Rethinking API 13A for Pond, Lake & Dam Sealing

API 13A is widely referenced as a quality benchmark for sodium bentonite. Its long history, standardized testing methods, and performance-based criteria make it attractive when engineers are asked to specify a bentonite product. However, API 13A was developed exclusively for drilling-fluid applications. When applied to compacted soil liners for ponds, lakes, and dams, one specific requirement—particle size distribution—becomes misaligned with real-world earthwork performance.

What API 13A Is Designed to Do

API 13A evaluates bentonite behavior in an aqueous slurry environment. The intent is to ensure predictable drilling-fluid performance, not soil sealing.

- Ensure rapid hydration and platelet dispersion in water
- Develop predictable viscosity and gel strength
- Control filtrate loss through formation of a thin filter cake
- Promote interchangeability of drilling-fluid materials

What API 13A Does Not Evaluate

API 13A does not address the conditions that control performance of a compacted soil liner. These factors govern whether a pond or dam liner will actually seal.

- Hydraulic conductivity of compacted soil-bentonite mixtures
- Lift thickness and compaction methodology
- Uniformity of bentonite distribution in soil
- Worker exposure and dust generation during bulk placement
- Long-term performance under confinement and moisture cycling

Particle Size: The Critical Disconnect

API 13A limits material coarser than 75 microns (~#200 sieve) to a very small fraction, driving the product toward an ultra-fine powder. This requirement is appropriate for drilling fluids but problematic in soil sealing applications.

- Ultra-fine powder becomes wind-borne during open-air placement
- Material loss and inconsistent dosing are common in field conditions
- Dust generation increases PPE requirements and safety risk
- No demonstrated improvement in confined soil permeability

Standards That Govern Pond & Dam Sealing

NRCS Conservation Practice Standard 520 establishes a framework specifically for compacted soil liners. Unlike API 13A, it directly addresses seepage control in earthwork applications.