Interim Risk Reduction Measures for Seepage Mitigation and Stability Improvement at Laurel Mountain State Park Water Supply Impoundment

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The unnamed pond (clay lined water supply impoundment with an earthen embankment) is part of a multi impoundment system that supplies water for snowmaking for the ski resort in Laurel Mountain State Park. During construction to enlarge the unnamed pond, seepage and slumps were observed.

Interim Risk Reduction Measures (IRRM) were developed to mitigate adverse seepage impact on the stability of enlarged pond dike. To assess the existing seepage Michael Baker executed a site reconnaissance; conducted a desktop study utilizing infrared aerial photography; performed a geophysical and static LiDAR survey; and performed Seepage and Embankment Stability Sensitivity Analysis. These analyses included interpretation of the panchromatic and infrared imagery to determine that historical seepage patterns and groundwater presence.

Based on the results of the survey and analysis a seepage toe berm with a drainage collection system was recommended as the IRRM. The seepage toe berm consisted of a 3-layer graded filter which promoted seepage collection and prevented piping of embankment materials. The addition of a seepage toe berm improved the existing slope stability factor of safety by about 20 to 30 percent.