Pumped Storage Plant Waldeck-I, North Wall (D)
Exposed Geomembrane System

Country	Germany, Hemfurth-Edersee
Type	Pumped Storage Plant, Reservoir
Client	Uniper Kraftwerke GmbH
Main Contractor	Renesco GmbH
Execution of the Work	Renesco GmbH
Designer	M4 Ingenieure GmbH
Quality & Material Consultancy	GEOscope GmbH
Construction Period	2025

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Project Description

After nearly 100 years of service, the entire pumped storage plant (70MW), including various structures, requires a renovation. The aim is to carry out a major overhaul to upgrade and modernize all relevant structures, building and plant components in order to ensure the safe operation of the power plant in the future. As part of the major overhaul of the Waldeck 1 PSW, the upper reservoir (695.000m³) with the intake structure, among other things, is to be upgraded in line with the current state of the art over the next few years in order to ensure safe continued operation for the next decades and to preserve the structures.

The upper basin was upgraded in 2008 with a plastic geomembrane/geocomposite (Sibelon CNT 3750) in the wall area (14,000sqm) and with asphalt on the floor (18,500sqm). Nevertheless, Uniper is now replacing the previous installed geomembrane, partially with concrete facing shells and, over a distance of 820m, with a flexible polyolefin-based geomembrane/ geocomposite.

Scope of Service

Supply & Installation of a drained waterproofing system in the wall area using an exposed geomembrane/geo-composite, stretched and comparted by tensioning profiles. In detail:

- Dismantling of the existing geomembrane system
- Substrate preparation & concrete rehabilitation work
- Installation of the stainless-steel tensioning profiles and setting of the adhesive anchors (face anchorage)
- Installation of a TPO geomembrane/ geocomposite acc. to EN 13361, which is reinforced via an inlet and laminated on the backside with a PP geotextile of 500g/sqm
- Area of installation: North wall with a length of 340m, South wall with a length of 480m. The average wall height is approximately 17m
- HDPE geogrid (4mm) was installed behind the sealing liner
- Perimeter seal, termination & transition detail with the concrete facing shell structure & asphalt flooring
- Rehabilitation of the existing PVC based geomembrane/geocomposite system.

1. Overview upper basin
2. Dismantling of the previous geomembrane system
3. Installation of the new geomembrane system (TPO)