AGNICO EAGLE

MELIADINE GOLD MINE

Mine Waste Management Plan

DECEMBER 2022

VERSION 9_NWB

ᐃᓈᖅᓯᒪᔪᖅ

ᐊᒡᓃᑯ ᐄᒍ ᐅᔭᕋᒃᑕᓇᐊᓕᓇᔨᒃᑯᑦ (ᐊᒡᓃᑯᒃᑯᑦ) ᒫᓐᓇ ᐊᐅᓚᖅᑎᑦᑎᔪᑦ ᑕᓯᕐᔪᐊᕐᒥᑦ ᒨᓗᒧᑦ ᐅᔭᕋᒃᑕᓇᐊᕐᒥᑦ (ᐅᔭᕋᒃᑕᓇᐊᖅ), 25 ᕿᓛᒥᑕᐃᑦ ᐅᐊᖕᓇᖕᒐᓂᑦ ᑲᖏᖅᖠᓂᕐᒥᑦ ᐅᖕᒐᓯᒃᑎᕆᔪᖅ, ᐊᒻᒪ 80 ᕿᓛᒥᑕᐃᑦ ᓂᒋᖅᐸᓯᐊᓂᑦ ᐱᖕᒐᖕᓇᖅᐸᓯᐊᓂᑦ ᐃᒡᓗᓕᒑᕐᔪᖕᒥᑦ ᐅᖕᒐᓯᒃᑎᕆᔪᖅ ᑭᕙᓪᓕᕐᒥᑦ ᓄᓇᕗᒥᑦ.

ᑕᐃᒪᙵᓂᑦ ᐊᑯᑎᓕᓇᔨᒃᑯᑦ ᓈᒻᒪᒋᓚᐅᕐᒪᒍ 2015-ᒥᑦ ᐊᒻᒪ ᑎᑭᐅᑎᓂᖓᓄᑦ ᐊᐅᓚᕐᓂᕈᒃᑖᖓᓄᑦ ᐅᔭᕋᒃᑕᓇᐊᖅ, ᐊᒡᓃᑯᒃᑯᑦ ᐅᐃᒍᕆᐊᖅᓯᖃᑦᑕᖅᑐᑦ ᖃᐅᔨᒪᓂᖕᒐᓐᓂᒃ ᒨᓗᑕᓕᖕᓂᑦ ᖃᓂᑕᖕᒐᓂᑦ ᑕᓯᕐᔪᐊᑉ ᖃᓂᖅᓴᐃᒃᑲᓐᓂᖃᑦᑕᖅᓱᑎᒃ. ᑕᐃᒪᓐᓇᒧᑦ, ᑕᓯᕐᔪᐊᕐᒥᑦ ᐅᐃᒍᕆᐊᖅᓯᓂᖅ ᑐᒃᓯᕋᐅᑕᐅᔪᖅ. ᐊᐅᓚᑦᑎᓂᕐᒧᑦ ᐸᕐᓇᐅᑎ ᓄᑖᙳᖅᑎᖅᑕᐅᓚᐅᖅᑐᖅ ᐃᓚᐅᑎᓐᓂᐊᕐᓗᒍ ᐊᒃᑕᑯᓂᒃ ᐊᐅᓚᑦᑎᓂᕐᒧᑦ ᐸᕐᓇᐅᑎ ᑕᓯᕐᔪᐊᕐᒥᑦ ᐅᐃᒍᕆᐊᖅᓯᓂᕐᒥᑦ. ᑕᓯᕐᔪᐊᕐᒥᑦ ᐅᐃᒍᕆᐊᖅᓯᒪᔪᖅ ᐅᐃᒍᕆᐊᖅᓯᓂᐊᖅᑐᖅ ᐊᐅᓚᕐᓂᖓᓂᑦ ᐅᔭᕋᒃᑕᓇᐊᖅ 2032-ᒥᑦ 2043-ᒧᑦ ᐊᒻᒪ ᐃᓚᓯᔪᑎᒃ ᓄᓇᐅᑉ ᐃᓗᐊᓂᑦ ᐅᔭᕋᒃᑕᕐᓂᕐᒥᑦ ᓈᒻᒪᒋᔭᐅᕌᓂᒃᓯᒪᔪᖅ ᑎᓇᒐᓂᐊᕐᒥᑦ, ᐸᒻᐸ (Pump), F Zone, ᐊᒻᒪ ᑎᒃᑳᓇᒥᑦ (Discovery) ᐱᑕᓕᖕᓂᑦ.

ᐃᓚᒋᔭᐅᓗᓂ ᑕᓯᕐᔪᐊᕐᒥᑦ ᐅᐃᒍᕆᐊᖅᓯᓂᕐᒧᑦ, 65.0 ᒥᓕᔭᓐ ᑕᓐᓗᐊᓂᒃ (Mt) ᐅᔭᕋᒃᑕᖅᑕᐅᔪᓂᑦ ᐱᓕᐅᓇᕙᓪᓕᐊᓂᐊᖅᑐᑦ. ᐅᔭᕋᒃᑕᖅᑕᐅᔪᑦ ᓯᖄᓪᓕᑎᖅᑕᐅᓂᐊᖅᑐᑦ 20 ᐅᑭᐅᓪᓗᐊᓄᑦ ᐅᔭᕋᒃᑕᓇᐊᖅ ᐊᐅᓚᕐᓂᖓᓂᑦ 8,500 ᑕᓐᓗᐊᓂᒃ ᖃᐅᑕᒫᒃᑯᑦ (tpd).

191.6 ᒥᓕᔭᓐ ᑕᓐᓗᐊᑦ ᐊᒃᑕᑰᖅᑕᐅᔪᑦ ᐅᔭᖅᖃᐃᑦ (ᓄᓇᒥᑦ ᐅᒃᑯᐃᖕᒐᔪᒥᑦ ᐊᒻᒪ ᓄᓇᐅᑉ ᐃᓗᐊᓂᑦ), ᐊᒻᒪ 34.6 ᒥᓕᔭᓐ ᑕᓐᓂᒃ ᐅᖕᒐᑕᐅᑦᑎᔪᓂᒃ ᑕᓯᕐᔪᐊᕐᒥᑦ ᐅᐃᒍᕆᐊᖅᓯᓂᕐᒥᑦ ᐱᓂᐊᖅᑐᑦ. ᐊᒃᑕᑰᖅᑕᐅᔪᑦ ᐅᖕᒐᑕᐅᑦᑎᔪᓂᑦ ᓄᓇᒃᑰᕈᑎᒃᑯᑦ ᐊᒃᑕᑯᐃᑦ ᐅᔭᖅᖃᓄᑦ ᑐᖅᑯᖅᓯᓯᒪᕝᕕᖕᒧᐊᖅᑕᐅᖃᑦᑕᕐᓂᐊᖅᑐᑦ ᑭᓯᐊᓂ ᐅᔭᕋᒃᑕᓇᐊᐸ ᐊᐅᓚᕐᓂᖕᒐ ᐃᓱᓕᑉᐸᑦ, ᓇᒨᖕᒐᐅᑎᑕᐅᓂᖕᒋᑦ ᒪᓕᒡᓗᑎᒃ ᐊᐅᓚᖅᑎᑦᑎᓂᕐᒧᑦ ᖃᖕᒐᒃᑰᖕᒐᔪᒥᑦ ᐊᒻᒪ ᐅᖕᒐᑕᐅᑦᑎᔪᑦ ᐊᕙᓗᔭᐅᓗᑎᒃ ᐋᖅᑭᒪᐅᔪᒧᑦ ᓈᒻᒪᒋᔭᐅᓯᒪᔪᖅ ᓄᓇᕗᒻᒥ ᐃᒪᓕᓇᔨᒃᑯᓐᓄᑦ. ᐅᒃᑯᐊᖅᑕᐅᓂᖕᒐ ᐊᒃᑕᑯᐃᑦ ᐅᔭᖅᖃᓄᑦ ᑐᖅᑯᖅᓯᓯᒪᕝᕕᒃ ᐱᒋᐊᕐᓂᐊᖅᑐᖅ ᓈᒻᒪᒃᓯᒃᐸᑦ ᐃᓚᒋᔭᐅᓗᓂ ᐅᑎᖅᑎᑎᓇᕙᓪᓕᐊᓂᕐᒧᑦ ᑐᕌᖕᒐᔪᒧᑦ ᓇᓗᓇᐃᔭᖅᓯᒪᔪᖅ ᑕᐅᑐᒐᐅᔪᖅ ᐅᒃᑯᐊᖅᐸᓪᓕᐊᓂᕐᒧᑦ ᐸᕐᓇᐅᑎᒥᑦ.

ᑎᒃᑳᓇᒥᑦ (Discovery) ᐊᒃᑕᑰᖅᑕᐅᔪᑦ ᐅᔭᖅᖃᓄᑦ ᑐᖅᑯᖅᓯᓯᒪᕝᕕᒃ (ᓲᕐᓗ, WRSF9) ᐃᓗᓕᖃᖅᑐᖅ ᐅᔭᖅᖃᓂᒃ ᐋᓯᑦᑎᓕᐅᓇᕙᓪᓕᐊᔪᖕᓇᖅᑐᓂᒃ ᐅᕝᕙᓘᓐᓃᑦ ᑯᕕᔪᖕᓇᖅᑐᑦ ᓴᕕᖕᓂᑦ ᐊᒻᒪ ᐆᓇᕐᓂᖃᖅᑐᒥᒃ ᖃᓪᓕᖅᑕᐅᔭᓇᐊᖃᕐᓂᐊᖅᑐᖅ ᒥᒃᓴᒋᐊᕐᓂᐊᕐᓗᒋᑦ ᐊᒃᑐᖅᓯᓂᐅᔪᖕᓇᖅᑐᑦ ᐊᕙᑎᒧᑦ. ᐆᓇᕐᓂᕐᒥᒃ ᖃᐅᔨᓴᐃᔾᔫᑎᑦ ᐃᓕᔭᐅᓂᐊᖅᑐᑦ ᐊᒃᑕᑰᖅᑕᐅᔪᑦ ᐅᔭᖅᖃᓄᑦ ᑐᖅᑲᖅᓯᓯᒪᕝᕕᖕᓄᑦ ᖃᐅᔨᓴᕐᓂᐊᕐᓗᒋᑦ ᖁᐊᖑᐃᓐᓇᐅᔭᖅᑐᓕᐅᕐᓃᑦ.

ᐊᒃᑕᑰᖅᑕᐅᔪᑦ ᐅᔭᖅᖃᓕᐊᖑᔪᑦ ᓄᓇᐅᑉ ᐃᓗᐊᓂᑦ ᐅᔭᕋᒃᑕᖅᑐᓂᑦ ᐊᑎᖅᑕᐅᖃᑦᑕᕐᓂᐊᖅᑐᑦ ᓄᓇᒥᑦ ᐅᒃᑯᐃᖕᒐᔪᒥᑦ ᐊᒃᑕᑰᖅᑕᐅᔪᑦ ᐅᔭᖅᖃᐃᑦ ᐊᒻᒪ ᑐᖅᑯᖅᑕᐅᓯᒪᓚᐅᐱᓪᓚᒃᑐᑎᒃ ᑕᓇᐅᓕᖕᒥᑦ ᐊᒃᑕᑰᖅᑕᐅᔪᑦ ᐅᔭᖅᖃᓄᑦ ᑐᖅᑯᖅᓯᓯᒪᕝᕕᖕᓂᑦ ᓄᓇᐅᑉ ᖄᖕᒐᓂᑦ. ᑕᓇᐅᓕᖕᒥᑦ ᐊᒃᑕᑰᖅᑕᐅᔪᑦ ᐅᔭᖅᖃᓄᑦ ᑐᖅᑯᖅᓯᓯᒪᕝᕖᑦ ᐅᑎᖅᑎᑕᐅᖃᑦᑕᕐᓂᐊᖅᑐᑦ ᓄᓇᐅᑉ ᐃᓗᐊᓄᑦ ᐃᓱᓕᓯᒪᓕᖅᑎᓪᓗᒋᑦ ᐊᐅᓚᖅᑎᑦᑎᓃᑦ.

ᑲᑎᓪᓗᒋᑦ 64.9 ᒥᓕᔭᓐ ᑕᓐ ᕿᒪᒃᑎᑦᑐᓕᐅᖃᑦᑕᕐᓂᐊᖅᑐᑦ ᑕᓯᕐᔪᐊᕐᒥᑦ ᐅᐃᒍᕆᐊᖅᓯᓂᕐᒧᑦ. ᑖᑉᑯᓇᙵ, 51.6 ᑕᓐᓗᐊᑦ ᓴᓗᒪᐃᔭᐃᔾᔪᑎᒃᑰᖅᓯᒪᔪᑦ ᕿᒪᒃᑎᑦᑐᑦ ᐃᓕᔭᐅᖃᑦᑕᕐᓂᐊᖅᑐᑦ ᕿᒪᒃᑎᑦᑐᓄᑦ ᑐᖅᑯᖅᓯᓯᒪᕝᕕᖕᒧᑦ, ᐊᒥᐊᒃᑯᐃᓪᓕ 13.4 ᒥᓕᔭᓐ ᑕᓐ ᐊᑐᖅᑕᐅᓂᐊᖅᑐᑦ ᓄᓇᐅᑉ ᐃᓗᐊᓂᑦ ᕿᑯᓕᖅᑐᐃᔾᔪᑕᐅᓗᑎᒃ. ᕿᒪᒃᑎᑦᑐᓄᑦ ᑐᖅᑯᖅᓯᓯᒪᕝᕕᒃ ᐅᑎᖅᑎᑎᖅᑕᐅᕙᓪᓕᐊᓂᐊᖅᑐᑦ ᐊᐅᓚᖅᑎᑦᑎᓂᖃᖅᑎᓪᓗᒋᑦ ᓱᓇᑐᐃᓐᓇᓕᐅᓇᓂᒃᑯᑦ ᖄᖓ ᐃᓕᔭᐅᓗᓂ ᕿᒪᒃᑎᑦᑐᑦ

ᖄᖕᒐᓄᑦ ᕿᒪᒃᑎᑦᑐᐃᑦ ᑎᑭᐅᑎᒃᐸᑕ ᑭᖑᓪᓕᖅᐹᒧᑦ ᖁᑦᑎᖕᓂᐅᔪᒧᑦ. ᐃᓚᖓ ᖄᓕᒃ ᐅᖓᑕᐅᑦᑎᔪᓂᑦ ᐊᒻᒪᓗ ᐊᒃᑕᒨᖅᑕᐅᔪᑦ ᐅᔭᖅᑲᐃᑦ ᐊᑐᖅᑕᐅᓂᐊᖅᑐᑦ ᕿᒪᒃᑎᑦᑐᓄᑦ ᑐᖅᑯᖅᓯᕐᒪᕝᕕᒃ ᐅᒃᑯᐊᖅᑕᐅᓂᖓᓄᑦ. ᐆᓇᕐᓂᕐᒥᒃ ᖃᐅᔨᓴᐃᔾᔪᑏᑦ ᐃᓕᓴᐅᓂᐊᖅᑐᑦ ᖃᐅᔨᓴᕐᓂᐊᕐᓗᒋᑦ ᖁᐊᒃᑲᓂᖅᑲᑦᑕᕐᓃᑦ ᐊᒻᒪᓗ ᖁᐊᖑᐃᓐᓇᐅᔭᓕᐅᕆᓂᕐᒧᑦ.

ᐊᒃᑕᒨᖅᑕᐅᔪᑦ ᐅᔭᖅᑲᓄᑦ ᑐᖅᑯᖅᓯᕐᒪᕝᕚᑦ ᐊᒻᒪᓗ ᕿᒪᒃᑎᑦᑐᓄᑦ ᑐᖅᑯᖅᓯᕐᒪᕝᕕᒃ ᐋᖅᑭᒃᑕᐅᓯᒪᔪᑦ ᐊᒻᒪᓗ ᐊᐅᓛᖅᑎᑕᐅᓗᑎᒃ ᒥᑭᓛᒃᑰᖅᑎᓐᓂᐊᕐᓗᒋᑦ ᐊᕙᑎᒥᒃ ᐊᒃᑐᖅᓯᓃᑦ ᐊᒻᒪᓗ ᐃᓱᒪᒋᐸᓗᒋᑦ ᓄᓇ ᐊᒻᒪᓗ ᓄᓇᒧᑦ ᐃᓚᒋᔭᐅᔪᑦ ᐊᔪᙱᓐᓂᐊᕐᓂᖕᒋᓐᓄᑦ. ᓄᓇᐅᑉ ᖄᖕᒐᓂ ᑯᕙᔪᖅ ᐊᒻᒪᓗ ᐃᒪᕐᒥᑦ ᑯᕙᓂᐅᔪᖅ ᑐᖅᑯᖅᓯᕐᒪᕝᕕᖕᓂᑦ ᓱᑉᓗᓕᒃᑰᖅᑎᑕᐅᓂᐊᖅᑐᑦ ᐊᒻᒪᓗ ᑲᑎᑕᐅᓗᑎᒃ ᐃᒪᕐᒥᒃ ᑲᑎᖅᓱᐃᓂᕐᒧᑦ ᑕᓯᕋᔭᖕᓂᑦ. ᑭᓱᐊᓂ, ᐅᖓᑕᐅᑦᑎᓯᒪᔪᑦ ᑕᕆᐅᓕᒃ ᐃᒪᐃᑦ ᓄᓇᐅᑉ ᐃᓗᐊᓂᑦ ᐅᔭᕆᒃᑕᖅᑐᓂᑦ ᐱᔭᐅᔪᑦ ᐊᒻᒪᓗ ᑕᕆᐅᓕᒃ ᐊᒃᑐᖅᑕᐅᓯᒪᔪᖅ ᐃᒪᖅ ᑕᕆᐅᓕᖕᒥᑦ ᐊᒃᑕᒨᖅᑕᐅᔪᑦ ᐅᔭᖅᕿᓄᑦ ᑐᖅᕐᑯᖅᓯᕐᒪᕝᕕᖕᓂᑦ ᓴᖑᑎᑕᐅᓂᐊᖅᑐᑦ ᑕᕆᐅᓖᑦ ᑕᓯᕋᔭᖕᓄᑦ. ᐃᒪᐅᑉ ᖃᓄᐃᓐᓂᖓ ᑎᑭᐅᑎᙱᓐᐸᑦ ᑯᕙᑎᑦᑎᓂᕐᒧᑦ ᐊᑐᕆᐊᓕᖕᒥᑦ ᒪᓕᒃᓱᒍ Type A ᐃᒪᕐᒧᑦ ᓚᐃᓴᓐᓯ 2AM-MEL1631-ᒥᑦ ᐱᔭᕆᐊᓕᒃ, ᑲᑎᑕᐅᔪᖅ ᐃᒪᖅ ᐱᓕᕆᐊᖑᓂᐊᖅᑐᖅ ᑯᕙᑎᑕᐅᓂᐊᓵᕐᓗᓂ ᓯᓚᒧᑦ.

EXECUTIVE SUMMARY

Agnico Eagle Mines Limited (Agnico Eagle) is operating the Meliadine Gold Mine (Meliadine), located approximately 25 km north of Rankin Inlet, and 80 km southwest of Chesterfield Inlet in the Kivalliq Region of Nunavut.

Since NIRB approval in 2015, and to extend the life of the mine, Agnico Eagle has continued to extend its knowledge of the gold deposits around the Meliadine Mine by way of additional exploration. As a result, Meliadine Extension is being proposed. This management plan has been updated to include the waste management plan of Meliadine Extension. Meliadine Extension will extend the life of the mine from 2032 to 2043 and will add underground mining activities at the already approved Tiriganiaq, Pump, F Zone, and Discovery deposits.

As part of the Meliadine Extension, approximately 65.0 million tonnes (Mt) of ore will be produced. The produced ore will be milled over approximately 20 years of mine life at a rate of approximately 8,500 tonnes per day (tpd).

Approximately, 191.6 Mt of waste rock (from open pit and underground), and 34.6 Mt of overburden will be generated with Meliadine Extension. Waste rock and overburden will be trucked to the waste rock storage facilities (WRSFs) until the end of mine operation, with distribution according to an operation schedule and overburden encapsulation design approved by the Nunavut Water Board (NWB). Closure of the WRSFs will begin when practical as part of the progressive reclamation program detailed in the Interim Closure and Reclamation Plan.

The Discovery WRSFs (i.e., WRSF8 and WRSF9) contain rock with potential for acid generation or potential to leach metals and will require a thermal cover to reduce potential impacts on the environment. Thermistors will be installed within the WRSFs to monitor permafrost development.

The waste rock generated from the underground mining activities will be segregated from the open pit waste rock and stored temporarily in saline WRSFs on surface. The saline WRSFs will be returned underground by the end of operations.

A total of 64.9 Mt of tailings will be produced with Meliadine Extension. Of the total, about 51.6 Mt of filtered tailings will be placed in the tailings storage facility (TSF), while the remaining 13.4 Mt will be used underground as cemented paste backfill. The TSF will be progressively reclaimed during operations such that an engineered cover will be placed on the tailings surface as the tailings reach final elevation. A layer of overburden and waste rock will be used for the TSF closure. Thermistors installed within the facility will monitor freeze-back and permafrost development.

The WRSFs and TSF were designed and will be operated to minimize the impact on the environment and taking into consideration their geotechnical and geochemical stability. The surface runoff water from the storage facilities will be diverted via channels and collected in water collection ponds (CPs). However, excess saline water from underground mines and saline contact water from the saline WRSFs will be diverted to saline ponds and sumps. If the water quality does not meet the discharge criteria as per the Type A Amended Water Licence 2AM-MEL1631 requirement, the collected water will be treated accordingly prior to being discharged to the receiving environment.

TABLE OF CONTENTS

List of Tables

DOCUMENT CONTROL

Version	Date	Section	Page	Revision	Author
1	April 2015			First draft version of Mine Waste Management Plan as Supporting Document for Type A Water Licence Application, submitted to Nunavut Water Board for review and approval	Tetra Tech EBA Inc.
2	June 2016	1.1, 1.2, 1.3 3.3 5.5, 6.1, 9.1, 9.2	1-2 12-15 22-24 34-35; 37-38	Update to reflect issuance of the Type A Water Licence. Removal of original Section 1.3 as was specifically linked to the application. Update to reflect receipt of Type A Water Licence The Plan updated to comply with Part B Section 13, and Part F Sections 12, and20 of the Type A Water Licence 2AM-MEL1631 and commitments made during the licensing process.	Golder Associates Ltd.
3	March 2018			Minor revisions	Environment, Engineering Departments
4	December 2018	All 1.3 3.1, 3.2 4.1, 4.3, 4.4 4.2 5.2, 5.4 5.5, 5.6 6.1 7 8.2 9.2 Appendix A	All 11,14 20-23 24, 27-28 29 30-32 33-35 36-38 43 46-47 50-52	Plan update in response to approved TSF Design Report (6515-583-163-REP-001) Update of production timeline Update of tailing quantities Update of closure cover material values Inclusion of temporary waste rock stockpile for construction of saline pond 2 (Figure 4.1.1; Tables 4.1.1, 4.1.2, 4.1.3) Update of TSF design, parameters, and schedule Update of tailings placement plan dimensions within each cell of TSF Update of Water Management based on TSF design report (6515-583-163-REP-001) and infrastructure updates Minor dust management revision Updates to closure plan based on approved TSF design report (6515-583-163-REP-001) Monitoring program update based on Type A Water Licence 2AM-MEL1631 requirements and TSF design report (6515-583-163-REP-001) Figs 1.2, 5.1, 5.4 updated. Add Figs 5.2, 5.3	Environment Department
5	March 2019	Table 1.1 Table 4.2, 4.3, 5.1 6.1.1 and 6.1.3		Updated according to current status Update quantities according to the latest mine plan Catchment ponds name changes	Environment Department

Version	Date	Section	Page	Revision	Author
		4.1 T 4.1.3 8.1	26 31 45	Name Change from MMER to MDMER	
6	March 2020	All	All	Update to reflect Meliadine operational status from Project to Mine; Major revisions throughout	Engineering, Environment Departments
7	March 2021	All	All	Update to reflect Meliadine operational status Update quantities according to latest mine plan	Engineering, Environment Departments
8	August 2021	All	All	Update to reflect change in waste management strategy and decommissioning of P-Area	Engineering Department
9_NIRB	December 2021	All	All	Updated to include the mine waste management strategy of Meliadine Extension as part of the FEIS Addendum submission to the NIRB	Permitting Department
9_NWB	December 2022	A yellow arrow in the right-hand margin indicates where updates have been made		Submitted to Nunavut Water Board as part of the Meliadine Extension Amendment.	Permitting Department

ACRONYMS

ABA	Acid Base Accounting
Agnico Eagle	Agnico Eagle Mines Limited
ARD	Acid Rock Drainage
CP	Containment Pond
CRA	Commercial, Recreational, and Aboriginal
DFO	Department of Fisheries and Oceans Canada
EWTP	Effluent Water Treatment Plant
FEIS	Final Environmental Impact Statement
GWMP	Groundwater Management Plan
IFC	Issued for Construction
LOM	Life of Mine
MDMER	Metal and Diamond Mining Effluent Regulation
MEND	Mining Environment Neutral Drainage
ML	Metal Leaching
NIRB	Nunavut Impact Review Board
NML	Non-Metal Leaching
NPAG	Non-Potential Acid Generating
NPR	Net Potential Ratio
NWB	Nunavut Water Board
OP	Ore Pad
PAG	Potential Acid Generating
PGA	Peak Ground Acceleration
Project	Meliadine Gold Mine Project
SFE	Shake Flask Extraction
SP	Saline Pond
STP	Sewage Treatment Plant
TSF	Tailings Storage Facility
WMP	Water Management Plan
WRSF	Waste Rock Storage Facility
WTC	Water Treatment Complex

UNITS

%	percent
°C	degrees Celsius
°C/m	degrees Celsius per meter
cm/s	centimetre per second
ha	hectare
kPa	kilopascal
km	kilometre(s)
L	liter(s)
m	metre
mg	milligram
m/s	metre per second
mm	millimetre
mm/h	millimetre per hour
m^2/year	square metre(s) per year
m^3	cubic metre(s)
Mm^3	million cubic metre(s)
t	tonne
t/m^3	tonne per cubic metre
Mt	million tonne(s)
µm	micrometre

SECTION 1 • INTRODUCTION

Agnico Eagle Mines Ltd. (Agnico Eagle) operates the Meliadine Gold Mine (the Mine) located approximately 25 kilometres (km) north of Rankin Inlet, Nunavut, and 80 km southwest of Chesterfield Inlet in the Kivalliq Region of Nunavut. The Mine is subject to the terms and conditions of both the amended Project Certificate 006 issued by the Nunavut Impact Review Board (NIRB) in accordance with the Nunavut Land Claims Agreement Article 12.5.12 on February 26, 2019 (NIRB, 2019) and the Type A Amended Water Licence No. 2AM-MEL1631 (the Licence) issued by the Nunavut Water Board (NWB) on May 13, 2021 (NWB, 2021).

In July 2022, Agnico Eagle submitted to the NIRB the Final Environmental Impact Statement (FEIS) Addendum of the Meliadine Extension, which is currently under review. This document presents an updated version of the Mine Waste Management Plan, submitted as part of the Meliadine Extension Water Licence Amendment to the NWB.

1.1 Waste Management Objectives

The waste management objectives are to minimize potential impacts to the environment during all phases of mining. The purpose of the Mine Waste Management Plan is to provide information to applicable mine departments (Environment, Engineering, Mine, Energy, and Infrastructure, etc.) for sound mine waste management practices, proposed and existing infrastructure, and provide strategies for water management (runoff), dust control and monitoring programs.

Mine waste management structures (tailings storage, waste rock and overburden storage) are utilized to contain and manage mine waste from areas affected by mining activities. Measures have been implemented for the Mine Construction and Mine Operation phases.

1.2 Management and Execution of the Mine Waste Management Plan

Revisions of the Mine Waste Management Plan can be initiated by changes in the Mine Development Plan (Mine Plan), operational performance, personnel, or organizational structure, regulatory or social considerations, and/ or design philosophy. The Mine Waste Management Plan will be reviewed annually by Agnico Eagle and updated as necessary.

1.3 Background

A summary of the Meliadine Mine site conditions is provided in detail in the Environmental Management and Protection Plan.

SECTION 2 • MINE WASTE DEVELOPMENT

2.1 Mine Development Plan

The NIRB approved Meliadine Mine was scheduled to be completed in 2032. With the Meliadine Extension, it is proposed to extend the LOM (i.e., operation phase) until 2043. Agnico Eagle will continue exploration activities with the objective to extend mine life beyond 2043. Closure will start in 2044 for a total of seven years, followed by post-closure in 2051 onwards. The Meliadine Extension Mine Plan includes the following underground mines and open pits:

Tiriganiaq Mining Area

- Tiriganiaq Open Pit 1 (TIR01)
- Tiriganiaq Open Pit 2 (TIR02)
- Tiriganiaq Open Pit 3 (TIR03)
- Tiriganiaq Open Pit 4 (TIR04)
- Tiriganiaq Underground

Wesmeg Mining Area

- Wesmeg Open Pit 1 (WES01)
- Wesmeg Open Pit 2 (WES02)
- Wesmeg Open Pit 3 (WES03)
- Wesmeg Open Pit 4 (WES04)
- Wesmeg Open Pit 5 (WES05)
- Wesmeg North Open pit 1 (WN01)

Pump Mining Area

- Pump Open Pit 1 (PUM01)
- Pump Open Pit 2 (PUM02)
- Pump Open Pit 3 (PUM03)
- Pump Open Pit 4 (PUM04)
- Pump Underground

F Zone Mining Area

- F Zone Open Pit 1 (FZO01)
- F Zone Open Pit 2 (FZO02)
- F Zone Open Pit 3 (FZO03)
- F Zone Underground

Discovery Mining Area

- Discovery Open Pit 1 (DIS01)
- Discovery Underground

The general mine site layout plan is shown on Figures 2.1 and Figure 2.2. Table 2.1 provides the key mine development activities and sequence. The Meliadine Extension is expected to produce approximately 65 million tonnes (Mt) of ore, 191.6 Mt of waste rock, 34.6 Mt of overburden waste, and 65.0 Mt of tailings.

Figure 2.1 Mine Site Layout – Main Site (Year 2040)

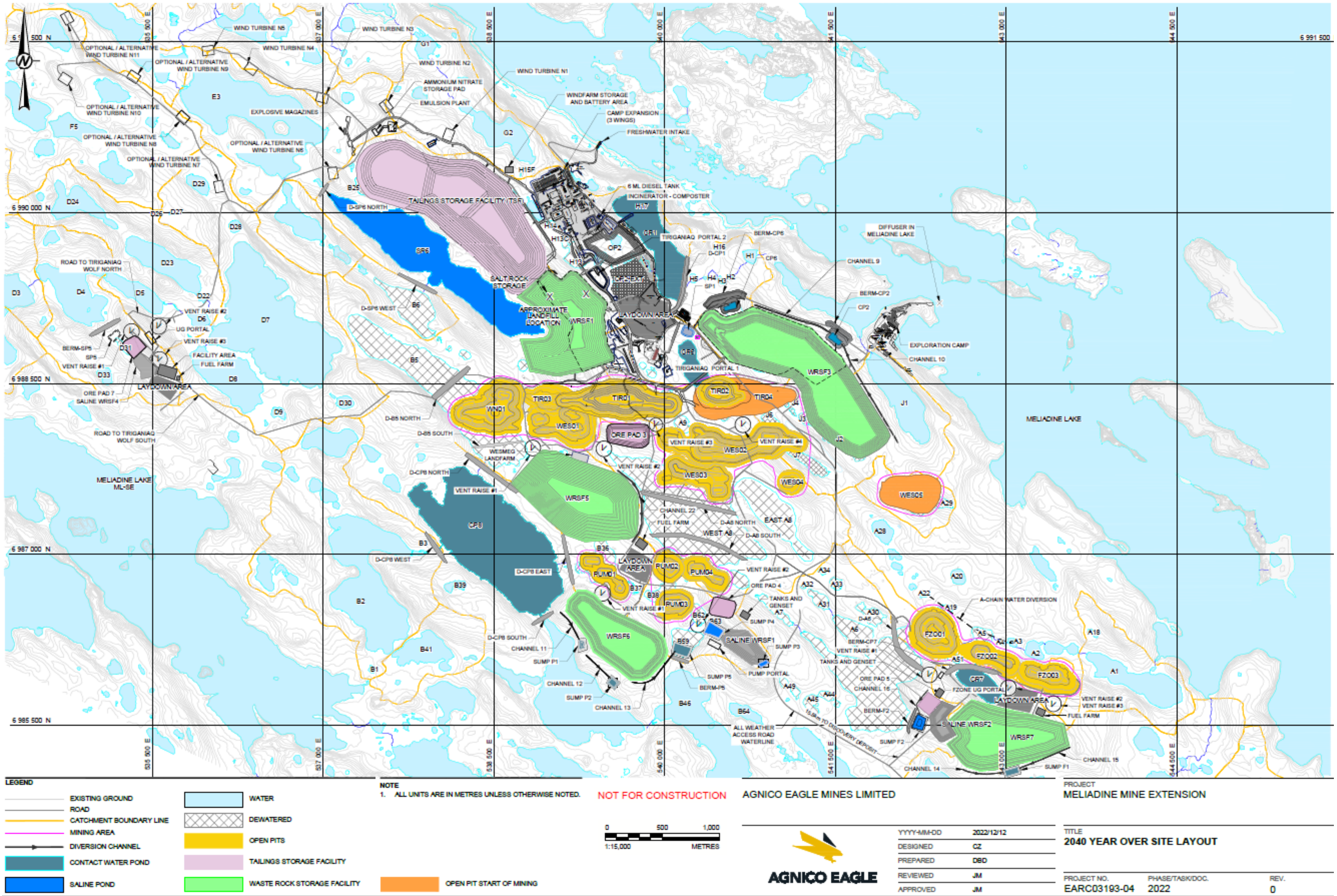

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Figure 2.2 Mine Site Layout –Discovery Deposit (2040)

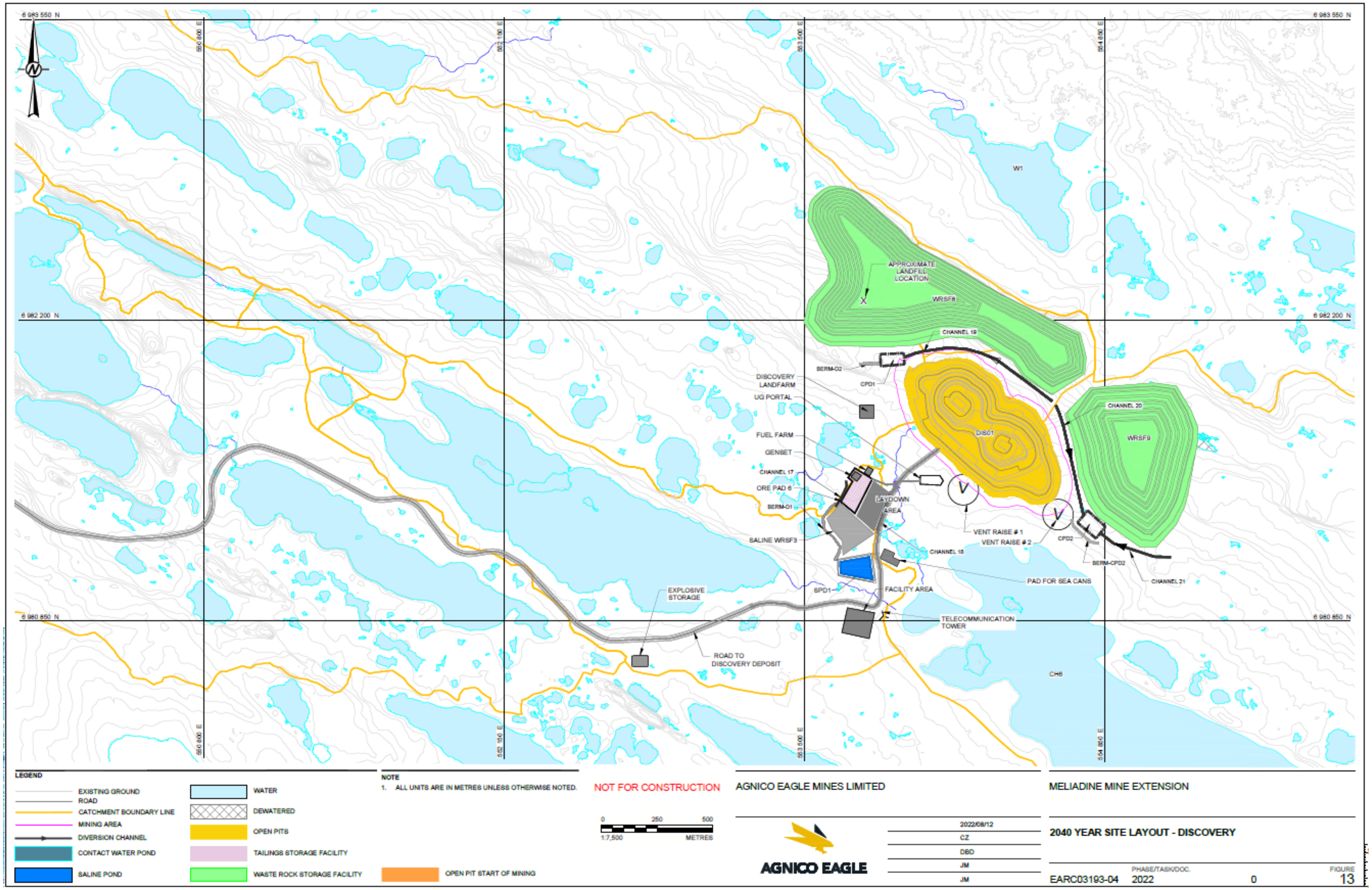

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Table 2.1: Key Meliadine Extension Mine Development and Sequence

	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047-2050	2051-2060
Approved Mining																													
Tiriganiaq Deposit	■	■	■	■	■																								
Construction																													
Infrastructure					■	■	■	■	■	■	■	■	■																
Dewatering & Fish out					■	■	■	■	■	■																			
Tiriganiaq Deposit																													
Open Pit					■	■	■	■										■	■	■	■	■	■	■					
Underground					■	■	■	■	■	■	■	■	■	■	■	■	■	■											
Wesmeg Deposit																													
Open Pit					■		■	■	■	■	■							■	■	■	■	■	■						
Pump Deposit																													
Open Pit									■	■	■	■	■	■	■	■	■												
Underground										■	■	■	■	■	■	■													
F Zone Deposit																													
Open Pit											■	■	■	■	■	■	■												
Underground														■	■	■	■	■	■	■									
Discovery Deposit																													
Open Pit												■	■	■	■	■	■												
Underground							■	■	■	■	■	■																	
Tiriganiaq-Wolf Mining Area																													
Underground															■	■	■	■	■	■	■	■	■	■					
Closure																													
Infrastructure																									■	■	■		
Flooding																									■	■	■	■	
Post-Closure																													
Monitoring																													■

2.2 Meliadine Extension Development Schedule and Quantities

Meliadine Extension gold deposits will be developed using traditional open-pit and underground mining methods. The initial construction phase for the Meliadine Extension is planned to commence in 2024 upon reception of permits and approvals. Construction will continue through the operation phase to prepare for mining of new deposits. Meliadine mine waste production by deposit is presented in Table 2.2.

Table 2.2: Summary of Meliadine Extension Mine Waste Production Quantities Per Deposit and type of waste (V11_LOM, 2020)

Deposit (Year 2020-2043)	Overburden (Mt)	Waste Rock from Open Pit (Mt)	Waste Rock from Underground (Mt)	Saline Waste Rock from UG (Mt)
Tiriganiaq[1]	9.2	42.4	6.7	
Wesmeg[2]	14.3	69.3	4.2	
Pump	3.6	7.8	2.0	0.6
F Zone	5.0	18.5	1.9	0.3
Discovery	2.5	36.5	1.1	0.2
Total	**34.6**	**174.6**	**15.9**	**1.1**

[1] Includes Tiriganiaq-Wolf; [2] Includes Wesmeg North

2.2.1 Mine Waste Designation and Destination

Three mine waste streams will be produced: waste rock, tailings, and overburden material. The overall usage or destination of the three mine waste materials is presented in Table 2.3.

Table 2.3: Summary of Mine Waste Tonnage and Destination

Mine Waste Stream	Estimated Quantities		Waste Destination
Overburden	34.6 Mt	0.3 Mt	Construction of the TSF cover
		34.3 Mt	Co-disposed with waste rock within WRSFs
Total Waste Rock from Open Pit	174.6 Mt	2.4	Infrastructure construction and thermal protection
		8.32	Construction of TSF cover
		10.2	Construction of WRSF8 and WRSF9 cover
		153.6	Stored in WRSFs
Total waste rock from underground	15.9 Mt	4.0 Mt	Placed in WRSF1 and WRSF3
		11.9 Mt	Required for backfill underground[1]
Saline WRSFs[2]	1.1 Mt	0.6 Mt	Saline WRSF1 (Pump Deposit, reclaimed at closure)
		0.3 Mt	Saline WRSF2 (F Zone UG, reclaimed at closure)
		0.15 Mt	Saline WRSF3 (Discovery UG, reclaimed at closure)
		0.05 Mt	Saline WRSF4 (Tiriganiaq-Wolf UG, reclaimed at closure)
Tailings	65 Mt	51.6 Mt	Filtered tailings placed in the TSF
		13.4Mt	Used in underground mine as cemented paste backfill

[1] The waste from underground required as backfill never comes to surface; [2] Saline waste rock from underground temporarily comes to surface and then is returned to the underground as backfill by the end of operations.

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Closure will extend for 7 years as pits are being re-flooded, from 2044 to 2050. The filling of open pits with water would extend until the end of the closure phase. Post-closure will be initiated when flooded pits are reconnected to the surrounding environment and will last 10 years, from 2051 onwards.

SECTION 3 • WASTE ROCK AND OVERBURDEN MANAGEMENT

The term "overburden" designates all soils above the bedrock that need to be stripped at surface prior to developing the open pits. Generally, the overburden at the site consists of a thin layer of organic material overlying a layer of non-cohesive soil with variable amounts of silt, sand, and gravel.

Overburden and waste rock will be co-disposed within the WRSFs, with the overburden being encapsulated within the waste rock to increase overall stability. Waste material from the open pits and the underground will be trucked to the designated storage facilities, and placed in lifts.

3.1 Expected Overburden and Waste Rock Quantities and Distribution

3.1.1 Overburden Quantities and Distribution

Approximately 34.6 Mt of overburden will be produced, with about 34.3 Mt of overburden being co-disposed within the WRSFs. Approximately 0.3 Mt will be used as cover material for progressive closure and reclamation of the TSF. The annual production of overburden for Meliadine Extension is presented in Table 3.1.

Table 3.1: Overburden Production Meliadine Extension Life of Mine

Year	Total Overburden (t)
2020	693,226
2021	3,349,130
2022	1,221,917
2023	1,194,525
2024	623,602
2025	787,056
2026	2,225,166
2027	2,087,886
2028	1,918,261
2029	350,370
2030	2,432,426
2031	1,716,222
2032	1,655,221
2033	989,498
2034	-
2035	2,217,665
2036	1,818,870
2037	5,373,987
2038	19,947
2039	-
2040	2,790,454
2041	1,171,814
2042	-
2043	-
Total	**34,637,243**

3.1.2 Waste Rock Quantities and Distribution

The term "waste rock" designates all fragmented rock mass that has no economic value and needs to be stored separately. Typically, waste rock is produced during the initial stripping and the subsequent development of open pits and underground workings. Waste rock generated from the underground mining activities is referred to as saline waste rock and will be mostly separated from the open pit waste rock and stored in separate saline waste rock storage facilities on surface temporarily.

Table 3.2 presents the open pit and underground waste rock production for Meliadine Extension. Most of the open pit waste rock produced (174.6Mt) will be placed and stored within the designated WRSFs (152.7 Mt). NPAG/NML waste rock will be used as thermal cover material of the TSF (11.1 Mt), and the Discovery WRSFs (7.6 Mt), for infrastructure construction and thermal protection and aggregate production to support the open pits (3.2 Mt).

Most of the waste rock produced underground (16.9 Mt) will be used as underground backfill (11.9 Mt). It is anticipated that approximately 4 Mt of waste rock from underground will be place within WRSFS1 and WRSF3 and will freeze back within these facilities. Approximately 1.1 Mt of underground waste rock will be temporarily placed in the Saline WRSFs on surface. The saline WRSFs will be backfilled to the underground by the end of operations.

Table 3.2: Waste Rock Production during Meliadine Extension Life of Mine

Year	Total Waste Rock Open Pit			Total Waste Rock UG (t)		Waste Rock from underground temporarily stored in saline WRSFs (t)[2]
	Total NPAG Waste Rock Open Pit (t)	Total Uncertain Waste Rock Open Pit (t)	Total PAG Waste Rock Open Pit (t)	Waste rock required for backfill UG (t)[1]	UG Waste rock placed in WRSFs (t)[1]	
2020	2,356,329.00	28,165.00	39,639.00	305,119	527,060	-
2021	1,468,711.00	16,438.00	21,547.00	335,209	373,015	-
2022	2,550,222.00	16,458.00	27,230.00	338,728	329,972	-
2023	4,200,673.00	29,321.00	38,271.00	345,721	445,927	-
2024	4,628,667.00	18,718.00	32,620.00	346,512	489,930	-
2025	5,164,853.00	78,293.00	90,006.00	342,999	416,050	113,528
2026	2,995,754.00	30,515.00	36,486.00	344,932	473,218	161,238
2027	6,580,648.00	311,411.00	24,210.00	354,546	430,499	389,231
2028	7,884,988.00	1,343,167.00	58,760.00	605,205	422,102	97,855
2029	9,070,182.00	1,452,931.00	146,429.00	744,724	437,112	-113,930
2030	7,353,310.00	890,406.00	70,058.00	574,068	428,176	206,807
2031	8,562,591.00	584,151.00	323,499.00	536,217	366,623	205,988
2032	6,131,112.00	2,544,224.00	908,485.00	631,684	204,178	170,896
2033	4,279,185.00	4,656,736.00	1,447,554.00	614,309	-209,202	272,678
2034	4,614,347.00	5,020,064.00	1,571,914.00	642,809	-303,863	173,643
2035	3,047,692.00	4,582,174.00	1,348,898.00	645,155	-301,371	258,072
2036	4,862,433.00	2,847,076.00	926,547.00	699,627	-298,544	120,250
2037	5,549,555.00	264,859.00	135,397.00	869,024	-227,911	-46,785
2038	9,706,534.00	641,334.00	380,175.00	784,601	-	-487,112
2039	9,204,781.00	690,328.00	428,282.00	715,817	-	-422,359
2040	6,580,087.00	501,689.00	297,757.00	315,939	-	-
2041	9,745,340.00	245,438.00	161,477.00	361,096	-	-
2042	10,114,387.00	284,232.00	393,140.00	292,494	-	-
2043	1,802,529.00	54,453.00	79,051.00	122,245	-	-
Subtotal	**138,454,910.00**	**27,132,581.00**	**8,987,432.00**	**11,868,780**	**4,002,971**	**1,100,000**
Total	**174,574,923**			**15,871,751**		

[1] The waste from underground required as backfill never comes to surface; [2] Saline waste rock from underground temporarily comes to surface and then is returned to the underground as backfill by the end of operations.

3.2 Waste Rock Storage Facility Locations

Waste rock and overburden generated from open pits activities will be placed in one of the following WRSFs:

- **WRSF1**: Located North of the Tiriganiaq and Wesmeg deposits
- **WRSF3**: Located on the West end of the Wesmeg and Tiriganiaq deposits
- **WRSF5**: Located between the Wesmeg and Pump deposits
- **WRSF6**: Located North of the Pump deposit
- **WRSF7**: Located South of the F Zone deposit
- **WRSF8 and WRSF9:** Located northwest and northeast of the Discovery deposit, respectively

The Discovery WRSFs (i.e., WRSF8 and WRSF9) contain rock with potential for acid generation or potential to leach metals and will require a thermal cover to reduce potential impacts on the environment.

Most of the waste rock generated from the underground mining activities will be segregated from the open pit waste rock. A small volume of excess underground waste rock will be temporarily stored in saline waste rock storage facilities on surface. The saline WRSFs will be brought back underground throughout the mine life and completely removed from surface at the end of operations. The four saline WRSFs are:

- **Saline WRSF 1** – from Pump Underground
- **Saline WRSF 2** – from F Zone Underground
- **Saline WRSF 3** – from Discovery Underground
- **Saline WRSF 4** – from Tiriganiaq-Wolf Underground

All WRSFs will be designed and operated to minimize the impact on the environment and with geotechnical stability and geochemical considerations. The material will be generally transported by truck and placed in lifts, following a sequence developed for the operation. Waste rock and overburden will be managed within the same area.

Waste rock and overburden will be co-disposed in the WRSFs in a manner that encourages total freezing. Timing of overburden material placement is expected to have a large impact on freeze-back time. It was assumed that the first lift of overburden is to be placed only in winter to maintain frozen conditions within the WRSF foundation materials.

Several thermistors will be installed during operation, following construction, or when the instrument can be installed to the ultimate design safely to monitor the rate of freezing and modify the management if required.

3.3 Waste Rock Storage Facility Design Parameters

Tables 3.3 and 3.4 summarize some of the key physical parameters used for the design of the generic WRSFs and the Discovery WRSFs, respectively. Table 3.5 presents the maximum height of each WRSFs. Each WRSF will be constructed with material placed in controlled lifts. Figure 3.1 to Figure 3.5 show the typical cross-section of generic WRSFs, and Figure 3.6 and Figure 3.7 show the typical cross-section of the Discovery WRSFs. The side slopes of each lift of material will be at the angle of repose, while the overall side slopes of each facility will be determined by stepping in each lift of material.

Agnico Eagle will utilize an adaptive, performance-based management system of the WRSFs. Opportunities to increase the capacity of the facilities may present themselves dependent on the mining sequence and on-going analysis of the foundation soils.

Table 3.3: WRSF Key Design Parameters for WRSF1, WRSF3, and WRSF5

Design Parameters	WRSF1	WRSF3	WRSF5
Maximum height of each overburden and waste rock bench (m)	5		
Side slope of each lift of waste rock	Angle of repose (Approx. 1.3H:1V)		
Typical width of the horizontal offset between adjacent waste rock lifts (m)	16.5		
Average overall side slopes of the WRSF (from bottom toe of first lift to top crest of final lift)	3H:1V	3H:1V	2.5H:1V [(a)]
Side slope for each lift of overburden	Angle of repose (Approx.1.8H:1V)		
Typical width of horizontal offset between adjacent overburden lifts (m)	21.0		
Internal overburden setback from toe of the WRSF for the first lift (m)	Minimum 40.0		
Maximum waste rock crest elevation above the sea level (masl)	136	132	150
Maximum overburden top elevation above the sea level (masl)	100	82	95
Storage Capacity Required (Mm3)	16.9	30.9	27.7
Design Storage Capacity (Mm3)	16.9	31	27.9
Assumed waste rock in place bulk density (t/m3)	1.88		
Assumed overburden in place bulk density (t/m3)	1.62		

[(a)]: Assumed that ice-rich overburden and till within the proposed footprint of WRSF5 will be fully excavated out for dike construction and improve the stability of the WRSF5

Reference: Tetra Tech, 2022

Table 3.4: Idealized Cross-section of WRSF6, WRSF7, and the Discovery WRSFs

Design Parameters	WRSF6	WRSF7	WRSF8	WRSF9
Maximum height of each overburden and waste rock bench (m)	5			
Side slope of each lift of waste rock	Angle of repose (Approx. 1.3H:1V)			
Typical width of the horizontal offset between adjacent waste rock lifts (m)	16.5			
Average overall side slopes of the WRSF (from bottom toe of first lift to top crest of final lift)	3H:1V			
Side slope for each lift of overburden	Angle of repose (Approx.1.8H:1V)			
Typical width of horizontal offset between adjacent overburden lifts (m)	21.0			
Internal overburden setback from toe of the WRSF for the first lift (m)	Minimum 40.0			
Maximum waste rock crest elevation above the sea level (masl)	92	108	126	126
Maximum overburden top elevation above the sea level (masl)	87	105	90	n/a
Storage Capacity Required (Mm3)	6.4	13	12.3	8.7
Design Storage Capacity (Mm3)	6.7	13.6	12.5	9.2
Assumed waste rock in place bulk density (t/m3)	1.88			
Assumed overburden in place bulk density (t/m3)	1.62			

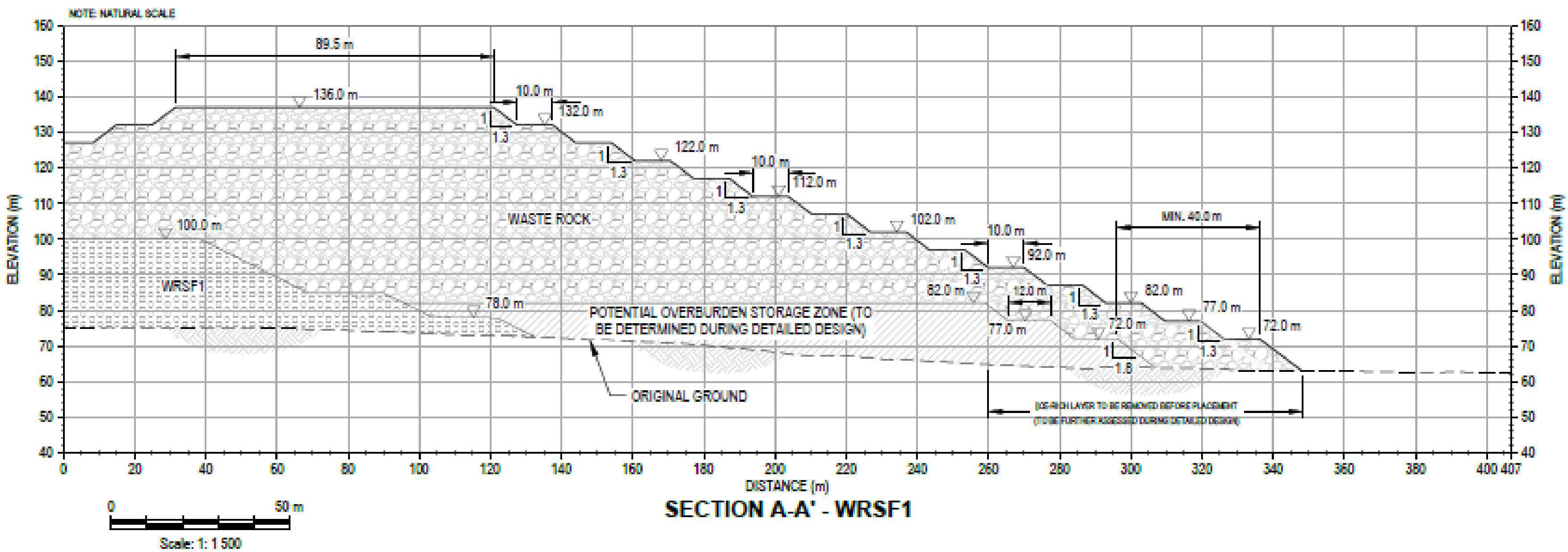
Reference: Tetra Tech, 2022

Table 3.5: Estimated Maximum Height of the Waste Rock Storage Facilities

WRSF	Estimated Maximum Height [(a)], m
WRSF1	65
WRSF3	65
WRSF5	92
WRSF6	40
WRSF7	50
WRSF8	61
WRSF9	60

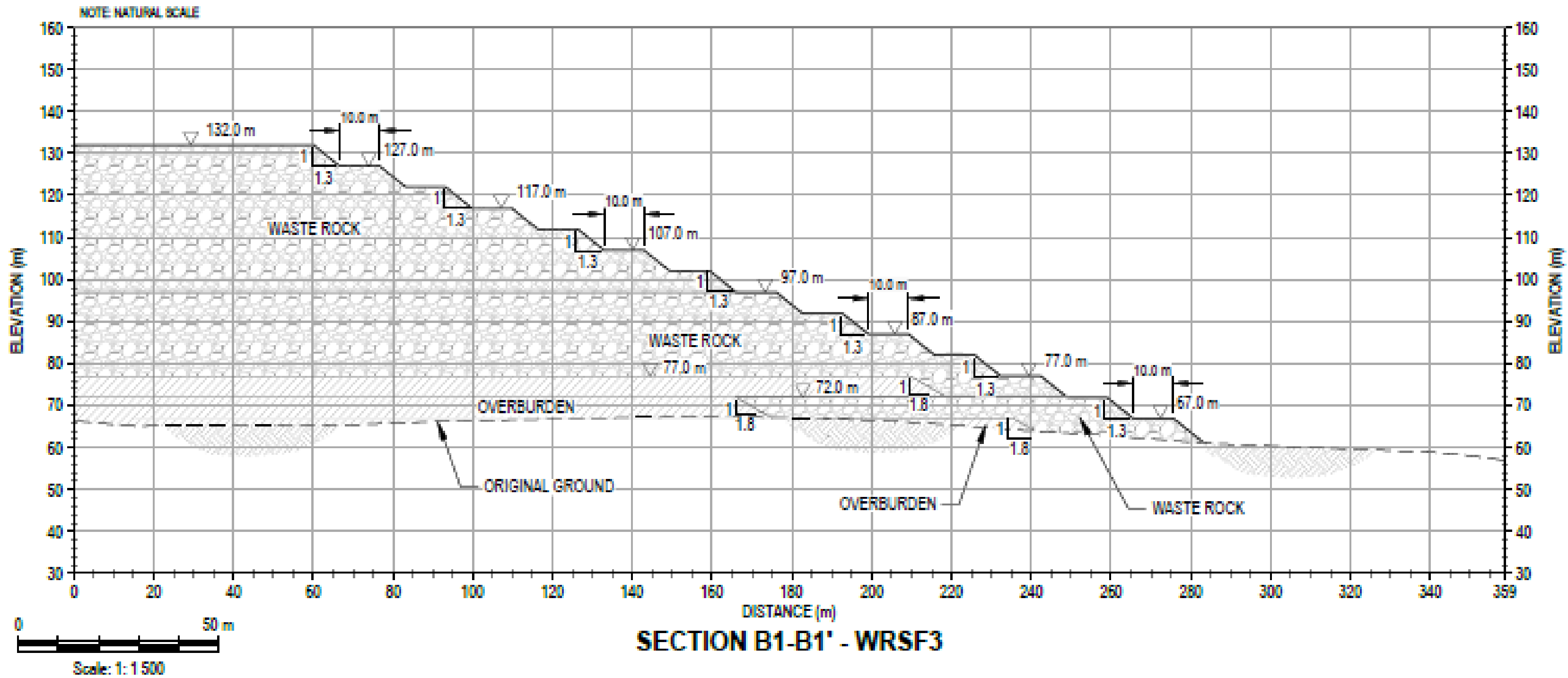
(a): maximum height is estimated to be the vertical distance between the lowest ground surface elevation within the footprint of the WRSF and the top crest elevation of the WRSF. Tetra Tech, 2022

Figure 3.1: Typical Cross-section of the Meliadine Extension WRSF1



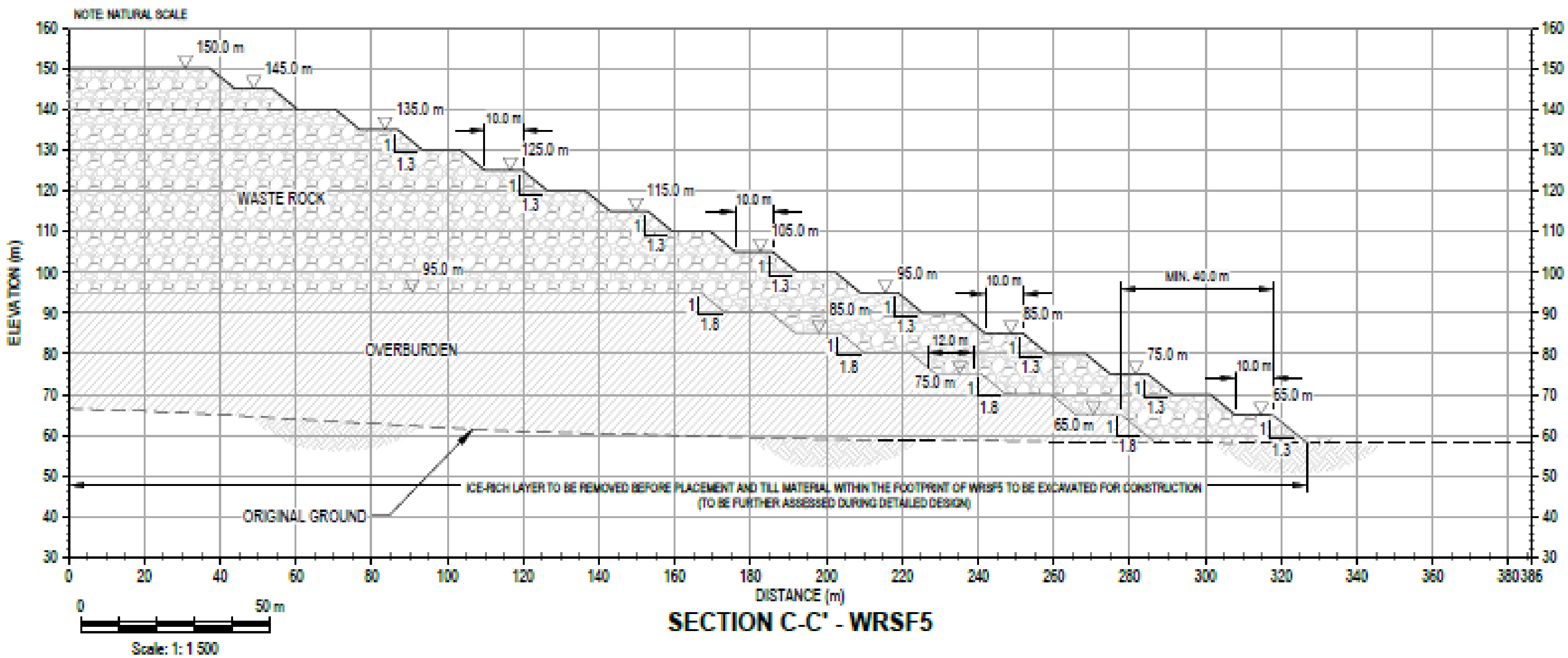
Reference: Tetra Tech, 2022

Figure 3.2: Typical Cross-section of the Meliadine Extension WRSF3



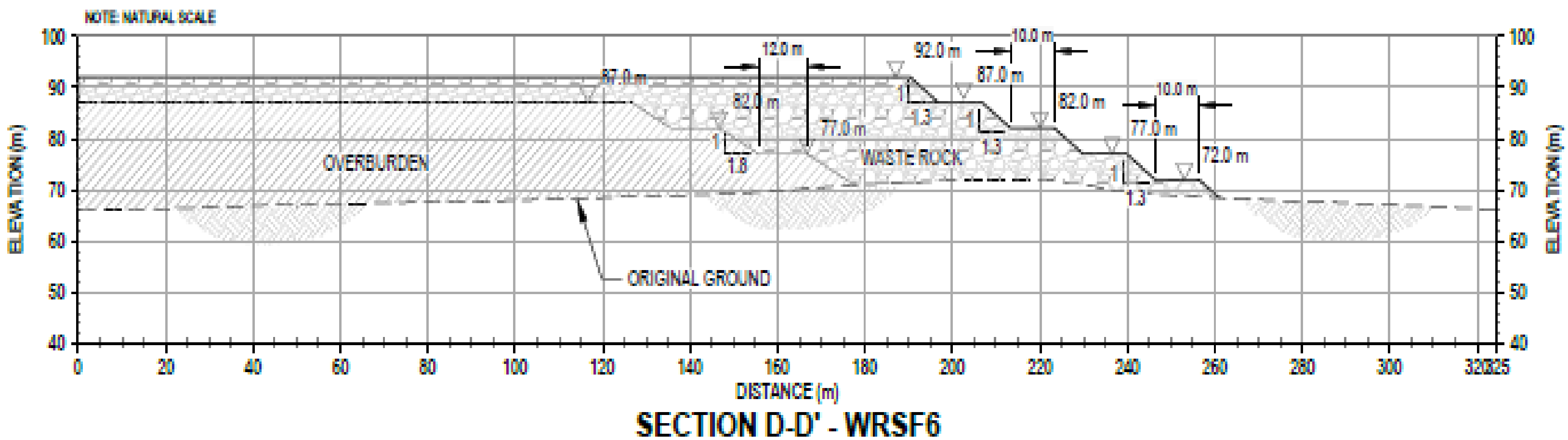
Reference: Tetra Tech, 2022

Figure 3.3: Typical cross section of the Meliadine Extension WRSF5



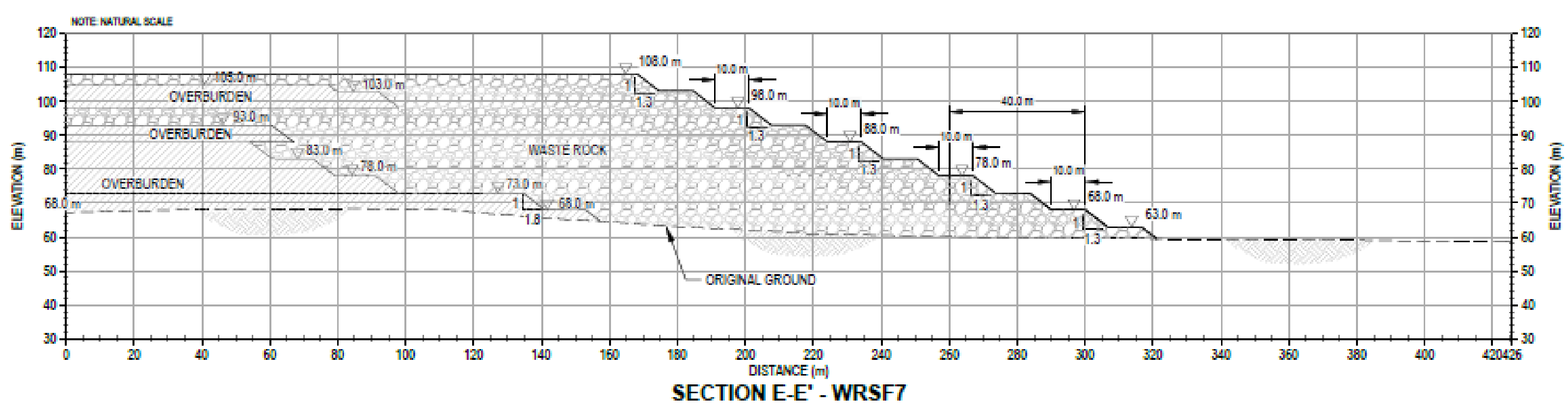
Reference: Tetra Tech, 2022

Figure 3.4: Typical Cross-section of the Meliadine Extension WRSF6



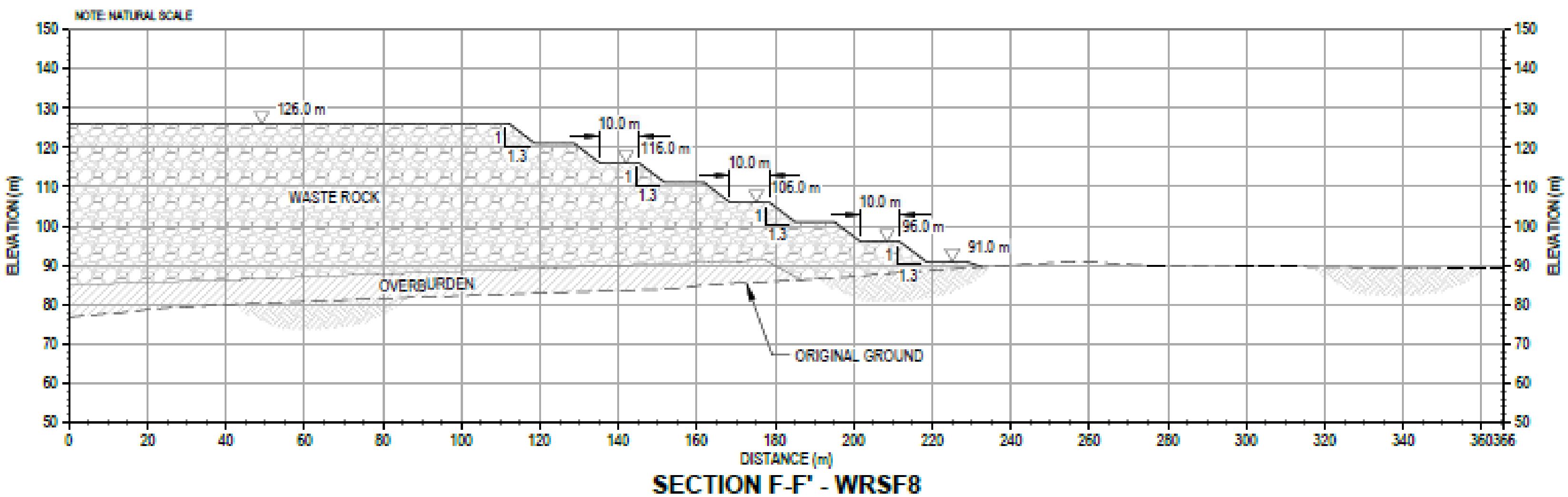
Reference: Tetra Tech, 2022

Figure 3.5: Typical Cross-section of the Meliadine Extension WRSF7



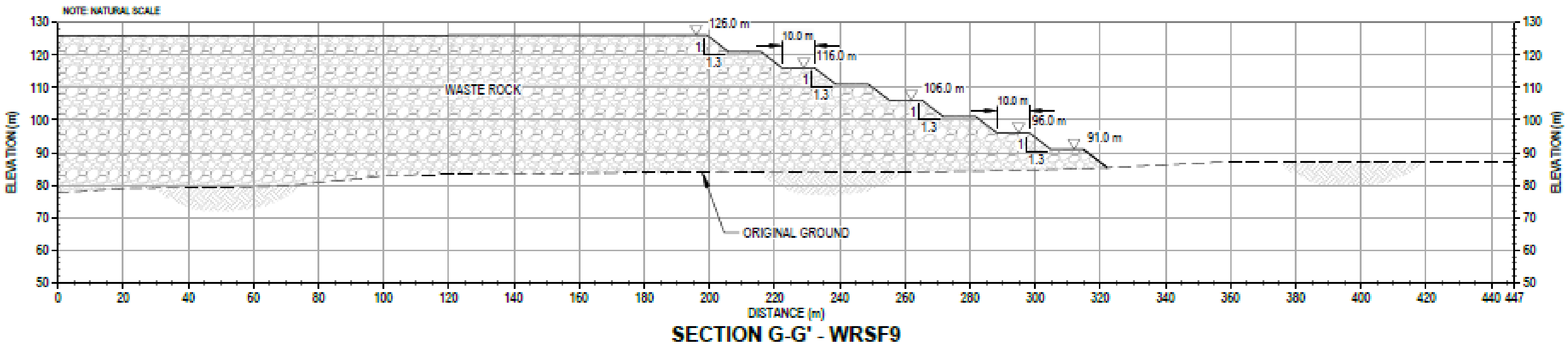
Reference: Tetra Tech, 2022

Figure 3.6: Typical Cross-section of the Discovery WRSF8



Reference: Tetra Tech, 2022

Figure 3.7: Typical Cross-section of the Discovery WRSF9



Reference: Tetra Tech, 2022

3.4 Anticipated Design Performance of WRSFs

Stability analyses were conducted to determine the factor of safety against slope failure under static and pseudo-static loading conditions post-construction of each WRSFs. Consistent with the results of the stability analyses of the Approved WRSFs, the results of the stability analyses for Meliadine Extension indicate that the calculated minimum factors of safety meet or exceed the acceptable guidelines (Tetra Tech, 2022).

3.4.1 Foundation Soil Profile and Material Properties

The foundation soil profiles to be used for the stability for each WRSF was based on the available drilling borehole information. For WRSF1 it was assumed that the original ground within the footprint of the WRSF1 consists of 1.5 m sand and silt, 1.0 m ice-rich silt (weak layer under long-term condition), 2.0 m to 10 m silty sand over bedrock. For WRSF 3, it was assumed that the original ground consists of 1.5 m sand, 1.0 m ice-rich sand/silt, 1.5 m sandy silt over bedrock. The foundation of WRSF5, WRSF6, WRSF7, WRSF8, and WRSF9 is assumed to be similar to WRSF1.

Thermal analyses for the approved WRSFs under long term conditions were completed (Agnico Eagle, 2019; Agnico Eagle, 2020, Okane 2022a and Okane, 2022b). Table 3.6 summarizes the material properties to used for the stability of each WRSF for Meliadine Extension.

Table 3.6: Material Properties for the WRSFs Stability Analyses

<table>
<tr><th colspan="2">Material</th><th>Effective Angle of Internal Friction, Ø (°)</th><th>Cohesion, c (kPa)</th><th>Unit Weight, ϒ (kN/m³)</th></tr>
<tr><td colspan="2">Waste Rock</td><td>42</td><td>0</td><td>19</td></tr>
<tr><td colspan="2">Overburden Waste</td><td>28</td><td>0</td><td>16</td></tr>
<tr><td colspan="2">Sand/gravel and Silt</td><td>19.1</td><td>0</td><td>20</td></tr>
<tr><td colspan="2">Unfrozen Silt</td><td>28</td><td>0</td><td>17</td></tr>
<tr><td rowspan="4">Ice-rich Silt</td><td>Ice-rich Silt C40 (for zones with predicted temperatures of -0.2°C to -0.5°C)</td><td>0</td><td>40</td><td>16</td></tr>
<tr><td>Ice-rich Silt C60 (for zones with predicted temperatures of -0.5°C to -1.0°C)</td><td>0</td><td>60</td><td>16</td></tr>
<tr><td>Ice-rich Silt C90 (for zones with predicted temperatures of -1.0°C to -1.5°C)</td><td>0</td><td>90</td><td>16</td></tr>
<tr><td>Ice-rich Silt C120 (for zones with predicted temperatures of -1.5°C to -2.0°C)</td><td>0</td><td>120</td><td>16</td></tr>
<tr><td colspan="2">Thawing Ice-rich Silt</td><td>28</td><td>0</td><td>16</td></tr>
</table>

Reference: Tetra Tech, 2022

3.5 Waste Rock and Overburden Deposition

The general construction sequence of the WRSFs will be as follows:

- A topographical survey of the original ground will be conducted, and stakes placed to mark the dumping limits;
- Overburden and/or waste rock will be hauled and placed within its designated location. The material will be placed with a dozer and track-packed. Side slopes of each lift will be the natural angle of repose.

Various strategies to promote freeze-back and permafrost development will be deployed, including:

- Snow/ice removal prior to material placement over either original ground or an existing lift;
- Overburden placement of first couple lifts restricted to 2.5 m maximum height and will only be placed when underlying ground is frozen.

Temperatures within the waste and the underlying ground will be monitored throughout the operational lifespan of the facilities and will be discussed in further detail in Section 8.0. An adaptive, performance-based management approach will be applied to the WRSFs and opportunities to increase the capacities may present themselves depending on the mining sequence and foundation temperatures.

3.6 Additional Waste Material Placed in WRSFs

Although the WRSFs were designed to accommodate mine waste rock and overburden, additional waste matter may also be periodically deposited within the core of the facilities. This additional waste will not affect the freeze-back or stability of the facilities and will be approved for placement by the geotechnical engineer. It is expected that this additional waste will consist of:

- Solid Sewage Treatment Plant (STP) material. Agnico Eagle invested in a screw press technology in 2019 to remove approximately 85% of the water from the treated sewage. The remaining semi-solid product (referred to as cake at with 15-20% moisture content) will be placed and covered with overburden/waste rock in the WRSFs, as presented under Section 3.2 of the (STP) Upgrade Operation and Maintenance Manual (Agnico Eagle, 2021c). The volume of sewage material will be recorded monthly, pursuant to Part I Item 8h of the Water Licence.
- Limited volumes of liquid STP material. During planned and unplanned maintenance on the STP screw press, liquid sludge will be produced. This material will also be placed within the WRSFs as per the bullet above.
- Limited volumes of sand and soil related to spill clean-up on site (for non-hazardous products such as sewage water or heat recovery water).
- Landfill waste consisting of acceptable waste materials are non-salvageable, non-hazardous, non-putrescible solid industrial wastes that have a low leachate and low heat generation potential and cannot be incinerated in the site’s incinerator.
- Hardened cement.

SECTION 4 • TAILINGS MANAGEMENT

Tailings are the processed material by-product of the gold recovery process and generally comprise of sand, silt, and clay sized particles.

Tailings generated by mill production at Meliadine will be dewatered by pressure filtration to a solids content of approximately 85% by weight. The filtered tailings will have the consistency of damp, sandy silt and will be transported by haul truck to either the paste plant for use underground as backfill or for placement and storage in the TSF.

4.1 Tailings Expected Quantities and Distribution

Approximately 51.6 Mt or 79% of the tailings will be deposited within the TSF and the remaining 13.4 Mt or 21% will be used as underground cemented paste backfill for Meliadine Extension. The Meliadine Extension tailings production schedule, quantities, and distribution by year are presented in Table 4.1.

Approximately 11.1 Mt of waste and 0.3 Mt of overburden will be placed at the TSF as progressive cover material.

Table 4.1: Schedule, Quantities, and Distribution of Tailings by Year

Year	Tailings Generated (t)	Returned UG as Pastefill (t)	Returned UG as Pastefill (m^3)	Stored in TSF (t)
2020	1,518,900	661,263	333,971	857,637
2021	1,770,250	726,475	366,906	1,043,775
2022	1,770,250	734,101	370,758	1,036,149
2023	2,007,500	749,257	378,413	1,258,243
2024	2,190,000	750,970	379,278	1,439,030
2025	2,190,000	743,356	375,433	1,446,644
2026	3,102,500	747,545	377,548	2,354,955
2027	3,102,500	768,383	388,072	2,334,117
2028	3,102,500	828,973	418,673	2,273,527
2029	3,102,500	782,811	395,359	2,319,689
2030	3,102,500	762,681	385,192	2,339,819
2031	3,102,500	811,585	409,891	2,290,915
2032	3,102,500	763,858	385,787	2,338,642
2033	3,102,500	769,200	388,485	2,333,300
2034	3,102,500	751,731	379,662	2,350,769
2035	3,102,500	740,821	374,152	2,361,679
2036	3,102,500	735,633	371,532	2,366,867
2037	3,102,500	560,673	283,168	2,541,827
2038	3,102,500	-	-	3,102,500
2039	3,102,500	-	-	3,102,500
2040	3,102,500	-	-	3,102,500
2041	3,102,500	-	-	3,102,500
2042	3,093,632	-	-	3,093,632
2043	808,256	-	-	808,256
Total	**64,988,789**	**13,389,318**	**6,762,282**	**51,599,471**

4.2 Tailings Storage Facility Location

The TSF is located on high ground west of the mill and east of Lake B7, as shown in Figure 3.1. The direct distance from the mill to the tailings stack ranges from 400 to 800 m. The minimum setback distance from the edge of Lake SP6 is approximately 150 m.

4.3 Tailings Storage Facility Design Parameters

Table 4.2 summarizes some of the key physical parameters used for the TSF design. The TSF will be constructed using a cell-by-cell approach to limit the active deposition area such that dust generation, and surface erosion can be effectively managed and progressive reclamation and closure of the TSF can be conducted during the operation phase. The current cover system for the TSF includes a layer of waste rock on the slopes and a layered combination of waste rock and overburden on the crest. The typical cross section of the Meliadine Extension TSF is shown in Figure 4.2.

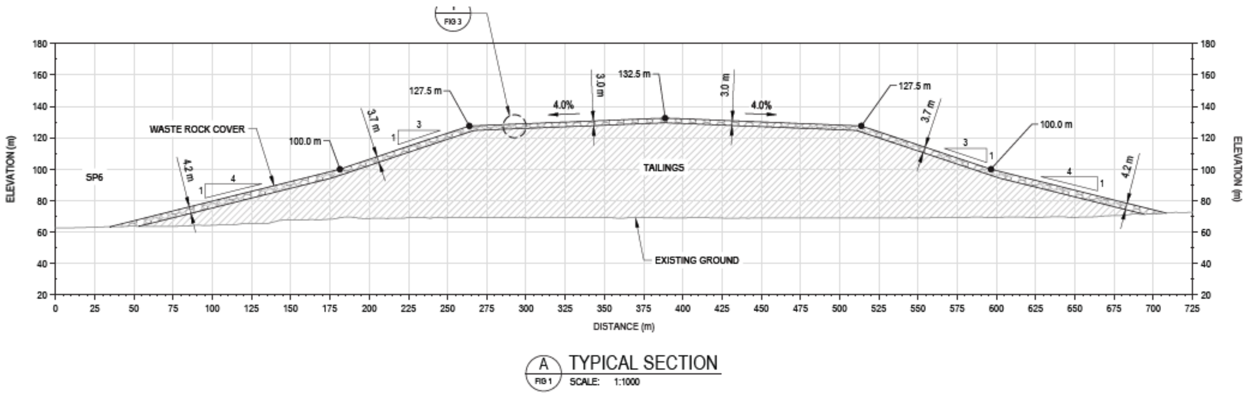
Table 4.2: Design Parameters for the Tailings Storage Facility

Parameters	Value
Meliadine Extension TSF crest elevation	129 masl
Reference ground elevation	65 masl
Average height of TSF over original ground surface	62 m
Side slope for lower placed tailings (or below elevation 100 m)	4H:1V
Side slope for upper placed tailings (or above elevation 100 m)	3H:1V
Slope of the final tailings surface at crest	4%
NPAG/NML waste rock cover system thickness on slopes	3.7 m to 4.2 m
NPAG/NML waste rock cover system thickness on plateau	2.5 m
Overburden cover system thickness on plateau	0.5 m
Assumed moisture content of tailings to TSF	17.6% (by mass)
Assumed tailings solid content to TSF	85% w/w (by weight)
Minimum target dry density of compacted tailings	1.65 t/m^3
Assumed waste rock in place bulk density	1.88 t/m3
Assumed overburden in place bulk density	1.62 t/m3
Total footprint of the TSF	1,071,842 (m2)

Tetra Tech, 2022

Based on the conceptual design criteria, the TSF has a capacity for 31.3 Mm^3 (51.6 Mt) of tailings.

Figure 4.2 Typical cross section of the Meliadine Extension TSF



Source: Tetra Tech 2022

4.4 Anticipated Design Performance of TSF

The TSF is designed to minimize the impact to the environment and the design does not rely on freeze-back of the tailings to meet the design intent of the structure. However, the freeze-back of the TSF and the foundations will provide additional benefits such as increasing stability and minimizing infiltration and run-off from the TSF during operation and closure of TSF.

The long-term static and pseudo static stability analyses of the Meliadine Extension TSF design indicate that the minimum factors of safety meet or exceed the acceptable guidelines (Tetra Tech, 2022). Thermal analysis under climate change conditions predicts that most tailings will be frozen after the closure cover is placed and will remain frozen for many years after mine closure (Okane, 2022c).

4.5 Material Properties

The material properties to be adopted for the dry stack tailings and foundation materials in the stability analyses are presented in Table 4.3. Laboratory direct shear tests on the tailings (Tetra Tech EBA, 2014) indicated that the tailings had an inferred peak internal angle of friction of 33.5° for the tailings sample with a dry density of 1,708 kg/m^3. In consideration of the large-strain shear stress softening behaviour observed in the direct shear tests and possible lower dry density in the field conditions, a relative conservative internal angle of friction of 30° was adopted for the dry stack tailings. A laboratory consolidated-undrained triaxial test on a silty sand overburden sample was conducted (EBA, 2014). The test indicated the soil had an inferred peak internal angle of friction of 36º. The long-term cohesion of the frozen ice rich silt was adopted based on the estimated ground temperatures and a figure presented in Weaver and Morgenstern (Tetra Tech, 2022).

Table 4.3: Material Parameters Used in Meliadine Extension TSF Stability Analyses

Material	Thickness (m)	Angle of Internal Friction, Ø (º)	Cohesion, c (kPa)	Unit Weight, ϒ (kN/m^3)
Waste Rock Closure Cover	2.5 (top); 3.7 to 4.2 (side slopes)	42	0	19
Overburden Till Fill for Closure Cover	0.5 (top only)	30	0	18
Dry Stacked Tailings	Up to 65	30	0	19.4
Sand and Silt	1.5	31	0	20
Unfrozen Ice rich Silt	1	28	0	17
Long-term Frozen Ice rich Silt (c=70 kPa)		0	70	17
Long-term Frozen Ice rich Silt (c=160 kPa)		0	160	17
Ice-poor Sand/Silt	2.5	32	0	20

$\bar{B}$= 0.1 for sand and silt during construction period.

$\bar{B}$= 0.2 for unfrozen ice rich silt during construction period.

$\bar{B}$= 0 for long term after construction.

From Tetra Tech, 2022

4.6 Tailings Deposition Principles

Generally, deposition at the TSF consists of the following sequence:

- The filtered tailings are hauled to the TSF with haul trucks, end dumped, and placed into lifts of maximum height 0.3 m using a dozer. Each tailings lift is then compacted using a vibratory drum roller. This compaction is intended to promote runoff, reduce the potential for oxygen ingress and water infiltration, and maintain geotechnical stability.
- A starter waste rock berm was initially placed along the outside perimeter to contain the initial lifts of the tailings; the berm will become a part of the closure cover. Additional lifts of compacted waste rock (with a maximum lift thickness of 1 m) are placed as the tailings surface is brought up as erosion and thermal protection. Safety berms are placed on each lift of the waste rock that also help to reduce dust generation from the tailings surface.
- Surface water or excess snow/ice is removed from the natural ground within the footprint prior to tailings placement.

To promote freeze-back, the initial lift of tailings over original ground is placed during winter conditions. An adaptive, performance-based management approach has been used at the TSF to adapt the yearly deposition strategy to actual mill and paste plant production quantities.

Ground temperatures are closely monitored throughout the year to measure freeze-back of the facility. Temperature data indicates that despite an increase in the estimated average yearly height of tailings placed in each cell from design assumptions for the first two years of operations, freeze-back of the facility is occurring and no performance-related issues have been observed to date.

4.7 Additional Waste Materials Placed in TSF

Due to the design specifications regarding placement of the tailings and waste rock at the facility, generally no other waste materials will be placed in the TSF during its operational life. Exceptions must be approved by the geotechnical engineer and include used filter cloths from the mill. These cloths are collected from the process plant and brought periodically to the TSF for placement. Each cloth is unrolled and placed flat on the tailings surface before backfilling with tailings material as per specifications.

SECTION 5 • WATER MANAGEMENT ASSOCIATED WITH MINE WASTE MANAGEMENT

The water management objectives for the Mine are to minimize potential impacts to the quantity and quality of surface water at the Mine and surrounding waterbodies. Seepage and runoff water from the waste management facilities are managed with water diversion channels, water retention dikes/berms, and water collection ponds.

For more details on the water management systems and infrastructures associated with waste management facilities refer to the Water Management Plan.

SECTION 6 • DUST MANAGEMENT ASSOCIATED WITH MINE WASTE MANAGEMENT

The possible sources of dust related to the waste rock, overburden, and filtered tailings management during construction, operation, and closure include:

- Site preparation prior to placement of waste materials i.e., stripping, excavation and/or placement of foundation pad;
- Wind erosion of fine particles from the WRSFs and TSF surface;
- Vehicle traffic dislodging fine particles from the surface of WRSFs and TSF, and associated service and haul roads to WRSFs and TSF;
- Waste rock, overburden, and filtered tailings handling and transfer - loading, hauling, unloading, placement and compaction; and
- Placement of closure and capping layers.

Dust suppression measures, which are typical of the current mine practices and consistent with best management practices, will be considered through design, operation, and closure phases to control the dust.

Dust is expected to be a minor issue during the operation of the WRSFs as the waste rock produced at the mine generally comprises large pieces of rock that is not be susceptible to wind erosion. Although overburden contains material that is fine-grained and thus more susceptible to wind erosion, the plan is to store most of the overburden materials within the core of the WRSFs. Dust from the overburden materials is therefore not expected to be a concern.

The surface compaction of the filtered tailings lifts and limiting traffic over the compacted surface will significantly reduce the potential for wind erosion of the tailings surface. Dust related to TSF operation during the winter season will be further managed by limiting the exposed surface area of the tailings. Other control measures considered in the design of TSF to minimize dust generation include:

- Placement of waste rock cover over the final perimeter tailings slope surface as soon as possible. Safety berms around the perimeter of the waste rock slopes are expected to both trap dust from leaving the TSF and cut exposure of the tailings surface to wind erosion;
- TSF will be operated by cells to limit the tailings surface area exposed to wind and facilitate progressive closure;
- Tailings surface will be covered progressively once it reaches the design elevation; and
- Side slope for lower placed tailings (or below elevation 100 m) 4H:1V and s ide slope for upper placed tailings (or above elevation 100 m) 3H:1V was adopted to minimize the erosion potential and maintain overall stability of the TSF;
- Using an approved cover material on the inactive surfaces of TSF to reduce exposed tailings surface area.

For more details on dust management activities for Meliadine Extension, refer to the Dust Management Plan.

SECTION 7 • RECLAMATION AND CLOSURE OF THE WRSFs AND TSF

Closure and reclamation activities are provided in the Interim Closure and Reclamation Plan.

Key mine development activities during the closure process include:

- Place final closure cover on top of tailings surface
- Finalize placement of Discovery WRSF thermal cover
- Decommission non-essential mine infrastructure and support buildings
- Conduct monitoring and maintenance

Breaching of dikes and berms will be completed at the end closure after water quality meets licence criteria for direct discharge to the environment.

Geochemical testing indicates that the waste rock and overburden from the Tiriganiaq, Wesmeg, Pump and F Zone deposits is non-potentially acid generating (NPAG) and non-metal leaching (NML). Kinetic tests completed on all waste rock types and at various scales show that drainage water quality is expected to meet MDMER monthly mean effluent limits, including results for arsenic. Therefore, a closure cover system is not proposed for the WRSFs.

Discovery WRSFs (i.e., WRSF8 and WRSF9) contain rock with potential for acid generation or potential to leach metals and will require a thermal cover to reduce potential impacts on the environment. All saline WRSFs will be brought back underground at closure.

The WRSFs were designed for long-term stability and no additional re-grading will be required at closure except WRSF 8 and WRSF 9 It is anticipated that the native lichen community will naturally re-vegetate the surface of the WRSFs over time.

Monitoring will be carried out during all stages of the mine life to demonstrate geotechnical and geochemical stability and the safe environmental performance of the facilities. If any non-compliant conditions are identified, then maintenance and planning for corrective measures will be completed in a timely manner to ensure successful completion of the Final Closure and Reclamation Plan.

Results of geochemical characterization indicates that most of the tailings produced to-date at the mine fall under the “uncertain” category, while ML has not been observed to be an issue. Despite this classification, the TSF is not considered to pose an ARD risk due to the placement methodology used, assumption of freeze-back within the facility and progressive reclamation cover placement.

The preliminary closure cover design adopted for the TSF (Section 4.3) will be further evaluated and updated based on the TSF performance monitoring, water quality monitoring and evaluation, and the overall mine closure plan. The final closure cover design for the TSF will be developed before mine closure.

7.1 Closure and Reclamation of Mine Waste Water Management Systems

The contact water management systems for the WRSFs and TSF will remain in place until mine closure activities are completed, and monitoring results demonstrate that water quality conditions are acceptable for the discharge of all contact water to the environment with no further treatment required. Once the water quality meets the discharge criteria established through the water licensing process, the water management infrastructures will be decommissioned to allow the water to naturally flow to the receiving environment.

SECTION 8 • MONITORING PROGRAM

This section presents a summary of the monitoring programs that will be carried out during construction and operation related to mine waste storage management. The monitoring programs presented here include stability and deformation, ground temperature and annual inspections per the Licence. Surface contact water monitoring is described in the WMP and in the Water Quality and Flow Monitoring Plan (Agnico Eagle 2021). General monitoring is subject to change as directed by an Inspector, or by the Licensee, subject to approval by the NWB.

8.1 Monitoring Activities for WRSFs

Table 8.1 summarizes the monitoring activities for the WRSFs.

Table 8.1: Waste Rock Storage Facilities Monitoring Activities

Monitoring Component		Monitoring Frequency	Reporting
Verification Monitoring	Quantities of waste rock produced	Monthly	Monitoring data will be used by Agnico Eagle internally.
	Routine visual inspections of WRSFs	Daily during active rock placement, Monthly to semi-annually after placement	
	Elevation and geometry survey	Annually	
	Waste rock and overburden sampling	On as-needed basis	
	Run-off collection and monitoring	Monthly over the open water season	
General Monitoring	Quantities of waste rock placed into facilities	Monthly	Monitoring data will be reported to the Regulators in the Annual Water Licence report or Annual Inspection Report
	Geochemical monitoring	Approximately eight samples per 100,000 tonnes of mined material as per MEND (2009) recommendations	
	Thermal and freeze-back monitoring	Monthly during first year; then quarterly	
	Dust monitoring related to WRSFs	Governed by Air Quality Monitoring Plan	
	Geotechnical inspection by qualified Geotechnical Engineer	Annually or more frequent at the request of an Inspector	

8.1.1 Verification Monitoring Program for WRSF

Verification monitoring data will be used by Agnico Eagle for the management of waste rock and overburden. The following verification monitoring data will be collected, compiled, and managed internally:

- Each WRSF was designed to store a specific volume of waste rock and overburden material during mine operations. Monthly quantities of the waste rock and overburden produced and placed during mine operation will be recorded.

- During the active development of each WRSF, daily visual inspections will be carried out in relation to the performance and condition of each structure as per Mine Act requirements. When placement activity ceases on an interim or seasonal basis, the inspection frequency will shift to monthly. Following the completion of a WRSF, inspections will continue on a semi-annual basis until closure. The purpose of these inspections is to identify and document any potential hazards or risks to the facility, such as deformations, unusual seepage, slumping, local failure, etc.
- During operations, an annual elevation survey of the WRSFs will be performed to estimate the overall volume placed, determine the reclamation progress, and provide input information to the operation plan.
- Surface runoff from the WRSFs will be monitored during the construction and operation phases by visual inspection during the ice-free season. Additional inspections will be carried out after rainfall events and during the freshet period. The detailed information on the monitoring of surface runoff from the WRSFs is described in the WMP.

8.1.2 General Monitoring Program for WRSF

The following general monitoring data will be reported to the NWB through either the Water Licence Annual Report or an Annual Inspection Report:

- Monthly quantities of the waste rock and overburden placed into the WRSFs during mine operation will be recorded. Samples will be taken as per MEND (2009) recommendations.
- The placed waste rock and overburden are expected to freeze-back and permafrost is likely to develop within the WRSFs with time. Thermistors will be installed in each WRSF to monitor the rate of freeze-back and permafrost development progress in the facilities during closure. Temperature readings will be taken monthly during the first year after installation and then quarterly to track permafrost development within the WRSFs.
- Dust related to waste rock and overburden management is not expected to be an issue by employing the dust suppression measures presented in Section 6.0 through design, operation, and closure phases. Air quality at the mine site will be monitored during construction, operation, and closure through air quality monitoring stations and reported annually.
- The performance of the WRSFs will be inspected and assessed during the annual geotechnical site inspection by a geotechnical or civil engineer registered in Nunavut. The visual assessment and recommended actions to be taken related to the WRSFs will be summarized in the Annual Inspection Report. Inspections may occur more frequently at the request of the Inspector. Records of all inspections will be maintained for the review of the Inspector upon request.

The results from the general monitoring program related to waste rock and overburden management will be reported to the Regulators in the Annual Water Licence report or in the Annual Geotechnical Inspection Report.

8.2 Monitoring Activities for the TSF

Table 8.2 summarizes the monitoring activities for the TSF.

Table 8.2: Tailings Storage Facility Monitoring Activities

Monitoring Component		Monitoring Frequency	Reporting
Verification Monitoring	Tailings production rate and solid content	Continuous	Monitoring data will be used by Agnico Eagle internally, and will be reported to the Regulators upon request
	Design verification of placed tailings (moisture content, density, particle size)	Quarterly/Bi-annually	
	Routine visual geotechnical inspections of TSF	Weekly	
	Elevation and geometry survey	Annually	
General Monitoring	Quantities of tailings placed into facilities	Monthly	Monitoring data will be reported to the Regulators in Annual Water Licence Report or Annual Inspection Report
	Thermal and freeze-back monitoring	Monthly during first year and quarterly thereafter	
	Dust monitoring related to TSF	Daily during operation phase	
	Geochemical monitoring	Bi-monthly	
	Geotechnical inspection by qualified Geotechnical Engineer	Annually or more frequent at the request of an Inspector	

8.2.1 Verification Monitoring Program for TSF

A summary of the verification monitoring program for the TSF is presented below.

- The tailings production rate at the mill and solid content will be continuously monitored during mine operation.
- Off-site geotechnical testing of tailings properties (density, moisture content and particle size) tailings will be carried out quarterly to ensure that the placed tailings meet the design criteria. Bi-annual testing of in situ density and moisture contents will be conducted by a third-party geotechnical firm.
- Visual inspections and monitoring can provide early warning of many conditions that can contribute to structure failures and incidents. Pursuant Part F Item 21 of the Amended Licence, Agnico Eagle will undertake weekly visual inspections of the TSF and note areas of erosion, unusual settlement, or deformation, cracking or other signs of instability. Records of all inspections will be maintained.
- The average final height of the TSF will be approximately 50 m. An annual elevation survey of the TSF will be performed to estimate the overall volume placed, determine the reclamation progress, and provide input information to the operation plan.
- The runoff monitoring procedures and protocols for the WRSFs during mine operation will also apply to the TSF. Specifically, SP6 water quality will be monitored at a monthly frequency or when water is present.

8.2.2 General Monitoring Program for TSF

A summary of the general monitoring program for the TSF is presented below.

- The monthly quantities of tailings placed into the TSF will be recorded.
- In accordance with Part I Item 12 of the Licence, a TSF thermal monitoring regime will be implemented. This will include a thermistor cables being installed in the TSF to monitor the permafrost development within the facility during operation and closure. The planned locations of these thermistors will be presented as the engineering level of the TSF progresses and will be done according to the Approved TSF monitoring program.
- For the approved project, temperature readings are taken quarterly (i.e., 4 times per year) to verify thermal conditions and assumptions. The same frequency of readings will be implemented for Meliadine Extension. The monitoring schedule will be reviewed and modified as necessary. The measured temperatures within the TSF will also provide the background information for the study of permafrost development.
- Dust related to tailings management is not expected to be an issue by employing the dust suppression measures presented in the Dust Management Plan through design, operation, and closure phases. Air quality at the mine site will be monitored during construction, operation, and closure through air quality monitoring stations.
- Filtered tailings samples will be taken from the mill bi-monthly and analyzed for the percentage of sulphur and carbon. The results from these analyses will be used to differentiate NPAG and PAG based on the derived NPR. The collected samples will be sent to an accredited commercial laboratory for ARD and ML using the ABA (the modified Sobek method).
- Pursuant Part I Item 13 of the Licence, the performance of the TSF will be inspected and assessed during the annual geotechnical site inspection by a geotechnical or civil engineer registered in Nunavut. The visual assessment and recommended actions to be taken related to the TSF will be summarized in the Annual Inspection Report. Inspections may occur more frequently at the request of the Inspector. Records of all inspections will be maintained for the review of the Inspector upon request.

The results from general monitoring program related to tailings management will be reported to the Regulators in the Annual Water Licence Report or in the Annual Geotechnical Inspection Report.

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