How are process ponds constructed and monitored?

Pregnant and barren ponds are used to store chemical process solutions at a mine facility. The Division requires these ponds to be constructed with two plastic liners to keep the solution from leaking into the environment, and include a leak detection system installed between the liners to alert the operators if any leaks develop in the top liner. The liners are constructed with a tough plastic, such as high-density polyethylene (HDPE) or linear low-density polyethylene (LLDPE), that are typically 60- or 80-mil thick. The bottom liner is referred to as the "secondary" liner and the top liner the "primary" liner. Similar to the installation of heap leach pad liners, each pond liner sheet is welded together and pressure tested at the seams using standardized and internationally accepted testing protocols to ensure there are no gaps, holes, or areas of potential failure. Layered between the two liners is a leak detection system, also referred to as a leak collection and recovery system, consisting of a layer of porous plastic with access ports for determining whether the primary liner is leaking. The pond bottom is sloped to a sump where the leak detection system reports. If the primary liner has a leak, the water will report to the leak detection sump. As with all process components at a mine site, a pond cannot be put into service or operation until the Division has reviewed and approved a detailed "as-built" report prepared by a Nevada licensed professional engineer showing that the pond was constructed properly and has been tested to ensure that it will not leak to the environment when it is filled with process solution. Minimum quarterly and annual leakage limits have been established by the Division and mining facilities are required to monitor their leak detection systems regularly. If the primary liner is found to have a leak, the mine operator is required to repair it. No leakage is allowed through the secondary liner. If the pond will contain toxic chemicals above concentration limits established by the Nevada Department of Wildlife, the top of the pond must be netted, covered with floating "bird balls," hazing devices such as propane cannons, or other measures to keep animals from using the ponds. See Figure 1 for a cross section of a process pond.

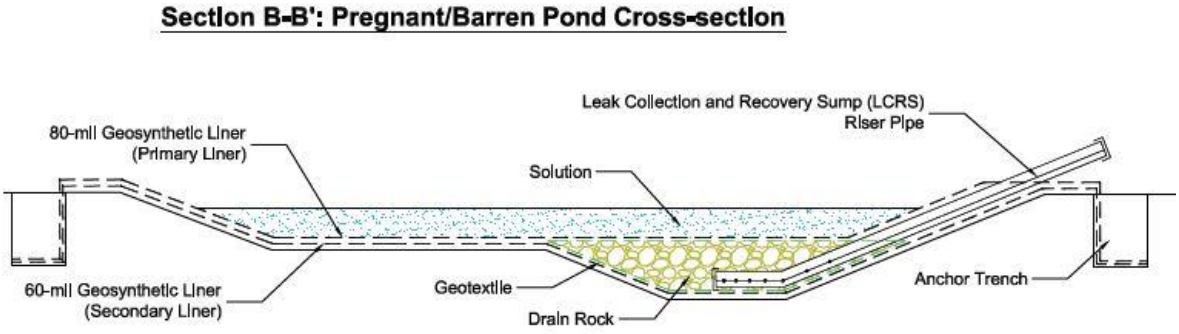

Figure 1: Process ponds are required to be double-lined with a functioning leak detection system.