



Protecting Water Quality in a Complex Lake Basin

Wastewater Infrastructure Challenges and Long-Term Planning in the Coeur d'Alene Basin


Jason Peppin

Panhandle Health District

Environmental Health Division

Coeur d'Alene Basin Commission Meeting
May 13, 2026

Shared Stewardship of a Complex Lake System

An aerial photograph showing a large, complex lake system. The main lake is a deep blue color, surrounded by dense green forest. A winding river flows through the forest, eventually emptying into the lake. The landscape is hilly and mountainous, with the forest covering most of the slopes. The sky is clear and blue.

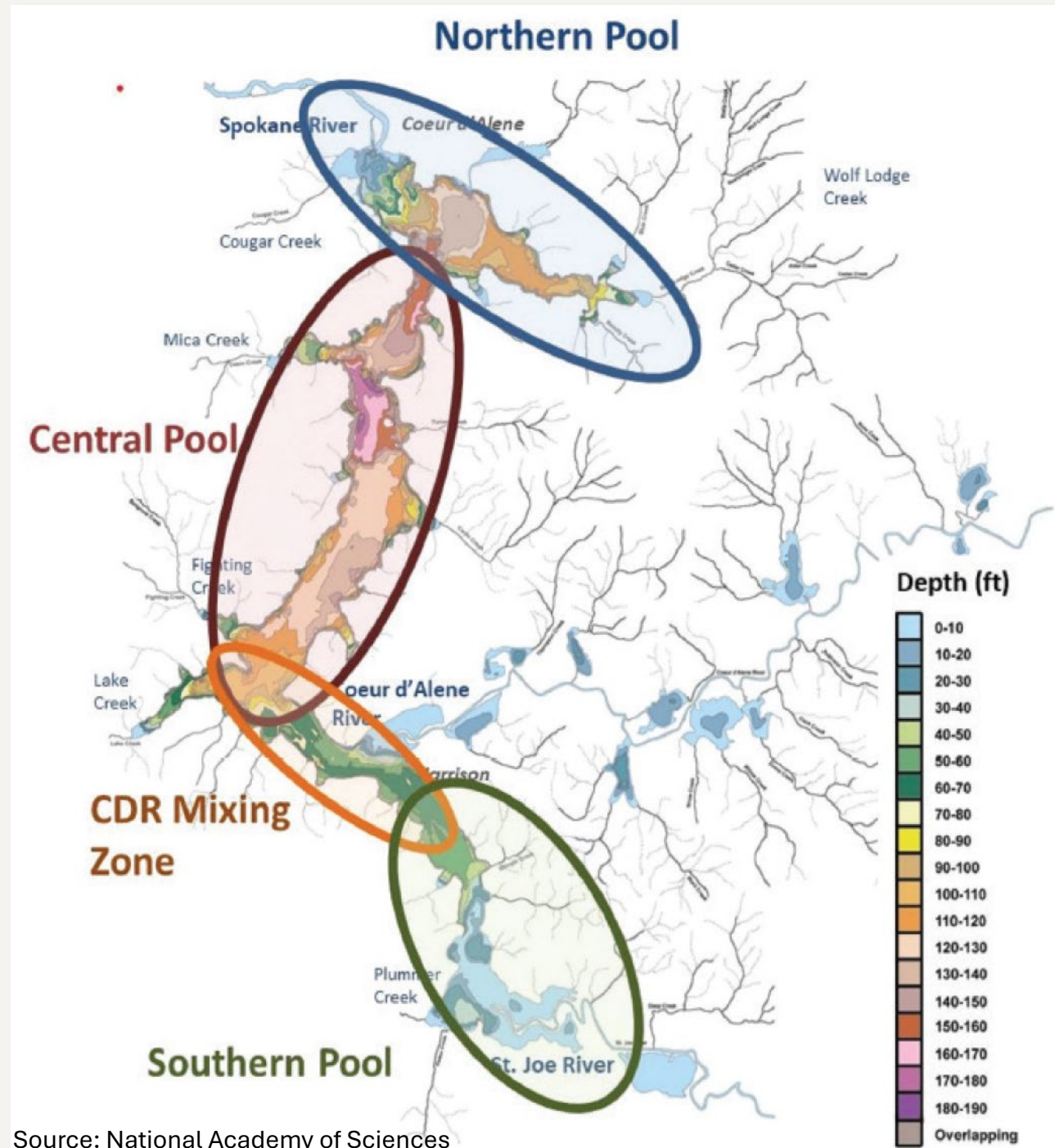
- Coeur d'Alene Lake is an important environmental, cultural, recreational, and economic resource
- Long-term lake stewardship involves many partners across the basin
- Wastewater infrastructure is one of many considerations within the broader nutrient framework

Multiple Factors Influence Basin Water Quality

Basin water quality is influenced by multiple natural and human factors

Recent scientific research continues to evaluate phosphorus interactions within the lake system

Wastewater infrastructure represents one component within the broader basin framework



Source: National Academy of Sciences

A Basin Reliant on Decentralized Wastewater Infrastructure

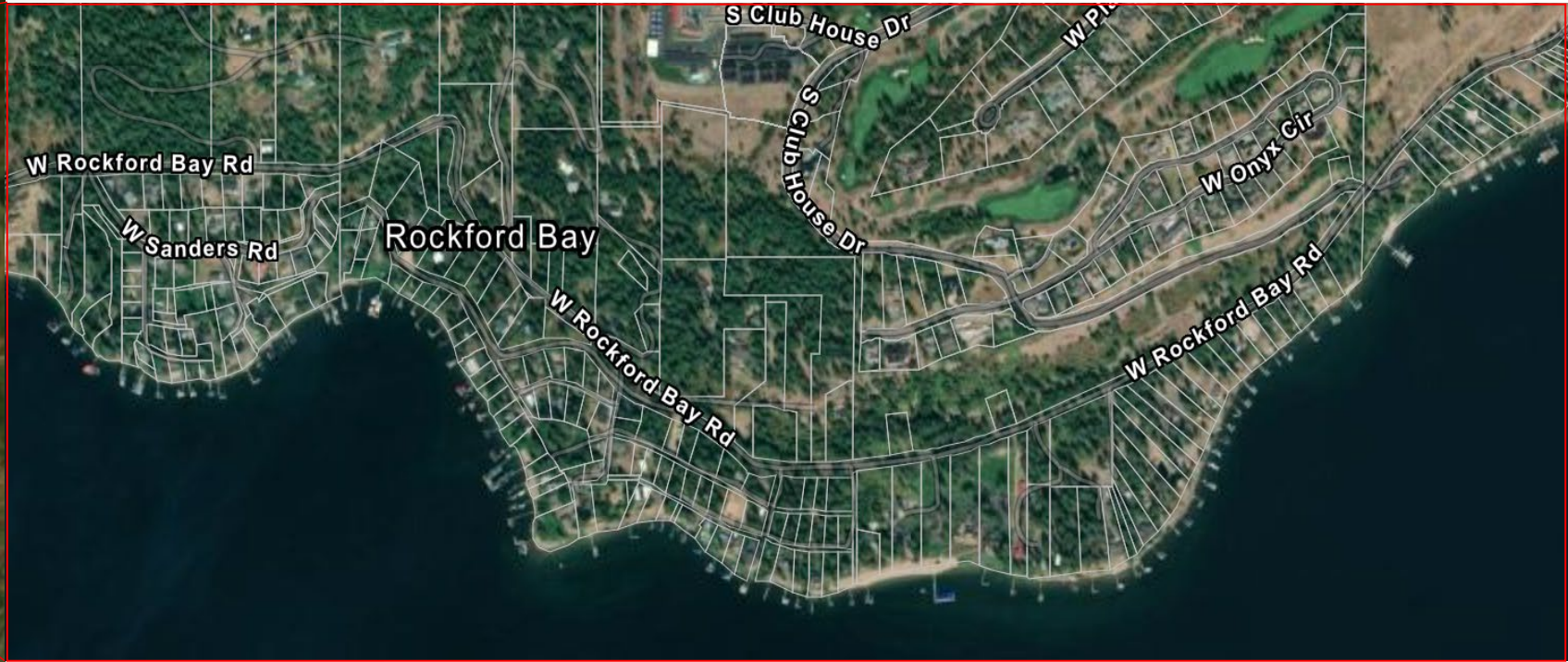
Limited centralized sewer availability across much of the basin shoreline

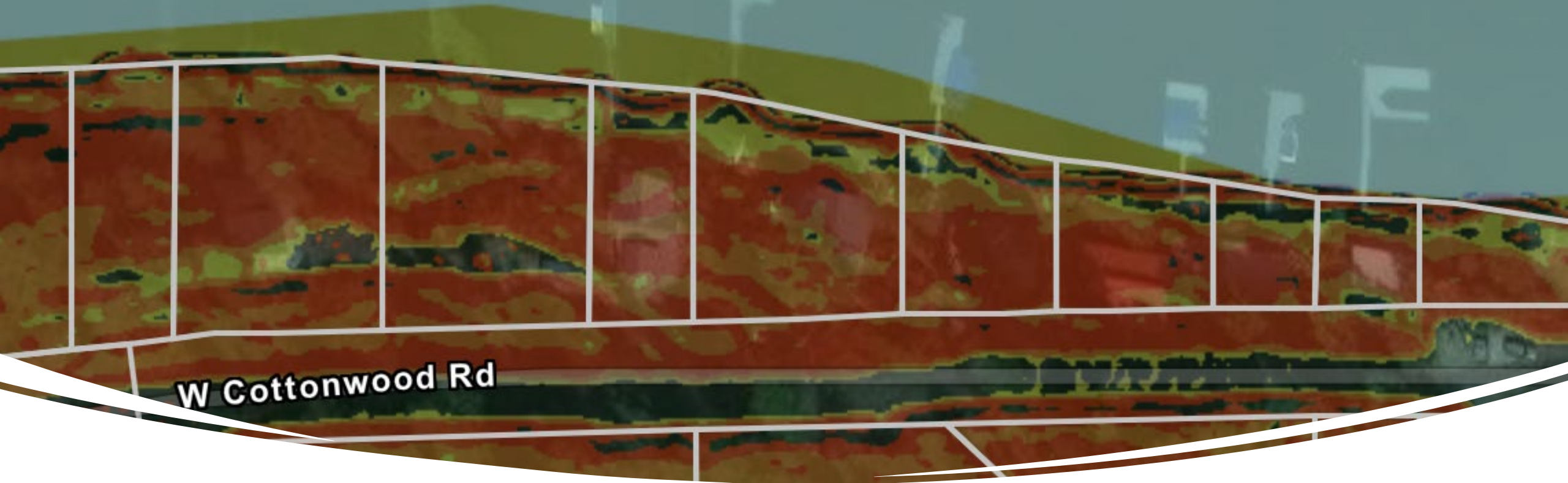


Sewer district boundaries and recent onsite wastewater evaluations within the Coeur d'Alene Basin

Legacy Shoreline Development Patterns

- Many shoreline parcels were created before modern wastewater regulations existed
- Numerous structures and systems predate current state and county standards
- Existing systems retain vested rights for continued subsurface wastewater discharge
- System replacement often occurs within highly constrained sites



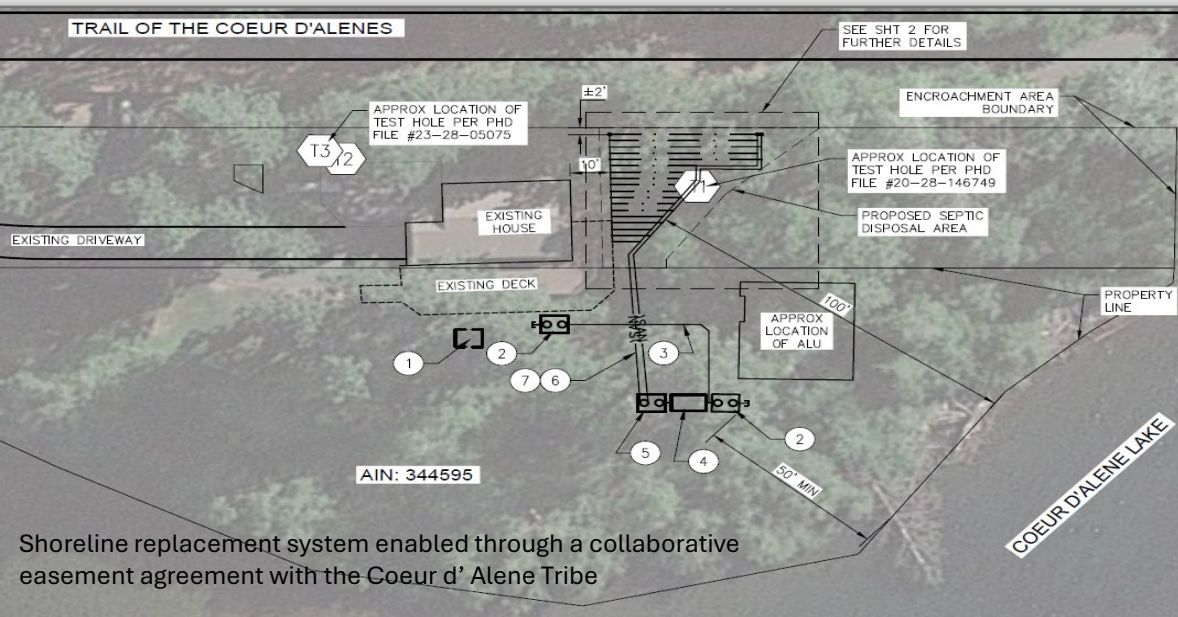


Example of Cumulative Site Constraints

- Basalt outcrop / shallow rock
- Slopes exceeding 45%
- Limited parcel depth
- Approximately 50 ft between shoreline to roadway
- Dense legacy lot configuration

Protective Standards and Modern Technologies

- Idaho maintains some of the most protective surface water setback requirements in the country
- Advanced treatment technologies provide additional options in constrained environments
- When full current standards can be applied, modern onsite systems are effective and protective of water quality



Shoreline replacement system enabled through a collaborative easement agreement with the Coeur d' Alene Tribe



Long-Term Wastewater Disposal Approaches

An aerial photograph of a large lake with a forested shoreline. A paved road winds through the trees on the right side of the image. Several docks and boats are visible in the water. The background shows distant mountains under a blue sky with light clouds.


Area-wide planning provides more flexibility than parcel-by-parcel replacement

Bay-based or smaller-scale wastewater solutions may help reduce cumulative nutrient inputs

Coordinated approaches may improve long-term reliability in constrained shoreline areas

Infrastructure planning can support future property improvements and redevelopment

Collaborative Planning for the Future

An aerial photograph of a large, deep blue lake with several forested islands. The background shows rolling hills and mountains under a clear sky. The text is overlaid on a dark grey rectangular box at the top of the image.

No single agency or jurisdiction can address these challenges alone

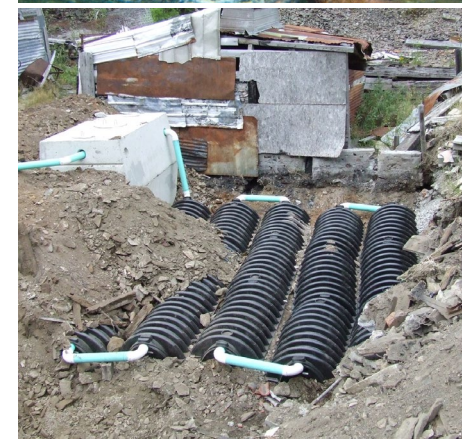
Long-term solutions will require collaboration among property owners, utilities, local governments, the Coeur d'Alene Tribe, DEQ, and other partners

Prioritization and phased implementation can help focus resources effectively

External funding will likely be necessary for meaningful infrastructure improvements

Infrastructure Challenges Shaped by History

Burke Canyon as an Example of Legacy Development and Incremental Wastewater Improvement



Burke Canyon presented severe physical and infrastructure constraints

Many legacy discharges occurred in areas with limited replacement options

Collaboration among property owners and agencies resulted in meaningful improvements

Approximately 37 residential direct discharges were eliminated through grant-supported infrastructure work

While not all systems met full modern standards, wastewater management and environmental protection were substantially improved

Key Takeaways



Coeur d'Alene Basin communities rely heavily on decentralized wastewater systems

Many shoreline wastewater challenges stem from historical development patterns and physical site constraints

Modern Idaho wastewater standards are protective and effective when site conditions allow full implementation

Long-term wastewater solutions will require collaborative planning, prioritization, and partnership

Incremental infrastructure improvements can produce meaningful long-term water quality benefits

Long Term Path Forward

An aerial photograph showing a wide river with several meanders. The river is a deep blue color, contrasting with the vibrant green grass and dense forest along its banks. In the background, there are rolling hills under a clear blue sky with some light clouds. The overall scene is a natural, scenic landscape.

Continued collaboration among agencies, utilities, property owners, and the Coeur d'Alene Tribe

Strategic prioritization of constrained shoreline areas and long-term infrastructure planning

Incremental improvements can continue reducing cumulative impacts across the basin

Sustained investment and partnership will be necessary to protect water quality for future generations

Questions?

