

**Ministry of Energy, Northern Development and Mines**

**Closure Plan Requirements and Best Practices for Tailings  
Dams and Other Containment Structures**



Mineral Development Branch  
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## Introduction

The purpose of this guideline is to outline the focused approach and the requirements to submit a Closure Plan or Closure Plan Amendment specifically for projects that include tailings dams or other containment structures where the dams or structures are “offline”, as defined in the Ministry of Natural Resources and Forestry’s (MNRF) *Lakes and Rivers Improvement Act* Administrative Guide.<sup>1</sup>

Through this guideline, the Ministry of Energy, Northern Development and Mines (the “Ministry”) intends to clarify the Closure Plan and Closure Plan Amendment requirements related to tailings dams and containment structures (referred to as “structures”) and the closure condition of the retained tailings and mine waste.

This guideline focuses on the following topics:

1. Administrative Process
2. Technical Information Requirements
3. Appendix A – Best Practices
4. Appendix B – Process for Existing Tailings Dams – Annual Lifts

The Ministry will review each Closure Plan or Closure Plan Amendment and will encourage early discussion with a Mineral Exploration and Development Consultant for any clarification sought by the Proponent.

### 1. Administrative Process:

The following process will be followed by the Proponent prior to a Closure Plan or Closure Plan Amendment being submitted:

1. The Proponent shall provide a Notice of Project Status (NPS) or Notice of Material Change (NMC) to the Director describing project details (including detailed plans and specifications).
2. ENDM staff will review the NPS and NMC and assess if the proposed structure(s) could be subject to regulation by MNRF under the *Lakes and Rivers Improvement Act*.
  - 2.1. If the proposed structure is considered to be “online” and is likely regulated under the *Lakes and Rivers Improvement Act*, a letter from the Manager of the Engineering Services Unit will be sent to the MNRF Regional Engineering

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<sup>1</sup> <https://files.ontario.ca/lria-administrative-guide.pdf>

Services Supervisor with a copy to the proponent stating that the MNRF process needs to be followed.

2.2. If the proposed structure is considered to be “offline”/existing structure and likely not subject to regulation under the *Lakes and Rivers Improvement Act*, the following will occur:

- i. The Director of Mine Rehabilitation will provide a letter to the proponent with a copy to the MNRF Regional Engineering Services Supervisor stating that the proposed project is considered offline and likely would not be subject to the LRIA. The letter will also provide written direction to the proponent confirming the need for a CP or CPA and guidance for public or Aboriginal consultation. Should there be more than one ministry involved in the projects permitting at this time, the Aboriginal communities identified will be coordinated through the Ministry’s One Window Coordination Process.
- ii. A Closure Plan or Closure Plan Amendment must be submitted by the Proponent for all offline structures. The Closure Plan or Closure Plan Amendment must include engineering details for the structures and will be reviewed for compliance with the requirements of the *Mining Act* and O. Reg. 240/00 (in the case of tailings dams, to determine whether due regard has been given to the Canadian Dam Association’s (CDA) *Dam Safety Guidelines* and technical bulletins (together, the “CDA Guidelines”)), and technical information requirements below.
- iii. Should the Closure Plan or Closure Plan Amendment meet the requirements of the *Mining Act* and O. Reg. 240/00 (in all respects), the Director of Mine Rehabilitation will acknowledge that the Closure Plan or Closure Plan Amendment is filed. In either case, the mine development described in the Closure Plan or Closure Plan Amendment cannot commence until the document is filed.

## **2. Technical Information Requirements for Offline Tailings Dams:**

The Mine Rehabilitation Code in O. Reg. 240/00 provides that all persons engaged in the design, construction, maintenance and decommissioning of tailings dams and other containment structures must give due regard to the CDA Guidelines and must provide details of that consideration in Closure Plans or Closure Plan Amendments submitted in accordance with the requirements of the *Mining Act*.

Below are a number of items within the project description and certification portions of a Closure Plan or Closure Plan Amendment that relate to tailings dams and other containment structures. Details are provided with each item in order to establish the

required information to be included in each Closure Plan or Closure Plan Amendment that contains an “offline” tailings dam. Note that there are additional requirements included in sections 7, 8 and 9 of Schedule 2 (descriptions of rehabilitation measures for each of the three stages of closure) that are required for all tailings dams and other containment structures, in addition to the information described in this guideline.

In order to establish that due regard has been given to the CDA Guidelines, the Proponent shall provide the following:

1. Design drawings of tailings dams must be submitted in accordance with O. Reg. 240/00, Schedule One, Part 7, ss. 58 and 59 as well as Part 8 ss. 61-67, as applicable. Design drawings must include input and approval from the appropriate qualified professionals (reviewed by the Engineer of Record). Any recent Dam Safety Review’s (DSR) or Dam Safety Inspection’s (DSI) should be included as part of the submittal package. Sites with engineered covers, an estimate of the service life expressed in years together with recommendations for its maintenance, repair and replacement, as needed to maintain its continued performance in order to provide the detailed cost estimates is required to be included in a Closure Plan – see item 12 of Schedule 2 to O. Reg. 240/00. For the initial construction of engineered covers, the FA breakdown should allow a practicable time period and associated costs to construct the cover over soft ground conditions, including the costs of dewatering, and other site-specific conditions.
2. The ministry may require submission of a DSI report and/or DSR report in accordance with the frequency established in the CDA Guidelines to support inspections. DSIs and DSRs are to be signed and sealed by a professional engineer and reviewed by the Engineer of Record<sup>2</sup>.
3. Two plan view drawings, with associated cross sections for clarity, showing the Active Care Phase<sup>3</sup> and Passive Care Phase<sup>3</sup>, respectively.

**Schedule 2, Item 2 “Certification”, “(j)” – “statement of certification set out in subsections 12 (2) and (3) of the regulation”.**

1. Certification as set out in subsections 12 (2) and (3) of O. Reg. 240/00 including any FA is required.

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<sup>2</sup> Applies only when the required information has not already been provided to the Ministry of the Environment, Conservation and Parks in compliance with existing Environmental Compliance Approval conditions.

<sup>3</sup> CDA Technical Bulletin: Application of Dam Safety Guidelines to Mining Dams (2014) or most recent version.

**Schedule 2, Item 5 “Project Description”**, “(vi)” – “details of the production, handling and disposal of any tailings on the site, including the physical and chemical nature of the tailings, an assessment of the potential for metal leaching and acid mine drainage in accordance with the Code, the rate of production of tailings, methods of handling tailings, the location, size and nature of any tailings impoundment and treatment areas and a surface plan of legible scale showing the location of any such areas with engineering details of any impoundment structures”. The following is the information required to comply with this requirement:

1. The Proponent will provide the Director sufficient engineering details to allow for the structures to be reviewed pursuant to the requirements of the *Mining Act* and O. Reg. 240/00, and to allow for consultation with the public and with Aboriginal communities, where required. Detailed design drawings need to be provided with supporting technical specifications listed in accordance with the Technical Information Requirements section of this guideline.
2. Plans, sections, and specifications for the structures, presented at legible scale, showing the proposed tailings dams and other containment structures (dam heights, dam slopes, foundation conditions, construction materials, tailings beach locations, pond locations, freeboard etc.). Design drawings and specifications for the structures to be identified as “Issued for Construction” and signed and sealed by a professional engineer licensed in the province of Ontario. Conceptual profiles of future dam raises projected over the life of the mine are to be included.
3. Supporting geotechnical design report with associated results of the geotechnical site investigation program and laboratory testing confirming primary design features and foundation conditions of the dam locations.
4. The determination of the Dam Classification as a consequence of failure, as outlined in the CDA Guidelines. This includes dam break analyses under both “sunny day” and “flood induced” conditions to assess the potential inundation area and the subsequent public safety and environmental impacts. Proponents will describe how the seismic design parameters and design flood requirements was influenced by the Dam Classification.
5. Inflow design flood<sup>4</sup> and earthquake design ground motion<sup>2</sup>, required freeboard<sup>2</sup>, required and calculated factors of safety, dam classification and design criteria considering both operational and closure scenarios.

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<sup>4</sup> As defined in the Dam Safety Guidelines 2007 (2013 Edition) and the Technical Bulletin: Application of Dam Safety Guidelines to Mining Dams (2014)

6. Detailed design report for starter dams and subsequent raises, including dam classification, supporting data from the geotechnical field investigations, and associated laboratory work, to confirm stability and sensitivity analyses demonstrating input parameters, and associated factors of safety.
7. Description of any water diversion structures and spillways, including invert elevations and cross-sectional details with environmental design flood<sup>5</sup> (EDF) and inflow design flood (IDF) design criteria.
8. Description of the physical and chemical characteristics of the tailings and a description of the tailing's deposition plan.
9. Description of seepage rates and seepage management plan, addressing any potential for groundwater contamination, especially in cases where impacted groundwater could report to surface water, as well as plans to monitor and mitigate seepage during operations and at closure.
10. Design drawings for structures, which include features that will accommodate the closure of the facility such as: final spillway hydraulic capacity; perimeter roads to support monitoring and inspection; projected location of the downstream toe of the dam; and, location of geotechnical instrumentation.

## **Contact**

If you require further clarifications, please do not hesitate to contact the Ministry of Energy, Northern Development and Mines, Mineral Development Branch at one of the following locations:

- Northwest – Thunder Bay Office (807) 475-1123
- Northeast – Timmins Office (705) 235-1625
- South/Central – Sudbury Office (705) 235-1625

## **3. Appendix A – Best Practices**

In addition to legislated requirements, ENDM requires that proponents with projects involving tailings dams and other containment structures comply with the most recent version of the CDA Guidelines and associated Technical Bulletins

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<sup>5</sup> CDA Technical Bulletin: Application of Dam Safety Guidelines to Mining Dams (2014) or most recent version.

with respect to operation, monitoring and maintenance of their tailings dams over the life of the project.

These proposed best practices will include working with the ministry staff, to create a mutually agreed upon schedule for providing the following information with respect to tailings dams:

1. The name of the Engineer of Record and their employer responsible for the design and performance of the structures and other roles and responsibilities that are defined in the CDA Technical Bulletin: Application of Dam Safety Guidelines to Mining Dams (2014) or most recent version. Information about the Engineer of Record and their employer is to be kept up to date and any changes should be submitted to the Manager of the Engineering Services Unit.
2. A monitoring plan or an Operation, Maintenance and Surveillance manual for all dams, listing the monitoring frequency with the instrument location shown on a drawing(s) with details on the type and composition of the instrumentation. Include threshold response levels commensurate with the type of instrument and the associated risk/concern<sup>6</sup>.

As-built report detailing field fit activities made during construction including QA/QC testing summaries to confirm minor modifications meet or exceed initial design standards as confirmed through the Design Engineer and the Engineer of Record.<sup>7</sup>

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<sup>6</sup> Item 2 applies only when the required information has not already been provided to the Ministry of the Environment, Conservation and Parks in compliance with existing Environmental Compliance Approval conditions.

<sup>7</sup> If it is determined through construction that design changes are required that are reasonably expected to have a material affect on the adequacy of the Closure Plan, the Proponent is required to provide a Notice of Material Change.



#### 4. Appendix B – Process for Existing Tailings Dams – Annual Lifts

