



2008-10-09

File: 3433-LD-03

Ministry of the Environment
Environmental Assessment and Approvals Branch
2 St. Clair Avenue West, 12th Floor
Toronto, Ontario
M4V 1L5

Dear Sir/Madam:

***Application for Approval of Municipal and Private Sewage Works
Existing Kanata Lakes Stormwater Management Facility
Water Quantity and Quality Objectives***

The purpose of this letter is to provide supporting information to obtain a Certificate of Approval for Municipal and Private Sewage Works for an existing stormwater management facility, constructed in 1987. In previous studies, the facility is referred to as the Beaver Pond and Kizell Pond. For the purposes of this application, the facility will be referred to as Kanata Lakes Stormwater Management Facility (KLSWMF).

This Stormwater Management Facility is first presented for approval in the Master Drainage Plan prepared by Cumming Cockburn and Associates in 1984. The approved Master Drainage Plan (MDP) titled "Master Drainage Plan, Stormwater Management, City of Kanata, for the New Community of Marchwood-Lakeside" is dated April 25, 1984. This report was reviewed by the Mississippi Valley Conservation Authority, the Ministry of Natural Resources, the Ministry of the Environment, the Regional Municipality of Ottawa Carleton, and the City of Kanata. The MDP presents "a detailed concept for an overall Master Drainage Plan" addressing both engineering and environmental components associated with the proposed development.

The first stages of development of the Marchwood-Lakeside Community (later named Kanata Lakes) in the late 1980's included construction of part of the Beaver Pond Stormwater Management Facility as outlined in the approved MDP to accommodate this development. As development progressed in multiple phases over the next twenty years, the stormwater management system as developed in the MDP, has been implemented to satisfy the stormwater management requirements as specified in the approved MDP. As implementation of the stormwater management system progressed, upgrades to the approved MDP were also incorporated, such as water quality treatment, to improve the overall system performance to meet current municipal standards for new applications. The most up-to-date document itemizing the preferred stormwater management system, including upgrades incorporated over the past 20 years is the "Kanata Lakes North Serviceability Study" dated November 2002. This report details the preferred stormwater management system for Kanata Lakes including the diversion of flows between the Kizell Drain and Shirley's Brook, and water quality and quantity treatment requirements.

The Kanata Lakes North Serviceability Report was the subject of extensive public scrutiny including presentation at public meetings for the preparation of a Community Design Plan (CDP) for Kanata Lakes North, and as evidence submitted to the Ontario Municipal Board. The Ontario Municipal Board hearing was a hearing for Kanata Lakes North, where the OMB approved the CDP and the accompanying Serviceability Report for Kanata Lakes North. The Board decision dated February 6, 2006 and a copy of the 2002 Serviceability Report are attached for reference.

In addition to the attached information, the following is a brief history and description of how the Kanata Lakes Stormwater Management Facility (Beaver Pond) functions.

The facility consists of two cells in cascade separated by Goulbourn Forced Road. The downstream cell (east of Goulbourn Forced Road) was referred to in previous studies as the Beaver Pond. The upstream cell (west of Goulbourn Forced Road) has been referred to as the Kizell Pond. Following extensive review of the existing information over the past 15 years, it has been concluded in the form of the 2002 Serviceability Report that the KLSWMF provides water quantity and quality control of stormwater runoff for an urban area of 421.5ha.

1.0 Water Quantity Control

The water quantity control provided by the Beaver Pond was evaluated within the report "Kanata Lakes Storm Drainage Report" (Oliver, Mangione, McCalla and Associates, 1985). This report built upon the conclusions presented within the "Marchwood-Lakeside Master Drainage Plan Stormwater Management" (CCL, 1984), recommending the control of post-development flows from the site to 3.6m³/s. A summary of the findings from the Storm Drainage Report¹ are presented in the following table:

Table 1 – Summary from "Kanata Lakes Storm Drainage Report" (OMM, 1985)

Parameter	Storm Event	
	5 Year	100 Year
Peak Inflow to Beaver Pond (m ³ /s)	22.5	39.9
Peak Outflow from Beaver Pond (m ³ /s)	0.7	1.1
Maximum Storage Volume (ha*m)	8.29	18.71
Maximum Water Level (m)	91.70	92.80
Flow at northern limit of site (m ³ /s)	1.1	3.1

The above table indicates that post-development peak flow rates would be controlled to the criteria set forth in the 1984 Master Drainage Plan (CCL, 1984).

It should be noted that the analysis presented within the Master Drainage Report and the 1985 Storm Drainage Report included an allowance for diversion of a portion of the Shirley's Brook watershed into the KLSWMF. This was based upon anticipated land uses within the Shirley's Brook watershed. Drainage areas presented within the Storm Drainage Report included a total catchment area of 398ha for the proposed development, and 319ha diverted from Shirley's Brook watershed into the KLSWMF. This stormwater management scheme has been updated by various consultants as the Kanata Lakes

development plans became finalized. In order to maintain the natural equilibrium on a subwatershed basis, the diversion of 319ha from Shirley's Brook to the KLSWMF was eliminated. As such, drainage areas tributary to the pond have been updated since the original 1985 Storm Drainage Report. The "Kanata Lakes North Serviceability Report" (IBI, 2006) reported the updated drainage areas tributary to the pond totalling approximately 552ha, including 421.5ha of urban development and 130.5ha of parks, open space and golf course area. ||

2.0 Water Quality Control


Water quality control provided by the Beaver Pond was evaluated within the report "Kanata Lakes, Beaver Pond Urban Stormwater Quality Control, City of Kanata" (CCL, 1994). This report outlined the required volume of the permanent pool based on the "Stormwater Management Planning and Design Manual, MOEE 1994." The permanent pool volume required to achieve Level 1 protection was reported as $90\text{m}^3/\text{ha}$, from Table 4.1 of the manual. The urban drainage area tributary to the facility is approximately 420ha, therefore the required permanent storage volume is $37,800\text{m}^3$. The total volume of the permanent pool is approximately $50,000\text{m}^3$ at a water surface elevation of 90.55m. Therefore, the permanent pool volume provided by the Beaver Pond exceeds MOEE requirements for Level 1 protection.

The 1994 Report also outlined the extended detention volume provided by the pond. Calculations were based on the Ministry of Natural Resources "General Guidelines for Development" (revised August 7, 1992) requirements to attenuate the first 10mm of runoff from paved areas over 72 hours. The extended detention volume was determined to be $17,000\text{m}^3$ ($40\text{m}^3/\text{ha}$) for the 420ha development area. The report demonstrated that the Beaver Pond would accommodate this volume at a water surface elevation of approximately 0.30m above normal water level. Further, hydraulic calculations indicated that the first flush volume would be released over approximately a 130 hour time period. The Kanata Lakes North Serviceability Report also outlines the water quality requirements for the proposed development.

The application for MOE approval of the Beaver Pond SWM facility (KLSWMF) is a unique situation in that the facility was constructed in 1987 and has been in service for over 20 years, and yet the development area tributary to this facility is still being developed and will be completed in several phases for several years to come. We trust this summary of information, together with the attachments provided herein, are sufficient for you to process this Certificate of Approval. Should you have any further questions regarding the above mentioned project please do not hesitate to contact our office.

Yours truly,

IBI GROUP


Peter Spal, P.Eng.
Associate
Manager - Water Resources

PS/ks