – Geoscientific Feasibility Study

### Objective

- » Assess whether a candidate area contains siting areas that are potentially suitable for hosting a deep geological repository.

### Suitable sites must satisfy six safety functions

1. Safe containment and isolation of used nuclear fuel
2. Long-term resilience to future geological processes and climate change
3. Isolation of used fuel from future human activities
4. Amenable to site characterization and data interpretation activities
5. Safe construction, operation and closure of the repository
6. Safe and secure transportation routes



# Activities During Phase 1 of the Desktop Feasibility Study

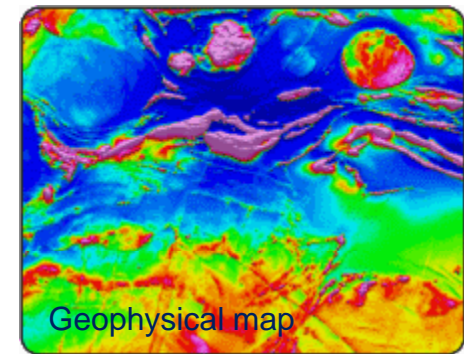


## Objective

- » Identify potentially suitable siting areas within each community
- » Focus on areas identified as potentially suitable during the initial screening

## Approach

- » Detailed review of all available geoscientific information (geology, seismicity, hydrogeology, etc.)
- » Conduct new interpretation studies using available information
- » Optional field observations to ground truth desktop findings



## Phase 1: Detailed Review of Available Geoscientific Information



- » Build on work conducted during the initial screening
- » Identify new sources of information (e.g. from mining companies, quarries, etc.)
- » Review will provide further information on key geoscientific factors:
  - Rock type
  - Hydrogeology
  - Bedrock exposure and thickness overburden
  - Surface constraints (water bodies, topography, etc.)
  - Potential for natural resources
  - Etc.

## Phase 1: Further Studies



### Detailed Analysis of Available Geophysical Surveys

- » Analysis will provide more information on type, homogeneity and thickness of the rock formations (using public and privately owned geophysical datasets)

### Lineament Studies (Identification of Faults and Fractures)

- » Will provide information on distribution, frequency and nature of surface faults and fractures using topographic maps, satellite images and geophysical surveys

### Remote Sensing Data Interpretation

- » Identify areas of exposed bedrock or with relatively thin overburden cover and confirm surface hydrological features (watershed and catchment areas, recharge/discharge zones, water flow direction, etc.)
- » Identify site accessibility constraints (topography, water bodies, infrastructure, etc.)

## Phase 1: Optional Field Observations

### Objective

- » Short duration non-intrusive field observations to further assess potential suitability of identified “siting areas”

### Activities

- » Confirm characteristics of the rock
- » Estimate thickness overburden and extent of areas where the bedrock is exposed
- » Confirm hydrological features, and site accessibility
- » Confirm the presence and characteristics of interpreted faults and fractures
- » Etc.

# Preliminary Field Investigations During Phase 2 of the Feasibility Study



## Objective

- » Further assess and refine location of siting areas identified during the desktop study

## Activities

- » High-resolution geophysical surveys (gravity, magnetic, electromagnetic)
- » Refined lineament studies (detailed identification of faults and fractures)
- » Drilling of a limited number of deep boreholes
- » Sampling and testing





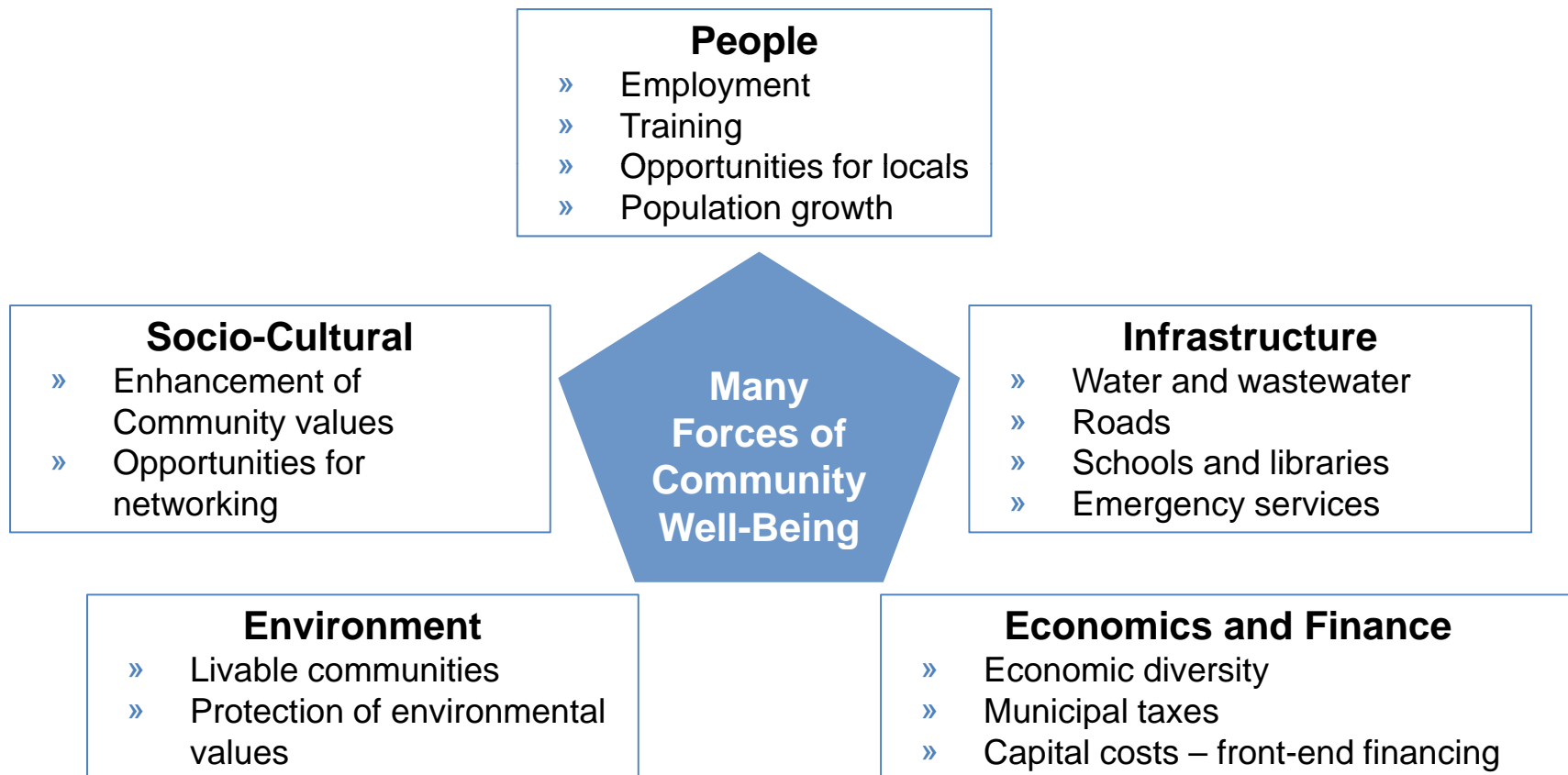
# Questions on Safety: Technical Site Evaluation Process?



# Focus on Community Well-Being and Engagement

# Fostering Community Well-Being

- » Communities will want to consider the APM project from all dimensions of long-term sustainability
- » Only the host community can define the factors and balance most appropriate for them





## Community Well-Being Evaluation Factors

- » Potential social, economic and cultural effects during implementation phase of project, including factors identified by ATK
- » Potential for enhancement of the community's and the region's long-term sustainability through implementation of the project
- » Potential to avoid ecologically sensitive areas and locally significant features
- » Potential for physical and social infrastructure to adapt to changes resulting from the project
- » Potential to avoid or minimize effects of the transportation of used nuclear fuel from existing storage facilities to the repository and site
- » Willingness; total resources

## Activities During Phase One Feasibility Studies

- » **Agreement:** Confirm agreement with community on how work will be conducted
- » **Communication:** Notify surrounding municipal and Aboriginal communities
- » **Identify No-Go Areas:** Discuss the community's preference for which of the potential siting areas identified in Step 2 should be excluded from further consideration
- » **Information Sources:** Discuss information that might be used to support feasibility studies
- » **Community Profile:** Work together to develop a profile of the community based on existing information
- » **Initial Assessment of Community Well-Being:** Work together to produce an assessment of potential for fostering the well-being of the community
- » **Community Outreach:** Work together to identify and implement activities to involve the community in reviewing and contributing to assessment
- » **Surrounding Area Outreach:** Work together to engage accountable authorities in surrounding municipalities and Aboriginal communities to learn their interest, questions and concerns about the project. May involve one-on-one meetings and workshops
- » **Preliminary Agreement on Potential Siting Areas:** Review the findings from scientific and technical studies of potentially suitable siting areas, and discuss which of these the community may wish to have explored in subsequent steps of the site selection process
- » **Stock-Taking:** Review findings of the assessment and mechanism for communicating the findings

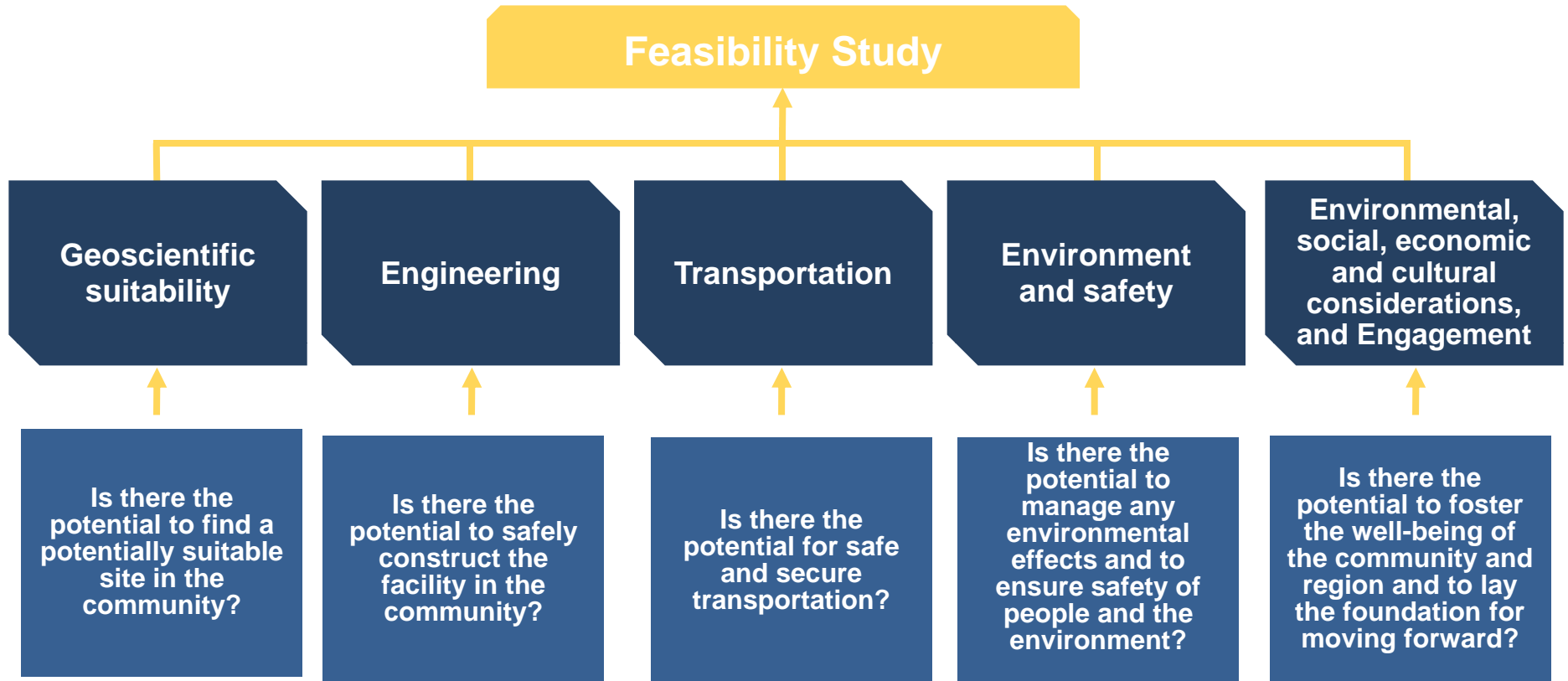
## Activities During Phase Two Feasibility Studies

- » **Agreement:** Confirm extension of agreement with community to cover Phase Two activities
- » **Communication:** Update surrounding municipal and Aboriginal communities about work
- » **Plan for Field Studies:** Discuss how scientific and technical field studies will be conducted. Work together to plan for community well-being related field studies, which may include interviews, open houses to engage citizens in the community and those in the surrounding area, market studies, other
- » **Preliminary Agreement on Potential Sites:** Work together to engage community residents in process of identifying potential site(s) within the identified siting areas
- » **More Detailed Assessment of Community Well-Being:** Work together to explore further the potential for fostering the well-being of the community through implementing primary data collection activities and review of their findings
- » **Community Outreach:** Work together to identify and implement engagement activities to involve the community in the assessment
- » **Formal Regional Engagement and Regional Study:** Work together to more formally engage those in the region, municipal authorities and Aboriginal communities, to review and discuss potential effects of the project at the regional level, and to identify interest in the project, questions and issues. This may involve one-on-one meetings, workshops, formation of a regional Liaison Group and agreements with Aboriginal communities
- » **Preliminary Agreement on Potential Siting Areas:** Review the findings from scientific and technical studies of potentially suitable siting areas and discuss which of these the community may wish to have explored in subsequent steps of the site selection process
- » **Stock-Taking:** Review findings of the assessment and mechanism for communicating the findings



# Feasibility Study Report

# Feasibility Study Components





# Questions on Community Well-Being and Engagement?



# Requesting a Feasibility Study

## Requesting a Feasibility Study

- » Eligible communities must have successfully undergone initial screening
- » Communities notify the NWMO of their interest in proceeding to feasibility and pass a Council resolution
- » Sample Resolution:  
BE IT RESOLVED THAT (***name of community***) does hereby express interest and desire to continue to learn more about Adaptive Phased Management, and to proceed to the initial phase of the Feasibility Study step of the site selection process known as Step 3 including preliminary discussions with the NWMO.
- » Communities must show:
  - A continued interest in learning more about the project;
  - A willingness to engage community members in the learning process;
  - A willingness to work with surrounding communities and Aboriginal peoples to learn about and explore the project; and
  - A willingness to participate with integrity, transparency and accountability throughout all activities associated with participation in the process.
- » Requests are made to the NWMO Vice-President of APM Engagement and Site Selection



## Next Steps

- » Council considers whether it wishes to enter into feasibility
- » Council resolution to proceed
- » Letter of Agreement confirmed with the NWMO
- » Council and Community Liaison Committee meet with the NWMO to confirm how work will proceed
- » Community and the NWMO confirm plans for communications and engagement
- » Community and the NWMO confirm schedule for meetings and key activities over the next 12 months
- » Capacity-building and engagement resources (administrative expenses, community planning, independent advice, other) available to the community

## To Summarize...

Preliminary Assessment of Potential Suitability – Feasibility Studies are an opportunity for both the community and the NWMO to explore four key questions

1. *Is there the potential to find a safe site?*
2. *Is there the potential to foster the well-being of the community through the implementation of the project, and what might need to be put in place (e.g. infrastructure, resources, planning initiatives) to ensure this outcome?*
3. *Is there the potential for citizens in the community to continue to be interested in exploring this project through subsequent steps in the site selection process?*
4. *Is there the potential to foster the well-being of the surrounding area and to establish the foundation to move forward with the project?*



Questions?