Q. [D01-Dams] - Please identify the fill composition of each of Hydro's earthen dams. Further, compare the fill composition and construction to other Canadian earthen dams and US earthen dams. Provide all workpapers, assumptions, considerations and material reviewed and relied on in sufficient detail to permit verification of the response.

A. Embankment dams are made of compacted earth and have two main types, rock-fill and earth-fill. These dams rely on their weight to hold back the force of water. Rock-fill dams are compacted of free draining granular earth with an impervious zone. These types of dams usually contain a large percentage of large particles. The impervious zone can be made up of a number of different types of materials that have the ability to block the flow of water. Filters are employed to prevent internal erosion. These are specifically graded soils designed to prevent the migration of fine grained soil particles (made up of fine and coarse sands).

Earth-fill embankments are comprised of well compacted earth. There are two types, zoned and homogeneous. Zoned earth-fill dams have distinct parts or zones of dissimilar materials, typically locally available shell materials with a watertight core. These typically employ filter and drain zones to collect and remove seepage water, whereas homogeneous earth-fill dams are constructed entirely of one material.

The earthen dams owned by Hydro are made up of either rock-fill, zoned earth-fill or homogeneous dams. Also see CA-NLH-246 Attachment 1. These are very typical of the thousands of earth embankments in the U.S. and Canada.