

# The Earth Rangers Centre

**Building Type:** Recreation/Animal Care

**Building Size:** 60,000 ft<sup>2</sup> (5,575 m<sup>2</sup>)

**Location:** Woodbridge, Ontario, Canada

**Occupancy Date:** March 2004

**Application:** Wastewater reuse

**Treatment Plant Size:** 845 ft<sup>2</sup> (78.5 m<sup>2</sup>)

**Capacity:** 2,900 gpd (11 m<sup>3</sup>/d)

**LEED Rating:** Canada Green Building Council LEED-NC Gold

## Introduction

Earth Rangers is a partnership-driven environmental organization, established in 1999, with the mission of inspiring children with a lasting passion to build a better future. The Earth Ranger education and outdoor leadership programs are centered out of the award-winning, LEED Gold building located just north of Toronto, Ontario, Canada. The building incorporates leading edge environmental technologies and is recognized as being one of the most energy efficient of its kind and a showpiece for sustainable building.



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The facility encompasses 5,575 m<sup>2</sup> (60,000 ft<sup>2</sup>) on a 31 acre site. It houses a small interactive theatre, educational displays, animal ambassadors, and staff. The Centre welcomes thousands of visitors every year, including government officials, architects, land developers, green builders, and consultants.

The Centre is surrounded by old farmland pasture and woodland that is the natural habitat of many of resident animals. The building's location is a result of an extensive study to minimize disruption of the local ecosystem and preserve views. Incorporating leading edge environmental technologies, the Centre is a showcase of environmental responsibility.

## Plant Overview

Among the many innovative technologies that make the Centre a model of sustainable design, the Earth Rangers Centre features on-site wastewater treatment and reuse. Earth Rangers selected a ZeeWeed\* membrane bioreactor (MBR), to treat all the sewage generated at the facility in a compact, odor-free, in-house system. Sanitary wastewater is treated onsite to near drinking water quality using ZeeWeed MBR and UV light sterilization. The treated water is then reused within the facility for toilet flush water, animal ponds, irrigation and floor

washing. Potable water for the facility is supplied from an onsite well.

By re-using all the treated wastewater, the consumption of fresh water and the discharge of wastewater are significantly reduced. The ZeeWeed MBR system allows the Earth Rangers Centre to consistently operate with significantly reduced impact on the environment—providing a true demonstration of sustainable development.

## Process Overview

The 2,900-gpd system will process the entire wastewater load from the facility and is concealed in the Centre’s basement. Wastewater is pumped from the sewage collection equalization tank. The equalized flow is then sent through trash grinder pumps and is then pumped to the bioreactor where bacteria consume or digest the biodegradable waste before it enters the membrane chamber containing immersed ZeeWeed membranes.

Water is gently drawn through billions of microscopic pores on the surface of the membrane fiber via a permeate pump. The pores act as a filter that physically block suspended solids, bacteria and viruses from passing through, producing an exceptional water quality that is completely suitable for non-potable applications.

The treated water then flows through an activated carbon filter, and ultraviolet units for further disinfection. The sanitized, finished water flows to the water storage tank for use within the facility.



Water Supply and Wastewater Treatment

### Typical Treated Water Results

BOD (mg/L)	< 2
TP (mg/L)	< 0.05
BOD (mg/L)	< 2