



THE CITY OF WINNIPEG
WATERWORKS, WASTE, AND DISPOSAL DEPARTMENT

IN REPLY PLEASE REFER TO

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1990 02 26

Manitoba Environment
Building 2
139 Tuxedo Avenue
Winnipeg, Manitoba
R3N 0H6

ATTENTION: Mr. N.B. Brandson, P.Eng., DIRECTOR OF ENVIRONMENTAL MANAGEMENT SERVICES

Dear Sir:

RE: ENVIRONMENT ACT PROPOSAL FOR THE NORTH END WATER POLLUTION CONTROL CENTRE - Our File ST-3.1

In accordance with the request of November 14, 1989 from the Honourable J. Glen Cummings, Minister of Environment to His Worship, Mayor William Norrie, please find enclosed 20 copies of an Environment Act proposal for the North End Water Pollution Control Centre (NEWPCC). This proposal is submitted pursuant to Section 11(6) of the Act for the existing development.

This proposal is for the existing facility including the sludge dewatering facility which is currently under construction and was approved May 12, 1989, pursuant to Section 14(2) of the Environment Act.

Please contact Mr. B.D. MacBride at 986-4434 if you have any further requests regarding this application.

Yours truly,

W.J. Borlase, P.Eng.
Acting Director

EJS/lw
attach.

cc: L. Strachan, P.Eng.
R.J. McRae, P.Eng. Commissioner of Works and Operations
B.D. MacBride, P.Eng.
G. Rempel, P.Eng., Wardrop/MacLaren



WINNIPEG
..where the New West begins.

Environment Act Proposal Form

Manitoba
Environment and
Workplace Safety
and Health



This form prescribes the nature and sequence of the information required to file a proposal for a development pursuant to subsections 10(3), 11(7), and 12(3) of the Manitoba Environment Act.

Name of development	
North End Water Pollution Control Centre	
Name of the proponent of the development	
City of Winnipeg; Waterworks, Waste and Disposal Department	
Location (city, town, legal description)	
2230 Main Street in the City of Winnipeg	
Name of principal contact person for purposes of the environmental assessment	
Mr. B.D. MacBride, P.Eng.	
Mailing address	
1500 Plessis Road, Box 178 Transcona P.O.	Postal code
Winnipeg, Manitoba	R2C 2Z9
	Telephone
	986-4434
Date	Signature of Contact Person
February 25, 1990	<i>B MacBride</i>

OFFICE USE ONLY	
Date Received	<i>March 2/90</i>
Client File Number	<i>107100</i>
Development Review Class	<i>2</i>
Region	<i>City of Wpg</i>
Department Contact Person	<i>Harry Starcher</i>
Phone Number	<i>945-7011</i>

(The proponent should reproduce the underlined portions of each section as noted below adding the required information following each section).

DESCRIPTION OF THE DEVELOPMENT:

- i) Certificate of Title showing the legal description of the development; or in the case of highways, rail lines, electrical transmission lines, or pipelines a map or maps at a scale no less than 1:50,000 showing the location of the proposed development:
- ii) Name of the owner(s) of the land upon which the development will be constructed:
- iii) Name of the owner of Mineral Rights beneath the Land if this is not the same as the surface owner:
- iv) Description of the existing land use on the site and adjoining it as well as changes that will be made thereto for the purposes of the development:
- v) Land use designation for the site and adjoining land as identified in a development plan adopted pursuant to the Planning Act or the City of Winnipeg Act and the zoning designation as identified in a Zoning By-Law, if applicable:
- vi) Description of the previous studies and activities relating to feasibility, exploration, or project siting and prior authorization received from other government agencies:
- vii) A description of the proposed development and the method of operation including hours of operation:
- viii) A description of the potential impacts of the development on the environment, including, but not necessarily limited to:
 - type, quantity and concentration of pollutants to be released into the air, water or land
 - impact on wildlife
 - impact on fisheries
 - impact on surface water, and groundwater
 - forestry related impacts
 - impact on heritage resources
 - socio-economic implications resulting from the environmental impacts

- ix) A description of the proposed environmental management practices to be employed to prevent or mitigate adverse implications from the impacts identified in (viii) which will have regard to, where applicable: containment, handling, monitoring, storage, treatment and final disposal of pollutants; conservation and protection of natural or heritage resources; environmental restoration and rehabilitation of the site upon decommissioning; and protection of environmental health.

SCHEDULE:

- i) The date of commencement of construction, commencement of operation including staging of the development and termination of operation, if known:
- ii) Latest date by which the proponent would like to complete the requirements of the Environment Act and seek approval for the development. Briefly state the reasons for the selection of this date.

FUNDING:

Name and address of the the Government Agency (Federal, Provincial or otherwise) from which a grant or loan of capital funds have been requested, where applicable.

NOTE:

The Environment Act requires that subject to the Confidential Information clause, Section 47, a proposal shall be filed in the public registry.

Proprietary information provided in this form should be clearly noted. A separate summary of the proposal excluding the proprietary information should accompany the proposal for the public registry file.

The completed Proposal Form should be sent together with a covering letter to:

Environmental Management Division
Department of Environment and Workplace
and Safety and Health
Box 7, Building 2
139 Tuxedo Avenue
Winnipeg, Manitoba
R3N 0H6

ENVIRONMENTAL ACT PROPOSAL FORM

CITY OF WINNIPEG
NORTH END WATER POLLUTION CONTROL CENTRE

DESCRIPTION OF THE DEVELOPMENT

i) Certificate of Title

A copy of the Certificate of Title showing the legal description of the land is appended to this proposal as Appendix 1.

ii) Owner of the Land

The owner of the land is the City of Winnipeg.

iii) Owner of Mineral Rights

The owner of the Mineral Rights beneath the land is the City of Winnipeg.

iv) Existing Land Use

The existing land use on the site is a wastewater treatment plant, the North End Water Pollution Control Centre. No changes to this land use will be made for purposes of the development. Adjoining land uses include industrial and residential to the north; the Kildonan Golf Course and park to the east (east of Main Street); a mixture of industrial, residential, and park/community centre to the south; and industrial to the west.

v) Land Use Designation

The land use designations for the site and the adjoining lands are established by the City of Winnipeg By-Law No. 2960/81- "Plan Winnipeg" as shown by the drawing enclosed as Appendix 2. The land use designation for the subject site as established by "Plan Winnipeg" is "Industrial". Lands to the north and south of the site are designated as "Suburban Residential", while lands to the east are designated as "Golf Course" and "Regional Park". Lands to the west of the site are currently designated as "Industrial", however City Council has given second reading to a by-law amending the "Plan Winnipeg" designation from "Industrial" to "Suburban Residential" for the lands west of Ferrier Street up to the future McGregor Street extension and south of the CPR Bergen right-of-way. This amendment is currently before the Minister of Urban Affairs as part of the "Plan Winnipeg" amendment process.

Additionally, under "Plan Winnipeg", development within one kilometre of Water Pollution Control Centres is subject to the following policy which is quoted verbatim from By-Law 2960/81:

"CHAPTER: WATER, WASTE AND DISPOSAL

SECTION: SEWERAGE AND POLLUTION CONTROL SYSTEM

SUBJECT: ODOUR CONTROL

61(1) POLICY

- (a) The City shall, through the development approval process and land use controls, regulate all development within the development control lines around wastewater treatment plants and facilities, as defined on the Map attached to this By-law and marked "Plan Winnipeg Policy Areas," in order to minimize the impact of odour emissions on adjoining land uses; and
- (b) The City shall ensure that whenever a major wastewater treatment plant or facility requires expansion or modification, an analysis of odour control methods is included in the expansion design including a review of the separation areas defined by the development control lines on the Map attached to this By-law and marked "Plan Winnipeg Policy Areas".

61(2) OBJECTIVE

To minimize the impacts of odour emissions from wastewater treatment facilities upon living and working areas."

The Lord-Selkirk-West Kildonan Zoning By-law No. 4450/86 specifies zoning districts for the subject site and adjoining lands. The zoning designation for the site is "M3-Restricted Industrial District". Zoning designations for adjacent lands are shown in Appendix 3.

vi) Previous Studies and Activities

The North End Treatment Facility has undergone several expansions since it's construction in 1937. Some of the major expansions and upgradings included: providing secondary treatment to sewage in 1965, increasing total solids removal from 40-90%; the addition of 2 rectangular primary clarifiers in 1978; secondary upgrading to a high purity oxygen activated sludge process in 1982; pretreatment upgrading in 1987; and most recently the sludge dewatering facility in 1989.

The total number of reports written on the North End facility held in this department's library is 238. The listing provided herewith indicates several main reports related to the planning, design and operation for the major works and expansions of the North End Plant. Copies of the reports listed below and a copy of the listing of all reports are available upon request. A separate

listing of reports written on the Red and Assiniboine Rivers is also available upon request.

Predesign Report: Primary Clarifier Addition at the North End Water Pollution Control Centre for the City of Winnipeg, Part 1 to 3, 1977.

Author: Wardrop/MacLaren Engineers

Subjects:

1. Architectural and Structural Considerations
2. Ventilation and Odour Control
3. Flow Measurement

Conceptual Design Report: North End Water Pollution Control Centre Secondary Process Expansion, 1980.

Author: Waterworks, Waste & Disposal Dept.

Subjects:

1. Existing wastewater characteristics
2. Design Criteria
3. Secondary Expansion Process Description

Summary Functional Design Report: North End Water Pollution Control Centre Secondary Treatment Expansion, 1981.

Author: Wardrop/MacLaren Engineers

Subject: Design Conditions

Functional Design Report: North End Water Pollution Control Centre Secondary Treatment Expansion, 1981.

Author: Wardrop/MacLaren Engineers

Subject: Process Design Criteria

Summary Report and Technical Discussions: Odour Control at the North End Water Pollution Control Centre, 1985

Author: Wardrop/MacLaren Engineers

Subjects:

1. Existing Odour Conditions
2. Future Odour Conditions
3. Options for Future Odour Control

Functional Design Report: North End Water Pollution Control Centre Sludge Digestion Expansion, 1985.

Author: Underwood McLellan Ltd.

Subjects:

1. Sludge Production & Characteristics
2. Sludge Digestion Process Description

Summary Report: Sludge Dewatering & Disposal at the North End Water Pollution Control Centre, 1985.

Author: Wardrop/MacLaren Engineers

Subjects:

1. Existing Conditions
2. Ultimate Sludge Disposal and Description

Functional Design Report: North End Water Pollution Control Centre, Upgrading of Pretreatment Works, 1988.

Author: Wardrop/MacLaren Engineers

Subjects:

1. Screening and Grit System Upgrading
2. Pretreatment Building Ventilation
3. Plant Power Supply

Functional Design Report: North End Water Pollution Control Centre Sludge Dewatering Facility, 1988.

Author: Wardrop/MacLaren Engineers

Subjects:

1. Sludge Quantities and Characteristics
2. Dewatering Process Description

vii) Description of the Proposed Development and the Method of Operation

The NEWPCC is a secondary sewage treatment plant with the following processes:

- Main Pumps
- Chlorination for odour control
- Screening, Aerated Grit Removal, and Pre-Aeration
- Primary Clarifiers
- Oxygen Activated Sludge
- Secondary Clarifiers
- Mesophyllic Anaerobic Sludge Digestion
- Sludge Dewatering (on stream July 1, 1990)
- Odour control through dilution stacks

A fact sheet on the NEWPCC giving capacities for these processes is attached as Appendix 4. Appendix 5 includes planning data on population served and the trend in flows. Detailed descriptions of the facility and drawings are available as outlined in vi) above, previous studies and activities. Appendix 6 attached is a brochure on the facility which includes a site plan and photographs.

The plant is operated continuously, 24 hours a day, 365 days a year. Most operating and maintenance staff work a regular five day week. A skeleton staff (2 or 3 people) operate the facility at nights and on weekends.

The facility has a staff as follows:

Supervisory	4
Senior Operator	4
Operator	21
Assistant Operator	8 (2)
Maintenance (Mechanical, Electrical)	14 (4)
Process Control	2 (1)
Support	5 (2)
Total	53 (9)

Numbers in brackets are proposed additional staff for dewatering (July 1, 1990). In addition, the Laboratory Services Division Offices and Laboratory are located on-site with a permanent staff of 21.

The NEWPCC is designed to provide primary treatment to 2.75 times average dry weather (winter) flows. The present primary capacity is 827 ML/d which is based on a 1994 design average dry weather flow of 302 ML/d. The secondary process is designed to provide treatment to 2.0 times average dry weather flow. The present secondary process capacity is 598 ML/d based on a 1994 average annual flow of 332 ML/d.

The plant operation is controlled by a distributed computer control system. The computer control system automatically adjusts pumps and valves to provide a high degree of treatment. Servicing and breakdowns can reduce capacity. The plant is designed so that process units can be taken out of service and treatment can be provided by the remaining process units. Routine maintenance is timed to occur at low flow periods.

viii) Description of the Potential Impacts of the Development on the Environment

The purpose of the NEWPCC is to protect the aquatic environment of the Red River. This is done by treating raw sewage to produce an effluent amenable to discharge into the river. In this sense the NEWPCC has an important positive impact on the environment.

Residual pollutants from the treatment of raw sewage are released into the environment from the NEWPCC. These include the liquid effluent released into the Red River, the semi-solid sludge which is beneficially utilized on agricultural land, and odorous air streams released to the atmosphere, and noise. Of these only the liquid effluent has not been dealt with and licensed under the Environment Act. Land disposal of sludge is dealt with in License 1089E. Odour and air emissions are covered by Clean Environment Commission Order 1188.

Process control parameters within the North End Water Pollution Control Centre, including effluent quality, are monitored daily by means of 24-hour composite samples. Appendix 7 attached details the monitoring that is done and includes a summary of plant operation and quality of discharges for 1989. Detailed daily data is available upon request.

The impacts of the discharge of treated sewage effluent are considered to be most significant on surface water quality and on aquatic life in the Red River. Impacts on wildlife, groundwater, forestry, heritage resources, and socio-economic impacts from sewage treatment are, to our knowledge, not significant.

The City and other agencies have carried out numerous studies of the impact of liquid discharges on the Red River. In general, typical of all major wastewater treatment plants, the impacts of the effluent are as follows:

1. Sewage effluent has a biochemical oxygen demand (i.e. is biodegradable). This biodegradation uses oxygen in a stream and lowers the dissolved

oxygen of the surface water. It is important that the dissolved oxygen levels remain above that required to support the most sensitive species of fish.

2. Sewage effluent from the NEWPCC contains ammonia which is also toxic to fish above certain concentrations.
3. Sewage effluent contains nitrogen and phosphorus which may promote algae and weed growth in the surface water.
4. Sewage effluent contains microbiological discharges, bacteria and pathogens which raise the concentration of these in the river.
5. Sewage effluent contains low levels of other pollutants such as heavy metals, pesticides and other organics.

Assessment of the impact of these effluent on the river are done in two major ways:

- 1) Direct monitoring of the river (see section ix below); and
- 2) Use of calibrated computer models.

Recent receiving stream assessments by the City include

1. "Report on Pollution Abatement and River Quality Study" - James F. MacLaren Limited, November 1979.
2. "Conceptual Design Study - Expansion Requirements of South and West End Water Pollution Control Centres" report to City of Winnipeg by MacLaren Engineers. November 1986.

Chapter 5.0 - Receiving Stream Assessment
Appendix D - Receiving Stream Assessment

3. Disinfection Evaluation: "City of Winnipeg Wastewater Treatment Plant Effluent". Report to City of Winnipeg, Province of Manitoba by MacLaren Engineers. October 1986.

These assessments carefully document the impacts of effluent on the river. The first two reports deal with dissolved oxygen and nutrients. The third deals with microbiological discharges.

The City has also retained a consultant to prepare a study and update the City's river quality model in preparation for the Clean Environment Commission hearings on establishing water quality for the Red and Assiniboine Rivers. This study will involve defining existing, and projecting future land uses, to establish point and non-point discharges to the rivers for input to the model. The model will be utilized to simulate existing and future river quality regimes in consideration of various pollution control options. Implications of enhanced river uses with associated pollution control strategies including infrastructure

requirements, land use strategies, costs, and benefits will be assessed, and water quality objectives recommended.

ix) Proposed Environmental Management Practices

The operation of the North End Water Pollution Control Centre is in itself an environmental management practice to prevent adverse environmental impacts on the Red River due to wastewater disposal from the City of Winnipeg. Accordingly, the sole environmental management practice undertaken by the City of Winnipeg is an extensive monitoring program related to both process control within the facility and river water quality both downstream and upstream of the plant.

The Red River is monitored bi-weekly in six locations from the South Floodway control structure up to Lockport. A typical report is included as Appendix 8. No monitoring of the Red River is undertaken in late fall and early spring because safety considerations preclude monitoring.

Because there are no adverse impacts related to land attributed to the North End Water Pollution Control Centre, there are no environmental management practices proposed in this area.

Air emissions from the North End Water Pollution Control Centre are limited to odour and noise. These are covered under a Clean Environment Commission Order No. 1188 dated March 30, 1988. Monitoring of odour and noise are undertaken in accordance with this license.

The City is also considering future treatment and other improved environmental management practices to protect the rivers. These are highlighted in the attached brochure titled "Winnipeg's Wastewater Treatment Program, Past, Present & Future", included as Appendix 9.

SCHEDULE

i) Date of Commencement of Construction, Operation

Construction of the Dewatering Facility commenced in April 1989 and is expected to be completed by July 1, 1990. Approval pursuant to Section 14(2) of the Environment Act has previously been granted.

The remainder of the NEWPCC is an existing facility and has been operational at various stages of development over the past 50 years.

ii) Latest Date to Complete the Requirements of the Environment Act

Whereas all construction activities have been approved under the Environment Act, a specific date for approval is not being requested.

It is suggested that the issuance of a licence for the NEWPCC be deferred until after the public hearings concerning water quality objectives, since the

hearings will provide the basis for setting sewage treatment plant discharge requirements.

FUNDING

Grant of Loan of Capital Funds

A provincial contribution to the City of Winnipeg's 1986 capital works program of \$2,850,000 was made for the Sludge Dewatering Project. All remaining funding has been through the City of Winnipeg Sewer Utility.