# Will Sediment Caps Last Forever?
# And How Should We Address the Possibility that They Don't?

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Capping contaminated sediment has been a proven remedy for decades. EPA's 2005 Sediment Guidance recognizes sediment capping, along with dredging and monitored natural recovery, as an effective long-term sediment remedy. Caps can withstand many physical and hydrodynamic conditions, leading to long-term effectiveness and permanence. Establishing a reasonable cap design life requires understanding the long-term stability of cap structures and the environment within which they are constructed. Critical to understanding cap stability is the evaluation of technical factors, design features, monitoring requirements, and engineering controls to manage long-term effectiveness and risks.

When capping is proposed, stakeholders need to quantify and control long-term risks. Additional institutional controls, insurance instruments, or financial assurance instruments are increasingly under consideration to address potential long-term risks. Estimates developed for alternatives analyses may use these considerations to help manage expectations and determine long-term maintenance costs (beyond design life), the potential for cap failures, and what constitutes failure under probabilistic events like earthquakes.

In some states, initiatives are under consideration or already exist to require financial instruments (trusts and insurance policies) to mitigate risks of cap damage and failure, or to finance long-term cap maintenance. Possibly, the cost or complexity of these measures will lead to different conclusions about the preference to cap when comparing long-term effectiveness and cost to overall costs of other remedial technologies for contaminated sediment management.

Maintenance and monitoring practices can lead to increased confidence in cap longevity by reliably observing problems in time to address long-term risks. For caps with a predictable design life, repair or replacement strategies can help avoid unanticipated failures. However, we recognize that potentially responsible parties and regulatory agencies do not want endless project maintenance, which leads to the question: at what point, if any, is no further monitoring needed and what demonstrates adequate performance and permanence?