

DYREGROV CONSULTANTS
CONSULTING GEOTECHNICAL ENGINEERS

1666 DUBLIN AVE.
WINNIPEG, MANITOBA
R3H 0H1
(204) 632-7252
FAX (204) 632-1442

September 27, 2005

File #252763

Earth Tech (Canada) Ltd.
850 Pembina Highway
Winnipeg, Manitoba
R3M 2M7

Attention: Mr. Eric Hutchison, P.Eng.

Dear Sir:

Re: NEWPCC
Centrate Treatment Facility - Phosphorous Removal

You have asked that we address the geotechnical aspects for the design of the proposed Centrate Storage Building at the NEWPCC. We have recently visited the site and reviewed our geotechnical 1987 report on the existing "Sludge Dewatering Building" and consider that this report is suitable for the additions of the Phosphorous Removal development. This report is attached.

It is our understanding that the proposed development will include an attached Chemical Storage Building, with a footprint of approximately 9 by 12 metres. It will contain several chemical tanks. A heated (min. 5°C) rail car shelter will also be provided which will be serviced with a new rail spur. These are illustrated on the attached drawing.

The 1987 geotechnical report is attached. The soil profile consists of the usual Lake Agassiz lacustrine clays which overlie a glacial till deposit at a depth of about 18 to 19 metres. These large depths are consistent with other investigations at the NEWPCC. Within the upper 2 to 4 metres are variable thicknesses of clay fill and silt deposits.

The Chemical Storage Building will have a main floor slab which will be relatively heavily loaded by tankage. We would recommend that a structurally supported floor slab be used which would be provided with at least a 150 mm void between the underside of the slab and the subgrade soil. A similar void should be provided under grade beams and pile caps. If the floors in the existing building have shown any distress, the void space should be increased.

Driven precast concrete piles are the preferred foundation. These piles if driven to practical refusal in the underlying glacial till may be assigned capacities of 445, 625 and 800 kN for 300, 350 and 400 mm diameter sizes. They should be driven with energies of at least 40 kilojoules. Preboring should be done at all pile locations to minimize the effects of vibrations on the existing structure. Pile spacing from the existing foundation units should not be closer than 2.5 pile diameters.

The proposed rail car shelter, which will be heated, could be supported on the driven precast concrete pile foundation as described for the Chemical Storage Building. However, if the loads are smaller, some consideration could be given to the use of cast-in-place concrete friction piles which may be designed on the basis of an allowable adhesion value of 18 kPa. The upper 3 metres of shaft support and/or the depth to the bottom of the silt should be discounted. Temporary steel sleeves might be required to prevent problems of seepage and caving into the augered borings.

It is understood that the floor in the rail car shelter will be compacted granular.

The construction of a spur line should recognize the presence of fill and silt which were identified in the test holes in 1987. This is common to the conditions found elsewhere on the NEWPCC site. The subgrade preparation should include the removal of topsoil, trees and brush. Where fill is encountered, it should be "proof rolled" and any soft areas should be reworked or removed and replaced with acceptable materials. The subgrade should be compacted to a uniform density of 95 percent of Standard Proctor Density. The embankment section and rail design section may be placed on the prepared subgrade.

All concrete in contact with the soil should be manufactured with sulphate resistant cement and should be of high quality.

Yours truly,

DYREGROV CONSULTANTS

Per:



A.O. Dyregrov, P.Eng.



Attch.