ENVIRONMENT ACT

PROPOSED TERMS OF REFERENCE

FOR

PUBLIC REVIEW AND COMMENT

NOVA SCOTIA DEPARTMENT OF TRANSPORTATION AND PUBLIC WORKS

Beaver Bank Bypass

Highway 101 to the Beaver Bank Road
Halifax County, NS

NOVA SCOTIA
DEPARTMENT OF THE ENVIRONMENT

December 21, 1999

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FOREWORD

On December 17, 1999 the Nova Scotia Department of Transportation and Public Works registered its Beaver Bank Bypass Project with the Minister of Environment pursuant to provisions of Part IV of the *Environment Act* and Environmental Assessment Regulations.

The project is a Class II undertaking, therefore the Nova Scotia Department of Transportation and Public Works is required to prepare an Environmental Assessment Report for the proposed roadway construction and operation. Regulations require that Proposed Terms of Reference for the Environmental Assessment Report be prepared by the Environmental Assessment Administrator and made available for public review and comment prior to being finalized and provided to the proponent.

This document presents the Proposed Terms of Reference for public review and comment. The Minister of the Environment invites interested Nova Scotians to examine the Proposed Terms of Reference and provide comments on their adequacy and suggestions for their modification.

Comments must be submitted in writing on or before February 7, 2000, and addressed to:

ENVIRONMENTAL ASSESSMENT ADMINISTRATOR
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PROPOSED TERMS OF REFERENCE

ENVIRONMENTAL ASSESSMENT REPORT

Beaver Bank Bypass

1.0 INTRODUCTION

This section introduces readers to the Report. It shall describe the organizational framework, including study strategy and methodology, within which the Environmental Assessment Report will be prepared.

At the outset, the following must be clearly defined:

a) The valued ecosystem components (VEC's)[1] within the study boundaries and how they were determined as the basis for discussions which follow on impact prediction, evaluation and mitigation.

b) The temporal boundaries (i.e. duration of specific project activities and potential impacts) for construction and operation.

c) The study boundaries or project area and all space that will be potentially impacted by the project as proposed or subject to subsequent modifications.

d) Strategy for investigating the interactions between the project and each VEC and how that strategy will be used to coordinate the individual studies undertaken.

e) Strategy for predicting and evaluating project impacts upon the environment; determining necessary mitigation, remediation and/or compensation; and evaluating residual impacts.

The following sections outline specific concerns and requirements related to the description of the project, the existing environment, predicted environmental impacts, environmental monitoring, contingency planning, site rehabilitation, and residual

[1] Valued Ecosystem Components are interpreted within the context of the Nova Scotia Environmental Assessment Regulations as environmental, socio-economic, health, cultural, historical, archaeological, paleontological and architectural features that may be impacted, whether positive or negative, by the proposed undertaking.

environmental impacts that are to be addressed in the Environmental Assessment Report for the proposed undertaking.

2.0 PROJECT DESCRIPTION

This section of the Report shall describe the project as it is planned to progress through the construction and operation phases of its life. Any assumptions which underlie the details of the project design shall be described. Where specific codes of practice, guidelines and policies apply to items to be addressed, those documents shall be cited and included as appendices to the Environmental Assessment Report.

Items to be addressed shall include, but not be limited to:

2.1 Highway Corridor Location

Ultimate boundaries of the proposed corridor and highway route in a regional context showing existing and proposed land uses and infrastructure such as road networks, railways, power lines, proximity to settled areas, individual and community water supplies and archaeological sites shall be described. This section shall include a detailed discussion of the criteria used to select the corridor/alignment.

2.2 Construction Methods, Schedule and Other Constraints

This section shall include a description of the following:

2.2.1 general construction practices, including but not limited to:
- pit and quarry operations
- erosion and sedimentation control

2.2.2 description of vehicle types, truck routes, hours of operation of vehicles to be used in highway construction;

2.2.3 proposed construction schedules, including proposed time frames for right-of-way clearing and slash disposal (i.e., chipping) and timing of highway construction, and construction work adjacent to watercourses;

2.2.4 identification of areas requiring major cut and/or fill operations; and

2.2.5 slash gathering and disposal methods. Methods of slash fire maintenance shall be presented.

2.3 Structures

Describe the structures proposed for all water crossings.

2.4 Acid Producing Bedrock

Provide an indication of the location and quantity of net acid producing bedrock to the disturbed.

2.5 Borrow Material

Describe the acceptable types of borrow material for highway construction and any currently identified sources likely to be used in the highway construction.

2.6 Paving Materials

Describe the proposed road paving materials.

2.7 Construction Waste Disposal

Describe the criteria for the selection of candidate sites for:

- the disposal of excess/waste excavated rock and overburden, including locations of any currently know planned disposal sites;
- the disposal of organic soil, slash, grubbing and wood fibre, including locations of any currently known or planned disposal sites.

2.8 Public Involvement

Discuss the community information and public liaison plans and requirements during construction and operation.

3.0 REGULATORY ENVIRONMENT

Describe the existing regulatory environment (Federal, Provincial, Municipal) including all permitting, licensing and regulatory requirements, appropriate guidelines, land use zoning and Municipal Planning Strategy requirements that apply to all phases of this proposal.

4.0 REASON FOR THE UNDERTAKING

In recognition of the fact that the project has a potentially negative impact upon the environment, this section shall discuss the public need for the undertaking. The Nova Scotia Department of Transportation and Public Works will make available traffic counts, vehicle classifications and accident rate study information accessible to the consultant.

5.0 A DESCRIPTION OF ALTERNATIVES TO THE UNDERTAKING

This section of the Report shall describe functionally different ways to meet the project need and achieve the project purpose. This discussion shall address but not necessarily be limited to (a) other modes of transportation, (b) upgrading of existing roadway and (c) the null (do nothing) alternative.

6.0 OTHER METHODS FOR CARRYING OUT THE UNDERTAKING

This section of the Report shall detail the process the proponent undertook to determine the proposed corridor. The environmental and socio-economic reasons (e.g., construction costs, fuel savings, technical factors) for the preferred corridor shall be provided. The Report shall discuss other methods for implementing the registered undertaking, including, but not necessarily be limited to, items such as adjusting median width and different methods for watercourse crossings.

7.0 EXISTING ENVIRONMENT

This section of the Report shall identify the study area and shall describe the existing environment over four seasons in the study area through the use of original baseline studies of existing data where appropriate.

The Report shall clearly indicate baseline data/information which is not available or existing data which cannot accurately represent environmental conditions in the project area over four seasons.

If the background data has been extrapolated or otherwise manipulated to depict environmental conditions in the project area, modeling methods and equations shall be described and shall include calculations of margins of error.

All categories and constraints covered in the Highway Environmental Database Study screening matrix shall be included in this section of the Report.

The components of the environment to be discussed shall include, but not necessarily be limited to the following:

7.1 Area Geography

Describe the study area geography and topography including features such as lakes, streams, wetlands, and topography within a minimum of five hundred (500) meters of the centerline of the proposed alignment.

7.2 Existing Land Uses

Describe the patterns of land use and settlement along the proposed highway corridor.

7.3 Socio-Economic Conditions

Describe the current socio-economic conditions of the area along the proposed highway corridor. Include population demographics and economic conditions of the area.

7.4 Atmospheric Conditions

7.4.1 Describe the air quality to include but not necessarily be limited to wind speeds and directions, precipitation amounts and precipitation chemistry. Particular attention is to be paid to ambient dust levels in areas where construction activities may contribute to increased dust levels.

7.4.2 Describe the weather patterns along the proposed route as they relate to highway operation, maintenance and safety. Include how snow, ice and wind conditions may be expected to change with geographic conditions and season, and how these relate to the proposed project.

7.4.3 Indicate how precipitation events will change over the years due to atmospheric warming.

7.5 Ambient Noise Levels

Describe the average noise levels and sources that characterize the study area. Background ambient noise levels should be characterized for various locations along the corridor where traffic noise on the proposed highway could be expected to be heard and felt to be a negative impact, i.e., residential areas, commercial areas, recreational, institutional areas and sensitive wildlife habitats.

Provide a baseline study of all residential and other sensitive areas (i.e., commercial, recreational and institutional) within two hundred (200) meters of the proposed right of way and at any other areas where traffic noise could be expected to have a significant negative impact.

7.6 Surface Water

Provide a general hydrologic, hydraulic and water quality description of all surface water bodies in the vicinity of the project, especially downstream of the project. The drainage areas of individual streams both above and below the proposed highway shall be described.

Existing uses and users of the watercourses shall be identified.

7.7 Groundwater

Provide a general hydrologic, hydrogeologic, and water quality description of the groundwater in the study area.

Complete a well water quality and quantity survey of all domestic and other wells within the expected impact area of the highway corridor. Locations of all wells in the anticipated impact area shall be identified and plotted. Information shall be recorded on NSDOTPW Water Supply Inventory Checklist forms.

7.8 Habitat Evaluation

Identify the following types of habitat. A field survey shall be conducted as part of the evaluation.

7.8.1 Identify any wildlife management areas, ecological reserves, wilderness areas, managed wetlands and other important habitats.

7.8.2 Identify the location, size and class of any wetland within the predicted zone of influence.

7.8.3 Identify any rare or endangered flora species that are typically found in the area. Also identify any potential habitat for rare and endangered plant species.

7.8.4 Identify the species of fauna (including migratory species) that are typically found in the area. Identify any rare or endangered species found in the area, as well as any potential habitat for rare and endangered species.

7.8.5 Fish habitat descriptions shall include but not be restricted to stream size, bottom composition, stream gradient at each potential watercourse crossing, and annual temperatures and sediment loading where data is available from appropriate regulatory and resource agencies. Fish spawning, rearing nursery, food supply and migration areas are to be evaluated within the predicted zone of influence.

7.8.6 The relative distribution, abundance, composition and socioeconomic importance of valued fishery components within the predicted zone of influence is to be determined. Fish species, age, health and diversity shall be described.

7.9 Fishery Resource

Describe any commercial, recreational and Native (Mi'kmaq) fishing. Describe the commercial and recreational species caught, fishing locations, amount caught, and fishing methods used.

7.10 Bedrock and Surficial Geology

Provide a general description of the bedrock and surficial geology of this study area, to include but not necessarily be limited to a discussion of:

7.10.1 The bedrock geology along the proposed corridor.

7.10.2 Acid production/consumption data for all bedrock formations that will be encountered and disturbed by the highway proposal.

7.10.3 The surficial cover including overburden depth, soil types, permeability and porosity, and areas of high erosion risk.

7.10.4 The potential for disturbance of contaminated soils.

7.10.5 Any areas having known or proven economic mineral deposits, areas under advanced mineral exploration, and the

location and extent of existing and abandoned mines, pits and quarries.

7.11 Archaeological Sites

Identify any areas containing features of historical, paleontological, cultural or archaeological importance and describe the nature of the feature located in those areas.

7.12 Transportation

Describe the existing road conditions in the area, including traffic volumes and traffic types, and the road surface conditions.

7.13 Pre-Blast Survey

Discuss plans for a survey of structures within a minimum radius of eight hundred (800) meters of any areas along the highway route where blasting is planned. The survey shall include structures and building foundations which may experience drainage or impact due to seismic vibration or air concussion.

8.0 PREDICTED IMPACTS UPON THE ENVIRONMENT

The Report shall identify and predict the magnitude and importance of project impacts, both positive and negative, on the environment. This section shall address socio-economic, and community impacts as well as impacts on the bio-physical environment including but not limited to the following:

8.1 Land Use Impacts

Predict the impacts of the highway, including the effects of fragmentation of landholding, on the existing land uses and on proposed future land uses.

8.2 Socio-economic and Recreation Impacts

8.2.1 Discuss the impact on residential property values.

8.2.2 Discuss the effect of proposed interchange locations on present and future expansion of commercial/residential/institutional/recreational and resource laid uses within the study area.

8.2.3 Discuss the impact on proposals for hiking trail development, especially for any developments proposed for abandoned railways.

8.3 Atmospheric Conditions

8.3.1 Discuss the impact of dust generated from highway construction on residential, agricultural, recreational and institutional areas.

8.3.2 Discuss the potential for micro-climate modifications in the vicinity of the project.

8.4 Noise Impacts

Discuss the predicted increase and impact of background noise levels from highway construction activity and from traffic on residential areas, recreational areas, institutional areas and sensitive wildlife habitats.

8.5 Surface Water and Run-off

8.5.1 Identify receiving waters for highway run-off, and discuss all associated impacts to surface water quality, fish habitat and groundwater. The CCME Canadian Water Quality Guidelines as they pertain to aquatic life and existing ambient water quality shall be used as a context for addressing the magnitude and importance of the predicted impacts.

8.5.2 Discuss the potential for soil eroding from highway sideslopes and backslopes into adjacent watercourses. Also discuss the potential impact of contaminated run-off on aquatic habitat.

8.5.3 Discuss the criteria used for design of run-off control features, i.e., expected run-off volumes, storm design data, etc. This section shall indicate if allowance has been made for anticipated increases in precipitation, caused by atmospheric warming.

8.5.4 The predicted impacts on surface water and vegetation resulting from the use of ice and snow control procedures, and from other maintenance activities.

8.5.5 Discuss the predicted impacts resulting from the disturbance of contaminated soils.

8.5.6 Indicate the watercourses (particularly wetlands) to be infilled, the area to be infilled, and the associated impacts.

8.5.7 The potential impacts on migratory bird habitat shall be assessed with reference to the Wetlands Atlas for Nova Scotia

8.6 Ground Water Impacts

Predict any anticipated changes to groundwater quality and quantity and the significance of the anticipated changes including impacts from groundwater contaminated from road deicing practices.

Discuss potential impacts of contaminated groundwater on fish, fish habitat and water quality.

8.7 Impacts on Flora

Predict the impacts of construction and operation of the project on flora.

8.8 Impacts on Fauna

Predict the impacts of construction and operation of the project on terrestrial and aquatic fauna.

8.9 Geological Impacts

Discuss the potential for the impact of acidic water run-off from bedrock disturbed by highway construction on Valued Ecosystem Components.

8.10 Archaeological Resources Impacts

Predict the impacts to all archaeological resources that will be affected by the project.

8.11 Transportation Impacts

8.11.1 Discuss the anticipated changes in traffic speed and density in adjacent residential and commercial areas.

8.11.2 Discuss the effect of the proposed interchange and connector location on local and regional traffic types, patterns and volumes.

9.0 EVALUATION OF THE ADVANTAGES AND DISADVANTAGES TO THE ENVIRONMENT

This section shall present an evaluation of the advantages and disadvantages to the valued ecosystem components during the construction and maintenance phases of the undertaking.

10.0 PROPOSED MITIGATION, REMEDIATION AND COMPENSATION

The Environmental Assessment Report shall describe all measures that have or will be taken to minimize negative impacts and maximize the positive environmental effects of the project and describe compensation that will be provided when environmental damage is expected or unavoidable. This section shall address but not necessarily be limited to the following:

10.1 Mitigation

10.1.1 Corridor Selection and Revision

Describe the corridor selection process and indicate how the chosen alignment minimizes/mitigates adverse environmental impact.

10.1.2 Regulatory Compliance

Describe any legislation, regulations, guidelines, policies and specifications that will be adhered to during design and construction of the roadway, that will lead to mitigation of environmental impacts.

10.1.3 Biophysical Resources

10.1.3.1 Air Quality

Describe measures that will be taken to provide noise mitigation and dust control during highway construction.

10.1.3.2 Groundwater Quality and Quantity

Describe actions that will be taken to moderate negative impacts on groundwater quality and quantity.

Describe measures to be employed to the event of accidental dewatering of domestic water supply wells through highway construction activity.

10.1.2.3 Aquatic Environment

10.1.2.3.1 Describe alternatives to disrupting net acid producing bedrock. When no practical alternative to exposing this bedrock exists, contingency plans shall be developed for minimizing the impacts on the aquatic environment.

10.1.2.3.2 Present an outline of erosion and sediment control measures that will be used in the following situations: (a) clearing and grubbing of the proposed corridor, (b) installation of watercourse structures, (c) subgrade work, (d) construction of service roads, and (e) highway maintenance. The Report shall also provide a commitment that the Nova Scotia Department of

Transportation and Public Works will prepare an Environmental Protection Plan for the above activities. The EPP shall be provided as part of the Water Rights Application for the project.

10.1.2.3.3 Describe the timing of work in and immediately adjacent to watercourses, and the fish passage at watercourse crossings.

10.1.2.3.4 If contaminated soils are to be disturbed, discuss methods to minimize adverse impacts.

10.1.2.3.5 Discuss siltation, erosion and run-off control features, storm drainage management procedures and mitigation measures proposed to control sedimentation, to ensure ongoing stabilization of all step slopes, and to maintain ecological integrity of any wetlands in the area.

10.1.2.4 Terrestrial Environment

Discuss measures that will be taken to moderate the impacts of road construction and operation on the terrestrial environment. Include any plans for landscaping and preservation of existing vegetation.

10.1.2.5 Socio-Economic Mitigation

Describe actions that will be taken to mitigate adverse impacts on private and commercial property and on human activities.

10.1.2.6 Archaeological Resources

Describe mitigation measures to preserve, protect, or recover and features of socio-economic, cultural, or archaeological value that are identified in the proposed highway corridor.

10.2 Contingency and Remediation Plans

Recommend contingency and remediation plans for:

10.2.1 Any contamination of or drainage to groundwater resources, including decrease of groundwater quality.

10.2.2 Watercourses that have been degraded due to the disturbance of acid-generating bedrock of tills.

10.2.3 Drainage to aquatic and terrestrial habitat as a result of accidental events.

10.3 Compensation

Discuss compensation policies which shall include but not be limited to:

10.3.1 Compensation for loss or degradation of aquatic and terrestrial habitat (i.e., habitat rehabilitation/replacement).

10.3.2 Compensation for loss of degradation of domestic water supplies.

10.3.3 Compensation for loss of property or property value.

10.4 Dispute Resolution

Provide a policy for addressing complaints and concerns that may be received from nearby land owners or residents.

11.0 RESIDUAL ADVERSE EFFECTS AND ENVIRONMENTAL IMPACTS

This section of the Report shall list and contain a detailed discussion and evaluation of residual impacts. Those impacts that cannot be mitigated or avoided shall be clearly distinguished from those impacts that will not be mitigated or avoided.

These impacts become important in the evaluation of a proposed project as they represent the environmental cost of the project.

12.0 PROPOSED COMPLIANCE AND EFFECTS MONITORING PROGRAMS

The Environmental Assessment Report shall include a framework upon which compliance and effects monitoring will be based throughout the life of the proposed project, including abandonment. The discussion on compliance monitoring shall include, but not necessarily be limited to, plans and procedures for water quality compliance monitoring, especially for suspended sediment and pH levels, during construction. This monitoring must be designed to determine the effect of the proposed mitigation measures.

This section shall also include, but not be limited to, commitments to undertake the following surveys prior to blasting operations in the corridor or at associated quarry sites.

12.1 Pre-Blast Survey

Discuss plans for a survey of structures within a 800 meter radius of any areas along the highway route where blasting is planned, to include wells, building foundations, etc. which may experience damage or impact due to seismic vibrations or air concussion.

12.2 Well Water Survey

Discuss plans for periodic monitoring of water quality and quantity of springs (if used as a water supply), and domestic and other wells within a 800 meter radius of any proposed blasting operations, and within 300 meters of significant roadway cuts that do not involve blasting.

13.0 PUBLIC INFORMATION PROGRAM

This section of the Report shall detail any public information program initiated by the Proponent. The Proponent shall describe in detail any opportunities that have been or will be provided to allow the public to express their concerns and receive information on the various phases of project development including planning design, environmental assessment review, operation, abandonment, site rehabilitation, post abandonment and monitoring.

The results of public consultation and information sessions shall detail any commitments made by the Proponent.