

## How Process Ponds are Constructed and Monitored

Pregnant and barren ponds are used to store chemical process solutions at a mine facility. The Nevada Division of Environmental Protection (Division) requires that these ponds be constructed with two plastic liners to keep the solution from leaking into the environment. They must 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 tough plastic sheets, such as high-density polyethylene (HDPE) or linear low-density polyethylene (LLDPE). These are typically 60- or 80-mils thick. The bottom liner is referred to as the “secondary” and the top one is the “primary” liner.

A “mil” is a unit of measurement that is 1:1000 of an inch. A kitchen trash bag is typically 1 – 2 mils; a credit card is approximately 30 mils. Therefore, an 80-mil liner is strong, elastic, and very tough material.

Similar to the installation of a heap leach pad, each pond liner 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 operated until the Division has reviewed and approved a detailed Record of Construction (“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 accessing the ponds. See Figure 1 for a cross section of a process pond.

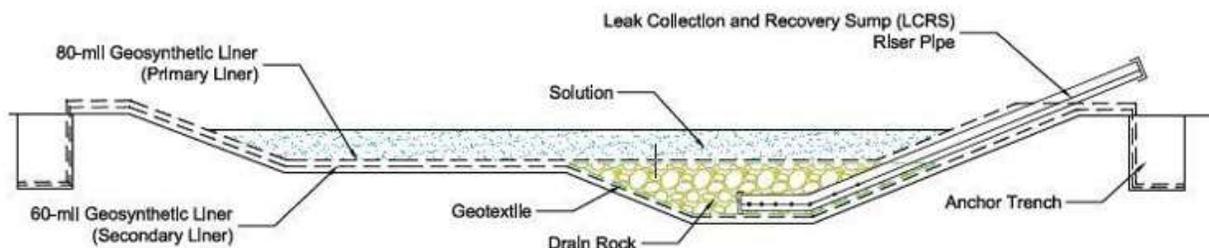


Figure 1: Process ponds are required to be double-lined with a leak detection system.