

# A Preliminary Assessment of Illustrative Generic Community Economic Benefits from Hosting the APM Project

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AECOM

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NUCLEAR WASTE  
MANAGEMENT  
ORGANIZATION

SOCIÉTÉ DE GESTION  
DES DÉCHETS  
NUCLÉAIRES



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## **Nuclear Waste Management Organization**

The Nuclear Waste Management Organization (NWMO) was established in 2002 by Ontario Power Generation Inc., Hydro- Québec and New Brunswick Power Corporation in accordance with the *Nuclear Fuel Waste Act (NFWA)* to assume responsibility for the long-term management of Canada's used nuclear fuel.

NWMO's first mandate was to study options for the long-term management of used nuclear fuel. On June 14, 2007, the Government of Canada selected the NWMO's recommendation for Adaptive Phased Management (APM). The NWMO now has the mandate to implement the Government's decision.

Technically, Adaptive Phased Management (APM) has as its end-point the isolation and containment of used nuclear fuel in a deep repository constructed in a suitable rock formation. Collaboration, continuous learning and adaptability will underpin our implementation of the plan which will unfold over many decades, subject to extensive oversight and regulatory approvals.

## **NWMO Social Research**

The objective of the social research program is to assist the NWMO, and interested citizens and organizations, in exploring and understanding the social issues and concerns associated with the implementation of Adaptive Phased Management. The program is also intended to support the adoption of appropriate processes and techniques to engage potentially affected citizens in decision-making.

The social research program is intended to be a support to NWMO's ongoing dialogue and collaboration activities, including work to engage potentially affected citizens in near term visioning of the implementation process going forward, long term visioning and the development of decision-making processes to be used into the future. The program includes work to learn from the experience of others through examination of case studies and conversation with those involved in similar processes both in Canada and abroad. NWMO's social research is expected to engage a wide variety of specialists and explore a variety of perspectives on key issues of concern. The nature and conduct of this work is expected to change over time, as best practices evolve and as interested citizens and organizations identify the issues of most interest and concern throughout the implementation of Adaptive Phased Management.

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Nuclear Waste Management Organization

# A Preliminary Assessment of Illustrative Generic Community Economic Benefits from Hosting the APM Project

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## Executive Summary

The NWMO is initiating a process to identify a location in an informed, willing community for a repository for the long term management of used nuclear fuel in Canada. Canada's Plan is referred to as Adaptive Phased Management (APM). A preliminary projection of the timing and costs for the project indicate billions of dollars will be invested in a host community, region and province over an extended period of time (i.e. greater than 150 years). This report provides an "order-of-magnitude" indication of the possible economic benefits to a host community, Economic Region, and host province, associated with the siting of the project.

Indicative results are presented for four generic and illustrative host communities:

1. A small northern community;
2. A large northern community;
3. A small southern community; and
4. A large southern community.

In general, it is demonstrated that economic benefits tend to be greatest in larger host communities (or a collection of smaller communities working as a group), however all generic host communities would experience significant economic benefits including:

1. Increased employment,
2. Higher employment income, and
3. Overall wealth creation as measured by GDP.

In most cases, the APM project could be a catalyst for dramatic improvements in community well-being and sustainability for the long-term. The infusion of new employment and associated business activity could provide the basis for major investments in people (e.g. education and training), infrastructure, and other community assets deemed of value to a host community and region.

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# 1. Introduction

The Nuclear Waste Management Organization (NWMO) is initiating a process to identify a location in an informed, willing community for a deep geological repository for the long term management of used nuclear fuel in Canada. Canada's plan is referred to as Adaptive Phased Management (APM). To support the siting process, and in response to a request made by its Municipal Forum, the NWMO is seeking to update and elaborate on existing community economic benefit knowledge that may be of interest to Canadian stakeholders and interested parties. This update will allow for a better understanding of the possible range of economic benefits and other implications that might result in a Province, Economic Region, or community should it choose to host the APM Project. This report is designed to build upon and update a high-level analysis first completed in 2005<sup>12</sup> and summarized most recently in a brief report published in April 2009<sup>3</sup>.

This report updates previous (2005) economic benefit information and provides more insight into possible benefits at a host community level.

The existing economic benefit information only provided an indication of possible impact at an Economic Region level. An Economic Region is a very large census region, as defined by Statistics Canada, which is made up of many communities or sub regions. As such, it is not easy for an individual community to assess the possible implications for themselves. For example, the implications for a small community of 5,000 people would be undistinguishable from the information relating to a much larger economic region that could be several hundred-fold larger in population size.

This report updates the 2005 economic benefit information, (which is based on the 2001 Census), and extends the analysis to a more local level. ***This study was not undertaken to determine the definitive economic benefits to any host community.*** Rather, at this very early stage in the siting process the primary objective is to illustrate the possible “***order-of-magnitude***” economic benefits to a host Province, Economic Region, and community. Therefore, the analysis and discussion of economic benefits in this report must be interpreted as preliminary, high level, and based on a static set of assumptions which are likely to change. The possible economic benefits are not meant to be extrapolated to any one community.

The analysis and discussion of economic benefits in this report must be interpreted as preliminary, high level and based on a set of static assumptions that are subject to change.

This report discusses possible economic benefits to generic communities within generic Economic Regions within a host province. Data referring to one of the illustrative generic host communities in this report is an average of all communities of a selected size range in the generic Economic Regions divided roughly between northern and southern parts of a Province. This generic community data is used to illustrate the possible range of economic impacts in what is called in this report a “generic” community that is a community type, characterized by size, and location in a northern or southern part of the province, with the expectation that each of these communities will have unique capacities and drivers.

<sup>1</sup> NWMO, 2005. Choosing a Way Forward: The Future Management of Canada's Used Nuclear Fuel, Final Study, November 2005.

<sup>2</sup> Gartner Lee Limited and Golder Associates Ltd. 2005. Assessment of Benefits, Risks, and Costs of Management Approaches by Illustrative Economic Regions. Technical Report to the NWMO.

<sup>3</sup> Summary of Economic Benefits Linked to Adaptive Phased Management at an Economic Region Level, AECOM, April 2009

This report first provides an overview of the methodology, followed by a presentation and discussion of illustrative economic benefits to:

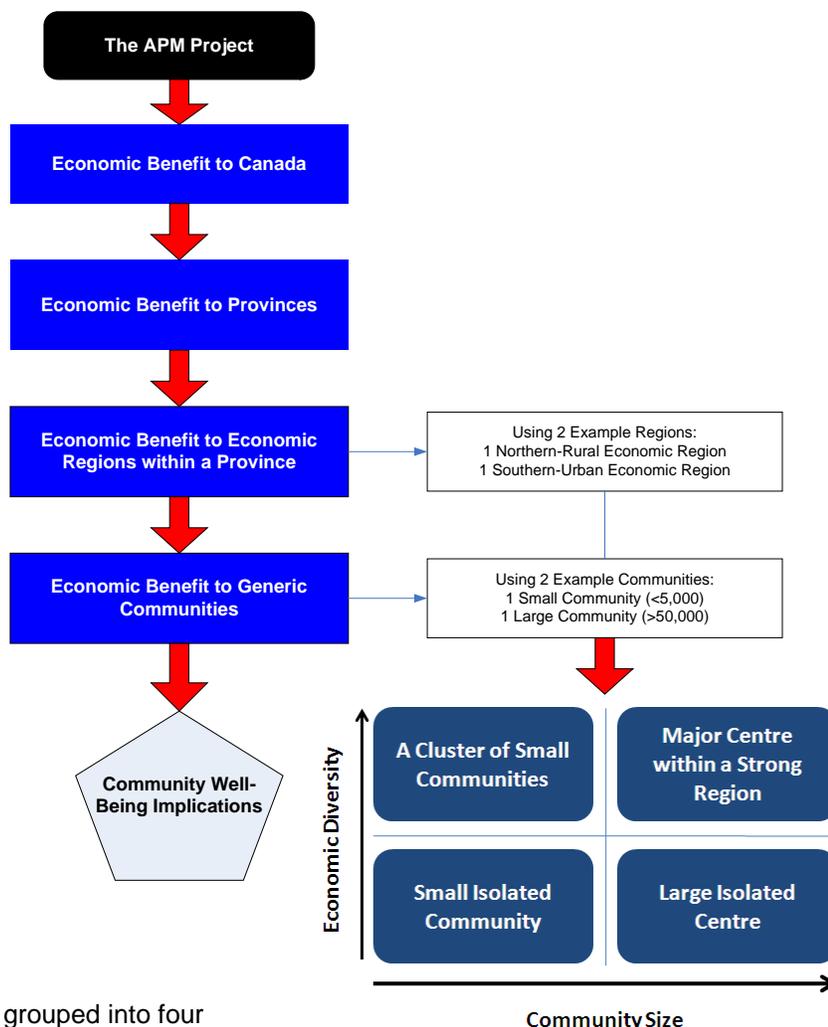
1. A host province and the rest of Canada;
2. A host Economic Region within a province; and
3. Two generic sizes of communities within a host Economic Region.

The summary section draws the reader’s attention to a high level understanding and appreciation of the range of possible economic benefits, and the broader associated issues and considerations that might need to be considered within a Community Well-Being context. The NWMO has committed to implementing the project in a manner that fosters the long term well-being of the community which hosts it.

### 1.1 Approach and Methodology

This report provides an illustration of the nature and magnitude of economic benefits that may result for a community wishing to host the APM project. The approach and methods are based on creating illustrative “reference” communities in the province for the purpose of exploring economic effects, (Figure 1).

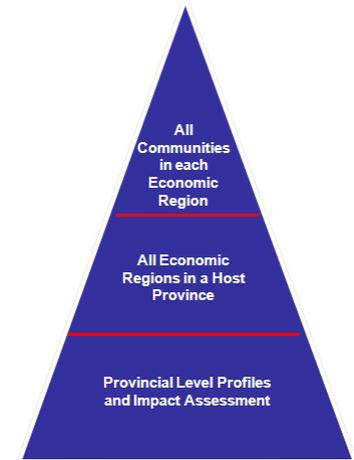
Figure 1: Approach to Developing Illustrative and Generic Economic Benefits



Communities were grouped into four

categories:

1. **Small northern community and host region** – to represent a small isolated community with limited economic diversity.
2. **Large northern community and host region** – to represent a large community that possesses a wider diversity of economic activity compared to a small isolated community but is still located in a remote or rural region of the province.
3. **Small southern community and host region** – to represent a cluster of small communities that together possess a wide economic diversity within the populated region of each province.
4. **Large southern community and host region** – to represent a community that not only contains a large workforce base, but also has a diverse economy to serve the APM project and its workforce.



The economic analysis started with a detailed compilation of all communities in the province by Economic Region. Data collection and synthesis focused on the following economic variables that were derived from the most recent Statistics Canada census and community profiles (2006-2007):

- Number and location of communities
- Population
- Employment by industry:
  - Goods producing industries; and
  - Service industries
- Labour force demographics

Concurrent with the above community profile development, the preliminary expenditure profile for the APM project was used to “run” the national Interprovincial Input-Output (I-O) model of the Canadian economy with the assistance of the I-O division of Statistics Canada. The I-O model was applied to each province and Canada to obtain a comprehensive and unique set of impact multipliers for employment, labour income, GDP and Gross Output. The results from the I-O model not only indicate the impact on these four indicators within each province, but also provide an indication of the level of economic benefit that would accrue to the rest of Canada, since no single province has all the necessary resources to supply a project of this nature and scale. The I/O model was used to derive the direct and indirect effects or multipliers for employment, labour income and GDP by phase of operation. The national income expenditure model was used to derive the induced multipliers for the same economic variables.

**Statistics about medium sized communities were also collected for this report. However, it was decided to conduct the analysis for only large and small communities. Since the I/O analysis is linear in scale, medium sized communities can expect that their generic benefits will fall between those illustrated for small and large communities.**

Once the provincial impacts were determined, the task of allocating economic benefits to a generic Economic Region<sup>4</sup>, and then ultimately to a generic host community and host sub-region, was accomplished in a separate process. This process essentially distributed the economic benefits derived from previous analyses into the **four generic reference communities** to determine the flow of economic benefits to:

- A host Economic Region,
- The host generic/average host community created for this analysis,
- Surrounding communities within a primary and secondary radius of the host community, and
- The host zone which includes the total economic benefits to the host community, the surrounding primary and secondary communities.

The benefit allocation parameters selected for illustration are reproduced for each of the four community types in Table 1. These parameters are simply a first approximation of how benefits might “flow” into generic communities and regions based on location and size. These estimates are based on the experience and judgement of the authors. Clearly, when a host community and region comes forward, these allocations can be tailored to better represent the conditions and aspirations of the community.

Table 1: Allocation Variables (Percent Capture) That Determine the Distribution of Benefits to Generic Host Regions and Generic Communities

	Generic Small Community		Generic Large Community			
	Construction	Operations	Construction	Operations		
Generic Southern Economic Region	Region	50	60	Region	60	65
	Host Community	35	40	Host Community	40	50
	Primary Zone	15	15	Primary Zone	20	20
	Secondary Zone	10	10	Secondary Zone	10	5
	Host Zone	60	65	Host Zone	70	75
Generic Northern Economic Region	Region	40	50	Region	50	55
	Host Community	25	35	Host Community	35	40
	Primary Zone	10	15	Primary Zone	15	15
	Secondary Zone	5	5	Secondary Zone	5	5
	Host Zone	40	55	Host Zone	55	60

<sup>4</sup> A “generic” northern or southern Economic Region is an average of the all northern or southern Economic Regions within a province. No attempt was made to “pick” a generic or illustrative region.

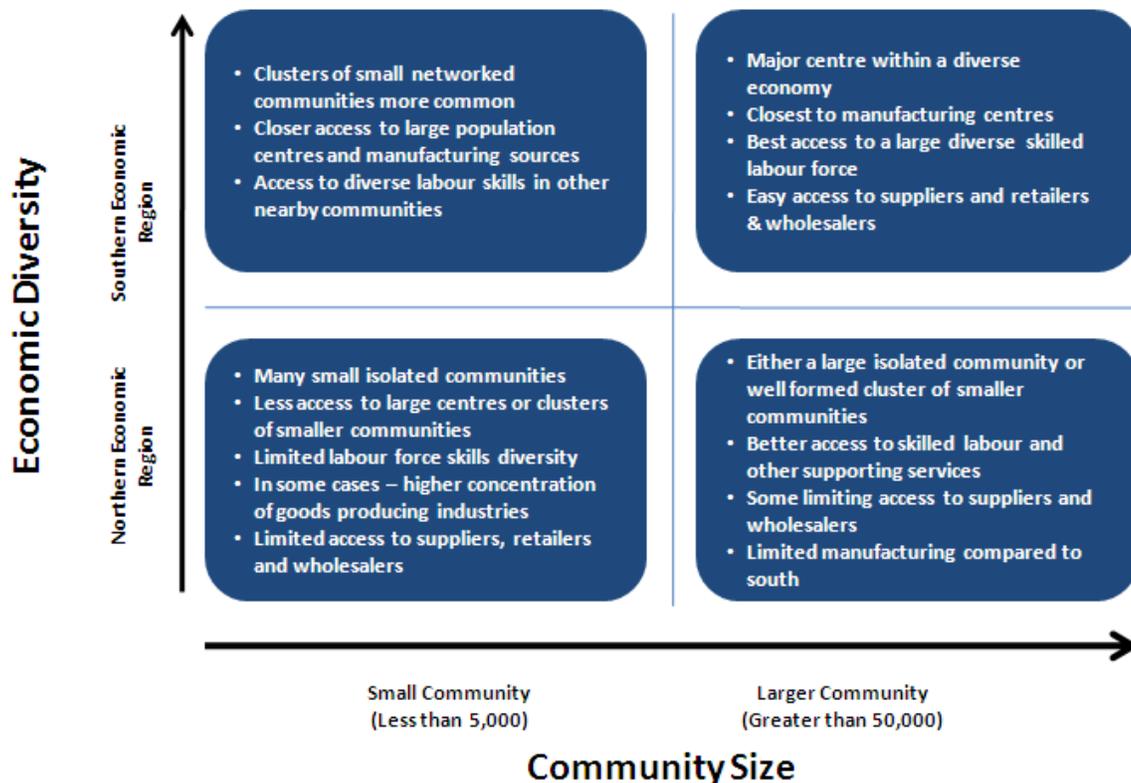
The allocation parameters in Table 1 are the percentages applied to the provincial economic benefits derived from the I-O and national income expenditure models that allocate benefits to a host Economic Region and host community(s). These percent allocations only represent those for the construction and operations phases of the APM project. In all cases, the site preparation phase percent allocation variables were similar to construction but slightly lower (up to 5% in total), and for the long term monitoring phase, the allocation variables were set to 70% in the host community with an additional 15% in the surrounding communities.

The overall logic for selecting the above allocation variables is based on past experience with major new development projects, in that the larger the host community and more economically diverse it or its region is, the better able it is to capture the economic benefits of a major new development.

The resulting economic benefits are expressed in this report from two perspectives:

1. Impact on employment opportunities, and
2. Estimated average annual labour income.

Figure 2: Rationale for Baseline Benefit Capture Allocations



Northern communities tend to be small, rural and remote with few large centres. Some northern communities have a higher proportion of goods production industries, most likely connected to natural resources processing such as forestry and mining products.

Southern communities, on the other hand, tend to have a more diverse economy (i.e. mix of goods and services industries) as well as a broader collection of small, medium and large communities, typically in closer proximity to each other with well developed transportations routes. The southern regions of each province tend to be the focus of population growth and a diverse base of economic activity and, thus, they are better able to access a large skilled labour force, many suppliers and a broad range of services that would benefit from the APM project. This means that a greater share of indirect project expenditures and indirect labour/household (consumers) expenditures will be spent in the southern regions compared to the north as this is where most supplies and consumer products originate from. This reality is an important consideration when establishing the baseline economic allocation parameters illustrated in Table 1.

Small northern communities operating alone will tend to capture less of the economic benefit opportunities for the reasons described above. However, when working as a cluster of small communities or as one large northern community (of communities) a greater portion of the economic benefit opportunities can be captured, such as: greater employment, and more local consumer spending and hence greater local business spinoffs. This notion is consistent with spatial economic analysis.

A host Economic Region or province may decide to invest in a host region or community to enhance its capacity to capture a greater share of the economic benefits illustrated in this report.

In many respects, a small community or cluster of communities in the southern regions of any host province can be similar to a large community or a cluster of small communities in the north in terms of its ability to capture a broad range of economic benefits from the APM project.

It is conceivable that should the APM project be sited in the northern region of any province, that there may be some infusion of new economic diversity in these regions, such as light manufacturing and wholesale trades, bringing new employment opportunities. In other words, the APM project may be sufficient in size and scale to alter the current state of economic diversity and opportunity in the north. In fact, given the size and scale of the APM project it is possible that the economy of any province will experience a fundamental shift that might alter the current structure.

## 1.2 Linkage to NWMO Siting Documents

The NWMO has published information regarding some of the economic benefits possible for a host community and region in Canada<sup>5</sup>. It states that construction activities will involve about 600-800 workers at the site. This report goes the next step and illustrates the “spinoff” benefits (including other direct, indirect and induced benefits) which in total amount to thousands of new jobs per year during construction in a host province and hundreds of new jobs per year in a host community and region. It should be noted that not all on-site workers will live in the local host community or host region, which is typical with major development projects of this nature in Canada.

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<sup>5</sup> NWMO, 2009. Moving Forward Together: Designing the Siting Process for Selecting a Site. Invitation to Review a Proposed Process for Selecting a Site, page 14, May 2009

## 2. The APM Project

This section provides a high level illustration of the expected nature and scale of capital and labour expenditures over the life of the APM project.

### 2.1 Expenditure Profile for APM in Canada

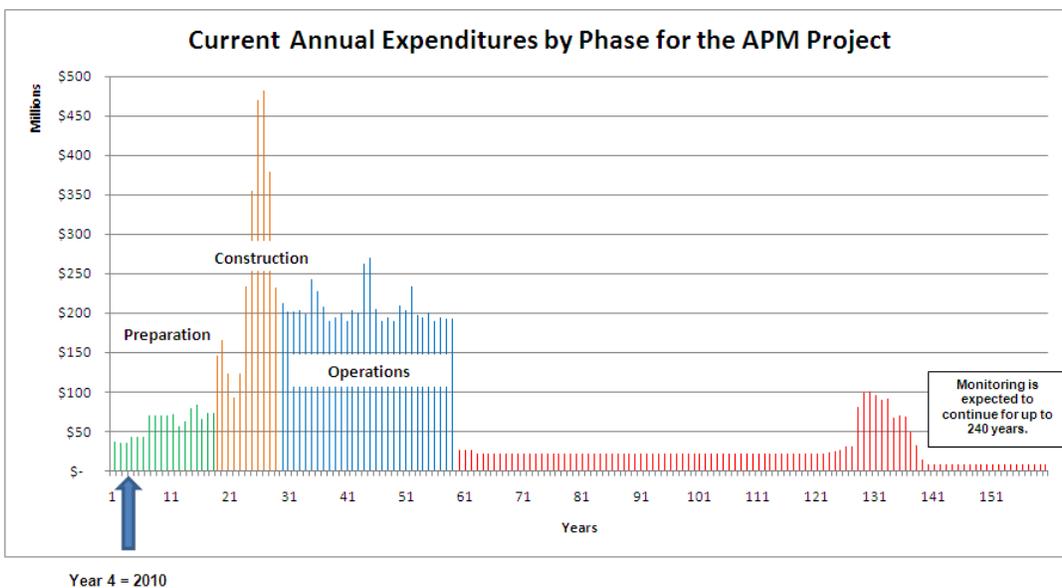
For any selected site in Canada a common preliminary expenditure profile provides the basis of this economic benefit update. The expenditure profile illustrated in Figure 3 is divided into four phases:

1. Site preparation and development of an on-site research centre,
2. Construction of the repository,
3. Operations, and
4. Long-term monitoring.

An overview of the project description is articulated in the NWMO publication *“Moving Forward Together: Designing the Process for Selecting a Site”*.<sup>6</sup> The important and relevant considerations for this report are the following:

- Overall expenditure on the APM project is estimated to be in the range of between \$16 to \$24 billion.
- The project will end, following completion of long-term monitoring, currently estimated at about 160 years after initiation.
- Current estimates place about 600 to 800 jobs on-site during peak construction. Many other additional jobs will be generated through “spin-off” activities that directly and indirectly support the four phases of the APM project.
- The many indirect and induced employment benefits will be distributed to many communities and regions across Canada, which will be illustrated in the following sections.

Figure 3: Preliminary Expenditure Profile for the APM Project

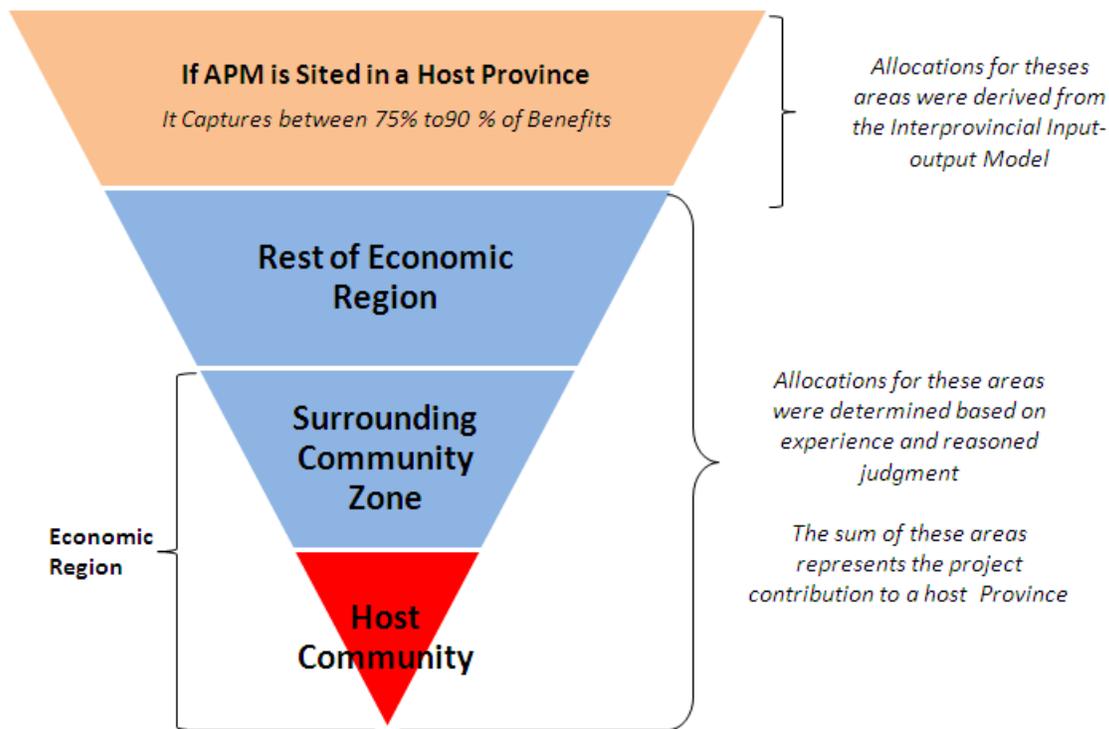


<sup>6</sup> NWMO, 2009. Moving Forward Together: Designing the Process for Selecting a Site – Invitation to Review a Proposed Process for Selecting a Site, May 2009.

### 3. National and Provincial Level Economic Benefits

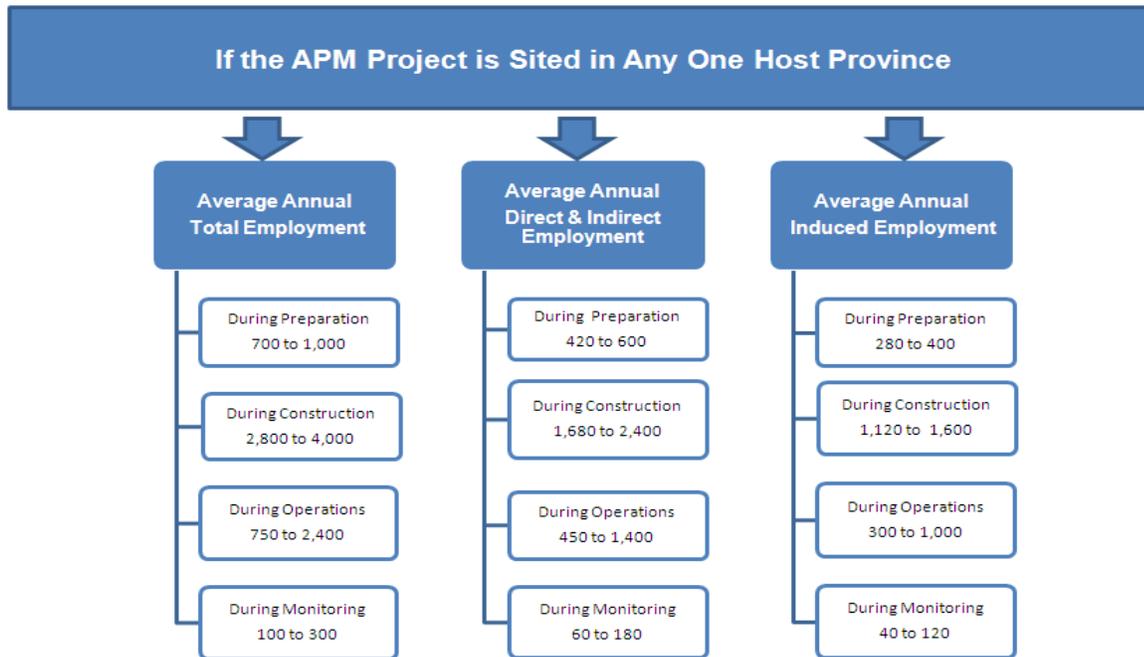
The APM project is by many accounts and measures a major undertaking in Canada. For comparison, a large mining operation in the rural and/or remote regions of Canada can cost in the order of \$2 billion to develop. So this means that the APM project might be about 10 times (or greater) than that based on its projected expenditures. Upon estimating the overall economic benefit to a host province it is evident that, a portion of the benefits (i.e. about 10 to 25%) will fall within the rest of Canada and internationally (see Figure 4), as certain products and services are currently derived from many national and international sources.

Figure 4: Provincial and National Share of Economic Benefits from the APM Project



The possible economic benefit to a host province during the four phases of the APM project is illustrated below in Figure 5.

Figure 5: Potential Provincial Level Employment Supported by the APM Project



Employment opportunities vary by project phase from 700 to 1,000 people (full-time equivalents) during site preparation, to about 2,800 to 4,000 people during construction, to about 750 to 2,400 people during operations, and ultimately settling into about 100 to 300 people during the long-term monitoring phase. These employment values include direct, indirect and induced effects. Values for direct and indirect employment ranges, as well as induced employment ranges are also provided. Generally, induced labour effects account for about 40% of the total employment effect, Figure 6.

Figure 6: Multiplier Definitions and Proportions



It is important to note that the above results have been estimated at one point in time using the national Interprovincial Input-Output model. This model is the primary tool used in Canada by government and the private sector for such analyses. In addition, this static model has certain limitations which must be considered when considering these results (See Appendix A for more detail).

## 4. Potential Benefits

This section provides a preliminary assessment of the possible range of economic benefits available in a:

- Host community (small or large),
- Host economic region (northern or southern), and
- Host province.

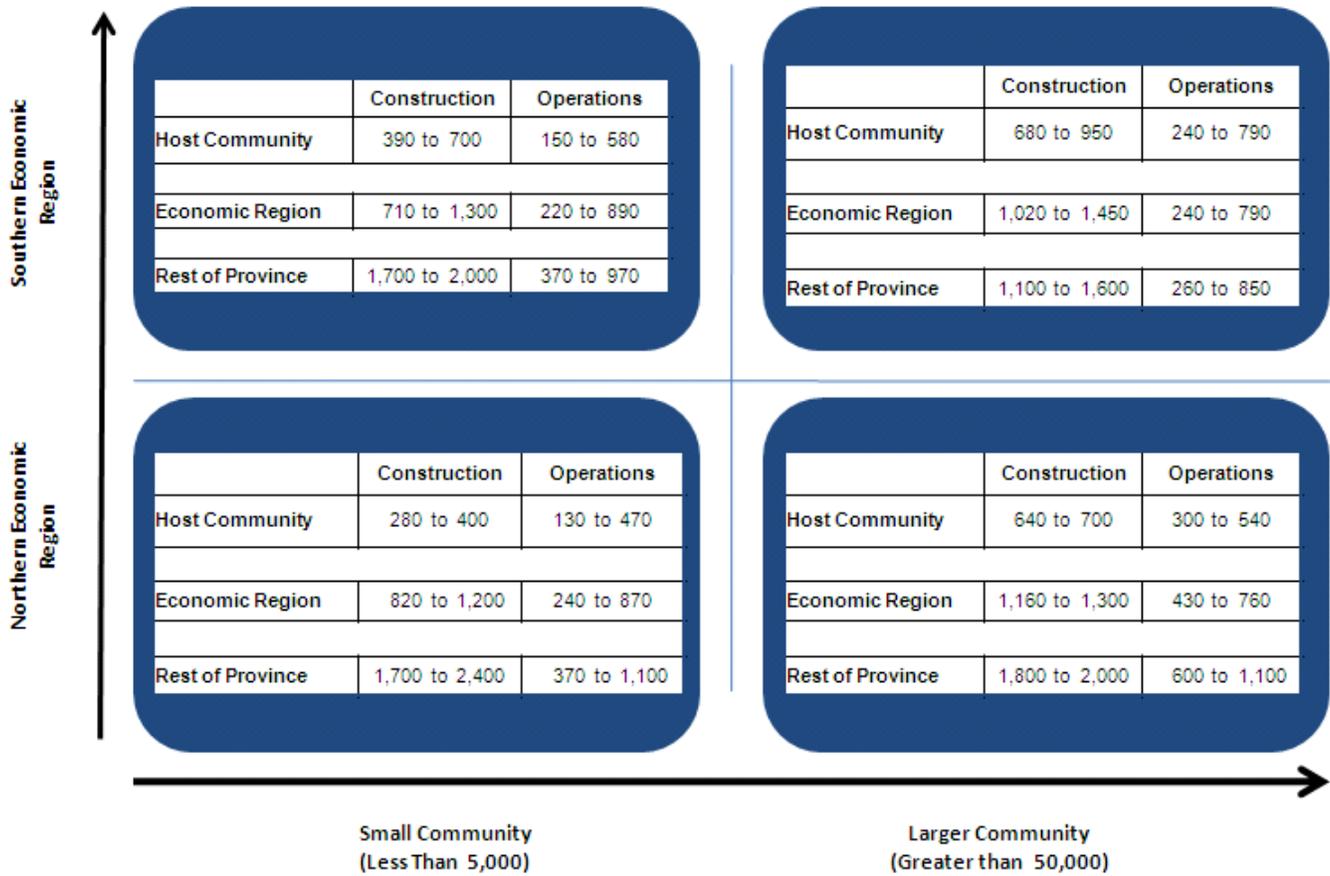
The information presented in this section is generic in nature with the intent of providing the reader with an indication only of the possible range of benefits that might occur in a host community and region in any of the host provinces. The possible benefits at all levels depend on the location of the host community and region. As discussed in the previous section, one can expect initially a different set of economic outcomes in a small northern community compared to a large southern community. However, the results presented in this section are simply illustrative since a host community, host region, and host province can collectively work together to influence the nature and scope of benefits that can be achieved. For example, certain investments can be made (such as labour training, supporting infrastructure, etc.) which can alter the amount of economic benefits captured in the local community and region. .

**Every generic host community scenario generates a very large economic benefit to the host region, the host community and its surrounding communities – host community zone.**

### 4.1 Employment Benefits to Generic Reference Communities

The level and distribution of employment opportunities resulting from the APM project if it were located in a host province is illustrated in Figure 7 for a host community, Economic Region and the rest of the province during construction and operations for each of the four generic communities.

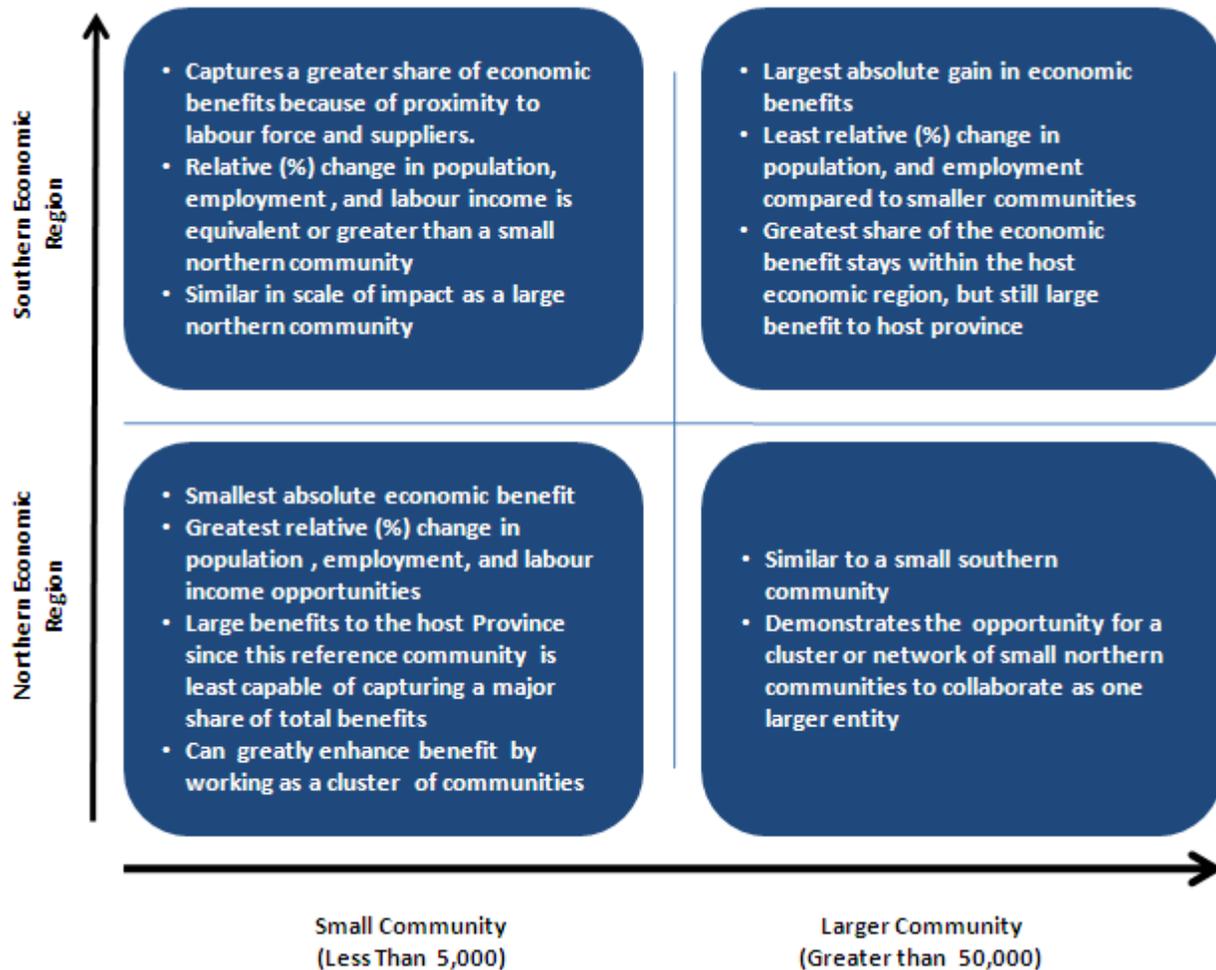
Figure 7: Employment Benefits to a Host Community, Economic Region, and Province During Construction and Operations



The results in Figure 7 illustrate the possible range and distribution of economic benefit opportunities made possible with the APM project for four reference communities across the four illustrative host provinces, using employment as a prime indicator. In general, the key themes of this analysis (as illustrated in Figure 8) are as follows:

1. All generic reference communities have the potential to experience very significant economic benefits from hosting the APM project, as represented by the employment opportunities. For example, a host community can potentially experience between 280 and 1,000 new employment opportunities during construction, depending on its location and working relationships with surrounding communities and the host economic region. Similarly, annual employment opportunities during operations in a host community are between 130 and 800 jobs per year, but persist for about 30 years, about 3 times longer than construction.

Figure 8: Key Conclusions of the Economic Assessment



2. In all cases, provinces (and all of the Economic Regions within the province) benefit greatly from the APM project since no single region can capture all of the direct, indirect and/or induced economic benefits. Depending on how a prospective host community, region, and province work together in planning for the APM project it is possible to “re-distribute” the generic illustrative benefits documented in this report through strategic investments in education, training and supporting infrastructure.
3. The smaller generic reference communities have the potential to experience the greatest net change in population growth, employment opportunities, and other economic benefits relative to larger communities. In most cases, the APM project has the potential to double the number of households and the overall population levels in a small community. By comparison, the relative impact on larger communities is much more diluted but still very significant.
4. Communities in the southern regions of a host province tend to have greater opportunity to capture a larger share of the project benefits for two reasons:
  - a. More people live in the southern regions and hence there is better access to the direct and indirect labour force requirements, and

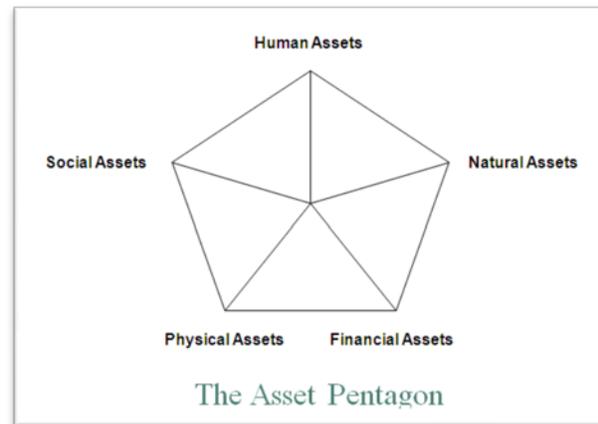
- b. There are more suppliers and other industrial/service industries in closer proximity.
5. A small community (located in the north or south) can greatly enhance overall economic benefits to itself and its region if a cluster or network of communities work together in an equivalent manner as one large community.

## 5. Implications for Community Well-Being

This section is intended to place the range of possible economic benefits described above into the broader context of Community Well-Being. As mentioned previously, the NWMO has made a commitment to implementing the project in a way which helps foster the long term Well-Being of the community. As learned during research undertaken by the NWMO<sup>7</sup>, the term “Community Well-Being” includes a combination of abstract ideas and human actions. Its meaning and interpretation is unique not only for communities but even for individuals and groups within a community. Concepts of community well-being may reflect the interests of individuals within a community and they may also reflect the interests of the collective of community interests. Concepts of well-being are recognized by NWMO to encompass social, economic, spiritual and cultural factors, as well as individual health and security that are defined by the community.

There is no single or best definition of “community well-being” as no two communities are alike. Ultimately, communities must define what they mean by well-being for themselves. A “community” can be a group of individuals linked by geography or interests (whether bound by physical, sociological, economic, cultural, and/or psychological dimensions)<sup>8</sup>.

“Well-being” relates to the quality of life or state of satisfaction within a community, and it is a ubiquitous term. There is no consensus about a definition of community well-being; however, there is consensus that these terms are best defined and measured by members of the community itself. When a community establishes for itself these terms it then starts to set its own goals and parameters for enhancing well-being. It is recognized by some experts that community considerations for well-being can be captured in one of five asset categories of; human, natural, financial, physical, and social assets.<sup>9</sup>



This consideration of community well-being acknowledges there are multiple scales on which the effects of the APM Project can be examined and the multi-dimensionality of communities and well-being (Ramsey and Smit 2002<sup>10</sup>). It supports the notion that if the benefits of the APM project are to be sustained over the long-term, then it is critical that a portion of the wealth created during the development activity be invested in a wide range of **Community**

<sup>7</sup> AECOM Canada Limited, 2009. Applying Community Well-Being: Lessons and Experience of Canadian Practitioners. A report prepared for the Nuclear Waste Management Organization, April, 2009.

<sup>8</sup> Gartner Lee Limited. 2007. The Role and Application of Sustainable Livelihoods Framework for Measuring and Monitoring Community Well-Being. Discussion Paper prepared for the NWMO, November 2007.

<sup>9</sup> AECOM, 2009. Applying Community Well-Being: Lessons and Experience of Canadian Practitioners. Discussion Paper prepared for NWMO, April 2009.

<sup>10</sup> Ramsey, Doug & Smit, Barry 2002. Rural community well-being: models and application to changes in the tobacco-belt in Ontario, Canada. *Geoforum*, 33(3), 367-384.

**Assets** that drive future growth, capabilities and expertise that will sustain a community over time. As well this investment should assist in capturing a greater portion of benefits locally than would be the case otherwise. The Community Assets we refer to in this report are defined below:

- **Human Assets** refer to the skills and knowledge inherent in the community(s) and the ability of various organizations and institutions that operate in the community(s) to provide people with opportunities for growth and learning, access to skills and knowledge, and access to essential services that are fundamental in maintaining people's feelings of health, sense of personal safety and their overall satisfaction with community.
- **Financial Assets** reflect the opportunities available to people for employment and participation in the economic life of the community(s), including the monetary or financial resources that people and municipalities use to achieve their economic objectives. Financial Assets are key determinants of a community's overall economic vitality.
- **Physical Assets** refer to the basic municipal infrastructure or hard services that allow a community to function effectively. The availability and quality of such Physical Assets serve to attract and retain people and investment in a community; they influence personal health and satisfaction with community. Overall, these Physical Assets serve to maintain overall community well-being.
- **Social Assets** of a community reflect the social and community activities in which people participate and the facilities or amenities that they draw upon in pursuit of their personal and community well-being objectives. Social Assets include the networks within the community and among communities, the connectivity among people that generate relationships.
- **Natural Assets** are those aspects of the biophysical environment (i.e., the land, air, water, wildlife, etc.) upon which community well-being depends.



This report focused on the economic benefits of the APM project from the primary perspective of employment opportunities and the implication it has for labour income and GDP at the provincial level.

As Financial Assets, employment and labour income determine the participation of residents in a community's economic life. As such, employment is a major determinant of overall community well-being. To individuals, families or households, employment provides the income that people use to achieve their personal financial objectives, which define their style and quality of life. Employment and its associated income provide a sense of personal security and have a symbolic value which contributes to a person's own self-image and their status within a community. To a community or region, employment influences its Human, Physical and Social Assets, while income provides the financial means for residents to undertake a variety of educational, social and community activities that strengthen a community's Human and Social Assets. For example, employment opportunities influence the way a community or region is perceived, that is, its attractiveness as a place to live or do business. As such, the availability of employment opportunities ultimately affects population levels (Human Assets), housing, community infrastructure and services (Physical Assets) which are major determinants of community character and cohesion (Social Assets).

The preceding economic analysis demonstrated that, as a result of the APM project, substantial economic benefits can be captured by a host province and its many regions and communities. The majority of these benefits will directly and positively contribute to the well-being of not only a host community(s) but other communities within an

Economic Region and beyond to the rest of the province and to some degree the rest of Canada. The degree to which this happens will depend on the host community in dialogue with its surrounding communities and region. These economic benefits can have profound implications for other Community Assets that determine a community's overall well-being. However, experience shows that several community traits in the five assets described above, beyond those considered in this economic analysis, will be critical in determining the overall effect of a major project on community well-being.

### 5.1 Partnering with NWMO to Achieve Community Well-being

NWMO has committed to working with communities to implement APM in a way which fosters the well-being of the host community and region. By working with the NWMO action plans can be established to ensure that the well-being goals that the community has set for itself help guide decision-making at each phase of the project, from construction through operation and long term monitoring to the benefit of the community.