

## RESERVOIR SEDIMENTATION ASSESSMENT USING SUB-BOTTOM PROFILER AT SAMANALAWEWA RESERVOIR

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### Abstract

Sub-Bottom Profiler (SBP) is one of the effective tools used to identify the sediment layers beneath the seabed or bottom of any water body. SBP is similar to the echo sounder, but parts of the sound pulse penetrate the seabed and reflect the various layers below the surface. The Stratabox HD is a pinger-type SBP capable of detecting soft sediment layers at high resolution. Data was collected in the Samanalawewa Reservoir, one of the largest hydropower plants in Sri Lanka which generates 120 MW to the national Grid. There is a leakage on the right bank of the dam started in 1992. This leakage has continued from 1992 to today and is still to find a solution. The study focused on the remedial actions taken to prevent the leakage. A large amount of soil was cast to those areas as a solution called “Wet Blanketing” from 1997 to 1999. But no study was done to analyze the effects of wet blanketing to the right bank of the dam. The results have shown that the final expected design bed shape has not achieved. Further to that, using the SBES data, existing Digitized plans, and SBP data were used to analyze the overall sedimentation of the reservoir and the results were validated using grab samples. The initial sediment layers of the soft subsurface closely matched to the grab samples and clearly showed a significant increasing trend of sedimentation from the dam to the upstream area where Belihul Oya and Hirikatu Oya discharged to the Samanalawewa reservoir. But there is no significant sedimentation deposition according to the analysis in the reservoir to affect the Minimum Operational Level (MOL).

**Keywords:** Hydrography, Bathymetry, Sub-bottom Profiler, Reservoir Sedimentation