

Synopsis of April 1983 'Cherry' Report

The report covers work performed May 1982 - February 1983.

The survey involves water samples from 25 test sites widely separated in the general vicinity of the Bay View Park Landfill. It is concerned with water movement horizontally along the surface layers and vertically downward into the underlying shale to a depth of up to 200 feet. Only 2 of the 25 test sites are within the boundaries of the Bay View Park Landfill, the rest extend from 1/4 mile north of the landfill and as far south as North Service Road, one site being south of highway 403.

The survey set out to define (i) how fast the groundwater was moving southward to the lake and (ii) how much leachate was entering the groundwater from the landfill site.

GROUNDWATER FLOW

The findings reflect the ill defined nature of the fractures in the red shale that extends from a few feet below the surface down to 300-400 feet. The porosity of the rock is so highly variable that estimates of the time the groundwater under the site will take to reach the lake vary from 10 to 600 years.

LEACHATE INFILTRATION

Contamination by leachate was measured by analyses of chloride and total organic carbon, both found to be useful in other landfill sites. In this study, the background levels of these two constituents in water entering the site from the north were so large and so variable that additions to them by the leachate would be likely to pass unnoticed.

VERTICAL WATER MOVEMENT

An independent marker of vertical movement of groundwater is available as tritium, a radioactive isotope of hydrogen, which has been added to rainwater by atmospheric atomic bomb explosions from 1953 to 1969. This study indicates groundwater in the Bay View environs has permeated to a depth of 60 feet over the past 20 years and this represents the depth of potential contamination in this area by leachate.

NEW MARKERS

Studies continue to find markers such as chlorinated hydrocarbons which are unique to the fill and do not occur naturally in the background water. Only by using such markers can leachate in small amounts be detected.

CONCLUSION

The study is concerned with the water flow characteristics in the subsoil in the wide vicinity of the Bayview Park site. Its conclusions must be considered relevant to the subsoil under the Site A landfill site. The findings are independent of the nature of the drainage systems in the 2 sites. Any runoff that escapes those drainage systems will enter the underlying shale and permeate vertically downwards to enter adjacent watercourses.

This study shows that current markers of leachate are unsuited to detecting leachate in this area because both markers occur naturally in large and variable amounts.

The tritium data show downward movement to a depth of 60 feet over 20 years. The shale in the wide area tested, which extends from north of Bayview to south of Highway 403, is shown to be 'moderately active environment for contaminant transport'.

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