

McGregor Reservoir Erosion Protection

Fact Sheet

Project Overview

McGregor Reservoir is a popular camping and recreation area located in Vulcan County, approximately 100 km southeast of Calgary. It is owned by the Government of Alberta, operated by Alberta Environment and Parks (AEP). Erosion from high waves is impacting private lands and prevents the reservoir from being filled to its full capacity. Rock berms will be built in three locations to protect against further erosion and provide greater irrigation flexibility by enabling the reservoir to accommodate its full capacity. Construction is anticipated to take approximately two years, beginning in Fall 2022; it will be completed in two phases. Phase 1 will include restoring two locations: Milo and Sunset Marks. Phase 2 will include shoreline restoration at Monner.

Timeline (Estimated)

- Stakeholder engagement – Summer 2022
- Phase 1 construction - Fall 2022 to Spring 2023
- Phase 2 construction – Fall 2023 to Winter 2024

*Timelines are approximate and contingent on completion of regulatory and environmental approvals.

Mechanism of Erosion

Severe winds typical to this area often cause high waves on the reservoir. The action of the waves then causes shoreline erosion and the formation of bluffs. The breaking waves along the shoreline saturate, disturb, and erode the clay-rich soil, causing erosion.

Background

McGregor Reservoir was built in 1920; it is one of three main water storage reservoirs in the Carseland-Bow Headworks system. The Travers and Little Bow Reservoirs are downstream of Lake McGregor Reservoir. The shoreline has been eroding more than one meter per year, including considerable yearly variation based on climate and reservoir levels.

AEP has operated the reservoir below its full capacity for several years to mitigate against shoreline erosion. While this approach protects against erosion, it results in reduced reservoir storage and less flexibility for the irrigation district. This means there is less range in operating levels, which should be lowered or raised based on climate forecasts, irrigation needs, flood warnings, etc.



Bluffs along the northeast shoreline of McGregor Reservoir (March, 2021)

With development along the reservoir shoreline increasing in recent years, erosion has begun to impact multiple private lands. The Government of Alberta is currently undertaking land access and acquisition negotiations with stakeholders to move forward with the project.

Berm Construction

Berm construction will involve excavating the bluffs. A rock berm will be built along the excavated slope, and may include blast rock, riprap, or fieldstone. The rock berm will extend approximately 1.3 metres above the reservoir's full capacity (full supply level) to provide protection against waves. The top of the berm will have a 4.5-metre-wide flat area, above which the excavation will finish with a vegetated slope.

Engineering, Environmental Studies & Project Impacts

Preliminary engineering design and environmental studies for this project began in 2021 and included a geotechnical assessment of the soil conditions, hydro-technical analysis, prediction of wave heights, and berm design. Environmental studies have been conducted on aquatic and terrestrial habitats within the proposed project footprint and included fisheries, wildlife, wetlands, vegetation, soils, and historical resources evaluations. Most potential impacts can be avoided through habitat management and mitigation measures. Fish habitat enhancement features such as rock structures have also been incorporated into the design to break waves and encourage fish to hide and feed along the shoreline. Gravel will be installed over the lower portion of the berm to provide habitat for fish egg development.

Regulatory Requirements

A comprehensive regulatory approval process includes the following provincial and federal legislation and policies:

- Fisheries Act
- Species at Risk Act
- Indigenous Consultation
- Canadian Navigable Waters Act
- Public Lands Act
- Historical Resources Act