

APPENDIX 2

Supplemental Regulatory/ Assessment Approach Information



**Environmental Assessment of
Canadian Strategic Infrastructure Funded
Upgrades to the City of Winnipeg
Water Pollution Control Centres**

**APPENDIX 2
Supplemental Regulatory/
Assessment Approach Information**

**Environmental Assessment of
Canadian Strategic Infrastructure Funded
Upgrades to the City of Winnipeg
Water Pollution Control Centres**

**APPENDIX 2A
Acts and Regulations**

1.0 REGULATORY REQUIREMENTS

The central elements of the regulatory framework, which creates the context for this assessment, are noted in the following subsections (grouped by jurisdiction). The requirements associated with these statutes or regulations, as well as other applicable guidelines, were considered in this EIA.

1.1 PROVINCIAL

The Acts and associated regulations relevant to the Project are as follows:

- The Environment Act (S.M. 1990. c.26 C.C.S.M. E125) and associated regulations, including:
 - Classes of Development Regulation (MR 164/88).
 - Water and Wastewater Facility Operators Regulation (MR 77/2003).
 - *Environment Act* licence No. 2684, (issued June 1, 2005), for the alteration and operation of the North End Water Pollution Control Centre.
 - *Environment Act* licence No. 2669 E, (issued September 3, 2004, revised April 12, 2005), for the alteration and operation of the West End Water Pollution Control Centre.
 - *Environment Act* licence No. 1089 E RR, (issued February 21, 1989, revised April 28 and June 14, 2000) for the operation of a sludge dewatering system, a facility for the temporary storage of biosolids, the transportation of biosolids and the disposal of biosolids on agricultural land.
- The Sustainable Development Act (S.M. 1997, c.61, C.C.S.M. S270).
- The Heritage Resources Act (R.S.M. 1987, c.H39.1).
- The Workplace Safety and Health Act (R.S.M. 1987 c.W210), including:
 - Construction Industry Safety Regulation (MR 189/85).
 - Workers Working Alone Regulation (MR 105/88R).
 - Hearing Conservation and Noise Control Regulation (MR 227/94).
 - Workplace Hazardous Materials Information System Regulation (MR 52/88).

- The Dangerous Goods Handling and Transportation Act (R.S.M. 1987, c.D12) and associated regulations, including:
 - Environmental Accident Reporting Regulation (MR 439/87).
 - Generator Registration and Carrier Licensing Regulation (MR 175/87).
 - Dangerous Goods Handling and Transportation Regulation (MR 55/2003).
 - Storage and Handling of Petroleum Products and Allied Products (MR 188/2001).
- The Public Health Act (R.S.M. 1987, c.P210) and associated regulations, including:
 - Collection and Disposal of Wastes Regulation (MR 321/88).
 - Waterworks, Sewerage and Sewage Disposal Regulation (MR 331/88R).
 - Protection of Water Sources Regulation (MR 326/88R).
- The Manitoba Endangered Species Act and appropriate provisions of the Manitoba Wildlife Act.

1.2 FEDERAL

- Canadian Environmental Assessment Act:
 - Creating the assessment standard to be satisfied for any proponent requiring environmental assessments to be conducted of projects that apply for federal funding.
- Canadian Environmental Protection Act:
 - "Greenhouse gas" reduction targets adopted by the federal and provincial governments to satisfy the Kyoto Agreement that was ratified on December 17, 2002, by Parliament.
 - PSL 1 and 2 process for the management of toxic substances, including *Guideline for the release of ammonia dissolved in water found in wastewater effluents* published in the Canada Gazette, Part I on December 4, 2004.
- Migratory Bird Convention Act:
 - Environment Canada administers the provisions of the Migratory Bird Convention Act, of which Section 6 of the Migratory Bird Regulations state that "no person shall... (a) disturb, destroy or take a nest, egg, nest shelter, eider duck shelter or duck box of a migratory bird or ...(b) have in his possession a live migratory bird, or a carcass, skin nest or egg of a migratory bird."

- Fisheries Act:
 - Subsection 36(3) "...no person shall deposit or permit the deposit of a deleterious substance of any type in water frequented by fish..."
- Species at Risk Act.

1.3 MUNICIPAL

- City of Winnipeg Sewer Bylaw 7070/97.

1.4 PERMITTING PROCESS AND OTHER

- Manitoba Building Code -Permits issued under provisions of the Manitoba Building Code for;
 - Address "buildings" in the project.
- Manitoba Fire Code.

1.5 OTHER REGULATORY AND RELATED REQUIREMENTS

Other regulatory requirements pertaining to the Project include:

- Manitoba's Ambient Air Quality Objectives and Guidelines
- Manitoba Conservation's Odour Nuisance Management Strategy
- The Manitoba Water Strategy
- Manitoba Water Policies
- Manitoba Surface Water Quality Standards, Objectives and Guidelines
- Manitoba's Sustainable Development Strategy
- Nutrient Management Strategy
- Manitoba Industrial Accidents Council Industrial Emergency Response Planning Guide
- Manitoba Stream Crossing Guidelines for the Protection of Fish and Fish Habitat
- Canada-Manitoba Agreement on Environmental Assessment Cooperation
- Manitoba Guidelines for Sound Pollution, Environmental Sound Objectives, Schedule A

**Environmental Assessment of
Canadian Strategic Infrastructure Funded
Upgrades to the City of Winnipeg
Water Pollution Control Centres**

**APPENDIX 2B
Environmental Assessment
Approach and
Definitions**

1.0 REGULATORY FRAMEWORK AND BASIC DEFINITIONS

1.1 REGULATORY FRAMEWORK

This Environmental Assessment (EA) of the proposed Project has been prepared in accordance with the requirements of the Manitoba *Environment Act* (1988) and the *Canadian Environmental Assessment Act* (CEAA 1992). The EA identifies potential environmental effects of the Project and their significance, as primarily defined in the CEAA (1992), after consideration of implementation of proposed mitigation (ways to avoid or reduce adverse effects or enhance environmental benefits), monitoring and follow-up measures. Where mitigation measures are required, these are incorporated into the Project design to the extent feasible.

1.2 DEFINITIONS USED IN THE ASSESSMENT

Fundamental to the approach are the definitions and objectives of the process listed by the respective Acts. The *Canadian Environmental Assessment Act* (1992) provides the following definitions:

- "environmental effect" means, in respect of a project:

(a) any change that the project may cause in the environment, including any change it may cause to a listed wildlife species, its critical habitat or the residences of individuals of that species, as those terms are defined in subsection 2(1) of the Species at Risk Act,

(b) any effect of any change referred to in paragraph (a) on

(i) health and socio-economic conditions, (ii) physical and cultural heritage,

(iii) the current use of lands and resources for traditional purposes by aboriginal persons, or

(iv) any structure, site or thing that is of historical, archaeological, paleontological or architectural significance, or

(c) any change to the project that may be caused by the environment, whether any such change or effect occurs within or outside Canada”.

The Manitoba *Environment Act* (1988) uses a slightly different list of definitions and includes the following:

- "assessment" means an evaluation of a proposal to ensure that appropriate environmental management practices are incorporated into all components of the life cycle of a development;”
- "environment" means:
 - (a) air, land, and water, or*
 - (b) plant and animal life, including humans.”*

The provincial Act provides direction with respect to the purpose of the assessment in:

- Section 11 (9) – “For the purposes of assessing the environmental impacts of a proposed Class 2 development, the director may do any or all of the following things:
 - (a) require from the proponent additional information;*
 - (b) issue guidelines and instructions for the assessment and require the proponent to carry out public consultation;*
 - (c) require the proponent to prepare and submit to the director an assessment report to include such studies, research, data gathering and analysis or monitoring, alternatives to the proposed development processes and locations, and the details of proposed environmental management practices to deal with the issues;*
 - (d) conduct or cause to be conducted a review of the assessment report;*
 - (e) request the minister to direct the chairperson of the commission to conduct a public hearing.”*

The federal Act requests that the assessment include the following:

- “16 (1) Every screening or comprehensive study of a project and every mediation or assessment by a review panel shall include a consideration of the following factors:
 - (a) the environmental effects of the project, including the environmental effects of malfunctions or accidents that may occur in connection with the project and any cumulative environmental effects that are likely to result from the project in combination with other projects or activities that have been or will be carried out;*
 - (b) the significance of the effects referred to in paragraph (a);*
 - (c) comments from the public that are received in accordance with this Act and the regulations;*
 - (d) measures that are technically and economically feasible and that would mitigate any significant adverse environmental effects of the project; and*
 - (e) any other matter relevant to the screening, comprehensive study, mediation or assessment by a review panel, such as the need for the project and alternatives to the project, that the responsible authority or, except in the case of a screening, the Minister after consulting with the responsible authority, may require to be considered.”*

While the Provincial Act refers to the assessment of “impacts” (i.e., negative effects), the Federal Act refers to the assessment of “effects” (i.e., both positive and negative effects). The federal process conclusions are with respect to whether “significant adverse effects” will occur (i.e., negative only). For the purpose of this assessment, the neutral term “effect” is used, but conclusions about whether a change is a “significant” effect is consistent with both the federal definition of “significant adverse effect” and the provincial environmental determination of an “impact.”

1.3 CUMULATIVE EFFECTS ASSESSMENT

Cumulative effects assessment (CEA) approach consistent with CEAA (1992), was done concurrently with all other elements of the EA, without any explicit distinction in the EA between the CEA and other elements of the EA.

1.3.1 Background

Guidelines issued with respect to recent Projects in Manitoba typically state that *“Cumulative effects assessment (CEA) shall form an integral part of the environmental and socio-economic assessment. The cumulative effects assessment shall examine all effects that are likely to result from the Project when they are anticipated to occur in combination with other projects or activities that have been, or will be carried out.”*

Section 16 of CEAA (1992) states that every screening or comprehensive study of a project, and every mediation or assessment by a review panel, shall include consideration of the following (among other factors):

- a. *“the environmental effects of the project, including the environmental effects of malfunctions or accidents that may occur in connection with the project and any cumulative environmental effects that are likely to result from the project in combination with other projects or activities that have been or will be carried out”;*
and
- b. *“the significance of the effects referred to in paragraph (a)”.*

The Canadian Environmental Assessment Agency (CEAA) provides guidance on CEA practice, including its *Cumulative Effects Assessment Practitioners Guide* (Hagmann *et al.* 1999, referred to as “CEAA CEA Practitioners Guide”). Section 2.1 of the CEAA CEA Practitioners Guide provides the following overall guidance as to definitions and CEA relationship to EA:

"Cumulative effects are changes to the environment that are caused by an action in combination with other past, present and future human actions.... [... This definition is intended specifically for single-project assessments as opposed to regional planning (in which case there is not necessarily a single project that serves as the starting point and focus of the assessment), and borrows the broad definition of 'environment' as used in the [CEAA].] A CEA is an assessment of those effects."

"CEA is an environmental assessment as it should always have been: an Environmental Impact Assessment (EIA) done well."

"Action: Any project or activity of human origin."

Section 3.1 of the CEAA CEA Practitioners Guide (Hagmann *et al.* 1999) includes the general guidance as to CEA framework practice, confirming that CEA ideally forms an integral part of the overall environmental assessment (as set out in typical EA guidelines) and that the ultimate goal of CEA remains the assessment of effects specific to the Project (rather than the separate assessment of effects as such from other specific projects or activities):

"Ideally, all aspects of a CEA ... are done concurrently with the EIA, resulting in an assessment approach that makes no explicit distinction between the two parts."

"With the exception of the consideration of future actions, the above [three fundamental CEA requirements for a single project under regulatory review] are identical to the requirements for a good EIA (the consideration of the effects of other actions is not necessarily new to CEA, as the existing environmental setting of a project has typically recognized other actions at least within the EIA's study area)."

"... an assessment of a single project (which is what almost all assessments do) must determine if that project is incrementally responsible for adversely affecting a VEC [valued ecosystem component] beyond an acceptable point (by whatever definition). Therefore, although the cumulative effect on a VEC due to many actions must be identified, the CEA must also make clear to what degree the project under review is alone contributing to that total effect. Regulatory reviewers may consider both of these contributions in their deliberation on the project application".

This approach is consistent with Section 3.1 of the CEAA CEA Practitioners Guide (Hagmann *et al.* 1999) and was explicitly recognized as follows in Section 3.2.4.1 of that document¹:

"In practice, past actions often become part of the existing baseline conditions. It is important, however, to ensure that the effects of these actions are recognized."

CEA scoping requirements recognize that cumulative environmental effects must qualify as "environmental effects" of the Project as defined in CEAA (e.g., must fall within the spatial and temporal boundaries applicable for Project effects, must be caused at least in part by the Project), and must be "*likely* to result from the project when they are anticipated to occur *in combination with other projects or activities* that have been, or *will* be carried out." (italics added for emphasis). In essence, to be scoped into the CEA relating to assessing any specific environmental component, effects pathways from other projects and human activities must overlap with the effects pathways otherwise identified for the Project with regard to the specific environmental component.

¹ The 1994 FEARO Reference Guide on *Addressing Cumulative Environmental Effects* also noted: "For example, most [existing environmental assessment reports] examine the baseline environmental conditions, which include the cumulative environmental effects of past and existing projects and activities."

1.3.2 Past, Current, and Future Projects and Activities

Past and current projects and activities (i.e., actions that “have been carried out”) were considered to form an integral part of the existing biophysical/ecological environment against which predicted effects are assessed. As such, these past and current projects and activities, along with their projected future levels, are properly accounted for in the assessment of Project effects. This approach is consistent with Section 3.1 of the CEEA CEA Practitioners Guide (Hagmann *et al.* 1999).

- In recognizing such effects it is relevant to consider ongoing trends (i.e., future effects as well as past and existing effects from actions that have been carried out). Past and current projects and activities considered in the baseline setting conditions are reviewed.

In identifying future projects or activities (i.e., human actions that “will be carried out”) to be included in the CEA, the following additional considerations have been noted:²

- At a minimum, otherwise eligible projects or activities that have already been approved must be taken into account.
- It would be prudent also to consider otherwise eligible projects or activities that are already in a government approvals process.
- Other eligible projects or activities not subject to a formal government approvals process should be included if there is a high level of certainty that they will occur.
- The environmental effects of uncertain or hypothetical projects need not be considered.

² See *Addressing Cumulative Environmental Effects, A Reference Guide for the Canadian Environmental Assessment Act (Federal Environmental Assessment Review Office. 1994)*. This guidance remains consistent with that provided in the Section 3.2.4.1 of the CEEA CEA Practitioners Guide (Hagmann *et al.* 1999) which references future actions under three types: “certain” (action will proceed or there is high probability it will proceed), “reasonably foreseeable” (action may proceed, but there is some uncertainty about this conclusion - these may be considered to the extent that the action is likely and could have a significant cumulative effect with the project under review), and “hypothetical” (considerable uncertainty over whether the action will ever proceed).

Eligible past, current and future activities that could potentially overlap with the Project were identified. A description of these activities, along with their spatial and temporal scale and additional assumptions and analysis regarding how they were addressed in the EA, is further discussed as required for each specific environmental component.

For the purpose of CEA related to the Project, projects and activities considered under “future actions” reasonably likely to proceed are those which are expected to have effects that potentially overlap in a significant way with effects of the Project and also:

- Have been approved.
- Have been officially announced by the proponent or are otherwise directly associated with the Project.
- Are currently in a government approvals process (e.g., an EA is available for public review).
- For which there is very strong indication that they will start to be carried out before completion of the Project’s construction phase. This time frame was chosen to address projects likely to be carried out which might otherwise be ignored. Beyond this planning horizon, it is considered that the likelihood of projects and activities, or their possible effects, remain hypothetical for CEA purposes.

The types of effects stemming from future activities and projects are predicted based on best available information and professional judgement. In most cases, the detail known about future projects and activities and their possible interaction with the Project is such that only a general description of anticipated cumulative effects is possible. For this reason, and in accordance with typical EA guidelines, each section addressing cumulative effects includes, where relevant, discussion of the assumptions and analyses used to develop the conclusions reached, as well as the level of confidence in the data used to develop the analyses based on available project description information and level of commitment about when the development will proceed.

In dealing with uncertain future projects or activities potentially relevant to CEA of the Project, it is important to note that any such project would typically be subject to its own regulatory

review and approvals. Issues related to the cumulative effects of such new future developments in combination with the Project can therefore be best and most properly assessed when or if new government approvals are sought for such projects.

2.0 ASSESSMENT APPROACH

2.1 GENERAL PRINCIPLES

In accordance with conventional environmental assessment practice³, the basic assessment framework for EA (including cumulative effects assessment) includes five steps:

1. *Scoping*: This step includes identifying issues of concern related to the Project, selecting environmental components to be examined in the EA, identifying potential sources and pathways of effects from the Project to each environmental component, identifying spatial and temporal boundaries for assessing effects of the Project for each selected environmental component, and identifying other actions and effects pathways (i.e., other actions to be included to meet cumulative effects assessment requirements) that may affect the same environmental components.
2. *Analysis of Effects*: This step involves collection of baseline data for each environmental component (i.e., data for that environment without the Project), and assessing the effects of the Project as well as all selected other actions (i.e., cumulative effects) on the selected environmental components.
3. *Identification of Mitigation*: This step sets out recommended mitigation measures.
4. *Evaluation of Significance – Describing Residual Effects*: This step evaluates the significance of residual effects (i.e., adverse effects after consideration of full recommended mitigation) likely to result from the Project. Evaluation of significance must be carried out in accordance with CEAA (1992), and may involve comparing such residual effects against thresholds for an environmental component (e.g., specified goals

³ See Section 3.1 of CEAA CEA Practitioners Guide (Hagmann *et al.* 1999).

or targets, standards or guidelines, carrying capacity, or limits of acceptable change), or to land use objectives and trends. The EA addresses significance under the assessment of residual effects (rather than as part of “effects and mitigation”).

5. *Follow-up*: This step sets out recommended monitoring and effect management measures. residual effects.

For the purpose of assessing the environmental effects of the proposed Project, the current environment with the existing Project and the projected future evolution of this environment without the Project is considered the baseline. Potential environmental effects of the Project on this existing environment are assessed separately in the EA during construction and operation by comparing:

- a. *What would be expected without the Project* (i.e., the “existing environment” or baseline expected for each relevant environmental component with the Project and without the Project, including as relevant consideration of other projects or activities that have been or will be carried out without the Project).
- b. *What is expected to happen with the Project* (i.e., each environmental component as modified or impacted by the Project based on direct and indirect effects pathways from the Project to the environmental component, including as relevant consideration of other projects or activities that have been or will be carried out in combination with the Project).

Comparing the existing baseline situation with the environment anticipated once the Project is developed and operational assesses the potential effects of the proposed Project on the biophysical and socio-economic environments. The extent, magnitude, duration and frequency of impacts, their apparent reversibility, their apparent environmental sensitivity, and recovery ability to a pre-Project state are considered. The data available and collected were assessed for completeness, information gaps were identified, and additional data collection measures were implemented prior to EA submission, or where necessary, as outlined in the EA as a necessary requirement. For each of the environmental components the assessment examines:

- *Approach and Method* addresses scoping issues and includes categories of assessment, sources of effects, scope of geographic and temporal assessment boundaries, and overview of other specific methods of approach.
- *Existing Environment* baseline analysis includes review of current and evolving future environment as affected by the Project. As stipulated in typical EA guidelines, each “existing environment” component is described only to the extent needed to predict the effect of the Project on that environment. Cumulative effects assessment (CEA) forms an integral part of this assessment of baseline conditions.
- *Effects and Mitigation* describes quantitatively and qualitatively both positive and adverse environmental effects likely to result from the Project after consideration of proposed mitigation measures beyond those already included in the Project Description. In accordance with CEAA (1992), the scope of this assessment includes socio-economic effects arising from the biophysical effects of the Project. Cumulative effects assessment (CEA) forms an integral part of this assessment.
- *Residual Impacts and their Significance* describes summaries of the nature and extent of any residual environmental effects of the Project after full implementation of proposed mitigation, and characterization, with rationale as to whether adverse residual environmental effects are significant or insignificant, as defined in the CEAA (1992). Included as part of mitigation are any plans for responding to any known or predicted residual effects, and procedures for identifying and responding to effects that were not predicted or foreseen.
- *Monitoring and Follow-up* is a description of the proposed monitoring and follow-up activities should the Project proceed.

Temporal and geographic study area boundaries for Project effects are identified separately for each environmental component, as appropriate, as part of the scoping for each assessment chapter based on predicted links between the Project and each environmental component.

The time periods examined in the assessment include the Project construction period and the operations period as required to assess duration and/or timing of specific effects related to the Project.

The assessment focuses on potential effects of Project Construction (including site preparation) and operation (including maintenance). The assessment of the significance of environmental effects of the Project includes a consideration of technical aspects, societal values and the provincial legal requirement to assess effects as either “insignificant” or “significant.” A consideration of societal values was integrated into the assessment as an essential requirement under the provincial *Sustainable Development Act* (1997). Recognition of particular concerns to the public were also considered (e.g., human health and safety, priority on areas of recreational/ aesthetic importance, etc.). This analysis includes a consideration of regulatory requirements as well as likely requirements for public acceptance.

2.2 DEFINING SIGNIFICANCE OF RESIDUAL ENVIRONMENTAL EFFECTS

Predicted residual environmental effects of the Project after implementation of mitigation measures are set out for each of the biophysical, socio-economic and cultural environmental components selected for their direct importance and interest to regulators and stakeholders. The description of residual effects includes a characterization as to whether residual environmental effects “are significant or insignificant, and the rationale for such characterization”. Environmental effects and their significance are identified as defined in the CEAA (1992). The assessment approach has considered scientific analysis of ecosystem effects along with local knowledge and available experience in determining the significance of potential effects.

The Federal Environmental Assessment Review Office (1994) notes that *“Deciding whether a project is likely to cause significant adverse environmental effects is central to the concept and practice of environmental assessment....The concept of ‘significance’ cannot be separated from*

*the concepts of 'adverse' and 'likely'*⁴. In considering significance, "environmental effects" are defined as set out in CEAA, *which* restricts socio-economic and heritage resource effects, for example, to those arising from biophysical effects of the Project⁵.

Determining "significance" involves scientific analysis and interpretation. The Federal Environmental Assessment Review Office (1994), for example, states:⁶

"...public input into the determination of significant adverse environmental effects must limit itself to questions related to scientific analysis and interpretation...Issues that are not directly linked to the scientific (including traditional ecological knowledge) analysis of environmental effects, such as long-term unemployment in a community or fundamental personal values, cannot be introduced into the determination at this step."

Determining "significance" involves scientific analyses and interpretation of the capacity of potential post-mitigation scenarios to be free of, or to have reduced potential for adverse effects. The following criteria were used in the EA to evaluate the significance of environmental effects:

- Nature of the effect (positive, neutral, or negative/adverse).
- Temporal boundaries (when the effect would occur and if the Project effects can be reversed):

⁴ The Guide also notes: *"The 'likely' applies to the environmental effects of the project that are both adverse and significant."*

⁵ The Guide explains that under CEAA (1992), for example, environmental effects include socio-economic and heritage resource effects caused by a change in the "environment" (as defined, this includes changes to the physical and biological environments, i.e., aquatic and terrestrial environments) which in turn is caused by the project, e.g., resource use or job losses due to a loss of fish habitat. However, if a socio-economic or heritage resource change is not caused by a change in the environment, but by something else related to the project (e.g., effects caused by employment or purchasing related to the project), the socio-economic or heritage resource effect is not an "environmental effect" within the meaning of CEAA (1992) and cannot be considered in the determination of significance and related matters.

⁶ The Guide notes that public concerns and values not eligible for consideration in the determination of significance are given prominence elsewhere in the EA process, i.e. under CEAA (1992), serious public concerns can warrant referral of the project to a public review through either mediation or a public panel review.

- Frequency of the effect (how often would the impact occur, e.g., once, sporadic, or continuous).
 - Duration of the effect (how long would the impact last, i.e., short-term, immediate-term, or long-term).
 - Reversibility of the effect (within the timeframe of the Project).
-
- Spatial boundaries, or the geographic extent of the potential effect (would the effect be limited to the Project Site, to a local area, to a regional scale, or could it affect the environment on a global scale).
 - Ecological/sociological context (would highly valued features [e.g., culturally or historically significant areas; protected species] be affected by the Project).
 - Uncertainty (is the overall effect unknown or indefinable).

Compared to assessment of significance for effects on components of the biophysical environment, the assessment of significance for socio-economic components considers:

- Differing perspectives and values among different groups of people about their community and region, as well as their individual and family circumstances.
- The problems inherent in assessing separately effects on different aspects or components of people's lives that each contribute to an overall "effect" on any group of people, i.e., effects may be either positive and negative, depending on the group affected, and may be both positive and negative when different groups are differentially affected.

Where significant adverse effects are predicted for biophysical or socio-economic residual effects (as defined by CEAA), the likelihood of significance is discussed in terms of both the probability of occurrence and the degree of "scientific uncertainty". In this context, Table 1 defines an assessed significant adverse effect as "moderately likely" when there is a material uncertainty that the effect will in fact end up being "significant".

Table 1 Definitions for Likelihood of Significance as Applied to Significant Adverse Residual Effects	
Rating	Likelihood of Significance
Highly Likely	The effect is probable and there is limited uncertainty based on previous experience and local knowledge.
Moderately Likely	The effect is considered likely to occur, but there is material uncertainty that it will be significant, based on previous experience and local knowledge.
Not Likely	The effect has a small probability of occurring and there is little uncertainty based on previous experience and local knowledge.
Unknown	There is insufficient experience and local knowledge to predict the probability of the effect occurring and it is difficult to determine the probable outcome of mitigation measures.

3.0 DETERMINATION OF SIGNIFICANCE OF RESIDUAL ENVIRONMENTAL EFFECTS

Predicted environmental effects of the Project after implementation of mitigation measures are documented in the EA for the physical, biological, and socio-economic components of importance and interest to regulators and stakeholders. In accordance with regulatory requirements, conclusions are made in the EA regarding whether any potential environmental change is “significant,” relying on published criteria (see below).

A systematic application of the above-noted criteria was relied upon for scoping the assessment of the Project’s effects and creating conclusions about their significance. The scoping of the assessment included the following process:

- Define the Project (pre-construction, construction, operation through to completion of Decommissioning).
- Describe the effect and determine if it is reversible (Yes or No).
- Effect is Short-, Intermediate- or Long-term in nature.
- Short-term over part of the life of the Project.
- Intermediate-term over the life of the Project.

- Long-term extending past the life of the Project.
- Define the spatial extent of the effect:
 - Project Site, Local, Regional or Global.
- Define if and how the effect acts in a cumulative way with other projects or activities with respect to the spatial extent of the effect (applies to intermediate- and long-term effects occurring at Local, Regional or Global scales).
- Effects that are short-term in nature or are restricted to the Project Site are assumed to not be able to act cumulatively.
- Is the uncertainty associated with the assessment of the effect acceptable?
- If unacceptable, then the effect cannot be assessed further (and monitoring may be needed to create data needed to resolve the uncertainty).
- Define the magnitude of the effect (low - cannot be measured, Moderate – can be measured, High – is obvious).
- Is it likely that the effect will exceed an ecological or socio-cultural threshold that is identified within provincial or federal legislation, statutes or applicable regulations or guidelines?
- If such a threshold is exceeded, then the effect is deemed significant.

The final step is to determine the significance of the effect (this consideration is generally applied only to adverse effects). Figure 1 summarizes the following approach to determining that adverse effects are “significant”:

- All effects found (or judged) to be in excess of established regulatory ecological or socio-cultural thresholds are considered to be “significant.”
- Irreversible Long-Term Effects:
 - All magnitudes of long-term irreversible effects global in scope are considered to be “significant” (e.g., the Project being evaluated is going to permanently alter the world).
 - All high-magnitude, long-term, irreversible effects are considered to be “significant” (e.g., the Project is going to have a permanent and obvious effect).

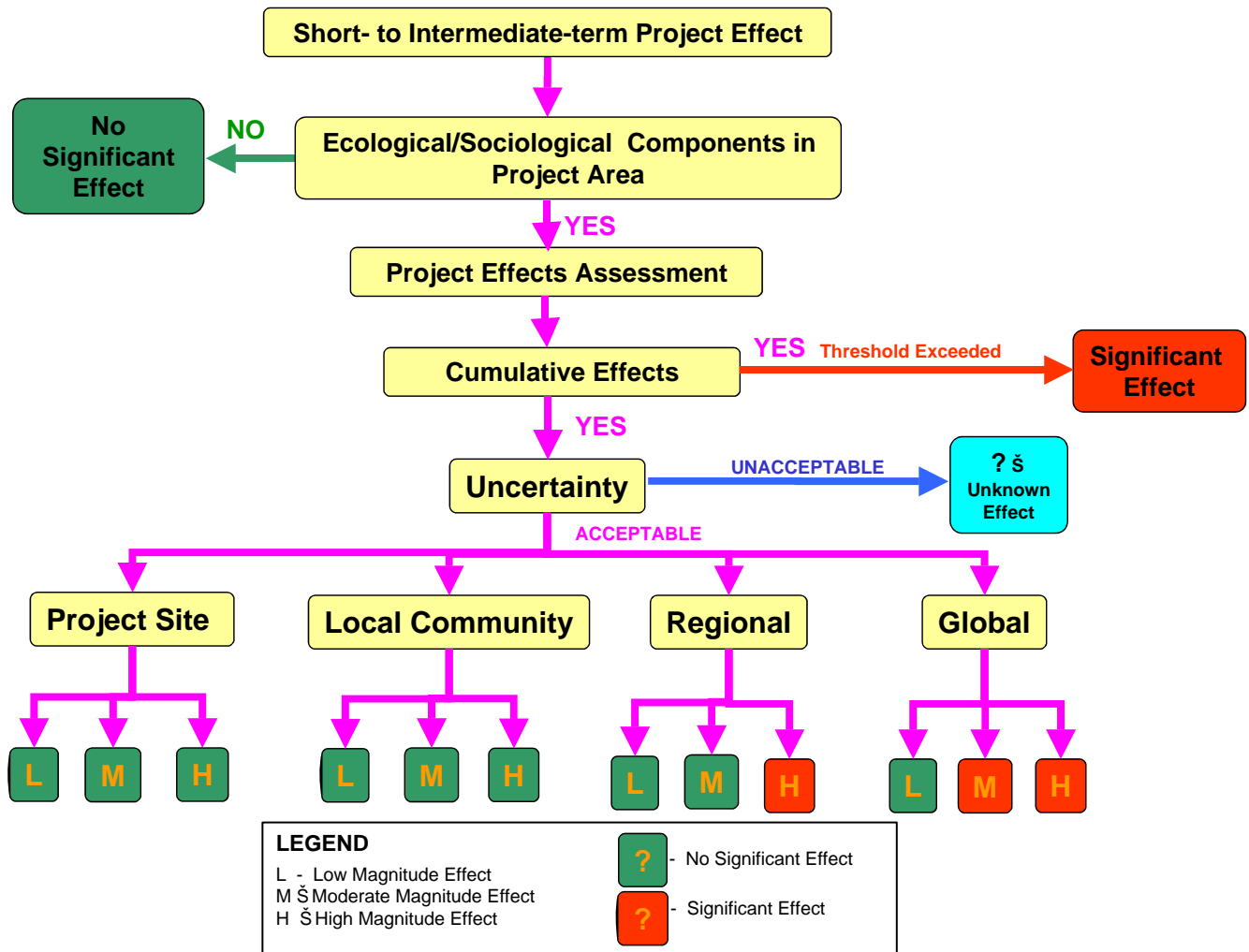
- All moderate-magnitude, long-term, irreversible effects that are regional or in scope are considered to be "significant."

- Reversible Effects:
 - All moderate and high-magnitude, reversible effects which are global in scope are considered to be "significant."
 - All moderate-magnitude, long-term, reversible effects that are regional in scope are considered to be "significant."

All other Project effects (e.g., reversible, site-specific, and short-term effects) are considered to be "not significant."

This process of determining significance of effects considers mitigation measures and incorporates the concept of "cumulative effects" into the assessment before determining whether the effect is "significant."

The residual effects of the Project (i.e., after mitigation) were assessed as "significant" or "not significant." Further to this judgement, a qualitative assessment was conducted of the magnitude of the effects and whether it is positive, neutral, uncertain, or negative.



Decision Tree for Determining Significance of Short- and Intermediate-term Effects
 Figure 1

4.0 REFERENCES

Federal Environmental Assessment Review Office. 1994. Addressing Cumulative Environmental Effects, A Reference Guide for the *Canadian Environmental Assessment Act*.

Hagmann, G.C., C. Cocklin, R. Creasey, S. Dupuis, A. Kennedy, L. Kingsley, W. Ross, H. Spalding, D. Stalker and AXYS Environmental Consulting Ltd. 1999. Cumulative Effects Assessment Practitioners Guide. Prepared for Canadian Environmental Assessment Agency by the Cumulative Effects Assessment Working Group. Hull, Quebec. February 1999.

The *Canadian Environmental Assessment Act* (CEAA). 1992. C.37.

The Environment Act. 1988. CCSM. E125. Queen's Printer. Winnipeg.

The *Sustainable Development Act*. 1997. CCSM S270. Queen's Printer. Winnipeg.

**Environmental Assessment of
Canadian Strategic Infrastructure Funded
Upgrades to the City of Winnipeg
Water Pollution Control Centres**

**APPENDIX 2C
Historic Reports Relevant
to the Study Area
and Project**

LIST OF REPORTS

- Red and Assiniboine Ammonia Criteria Study: Final Technical Report
- Phase 2 Technical Memorandum for Red and Assiniboine Ammonia Criteria Study
Fish Behaviour Technical Memorandum FB 01
- Phase 2 Technical Memorandum for Red and Assiniboine Ammonia Criteria Study
Fish Behaviour Technical Memorandum FB 02
- Phase 2 Technical Memorandum for Red and Assiniboine Ammonia Criteria Study
Fish Behaviour Technical Memorandum FB 03
- Phase 2 Technical Memorandum for Red and Assiniboine Ammonia Criteria Study
Fish Behaviour Technical Memorandum FB 04
- Phase 2 Technical Memorandum for Red and Assiniboine Ammonia Criteria Study
Fish Habitat Technical Memorandum FH 01
- Phase 2 Technical Memorandum for Red and Assiniboine Ammonia Criteria Study
Fish Habitat Technical Memorandum FH 02
- Phase 2 Technical Memorandum for Red and Assiniboine Ammonia Criteria Study
Fish Habitat Technical Memorandum FH 03
- Phase 2 Technical Memorandum for Red and Assiniboine Ammonia Criteria Study
Fish Population Technical Memorandum FP 01
- Phase 2 Technical Memorandum for Red and Assiniboine Ammonia Criteria Study
Fish Population Technical Memorandum FP 02
- Phase 2 Technical Memorandum for Red and Assiniboine Ammonia Criteria Study
Fish Population Technical Memorandum FP 03
- Phase 2 Technical Memorandum for Red and Assiniboine Ammonia Criteria Study
Other Stressors; Physical Constraints Memorandum #OSPC 01
- Phase 2 Other Stressors Workstream: Resource Harvesting Program Report for 1999,
Technical Memorandum #RH2.0
- Phase 2 Technical Memorandum for Red and Assiniboine Ammonia Criteria Study
– River Conditions; Technical Memorandum #RC2.0
- Phase 2 Technical Memorandum for Red and Assiniboine Ammonia Criteria Study
– Phase 2 Toxicity Workstream: Ammonia Toxicity-Testing Program in 1999 and 2000;
Technical Memorandum #T1.0