Jacques Whitford

Environmental
Engineering
Scientific
Management
Consultants

3 Spectacle Lake Drive
Dartmouth NS
Canada B3B 1W8

Bus 902 468 7777
Fax 902 468 9009

www.jacqueswhitford.com

REPORT

Supplemental Information to the Environmental Registration for the Proposed Alton Natural Gas Storage Project

ALTON NATURAL GAS STORAGE L.P.

PROJECT NO. 1012229.

Jacques Whitford

An Environment
of Exceptional
Solutions

Registered to
ISO 9001:2000

REPORT NO. 1012229.

REPORT TO	**Alton Natural Gas Storage L.P.** **PO Box 36052** **Halifax, NS** **B3J 3S9**
FOR	**Supplemental Information to the Environmental Registration for the Proposed Alton Natural Gas Storage Project**

November 23, 2007

Jacques Whitford
3 Spectacle Lake Drive
Dartmouth, Nova Scotia,
B3B 1W8

Phone: 902-468-7777
Fax: 902-468-9009

www.jacqueswhitford.com

Jacques Whitford

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1.0 INTRODUCTION

1.1 Purpose

On July 6, 2007, Alton Natural Gas Storage L.P. (Alton) filed an Environmental Assessment (EA) Registration with Nova Scotia Environment and Labour (NSEL) for the proposed Alton Natural Gas Storage Project. The Minister responded on July 31, 2007 that he required additional information before he could make a decision about the Project (Appendix A). This report is a response to the Minister's request for additional information.

1.2 Objectives

The objective of this document is to address the specific items of the Minister's request. Specifically, the Minister requested the following in his July 31, 2007 letter:

1) Alton Natural Gas L.P. shall provide additional information to demonstrate that the prediction that project related effects to fish and fish habitat from the development, operation, and maintenance of the Alton Underground Natural Gas Storage Facility are insignificant. This information shall be prepared in consultation with Fisheries and Oceans Canada (DFO).

2) Details of discussions with First Nations regarding potential environmental effects of the project, and issues identified through these discussions. Plans for addressing identified First Nations' concerns including procedures to deal with project-related issues that may arise, and ensuring issues are recorded and resolved in a timely manner.

Supplemental information for each of these items is provided in the following sections. The fish and fish habitat concerns are addressed in Section 2.0 and Appendices B to I. First Nations and Aboriginal issues are addressed in Section 3.0 and Appendix J.

1.3 Summary of Proponent Activities Subsequent to EA Registration

Subsequent to the EA Registration filing, the Proponent has been active in addressing government issues and concerns raised during the review process. These included:

- DFO Working Session held at the Halifax Marriott Harbourfront Hotel on September 19, 2007. The session was attended by representatives from DFO, NSEL and the Proponent. The agenda, list of attendees, and notes from the session are presented in Appendix A;
- Meeting with representatives from the NSEL EA Branch;
- Additional detailed design, contingency planning and risk evaluation to respond to issues raised by DFO (Section 2.0 and Appendices B to I); and
- Correspondence and meeting with First Nations and Aboriginal community representatives (Section 3.0 and Appendix J).

1.4 Alton Commitment

Alton welcomes the opportunity to provide this supplemental information and engage in additional productive discussion with government representatives and representatives from First Nations and Aboriginal communities. Alton believes this has resulted in an improved Project that is environmentally sustainable and will be a benefit to Nova Scotians. Alton plans to continue these discussions throughout the life of the Project to ensure that benefits are optimized and any issues that arise are rapidly addressed.

Alton is committed to a program of environmental management that includes:

- Environmental protection planning;
- Monitoring; and
- Adaptive management (including contingency plans).

Alton will develop a detailed EA monitoring program in consultation with DFO regarding the development of sampling:

- Parameters;
- Locations;
- Frequency;
- Reporting; and
- Adaptive management.

Details on the proposed monitoring program are provided in Appendix C and elsewhere in this report.

Alton is also committed to ongoing communication and dialogue with representatives from First Nations and Aboriginal communities on issues of mutual interest. Detailed information on activities to-date and planned are included in Section 3.0 and Appendix J.

1.5 Project Benefits

Virtually every major natural gas market has access to natural gas storage facilities. Storage facilities were developed early on as part of the natural gas infrastructure and although they have been in operation in many areas of North America for fifty years, they continue to be a leading edge, environmentally sustainable technology. Clearly gas storage plays an integral role in the operation of many natural gas pipelines and market areas. Some of the benefits and reasons why storage has been developed in so many areas are outlined below.

1) Natural gas is the cleanest burning fossil fuel.

   The stability and security of supply encourages more customers to switch to natural gas lowering greenhouse gases and creating energy efficiency. This is particularly true for large industrial customers and power generators. Natural gas used in industrial and power generation applications is a very low emitter of greenhouse gases compared to coal and oil. For example, a high efficiency simple cycle natural gas fired turbine generating approximately 100 MW of electricity for one year[1] can lead to a reduction in greenhouse gas emissions of over 200,000 tonnes per year of peak load

[1] Enough electricity to supply the needs of 85,000 average households assuming approximately a 2,184 peaking hour season.

demand when compared to the amount of carbon dioxide emitted using the conventional mix of electricity generation in Nova Scotia.

2) Natural gas provides stable and secure supply.

   Gas storage in the market is highly valued because it helps ensure gas is available where it is needed when it is needed. During the winter natural gas demand can be many times higher than at other times of the year. Market area storage ensures that gas can be positioned close to the market during the summer when excess pipeline capacity typically occurs. During the winter, gas can be brought out of storage on very short notice and at very high delivery rates to help ensure that customers such as residential, schools and hospitals receive the gas supply they need for heating purposes at the coldest time of the year.

   The Maritimes and Northeast Pipeline (M&NP) has had a single gas supply source for many years, Sable Offshore Energy Project (SOEP). When SOEP gas supply is adequate or somewhat larger than expected, gas can be stored for use at a later date when gas production is curtailed. Because SOEP gas supply has been so variable, gas storage is a necessary technology to ensure a constant and reliable supply to the market all year round.

3) Salt cavern storage contributes to a renewable energy infrastructure.

   Salt caverns can complement other energy related projects through application of Compressed Air Energy Storage (CAES). CAES systems can store excess power from renewable energy sources such as solar energy, wind farms and tidal farms for later use.

4) Natural gas storage contributes to the natural gas infrastructure.

   Alton may help in developing natural gas infrastructure in Colchester County. The Alton facility will be located near Stewiacke, Brookfield, Millbrook, Truro and Alton. As a result, the location of Alton may hasten the development and reduce the cost of gas distribution facilities in the surrounding communities.

5) Natural gas storage contributes to an environmentally sustainable economic development.

   Alton has spent almost $5 million on the project to date with the majority of this being spent in the project area. Alton will continue to contribute to the community through job creation during and after construction, property and income taxes and sponsorship of community programs.

6) Natural gas storage maximizes the use of M&NP.

   The storage facility may be utilized by a variety of firms including large trading firms. These trading firms will typically cycle a high deliverability gas storage facility such as Alton four to five times per year to capture short term arbitrage opportunities. Because the gas cycled in and out of the Alton facility must always be transported on the M&NP system, additional gas will be transported on the pipeline. If the full 4 Bcf of gas is cycled five times per year, and all of that gas was moved under current interruptible tariffs on the M&NP system, M&NP would collect incremental revenue of approximately $18 million. This revenue would result in lower transport rates for firm shippers on the M&NP system, primarily the SOEP producers, resulting in higher netback prices for the producers and higher royalties for the Nova Scotia province. In addition, if the SOEP producers stored their gas during the low priced summer periods and then moved that gas to market during the higher priced winter periods, then the producer's average yearly price could be increased.

7) Natural gas storage saves costs.

   Natural gas purchased and put into storage in the summer is usually significantly cheaper than purchasing gas in the higher priced winter months. When looking at the seasonal natural gas prices for SOEP production since 1999, if in each year 4 Bcf of gas was bought and stored at the lowest prices in the summer months and then brought out and used during the highest priced winter months, then gas consumers could have saved up to $155 million over seven years.

As outlined above, Alton greatly contributes to Nova Scotia's *Environmental Goals and Sustainable Prosperity Act* (http://www.gov.ns.ca/legislature/legc/bills/60th_1st/3rd_read/b146.htm), which has a strong emphasis on innovation, technology, reduction of emissions, sustainability and economic prosperity. Alton is committed to working with the province to achieve and exceed their long term environmental and sustainability goals.

2.0 SUPPLEMENTAL INFORMATION RELATED TO FISH AND FISH HABITAT

2.1 Minister's Request

The Minister identified protection of fish and fish habitat as an issue requiring further information. Specifically, the Minister stated (Appendix A):

"Fisheries and Oceans Canada (DFO) and other interested stakeholders, raised concerns that the report failed to provide adequate information to support the prediction that effects to fish and fish habitat, which includes a species at risk (Inner Bay of Fundy Atlantic Salmon), are insignificant. Concerns include the effects of the withdrawal of water from the Shubenacadie River into both the water intake and the pre-mixing pond; the brine being discharged into the Shubenacadie River; and the discharge of sediments into the Shubenacadie River. DFO has determined that, based on the information provided to date, there is uncertainty in regards to the potential for certain works or undertakings associated with this project to contravene provisions of the Habitat Protection Provisions of the *Fisheries Act,* and the *Species at Risk Act*."

The Minister requested the Proponent to provide the following specific information:

- Alton Natural Gas L.P. shall provide additional information to demonstrate that the prediction that project related effects to fish and fish habitat from the development, operation, and maintenance of the Alton Underground Natural Gas Storage Facility are insignificant. This information shall be prepared in consultation with Fisheries and Oceans Canada.

Additional information on the three key issues - water intake, brine discharge, and sedimentation - and their effects on fish and fish habitat are provided in the following sections and related appendices.

2.2 Key Issues

The three key issues from the Minister's request include:

- Water Intake;
- Brine discharge; and
- Sedimentation.

Each of these elements, along with updated design information, is addressed in the following sections.

2.2.1 Water Intake

The key issue with water withdrawal is the potential for entrainment and impingement of adult fish, juveniles, larvae and eggs, particularly for species at risk. These issues were discussed in the EA Registration (Section 6.1.5.1), and additional information was provided at the DFO Working Session on September 19, 2007. Table 2.1 presents the key issues raised by DFO at the Working Session.

TABLE 2.1 Water Intake Issues

Question/Comment	Supplemental Information Report Reference
Description of fish species in the Shubenacadie River, their expected locations and spawning times	Table 1 in Appendix C: Species vs. Activity: Impact Assessment in the Mixing Channel
Risk assessment for entrainment of eggs and larvae	Table 1 in Appendix C: Species vs. Activity: Impact Assessment in the Mixing Channel Appendix C: Biological Impact Statement (Sections 3.1 and 3.2) Appendix B: Intake and Discharge Facilities, Section 3.4 and Figures 2,3 and 6
Intake design	Appendix B: Intake and Discharge Facilities, Section 3.4 and Figures 3 and 6
Site location	Appendix B: Intake and Discharge Facilities, Sections 2.2, 2.3 and Figure 1
Upset conditions and shutoffs	Appendix D: Adaptive Management – Cavern Development Process Appendix E: Upset Conditions and Emergency Shutdowns
Intake design and velocities	Appendix C: Biological Impact Statement (Section 3.1) Appendix B: Intake and Discharge Facilities, Section 3.4
Monitoring	Appendix B: Intake and Discharge Facilities, Section 2.3 and Table 1 (“What If” Scenarios) Table 1 in Appendix C: Species vs. Activity: Impact Assessment in the Mixing Channel Appendix C: Biological Impact Statement (Section 3.1) Appendix D: Adaptive Management – Cavern Development Process Appendix F: Management of Sediments

Further engineering design details to address this issue were initially provided at the DFO working session by Mr. Wim Veldman of Matrix Solutions Inc., with a refined intake design currently presented in Appendix B.

In addition, a biological risk analysis was conducted for various life stages of fish found in and near the Project area with respect to potential harm from the water intake. This work was conducted by Mr. Bob Rutherford of Thaumas Environmental Consultants Ltd. and is provided in Appendix C. Additional monitoring requirements are also provided in Appendix C.

Appendix D provides details on how the development of brine salinity and release rate will allow for adaptive management. Further information on contingency plans, including upset conditions and emergency shutdowns for the cavern brining process (“what if” scenarios), are provided in Appendix E. Supplementary information and engineering design details conducted by Soltech Projects Inc. regarding sediment loading are presented in Appendix F.

Alton is committed to a program of environmental management that includes environmental protection planning, monitoring, and adaptive management (including contingency plans). Alton will develop a detailed monitoring program to verify environmental effects predictions related to the water intake in

consultation with DFO. This program will include monitoring parameters, locations, frequency, reporting, and adaptive management. A proposed monitoring program is included in the EA Registration and Appendix C of this report.

The additional Project design details and the biological evaluation confirm and provide additional support for the conclusion in the EA Registration that the risk of entrainment and impingement from the water intake structures is not likely to be significant with respect to fish and fish habitat including protected species. This prediction, while confident, will be verified through the proposed environmental monitoring program to be developed in consultation with DFO.

2.2.2 Brine Discharge

Diluted brine discharge from the caverns into the Shubenacadie River was first addressed in the EA Registration document (Section 6.1.5.1). Additional information was provided at the DFO Working Session on September 19, 2007. Table 2.2 presents the key issues raised by DFO at the Working Session.

TABLE 2.2 Brine Discharge Issues

Comment	Supplemental Information Report Reference
Description of fish species in the Shubenacadie River, their expected locations and spawning times	Table 1 in Appendix C: Species vs. Activity: Impact Assessment in the Mixing Channel
Collect additional salinity data at project site	Appendix G: Ongoing Salinity, Temperature and Depth Monitoring
Salinity management	Appendix B: Intake and Discharge Facilities, (Sections 2.2, 2.3, 3.1, 3.2, 3.3 and Figure 5) Appendix D: Adaptive Management – Cavern Development Process
Effect of the erosion area and salinities on eggs/larvae	Appendix C: Biological Impact Statement (Sections 3.1 and 3.2) Appendix D: Adaptive Management– Cavern Development Process Table 1 in Appendix C: Species vs. Activity: Impact Assessment in the Mixing Channel
Salinity mixing and dispersion rates in the mixing channel	Appendix B: Intake and Discharge Facilities (Sections 3.2, 3.3 and Figure 5) Appendix C: Biological Impact Statement (Section 3.2) Table 1 in Appendix C: Species vs. Activity: Impact Assessment in the Mixing Channel Appendix D: Adaptive Management– Cavern Development Process
Increased salinity in the Minas Basin	Appendix B (Section 2.1)
Increased salinity in the Shubenacadie River	Appendix B (Section 2.2)
Temperature differential between discharge and ambient during seasons	Appendix C: Biological Impact Statement (Section 3.2.5) Appendix H: Heat Transfer Study
Risk assessment for brine discharge related to mixing zone	Appendix C: Biological Impact Statement (Sections 3.1 and 2.1) Appendix D: Adaptive Management
Site location	Appendix B: Intake and Discharge Facilities (Sections 2.2, 2.3 and Figure 1)
Detailed channel design	Appendix B: Intake and Discharge Facilities (Sections 2.0, 3.4 and Figures 2 to 6)

TABLE 2.2 Brine Discharge Issues

Comment	Supplemental Information Report Reference
Upset conditions and shutoffs	Appendix D: Adaptive Management – Cavern Development Process Appendix E: Upset Conditions and Emergency Shutdowns
Nitrogen conditions	Appendix I: Nitrogen and Oxygen
Oxygen conditions	Appendix B: Intake and Discharge Facilities, Table 1 (Sections 3.3, 4.0, and Figure 6) Appendix I: Nitrogen and Oxygen
Mixing channel flow and velocities	Appendix B: Intake and Discharge Facilities (Sections 2.0, 2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 2.7, 3.0, 3.1, 3.2, 3.3 and Figure 2) Table 1 in Appendix C: Species vs. Activity: Impact Assessment in the Mixing Channel Appendix C: Biological Impact Statement (Sections 3.1 and 3.2)
Outfall design velocities	Appendix C: Biological Impact Statement (Section 3.2)

Further engineering design details to address this issue were initially provided at the DFO working session by Matrix Solutions Inc. with a refined discharge and mixing channel design currently presented in Appendix B.

A biological risk analysis was conducted by Thaumas Environmental Consultants Ltd. for various life stages of fish found in and near the Project area with respect to potential harm from the brine discharge (Appendix C) including additional monitoring requirements.

Appendix D provides details on how the development of brine salinity and release rate will allow for adaptive management. Additional information on contingency plans, including upset conditions and emergency shutdowns for the cavern brining process ("what if" scenarios), are provided in Appendix E.

Appendix G includes results from recent and ongoing salinity monitoring in the Estuary conducted by Martec Limited. Appendix H includes additional information from Soltech Projects Inc. on the likely temperature of brine returning to the Shubenacadie River Estuary from the cavern site. Details on nitrogen and oxygen in the returning brine water are provided in Appendix I.

Alton is committed to a program of environmental management that includes environmental protection planning, monitoring, and adaptive management (including contingency plans). Alton will develop a detailed monitoring program to verify environmental effects predictions related to the brine discharge in consultation with DFO. This program will include monitoring parameters, locations, frequency, reporting, and adaptive management. A proposed monitoring program is included in the EA Registration and Appendix C of this report.

The additional Project design details and the biological evaluation confirm and provide additional support for the conclusion in the EA Registration that the risk from discharge of diluted brine is not likely to be significant with respect to fish and fish habitat including protected species. This prediction, while confident, will be verified through the proposed environmental monitoring program to be developed in consultation with DFO.

2.2.3 Sedimentation

Discharge of sediments into the Shubenacadie River due to Project construction was first addressed in the EA Registration document (Section 6.1.5.1). Further sediment loading information was presented at the DFO Working Session. Table 2.3 presents the key issues raised by DFO at the Working Session.

TABLE 2.3 Sedimentation Issues

Comment	Supplemental Information Report Reference
Sediment effects on intake	Appendix B: Intake and Discharge Facilities (Sections 2.3, 3.4 and Table 1 - "What If" Scenarios) Appendix D: Adaptive Management – Cavern Development Process Appendix F: Management of Sediments
Sediment effects on outfall	Appendix B: Intake and Discharge Facilities, (Sections 2.3 and Table 1 - "What If" Scenarios) Appendix D: Adaptive Management – Cavern Development Process Appendix F: Management of Sediments
Sediment effects on mixing channel	Appendix B: Intake and Discharge Facilities (Sections 2.2, 2.3, 2.5, 2.7 and Table 1 - "What If" Scenarios) Appendix D: Adaptive Management – Cavern Development Process Appendix F: Management of Sediments
Sediment effects on operations	Appendix D: Adaptive Management – Cavern Development Process Appendix F: Management of Sediments

Further engineering design details to address this issue were initially provided at the DFO working session by Matrix Solutions Inc. with a refined discharge and mixing channel design currently presented in Appendix B. Contingency planning ("what if" scenarios) to address siltation of the mixing channel and water intake are included in Appendix B.

Appendix D provides details on how the development of brine salinity and release rate will allow for adaptive management. Further information and engineering design details conducted by Soltech Projects Inc. regarding sediment loading are presented in Appendix F. Sediment loadings (both intake and discharge) will be managed through Project design (*e.g.,* design of mixing channel and water intake to accommodate high natural level of suspended sediments) and operation.

The additional Project design details and the biological evaluation confirm and provide additional support for the conclusion in the EA Registration that the risk from discharge of sediment is not likely to be significant with respect to fish and fish habitat including protected species. This prediction, while confident, will be verified through the proposed environmental monitoring program to be developed in consultation with DFO.

3.0 SUPPLEMENTAL INFORMATION RELATED TO FIRST NATIONS AND ABORIGINIAL COMMUNICATIONS

3.1 Minister's Request

Additional information was requested from the Proponent to demonstrate how First Nations' concerns will be considered in the development and operation of the undertaking. Specifically, the Minister requested:

"Details of discussions with First Nations regarding potential environmental effects of the project, and issues identified through these discussions. Plans for addressing identified First Nations' concerns including procedures to deal with project-related issues that may arise, and ensuring issues are recorded and resolved in a timely manner".

In support of the EA Registration and in subsequent activities, the proponent sought to identify First Nations' and Aboriginal community issues related to the proposed Project. Ensuring good relations with potentially affected communities of interest are of prime concern to Alton and are seen as a key component for a long and beneficial Project life. These activities are ongoing and will continue, as required, throughout the life of the Project. These details are provided below and are divided into proponent activities to-date and planned activities.

3.2 Proponent Activities To-Date

3.2.1 Proponent Activities Prior to EA Registration Submission

Mi'kmaq Ecological Knowledge Study (MEKS)

The Proponent commissioned a qualified First Nations consultant (Membertou Geomatics) to undertake a Mi'kmaq Ecological Knowledge Study (MEKS) specifically to identify and evaluate potential issues of concern to First Nations communities in the Project area. This report was filed as Appendix J of the EA Registration and was available for public review and comment. A summary of the MEKS is presented in Section 6.7 of the EA Registration.

In particular, the purpose of the MEKS was to:

- determine historic and current Mi'kmaq land and resource use in the Project area;
- provide an inventory of plants of significance to the Mi'kmaq in the Project area;
- provide an analysis of potential impacts of the Project on Mi'kmaq land and resource use; and
- provide recommendations for further action or mitigation.

This information was used to assess any interactions that may occur between Project activities and Mi'kmaq traditional resource use in the Project area.

The objective of the MEKS was to identify and gather Mi'kmaq Ecological Knowledge with respect to traditional and current land and resource use within the Project area. The MEKS study area included the areas of land where the underground storage facility is to be formed, near Alton, Nova Scotia, and the 12 km proposed underground pipeline to the Shubenacadie River. In addition, the study area

included traditional use activities that occur in a 10 km buffer zone surrounding the Project area. All proposed Project components were within the MEKS study boundaries.

Information was gathered by three means:

- literature and archival research;
- interviews; and
- field sampling.

For the literature and archival research, various archival documents and published works were reviewed for information regarding the past or present Mi'kmaq occupation of the study area. Reviewed documents included census records, colonial government records, and published books.

For the interviews, an initial list of potential Mi'kmaq interviewees was developed and those were targeted for interviews. Numerous interviews were undertaken with individuals from the Mi'kmaq communities of Millbrook and Indian Brook. Interviewees were shown maps of the study area and asked various questions regarding their Mi'kmaq traditional use activities, including where they undertook those activities, when they undertook them, and what type of resource they utilized.

Site visits were undertaken with two Mi'kmaq Ecological Knowledge holders from the Indian Brook First Nation community at the proposed underground storage facility as well as at the site of water intake and diluted brine discharge at the Shubenacadie River. This provided the opportunity for further identification of traditional use activities occurring in the Project area.

The MEKS report findings are available in Section 6.7 and Appendix J of the EA Registration. The Table of Contents for the MEKS is provided below for reference.

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Schedule B – Mi'kmaq Fishing Sites and Areas

Schedule C – Mi'kmaq Hunting Sites and Areas

Schedule D – Mi'kmaq Plant Gathering Sites and Areas

Schedule E – Mi'kmaq Land Occupation Sites and Areas

It should be noted that many issues and concerns for First Nations and Aboriginal communities such as species and habitat protection and resource use are not unique to those communities; these issues and mitigation measures are thoroughly addressed in the EA Registration as well as in other sections of this supplemental report.

Other Activities

In addition to commissioning the MEKS, Alton also sent letters to the two local Chiefs and Council, namely Chief MacDonald (who has since been replaced by Chief Sack who was elected in 2006) and Council for the Shubenacadie First Nation, and Chief Paul and Council for the Millbrook First Nation. The purpose was to inform the Chiefs and Councils about the proposed Project and to seek their advice with respect to any issues and concerns prior to submission of the EA Registration. Copies of these letters were provided in Appendix I of the EA Registration.

Invitations were sent to Chief Paul and Lloyd Johnson of the Millbrook First Nation to request their attendance at the Project Launch on October 12, 2006 and at the Open House on November 22, 2006. However, they were unable to attend either event.

3.2.2 Proponent Activities Post EA Registration Submission

Since the EA Registration was filed, the Proponent has made additional contact with First Nations and Aboriginal organizations. On July 25, 2007, the proponent met with representatives of the Native

Council of Nova Scotia to discuss issues raised in response to the EA Registration. The Proponent addressed some of the issues raised during the meeting and provided additional information as a follow-up by letter on July 26, 2007. This letter is provided in Appendix J of this report.

In addition, on September 9, 2007, the Proponent sent letters to the Chief and Council of the Shubenacadie and Millbrook First Nations to seek further input and make the Project team available for any questions. These letters are provided in Appendix J of this report. Follow-up phone calls were made to both Chief Paul (Millbrook First Nation) and Chief Sack (Shubenacadie First Nation) on September 27, 2007 offering to meet with them and their council if they desired. Chief Paul stated that "they have no problem with what we [Alton] are doing" and would check with his council about holding a meeting with the Proponent. Chief Sack was out of town; however, the Proponent spoke with Mr. David Nevin, Economic Development Officer for Shubenacadie First Nation, and communicated the same message. Mr. Nevin said he would check with their Chief and get back to the Proponent if they would like to meet. Follow up letters were sent to Chief Paul and Chief sack on November 2, 2007. These letters are also provided in Appendix J of this report.

On November 15, 2007, The Proponent met with David Nevin, as well as Lloyd Johnson, Economic Development Officer for Millbrook First Nation and answered their questions and committed to meeting with the Councils if they wish.

On October 26, 2007 a phone discussion was held with Roger Hunka from the Native Council of Nova Scotia, and who is also the Director of Aboriginal Intergovernmental Affairs with Maritime Aboriginal Peoples Council. A meeting was arranged for November 13, 2007. At the meeting, the Proponent answered his questions and provided additional detailed design information.

Alton Natural Gas Storage also participated in the launch of the Atlantic Aboriginal Economy Building Strategy on November 7, 2007. This event was organized by the Atlantic Policy Congress of First Nation Chiefs.

3.3 Planned Proponent Activities

Throughout the planning and development stages of the Project, Alton is committed to the following activities with respect to the interests of potentially affected First Nations and Aboriginal communities:

- Ongoing Project information will be presented in a form and at times requested by potentially affected First Nations and Aboriginal communities. This information could include briefings to Chiefs and Councils, newsletters, or informal updates.
- Employment and business opportunities of mutual interest to Alton and First Nations and Aboriginal communities will be explored and pursued where appropriate. Such arrangements can include construction contracts; invitations to tender will be extended to all qualified local suppliers.
- A procedure will be developed so that any issues or concerns raised by potentially affected First Nations and Aboriginal communities, particularly those related to environmental effects, can be directed to Alton and resolved in a timely manner. This procedure will include contact information, documentation, and a resolution process.

4.0 SUMMARY AND CONCLUSIONS

4.1 Significance of Environmental Effects

One of the main purposes of environmental assessment is to ensure that potential environmental effects are considered early in project planning so that mitigative measures, including design modifications, can be undertaken to reduce the potential for significant adverse effects, and sustainable development can be achieved. Ultimately, environmental assessment considers residual environmental effects, that is the effects that remain after technically and economically feasible mitigation measures have been incorporated.

Principle 15 of the 1992 Rio Declaration on Environment and Development states that "Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation." Alton believes that it has followed this "precautionary principle" during Project planning including environmental assessment, design modification (as described in this document) and as well as commitments for site specific mitigation and monitoring.

In general, the "significance" of environmental effects is a broad term that incorporates a number of factors, typically:

- Direction: The ultimate long term effects of the Project (positive, neutral, adverse).
- Magnitude: The change in the amount of habitat or population from the baseline state.
- Geographical Extent: The area of habitat affected by the Project.
- Frequency: The number of times the Project or phase will have an environmental effect on the resource.
- Duration: The period of time required for the resource to return to pre-Project baseline conditions.
- Reversibility: The likelihood that the resource will recover from the effects of the Project.
- Ecological or Social Context: The general characteristics of the area with respect to habitat and abundance.

Significant project-related environmental effects on the resource are those considered to be of sufficient magnitude, duration, frequency, geographical extent or irreversibility to cause a change in resource habitat or population abundance that will alter its status or integrity beyond a sustainable level. Essentially, significance is the threshold of sustainability.

Significance is determined on a "residual" basis after all mitigation (design and site specific) has been incorporated. Significance determination does allow for some uncertainty; for example federal environmental assessment regulations and guidance directs EA practitioners and regulators to consider the "likelihood" of significant effects and a measure of uncertainty is inherent in predictive methods. Where predictive uncertainty and/or environmental risk is relatively high, the government directs proponents to develop a follow-up or monitoring program to verify effects predictions and/or the efficacy of mitigative measures. Where necessary, mitigative measures and/or project design must be modified, through a process known as adaptive management.

For the Alton Project, significance criteria were applied to each Valued Environmental Component (VEC) (*i.e.,* Sections 6.1.3, 6.2.3, 6.3.3, 6.4.3, 6.5.3, and 6.6.3 of the EA Registration). Residual environmental effects evaluation criteria were described in Section 6.1.3 of the EA Registration. The criteria were developed with a high degree of protection for fish and fish habitat, including SARA-listed species and their habitats.

4.2 Environmental Management

As stated in Section 1.4, Alton welcomes the opportunity to provide this supplemental information and engage in additional discussion with government representatives and representatives from First Nations and Aboriginal communities. Alton believes that the Minister's request for additional information has resulted in an improved Project that is environmentally sustainable and will be a benefit to Nova Scotians.

Alton is committed to a program of environmental management that includes:

- Environmental protection planning;
- Monitoring; and
- Adaptive management (including contingency plans).

Alton will develop a detailed EA monitoring program in consultation with DFO as noted throughout this document.

Alton is also committed to ongoing communication and dialogue with representatives from First Nations and Aboriginal communities on issues of mutual interest.

Particular Project effects related to brine discharge, water withdrawal, habitat effects such as potential infilling and sedimentation, and details on follow-up and monitoring for fish and fish habitat are presented in Section 2.0 and Appendices B to D of this report.

As outlined in Appendix C of this report, key intake and discharge monitoring commitments will include:

- Monitoring the water velocities at the intake both in and out to confirm design;
- Monitoring for fish impingement;
- Egg and larvae sampling for presence and to see if the salinity from the outfall is having a negative effect on species in the Estuary; and
- Fish behaviour monitoring in the mixing channel to ensure they do not encounter high salinities that affect their survival. Operational changes can be made, if necessary, to lower brining rates, improve mixing, lower or stop brining during low tide when fish would be closer to the outfall. Fish are likely to avoid unfavourable salinities, and time exposure will be very short as the water mixes. In general, fish are unlikely to be subject to salinities in excess of those experienced during normal tidal fluctuations.

Section 6.1 of the EA Registration also provided the preliminary evaluation and details on follow-up and monitoring for fish and fish habitat, including:

- A variety of monitoring and follow-up programs will be initiated during the cavern development phase of the Project to verify predictions of this assessment and, if required, re-assess mitigation to ensure no significant effects on fish and fish habitat. It is recognized that these monitoring programs will be refined and developed in consultation and collaboration with regulators and other stakeholders.
- Salinity will be measured in the Estuary at the site of water withdrawal and discharge on an ongoing basis. *In situ* salinity meters will be used to quantify tidal and seasonal changes in salinity levels and data loggers will be used to determine statistics such as maximum and minimum salinities, mean salinity by tide cycle and variance. These data will be incorporated into the Project design in terms of determining salinity of discharge to mimic natural variability in the Estuary. Baseline salinity monitoring is currently ongoing.
- Assessing the toxicity of brine on representative organisms prior to discharge of diluted brine to the Estuary can be undertaken if necessary in consideration of their likely presence within areas of elevated salinities. The specifics of such a testing program can be developed in consultation with regulators.
- Monitoring of discharge salinity will occur continuously throughout the solution mining phase of the Project. Automated controls of water intake and diluted brine discharge will use this constant data-feed to refine intake and outflow volumes according to the salinity in the Estuary and the discharge.
- Biological monitoring will occur before and during solution mining. Monitoring of striped bass eggs and larvae will be conducted during the operational life of the Project to routinely evaluate the need for an operational slowdown/shutdown during the striped bass spawning period. Monitoring data will provide valuable information to determine the specifics of an operational slowdown/shutdown (if deemed necessary) such as timing. Monitoring of striped bass eggs and larvae will be coordinated in consultation with DFO species experts. Additional biological monitoring information subsequent to the EA Registration is presented in Appendix C of this report.
- Alton will comply with all of the relevant regulatory requirements under the federal *Fisheries Act* and *Species at Risk Act* and other applicable legislation as well as environmental assessment conditions of release and any other conditions approval to construct and operate. Alton understands that significant residual effects on fish and fish habitat are not acceptable and will not be permitted.

4.3 Conclusion

A precautionary approach to environmental management of the brining system has been taken including innovative design and engineering combined with a codified and proven method of cavern development. The current design minimizes the risk of effects on fish and fish habitat as determined through the EA process and subsequent design enhancements. Significant Project-related adverse residual environmental effects on fish or fish habitat are therefore not likely to occur. The Proponent recognizes the unique sensitivities of the Estuary and the concerns of regulators and other stakeholders and is therefore committed to ongoing consultation and cooperation with regulators (such as the DFO Working Session discussed in Section 1.3) and First Nations and Aboriginal communities to further minimize environmental risks and realize project benefits. Monitoring and follow-up, described previously, will be an integral part of confirming the predictions of this assessment and will provide opportunities for adaptive management, and further research on the Estuary.

It remains the Project team's prediction that significant effects are not likely according to the assessment conducted, design mitigation, proposed follow-up and adaptive management as necessary. The proponent will continue to consult with DFO to develop a monitoring program, and throughout Project commissioning to confirm the impact predictions (*i.e.,* that they are not significant) and the sufficiency of monitoring programs and contingency plans. The Proponent will also comply with any conditions of approval provided by the Minister of Environment and Labour.

Alton believes that the proposed project can be developed in a way that is both environmentally and economically sustainable and offer important benefits to Nova Scotians, including critical opportunities for development of energy infrastructure.

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