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Your File/V/Réf.

DATE 8 November 1996

TO/DEST. The Chair and Members of Regional Council

FROM/EXP. Environment and Transportation Commissioner

SUBJECT/OBJET **NEPEAN LANDFILL SITE - BUFFERLAND ASSESSMENT**

INTRODUCTION

As part of the closure of the Nepean Landfill Site, the Region is required to put in place a program to reduce leachate production in the long term and reduce any potential for environmental concerns in the short to medium term. The long term leachate control system has been implemented through the capping of the Nepean Landfill site to reduce leachate production through the minimization of infiltration. A bufferland assessment has recently been completed to confirm the leachate migration pattern in the areas acquired or identified to be acquired as bufferland around the Nepean Landfill Site. The study recommends cost-effective short to medium term leachate management systems.

BACKGROUND

In 1977, the Region took over the operations of the Nepean Landfill Site from then the Township of Nepean. This site was operated as the main Regional landfill site until operations moved to the newly approved Trail Road Landfill Site in 1980. Construction waste continued to be deposited at the Nepean Landfill Site until 1986 when operations were stopped. The site is now closed and the Region is responsible for the long term care.

The Nepean Landfill Site has historical leachate migration patterns west and south of the site. A closure plan was developed that included acquiring additional bufferland and the installation of a low permeability cap. Much of the bufferland has been acquired and the low permeability cap was installed in the early 1990's, however, the cap is a long term solution to the historical leachate migration patterns. In the short term, a remedial action plan is required. In July of 1995, the Corporate Services and Economic Development Committee approved the appointment of M. M. Dillon Ltd. to do an assessment of the Nepean Bufferlands and develop a remedial action plan.

Information Previously Distributed

To be listed on Planning and Environment
Committee Agenda of 26 November 1996

DISCUSSION

The Bufferlands Assessment Study was completed in May of 1996. The objectives of the bufferland study were as follows:

- Confirm the groundwater patterns in the area of the Nepean Landfill Site.
- Determine the degree of leachate migration in the Nepean Landfill Site bufferlands.
- Develop a remedial action plan.
- Provide support for property negotiations for the period of the study.

Twenty-five new groundwater monitoring points were drilled and confirmed previous leachate migration patterns. There are two groundwater systems under the Nepean Landfill Site separated by a clay layer, except in the northern part of the site where the clay layer is absent (see attached sketch, Annex A). The Nepean Landfill Site does not have an engineered liner system as it was developed prior to current landfill design standards. Leachate enters the deep aquifer in the northern part of the site where the clay layer is absent and moves toward a spring feed pond north of the Trail Road Landfill Site. This pond also acts as the outlet for the deep groundwater system under the Trail Road Landfill Site. This migration pattern will be monitored and handled as part of the leachate migration management for the Trail Road Landfill Site. There is little or no evidence of leachate in the deep aquifer south, east and west of the Nepean Landfill site.

The shallow aquifer continues to have leachate effects that move south and west of the Nepean Landfill Site. The dominant direction of the migration pattern is toward a pond on the property owned by Goldie Mohr Ltd. There is a component of the leachate migration that moves south into the property owned by Burnside Sand and Gravel Ltd. There is also evidence of leachate on the property to the north-west owned by Cohen and Cohen Ltd, however, this appears to be a remnant leachate effect and groundwater flow and chemistry indicate quality should now improve with time.

Much of the water from the Goldie Mohr pond and the Cohen and Cohen property leaves the area via a series of agricultural drains. The water in these drains has low levels of leachate indicators, however, chemistry, flow and modelling data lead to the conclusion that leachate levels will continue to increase in concentration for the next several years. The remedial action plan will aim to maintain a level of water quality that meets reasonable-use criteria in these drains and redirect the southerly migration pattern toward the Burnside Sand and Gravel property in the short to medium term until the full effect of the low permeability cap develops.

The remedial action plan (see Annex B) considered methods of controlling and treating the groundwater and surface water. The recommended concept includes a perforated pipe subdrain south of the Nepean Landfill Site to cut off groundwater flow to the south and redirect the flow to the Goldie Mohr ponds. The discharge from these ponds will be directed into an engineered wetland where the water will be treated by natural processes and tested before it is allowed to enter the agricultural drain. Engineered wetlands have been used successfully at improving or polishing water in similar applications that are not easily treated by conventional treatment plant technology systems.

The advantages of this concept are that the subdrain is underground and therefore will have little effect on the operations of Burnside Sand and Gravel. No additional land is expected to be required beyond the bufferland that was originally identified by the Nepean Closure report or is already owned by the Region, and the concept is a relatively simple natural process with low operating costs.

The remedial action plan is expected to take two to three years to complete due to the extensive environmental approvals that may be required. During this period, a temporary water treatment system will be installed that will enhance the surface water quality leaving the area. A copy of the Nepean Landfill Site Bufferland Assessment has been sent to the Ministry of Environment and Energy for information and comment. The project will proceed and the Ministry's comments will be incorporated as they become available. A copy of the report has also been filed with the Resource Centre and is available for your review.

CONSULTATION

Staff at the Trail Road Landfill Site regularly meet with surrounding landowners to keep them advised of monitoring results and planned remedial action.

EXPENDITURE JUSTIFICATION

The estimated cost of the project is \$1.5 million with the majority of the funds being required in 1997/98. Some funds may need to be transferred into the Nepean Landfill Closure account for 1996 to allow the initiation of a consultant assignment. The balance of the project will be presented for approval in the 1997 Capital Budget.

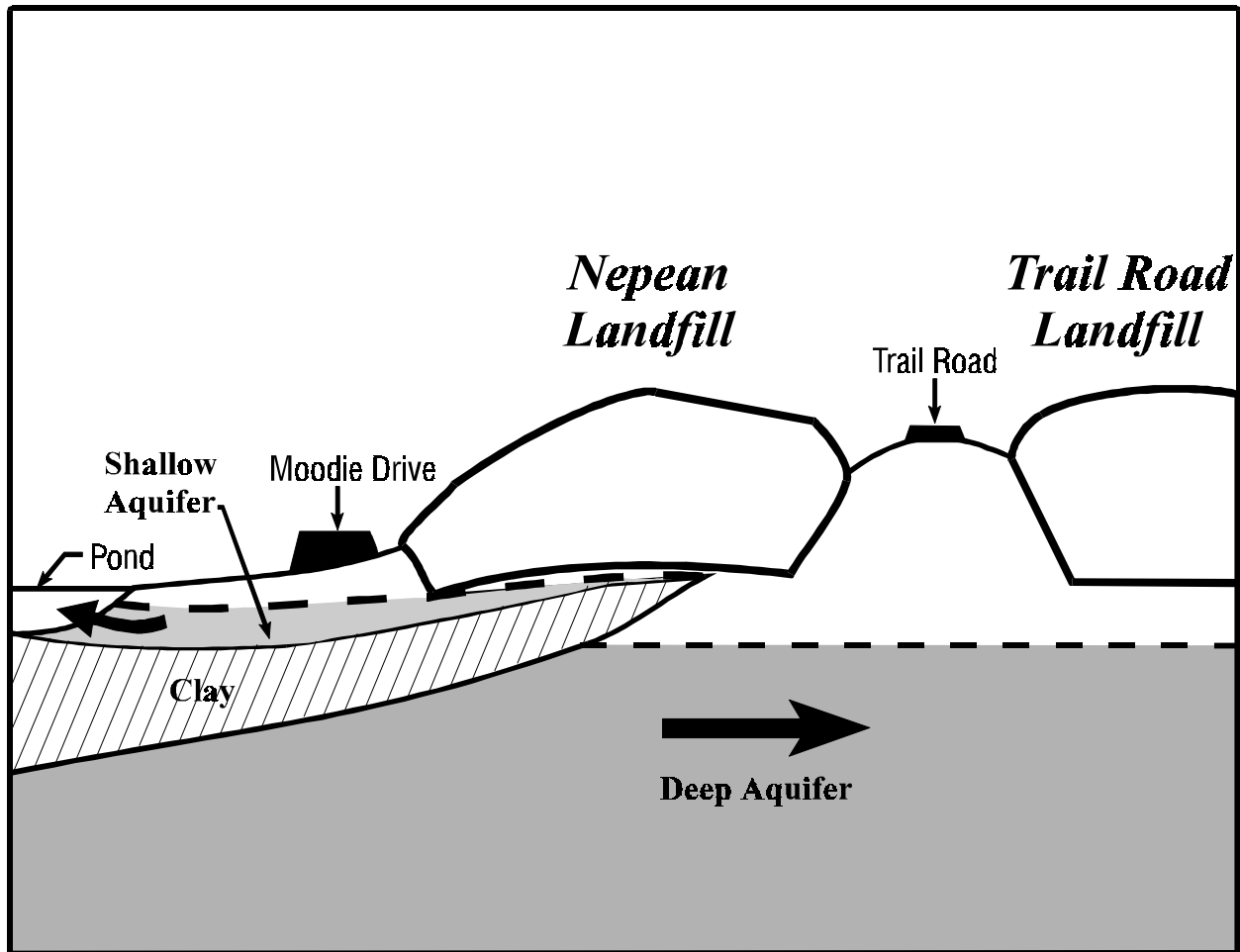
CONCLUSION

In fulfilling our obligations with respect to the long term perpetual care of the Nepean Landfill Site, and to reduce impact on the adjacent landowners, the 1997 Capital Budget will identify a new project to intercept and treat some of the groundwater flowing south from the site.

*Approved by
M.J.E. Sheflin, P.Eng.*

KW/

Nepean Bufferland Assessment Cross Section



Nepean Bufferland Assessment Proposed Recommendation