GREAT LAKES FISHERY COMMISSION

1997 Project Completion Report[1]

Standard Departmental Procedures for Screening the Environmental Effects of Lamprey Barriers

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July 1997

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Standard Departmental Procedures for Screening the Environmental Effects of Lamprey Barriers

Report Prepared for

Department of Fisheries and Oceans
Ontario Region

and

Great Lakes Fishery Commission

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July 11, 1997

Citation: **Abraham, D.M. and L.A. Greig.** 1997. Standard Departmental Procedures for Screening the Environmental Effects of Lamprey Barriers. Prepared by ESSA Technologies Ltd. for the Department of Fisheries and Oceans, Ontario Region and the Great Lakes Fishery Commission, Ann Arbor, Michigan. 94 pp.

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1.0 Introduction

This brief report recommends standard departmental procedures for screening the environmental impacts of lamprey barrier projects to fulfill the requirements of the *Canadian Environmental Assessment Act* (CEAA). The procedures are based on the basic method for working with the Calyx EA® Decision Support System (DSS) which is designed to support analysts who must undertake environmental analysis. The essential approach is to combine a simple and strait forward set of procedural steps with a substantial body of knowledge of the potential impacts of barrier development to produce screening reports which are thorough and consistent in their consideration of environmental effects.

Additionally, this report documents potential environmental impacts of the Cobourg Brook Lamprey Barrier Project as identified and reported using the Calyx EA® DSS. This screening has been done to demonstrate the results that will typically be generated by an environmental screening of a standard lamprey barrier project. The results reported here should be considered strictly as an example, because the Cobourg Brook lamprey barrier has already undergone a formal Environmental Assessment (EA) (DFO 1996a, b) and construction was completed in the fall of 1996 as planned.

2.0 Working with Calyx

The following points outline the steps to take when using Calyx to screen a development project.

- describe the Environmental Setting in which the project will occur;
- describe the Project Activities;
- calculate Primary Impacts;
- adjust impact importance as appropriate, given site specific knowledge;
- identify impacts that can be excluded given site specific knowledge;
- calculate Secondary Impacts; and
- identify the mitigation activities needed to mitigate any remaining impacts.

2.1 Describe the Environmental Setting

The first step in developing a description of the *Setting* at the development site is to identify and describe all the physical, biological, social and economic *Components* of the environment that may be impacted by one or more of the proposed activities. The Setting description can include a list of important animal and plant species within the site's sphere of influence, the physiographic features of the site, and the nature of the socio-economic environment of the local region around the site. Calyx provides a list of Components from which to choose.

Information about the state or status of Components can be entered into Calyx by identifying *Component Characteristics*. Characteristics can express a Component's sensitivity or vulnerability to impacts, e.g., sensitive to disturbance; or special status or designation, e.g., rare/endangered; or the state of a Component quality, e.g., low turbidity. Calyx provides a list of Component Characteristics from which to choose.

Relationships between Components are also an important part of the Setting. A Relationship between two Components (e.g., on/in) exists if potential impacts on one Component can cause an impact on another Component. For example, impacts on the water quality of a *stream* will likely have an impact on the *fish* that live in that stream. Calyx provides a list of spatial *Component-Component Relationships* from which to choose.

2.2 Identify the Project

An integral part of any Project is the list of Activities that will take place as part of the proposed work, e.g., vegetation removal. Activities are then combined with an environmental Setting to create a Scenario that represents one possible way of performing the work at hand. Any given Project may be composed of a number of Scenarios that describe different combinations of Activities in one or more different environmental settings. Each Scenario associated with a development project defines a project alternative. Calyx provides a list of Activities for lamprey barrier projects from which to

choose.

Information about the magnitude, frequency or extent of Activities can be entered into Calyx by identifying *Activity Characteristics*, e.g., high noise level. This information is important in assessing the Activity's potential impact on one or more environmental Components. Calyx provides a list of Activity Characteristics from which to choose.

The spatial and temporal relationships that exist between Activities and Components are also an important part of determining whether an impact will occur. Calyx provides a list of *Activity-Component Relationships* from which to choose.

2.3 Calculate Primary and Secondary Impacts

Once a Project Scenario (i.e, an environmental Setting plus a list of Activities) has been developed, Calyx can use it to generate a list of Primary Impacts. Primary Impacts are caused by the effect of an activity on a component. From this list, the user can review the impacts and identify those that can be excluded from further analysis and those that can be mitigated by modifying the project (e.g., construction techniques to be used, location or nature of the work site, timing of work, etc.). Additionally, impact importance levels can be adjusted as appropriate, given specific knowledge about the site. When a Primary Impact is identified in Calyx as either excluded or mitigated, all linked secondary impacts are deleted from the calculation of Secondary Impacts.

Using the final list of Primary Impacts, Calyx calculates the Secondary Impacts associated with the development project. Secondary Impacts are those that are initiated by another impact on a related component. For example, activities that cause a Primary Impact on the quality of *embankment soils* may secondarily impact the related *terrestrial invertebrates* component. Secondary Impacts may also cause other Secondary Impacts on related components. The exclusion or mitigation of Secondary Impacts will cause all linked Secondary Impacts to be deleted from the final list of Secondary Impacts.

2.4 Project Analysis and Reporting

Once the primary and secondary impacts are known, the final step in preparation of the environmental screening is to review each of the impacts and as necessary to reset the impact importance, exclude the impact or define mitigation measures to reduce or eliminate the impact. The impact rules contained within the Calyx knowledge base is of necessity both general and conservative. As such, the system will in some cases suggest impacts where specific local knowledge indicates that the impact will not occur. This may be for a variety of reasons but frequently may reflect the fact that either a very small area (or proportion) of a component will be effected, the effect will last for only a brief time and/or there are other circumstances not accounted for in the knowledge base. When this is the case, the user of the system may override the screening result. In doing so, they are required to enter the rationale for the override so that this may be

included in the screening documentation. For all remaining impacts, the appropriate step is to specify the mitigation measures that will be required to reduce or eliminate the impact. When this is done using Calyx one or several of system standard options may be selected and supplemented as necessary with project specific specifications. Additional mitigations may also be added to the knowledge base where experience indicates that this is warranted.

The final step is to produce standard screening reports for inclusion in the screening report forwarded to the regulatory agency.

3.0 Standard Departmental Procedures for Screening Lamprey Barriers

The recommended standard departmental procedures for screening lamprey barriers are based on the sequence of steps described above for working with Calyx. The rationale for this is that regardless of whether the assessment is done using a decision support tool such as Calyx or done manually, the steps described in the previous section of this report represent a natural sequence of events for how environmental assessments should be conducted. It should be noted however that while this is the desired sequence it is not always what is done. In many cases, environmental assessment is the final stage in project development and is done after the project design is finalized. This latter approach is not a desirable one. The best approach is to commence the environmental assessment work in parallel with the project design phase and for the assessment to become an integral component of the design work. In this way, collection of the basic environmental inventory information needed to conduct the environmental screening will commence as early as possible in the project design, and the environmental impacts may become an explicit factor in site selection as well as barrier design. Consequently, the recommended steps for standard environmental procedures are:

1) Conduct a preliminary environmental inventory of candidate sites. The inventory does not need to be intensive but must be thorough enough to confirm the presence or absence of the potential environmental components to be included in the description of the setting as identified in the Lamprey Barrier Knowledge Base (LBKB) (Murray, 1997). The initial scoping of potential concerns should also include consultation with local resource management agencies (e.g. the Ontario Ministry of Natural Resources (OMNR); the Ontario Ministry of Environment and Energy (OMEE); the Department of Fisheries and Oceans (DFO); municipalities and local stakeholder groups such as landowners and local associations). This can be useful in identifying any environmental components and/or concerns that may be present, including any which may not be represented in the standard LBKB.

2) Based on initial engineering concepts, identify the project activities that will be included in the project as defined in the LBKB.

3) Based on the Components and Activities included in the project, determine the characteristics of components and activities that need to be defined and also the spatial relationships between Components-Components and Components-Activities. Important characteristics and relationships are specified in the LBKB. Conduct further field investigations or consultations with knowledgeable persons to determine the status of the characteristics and spatial relationships.

   Note: Some of the impact rules in the LBKB suggest differential levels of impacts for such qualitative characteristics as *Value* of an environmental component. Consultation with local stakeholders and resource management agencies (as noted in step (1) above) can be critical

in assessing such value judgements. Whenever value characteristics are defined the definition should reflect the values of the local or affected stakeholders and should not be arbitrarily assigned.

4) With the information from steps (1) through (3) develop a list of primary impacts based on the impact rules contained within the LBKB.

   Note: If this is being done using the Calyx EA® DSS it is not necessary to define all of the component or activity characteristics before the initial impact analysis is conducted. Where information is missing, Calyx will handle this by reporting a range of possible impact importance values rather than just one value of impact importance. Also if there is any doubt about the presence of a Component within the setting it should be left as not accounted for, in which case the Calyx EA® DSS will define hypothetical impacts for the component.

5) As changes are made that either alter the candidate site or change the construction design, the information from steps (1) through (3) should be updated and the potential impacts re-estimated based on the updated information. This process may be iterated as necessary to provide input to the project design process.

   If the analysis is done using the Calyx EA® DSS, it is not necessary during early iterations of the analysis process to re-set impact importance values or exclude impacts. The critical element of the analysis at this stage is to identify and focus on potentially significant impacts that require mitigation, especially those that may be mitigated through changes to the project design.

6) Once the site and design have been finalized any potential impacts that are not likely to occur (based on site specific information) should be excluded and impacts of likely low significance noted. In both cases, the rationale for excluding or defining a low impact level for these impacts should be provided.

7) For any remaining significant impacts, the mitigation actions needed to reduce or eliminate the impacts must be specified. The LBKB provides a set of standard mitigations which may be assigned to mitigate the effects of specific activities. Additional project specific mitigations should be developed when necessary.

8) The results of the impact analysis listing the full set of impacts and how they have been handled (whether excluded, assessed to be of low importance, or mitigated) should be documented. The impact analysis documentation, together with the basic construction specifications (including drawings) and details of project mitigations (as specified in the project Terms of Reference), should constitute the documentation submitted for review by DFO Habitat Management.

4.0 The Cobourg Brook Lamprey Barrier Project - Sample Screening

4.1 Developing the Environmental Setting

The first step in screening any project is to describe the environmental setting by identifying the resource components (e.g., emergent vegetation; recreational use) associated with the project. Using the documentation that describes the initial EA of the project (DFO 1996a), the EA Screening Report (DFO 1996b), and the "Invitation to Tender" document, we identified 27 environmental and 6 socio-economic *Components* at or near the site (see Appendix 1). The EA documents for the Cobourg Brook project do not include a detailed description of the affected environment and consequently provide relatively little information about the environmental Components at the site. For example, the May 1996 EA document does not identify Components likely to be present, such as aquatic vegetation, aquatic animals other than fish, terrestrial vegetation, and terrestrial animals. In defining the environmental Setting, we chose to include these in the Components list because the probability that they were present at the site was high. Other Components for which there was no information provided in the EA document were: groundwater features; landform/geological resources; physical structures such as power and gas lines; services such as irrigation water; traditional, recreational and special land uses; and aesthetic values. Because there was no logical or scientific basis on which to either include or exclude these Components from the analysis, we chose to include them as "unaccounted for" so that the impacts they generated would be identified as hypothetical (see Environmental Impacts Analysis, below).

The next step in the environmental screening of the Cobourg Brook Lamprey Barrier Project was to enter into Calyx as many descriptive details as possible for the Components in the setting. Using the descriptive information available from the EA document and a general knowledge of aquatic ecosystems, we identified 21 *Component Characteristics* for 8 different Components (see Appendix 2). (For the full list of characteristics available for the Components in the Cobourg Brook Setting, see Appendix 3.) Also, we specified 47 spatial (e.g., Cobourg Brook → Carries/Contains → Chinook Salmon) *Component-Component Relationships* (see Appendix 4).

In addition to identifying when conditions for significant impact exist (e.g., characteristic = rare/endangered; relationship = on/in), characteristics and relationships also help determine the importance of that impact (see Environmental Impact Analysis, below). Component-component relationships also provide Calyx with the information it needs to determine the links between primary and secondary impacts and among secondary impacts.

4.2 Developing the Project Scenario

Once the description of the environmental setting was complete, the *Activities* associated with the project were identified and entered into Calyx. From the EA and "Invitation to Tender" documents, we identified 33 Activities associated with the construction and operation of the Cobourg Brook

lamprey barrier (see Appendix 5). We have included some activities in the analysis for which there is no explicit supporting documentation. For example, although the EA and "Invitation to Tender" documents both identify the need for bedrock removal, there is no information provided as to how this was accomplished. We have inferred that there was blasting and drilling associated with the construction of the barrier. Additionally, although there is no mention of it in the documentation, we have assumed that pile driving/post setting was required to key the barrier into the bedrock. Similarly, we have assumed that there were fuel storage, fuel transport and surveying activities, as well as a workcamp at the construction site even though these were not explicitly identified in the documentation.

Descriptive details were entered into Calyx for as many Activities as the documentation could support. We specified 48 *Activity Characteristics* for 27 different Activities (see Appendix 6). (For the full list of characteristics available for the Activities associated with the Cobourg Brook Lamprey Barrier Project, see Appendix 7.) Additionally, 324 spatial and temporal *Activity-Component Relationships* were established in the database (e.g., building/erecting → On/In → streams; truck traffic/hauling → Coincident With → the activities of terrestrial birds) (see Appendix 8).

In addition to identifying when conditions for significant impact exist (e.g., characteristic = high vibration level; relationship = near to), characteristics and relationships also help determine the importance of that impact (see Environmental Impact Analysis, below).

4.3 Environmental Impact Analysis

Calculation of Primary Impacts

The *Primary Impact Report* generated by Calyx lists 201 primary impacts associated with lamprey barrier construction and operation (see Appendix 9). The *Primary Impact Report* has been sorted by Activity (e.g., equipment use) and identifies the Mode of impact (e.g., increases noise levels disturbing) as well as the Component that has been impacted (e.g., Rainbow Trout). Of the 201 primary impacts listed, 23 have been excluded from further analysis and 27 have been mitigated based on information about the nature of the site and/or the design of the project (i.e., technique and/or timing of construction). For example, Calyx identified that blasting and drilling activity could cause increased sedimentation and turbidity in Cobourg Brook. This impact has been excluded because the May 1996 EA document states that Cobourg Brook runs over bedrock at the site (pg. 15) and that sedimentation was to be controlled with silt fences and by working during the low flow period in late summer using coffer dams (pg. 16). All excluded primary impacts are identified as such in the *Primary Impact Report*, and the Rationale for exclusion is provided in each case. Mitigated primary impacts are also identified as such in the *Primary Impact Report*, but the detailed description of the reason(s) behind the mitigation appears in a *Mitigations Report* generated by Calyx (see Appendix 10). Entries in the *Mitigations Report* are sorted by type of mitigation, e.g., approved disposal site. Each entry provides a general description of the mitigation type, a field for Comments entered by the user that specifically relate to the mitigation applied, and a list of the

primary impacts affected by the mitigation (including Activity, Mode, and Component). An impact was considered to be mitigated rather than excluded whenever it appeared likely that some level of environmental change would occur despite the implementation of counter-measures designed to avoid it. Impacts that have been excluded or mitigated at the primary level will not trigger secondary impacts.

The importance of each primary impact listed in the *Primary Impact Report* is determined by Calyx using the characteristics and relationships entered for each Component and Activity in the database. Often, the importance of impacts is expressed in the impact report as a range of values, e.g., Medium TO High. However, Calyx allows users to over-ride these values and explicitly set the importance of certain impacts. The Rationale behind setting importance values can also be entered into the system and appears in the report. We chose this *User Set* option for 52 cases in the lamprey barrier screening, based on the information provided in the documentation. For example, we set the impact described by filling/placing concrete → increases dust affecting → lichens and mosses to *Low* and entered the Rationale behind the decision into the report. In this case, the impact of dust on lichens and mosses could not be excluded and there were no counter-measures in the project design to mitigate the effects. However, the impact was likely to be low in view of the small size of the area involved relative to the entire length of Cobourg Brook's shoreline.

Calyx also identified 70 hypothetical primary impacts which are not listed in the *Primary Impact Report*. Hypothetical impacts are identified by Calyx whenever there are environmental or social components that cannot, for lack of solid information about the site, be confirmed as either present or absent (see Developing the Environmental Setting, above). For example, if there were any archaeological features present at the construction site, earthworks (cut/fill) activities would likely have damaged or destroyed them. Because there is no detailed site description provided in the EA documentation, the possibility that archaeological (and other) features might have been present could not be excluded. Calyx has included this impact pathway (along with 69 others) and labelled it as *hypothetical*.

Calculation of Secondary (Higher Order) Impacts

Based on the list of Primary Impacts (excepting those that were excluded or mitigated), Calyx generated a *Secondary Impact Report* that includes 44 secondary environmental impacts associated with lamprey barrier construction and operation (see Appendix 11). The *Secondary Impact Report* has been sorted by Initiating Mode (e.g., alters soil/surface material affecting) and identifies the Initiator (e.g., embankment), the Mode of impact (e.g., destroys/alters habitat affecting) and the Receptor component (e.g., terrestrial invertebrates). No secondary impacts have been excluded or mitigated in this screening process.

Although the Calyx system uses the term "secondary impacts", it should be noted that the impacts identified can reflect process chains of unlimited length. For example, an action that causes a primary impact on embankment soils might cause a series of subsequent impacts initiated by a

secondary impact on the stream water that, in turn, causes an impact on aquatic substrates that, in turn, impacts fish. In such a case, each of these impacts would appear in the *Secondary Impact Report*.

4.4 Summary

The results of this example screening of the Cobourg Brook Lamprey Barrier Project demonstrate the scope of impact knowledge and capabilities of the Calyx system. Both Primary (201) and higher order (44) impacts were identified. Since the environmental setting contains components inferred to be present but not confirmed through field observation, some of the impacts reported here may not have occurred. Furthermore, it might be possible to eliminate some of the impacts from the list once all of the Activity and Component characteristics are known. If this work was being done to provide a full screening of the Cobourg Brook project for approval purposes, the next step would be to determine if any Components inferred to be present were in fact not present and to identify them in Calyx as "accounted for". This step would eliminate the hypothetical impacts currently included in both the *Primary* and *Secondary Impact Reports*. Additionally, missing information about component-component and activity-component characteristics would be collected and entered into the database.

The final steps in the screening process would then be to:

a) review the impacts list and, where appropriate, exclude impacts that will not occur;
b) adjust impact importance levels as appropriate, given site specific knowledge; and
c) apply mitigations as necessary to mitigate the remaining impacts.

In this sample screening of the Cobourg Brook project, these steps have been undertaken only in as much detail as needed to provide examples of both the process followed and the results obtained from an environmental screening of a typical lamprey barrier.

References

Murray, C.L. 1997. Lamprey Barrier Knowledge Base Description. Prepared by ESSA Technologies Ltd. for the Department of Fisheries and Oceans, Ontario Region and the Great Lakes Fishery Commission, Ann Arbor, Michigan. 186 pp.

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Department of Fisheries and Oceans (DFO). 1996b. CEAA Environmental Assessment Screening Report, Cobourg Brook Low Head Sea Lamprey Barrier Dam. Prepared by the Department of Fisheries and Oceans, Sea Lamprey Control Centre, Sault Ste. Marie, Ontario. 14 pp.

Invitation to Tender. 1996. Prepared by the Great Lakes Fishery Commission (GLFC) and the Department of Fisheries and Oceans, Canada. 17 pp.

Appendix 1: List of Components in the Cobourg Brook Setting

Component Type	Component
algae/phytoplankton	2, CB algae/phytoplankton
aquatic birds	2, CB aquatic birds
aquatic ecosystem	2, CB aquatic ecosystem
aquatic invertebrates	2, CB aquatic invertebrates
aquatic mammals	2, CB aquatic mammals
aquatic reptiles/amphibians	2, CB aquatic reptiles/amphibians
aquatic substrate	2, CB aquatic substrate
boaters	2, CB recreational boaters
cover habitat for adult fish	2, CB cover habitat for adult fish
emergent vegetation	2, CB emergent vegetation
fish	2, CB Chinook Salmon
fish	3, CB Rainbow Trout
fish	4, CB minnows & suckers
fish	5, CB White Sucker
grasses/herbs/ferns	2, CB grasses/herbs/ferns
lichen/moss	2, CB lichen/moss
local air quality	2, CB local air quality
nearby residents	2, CB nearby residents
nearby/adjacent landowners	2, CB nearby/adjacent landowners
nursery habitat for larval/juvenile fish	2, CB nursery habitat for larval/juvenile fish
sewage system	2, Cobourg Treatment Plant
shoreline	2, CB shoreline
shrubs	2, CB shrubs
soil	2, CB embankment
streams	2, Cobourg Brook (south of Treatment Plant)
submerged vegetation	2, CB submerged vegetation
terrestrial birds	2, CB terrestrial birds
terrestrial ecosystem	2, CB terrestrial ecosystem
terrestrial invertebrates	2, CB terrestrial invertebrates
terrestrial mammals	2, CB terrestrial mammals
terrestrial reptiles/amphibians	2, CB terrestrial reptiles/amphibians
trees	2, CB trees
workers	2, CB Treatment Plant workers

Appendix 2: List of Component Characteristics in the Cobourg Brook Setting

Component Type	Component	Characteristic	Set To
aquatic substrate	2, CB aquatic substrate	Value	Low
emergent vegetation	2, CB emergent vegetation	Value	Low
fish	2, CB Chinook Salmon	jumping fish	True
fish	2, CB Chinook Salmon	rare/endangered	False
fish	2, CB Chinook Salmon	recreationally important	True
fish	2, CB Chinook Salmon	spawning type	gravel spawners
fish	2, CB Chinook Salmon	Value	High
fish	3, CB Rainbow Trout	jumping fish	True
fish	3, CB Rainbow Trout	rare/endangered	False
fish	3, CB Rainbow Trout	recreationally important	True
fish	3, CB Rainbow Trout	spawning type	gravel spawners
fish	3, CB Rainbow Trout	Value	High
fish	4, CB minnows & suckers	jumping fish	False
fish	4, CB minnows & suckers	rare/endangered	False
fish	4, CB minnows & suckers	Value	Medium
fish	5, CB White Sucker	jumping fish	False
fish	5, CB White Sucker	rare/endangered	False
fish	5, CB White Sucker	turbidity tolerance	turbidity-tolerant
fish	5, CB White Sucker	Value	High
streams	2, Cobourg Brook (south of Treatment Plant)	clear	True
submerged vegetation	2, CB submerged vegetation	Value	Low

Appendix 3: List of Component Characteristics Available for Inclusion in the Cobourg Brook Setting

Component Type	Component	Characteristic
algae/phytoplankton	2, CB algae/phytoplankton	pollutant-sensitive
algae/phytoplankton	2, CB algae/phytoplankton	rare/endangered
algae/phytoplankton	2, CB algae/phytoplankton	Value
aquatic birds	2, CB aquatic birds	critical habitat
aquatic birds	2, CB aquatic birds	rare/endangered
aquatic birds	2, CB aquatic birds	sensitive to disturbance
aquatic birds	2, CB aquatic birds	temperature sensitive
aquatic birds	2, CB aquatic birds	Value
aquatic ecosystem	2, CB aquatic ecosystem	high ecological value
aquatic ecosystem	2, CB aquatic ecosystem	sensitive
aquatic ecosystem	2, CB aquatic ecosystem	Value
aquatic invertebrates	2, CB aquatic invertebrates	critical habitat
aquatic invertebrates	2, CB aquatic invertebrates	rare/endangered
aquatic invertebrates	2, CB aquatic invertebrates	sensitive to disturbance
aquatic invertebrates	2, CB aquatic invertebrates	temperature sensitive
aquatic invertebrates	2, CB aquatic invertebrates	Value
aquatic mammals	2, CB aquatic mammals	critical habitat
aquatic mammals	2, CB aquatic mammals	rare/endangered
aquatic mammals	2, CB aquatic mammals	sensitive to disturbance
aquatic mammals	2, CB aquatic mammals	temperature sensitive
aquatic mammals	2, CB aquatic mammals	Value
aquatic reptiles/amphibians	2, CB aquatic reptiles/amphibians	critical habitat
aquatic reptiles/amphibians	2, CB aquatic reptiles/amphibians	rare/endangered
aquatic reptiles/amphibians	2, CB aquatic reptiles/amphibians	sensitive to disturbance
aquatic reptiles/amphibians	2, CB aquatic reptiles/amphibians	temperature sensitive
aquatic reptiles/amphibians	2, CB aquatic reptiles/amphibians	Value
aquatic substrate	2, CB aquatic substrate	Value
boaters	2, CB recreational boaters	Value
cover habitat for adult fish	2, CB cover habitat for adult fish	Value
emergent vegetation	2, CB emergent vegetation	pollutant-sensitive
emergent vegetation	2, CB emergent vegetation	rare/endangered
emergent vegetation	2, CB emergent vegetation	Value
fish	2, CB Chinook Salmon	critical habitat
fish	2, CB Chinook Salmon	fish size
fish	2, CB Chinook Salmon	jumping fish
fish	2, CB Chinook Salmon	rare/endangered
fish	2, CB Chinook Salmon	recreationally important
fish	2, CB Chinook Salmon	sensitive to disturbance
fish	2, CB Chinook Salmon	spawning type
fish	2, CB Chinook Salmon	temperature sensitive

Component Type	Component	Characteristic
fish	2, CB Chinook Salmon	turbidity tolerance
fish	2, CB Chinook Salmon	Value
fish	3, CB Rainbow Trout	critical habitat
fish	3, CB Rainbow Trout	jumping fish
fish	3, CB Rainbow Trout	rare/endangered
fish	3, CB Rainbow Trout	recreationally important
fish	3, CB Rainbow Trout	sensitive to disturbance
fish	3, CB Rainbow Trout	spawning type
fish	3, CB Rainbow Trout	temperature sensitive
fish	3, CB Rainbow Trout	turbidity tolerance
fish	3, CB Rainbow Trout	fish size
fish	3, CB Rainbow Trout	Value
fish	4, CB minnows & suckers	critical habitat
fish	4, CB minnows & suckers	jumping fish
fish	4, CB minnows & suckers	rare/endangered
fish	4, CB minnows & suckers	sensitive to disturbance
fish	4, CB minnows & suckers	temperature sensitive
fish	4, CB minnows & suckers	turbidity tolerance
fish	4, CB minnows & suckers	recreationally important
fish	4, CB minnows & suckers	spawning type
fish	4, CB minnows & suckers	fish size
fish	4, CB minnows & suckers	Value
fish	5, CB White Sucker	critical habitat
fish	5, CB White Sucker	jumping fish
fish	5, CB White Sucker	rare/endangered
fish	5, CB White Sucker	sensitive to disturbance
fish	5, CB White Sucker	temperature sensitive
fish	5, CB White Sucker	turbidity tolerance
fish	5, CB White Sucker	recreationally important
fish	5, CB White Sucker	spawning type
fish	5, CB White Sucker	fish size
fish	5, CB White Sucker	Value
grasses/herbs/ferns	2, CB grasses/herbs/ferns	pollutant-sensitive
grasses/herbs/ferns	2, CB grasses/herbs/ferns	rare/endangered
grasses/herbs/ferns	2, CB grasses/herbs/ferns	susceptible to fire
grasses/herbs/ferns	2, CB grasses/herbs/ferns	sensitive to trampling
grasses/herbs/ferns	2, CB grasses/herbs/ferns	used by terrestrial animals
grasses/herbs/ferns	2, CB grasses/herbs/ferns	Value
lichen/moss	2, CB lichen/moss	pollutant-sensitive
lichen/moss	2, CB lichen/moss	rare/endangered
lichen/moss	2, CB lichen/moss	sensitive to trampling
lichen/moss	2, CB lichen/moss	used by terrestrial animals
lichen/moss	2, CB lichen/moss	Value
local air quality	2, CB local air quality	low pollutant levels

Component Type	Component	Characteristic
local air quality	2, CB local air quality	stable conditions
local air quality	2, CB local air quality	subject to inversions
local air quality	2, CB local air quality	Value
nearby residents	2, CB nearby residents	Value
nearby/adjacent landowners	2, CB nearby/adjacent landowners	with riparian rights
nearby/adjacent landowners	2, CB nearby/adjacent landowners	Value
nursery habitat for juvenile/ larval fish	2, CB nursery habitat for juvenile/ larval fish	Value
sewage system	2, Cobourg Treatment Plant	Value
shoreline	2, CB shoreline	erodible
shoreline	2, CB shoreline	marshy
shoreline	2, CB shoreline	rare/unique
shoreline	2, CB shoreline	Value
shrubs	2, CB shrubs	pollutant-sensitive
shrubs	2, CB shrubs	rare/endangered
shrubs	2, CB shrubs	susceptible to fire
shrubs	2, CB shrubs	susceptible to trampling
shrubs	2, CB shrubs	used by terrestrial animals
shrubs	2, CB shrubs	Value
soil	2, CB embankment	clay
soil	2, CB embankment	poorly drained
soil	2, CB embankment	high organic content
soil	2, CB embankment	low contaminant levels
soil	2, CB embankment	potentially erodible
soil	2, CB embankment	sensitive
soil	2, CB embankment	steep slope
soil	2, CB embankment	used by terrestrial animals
soil	2, CB embankment	Value
streams	2, Cobourg Brook (south of Treatment Plant)	clear
streams	2, Cobourg Brook (south of Treatment Plant)	high swimming potential
streams	2, Cobourg Brook (south of Treatment Plant)	low contaminant levels
streams	2, Cobourg Brook (south of Treatment Plant)	low flow/flushing rates
streams	2, Cobourg Brook (south of Treatment Plant)	low turbidity
streams	2, Cobourg Brook (south of Treatment Plant)	unproductive
streams	2, Cobourg Brook (south of Treatment Plant)	Value
submerged vegetation	2, CB submerged vegetation	pollutant-sensitive
submerged vegetation	2, CB submerged vegetation	rare/endangered

Component Type	Component	Characteristic
submerged vegetation	2, CB submerged vegetation	Value
terrestrial birds	2, CB terrestrial birds	critical habitat
terrestrial birds	2, CB terrestrial birds	sensitive to disturbance
terrestrial birds	2, CB terrestrial birds	rare/endangered
terrestrial birds	2, CB terrestrial birds	Value
terrestrial ecosystem	2, CB terrestrial ecosystem	high ecological value
terrestrial ecosystem	2, CB terrestrial ecosystem	sensitive
terrestrial ecosystem	2, CB terrestrial ecosystem	Value
terrestrial invertebrates	2, CB terrestrial invertebrates	critical habitat
terrestrial invertebrates	2, CB terrestrial invertebrates	sensitive to disturbance
terrestrial invertebrates	2, CB terrestrial invertebrates	rare/endangered
terrestrial invertebrates	2, CB terrestrial invertebrates	Value
terrestrial mammals	2, CB terrestrial mammals	commercially/traditionally important
terrestrial mammals	2, CB terrestrial mammals	critical habitat
terrestrial mammals	2, CB terrestrial mammals	recreationally important
terrestrial mammals	2, CB terrestrial mammals	sensitive to disturbance
terrestrial mammals	2, CB terrestrial mammals	rare/endangered
terrestrial mammals	2, CB terrestrial mammals	Value
terrestrial reptiles/amphibians	2, CB terrestrial reptiles/amphibians	critical habitat
terrestrial reptiles/amphibians	2, CB terrestrial reptiles/amphibians	sensitive to disturbance
terrestrial reptiles/amphibians	2, CB terrestrial reptiles/amphibians	rare/endangered
terrestrial reptiles/amphibians	2, CB terrestrial reptiles/amphibians	Value
trees	2, CB trees	pollutant-sensitive
trees	2, CB trees	rare/endangered
trees	2, CB trees	susceptible to fire
trees	2, CB trees	susceptible to windthrow
trees	2, CB trees	used by terrestrial animals
trees	2, CB trees	sensitive to trampling
trees	2, CB trees	Value
workers	2, CB Treatment Plant workers	Value

Appendix 4: List of Component-Component Relationships[1] in the Cobourg Brook Setting

Component	Relationship	To Component	Value
algae/phytoplankton	proximity	aquatic ecosystem	On/In
aquatic substrate	proximity	algae/phytoplankton	Adjacent to
cover habitat for adult fish	proximity	fish	Carries/Contains
emergent vegetation	proximity	aquatic ecosystem	On/In
grasses/herbs/ferns	proximity	terrestrial ecosystem	On/In
lichen/moss	proximity	terrestrial ecosystem	On/In
local air quality	air flow	boaters	Within the airshed for
local air quality	air flow	nearby residents	Within the airshed for
local air quality	air flow	nearby/adjacent landowners	Within the airshed for
local air quality	air flow	workers	Within the airshed for
nursery habitat for larval/juvenile fish	proximity	fish	Carries/Contains
shrubs	proximity	terrestrial ecosystem	On/In
soil	proximity	grasses/herbs/ferns	Carries/Contains
soil	proximity	lichen/moss	Carries/Contains
soil	proximity	shrubs	Carries/Contains
soil	water flow	streams	Where the fluids run into
soil	proximity	streams	Adjacent to
soil	proximity	terrestrial birds	In an area used by
soil	proximity	terrestrial invertebrates	Carries/Contains
soil	proximity	terrestrial mammals	In an area used by
soil	proximity	terrestrial reptiles/amphibians	In an area used by
soil	proximity	trees	Carries/Contains
streams	proximity	algae/phytoplankton	Carries/Contains
streams	proximity	aquatic birds	In an area used by
streams	proximity	aquatic invertebrates	Carries/Contains
streams	proximity	aquatic mammals	Carries/Contains
streams	proximity	aquatic reptiles/amphibians	Carries/Contains
streams	proximity	emergent vegetation	Carries/Contains
streams	proximity	fish	Carries/Contains
streams	proximity	nearby/adjacent landowners	Near to
streams	proximity	submerged vegetation	Carries/Contains
submerged vegetation	proximity	aquatic ecosystem	On/In
trees	proximity	nearby residents	Near to
trees	proximity	terrestrial birds	Carries/Contains
trees	proximity	terrestrial ecosystem	On/In
trees	proximity	terrestrial invertebrates	Carries/Contains
trees	proximity	terrestrial mammals	Carries/Contains
trees	proximity	terrestrial reptiles/amphibians	Carries/Contains

[1] all four *fish* components (Chinook Salmon, Rainbow Trout, White Sucker, and minnows & suckers) have been assigned the same relationship (i.e., Carries/Contains) with each of the 3 components spatially related to them; for the sake of brevity, we have listed the *fish* component only once for each of these related components

Appendix 5: List of Activities Associated with Lamprey Barrier Construction and Operation

blasting and drilling
building/erecting
clearing/grubbing scarifying
coffer damming
cutting trees/logging
dewatering/draining
disposal of rock/aggregate/asphalt
earthworks (cut/fill)
equipment maintenance
equipment use
filling/placing concrete
fuel storage
fuel transport
grading
impounding
landscaping/erosion control
pile driving/post setting
placing armor/gabions/rip-rap
planting/seeding
pumping water
substrate removal
surveying
temporary channel diversion
temporary roads
topsoil stripping
truck traffic/hauling
vegetation disposal
vegetation removal
vehicle fueling
vehicle maintenance
vehicle travel
vehicle washing
workcamps

Appendix 6: List of Activity Characteristics in the Lamprey Barrier Construction and Operation Scenario

Activity	Characteristic	Set To
blasting and drilling	high noise level	True
blasting and drilling	high vibration level	True
blasting and drilling	large area	False
blasting and drilling	underwater	False
building/erecting	dams	True
clearing/grubbing scarifying	large area	False
coffer damming	large area	False
coffer damming	using pre-cast materials	True
cutting trees/logging	clearcutting	False
cutting trees/logging	large area	False
dewatering/draining	large area	False
dewatering/draining	large volume	False
disposal of rock/aggregate/asphalt	asphalt	False
disposal of rock/aggregate/asphalt	large area	False
disposal of rock/aggregate/asphalt	large volume	False
earthworks (cut/fill)	large area	False
equipment maintenance	heavy equipment	True
equipment use	heavy equipment	True
equipment use	large area	False
filling/placing concrete	large area	False
filling/placing concrete	large volume	False
filling/placing concrete	pouring concrete	True
fuel storage	large area	False
fuel transport	large area	False
grading	large area	False
impounding	large area	False
impounding	large volume	False
landscaping/erosion control	large area	False
pile driving/post setting	high vibration level	True
pile driving/post setting	large area	False
placing armor/gabions/rip-rap	large area	False
planting/seeding	large area	False
pumping water	high velocity	False
pumping water	large volume	False
surveying	large area	False

Activity	Characteristic	Set To
temporary roads	frequent passage	True
temporary roads	previous accessibility of area	inaccessible
temporary roads	unpaved road	True
topsoil stripping	large area	False
truck traffic/hauling	high noise level	True
truck traffic/hauling	large area	False
truck traffic/hauling	unpaved road	True
vegetation disposal	large volume	False
vegetation removal	aquatic vegetation	True
vegetation removal	large area	False
vegetation removal	woody vegetation	True
vehicle travel	large area	False
vehicle travel	unpaved road	True

Appendix 7: List of Activity Characteristics Available for Inclusion in the Lamprey Barrier Construction and Operation Scenario

Activity	Characteristic
blasting and drilling	frequent/long duration
blasting and drilling	high noise level
blasting and drilling	high vibration level
blasting and drilling	large area
blasting and drilling	underwater
building/erecting	dams
clearing/grubbing scarifying	large area
coffer damming	large area
coffer damming	using pre-cast materials
cutting trees/logging	clearcutting
cutting trees/logging	large area
dewatering/draining	large area
dewatering/draining	large volume
disposal of rock/aggregate/asphalt	asphalt
disposal of rock/aggregate/asphalt	large area
disposal of rock/aggregate/asphalt	large volume
earthworks (cut/fill)	during dry weather
earthworks (cut/fill)	large area
equipment maintenance	heavy equipment
equipment maintenance	large numbers/frequent
equipment use	frequent passage
equipment use	heavy equipment
equipment use	high noise level
equipment use	large area
equipment use	off-road travel
filling/placing concrete	concrete plant
filling/placing concrete	large area
filling/placing concrete	large volume
filling/placing concrete	pouring concrete
fuel storage	large area
fuel storage	large volume
fuel transport	large area
fuel transport	large volume
grading	large area
impounding	large area
impounding	large volume
landscaping/erosion control	contains exotic species
landscaping/erosion control	large area
pile driving/post setting	high vibration level

Activity	Characteristic
pile driving/post setting	large area
placing armor/gabions/rip-rap	large area
planting/seeding	exotic species
planting/seeding	large area
pumping water	high velocity
pumping water	large volume
surveying	large area
temporary roads	frequent passage
temporary roads	previous accessibility of area
temporary roads	unpaved road
topsoil stripping	large area
truck traffic/hauling	frequent passage
truck traffic/hauling	high noise level
truck traffic/hauling	high vibration level
truck traffic/hauling	large area
truck traffic/hauling	off-road travel
truck traffic/hauling	unpaved road
vegetation disposal	burning
vegetation disposal	contains exotic species
vegetation disposal	dumping
vegetation disposal	large volume
vegetation removal	aquatic vegetation
vegetation removal	distance along shoreline
vegetation removal	large area
vegetation removal	woody vegetation
vehicle fueling	large volume
vehicle travel	frequent passage
vehicle travel	high vibration level
vehicle travel	large area
vehicle travel	off-road travel
vehicle travel	unpaved road
workcamps	sanitary sewage

Appendix 8: List of Activity-Component Relationships[1] in the Lamprey Barrier Construction and Operation Scenario

Activity Name	Component Name	Relation	Value
blasting and drilling	algae/phytoplankton	proximity	Adjacent to
blasting and drilling	aquatic birds	proximity	Near to
blasting and drilling	aquatic ecosystem	proximity	Near to
blasting and drilling	aquatic invertebrates	proximity	In the area of/for
blasting and drilling	aquatic mammals	proximity	In the area of/for
blasting and drilling	aquatic reptiles/amphibians	proximity	In the area of/for
blasting and drilling	aquatic substrate	proximity	On/In
blasting and drilling	boaters	proximity	Near to
blasting and drilling	emergent vegetation	proximity	In the area of/for
blasting and drilling	fish	proximity	Far removed from
blasting and drilling	grasses/herbs/ferns	proximity	In the area of/for
blasting and drilling	lichen/moss	proximity	In the area of/for
blasting and drilling	nearby residents	proximity	Near to
blasting and drilling	nearby/adjacent landowners	proximity	Near to
blasting and drilling	sewage system	proximity	Near to
blasting and drilling	shrubs	proximity	In the area of/for
blasting and drilling	soil	proximity	Adjacent to
blasting and drilling	streams	proximity	Adjacent to
blasting and drilling	submerged vegetation	proximity	In the area of/for
blasting and drilling	terrestrial birds	proximity	In an area used by
blasting and drilling	terrestrial invertebrates	proximity	In an area used by
blasting and drilling	terrestrial mammals	proximity	In an area used by
blasting and drilling	terrestrial reptiles/amphibians	proximity	In an area used by
blasting and drilling	trees	proximity	Near to
blasting and drilling	workers	proximity	Near to
building/erecting	cover habitat for adult fish	proximity	On/In
building/erecting	nearby/adjacent landowners	proximity	Near to
building/erecting	streams	proximity	On/In
clearing/grubbing scarifying	grasses/herbs/ferns	proximity	In the area of/for
clearing/grubbing scarifying	lichen/moss	proximity	In the area of/for
clearing/grubbing scarifying	shrubs	proximity	In the area of/for
clearing/grubbing scarifying	soil	proximity	On/In
clearing/grubbing scarifying	streams	water flow	Where the fluids run into
clearing/grubbing scarifying	terrestrial birds	proximity	In an area used by
clearing/grubbing scarifying	terrestrial ecosystem	proximity	On/In
clearing/grubbing scarifying	terrestrial invertebrates	proximity	In an area used by
clearing/grubbing scarifying	terrestrial mammals	proximity	In an area used by
clearing/grubbing scarifying	terrestrial reptiles/amphibians	proximity	In an area used by
clearing/grubbing scarifying	trees	proximity	In the area of/for
coffer damming	aquatic birds	proximity	In an area used by

Activity Name	Component Name	Relation	Value
coffer damming	aquatic invertebrates	proximity	In an area used by
coffer damming	aquatic mammals	proximity	In an area used by
coffer damming	aquatic reptiles/amphibians	proximity	In an area used by
coffer damming	aquatic substrate	proximity	In the area of/for
coffer damming	fish	proximity	In an area used by
coffer damming	streams	water flow	Where the fluids run into
cutting trees/logging	streams	proximity	Adjacent to
cutting trees/logging	trees	proximity	On/In
dewatering/draining	algae/phytoplankton	proximity	In an area used by
dewatering/draining	aquatic birds	proximity	In an area used by
dewatering/draining	aquatic ecosystem	proximity	On/In
dewatering/draining	aquatic invertebrates	proximity	In an area used by
dewatering/draining	aquatic mammals	proximity	In an area used by
dewatering/draining	aquatic reptiles/amphibians	proximity	In an area used by
dewatering/draining	emergent vegetation	proximity	In the area of/for
dewatering/draining	fish	proximity	Carries/Contains
dewatering/draining	grasses/herbs/ferns	proximity	Adjacent to
dewatering/draining	lichen/moss	proximity	Adjacent to
dewatering/draining	shrubs	proximity	Adjacent to
dewatering/draining	submerged vegetation	proximity	In the area of/for
dewatering/draining	terrestrial birds	proximity	In an area used by
dewatering/draining	terrestrial invertebrates	proximity	In an area used by
dewatering/draining	terrestrial mammals	proximity	In an area used by
dewatering/draining	terrestrial reptiles/amphibians	proximity	In an area used by
dewatering/draining	trees	proximity	Adjacent to
earthworks (cut/fill)	aquatic ecosystem	proximity	On/In
earthworks (cut/fill)	aquatic ecosystem	water flow	Where the fluids run into
earthworks (cut/fill)	grasses/herbs/ferns	proximity	On/In
earthworks (cut/fill)	lichen/moss	proximity	On/In
earthworks (cut/fill)	shrubs	proximity	Carries/Contains
earthworks (cut/fill)	soil	proximity	On/In
earthworks (cut/fill)	trees	proximity	In the area of/for
equipment maintenance	soil	water flow	Within the watershed for
equipment maintenance	streams	proximity	Adjacent to
equipment use	aquatic birds	proximity	In an area used by
equipment use	aquatic invertebrates	proximity	In an area used by
equipment use	aquatic mammals	proximity	In an area used by
equipment use	aquatic reptiles/amphibians	proximity	In an area used by
equipment use	aquatic substrate	proximity	Adjacent to
equipment use	boaters	proximity	Near to
equipment use	fish	proximity	Adjacent to
equipment use	grasses/herbs/ferns	proximity	On/In
equipment use	lichen/moss	proximity	On/In
equipment use	local air quality	air flow	Within the airshed for

Activity Name	Component Name	Relation	Value
equipment use	local air quality	proximity	On/In
equipment use	nearby residents	proximity	Near to
equipment use	nearby/adjacent landowners	proximity	Near to
equipment use	shrubs	proximity	In the area of/for
equipment use	soil	proximity	On/In
equipment use	streams	proximity	Adjacent to
equipment use	terrestrial birds	proximity	In an area used by
equipment use	terrestrial invertebrates	proximity	In an area used by
equipment use	terrestrial mammals	proximity	In an area used by
equipment use	terrestrial reptiles/amphibians	proximity	In an area used by
equipment use	trees	proximity	In the area of/for
equipment use	workers	proximity	Near to
filling/placing concrete	grasses/herbs/ferns	proximity	Adjacent to
filling/placing concrete	lichen/moss	proximity	Adjacent to
filling/placing concrete	shrubs	proximity	In the area of/for
filling/placing concrete	soil	proximity	On/In
filling/placing concrete	streams	water flow	Far removed from
filling/placing concrete	trees	proximity	In the area of/for
fuel storage	grasses/herbs/ferns	water flow	Within the watershed for
fuel storage	lichen/moss	water flow	Within the watershed for
fuel storage	shrubs	water flow	Within the watershed for
fuel storage	streams	water flow	Within the watershed for
fuel storage	trees	water flow	Within the watershed for
fuel transport	boaters	proximity	Near to
fuel transport	grasses/herbs/ferns	water flow	Within the watershed for
fuel transport	lichen/moss	water flow	Within the watershed for
fuel transport	nearby residents	proximity	Near to
fuel transport	nearby/adjacent landowners	proximity	Near to
fuel transport	shrubs	water flow	Within the watershed for
fuel transport	soil	proximity	On/In
fuel transport	streams	water flow	Within the watershed for
fuel transport	terrestrial birds	proximity	In an area used by
fuel transport	terrestrial invertebrates	proximity	In an area used by
fuel transport	terrestrial mammals	proximity	In an area used by
fuel transport	terrestrial reptiles/amphibians	proximity	In an area used by
fuel transport	trees	water flow	Within the watershed for
fuel transport	workers	proximity	Near to
grading	grasses/herbs/ferns	proximity	On/In
grading	lichen/moss	proximity	On/In
grading	nearby residents	proximity	Near to
grading	shrubs	proximity	In the area of/for
grading	streams	water flow	Far removed from
grading	trees	proximity	In the area of/for
impounding	algae/phytoplankton	water flow	Where the fluids run into

Activity Name	Component Name	Relation	Value
impounding	aquatic birds	proximity	In an area used by
impounding	aquatic invertebrates	proximity	In an area used by
impounding	aquatic mammals	proximity	In an area used by
impounding	aquatic reptiles/amphibians	proximity	In an area used by
impounding	emergent vegetation	water flow	Where the fluids run into
impounding	fish	proximity	On/In
impounding	fish	water flow	Where the fluids run into
impounding	grasses/herbs/ferns	proximity	Adjacent to
impounding	lichen/moss	proximity	Adjacent to
impounding	nearby/adjacent landowners	proximity	Near to
impounding	shoreline	proximity	Adjacent to
impounding	shrubs	proximity	In the area of/for
impounding	submerged vegetation	water flow	Where the fluids run into
impounding	terrestrial birds	proximity	In an area used by
impounding	terrestrial birds	water flow	Where the fluids run into
impounding	terrestrial invertebrates	proximity	In an area used by
impounding	terrestrial invertebrates	water flow	Where the fluids run into
impounding	terrestrial mammals	proximity	In an area used by
impounding	terrestrial mammals	water flow	Where the fluids run into
impounding	terrestrial reptiles/amphibians	proximity	In an area used by
impounding	terrestrial reptiles/amphibians	water flow	Where the fluids run into
impounding	trees	proximity	In the area of/for
landscaping/erosion control	grasses/herbs/ferns	proximity	On/In
landscaping/erosion control	lichen/moss	proximity	On/In
landscaping/erosion control	shrubs	proximity	In the area of/for
landscaping/erosion control	trees	proximity	In the area of/for
pile driving/post setting	aquatic birds	proximity	In an area used by
pile driving/post setting	aquatic invertebrates	proximity	In an area used by
pile driving/post setting	aquatic mammals	proximity	In an area used by
pile driving/post setting	aquatic reptiles/amphibians	proximity	In an area used by
pile driving/post setting	aquatic substrate	proximity	On/In
pile driving/post setting	boaters	proximity	In an area used by
pile driving/post setting	fish	proximity	In the habitat of
pile driving/post setting	nearby residents	proximity	Near to
pile driving/post setting	nearby/adjacent landowners	proximity	Near to
pile driving/post setting	sewage system	proximity	Near to
pile driving/post setting	streams	proximity	Adjacent to
pile driving/post setting	streams	water flow	Within the watershed for
pile driving/post setting	terrestrial birds	proximity	In an area used by
pile driving/post setting	terrestrial invertebrates	proximity	In an area used by
pile driving/post setting	terrestrial mammals	proximity	In an area used by
pile driving/post setting	terrestrial reptiles/amphibians	proximity	In an area used by
pile driving/post setting	workers	proximity	Near to
placing armor/gabions/rip-rap	aquatic birds	proximity	In an area used by

Activity Name	Component Name	Relation	Value
placing armor/gabions/rip-rap	aquatic invertebrates	proximity	In an area used by
placing armor/gabions/rip-rap	aquatic mammals	proximity	In an area used by
placing armor/gabions/rip-rap	aquatic reptiles/amphibians	proximity	In an area used by
placing armor/gabions/rip-rap	aquatic substrate	proximity	Adjacent to
placing armor/gabions/rip-rap	emergent vegetation	proximity	Adjacent to
placing armor/gabions/rip-rap	fish	proximity	Adjacent to
placing armor/gabions/rip-rap	shoreline	proximity	On/In
placing armor/gabions/rip-rap	streams	water flow	Within the watershed for
planting/seeding	algae/phytoplankton	proximity	Adjacent to
planting/seeding	aquatic ecosystem	proximity	Adjacent to
planting/seeding	aquatic mammals	proximity	In an area used by
planting/seeding	emergent vegetation	proximity	Adjacent to
planting/seeding	grasses/herbs/ferns	proximity	On/In
planting/seeding	lichen/moss	proximity	On/In
planting/seeding	shrubs	proximity	In the area of/for
planting/seeding	streams	water flow	Within the watershed for
planting/seeding	submerged vegetation	proximity	Adjacent to
planting/seeding	terrestrial ecosystem	proximity	On/In
planting/seeding	trees	proximity	In the area of/for
pumping water	aquatic invertebrates	proximity	Carries/Contains
pumping water	aquatic invertebrates	temporal	Coincident with
pumping water	aquatic reptiles/amphibians	proximity	In an area used by
pumping water	aquatic substrate	proximity	In an area used by
pumping water	fish	proximity	Carries/Contains
pumping water	fish	temporal	Coincident with
pumping water	streams	proximity	On/In
substrate removal	aquatic birds	proximity	In an area used by
substrate removal	aquatic invertebrates	proximity	In an area used by
substrate removal	aquatic mammals	proximity	In an area used by
substrate removal	aquatic reptiles/amphibians	proximity	In an area used by
substrate removal	fish	proximity	In the habitat of
substrate removal	streams	water flow	Where the fluids run into
surveying	aquatic birds	proximity	In an area used by
surveying	aquatic invertebrates	proximity	Adjacent to
surveying	aquatic mammals	proximity	In an area used by
surveying	aquatic reptiles/amphibians	proximity	In an area used by
surveying	fish	proximity	Adjacent to
surveying	terrestrial birds	proximity	In an area used by
surveying	terrestrial invertebrates	proximity	In an area used by
surveying	terrestrial mammals	proximity	In an area used by
surveying	terrestrial reptiles/amphibians	proximity	In an area used by
temporary channel diversion	aquatic birds	proximity	In an area used by
temporary channel diversion	aquatic invertebrates	proximity	Carries/Contains
temporary channel diversion	aquatic mammals	proximity	In an area used by

Activity Name	Component Name	Relation	Value
temporary channel diversion	aquatic reptiles/amphibians	proximity	In an area used by
temporary channel diversion	fish	proximity	Carries/Contains
temporary channel diversion	streams	water flow	Where the fluids run into
topsoil stripping	soil	proximity	On/In
topsoil stripping	streams	water flow	Within the watershed for
truck traffic/hauling	aquatic birds	proximity	In an area used by
truck traffic/hauling	aquatic mammals	proximity	Adjacent to
truck traffic/hauling	grasses/herbs/ferns	proximity	Adjacent to
truck traffic/hauling	lichen/moss	proximity	Adjacent to
truck traffic/hauling	nearby residents	proximity	Near to
truck traffic/hauling	shrubs	proximity	In the area of/for
truck traffic/hauling	streams	water flow	Within the watershed for
truck traffic/hauling	terrestrial birds	proximity	In an area used by
truck traffic/hauling	terrestrial birds	temporal	Coincident with
truck traffic/hauling	terrestrial invertebrates	proximity	In an area used by
truck traffic/hauling	terrestrial invertebrates	temporal	Coincident with
truck traffic/hauling	terrestrial mammals	proximity	In an area used by
truck traffic/hauling	terrestrial mammals	temporal	Coincident with
truck traffic/hauling	terrestrial reptiles/amphibians	proximity	In an area used by
truck traffic/hauling	terrestrial reptiles/amphibians	temporal	Coincident with
truck traffic/hauling	trees	proximity	In the area of/for
vegetation removal	algae/phytoplankton	proximity	Adjacent to
vegetation removal	aquatic birds	proximity	Adjacent to
vegetation removal	aquatic ecosystem	proximity	Adjacent to
vegetation removal	aquatic invertebrates	proximity	Adjacent to
vegetation removal	aquatic mammals	proximity	Adjacent to
vegetation removal	aquatic reptiles/amphibians	proximity	Adjacent to
vegetation removal	emergent vegetation	proximity	Adjacent to
vegetation removal	fish	proximity	Adjacent to
vegetation removal	grasses/herbs/ferns	proximity	On/In
vegetation removal	lichen/moss	proximity	On/In
vegetation removal	shrubs	proximity	On/In
vegetation removal	streams	proximity	Adjacent to
vegetation removal	streams	water flow	Within the watershed for
vegetation removal	submerged vegetation	proximity	Adjacent to
vegetation removal	terrestrial birds	proximity	In an area used by
vegetation removal	terrestrial ecosystem	proximity	On/In
vegetation removal	terrestrial invertebrates	proximity	In an area used by
vegetation removal	terrestrial mammals	proximity	In an area used by
vegetation removal	terrestrial reptiles/amphibians	proximity	In an area used by
vegetation removal	trees	proximity	On/In
vehicle fueling	algae/phytoplankton	water flow	Within the watershed for
vehicle fueling	emergent vegetation	water flow	Within the watershed for
vehicle fueling	grasses/herbs/ferns	water flow	Within the watershed for

Activity Name	Component Name	Relation	Value
vehicle fueling	lichen/moss	water flow	Within the watershed for
vehicle fueling	shrubs	water flow	Within the watershed for
vehicle fueling	soil	proximity	On/In
vehicle fueling	streams	water flow	Within the watershed for
vehicle fueling	submerged vegetation	water flow	Within the watershed for
vehicle fueling	trees	water flow	Within the watershed for
vehicle maintenance	soil	water flow	Within the watershed for
vehicle maintenance	streams	water flow	Within the watershed for
vehicle travel	aquatic mammals	proximity	Adjacent to
vehicle travel	boaters	proximity	Adjacent to
vehicle travel	grasses/herbs/ferns	proximity	Adjacent to
vehicle travel	lichen/moss	proximity	Adjacent to
vehicle travel	nearby residents	proximity	Near to
vehicle travel	nearby/adjacent landowners	proximity	Near to
vehicle travel	shrubs	proximity	In the area of/for
vehicle travel	terrestrial birds	proximity	In an area used by
vehicle travel	terrestrial mammals	proximity	In an area used by
vehicle travel	trees	proximity	In the area of/for
vehicle travel	workers	proximity	Near to
vehicle washing	soil	proximity	Near to
vehicle washing	streams	water flow	Within the watershed for
workcamps	streams	water flow	Within the watershed for

[1] all four *fish* components (Chinook Salmon, Rainbow Trout, White Sucker, and minnows & suckers) have been assigned the same relationship (e.g., In an Area Used By) for each of the 14 components spatially related to them; for the sake of brevity, we have listed the *fish* component only once for each of these related components

Appendix 9:
PRIMARY IMPACT REPORT

PROJECT: GLFC Cobourg Brook 95
SCENARIO: Cobourg Brook A

Activity: blasting and drilling 1
Type: blasting and drilling
Mode: increases noise levels disturbing
Component: 2, CB Treatment Plant workers
Type: workers
Excluded: No Mitigated: No
Importance: High TO High User Set:
Rationale:

Activity: blasting and drilling 1
Type: blasting and drilling
Mode: increases vibration levels disturbing
Component: 2, Cobourg Treatment Plant
Type: sewage system
Excluded: No Mitigated: No
Importance: High TO High User Set:
Rationale:

Activity: blasting and drilling 1
Type: blasting and drilling
Mode: increases sediment load/turbidity of
Component: 2, Cobourg Brook (south of Treatment Plant)
Type: streams
Excluded: Yes Mitigated: No
Importance: None TO High User Set:
Rationale: The streambed is bedrock so there is little substrate to be disturbed by blasting.

Activity: blasting and drilling 1
Type: blasting and drilling
Mode: increases vibration levels disturbing
Component: 2, CB trees
Type: trees
Excluded: No Mitigated: No
Importance: High TO High User Set:
Rationale:

Activity: blasting and drilling 1
Type: blasting and drilling
Mode: increases vibration levels disturbing
Component: 2, CB trees
Type: trees

Excluded:	No	Mitigated:	No
Importance:	None TO High	User Set:	
Rationale:			

Activity:	blasting and drilling 1		
Type:	blasting and drilling		
Mode:	increases noise levels disturbing		
Component:	2, CB recreational boaters		
Type:	boaters		
Excluded:	No	Mitigated:	No
Importance:	High TO High	User Set:	
Rationale:			

Activity:	blasting and drilling 1		
Type:	blasting and drilling		
Mode:	increases noise levels disturbing		
Component:	2, CB nearby/adjacent landowners		
Type:	nearby/adjacent landowners		
Excluded:	No	Mitigated:	No
Importance:	High TO High	User Set:	
Rationale:			

Activity:	blasting and drilling 1		
Type:	blasting and drilling		
Mode:	increases noise levels disturbing		
Component:	2, CB nearby residents		
Type:	nearby residents		
Excluded:	No	Mitigated:	No
Importance:	High TO High	User Set:	
Rationale:			

Activity:	blasting and drilling 1		
Type:	blasting and drilling		
Mode:	increases vibration levels disturbing		
Component:	2, CB embankment		
Type:	soil		
Excluded:	No	Mitigated:	No
Importance:	Medium TO High	User Set:	
Rationale:			

Activity:	blasting and drilling 1		
Type:	blasting and drilling		
Mode:	increases vibration levels disturbing		
Component:	2, CB aquatic substrate		
Type:	aquatic substrate		
Excluded:	No	Mitigated:	No
Importance:	Low TO Low	User Set:	
Rationale:			

Activity: blasting and drilling 1
Type: blasting and drilling
Mode: increases noise levels disturbing
Component: 2, CB aquatic birds
Type: aquatic birds
Excluded: No Mitigated: No
Importance: Medium TO High User Set:
Rationale:

Activity: building/erecting 1
Type: building/erecting
Mode: damages/destroys
Component: 2, CB nursery habitat for larval/juvenile fish
Type: nursery habitat for larval/juvenile fish
Excluded: No Mitigated: No
Importance: None TO High User Set:
Rationale: The timing of construction activities was late enough (Sept/Oct) that young fish no longer required nursery habitat.

Activity: building/erecting 1
Type: building/erecting
Mode: damages/destroys
Component: 2, CB cover habitat for adult fish
Type: cover habitat for adult fish
Excluded: No Mitigated: No
Importance: High TO High User Set:
Rationale:

Activity: building/erecting 1
Type: building/erecting
Mode: generates solid waste impacting
Component: 2, Cobourg Brook (south of Treatment Plant)
Type: streams
Excluded: No Mitigated: Yes
Importance: Medium TO Medium User Set:
Rationale:

Activity: clearing/grubbing scarifying 1
Type: clearing/grubbing scarifying
Mode: erodes
Component: 2, CB embankment
Type: soil
Excluded: No Mitigated: Yes
Importance: None TO High User Set:
Rationale:

Activity: clearing/grubbing scarifying 1
Type: clearing/grubbing scarifying
Mode: promotes new species invasion affecting

Component: 2, CB terrestrial ecosystem
Type: terrestrial ecosystem
Excluded: No Mitigated: Yes
Importance: High TO High User Set:
Rationale:

Activity: clearing/grubbing scarifying 1
Type: clearing/grubbing scarifying
Mode: increases sediment load/turbidity of
Component: 2, Cobourg Brook (south of Treatment Plant)
Type: streams
Excluded: No Mitigated: No
Importance: Medium TO Medium User Set:
Rationale:

Activity: cutting trees/logging 1
Type: cutting trees/logging
Mode: alters microclimate affecting
Component: 2, CB trees
Type: trees
Excluded: No Mitigated: Yes
Importance: None TO Medium User Set:
Rationale:

Activity: dewatering/draining 1
Type: dewatering/draining
Mode: alters surface water flows disturbing
Component: 4, CB minnows & suckers
Type: fish
Excluded: No Mitigated: No
Importance: Low TO High User Set:
Rationale:

Activity: dewatering/draining 1
Type: dewatering/draining
Mode: alters surface water flows disturbing
Component: 5, CB White Sucker
Type: fish
Excluded: No Mitigated: No
Importance: Medium TO High User Set:
Rationale:

Activity: dewatering/draining 1
Type: dewatering/draining
Mode: alters surface water flows disturbing
Component: 2, CB aquatic reptiles/amphibians
Type: aquatic reptiles/amphibians
Excluded: No Mitigated: No
Importance: None TO High User Set:

Rationale:

Activity: dewatering/draining 1
Type: dewatering/draining
Mode: alters surface water flows disturbing
Component: 2, CB aquatic mammals
Type: aquatic mammals
Excluded: No Mitigated: No
Importance: None TO High User Set:
Rationale:

Activity: dewatering/draining 1
Type: dewatering/draining
Mode: alters surface water flows disturbing
Component: 2, CB aquatic birds
Type: aquatic birds
Excluded: No Mitigated: No
Importance: None TO High User Set:
Rationale:

Activity: dewatering/draining 1
Type: dewatering/draining
Mode: alters surface water flows disturbing
Component: 3, CB Rainbow Trout
Type: fish
Excluded: No Mitigated: No
Importance: Medium TO High User Set:
Rationale:

Activity: dewatering/draining 1
Type: dewatering/draining
Mode: alters surface water flows disturbing
Component: 2, CB Chinook Salmon
Type: fish
Excluded: No Mitigated: No
Importance: Medium TO High User Set:
Rationale:

Activity: dewatering/draining 1
Type: dewatering/draining
Mode: alters surface water flows disturbing
Component: 2, CB aquatic invertebrates
Type: aquatic invertebrates
Excluded: No Mitigated: No
Importance: None TO High User Set:
Rationale:

Activity: dewatering/draining 1
Type: dewatering/draining

Mode:	alters surface water flows disturbing		
Component:	2, CB aquatic ecosystem		
Type:	aquatic ecosystem		
Excluded:	No	Mitigated:	No
Importance:	Medium TO Medium	User Set:	
Rationale:			

Activity:	disposal of rock/aggregate/asphalt 1		
Type:	disposal of rock/aggregate/asphalt		
Mode:	alters vegetation community affecting		
Component:	2, CB grasses/herbs/ferns		
Type:	grasses/herbs/ferns		
Excluded:	No	Mitigated:	Yes
Importance:	None TO High	User Set:	
Rationale:			

Activity:	disposal of rock/aggregate/asphalt 1		
Type:	disposal of rock/aggregate/asphalt		
Mode:	destroys/alters habitat affecting		
Component:	2, CB aquatic reptiles/amphibians		
Type:	aquatic reptiles/amphibians		
Excluded:	No	Mitigated:	Yes
Importance:	None TO Medium	User Set:	
Rationale:			

Activity:	disposal of rock/aggregate/asphalt 1		
Type:	disposal of rock/aggregate/asphalt		
Mode:	destroys/alters habitat affecting		
Component:	2, CB aquatic mammals		
Type:	aquatic mammals		
Excluded:	No	Mitigated:	Yes
Importance:	None TO Medium	User Set:	
Rationale:			

Activity:	disposal of rock/aggregate/asphalt 1		
Type:	disposal of rock/aggregate/asphalt		
Mode:	destroys/alters habitat affecting		
Component:	2, CB terrestrial reptiles/amphibians		
Type:	terrestrial reptiles/amphibians		
Excluded:	No	Mitigated:	Yes
Importance:	None TO Medium	User Set:	
Rationale:			

Activity:	disposal of rock/aggregate/asphalt 1		
Type:	disposal of rock/aggregate/asphalt		
Mode:	destroys/alters habitat affecting		
Component:	2, CB terrestrial mammals		
Type:	terrestrial mammals		
Excluded:	No	Mitigated:	Yes

Importance: None TO Medium User Set:
Rationale:

Activity: disposal of rock/aggregate/asphalt 1
Type: disposal of rock/aggregate/asphalt
Mode: destroys/alters habitat affecting
Component: 2, CB terrestrial invertebrates
Type: terrestrial invertebrates
Excluded: No Mitigated: Yes
Importance: None TO Medium User Set:
Rationale:

Activity: disposal of rock/aggregate/asphalt 1
Type: disposal of rock/aggregate/asphalt
Mode: destroys/alters habitat affecting
Component: 2, CB terrestrial birds
Type: terrestrial birds
Excluded: No Mitigated: No
Importance: None TO Medium User Set:
Rationale:

Activity: disposal of rock/aggregate/asphalt 1
Type: disposal of rock/aggregate/asphalt
Mode: alters vegetation community affecting
Component: 2, CB lichen/moss
Type: lichen/moss
Excluded: No Mitigated: Yes
Importance: None TO High User Set:
Rationale:

Activity: disposal of rock/aggregate/asphalt 1
Type: disposal of rock/aggregate/asphalt
Mode: destroys/alters habitat affecting
Component: 3, CB Rainbow Trout
Type: fish
Excluded: No Mitigated: Yes
Importance: None TO Medium User Set:
Rationale:

Activity: disposal of rock/aggregate/asphalt 1
Type: disposal of rock/aggregate/asphalt
Mode: alters vegetation community affecting
Component: 2, CB shrubs
Type: shrubs
Excluded: No Mitigated: Yes
Importance: None TO High User Set:
Rationale:

Activity: disposal of rock/aggregate/asphalt 1

Type:	disposal of rock/aggregate/asphalt		
Mode:	destroys/alters habitat affecting		
Component:	4, CB minnows & suckers		
Type:	fish		
Excluded:	No	Mitigated:	Yes
Importance:	None TO Low	User Set:	
Rationale:			

Activity:	disposal of rock/aggregate/asphalt 1		
Type:	disposal of rock/aggregate/asphalt		
Mode:	increases sediment load/turbidity of		
Component:	2, Cobourg Brook (south of Treatment Plant)		
Type:	streams		
Excluded:	No	Mitigated:	Yes
Importance:	None TO Medium	User Set:	
Rationale:			

Activity:	disposal of rock/aggregate/asphalt 1		
Type:	disposal of rock/aggregate/asphalt		
Mode:	contaminates		
Component:	2, Cobourg Brook (south of Treatment Plant)		
Type:	streams		
Excluded:	No	Mitigated:	Yes
Importance:	None TO Medium	User Set:	
Rationale:			

Activity:	disposal of rock/aggregate/asphalt 1		
Type:	disposal of rock/aggregate/asphalt		
Mode:	destroys/alters habitat affecting		
Component:	5, CB White Sucker		
Type:	fish		
Excluded:	No	Mitigated:	Yes
Importance:	None TO Medium	User Set:	
Rationale:			

Activity:	disposal of rock/aggregate/asphalt 1		
Type:	disposal of rock/aggregate/asphalt		
Mode:	alters vegetation community affecting		
Component:	2, CB trees		
Type:	trees		
Excluded:	No	Mitigated:	Yes
Importance:	None TO High	User Set:	
Rationale:			

Activity:	disposal of rock/aggregate/asphalt 1		
Type:	disposal of rock/aggregate/asphalt		
Mode:	destroys/alters habitat affecting		
Component:	2, CB aquatic invertebrates		
Type:	aquatic invertebrates		

Excluded:	No	Mitigated:	Yes
Importance:	None TO Medium	User Set:	
Rationale:			

Activity:	disposal of rock/aggregate/asphalt 1		
Type:	disposal of rock/aggregate/asphalt		
Mode:	destroys/alters habitat affecting		
Component:	2, CB aquatic birds		
Type:	aquatic birds		
Excluded:	No	Mitigated:	Yes
Importance:	None TO Medium	User Set:	
Rationale:			

Activity:	earthworks (cut/fill) 1		
Type:	earthworks (cut/fill)		
Mode:	increases dust affecting		
Component:	2, CB grasses/herbs/ferns		
Type:	grasses/herbs/ferns		
Excluded:	No	Mitigated:	No
Importance:	Medium TO High	User Set:	
Rationale:			

Activity:	earthworks (cut/fill) 1		
Type:	earthworks (cut/fill)		
Mode:	erodes		
Component:	2, CB embankment		
Type:	soil		
Excluded:	No	Mitigated:	No
Importance:	None TO High	User Set:	
Rationale:			

Activity:	earthworks (cut/fill) 1		
Type:	earthworks (cut/fill)		
Mode:	increases sediment load/turbidity of		
Component:	2, CB aquatic ecosystem		
Type:	aquatic ecosystem		
Excluded:	No	Mitigated:	No
Importance:	Medium TO Medium	User Set:	
Rationale:			

Activity:	earthworks (cut/fill) 1		
Type:	earthworks (cut/fill)		
Mode:	increases dust affecting		
Component:	2, CB lichen/moss		
Type:	lichen/moss		
Excluded:	No	Mitigated:	No
Importance:	Medium TO High	User Set:	
Rationale:			

Activity: earthworks (cut/fill) 1
Type: earthworks (cut/fill)
Mode: increases dust affecting
Component: 2, CB shrubs
Type: shrubs
Excluded: No Mitigated: No
Importance: None TO High User Set:
Rationale:

Activity: equipment maintenance 1
Type: equipment maintenance
Mode: contaminates
Component: 2, Cobourg Brook (south of Treatment Plant)
Type: streams
Excluded: No Mitigated: Yes
Importance: High TO High User Set:
Rationale:

Activity: equipment use 1
Type: equipment use
Mode: increases noise levels disturbing
Component: 3, CB Rainbow Trout
Type: fish
Excluded: No
Mitigated: No
Importance: Medium TO High User Set:
Rationale:

Activity: equipment use 1
Type: equipment use
Mode: increases noise levels disturbing
Component: 2, CB Chinook Salmon
Type: fish
Excluded: No
Mitigated: No
Importance: Medium TO High User Set:
Rationale:

Activity: equipment use 1
Type: equipment use
Mode: increases disturbance levels affecting
Component: 5, CB White Sucker
Type: fish
Excluded: No
Mitigated: No
Importance: None TO High User Set:
Rationale:

Activity: equipment use 1

Type: equipment use
Mode: increases disturbance levels affecting
Component: 4, CB minnows & suckers
Type: fish
Excluded: No
Mitigated: No
Importance: None TO High User Set:
Rationale:

Activity: equipment use 1
Type: equipment use
Mode: increases disturbance levels affecting
Component: 3, CB Rainbow Trout
Type: fish
Excluded: No
Mitigated: No
Importance: None TO High User Set:
Rationale:

Activity: equipment use 1
Type: equipment use
Mode: increases disturbance levels affecting
Component: 2, CB Chinook Salmon
Type: fish
Excluded: No
Mitigated: No
Importance: None TO High User Set:
Rationale:

Activity: equipment use 1
Type: equipment use
Mode: increases soil compaction impacting
Component: 2, CB embankment
Type: soil
Excluded: No Mitigated: No
Importance: Medium TO Medium User Set:
Rationale:

Activity: equipment use 1
Type: equipment use
Mode: increases noise levels disturbing
Component: 4, CB minnows & suckers
Type: fish
Excluded: No Mitigated: No
Importance: Low TO High User Set:
Rationale:

Activity: equipment use 1
Type: equipment use

Mode:	increases vibration levels disturbing		
Component:	2, CB nearby/adjacent landowners		
Type:	nearby/adjacent landowners		
Excluded:	No	Mitigated:	No
Importance:	High TO High	User Set:	
Rationale:			

Activity:	equipment use 1		
Type:	equipment use		
Mode:	increases vibration levels disturbing		
Component:	2, CB nearby residents		
Type:	nearby residents		
Excluded:	No	Mitigated:	No
Importance:	High TO High	User Set:	
Rationale:			

Activity:	equipment use 1		
Type:	equipment use		
Mode:	increases vibration levels disturbing		
Component:	2, CB Treatment Plant workers		
Type:	workers		
Excluded:	No	Mitigated:	No
Importance:	High TO High	User Set:	
Rationale:			

Activity:	equipment use 1		
Type:	equipment use		
Mode:	increases vibration levels disturbing		
Component:	2, CB recreational boaters		
Type:	boaters		
Excluded:	No	Mitigated:	No
Importance:	High TO High	User Set:	
Rationale:			

Activity:	equipment use 1		
Type:	equipment use		
Mode:	increases noise levels disturbing		
Component:	2, CB nearby/adjacent landowners		
Type:	nearby/adjacent landowners		
Excluded:	No	Mitigated:	No
Importance:	None TO High	User Set:	
Rationale:			

Activity:	equipment use 1		
Type:	equipment use		
Mode:	increases noise levels disturbing		
Component:	2, CB nearby residents		
Type:	nearby residents		
Excluded:	No	Mitigated:	No

Importance: None TO High User Set:
Rationale:

Activity: equipment use 1
Type: equipment use
Mode: increases noise levels disturbing
Component: 2, CB Treatment Plant workers
Type: workers
Excluded: No Mitigated: No
Importance: None TO High User Set:
Rationale:

Activity: equipment use 1
Type: equipment use
Mode: increases noise levels disturbing
Component: 2, CB recreational boaters
Type: boaters
Excluded: No Mitigated: No
Importance: None TO High User Set:
Rationale:

Activity: equipment use 1
Type: equipment use
Mode: increases noise levels disturbing
Component: 5, CB White Sucker
Type: fish
Excluded: No Mitigated: No
Importance: Medium TO High User Set:
Rationale:

Activity: equipment use 1
Type: equipment use
Mode: increases sediment load/turbidity of
Component: 2, Cobourg Brook (south of Treatment Plant)
Type: streams
Excluded: No Mitigated: No
Importance: None TO High User Set:
Rationale:

Activity: equipment use 1
Type: equipment use
Mode: contaminates
Component: 2, CB local air quality
Type: local air quality
Excluded: No Mitigated: Yes
Importance: None TO High User Set:
Rationale:

Activity: equipment use 1

Type:	equipment use		
Mode:	increases dust affecting		
Component:	2, CB lichen/moss		
Type:	lichen/moss		
Excluded:	No	Mitigated:	No
Importance:	None TO High	User Set:	
Rationale:			

Activity:	equipment use 1		
Type:	equipment use		
Mode:	increases dust affecting		
Component:	2, CB grasses/herbs/ferns		
Type:	grasses/herbs/ferns		
Excluded:	No	Mitigated:	No
Importance:	None TO High	User Set:	
Rationale:			

Activity:	equipment use 1		
Type:	equipment use		
Mode:	alters vegetation community affecting		
Component:	2, CB lichen/moss		
Type:	lichen/moss		
Excluded:	No	Mitigated:	No
Importance:	None TO High	User Set:	
Rationale:			

Activity:	equipment use 1		
Type:	equipment use		
Mode:	alters vegetation community affecting		
Component:	2, CB grasses/herbs/ferns		
Type:	grasses/herbs/ferns		
Excluded:	No	Mitigated:	No
Importance:	None TO High	User Set:	
Rationale:			

Activity:	filling/placing concrete 1		
Type:	filling/placing concrete		
Mode:	increases dust affecting		
Component:	2, CB lichen/moss		
Type:	lichen/moss		
Excluded:	No	Mitigated:	No
Importance:	User Set = Low		
Rationale:	The area affected is small.		

Activity:	filling/placing concrete 1
Type:	filling/placing concrete
Mode:	increases dust affecting
Component:	2, CB grasses/herbs/ferns
Type:	grasses/herbs/ferns

Excluded:	No	Mitigated:	No
Importance:	User Set = Low		
Rationale:	The area affected is small.		

Activity:	filling/placing concrete 1		
Type:	filling/placing concrete		
Mode:	contaminates		
Component:	2, CB embankment		
Type:	soil		
Excluded:	No	Mitigated:	No
Importance:	User Set = Low		
Rationale:	The area affected is small.		

Activity:	fuel transport 1		
Type:	fuel transport		
Mode:	contaminates		
Component:	2, CB embankment		
Type:	soil		
Excluded:	No	Mitigated:	No
Importance:	Medium TO High	User Set:	
Rationale:			

Activity:	fuel transport 1		
Type:	fuel transport		
Mode:	risks human health/safety affecting		
Component:	2, CB Treatment Plant workers		
Type:	workers		
Excluded:	No	Mitigated:	No
Importance:	Medium TO High	User Set:	
Rationale:			

Activity:	fuel transport 1		
Type:	fuel transport		
Mode:	risks human health/safety affecting		
Component:	2, CB nearby residents		
Type:	nearby residents		
Excluded:	No	Mitigated:	No
Importance:	Medium TO High	User Set:	
Rationale:			

Activity:	fuel transport 1		
Type:	fuel transport		
Mode:	risks human health/safety affecting		
Component:	2, CB recreational boaters		
Type:	boaters		
Excluded:	No	Mitigated:	No
Importance:	Medium TO High	User Set:	
Rationale:			

Activity:	fuel transport 1		
Type:	fuel transport		
Mode:	risks human health/safety affecting		
Component:	2, CB nearby/adjacent landowners		
Type:	nearby/adjacent landowners		
Excluded:	No	Mitigated:	No
Importance:	Medium TO High	User Set:	
Rationale:			

Activity:	grading 1		
Type:	grading		
Mode:	increases noise levels disturbing		
Component:	2, CB nearby residents		
Type:	nearby residents		
Excluded:	No	Mitigated:	No
Importance:	High TO High	User Set:	
Rationale:			

Activity:	grading 1		
Type:	grading		
Mode:	increases dust affecting		
Component:	2, CB lichen/moss		
Type:	lichen/moss		
Excluded:	No	Mitigated:	No
Importance:	Medium TO High	User Set:	
Rationale:			

Activity:	grading 1		
Type:	grading		
Mode:	increases dust affecting		
Component:	2, CB grasses/herbs/ferns		
Type:	grasses/herbs/ferns		
Excluded:	No	Mitigated:	No
Importance:	Medium TO High	User Set:	
Rationale:			

Activity:	impounding 1		
Type:	impounding		
Mode:	alters microclimate affecting		
Component:	5, CB White Sucker		
Type:	fish		
Excluded:	No	Mitigated:	No
Importance:	None TO Medium	User Set:	
Rationale:	The area affected is relatively small.		

Activity:	impounding 1		
Type:	impounding		
Mode:	alters microclimate affecting		
Component:	4, CB minnows & suckers		

Type:	fish		
Excluded:	No	Mitigated:	No
Importance:	None TO Low	User Set:	
Rationale:	The area affected is relatively small.		

Activity:	impounding 1		
Type:	impounding		
Mode:	alters microclimate affecting		
Component:	3, CB Rainbow Trout		
Type:	fish		
Excluded:	No	Mitigated:	No
Importance:	None TO Medium	User Set:	
Rationale:	The area affected is relatively small.		

Activity:	impounding 1		
Type:	impounding		
Mode:	alters microclimate affecting		
Component:	2, CB Chinook Salmon		
Type:	fish		
Excluded:	No	Mitigated:	No
Importance:	None TO Medium	User Set:	
Rationale:	The area affected is relatively small.		

Activity:	impounding 1		
Type:	impounding		
Mode:	alters surface water flows disturbing		
Component:	5, CB White Sucker		
Type:	fish		
Excluded:	No	Mitigated:	Yes
Importance:	Medium TO High	User Set:	
Rationale:			

Activity:	impounding 1		
Type:	impounding		
Mode:	alters surface water flows disturbing		
Component:	4, CB minnows & suckers		
Type:	fish		
Excluded:	No	Mitigated:	No
Importance:	Low TO High	User Set:	
Rationale:			

Activity:	impounding 1		
Type:	impounding		
Mode:	alters surface water flows disturbing		
Component:	3, CB Rainbow Trout		
Type:	fish		
Excluded:	No	Mitigated:	Yes
Importance:	Medium TO High	User Set:	
Rationale:			

Activity:	impounding 1		
Type:	impounding		
Mode:	alters surface water flows disturbing		
Component:	2, CB Chinook Salmon		
Type:	fish		
Excluded:	No	Mitigated:	Yes
Importance:	Medium TO High	User Set:	
Rationale:			

Activity:	impounding 1		
Type:	impounding		
Mode:	alters surface water flows disturbing		
Component:	2, CB algae/phytoplankton		
Type:	algae/phytoplankton		
Excluded:	No	Mitigated:	No
Importance:	User Set = Low		
Rationale:	Any impact that may occur will be "low" because of the small size of the impoundment.		

Activity:	impounding 1		
Type:	impounding		
Mode:	alters surface water flows disturbing		
Component:	2, CB emergent vegetation		
Type:	emergent vegetation		
Excluded:	No	Mitigated:	No
Importance:	User Set = Low		
Rationale:	Any impact that may occur will be "low" because of the small size of the impoundment.		

Activity:	impounding 1		
Type:	impounding		
Mode:	alters surface water flows disturbing		
Component:	2, CB lichen/moss		
Type:	lichen/moss		
Excluded:	No	Mitigated:	No
Importance:	User Set = Low		
Rationale:	Any impact that may occur will be "low" because of the small size of the impoundment.		

Activity:	impounding 1		
Type:	impounding		
Mode:	alters surface water flows disturbing		
Component:	2, CB grasses/herbs/ferns		
Type:	grasses/herbs/ferns		
Excluded:	No	Mitigated:	No
Importance:	User Set = Low		
Rationale:	Any impact that may occur will be "low" because of the small size of the impoundment.		

Activity:	impounding 1
Type:	impounding
Mode:	alters surface water flows disturbing

Component: 2, CB submerged vegetation
Type: submerged vegetation
Excluded: No Mitigated: No
Importance: User Set = Low
Rationale: Any impact that may occur will be "low" because of the small size of the impoundment.

Activity: landscaping/erosion control 1
Type: landscaping/erosion control
Mode: promotes new species invasion affecting
Component: 2, CB lichen/moss
Type: lichen/moss
Excluded: No Mitigated: No
Importance: None TO Medium User Set:
Rationale:

Activity: landscaping/erosion control 1
Type: landscaping/erosion control
Mode: promotes new species invasion affecting
Component: 2, CB grasses/herbs/ferns
Type: grasses/herbs/ferns
Excluded: No Mitigated: No
Importance: None TO Medium User Set:
Rationale:

Activity: pile driving/post setting 1
Type: pile driving/post setting
Mode: increases noise levels disturbing
Component: 2, CB Treatment Plant workers
Type: workers
Excluded: No Mitigated: No
Importance: High TO High User Set:
Rationale:

Activity: pile driving/post setting 1
Type: pile driving/post setting
Mode: increases noise levels disturbing
Component: 2, CB nearby residents
Type: nearby residents
Excluded: No Mitigated: No
Importance: High TO High User Set:
Rationale:

Activity: pile driving/post setting 1
Type: pile driving/post setting
Mode: increases vibration levels disturbing
Component: 2, Cobourg Treatment Plant
Type: sewage system
Excluded: No Mitigated: No
Importance: High TO High User Set:

Rationale:

Activity: pile driving/post setting 1
Type: pile driving/post setting
Mode: increases noise levels disturbing
Component: 5, CB White Sucker
Type: fish
Excluded: No Mitigated: No
Importance: Medium TO High User Set:
Rationale:

Activity: pile driving/post setting 1
Type: pile driving/post setting
Mode: increases noise levels disturbing
Component: 4, CB minnows & suckers
Type: fish
Excluded: No Mitigated: No
Importance: Low TO High User Set:
Rationale:

Activity: pile driving/post setting 1
Type: pile driving/post setting
Mode: increases noise levels disturbing
Component: 3, CB Rainbow Trout
Type: fish
Excluded: No Mitigated: No
Importance: Medium TO High User Set:
Rationale:

Activity: pile driving/post setting 1
Type: pile driving/post setting
Mode: increases noise levels disturbing
Component: 2, CB nearby/adjacent landowners
Type: nearby/adjacent landowners
Excluded: No Mitigated: No
Importance: High TO High User Set:
Rationale:

Activity: pile driving/post setting 1
Type: pile driving/post setting
Mode: increases disturbance levels affecting
Component: 2, CB aquatic substrate
Type: aquatic substrate
Excluded: No Mitigated: No
Importance: Low TO Low User Set:
Rationale:

Activity: pile driving/post setting 1
Type: pile driving/post setting

Mode:	increases noise levels disturbing		
Component:	2, CB Chinook Salmon		
Type:	fish		
Excluded:	No	Mitigated:	No
Importance:	Medium TO High	User Set:	
Rationale:			

Activity:	placing armor/gabions/rip-rap 1		
Type:	placing armor/gabions/rip-rap		
Mode:	alters soil/surface material affecting		
Component:	2, CB shoreline		
Type:	shoreline		
Excluded:	No	Mitigated:	No
Importance:	None TO High	User Set:	
Rationale:			

Activity:	planting/seeding 1		
Type:	planting/seeding		
Mode:	promotes new species invasion affecting		
Component:	2, CB grasses/herbs/ferns		
Type:	grasses/herbs/ferns		
Excluded:	No	Mitigated:	No
Importance:	User Set = Low		
Rationale:	The area affected is small.		

Activity:	planting/seeding 1		
Type:	planting/seeding		
Mode:	alters vegetation community affecting		
Component:	2, CB terrestrial ecosystem		
Type:	terrestrial ecosystem		
Excluded:	No	Mitigated:	No
Importance:	User Set = Low		
Rationale:	The area affected is small.		

Activity:	planting/seeding 1		
Type:	planting/seeding		
Mode:	promotes new species invasion affecting		
Component:	2, CB terrestrial ecosystem		
Type:	terrestrial ecosystem		
Excluded:	No	Mitigated:	No
Importance:	User Set = Low		
Rationale:	The area affected is small.		

Activity:	planting/seeding 1		
Type:	planting/seeding		
Mode:	promotes new species invasion affecting		
Component:	2, CB aquatic ecosystem		
Type:	aquatic ecosystem		
Excluded:	No	Mitigated:	No

Importance: User Set = Low
Rationale: The area affected is small.

Activity: planting/seeding 1
Type: planting/seeding
Mode: alters vegetation community affecting
Component: 2, CB terrestrial ecosystem
Type: terrestrial ecosystem
Excluded: No Mitigated: No
Importance: User Set = Low
Rationale: The area affected is small.

Activity: planting/seeding 1
Type: planting/seeding
Mode: promotes new species invasion affecting
Component: 2, CB lichen/moss
Type: lichen/moss
Excluded: No Mitigated: No
Importance: User Set = Low
Rationale: The area affected is small.

Activity: pumping water 1
Type: pumping water
Mode: alters microclimate affecting
Component: 4, CB minnows & suckers
Type: fish
Excluded: Yes
Mitigated: No
Importance: Low TO Low User Set:
Rationale: Only the water enclosed by the coffer dams will be pumped out and into an onshore settling area. The volume of water involved is small.

Activity: pumping water 1
Type: pumping water
Mode: alters microclimate affecting
Component: 2, CB Chinook Salmon
Type: fish
Excluded: No Mitigated: No
Importance: Medium TO Medium User Set:
Rationale: Only the water enclosed by the coffer dams will be pumped out and into an onshore settling area. The volume of water involved is small.

Activity: pumping water 1
Type: pumping water
Mode: increases sediment load/turbidity of
Component: 2, Cobourg Brook (south of Treatment Plant)
Type: streams
Excluded: No Mitigated: Yes
Importance: Medium TO Medium User Set:

Rationale:

Activity: pumping water 1
Type: pumping water
Mode: decreases the level of
Component: 2, Cobourg Brook (south of Treatment Plant)
Type: streams
Excluded: No Mitigated: No
Importance: Medium TO Medium User Set:
Rationale: Only the water enclosed by the coffer dams will be pumped out and into an onshore settling area. The volume of water involved is small.

Activity: pumping water 1
Type: pumping water
Mode: alters microclimate affecting
Component: 5, CB White Sucker
Type: fish
Excluded: No Mitigated: No
Importance: Medium TO Medium User Set:
Rationale: Only the water enclosed by the coffer dams will be pumped out and into an onshore settling area. The volume of water involved is small.

Activity: pumping water 1
Type: pumping water
Mode: alters microclimate affecting
Component: 3, CB Rainbow Trout
Type: fish
Excluded: No Mitigated: No
Importance: Medium TO Medium User Set:
Rationale: Only the water enclosed by the coffer dams will be pumped out and into an onshore settling area. The volume of water involved is small.

Activity: pumping water 1
Type: pumping water
Mode: harms/kills
Component: 2, CB Chinook Salmon
Type: fish
Excluded: No Mitigated: No
Importance: User Set = Low
Rationale: Only the water enclosed by the coffer dams will be pumped out and into an onshore settling area. The volume of water involved is small.

Activity: pumping water 1
Type: pumping water
Mode: alters microclimate affecting
Component: 2, CB aquatic invertebrates
Type: aquatic invertebrates
Excluded: No Mitigated: No
Importance: Medium TO Medium User Set:

Rationale: The volume of water involved is small.

Activity: pumping water 1
Type: pumping water
Mode: harms/kills
Component: 2, CB aquatic invertebrates
Type: aquatic invertebrates
Excluded: No Mitigated: No
Importance: User Set = Low
Rationale: Only the water enclosed by the coffer dams will be pumped out and into an onshore settling area. The volume of water involved is small.

Activity: pumping water 1
Type: pumping water
Mode: harms/kills
Component: 5, CB White Sucker
Type: fish
Excluded: No Mitigated: No
Importance: User Set = Low
Rationale: Only the water enclosed by the coffer dams will be pumped out and into an onshore settling area. The volume of water involved is small.

Activity: pumping water 1
Type: pumping water
Mode: harms/kills
Component: 4, CB minnows & suckers
Type: fish
Excluded: No Mitigated: No
Importance: User Set = Low
Rationale: Only the water enclosed by the coffer dams will be pumped out and into an onshore settling area. The volume of water involved is small.

Activity: pumping water 1
Type: pumping water
Mode: harms/kills
Component: 3, CB Rainbow Trout
Type: fish
Excluded: No Mitigated: No
Importance: User Set = Low
Rationale: Only the water enclosed by the coffer dams will be pumped out and into an onshore settling area. The volume of water involved is small.

Activity: substrate removal 1
Type: substrate removal
Mode: increases sediment load/turbidity of
Component: 2, Cobourg Brook (south of Treatment Plant)
Type: streams
Excluded: No Mitigated: No
Importance: High TO High User Set:

Rationale: Cobourg Brook runs over bedrock at the barrier site. Also, the amount of substrate removal will be relatively small.

Activity: substrate removal 1
Type: substrate removal
Mode: destroys/alters habitat affecting
Component: 2, CB Chinook Salmon
Type: fish
Excluded: No Mitigated: No
Importance: User Set = Low
Rationale: There will be some destruction of fish habitat, but the small area affected and the nature of the substrate (bedrock) combine to keep its significance low.

Activity: substrate removal 1
Type: substrate removal
Mode: destroys/alters habitat affecting
Component: 5, CB White Sucker
Type: fish
Excluded: No Mitigated: No
Importance: User Set = Low
Rationale: There will be some destruction of fish habitat, but the small area affected and the nature of the substrate (bedrock) combine to keep its significance low.

Activity: substrate removal 1
Type: substrate removal
Mode: destroys/alters habitat affecting
Component: 4, CB minnows & suckers
Type: fish
Excluded: No Mitigated: No
Importance: User Set = Low
Rationale: There will be some destruction of fish habitat, but the small area affected and the nature of the substrate (bedrock) combine to keep its significance low.

Activity: substrate removal 1
Type: substrate removal
Mode: destroys/alters habitat affecting
Component: 3, CB Rainbow Trout
Type: fish
Excluded: No Mitigated: No
Importance: User Set = Low
Rationale: There will be some destruction of fish habitat, but the small area affected and the nature of the substrate (bedrock) combine to keep its significance low.

Activity: surveying 1
Type: surveying
Mode: increases disturbance levels affecting
Component: 3, CB Rainbow Trout
Type: fish
Excluded: No Mitigated: No

Importance: Medium TO High User Set:
Rationale:

Activity: surveying 1
Type: surveying
Mode: increases disturbance levels affecting
Component: 5, CB White Sucker
Type: fish
Excluded: No Mitigated: No
Importance: Medium TO High User Set:
Rationale:

Activity: surveying 1
Type: surveying
Mode: increases disturbance levels affecting
Component: 2, CB aquatic invertebrates
Type: aquatic invertebrates
Excluded: No Mitigated: No
Importance: Medium TO High User Set:
Rationale:

Activity: surveying 1
Type: surveying
Mode: increases disturbance levels affecting
Component: 4, CB minnows & suckers
Type: fish
Excluded: No Mitigated: No
Importance: Low TO High User Set:
Rationale:

Activity: surveying 1
Type: surveying
Mode: increases disturbance levels affecting
Component: 2, CB Chinook Salmon
Type: fish
Excluded: No Mitigated: No
Importance: Medium TO High User Set:
Rationale:

Activity: temporary channel diversion 1
Type: temporary channel diversion
Mode: increases sediment load/turbidity of
Component: 2, Cobourg Brook (south of Treatment Plant)
Type: streams
Excluded: No Mitigated: No
Importance: High TO High User Set:
Rationale:

Activity: temporary channel diversion 1

Type:	temporary channel diversion		
Mode:	destroys/alters habitat affecting		
Component:	5, CB White Sucker		
Type:	fish		
Excluded:	No	Mitigated:	No
Importance:	Medium TO Medium	User Set:	
Rationale:			

Activity:	temporary channel diversion 1		
Type:	temporary channel diversion		
Mode:	destroys/alters habitat affecting		
Component:	2, CB aquatic invertebrates		
Type:	aquatic invertebrates		
Excluded:	No	Mitigated:	No
Importance:	Medium TO High	User Set:	
Rationale:			

Activity:	temporary channel diversion 1		
Type:	temporary channel diversion		
Mode:	destroys/alters habitat affecting		
Component:	4, CB minnows & suckers		
Type:	fish		
Excluded:	No	Mitigated:	No
Importance:	Low TO Low	User Set:	
Rationale:			

Activity:	temporary channel diversion 1		
Type:	temporary channel diversion		
Mode:	destroys/alters habitat affecting		
Component:	2, CB Chinook Salmon		
Type:	fish		
Excluded:	No	Mitigated:	No
Importance:	Medium TO Medium	User Set:	
Rationale:			

Activity:	temporary channel diversion 1		
Type:	temporary channel diversion		
Mode:	destroys/alters habitat affecting		
Component:	3, CB Rainbow Trout		
Type:	fish		
Excluded:	No	Mitigated:	No
Importance:	Medium TO Medium	User Set:	
Rationale:			

Activity:	temporary roads 1
Type:	temporary roads
Mode:	increases dust affecting
Component:	2, CB shrubs
Type:	shrubs

Excluded:	No	Mitigated:	No
Importance:	None TO High	User Set:	
Rationale:			

Activity:	temporary roads 1
Type:	temporary roads
Mode:	increases dust affecting
Component:	2, CB grasses/herbs/ferns
Type:	grasses/herbs/ferns
Excluded:	No
Importance:	None TO High
Rationale:	

Mitigated:	No		
User Set:			

Activity:	temporary roads 1
Type:	temporary roads
Mode:	increases harvest affecting
Component:	2, CB terrestrial mammals
Type:	terrestrial mammals
Excluded:	No
Importance:	None TO High
Rationale:	The area around the barrier site is currently developed; access to the brook has not been limited. There will be a gated fence limiting access to the barrier itself.

Mitigated:	No		
User Set:			

Activity:	temporary roads 1
Type:	temporary roads
Mode:	increases harvest affecting
Component:	5, CB White Sucker
Type:	fish
Excluded:	No
Importance:	None TO High
Rationale:	The area around the barrier site is currently developed; access to the brook has not been limited. There will be a gated fence limiting access to the barrier itself.

Mitigated:	No		
User Set:			

Activity:	temporary roads 1
Type:	temporary roads
Mode:	increases harvest affecting
Component:	4, CB minnows & suckers
Type:	fish
Excluded:	No
Importance:	None TO High
Rationale:	The area around the barrier site is currently developed; access to the brook has not been limited. There will be a gated fence limiting access to the barrier itself.

Mitigated:	No		
User Set:			

Activity:	temporary roads 1
Type:	temporary roads
Mode:	increases harvest affecting
Component:	3, CB Rainbow Trout
Type:	fish
Excluded:	No

Mitigated:	No		

Importance: None TO High User Set:
Rationale: The area around the barrier site is currently developed; access to the brook has not been limited. There will be a gated fence limiting access to the barrier itself.

Activity: temporary roads 1
Type: temporary roads
Mode: increases harvest affecting
Component: 2, CB Chinook Salmon
Type: fish
Excluded: No Mitigated: No
Importance: None TO High User Set:
Rationale: The area around the barrier site is currently developed; access to the brook has not been limited. There will be a gated fence limiting access to the barrier itself.

Activity: temporary roads 1
Type: temporary roads
Mode: increases harvest affecting
Component: 2, CB aquatic birds
Type: aquatic birds
Excluded: No Mitigated: No
Importance: None TO High User Set:
Rationale: The area around the barrier site is currently developed; access to the brook has not been limited. There will be a gated fence limiting access to the barrier itself.

Activity: temporary roads 1
Type: temporary roads
Mode: increases harvest affecting
Component: 2, CB terrestrial birds
Type: terrestrial birds
Excluded: No Mitigated: No
Importance: None TO High User Set:
Rationale: The area around the barrier site is currently developed; access to the brook has not been limited. There will be a gated fence limiting access to the barrier itself.

Activity: temporary roads 1
Type: temporary roads
Mode: increases dust affecting
Component: 2, CB lichen/moss
Type: lichen/moss
Excluded: No Mitigated: No
Importance: None TO High User Set:
Rationale:

Activity: temporary roads 1
Type: temporary roads
Mode: increases dust affecting
Component: 2, CB trees
Type: trees
Excluded: No Mitigated: No

Importance: None TO High User Set:
Rationale:

Activity: temporary roads 1
Type: temporary roads
Mode: increases harvest affecting
Component: 2, CB aquatic mammals
Type: aquatic mammals
Excluded: No Mitigated: No
Importance: None TO High User Set:
Rationale: The area around the barrier site is currently developed; access to the brook has not been limited. There will be a gated fence limiting access to the barrier itself.

Activity: topsoil stripping 1
Type: topsoil stripping
Mode: erodes
Component: 2, CB embankment
Type: soil
Excluded: No Mitigated: No
Importance: None TO Medium User Set:
Rationale:

Activity: truck traffic/hauling 1
Type: truck traffic/hauling
Mode: increases noise levels disturbing
Component: 2, CB aquatic mammals
Type: aquatic mammals
Excluded: No Mitigated: No
Importance: Medium TO High User Set:
Rationale:

Activity: truck traffic/hauling 1
Type: truck traffic/hauling
Mode: increases dust affecting
Component: 2, CB lichen/moss
Type: lichen/moss
Excluded: No Mitigated: No
Importance: Medium TO High User Set:
Rationale:

Activity: truck traffic/hauling 1
Type: truck traffic/hauling
Mode: increases dust affecting
Component: 2, CB grasses/herbs/ferns
Type: grasses/herbs/ferns
Excluded: No Mitigated: No
Importance: Medium TO High User Set:
Rationale:

Activity:	truck traffic/hauling 1		
Type:	truck traffic/hauling		
Mode:	increases dust affecting		
Component:	2, CB nearby residents		
Type:	nearby residents		
Excluded:	No	Mitigated:	No
Importance:	Medium TO High	User Set:	
Rationale:			

Activity:	vegetation disposal 1
Type:	vegetation disposal
Mode:	destroys/alters habitat affecting
Component:	5, CB White Sucker
Type:	fish
Excluded:	No Mitigated: No
Importance:	User Set = Low
Rationale:	Vegetation disposal must be carried out according to the satisfaction of the landowner and regulatory authority. All vegetation taken from the construction site must be mulched, chipped or removed to another location. The documentation for this project doesn't state that vegetation must be removed from the site, so the impact importance has been set to "low" rather than as "excluded" to account for the possibility that mulch or chips might be left on site after construction is completed.

Activity:	vegetation disposal 1
Type:	vegetation disposal
Mode:	alters vegetation community affecting
Component:	2, CB shrubs
Type:	shrubs
Excluded:	No Mitigated: No
Importance:	User Set = Low
Rationale:	Vegetation disposal must be carried out according to the satisfaction of the landowner and regulatory authority. All vegetation taken from the construction site must be mulched, chipped or removed to another location. The documentation for this project doesn't state that vegetation must be removed from the site, so the impact importance has been set to "low" rather than as "excluded" to account for the possibility that mulch or chips might be left on site after construction is completed.

Activity:	vegetation disposal 1
Type:	vegetation disposal
Mode:	alters surface water flows disturbing
Component:	2, Cobourg Brook (south of Treatment Plant)
Type:	streams
Excluded:	No Mitigated: No
Importance:	User Set = Low
Rationale:	Vegetation disposal must be carried out according to the satisfaction of the landowner and regulatory authority. All vegetation taken from the construction site must be mulched, chipped or removed to another location. The documentation for this project doesn't state that vegetation must be removed from the site, so the impact importance has been set to "low" rather than as "excluded" to account for the possibility that mulch or chips might be left on site after construction is completed.

Activity: vegetation disposal 1

Type:	vegetation disposal
Mode:	alters soil/surface material affecting
Component:	2, CB embankment
Type:	soil
Excluded:	No Mitigated: No
Importance:	User Set = Low
Rationale:	Vegetation disposal must be carried out according to the satisfaction of the landowner and regulatory authority. All vegetation taken from the construction site must be mulched, chipped or removed to another location. The documentation for this project doesn't state that vegetation must be removed from the site, so the impact importance has been set to "low" rather than as "excluded" to account for the possibility that mulch or chips might be left on site after construction is completed.

Activity:	vegetation disposal 1
Type:	vegetation disposal
Mode:	alters vegetation community affecting
Component:	2, CB trees
Type:	trees
Excluded:	No Mitigated: No
Importance:	User Set = Low
Rationale:	Vegetation disposal must be carried out according to the satisfaction of the landowner and regulatory authority. All vegetation taken from the construction site must be mulched, chipped or removed to another location. The documentation for this project doesn't state that vegetation must be removed from the site, so the impact importance has been set to "low" rather than as "excluded" to account for the possibility that mulch or chips might be left on site after construction is completed.

Activity:	vegetation disposal 1
Type:	vegetation disposal
Mode:	risks human health/safety affecting
Component:	2, CB nearby/adjacent landowners
Type:	nearby/adjacent landowners
Excluded:	No Mitigated: No
Importance:	User Set = Low
Rationale:	Vegetation disposal must be carried out according to the satisfaction of the landowner and regulatory authority. All vegetation taken from the construction site must be mulched, chipped or removed to another location. The documentation for this project doesn't state that vegetation must be removed from the site, so the impact importance has been set to "low" rather than as "excluded" to account for the possibility that mulch or chips might be left on site after construction is completed.

Activity:	vegetation disposal 1
Type:	vegetation disposal
Mode:	risks human health/safety affecting
Component:	2, CB nearby residents
Type:	nearby residents
Excluded:	No Mitigated: No
Importance:	User Set = Low
Rationale:	Vegetation disposal must be carried out according to the satisfaction of the landowner and regulatory authority. All vegetation taken from the construction site must be mulched, chipped or removed to another location. The documentation for this project doesn't state that vegetation must be removed from the site, so the impact importance has been set to "low" rather than as "excluded" to account for the

possibility that mulch or chips might be left on site after construction is completed.

Activity: vegetation disposal 1
Type: vegetation disposal
Mode: risks human health/safety affecting
Component: 2, CB Treatment Plant workers
Type: workers
Excluded: No Mitigated: No
Importance: User Set = Low
Rationale: Vegetation disposal must be carried out according to the satisfaction of the landowner and regulatory authority. All vegetation taken from the construction site must be mulched, chipped or removed to another location. The documentation for this project doesn't state that vegetation must be removed from the site, so the impact importance has been set to "low" rather than as "excluded" to account for the possibility that mulch or chips might be left on site after construction is completed.

Activity: vegetation disposal 1
Type: vegetation disposal
Mode: risks human health/safety affecting
Component: 2, CB recreational boaters
Type: boaters
Excluded: No Mitigated: No
Importance: User Set = Low
Rationale: Vegetation disposal must be carried out according to the satisfaction of the landowner and regulatory authority. All vegetation taken from the construction site must be mulched, chipped or removed to another location. The documentation for this project doesn't state that vegetation must be removed from the site, so the impact importance has been set to "low" rather than as "excluded" to account for the possibility that mulch or chips might be left on site after construction is completed.

Activity: vegetation disposal 1
Type: vegetation disposal
Mode: destroys/alters habitat affecting
Component: 2, CB terrestrial ecosystem
Type: terrestrial ecosystem
Excluded: No Mitigated: No
Importance: User Set = Low
Rationale: Vegetation disposal must be carried out according to the satisfaction of the landowner and regulatory authority. All vegetation taken from the construction site must be mulched, chipped or removed to another location. The documentation for this project doesn't state that vegetation must be removed from the site, so the impact importance has been set to "low" rather than as "excluded" to account for the possibility that mulch or chips might be left on site after construction is completed.

Activity: vegetation disposal 1
Type: vegetation disposal
Mode: destroys/alters habitat affecting
Component: 2, CB aquatic ecosystem
Type: aquatic ecosystem
Excluded: No Mitigated: No
Importance: User Set = Low
Rationale: Vegetation disposal must be carried out according to the satisfaction of the landowner and regulatory

authority. All vegetation taken from the construction site must be mulched, chipped or removed to another location. The documentation for this project doesn't state that vegetation must be removed from the site, so the impact importance has been set to "low" rather than as "excluded" to account for the possibility that mulch or chips might be left on site after construction is completed.

Activity: vegetation disposal 1
Type: vegetation disposal
Mode: promotes new species invasion affecting
Component: 2, CB terrestrial ecosystem
Type: terrestrial ecosystem
Excluded: No Mitigated: No
Importance: User Set = Low
Rationale: Vegetation disposal must be carried out according to the satisfaction of the landowner and regulatory authority. All vegetation taken from the construction site must be mulched, chipped or removed to another location. The documentation for this project doesn't state that vegetation must be removed from the site, so the impact importance has been set to "low" rather than as "excluded" to account for the possibility that mulch or chips might be left on site after construction is completed.

Activity: vegetation disposal 1
Type: vegetation disposal
Mode: alters vegetation community affecting
Component: 2, CB grasses/herbs/ferns
Type: grasses/herbs/ferns
Excluded: No Mitigated: No
Importance: User Set = Low
Rationale: Vegetation disposal must be carried out according to the satisfaction of the landowner and regulatory authority. All vegetation taken from the construction site must be mulched, chipped or removed to another location. The documentation for this project doesn't state that vegetation must be removed from the site, so the impact importance has been set to "low" rather than as "excluded" to account for the possibility that mulch or chips might be left on site after construction is completed.

Activity: vegetation disposal 1
Type: vegetation disposal
Mode: alters vegetation community affecting
Component: 2, CB lichen/moss
Type: lichen/moss
Excluded: No Mitigated: No
Importance: User Set = Low
Rationale: Vegetation disposal must be carried out according to the satisfaction of the landowner and regulatory authority. All vegetation taken from the construction site must be mulched, chipped or removed to another location. The documentation for this project doesn't state that vegetation must be removed from the site, so the impact importance has been set to "low" rather than as "excluded" to account for the possibility that mulch or chips might be left on site after construction is completed.

Activity: vegetation disposal 1
Type: vegetation disposal
Mode: destroys/alters habitat affecting
Component: 2, CB aquatic reptiles/amphibians
Type: aquatic reptiles/amphibians

Excluded: No Mitigated: No
Importance: User Set = Low
Rationale: Vegetation disposal must be carried out according to the satisfaction of the landowner and regulatory authority. All vegetation taken from the construction site must be mulched, chipped or removed to another location. The documentation for this project doesn't state that vegetation must be removed from the site, so the impact importance has been set to "low" rather than as "excluded" to account for the possibility that mulch or chips might be left on site after construction is completed.

Activity: vegetation disposal 1
Type: vegetation disposal
Mode: destroys/alters habitat affecting
Component: 2, CB aquatic mammals
Type: aquatic mammals
Excluded: No Mitigated: No
Importance: User Set = Low
Rationale: Vegetation disposal must be carried out according to the satisfaction of the landowner and regulatory authority. All vegetation taken from the construction site must be mulched, chipped or removed to another location. The documentation for this project doesn't state that vegetation must be removed from the site, so the impact importance has been set to "low" rather than as "excluded" to account for the possibility that mulch or chips might be left on site after construction is completed.

Activity: vegetation disposal 1
Type: vegetation disposal
Mode: destroys/alters habitat affecting
Component: 2, CB aquatic invertebrates
Type: aquatic invertebrates
Excluded: No Mitigated: No
Importance: User Set = Low
Rationale: Vegetation disposal must be carried out according to the satisfaction of the landowner and regulatory authority. All vegetation taken from the construction site must be mulched, chipped or removed to another location. The documentation for this project doesn't state that vegetation must be removed from the site, so the impact importance has been set to "low" rather than as "excluded" to account for the possibility that mulch or chips might be left on site after construction is completed.

Activity: vegetation disposal 1
Type: vegetation disposal
Mode: destroys/alters habitat affecting
Component: 2, CB aquatic birds
Type: aquatic birds
Excluded: No Mitigated: No
Importance: User Set = Low
Rationale: Vegetation disposal must be carried out according to the satisfaction of the landowner and regulatory authority. All vegetation taken from the construction site must be mulched, chipped or removed to another location. The documentation for this project doesn't state that vegetation must be removed from the site, so the impact importance has been set to "low" rather than as "excluded" to account for the possibility that mulch or chips might be left on site after construction is completed.

Activity: vegetation disposal 1
Type: vegetation disposal

Mode: destroys/alters habitat affecting
Component: 4, CB minnows & suckers
Type: fish
Excluded: No Mitigated: No
Importance: User Set = Low
Rationale: Vegetation disposal must be carried out according to the satisfaction of the landowner and regulatory authority. All vegetation taken from the construction site must be mulched, chipped or removed to another location. The documentation for this project doesn't state that vegetation must be removed from the site, so the impact importance has been set to "low" rather than as "excluded" to account for the possibility that mulch or chips might be left on site after construction is completed.

Activity: vegetation disposal 1
Type: vegetation disposal
Mode: destroys/alters habitat affecting
Component: 3, CB Rainbow Trout
Type: fish
Excluded: No Mitigated: No
Importance: User Set = Low
Rationale: Vegetation disposal must be carried out according to the satisfaction of the landowner and regulatory authority. All vegetation taken from the construction site must be mulched, chipped or removed to another location. The documentation for this project doesn't state that vegetation must be removed from the site, so the impact importance has been set to "low" rather than as "excluded" to account for the possibility that mulch or chips might be left on site after construction is completed.

Activity: vegetation disposal 1
Type: vegetation disposal
Mode: destroys/alters habitat affecting
Component: 2, CB Chinook Salmon
Type: fish
Excluded: No Mitigated: No
Importance: User Set = Low
Rationale: Vegetation disposal must be carried out according to the satisfaction of the landowner and regulatory authority. All vegetation taken from the construction site must be mulched, chipped or removed to another location. The documentation for this project doesn't state that vegetation must be removed from the site, so the impact importance has been set to "low" rather than as "excluded" to account for the possibility that mulch or chips might be left on site after construction is completed.

Activity: vegetation disposal 1
Type: vegetation disposal
Mode: harms/kills
Component: 2, CB grasses/herbs/ferns
Type: grasses/herbs/ferns
Excluded: No Mitigated: No
Importance: User Set = Low
Rationale: Vegetation disposal must be carried out according to the satisfaction of the landowner and regulatory authority. All vegetation taken from the construction site must be mulched, chipped or removed to another location. The documentation for this project doesn't state that vegetation must be removed from the site, so the impact importance has been set to "low" rather than as "excluded" to account for the possibility that mulch or chips might be left on site after construction is completed.

Activity:	vegetation disposal 1
Type:	vegetation disposal
Mode:	harms/kills
Component:	2, CB shrubs
Type:	shrubs
Excluded:	No Mitigated: No
Importance:	User Set = Low
Rationale:	Vegetation disposal must be carried out according to the satisfaction of the landowner and regulatory authority. All vegetation taken from the construction site must be mulched, chipped or removed to another location. The documentation for this project doesn't state that vegetation must be removed from the site, so the impact importance has been set to "low" rather than as "excluded" to account for the possibility that mulch or chips might be left on site after construction is completed.

Activity:	vegetation disposal 1
Type:	vegetation disposal
Mode:	harms/kills
Component:	2, CB trees
Type:	trees
Excluded:	No Mitigated: No
Importance:	User Set = Low
Rationale:	Vegetation disposal must be carried out according to the satisfaction of the landowner and regulatory authority. All vegetation taken from the construction site must be mulched, chipped or removed to another location. The documentation for this project doesn't state that vegetation must be removed from the site, so the impact importance has been set to "low" rather than as "excluded" to account for the possibility that mulch or chips might be left on site after construction is completed.

Activity:	vegetation removal 1
Type:	vegetation removal
Mode:	alters vegetation community affecting
Component:	2, CB lichen/moss
Type:	lichen/moss
Excluded:	No Mitigated: No
Importance:	User Set = Low
Rationale:	Area involved will be small.

Activity:	vegetation removal 1
Type:	vegetation removal
Mode:	alters vegetation community affecting
Component:	2, CB trees
Type:	trees
Excluded:	No Mitigated: No
Importance:	User Set = Low
Rationale:	Area involved will be small.

Activity:	vegetation removal 1
Type:	vegetation removal
Mode:	alters vegetation community affecting
Component:	2, CB shrubs

Type:	shrubs		
Excluded:	No	Mitigated:	No
Importance:	User Set = Low		
Rationale:	Area involved will be small.		

Activity:	vegetation removal 1		
Type:	vegetation removal		
Mode:	alters vegetation community affecting		
Component:	2, CB grasses/herbs/ferns		
Type:	grasses/herbs/ferns		
Excluded:	No	Mitigated:	No
Importance:	User Set = Low		
Rationale:	Area involved will be small.		

Activity:	vegetation removal 1		
Type:	vegetation removal		
Mode:	erodes		
Component:	2, CB embankment		
Type:	soil		
Excluded:	No	Mitigated:	No
Importance:	None TO High	User Set:	
Rationale:			

Activity:	vegetation removal 1		
Type:	vegetation removal		
Mode:	alters microclimate affecting		
Component:	2, CB trees		
Type:	trees		
Excluded:	No	Mitigated:	No
Importance:	None TO Medium	User Set:	
Rationale:	The area affected is not sufficiently large to have microhabitat impacts that will affect trees.		

Activity:	vegetation removal 1		
Type:	vegetation removal		
Mode:	alters microclimate affecting		
Component:	2, Cobourg Brook (south of Treatment Plant)		
Type:	streams		
Excluded:	No	Mitigated:	No
Importance:	None TO High	User Set:	
Rationale:	The area affected is not sufficiently large to have microclimate impacts that will affect the stream.		

Activity:	vegetation removal 1		
Type:	vegetation removal		
Mode:	alters vegetation community affecting		
Component:	2, CB terrestrial ecosystem		
Type:	terrestrial ecosystem		
Excluded:	No	Mitigated:	No
Importance:	User Set = Low		

Rationale: The area affected is relatively small.

Activity: vehicle fueling 1
Type: vehicle fueling
Mode: contaminates
Component: 2, CB embankment
Type: soil
Excluded: No Mitigated: No
Importance: Medium TO High User Set:
Rationale:

Activity: vehicle travel 1
Type: vehicle travel
Mode: increases noise levels disturbing
Component: 2, CB recreational boaters
Type: boaters
Excluded: No Mitigated: No
Importance: Medium TO High User Set:
Rationale:

Activity: vehicle travel 1
Type: vehicle travel
Mode: alters animal movement affecting
Component: 2, CB aquatic mammals
Type: aquatic mammals
Excluded: No Mitigated: No
Importance: MediumTOHigh User Set:
Rationale:

Activity: vehicle travel 1
Type: vehicle travel
Mode: increases dust affecting
Component: 2, CB lichen/moss
Type: lichen/moss
Excluded: No Mitigated: No
Importance: MediumTOHigh User Set:
Rationale:

Activity: vehicle travel 1
Type: vehicle travel
Mode: increases dust affecting
Component: 2, CB grasses/herbs/ferns
Type: grasses/herbs/ferns
Excluded: No Mitigated: No
Importance: MediumTOHigh User Set:
Rationale:

Activity: vehicle travel 1
Type: vehicle travel

Mode:	increases noise levels disturbing		
Component:	2, CB nearby/adjacent landowners		
Type:	nearby/adjacent landowners		
Excluded:	No	Mitigated:	No
Importance:	Medium TO High	User Set:	
Rationale:			

Activity:	vehicle travel 1		
Type:	vehicle travel		
Mode:	increases noise levels disturbing		
Component:	2, CB Treatment Plant workers		
Type:	workers		
Excluded:	No	Mitigated:	No
Importance:	Medium TO High	User Set:	
Rationale:			

Activity:	vehicle travel 1		
Type:	vehicle travel		
Mode:	increases noise levels disturbing		
Component:	2, CB nearby residents		
Type:	nearby residents		
Excluded:	No	Mitigated:	No
Importance:	Medium TO High	User Set:	
Rationale:			

Appendix 10:
MITIGATIONS REPORT
(Primary Impacts)

PROJECT: GLFC Cobourg Brook 95
SCENARIO: Cobourg Brook A

Mitigation: approved disposal site 1
Type: approved disposal site
Description: Asphalt to be removed requires sampling and analysis to determine possible lead contamination and corresponding disposal methods. If contaminated, special measures are required to prevent release of the lead, and the asphalt should be disposed of only at approved disposal sites with appropriate rehabilitation measures. Contaminated asphalt should be transported to an approved toxic waste disposal site, if such facilities are available. Asphalt not contaminated will also only be disposed of at approved disposal sites. Under no circumstances should the asphalt that is to be removed be disposed of along the roadside or adjacent to the right-of-way. In national parks, approved sites should be identified in the Maintenance Management Manual of each park.
Comments: Disposal of rock has been incorporated into the project design. Excavated rock may be used as abutment fill above the finished water line, or as rip rap according to size. See page 1 of the Tender Specifications document.

Primary Impacts:

Activity	Mode	Component
disposal of rock/aggregate/asphalt 1	*alters vegetation community affecting*	*2, CB shrubs*
disposal of rock/aggregate/asphalt 1	*destroys/alters habitat affecting*	*2, CB terrestrial mammals*
disposal of rock/aggregate/asphalt 1	*destroys/alters habitat affecting*	*2, CB terrestrial invertebrates*
disposal of rock/aggregate/asphalt 1	*destroys/alters habitat affecting*	*2, CB terrestrial birds*
disposal of rock/aggregate/asphalt 1	*destroys/alters habitat affecting*	*2, CB Chinook Salmon*
disposal of rock/aggregate/asphalt 1	*alters vegetation community affecting*	*2, CB trees*
disposal of rock/aggregate/asphalt 1	*destroys/alters habitat affecting*	*3, CB Rainbow Trout*
disposal of rock/aggregate/asphalt 1	*alters vegetation community affecting*	*2, CB grasses/herbs/ferns*
disposal of rock/aggregate/asphalt 1	*increases sediment load/turbidity of*	*2, Coburg Brook*
disposal of rock/aggregate/asphalt 1	*contaminates*	*2, Coburg Brook*
disposal of rock/aggregate/asphalt 1	*alters vegetation community affecting*	*2, CB lichen/moss*
disposal of rock/aggregate/asphalt 1	*destroys/alters habitat affecting*	*2, CB terr. reptiles/amphibians*
disposal of rock/aggregate/asphalt 1	*destroys/alters habitat affecting*	*2, CB aquatic birds*
disposal of rock/aggregate/asphalt 1	*destroys/alters habitat affecting*	*2, CB aquatic invertebrates*
disposal of rock/aggregate/asphalt 1	*destroys/alters habitat affecting*	*2, CB aquatic mammals*
disposal of rock/aggregate/asphalt 1	*destroys/alters habitat affecting*	*2, CB aqu. reptiles/amphibians*
disposal of rock/aggregate/asphalt 1	*destroys/alters habitat affecting*	*5, CB White Sucker*
disposal of rock/aggregate/asphalt 1	*destroys/alters habitat affecting*	*4, CB minnows & suckers*

Mitigation: avoid significant vegetation 1
Type: avoid significant vegetation
Description: Plowing snow into areas of important vegetation cover should be avoided.
Comments: Where ever possible, trees will be preserved during construction of the barrier. Only those with trunk

diameters of less than 10 cm will be cut. See page 16 of May '96 EA document.

Primary Impacts:

Activity	Mode	Component
cutting trees/logging 1	*alters microclimate affecting*	*2, CB trees*

Mitigation: catchment facilities 1
Type: catchment facilities
Description: Design catchment facilities around the periphery of the site with the flow directed to one location for treatment if feasible.
Comments: Construction will be carried out "in the dry" and silt fences will be used in conjuntion with coffer dams to prevent solid construction wastes from entering the stream. No solid construction wastes will be disposed of in the stream.

Primary Impacts:

Activity	Mode	Component
building/erecting 1	*generates solid waste impacting*	*2, Coburg Brook (south of Treatment Plant)*

Mitigation: clear but do not grub 1
Type: clear but do not grub
Description: Grubbing only when essential in cleared areas can lessen the visual impact of clearing and grubbing and can reduce surface erosion.
Comments: No grubbing will occur within 10 m of the watercourse, except within the weir limits. See page 18 of the May '96 EA document.

Primary Impacts:

Activity	Mode	Component
clearing/grubbing scarifying 1	*promotes new species invasion affecting*	*2, CB terrestrial ecosystem*

Mitigation: * clearing restrictions 1
Type: * clearing restrictions
Description: Leave an undisturbed organic mat within a buffer zone along the watercourse to limit the potential for sediment to enter the water. Keep the clearing activities to a minimum to prevent erosion. Do not grub within 10m of the watercourse except along the weir line. Revegetate streambanks, approach slopes and exposed areas with an appropriate seed mix at twice the standard pasture rate. Incorporate a cover crop seed (e.g. biannual fall rye or annual oats) into the mix as a cover crop.

References:

DFO. 1993. Initial Environmental Assessment. McIntyre River Experimental Sea Lamprey Velocity Barrier. Department of Fisheries and Oceans, Sea Lamprey Control Centre, Sault Ste. Marie, Ontario. 15pp.

DFO. 1995. Initial Environmental Impact Assessment. Big Creek Inflatable-Crest Sea Lamprey Barrier. Department of Fisheries and Oceans, Sea Lamprey Control Centre, Sault Ste. Marie, Ontario. 23pp.

Comments: No grubbing will occur within 10 m of the watercourse, except within the weir limits. See page 18 of the May '96 EA document.

Primary Impacts:

Activity	Mode	Component
clearing/grubbing scarifying 1	*erodes*	*2, CB embankment*

Mitigation: coffer dams 1
Type: coffer dams
Description: The work area should be separated from the flowing stream or water bodies. A coffer dam may be used to separate the work area from the flowing stream but should be limited to one side of the river at a time. Excavated materials should not be allowed to enter the stream. Care must be taken during removal of coffer dams to prevent coffer dam material from washing into the stream. Ensure that excavations are filled to prevent fish being trapped during low stages.
Comments: Coffer dams will be used to divert stream flow around the work site so that construction can be carried out "in the dry". This construction technique minimizes the likelihood that any solid construction waste will enter the stream.
Primary Impacts:

Activity	Mode	Component
building/erecting 1	*generates solid waste impacting*	*2, Coburg Brook (south of Treatment Plant)*

Mitigation: * construct during seasonal low water period 1
Type: * construct during seasonal low water period
Description: Undertake lamprey barrier construction during the seasonal low water period for the river or stream in which the construction will take place.

References:

McAuley, T. 1994. Initial Environmental Impact Assessment. Big Carp River Experimental Inflatable Crest Sea Lamprey Barrier. Department of Fisheries and Oceans, Sea Lamprey Control Centre, Sault Ste. Marie, Ontario. 15pp.

DFO. 1995. Initial Environmental Impact Assessment. Big Creek Inflatable-Crest Sea Lamprey Barrier. Department of Fisheries and Oceans, Sea Lamprey Control Centre, Sault Ste. Marie, Ontario. 23pp.

Comments:
Primary Impacts:

Activity	Mode	Component
disposal of rock/aggregate/asphalt 1	*increases sediment load/turbidity of*	*2, Coburg Brook (south of Treatment Plant)*

Mitigation: fish passage structure 1
Type: fish passage structure
Description: Any artificial structure or stream channel change that causes a permanent blockage to the migration of fish should be provided with a permanent fish passage structure. Federal and/or provincial fisheries authorities should be consulted.
Comments:
Primary Impacts:

Activity	Mode	Component

impounding 1	*alters surface water flows disturbing*	*2, CB Chinook Salmon*
impounding 1	*alters surface water flows disturbing*	*3, CB Rainbow Trout*

Mitigation: fish passage structure 2
Type: fish passage structure
Description: Any artificial structure or stream channel change that causes a permanent blockage to the migration of fish should be provided with a permanent fish passage structure. Federal and/or provincial fisheries authorities should be consulted.
Comments:
Primary Impacts:

Activity	Mode	Component
impounding 1	*alters surface water flows disturbing*	*5, CB White Sucker*

Mitigation: recycle/reuse 1
Type: recycle/reuse
Description: Industrial waste oils and solvents should be recycled and reused as much as possible rather than be disposed on or off site.
Comments: Spent oils, lubricants, filters, etc., will be collected and disposed of at an approved location and in an approved manner. Maintenance work will be carried out at least 100 m from the watercourse. See page 18 of the May '96 EA document.
Primary Impacts:

Activity	Mode	Component
equipment maintenance 1	*contaminates*	*2, Coburg Brook (south of Treatment Plant)*

Mitigation: restricted time frame for operation
Type: restrict engine operation
Description: Restrict unnecessary engine idling. Limit the size and number of engines permitted in the area.
Comments: Equipment use will be restricted to a relatively brief time period of 8 weeks.
Primary Impacts:

Activity	Mode	Component
equipment use 1	*contaminates*	*2, CB local air quality*

Mitigation: settling basins 2
Type: settling basins
Description: Water from aggregate washing operations, water pumped out of the construction area for the purpose of trench de-watering or similar operations, should be channelled to a settling basin or other similar structure when required to reduce the suspended solids content and turbidity. The construction of settling ponds can minimize the amount of silt and debris that reaches the water.
Comments: See page 19 of the May '96 EA document.

Primary Impacts:

Activity	Mode	Component
pumping water 1	*increases sediment load/turbidity of*	*2, Coburg Brook (south of Treatment Plant)*

Mitigation: small area affected 1
Type: small area affected
Description: The area or volume affected is too small to result in a significant environmental impact.
Comments: There is very little vegetation at the site, and little clearing will be necessary. See page 16 of the May '96 EA document.

Primary Impacts:

Activity	Mode	Component
clearing/grubbing scarifying 1	*erodes*	*2, CB embankment*

Mitigation: small area affected 2
Type: small area affected
Description: The area or volume affected is too small to result in a significant environmental impact.
Comments: There is very little vegetation at the site, and little clearing will be necessary. See page 16 of the May '96 EA document.

Primary Impacts:

Activity	Mode	Component
clearing/grubbing scarifying 1	*promotes new species invasion affecting*	*2, CB terrestrial ecosystem*

Mitigation: small area affected 3
Type: small area affected
Description: The area or volume affected is too small to result in a significant environmental impact.
Comments: There is very little vegetation at the site, and little clearing will be necessary. See page 16 of the May '96 EA document.

Primary Impacts:

Activity	Mode	Component
cutting trees/logging 1	*alters microclimate affecting*	*2, CB trees*

Mitigation: small area affected 5
Type: small area affected
Description: The area or volume affected is too small to result in a significant environmental impact.
Comments: Only the water enclosed by the coffer dams will be pumped out. The volume of water being pumped is relatively small.

Primary Impacts:

Activity	Mode	Component
pumping water 1	*increases sediment load/turbidity of*	*2, Coburg Brook (south of Treatment Plant)*

Appendix 11:
SECONDARY IMPACT REPORT

PROJECT: GLFC Cobourg Brook 95
SCENARIO: Cobourg Brook A

Initiating Mode:	alters soil/surface material affecting		
Initiator:	2, CB embankment		
Type:	soil		
Mode:	destroys/alters habitat affecting		
Receptor:	2, CB terrestrial invertebrates		
Type:	terrestrial invertebrates		
Excluded:	No	Mitigated:	No
Importance:	None TO High	User Set:	
Rationale:			

Initiating Mode:	alters vegetation community affecting		
Initiator:	2, CB trees		
Type:	trees		
Mode:	alters ecological balance of		
Receptor:	2, CB terrestrial ecosystem		
Type:	terrestrial ecosystem		
Excluded:	No	Mitigated:	No
Importance:	None TO High	User Set:	
Rationale:			

Initiating Mode:	alters vegetation community affecting		
Initiator:	2, CB grasses/herbs/ferns		
Type:	grasses/herbs/ferns		
Mode:	alters ecological balance of		
Receptor:	2, CB terrestrial ecosystem		
Type:	terrestrial ecosystem		
Excluded:	No	Mitigated:	No
Importance:	None TO High	User Set:	
Rationale:			

Initiating Mode:	alters vegetation community affecting		
Initiator:	2, CB trees		
Type:	trees		
Mode:	degrades the visual landscape affecting		
Receptor:	2, CB nearby residents		
Type:	nearby residents		
Excluded:	No	Mitigated:	No
Importance:	None TO High	User Set:	
Rationale:			

Initiating Mode:	alters vegetation community affecting		
Initiator:	2, CB lichen/moss		
Type:	lichen/moss		
Mode:	alters ecological balance of		
Receptor:	2, CB terrestrial ecosystem		
Type:	terrestrial ecosystem		
Excluded:	No	Mitigated:	No
Importance:	None TO High	User Set:	
Rationale:			

Initiating Mode:	alters vegetation community affecting		
Initiator:	2, CB shrubs		
Type:	shrubs		
Mode:	alters ecological balance of		
Receptor:	2, CB terrestrial ecosystem		
Type:	terrestrial ecosystem		
Excluded:	No	Mitigated:	No
Importance:	None TO High	User Set:	
Rationale:			

Initiating Mode:	alters vegetation community affecting		
Initiator:	2, CB trees		
Type:	trees		
Mode:	destroys/alters habitat affecting		
Receptor:	2, CB terrestrial reptiles/amphibians		
Type:	terrestrial reptiles/amphibians		
Excluded:	No	Mitigated:	No
Importance:	None TO High	User Set:	
Rationale:			

Initiating Mode:	alters vegetation community affecting		
Initiator:	2, CB trees		
Type:	trees		
Mode:	destroys/alters habitat affecting		
Receptor:	2, CB terrestrial mammals		
Type:	terrestrial mammals		
Excluded:	No	Mitigated:	No
Importance:	None TO High	User Set:	
Rationale:			

Initiating Mode:	alters vegetation community affecting		
Initiator:	2, CB trees		
Type:	trees		
Mode:	destroys/alters habitat affecting		
Receptor:	2, CB terrestrial invertebrates		
Type:	terrestrial invertebrates		
Excluded:	No	Mitigated:	No
Importance:	None TO High	User Set:	
Rationale:			

Initiating Mode:	alters vegetation community affecting		
Initiator:	2, CB trees		
Type:	trees		
Mode:	destroys/alters habitat affecting		
Receptor:	2, CB terrestrial birds		
Type:	terrestrial birds		
Excluded:	No	Mitigated:	No
Importance:	None TO High	User Set:	
Rationale:			

Initiating Mode:	contaminates		
Initiator:	2, Cobourg Brook (south of Treatment Plant)		
Type:	streams		
Mode:	contaminates		
Receptor:	2, CB aquatic mammals		
Type:	aquatic mammals		
Excluded:	No	Mitigated:	No
Importance:	None TO Medium	User Set:	
Rationale:			

Initiating Mode:	contaminates		
Initiator:	2, Cobourg Brook (south of Treatment Plant)		
Type:	streams		
Mode:	reduces the survival rate of		
Receptor:	2, CB aquatic invertebrates		
Type:	aquatic invertebrates		
Excluded:	No	Mitigated:	No
Importance:	None TO High	User Set:	
Rationale:			

Initiating Mode:	contaminates		
Initiator:	2, Cobourg Brook (south of Treatment Plant)		
Type:	streams		
Mode:	reduces the survival rate of		
Receptor:	4, CB minnows & suckers		
Type:	fish		
Excluded:	No	Mitigated:	No
Importance:	None TO Medium	User Set:	
Rationale:			

Initiating Mode:	contaminates		
Initiator:	2, Cobourg Brook (south of Treatment Plant)		
Type:	streams		
Mode:	reduces the survival rate of		
Receptor:	3, CB Rainbow Trout		
Type:	fish		
Excluded:	No	Mitigated:	No
Importance:	None TO High	User Set:	

Rationale:

Initiating Mode: contaminates
Initiator: 2, Cobourg Brook (south of Treatment Plant)
Type: streams
Mode: reduces the survival rate of
Receptor: 2, CB Chinook Salmon
Type: fish
Excluded: No Mitigated: No
Importance: None TO High User Set:
Rationale:

Initiating Mode: contaminates
Initiator: 2, Cobourg Brook (south of Treatment Plant)
Type: streams
Mode: contaminates
Receptor: 2, CB aquatic reptiles/amphibians
Type: aquatic reptiles/amphibians
Excluded: No Mitigated: No
Importance: None TO Medium User Set:
Rationale:

Initiating Mode: contaminates
Initiator: 2, Cobourg Brook (south of Treatment Plant)
Type: streams
Mode: contaminates
Receptor: 2, CB aquatic invertebrates
Type: aquatic invertebrates
Excluded: No Mitigated: No
Importance: None TO Medium User Set:
Rationale:

Initiating Mode: contaminates
Initiator: 2, Cobourg Brook (south of Treatment Plant)
Type: streams
Mode: contaminates
Receptor: 4, CB minnows & suckers
Type: fish
Excluded: No Mitigated: No
Importance: None TO Low User Set:
Rationale:

Initiating Mode: contaminates
Initiator: 2, Cobourg Brook (south of Treatment Plant)
Type: streams
Mode: contaminates
Receptor: 3, CB Rainbow Trout
Type: fish
Excluded: No Mitigated: No

Importance:	None TO Medium	User Set:	
Rationale:			

Initiating Mode:	contaminates		
Initiator:	2, Cobourg Brook (south of Treatment Plant)		
Type:	streams		
Mode:	contaminates		
Receptor:	2, CB Chinook Salmon		
Type:	fish		
Excluded:	No	Mitigated:	No
Importance:	None TO Medium	User Set:	
Rationale:			

Initiating Mode:	contaminates		
Initiator:	2, Cobourg Brook (south of Treatment Plant)		
Type:	streams		
Mode:	chemical destruction/alteration affecting		
Receptor:	2, CB algae/phytoplankton		
Type:	algae/phytoplankton		
Excluded:	No	Mitigated:	No
Importance:	None TO High	User Set:	
Rationale:			

Initiating Mode:	contaminates		
Initiator:	2, Cobourg Brook (south of Treatment Plant)		
Type:	streams		
Mode:	chemical destruction/alteration affecting		
Receptor:	2, CB emergent vegetation		
Type:	emergent vegetation		
Excluded:	No	Mitigated:	No
Importance:	None TO Medium	User Set:	
Rationale:			

Initiating Mode:	contaminates		
Initiator:	2, Cobourg Brook (south of Treatment Plant)		
Type:	streams		
Mode:	chemical destruction/alteration affecting		
Receptor:	2, CB submerged vegetation		
Type:	submerged vegetation		
Excluded:	No	Mitigated:	No
Importance:	None TO Medium	User Set:	
Rationale:			

Initiating Mode:	contaminates
Initiator:	2, Cobourg Brook (south of Treatment Plant)
Type:	streams
Mode:	contaminates
Receptor:	5, CB White Sucker
Type:	fish

Excluded:	No	Mitigated:	No
Importance:	None TO Medium	User Set:	
Rationale:			

Initiating Mode:	contaminates		
Initiator:	2, Cobourg Brook (south of Treatment Plant)		
Type:	streams		
Mode:	reduces the survival rate of		
Receptor:	5, CB White Sucker		
Type:	fish		
Excluded:	No	Mitigated:	No
Importance:	None TO High	User Set:	
Rationale:			

Initiating Mode:	contaminates		
Initiator:	2, Cobourg Brook (south of Treatment Plant)		
Type:	streams		
Mode:	reduces the survival rate of		
Receptor:	2, CB aquatic reptiles/amphibians		
Type:	aquatic reptiles/amphibians		
Excluded:	No	Mitigated:	No
Importance:	None TO High	User Set:	
Rationale:			

Initiating Mode:	contaminates		
Initiator:	2, Cobourg Brook (south of Treatment Plant)		
Type:	streams		
Mode:	reduces the survival rate of		
Receptor:	2, CB aquatic mammals		
Type:	aquatic mammals		
Excluded:	No	Mitigated:	No
Importance:	None TO High	User Set:	
Rationale:			

Initiating Mode:	contaminates		
Initiator:	2, CB embankment		
Type:	soil		
Mode:	contaminates		
Receptor:	2, Cobourg Brook (south of Treatment Plant)		
Type:	streams		
Excluded:	No	Mitigated:	No
Importance:	None TO High	User Set:	
Rationale:			

Initiating Mode:	contaminates		
Initiator:	2, CB embankment		
Type:	soil		
Mode:	destroys/alters habitat affecting		
Receptor:	2, CB terrestrial invertebrates		

Type:	terrestrial invertebrates		
Excluded:	No	Mitigated:	No
Importance:	High TO High	User Set:	
Rationale:			

Initiating Mode:	contaminates		
Initiator:	2, CB embankment		
Type:	soil		
Mode:	reduces the survival rate of		
Receptor:	2, CB lichen/moss		
Type:	lichen/moss		
Excluded:	No	Mitigated:	No
Importance:	High TO High	User Set:	
Rationale:			

Initiating Mode:	contaminates		
Initiator:	2, CB embankment		
Type:	soil		
Mode:	reduces the survival rate of		
Receptor:	2, CB trees		
Type:	trees		
Excluded:	No	Mitigated:	No
Importance:	High TO High	User Set:	
Rationale:			

Initiating Mode:	contaminates		
Initiator:	2, CB embankment		
Type:	soil		
Mode:	reduces the survival rate of		
Receptor:	2, CB shrubs		
Type:	shrubs		
Excluded:	No	Mitigated:	No
Importance:	High TO High	User Set:	
Rationale:			

Initiating Mode:	contaminates		
Initiator:	2, CB embankment		
Type:	soil		
Mode:	reduces the survival rate of		
Receptor:	2, CB grasses/herbs/ferns		
Type:	grasses/herbs/ferns		
Excluded:	No	Mitigated:	No
Importance:	High TO High	User Set:	
Rationale:			

Initiating Mode:	damages/destroys
Initiator:	2, CB cover habitat for adult fish
Type:	cover habitat for adult fish
Mode:	reduces the survival rate of

Receptor:	5, CB White Sucker		
Type:	fish		
Excluded:	No	Mitigated:	No
Importance:	High TO High	User Set:	
Rationale:			

Initiating Mode:	damages/destroys		
Initiator:	2, CB cover habitat for adult fish		
Type:	cover habitat for adult fish		
Mode:	reduces the survival rate of		
Receptor:	4, CB minnows & suckers		
Type:	fish		
Excluded:	No	Mitigated:	No
Importance:	High TO High	User Set:	
Rationale:			

Initiating Mode:	damages/destroys		
Initiator:	2, CB cover habitat for adult fish		
Type:	cover habitat for adult fish		
Mode:	reduces the survival rate of		
Receptor:	2, CB Chinook Salmon		
Type:	fish		
Excluded:	No	Mitigated:	No
Importance:	High TO High	User Set:	
Rationale:			

Initiating Mode:	damages/destroys		
Initiator:	2, CB cover habitat for adult fish		
Type:	cover habitat for adult fish		
Mode:	reduces the survival rate of		
Receptor:	3, CB Rainbow Trout		
Type:	fish		
Excluded:	No	Mitigated:	No
Importance:	High TO High	User Set:	
Rationale:			

Initiating Mode:	erodes		
Initiator:	2, CB embankment		
Type:	soil		
Mode:	increases sediment load/turbidity of		
Receptor:	2, Cobourg Brook (south of Treatment Plant)		
Type:	streams		
Excluded:	No	Mitigated:	No
Importance:	None TO High	User Set:	
Rationale:			

Initiating Mode:	increases sediment load/turbidity of		
Initiator:	2, Cobourg Brook (south of Treatment Plant)		
Type:	streams		

Mode:	reduces the survival rate of		
Receptor:	4, CB minnows & suckers		
Type:	fish		
Excluded:	No	Mitigated:	No
Importance:	None TO Medium	User Set:	
Rationale:			

Initiating Mode:	increases sediment load/turbidity of		
Initiator:	2, Cobourg Brook (south of Treatment Plant)		
Type:	streams		
Mode:	reduces the survival rate of		
Receptor:	3, CB Rainbow Trout		
Type:	fish		
Excluded:	No	Mitigated:	No
Importance:	None TO High	User Set:	
Rationale:			

Initiating Mode:	increases sediment load/turbidity of		
Initiator:	2, Cobourg Brook (south of Treatment Plant)		
Type:	streams		
Mode:	reduces the survival rate of		
Receptor:	2, CB Chinook Salmon		
Type:	fish		
Excluded:	No	Mitigated:	No
Importance:	None TO High	User Set:	
Rationale:			

Initiating Mode:	increases sediment load/turbidity of		
Initiator:	2, Cobourg Brook (south of Treatment Plant)		
Type:	streams		
Mode:	restricts future land use affecting		
Receptor:	2, CB nearby/adjacent landowners		
Type:	nearby/adjacent landowners		
Excluded:	No	Mitigated:	No
Importance:	None TO High	User Set:	
Rationale:			

Initiating Mode:	promotes new species invasion affecting		
Initiator:	2, CB grasses/herbs/ferns		
Type:	grasses/herbs/ferns		
Mode:	alters ecological balance of		
Receptor:	2, CB terrestrial ecosystem		
Type:	terrestrial ecosystem		
Excluded:	No	Mitigated:	No
Importance:	None TO High	User Set:	
Rationale:			

Initiating Mode:	promotes new species invasion affecting
Initiator:	2, CB lichen/moss

Type:	lichen/moss		
Mode:	alters ecological balance of		
Receptor:	2, CB terrestrial ecosystem		
Type:	terrestrial ecosystem		
Excluded:	No	Mitigated:	No
Importance:	None TO High	User Set:	
Rationale:			