



The Liner Company

# SOLUTIONS

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## Underwater PVC Lining Coachella Canal

**Problem:** A nine-foot-deep canal, built in 1942 in sandy desert soil now leaks up to 115,000 acre-feet annually - enough fresh water for up to 150,000 households. The canal needed relining but the project had to be accomplished without draining the water.

**Solution:** Develop equipment that trims and grades the canal and then lines it in one multi-layered process with a polyvinyl chloride (PVC) geomembrane, geotextile and a concrete cover. All accomplished while tons of water flow through the canal.

A prototype project for lining 1.5 miles of the Coachella Canal in southern California began in 1988. The project is to present new technology and methods that can be used to line all leaking portions of both the Coachella and All-American Canals. This project marks the first time PVC (or any geomembrane) has been used for underwater lining of an operating canal.

The U.S. Bureau of Reclamation awarded the Kiewit Pacific Company of Santa Fe Springs, Calif., the contract to develop equipment to line the canal. Kiewit subcontracted with EPI to supply the custom-fabricated PVC liner and to provide on-site hot wedge field welding of the panels during installation.

Two gigantic machines were designed and built - a dredge and a paver - so that the operation could be

conducted in two steps. The dredge prepared the canal while the paver placed the geomembrane (bonded with geotextile) and immediately covered it with 3 inches of specially formulated concrete. To install the geomembrane liner underwater, a unique tracking system was designed that allowed the liner to be rolled out flat against the sides and bottom of the canal. EPI developed and patented the proprietary fabrication process to accommodate this tracking system.

BuRec selected PVC as the appropriate liner for the project for four reasons:

1. **Availability in large sheets.** 60-by-200-foot panels were used to provide the one million sq. ft. of liner.
2. **Flexibility.** PVC is flexible over a wide range of temperatures, permitting it to conform to the subgrade better than other geomembranes.
3. **Easy field welding.** PVC is easily field-welded with a solvent. Its tensile strength, puncture, abrasion and tear resistance properties were important to minimize damage during installation.
4. **Proven record.** PVC has been used for four decades as a canal-lining material in reclamation work.



*Preserving water resources for future generations*