# MARY RIVER PROJECT
## Terrestrial Environment
## 2024 Annual Monitoring Report

**Prepared For**
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Down to Earth Biology

*Cover photo: Three caribou bulls seen grazing adjacent to the Tote Road at KM 82. Photographed by site environment staff while observing caribou behaviour and response to the Tote Road on June 27, 2024.*

# ᓇᐃᓈᖅᓯᒪᔪᖅ

ᓄᓘᔾᔪᓐᓂ ᐱᓕᕆᐊᖅ (ᐱᓕᕆᐊᖅ) ᓴᕕᒃᓵᓂᒃ ᐅᔭᕋᓐᓂᐊᖅᑐᑦ ᕿᑭᖅᑕᓂ ᓄᓇᖁᑖᓂ ᕿᑭᖅᑖᓗᑉ ᐅᐊᓐᓇᖓᓂ ᕿᑭᖅᑖᓗᓐᒥ, ᓄᓇᕗᒻᒥ. ᐱᓕᕆᐊᖅ ᐱᖃᓯᐅᔾᔨᓯᒪᔪᖅ ᓴᓇᔭᐅᓂᖓᓂᒃ, ᐊᐅᓚᑕᐅᓂᖓᓂᒃ, ᒪᑐᓂᒃᓴᖓᓂᒃ ᐊᒻᒪ ᓄᓇᖓᑕ ᑕᐅᑦᑐᕆᓚᐅᖅᑕᖓᓂᒃ ᐅᑎᖅᑎᑦᑎᓂᖅ 22.2 ᒥᓕᐊᓐ ᑕᓐᓯᑦ ᐊᕐᕌᒍᑕᒫᒧᑦ (mtpa) ᐃᑎᖅᓴᓕᐅᖅᓱᑎᒃ ᐅᔭᕋᓐᓂᐊᖅᑐᑦ ᐊᐅᓚᓂᖃᕐᓂᐊᖅᑐᑦ 21-ᓄᑦ ᐊᕐᕋᒍᓄᑦ. 2024-ᒥ, ᐹᕙᓪᓕᓐᓂᑯᑦ ᓴᕝᒃᓵᓂᒃ ᐅᔭᕋᓐᓂᐊᖅᑏᑦ ᑯᐊᐅᓇᓴᖓᑦ (ᐹᕙᓪᓕᓐ) ᐅᓯᑲᖅᑕᖅᓱᑎᒃ 5.9 ᒥᓕᐊᓐᐸᓗᓐᓂᒃ ᑕᓐᓯᓂᒃ (mt) ᓴᕝᒃᓵᓂᒃ ᐅᔭᕋᓐᓂᐊᖅᑕᐅᔪᒥᑦ ᕿᓐᖑᐊᓄᑦ ᑐᓚᒃᑕᕐᕕᖕᒧᑦ ᑲᑎᑦᑎᕝᕕᖕᒧᑦ. 2024-ᒥ, ᓴᓇᔭᐅᓂᒃᓴᖓᓄᑦ-ᐊᒃᑐᐊᔪᑦ ᐱᓕᕆᓃᑦ ᑭᒡᓕᖅᑲᖅᓯᒪᔪᑦ ᐱᕙᓪᓕᐊᑎᑕᐅᖕᒋᓇᕐᓂᖓᓄᑦ, ᓴᓇᔭᐅᓂᒃᓴᖓᓄᑦ ᐊᒻᒪ ᐋᖅᑭᐅᒪᑎᑕᐅᓂᖕᒋᓐᓄᑦ ᐱᕐᑯᑎᕐᔪᐊᑦ ᐱᕐᑯᑎᒃᑯᕚᓪᓗ ᐅᔭᕋᓐᓂᐊᕐᕕᖕᒥ ᐊᒻᒪ ᕿᙵᐊᓂ ᑐᓚᒃᑕᕐᕕᖕᒥ ᐃᑲᔪᖅᑕᐅᕐᑯᓪᓗᒍ ᐊᐅᓚᓂᖓ. ᑲᑎᖓᒋᑦ ᐱᓕᕆᐊᒥ ᐃᓂᐅᔪᖅ 735 Hᐊᒃᑎᐅᔅ ᓄᙳᐊᓂ 2024-ᒥ.

ᓄᓇᕗᒻᒥ ᐊᕙᑎᓕᕆᔩᒃᑯᑦ ᑲᑎᒪᔩᖏᑦᑕ ᐅᔭᕋᓐᓂᐊᕈᓐᓇᐅᑎ ᓈᓴᐅᑖ 005 ᐱᖃᓯᐅᔾᔨᔪᖅ ᐊᒥᓱᓚᖓᓂᒃ ᒪᓕᒃᑕᐅᔭᕆᐊᓕᖓᓂᒃ ᐱᑕᖃᕆᐊᖃᖅᑎᑦᑎᔪᑦ ᐹᕙᓪᓕᓐᑯᑦ ᐱᓕᕆᐊᖃᕐᓗᑎᒃ ᐊᒃᑐᐃᓂᕐᓂᒃ ᖃᐅᔨᓴᖅᐸᓪᓕᐊᓐᖏᓇᕐᓂᕐᒥᒃ ᓄᓇᐅᑉ ᐊᕙᑎᖓᓂᒃ. ᐱᓕᕆᐊᒃᓴᑦ ᐱᓕᕆᐊᖑᓚᐅᖅᑐᑦ ᓄᓇᐅᑉ ᐊᕙᑎᖓᓂᒃ ᖃᐅᔨᓴᖅᐸᓪᓕᐊᓐᖏᓇᕐᓂᕐᒧᑦ ᐱᓕᕆᐊᒧᑦ ᖃᐅᔨᒪᔾᔪᑎᖃᓚᐅᖅᑐᑦ ᓄᓇᐅᑉ ᐊᕙᑎᖓᓂᒃ ᐸᓚᐅᒪᑎᑦᑎᓇᓲᑎᓂᒃ ᐊᒻᒪ ᖃᐅᔨᓴᖅᐸᓪᓕᐊᓐᖏᓇᕐᓂᕐᒧᑦ ᐸᕐᓇᐅᑎᓂ (ᐹᕙᓪᓕᓐ ᓴᕝᒃᓵᓂᒃ ᐅᔭᕋᓐᓂᐊᖅᑏᑦ 2016ᐃ). ᓄᓇᐅᑉ ᐊᕙᑎᖓᓂᒃ ᖃᐅᔨᓴᖅᐸᓪᓕᐊᓐᖏᓇᕐᓂᕐᒧᑦ ᐱᓕᕆᐊᖅ ᑲᒪᒋᔭᐅᓚᐅᖅᑐᖅ ᓄᓇᐅᑉ ᐊᕙᑎᖓᓄᑦ ᐱᓕᖅᑎᒌᓂᑦ (TEWG), ᐱᖃᓯᐅᔾᔨᓯᒪᔪᖅ ᐃᓚᒋᔭᐅᔪᓂᒃ ᐹᕙᓪᓕᓐᑯᓐᓂᑦ, ᕿᑭᑦᑕᓂ ᐃᓄᐃᑦ ᑲᑐᔾᔨᖃᑎᒌᓂ (QIA), ᒐᕙᒪᖕᒋᓐᓂ ᓄᓇᕗᒻᒥ, ᐊᕙᑎᓕᕆᓂᕐᒥᑦ ᐊᒻᒪ ᓯᓚᒥᒃ ᐊᓯᔾᔨᖅᐸᓪᓕᐊᓂᕐᒧᑦ ᑲᓇᑕᒥᒃᑯᑦ (ECCC), ᒥᑦᑎᒪᑕᓕᖕᒥ ᐊᖑᓇᓱᒃᑐᓕᕆᔩᒃᑯᑦ, ᐃᒡᓗᓕᒃ ᐊᖑᓇᓱᒃᑐᓕᕆᔩᒃᑯᓐᓂᑦ, ᐊᒻᒪ ᓴᓂᕋᔭᒃ ᐊᖑᓇᓱᒃᑐᓕᕆᔩᒃᑯᓐᓂᑦ. ᑖᓐᓇ ᓄᓇᐅᑉ ᐊᕙᑎᖓᓂᒃ ᖃᐅᔨᓴᖅᐸᓪᓕᐊᓐᖏᓇᕐᓂᕐᒧᑦ ᐱᓕᕆᐊᖅ ᐱᒋᐊᓚᐅᖅᑐᑦ 2012-ᒥ ᐊᒻᒪ ᐱᕙᓪᓕᐊᓯᒪᐃᓐᓇᖅᓱᓂ 2024-ᒧᑦ ᐋᖅᑭᒡᕕᖃᐃᓐᓇᖅᓱᑎᒃ ᐱᓕᕆᐊᑦ ᐱᔾᔪᑎᖃᖅᓱᑎᒃ ᖃᐅᔨᔭᐅᔪᓂᒃ ᐊᒻᒪ ᐅᖃᐅᓯᒃᓴᕆᔭᐅᕙᒃᑐᓂ ᓄᓇᐅᑉ ᐊᕙᑎᖓᓄᑦ ᐱᓕᖃᑎᒌᓂᑦ.

ᑖᓐᓇ ᐅᓂᒃᑳᖅ ᓇᐃᒡᓕᑎᕆᓯᒪᔪᖅ ᖃᐅᔨᓴᕈᑎᓂᒃ ᑲᑎᑕᐅᓯᒪᔪᓂᒃ ᐊᒻᒪ ᖃᐅᔨᓴᖅᐸᓪᓕᐊᓐᖏᓇᕐᓂᕐᒧᑦ ᐱᓕᕆᐊᑦ ᐱᓕᕆᐊᖑᓯᒪᔪᑦ 2024-ᒥ ᐱᓕᕆᐊᒧᑦ, ᐱᖃᓯᐅᑎᓪᓗᒋᑦ ᐅᑯᐊ ᐃᓗᓕᖕᒋᑦ (ᓇᐃᓈᖅᓯᒪᔪᑦ ᐊᑐᐃᓐᓇᐅᔪᑦ ᑎᑎᕋᖅᓯᒪᔪᖅ 0-ᒥ):

- ᓯᓚᒥᒃ ᖃᐅᔨᓴᖅᐸᓪᓕᐊᓐᖏᓇᕐᓂᖅ';
- ᖁᓕᒨᑦ ᖁᓚᐅᓐᓂᖕᒋᓐᓂᒃ ᕿᒥᕐᕈᓅᑦ;
- ᐅᓯᑲᖅᑕᖅᑐᑦ ᐊᖅᑯᑖᓂ ᐃᖕᒋᕋᖃᑦᑕᖅᑐᓂᒃ ᖃᐅᔨᓴᖅᐸᓪᓕᐊᓐᖏᓇᕐᓂᖅ;
- ᐳᔪᕋᕐᒥᒃ ᓯᐊᒻᒪᖃᑦᑕᖅᑐᒥᒃ ᖃᐅᔨᓴᖅᐸᓪᓕᐊᓐᖏᓇᕐᓂᖅ (ᐱᑕᖃᐃᓐᓇᖅᑐᓂᒃ ᖃᐅᔨᓴᖅᐸᓪᓕᐊᓐᖏᓇᕐᓂᖅ ᐊᒻᒪ ᐊᖕᒋᑎᒋᓂᖓᓄᑦ ᐊᔾᔨᙳᐊᑎᒍᑦ ᕿᒥᕐᕈᓂᖅ);
- ᑕᒫᓂᕐᒥᐅᑕᐅᙱᑦᑐᓂᒃ ᐱᕈᖅᑐᓂᒃ ᖃᐅᔨᓴᖅᐸᓪᓕᐊᓐᖏᓇᕐᓂᖅ;
- ᐊᐳᑎᒃᑯᑦ ᑐᒥᓂᒃ ᖃᐅᔨᓴᕐᓂᖅ;
- ᐊᐳᔾᔭᕆᓐᓂᐅᕙᒃᑐᓂᒃ ᖃᐅᔨᓴᖅᐸᓪᓕᐊᓐᖏᓇᕐᓂᖅ
- ᓇᓯᑦᑕᖅᑐᖃᑦᑕᕐᓂᒃᑯᑦ ᖃᐅᔨᓴᕐᓃᑦ (HOL) ᑐᒃᑐᓂᒃ ᖃᐅᔨᓴᕐᓂᖅ;
- ᐅᖓᓯᒃᑐᒥᖁᑎᒃ ᐊᔾᔨᓕᐅᕈᑎᑎᒍᑦ ᖃᐅᔨᓴᖅᐸᓪᓕᐊᓐᖏᓇᕐᓃᑦ;
- ᑐᒃᑐᓂᒃ ᓇᐅᑦᑎᖅᓱᕐᓂᖅ;
- ᐊᖑᓇᓱᒃᑏᑦ ᐳᖏᖅᑎᓪᓗ ᐊᑎᓕᐅᕐᕕᖕᒋᑦ ᓇᐃᓈᖅᓯᒪᔪᑦ;
- ᑎᑭᑉᐸᒃᑐᑦ ᑎᖕᒥᐊᑦ ᐃᕙᕝᕕᖕᒋᓐᓂᒃ ᖃᐅᔨᓴᕐᓂᖅ (AMBNS); ᐊᒻᒪᓗ,
- ᓂᕐᔪᑎᒃ ᑕᖁᖃᑦᑕᐅᑎᖃᑦᑕᕐᓂᖅ ᐊᒻᒪ ᑐᕐᖁᑕᐅᔪᑦ.

**ᐃᓄᐃᑦ ᐃᓚᐅᓂᖏᑦ** - ᑎᓴᒪᑦ ᐃᓄᐃᑦ ᓄᓇᖃᖅᑐᑦ ᐃᑲᔪᓚᐅᖅᑐᑦ ᓇᓯᑦᑕᖅᑐᖃᑦᑕᕐᓂᒃᑯᑦ ᖃᐅᔨᓴᕐᓂᕐᓂᑦ (HOL) ᑐᒃᑐᓂᒃ ᖃᐅᔨᓴᕐᓂᕐᒥ ᐊᒻᒪ ᐃᔾᔪᕐᒥᒃ ᐱᕈᖅᑐᓂᓪᓗ ᖃᐅᔨᓴᖅᐸᓪᓕᐊᖏᓐᓇᕐᓂᕐᒧᑦ ᖃᐅᔨᔭᐅᔪᑦ ᓴᖅᑮᓪᓗᑎᒃ ᐃᑲᕐᕋᓂᒃ 663 ᐃᓄᐃᑦ ᐃᓚᐅᓂᖏᓐᓄᑦ ᐃᑲᕐᕋᓂᒃ ᐊᑐᖅᑎᓪᓗᒍ 2024-ᒥ ᓯᓚᒥ ᐱᓕᕆᓐᓇᐅᑎᓪᓗᒍ.

**ᓯᓚ** - ᓯᓚᐅᑉ ᖃᓄᐃᑦᑑᓂᖓᓄᑦ 2024-ᒥ ᓇᐃᓪᓕᑎᖅᑕᐅᓯᒪᔪᑦ ᐊᒻᒪ ᖃᓄᐃᓐᓂᖅᓴᐅᓂᖏᓐᓄᑦ ᕿᒥᕐᕈᔭᐅᓪᓗᑎᒃ ᖃᓄᐃᓕᖓᓂᐅᕙᒃᑐᓄᑦ. ᓂᓪᓚᓱᙱᑦᑏᑦ ᐊᒻᒪ ᓂᓪᓚᓱᑏᑦ ᐅᔾᔨᖅᓯᐊᕐᕕᖕᒥ ᕿᙵᐊᓂᓗ 2024-ᒥ ᐃᓗᐊᓃᓚᐅᖅᑐᑦ ᑎᑎᕋᖅᑕᐅᓯᒪᔪᑦ ᐃᒪᕐᓂᓴᑦ ᓈᓴᐅᑎᒋᕙᒃᑕᖏᓐᓂ. ᐅᔭᖃᖅᓂᐊᕐᕕᒃ ᐅᖅᑰᓂᖅᓴᐅᓲᖅ ᐊᒻᒪ ᒪᕐᑯᖃᑦᑕᕐᓂᖅᓴᐅᓪᓗᓂ ᕿᙳᐊᓂᒥᑦ. 2024-ᒥ, ᐅᔭᕋᖅᓂᐊᕐᕕᒃ ᐊᕐᕌᒍᑕᒫᖅ ᓂᓪᓚᓱᖅᓂᖃᕙᔪᓚᐅᖅᑐᖅ -10.4°C ᐊᒻᒪ 338.4 ᒥᓕᒥᑕᒥᒃ ᒪᕐᑯᖃᑦᑕᖅᓱᑎᒃ, ᖃᓄᐃᓐᓂᖅᓴᐅᓂᖏᑦ ᑕᑯᓪᓗᒋᑦ ᑖᒃᑯᓄᖓ -10.6°C ᐊᒻᒪ 200.4 ᒥᓕᒥᑕᒥᒃ, ᐃᓱᒪᒋᓪᓗᒋᑦ, ᕿᙳᐊᓂ. ᓂᓪᓚᔫᔭᐊᖃᑦᑕᕐᓃᑦ ᐅᖓᓯᑏᒃᑕᕐᓂᖅᓴᐅᓚᐅᖅᑐᑦ ᐅᔭᕋᖅᓂᐊᕐᕕᖕᒥ, ᐱᔾᔭᑕᐅᔫᖅᓴᐅᓪᓗᓂ ᐊᒃᑐᐃᓃᑦ ᑕᕆᐅᒥᑦ ᖃᓂᒋᔭᖓᓂ ᕿᙳᐊᓂ ᓯᓚᓐᓂᐊᕐᕕᖕᒥ (MET). ᓇᑭᙶᔮᖃᑦᑕᕐᓂᖓ ᐊᒻᒪ ᐊᓄᕌᔭᐊᕐᓂᖓ 2024-ᒥ ᐅᔭᕋᖅᓂᐊᕐᕕᖕᒥ ᓯᓚᓐᓂᐊᕐᕕᖕᒥ ᒪᓕᑐᐃᓐᓇᖅᓯᒪᔪᑦ 2013-ᒥ 2023-ᒧᑦ ᐊᑐᖅᓯᒪᔪᓂ. ᐊᓄᓇ ᐊᓄᓇᖃᓚᔪᒃᑐᑦ ᐅᐊᓐᓇᔾᒥ ᑲᓇᓐᓇᔾᒥ ᐅᕝᕙᓘᓐᓃᑦ ᓂᒋᕐᒥᑦ ᑲᓇᓐᓇᔾᒥᑦ. ᐊᓄᓇ ᑲᓇᓐᓇᒥ ᑕᐃᒪᐃᓚᔫᙱᑦᑐᖅ ᑭᓯᐊᓂᓕ ᓵᙱᕚᖑᖃᑦᑕᖅᑐᑦ, ᐊᓄᓇ ᐅᐊᓐᓇᒥ, ᐱᓇᓐᓇᒥᓪᓗ, ᐊᒻᒪ ᓂᒋᖅ ᐱᓇᓐᓈᖅ ᐊᓄᓇᐅᓚᔫᙱᓱᑎᒃ ᐊᒡᓱᐊᖑᕚᙱᓱᑎᓪᓗ. ᐅᑭᐅᒃᑯᑦ, ᐊᓄᓇ ᐊᓄᕌᖃᑦᑕᖅᓯᒪᔪᖅ ᓂᒋᖅ ᑲᓇᓐᓈᔾᒥ - ᐅᐊᓐᓇᖅ ᑲᓇᓐᓇᔾᒥᑦ (ᐋᖅᑭᒃᓯᒪᓂᖓ ᑲᖏᖅᓱᐊᓄᑦ), ᐊᓄᕌᓚᔪᒃᑐᖅ ᓂᒋᖅᐸᓯᖕᒥ ᐱᓇᓐᓈᔾᒥᑦ. ᑕᒪᓐᓇ ᐱᖅᑯᓯᐅᔪᖅ ᓇᓗᓇᙱᑦᑎᐊᓲᖅ ᑎᓯᐱᑎᒥᑦ ᒫᔾᔮᒧᑦ. ᐊᐅᔭᒃᑯᑦ, ᐊᓄᓇ ᐅᐊᓐᓇᖅ – ᐅᐊᓐᓈᔾᖅ ᐱᓇᓐᓈᔾᖅᐸᓯᐅᕚᒃᑐᖅ ᐊᒻᒪ ᓂᒋᖅ ᐱᓇᓐᓈᔾᖅᐸᓯᒃ, ᓂᒋᖅ ᑲᓇᓐᓈᔾᖅᒋᓐᓂᖅᓴᐅᓕᖅᐸᒃᓱᓂ. ᑕᒪᓐᓇ ᐃᓕᖅᑯᓯᖅ ᓇᓗᓇᙱᑦᑎᐊᓲᖅ ᔫᓂᒥᑦ ᓯᑎᐱᕆᒧᑦ. ᑕᒪᒃᑯᐊ ᐃᓕᖅᑯᓯᐅᕙᒃᑐᑦ ᓯᕗᓪᓕᖅᐹᒥᒃ ᓇᓗᓇᐃᔭᖅᑕᐅᓯᒪᔪᑦ 2023-ᒥ, ᐊᒻᒪ ᐅᔾᔨᕆᔭᐅᓯᒪᓪᓗᑎᒃ ᑕᐃᒪᓐᓇᓴᐃᓐᓇᖅ 2024-ᒥ.

**ᖁᓕᒨᑦ ᖁᓚᐅᓐᓂᖏᑦ** - ᖁᓕᒨᑦ ᖁᓚᐅᓐᓂᖏᓐᓂᒃ ᕿᒥᕐᕈᓃᑦ ᖃᐅᔨᓴᐃᓐᓇᖅᐸᒃᑐᑦ ᐸᒡᕕᓴᐃᓂᐅᑐᐃᓐᓇᕆᐊᓕᖕᓂᒃ ᑎᖕᒥᐊᓄᑦ ᐊᓯᖏᓐᓄᓪᓗ ᐆᒪᔪᓄᑦ ᐃᓗᐊᓂ ᓄᓇᓂ ᐊᕕᒃᑐᖅᓯᒪᔪᓂ ᖃᐅᔨᓴᕐᕕᐅᔪᒥ (RSA) ᐊᒻᒪ ᑎᒃᑯᐊᖅᑕᐅᓯᒪᔪᒥ ᑲᙳᖃᕐᕕᖕᒥ. ᕿᒥᕐᕈᒃᑲᓂᕐᓃᑦ (ᓲᕐᓗ ᐃᓱᒪᒋᔭᖃᕐᓂᖅ ᐊᕐᑯᑏᑦ ᐃᓱᒪᒋᔭᖕᒋᓐᓂᒃ) ᐃᓚᓕᐅᔾᔭᐅᓯᒪᔪᑦ ᖁᓚᐅᓐᓂᕐᓂᒃ ᕿᒥᕐᕈᓂᕐᒧᑦ ᐊᕐᕕᓂᓖᑦ ᒪᕐᕿᒃ ᑭᖑᓕᕇᑦ ᐊᕐᕌᒍᕆᓕᖅᑕᖓᓂ 2024-ᒥ. ᐱᓗᐊᖅᑐᒥᒃ, ᐊᕕᒃᑐᖅᓯᒪᔪᑦ ᖃᖓᑕᓃᒃ 'ᒪᓕᒃᑐᑦ ᐃᓱᒪᒋᔭᐅᔪᓂᒃ' ᑭᒻᒪᖅᑐᐃᓯᒪᔪᑦ 54%-ᒥᒃ ᑲᑎᕐᒋᑦ ᖃᖓᑕᓃᑦ ᐃᑲᕐᕋᖏᑦ ᕿᒥᕐᕈᔭᐅᓯᒪᔪᑦ ᕿᒥᕐᕈᓂᕐᒥ. ᐃᓱᒪᒋᔭᐅᓚᔫᓖᑦ ᖃᖓᑕᓃᑦ ᐊᑎᓈᖅᑐᑦ ᐱᑕᖃᓇᐊᖃᖅᑐᑦ 2024-ᒥ ᓄᓇᒥᒃ ᖃᐅᔨᓴᕐᓂᕐᒥ (16% ᑲᑎᕐᒋᑦ ᖃᖓᑕᓂᕐᓄᑦ ᐃᑲᕐᕋᑦ), ᓯᓚᒧᑦ-ᐊᒃᑐᐊᓂᓖᑦ ᖃᓂᐃᓕᖓᓕᕐᓃᑦ (15% ᑲᑎᕐᒋᑦ ᖃᖓᑕᓂᕐᓄᑦ ᐃᑲᕐᕋᑦ), ᐊᒻᒪ ᖃᓂᑦᑐᒧᑦ ᖃᖓᑕᓃᑦ (14% ᑲᑎᕐᒋᑦ ᖃᖓᑕᓂᕐᓄᑦ ᐃᑲᕐᕋᑦ). ᑕᒪᐃᓐᓄᒃᑖᖅ ᑲᑎᒃᑖᖅᒋᑦ ᒪᓕᖕᓂᕐᒧᑦ ᐅᓄᕐᓂᖅᓴᐅᓚᐅᖅᑐᑦ 90%-ᒥᒃ 2018-ᒥᑦ 2023-ᒧᑦ, ᒪᓕᙱᑦᑐᑦ ᖃᖓᑕᓃᑦ ᐊᔾᔨᒋᒃᑕᖃᑦᑕᙱᓐᒋᑦ ᐊᑯᓐᓂᖏᓐᓂᒃ 4% ᐊᒻᒪ 8%. ᐅᓄᓛᑦ ᐅᑎᖅᑕᕐᓃᑦ (204) ᐊᒻᒪ ᖃᖓᑕᓂᐅᔪᑦ (~25 ᐃᑲᕐᕋᑦ) ᑲᖑᒃᑯᕕᖅᓂ ᐃᓴᐅᑎᓪᓗᒋᑦ ᐊᒃᐸᓯᖅᓂᖅᓴᐅᓚᐅᖅᑐᑦ 2024-ᒥ ᖃᓄᐃᓐᓂᖅᓴᐅᓂᖏᑦ ᑕᑯᓪᓗᒋᑦ 2023-ᒥ, ᑭᓯᐊᓂᓕ ᐊᔾᔨᐸᓗᒋᓪᓗᒋᑦ ᐊᕐᕌᑰᓯᒪᔪᓄᑦ (2019 ᐊᒻᒪ 2021). ᒪᓕᙱᑦᑐᑦ ᑲᖑᖃᖅᑐᓂ ᐃᓂᓂ ᐃᓴᐅᑎᓪᓗᒋᑦ ᐅᓄᖅᓯᒋᐊᖅᓯᒪᔪᖅ 30%-ᒥᑦ 2024-ᒥ, ᖁᕝᕙᓯᓛᖅ ᑕᐃᒪᙶᓂᑦ 2022-ᒥ ᐱᔾᔪᑕᐅᓪᓗᑎᒃ ᖃᐅᔨᓴᖅᐸᓪᓕᐊᕐᓂᖅᓇᕐᓂᕐᒧᑦ ᐱᓕᕆᓂᕆᔭᐅᒃᑳᓂᖅᑐᑦ.

**ᐅᓯᒃᖅᑕᖅᐆᑦ ᐊᖅᑯᑖᓂ ᐃᖏᕐᕋᒃᑕᕐᓃᑦ** - ᓈᓴᐅᑕᐅᓚᔪᒃᑐᖅ ᑲᑎᕐᒋᑦ ᓄᓇᓯᐅᑏᑦ ᐅᑎᖅᑕᖅᑐᑦ 2024-ᒥ ᐊᒻᒪ 281.2 ᐅᑎᖅᑕᒃᑕᓚᐅᖅᑐᑦ ᖃᐅᑕᒫᑦ (ᐊᑕᐅᓯᖅ ᓴᕕᒃᓴᓂᒃ ᐅᓯᔪᖅ 246.3-ᖏᖅᓱᖅᓱᓂ ᐅᑎᖅᑕᖅᑐᖅ ᖃᐅᑕᒫᑦ). ᑕᒪᒃᑯᐊ ᖃᐅᑕᒫᑦ ᓈᓴᐅᑎᐅᓚᔪᒃᑐᑦ ᐅᖓᑕᐅᔾᔨᐊᕐᔪᒃᓯᒪᔪᑦ ᓇᓚᐅᑦᑖᖅᑕᐅᓯᒪᔪᓂ ᓈᓴᐅᑎᐅᔪᓂ ᑕᐃᑲᓂ ᑭᖑᓕᖅᐹᒥᒃ ᐊᕙᑎᒧᑦ ᐊᒃᑐᐃᓂᐅᓂᐊᖅᑐᑦ ᐅᓂᒃᑳᓂ (FEIS) ᐅᔭᕋᖅᓂᐊᕆᐊᓖᓪᒎᒪᓂᕐᒧᑦ ᑐᒃᓯᕋᐅᓪᒥ (ᓲᕐᓗ 236 ᓴᕕᒃᓴᓂᒃ ᐅᓯᔪᑦ ᐅᑎᖅᑕᕐᓗᑎ, ᑦᑖᓐᑕᒃ ᑐᓴᕋᓯᐊᖅᑏᑦ ᓕᒥᑎᑦ, 2018).

**ᐳᔪᕋᖅ** - 2024-ᒥ ᐱᑕᖃᐃᓐᓇᖅᑐᑦ ᐳᔪᕋᖅ ᓯᐊᒻᒪᒃᐸᓪᓕᐊᔪᒥᒃ ᖃᐅᔨᓴᖅᐸᓪᓕᐊᕐᓂᖅᓇᕐᓂᖅ ᐱᓕᕆᐊᖅ ᐊᑐᖅᓯᒪᔪᖅ 43-ᓂᒃ ᐱᑕᖃᐃᓐᓇᖅᑐᓄᑦ ᐳᔪᕋᖅ ᓯᐊᒻᒪᒃᐸᓪᓕᐊᔪᓂᒃ ᑲᑎᖅᓯᐃᕝᕚᑦ ᐆᒃᑐᕋᖅᑕᐅᖁᓪᓗᒋᑦ ᐊᒃᑐᐊᓂᓛᑦ ᐱᓕᕆᐊᒥ ᐱᓕᕆᓂᐅᔪᓄᑦ. 36 ᑲᑎᖅᓯᐃᕝᕚᑦ ᖃᐅᔨᓴᒃᓴᐅᓕᐅᖅᑕᐅᓖᑦ ᑕᖅᑭᑕᒫᑦ; ᐊᒥᐊᒃᑯᑦ ᑲᑎᖅᓯᐃᕝᕚᑦ ᖃᐅᔨᓴᒃᓴᓕᐅᖅᑕᐅᕙᒃᓱᑎᒃ ᐊᐅᔭᒃᑯᑦ. ᖃᓄᑎᒋᐅᓂᖓ ᐊᕐᕌᒍᑕᒫᖅ ᐳᔪᕋᖅ ᓯᐊᒻᒪᒃᐸᓪᓕᐊᔪᖅ ᐅᔭᕋᖅᓂᐊᕐᕕᖕᒥ ᖃᐅᔨᓴᒃᓴᓕᐅᕐᕕᖕᓂ ᐅᓄᕈᓐᓂᖅᐸᓪᓕᐊᖏᓐᓇᖅᑐᑦ. ᐳᔪᕋᖅ ᓯᐊᒻᒪᒃᐸᓪᓕᐊᔪᖅ ᐸᓚᐅᒪᑎᓐᓇᓱᒃᓗᒍ ᑕᐅᕗᓇ ᐅᔭᕋᖅᓂᐊᕐᕕᖕᒥ ᐅᓯᒃᖅᑕᖅᐆᑦ ᐊᖅᑯᑖᒍᑦ ᐊᒻᒪ ᒥᕝᕕᖕᒥ ᐊᑑᑎᖃᖅᑯᔨᔪᑦ. ᖃᓄᑎᒋᐅᓂᖓ ᐳᔪᕋᖅ ᓯᐊᒻᒪᒃᐸᓪᓕᐊᔪᖅ ᕿᙳᐊᓂ ᑐᓚᒃᑕᕐᕕᖕᒥ ᓯᓕ ᑕᐃᒪᓐᓇᐃᖏᓐᓇᖅᑐᖅ ᐅᕙᓘᓐᓃᑦ, ᐃᓚᖏᓐᓂ, ᐅᓄᕈᓐᓂᖅᓯᕚᒃᑐᖅ, ᐱᐅᓯᐅᓕᖅᑐᖅ ᐱᒋᐊᓚᐅᖅᑐᖅ 2018-ᒥ. ᖁᕝᕙᓯᓛᑦ ᐳᔪᕋᖅ ᓯᐊᒻᒪᒃᐸᓪᓕᐊᔪᖅ ᕿᙳᐊᓂ ᑐᓚᒃᑕᕐᕕᖕᒥ ᐊᒃᑐᐊᓂᖃᓚᐅᖅᑐᖅ ᓴᕕᒃᓴᐃᑦ ᑲᑎᖅᓱᖅᑕᐅᕝᕕᖏᓐᓂ, ᐱᓗᐊᙱᓐᓂᖅᓴᐅᓗᓂ ᐱᕙᓪᓕᐊᓂᖓ ᐅᒥᐊᕐᔪᐊᓄᑦ ᐋᖅᑭᒃᓯᒪᕝᕕᐅᕙᒃᑐᒥ ᐃᓂᒥ. ᑕᐅᕗᓇ ᐅᓯᒃᖅᑕᖅᐆᑦ ᐊᖅᑯᑖᓂ, ᐳᔪᕋᖅ ᓯᐊᒻᒪᒃᐸᓪᓕᐊᔪᖅ 2024-ᒥ

ᒪᓕᑐᐃᓐᓇᓚᐅᖅᑐᑦ ᐅᐊᙵᔮᖃᑦᑕᕐᓂᖓᓄᑦ ᑕᐅᕝᕙ ᐃᓂᒃᑯᑦ ᖃᓄᐃᓐᓂᖅᓴᐅᓂᖏᑦ ᕿᒥᕐᕈᓪᓗᒋᑦ ᒫᓐᓇᕈᓘᒃ ᐊᕐᕌᒎᓯᒪᔪᓄᑦ. ᐊᖏᓂᖅᓴᖅ ᐊᑐᖅᑕᐅᓂᖓ ‘ᖄᕝᖅᑖᖅᑎᑦᑎᔾᔪᑎ” ᑕᕆᐅᖅ ᖃᐅᔨᓴᖅᑕᐅᔪᖅ ᐊᒻᒪ ᖃᐅᔨᔭᐅᓯᒪᓪᓗᓂ ᐊᑑᑎᖃᕐᓂᖓᓂᒃ 2024-ᒥ.

ᐳᔪᕋᖅ ᓯᐊᒻᒪᒃᐸᓪᓕᐊᔪᖅ ᐊᕙᒃᑐᖅᑕᐅᓚᐅᖅᓯᒪᖕᒥᔪᖅ ᖃᐅᔨᓴᖅᑕᐅᓪᓗᑎᒃ ᖃᖓᒃᑕᖅᑎᑕᐅᓯᒪᔪᑎᒍᑦ ᐊᔾᔨᙳᐊᑎᒍᑦ. ᑕᒪᓐᓇ ᕿᒥᕐᕈᓂᖅ ᐱᔭᕇᖅᑕᐅᓯᒪᔪᖅ ᓇᓗᓇᐃᖅᑕᐅᓪᓗᓂ ᐃᓄᖕᓂ ᓄᓇᒥᒃ ᐊᑐᖅᑎᓂᒃ ᐅᖃᐅᓯᐅᓪᓗᓂ ᐅᔾᔨᕈᓱᖕᓂᖏᓐᓂᒃ ᐳᔪᕋᒥᒃ ᐅᖓᑖᓄᑦ ᑕᒪᒃᑯᓄᖓ ᓇᓚᐅᑦᑖᖅᑕᐅᓯᒪᔪᓄᑦ ᐱᒋᐊᕈᑕᐅᔪᓄᑦ ᖃᐅᔨᓴᕈᑏᑦ ᐋᖅᑭᒃᑯᐊᖅᑕᐅᓯᒪᔪᓄᑦ ᐊᒻᒪ ᑕᑯᓪᓗᒍ ᐳᔪᕋᖅ ᓯᐊᒻᒪᒃᐸᓪᓕᐊᔫᑉ ᐊᖏᓂᖓ ᐃᓂᓂ ᐳᔪᕋᖅ ᓯᐊᒻᒪᒃᐸᓪᓕᐊᔪᖅ ᑐᖓᓃᑦᑐᖅ ᖃᐅᔨᓴᐅᔪᓐᓇᕐᓂᕐᓄᑦ ᐳᔪᕋᕐᒥᒃ ᑲᑎᑦᑎᕝᕕᓐᓂ. 2024-ᒥ ᐳᔪᕋᖅ ᓯᐊᒻᒪᒃᐸᓪᓕᐊᔪᖅ ᐊᖏᑎᒋᓂᖓ ᖃᐅᔨᓴᕐᕕᐅᔪᒥ ᐊᔾᔨᐸᓗᒋᓚᐅᖅᑕᖓ 2023-ᒥ, ᐱᒋᐊᓪᓚᒃᓯᒪᓪᓗᓂ ᐅᓯᒃᑲᖅᑏᑦ ᐊᖅᑯᑖᓂ ᓇᓕᒧᕝᕕᓗ ᐅᓄᖅᓯᒋᐊᕐᓂᕐᓂᒃ ᐊᓯᖏᓐᓄᑦ ᐃᓂᓄᑦ. ᐹᕝᕚᓐᓇᑯᑦ ᐊᑐᖅᓯᒪᔪᑦ ᐊᒥᓱᓚᖓᓂ ᐅᔭᕋᖓᓂᐊᕐᕕᓗᒃᑖᒥ ᐳᔪᕋᖃᓗᐊᔾᔭᐃᒃᑯᑎᓂᒃ ᐱᓕᕆᔾᔪᓯᕐᓂᒃ ᐳᔪᕋᖅ ᓯᐊᒻᒪᓗᐊᕐᑯᓇᒍ, ᐱᖃᓯᐅᑎᓪᓗᒍ ᐃᒥᖅ, ᑕᕆᐅᖅᑎᖅᑕᐅᕚᓪᓗᓂ ᐊᖅᑯᑦ, ᐊᒻᒪ ᐊᑐᐃᓐᓇᖅᓱᑎᒃ ᐅᓕᓐᓂᒃ ᓴᕝᕙᒥ ᓯᖃᓕᑦᑎᕝᕕᒥ, ᐱᐅᓯᒋᐊᖅᑕᐅᖁᓪᓗᒋᑦ ᐱᓕᕆᔾᔨᔫᑦ ᓃᑕᐅᓕᖅᑎᓪᓗᒋᑦ ᓴᕝᕙᖅ ᑲᑎᖅᓯᐃᕝᕙᒥ. ᑎᒥᖄᖅᑎᑦᑎᔾᔪᑎ (DustBlockr®) ᐊᑐᖅᑕᐅᓚᕐᖅ ᐅᓯᒃᑲᖅᑏᑦ ᐊᖅᑯᑎᓗᒃᑖᖓᓂ ᐊᐅᔭᖓᓂ 2024-ᒥ. ᑎᒥᖄᖅᑎᑦᑎᔾᔪᑎ (DustBlockr) ᐳᔪᖃᓗᐊᖅᑕᐃᓕᑎᑦᑎᔾᔪᑎ ᑎᒥᖄᖅᑎᑕᐅᖃᑦᑕᖅᓯᒪᔪᖅ ᓴᕝᕙᒧᑦ ᑲᑎᖅᓱᖅᑕᐅᔪᒧᑦ ᑕᐃᒪᐃᓕᐅᓚᔫᓯᒪᔪᑦ 2024-ᒥ. ᑎᒥᖄᖅᑎᑦᑎᔾᔪᑎ (DustBlockr) ᑐᕐᑯᓇᖅᑐᖃᙱᑦᑐᖅ, ᐃᒪᕆᑦ-ᐱᓯᒪᔪᖅ, ᐊᑯᓂᐅᔫᒃᑯᑦ ᐳᔪᕋᖃᓗᐊᔾᔭᐃᒃᑯᑎ ᖄᕝᙳᓖᖅ ᓴᕝᕙᓂᒃ ᑲᑎᖅᓯᐃᕝᕙᓐᓂ ᐳᔪᕋᖃᓗᐊᕐᑯᓇᒍ. ᐹᕝᕚᓐᓇᑯᑦ ᐸᕐᓇᒃᓯᒪᔪᑦ ᑎᒥᖄᖅᑎᑦᑎᖃᑦᑕᕐᓂᐊᕐᓗᑎᒃ ᑎᒥᖄᖅᑎᑦᑎᔾᔪᑎᒥᒃ (DustBlockr) ᑎᒥᖄᖅᑎᑦᑎᓚᔪᓐᓂᖅᓴᐅᓗᑎᒃ ᓴᕝᕙᓂᒃ ᑲᑎᖅᓱᖅᑕᐅᔪᓂᒃ ᕿᙳᐊᓂ ᑐᓚᒃᑕᕐᕕᖕᒥ.

**ᐱᕈᖅᑐᑦ** - ᐱᕈᖅᑐᓂᒃ ᖃᐅᔨᓴᖅᐸᓪᓕᐊᖏᓐᓇᕐᓂᖅ ᐱᓕᕆᐊᖅ 2024-ᒥ ᑐᕌᒐᖅᓯᒪᔪᖅ ᖃᐅᔨᓴᖅᐸᓪᓕᐊᖏᓐᓇᕐᓂᕐᒥᒃ ᑕᒫᓂᕐᒥᐅᑕᐅᙱᑦᑐᓂᒃ ᐱᕈᖅᑐᓂᒃ ᐃᓗᐊᓂ ᐱᓕᕆᕝᕕᐅᑐᐃᓐᓇᕆᐊᓕᖕᒥ ᐃᓂᒥ (PDA). ᑐᕌᓚᕆᔭᐅᔪᑦ ᖃᐅᔨᓴᕈᑏᑦ ᑕᒫᓂᕐᒥᐅᑕᐅᙱᑦᑐᓄᑦ ᐱᕈᖅᑐᓄᑦ ᐱᔭᕇᖅᑕᐅᖃᑦᑕᖅᑐᑦ ᐊᓂᒍᕋᖓᑕ ᐱᖓᓱᑦ ᑕᑦᓕᒪᑦᓘᓐᓂᑦ ᐊᕐᕌᒍᑦ. ᑭᖑᓂᖓᑦᑎᓐᓂ ᑕᒫᓂᕐᒥᐅᑕᐅᙱᑦᑐᓂᒃ ᐱᕈᖅᑐᓂᒃ ᖃᐅᔨᓴᕐᓂᖅ ᑎᑎᕋᖅᓯᒪᓚᐅᖅᑐᖅ ᐊᑕᐅᓯᕐᒥᒃ ᑕᒫᓂᕐᒥᐅᑕᐅᙱᑦᑐᒥᒃ ᐱᕈᖅᑐᑦ ᐊᔾᔨᐅᙱᑦᑐᐊᕐᔪᒃᑐᓂ (ᐱᕈᖅᓯᐊᖑᔫᑦ ᑐᒪᐃᑐ) ᐱᕈᖅᐸᓪᓕᐊᔪᖅ ᐊᑎᑦᑎᐊᖓᓂ ᑭᓈᓗᖃᕐᕕᐅᑉ / ᓴᓗᒻᒪᖅᓴᖅᓯᒪᔪᖅ ᐃᒥᐅᑉ ᑯᕙᔭᐅᓃᑉ ᓱᓪᓗᐊᓂ 2019-ᒥ. ᑕᒫᓂᕐᒥᐅᑕᐅᙱᑦᑐᓂᒃ ᐱᕈᖅᑐᓂᒃ ᐊᔾᔨᐅᙱᑦᑐᐊᕐᔪᒃᑐᓂᒃ ᑎᑎᕋᖅᑕᐅᓯᒪᔪᖃᓚᐅᙱᑦᑐᑦ ᐱᓕᕆᐊᖑᑎᓪᓗᒋᑦ 2024 ᖃᐅᔨᓴᕐᓃᑦ. ᖃᐅᔨᓴᖅᐸᓪᓕᐊᖏᓐᓇᕐᓃᑦ ᑕᒫᓂᕐᒥᐅᑕᐅᙱᑦᑐᓄᑦ ᐱᕈᖅᑐᓄᑦ ᓂᕆᐅᒋᔭᐅᔪᖅ ᐱᓕᕆᐊᖑᒃᑲᓐᓃᕐᓗᓂ ᐊᑯᓐᓂᖏᓐᓂ 2027 ᐊᒻᒪ 2029.

**ᐆᒪᔪᑦ** - ᐊᐳᑦ ᑐᒥᖏᓐᓂᒃ ᖃᐅᔨᓴᕐᓂᖅ ᕿᒥᕐᕈᖅᐳᖅ ᐆᒪᔫᑦ ᐃᓕᖅᑯᓯᕆᓕᖅᐸᒃᑕᖏᓐᓂᒃ ᐅᓯᒃᑲᖅᑏᑦ ᐊᖅᑯᑖᓂ, ᐱᔪᐊᖅᑐᒥᒃ ᑐᒃᑐᐃᑦ. 12 ᐊᐳᑦ ᑐᒥᖏᓐᓂᒃ ᖃᐅᔨᓴᕐᓃᑦ ᐱᔭᕇᖅᑕᓚᐅᖅᑐᑦ 2024-ᒥ. ᐊᔾᔨᐸᓗᒋᓪᓗᒋᑦ ᑭᖑᓂᖓᑦᑎᓐᓂ ᐊᕐᕌᒍᔪᓂ, ᑐᒥᖃᐅᕐᓂᖅᓴᐅᓚᐅᖅᑐᑦ ᑎᕆᒐᓂᐊᑦ, ᖃᔪᖅ ᑎᕆᒐᓂᐊᖅ, ᐅᑲᓕᖅ, ᐊᒻᒪ ᐊᕿᒡᒋᖅ. ᑐᒃᑐᓄᑦ ᑐᒥᑕᖃᓚᐅᙱᑦᑐᖅ ᑕᑯᔭᐅᔪᓂᒃ 2024-ᒥ. ᐊᕙᙱᓚᐃᑦ (30%) ᐊᒻᒪ ᑎᕆᒐᓂᐊᖅ (11%) ᑐᒥᖏᑦ ᑖᒃᑯᐊᑐᐊᖅ ᐆᒪᔪᓂ ᐊᔾᔨᙱᑦᑐᐊᕐᔪᒃᑐᓂ ᓇᓗᓇᐃᖅᑕᐅᔪᖃᖅᓯᒪᔪᑦ ᓴᖑᓯᒪᔪᓂᒃ ᐅᓯᒃᑲᖅᑏᑦ ᐊᖅᑯᑖᓂ.

ᐊᐳᔾᔭᕆᐊᖅᓂᐅᔪᓂᒃ ᖃᐅᔨᓴᖅᐸᓪᓕᐊᖏᓐᓇᕐᓂᖅ ᐱᓕᕆᐊᖑᓚᐅᖅᑐᑦ ᕿᒥᕐᕈᕐᑯᓪᓗᒋᑦ ᒪᓕᒃᓂᕐᒧᑦ ᐊᐅᓚᓂᖃᕐᓗᑎᒃ 1 ᒦᑕᒥ ᐳᖅᑐᓂᖃᖅᐸᓪᓗᑎᒃ, ᓂᕐᔪᑏᑦ ᐃᑳᕈᓐᓇᕐᑯᓪᓗᒋᑦ ᐊᒻᒪ ᑕᑯᒃᓴᐅᑦᑎᐊᕐᓂᖅᓴᐅᓗᓂ ᐊᕐᑯᑎᓄᑦ ᓂᕐᔪᑎᓂᒃ ᐊᐳᖅᓯᕐᑯᓇᒋᑦ. ᐊᐳᔾᔭᕆᐊᖅᓂᐅᔪᓂᒃ ᖃᐅᔨᓴᖅᐸᓪᓕᐊᖏᓐᓇᕐᓂᑦ ᐱᓕᕆᐊᖑᓚᐅᖅᑐᖅ 2024-ᒥ ᐅᑭᐅᒃᑯᑦ. ᑭᐅᔾᔪᑕᐅᓇᓱᐊᖅᓱᓂ ᓄᓇᐅᑉ ᐊᕙᑎᖓᓄᑦ ᐱᓕᕆᖃᑎᖓᑦ ᑐᒃᓯᕋᐅᑎᖓᓄᑦ, ᐆᒃᑐᕋᖅᑕᐅᓯᒪᔪᑦ ᐃᓅᑦ ᓇᒥᑐᐃᓐᓈᖅᓯᒪᔪᑦ ᑕᐃᒪᙵᓂᑦ 2020-ᒥ ᐊᑐᙱᖖᒫᖅᓱᑎᒃ ᐋᖅᑭᒃᓱᖅᑕᐅᓯᒪᔪᓂᒃ ᑭᓵᒥᑕᓄᑦ ᓇᓗᓇᐃᒃᑯᑕᓂᒃ ᐆᒃᑐᕋᐅᑎᓄᑦ. ᑕᒪᐃᓐᓄᓗᒃᑖᖅ, ᒪᓕᖕᓂᕐᒧᑦ 86%-ᖑᓚᐅᖅᑐᖅ, ᐊᑦᑎᖕᓂᖅᓵᕐᔫᓗᓂ 2022-ᒥᓂᑦ (91%) ᑭᓯᐊᓂᓕ ᖃᓂᖅᑯᑦᑎᓯᒪᓪᓗᓂ ᐊᓯᖏᓐᓄᑦ ᐊᕐᕌᒎᓄᑦ ᐊᐳᔾᔭᕆᐊᖅᓂᒥᒃ ᖃᐅᔨᓴᖅᐸᓪᓕᐊᖏᓐᓇᕐᓂᕐᒧᑦ.

ᓇᓯᑦᑕᖅᑐᖃᑦᑕᕐᓂᒃᑯᑦ ᖃᐅᔨᓴᕐᓃᑦ (HOL) ᑐᒃᑐᓂᒃ ᖃᐅᔨᓴᕐᓃᑦ ᐱᓕᕆᐊᖑᓚᐅᖅᑐᑦ ᕿᒥᕐᕈᔭᐅᕐᑯᓪᓗᒋᑦ ᓇᓃᖃᑦᑕᕐᓂᖏᑦ ᐊᒻᒪ ᐃᓕᖅᑯᓯᖏᑦ ᐱᓕᕆᐊᑉ ᐱᕙᓪᓕᐊᕝᕕᖓ (PDA) ᓄᕐᕆᐅᖅᑎᓪᓗᒋᑦ. ᓇᓯᑦᑕᖅᑐᖃᑦᑕᕐᓂᒃᑯᑦ ᖃᐅᔨᓴᕐᓃᑦ (HOL) ᑐᒃᑐᓂᒃ ᖃᐅᔨᓴᕐᓃᑦ ᐱᔭᕇᖅᑕᓚᐅᖅᑐᑦ ᐊᑯᓐᓂᖓᓂ ᒪᐃ 29 ᐊᒻᒪ ᔫᓂ 10, 2024-ᒥ. ᑲᑎᖕᒋᑦ ᑕᑯᓇᓱᖕᓂᕐᒧᑦ 32-ᓄᑦ ᐃᑲᕐᕋᓄᑦ ᐊᒻᒪ 25 ᑎᑦᑕᑦ, ᑕᑯᓇᓱᒐᔪᖕᓃᑦ ᐊᑐᓂ ᖃᐅᔨᓴᕝᕕᖕᒧᑦ 40 ᑎᑦᑕᐅᔪᑦ. 15 ᐃᓛᒃᑰᖅᑐᑦ ᑐᒃᑐᐃᑦ ᑕᑯᔭᐅᓚᐅᖅᑐᑦ ᐱᓕᕆᑎᓪᓗᒋᑦ ᓇᓯᑦᑕᖅᑐᖃᑦᑕᕐᓂᒃᑯᑦ ᖃᐅᔨᓴᕐᓃᑦ (HOL) ᑐᒃᑐᓂᒃ ᖃᐅᔨᓴᕐᓂᕐᓂ 2024-ᒥ ᔫᓂ 3, 4, 5 ᐊᒻᒪᓗ 8-ᒥ. ᐱᓕᕆᐊᖑᓯᒋᐊᖅᑳᖅᑎᓇᒋᑦ 2024-ᒥ ᓇᓯᑦᑕᖅᑐᖃᑦᑕᕐᓂᒃᑯᑦ ᖃᐅᔨᓴᕐᓃᑦ (HOL) ᑐᒃᑐᓂᒃ ᖃᐅᔨᓴᕐᓃᑦ, ᑭᖑᓪᓕᖅᐹᒥᒃ ᑐᒃᑐᐃᑦ ᑕᑯᔭᐅᔪᑦ ᐱᓕᕆᐊᖑᑎᓪᓗᒋᑦ ᓇᓯᑦᑕᖅᑐᖃᑦᑕᕐᓂᒃᑯᑦ ᖃᐅᔨᓴᕐᓃᑦ (HOL) ᖃᐅᔨᓴᕐᓃᑦ 2013-ᒥ.

ᐅᖓᓯᒃᑐᒦᕆᑎᒃ ᐊᔾᔨᓕᐅᕈᑏᑦ ᐊᔾᔨᓕᐅᖅᓯᓯᒪᔪᑦ ᐊᔾᔨᑦᖏᕆᕈᓘᔭᖅᑐᓂᒃ ᑎᖏᐊᓂᒃ (ᓲᕐᓗ ᐊᕿᒡᒋᖅ, ᓂᕿᑐᖅᑏᑦ, ᐊᒻᒪ ᐅᖃᓗᒃᐅᔭᖅᑏᑦ) ᐅᑲᓕᖅ ᐊᒻᒪ ᑎᓇᒐᓂᐊᖅ ᐊᑯᓐᓂᖓᓂ ᔫᓄᐊᕆ 1 ᐊᒻᒪ ᑎᓯᐱᕆ 28, 2024-ᒥ. 15 ᖃᐅᔾᔭᐅᓯᒪᔪᑦ ᑐᒃᑐᐃᑦ ᓇᓗᓇᐃᖅᑕᐅᓯᒪᔪᑦ ᐊᑕᐅᓯᕐᒥ ᐊᔾᔨᓕᐅᕈᑎᒥ (ᓲᕐᓗ ᕿᑭᖅᑖᓗᒃ-11). ᐊᒪᕈᕐᓂᒃ ᐅᕙᓘᓐᓃᑦ ᓇᓄᕐᓂᒃ ᑕᑯᔭᐅᔪᖃᓚᐅᙱᑦᑐᑦ ᓇᓕᐊᖕᓂᑐᐃᓐᓇᖅ ᕿᒥᕐᕈᔭᐅᔪᓂ ᐊᔾᔨᙳᐊᓂ. ᑕᒪᓐᓇ ᐃᑲᔪᖅᑐᐃᔪᖅ ᒫᓐᓇ ᐅᔾᔨᕆᔭᐅᔪᓂᒃ ᐅᓄᙱᓐᓂᖏᓐᓄᑦ ᑐᒃᑐᐃᑦ ᐊᒻᒪ ᓅᖃᑦᑕᕐᓂᖏᑦ ᐱᓕᕆᐊᑉ ᐱᕙᓪᓕᐊᕝᕕᖓᓂ (PDA), ᐅᓄᖅᓯᕙᓪᓕᐊᓕᕋᓗᐊᖅᑎᓪᓗᒋᑦ ᑕᑯᔭᐅᔪᑦ ᖃᐅᔨᓴᖅᐸᓪᓕᐊᓂᖅᑕᖅᑎᓪᓗᒍ. ᖃᖓᑕᓲᒃᑯᑦ ᑐᒃᑐᓂᒃ ᖃᐅᔨᓴᕐᓂᖅ ᐱᓕᕆᐊᖑᓚᐅᖅᑐᑦ ᒫᔾᔨ 2023-ᒥ, ᑐᒃᑐᐃᑦ ᓄᕐᓇᐅᙱᑎᓪᓗᒋᑦ. ᖃᐅᔨᓴᖅᑎᓪᓗᒋᑦ, 112 ᐃᓛᒃᑰᖅᑕᖅᑐᑦ ᑐᒃᑐᐃᑦ ᐊᒻᒪ 36 ᑲᑎᙵᐅᖅᑐᑦ ᑐᒃᑐᐃᑦ ᑕᑯᔭᐅᓯᒪᔪᑦ. ᑐᒃᑐᓂᒃ ᑕᑯᓂᓗᒃᑖᖅ ᓂᒋᖅᐸᓯᐊᓃᓚᐅᖅᑐᑦ ᐊᕕᒃᑐᖅᓯᒪᒃᑲᓂᐅᔭᖅᑐᓂ ᐃᒫᔪᓂᒃ ᓄᓇᓂ ᐊᕕᒃᑐᖅᓯᒪᔪᓂ ᖃᐅᔨᓴᕝᕕᐅᔪᓂ, ᒪᕈᑐᐊᑦ ᑲᑎᙵᐅᖅᑐᖅ (ᖁᓕᐅᙱᑐᐃᓐᓇᖅᑐᑦ ᐃᓛᒃᑰᖅᑐᑦ ᑐᒃᑐᐃᑦ) ᑐᔾᔭᐱᖕᓂᖓᓃᓚᐅᖅᑐᑦ ᐅᐊᖕᓇᖓᓂ ᐊᕕᒃᑐᖅᓯᒪᒃᑲᓂᐅᔭᖅᑐᓂ. ᖃᖓᑕᓲᒃᑯᑦ ᖃᐅᔨᓴᕐᓂᖅᑕᖃᓚᐅᙱᑦᑐᖅ 2024-ᒥ.

ᑐᒃᑐᐃᑦ ᑕᑯᔭᐅᔭᕋᖓᑕ ᑕᐅᕙᓂ ᖃᓂᒋᔭᖓᓂᓘᓐᓃᑦ ᐅᓯᑲᖅᑕᖅᑏᑦ ᐊᖅᑯᑖᓂ, ᑐᒃᑐᓄᑦ ᐃᓯᒪᓕᐅᕈᑎᓄᑦ ᐋᖅᑭᒃᓯᒪᓃᑦ ᐊᑐᓕᖅᑐᑦ ᐊᒻᒪ ᖃᐅᔨᒪᔾᔭᑕᐅᓪᓗᓂ ᐱᓕᕆᐊᒃᓴᓄᑦ ᐊᖅᑯᒥ ᐊᑐᓲᓄᑦ. 51 ᑐᒃᑐᐃᑦ ᑕᑯᔭᐅᓚᐅᖅᑐᑦ ᐱᓕᕆᐊᖑᑎᓪᓗᒋᑦ 22 ᖃᐅᔨᓴᖅᐸᓪᓕᐊᖕᒋᓇᕐᓂᕐᒧᑦ ᑎᑎᕋᖅᑕᐅᓯᒪᓚᐅᖅᑐᑦ ᑕᐅᕗᓇ ᐅᓯᑲᖅᑕᖅᑏᑦ ᐊᖅᑯᑖᒍᑦ ᒪᐃᒥ, ᔫᓂᒥ ᐊᒻᒪ ᐅᑐᐱᕆ 2024-ᒥ. ᐱᐅᙱᑦᑐᒃ ᐃᓕᖅᑯᓯᖅᑕᖃᓕᖅᓯᒪᙱᑦᑐᑦ ᑕᐅᕗᓇ ᐅᓯᑲᖅᑕᖅᑏᑦ ᐊᖅᑯᑖᒍᑦ ᐊᒻᒪ ᐊᖅᑰᖅᐸᓪᓕᐊᔪᑦ ᓄᓇᓯᐅᑎᓂ ᓇᓗᓇᐃᖅᑕᐅᓚᐅᖅᑐᖅ 22-ᓂ ᖃᐅᔨᓴᖅᐸᓪᓕᐊᖕᒋᓇᕐᓂᕐᒧᑦ ᐱᓕᕆᓂᕐᓂ. ᐃᓕᖅᑯᓯᐅᓕᖅᐸᒃᑐᑦ ᓇᓗᓇᐃᖅᑕᐅᓚᐅᖅᑐᑦ ᐱᖃᓯᐅᑎᓪᓗᒋᑦ ᓂᕐᒪᔾᔪᑦ/ᓂᕆᔪᑦ, ᐃᓂᓪᓚᖓᔪᑦ, ᐊᒻᒪ ᓂᕐᔪᑏᑦ ᓅᑉᐸᓪᓕᐊᔪᑦ 'ᓱᒃᑲᓕᓂᖃᕆᑎᒃ ᐱᓱᒃᑐᑐᑦ'.

**ᑎᖏᐊᑦ** - ᑎᑭᑉᐸᒃᑐᑦ ᑎᖏᐊᑦ ᐃᕙᕝᕕᖕᓂᒃ ᖃᐅᔨᓴᕐᓃᑦ ᐱᔭᕇᖅᑕᐅᓚᐅᖅᑐᑦ ᐱᒋᐊᖅᑕᐅᖅᑳᖅᑎᓐᓇᒋᑦ ᖃᓄᑐᐃᓐᓇᖅ ᐱᕈᖅᑐᓂᒃ ᐋᔭᐃᓐᓃᑦ ᐅᕙᓘᓐᓃᑦ ᓄᓇᙵᓂ ᐸᒡᕕᓴᐃᓐᓃᑦ ᐱᓕᕆᐊᒥ ᓄᓕᐅᑎᓪᓗᒋᑦ ᑎᖏᐊᑦ (ᒪᐃ 17-ᒥᑦ ᐋᒡᒋᓯ 19-ᒧᑦ). ᖃᐅᔨᓴᕐᓃᑦ ᐱᖃᓯᐅᔾᔨᓯᒪᓚᐅᖅᑐᑦ ᓇᐅᑦᑎᖅᓱᕐᓂᖅ ᐊᑐᖅᑲᑎᒃ ᐊᒃᑲᓐᓂᒃ ᑲᓕᑲᑕᖕᓃᑦ ᐱᓕᕆᔾᔪᓯᖅ (ᕋᐅᔾ 2015) ᖃᐅᔨᓭᔭᐅᕐᑯᓪᓗᑎᑦ ᑎᖏᐊᑦ ᐃᕙᕝᕕᖏᑦ ᓴᓇᓯᒋᐊᖅᑳᖅᑎᓐᓇᒋᑦ. ᑎᓴᒪᑦ ᖃᐅᔨᓴᕐᓃᑦ ᐱᔭᕇᖅᑕᐅᓚᐅᖅᑐᑦ 2024-ᒥ; ᐃᕙᕝᕕᖕᓂᒃ ᖃᐅᔨᔭᐅᔪᖃᓚᐅᙱᑦᑐᖅ.

ᐊᒥᓱᓚᓪᓚᑦ ᐊᕐᕌᒍᐃᑦ ᓂᕿᑐᖅᑎᓂᒃ ᑎᖏᐊᓂᒃ ᐊᒃᑐᐃᓂᕐᓄᑦ ᖃᐅᔨᓴᖅᐸᓪᓕᐊᖕᒋᓇᕐᓃᑦ, ᐃᓂᕆᕙᒃᑕᖏᑦ ᐊᒻᒪ ᕿᑐᕐᖏᐅᖅᐸᖕᓂᖏᑦ ᓱᕋᖕᒋᓂᕋᖅᑕᐅᓚᐅᖅᑐᑦ, ᐊᒻᒪ ᓇᓗᓇᐃᕈᑎᑕᖃᓂ ᖃᐅᔨᓴᐅᔪᓂᒃ ᐱᓕᕆᐊᒧᑦ-ᐊᒃᑐᐊᔪᓂᒃ ᐊᒃᑐᐃᓂᕐᓂᒃ ᑎᖏᐊᓄᑦ ᓂᕿᑐᖅᑎᓄᑦ (ᑮᕝ ᐃᓘᓐᓇᑎ 2024). ᑕᐃᒪᐃᓐᓂᖓᓄᑦ, ᑎᖏᐊᑦ ᓂᕿᑐᖅᑏᑦ ᐃᓂᖃᕝᕕᖏᑦ ᐊᒻᒪ ᐃᕐᓂᐅᕐᕈᓯᖏᓐᓄᑦ ᖃᐅᔨᓴᕐᓃᑦ ᓄᖅᑲᖅᑎᑕᐅᓚᐅᑲᒃᓯᒪᔪᑦ ᑕᐃᒪᙱᓚᓂᑦ 2021-ᒥ. ᓯᕗᓂᒃᓴᒥ ᖃᐅᔨᓴᕐᓂᕐᒥᒃ ᑐᒃᓯᕋᖅᑕᐅᓯᒪᔭᖃᙱᑦᑐᖅ.

**ᓂᕐᔪᑎᓂᒃ ᑕᑯᒃᑦᑕᐅᑎᖃᑦᑕᕐᓂᖅ** - ᖁᓛᑦ ᓂᕐᔪᑏᑦ ᑐᖁᑕᐅᓯᒪᔪᑦ ᐅᖃᐅᓯᐅᔪᑦ 2024-ᒥ, ᐊᑕᖏᖅᓗᒋᖅ ᐃᓛᒃᑰᖅᑕᖅᑲᑎᒃ ᑐᖁᓯᒪᔪᑦ. ᑐᖁᔪᑦ 2024-ᒥ ᐱᖃᓯᐅᔾᔨᓯᒪᔪᑦ ᐊᕕᓂᕐᓂᒃ ᐃᒪᔪᒃ ᐊᔾᔨᑦᖏᕆᐊᕐᔪᒃᑐᓂᒃ: ᑎᓇᒐᓂᐊᖅ (4), ᐅᑲᓕᖅ (1), ᖃᖅᓴᐅᖅ (1) , ᐊᕿᒡᒋᖅ (2), ᖁᐸᓄᐊᖅ (1), ᐊᒻᒪ ᓇᓗᓇᐃᖅᑕᐅᓯᒪᙱᑦᑐᑦ ᐅᖃᓗᕋᐅᔭᖅᑎ ᑎᖏᐊᕋᓛᖅ (1). ᓄᓇᓯᐅᑎᓄᑦ ᐊᐳᖅᑕᐅᓂᖏᑦ ᓇᓗᓇᐃᖅᑕᐅᓯᒪᔪᑦ ᐅᕙᓘᓐᓃᑦ ᐸᓴᔭᐅᔪᑦ ᑐᖁᑕᐅᔪᓪᓗᒃᑖᓂ ᑭᑭᑕᐅᓪᓗᑎᒃ ᐱᖓᓱᑦ - ᒪᕐᕉᒃ ᑐᖁᔫᒃ ᖃᐅᔨᒪᔭᐅᙱᑦᑐᑦ ᑭᓯᒨᖏᓐᓄᑦ, ᐊᑕᐅᓯᖅ ᑐᖁᔪᖅ ᐱᔾᔪᑕᐅᓪᓗᑎᒃ ᐊᑦᑕᑕᕐᓂᖏᓐᓄᑦ ᐱᔭᕇᖅᓯᓇᓱᐊᖅᑎᓪᓗᒋᑦ ᐊᓱᖏᓐᓂᒃ ᖃᐅᔨᓴᕐᓂᒥ. ᐊᔪᕐᓇᙱᑐᐊᕌᖓᑦ, ᐸᓚᐅᒪᑎᑦᑎᓇᓱᖕᓃᑦ ᐊᑐᓕᖅᑎᑕᐅᓯᒪᒃᑕᖅᑐᑦ ᐱᓗᐊᕐᑯᔭᐅᓇᑎᒃ ᐅᓗᕆᐊᓇᕈᓐᓇᖅᑐᑦ ᐱᓕᕆᐊᒧᑦ-ᐊᒃᑐᐊᔪᑦ ᓂᕐᔪᑏᑦ ᐋᓐᓂᕐᓂᖏᓐᓄᑦ ᑐᖁᑕᐅᓂᖏᓐᓄᓪᓘᓐᓃᑦ.

## ᑎᑎᕋᖅᓯᒪᔪᖅ 0. ᓇᐃᓈᖅᓯᒪᔪᑦ ᐊᕙᑎᒧᑦ ᐊᒃᑐᐃᓂᕐᓂᒃ ᖃᐅᔨᓴᖅᐸᓪᓕᐊᖏᓐᓇᕐᓃᑦ ᐊᒻᒪ ᖃᐅᔨᓴᕐᓂᕐᒥ ᐱᓕᕆᓃᑦ ᓄᓘᔾᔪᓐᓂ ᐱᓕᕆᐊᒥ 2024-ᒥ

| ᖃᐅᔨᓴᕐᓂᖅ | ᐱᔾᔪᑖ ᖃᐅᔨᓴᕐᓂᕐᒧᑦ[1] | ᐱᓕᕆᐊᑦ ᐱᔭᕇᖅᑕᐅᓯᒪᔪᑦ, ᐊᒃᑐᐃᓃᑦ ᐅᔾᔨᕆᔭᐅᔪᑦ, ᐱᑕᖃᕆᐊᓖᑦ ᐸᓪᐅᒪᑎᑦᑎᓇᓱᐃᑦ, ᐊᒻᒪ ᐊᑐᓕᕐᑯᔭᐅᔪᑦ ᓯᕗᓂᒃᓴᒥ ᐱᓕᕆᐊᒃᓴᓄᑦ | ᖃᓄᐃᓐᓂᖅᓴᐅᓂᖏᑦ ᐊᒃᑐᐃᓂᕐᓄᑦ ᓇᓚᐅᑦᑖᖅᑕᐅᓯᒪᔪᓄᑦ[2] |
|---|---|---|---|
| ᓯᓚᒥᒃ ᖃᐅᔨᓴᖅᐸᓪᓕᐊᖏᓐᓇᕐᓂᖅ | ᐃᑲᔪᖅᑐᐃᔪᖅ ᐊᓯᔫᒃᑖᖏᓐᓂᒃ ᖃᐅᔨᓴᕈᑎᓂᒃ ᑲᑎᑦᑎᓂᕐᒧᑦ ᐊᒻᒪ ᖃᐅᔨᓴᖅᐸᓪᓕᐊᖏᓐᓇᕐᓂᕐᒧᑦ ᐱᓕᕆᐊᓄᑦ | ᓯᓚᐅᑉ ᖃᓄᐃᑦᑑᓂᖓ ᑎᑎᕋᖅᑕᐅᖃᑦᑕᖅᑐᑦ ᐃᑲᕐᕋᑕᒫᑦ ᐅᔾᔨᖕᓂᐊᕐᕕᖕᒥ ᐊᒻᒪ ᕿᒪᒍᐊᓂ ᑐᓚᒃᑕᕐᕕᖕᒥ ᓯᓚᓐᓂᐊᕐᕕᖕᒥ. ᓯᓚᒧᑦ ᖃᐅᔨᓴᕈᑏᑦ ᑎᑎᕋᖅᑕᐅᖏᓐᓇᐅᔭᖅᑐᑦ ᑕᐃᒪᙵᓂᑦ 2005-ᒥᓂᑦ (ᐅᔭᕋᖕᓂᐊᕕᒃ ᐊᒻᒪ 2006 (ᕿᒪᒍᐊᓂ ᑐᓚᒃᑕᕐᕕᒃ). ᓯᓚᒧᑦ ᖃᐅᔨᓴᕈᑏᑦ ᐊᑐᖅᑕᐅᓲᑦ ᐃᑲᔪᖅᑕᐅᕐᑯᓪᓗᖏᑦ ᐊᓯᖏᑦ ᖃᐅᔨᓴᖅᐸᓪᓕᐊᖏᓐᓇᕐᓂᕐᒧᑦ ᐱᓕᕆᐊᑦ; ᐸᓚᐅᒪᑎᑦᑎᓇᓲᑏᑦ ᐊᔪᕐᓇᖅᑎᓪᓗᒋᑦ.<br>ᓯᓚᓐᓂᐊᕐᕖᑦ ᑲᑎᑦᑎᕙᓪᓕᐊᖏᓐᓇᕐᓂᐊᖅᑐᑦ ᓯᓚᒧᑦ ᖃᐅᔨᓴᕈᑎᓂᒃ 2025-ᒥ. | ᐱᑕᖃᙱᑦᑐᖅ |
| ᖁᓕᒨᑦ ᖁᓚᐅᖃᑦᑕᕐᓂᖏᓐᓄᑦ ᕿᒥᕐᕈᓂᖅ | 72<br>ᑲᒪᔭᖃᖅᑐᑦ ᐱᓕᕆᐊᒥ ᒪᓕᒃᑕᐅᔭᕆᐊᓖᑦ 59, 71, ᐊᒻᒪ 72 | ᑭᑭᓯᒪᓪᓗᑎᒃ ᐊᐅᓚᓂᕐᒧᑦ ᐱᔾᔪᑎᖃᖅᐳᑎᒃ, ᐊᒻᒪ ᐱᔾᔪᑕᐅᔪᖅ ᖁᓕᒨᒧᑦ ᐊᕐᑯᑎᐅᑉ ᐃᓱᒪᒃᓰᑎᒋᓪᓗᓂᐅᒃ ᐱᔪᑎᒋᓪᓗᒋᑦ ᖃᖓᑕᓲᑦ ᐊᒻᒪ ᐃᓄᐃᑦ ᐊᑦᑕᕐᓇᖅᑕᐃᓕᒫᔪᑎᖏᓐᓄᑦ, ᐊᕐᑯᑏᑦ ᖁᓚᐅᓐᓂᖃᐃᓐᓇᓇᐊᓖᑦ 650 ᒦᑕᓂᒃ ᐃᖏᕐᕋᑎᓪᓗᒋᑦ ᐃᓂᒃᑯᑦ ᓲᕐᓗ ᑎᑭᑉᐸᒃᑐᑦ ᑎᖕᒥᐊᑦ ᐃᓂᐊᒍᑦ, ᐊᒻᒪ 1,100 ᖁᒻᒧᑦ ᐊᒻᒪ 1,500 ᓴᓂᒧᑦ ᐅᖓᓯᖏᓂᖃᕐᓗᑎᒃ ᖃᐅᔨᒪᔭᐅᔪᓂ ᐱᑕᖃᕐᕕᐅᔪᓂ ᑎᑭᑉᐸᒃᑐᑦ ᑎᖕᒥᐊᑦ ᐃᓂᐊᒍᑦ (ᓲᕐᓗ ᑲᖑᐃᑦ ᐃᓂᐊᒍᑦ). ᖃᖓᑕᓂᕐᒧᑦ ᐊᖅᑯᑏᑦ ᐊᑐᖅᑕᐅᓲᑦ ᐃᓂᒃᑰᕐᑯᔭᐅᓇᑎᒃ ᓂᕐᔪᑎᓄᑦ ᐱᕐᔪᐊᕆᔭᐅᔪᑎᒍᑦ.<br>ᖁᓕᒨᑦ ᖃᖓᑕᖃᑦᑕᕐᓂᖏᑦ ᑲᑎᙵᑦ ᒪᓕᖕᓂᕐᒧᑦ ᐃᓗᐊᓂ ᑲᖑᐃᑦ ᐃᓂᖃᕐᕕᖓᒍᑦ ᐃᓴᐅᑎᓪᓗᖏᑦ (ᔪᓚᐃᒥᑦ ᐋᒌᓯᒧᑦ) 70.03%-ᖑᓚᐅᖅᑐᑦ 2024-ᒥ. ᓯᓚᑖᒍᑦ ᑲᖑᐃᑦ ᐃᓂᖃᕐᕕᖓᒍᑦ, ᐊᒻᒪ ᐊᓯᔫᒃᑖᖏᓐᓂ ᐃᓂᓂ ᐃᓴᐅᙱᑎᓪᓗᒋᑦ ᑕᖅᑭᕐᓂ (ᓯᑎᐱᕆᒥᑦ ᒪᐃᒧᑦ), 2024 ᑲᑎᙵᑦ ᒪᓕᖕᓃᑦ 72.42%. ᖁᓚᐅᓐᓂᕐᒧᑦ ᖃᐅᔨᓴᕈᑏᑦ ᖃᐅᔨᒋᐊᕐᕕᐅᓯᒪᔪᑦ ᐊᕐᕕᓂᓖᑦ ᒪᕆᐳᓪᓗ ᑭᖑᓕᕇᑦ ᐊᕐᕌᒍᑦ ᖃᐅᑕᒫᑦ ᖁᓕᒨᑦ ᐊᕐᑯᑎᖏᑕ ᑎᑎᕋᖅᐸᒃᑕᖏᓐᓄᑦ ᓈᒻᒪᖕᓂᕋᐃᓇᓱᐊᖅᐳᑎᒃ ᐊᑦᑎᓈᖅᑐᓄᑦ ᖃᖓᑕᓂᕐᓄᑦ 2024-ᒧᑦ. ᐊᑦᑎᓈᖅᑐᑦ ᓈᒻᒪᒃᑐᒥᒃ ᐃᓱᒪᒋᔭᐅᔪᑦ ᐃᓱᒪᕆᖅᓱᐅᔾᔭᐅᓯᒪᔪᑦ "ᒪᓕᖕᓂᕐᓇᓂᒃ ᐃᓱᒪᒋᔭᐅᔪᓂᒃ". ᓈᒻᒪᒃᑐᒥᒃ ᐃᓱᒪᒋᔭᐅᔪᑦ ᐱᖃᓯᐅᔾᔨᔪᑦ ᓯᓚ, ᑲᓕᓐᓂᕐᓂᒃ, ᖃᓂᑦᑐᒧᑦ ᖃᖓᑕᓃᑦ, ᐱᖏᖕᓇᖅᑐᓕᕆᓃᑦ, ᖃᐅᔨᓴᕐᓃᑦ, ᐋᖅᑭᐅᒪᑎᑦᑎᓂᕐᒧᑦ ᖃᖓᑕᓃᑦ, ᑐᐊᕕᕐᓇᖅᑐᒃᑯᑦ ᖃᖓᑕᓃᑦ, ᐊᒻᒪ ᓄᓇᒥᑦ ᖃᐅᔨᓴᕐᓂᕐᒧᑦ. | ᑮᓕᐅᔪᖅ ᐊᒃᑐᖅᑕᐅᔪᓄᑦ (ZOI), ᐊᒃᑐᐃᓃᑦ ᓂᕆᐅᒋᔭᐅᔪᑦ ᑮᓕᖃᕐᓂᐊᕐᓂᖏᓐᓇᓂᒃ. ᑕᒪᐃᓐᓄᓗᒃᑖᖅ, ᓄᓇᖓᓂ ᐸᒡᕕᓴᐃᓃᑦ ᐊᒃᑐᐊᓂᖃᖅᑐᑦ ᐱᓕᕆᐊᑉ ᐱᕙᓪᓕᐊᕝᕕᖓᓂ (PDA) ᐊᒻᒪ ᓄᓇᖓᓂ ᖃᐅᔨᓴᕝᕕᐅᔪᑦ ᐊᖏᔫᓂᖓᓄᑦ ᓂᕆᐅᒋᔭᐅᔪᖅ ᐱᑕᖃᕐᓂᐊᕋᓱᒋᔭᐅᓪᓗᓂ ᐃᓚᖓᓂᒃ ᐃᒃᐱᖕᓂᖅᓴᕋᐃᑦᑐᓄᑦ ᐸᒡᕕᓴᐃᓂᕐᓂᒃ, ᑭᓱᐊᓂᓕ ᓴᖅᑮᓇᔭᙱᑦᑐᑦ ᐊᖏᔪᒥᒃ ᐊᒃᑐᐃᓂᕐᔪᖕᓂᕐᒥᒃ ᑲᖑᐃᑦ ᐅᓄᕐᓂᖏᓐᓄᑦ. ᑐᕐᑕᐅᓪᓚᑦᑖᖃᑦᑕᕐᓂᖏᑦ ᐱᔾᔪᑕᐅᓪᓗᑎᒃ ᖃᖓᑕᓲᑦ ᑕᐃᒪᐃᓐᓂᐊᕋᓱᒋᔭᐅᙱᑦᑐᑦ ᐊᒻᒪ, ᑕᐃᒪᐃᒻᒪᑦ, ᓂᕆᐅᒋᔭᐅᔪᑦ ᐊᖏᔫᒥᒃ ᐊᒃᑐᐃᓂᕐᔪᒃᓂᖅᑕᖃᕐᓂᐊᕋᓱᒋᔭᐅᙱᓐᓂ.<br>ᒪᓕᖕᓂᕐᒧᑦ ᐊᑦᑎᓖᓇᔫᓇᖅᑕᖏᓐᓄᑦ ᖃᖓᑕᓃᑦ ᐊᑯᓂᖅᓯᓚᐅᖅᑐᑦ 2024-ᒥ ᐃᓱᒪᒋᖅᑯᓯᐅᔾᔭᐅᓗᑎᒃ ᖃᖓᑕᓲᖅᑏᑦ ᐃᓱᒪᒋᔭᖏᑦ ᐊᑦᑎᓈᕐᓂᕐᒧᑦ ᖃᖓᑕᓃᑦ ᐊᒻᒪ ᖃᖓᑕᓃᑦ ᐃᑲᕐᕋᑦ ᐃᓗᐊᓂ ᑲᖑᖃᖅᑐᓂ ᑮᓕᖃᖅᓯᒪᓗᑎᒃ ᓂᒥᖅᐸᓯᖕᒧᑦ ᑲᓇᖕᓇᔾᔨᒧᑦ ᑮᓕᖃᖅᐳᑎᒃ, ᑕᐃᒪᐃᓐᓂᖓᓄᑦ ᖃᓄᐃᓈᖅ ᐸᒡᕕᓴᐃᓃᑦ ᐱᓗᐊᖅᑎᓯᒪᙱᑦᑐᑦ ᐃᓱᒪᒋᓪᓗᒋᑦ ᐊᑕᖏᖅᐳᒋᑦ ᑲᖑᖃᖅᑐᑦ, ᒪᓕᑐᐃᓇᖅᑐᑦ ᑭᖑᓪᓕᖅᐸᒥ ᐊᕙᑎᒧᑦ ᐊᒃᑐᐃᓂᐅᓂᐊᖅᑐᑦ ᐅᓂᒃᑳᓂ (FEIS) ᓇᓚᐅᑦᑖᖅᑕᐅᓯᒪᔪᓂ. ᑭᓯᐊᓂᓕ, ᓈᒻᒪᑲᓯᒋᔭᐅᙱᑦᑐᑦ ᖃᐅᔨᓴᖅᐸᓪᓕᐊᖏᓐᓇᖅᑕᐅᓗᑎᒃ ᐊᒃᑐᐃᓂᐅᑐᐃᓐᓇᓇᐊᓖᑦ ᐊᑦᑎᓈᖅᑐᓄᑦ ᑲᖑᐃᑦ |

[1] ᐱᓕᕆᐊᒥ ᒪᓕᒃᑕᐅᔭᕆᐊᓖᑦ ᐊᒻᒪ ᐱᓕᕆᐊᒥ ᐱᓂᐊᕐᓂᕐᕈᑏᑦ ᒪᓕᒃᓗᒋᑦ ᓄᓇᕗᒻᒥ ᐊᕙᑎᓕᕆᔨᒃᑯᑦ ᑲᑎᒪᔨᖏᑦᑕ ᐅᔭᕋᖕᓂᐊᕈᓇᐅᑎ ᓈᓴᐅᑖ 005 (ᓄᓇᕗᒻᒥ ᐊᕙᑎᓕᕆᔨᒃᑯᑦ ᑲᑎᒪᔨᖏᑦ 2014)

[2] ᓄᓘᔾᔪᓐᓂ ᐱᓕᕆᐊᒥ ᑭᖑᓪᓕᖅᐸᒥ ᐊᕙᑎᒧᑦ ᐊᒃᑐᐃᓂᐅᓂᐊᖅᑐᑦ ᐅᓂᒃᑳᑦ (FEIS): ᕿᒥᕐᕈᐊᖅ 6 - ᓄᓇᐅᑉ ᐊᕙᑎᖓ (ᐸᕝᕙᓛ ᓴᕕᒃᓴᓂᒃ ᐅᔭᕋᖕᓂᐊᖅᑏᑦ ᑯᐊᐳᕇᓴ 2012ᐃ) ᐊᒻᒪ ᓄᓘᔾᔪᓐᓂ ᐱᓕᕆᐊᖅ ᑮᓇᐅᔭᒃᓴᓕᕆᓇᓱᐊᕐᓂᕐᒧᑦ ᐅᐃᒍᑦ ᑖᖁᓄᖓ ᑭᖑᓪᓕᖅᐸᒥ ᐊᕙᑎᒧᑦ ᐊᒃᑐᐃᓂᐅᓂᐊᖅᑐᑦ ᐅᓂᒃᑳᑦ (FEIS): ᕿᒥᕐᕈᐊᖅ 6 - ᓄᓇᐅᑉ ᐊᕙᑎᖓ (ᐸᕝᕙᓛ ᓴᕕᒃᓴᓂᒃ ᐅᔭᕋᖕᓂᐊᖅᑏᑦ ᑯᐊᐳᕇᓴ 2013ᐃ).

## ᑎᑎᕋᖅᓯᒪᔪᖅ 0. ᓇᐃᓈᖅᓯᒪᔪᑦ ᐊᕙᑎᒧᑦ ᐊᒃᑐᐃᓂᕐᓂᒃ ᖃᐅᔨᓴᖅᐸᓪᓕᐊᖏᓐᓇᕐᓃᑦ ᐊᒻᒪ ᖃᐅᔨᓴᕐᓂᕐᒥ ᐱᓕᕆᓃᑦ ᓄᓘᔾᔪᓐ ᐱᓕᕆᐊᒥ 2024-ᒥ

| ᖃᐅᔨᓴᕐᓂᖅ | ᐱᔾᔪᑖ ᖃᐅᔨᓴᕐᓂᕐᒧᑦ[1] | ᐱᓕᕆᐊᑦ ᐱᓯᕆᖅᑕᐅᓯᒪᔪᑦ, ᐊᒃᑐᐃᓃᑦ ᐅᔾᔨᕆᓴᐅᔪᑦ, ᐱᑕᖃᕆᐊᓖᑦ ᐸᓚᐅᒪᑎᑦᑎᓇᓲᑏᑦ, ᐊᒻᒪ ᐊᑐᓕᕐᑯᓴᐅᔪᑦ ᓯᕗᓂᒃᓴᒥ ᐱᓕᕆᐊᒃᓴᓄᑦ | ᖃᓄᐃᓐᓂᖅᓴᐅᓂᖏᑦ ᐊᒃᑐᐃᓂᕐᓄᑦ ᓇᓚᐅᑦᑖᖅᑕᐅᓯᒪᔪᓄᑦ[2] |
|---|---|---|---|
| | | ᕐᑯᓕᒨᒃᑯᑦ ᕐᑯᓚᐅᓐᓂᕐᓂᒃ ᕿᒥᕐᕈᓃᑦ ᑲᔪᓯᓂᐊᖅᑐᑦ ᑭᓯᐊᓂ ᒪᓕᖅᑎᕆᒃᑐᐃᓐᓇᐅᓕᕈᑎᒃ ᐱᐅᓯᐅᑉᐳᑦ ᓇᓗᓇᐃᖅᑕᐅᓯᒪᓕᕈᑎᒃ. | ᐊᓯᖏᓐᓄᓪᓘᓐᓂᑦ ᑎᑭᑉᐹᒃᑐᓄᑦ ᑎᖏᐊᓄᓪᓚᑦᑖᖅ, ᑕᐃᒪᐃᓕᐅᕋᓱᐊᕐᓂᖅ ᐅᐸᒃᓯᖃᑦᑕᔭᖅᑐᑦ ᑲᖑᕐᓂ ᐃᓴᐅᕝᕕᐅᔪᓄᑦ ᕐᑯᓕᒨᒃᑯᑦ, ᑕᐃᒪᐃᓂᖓᓄᑦ ᓴᖅᑮᓇᔭᖅᑐᑦ ᐸᒡᕕᓴᐃᒋᐊᓪᓚᖕᓂᐅᑐᐃᓐᓇᑎᐊᓕᖕᓂᒃ.<br><br>ᑐᕐᑯᑎᓂᖅᑕᒃᓪᓚᑦᑖᖏᑦᑐᖅ ᖃᖓᑕᓲᑦ ᐱᔾᔪᑕᐅᓪᓗᑎᒃ ᑎᑎᕋᖅᑕᐅᓯᒪᔪᓂᒃ, ᒪᓕᑐᐃᓐᓇᖅᑐᖅ ᐊᒃᑐᐃᓂᕐᓄᑦ ᓇᓚᐅᑦᑖᖅᑕᐅᓯᒪᔪᓄᑦ. |
| ᐅᓯᒃᖃᖅᑏᑦ ᐊᖅᑯᑖᓂ ᐃᖏᕐᕋᒃᑕᖅᑐᓂᒃ ᖃᐅᔨᓴᖅᐸᓪᓕᐊᖏᓐᓇᕐᓃᑦ | ᐊᒃᑐᐊᖃᑕᐅᔪᑦ ᓂᕐᔩᑦ ᐸᒡᕕᓴᒃᑕᐅᓂᖏᓐᓄᑦ ᐊᒻᒪ ᐃᑲᔪᖅᑑᑎᓂᒃ ᖃᐅᔨᓴᕈᑎᖃᕐᓗᑎᒃ ᐳᔪᖅ ᓯᐊᒻᒪᒃᐸᓪᓕᐊᕙᒃᑐᒥᒃ ᖃᐅᔨᓴᖅᐸᓪᓕᐊᖏᓐᓇᕐᓂᕐᒧᑦ ᐱᓕᕆᐊᒧᑦ | ᐊᕐᕌᒍᑕᒫᑦ ᓇᐃᓈᖅᓯᒪᔪᑦ ᐃᖏᕐᕋᒃᑕᐃᓐᓇᕐᓂᖏᓐᓄᑦ ᖃᐅᔨᓴᖅᐸᓪᓕᐊᖏᓐᓇᕐᓂᕐᒧᑦ. ᐊᒃᑐᐊᓂᒃᓪᓚᑦᑖᖅᑐᓂᒃ ᐅᔾᔨᕆᓴᐅᔪᖅᑲᖔᕐᑐᑦ ᓂᕆᐅᓇᖕᕐᑐᓄᑦ ᐊᒃᑐᐃᓂᕐᓄᑦ. ᐃᖏᕐᕋᒃᑕᕐᓃᑦ ᖃᓄᐃᕐᐅᓂᖏᓐᓄᑦ ᖃᐅᔨᓴᖅᐸᓪᓕᐊᖏᓐᓇᕐᓃᑦ ᑲᔪᓯᑎᑕᐅᒃᑕᕐᓂᐊᖅᑐᑦ ᐊᑯᓚᐃᓕᓈᑎᒍᑦ. | ᓈᓴᐅᑕᐅᓚᔫᑐᖅ ᑲᑎᓱᕆᑦ ᓄᓇᓯᐅᑏᑦ ᐃᖏᕐᕋᒃᑕᖅᑐᑦ 2024-ᒥ 281.2 ᐃᖏᕐᕋᒃᑕᖅᑐᑦ ᐊᑐᓂ ᐅᓪᓗᕐᒧᑦ (ᓴᕝᓴᓂᒃ ᐅᓯᔪᑦ ᓈᓴᐅᑎᖃᖅᓗᑎᒃ 246.3-ᒥᒃ ᐅᑎᖅᑕᖅᑐᑦ ᖃᐅᑕᒫᑦ). ᑖᒃᑯᐊ ᖃᐅᑕᒫᑦ ᓈᓴᐅᑎᐅᓚᔫᑦᑐᑦ ᐅᖓᑕᐅᔾᔮᐊᕐᔫᓯᒪᔪᑦ ᓇᓚᐅᑦᑖᖅᑕᐅᓯᒪᔪᓂ ᓈᓴᐅᑎᓂ ᑕᐃᑲᓂ ᑭᖑᓪᓕᖅᐹᒥᒃ ᐊᕙᑎᒧᑦ ᐊᒃᑐᐃᓂᐅᓂᐊᖅᑐᑦ ᐅᓂᒃᑳᓂ (FEIS) ᐅᐃᒍᓂ ᐅᔾᔪᖅᓂᐊᕆᐊᓪᓚᒍᒪᓂᕐᒧᑦ ᑐᒃᓯᕋᐅᑉᒥ. |
| ᐱᑕᖃᐃᓐᓇᖅᑐᖅ ᐳᔪᖅ ᓯᐊᒻᒪᒃᐸᓪᓕᐊᔪᒥᒃ ᖃᐅᔨᓴᖅᐸᓪᓕᐊᖏᓐᓇᕐᓃᑦ | ᑲᒪᒋᔭᖅᑐᖅ ᐱᓕᕆᐊᒥ ᒪᓕᒃᑕᐅᔪᓇᐊᓖᑦ 36, 50, 54ᑭ, 58ᑎ ᐊᒻᒪ ᐱᓕᕆᐊᒥ ᐱᓂᐊᕐᓂᕐᕈᑎ 60 | ᐳᔪᕐᒥᒃ ᑲᑎᖅᓱᐃᕚᑦ 43-ᓂ ᐃᓂᐅᔪᓂ ᐃᓕᐅᖅᑲᖅᑕᐅᓚᐅᖅᑐᑦ ᐱᓕᕆᕚᖕᒥᕈᔪᒃ, ᐅᖓᓯᖕᓂᖅᓴᐅᓪᓗᑎᒃ ᐱᓕᕆᐊᑉ ᐱᕙᓪᓕᐊᕚᖓᓂ (PDA) ᖃᐅᔨᒋᐊᕐᕕᐅᔪᓇᖅᑐᑦ ᐃᓃᑦ ᖃᐅᔨᓴᖅᐸᓪᓕᐊᖏᓐᓇᕐᓂᕐᒧᑦ ᐅᖓᓯᒃᑎᒋᓂᖓᓂ ᖃᓄᑎᒋᐅᖓᖔᑦ. ᐊᕐᕕᓂᓖᑦ ‘ᐳᒃᑭᑦᑐᑦ’ ᖃᐅᔨᓴᖅᐸᓪᓕᐊᖏᓐᓇᕐᓂᕐᒧᑦ ᐃᓚᔭᐅᓚᐅᖅᑐᑦ 2021-ᒥ ᐃᓚᒋᔭᐅᓪᓗᑎᒃ ᓯᕗᓪᓕᖅᐹᖅᓯᐅᑎᓄᑦ ᖃᐅᔨᓴᕈᑎᓄᑦ (ᑕᐃᒪᐃᕐᑯᔭᐅᓯᒪᔪᑦ ᕿᑭᖅᑕᓂ ᐃᓄᐃᑦ ᑲᑐᔾᔨᖃᑎᒌᖕᒋᓐᓂ ᐊᒻᒪ ᓄᓇᐅᑉ ᐊᕙᑎᖓᓄᑦ ᐱᓕᕆᖃᑎᒌᓂ) ᖃᐅᔨᓴᖅᑕᐅᕐᑯᓗᒋᑦ ᐊᔾᔨᒌᒃᑕᖃᑦᑕᙱᓐᓂᖏᑦ ᑖᒃᑯᓇᓂ ᐳᔪᖅ ᓯᐊᒻᒪᒃᐸᓪᓕᐊᔪᖅ ᖃᐅᔨᓴᓚᒃᓴᓕᐊᖅ ᐊᑐᖅᑕᐅᓚᔫᑐᒥ ᐳᖅᑐᓂᓕᖓᓂ 2.0 ᒦᑕᓂ ᐊᒻᒪ ᖃᓂᓐᓂᖅᓴᐅᓗᑎᒃ ᒪᓂᕋᕐᒧᑦ 0.5 ᒦᑕᒥ. ᕐᑯᓖᑦ ᒪᕿᒡᓗ ᐊᕐᕌᒍᐃᑦ ᖃᐅᔨᓴᖅᐸᓪᓕᐊᖏᓐᓇᖅᑎᓪᓗᒋᑦ ᐋᒃᒌᓯ 2013-ᒥᑦ ᑎᓯᐱᕆ 2024-ᒧᑦ ᐱᔭᕇᖅᑕᐅᓯᒪᓕᖅᑐᑦ ᐊᑐᖅᖢᑎᒃ 2.0 ᒦᑕᓂᒃ ᐳᖅᑐᓂᓕᖕᓂᒃ ᑲᑎᖅᓱᐃᕚᖕᓂᒃ.<br><br>ᐱᑕᖃᐃᓐᓇᖅᑐᑦ ᐳᔪᖅ ᓯᐊᒻᒪᒃᐸᓪᓕᐊᔪᓂᒃ ᖃᐅᔨᓴᖅᐸᓪᓕᐊᖏᓐᓇᕐᓃᑦ ᓇᓗᓇᐃᖅᓯᔪᑦ ᐃᓂᓂᒃ ᐱᑕᖃᕐᕕᐅᕙᒃᓯᒪᔪᓂᒃ ᐳᔪᖅ ᓯᐊᒻᒪᒃᐸᓪᓕᐊᔪᓂᒃ ᑭᒡᓕᖃᖅᑐᑦ ᐃᓗᐊᓂᓪᓗᐊᑕᖅ 1,000 ᒦᑕᑦ ᐱᓕᕆᐊᑉ ᐱᕙᓪᓕᐊᕚᖓᓂ (PDA). ᖃᐅᔨᓴᕐᓂᖅ ᐳᔪᖅ ᓯᐊᒻᒪᒃᑐᓂᒃ ᖃᐅᔨᓴᖅᐸᓪᓕᐊᖏᓐᓇᕐᓂᖅ ᓯᓚᑖᓂ ᐱᓕᕆᐊᑉ ᐱᕙᓪᓕᐊᕚᖓᓂ (PDA), ᑭᓯᐊᓂᓕ 5,000 ᒦᑕᑦ ᕿᑎᐊᓂᑦ ᐱᒋᐊᖅᖢᒍ, ᓇᓗᓇᐃᖅᓯᔪᖅ ᐳᔪᖅ ᓯᐊᒻᒪᒃᑐᖅ ᐱᓗᐊᖅᓯᒪᙱᓐᓂᖓᓂᒃ 2024-ᒥᓗᒃᑖᖅ. | ᐊᕐᕌᒍᑕᒫᑦ ᑲᑎᙵᖏᑦ ᖃᖓᑦᑕᑉᐳᑦ ᒥᑭᔪᖖᑦ ᓯᐊᒻᒪᒃᐸᓪᓕᐊᓂᖏᓐᓄᑦ ᖃᓄᑎᒋᐅᓂᖏᑦ ᓇᓚᐅᑦᑖᖅᑕᐅᓯᒪᔪᑦ ᐅᖓᑕᐅᔾᔨᓯᒪᓪᓗᑎᒃ 50 ᒍᕋᒻ/ᒦᑕᑦ ᑭᐸᖕᓇᒃᑐᑦ (m²)/ᐊᕐᕌᒍᒧᑦ ᐱᓕᕆᐊᑉ ᐱᕙᓪᓕᐊᕚᖓᓂ (PDA), ᑲᑎᙵᖏᑦ ᑲᑎᓪᓗᒃᑖᖅᑲᖏᑦ ᖃᖓᑦᑕᖅᑐᑦ ᒥᑭᑦᑐᕋᓛᑦ (TSP) ᖃᓄᑎᒋᐅᓂᖏᑦ ᐅᓄᕈᓐᓃᖅᐸᓪᓕᐊᔪᑦ ᐅᖓᓯᒋᐊᕐᔪᒃᑕᖓᓂ ᐱᓕᕆᐊᑉ ᐱᕙᓪᓕᐊᕚᖓᓂ (PDA). 2024-ᒥ ᐳᔪᖅ ᓯᐊᒻᒪᒃᐸᓪᓕᐊᔪᖅ ᖃᐅᔨᔭᐅᔪᖅ ᒪᓕᑐᐃᓐᓇᖅᓯᒪᔪᑦ ᓇᓚᐅᑦᑖᖅᑕᐅᔪᓂ ᐱᕙᓪᓕᐊᓂᖃᓪᓚᑦᑖᖅᑐᓂ ᐳᔪᖅ ᓯᐊᒻᒪᒃᐸᓪᓕᐊᔪᖅ ᐊᑐᖅᑕᐅᓇᔭᖅᑐᖅ ᐃᓗᐊᓂ ᐱᓕᕆᐊᑉ ᐱᕙᓪᓕᐊᕚᖓᓂ (PDA). |

## ᑎᑎᕋᖅᓯᒪᔪᖅ 0. ᓇᐃᓈᖅᓯᒪᔪᑦ ᐊᕙᑎᒧᑦ ᐊᒃᑐᐃᓂᕐᓂᒃ ᖃᐅᔨᓴᖅᐸᓪᓕᐊᕐᕆᓇᕐᓃᑦ ᐊᒻᒪ ᖃᐅᔨᓴᕐᓂᕐᒥ ᐱᓕᕆᓃᑦ ᓄᓘᔮᖕᓂ ᐱᓕᕆᐊᒥ 2024-ᒥ

| ᖃᐅᔨᓴᕐᓂᖅ | ᐱᔾᔪᑖ ᖃᐅᔨᓴᕐᓂᕐᒧᑦ[1] | ᐱᓕᕆᐊᑦ ᐱᔭᕇᖅᑕᐅᓯᒪᔪᑦ, ᐊᒃᑐᐃᓃᑦ ᐅᔾᔨᕆᔭᐅᔪᑦ, ᐱᑕᕐᑲᕆᐊᓖᑦ ᐸᓚᐅᒪᑎᑦᑎᓇᓰᑏᑦ, ᐊᒻᒪ ᐊᑐᓕᕐᑯᔭᐅᔪᑦ ᓯᕗᓂᒃᓴᒥ ᐱᓕᕆᐊᒃᓴᓄᑦ | ᖃᓄᐃᓐᓂᖅᓴᐅᓂᕐᒋᑦ ᐊᒃᑐᐃᓂᕐᓄᑦ ᓇᓚᐅᑦᑖᖅᑕᐅᓯᒪᔪᓄᑦ[2] |
|---|---|---|---|
| | | ᐊᔾᔨᒌᙱᓐᓂᖅᑕᖅᓯᒪᙱᑦᑐᖅ ᖃᐅᔨᓴᐅᔪᓂᒃ ᐳᔪᕐᖅ ᓯᐊᒻᒪᒃᐸᓪᓕᐊᔪᓂᑦ ᐆᒃᑐᕋᖅᑕᐅᓯᒪᔪᓂ ᐳᖅᑐᓂᐅᓚᔫᒃᑐᒥ 2.0 ᒦᑕᒥᑦ ᐊᒻᒪ ᒪᓂᕋᕐᒧᑦ ᖃᓂᓐᓂᖅᓵᐅᔪᓂ 0.5 ᒦᑕᓂ.<br>ᐅᓄᖅᓯᕆᐊᖅᑕᐅᕐᑯᓪᓗᒋᑦ ᖃᔾᓯᐅᓂᕐᒋᑦ ᖃᐅᔨᓴᒃᓴᑦ ᐊᐳᒥᒃ ᖃᐅᔨᓴᒃᓴᓕᐅᕐᓂᕐᒥ ᓯᕗᓪᓕᖅᐹᖅᓯᐅᑏᑦ ᖃᐅᔨᓴᖅᑕᐅᔪᓂ, ᐊᑐᓕᕐᑯᔭᐅᓯᒪᔪᖅ ᕿᑭᖅᑕᓂ ᐃᓄᐃᑦ ᑲᑐᔾᔨᖃᑎᒌᓂ ᐊᒻᒪ ᒐᕙᒪᕐᒋᓐᓂ ᓄᓇᕘᒥ, ᐱᐅᓯᕆᐊᕆᓃᑦ ᖃᐅᔨᓴᒃᓴᓂᒃ ᑲᑎᑦᑎᖃᑦᑕᕐᓂᕐᒧᑦ ᐊᑐᓕᖅᑎᑕᐅᓚᐅᖅᑐᑦ, ᐱᖃᓯᐅᑎᓪᓗᒋᑦ (1) ᐊᑐᕐᓗᑎᒃ ᖃᖓᑦᑕᖅᑎᑕᐅᓯᒪᔪᓂᒃ ᐱᔭᐅᔪᑦ ᐅᓪᓗᕐᒋᑦ ᐊᒻᒪ ᖃᓄᑎᒋᐅᓂᕐᒋᑦ ᐸᕐᓇᒃᑕᐅᔪᓄᑦ ᖃᐅᔨᓴᒃᓴᓕᐅᕐᓂᐅᓛᖅᑐᑦ ᐅᓪᓗᐃᑦ ᓇᓃᓐᓂᕐᒋᓪᓗ, (2) ᐅᖓᕙᕆᐊᕆᓂᖅ ᖃᐅᔨᓴᒃᓴᓕᐅᕐᓂᕐᒧᑦ ᐅᓪᓗᕐᒋᓐᓂᒃ ᓄᙳᐊᓄᑦ ᒪᐃ, (3) ᖃᐅᔨᓴᒃᓴᓕᐅᕐᓂᕐᒧᑦ ᓄᕗᔭᖃᙱᑎᓪᓗᒍ ᐅᓪᓗᓂ, ᐊᒻᒪᓗ (4) ᖃᐅᔨᓴᒃᓴᓕᐅᕐᓃᑦ ᐊᔾᔨᒌᙱᑦᑐᓃᔭᖅᑐᓂᒃ ᐳᔪᕐᓂᒃ ᐱᑕᖃᕐᓂᐅᔪᓂᒃ.<br>ᓯᕗᓂᒃᓴᒥ ᖃᐅᔨᓴᖅᐸᓪᓕᐊᕐᕆᓇᕐᓃᑦ ᑲᔪᓯᓂᐊᖅᑐᑦ ᖃᐅᔨᓴᖅᐸᓪᓕᐊᕐᕆᓇᕐᓗᑎᒃ ᐳᔪᕐᖅ ᓯᐊᒻᒪᒃᐸᒃᑐᒥᒃ 43-ᓂ ᐃᓂᐅᔪᓂ ᐊᐅᔭᒃᑯᑦ ᐊᒻᒪ ᐃᓂᒃᑲᓂᐅᔭᕐᓂ 36-ᓄᑦ ᐊᕐᕌᒍᓕᒫᖅ ᐃᓂᓂ. | |
| ᑕᒫᓂᕐᒥᐅᑕᐅᙱᑦᑐᓂᒃ ᐱᕈᖅᑐᓂᒃ ᖃᐅᔨᓴᖅᐸᓪᓕᐊᕐᕆᓇᕐᓂᖅ | ᑲᒪᒋᔭᖅᑐᖅ ᐱᓕᕆᐊᒥ ᒪᓕᒃᑕᐅᔭᕆᐊᓖᑦ 32 ᐊᒻᒪ 37 | ᖃᐅᔨᓴᕐᓃᑦ ᑐᕌᒐᖅᑐᑦ ᑭᙵᓂᙴᑎᓐᓂ ᐸᒃᕙᓴᒃᑕᐅᓯᒪᔪᓂ ᐃᓂᓂ ᐃᓗᐊᓂ ᐊᒻᒪ ᖃᓂᒋᔭᕐᒋᓐᓂ ᐱᓕᕆᐊᑉ ᐃᓂᕐᒋᓐᓂᑦ ᐱᖃᓯᐅᑎᓪᓗᒋᑦ ᐱᓕᕆᐊᑉ ᑭᒡᓕᕐᒋᓐᓂ ᑕᒫᓂᕐᒥᐅᑕᐅᙱᑦᑐᑦ ᐱᕈᑐᐃᓐᓇᕆᐊᖃᕐᕙᕐᒋᓐᓂ (ᓱᕐᓗ ᑕᐅᕙᓂ ᐱᓕᕆᐊᑉ ᐱᕐᑯᑎᕐᔪᐊᕐᒋᓐᓂ, ᐊᖅᑯᑎᓂ, ᐊᒻᒪ ᐱᕐᑯᑎᖃᕐᕙᐅᔪᓂ ᐃᓂᓂ). ᐅᔭᕋᖕᓂᐊᕐᕙᕐᒥ ᖃᐅᔨᓴᕐᕙᐅᔪᓂ ᐃᓱᒪᒋᖃᓯᐅᔾᔭᐅᔪᓂ ᒪᓂᕋᒐ ᐸᒃᕙᓴᒃᑕᐅᓂᖃᖅᑐᑦ (ᓱᕐᓗ ᓴᖅᑭᑕᐅᓯᒪᔪᑦ ᐃᔾᔪᖅ ᓴᖅᑭᕝᕙᐅᔪᓇᕐᓂᖅᓴᐅᔪᑦ ᑕᒫᓂᕐᒥᐅᑕᐅᙱᑦᑐᓂ ᐱᕈᖅᑐᓂ) ᖃᓂᒋᔭᕐᒋᓐᓂ ᐱᓕᕆᐊᒥ ᐱᓕᕆᐊᕐᒍᔪᓂ ᐊᒻᒪ ᓄᓇᓯᐅᑏᑦ ᐃᕐᒋᕋᖃᑦᑕᕐᕙᕐᒋᓐᓂ (ᓱᕐᓗ ᓄᓇᓯᐅᑏᑦ ᐃᕐᒋᕋᕝᕙᕐᒋᑦ ᑯᒪᕈᕋᖅᑦ ᐆᒪᔪᓇᕐᕙᕐᒋᑦ ᑕᒫᓂᕐᒥᐅᑕᐅᙱᑦᑐᓄᑦ ᐱᕈᖅᑐᓄᑦ).<br>ᑕᒫᓂᕐᒥᐅᑕᐅᙱᑦᑐᑦ ᐱᕈᖅᑐᑦ ᐆᒪᔪᑦ ᐊᔾᔨᒌᙱᖦᐊᔪᒃᑐᑦ ᑎᑎᕋᑕᐅᓯᒪᔪᖃᓚᐅᙱᑦᑐᑦ 2024-ᒥ ᖃᐅᔨᓴᕐᓂᕐᓂ. ᓄᓇᐅᑉ ᐊᕙᑎᖓᓂ ᐊᒻᒪ ᐸᓚᐅᒪᑎᑦᑎᓇᓰᑏᑦ ᖃᐅᔨᓴᖅᐸᓪᓕᐊᕐᕆᓇᕐᓂᕐᒧᑦᓗ ᐸᕐᓇᐅᑏᑦ ᐊᑐᕐᑯᔨᔪᑦ ᖃᐅᔨᓴᕈᑏᑦ ᐊᑯᓚᐃᓐᓂᕐᒋᓐᓂᒃ ᖃᐅᔨᓴᖅᐸᓪᓕᐊᕐᕆᓇᕐᓂᕐᒧᑦ ᑕᒫᓂᕐᒥᐅᑕᐅᙱᑦᑐᓄᑦ ᐱᕈᖅᑐᓄᑦ (ᐱᙶᓰᑦ ᑕᓪᓕᒪᓄᑦ ᐊᕐᕌᒍᓄᑦ, ᒪᓕᒃᑯᓗᑎᒃ ᖃᐅᔨᓴᐅᔪᓂᒃ ᐱᕙᓪᓕᐊᕐᕆᓇᖅᑐᓂ ᖃᓄᐃᑦᑐᖃᖅᑎᓪᓗᒍ ᖃᐅᔨᓴᖅᐸᓪᓕᐊᕐᕆᓇᕐᓂᕐᓂ). ᖃᐅᔨᓴᖅᐸᓪᓕᐊᕐᕆᓇᕐᓃᑦ ᑕᒫᓂᕐᒥᐅᑕᐅᙱᑦᑐᓄᑦ ᐱᕈᖅᑐᓄᑦ ᓂᕆᐅᒋᔭᐅᔪᑦ ᐱᓕᕆᐊᕐᒍᒃᑲᓂᕐᓂᕐᒋᓐᓂᒃ ᐊᑯᓐᓂᕐᒋᓐᓂ 2027 ᐊᒻᒪ 2029-ᒥ. | ᐱᑕᖃᙱᑦᑐᖅ |

## ᑎᑎᕋᖅᓯᒪᔪᖅ 0. ᓇᐃᓈᖅᓯᒪᔪᑦ ᐊᕙᑎᒧᑦ ᐊᒃᑐᐃᓂᕐᓂᒃ ᖃᐅᔨᓴᖅᐸᓪᓕᐊᖑᓇᕐᓃᑦ ᐊᒻᒪ ᖃᐅᔨᓴᕐᓂᕐᒥ ᐱᓕᕆᓃᑦ ᓄᓘᔾᖕᓂ ᐱᓕᕆᐊᒥ 2024-ᒥ

| ᖃᐅᔨᓴᕐᓂᖅ | ᐱᔾᔪᑖ ᖃᐅᔨᓴᕐᓂᕐᒧᑦ[1] | ᐱᓕᕆᐊᑦ ᐱᓯᕗᖅᑕᐅᓯᒪᔪᑦ, ᐊᒃᑐᐃᓂᑦ ᐅᖕᓂᕆᔭᐅᔪᑦ, ᐱᑕᖃᕆᐊᓖᑦ ᐸᓚᐅᒪᑎᑦᑎᓇᓲᑏᑦ, ᐊᒻᒪ ᐊᑐᓕᕐᑯᔭᐅᔪᑦ ᓯᕗᓂᒃᓴᒥ ᐱᓕᕆᐊᒃᓴᓄᑦ | ᖃᓄᐃᓐᓂᖅᓴᐅᓂᖏᑦ ᐊᒃᑐᐃᓂᕐᓄᑦ ᓇᓚᐅᑦᑖᖅᑕᐅᓯᒪᔪᓄᑦ[2] |
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| ᐊᐅᒥ ᑐᒥᓂᒃ ᖃᐅᔨᓴᕐᓂᖅ | ᑲᒪᒋᔭᒃᖢᖅ ᐱᓕᕆᐊᒥ ᒪᓕᒃᑕᐅᔭᕆᐊᓖᑦ 54dii ᐊᒻᒪᓗ 58ᒥ ᑲᒪᒋᔭᒃᖢᖅ ᕿᑭᖅᑕᓂ ᐃᓄᐃᑦ ᑲᑐᔾᔭᖃᑎᒌᑦ ᐃᓱᒪᓘᑎᖏᓐᓂᒃ ᐊᐅᔾᔭᓇᖕᓃᑦ ᐳᖅᑐᓂᖏᑕ ᒥᕐᖠᓄᑦ ᐊᒻᒪ ᐊᒃᑐᐃᓂᖏᑦ ᐆᒪᔪᓄᑦ | 12 ᐊᐅᒻᒥᒃ ᑐᒥᓂᒃ ᖃᐅᔨᓴᕐᓃᑦ ᐱᔭᕇᖅᑕᐅᓚᐅᖅᑐᑦ ᑕᐅᕝᕙ ᐅᓯᑲᖅᑕᖅᑏᑦ ᐊᖅᑯᑖᓂ ᖃᐅᔨᓴᖅᑕᐅᕙᓪᓗᖏᑦ ᓅᖃᑦᑕᕐᓂᖏᑦ ᐊᒻᒪ ᐃᓕᖅᑯᓯᖏᑦ ᑐᒃᑐᐃᑦ ᕼᐋᕗᕋᐊᓇᒥ, ᒫᔾᔨᒥ, ᐊᐃᕐᓇᓕᒥ, ᒪᐃᒥ, ᐅᑐᐱᓇᒥ, ᐊᒻᒪ ᓄᕕᐱᓇ 2024-ᒥ. ᑎᓇᒐᓂᐊᑦ, ᐅᑲᓖᑦ, ᐊᕙᙵᑦ, ᑐᓗᒐᐃᑦ, ᐊᒻᒪ ᐊᕿᒡᒋᑦ ᑖᒃᑯᐊᑐᐊᖑᓚᐅᖅᑐᑦ ᐆᒪᔪᑦ ᐊᔾᔨᒌᙱᐊᕐᔪᒃᑐᑦ ᖃᐅᔨᔭᐅᔪᑦ ᐱᓕᕆᐊᖑᑎᓗᒋᑦ 2024-ᒥ ᖃᐅᔨᓴᕐᓃᑦ. ᓇᓗᓇᐃᕈᑎᑕᖅᑲᐅᒋᑦᑐᖅ ᑐᒃᑐᐃᑦ ᑕᑯᔭᐅᓯᒪᙵᒻᒫᖅ ᖃᓂᒋᔭᖓᓂ ᐃᑳᖅᑐᕕᓂᕐᓂᓪᓘᓐᓃᑦ ᔫᓐᓄᐊᕆ 2020-ᒥᓂᑦ. ᓂᕐᔪᑏᑦ ᐃᓕᖅᑯᓯᖏᑦ ᐅᓯᑲᖅᑕᖅᑏᑦ ᐊᖅᑯᑖᓂ ᑎᑎᕋᖅᑕᐅᖃᑦᑕᖅᓯᒪᔪᑦ ᐊᑐᓂ ᐃᓂᓂ ᑐᒥᓂᒃ ᑕᑯᔪᖃᕐᓂᕋᖓᑦ. ᐅᖃᖃᑎᒋᔭᐅᑎᓪᓗᒋᑦ ᓄᓇᐅᑉ ᐊᕙᑎᖓᓄᑦ ᐱᓕᕆᖃᑎᒌᑦ ᑲᑎᒪᓂᖃᖅᑎᓪᓗᒋᑦ ᐊᑐᓕᕐᑯᔨᓂᖅ ᐊᐅᒥ ᑐᒥᖏᓐᓂᒃ ᖃᐅᔨᓴᕐᓃᑦ ᐊᒻᒪ ᐱᓕᕆᐊᖃᕋᓱᓪᓚᑦᑖᕐᓂᐊᑦᑐᑦ ᐱᓕᕆᔭᐅᕐᓗᓪᓗᒋᑦ ᑕᒪᒃᑯᐊ ᖃᐅᔨᓴᕐᓃᑦ ᐊᑯᓚᐃᓕᕆᐅᖕᓂᖏᓐᓄᑦ, ᐸᕝᕚᓖᓐᑯᑦ ᐊᖏᖅᓯᒪᔪᑦ ᐊᑐᓕᖅᑎᑦᑎᓗᑎᒃ ᑕᒪᒃᑯᓂᖓ ᐊᐅᒥ ᑐᒥᓂᒃ ᖃᐅᔨᓴᕐᓂᕐᓂᒃ ᐊᒻᒪ ᐱᓕᕆᐊᖃᕋᓱᓪᓚᑦᑖᕐᓂᐊᖅᑐᑦ ᐱᓕᕆᐊᖑᓗᑎᒃ ᑖᒃᑯᐊ ᖃᐅᔨᓴᕐᓃᑦ ᐊᑯᓚᐃᓐᓂᖃᕐᓗᑎᒃ ᐊᑕᐅᓯᐊᕐᓗᑎᒃ ᐱᓇᓱᐊᕈᓯᕐᒥ ᑕᐅᕝᕙ ᐅᓯᑲᖅᑕᖅᑏᑦ ᐊᖅᑯᑖᒍᑦ. ᖃᐅᔨᓴᕐᓃᑦ ᐱᓕᕆᐊᖑᖃᑦᑕᕐᓂᐊᖅᑐᑦ ᐊᐅᑎᖃᖅᑎᓪᓗᒍ ᐊᕙᑎᐅᑉ ᖃᓄᐃᓕᖓᓂᖏᑦ ᐱᔪᓇᖅᑎᑦᑎᓚᐅᖓᑕ ᖃᐅᔨᓴᕐᓂᕐᓂᒃ ᐱᓯᕗᖅᑕᐅᔪᓇᕐᓗᑎᒃ ᐊᑑᑎᖃᑦᑎᐊᖅᑐᒃᑯᒃ ᐊᒻᒪ ᐊᑦᑕᕐᓇᙱᑦᑐᒃᑯᑦ. ᖃᓄᐃᓕᖓᓂᕐᓄᑦ ᒪᓕᒋᐊᓖᑦ ᐱᖃᓯᐅᔾᔨᔪᑦ ᐊᐱᕼᖅᑎᓗᒍ (ᐃᓗᐊᓂ 48 ᐃᑲᕐᕋᑦ ᐃᓗᐊᓂ) ᐊᒻᒪ ᓈᒻᒪᒃᑐᒥᒃ ᖃᐅᔨᒪᓂᖅᖃᖅᑎᓪᓗᒍ. ᐊᐅᒥ ᖃᐅᔨᓴᖅᐸᓪᓕᐊᖑᓇᕐᓃᑦ ᑲᔪᓯᓂᐊᖅᑐᑦ 2025-ᒥ ᓈᒻᒪᓈᖅᓯᒪᒌᖓᑕ ᖃᐅᔨᓴᕐᓂᕐᒧᑦ ᖃᓄᐃᓕᖓᓃᑦ ᐊᒻᒪ ᐊᑦᑕᕐᓇᖅᑕᐃᓕᒪᓂᕐᒧᑦ ᐃᓱᒪᒋᖃᓯᐅᔾᔨᔪᑦ ᑎᑭᐅᑎᓯᒪᓂᕋᖓᑕ. | ᓅᖃᑦᑕᓗᐊᕈᓐᓂᖅᑎᓗᒋᑦ ᑐᒃᑐᐃᑦ ᑕᐅᕝᕙ ᐱᓕᕆᐊᒥ ᐱᕐᑯᑎᕐᔪᐊᑎᒧᑦ ᐊᐅᓚᓂᖃᕐᓂᓕᒻᒥᖕᓂ ᓇᓚᐅᑦᑖᖅᑕᐅᓚᐅᖅᓯᒪᔪᖅ ᑭᓯᐊᓂᓕ ᓂᕆᐅᕐᓯᐅᙱᑦᑐᑦ ᐊᖏᔫᑦᑐᐊᕐᓂᖓᓂ ᑐᕌᓇᓴᐅᔪᓂ ᕿᒃᑖᖅᑕᑯᑉ ᐅᐊᖕᓇᖓᓂ ᑐᒃᑐᐃᑦ ᐊᒥᓱᓂᖏᓐᓄᑦ.<br><br>ᒪᓂᕐᒥᒃ ᖃᐅᔨᓴᖅᐸᓪᓕᐊᖑᓇᕐᓃᑦ ᑐᒃᑐᓂᒃ ᐃᒪᐃᓐᓇᕆᐊᖅᑎᑦᑎᒋᐊᖁᑎᒃ ᐊᐅᖅᑕᕈᑎᓄᑦ ᐊᒃᑐᐃᓂᖅᑕᖅᑲᕈᓂ (ᕆᕐᓗ ᑐᓕᓃᑦ ᐊᐅᑎᕙᓪᓕᐊᓯᒪᓗᑎᒃ ᑭᓯᐊᓂᓕ ᐃᑳᖅᓯᒪᙱᓐᓂᓗᑎᒃ ᐊᖅᑯᒥᒃ) ᐊᒻᒪ ᑕᑎᒋᔭᐅᔪᓇᓗᐊᙱᓐᓂᓗᑎᒃ ᑐᒃᑐᐃᑦ ᐊᒥᓲᓂᖏᓐᓄᑦ ᓇᓗᓇᐃᒃᑯᒪᓄᑦ ᓴᕿᔮᖅᑎᑦᑎᔪᑦ ᐅᓄᖅᓯᕙᓪᓕᐊᓂᖏᓐᓄᑦ, ᖃᖓᑕᒌᒃᑯᑦ ᖃᐅᔨᓴᕐᓃᑦ ᐊᑐᖅᑕᐅᑐᐃᓐᓇᕐᓂᐊᓕᑦ ᖃᐅᔨᓴᖅᑕᐅᔪᓐᓂᖅᑐᑦ ᐊᒃᑐᐃᓂᐅᑐᐃᓐᓇᕐᓂᐊᓕᑦ ᐱᓕᕆᐊᖑᕆᐊᓕᓪᓗᑎᒃ.<br><br>ᓱᖃᐃᒻᒪ ᑐᒃᑐᓂᒃ ᑐᒥᑕᖅᑲᐅᓂᖓᓗᓄᑦ ᓇᓗᓇᐃᖅᑕᐅᓯᒪᔪᓂᒃ ᐊᐅᒥ ᑐᒥᖏᓐᓂᒃ ᖃᐅᔨᓴᕐᓂᕐᒥ 2024-ᒥ, ᓇᓗᓇᐃᖅᑕᐅᔪᓐᓇᖅᑐᑦ ᐃᒪᐃᙳᕆᑲᓗᐊᕐᓚᖓᑦ ᐱᓕᕆᐊᒥ ᐱᕐᑯᑎᕐᔪᐊᑦ ᐊᒃᑐᐃᓂᖃᕐᓗᑎᒃ ᑐᒃᑐᐃᑦ ᓅᑉᐸᓐᓂᖏᓐᓄᑦ. |
| ᐊᐅᔾᔭᓇᖕᓂᕐᓂᒃ ᐳᖅᑐᓂᖏᑕ ᖃᐅᔨᓴᖅᐸᓪᓕᐊᖑᓇᕐᓃᑦ | ᑲᒪᒋᔭᒃᖢᖅ ᐱᓕᕆᐊᒥ ᒪᓕᒃᑕᐅᔭᕆᐊᓖᑦ 53ai ᐊᒻᒪ 53ᑎ ᑲᒪᒋᔭᒃᖢᖅ ᐃᓄᐃᑦ ᑲᑐᔾᔭᖃᑎᒌᑦ ᐃᓱᒪᓘᑎᖏᓐᓂᒃ ᐊᐅᔾᔭᓇᖕᓃᑦ ᐳᖅᑐᓂᖏᑕ ᒥᕐᖠᓄᑦ ᐊᒻᒪ ᐊᒃᑐᐃᓂᖏᑦ ᐆᒪᔪᓄᑦ | ᐊᐅᔾᔭᓇᖕᓂᕐᓂᒃ ᖃᐅᔨᓴᖅᐸᓪᓕᐊᖑᓇᕐᓃᑦ ᐱᓕᕆᐊᖑᖃᑦᑕᖅᓯᒪᔪᑦ ᑕᖅᑭᑕᒦᑦ ᔫᓐᓄᐊᕆᒥᑦ ᑎᓯᐱᕆᒧᑦ 2024-ᒥ ᕿᒥᕐᕈᔭᐅᓚᐅᖅᑐᑦ ᒪᓕᖕᓂᕐᒧᑦ 1 ᒦᑕᒥᒃ ᐳᖅᑐᓂᖃᖅᑐᓂᒃ ᖃᓄᐃᓕᖓᓂᖃᖅᑎᖃᕆᐊᖃᓕᒥᒃ, ᐊᐅᑎᖃᖅᑎᓪᓗᒍ. ᐊᐅᓚᑕᐅᓂᖏᑦ ᐊᐅᔾᔭᓇᓃᑦ ᐱᕙᓪᓕᐊᑎᑦᑎᓂᓕᒃ ᐃᒪᔪᑦ ᐃᑳᕈᓯᐅᑎᓪᓗᒋᑦ ᐊᒻᒪ ᐊᕐᑎᑦ ᑕᑯᓐᓇᕐᓂᖅᓴᐅᑎᓪᓗᒋᑦ ᐃᑲᔪᑎᓪᓗᒍ ᐃᒪᔪᓂᒃ-ᓄᓇᓯᐅᑏᑦ ᐊᐅᖅᓯᖃᑦᑕᕐᓇᒥᑦ. ᒪᓕᒃᓗᒋᑦ ᓄᓇᐅᑉ ᐊᕙᑎᖓᓄᑦ ᐱᓕᕆᖃᑎᒌᑦ ᑐᐃᓴᐅᑖ, ᐃᐅᑐᕐᕋᐃᕐᒧᑦ ᐃᓃᑦ ᓇᓂᑐᐃᓈᖅᓯᒪᓕᖅᑐᑦ 2020-ᒥ.<br><br>2024-ᒥ, ᒪᓕᖕᓂᐅᕙᔪᑦ ᐊᐅᔾᔭᒃᑐᑦ ᐳᖅᑐᓂᖏᓂᒃ ᖃᐅᔨᓴᖅᐸᓪᓕᐊᖑᓇᕐᓂᕐᒥ 86%–ᖑᓚᐅᖅᑐᑦ, ᑕᐃᒪᐃᒐᔪᒃᓯᒪᓪᓗᓂᓗ ᐊᐅᔾᔭᒃᑐᑦ ᐳᖅᑐᓂᖏᓄᑦ ᒪᓕᖕᓃᑦ 66%-ᒥᑦ 97%-ᒧᑦ ᑕᐃᒪᙵᓂᑦ | ᓅᖃᑦᑕᓗᐊᕈᓐᓂᕐᓂᖏᑦ ᑐᒃᑐᐃᑦ ᑕᐅᕝᕙ ᐱᓕᕆᐊᒥ ᐱᕐᑯᑎᔪᐊᖃᕐᓇᖅ ᐊᐅᓚᓂᖃᕐᓂᕐᒧᑦ ᑖᕐᓂᖅ ᓇᓚᐅᑦᑖᖅᑕᐅᓯᒪᓚᐅᖅᑐᖅ. ᐸᓚᐅᒪᑎᑕᐅᓇᓲᑏᑦ ᐱᓗᒧᑦ ᑕᐅᕝᕙ ᐅᓯᑲᖅᑕᖅᑏᑦ ᐊᖅᑯᑖᓂ (ᓱᕐᓗ ᐊᐅᔾᔭᒃᑐᑦ ᐳᖅᑐᓂᖏᓐᓂᒃ ᐊᐅᓚᑎᓂᑦ, ᓯᕝᕕᓪᓗᐊᙱᖏᑦᑐᑦ), ᐅᓯᑲᖅᑕᖅᑏᑦ ᐊᖅᑯᑖᓂ ᓂᕆᐅᕐᓯᐅᙱᑦᑐᑦ ᐊᖅᑕᕈᑕᐅᓇᕐᓯᔭᐅᙱᑦᑐᑦ ᑐᒃᑐᐃᑦ ᓅᖃᑦᑕᕐᓂᖏᓐᓄᑦ. ᐊᒃᑐᑎᖅᑳᖏᑦᑐᖅ ᑐᒃᑐᓂ ᑐᖅᑯᑎᒋᐊᓪᓚᕙᔾᔨᓂᖏᓐᓂᒃ ᓂᕆᐅᕐᓯᔭᐅᓚᐅᖅᑐᑦ ᐱᓕᕆᐊᒥ, ᐊᒻᒪ ᐊᒃᑐᐃᓃᑦ ᓇᓚᐅᑦᑖᖅᑕᐅᓯᒪᔪᑦ ᐊᖏᔫᑎᑦ ᑐᕌᓚᐅᔪᓄᑦ ᕿᒃᑖᖅᑕᑯᑉ ᐅᐊᖕᓇᖓᓂ ᑐᒃᑐᐃᑦ ᐅᓄᕐᓂᖏᓐᓄᑦ. |

## ᑎᑎᕋᖅᓯᒪᔪᖅ 0. ᓇᐃᓈᖅᓯᒪᔪᑦ ᐊᕙᑎᒧᑦ ᐊᒃᑐᐃᓂᕐᓂᒃ ᖃᐅᔨᓴᖅᐸᓪᓕᐊᕐᕆᓇᕐᓃᑦ ᐊᒻᒪ ᖃᐅᔨᓴᕐᓂᕐᒥ ᐱᓕᕆᓃᑦ ᓄᓘᔫᖕᓂ ᐱᓕᕆᐊᒥ 2024-ᒥ

| ᖃᐅᔨᓴᕐᓂᖅ | ᐱᕝᔪᒑ ᖃᐅᔨᓴᕐᓂᕐᒧᑦ[1] | ᐱᓕᕆᐊᑦ ᐱᔭᕇᖅᑕᐅᓯᒪᔪᑦ, ᐊᒃᑐᐃᓃᑦ ᐅᕝᔨᕆᔭᐅᔪᑦ, ᐱᑕᖃᕆᐊᓖᑦ ᐸᓚᐅᒪᑎᑦᑎᓇᓲᑏᑦ, ᐊᒻᒪ ᐊᑐᓕᕐᑯᔭᐅᔪᑦ ᓯᕗᓂᒃᓴᒥ ᐱᓕᕆᐊᒃᓴᓄᑦ | ᖃᓄᐃᓐᓂᖅᓴᐅᓂᖏᑦ ᐊᒃᑐᐃᓂᕐᓄᑦ ᓇᓚᐅᑦᑖᖅᑕᐅᓯᒪᔪᓄᑦ[2] |
|---|---|---|---|
| | | 2014-ᒥᓂᑦ. ᐊᐳᕝᔭᕆᒃᑐᑦ ᐋᖅᑭᒋᐊᖅᑕᐅᔪᓐᓇᖅᓯᒪᙱᑦᑐᑦ ᐃᓚᖏᓐᓂ ᐃᓂᓂ ᓲᖃᐃᒻᒪ ᓄᓇᖓ ᐱᓪᓗᒍ ᐅᕝᕙᓘᓐᓃᑦ ᐊᑦᑕᕐᓇᖅᑕᐃᓕᒪᓂᕐᒧᑦ ᑭᒡᓕᐅᔪᑦ.<br>ᐊᐳᕝᔭᕆᖕᓂᕐᓂᒃ ᐳᖅᑐᕐᓂᕐᓂᒃ ᖃᐅᔨᓴᖅᐸᓪᓕᐊᕐᕆᓇᕐᓂᖅ ᐱᓕᕆᐊᖑᐃᓐᓇᕐᓂᐊᖅᑐᑦ ᐅᑭᐅᖓᓂ 2025. | ᒪᓕᒃᔪᐊᖃᑦᑕᖅᓯᒪᔪᑦ ᐊᐳᕝᔭᕆᖕᓂᕐᓂᒃ ᐳᖅᑐᓗᐊᖅᑎᑦᑎᑦᑕᐃᓕᒪᓪᓗᑎᒃ ᐅᓯᒃᖃᑦᑕᖅᐹᑦ ᐊᖅᑯᑖᓂ ᐊᐳᕈᑕᐅᑐᐃᓐᓇᕆᐊᖃᕐᓂᕐᒋᓐᓄᑦ ᑐᒃᑐᐃᑦ ᓈᐸᕐᓂᕐᒋᓐᓄᑦ. ᑭᓯᐊᓂᓕ, ᑕᑯᔭᐅᖃᑦᑕᑎᐊᕐᒋᓐᓂᕐᒋᓐᓄᑦ ᖃᐅᔨᓴᕈᑎᓐᑎᐊᕐᒋᓐᓂᕐᒋᓐᓄᑦ (ᐅᓄᙱᓗᐊᖅᑐᑦ ᑐᒃᑐᐃᑦ ᖃᕝᓯᐅᓂᕐᒋᑦ) ᐱᑕᖃᖅᑐᑦ ᖃᓄᑎᒋᐅᖓᓖᑦ ᐋᑐᑎᖃᕐᓂᖓ ᐸᓚᐅᒪᑎᑦᑎᓇᓲᑏᑦ ᑕᐅᕗᓇ ᐅᓯᒃᖃᑦᑕᖅᐹᑦ ᐊᖅᑯᑖᒍᑦ ᑐᒃᑐᐃᑦ ᓈᐸᕐᓂᕐᒋᓐᓄᑦ. ᑐᒃᑐᐃᑦ ᖃᕝᓯᐅᓂᕐᒋᑦ ᐅᓄᖅᓯᕚᓪᓕᐊᑎᓪᓗᒋᑦ, ᓇᓚᐅᑦᑖᖅᓯᒪᔪᑦ ᐃᓄᐃᑦ ᖃᐅᔨᒪᓂᕐᒋᑎᒍᑦ, ᐅᓄᖅᓯᕚᓪᓕᐊᒋᐊᖃᖅᑐᑦ ᖃᐅᔨᓴᖅᐸᓪᓕᐊᕐᕆᓇᕐᓂᕐᒧᑦ ᑐᒃᑐᐃᑦ ᓈᐸᕐᓂᕐᒋᓐᓄᑦ ᐃᑳᖅᑐᑦ ᐊᖅᑯᑎᓂ ᐊᑐᓕᖅᑎᑕᐅᓂᐊᖅᑐᖅ. |
| ᓇᓯᑦᑕᖅᑐᖃᑦᑕᕐᓂᒃᑯᑦ ᖃᐅᔨᓴᕐᓃᑦ (HOL) ᑐᒃᑐᓂᒃ ᖃᐅᔨᓴᕐᓃᑦ | ᑲᒪᒋᔭᖃᖅᑐᖅ ᐱᓕᕆᐊᒥ ᒪᓕᒃᑕᐅᔭᕆᐊᓖᑦ 53ᐃ, 53ᐱ, 54ᐱ, ᐊᒻᒪᓗ 58ᐱ | ᒪᕐᕉᒃ EDI-ᑯᓐᓂ ᐆᒪᔪᕆᔩᑦ ᐊᒻᒪ ᒪᕐᕉᒃ ᓄᓇᖃᖅᑐᑦ ᐃᓅᒃ ᐃᓚᐅᔫᒃᐱᓕᕆᐊᖃᓚᐅᖅᑐᑦ ᓇᓯᑦᑕᖅᑐᖃᑦᑕᕐᓂᒃᑯᑦ ᖃᐅᔨᓴᕐᓃᑦ (HOL) ᑐᒃᑐᓂᒃ ᖃᐅᔨᓴᕐᓂᕐᒥ ᓄᕐᕆᐅᖅᑎᓪᓗᒋᑦ (ᐱᒋᐊᓪᓚᕈᖅᑎᓪᓗᒍ ᔫᓂ 2023-ᒥ). ᑲᑎᓪᓗᒋᑦ ᓇᐅᑦᑎᖅᓱᕐᓃᑦ ᐊᑐᓂ ᖃᐅᔨᓴᕐᕕᖕᒧᑦ 40 ᑎᑦᑕᐅᓚᐅᖅᑐᑦ. 15 ᐃᓛᒃᑰᖅᑕᖅᑐᑦ ᑐᒃᑐᐃᑦ ᑕᑯᔭᐅᓚᐅᖅᑐᑦ ᐱᓕᕆᐊᖃᖅᑎᓪᓗᒋᑦ ᒪᕐᕉᒃ EDI-ᑯᓐᓂ ᐆᒪᔪᕆᔩᑦ ᐊᒻᒪ ᒪᕐᕉᒃ ᓄᓇᖃᖅᑐᑦ ᐃᓅᒃ ᐃᓚᐅᔫᒃᐱᓕᕆᐊᖃᓚᐅᖅᑐᑦ ᓇᓯᑦᑕᖅᑐᖃᑦᑕᕐᓂᒃᑯᑦ ᖃᐅᔨᓴᕐᓂᕐᓂ (HOL) ᖃᐅᔨᓴᕐᓂᕐᒥ 2024-ᒥ ᔫᓂ 3, 4, 5 ᐊᒻᒪᓗ 8-ᒥ. 2024–ᖑᖅᑳᖅᑎᓇᒍ, ᑭᖑᓪᓕᖅᐹᒥᒃ ᑐᒃᑐᒥᒃ ᑕᑯᔭᐅᔪᖃᓚᐅᖅᑐᑦ ᐱᓕᕆᐊᖃᖅᑎᓪᓗᒋᑦ ᓇᓯᑦᑕᖅᑐᖃᑦᑕᕐᓂᒃᑯᑦ ᖃᐅᔨᓴᕐᓂᕐᓂᑦ (HOL) 2013-ᒥ.<br><br>2016-ᒥ, ᐅᔭᐅᒪᔪᑎᒧᑦ ᓄᓇᙳᐊᓕᐅᕐᓂᖅ ᐱᔭᕇᖅᑕᐅᓚᐅᖅᑐᖅ ᓴᖅᑮᔭᖅᑎᑦᑎᕐᑯᔨᓪᓗᑎᒃ ᖃᓄᑎᒋ ᐃᓂᒥᒃ ᖃᐅᔨᓴᒃᑕᕐᒪᙱᑕ ᑕᑯᕝᕕᐅᔪᓇᕐᓗᑎᒃ ᐱᓕᕆᐊᖃᖅᑎᓪᓗᒋᑦ ᓇᓯᑦᑕᖅᑐᖃᑦᑕᕐᓂᒃᑯᑦ ᖃᐅᔨᓴᕐᓂᕐᓂ (HOL) ᑐᒃᑐᓂᒃ ᖃᐅᔨᓴᕐᓂᕐᒥ.<br><br>ᓇᓯᑦᑕᖅᑐᖃᑦᑕᕐᓂᒃᑯᑦ ᖃᐅᔨᓴᕐᓂᕐᓂ (HOL) ᑐᒃᑐᓂᒃ ᖃᐅᔨᓴᕐᓃᑦ ᑲᔪᓯᓂᐊᖅᑐᑦ ᐊᕐᕌᒍᑕᒫᑦ ᓄᕐᕆᐅᖅᑎᓪᓗᒋᑦ. 2024-ᒥ ᑕᑯᔭᐅᔪᑦ ᐃᓚᔭᐅᓂᐊᖅᑐᑦ ᐊᕐᒥᓂᖅᓴᓄᑦ ᖃᐅᔨᓴᕈᑎᖃᐅᕐᓂᖅᓴᐅᔪᓄᑦ ᖃᐅᔨᓴᖅᐸᓪᓕᐊᕐᕆᓇᕋᓱᒃᑎᓪᓗᒋᑦ ᐱᓕᕆᐊᖅ ᐅᔭᕋᖕᓂᐊᕐᕕᐅᓂᓗᒃᑖᖓᓂ. | ᕿᒥᕐᕈᓂᖅ ᓇᓚᐅᑦᑖᕐᓂᖃᖅᓯᒪᔪᖅ ᐃᓚᖓᓂ ᐊᒃᑐᐊᓂᒃᓪᓚᑦᑖᙱᑦᑐᓂᒃ ᓇᔪᒐᖃᕈᓐᓂᕐᓂᕐᒧᑦ ᑐᒃᑐᓄᑦ ᐱᕝᔪᑕᐅᓪᓗᑎᒃ ᐃᒃᐱᖕᓂᖅᓴᕋᐃᑦᑐᑎᒧᑦ ᐸᒡᕕᓴᐃᓃᑦ ᐊᒻᒪ ᐳᔪᕋᖅ ᓯᐊᒻᒪᒃᐸᓪᓕᐊᔪᖅ, ᑎᑭᐅᑎᓪᓗᒋᑦ ᓇᔪᒪᖃᓗᐊᕈᓐᓂᖅᓱᒋᑦ ᐋᑐᑎᖅᑐᒥ ᐃᓗᐊᓂ ᑭᒡᓕᐅᔪᖅ ᐊᒃᑐᖅᑕᐅᔪᓄᑦ (ZOI). ᑭᓯᐊᓂᓕ, ᓇᔪᒪᐃᑦ ᐋᑐᑎᖃᑦᑎᐊᖅᑐᑦ ᓇᓚᐅᑦᑖᖅᑕᐅᓯᒪᔪᑦ ᐅᓄᕈᓐᓂᖅᐹᓪᓕᕋᔭᕐᓂᕐᒋᓐᓂᒃ 2%-ᒥᑦ 4%-ᒧᑦ. ᐃᓚᖏᑦ ᐸᑦᕕᓴᐃᓃᑦ (ᓱᕐᓗ ᐃᖏᕐᕋᑦᑕᕐᓃᑦ) ᕿᓚᒻᒥᐅᔪᑦ ᐊᒻᒪ ᑐᒃᑐᐃᑦ ᓱᖏᐅᑎᑐᐃᓐᓇᕆᐊᓖᑦ ᑖᒃᑯᓂᖓ, ᑭᒡᓕᓕᖅᓯᓪᓗᑎᒃ ᐊᒃᑐᐃᓂᐅᑐᐃᓐᓇᕆᐊᓕᖕᓂᒃ. ᐊᒥᓱᑦ ᐊᑐᖅᑕᐅᖓᓚᕈᓇᖅᑐᑦ ᓄᕐᕆᐅᕝᕕᑦ ᐱᑕᖃᐅᖅᑐᑦ ᑕᐃᑲᓂ ᐊᒻᒪ ᓯᓚᑖᓂ ᑭᒡᓕᐅᔪᖅ ᐊᒃᑐᖅᑕᐅᔪᓄᑦ (ZOI). ᑕᕝᕚᖓᓪᓚᑦᑖᖑᙱᑐᖅ ᓇᔪᒪᕐᓂᒃ ᐊᓯᐅᔨᓃᑦ ᓇᓚᐅᑦᑖᖅᑕᐅᓯᒪᒧᑦ ᐊᕝᔨᒌᒍᓐᓂᖅᑎᑕᐅᔪᓐᓇᕐᓗᑎᒃ ᑕᐃᒪᐃᑕᐃᓐᓇᖃᑦᑕᕐᓂᕐᒋᓐᓄᑦ ᐊᕝᔨᒌᒃᑕᙱᕈᑎᒃ ᐊᒻᒪ ᐊᕐᒋᔫᓂᐊᕋᓱᒋᔭᐅᙱᑦᑐᑦ ᕿᑭᖅᑖᕈᑉ ᐅᐊᖕᓇᖓᓂ ᑐᒃᑐᐃᑦ ᐅᓄᕐᓂᕐᒋᓐᓄᑦ.<br><br>ᑐᒃᑐᐃᑦ ᑕᑯᔭᐅᓯᒪᔪᑦ ᓇᓯᑦᑕᖅᑐᖃᑦᑕᕐᓂᒃᑯᑦ ᖃᐅᔨᓴᕐᓂᕐᓂ (HOL) 2024-ᒥ; ᑭᖑᓂᖓᑎᓐᓂ 2024-ᖑᖅᑳᖅᑎᓇᒍ, ᑐᒃᑐᐃᑦ ᑕᑯᔭᐅᖃᑦᑕᖅᓯᒪᙱᑦᑐᑦ ᐱᓕᕆᐊᖑᑎᓪᓗᒋᑦ ᓇᓯᑦᑕᖅᑐᖃᑦᑕᕐᓂᒃᑯᑦ ᖃᐅᔨᓴᕐᓂᕐᓂ |

## ᑎᑎᕋᖅᓯᒪᔪᖅ 0. ᓇᐃᓈᖅᓯᒪᔪᑦ ᐊᕙᑎᒧᑦ ᐊᒃᑐᐃᓂᕐᓂᒃ ᖃᐅᔨᓴᖅᐸᓪᓕᐊᙱᓐᓂᕐᓃᑦ ᐊᒻᒪ ᖃᐅᔨᓴᕐᓂᕐᒥ ᐱᓕᕆᓃᑦ ᓄᓘᔫᖕᓂ ᐱᓕᕆᐊᒥ 2024-ᒥ

| ᖃᐅᔨᓴᕐᓂᖅ | ᐱᔾᔪᑖ ᖃᐅᔨᓴᕐᓂᕐᒧᑦ[1] | ᐱᓕᕆᐊᑦ ᐱᓯᕗᖅᑕᐅᓯᒪᔪᑦ, ᐊᒃᑐᐃᓃᑦ ᐅᔾᔨᕆᓴᐅᔪᑦ, ᐱᑕᖃᕆᐊᓖᑦ ᐸᓚᐅᒪᑎᑦᑎᓇᓱᐃᑏᑦ, ᐊᒻᒪ ᐊᑐᓕᕐᑯᓴᐅᔪᑦ ᓯᕗᓂᒃᓴᒥ ᐱᓕᕆᐊᒃᓴᓄᑦ | ᖃᓄᐃᓐᓂᖅᓴᐅᓂᖕᒋᑦ ᐊᒃᑐᐃᓂᕐᓄᑦ ᓇᓚᐅᑦᑖᖅᑕᐅᓯᒪᔪᓄᑦ[2] |
| --- | --- | --- | --- |
| | | 12-ᖑᔪᑦ ᐅᖓᓯᒃᑐᒦᑦᑐᑦ ᐊᔾᔨᓕᐅᕈᑎᑦ ᐋᖅᑭᒃᑕᐅᓚᐅᖅᑐᑦ 2021-ᒥ ᐊᕐᕕᓂᓕᖕᓂ ᓇᓯᑦᑕᖅᑐᖃᑦᑕᕐᓂᒃᑯᑦ ᖃᐅᔨᓴᕐᓂᕐᓂ (HOL) ᐊᒻᒪ 15 ᖃᐅᔨᔪᓈᖅᑐᑦ ᑐᒃᑐᓂᒃ ᓇᓗᓇᐃᖅᑕᐅᓪᓗᑎᒃ ᐊᑕᐅᓯᕐᒥ ᐊᔾᔨᓕᐅᕈᒻᒥ ᐱᒋᐊᓕᓵᖅᑎᓪᓗᒍ ᔫᓂ 2024-ᒥ. | (HOL) ᑕᐃᒪᙵᓂᑦ 2013-ᒥᓂᑦ. ᑐᒃᑐᒃᓈᓂᕐᓂᒃ ᑕᑯᖃᑦᑕᖅᓯᒪᔪᑦ ᐱᓕᕆᐊᖃᖅᑎᓪᓗᒋᑦ ᓇᓯᑦᑕᖅᑐᖃᑦᑕᕐᓂᒃᑯᑦ ᖃᐅᔨᓴᕐᓂᕐᓂ (HOL) ᐱᔭᐅᔭᕆᐊᖃᖅᓯᒪᔪᑦ ᕿᒥᕐᕈᑯᓪᓗᒋᑦ ᖃᓄᐃᓈᖅ ᐱᓕᕆᐊᒧᑦ-ᐊᒃᑐᐊᔪᓂᒃ ᐊᒃᑐᐃᓂᕐᓂᒃ ᑐᒃᑐᐃᑦ ᐃᓕᖅᑯᓯᕆᓕᖅᐸᒃᑕᖕᒋᓐᓄᑦ ᐅᕝᕙᓘᓐᓃᑦ ᓇᔪᒐᕐᒥᒃ ᐊᑐᕐᓂᖕᒋᓐᓄᑦ. |
| ᐊᖑᓇᓱᒃᑏᑦ ᐊᒻᒪ ᐳᓛᖅᑐᑦ ᐊᑎᓕᐅᖅᐸᒃᑐᑦ ᓇᐃᓈᖅᓯᒪᔪᑦ | ᑲᒪᒋᔭᖃᖅᑐᖅ ᐱᓕᕆᐊᒥ ᒪᓕᒃᑕᐅᔭᕆᐊᓖᑦ 54ᒥ | ᐱᓕᕆᐊᖑᔭᕆᐊᓕᒃ ᑭᒡᐊᓕᓕᓂ ᐸᕙᓛᓐᑯᑦ ᐱᕐᑯᑎᖃᕐᕕᐊᓂᒃ ᐊᑐᕈᑎᒃ, ᐳᓛᖅᑏᑦ ᐅᔭᕋᖕᓂᐊᕐᕕᖕᒧᑦ ᖃᐅᔨᒋᐊᕈᓐᓇᖅᑐᑦ ᐸᕙᓛᓐᑯᑦ ᐅᐊᑦᑎᔨᖕᒋᓐᓄᑦ. 2024-ᒥ, 469 ᐃᓛᒃᑯᖅᑕᖅᑐᑦ ᐃᓂᖃᓚᐅᖅᑐᑦ ᓇᓕᐊᖕᓂᑐᐃᓐᓇᖅ ᐅᔭᕋᖕᓂᐊᕐᕕᖕᒥ ᐅᕝᕙᓘᓐᓃᑦ ᕿᙵᐊ ᑐᓚᒃᑕᕐᕕᖕᒥ ᓇᔪᒪᐅᔪᓂ. ᐊᑐᖅᐳᑎᒃ ᐊᖑᓇᓱᒃᑏᑦ ᐊᒻᒪ ᐳᓛᖅᑐᑦ ᐊᑎᓕᐅᖅᕕᖕᒋᓐᓂᒃ ᓇᐃᓈᖅᓯᒪᔪᑦ ᑲᔪᓯᕙᓪᓕᐊᖕᒋᓐᓇᕐᓂᐊᖅᑐᑦ ᐅᔭᕋᖕᓂᐊᕐᓂᓕᒫᖕᒋᓐᓂ. | ᐱᓕᕆᐊᒧᑦ-ᐊᒃᑐᐊᔪᑦ ᐊᒃᑐᐃᓐᓂᑦ ᐊᑐᖃᑎᖃᑐᐃᓐᓇᑎᐊᓖᑦ ᓄᓇᒥᒃ-ᐊᑐᖅᑏᑦ ᐱᓕᕆᓂᖕᒋᓐᓄᑦ (ᓲᕐᓗ ᓂᕿᒃᓴᖅᓯᐅᕐᓂᑦ, ᐃᖕᒋᕐᖃᑦᑕᕐᓂᑦ, ᐊᐅᓪᓛᖅᓯᒪᓂᑦ, ᐊᒃᑐᐃᓐᓂᑦ ᐊᖏᔫᓂᐊᕐᕋᓯᒋᔭᐅᙳᕆᓗᑎᒃ.<br><br>ᕿᑭᑕᐅᓯᒪᓪᓗᓂ 2020 ᐊᒻᒪ ᑭᓪᓕᐅᔪᑦ ᐊᒃᑐᐊᓂᓖᑦ ᓄᕙᒡᔪᐊᕐᒧᑦ ᓄᓇᕐᔪᐊᒥ ᖃᓂᒪᓇᐅᓚᐅᖅᑐᒥᒃ ᐱᕙᓪᓕᐊᓂᖃᖅᓯᒪᓚᐅᖅᑐᖅ 2021-ᒧᑦ, ᐊᖑᓇᓱᒃᑏᑦ ᐊᒻᒪ ᐳᓛᖅᑐᑦ ᐃᓂᖃᖅᑐᕕᓃᑦ ᐅᓄᖅᓯᕙᓪᓕᐊᖕᒋᓐᓇᖅᓯᒪᔪᑦ ᐱᒋᐊᓕᖅᑎᓪᓗᒋᑦ-2017-ᒥᑦ ᓈᓴᐅᑎᓄᑦ, ᐱᖅᓯᐅᑎᓪᓗᒋᑦ ᐊᒥᓱᑦ ᐊᖑᓇᓱᖕᓂᕐᒧᑦ ᐊᒻᒪ ᐊᐅᓪᓛᖅᓯᒪᓂᕐᓂᒃ. 2022-ᖑᑎᓪᓗᒍ ᑖᒃᑯᐊ ᓈᓴᐅᑏᑦ ᐅᓄᖅᓯᕙᓪᓕᐊᓕᖅᓯᒪᔪᑦ, ᐊᔾᔨᐸᓗᒋᓕᖅᓗᓂᒋᑦ ᑕᑯᔭᐅᓯᒪᔪᓄᑦ 2018-ᒥ, ᐊᒻᒪ ᑕᐃᒪᐃᖕᒋᓇᖅᓯᒪᔪᑦ ᑕᐃᒪᙵᓂᑦ 2023-ᒥᓂᑦ. |
| ᑎᑭᑉᐸᒃᑐᑦ ᑎᖕᒥᐊᑦ ᐃᕙᖏᕙᖕᒋᓐᓂᒃ ᖃᐅᔨᓴᕐᓃᑦ | ᑲᒪᒋᔭᖃᖅᑐᖅ ᐱᓕᕆᐊᒥ ᒪᓕᒃᑕᐅᔭᕆᐊᓖᑦ 66 ᐊᒻᒪᓗ 70 | 2024-ᒥ, 41,927 ᒦᑕᑦ ᑭᐸᓐᓇᒃᑐᑦ (m²) (~4.2 Hᐃᐊᒃᑐᕐ (ha) ᓄᓇᒥ ᐸᒡᕕᓴᒃᑕᐅᓚᐅᖅᑐᑦ ᐱᓕᕆᕝᕕᖕᒥ ᐱᕐᑯᑎᕝᔪᐊᓂ ᒪᓂᖃᕐᓇᖅᑎᓪᓗᒍ ᑎᖕᒥᐊᓄᑦ (ᒪᐃ 17-ᒥᑦ ᐋᒡᒌᓯ 19–ᒧᑦ) ᑎᓴᒪᑦ ᑎᑭᑉᐸᒃᑐᑦ ᑎᖕᒥᐊᑦ ᐃᕙᖏᕙᖕᒋᓐᓂᒃ ᖃᐅᔨᓴᕐᓂᖅ (AMBNS) ᐱᔭᕇᖅᑕᐅᖅᑐᑦ; ᑎᖕᒥᐊᑦ ᐃᕙᖏᕙᖕᒋᓐᓂᒃ ᑕᑯᔭᖃᓚᐅᙱᑦᑐᖅ. ᖃᐅᔨᓴᕐᓃᑦ ᑲᔪᓯᓂᖃᕐᓂᐊᖅᑐᑦ ᐱᓕᕆᐊᖑᐃᓐᓇᖅᐸᒡᓗᑎᒃ ᐱᕈᖅᑐᓂᒃ ᐲᔭᐃᓂᖅᑕᖃᓕᕿᖓᑦ ᐅᕝᕙᓘᓐᓃᑦ ᓄᓇᖓᓂᒃ ᐸᒡᕕᓴᐃᓂᖅᑕᖃᕿᖓᑦ ᑎᖕᒥᐊᑦ ᐃᕐᓂᐅᖅᑎᓪᓗᒋᑦ. | ᒥᑭᑦᑑᑎᓇᓱᒡᓗᒍ ᒥᑭᑦᑐᓇᕐᓂᓕᒫᖓᓂ ᐱᓕᕆᐊᑉ ᐃᓂᒋᕙᒃᑕᖓ, ᐱᓕᕆᖃᑦᑕᕐᓗᑎᒃ ᑎᑭᑉᐸᒃᑐᑦ ᑎᖕᒥᐊᑦ ᐃᕙᖏᕙᖕᒋᓐᓂᒃ ᖃᐅᔨᓴᕐᓂᖅ (AMBNS). ᐊᒻᒪ ᐊᑐᓕᖅᑎᑦᑎᓗᑎᒃ ᐃᕙᖏᕙᖕᓂᒃ ᐊᐅᓚᑦᑎᓂᕐᒧᑦ ᐸᕐᓇᐅᑎᓂᒃ, ᐱᓕᕆᐊᒧᑦ-ᐊᒃᑐᐊᔪᑦ ᐊᒃᑐᐃᓐᓂᑦ ᑎᖕᒥᐊᑉ ᐃᕙᖏᕙᖕᒋᓐᓄᑦ ᓂᕆᐅᒋᔭᐅᔪᑦ ᐊᒃᐸᓱᒃᑑᓂᐊᕐᓂᖕᒋᓐᓂᒃ ᐱᑕᖅᑲᙱᓪᓗᑎᓪᓘᓐᓃᑦ. |
| ᓂᕐᔪᑎᓂᒃ ᑕᑯᖃᑦᑕᐅᑎᖃᑦᑕᕐᓂᖅ ᐊᒻᒪ ᑐᕐᑯᑕᐅᕙᒃᑐᑦ | ᑲᒪᒋᔭᖃᖅᑐᖅ ᐱᓕᕆᐊᒥ ᒪᓕᒃᑕᐅᔭᕆᐊᓖᑦ 53ᐃ, 53ᐱ, ᐊᒻᒪᓗ 57ᑭ | ᖃᓄᐃᓈᖅ ᑕᑯᖃᑦᑕᐅᑎᖃᑦᑕᕐᓃᑦ ᐅᕝᕙᓘᓐᓃᑦ ᑐᕐᑯᑕᐅᔪᑦ ᐱᖃᓯᐅᔾᔨᔪᑦ ᓂᕐᔪᑎᓂ ᐱᓕᕆᕝᕕᐅᔪᒥ ᐅᖃᐅᓯᐅᓯᒪᔪᓂᒃ ᐊᒻᒪ ᖃᐅᔨᓴᖅᑕᐅᕙᒃᐳᑎᒃ ᐊᕐᕌᒍᓕᒫᖅ. ᐊᔪᕐᓇᙱᑐᐊᕐᕌᖓᑦ, ᐸᓚᐅᒪᑎᑦᑎᓇᓱᐃᑏᑦ ᐊᑐᓕᖅᑎᑕᐅᕙᒃᑐᑦ ᐱᓗᐊᕐᑯᓇᒋᑦ ᓯᕗᓂᒃᓴᒥ ᓂᕐᔪᑎᒃ ᑕᑯᖃᑕᐅᑎᖃᑦᑕᕐᓃᑦ ᐊᒻᒪ ᑐᕐᑯᑕᐅᕐᑯᓇᒋᑦ. | ᐊᒃᑐᐊᓂᖃᓪᓚᓐᓇᒃᑐᑦ ᐆᒪᔪᓂᒃ ᑐᕐᑰᑎᖃᑦᑕᕐᓃᑦ ᐱᓕᕆᐊᒧᑦ-ᐊᒃᑐᐊᔪᓄᑦ ᐱᓕᕆᓂᕐᓂᑦ ᓇᓚᐅᑦᑖᖅᑕᐅᓯᒪᔪᑦ ᐊᒃᐸᓱᒃᑑᓂᐊᕐᓂᖕᒋᓐᓂᒃ ᐅᕝᕙᓘᓐᓃᑦ ᐱᑕᖅᑲᙱᓪᓗᑎᒃ ᓂᕿᑐᖅᑎᓄᑦ ᑎᖕᒥᐊᓄᑦ, ᑎᖕᒥᐊᓄᑦ, ᑐᒃᑐᓄᑦ, ᐊᓯᖏᓄᑦ ᓂᕐᔪᑎᓄᓪᓗ. ᖃᓄᐃᓈᖅ ᑐᕐᑯᔪᑦ ᓂᕆᐅᒋᔭᐅᓯᒪᔪᑦ ᑭᒡᒐᖅᑐᐃᓗᑎᒃ ᐅᓄᙱᑦᑐᓂᒃ ᐊᑕᖏᓯᒪᔪᓄᑦ ᐊᒥᓲᓂᖕᒋᓄ. |

**ᑎᑎᕋᖅᓯᒪᔪᖅ 0. ᓇᐃᓈᖅᓯᒪᔪᑦ ᐊᕙᑎᒧᑦ ᐊᒃᑐᐃᓂᕐᓂᒃ ᖃᐅᔨᓴᖅᐸᓪᓕᐊᖏᓐᓇᕐᓃᑦ ᐊᒻᒪ ᖃᐅᔨᓴᕐᓂᕐᒥ ᐱᓕᕆᓃᑦ ᓄᓘᔾᔭᓐᓂ ᐱᓕᕆᐊᒥ 2024-ᒥ**

| ᖃᐅᔨᓴᕐᓂᖅ | ᐱᔾᔪᑖ ᖃᐅᔨᓴᕐᓂᕐᒧᑦ[1] | ᐱᓕᕆᐊᑦ ᐱᔭᕇᖅᑕᐅᓯᒪᔪᑦ, ᐊᒃᑐᐃᓃᑦ ᐅᔾᔨᕆᔭᐅᔪᑦ, ᐱᑕᖃᕆᐊᓖᑦ ᐸᓚᐅᒪᑎᑦᑎᓇᓲᑏᑦ, ᐊᒻᒪ ᐊᑐᓕᕐᑯᔭᐅᔪᑦ ᓯᕗᓂᒃᓴᒥ ᐱᓕᕆᐊᒃᓴᓄᑦ | ᖃᓄᐃᓐᓂᖅᓴᐅᓂᖏᑦ ᐊᒃᑐᐃᓂᕐᓄᑦ ᓇᓚᐅᑦᑖᖅᑕᐅᓯᒪᔪᓄᑦ[2] |
|---|---|---|---|
| | | 2024-ᒥ, 24-ᖑᔪᑦ ᐃᓛᒃᑰᖅᑕᖅᑐᑦ ᓂᕈᐋᑦ ᑐᕐᑯᑕᐅᔪᑦ ᐅᖃᐅᓯᐅᓯᒪᓗᐅᖅᑐᑦ ᐃᓗᐅᓪᓗᑎᒃ ᐊᕝᕙᓂᓛᑦ ᐊᔾᔨᒌᖕᖏᐊᕐᔪᒃᑐᑦ ᐆᒪᔪᑦ: ᑎᕆᒐᓂᐊᖅ (4), ᐅᑲᓕᖅ (1), ᖃᖅᓴᐅᖅ (1), ᐊᕿᒡᒋᖅ (2), ᖁᐸᓄᐊᖅ (1), ᐊᒻᒪ ᖃᐅᔨᒪᔭᐅᙱᑦᑐᑦ ᐅᖃᓗᕋᐅᔭᖅᑎ ᑎᖕᒥᐊᕈᓯᖅ (1).<br><br>ᐹᕗᓛᓐᑯᑦ ᐸᓚᐅᒪᑎᑦᑎᓇᓱᐃᓐᓇᖅᑐᑦ ᓂᕈᑎᓂᒃ ᑕᑯᖃᑦᑕᐅᑎᖃᑦᑕᕐᓂᕐᓂᒃ ᐱᓕᕆᕝᕕᐅᔪᒥ ᐃᓕᓐᓂᐊᖅᑎᑦᑎᓂᒃᑯᑦ, ᐊᑐᓕᖅᑎᑦᑎᓂᒃᑯᑦ, ᐊᒻᒪ ᖃᐅᔨᓴᖅᐸᓪᓕᐊᖏᓐᓇᖅᓱᒋᑦ ᐊᒃᑕᑯᑦ ᐊᐅᓚᑕᐅᔪᑦ ᐱᐅᓯᐅᕙᒃᑐᑦ ᐊᒻᒪᓗ ᖃᐅᔨᒪᔾᔪᑎᑎᒍᑦ. ᓂᕈᑎᓂᒃ ᑕᑯᖃᑦᑕᐅᑎᖃᑦᑕᕐᓂᖅ ᐊᒻᒪ ᑐᕐᑯᑕᐅᕙᒃᑐᓂᒃ ᖃᐅᔨᓴᖅᐸᓪᓕᐊᖏᓐᓇᕐᓂᖅ ᐱᕙᓪᓕᐊᖏᓐᓇᕐᓂᐊᖅᑐᑦ 2025-ᒥ. | ᓂᕈᐋᑦ ᑐᕐᑯᑕᐅᕙᒃᑐᑦ 2024-ᒥ ᐊᑕᖏᖅᓱᑎᒃ ᐃᓛᒃᑰᖅᑕᖅᑐᓯᒪᓗᑎᒃ ᑐᕐᑯᑕᐅᓯᒪᓗᐅᖅᑐᑦ ᐊᒻᒪ ᐱᖃᓯᐅᔾᔨᓯᒪᓇᑎᒃ ᓇᓕᐊᖕᓂᑐᐃᓐᓇᖅ ᐅᓗᕆᐊᓇᖅᑐᒦᑦᑐᓂᒃ ᐆᒪᔪᓂ ᐊᔾᔨᒌᖕᖏᐊᕐᔪᒃᑐᓂᒃ. ᑕᐃᒪᐃᓐᓂᖓᓄᑦ, ᓂᕈᑎᓂᒃ ᑐᕐᑰᑦᑎᓃᑦ ᐅᓄᙱᓯᒪᔪᑦ ᐊᑕᖏᖅᓱᒋᑦ ᐊᒻᒪ ᑭᒡᒐᖅᑐᐃᓪᓗᑎᒃ ᐅᓄᙱᑦᑐᒻᒪᕆᖕᓂᒃ ᐃᓚᖏᓐᓄᑦ ᐊᑕᖏᖅᓯᒪᔪᓄᑦ ᐅᓄᕐᓂᖏᓐᓄᑦ, ᒪᓕᑐᐃᓐᓇᖅᑐᑦ ᐊᒃᑐᐃᓃᑦ ᓇᓚᐅᑦᑖᖅᑕᐅᓯᒪᔪᓄᑦ. 2024-ᒥ ᑐᕐᑯᑕᐅᔪᑦ ᑲᑎᖓᒋᑦ ᑐᖅᖠᓃᓚᐅᖅᑐᑦ ᐅᓄᓛᖑᔪᓐᓇᖅᑐᑦ ᑭᖑᓂᖅᖢᑦᑎᓐᓂ ᑐᕐᑯᑕᐅᓯᒪᔪᑦ, 2015-ᒥ ᐅᓄᙱᓛᖑᓪᓗᑎᒃ (5 ᑐᕐᑯᔪᑦ) ᐊᒻᒪ 2016-ᒥ ᐅᓄᓛᖑᓪᓗᑎᒃ (25 ᑐᕐᑯᑕᐅᔪᑦ). |

# SUMMARY

The Mary River Project (the Project) is an iron ore mine in the Qikiqtaaluk Region on North Baffin Island, Nunavut. The Project involves the construction, operation, closure, and reclamation of a 22.2 million tonne per annum (mtpa) open pit mine that will operate for 21 years. In 2024, Baffinland Iron Mines Corporation (Baffinland) hauled roughly 5.9 million tonnes (mt) of iron ore from the Mine Site to the Milne Port stockpile. In 2024, construction-related activities were limited to ongoing development, construction and maintenance of infrastructure and laydowns at the Mine Site and Milne Port to support operations. The total Project footprint was 735 ha at the end of 2024.

The Nunavut Impact Review Board Project Certificate No. 005 includes numerous conditions that require Baffinland to conduct effects monitoring for the terrestrial environment. Work performed for the Terrestrial Environment Monitoring Program is guided by the Terrestrial Environment Mitigation and Monitoring Plan (Baffinland Iron Mines Corporation 2016a). The Terrestrial Environment Monitoring Program is overseen by the Terrestrial Environment Working Group (TEWG), which includes members from Baffinland, the Qikiqtani Inuit Association (QIA), the Government of Nunavut, Environment and Climate Change Canada, the Mittimatalik Hunters and Trappers Organization, the Ikahutit Hunters and Trappers Association, the Nangmautuq Hunters and Trappers Association, the Igloolik Hunters and Trappers Organization, and the Hall Beach Hunters and Trappers Organization. The Terrestrial Environment Monitoring Program began in 2012 and continued through 2024 with adaptations to the program based on results and input from the TEWG.

This report summarizes the data collection and monitoring programs conducted in 2024 for the Project, including the following components (summaries provided in Table 0):

- weather monitoring;
- helicopter flight height analysis;
- Tote Road traffic monitoring;
- dustfall monitoring (passive monitoring & extent imagery analysis);
- exotic invasive vegetation monitoring;
- snow track surveys;
- snowbank height monitoring;
- Height of Land (HOL) caribou surveys;
- remote camera monitoring;
- caribou observations;
- hunter and visitor log summaries;
- Active Migratory Bird Nest Surveys (AMBNS); and,
- wildlife interactions and mortalities.

**Inuit Participation —** Four Inuit residents assisted with HOL caribou surveys and soil and vegetation monitoring resulting in 663 hours Inuit Participation during the 2024 field season.

**Climate —** Weather conditions in 2024 were summarized and compared to average conditions. Minimum and maximum temperatures for the Mine Site and Milne Inlet in 2024 were within the recorded historical range. The Mine Site tended to be warmer and wetter than Milne Inlet. In 2024, the Mine Site had a mean annual temperature of -10.4°C and 338.4 mm of precipitation, compared to -10.6°C and 200.4 mm, respectively, at Milne Inlet. Extreme temperatures had a broader range at the Mine Site, possibly due to the moderating effects of ocean proximity on the Milne Port meteorological (MET) station. Wind directions and velocities in 2024 at the Mine Site MET station were consistent with the 2013 to 2023 period. Winds most frequently blew from the northwest or southeast. Winds from the east were uncommon but tended to be the strongest, while winds from the north, west, and southwest were uncommon and weak. During winter, winds blew along a southwest-northeast axis (the orientation of the inlet), predominantly from the southwest. This pattern was clearest from December to March. During summer, winds were primarily from the north-northwest and southwest, with northeast winds becoming less prominent. This pattern was clearest from June to September. These patterns were first described in 2023 and were observed to be the same in 2024.

**Helicopter Overflights —** The helicopter flight height analysis monitors potential disturbance to birds and other wildlife within the Regional Study Area (RSA) and a designated Snow Geese area. Additional analysis (i.e., accounting for pilot rationale) was incorporated into overflight analysis for the eighth consecutive year in 2024. Notably, categorizing flights as 'compliant with rationale' represented 54% of the total flight hours evaluated in the analysis. The most common rationales for flying below the cruising altitude requirements in 2024 were geophysical survey (16% of total flight hours), weather-related circumstances (15% of total flight hours), and short-distance flights (14% of total flight hours). Overall combined compliance was greater than 90% from 2018 to 2023, with non-compliant flights fluctuating between 4% and 8%. The number of transits (204) and flight hours (~25 hrs) within the Snow Geese area during the moulting season was lower in 2024 compared to 2023, but similar to previous years (2019 and 2021). Non-compliant flights within the Snow Geese area during the moulting season increased to 30% in 2024, the highest since 2022, due to geological exploration-related activities and traverses.

**Tote Road Traffic —** The mean number of combined vehicle transits for 2024 was 281.2 transits per day (ore haul accounted for 246.3 transits per day). These daily means slightly exceeded the predicted value in the Final Environmental Impact Statement Addendum for the Production Increase Proposal (i.e., 236 ore haul transits; Stantec Consulting Ltd. 2018).

**Dustfall —** The 2024 passive dustfall monitoring program used 43 passive dustfall collectors to measure dust deposition related to Project activities. Thirty-six collectors were sampled monthly; the remaining collectors were sampled during the summer only. The magnitude of annual dustfall deposition at the Mine Site sample locations continued to decrease. Dustfall mitigation along the mine haul road and at the airstrip appears effective. The magnitude of dustfall deposition at Milne Port remained constant or, in some cases, slightly decreased, a trend that began in 2018. The highest dustfall deposition at the Milne Port area was associated with the ore stockpiles, with lesser amounts generated by the sealift staging area. Along the Tote Road, dustfall in 2024 was consistent at the north crossing location compared to recent years. More extensive use of 'flake' calcium chloride was trialled and found to be effective in 2024.

Dustfall extent was also characterized by examining satellite imagery. This analysis was completed to verify Inuit land user reports of observing dust beyond what was predicted in baseline dust modelling and a visual representation of dustfall extent in areas where dustfall is below detection in dust collectors. The 2024 dustfall extent within the Study Area was similar to 2023, with an increase in the Tote Road south extent matched by decreases in other areas. Baffinland uses numerous site-wide dust suppression measures to reduce dust emissions, including water and calcium chloride on roads, continued use of shrouds and coverings on ore crushers, and improved methods of transferring ore onto stockpiles. DustBlockr® was applied to the entire Tote Road in the summer of 2024. DusTreat dust suppressant was applied to ore stockpiles regularly in 2024. DusTreat is a non-toxic, water-based, and long-lasting suppressant that acts as a sealant on the stockpiles to prevent dust. Baffinland plans to apply DusTreat more frequently to stockpiles at Milne Port.

**Vegetation —** The vegetation monitoring program in 2024 focused on monitoring exotic invasive vegetation within the Potential Development Area (PDA). Targeted surveys of exotic invasive vegetation are completed every three to five years. Previous exotic invasive vegetation surveys only documented one exotic invasive vegetation species (garden tomato) growing at the Mine Site below the sewage/effluent discharge pipe in 2019. No exotic invasive vegetation species were recorded during the 2024 surveys. Monitoring for exotic invasive vegetation is expected to occur again between 2027 and 2029.

**Wildlife —** Snow track surveys assessed wildlife response to the Tote Road, particularly for caribou. Twelve snow track surveys were completed in 2024. Similar to previous years, most tracks observed were from Arctic foxes, red foxes, Arctic hare, and ptarmigan. No caribou tracks were observed in 2024. Lemming (30%) and fox (11%) tracks were the only species noted to deflect from the Tote Road.

Snowbank height monitoring was conducted to assess compliance with the operational 1 m height, which facilitates wildlife crossings and improves visibility for drivers to avoid wildlife collisions. Snowbank height monitoring surveys were conducted in 2024 during the winter months. In response to a TEWG request, measurement locations have been randomized since 2020 instead of using repeated kilometre markers for measurements. Overall, compliance was at 86%, slightly lower than 2022 (91%) but within range of other years of snowbank height monitoring.

The HOL caribou surveys were conducted to assess distribution and behaviour in the PDA during the calving season. The HOL caribou surveys were completed between May 29 and June 10, 2024. The total observation time was 32 hours and 25 minutes, with an average observation time per station of 40 minutes. Fifteen individual caribou were observed during the HOL caribou surveys in 2024 on June 3, 4, 5, and 8. Before the 2024 HOL caribou surveys, the last time a caribou was observed during a HOL survey was in 2013.

Remote cameras documented a combination of birds (e.g., ptarmigan, raptors, and songbirds), Arctic hare, and Arctic fox between January 1 and December 28, 2024. Fifteen detections of caribou were noted on a single camera (i.e., Baffin-11). No wolves or bears were observed in any reviewed images. This supports the current observation of low caribou numbers and movement in the PDA, despite increased observation during the monitoring period. An aerial caribou survey was conducted in March 2023, before caribou calving. During the survey, 112 individual caribou and 36 caribou groups were observed. All caribou observations were in the southern subregion of the wildlife RSA, and only two groups (nine individuals total) were in an overlapping portion of the northern subregion. No aerial surveys occurred in 2024.

When caribou are observed on or near the Tote Road, the caribou decision framework comes into effect and guides the action of road users. Fifty-one caribou observations during 22 monitoring events were recorded along the Tote Road in May, June, and October 2024. No adverse behaviour towards the Tote Road and passing vehicles was noted during the 22 monitoring events. Behaviours noted included foraging/feeding, bedded animals, and animals travelling at a 'walking pace'.

**Birds —** Active Migratory Bird Nest Surveys were completed before any vegetation clearing or surface disturbance at the Project during the breeding bird season (May 17 to August 19). Surveys consisted of observers using a rope-drag method (Rausch 2015) to detect nesting birds before construction. Four surveys were completed in 2024; no nests were detected.

After several years of raptor effects monitoring, occupancy and productivity were deemed to be stable, and no evidence was found of Project-related effects on raptors (Franke et al. 2024). Therefore, raptor occupancy and productivity surveys have been paused since 2021. No future surveys are proposed.

**Wildlife Interactions —** Ten wildlife mortalities were reported in 2024, all of which were individual losses. Mortalities in 2024 involved six species: Arctic fox (4), Arctic hare (1), loon (1), ptarmigan (2), Snow Bunting (1), and an unknown songbird (1). Vehicle collisions were confirmed or suspected in all mortalities except three—two mortalities were unknown, and one mortality was a result of incidental catch while completing other surveys. Whenever possible, mitigations are implemented to reduce the risk of Project-related wildlife injury or mortality.

Table 0. Summary of environmental effects monitoring and research activities at the Mary River Project in 2024.

| Survey | Reason for Survey[1] | Work Completed, Effects Observed, Required Mitigation, and Recommendations for Future Work | Comparison to Impact Predictions[2] |
|---|---|---|---|
| Weather monitoring | Supports all other data collection and monitoring programs | Weather conditions were recorded hourly at the Mine Site and Milne Port MET stations. Weather data have been recorded since 2005 (Mine Site) and 2006 (Milne Port). Weather data are used to support other monitoring programs; mitigations are not necessary. Meteorological stations will continue to collect weather data in 2025. | N/A |
| Helicopter flight height analysis | Addresses Project Conditions 59, 71, and 72 | Except for operational purposes, and subject to pilot discretion regarding aircraft and human safety, pilots must maintain a cruising altitude of at least 650 m during point-to-point travel in areas likely to have migratory birds, and 1,100 m vertical and 1,500 m horizontal distance from observed concentrations of migratory birds (e.g., Snow Geese area). Flight corridors are used to avoid areas of significant wildlife importance.<br>Helicopter cruising altitude combined compliance within the Snow Geese area during the moulting season (July to August) was 70.03% in 2024. Outside the Snow Geese area, and in all other areas during non-moulting months (September to May), 2024 combined compliance was 72.42%. Flight height data were cross-referenced for the eighth consecutive year with daily pilot logs to justify low-level flights in 2024. Low-level flights with reasonable rationales were considered "compliant with rationale". Reasonable rationales included weather, slinging, short-distance flights, search and rescue, inspections, maintenance flights, medivac flights, and geophysical surveys.<br>Helicopter flight height analysis will continue until consistent trends are identified. | It was expected that Project-related activities would displace some Snow Geese but they would relocate to nearby, less disturbed areas. As only a small portion of the Snow Geese area is subject to helicopter flyovers and is mainly located outside the zone of influence (ZOI), effects are expected to be limited. Overall, local disturbance relative to the PDA and Local Study Area extents was expected to cause some sensory disturbance, but not result in significant adverse effects on the Snow Goose population. Direct mortality due to aircraft was deemed unlikely and, thus, expected to have no significant adverse effect.<br>Compliance with minimum helicopter flight heights was moderate in 2024 when considering pilots rationale for low-level flying and flight hours within the Snow Geese area during the moulting season. Flights over the Snow Geese area were limited to the southeastern edge, such that any sensory disturbance was minimal relative to the entire Snow Geese area, consistent with Final Environmental Impact Statement predictions. However, it is not sensible to monitor the potential effects of low-level flying on Snow Geese or other migratory birds directly, as doing so would involve accessing the Snow Goose moulting |

[1] Project Conditions and Project Commitments as per the Nunavut Impact Review Board Project Certificate No. 005 (Nunavut Impact Review Board 2014).

[2] Mary River Project Final Environmental Impact Statement: Volume 6 – Terrestrial Environment (Baffinland Iron Mines Corporation 2012a) and Mary River Project Early Revenue Phase Addendum to Final Environmental Impact Statement: Volume 6 – Terrestrial Environment (Baffinland Iron Mines Corporation 2013a).

Table 0. Summary of environmental effects monitoring and research activities at the Mary River Project in 2024.

| Survey | Reason for Survey[1] | Work Completed, Effects Observed, Required Mitigation, and Recommendations for Future Work | Comparison to Impact Predictions[2] |
|---|---|---|---|
| | | | areas by helicopter, thus introducing greater disturbance potential.<br>No direct mortality due to aircraft has been documented, which is consistent with effect predictions. |
| Tote Road traffic monitoring | Correlate to wildlife disturbance and provide supporting data to the dustfall monitoring program | Annual summary of continual traffic monitoring. No directly observed unexpected effects. Traffic volume monitoring will continue regularly. | The mean number of combined vehicle transits for 2024 was 281.2 transits per day (ore haul accounted for 246.3 transits per day). These daily means slightly exceeded the predicted value in the Final Environmental Impact Statement Addendum for the Production Increase Proposal. |
| Passive dustfall monitoring | Addresses Project Conditions 36, 50, 54d, and 58c and Project Commitment 60 | Dustfall collectors at 43 locations are distributed around the Project area, some further away from the PDA as Reference sites monitoring background levels. Six 'short' monitors were added in 2021 as part of a pilot study (requested by the QIA and the TEWG) to investigate variability between dustfall sampling at the standardized height of 2.0 m and closer to ground level at 0.5 m. Twelve years of monitoring from August 2013 to December 2024 are now complete using the 2.0 m height collectors.<br>Passive dustfall monitoring indicated the areas with the greatest dustfall deposition are restricted mainly to within 1,000 m of the PDA. An investigation of dustfall at monitors outside the PDA, but within a 5,000 m radius, indicated dustfall was generally low throughout 2024.<br>No difference was found in the dustfall measured at the standardized height of 2.0 m and closer to ground level at 0.5 m.<br>To increase the number of samples for the snow sampling pilot study, as recommended by the QIA and Government of Nunavut, improvements to sample collection were implemented, including (1) using satellite acquisition dates and footprints to plan sampling dates and locations, (2) extending the sampling period to late May, (3) sampling on | Annual total suspended particulate deposition levels were predicted to exceed 50 g/m²/year within the PDA, with total suspended particulate deposition levels decreasing to background beyond the PDA. The 2024 dustfall results were consistent with predictions that the highest dustfall would occur within the PDA. |

Table 0. Summary of environmental effects monitoring and research activities at the Mary River Project in 2024.

| Survey | Reason for Survey[1] | Work Completed, Effects Observed, Required Mitigation, and Recommendations for Future Work | Comparison to Impact Predictions[2] |
|---|---|---|---|
| | | cloud-free days, and (4) sampling a variety of dust concentrations.<br>Future monitoring will continue to investigate dustfall at the 43 sites through the summer season and a subset of 36 year-round sites. | |
| Exotic invasive vegetation monitoring | Addresses Project Conditions 32 and 37 | Surveys focused on previously disturbed areas within and adjacent to the Project footprint and along Project boundaries where exotic invasive vegetation is most likely to occur (e.g., along Project infrastructure, road margins, and laydown areas). Site surveys considered the level of ground disturbance (i.e., exposed soil can be more prone to the establishment of invasive vegetation) and proximity to Project activities and vehicle traffic (i.e., vehicle traffic is a vector for the proliferation of invasive vegetation).<br>No exotic invasive vegetation species were recorded during the 2024 surveys. The Terrestrial Environment and Mitigation and Monitoring Plan prescribes the survey frequency for monitoring of exotic invasive vegetation (three to five years, pending findings from ongoing incidental monitoring). Monitoring for exotic invasive vegetation is expected to occur again between 2027 and 2029. | N/A |
| Snow track surveys | Addresses Project Conditions 54dii and 58f<br>Addresses QIA concerns about snowbank heights and effects on wildlife | Twelve snow track surveys were completed along the Tote Road to investigate the movement and behaviour of caribou in February, March, April, May, October, and November 2024. Fox, Arctic hare, lemming, Common Raven, and ptarmigan were the only species detected during the 2024 surveys. No evidence of caribou has been observed near or crossing the Tote Road since January 2020. Wildlife response to the Tote Road was recorded at each location where tracks were seen. Based on discussions during TEWG meetings regarding snow track frequency, Baffinland agreed to implement snow track surveys and will make best efforts to conduct these surveys at a frequency of once per week along the Tote Road. Surveys will occur during snow cover seasons when environmental conditions permit the surveys to be completed effectively and safely. Conditions criteria include | A reduction in caribou movement across Project infrastructure throughout the Operation phase was predicted but not expected to be significant at the scale of the North Baffin Island caribou population. Data from the snow track surveys can be used to investigate the prediction when caribou numbers increase and movement resumes in the RSA.<br>If ground monitoring of caribou suggests barrier effects (e.g., trails approaching but not crossing the road) and anecdotal caribou abundance indices show increasing numbers, then aerial surveys may be used to investigate the potential effects further.<br>Because no caribou tracks were identified during snow track surveys in 2024, it cannot be determined |

Table 0. Summary of environmental effects monitoring and research activities at the Mary River Project in 2024.

| Survey | Reason for Survey[1] | Work Completed, Effects Observed, Required Mitigation, and Recommendations for Future Work | Comparison to Impact Predictions[2] |
|---|---|---|---|
| | | fresh snowfall (within the last 48 hours) and suitable light conditions. Snow track monitoring will continue in 2025 when ideal survey conditions and safety considerations are met. | whether Project infrastructure is affecting caribou movement. |
| Snowbank height monitoring | Addresses Project Conditions 53ai and 53c<br>Addresses QIA concerns about snowbank heights and effects on wildlife | Snowbank height monitoring was conducted monthly from January to December 2024 to assess compliance with the 1 m height threshold, when snow was present. Management of snowbank height facilitates wildlife crossings and increases driver visibility to help reduce wildlife-vehicle collisions. As per the TEWG's request, measurement locations were randomized in 2020.<br>In 2024, the average compliance for snowbank height monitoring was 86%, which was in the range of snowbank height compliance of 66% to 97% since 2014. Snowbanks could not be modified in some areas because of landscape or safety limitations.<br>Snowbank height monitoring will continue during the winter of 2025. | A reduction in caribou movement across Project infrastructure throughout the Operation phase was predicted. Due to mitigations along the Tote Road (e.g., snowbank height management, low embankments), the Tote Road was not expected to be a barrier to caribou movement. A negligible increase in caribou mortality was anticipated due to the Project, and effects were predicted to be not significant at the scale of the North Baffin caribou population.<br>High compliance with snowbank heights minimizes the Tote Road's potential to act as a barrier to caribou movement. However, insufficient observational data (low caribou numbers) exists to quantify the effectiveness of mitigations along the Tote Road on caribou movement. As caribou numbers increase, as predicted by Inuit traditional knowledge, increased monitoring of caribou movement across the roadway will be implemented. |
| Height of Land caribou surveys | Addresses Project Conditions 53a, 53b, 54b, and 58b | Two EDI Environmental Dynamics Inc. biologists and two local Inuit participants conducted HOL caribou surveys during the calving season (early June 2023). The total observation time was 32 hours and 25 minutes, with an average observation time per station of 40 minutes. Fifteen individual caribou were observed during the HOL surveys in 2024 on June 3, 4, 5, and 8. Before 2024, the last time a caribou was observed during a HOL survey was in 2013.<br>In 2016, viewshed mapping was completed to demonstrate the extent of area surveyors could observe while conducting HOL caribou surveys.<br>The HOL caribou surveys will continue annually during the calving season. The 2024 observations add to a more | The assessment predicted some indirect habitat loss for caribou due to sensory disturbance and dust deposition, leading to reduced habitat effectiveness within the ZOI. However, habitat effectiveness was estimated to be reduced by 2% to 4%. Some disturbances (i.e., traffic) are short duration and caribou may adapt to them, thus limiting potential effects. Many alternate calving sites exist within and outside the ZOI. Indirect habitat loss was predicted to be indistinguishable from natural variation and not significant at the scale of the North Baffin caribou population.<br>Caribou were observed during the HOL surveys in 2024; previous to 2024, caribou had not been |

**Table 0. Summary of environmental effects monitoring and research activities at the Mary River Project in 2024.**

| Survey | Reason for Survey[1] | Work Completed, Effects Observed, Required Mitigation, and Recommendations for Future Work | Comparison to Impact Predictions[2] |
|---|---|---|---|
| | | extensive database as monitoring efforts continue through the Project's life.<br>Twelve remote cameras were deployed in 2021 at six HOL stations, and 15 detections of caribou were noted on a single camera in early June 2024. | observed during HOL surveys since 2013. More caribou observations during HOL surveys are needed to assess any Project-related effects on caribou behaviour or habitat use. |
| Hunter and visitor log summaries | Addresses Project Condition 54f | Though not compulsory unless using Baffinland facilities, visitors to the site may check in with Baffinland security. In 2024, 469 individuals checked in at either the Mine Site or Milne Port camps. The use of the hunter and visitor log summaries will continue throughout the life of the Project. | Although Project-related effects may interact with land-use activities (e.g., harvesting, travel, camping), the effects are not expected to be significant.<br>Except for 2020 and restrictions associated with the COVID pandemic that continued into 2021, hunter and visitor check-ins have steadily increased from pre-2017 numbers, including numerous hunting and camping trips. During 2022 these numbers increased, similar to trends seen in 2018, and have remained consistent since 2023. |
| Active Migratory Bird Nest Surveys | Addresses Project Conditions 66 and 70 | In 2024, approximately 41,927 m² (4.2 ha) of land were disturbed for Project infrastructure during the breeding bird window (May 17 to August 19). Four AMBNS were completed; no bird nests were found. Surveys will continue to be conducted whenever vegetation clearing or surface disturbance occurs within the breeding bird window. | By minimizing the Project footprint, conducting AMBNS, and implementing a nest management plan, Project-related effects on nesting birds are expected to be low to nil. |
| Wildlife interactions and mortalities | Addresses Project Conditions 53a, 53b, and 57d | Any interactions or mortalities involving wildlife within the Project area are reported and investigated year round. If possible, mitigation measures are implemented to reduce future wildlife interactions and mortalities.<br>In 2024, 24 individual wildlife mortality incidents were reported involving six species: Arctic fox (4), Arctic hare (1), loon (1), ptarmigan (2), Snow Bunting (1), and an unknown songbird (1).<br>Baffinland continues to mitigate wildlife interactions in the Project area by training, enforcing, and monitoring waste management practices and guidelines. Wildlife interaction and mortality monitoring will continue in 2025. | Direct wildlife mortality from Project-related activities was predicted to be low to nil for raptors, birds, caribou, and other wildlife. Any mortalities that occur are expected to represent a small fraction of the overall population.<br>Wildlife mortalities in 2024 were all individual losses and did not involve any species at risk. Thus, wildlife mortalities were low overall and represented a very small proportion of overall populations, consistent with effect predictions. The 2024 mortality totals were below the highest range of past mortalities, with 2015 being the lowest (5 mortalities) and 2016 being the highest (25 mortalities). |

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# AUTHORSHIP

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# ACRONYMS AND ABBREVIATIONS

| Acronym/Abbreviation | Definition |
|---|---|
| AICc | Akaike's Information Criteria |
| ΔAIC | Difference in AICc between the given model and the lowest AICc |
| AMBNS | Active Migratory Bird Nest Surveys |
| ANOVA | Analysis of variance |
| Baffinland | Baffinland Iron Mines Corporation |
| CI | Confidence interval |
| CWS | Canadian Wildlife Service |
| DS | Distance sampling |
| EDI | EDI Environmental Dynamics Inc. |
| EPP | Environment Protection Plan |
| GN | Government of Nunavut |
| GPS | Geographic Positioning System |
| HOL | Height of Land |
| magl | Metres above ground level |
| masl | Metres above sea level |
| MET | Meteorological |
| MHTO | Mittimatalik Hunters and Trappers Organization |
| MR | Mark-recapture |
| MRDS | Mark-recapture distance sampling |
| NIRB | Nunavut Impact Review Board |
| PC | Project Condition |
| PDA | Potential Development Area |
| PRISM | Program for Regional and International Shorebird Monitoring |
| Project | Mary River Project |
| QIA | Qikiqtani Inuit Association |
| RSA | Regional Study Area |
| SDI | Snow Darkening Index |
| TEAMR | Terrestrial Environment Annual Monitoring Report |
| TEMMP | Terrestrial Environment Mitigation and Monitoring Plan |
| TEWG | Terrestrial Environment Working Group |
| TSP | Total suspended particulates |
| ZOI | Zone of influence |

# 1 OVERVIEW

The Mary River Project (the Project) is an iron ore mine in the Qikiqtaaluk Region of North Baffin Island, Nunavut. As a condition of Project approval, the Nunavut Impact Review Board Project Certificate No. 005 includes numerous conditions that require Baffinland Iron Mines Corporation (Baffinland) to conduct effects monitoring for the terrestrial environment. Work completed for the Terrestrial Environment Monitoring Program is guided by Inuit Qaujimajatuqangit and the Terrestrial Environment Mitigation and Monitoring Plan (TEMMP) (Baffinland Iron Mines Corporation 2016a). The Terrestrial Environment Working Group oversees this work (refer to Section 2), which is comprised of representatives from Baffinland, the Qikiqtani Inuit Association, Government of Nunavut, Environment and Climate Change Canada, Mittimatalik Hunters and Trappers Organization, Clyde River Hunter and Trapper Organization, Arctic Bay Hunter and Trapper Organization, Hall Beach Hunter and Trapper Organization, and Igloolik Hunter and Trapper Organization. The World Wildlife Fund, Nunavut Impact Review Board, Canadian Northern Economic Development Agency, and Natural Resources Canada all participate as observers on the Terrestrial Environment Working Group. Members of the TEWG are invited annually to comment on Annual Monitoring Reports; commentary and responses to the 2023 Annual Monitoring Report are provided in Appendix A. Relevant comments are incorporated into this report. This represents a key mechanism for transparency and continual improvement in the implementation of the TEMMP.

The TEMMP (illustrated in Figure 1-1) comprises the guidance, methods, and standards for assessing potential Project-related effects on multiple (often interrelated) Valued Ecosystem Components. Where possible, monitoring design and data capture facilitate cross-referencing between monitoring components to better determine cause and effect and support more effective corrective actions. For example, dustfall deposition is captured by passive dustfall sampling. Dustfall effects on vegetation are evaluated by vegetation monitoring (including abundance, composition, and health). A regional sampling program for caribou tissue monitors potential bioaccumulation effects in caribou (associated with metal uptake and transfer up the food chain). Table 1-1 summarizes components of the Terrestrial Environment Monitoring Program at the Project (2010 to present). Results and trend summaries from these monitoring programs are presented in each respective Terrestrial Environment Annual Monitoring Report (EDI Environmental Dynamics Inc. 2013−2023). The 2024 Annual Monitoring Report for the Terrestrial Environment Monitoring Program includes the following data collection and monitoring programs in 2024, the results of which are summarized in this report:

- weather monitoring;
- helicopter flight height analysis;
- Tote Road traffic monitoring;
- passive dustfall monitoring;
- dustfall extent imagery analysis;
- vegetation abundance;
- snow track surveys;
- snowbank height monitoring;
- Height of Land caribou surveys;
- remote camera monitoring;
- Active Migratory Bird Nest Surveys;
- hunter and visitor log summaries; and,
- wildlife interactions, incidental observations, and mortalities.

Table 1-1. Overview of Terrestrial Environment Monitoring Program components (2010 to present).

| Monitoring Programs and Endpoints | Previous Monitoring | Next Anticipated Monitoring |
|---|---|---|
| Passive Dustfall | 2013–23 | 2025 |
| Dustfall Extent Imagery Analysis | 2020–23 | 2025 |
| Soil and Vegetation Base Metals Monitoring | 2012–17, 2019–22 | 2025–27 |
| Vegetation Abundance Monitoring | 2012–17, 2019, 2023 | 2026–28 |
| Normalized Difference Vegetation Index Analysis | 2020 | — |
| Exotic Invasive Vegetation Monitoring Natural Revegetation | 2014, 2019, 2020, 2024 | 2027 |
| Height of Land Caribou Surveys | 2013–24 | 2025 |
| Snow Track Surveys and Snowbank Height Monitoring | 2014–24 | 2025 |
| Noise Monitoring | 2020, 2022 | — |
| Hunter and Visitor Logs | 2010–24 | 2025 |
| Wildlife Observations, Incidents, and Mortality Logs | 2020–24 | 2025 |
| Active Migratory Bird Nest Surveys | 2013–24 | 2025 |
| Helicopter Flight Height Analysis | 2015–24 | 2025 |
| Cliff-nesting Raptor Occupancy and Productivity Surveys | 2011–20 | — |
| Caribou Fecal Pellet Collection | 2011–14, 2020 | — |
| Caribou Water Crossing Surveys | 2014 | — |
| Carnivore Den Survey | 2014 | — |
| Communication Tower Surveys | 2014–15 | — |
| Roadside Waterfowl Surveys | 2012–14 | — |
| Staging Waterfowl Surveys | 2015 | — |
| Tundra Breeding Bird PRISM[1] Plots | 2012–13, 2018, 2024 | — |
| Bird Encounter Transects | 2013 | — |
| Coastline Nesting and Foraging Habitat Surveys | 2012[2], 2013[3] | — |
| Red Knot (*Calidris canutus*) Surveys | 2014, 2019 | — |

[1] PRISM: Program for Regional and International Shorebird Monitoring, led by Environment and Climate Change Canada.

[2] Steensby Inlet only.

[3] Milne Inlet only.

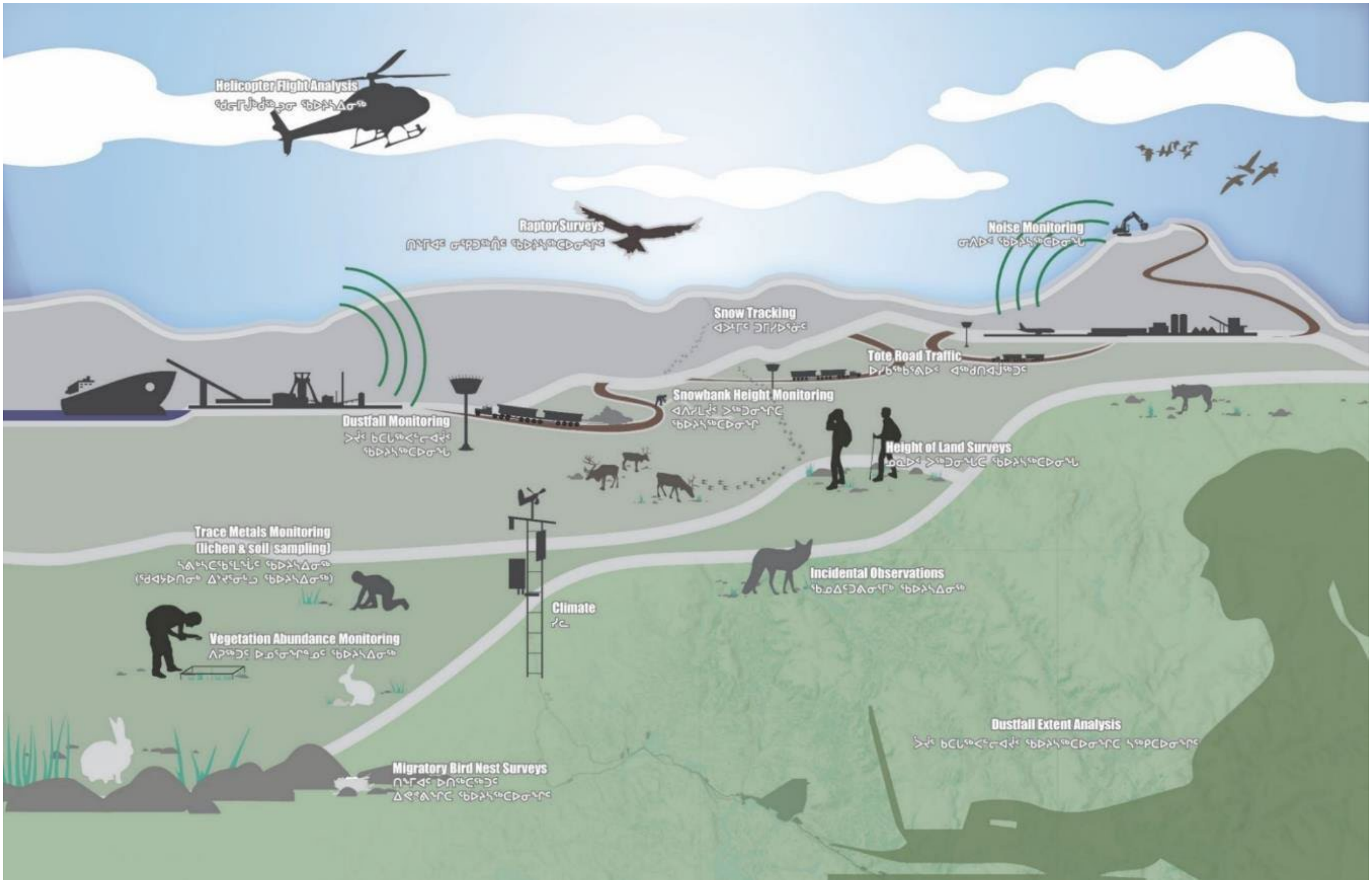



Figure 1-1. Graphical overview of the Project's Terrestrial Environment Monitoring Program.

# 2 TERRESTRIAL ENVIRONMENT WORKING GROUP

The Terrestrial Environment Working Group (TEWG) was formed in 2012 as a collaborative forum to discuss monitoring approaches and refine procedures based on data trends, local knowledge, and recent advances in science and technology. The TEWG has (at a minimum) convened biannually via in-person or teleconference meetings, typically before and after the summer field monitoring period. If/where possible, annual technical reports and other relevant discussion content are distributed before meetings. Baffinland Iron Mines Corporation (Baffinland) invites commentary from all representatives, reviews all comments and recommendations, and tries to provide meaningful responses to the TEWG. The following headings summarize comments, recommendations and actions from meetings held in 2024.

## 2.1 TEWG MEETING #31

Baffinland hosted the TEWG meeting #31 on 22 May 2024 via a virtual platform. The meeting agenda included a summary of the 2023 Terrestrial Environment Mitigation and Monitoring Plan findings and a discussion of two formal recommendations (refer to Appendix B) by the Qikiqtani Inuit Association (QIA) submitted to the TEWG:

- **QIA-TE-2(1)**: To improve the definition of caribou behaviour in response to the Project (i.e., caribou deflection), and
- **QIA-TE-2(2)**: To examine options for wildlife (caribou) monitoring along the Steensby Rail corridor (e.g., caribou collaring, aerial survey, remote wildlife cameras, and mark-recapture fecal pellet sampling).

Baffinland committed to addressing both recommendations and working with the TEWG to advance appropriate outcomes.

## 2.2 TEWG MEETING #32

Baffinland hosted TEWG meeting #32 on 10 October 2024 via a virtual platform. The meeting agenda focussed on previous actions and commitments. Before the meeting, Baffinland commissioned desktop studies (1) to inform on the value and feasibility of different options for wildlife monitoring at the Project and (2) to improve current operational definitions of caribou deflection. These studies (refer to Appendix B) were distributed to the TEWG; no comments were returned.

Regarding caribou deflection, definitions were drawn from other Projects and available literature sources to develop a behavioural ranking system. Based on the discussion, it was resolved that these definitions should be refined. Regarding the value and feasibility of different options for wildlife monitoring, it was emphasized that caribou collaring is the most robust approach to monitor caribou abundance and distribution, along with aerial surveys. Due to time constraints, this topic was committed to further discussion during TEWG Meeting (#33, held on 13 January 2025).

# 3 INUIT PARTICIPATION

Baffinland Iron Mines Corporation (Baffinland) actively encourages and facilitates recruitment of Inuit participants at the Mary River Project (the Project) via:

- hiring and training Inuit assistants to work on terrestrial monitoring programs;
- supporting the participation of the Mittimatalik Hunters and Trappers Organization, Ikahutit Hunters and Trappers Association, Nangmautuq Hunters and Trappers Association, Igloolik Hunters and Trappers Organization, and Hall Beach Hunters and Trappers Organization in the Terrestrial Environment Working Group;
- providing funding for four full-time, on-site Environmental Monitors, to be appointed and solely employed by the Qikiqtani Inuit Organization following Article 15.8 of the Inuit Impact and Benefit Agreement (Qikiqtani Inuit Association and Baffinland Iron Mines Corporation 2018); and,
- resourcing community-based programs through the Mary River Inuit Impact and Benefit Agreement (Qikiqtani Inuit Association and Baffinland Iron Mines Corporation 2018).

In their capacity as research assistants and consultants, Inuit participants from numerous communities across the Baffin region have contributed to many components of the Terrestrial Environment Monitoring Program since its inception (e.g., Height of Land caribou surveys, vegetation abundance surveys, vegetation and soil base metals sampling, and raptor monitoring), and have provided strategic support and insight on field programs. Inuit assistants have gained essential skills and training through participation in field programs, such as plant identification, bird identification, Arctic biology, field logistics, Geographic Positioning System (GPS) navigation, data collection methods, and data management.

Four local Inuit residents assisted with Height of Land caribou surveys and soil and vegetation monitoring for 663 hours during the 2024 field season (Figure 3-1). Additionally, Inuit Baffinland staff assisted with components of the 2024 Terrestrial Environment Monitoring Program as on-site Environmental Technicians. All 2024 Inuit assistants reside within Nunavut in Pond Inlet or Hall Beach.

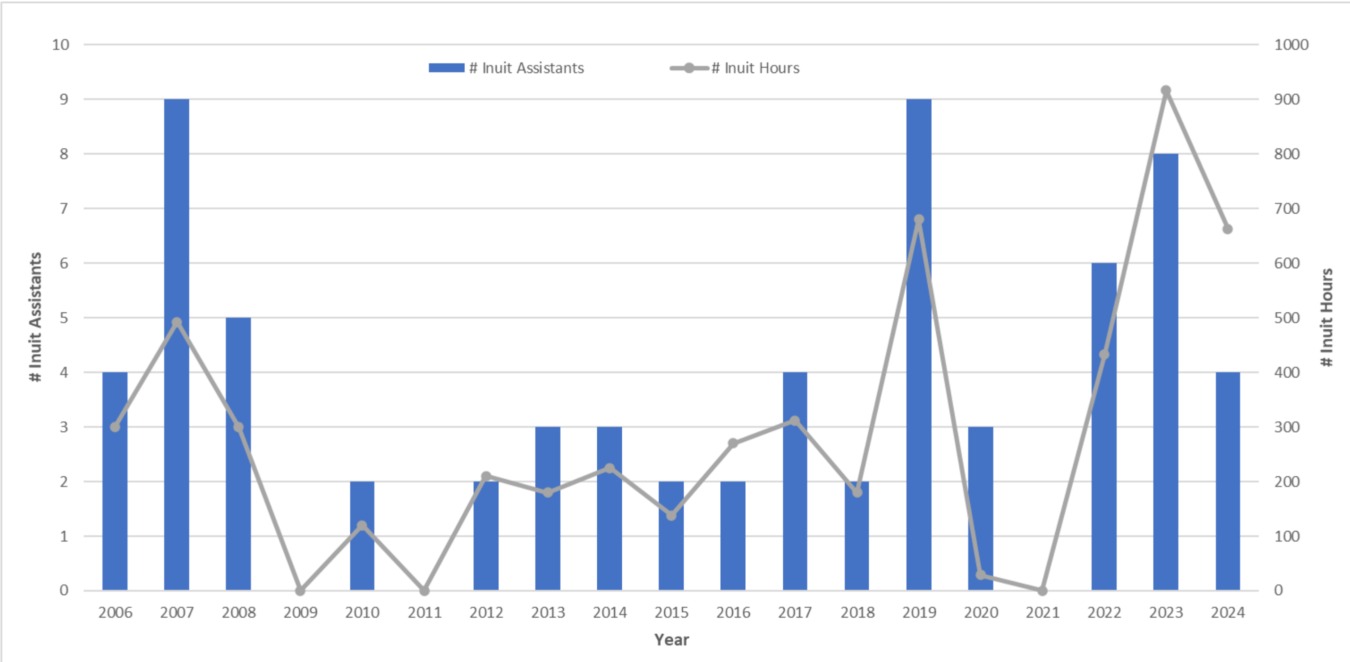



**Figure 3-1. Inter-annual trend (2006 to 2024) of Inuit participation in the Terrestrial Environment Monitoring Program.**
** The COVID pandemic resulted in little to no Inuit participation in 2020 and 2021.*

# 4 CLIMATE

## Climate Summary

Climate monitoring for the Mary River Project (the Project) can be summarized in the following three points:

- 2024 was a record-breaking rainy year for the Mine Site and Milne Inlet;
- 2024 was a moderately warmer than normal year for the Mine Site and Milne Inlet due to a milder winter and typical summer; and,
- wind patterns have remained stable at the Mine Site and Milne Inlet since continuous monitoring in 2013 began.

## 4.1 BACKGROUND

Climate data are recorded and summarized for the Project according to Nunavut Impact Review Board Project Certificate No. 005 Project Condition (PC) #57(g) (Nunavut Impact Review Board 2020):

- **PC #57** *"The Proponent shall report annually regarding its terrestrial environment monitoring efforts, with inclusion of the following information: an assessment and presentation of annual environmental conditions including timing of snowmelt, green-up, as well as standard weather summaries."*

Climate data from the reporting year are compared to data collected before Project operations (2005 to 2010) and data collected since the beginning of continuous monitoring (2013 to present). This comparison documents potential changes in climate patterns in the Regional Study Area. Climate data recorded at the Project are also cross-referenced with other datasets and analyses. For example, dustfall dispersion and deposition are strongly related to weather conditions (e.g., dustfall dispersion tends to be higher during dry, windy conditions than rainy conditions). Incorporating observed weather conditions into dustfall analyses can help explain specific patterns and trends in dustfall. Wind data are also used to estimate snow distribution before and during snow tracking surveys.

## 4.2 METHOD

From 1963 to 1965, Environment Canada operated a meteorological (MET) climate station at Mary River during the summer (Baffinland Iron Mines Corporation 2012b). Baffinland Iron Mines Corporation (Baffinland) established a MET station at Mary River Camp in June 2005 and Milne Port in June 2006. Data from these stations created a dataset from 2005 to 2010, preceding the development of the Project. Baffinland resumed collecting data from the MET stations at the Mine Site (Photo 4-1) and Milne Inlet (Photo 4-2) in August 2013. These MET stations recorded hourly air temperature, precipitation, wind speed (for all recorded periods), and wind direction (from 2013 onwards). The Milne Port wind direction data were found to have an offset error, which was corrected when Baffinland staff realigned the weathervane on June 26, 2021. A correction factor of 180° was applied to all wind vectors at Milne Inlet before this date. No such corrections were required for the Mine Site.

Where relevant, the 2024 weather data were compared with the 2005 to 2010 and 2013 to 2023 periods, and references were made to the 2013 to 2023 averages. Summaries of 2024 weather conditions at the Mine Site and Milne Port included monthly air temperatures (mean, minimum, and maximum), monthly precipitation (quantity and frequency), wind direction, and wind velocity. Temperature and precipitation data were accurate and reliable throughout 2024.

Baseline data were referenced from Appendix 5A of the Mary River Project Final Environmental Impact Statement (Carrière et al. 2010). Mean air temperatures and precipitation (quantity and frequency) were averaged across the years when those data were collected. Cumulative wind speed and direction proportions were calculated based on data across all years within each period. The complete 2024 climate dataset is contained in Appendix C.

Photo 4-1. Mine Site meteorological weather station.

Photo 4-2. Milne Port meteorological weather station.

## 4.3 AIR TEMPERATURE AND PRECIPITATION

### 4.3.1 MINE SITE

#### 4.3.1.1 Temperature

In 2024, monthly mean temperatures at the Mine Site were lowest in February (-29.6°C), rose above zero in June (4.3°C), and peaked in July (9.2°C). Monthly means fell back below zero in October (-3.0°C). The largest positive monthly anomaly occurred in January, at -25.9°C, which was 3.9°C warmer than the 2013 to 2023 average. December had the largest negative monthly anomaly at -29.0°C, which was -3.9°C colder than the 2013 to 2023 average. Temperatures in late winter (January to April) of 2023 to 2024 and early winter (September to November) of 2024 to 2025 were warmer than the 2013 to 2023 average. Mean daily temperatures between June 11 and October 7 remained above 0°C (Figure 4-1).

Extreme temperatures in 2024 at the Mine Site were recorded on January 28 (-47.3°C) and July 18 (19.2°C). These temperatures lie within the recorded historical range. The lowest temperature recorded at the Mine Site was -59.1°C in April 2007[3]. In the post-2013 monitoring period, the coldest recorded temperature was -48.9°C in February[4]. Comparable historical data (1963 to 1965) in winter months are lacking, but the lowest temperature recorded in late winter/spring was -40.6°C in April 1964. The highest temperature previously registered at the Mine Site was 24.5°C in July 2016. The 1963 to 1965 record is 20.6°C, recorded in July 1965. See Appendix Table C-1 for a complete monthly comparison from 2005 to 2010 and 2013 to 2024.

#### 4.3.1.2 Precipitation

June through September tend to be the wettest months for North Baffin Island, as seen in data trends from the Mine Site (Appendix Table C-1). 2024 was the wettest year since the beginning of detailed monitoring, with above-average rainfall from July to October, including a record-breaking 19 days (Figure 4-2) and 155.2 mm of precipitation in September, which broke the previous record of 18 days and 84.6 mm of precipitation in August 2023. Total annual precipitation was 338.4 mm, breaking the previous record of 187.2 mm in 2023. The average annual precipitation at the Mine Site (for years with good data from 2013 to present) is 179.7 mm. The number of days with precipitation continues to be reported to allow for direct comparisons with years when exact precipitation amounts became unclear due to rain gauge failures.

[3] Excluding erroneous readings of extreme lows below -60°C, post September 2009.

[4] Excluding an erroneous low of -73°C in September 2014.

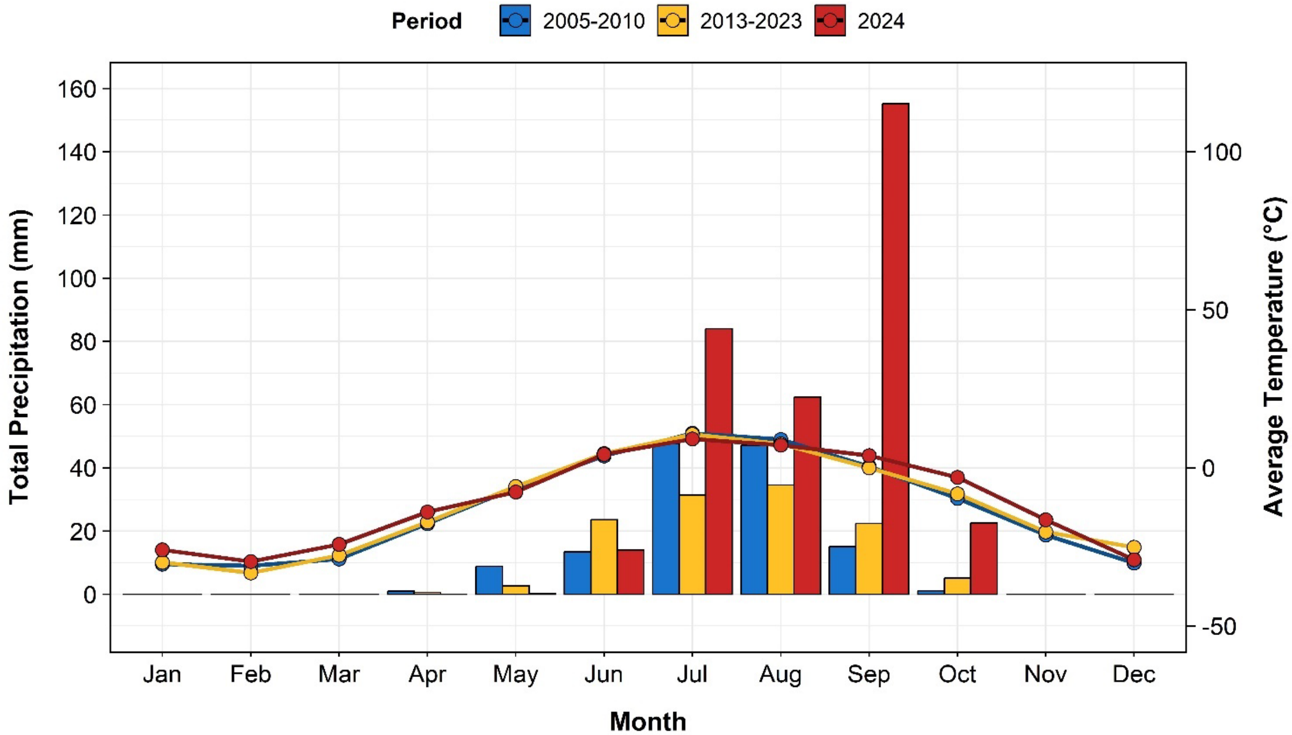



Figure 4-1. Mine Site monthly average air temperature (lines) and total precipitation (bars) from 2005–2010, 2013–2023, and 2024.

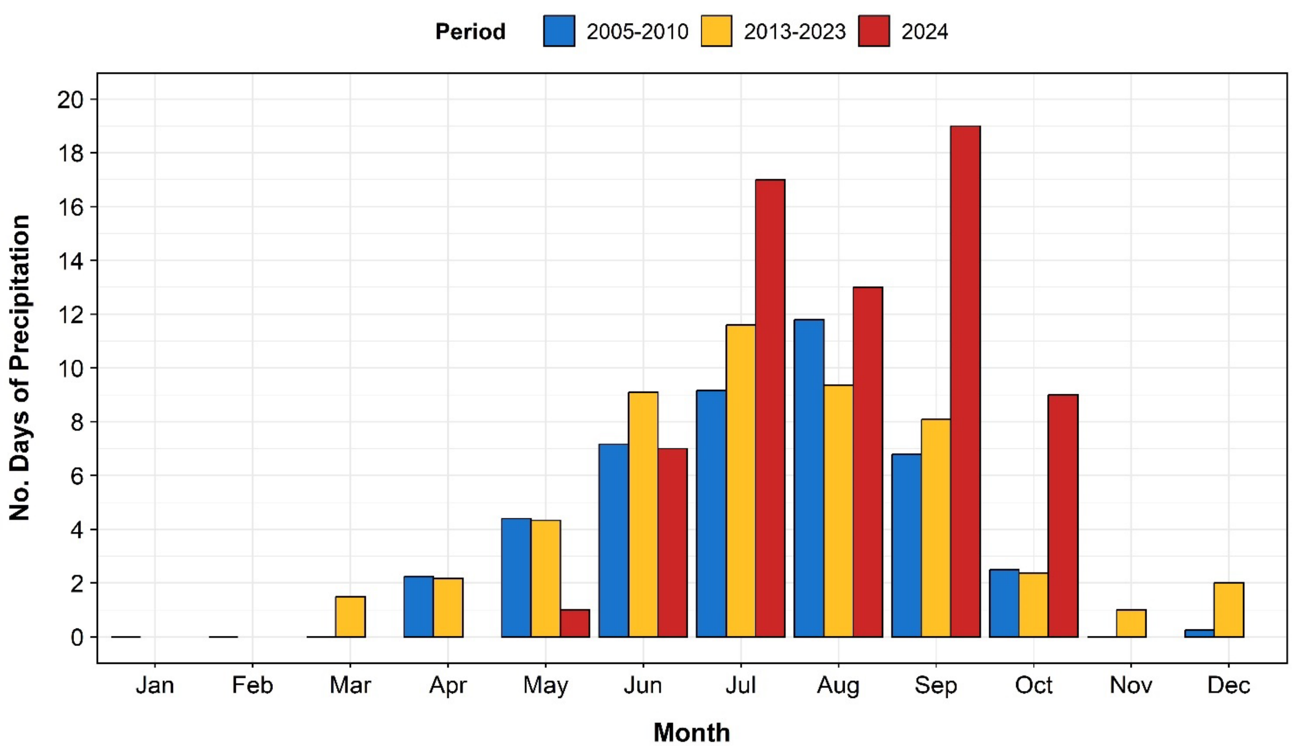



Figure 4-2. Mine Site monthly precipitation frequency (number of days experiencing precipitation) from 2005–2010, 2013–2023, and 2024.

### 4.3.2 MILNE INLET

#### 4.3.2.1 Temperature

The 2024 trends in temperature and precipitation measured at the Milne Inlet MET station closely reflect the MET station at the Mine Site, but are moderated (warmer in winter, cooler in summer), possibly due to proximity to the ocean. Monthly mean temperatures at Milne Port were at their lowest in February (-27.5°C), rose above freezing in June (2.8°C), and peaked in July (7.7°C) before dropping back below 0°C in October (-2.9°C). The largest positive monthly anomaly occurred in February, 6.4°C warmer than the 2013 to 2023 average. The largest negative monthly anomaly occurred in December, at -27.2°C, which was 0.5°C colder than the 2013 to 2023 average. Temperatures in late winter (January to April) of 2023 to 2024 and fall to early winter (September to November) of 2024 to 2025 were warmer than the 2013 to 2023 average, while all other months were within 1°C of the 2013 to 2023 average. Mean daily temperatures between June 6 and October 7 remained above 0°C (Figure 4-3).

Extreme temperatures in 2024 at Milne Inlet were recorded on January 27 (-41.8°C) and July 19 (18.9°C). These temperatures lie within the recorded historical range. The lowest temperature recorded at Milne Inlet was -50.2°C in January 2019, while the record high of 22.7°C was set in July 2020. See Appendix Table C-2 for a complete monthly comparison from 2006 to 2010 and 2013 to 2024.

#### 4.3.2.2 Precipitation

June through September tend to be the wettest months for North Baffin Island, as seen in data trends from Milne Inlet (Appendix Table C-2). 2024 was the wettest year on record at Milne Inlet, with above-average precipitation from July to October, including a record-breaking 19 days of precipitation in September, which broke the previous record of 17 days of precipitation in August 2023 (Figure 4-4). Total annual precipitation was 200.4 mm, breaking the previous record of 164.8 mm in 2018. The average annual precipitation at Milne Inlet (since 2013) is 88.7 mm. The number of days with precipitation continues to be reported to allow for direct comparisons with years when exact precipitation amounts became unclear due to rain gauge failures.

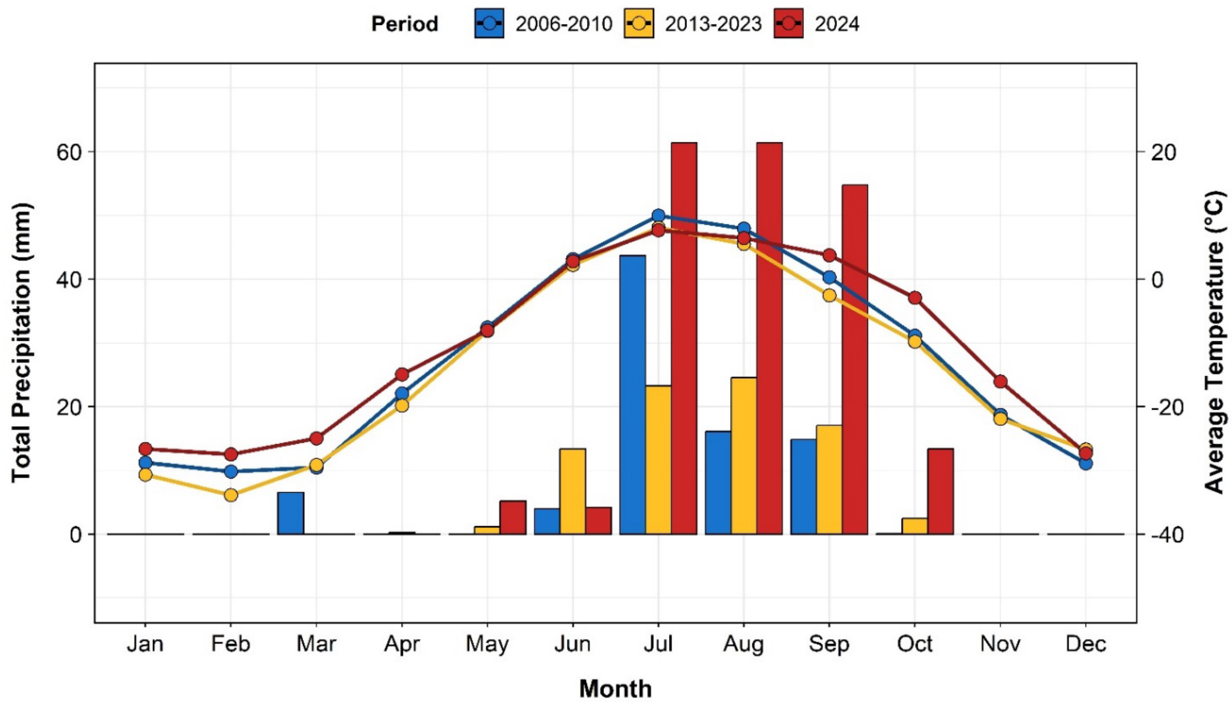



Figure 4-3. Milne Port monthly average air temperature (lines) and total precipitation (bars) from 2006–2010, 2013–2023, and 2024.

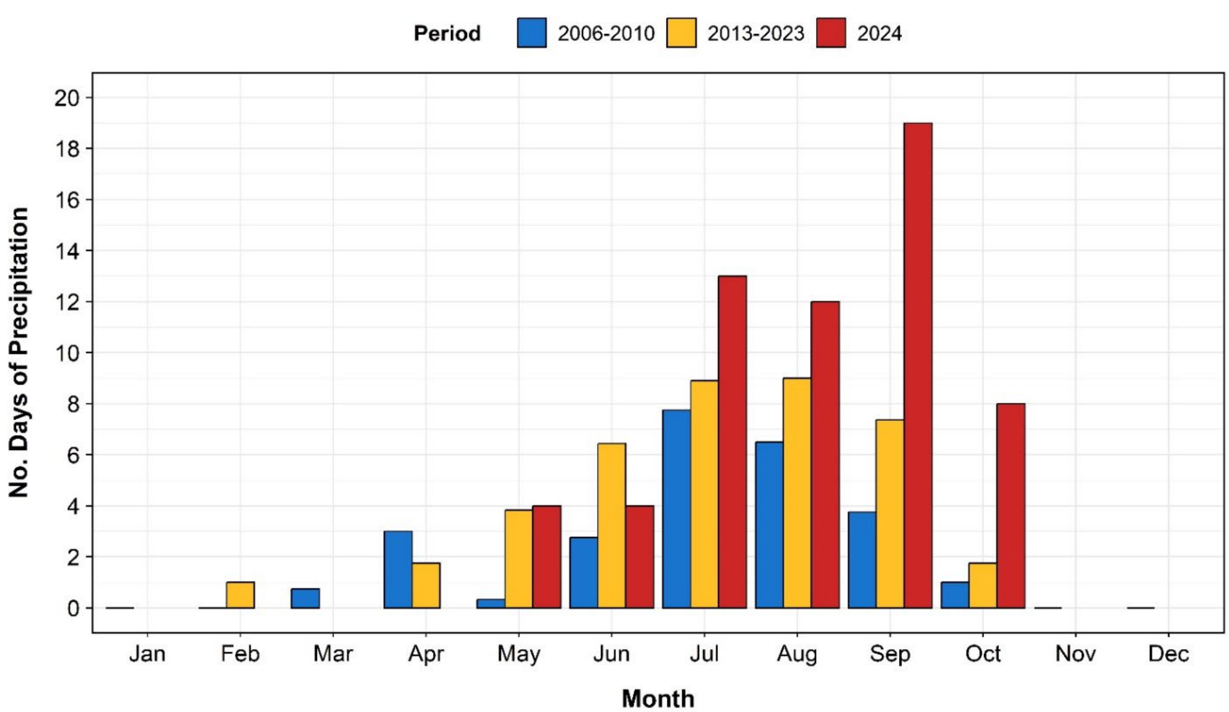



Figure 4-4. Milne Port monthly precipitation frequency (number of days experiencing precipitation) from 2006–2010, 2013–2023, and 2024.

### 4.3.3 COMPARISON BETWEEN SITES

The Mine Site tends to be warmer and wetter than Milne Inlet. Since the start of continual monitoring in 2013, the Mine Site has had a mean temperature of -11.5°C and annual precipitation of 179.7 mm, while Milne Inlet has had a mean temperature of -13.4°C and annual precipitation of 88.7 mm.

In 2024, the Mine Site had a mean annual temperature of -10.4°C and 338.4 mm of precipitation, compared to -10.6°C and 200.4 mm, respectively, at Milne Inlet. Extreme temperatures had a broader range at the Mine Site, possibly due to the moderating effects of ocean proximity on the Milne Inlet MET station.

Overall, 2024 could be considered a very wet and somewhat warm year at the Mine Site and Milne Inlet. Both sites had record-breaking rainfall frequency and depth, and both sites had seven months with mean temperatures greater than 3°C warmer than the post-2013 average. Observing the change in conditions from year to year, there has been a regional trend towards increased temperatures and rainfall.

## 4.4 WIND SPEED AND DIRECTION

A comparison of wind conditions between 2024 and the 2013 to 2023 period is provided in this subsection. Data are presented in the form of wind rose plots, which display wind direction, intensity, and frequency. A wind rose contains 'slices' pointing in different compass directions, with a longer slice indicating more time with wind blowing from that direction. The coloured bands of each slice correspond to wind velocities as defined by the Beaufort Scale (Table 4-1), with blue bands representing the lightest breezes and red bands representing the heaviest gales. Any average speeds >20.8 m/s were included in the 'gale' category because of their relatively low frequency of occurrence. Wind data with zero values for hourly average wind speed and wind direction were excluded from analyses. Environment Canada did not record wind data at the Mine Site MET station between 1963 and 1965, so no comparison was possible.

**Table 4-1. Beaufort Scale used for wind speed measurements at the Mary River Project.**

| Beaufort Number | Name | Knots | km/h | m/s |
|---|---|---|---|---|
| 0 | Calm | <1 | <1 | <0.3 |
| 1 | Light Air | 1–3 | 1–5 | 0.3–1.5 |
| 2 | Light Breeze | 4–6 | 6–11 | 1.6–3.3 |
| 3 | Gentle Breeze | 7–10 | 12–19 | 3.4–5.5 |
| 4 | Moderate Breeze | 11–16 | 20–28 | 5.5–7.9 |
| 5 | Fresh Breeze | 17–21 | 29–38 | 8.0–10.7 |
| 6 | Strong Breeze | 22–27 | 39–49 | 10.8–13.8 |
| 7 | Near Gale | 28–33 | 50–61 | 13.9–17.1 |
| 8 | Gale | 34–40 | 62–74 | 17.2–20.7 |
| 9 | Strong Gale | 41–47 | 75–88 | 20.8–24.4 |
| 10 | Storm | 48–55 | 89–102 | 24.5–28.4 |
| 11 | Violent Storm | 56–63 | 103–117 | 28.5–32.6 |
| 12 | Hurricane | >64 | >117 | >32.7 |

### 4.4.1 MINE SITE

#### 4.4.1.1 2024 Wind

At the Mine Site MET station in 2024, the prevailing wind directions were along a northwest-southeast axis, predominately from the southeast and south-southeast (Figure 4-5). Winds along the northwest-southeast axis were most commonly characterized as 'gentle breeze' (3.3 to 5.6 m/s) or 'moderate breeze' (5.6 to 8.1 m/s). Winds from the east were less common but tended to be higher intensity, and the heaviest wind in 2024, a 25.1 m/s 'storm', was recorded blowing from the east on October 2. Winds from the north, west, and southwest were uncommon and generally weak, with the most common winds from these directions being 'light air' (0.3 to 1.7 m/s).

#### 4.4.1.2 2013–2023 Wind

Wind directions and velocities in 2024 at the Mine Site MET station were consistent with the 2013 to 2023 period (Figure 4-6). Winds most frequently blew from the northwest or southeast, winds from the east were uncommon but tended to be the strongest, while winds from the north, west, and southwest were uncommon and weak. The maximum wind velocity recorded during this period at the Mine Site MET station was a 'violent storm' of 28.6 m/s from the east on October 23, 2023. A 41.9 m/s 'hurricane' was recorded in June 2006 during a period when wind speed was collected without directional information.

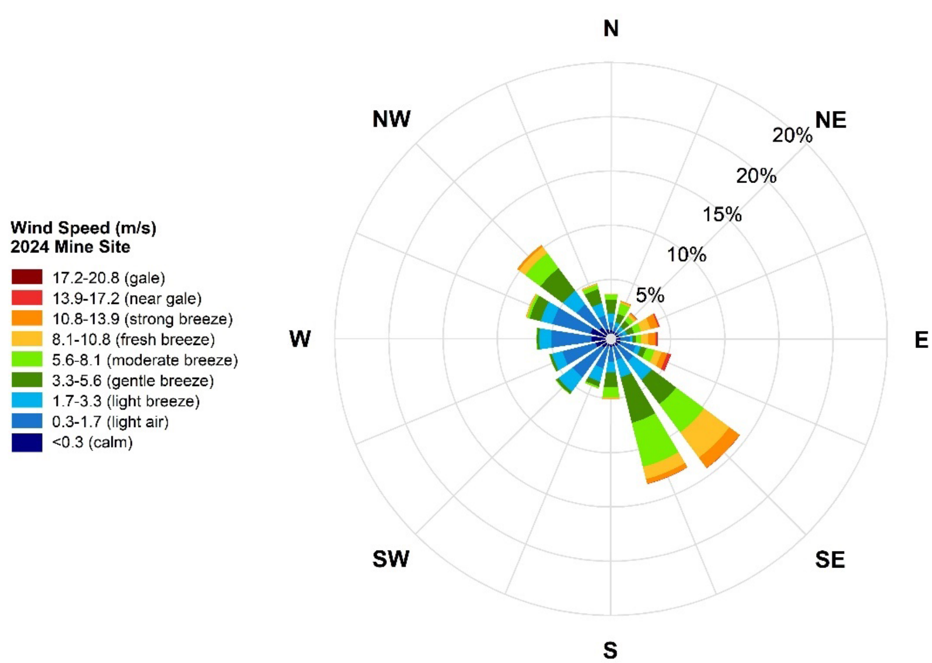



**Figure 4-5. The cumulative proportions of wind speeds and directions at the Mine Site meteorological station in 2024.**

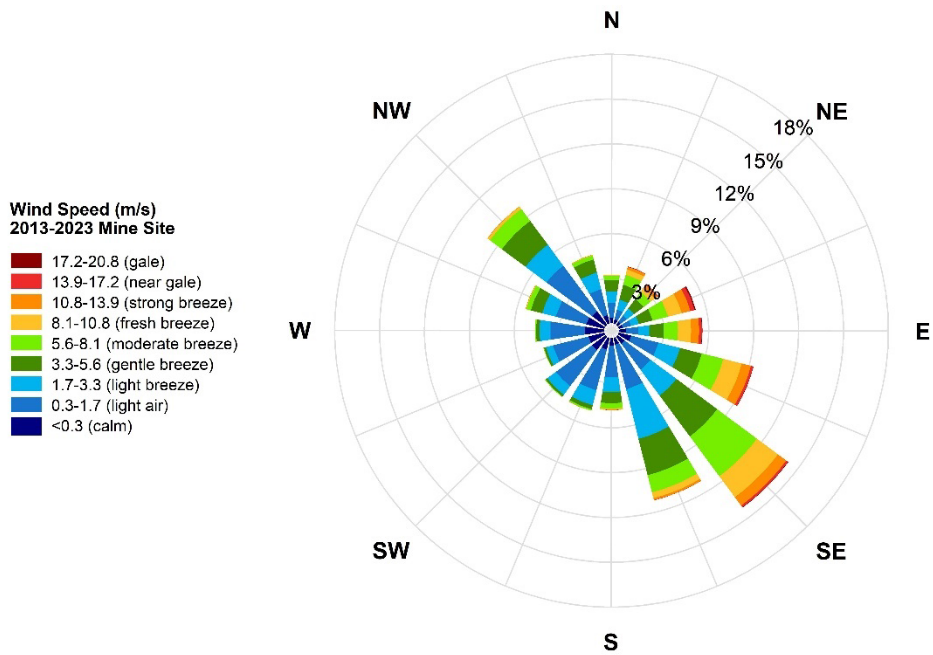



**Figure 4-6.** **The cumulative proportions of wind speeds and directions at the Mine Site meteorological station from 2013 to 2023.**

## 4.4.2 MILNE INLET

### 4.4.2.1 2024 Wind

Prevailing winds at the Milne Inlet MET station in 2024 came primarily from the southwest and north-northwest (Figure 4-7). The southwest winds are onshore winds (blowing from land to water) that move down Milne Inlet, while the north-northwest winds are offshore winds (blowing from water onto land) that blow perpendicular to the length of Milne Inlet.

The prevailing wind directions at the Milne Inlet MET station received the largest proportions of 'gale' (17.2 to 20.8 m/s) or stronger winds. The most common winds from the southwest were 'fresh breeze' (8.1 to 10.8 m/s) and 'strong breeze' (10.8 to 13.9 m/s), while the most common winds from the north-northwest were 'moderate breeze' (5.6 to 8.1 m/s). The heaviest wind in 2024 was a 33.7 m/s 'hurricane' on September 21, which blew from the southwest and south-southwest. Winds from the southeast and west were very uncommon and weak when they occurred.

### 4.4.2.2 2013–2023 Wind

Wind directions and velocities in 2024 at the Milne Inlet MET station were consistent with the 2013 to 2023 period (Figure 4-8). Winds most frequently blew from the southwest and northwest, and tended to be the strongest, while winds from the east and west were less common and weaker. Onshore winds from the southeast were relatively more common during the 2013 to 2023 period, but were still generally weak. The maximum reliable wind velocity recorded during this period at the Milne Inlet MET station was a 40.35 m/s 'hurricane' from the southwest in April 2016.

#### 4.4.2.3 Seasonal Patterns

A study of individual months of wind identified a seasonal pattern of winds at Milne Inlet. During winter, winds blew along a southwest-northeast axis (the orientation of the inlet), predominately from the southwest. This pattern was clearest from December to March (Figure 4-9). During summer, winds were primarily from the north-northwest and southwest, with northeast winds becoming less prominent (Figure 4-10). This pattern was clearest from June to September. These patterns were first described in 2023, and were observed to be the same in 2024.

#### 4.4.2.4 Data Quality

Recorded wind directions at Milne Inlet before June 26, 2021, were offset by 180° due to an error in installing the weather vane. This error was corrected on that date, but this correction was not immediately communicated to EDI Environmental Dynamics Inc. This caused the long-term dataset to incorrectly indicate a major shift in wind patterns during previous annual climate summaries. In this report, the erroneous wind directions have been corrected, showing that there has been no change in prevailing wind patterns at Milne Inlet since the beginning of monitoring.

Anomalously high wind speeds with a maximum output (100 m/s) were intermittently recorded between January 2018 and February 2019. These wind speed recordings are believed to be an anemometer error. Most occurred during very cold periods, with the mean temperature during these extreme readings being -35.4°C. This correlation does not make clear the mechanism that caused these erroneous and uncorroborated measurements. From March 2019 onwards, no such extreme wind speeds have been recorded.

Instrument failures occasionally interrupted climate data collection between January 2019 and August 2021. No such issues were detected after this period.

Reliable data collection since August 2021 can be attributed to improvements to the meteorology monitoring program. This includes monthly meteorology data quality checks, quarterly reviews by independent subject matter experts, and comparisons against other regional weather monitoring data. When data quality issues arise, the meteorology monitoring equipment is physically checked. Physical checks for the Milne Port MET stations are only possible when a helicopter is available (no helicopter is available during winter).

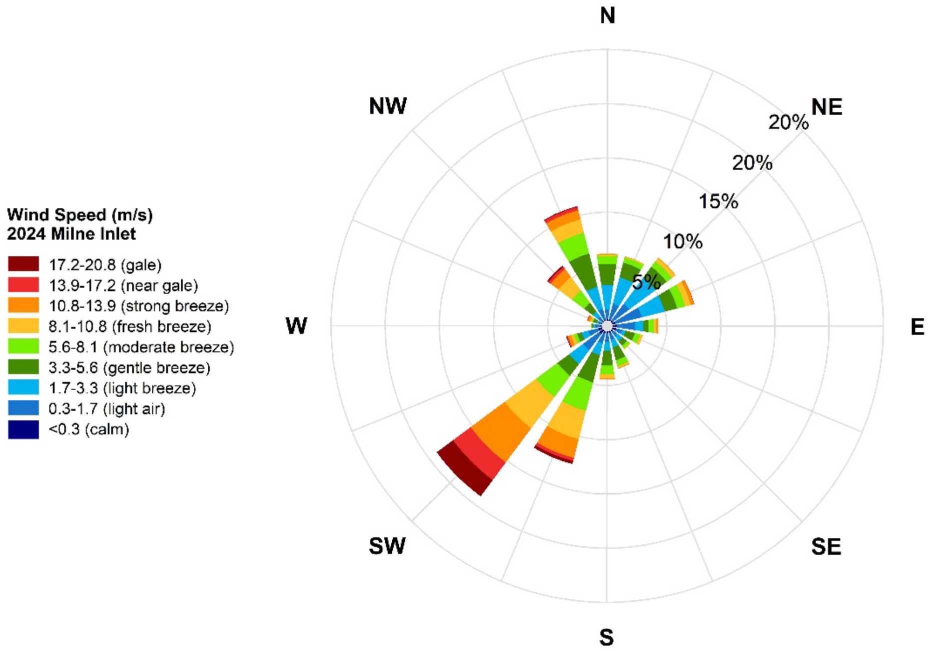



**Figure 4-7. The cumulative proportions of wind speeds and directions at the Milne Port meteorological station in 2024.**

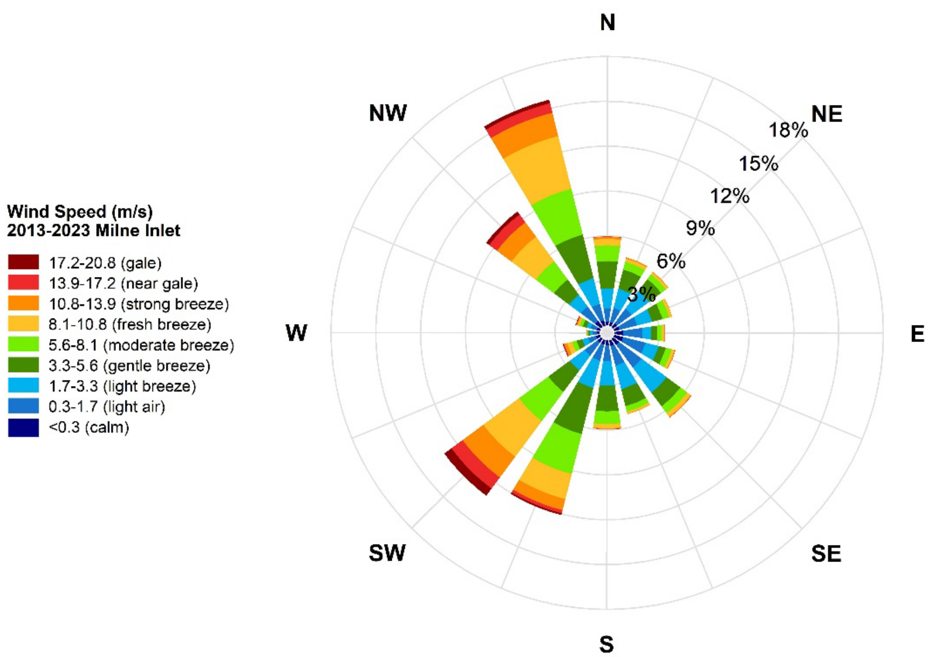



**Figure 4-8. The cumulative proportions of wind speeds and directions at the Milne Port meteorological station from 2013 to 2023.**

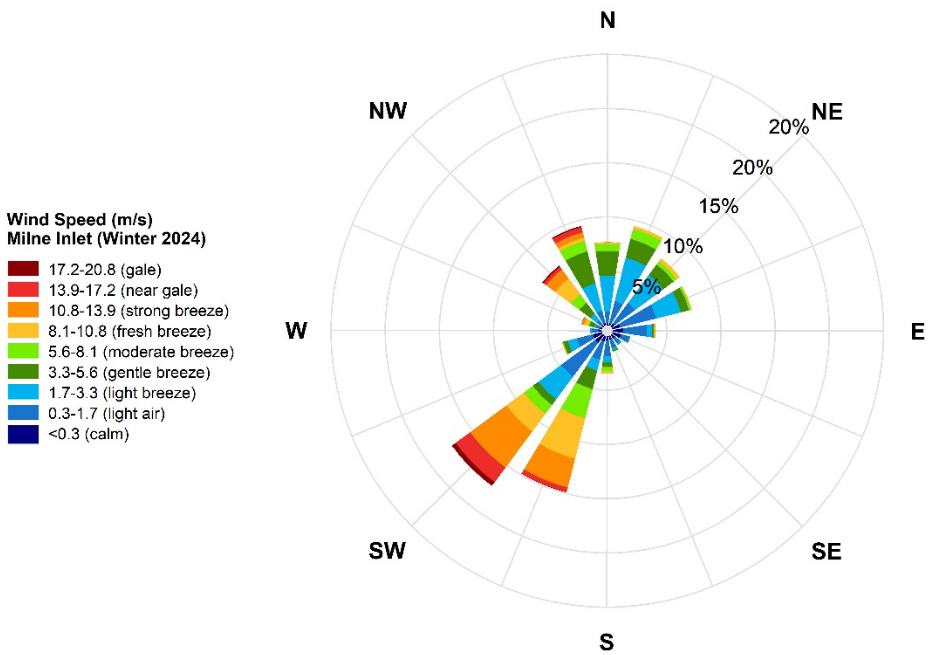



**Figure 4-9.** Winter wind patterns at the Milne Port meteorological station from January to March and December 2024.

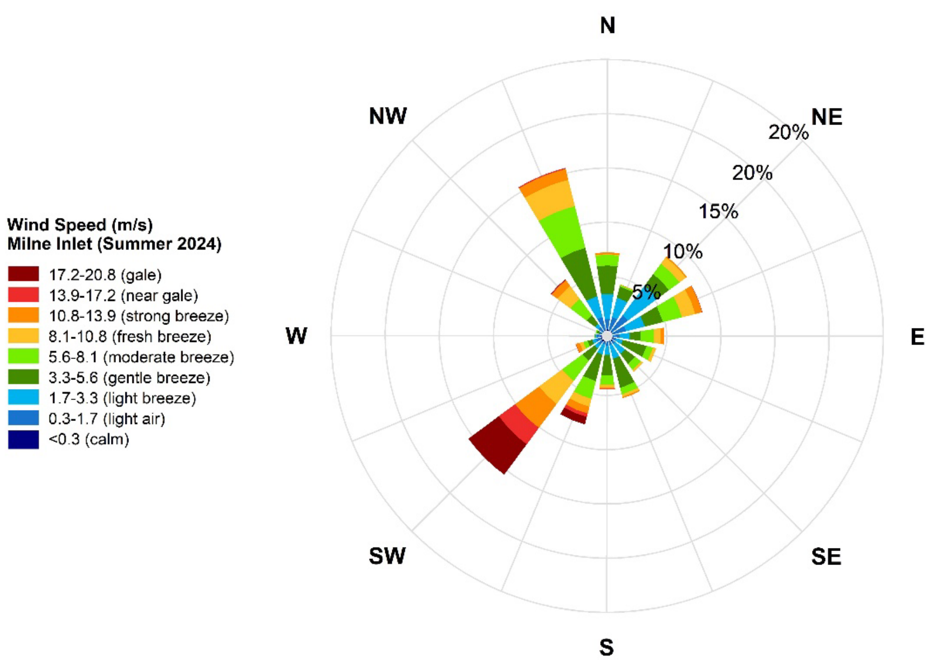



**Figure 4-10.** Summer wind patterns at the Milne Port meteorological station from June to September 2024.

# 5 HELICOPTER OVERFLIGHTS

The Nunavut Impact Review Board Project Certificate No. 005 Amendment 3 includes three Project Conditions (PCs) related to helicopter overflight altitudes to reduce disturbance to wildlife (Nunavut Impact Review Board 2020). The conditions include:

- **PC #59** *"The Proponent shall ensure that aircraft maintain, whenever possible (except for specified operational purposes such as drill moves, take offs and landings), and subject to pilot discretion regarding aircraft and human safety, a cruising altitude of at least 610 metres during point-to-point travel when in areas likely to have migratory birds, and 1,000 metres vertical and 1,500 metres horizontal distance from observed concentrations of migratory birds (or as otherwise prescribed by the Terrestrial Environment Working Group) and use flight corridors to avoid areas of significant wildlife importance…"*
- **PC #71** *"Subject to safety requirements, the Proponent shall require all project-related aircraft to maintain a cruising altitude of at least:*
  - *650 m during point-to-point travel when in areas likely to have migratory birds*
  - *1,100 m vertical and 1,50 m horizontal distance from observed concentrations of migratory birds*
  - *1,100 m over the area identified as a key site for moulting Snow Geese during the moulting period (July–August), and if maintaining this altitude is not possible, maintain a lateral distance of at least 1,500 m from the boundary of this site."*
- **PC #72** *"The Proponent shall ensure that pilots are informed of minimum cruising altitude guidelines and that a daily log or record of flight paths and cruising altitudes of aircraft within all Project Areas is maintained and made available for regulatory authorities such as Transport Canada to monitor adherence and to follow up on complaints."*

Baffinland Iron Mines Corporation (Baffinland), in collaboration with the Terrestrial Environment Working Group (TEWG), is committed to "*specific measures to ensure that employees and subcontractors providing aircraft services to the Project are respectful of wildlife and Inuit harvesting that may occur in and around Project areas*" (Qikiqtani Inuit Association and Baffinland Iron Mines Corporation 2014). Data from helicopter flight logs were analyzed to determine compliance with these PCs and Baffinland's commitments.

**Helicopter Overflights Summary**

Analysis of flight tracklog data and daily pilot timesheets (with flight details) was used to determine helicopter overflight compliance at the Project.

**Compliance —** From May 26 through September 26, the total flight time in 2024 was 434.95 hours, less than all previous years. Overall, compliance was 18.64% compliant, 53.64% compliant with rationale (combined compliance of 72.28%), and 27.72% non-compliant. Flights within the Snow Geese area accounted for 24.94 hours (5.73% of total flight hours) and 20.6% of all transits. During the moulting season (July 1 to August 31), compliance in the Snow Geese area was 9.41% compliant, 60.62% compliant with rationale (combined compliance of 70.03%), and 29.97% non-compliant.

**Compliance Rationale —** Flights with pilot rationale accounted for 53.64% of total flight hours. The most common rationales for flying below the cruising altitude requirements in 2024 were geophysical survey (16.49% of total flight hours), weather-related circumstances (15.12% of total flight hours), and short-distance flights (13.85% of total flight hours). Within the Snow Geese area and the 1,500 m buffer during the moulting season, where the cruising altitude requirement is ≥1,100 metres above ground level (magl), compliant with rationale flights accounted for 60.62% of flight hours (1.68% of total flight hours).

**Inter-annual Trends —** Overall, combined compliance was greater than 90% from 2018 to 2023, with non-compliant flights fluctuating between 4% and 8%. Combined compliance for 2024 (72.28%) was comparable to that for 2017 (73.39%). The number of transits (204) and flight hours (24.94) within the Snow Geese area during the moulting season was lower in 2024 compared to 2023, but similar to previous years (2019 and 2021). Flight hours (5.73%) within the Snow Geese area during the moulting season were higher than the previous six years, and non-compliant flights increased to 29.97% in 2024, the highest since 2022.

## 5.1 METHODS

### 5.1.1 MONITORING HISTORY AND CHANGES IN OVERFLIGHT ANALYSIS AT THE PROJECT

Changes have been made to the helicopter overflight monitoring and analysis program based on data analysis, interpretation, and input from the TEWG. The following information summarizes key milestones and responses to TEWG comments leading up to the 2024 helicopter overflight analysis.

**2015** — Start of helicopter overflight analysis. Compliance was determined based on the elevation above the ground of points using data from helicopter flight logs.

**2017** — Pilot rationale for low-level flights was included in flight logs and used in compliance evaluation.

**2020** — Additional reporting on helicopter pilot rationale and flight time was requested during the 2020 TEWG meeting (Baffinland Iron Mines Corporation 2020). Recommendations led to re-analyzing the 2017 to 2019 helicopter flight data[5] to align with updated (2020) standards.

**2021** — The Government of Nunavut (GN) requested—in commentary on the 2020 Terrestrial Environment Annual Monitoring Report (TEAMR; refer to comment GN AR#02; Nunavut Impact Review Board 2021)—re-analysis of 2015 to 2016 helicopter overflight data[6] to align with 2020 standards using the methods described in this section.

**2023** — The GN requested—in commentary on the 2022 Nunavut Impact Review Board Annual Report (refer to comment GN AR#01; Baffinland Iron Mines Corporation 2023a)—amendments to the helicopter

[5] 2017 to 2019 data re-analysis provided in Appendix D, 2020 TEAMR (EDI Environmental Dynamics Inc. 2021).

[6] 2015 to 2016 data re-analysis provided in Appendix B, 2021 TEAMR (EDI Environmental Dynamics Inc. 2022a). Only the flight time portion of the analysis could be conducted (partial analysis given that pilot rationale for non-compliance was not collected).

overflight rationale definitions that were addressed through ancillary consultations and discussions[7]. The 2023 helicopter overflight data were collected using the amended list of rationale. The 2017 to 2022 helicopter data were re-categorized into the new rationale to compare with the 2023 helicopter data.

**2024** — The Canadian Digital Elevation Model used in the previous years' analysis was no longer supported by Natural Resources Canada and was replaced by the Medium Resolution Digital Elevation Model for use in the flying height above sea level calculations (Natural Resources Canada 2024).

### 5.1.2 DATA COLLECTION AND ANALYSIS

A discrepancy exists between PC #59 (i.e., which prescribes a cruising altitude requirement of 610 magl in areas likely to have migratory birds) and PC #71 (i.e., which prescribes a cruising altitude requirement of 650 magl in areas likely to have migratory birds). Considering that most (if not all) areas where Baffinland operated from May through September 2024 were likely to have migratory birds present, the default minimum cruising altitude for the analysis was 650 magl.

As per PC #71, the analysis included the following aircraft cruising altitudes in consideration of migratory birds during specific periods:

- 1,100 magl while travelling within the key moulting area for Snow Geese during the moulting season (July and August) or maintaining 1,500 m horizontal distance from the boundary of the key moulting area (the combined areas hereafter referred to as the Snow Geese area);
- 650 magl during point-to-point travel in areas outside the Snow Geese area during the moulting season, and in all areas in all other months; and,
- 1,100 magl and 1,500 m horizontal distance from observed concentrations of migratory birds year round (i.e., all months).

Canadian Helicopters supplied flight tracklog data and daily pilot timesheets (with flight details) to provide context and further explain the need for transits that did not meet cruising altitude requirements. Point data were provided in feet above sea level and converted to metres above sea level (masl). A digital elevation model was used to estimate ground-level elevation above sea level, which provided elevation data to calculate the helicopter tracklog's altitude above ground level. To calculate the elevation above ground level in metres (i.e., magl) at each tracklog point, the masl from the digital elevation model was subtracted from the masl from the helicopter tracklog.

Quality assurance/quality control procedures were completed by comparing calculated values in relation to the status field of the flight tracklog data. It was assumed that when the helicopter status was 'TakeOff', 'Landing Time', or 'OnGround', the elevation would be at or close to 0 magl. With a sample size of 3,005

[7] "Baffinland met with Brad Pirie, John Ringrose, and Agnes Simonfalvy from the GN Department of Environment at 10:00 am EST on January 5, 2023, via ZOOM to discuss the current list of acceptable rationale for low-level helicopter flights. Baffinland jointly developed a revised list of acceptable rationale for low-level helicopter flights with the GN to aid with raising compliance, which is included as Table 4.22 in PC # 59 of the NIRB Annual Report" (from the TEWG No. 30 meeting minutes Action ID T-28042022-2; Baffinland Iron Mines Corporation 2023).

points, the average elevation above ground level was 16.96 m. The standard deviation in 2024 indicated accuracy was approximately ±7.52 m.

The flight tracklog points were joined with the pilot rationale from daily timesheets and converted to flight line segments for analysis. Each line segment represented a straight line between two consecutive flight tracklog points within the same transit. Tracklog points were recorded approximately every two minutes during flight, resulting in line segments with a duration of two minutes and variable lengths depending on the flight speed. The flight time and minimum cruising altitude were calculated for each flight line segment. Flight time was calculated for each pilot rationale stated in the daily timesheets.

Data were split into two categories: (1) data within the Snow Geese area during the moulting season (July and August) in relation to the 1,100 magl cruising altitude and 1,500 m horizontal distance requirement; and (2) data outside the Snow Geese area during the moulting season, and in all areas during all other months, in relation to the 650 magl cruising altitude requirement. The datasets were then analyzed separately to assess specific cruising altitude allowances using the different areas and minimum requirements. The first and last flight line segments of a flight as the helicopter takes off or lands were considered compliant, despite being below the cruising altitude requirement. Flight data with rationale for flying at lower elevations than required were deemed 'compliant with rationale'. Based on these criteria, flight data were organized into six categories described in Table 5-1.

Pilots were given the spatial boundaries of any identified concentrations of migratory birds to comply with the horizontal guidelines, which were buffered by the required 1,500 m horizontal avoidance distance. The boundaries were programmed into the helicopter Geographic Positioning System (GPS) and pilots were directed to avoid flying in these areas as specified in the *Canadian Helicopters Instructions Local Operating Procedures* checklist. The only area provided for horizontal avoidance and analysis in 2024 was the key moulting area for Snow Geese provided by Environment and Climate Change Canada.

**Table 5-1. Helicopter overflight compliant categories.**

| Compliant Category | Description |
|---|---|
| Compliant | Data within the Snow Geese area in July and August where the 1,100 magl cruising altitude requirement was achieved. |
| Compliant | Data outside the Snow Geese area in July and August, and in all areas during all other months, where the 650 magl cruising altitude requirement was achieved. |
| Compliant with rationale | Data within the Snow Geese area in July and August where the 1,100 magl cruising altitude requirement was not achieved, but a rationale for low-level flying was given. |
| Compliant with rationale | Data outside the Snow Geese area in July and August, and in all areas during all other months, where the 650 magl cruising altitude requirement was not achieved, but a rationale for low-level flying was given. |
| Non-compliant | Data within the Snow Geese area in July and August where the 1,100 magl cruising altitude requirement was not achieved and no rationale for low-level flying was given. |
| Non-compliant | Data outside the Snow Geese area in July and August, and in all areas during all other months, where the 650 magl cruising altitude requirement was not achieved and no rationale for low-level flying was given. |

## 5.2 RESULTS AND DISCUSSION

### 5.2.1 COMPLIANCE

Only the key moulting area for Snow Geese was identified for helicopter avoidance in 2024. No locations or boundaries of areas prescribed explicitly by the TEWG or areas of observed concentrations of other migratory birds were identified in 2024. As a result, except for the Snow Geese area, no analysis was required to determine compliance with the 1,100 m vertical and 1,500 m horizontal distances for any other location. No known public complaints were recorded in 2024 regarding helicopter overflights that required specific follow-up actions.

In 2024, Canadian Helicopters operated three helicopters during the summer season, one less than in 2023. The helicopters arrived on site May 26, June 2, and June 3. They were in operation for the entire season, then departed August 31, September 5, and September 28.

A total of 992 transits were flown from May to September 2024; 204 transits (20.6%) intersected the Snow Geese area (key moulting area plus the 1,500 m horizontal buffer) during the moulting season (July and August) and 788 transits (79.4%) were outside the Snow Geese area and in all areas during all other months (Table 5-2). The total flight time was 434.95 hours, accounting for 14.5% of available hours from May 26 to September 28 (3,000 hours). During the moulting season, 24.94 hours (5.73%) were flown within the Snow Geese area. Out of the Snow Geese area and in all areas during all other months, 410.02 hours (94.27%) were flown (Table 5-3).

The number of flights and flight hours within the Snow Geese area during the 2024 moulting season (July and August) decreased compared to 2023, but the percentage increased due to the reduced number of total flights and hours. These flight hours accounted for 1.68% of the total available hours during the two months of the moulting period (1,488 hours). Cruising altitude compliance within the Snow Geese area during the moulting season was 9.41% compliant, 60.62% compliant with rationale, and 29.97% non-compliant (Table 5-4, Map 5-3, Map 5-4). Combined compliance (compliant plus compliant with rationale) was 70.03%. Most flights within the Snow Geese area during the moulting season were transits along the edges, away from the core of the Snow Geese area, identified as having higher concentrations of geese[8] (Map 5-3, Map 5-4).

[8] Flights within the Snow Geese area are considered non-compliant if they do not meet the altitude requirements or are not provided rationale in the pilot daily timesheets. Pilots maintain a 1,100 m vertical distance above ground level when flying within the Snow Geese area during the moulting season whenever possible. If this cruising altitude is not possible for safety or operational reasons, pilots maintain a 1,500 m horizontal distance if the flight path allows. However, this 1,500 m horizontal buffer is not always practical as it results in longer flight times and prolongs potential disturbance. Alternatively, pilots occasionally fly over the eastern edge of the Snow Geese area to reduce flight time and minimize potential disturbance. Baffinland understands that Snow Geese are typically concentrated in the core of the moulting area and are seldom present along its periphery. Disturbance to birds under flight paths along this periphery is expected to be minimal.

Overall, compliance in all areas between May and September 2024 was 18.64% compliant, 53.64% compliant with rationale, and 27.72% non-compliant (Table 5-5, Map 5-1 to Map 5-5). Combined compliance (compliant plus compliant with rationale) varied across the reporting period, ranging from 18.51% in May to 79.28% in August, with June, July, and September falling within the 51.71% to 73.21% range. Non-compliant flights followed defined flight corridors to work areas and monitoring sites such as Brucehead, Steensby Inlet, surrounding lakes, and survey sites (Map 5-1 to Map 5-5).

**Table 5-2. The number of transits flown per month with a breakdown of transits (№ and %) flown within and outside the Snow Geese area, May 26 to September 28, 2024.**

| Month | Total № of Transits | Within Snow Geese Area During Moulting Season (July and August) | | Outside Snow Geese Area During Moulting Season and All Areas in Other Months | |
|---|---|---|---|---|---|
| | | № of Transits | % Transits | № of Transits | % Transits |
| May | 10 | - | - | 10 | 100.0 |
| June | 137 | - | - | 137 | 100.0 |
| July | 365 | 114 | 31.2 | 251 | 68.8 |
| August | 359 | 90 | 25.1 | 269 | 74.9 |
| September | 121 | - | - | 121 | 100.0 |
| **Total** | **992** | **204** | **20.6** | **788** | **79.4** |

Note: Total values may be off from row/column sums by 0.01 due to rounding.

**Table 5-3. Number of flight hours per month with a breakdown of flight time (hours and %) flown within and outside the Snow Geese area, May 26 to September 28, 2024.**

| Month | Total Hours per Month | Total Flight Hours | Within Snow Geese Area During Moulting Season (July and August) | | Outside Snow Geese Area During Moulting Season and All Areas in Other Months | |
|---|---|---|---|---|---|---|
| | | | Flight Hours | % Flight Time | Flight Hours | % Flight Time |
| May | 120 | 3.32 | - | - | 3.32 | 100.00 |
| June | 720 | 43.80 | - | - | 43.80 | 100.00 |
| July | 744 | 176.80 | 12.77 | 7.22 | 164.03 | 92.78 |
| August | 744 | 172.70 | 12.17 | 7.05 | 160.53 | 92.95 |
| September | 672 | 38.34 | - | - | 38.34 | 100.00 |
| **Total** | **3,000** | **434.95** | **24.94** | **5.73** | **410.02** | **94.27** |

Note: Total values may be off from row/column sums by 0.01 due to rounding.

**Table 5-4. Number of flight hours of cruising altitude compliance (≥1,100 magl) within the Snow Geese area during the moulting season, July 1 to August 31, 2024.**

| Month | Area | Total Hours per Month | Total Flight Hours | Compliant | | Compliant with Rationale | | Combined Compliance | Non-compliant | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | hrs | % | hrs | % | % | hrs | % |
| July | Within SNGO[1] Area | 744 | 12.77 | 1.39 | 10.87 | 7.22 | 56.56 | 67.43 | 4.16 | 32.57 |
| August | Within SNGO[1] Area | 744 | 12.17 | 0.96 | 7.88 | 7.90 | 64.89 | 72.77 | 3.31 | 27.23 |
| **Total** | | **1,488** | **24.94** | **2.35** | **9.41** | **15.12** | **60.62** | **70.03** | **7.47** | **29.97** |

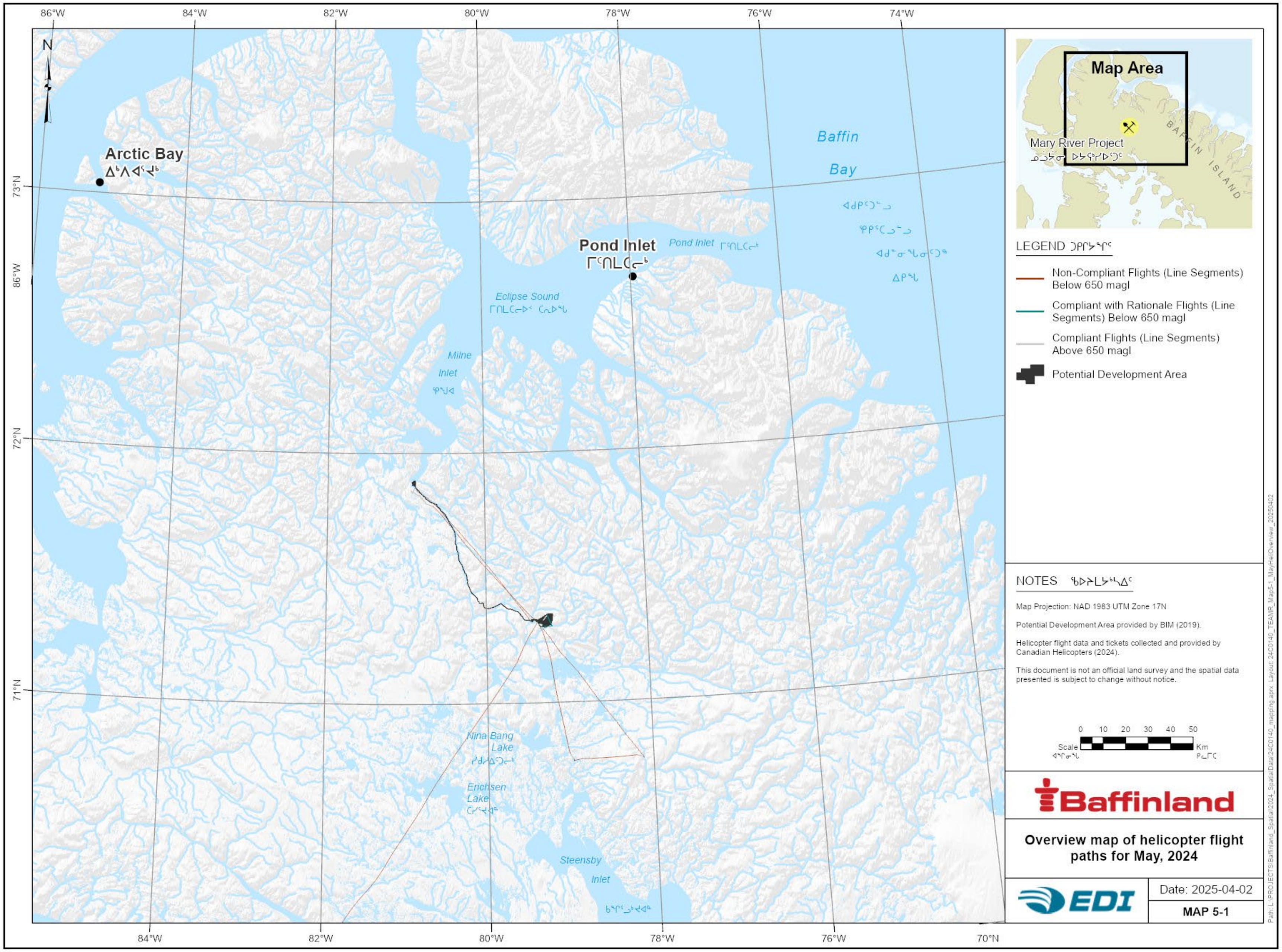
[1] SNGO = Snow Geese.

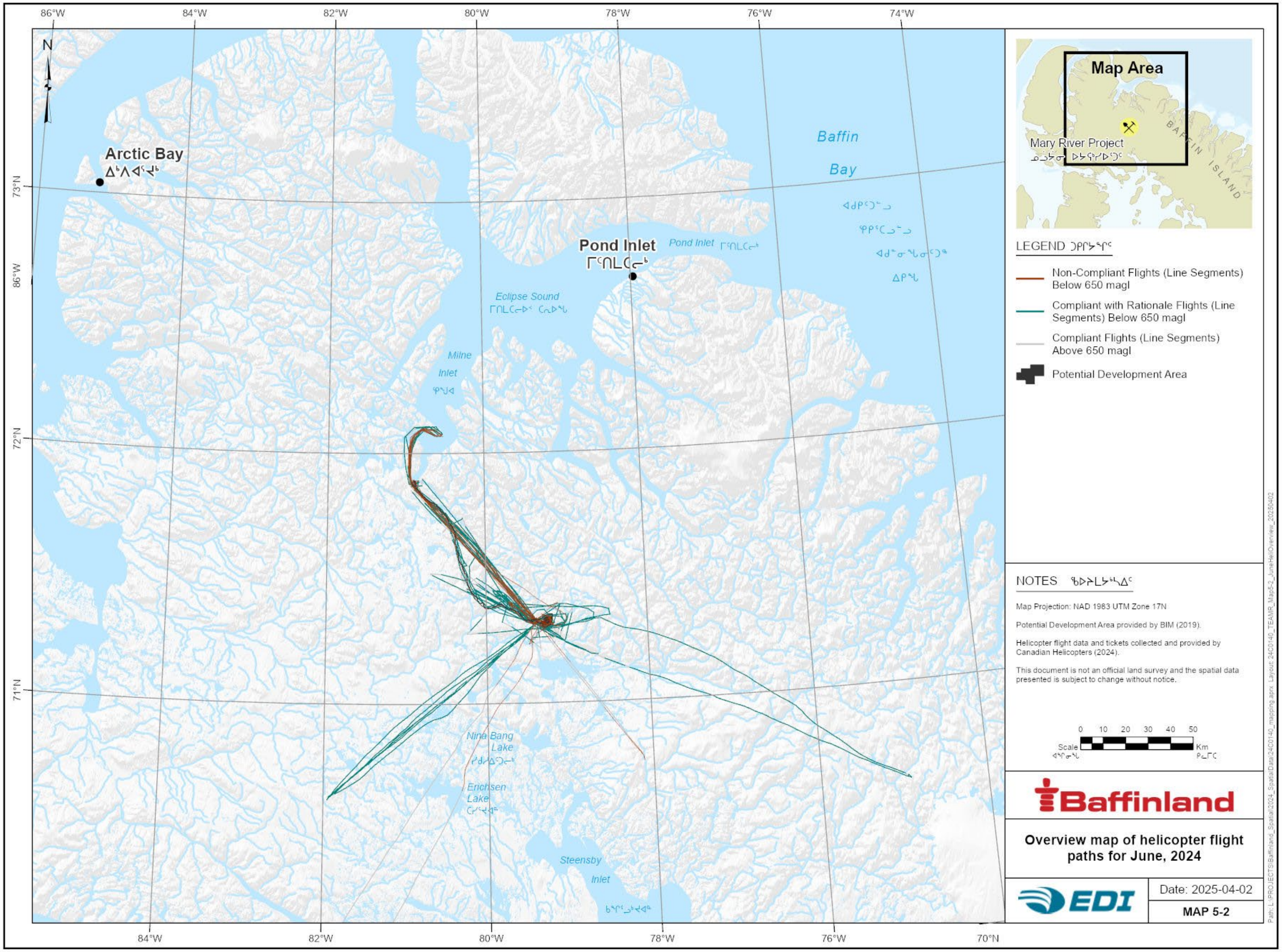
Note: Total values may be off from row/column sums by 0.01 due to rounding.

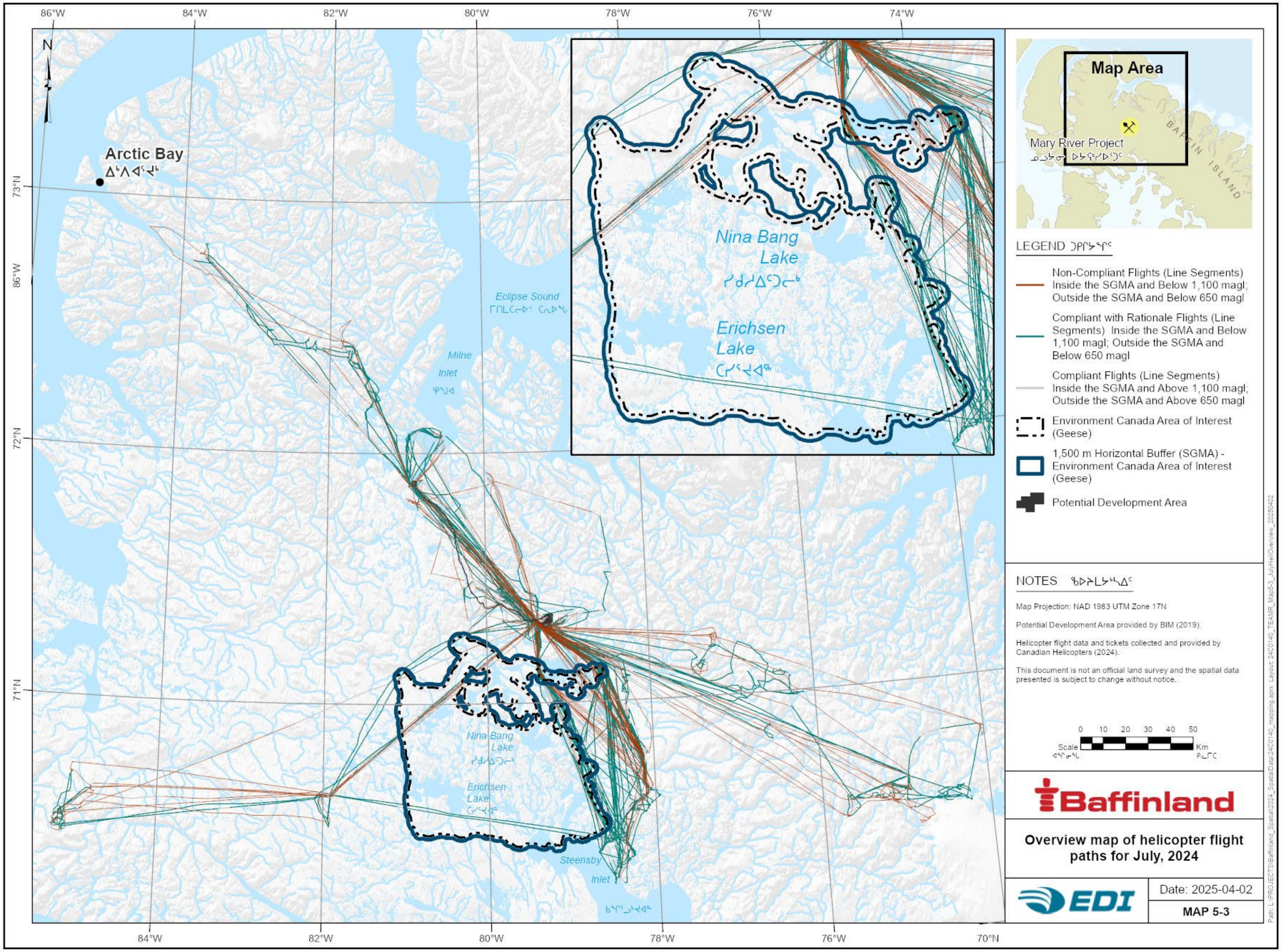
**Table 5-5. Number of flight hours of overall cruising altitude compliance in all areas for all months between May 26 to September 28, 2024.**

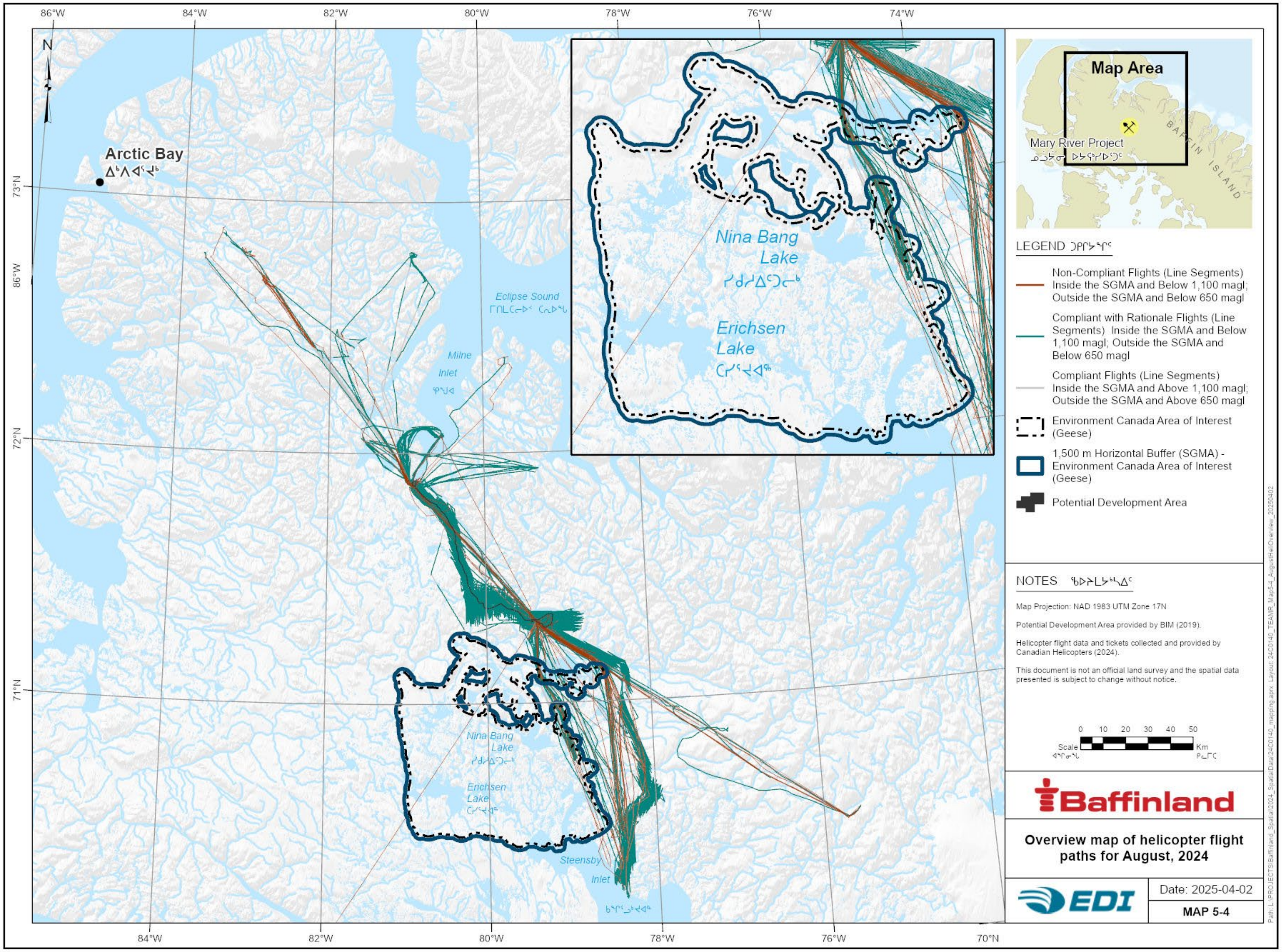
| Month | Area | Total Hours per Month | Total Flight Hours | Compliant | | Compliant with Rationale | | Combined Compliance | Non-compliant | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | hrs | % | hrs | % | % | hrs | % |
| May | All Areas | 120 | 3.32 | 0.51 | 15.49 | 0.10 | 3.02 | 18.51 | 2.70 | 81.49 |
| June | All Areas | 720 | 43.80 | 9.42 | 21.50 | 22.65 | 51.71 | 73.21 | 11.74 | 26.79 |
| July | All Areas | 744 | 176.80 | 35.41 | 20.03 | 84.77 | 47.95 | 67.98 | 56.61 | 32.02 |
| August | All Areas | 744 | 172.70 | 28.43 | 16.46 | 108.47 | 62.81 | 79.28 | 35.79 | 20.72 |
| September | All Areas | 672 | 38.34 | 7.30 | 19.04 | 17.34 | 45.21 | 64.25 | 13.71 | 35.75 |
| **Total** | | **3,000** | **434.95** | **81.08** | **18.64** | **233.33** | **53.64** | **72.28** | **120.55** | **27.72** |

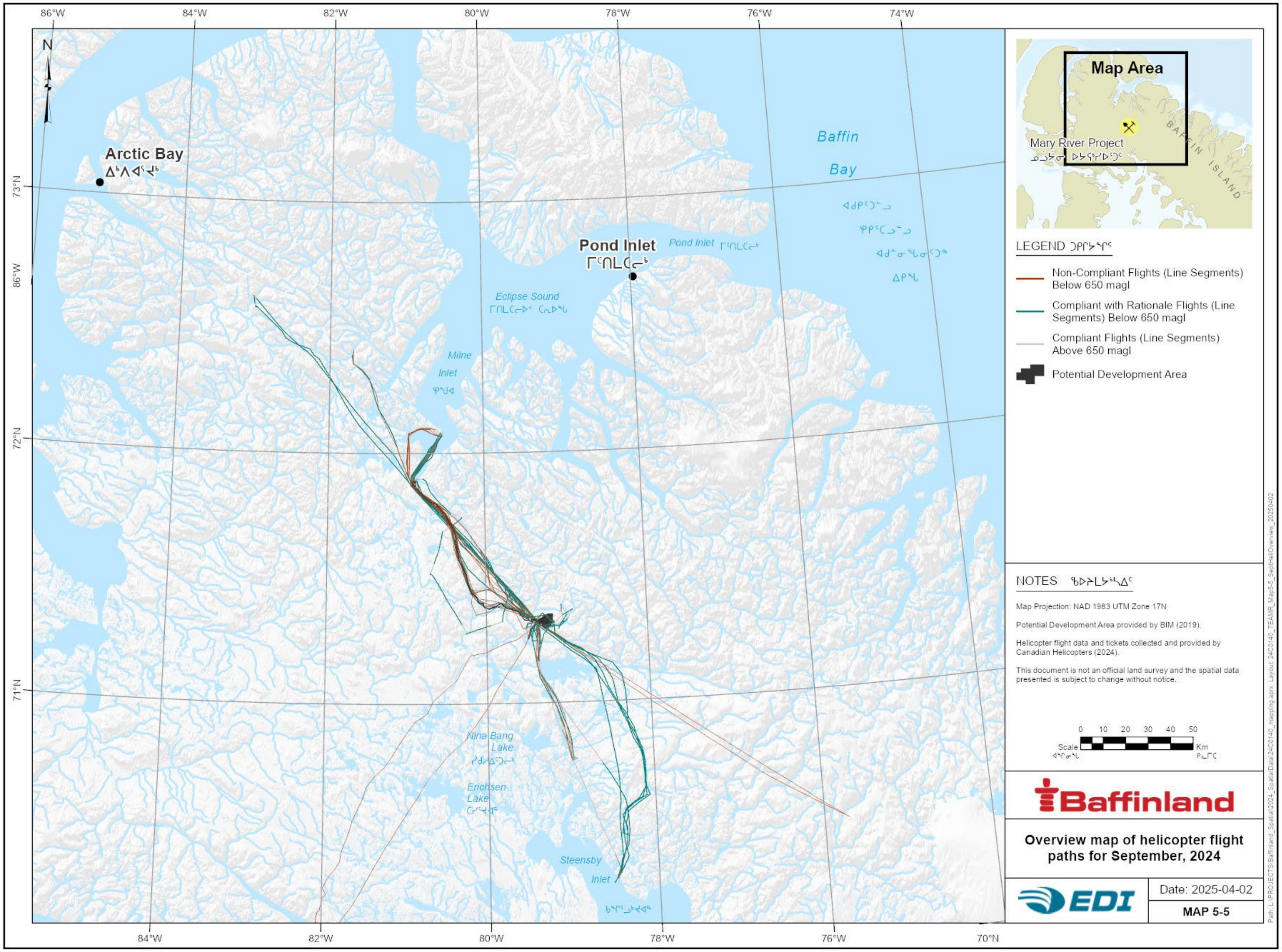
Note: Total values may be off from row/column sums by 0.01 due to rounding.


86°W
84°W
82°W
80°W
78°W
76°W
74°W
N
Arctic Bay
Pond Inlet
Baffin Bay
Pond Inlet
Eclipse Sound
Milne Inlet
Nina Bang Lake
Erichsen Lake
Steensby Inlet
73°N
72°N
71°N
70°N
Map Area
Mary River Project
BAFFIN ISLAND
LEGEND
Non-Compliant Flights (Line Segments) Below 650 magl
Compliant with Rationale Flights (Line Segments) Below 650 magl
Compliant Flights (Line Segments) Above 650 magl
Potential Development Area
NOTES
Map Projection: NAD 1983 UTM Zone 17N
Potential Development Area provided by BIM (2019).
Helicopter flight data and tickets collected and provided by Canadian Helicopters (2024).
This document is not an official land survey and the spatial data presented is subject to change without notice.
0 10 20 30 40 50
Scale
Km
Baffinland
Overview map of helicopter flight paths for May, 2024
EDI
Date: 2025-04-02
MAP 5-1


86°W
84°W
82°W
80°W
78°W
76°W
74°W
73°N
72°N
71°N
70°N
N
Arctic Bay
Pond Inlet
Baffin Bay
Pond Inlet
Eclipse Sound
Milne Inlet
Nina Bang Lake
Erichsen Lake
Steensby Inlet
Map Area
Mary River Project
BAFFIN ISLAND
LEGEND
Non-Compliant Flights (Line Segments) Below 650 magl
Compliant with Rationale Flights (Line Segments) Below 650 magl
Compliant Flights (Line Segments) Above 650 magl
Potential Development Area
NOTES
Map Projection: NAD 1983 UTM Zone 17N
Potential Development Area provided by BIM (2019).
Helicopter flight data and tickets collected and provided by Canadian Helicopters (2024).
This document is not an official land survey and the spatial data presented is subject to change without notice.
0 10 20 30 40 50
Scale
Km
Baffinland
Overview map of helicopter flight paths for June, 2024
EDI
Date: 2025-04-02
MAP 5-2


86°W
84°W
82°W
80°W
78°W
76°W
74°W
73°N
72°N
71°N
70°N
N
Arctic Bay
Eclipse Sound
Milne
Inlet
Nina Bang
Lake
Erichsen
Lake
Steensby
Inlet
Map Area
Mary River Project
BAFFIN ISLAND
LEGEND
Non-Compliant Flights (Line Segments) Inside the SGMA and Below 1,100 magl; Outside the SGMA and Below 650 magl
Compliant with Rationale Flights (Line Segments) Inside the SGMA and Below 1,100 magl; Outside the SGMA and Below 650 magl
Compliant Flights (Line Segments) Inside the SGMA and Above 1,100 magl; Outside the SGMA and Above 650 magl
Environment Canada Area of Interest (Geese)
1,500 m Horizontal Buffer (SGMA) - Environment Canada Area of Interest (Geese)
Potential Development Area
NOTES
Map Projection: NAD 1983 UTM Zone 17N
Potential Development Area provided by BIM (2019).
Helicopter flight data and tickets collected and provided by Canadian Helicopters (2024).
This document is not an official land survey and the spatial data presented is subject to change without notice.
0 10 20 30 40 50
Scale
Km
Baffinland
Overview map of helicopter flight paths for July, 2024
EDI
Date: 2025-04-02
MAP 5-3


Arctic Bay
Eclipse Sound
Milne Inlet
Nina Bang Lake
Erichsen Lake
Steensby Inlet
Map Area
Mary River Project
BAFFIN ISLAND
LEGEND
Non-Compliant Flights (Line Segments) Inside the SGMA and Below 1,100 magl; Outside the SGMA and Below 650 magl
Compliant with Rationale Flights (Line Segments) Inside the SGMA and Below 1,100 magl; Outside the SGMA and Below 650 magl
Compliant Flights (Line Segments) Inside the SGMA and Above 1,100 magl; Outside the SGMA and Above 650 magl
Environment Canada Area of Interest (Geese)
1,500 m Horizontal Buffer (SGMA) - Environment Canada Area of Interest (Geese)
Potential Development Area
NOTES
Map Projection: NAD 1983 UTM Zone 17N
Potential Development Area provided by BIM (2019).
Helicopter flight data and tickets collected and provided by Canadian Helicopters (2024).
This document is not an official land survey and the spatial data presented is subject to change without notice.
Scale
Km
Baffinland
Overview map of helicopter flight paths for August, 2024
EDI
Date: 2025-04-02
MAP 5-4


Map Area
Mary River Project
BAFFIN ISLAND
Arctic Bay
Pond Inlet
Pond Inlet
Baffin
Bay
Eclipse Sound
Milne
Inlet
Nina Bang
Lake
Erichsen
Lake
Steensby
Inlet
LEGEND
Non-Compliant Flights (Line Segments) Below 650 magl
Compliant with Rationale Flights (Line Segments) Below 650 magl
Compliant Flights (Line Segments) Above 650 magl
Potential Development Area
NOTES
Map Projection: NAD 1983 UTM Zone 17N
Potential Development Area provided by BIM (2019).
Helicopter flight data and tickets collected and provided by Canadian Helicopters (2024).
This document is not an official land survey and the spatial data presented is subject to change without notice.
0 10 20 30 40 50
Scale
Km
Baffinland
Overview map of helicopter flight paths for September, 2024
EDI
Date: 2025-04-02
MAP 5-5

### 5.2.2 COMPLIANCE RATIONALE

Cruising altitude data were cross-referenced with pilot rationale from daily timesheets for the eighth consecutive year in 2024. Flight data were collected following the amended rationale descriptions in Table 5-6. For analytical purposes, flight line segments were designated as either:

- **compliant** — if/when cruising altitude requirements were followed;
- **compliant with rationale** — if/when cruising altitude requirements were not met, but pilot discretionary rationale was provided (refer to Table 5-6 for rationale categories and descriptors); or,
- **non-compliant** — if/when cruising altitude requirements were not met, and explanation and/or rationale were not provided.

A breakdown of primary low-level flight hours with rationale for 2024 is provided in Table 5-7. Flights with justification from pilot daily timesheets accounted for 53.64% of total flight hours, lower than in 2023 (67.99%). Within the Snow Geese area during the moulting season, where the cruising altitude requirement is ≥1,100 magl, compliant with rationale flights accounted for 3.48% of total flight hours. Outside the Snow Geese area and in all areas in all other months where the cruising altitude requirement is ≥650 magl, compliant with rationale flights accounted for 50.17% of total flight hours.

Low-level flights with rationale are expected to continue in future due to safety requirements, operations, assessment activities (e.g., slinging, surveys), and/or because of multiple short-distance flights whereby helicopters are unable to reach the required elevations between take-off and landing sites (e.g., sampling, drop-offs/pickups). In 2024, the four most common reasons for flying below the cruising altitude requirements included geophysical survey (16.49% of total flight hours), weather-related circumstances (15.12% of total flight hours), short-distance flights (13.85% of total flight hours), and slinging (7.25% of total flight hours) (Table 5-7). In 2024, low-level flights within the Snow Geese area during the moulting season associated with weather-related circumstances accounted for 2.87 hours, a decrease of 3.71 hours compared to 2023. This decrease aligns with the mitigation protocol implemented in 2021 (summarized in EDI Environmental Dynamics Inc. 2022), which requires helicopters to travel around the Snow Geese area during the moulting season on days with poor weather.

Overall, 2024 cruising altitude combined compliance was 72.28%, similar to 2017 (73.39%). Non-compliant flight line segments included those that did not achieve cruising altitude requirements and where no rationale for low-level flying was provided. Some non-compliant flight line segments included ferrying flights to and from the Project at the start and end of the season, as well as approaches and departures. Some non-compliant flight line segments included traverses not visited in previous years (Map 5-3). Only the first and last flight segments can be identified as take-off or landing segments because the time and distance to reach the required cruising altitude (if reached at all) varies between flights. However, it may take multiple flight segments for a helicopter to reach or land from the required cruising altitude, resulting in non-compliant or compliant with rationale intermediary flight segments. Baffinland will continue to work with Canadian Helicopters to document cruising altitude compliance and communicate elevation requirements and protocols to pilots throughout the flying season.

**Table 5-6. Descriptions of pilot rationales given for low-level flights[1,2].**

| Rationale | Description |
|---|---|
| Slinging | Helicopters slinging external loads fly low for safety purposes. If issues occur, the load can be quickly lowered to the ground in a controlled manner or dropped while maintaining a visual reference of the landing location. |
| Short Distance | At the discretion of the pilot operating the aircraft during the flight. Considers the distance travelled during a flight as well as other contributing factors, which may result in a determination that gaining an altitude of 650 magl is unreasonable, unsafe, or impractical.<br>These types of trips are generally associated with specific monitoring programs that are MANDATORY with no other practical ways of completing them (e.g., water sampling locations not accessible by foot or boat, dustfall sampling, wildlife observations, noise sampling, prospecting). |
| Weather | Poor visibility associated with low cloud restricts pilots to flying below the cloud line, which is under 650 magl. High winds and/or flat light conditions (reduces a pilot's depth-of-field, causing poor ground reference) can make it difficult to maintain a consistent 650 magl flight height.<br>Even if pilots have enough ceiling to reach the required altitude at take-off, there could be poor weather conditions along the route or later in the day. Flights returning staff from remote work areas to camp are required regardless of the ceiling. |
| Search and Rescue | Flying the aircraft at low levels where Search and Rescue members have sufficient visual detail of the ground. |
| Inspection | Visual inspection of features on the ground (e.g., waterbodies, site infrastructure) where low-level flying is required for personnel to have sufficient visual detail. |
| Maintenance Flight | Flying the aircraft at low levels for purposes related to maintenance of the aircraft. |
| Medical Evacuation / Emergency Response | Flying the aircraft at low levels for purposes related to medical evacuation and/or emergency response where efficiency and/or other factors are of utmost importance. |
| Geophysical Survey | Low-level flying is required as part of the survey methodology (e.g., flying a low-level grid pattern for a geophysical survey, keeping a sensor at a constant elevation relative to the ground). The length of the survey is dependent on the size of the area to be surveyed. These surveys, if required, are conducted outside of the bird nesting or moulting windows. |

[1] Descriptions are stated with a cruising altitude requirement of 650 magl and apply to a cruising altitude requirement of 1,100 magl in the Snow Geese area during the moulting season (July and August).

[2] The pilot will have final authority for the disposition of the aircraft during the time in which they are in command.

**Table 5-7. Helicopter compliant with rationale flight hours summarized according to pilot rationale for flights within the ≥1,100 magl and ≥650 magl cruising altitude requirements, May 26 to September 28, 2024.**

| Rationale | Total Hours | Flight Hours | % of Total Flight Hours[1] | ≥1,100 magl Cruising Altitude Requirement | | ≥650 magl Cruising Altitude Requirement | |
|---|---|---|---|---|---|---|---|
| | | | | Flight Hours | % of Total Flight Hours[1] | Flight Hours | % of Total Flight Hours[1] |
| Slinging | 3,000 | 31.51 | 7.25 | 1.20 | 0.28 | 30.32 | 6.97 |
| Short Distance | 3,000 | 60.25 | 13.85 | 5.41 | 1.24 | 54.84 | 12.61 |
| Weather | 3,000 | 65.78 | 15.12 | 2.87 | 0.66 | 62.90 | 14.46 |
| Search and Rescue | 3,000 | - | - | - | - | - | - |
| Inspection | 3,000 | 2.90 | 0.67 | 0.00 | 0.00 | 2.90 | 0.67 |
| Maintenance Flight | 3,000 | 1.17 | 0.27 | 0.00 | 0.00 | 1.17 | 0.27 |
| Medical Evacuation / Emergency Response | 3,000 | - | - | - | - | - | - |
| Geophysical Survey | 3,000 | 71.72 | 16.49 | 5.64 | 1.30 | 66.09 | 15.19 |
| **Total** | **3,000** | **233.33** | **53.64** | **15.12** | **3.48** | **218.21** | **50.17** |

1 Percentages are calculated from the rationale flight hours divided by the total annual flight hours.

Note: Total values may be off from row/column sums by 0.01 due to rounding.

### 5.2.3 INTER-ANNUAL TRENDS

Flights within the Snow Geese area during the 2024 moulting season decreased to 204 transits compared to 2023 (335 transits), but were similar to flights in 2017, 2018, 2019, and 2021 (Table 5-8). This represents the highest proportion (20.60%) of transits above ≥1,100 magl compared to all previous years due to the lower number of total flights (992). Before 2023, the percentage of transits within the Snow Geese area was 4.1% to 16.5%, and the total number of transits was primarily above 1,500 magl.

In 2024, 5.73% of total flight hours occurred within the Snow Geese area, a slight increase from 4.61% in 2023 (Table 5-9). This percentage is comparable to values recorded between 2015 and 2017, which ranged from 5.69% to 5.94%. The percentage of total disturbance hours in 2024 was the lowest compared to all previous years at 14.50%. This percentage was 8.04% lower than the next lowest recorded value (22.54% in 2016).

Helicopter cruising altitude combined compliance within the Snow Geese area during the moulting season was 70.03% in 2024 (Figure 5-1). This percentage comprised 19.20% compliant flights and 53.22% flights compliant with rationale. Compared to previous years, 2024 compliance was lower than 2023 (93.37%), higher than 2022 (60.06%), and similar to 2021 (71.76%). The total flight hours within the Snow Geese area in 2024 were 24.94, which was lower than 2023 (48.05), higher than 2022 (15.82), and similar to 2021 (22.06).

Outside the Snow Geese area, and in all other areas during non-moulting months, 2024 combined compliance was 72.42%. This percentage was lower than the past six years, which were above 90%, but similar to 2017 at 72.91% (Figure 5-2). The most common pilot rationale for low-level flights in 2024 was geophysical survey, accounting for 16.49% of all rationale provided. A Light Detection and Ranging (LiDAR) survey of the Potential Development Area and route to Steensby Inlet was flown in August (Table 5-10 and Map 5-4). This percentage was higher than all previous years, which ranged from 0 to 14.6%. Weather-related circumstances were also a main factor, accounting for 15.12% of rationale, higher than in previous years (1.52% to 9.34%). Short-distance flights accounted for 13.85% of rationale, lower than all previous years (14.16% to 37.00%).

Total flight hours in 2024 were the lowest compared to all previous years at 434.95 (Table 5-11). Compliant flight hours decreased from 27.47% in 2023 to 18.64% in 2024. Similarly, compliant with rationale flight hours decreased from 67.99% in 2023 to 53.64% in 2024, and were lower than the past six years (59.60% to 72.89%). Non-compliant flights increased to 27.72% in 2024, higher than the past six years (3.78% to 8.41%) but comparable to 2017 (26.61%).

Within the Snow Geese area during the moulting season, compliant flight hours were 9.41% in 2024, which was lower compared to 2023 (19.12%) and all previous years (10.10% to 49.13%) (Table 5-12). Compliant with rationale flight hours decreased from 74.26% in 2023 to 60.62% in 2024. Non-compliant flights increased from 6.63% in 2023 to 29.97% in 2024, increasing from 3.18 hours to 7.47 hours. Compliant with rationale flight hour percentages fluctuated in previous years, but 2024 had similar compliance to 2017. Total flight hours in 2024 within the ≥1,100 magl requirement were 24.94, the lowest number of total flight hours since 2021 (22.06).

**Table 5-8. Number of transits flown per year with a breakdown of transits (№ and %) within the ≥1,100 magl and ≥650 magl cruising altitude requirements, 2015 to 2024.**

| Year | Total № of Transits | ≥1,100 magl Cruising Altitude Requirement | | ≥650 magl Cruising Altitude Requirement | |
|---|---|---|---|---|---|
| | | № of Transits | % Transits | № of Transits | % Transits |
| 2015 | 919 | 134 | 14.6 | 785 | 85.4 |
| 2016 | 1,063 | 175 | 16.5 | 888 | 83.5 |
| 2017 | 1,350 | 204 | 15.1 | 1,146 | 84.9 |
| 2018 | 2,489 | 198 | 8.0 | 2,291 | 92.0 |
| 2019 | 3,110 | 207 | 6.7 | 2,903 | 93.3 |
| 2020 | 1,863 | 77 | 4.1 | 1,786 | 95.9 |
| 2021 | 2,565 | 178 | 6.9 | 2,387 | 93.1 |
| 2022 | 2,715 | 117 | 4.3 | 2,598 | 95.7 |
| 2023 | 1,797 | 335 | 18.6 | 1,462 | 81.4 |
| 2024 | 992 | 204 | 20.60 | 788 | 79.40 |

**Table 5-9. Number of flight hours per year with a breakdown of flight time (hours and %) within the ≥1,100 magl and ≥650 magl cruising altitude requirements, 2015 to 2024.**

| Year | Total Hours | Total Flight Hours | % Disturbance Hours | ≥1,100 magl Cruising Altitude Requirement | | ≥650 magl Cruising Altitude Requirement | |
|---|---|---|---|---|---|---|---|
| | | | | Flight Hours | % Flight Hours | Flight Hours | % Flight Hours |
| 2015 | 3,192 | 893.07 | 27.98 | 50.84 | 5.69 | 842.23 | 94.31 |
| 2016 | 2,616 | 589.52 | 22.54 | 34.05 | 5.78 | 555.47 | 94.22 |
| 2017 | 3,096 | 719.62 | 23.24 | 42.72 | 5.94 | 676.90 | 94.06 |
| 2018 | 3,360 | 1,583.71 | 47.13 | 35.13 | 2.22 | 1,548.59 | 97.78 |
| 2019 | 3,120 | 1,340.33 | 42.96 | 26.41 | 1.97 | 1,313.92 | 98.03 |
| 2020 | 3,168 | 804.56 | 25.40 | 14.38 | 1.79 | 790.18 | 98.21 |
| 2021 | 3,024 | 1,271.45 | 42.05 | 22.06 | 1.74 | 1,249.39 | 98.26 |
| 2022 | 3,480 | 1,295.45 | 37.23 | 15.82 | 1.22 | 1,279.64 | 98.78 |
| 2023 | 3,672 | 1,041.89 | 28.37 | 48.05 | 4.61 | 993.84 | 95.39 |
| 2024 | 3,000 | 434.95 | 14.50 | 24.94 | 5.73 | 410.02 | 94.27 |

Note: Total values may be off from row/column sums by 0.01 due to rounding.

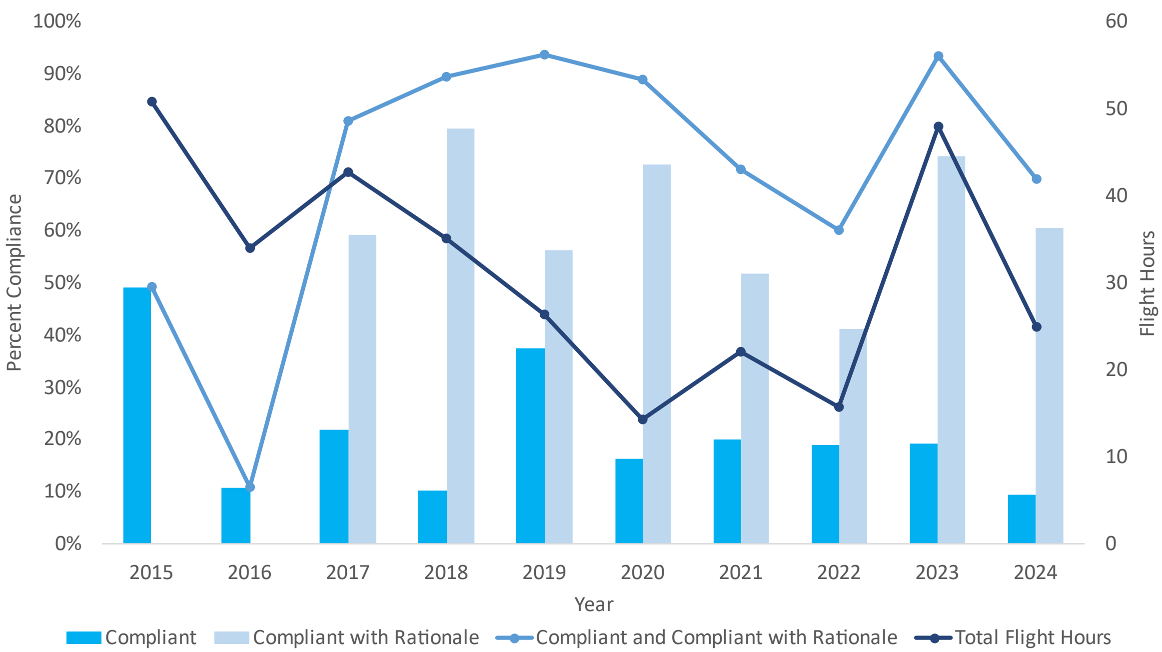



**Figure 5-1. Percent compliance and total flight hours for flights within the Snow Geese area during the moulting season, 2015 to 2024.**

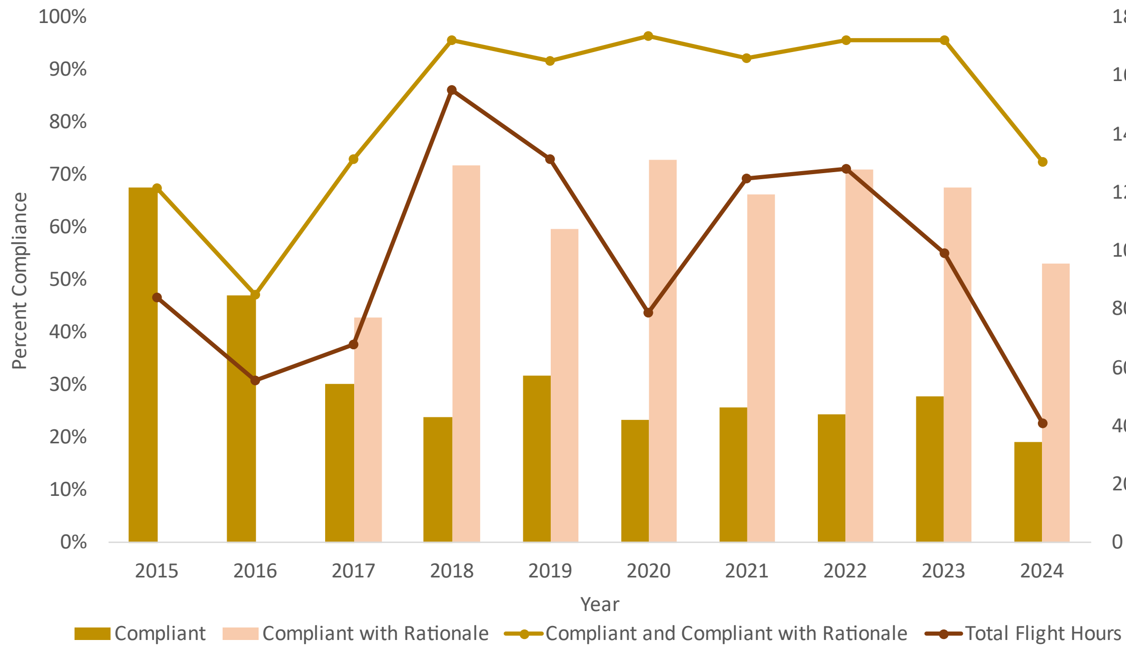



**Figure 5-2. Percent compliance and total flight hours for flights outside the Snow Geese area during the moulting season and in all areas in all other months, 2015 to 2024.**

**Table 5-10. Flight hours and percentage of total flight hours for compliant with rationale flights summarized by rationale category, 2017 to 2024.**

| Rationale | | Slinging | Short Distance | Weather | Search and Rescue | Inspection | Maintenance Flight | Medical Evacuation / Emergency Response | Geophysical Survey | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| 2017 | hrs | 121.79 | 133.87 | 57.75 | - | - | - | 1.37 | - | **314.77** |
| | %[1] | 16.92 | 18.60 | 8.03 | - | - | - | 0.19 | - | **43.74** |
| 2018 | hrs | 511.84 | 299.86 | 64.17 | 0.20 | 30.10 | - | 2.44 | 231.27 | **1,139.89** |
| | %[1] | 32.32 | 18.93 | 4.05 | 0.01 | 1.90 | - | 0.15 | 14.60 | **71.98** |
| 2019 | hrs | 248.07 | 495.88 | 23.00 | - | 29.08 | - | 2.80 | - | **798.84** |
| | %[1] | 18.51 | 37.00 | 1.72 | - | 2.17 | - | 0.21 | - | **59.60** |
| 2020 | hrs | 293.91 | 240.65 | 37.35 | - | 11.48 | - | 3.04 | - | **586.43** |
| | %[1] | 36.53 | 29.91 | 4.64 | - | 1.43 | - | 0.38 | - | **72.89** |
| 2021 | hrs | 521.73 | 180.00 | 35.62 | 2.74 | 11.62 | 0.40 | 0.67 | 86.63 | **839.41** |
| | %[1] | 41.03 | 14.16 | 2.80 | 0.22 | 0.91 | 0.03 | 0.05 | 6.81 | **66.02** |
| 2022 | hrs | 609.68 | 279.45 | 19.65 | - | 6.14 | - | 0.13 | - | **915.05** |
| | %[1] | 47.06 | 21.57 | 1.52 | - | 0.47 | - | 0.01 | - | **70.64** |
| 2023 | hrs | 397.40 | 199.29 | 97.29 | - | 12.56 | - | 1.84 | - | **708.38** |
| | %[1] | 38.14 | 19.13 | 9.34 | - | 1.21 | - | 0.18 | - | **67.99** |

**Table 5-10. Flight hours and percentage of total flight hours for compliant with rationale flights summarized by rationale category, 2017 to 2024.**

| Rationale | | Slinging | Short Distance | Weather | Search and Rescue | Inspection | Maintenance Flight | Medical Evacuation / Emergency Response | Geophysical Survey | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| 2024 | hrs | 31.51 | 60.25 | 65.78 | - | 2.90 | 1.17 | - | 71.72 | 233.33 |
| | %[1] | 7.25 | 13.85 | 15.12 | - | 0.67 | 0.27 | - | 16.49 | 53.64 |

[1] Percentages are calculated from rationale flight hours divided by total annual flight hours.

Note: Total values may be off from row/column sums by 0.01 due to rounding.

**Table 5-11. Total flight hours and overall cruising altitude compliance by flight hours and percentage, 2015 to 2024.**

| Year | Total Flight Hours | Compliant | | Compliant with Rationale | | Combined Compliance | Non-compliant | |
|---|---|---|---|---|---|---|---|---|
| | | hr | % | hr | % | % | hr | % |
| 2015 | 893.07 | 593.38 | 66.44 | n/a | n/a | 66.44 | 299.69 | 33.56 |
| 2016 | 589.52 | 265.18 | 44.98 | n/a | n/a | 44.98 | 324.33 | 55.02 |
| 2017 | 719.62 | 213.34 | 29.65 | 314.77 | 43.74 | 73.39 | 191.50 | 26.61 |
| 2018 | 1583.71 | 372.32 | 23.51 | 1139.89 | 71.98 | 95.49 | 71.50 | 4.51 |
| 2019 | 1340.33 | 428.72 | 31.99 | 798.84 | 59.60 | 91.59 | 112.77 | 8.41 |
| 2020 | 804.56 | 187.74 | 23.33 | 586.43 | 72.89 | 96.22 | 30.39 | 3.78 |
| 2021 | 1271.45 | 326.74 | 25.70 | 839.41 | 66.02 | 91.72 | 105.30 | 8.28 |
| 2022 | 1295.45 | 316.72 | 24.45 | 915.05 | 70.64 | 95.08 | 63.68 | 4.92 |
| 2023 | 1041.89 | 286.25 | 27.47 | 708.38 | 67.99 | 95.46 | 47.26 | 4.54 |
| 2024 | 434.95 | 81.08 | 18.64 | 233.33 | 53.64 | 72.28 | 120.55 | 27.72 |

Note: Total values may be off from row/column sums by 0.01 due to rounding.

**Table 5-12. Flight hours and overall cruising altitude compliance by flight hours and percentage within the ≥1,100 magl and ≥650 magl cruising altitude requirements, 2015 to 2024.**

| Year | ≥1,100 magl Cruising Altitude Requirement | | | | | | | ≥650 magl Cruising Altitude Requirement | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Flight Hours | Compliant | | Compliant with Rationale | | Non-compliant | | Flight Hours | Compliant | | Compliant with Rationale | | Non-compliant | |
| | | hr | % | hr | % | hr | % | | hr | % | hr | % | hr | % |
| 2015 | 50.84 | 24.98 | 49.13 | n/a | n/a | 25.86 | 50.87 | 842.23 | 568.40 | 67.49 | n/a | n/a | 273.83 | 32.51 |
| 2016 | 34.05 | 3.68 | 10.81 | n/a | n/a | 30.37 | 89.19 | 555.47 | 261.50 | 47.08 | n/a | n/a | 293.96 | 52.92 |
| 2017 | 42.72 | 9.30 | 21.77 | 25.27 | 59.16 | 8.15 | 19.07 | 676.90 | 204.04 | 30.14 | 289.50 | 42.77 | 183.36 | 27.09 |
| 2018 | 35.13 | 3.55 | 10.10 | 27.90 | 79.44 | 3.67 | 10.46 | 1,548.59 | 368.78 | 23.81 | 1,111.98 | 71.81 | 67.83 | 4.38 |
| 2019 | 26.41 | 9.90 | 37.49 | 14.84 | 56.22 | 1.66 | 6.30 | 1,313.92 | 418.82 | 31.88 | 783.99 | 59.67 | 111.11 | 8.46 |
| 2020 | 14.38 | 2.34 | 16.26 | 10.46 | 72.74 | 1.58 | 11.00 | 790.18 | 185.40 | 23.46 | 575.97 | 72.89 | 28.81 | 3.65 |
| 2021 | 22.06 | 4.42 | 20.01 | 11.42 | 51.75 | 6.23 | 28.24 | 1,249.39 | 322.32 | 25.80 | 827.99 | 66.27 | 99.07 | 7.93 |
| 2022 | 15.82 | 3.00 | 18.96 | 6.50 | 41.10 | 6.32 | 39.94 | 1,279.64 | 313.72 | 24.52 | 908.55 | 71.00 | 57.36 | 4.48 |
| 2023 | 48.05 | 9.19 | 19.12 | 35.68 | 74.26 | 3.18 | 6.63 | 993.84 | 277.06 | 27.88 | 672.71 | 67.69 | 44.08 | 4.44 |
| 2024 | 24.94 | 2.35 | 9.41 | 15.12 | 60.62 | 7.47 | 29.97 | 410.02 | 78.73 | 19.20 | 218.21 | 53.22 | 113.08 | 27.58 |

Note: Total values may be off from row/column sums by 0.01 due to rounding.

# 6 TOTE ROAD TRAFFIC

**Tote Road Traffic Summary**

The mean number of combined vehicle transits for 2024 was 281.2 transits per day (ore haul accounted for 246.3 transits per day). These daily means slightly exceeded the predicted value in the Final Environmental Impact Statement Addendum for the Production Increase Proposal (i.e., 236 ore haul transits; Stantec Consulting Ltd. 2018).

## 6.1 METHOD

Site Security at the Mary River Project (the Project) monitors and records traffic along the Tote Road and records non-haul vehicle traffic (e.g., transits related to personnel transfer, equipment, and fuel). Ore haul traffic is managed and recorded by Mine Operations staff. The Tote Road traffic data are compiled and compared with projected ore haul and non-haul vehicle transits. Not all vehicle travel on the Tote Road comprises return/round-trip travel between the Mine Site and Milne Port. Therefore, traffic is tracked in terms of 'vehicle transits' accounting for one-way trips (i.e., return/round-trip travel comprises two transits).

## 6.2 RESULTS AND DISCUSSION

The mean number of combined ore haul and non-haul vehicle transits from January 1 to December 31, 2024, was 281.2 transits per day (Table 6-1, Figure 6-1). The mean number of ore haul transits from January 1 to December 31, 2024, was 246.3 transits per day (Table 6-1, Figure 6-2). These daily means slightly exceeded the predicted value in the Final Environmental Impact Statement Addendum for the Production Increase Proposal (i.e., 236 ore haul transits; Stantec Consulting Ltd. 2018). The mean number of non-haul vehicle transits from January 1 to December 31, 2024, was 34.9 transits per day, which was less than predicted in the Final Environmental Impact Statement Addendum (i.e., 40 non-haul vehicle transits; Stantec Consulting Ltd. 2018). The monthly mean number of all vehicle transits combined varied from a low of 148 transits in September to a high of 350 transits in March (Table 6-1, Table 6-2, Figure 6-2).

Weather-related closures of the Tote Road in 2024, which resulted in multi-day stoppages of ore haul transits, occurred repeatedly in September. Heavy rainstorms closed the Tote Road from September 8 to 10, September 13 and 14, and September 21 through October 2. These events are visually displayed in Figure 6-2.

**Table 6-1. Mean and total transits along the Tote Road, including ore haul, non-haul, and all vehicles combined, from 2015 through 2024.**

| Sample Year | Ore Haul Transits | | Non-haul Vehicle Transits | | Combined Vehicle Transits | |
|---|---|---|---|---|---|---|
| | Daily Mean | Total | Daily Mean | Total | Daily Mean | Total |
| 2015 | 73.0 | 26,662 | 53.9 | 19,668 | 126.9 | 46,330 |
| 2016 | 151.2 | 55,354 | 27.7 | 10,150 | 179.0 | 65,504 |
| 2017 | 195.9 | 71,516 | 32.3 | 11,777 | 228.2 | 83,293 |
| 2018 | 219.5 | 80,118 | 37.3 | 13,616 | 256.8 | 93,734 |
| 2019 | 238.0 | 86,860 | 43.0 | 15,678 | 280.9 | 102,538 |
| 2020 | 243.3 | 88,807 | 28.4 | 10,361 | 271.7 | 99,168 |
| 2021 | 227.2 | 82,911 | 28.6 | 10,440 | 255.8 | 93,351 |
| 2022 | 243.6 | 88,908 | 26.7 | 9,749 | 269.7 | 98,443 |
| 2023 | 234.2 | 85,144 | 24.4 | 8,921 | 258.7 | 94,065 |
| 2024 | 246.3 | 90,190 | 34.9 | 12,750 | 281.2 | 102,940 |

**Table 6-2. Mean ore haul and non-haul transits and total monthly transits from January 1 to December 31, 2024.**

| Month | Daily Mean Ore Haul Transits | Daily Mean Non-haul Transits | Daily Mean Total Transits |
|---|---|---|---|
| January | 317 | 32 | 349 |
| February | 288 | 43 | 331 |
| March | 302 | 48 | 350 |
| April | 234 | 57 | 291 |
| May | 252 | 39 | 291 |
| June | 281 | 27 | 308 |
| July | 222 | 28 | 250 |
| August | 219 | 39 | 258 |
| September | 115 | 33 | 148 |
| October | 194 | 33 | 227 |
| November | 242 | 19 | 261 |
| December | 291 | 20 | 311 |


Figure 6-1. Mean ore haul and non-haul vehicle transits per day and total ore hauled between 2015 and 2024.

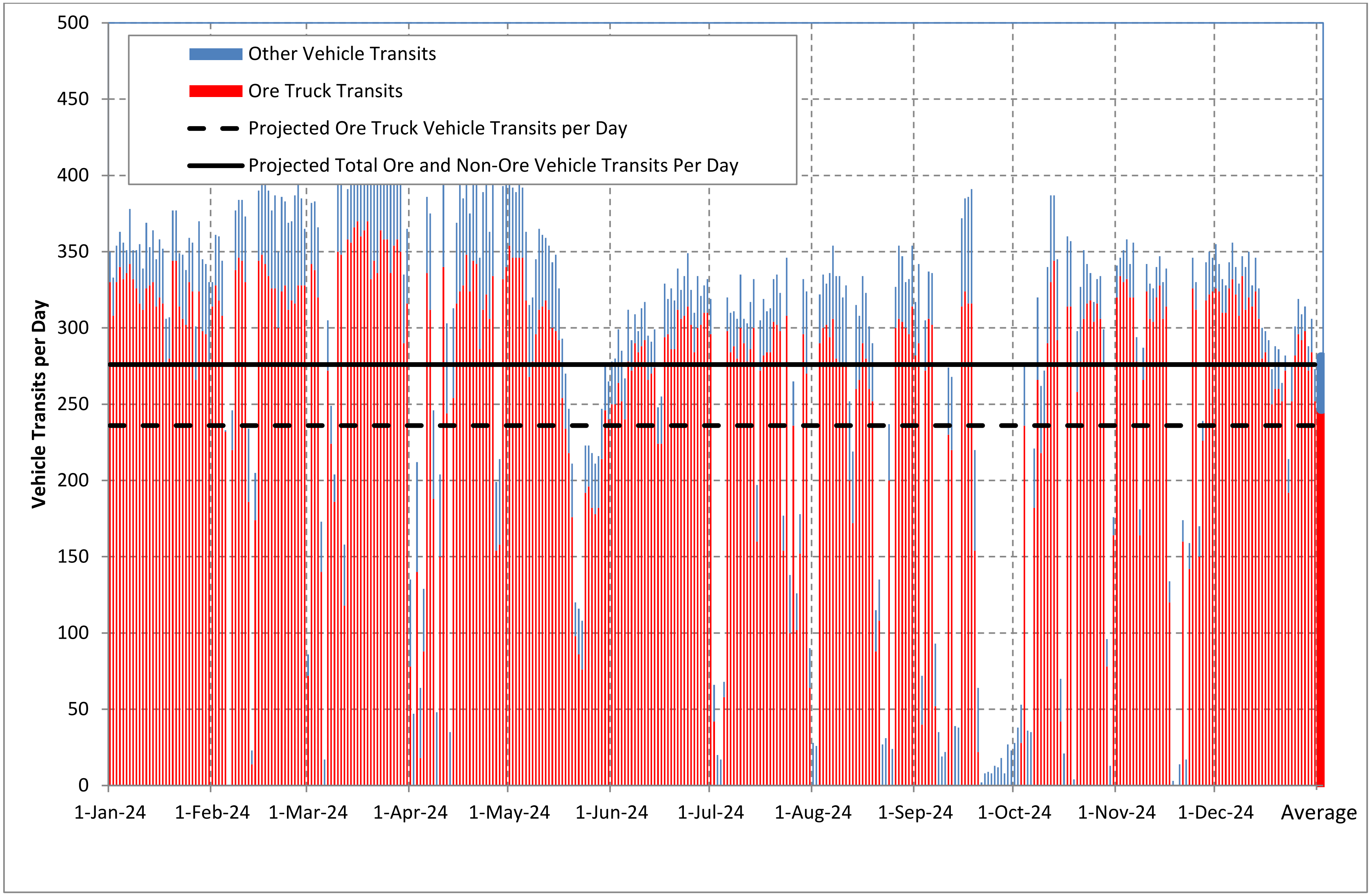



**Figure 6-2. Vehicle transits per day on the Tote Road, including ore trucks (red) and all other traffic (blue), January 1 to December 31, 2024.** *Also included are the projected maximum number of vehicle transits per day and the projected maximum number of ore haul trucks per day on the Tote Road.*

# 7 DUSTFALL

Project Conditions #36, 50, 54d, 58c, 187, and 188 relate to the effects of dustfall and dustfall monitoring at the Mary River Project (the Project; Nunavut Impact Review Board 2020). Since the summer of 2013, the Project has implemented a dustfall monitoring program intended to meet these conditions, the objectives of which are to:

- quantify the volume and extent of dustfall generated by Project activities;
- determine seasonal variations in dustfall; and,
- determine if annual dustfall volume and extent exceed the ranges predicted by the dustfall dispersion models (Baffinland Iron Mines Corporation 2013b).

The following subsections summarize the study design, methods, results, and discussion of the dustfall monitoring program.

**Note:** PC# 57g—referring to the requirements for "*an assessment and presentation of annual environmental conditions including timing of snowmelt, green-up and standard weather summaries*"—is considered ancillary to the dustfall monitoring program. Supporting information about these topics is presented in Section 4.

## Dustfall Summary

### *Passive Dustfall Monitoring*

Dustfall deposition decreased across the Project area in 2024. Ongoing dustfall suppression efforts at the crusher location and along the Tote Road appear to be behind these decreases.

**Dustfall Scene Distributions and Magnitudes —** The magnitude of annual dustfall deposition at the Mine Site sample locations continues to decrease. DusTreat is now applied to all ore at Crushers B and C, decreasing the dustfall generated at this site. Dustfall mitigation along the mine haul road and the airstrip also appears effective.

The magnitude of dustfall deposition at Milne Port has remained constant or, in some cases, has slightly decreased, a trend that began in 2018. The highest deposition was associated with the ore stockpiles, with lesser amounts generated by the sealift staging area.

Dustfall deposition along the Tote Road was consistent or decreasing at the north and south crossings compared with recent years. More extensive use of 'flake' calcium chloride was trialled and found to be effective in 2024. Continued monitoring in the coming years will confirm the effectiveness of this dust suppression mitigation.

Dustfall deposition at 1,000 m from the Potential Development Area (PDA) was measured year-round at 12 sites. Dustfall deposition remained low but measurable at these sites across all sampling years, including 2024. The geometric mean daily dustfall across all sites was consistently less than 0.5 $mg/dm^2 \cdot day$.

**Interannual Trends —** Despite increased production from 2016 to 2021, and steady production from 2021 through 2024, dustfall deposition is decreasing across all Project areas. Post-2016 decreases in dustfall deposition are likely associated with extensive dustfall mitigation strategies implemented across all Project areas.

*Dustfall Imagery Analysis*

Satellite-estimated dustfall concentrations were derived from a relationship between the dustfall accumulation calculated from passive dustfall monitor deposition rates and the Snow Darkening Index (SDI).

**Dustfall Scene Distribution, Magnitudes, and Extents —** Sixty-three Sentinel-2 images and 26 Landsat 8/9 images were acquired from March 14 to May 16, which was a decrease in the number of images acquired compared to 2023.

The 2023 dustfall extent covered 12.71% of the Study Area, with lower dustfall concentration classes (<4.5 g/m²) accounting for the largest dustfall area. The Tote Road south and the Mine Site had the largest percentage of dustfall extent (28.20% and 19.86%, respectively), followed by Milne Port at 16.33% and the Tote Road north and Milne Inlet at <10%.

Mean dustfall concentrations were highest near the PDA and decreased with distance. The pattern of dustfall on the landscape, particularly along Milne Inlet and around the Mine Site, reflected the direction of prevailing and strong winds. The mean dustfall concentrations at the Areas of Community Concern were less than (0.50 g/m²) except for the Eastern Channel and Ridge West sites.

**Inter-Annual Trends —** The 2024 dustfall extent within the Study Area was similar to 2023, with an increase in the Tote Road south extent matched by decreases in the other areas.

Satellite-derived mean dustfall concentrations across all areas generally increased from 2014 to 2020, which aligns with increased ore production. Mean dustfall concentrations decreased in 2024 after increasing since 2021. Most Areas of Community Concern had mean dustfall concentrations <1 g/m² for all years, similar to the Reference site, except for 2019. The Quarnak, Ridge West, and Eastern Channel sites had mean dustfall concentrations between 1 and 5.5 g/m² in three to five of the post-baseline years.

The overall trends between the satellite-derived late winter mean dustfall concentrations and the annual dustfall from the passive dustfall monitors were similar for the Tote Road and Mine Site, capturing most of the same fluctuations, but the trends were different for Milne Port.

**Snow Sampling Pilot Study —** Improved alignment of 2024 snow sampling with satellite acquisition and an extended sampling period (into late May) resulted in all 10 surface snow sample sites matching Landsat and Sentinel-2 images. The samples also spanned a wide range of concentrations. A non-linear regression model was fit to the Landsat data with significant coefficients but not to the Sentinel-2 data.

## 7.1 HISTORY OF DUSTFALL MONITORING AT THE PROJECT

The dustfall monitoring program has evolved based on data analysis, interpretation, and input from the Terrestrial Environment Working Group (Table 7-1).

**Table 7-1. Implementation of dustfall monitoring program from 2013 through 2024.**

| Program Year | Dustfall Program Updates |
|---|---|
| 2013 | • The dustfall monitoring program was initiated in August 2013.<br>• Twenty-six passive monitoring stations were established near Project infrastructure (Mine Site, Milne Port, the Tote Road, and reference sites). |
| 2014 | • The dustfall monitoring program was expanded in September 2014 to increase the number of monitoring stations at the Mine Site and Milne Port to improve understanding of 'how dustfall patterns may change with distance from Project infrastructure'. Three sites were added at the Mine Site and four sites were added at Milne Port.<br>• One site at Milne Port was removed because Project infrastructure rendered it inaccessible.<br>• The total number of monitoring stations at the end of 2014 was 32. |
| 2015 | • First full year of dustfall monitoring during mine operations.<br>• One additional monitoring site was added at the Mine Site to address a gap in the dustfall monitoring program associated with dustfall at distances greater than 1,000 m. Site DF-M-08 was established 4,000 m from the PDA.<br>• The total number of monitoring stations at the end of 2015 was 33. |
| 2019 | • Data collection at 1,000 m from the Tote Road was increased in response to a request from the Qikiqtani Inuit Organization and the Mittimatalik Hunters and Trappers Organization. Six additional dustfall monitors were installed (three paired monitoring stations, one of each on the east and west sides of the Tote Road at KM 25, KM 56, and KM 75).<br>• Dustfall data collection at other 1,000 m distant sites was increased to year round (only collected during the summer months from 2013 to 2018). This brought the total number of dustfall monitors at the 1,000 m PDA boundary to 12.<br>• One monitor at Milne Port (DF-P-01) was relocated and renamed (DF-P-08) to allow for the expansion of an ore stockpile.<br>• The total number of monitoring stations at the end of 2019 was 39. |
| 2020 | • Satellite imagery analysis of dustfall extent was conducted in 2020 to address concerns from the Mittimatalik Hunters and Trappers Organization that the past dustfall monitoring data and analyses did not reflect what hunters saw on the ground. The analysis included Landsat and Sentinel-2 imagery from 2004 to 2020 between March 15 and May 15. |
| 2021 | • Quantitative measurements from the dustfall satellite imagery analysis were reported as requested by the Nunavut Impact Review Board, including dustfall concentrations and area using the SDI, a measure of mineral dust on snow. Data from Steensby Inlet were included as a reference area for comparison.<br>• Fourteen new dustfall monitoring stations were installed, including: four additional monitors at Milne Port to better characterize dustfall moving off the Milne Port site; four additional monitors along the section of the proposed Phase 2 railway that departs from the Tote Road right-of-way to define baseline conditions; and six additional monitors installed to collect dust at a height of 0.5 m. These non-standard monitors are part of a pilot study investigating variability between dustfall sampling at the standardized height of 2.0 m and closer to ground level. This monitoring trial was implemented in response to specific requests from the Government of Nunavut (GN) and the Qikiqtani Inuit Organization (QIA).<br>• The total number of monitoring stations at the end of 2021 was 53, including the six 'short' monitors installed as part of the monitoring trial. |

Table 7-1. Implementation of dustfall monitoring program from 2013 through 2024.

| Program Year | Dustfall Program Updates |
|---|---|
| 2022 | • Sampling at the four dustfall monitors along the section of the proposed Phase 2 railway that departs from the Tote Road right-of-way were discontinued in October 2022 (i.e., following the Ministerial decision that Phase 2 expansion would not proceed at this time).<br>• The total number of monitoring stations at the end of 2022 was 49, including the six 'short' monitors installed as part of the monitoring trial in 2021. These 49 monitors were located across 43 monitoring stations.<br>• The dustfall imagery analysis study area was expanded to account for additional areas of interest identified in consultation with the Terrestrial Environment Working Group or highlighted in supplementary information requests (cf. Response to the Qikiqtani Inuit Association in 2022 Production Increase Proposal Renewal [QIA-09; Baffinland Iron Mines Corporation 2022a) and ancillary reports (cf. 2021 Dust Investigation; Hutchinson Environmental Sciences Ltd. 2022). The 2022 baseline imagery were processed for the expanded study area. |
| 2023 | • The pilot study to investigate dustfall monitoring closer to ground level was concluded in 2023. The results of the study indicated no difference in dustfall levels at the standardized sampling height of 2.0 m compared to the non-standardized sampling height of 0.5 m (EDI Environmental Dynamics Inc. 2023a).<br>• The total number of monitoring stations at the end of 2023 was 43.<br>• A terrain correction (Teillet et al. 1982, Hantson and Chuvieco 2011) was applied to the imagery to reduce the effects of bright south-facing slopes on the SDI. Imagery from all years were reprocessed for the expanded dustfall imagery analysis study area from 2022 and the terrain correction. |
| 2024 | • To increase the number of samples for the snow sampling pilot study , as recommended by the QIA and the GN (QIA DF #11 and GN AR #5; Baffinland Iron Mines Corporation 2024), improvements to sample collection were implemented, including (1) using satellite acquisition dates and footprints to plan sampling dates and locations, (2) extending the sampling period to late May, (3) sampling on cloud-free days, and (4) sampling a variety of dust concentrations. |

## 7.2 DUSTFALL SUPPRESSION AND MITIGATION

Baffinland Iron Mines Corporation (Baffinland) worked throughout 2024 to revise and improve dustfall suppression measures to mitigate dustfall from all Project areas.

**Dustfall Suppression Along the Tote Road** — Vehicle transits along the Tote Road result in Project-related dust generated from wheel entrainment with the road surface. Dust suppression along the Tote Road in 2024 consisted of seasonal water and calcium chloride application along the road surface. Suppression activities occurred from late June through early September when non-freezing conditions allowed for the safe use of dust suppressants on the road. Calcium chloride was applied to the road following industry-standard methodology that included spreading calcium chloride flake on the road surface and incorporating it into the top few inches of road aggregate, rather than application as a brine sprayed on the road, as has been done in the past. Trials found this method significantly more effective at mitigating dust and maintaining the road running surface through varying weather conditions.

In 2024, 609,000 kg of calcium chloride were applied to Project roadways for dust suppression. The industry standard and recommended application rate for calcium chloride is 1.69 pounds/square yard, which equates to 14,040 kg/km when applied to the Tote Road (assuming an average width of 13 m). Baffinland has taken a conservative approach and applied calcium chloride at an average rate of approximately 1,000 kg/km, or less than one-tenth of the industry-standard application rate.

Visible and measurable dust (from anecdotal statements of operators and discrete measurements) were lower in 2024 than in previous years. Periodic additions of water to the Tote Road were required to re-activate the effectiveness of the calcium chloride at controlling dust; however, the required water use for dust suppression where calcium chloride was in use was far reduced compared to using water alone as a dust suppressant.

**Dust Suppression at the Airport —** Airplane landings and takeoffs can generate dust when the airstrip bed materials are dry. From June through early September, water was applied as a dust suppressant to the airstrip and apron before the arrival and departure of most aircraft. Water was also used as needed when dry conditions were observed.

**Dust Suppression at the Crusher** — Baffinland is implementing mitigations to decrease dust associated with ore crushing and loading activities. Following successful testing trials in early 2024, applying DusTreat to ore before crushing at Crusher C has been used full-time since November 2024. Since February 2025, a second DusTreat application system has been deployed full-time at Crusher B.

**Dust Suppression at the Ore Stockpiles (Milne Port) —** The ore stockpiles at Milne Port are a source of Project-related dustfall. Dust is generated when ore is stacked onto the stockpiles and from the stockpiles via wind action, particularly during the non-shipping season when ore stockpiles grow in height.

Similar to 2023, the ore stockpiles were treated with DusTreat in 2024. The product was sprayed directly onto the surface of the stockpiles to create a crust, decreasing wind-generated dust. DusTreat was applied to the ore stockpiles in December 2024 and January 2025.

## 7.3 PASSIVE DUSTFALL MONITORING

### 7.3.1 METHODS

#### 7.3.1.1 Supporting Data Review

The dustfall monitoring program incorporated a review of supporting data to characterize the Project setting and identify factors that could influence the volume and extent of dustfall during 2024. These supporting data comprise an overview of weather conditions at the Mine Site and Milne Port meteorological stations and vehicle traffic on the Tote Road.

- Climate data (including a summary of air temperature and precipitation data) are presented in Section 4.
- Traffic data (including the number of ore haul truck transits and other vehicle transits on the Tote Road) are presented in Section 6.

#### 7.3.1.2 Passive Dustfall Sampling

The 2024 dustfall monitoring program comprised deploying passive dustfall samplers across the Project area for collecting and measuring dustfall following standard test methods (ASTM International 2010). Each dustfall sampler comprised a dust collection canister within a bowl-shaped terminal holder affixed to an approximately 2-m tall post that was anchored to solid ground. The terminal bowl was crowned with 'bird spikes' to prevent birds from perching and contaminating samples with feces (Photo 7-1). Dust collection canisters were pre-charged with 250 mL of algaecide in summer and 250 mL of isopropyl alcohol in winter. The percentage of isopropyl alcohol in the canisters was increased from 40% to 75% solution in 2021 to prevent freezing of the liquid media. Collection vessels were changed once per month and shipped to ALS Environmental Laboratory in Waterloo, Ontario, to analyze total insoluble dustfall and a suite of metals. Dustfall samples were also analyzed for total metal concentrations to characterize contaminants of potential concern and inform other monitoring endpoints (refer to Section 8).

The Regional Study Area (RSA) was divided into four areas to review dustfall data (Table 7-2):

- the Mine Site;
- Milne Port;
- the Tote Road north crossing (KM 28); and,
- the Tote Road south crossing (KM 78).

In 2024, the study design comprised 43 monitoring locations distributed across the Project area (Map 7-1).

- Nine dustfall monitors were located at the Mine Site: three within the Mine Site, four outside the mine footprint within low to moderate isopleth areas, and two reference sites (one to the northeast and one to the south) located at least 14,000 m from any Project infrastructure, outside of the extent of expected dustfall.
- Ten dustfall monitors were located at Milne Port: four active sites on the Port Site footprint, five active sites at the PDA boundary, and one reference site on a ridge approximately 3,000 m northeast (upwind), outside of the predicted extent of dustfall.
- Twenty-two dustfall monitors were located along the Tote Road.
    - Sixteen dustfall monitors were divided between two sites along the Tote Road (north and south sites). These two sites were organized into transects, each composed of eight dustfall monitors distributed perpendicular to the Tote Road centreline at 30 m, 100 m, 1,000 m, and 5,000 m on either side of the road.
    - Six additional dustfall monitors organized as three pairs, all located at a 1,000 m distance from the Tote Road.
- Two reference dustfall monitors located 14,000 m southwest of the Tote Road (one at the north sites and one at the south sites). These monitoring stations were established outside the 14 km caribou zone of influence as defined by Boulanger et al. (2012).

Dustfall sampling occurred year-round at 36 of 43 monitoring stations in 2024. These year-round stations are distributed within 1,000 m of the PDA and tend to experience higher dustfall levels. The remaining 11 monitoring stations are situated at, or greater than, 1,000 m from the PDA. For these 11 monitoring stations, sampling occurred monthly from May to October and was paused during winter (i.e., November to April) due to remote locations and inaccessibility without helicopter support. The sampling categories were delineated for data analysis as 'year-round' and 'summer.'

The 2024 dustfall monitoring program included data collected for a full calendar year from early January 2024 through early January 2025 (Table 7-3).

**Photo 7-1. Dustfall monitoring station DF-P-01.**

**Table 7-2. Summary of dustfall monitoring stations (locations and sampling period), 2024.**

| Site ID | Monitor Height (m) | Location | Sample Period | Distance to PDA[1] (m) | Expected Dustfall Exposure[2] | Latitude | Longitude |
|---|---|---|---|---|---|---|---|
| DF-M-01 | 2.0 | Mine Site | year-round | Within PDA | High | 71.3243 | -79.3747 |
| DF-M-02 | 2.0 | Mine Site | year-round | Within PDA | High | 71.3085 | -79.2906 |
| DF-M-03 | 2.0 | Mine Site | year-round | Within PDA | High | 71.3072 | -79.2433 |
| DF-M-04 | 2.0 | Mine Site | summer[3] | 9,000 | Nil | 71.2197 | -79.3277 |
| DF-M-05 | 2.0 | Mine Site | summer[3] | 9,000 | Nil | 71.3731 | -78.923 |
| DF-M-06 | 2.0 | Mine Site | summer[3] | 1,000 | Moderate | 71.3196 | -79.156 |
| DF-M-07 | 2.0 | Mine Site | summer[3] | 1,000 | Moderate | 71.3 | -79.1953 |

Table 7-2. Summary of dustfall monitoring stations (locations and sampling period), 2024.

| Site ID | Monitor Height (m) | Location | Sample Period | Distance to PDA[1] (m) | Expected Dustfall Exposure[2] | Latitude | Longitude |
|---|---|---|---|---|---|---|---|
| DF-M-08 | 2.0 | Mine Site | summer[3] | 4,000 | Moderate | 71.2945 | -79.1002 |
| DF-M-09 | 2.0 | Mine Site | summer[3] | 2,500 | Low | 71.2936 | -79.4127 |
| DF-RS-01 | 2.0 | Tote Road – south, KM 78 | summer[3] | 5,000 | Nil | 71.3275 | -79.8001 |
| DF-RS-02 | 2.0 | Tote Road – south, KM 78 | year-round | 1,000 | Low | 71.3893 | -79.8324 |
| DF-RS-03 | 2.0 | Tote Road – south, KM 78 | year-round | Within PDA, 100 m from Tote Road | Moderate | 71.3967 | -79.8228 |
| DF-RS-04 | 2.0 | Tote Road – south, KM 78 | year-round | Within PDA, 30 m from Tote Road | Moderate | 71.3975 | -79.8222 |
| DF-RS-05 | 2.0 | Tote Road – south, KM 78 | year-round | Within PDA, 30 m from Tote Road | Moderate | 71.398 | -79.8228 |
| DF-RS-06 | 2.0 | Tote Road – south, KM 78 | year-round | Within PDA, 100 m from Tote Road | Moderate | 71.3986 | -79.8234 |
| DF-RS-07 | 2.0 | Tote Road – south, KM 78 | year-round | 1,000 | Nil | 71.4077 | -79.8182 |
| DF-RS-08 | 2.0 | Tote Road – south, KM 78 | summer[3] | 5,000 | Nil | 71.4489 | -79.7106 |
| DF-RN-01 | 2.0 | Tote Road – north, KM 27 | summer[3] | 5,000 | Nil | 71.6883 | -80.5363 |
| DF-RN-02 | 2.0 | Tote Road – north, KM 27 | year-round | 1,000 | Low | 71.7145 | -80.4704 |
| DF-RN-03 | 2.0 | Tote Road – north, KM 27 | year-round | Within PDA, 100 m from Tote Road | Moderate | 71.7186 | -80.4473 |
| DF-RN-04 | 2.0 | Tote Road – north, KM 27 | year-round | Within PDA, 30 m from Tote Road | Moderate | 71.7189 | -80.4456 |
| DF-RN-05 | 2.0 | Tote Road – north, KM 27 | year-round | Within PDA, 30 m from Tote Road | Moderate | 71.7185 | -80.4414 |
| DF-RN-06 | 2.0 | Tote Road – north, KM 27 | year-round | Within PDA, 100 m from Tote Road | Moderate | 71.7189 | -80.4397 |
| DF-RN-07 | 2.0 | Tote Road – north, KM 27 | year-round | 1,000 | Nil | 71.7226 | -80.4165 |
| DF-RN-08 | 2.0 | Tote Road – north, KM 27 | summer[3] | 5,000 | Nil | 71.7435 | -80.2898 |
| DF-P-03 | 2.0 | Milne Port | summer[3] | 3,000 | Nil | 71.8996 | -80.7884 |
| DF-P-04 | 2.0 | Milne Port | year-round | Within PDA | Low | 71.871 | -80.8828 |
| DF-P-05 | 2.0 | Milne Port | year-round | Within PDA | Moderate | 71.8843 | -80.8945 |
| DF-P-06 | 2.0 | Milne Port | year-round | Within PDA | Low | 71.8858 | -80.879 |

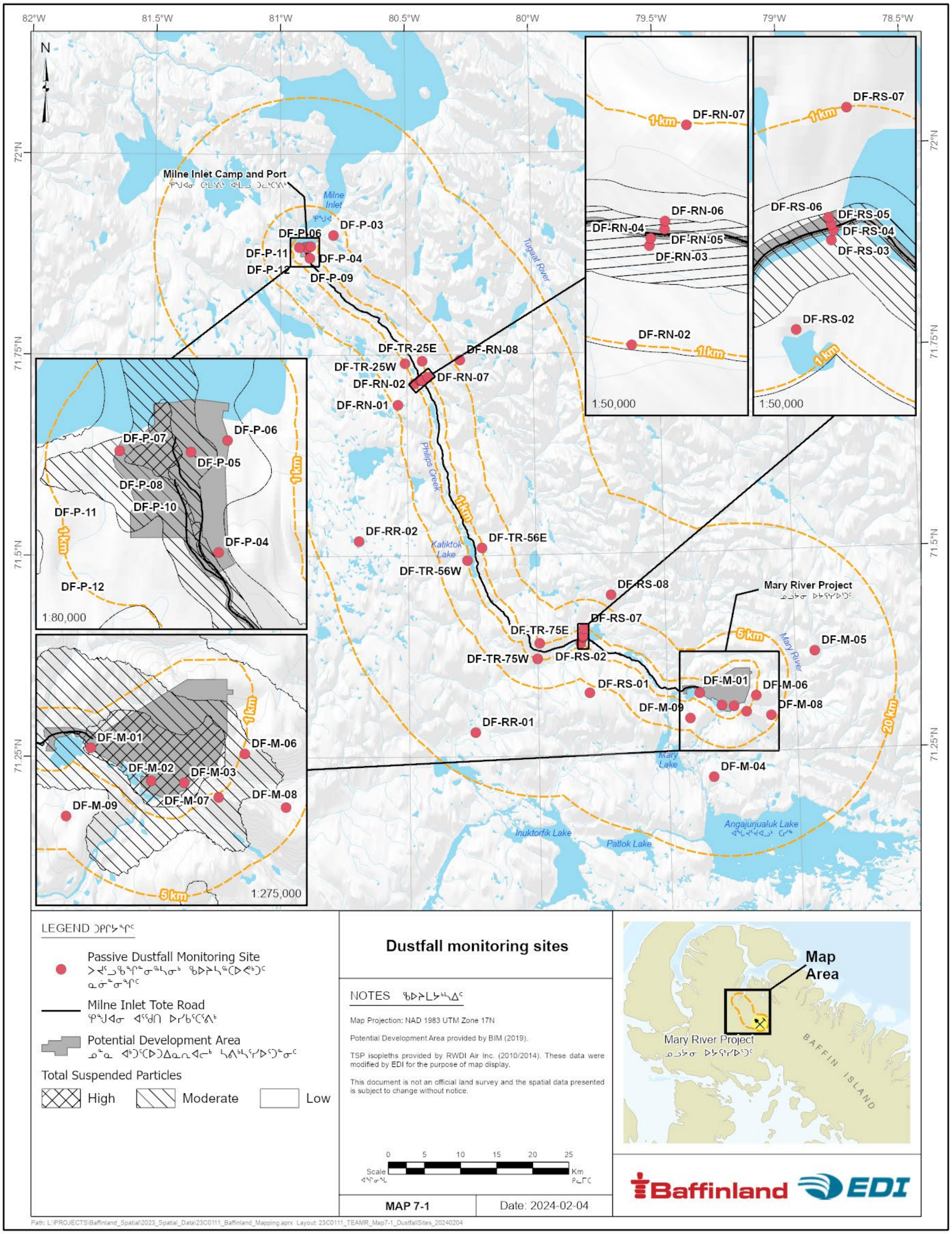
Table 7-2. Summary of dustfall monitoring stations (locations and sampling period), 2024.

| Site ID | Monitor Height (m) | Location | Sample Period | Distance to PDA[1] (m) | Expected Dustfall Exposure[2] | Latitude | Longitude |
|---|---|---|---|---|---|---|---|
| DF-P-07 | 2.0 | Milne Port | year-round | Within PDA | Moderate | 71.8838 | -80.916 |
| DF-P-08 | 2.0 | Milne Port | year-round | 1,000 | Moderate | 71.8722 | -80.9126 |
| DF-P-09 | 2.0 | Milne Port | year-round | 1,000 | Moderate | 71.855286 | -80.893269 |
| DF-P-10 | 2.0 | Milne Port | year-round | Within PDA | Moderate | 71.876033 | -80.919739 |
| DF-P-11 | 2.0 | Milne Port | year-round | 1,000 | Moderate | 71.875471 | -80.95393 |
| DF-P-12 | 2.0 | Milne Port | year-round | 1,000 | Moderate | 71.86558 | -80.951059 |
| DF-RR-01 | 2.0 | Reference – Road | summer[3] | 14,000 | Nil | 71.2805 | -80.245 |
| DF-RR-02 | 2.0 | Reference – Road | summer[3] | 14,000 | Nil | 71.5189 | -80.6923 |
| DF-TR-25E | 2.0 | Tote Road | year-round | 1,000 | Nil | 71.7425 | -80.4394 |
| DF-TR-25W | 2.0 | Tote Road | year-round | 1,000 | Low | 71.7395 | -80.5068 |
| DF-TR-56E | 2.0 | Tote Road | year-round | 1,000 | Nil | 71.5097 | -80.2109 |
| DF-TR-56W | 2.0 | Tote Road | year-round | 1,000 | Low | 71.4944 | -80.2685 |
| DF-TR-75E | 2.0 | Tote Road | year-round | 1,000 | Nil | 71.3902 | -79.9917 |
| DF-TR-75W | 2.0 | Tote Road | year-round | 1,000 | Low | 71.3709 | -80.0007 |

[1] PDA = Potential Development Area.

[2] Low (1 to 4.5 $g/m^2/year$), Moderate (4.6 to 50 $g/m^2/year$), and High ($\geq$50 $g/m^2/year$).

[3] Summer sampling includes data collection from June, July, August, and September.


Dustfall monitoring sites
MAP 7-1
Date: 2024-02-04
LEGEND
Passive Dustfall Monitoring Site
Milne Inlet Tote Road
Potential Development Area
Total Suspended Particles
High
Moderate
Low
NOTES
Map Projection: NAD 1983 UTM Zone 17N
Potential Development Area provided by BIM (2019).
TSP isopleths provided by RWDI Air Inc. (2010/2014). These data were modified by EDI for the purpose of map display.
This document is not an official land survey and the spatial data presented is subject to change without notice.
Milne Inlet Camp and Port
Mary River Project
Map Area
BAFFIN ISLAND
Milne Inlet
Tugaat River
Phillips Creek
Katiktok Lake
Mary River
Mary Lake
Inuktorfik Lake
Patlok Lake
Angajurjualuk Lake
DF-P-03
DF-P-04
DF-P-05
DF-P-06
DF-P-07
DF-P-08
DF-P-09
DF-P-10
DF-P-11
DF-P-12
DF-TR-25E
DF-TR-25W
DF-RN-01
DF-RN-02
DF-RN-03
DF-RN-04
DF-RN-05
DF-RN-06
DF-RN-07
DF-RN-08
DF-RR-01
DF-RR-02
DF-TR-56E
DF-TR-56W
DF-TR-75E
DF-TR-75W
DF-RS-01
DF-RS-02
DF-RS-03
DF-RS-04
DF-RS-05
DF-RS-06
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DF-M-01
DF-M-02
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DF-M-04
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DF-M-06
DF-M-07
DF-M-08
DF-M-09
1 km
5 km
20 km
1:80,000
1:275,000
1:50,000
Scale
Km
0 5 10 15 20 25
82°W 81.5°W 81°W 80.5°W 80°W 79.5°W 79°W 78.5°W
72°N 71.75°N 71.5°N 71.25°N
Path: L:\PROJECTS\Baffinland_Spatial\2023_Spatial_Data\23C0111_Baffinland_Mapping.aprx Layout: 23C0111_TEAMR_Map7-1_DustfallSites_20240204

Table 7-3. Dustfall monitoring sampling record, 2024 (date shown indicates the day the sample canister was collected).

| Site ID | January | February | March | April | May | June | July | August | September | October | November | December |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DF-M-01 | 23-Jan | 22-Feb | 22-Mar | 07-May | 23-May | 26-Jun | 24-Jul | 21-Aug | 20-Sep | 20-Oct | 17-Nov | 15-Dec |
| DF-M-02 | 23-Jan | 22-Feb | 22-Mar | 07-May | 23-May | 26-Jun | 24-Jul | 21-Aug | 20-Sep | 20-Oct | 17-Nov | 15-Dec |
| DF-M-03 | 23-Jan | 22-Feb | 22-Mar | 07-May | 23-May | 26-Jun | 24-Jul | 21-Aug | 20-Sep | 20-Oct | 17-Nov | 15-Dec |
| DF-M-04 | - | - | - | - | - | - | 17-Jul | 18-Aug | 17-Sep | - | - | - |
| DF-M-05 | - | - | - | - | - | - | 16-Jul | 16-Aug | 16-Sep | - | - | - |
| DF-M-06 | - | - | - | - | - | - | 16-Jul | 16-Aug | 16-Sep | - | - | - |
| DF-M-07 | - | - | - | - | - | - | 16-Jul | 16-Aug | 16-Sep | - | - | - |
| DF-M-08 | - | - | - | - | - | - | 16-Jul | 16-Aug | 16-Sep | - | - | - |
| DF-M-09 | - | - | - | - | - | - | 17-Jul | 18-Aug | 17-Sep | - | - | - |
| DF-P-03 | - | - | - | - | - | - | 18-Jul | 31-Aug | 17-Sep | - | - | - |
| DF-P-04 | 08-Feb | 07-Mar | 05-Apr | 03-May | 31-May | 28-Jun | 28-Jul | 26-Aug | 25-Sep | 23-Oct | 21-Nov | 21-Dec |
| DF-P-05 | 07-Feb | 07-Mar | 05-Apr | 03-May | 31-May | 28-Jun | 28-Jul | 26-Aug | 25-Sep | 23-Oct | 21-Nov | 21-Dec |
| DF-P-06 | 07-Feb | 07-Mar | 05-Apr | 03-May | 31-May | 28-Jun | 28-Jul | 26-Aug | 25-Sep | 23-Oct | 21-Nov | 21-Dec |
| DF-P-07 | 08-Feb | 07-Mar | 05-Apr | 03-May | 31-May | 28-Jun | 28-Jul | 26-Aug | 25-Sep | 23-Oct | 21-Nov | 21-Dec |
| DF-P-08 | 08-Feb | 07-Mar | 05-Apr | 03-May | 31-May | 28-Jun | 28-Jul | 26-Aug | 25-Sep | 23-Oct | 21-Nov | 21-Dec |
| DF-P-09 | 09-Feb | 10-Mar | 07-Apr | - | - | - | 18-Jul | 31-Aug | - | - | - | 22-Jan |
| DF-P-10 | 07-Feb | 07-Mar | 05-Apr | 03-May | 31-May | 28-Jun | 28-Jul | 26-Aug | 25-Sep | 23-Oct | 21-Nov | 21-Dec |
| DF-P-11 | 09-Feb | 10-Mar | 07-Apr | - | - | 17-Jun | 18-Jul | 31-Aug | - | - | - | - |
| DF-P-12 | 09-Feb | 10-Mar | 07-Apr | - | - | 17-Jun | 18-Jul | 31-Aug | - | - | - | 22-Jan |
| DF-RN-01 | - | - | - | - | - | - | 19-Jul | 31-Aug | 17-Sep | - | - | - |
| DF-RN-02 | 15-Feb | 11-Mar | 07-Apr | - | - | 17-Jun | 19-Jul | 31-Aug | - | - | 29-Nov | 23-Jan |
| DF-RN-03 | 08-Feb | 08-Mar | 05-Apr | 03-May | 31-May | 29-Jun | 27-Jul | 25-Aug | 24-Sep | 24-Oct | | 22-Dec |
| DF-RN-04 | 08-Feb | 08-Mar | 05-Apr | 03-May | 31-May | 29-Jun | 27-Jul | 25-Aug | 24-Sep | 24-Oct | 24-Nov | 22-Dec |
| DF-RN-05 | 08-Feb | 08-Mar | 05-Apr | 03-May | 31-May | 29-Jun | 27-Jul | 25-Aug | 24-Sep | 24-Oct | - | 22-Dec |
| DF-RN-06 | 08-Feb | 08-Mar | 05-Apr | 03-May | 31-May | 29-Jun | 27-Jul | 25-Aug | 24-Sep | 24-Oct | - | 22-Dec |
| DF-RN-07 | 12-Feb | 11-Mar | 07-Apr | - | - | 17-Jun | 18-Jul | 31-Aug | - | - | 29-Nov | 23-Jan |
| DF-RN-08 | - | - | - | - | - | - | 18-Jul | 31-Aug | 17-Sep | - | - | - |

Table 7-3. Dustfall monitoring sampling record, 2024 (date shown indicates the day the sample canister was collected).

| Site ID | January | February | March | April | May | June | July | August | September | October | November | December |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DF-RS-01 | - | - | - | - | - | - | 17-Jul | 31-Aug | 17-Sep | - | - | - |
| DF-RS-02 | 10-Feb | 10-Mar | 07-Apr | 07-May | - | 18-Jun | 17-Jul | 18-Aug | - | - | - | 16-Dec |
| DF-RS-03 | 08-Feb | 08-Mar | 06-Apr | 03-May | 31-May | 29-Jun | 27-Jul | 25-Aug | 26-Sep | 24-Oct | 24-Nov | 22-Dec |
| DF-RS-04 | 08-Feb | 08-Mar | 06-Apr | 03-May | 31-May | 29-Jun | 27-Jul | 25-Aug | 26-Sep | 24-Oct | 24-Nov | 22-Dec |
| DF-RS-05 | 08-Feb | 08-Mar | 06-Apr | 03-May | 31-May | 29-Jun | 27-Jul | 25-Aug | 26-Sep | 24-Oct | 24-Nov | 22-Dec |
| DF-RS-06 | 08-Feb | 08-Mar | 06-Apr | 03-May | 31-May | 29-Jun | 27-Jul | 25-Aug | 26-Sep | 24-Oct | 24-Nov | 22-Dec |
| DF-RS-07 | 10-Feb | 10-Mar | 07-Apr | 07-May | | 18-Jun | 17-Jul | 18-Aug | | | | 16-Dec |
| DF-RS-08 | - | - | - | - | - | - | 20-Jul | 18-Aug | 17-Sep | - | - | - |
| DF-RR-01 | - | - | - | - | - | - | 17-Jul | 31-Aug | 17-Sep | - | - | - |
| DF-RR-02 | - | - | - | - | - | - | 19-Jul | 31-Aug | 17-Sep | - | - | - |
| DF-TR-25E | 12-Feb | 11-Mar | 07-Apr | 08-May | - | 17-Jun | 18-Jul | 31-Aug | - | - | 29-Nov | 23-Jan |
| DF-TR-25W | 12-Feb | 11-Mar | 07-Apr | 08-May | - | 17-Jun | 18-Jul | 31-Aug | - | - | 29-Nov | 23-Jan |
| DF-TR-56E | 15-Feb | 10-Mar | 07-Apr | 08-May | - | 18-Jun | 19-Jul | 18-Aug | - | - | - | 24-Jan |
| DF-TR-56W | 15-Feb | 10-Mar | 07-Apr | 08-May | - | 18-Jun | 19-Jul | 18-Aug | - | - | - | 24-Jan |
| DF-TR-75E | 10-Feb | 10-Mar | 07-Apr | 07-May | - | 18-Jun | 17-Jul | 18-Aug | - | - | - | 25-Jan |
| DF-TR-75W | 10-Feb | 10-Mar | 07-Apr | 07-May | - | 18-Jun | 17-Jul | 18-Aug | - | - | - | 25-Jan |

#### 7.3.1.3 Data Trends and Statistical Analysis

**Extent and Magnitude of Dustfall at Various Sites** — Dustfall deposition rates (as total suspended particulates [TSP]) for each site were compiled for the 2024 monitoring season. Data were grouped according to the four study areas within the RSA. Data were reviewed to determine which sites in each sampling area were most affected by dustfall relative to reference sites.

Daily dustfall data from the summer sampling period (June to September) were used to evaluate the relationship between dustfall and distance from the road for the Mine Site and Tote Road. Mixed-effects models were used to test the relationship between distance from Project infrastructure and daily dustfall.

- Sites were treated as the random effect.
- Distance from the Mine Site was treated as a categorical variable with three classes: Near (within footprint), Far (1,000 to 5,000 m), and Reference (>5,000 m).
- Distance from the road was treated as a categorical variable with four classes: 30 m, 100 m, 1,000 m, and 5,000 m.

Data for daily dustfall as a function of distance from Project infrastructure did not always meet the assumptions of normality (Shapiro-Wilk test) or equality of variance (Levene's test) in the residuals required for a linear model. In such cases, differences in the distribution of dustfall were tested by distance class using non-parametric Kruskall-Wallis tests, with data stratified by sampling month. Pairwise Wilcoxon tests were performed to determine which distance classes were different. Ninety-five percent bias-corrected and accelerated confidence intervals (CIs) were calculated for each estimate by bootstrapping datasets and testing mixed-effects models 1,000 times. A Holm's p-value correction was applied when conducting pairwise comparisons. Medians and inter-quartile ranges were reported to summarize dustfall within distance classes. Statistical analyses were conducted using R version 4.4.2 (R Core Team 2024).

**Seasonal Variation in Dustfall** — Daily dustfall was assessed at year-round sites within all Project areas (i.e., the Mine Site, Milne Port, and the Tote Road crossings) to determine whether discrete seasonal/monthly patterns or continuous temporal patterns were evident. The month of dustfall collection was identified from the time between consecutive sample dates (e.g., samples collected early [<15] in December were associated with dustfall in November. In contrast, samples collected later [>15] in December were associated with dustfall in December). Generalized least-squares regressions were used to test for effects of season (summer and winter) or time (month time series) and sample site on daily dustfall accumulation. Seasonal models were used to test the main effects of season and sample site and the interaction between them. Time-series models were used to test the main effects of sample site and cosinusoidal functions of month and the interaction between them. All dustfall data were $\log_e$ transformed before analysis and results were back-transformed to the original scale. Models included a first-order autocorrelation structure, based on sampling period within a site, to account for the possibility that dustfall in one sampling period was most similar to samples from the preceding period (Zuur et al. 2009). Fixed model weights based on the number of days in each sampling period were used to give more weight to dust samples collected over a longer time (Zuur et al. 2009). Model selection procedures followed an information theoretic approach using corrected Akaike's Information

Criteria (AICc; Burnham and Anderson 2002). Models with the lowest scores were identified as the best trade-off between parsimony and explained variance.

Residual diagnostic plots were examined, and formal tests (Shapiro-Wilk and Levene's tests) were conducted to confirm assumptions of normality and homogeneity of variance in the residuals. Bootstrap resampling (1,000 times) was conducted if these assumptions were violated to develop 95% bias-corrected and accelerated CIs for each estimate. If evidence of an effect of season or month on daily dustfall was detected, estimated marginal means were used to determine the geometric mean effect after accounting for the effect of the sample site (Lenth et al. 2018). Statistical analyses were conducted using R version 4.4.2 (R Core Team 2024).

**Annual Dustfall** — Annual dustfall model predictions for large parts of the PDA were most recently developed by Nunami Stantec (Nunami Stantec Ltd. 2023). The 2024 passive dustfall monitoring program results for monitoring sites with year-round data collection were converted from $mg/dm^2 \cdot day$ units to $g/m^2/year$, and data for each month were converted to $g/m^2/day$ and then summed to add up to one year. Any data gaps were filled in using predicted dustfall, calculated as presented in Doetzel and Bajina (2023). Measured dustfall from the passive monitoring program was compared with the modelled annual dustfall for all sites for which modelled data were available.

**Inter-annual Trends** — Linear mixed-effects models were used to test for effects of year and season (summer and winter), month, or time (month time series) on daily dustfall accumulation for each Project area (i.e., the Mine Site, Milne Port, and the Tote Road crossings). Only sites that were sampled throughout the year were included in analyses. The month of dustfall collection was identified from the time between consecutive sample dates (e.g., samples collected early [<15] in December were associated with dustfall in November, whereas samples collected later [>15] in December were associated with dustfall in December). Monthly models were used to test the main effects of month and year and the interaction between them. Time-series models were used to test the main effects of year and sine/cosine functions of month and the interaction between them. The sample site was included as a random effect to account for lack of independence in samples collected from the same location over time. All dustfall data were $\log_e$ transformed before analysis, and results were back-transformed to the original scale. A variance structure was parameterized on the number of sampling days per month in a given year for all models (Zuur et al. 2009).

Residual diagnostic plots were examined, and formal tests (Shapiro Wilk and Leven's tests) were conducted to confirm assumptions of normality and equality of variance in the residuals. If these assumptions were violated, pairwise Wilcoxon tests were performed for factorial (categorical) designs and bootstrap resampling (1,000 times) was used to develop 95% bias-corrected and accelerated CIs for each estimate. If evidence of an effect of month on daily dustfall was detected, estimated marginal means were used to determine the geometric mean effect (Lenth et al. 2018). Model selection procedures followed an information theoretic approach using corrected AICc (Burnham and Anderson 2002). Models with the lowest scores were identified as the best trade-off between parsimony and explained variance. Statistical analyses were conducted using R version 4.4.2 (R Core Team 2024).

## 7.3.2 RESULTS AND DISCUSSION

### 7.3.2.1 Magnitude and Extent of 2024 Dustfall

**Mine Site** — The 2024 monitoring program included nine dustfall monitors at the Mine Site: three within the mine footprint (Near sites), four outside the mine footprint but within the 5,000 m buffer (Far sites), and two Reference sites located greater than 5,000 m from the Mine Site (Table 7-2). Within the mine footprint, dustfall deposition rates at DF-M-01, near the airstrip, were consistent all year round, save for a short-lived spike in May when spring melt conditions can make dust mitigations difficult (Table 7-4). At DF-M-02, located nearest to the crusher, dustfall deposition rates were highest during the winter months until early May, and were then consistently lower from late May through December. At DF-M-03, south of the mine haul road near the ore deposit, dustfall deposition rates varied throughout 2024.

Sites DF-M-06, DF-M-07, DF-M-08, and DF-M-09, located outside the mine footprint but within the 5,000 m buffer, were sampled during summer (July to September). Dustfall deposition rates at these stations were below detection during all sampling events (Table 7-4). Dustfall deposition rates at DF-M-04 and DF-M-05, greater than 5,000 m from the PDA and only sampled during summer, were below detection during all sampling events.

Dustfall deposition rates were significantly higher at Near sites versus Far and Reference sites ($\chi^2_2 = 34.51$, $P < 0.0001$; Figure 7-1). Geometric mean daily dustfall was highest in the Near distance class at 1.43 (95% CI = 1.10–1.92) mg/dm²·day, which was significantly higher than the other two distance classes (all $P < 0.002$). No statistically significant difference in mean daily dustfall occurred between the Far and Reference distance classes ($P = 0.85$). No samples in the Far distance class were above the laboratory detection limit; the geometric mean daily dustfall recorded at the Far distance class was 0.19 (95% CI = 0.15–0.29) mg/dm²·day. No samples in the Reference distance class were above the laboratory detection limit.

**Milne Port** — Ten dustfall monitors were associated with Milne Port in 2024 (Table 7-2, Map 7-1): five active sites within the Milne Port footprint and five active sites outside the PDA. The two main sources of dustfall at Milne Port are the sealift staging area and the ore stockpile area.

Dustfall deposition rates at Milne Port were highest at DF-P-05, located centrally in the camp area east of the sealift staging pad, and ranged from 0.46 mg/dm²·day in November to 7.30 mg/dm²·day in May (Table 7-4). Dustfall deposition rates at DF-P-06, located nearest to the sealift staging pad on the west side, ranged from 0.16 to 0.55 mg/dm²·day (Table 7-4). Dustfall deposition rates at DF-P-08, located nearest the ore pad, ranged from 0.23 to 2.48 mg/dm²·day, while dustfall deposition rates at DF-P-10, located in the same direction but further out near the PDA boundary, ranged from 0.21 to 2.32 mg/dm²·day. Dustfall deposition rates at DF-P-07, located near the ore pad but further to the north, ranged from below the laboratory detection limit (0.10 mg/dm²·day) to 0.39 mg/dm²·day in August. Dustfall deposition rates at DF-P-04, primarily associated with the Tote Road and quarry operations, ranged from below the laboratory detection limit to 1.22 mg/dm²·day. Dustfall deposition rates at DF-P-11 and DF-P-12, located west of the PDA at approximately 1,000 m distance, ranged from below the laboratory detection limit to a high of 0.12 mg/dm²·day and 0.15 mg/dm²·day, respectively. Dustfall deposition rates at DF-P-03, sampled only during summer months, were below the laboratory detection limit during all sampling events (July to September).

No evidence was present to indicate that Near and Far distance classes were statistically different in their geometric mean daily dustfall ($\chi^2_1 = 0.83$, $P = 0.41$; Figure 7-1). However, geometric mean daily dustfall was highest in the Near distance class at 0.47 (95% CI = 0.18–1.23), followed by the Far distance class at 0.19 (95% CI = 0.02–2.38). Forty-five samples (75%) in the Near distance class and no samples in the Reference distance class were above the laboratory detection limit.

**Tote Road Dustfall** — Twenty-four dustfall monitors were associated with the Tote Road in 2024: eight at each of two transects perpendicular to the road (the north crossing site at KM 28 of the Tote Road and the south crossing site at KM 78 of the Tote Road), two Reference monitors located approximately 14,000 m from the road, and three pairs of two sites located 1,000 m from each side of the road at KM 25, KM 56, and KM 75 of the Tote Road.

**North Crossing, Tote Road KM 28** — Dustfall deposition rates were highest at the monitors nearest the centerline on both sides of the Tote Road (DF-RN-04 and DF-RN-05), with dustfall ranging from 0.62 to 17.20 $mg/dm^2 \cdot day$ at DF-RN-04 and from 0.39 to 12.80 $mg/dm^2 \cdot day$ at DF-RN-05. Dustfall deposition rates decreased with distance from the centerline. Dustfall deposition rates at DF-RN-03 and DF-RN-06 ranged from 0.31 to 5.48 $mg/dm^2 \cdot day$ and from 0.22 to 8.14 $mg/dm^2 \cdot day$, respectively. Dustfall deposition rates at two monitors located 1,000 m from the PDA (DF-RN-02 and DF-RN-07) generally ranged below the laboratory detection limit. Dustfall deposition data collected during the summer season at the farthest sites (DF-RN-01 and DF-RN-08) were below the laboratory detection limit in all samples (Table 7-4).

An effect of distance from the north crossing on daily dustfall was evident ($\chi^2 3 = 41.45$, $P < 0.0001$; Figure 7-1). Geometric mean daily dustfall was higher in the 30 m distance class, 2.31 $mg/dm^2 \cdot day$ (95% CI = 1.66–3.59), compared to the 1,000 m and 5,000 m distance classes (all $P \leq 0.001$). The evidence suggested that daily dustfall in the 30 m distance class was statistically different from the 100 m distance class ($P = 0.05$). Geometric mean daily dustfall in the 100 m distance class was 1.18 (95% CI = 0.83–1.74) $mg/dm^2 \cdot day$, which was significantly higher than the two farther distance classes (all $P < 0.002$). The evidence suggested a difference in dustfall between the 1,000 m and 5,000 m distance classes ($P = 0.05$). Geometric mean daily dustfall in the 1,000 m distance class was 0.14 (95% CI = 0.11–0.21) $mg/dm^2 \cdot day$, and 21% of all samples were above the laboratory detection limit. Geometric mean daily dustfall in the 5,000 m distance class was 0.24 (95% CI = 0.16–0.39), but none of the samples were above the laboratory detection limit of 0.1 $mg/dm^2 \cdot day$.

**South Crossing, Tote Road KM 78** — The south crossing monitors are in a wide valley where high winds are common, generally blowing north to south. The south crossing monitors are also just north of a bridge crossing—as vehicles exit the bridge, they accelerate, increasing dust production. The winds then blow toward the south of the Tote Road. Dustfall at the south crossing generally represents the 'worst-case scenario' for dustfall along the Tote Road. Dustfall deposition rates were highest at monitors nearest the centerline on the south side of the Tote Road (DF-RS-04), where dustfall ranged from 1.46 to 25.80 $mg/dm^2 \cdot day$. On the north side of the Tote Road (DF-RS-05), dustfall deposition rates ranged from 0.99 to 17.90 $mg/dm^2 \cdot day$. Dustfall deposition rates decreased with distance from the centerline. Dustfall deposition rates at DF-RS-03 and DF-RS-06 ranged from 0.38 to 10.60 mg/dm²·day and from 0.29 to 8.20 mg/dm²·day, respectively. Dustfall deposition rates in collectors at 1,000 m from the PDA (DF-RS-02 and DF-RS-07) ranged from below the laboratory detection limit to 0.96 mg/dm²·day and from below the laboratory detection limit to 0.34 mg/dm²·day, respectively. Dustfall deposition data collected during the summer season at the farthest sites (DF-RN-01 and DF-RN-08) were below the laboratory detection limit in all samples (Table 7-4).

An effect of distance from the south crossing was evident on daily dustfall ($\chi^2_3 = 41.94$, $P < 0.0001$; Figure 7-1). Geometric mean daily dustfall was highest in the 30 m distance class at 3.00 (95% CI = 2.15–4.27) mg/dm²·day, which was significantly higher than the 1,000 m and 5,000 m distance classes (all $P < 0.0008$) but was not statistically different from the 100 m distance class ($P = 0.12$). Geometric mean dustfall in the 100 m distance class was 1.40 (95% CI = 0.84–3.01) mg/dm²·day; evidence was present that this amount was higher than the 1,000 m and 5,000 m distance classes (all $P < 0.007$). No difference in geometric mean dustfall was evident between the 1,000 m (0.18 [95% CI = 0.14–0.24] mg/dm²·day) and 5,000 m (0.19 [95% CI = 0.12–0.33] mg/dm²·day) distances classes ($P = 0.97$). Six samples (38%) in the 1,000 m distance class and no samples in the 5,000 m distance class were above the laboratory detection limit.

**Reference Sites** — Dustfall deposition rates at the two Tote Road Reference sites (DF-RR-01 and DF-RR-02), which are sampled only during summer months, were (like all other years) below the laboratory detection limit in all samples (Table 7-4).

**Dustfall at Sites 1,000 m from the PDA** — Twelve dustfall monitoring sites were located 1,000 m from the PDA: two at the Mine Site and 10 at various locations along the Tote Road. The two Mine Site collectors were sampled only during the summer, whereas the Tote Road sites were sampled throughout the year. Monitoring data from previous years indicate that across the Project areas, 1,00 m from the PDA is where dustfall deposition rates approach the laboratory detection limit. Additional data from sites located 1,000 m from the PDA were meant to indicate if dustfall deposition rates are consistent at this distance, or if variability occurs across the Project.

Daily dustfall deposition rates at all sites 1,000 m from mine infrastructure were consistently less than 1.0 mg/dm²·day when reviewing both year-round and summer-only data. Although statistical differences in dustfall were evident among the sites located 1,000 m from Project infrastructure during summer ($\chi^2 11 = 5.04$, $P = 0.0007$; Figure 7-2) and year-round ($\chi^2 11 = 5.53$, $P < 0.0001$; Figure 7-3), this variation appears to be site specific rather than Project area specific. For example, the sites with both the highest and lowest geometric mean daily dustfall were associated with the Tote Road. The geometric mean daily dustfall for sites with summer-only data was highest for DF-RS-02 (0.53 [95% CI = 0.18–1.52)] mg/dm²·day) and lowest for DF-RN-02 (0.14 [95% CI = 0.05–0.43)] mg/dm²·day) (Difference = 0.39 mg/dm²·day, $P = 0.002$). Geometric mean daily dustfall for sites with year-round data was highest for DF-RS-02 (0.27 [95% CI = 0.18–0.40)] mg/dm²·day) and lowest for DF-TR-75E (0.12 [95% CI = 0.08–0.18)] mg/dm²·day) (Difference = 0.15 mg/dm²·day, $P = 0.0002$).

**Table 7-4. Summary of total insoluble dustfall (mg/dm²·day), 2024.**

| Site ID | January | February | March | April | May | June | July | August | September | October | November | December |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DF-M-01 | 1.89 | 1.92 | 1.46 | 0.99 | 2.95 | 1.35 | 0.49 | 0.49 | <0.34 | 1.17 | 1.70 | 0.41 |
| DF-M-02 | 3.97 | 5.45 | 6.24 | 1.62 | 1.88 | 1.31 | 0.60 | 0.52 | <0.40 | 0.34 | 0.61 | 0.99 |
| DF-M-03 | 3.31 | 3.01 | 4.77 | 1.57 | 5.68 | 3.40 | 1.93 | 4.44 | <0.50 | 1.06 | 0.47 | 0.48 |
| DF-M-04 | - | - | - | - | - | - | <0.15 | <0.14 | <0.34 | - | - | |
| DF-M-05 | - | - | - | - | - | - | <0.16 | <0.14 | <0.33 | - | - | |
| DF-M-06 | - | - | - | - | - | - | <0.16 | <0.19 | <0.44 | - | - | |
| DF-M-07 | - | - | - | - | - | - | <0.16 | <0.10 | <0.29 | - | - | |
| DF-M-08 | - | - | - | - | - | - | <0.16 | <0.19 | <0.44 | - | - | |
| DF-M-09 | - | - | - | - | - | - | <0.11 | <0.10 | <0.25 | - | - | |
| DF-P-03 | - | - | - | - | - | - | <0.14 | <0.14 | <0.35 | - | - | |
| DF-P-04 | <0.15 | 0.16 | 0.99 | 0.74 | 1.22 | 0.95 | 0.33 | 0.29 | <0.20 | <0.16 | 0.13 | <0.15 |
| DF-P-05 | 1.80 | 1.59 | 3.32 | 5.73 | 7.30 | 1.91 | 1.26 | 1.72 | 0.64 | 0.98 | 0.46 | 0.88 |
| DF-P-06 | 0.25 | 0.29 | 0.45 | 0.55 | 0.42 | 0.26 | 0.16 | 0.36 | <0.15 | <0.16 | <0.10 | <0.15 |
| DF-P-07 | 0.39 | 0.38 | 0.39 | 0.39 | <0.16 | <0.16 | <0.15 | 0.35 | <0.20 | 0.25 | <0.15 | <0.15 |
| DF-P-08 | 2.48 | 1.52 | 2.11 | 1.62 | 0.83 | 0.57 | 0.61 | 0.55 | <0.25 | 0.34 | 0.23 | 0.55 |
| DF-P-09 | 0.16 | 0.22 | 0.22 | - | - | - | 0.25 | <0.14 | - | - | - | - |
| DF-P-10 | 2.32 | 1.78 | 1.64 | 1.57 | 0.69 | 0.60 | 0.67 | 0.46 | <0.20 | 0.39 | 0.21 | 0.36 |
| DF-P-11 | <0.10 | 0.12 | <0.11 | - | - | <0.10 | <0.10 | <0.10 | - | - | - | |
| DF-P-12 | 0.12 | 0.11 | 0.15 | - | - | <0.10 | <0.10 | <0.10 | - | - | - | |
| DF-RN-01 | - | - | - | - | - | - | <0.14 | <0.18 | <0.44 | - | - | |
| DF-RN-02 | <0.10 | <0.18 | <0.11 | - | - | 0.21 | <0.10 | <0.10 | - | - | <0.10 | <0.10 |
| DF-RN-03 | 0.67 | 0.55 | 0.86 | 0.67 | 5.48 | 1.89 | 0.51 | 1.44 | 0.31 | 3.20 | 0.99 | 0.45 |
| DF-RN-04 | 1.10 | 1.00 | 2.04 | 1.48 | 17.20 | 6.02 | 1.35 | 3.29 | 0.62 | 5.97 | 1.40 | 0.70 |
| DF-RN-05 | 1.53 | 1.59 | 3.35 | 2.01 | 12.80 | 12.70 | 2.92 | 3.82 | 0.71 | 4.91 | 1.31 | 0.39 |
| DF-RN-06 | 0.99 | 0.87 | 1.63 | 0.71 | 8.14 | 4.42 | 0.82 | 1.37 | 0.22 | 2.39 | 0.76 | 1.38 |
| DF-RN-07 | <0.10 | <0.16 | <0.11 | - | - | 0.81 | 0.10 | <0.14 | - | - | - | <0.10 |
| DF-RN-08 | - | - | - | - | - | - | <0.14 | <0.20 | <0.53 | - | - | |

**Table 7-4. Summary of total insoluble dustfall (mg/dm²·day), 2024.**

| Site ID | January | February | March | April | May | June | July | August | September | October | November | December |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DF-RS-01 | - | - | - | - | - | - | <0.15 | <0.10 | <0.53 | - | - | |
| DF-RS-02 | <0.13 | <0.15 | 0.15 | 0.37 | | 0.96 | 0.41 | 0.26 | - | - | - | <0.15 |
| DF-RS-03 | 0.78 | 0.89 | 0.74 | 1.07 | 10.60 | 7.70 | 3.25 | 3.80 | 0.43 | 0.74 | 0.47 | 0.38 |
| DF-RS-04 | 2.58 | 3.01 | 3.07 | 6.17 | 25.80 | 15.30 | 15.60 | 23.50 | 3.64 | 7.13 | 1.46 | 1.60 |
| DF-RS-05 | 2.04 | 2.38 | 2.79 | 8.68 | 16.10 | 17.90 | 12.80 | 8.40 | 1.06 | 4.44 | 1.56 | 0.99 |
| DF-RS-06 | 0.59 | 0.62 | 0.82 | 1.56 | 8.20 | 4.84 | 2.68 | 1.30 | <0.32 | 1.00 | 0.38 | 0.29 |
| DF-RS-07 | <0.10 | <0.15 | <0.11 | <0.10 | | 0.34 | <0.10 | <0.10 | - | - | - | <0.14 |
| DF-RS-08 | - | - | - | - | - | - | <0.10 | <0.15 | <0.30 | - | - | |
| DF-RR-01 | - | - | - | - | - | - | <0.15 | <0.10 | <0.44 | - | - | |
| DF-RR-02 | - | - | - | - | - | - | <0.14 | <0.10 | <0.44 | - | - | |
| DF-TR-25E | <0.10 | <0.11 | <0.11 | 0.11 | - | 0.35 | 0.12 | 0.14 | - | - | - | 0.11 |
| DF-TR-25W | <0.10 | <0.11 | <0.11 | - | - | 0.74 | 0.11 | 0.12 | - | - | - | 0.15 |
| DF-TR-56E | <0.10 | <0.18 | <0.11 | - | - | 0.29 | 0.17 | 0.19 | - | - | - | |
| DF-TR-56W | <0.10 | <0.18 | <0.11 | 0.15 | - | 0.37 | 0.10 | 0.11 | - | - | - | |
| DF-TR-75E | <0.10 | <0.10 | <0.11 | 0.13 | - | 0.17 | 0.12 | <0.10 | - | - | - | |
| DF-TR-75W | 0.40 | 0.18 | 0.15 | 0.17 | - | 0.55 | 0.23 | 0.29 | - | - | - | |

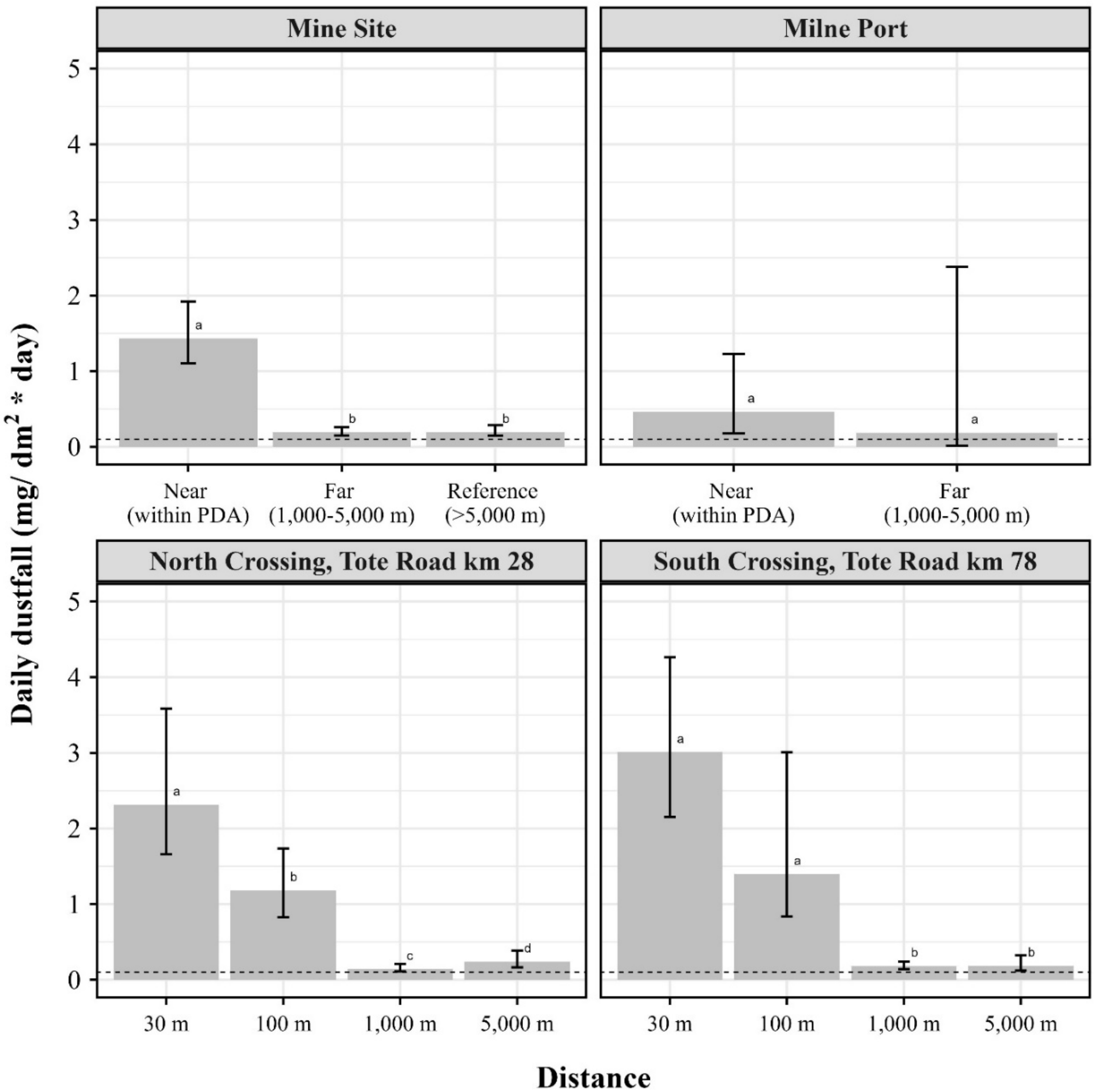



**Figure 7-1.** **Geometric mean daily dustfall (mg/dm²·day) for the Mine Site, Milne Port, the Tote Road north crossing (KM 28), and the Tote Road south crossing (KM 78). The Tote Road sites are measured as a function of distance from the Tote Road. Scales are equal for each area to allow comparison of differences between each area.**

*Bar heights show geometric mean daily dustfall with 95% confidence intervals. Confidence intervals are asymmetrical because dust data were analyzed on the $\log_e$ scale and back-transformed to the natural scale. The dashed horizontal line indicates the minimum detection limit for dust samples and the maximum dustfall rate at Reference sites unaffected by the Project.*

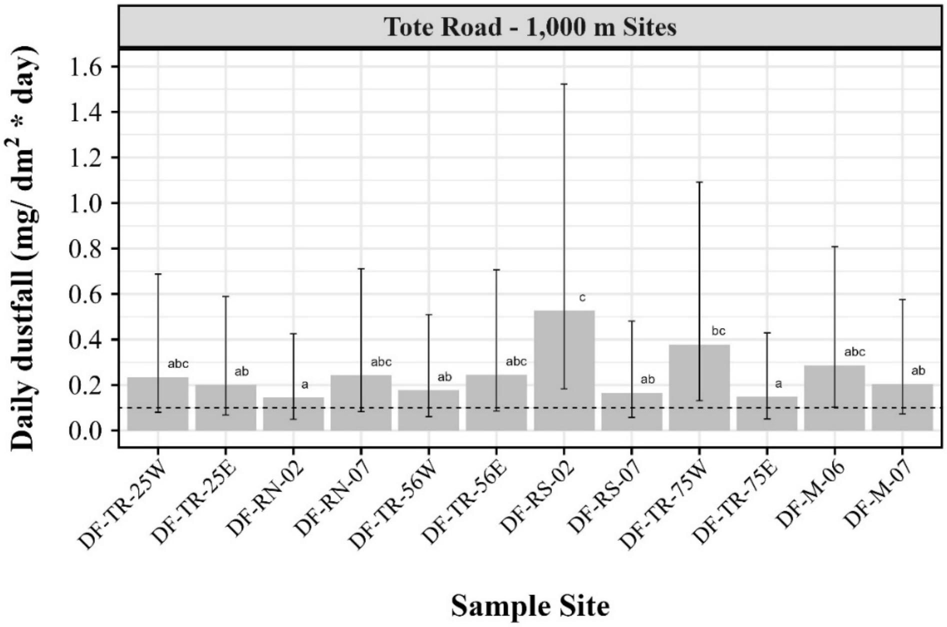



**Figure 7-2. Geometric mean daily dustfall (mg/dm²·day) for all sites located 1,000 m from Project infrastructure during the summer season.**

*Bar heights show geometric mean daily dustfall with 95% confidence intervals. Confidence intervals are asymmetrical because dust data were analyzed on the $\log_e$ scale and back-transformed to the natural scale. The dashed horizontal line indicates the minimum detection limit for dust samples and the maximum dustfall rate at Reference sites unaffected by the Project.*

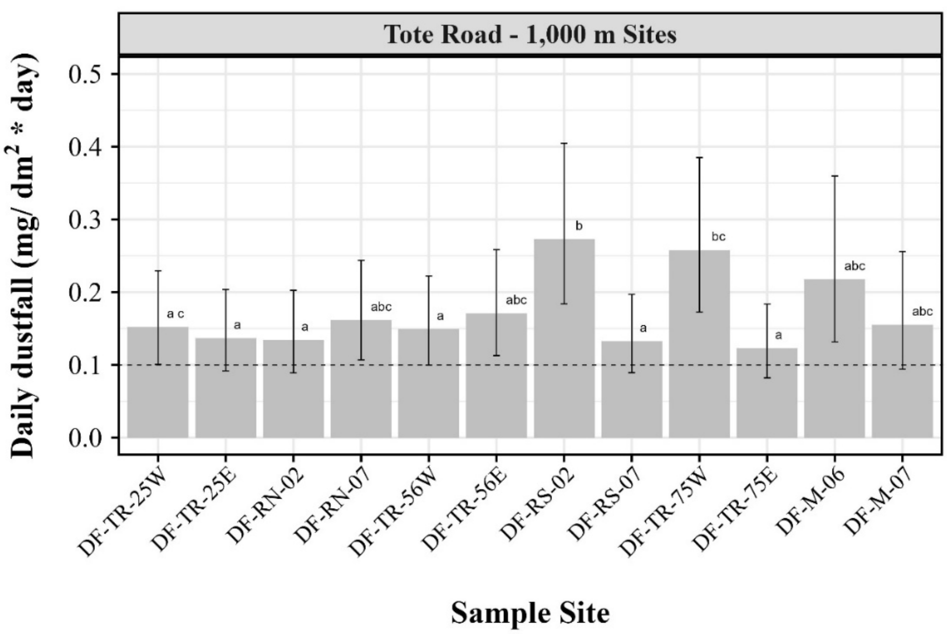



**Figure 7-3. Geometric mean daily dustfall (mg/dm²·day) for all sites located 1,000 m from the Tote Road using year-round data.**

*Bar heights show geometric mean daily dustfall with 95% confidence intervals. Confidence intervals are asymmetrical because dust data were analyzed on the $\log_e$ scale and back-transformed to the natural scale. The dashed horizontal line indicates the minimum detection limit for dust samples and the maximum dustfall rate at Reference sites unaffected by the Project.*

#### 7.3.2.2 Seasonal Comparisons of 2024 Dustfall

Seasonal variations in dustfall were investigated as per the dustfall monitoring objectives. Dustfall deposition across the PDA indicated different seasonal trends depending on location. Dustfall at the Mine Site was elevated during the winter (January through March) whereas dustfall at Milne Port was elevated in spring (May/June) and again in October. Dustfall along the Tote Road was elevated through spring and summer and lower during winter months when freezing conditions help to limit road-sourced dust. It has been noted for several years that spring and fall freeze/thaw conditions present challenges for dustfall mitigations such as road treatments (e.g., watering). Historically, elevated dustfall has been noted in September when variable freezing conditions may limit dust suppression; however, in September 2024 heavy rainfall closed the Tote Road for 17 days between September 8 and October 2.

**Mine Site —** Patterns across time were best represented by a common fluctuation in dustfall across months ($F_1$ = 3.54, $P$ = 0.07). Peaks occurred in April, July, and September/October (Figure 7-4). This model had a better trade off in complexity and variance explained relative to a model with month-only effects (AICc = 106.67 versus 113.39, respectively). The highest daily dustfall occurred in March (3.63 [95% CI = 1.53–7.00] mg/dm²·day) and the lowest daily dustfall occurred in September (0.41 [95% CI = 0.19–0.87] mg/dm²·day).

**Milne Port —** Patterns across time were best represented by mean differences among sites ($F_4$ = 35.55, $P$ < 0.0001) and months ($F_{11}$ = 12.45, $P$ < 0.0001). The peak in daily dustfall occurred in April (Figure 7-4). This model had a better trade off in complexity and variance explained relative to a model with month-only effects (AICc = 110.42 versus 181.46, respectively). The highest daily dustfall occurred in April at site DF-P-05 (3.96 [95% CI = 2.61–6.00] mg/dm²·day) and the lowest daily dustfall occurred in November at site DF-P-07 (0.09 [95% CI = 0.06–0.14] mg/dm²·day).

**North Crossing, Tote Road KM 28 —** Patterns across time were best represented by differences in sites ($\chi^2_3$ = 8.47, $P$ = 0.0003) and month ($\chi^2_{11}$ = 42.44, $P$ < 0.0001) (Figure 7-5). This model was the most parsimonious (AICc = 75.37) compared to models with an effect of season (ΔAICc = 21.15; Figure 7-6) or fluctuations across time (ΔAICc = 46.31; Figure 7-4). Geometric mean daily dustfall was highest at sites DF-RN-05 (15.64 [95% CI = 12.47–24.29] mg/dm²·day) and DF-RN-04 (12.96 [95% CI = 9.07–16.31] mg/dm²·day) in May 2024. Geometric mean daily dustfall was lowest at sites DF-RN-03 (0.26 [95% CI = 0.17–0.34] mg/dm²·day) and DF-RN-06 (0.34 [95% CI = 0.26–0.54] mg/dm²·day) in September 2024.

**South Crossing, Tote Road KM 78 —** Patterns across time were best represented by differences in sites ($F_3$ = 78.50, $P$ < 0.0001) and months ($F_{11}$ = 74.57, $P$ < 0.0001) (Figure 7-5). This model was the most parsimonious (AICc = 56.98) compared to models with an effect of season (ΔAICc = 31.32; Figure 7-5) or fluctuations across time (ΔAICc = 31.01; Figure 7-4). Geometric mean daily dustfall was highest at sites DF-RS-04 (31.39 [95% CI = 23.60–41.75] mg/dm²·day) and DF-RS-05 (23.34 [95% CI = 17.56–31.02] mg/dm²·day) in May 2024. Geometric mean daily dustfall was lowest at sites DF-RS-06 (0.29 [95% CI = 0.22–0.38] mg/dm²·day) and DF-RS-03 (0.35 [95% CI = 0.26–0.46] mg/dm²·day) in December 2024.

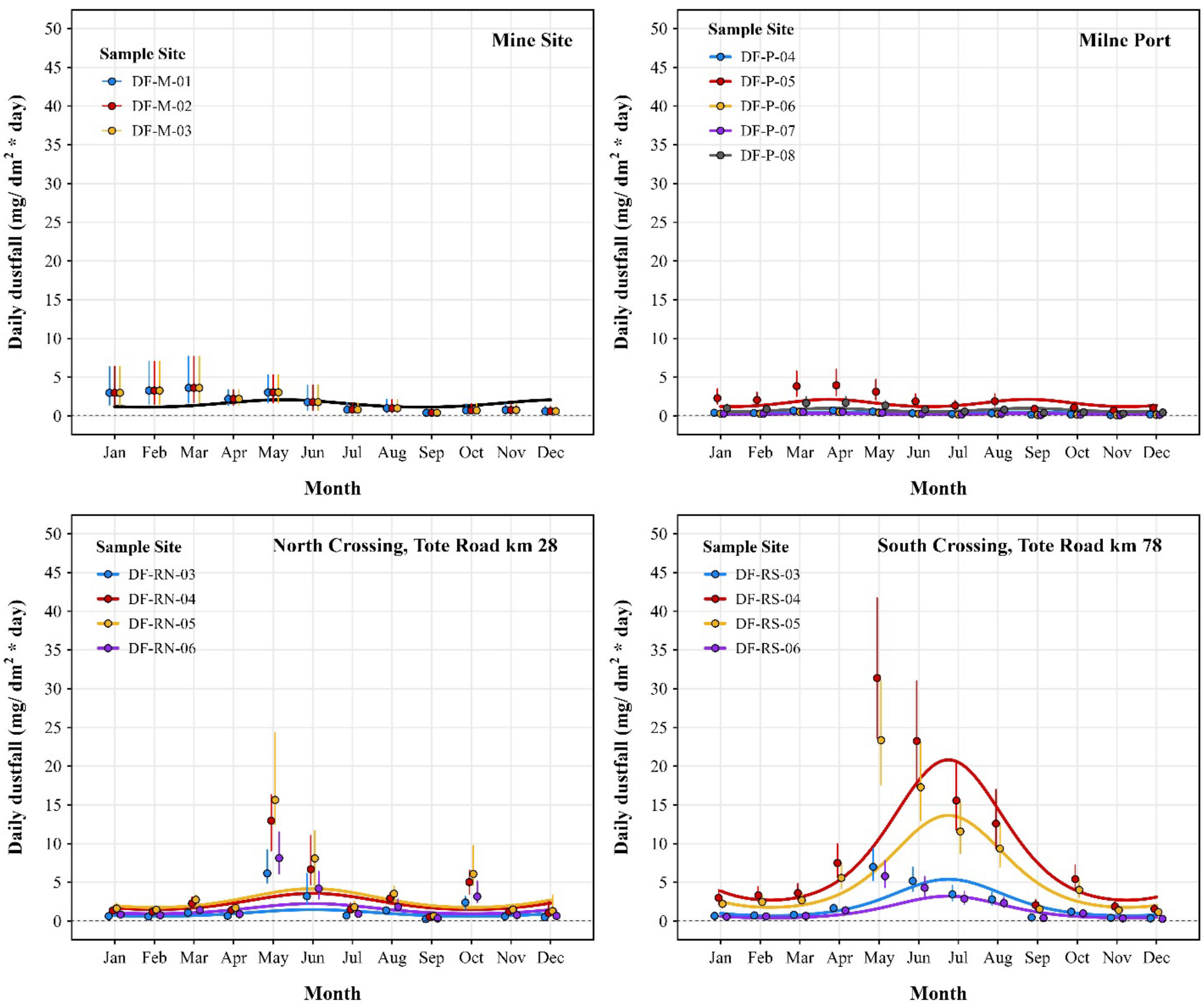



**Figure 7-4. Geometric mean daily dustfall (mg/dm²·day) by site and month (time-series or category) or season (category) for the Mine Site, Milne Port, the Tote Road north crossing (KM 28), and the Tote Road south crossing (KM 78).**

*Bar heights show geometric mean daily dustfall with 95% confidence intervals. Confidence intervals are asymmetrical because dust data were analyzed on the $\log_e$ scale and back-transformed to the natural scale. Lines correspond with sinusoidal functions relative to each sample site. The dashed horizontal line indicates the minimum detection limit for dust samples and the maximum dustfall rate at Reference sites unaffected by the Project.*

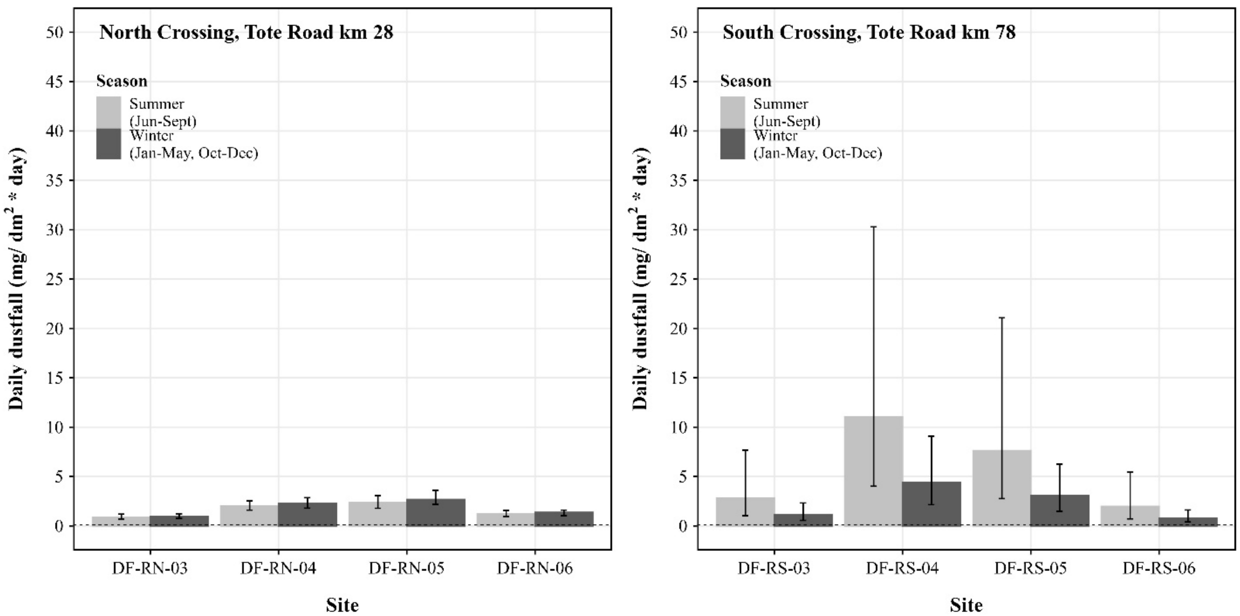



**Figure 7-5. Geometric mean daily dustfall (mg/dm²·day) by site and season (summer and winter) for the Tote Road north (KM 28) and south (KM 78) crossings.**

*Bar heights show geometric mean daily dustfall with 95% confidence intervals. Confidence intervals are asymmetrical because dust data were analyzed on the $\log_e$ scale and back-transformed to the natural scale. The dashed horizontal line indicates the minimum detection limit for dust samples and the maximum dustfall rate at Reference sites unaffected by the Project.*

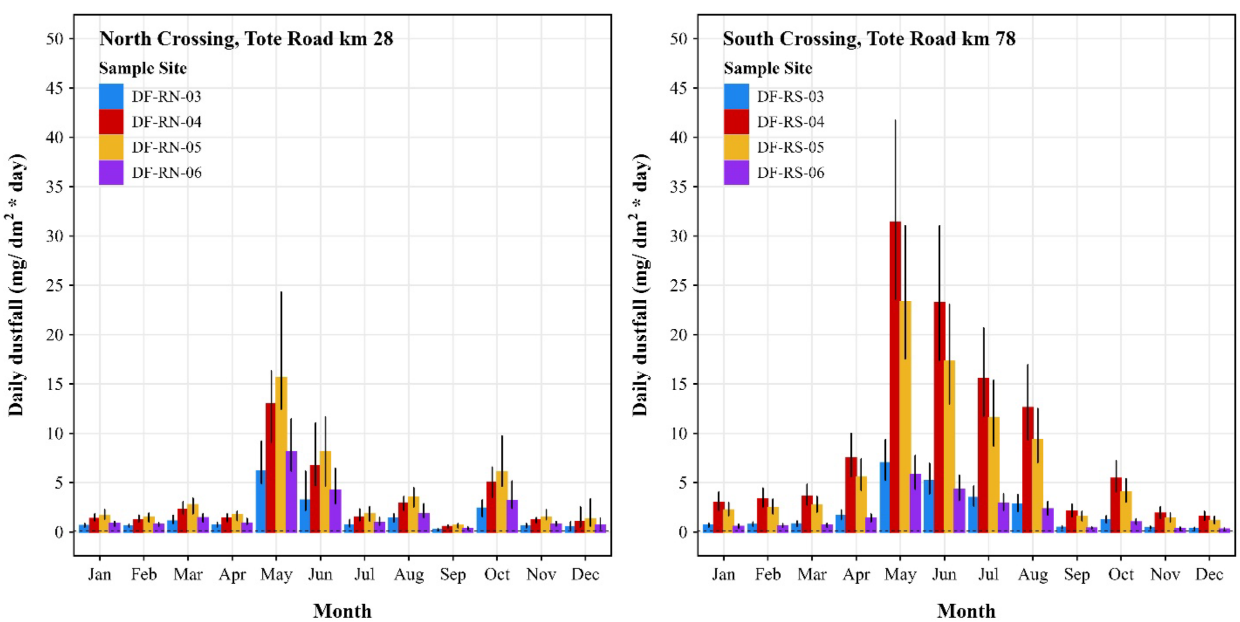



**Figure 7-6. Geometric mean daily dustfall (mg/dm²·day) by site and month for the Tote Road north (KM 28) and south (KM 78) crossings.**

*Bar heights show geometric mean daily dustfall with 95% confidence intervals. Confidence intervals are asymmetrical because dust data were analyzed on the $\log_e$ scale and back-transformed to the natural scale. The dashed horizontal line indicates the minimum detection limit for dust samples and the maximum dustfall rate at Reference sites unaffected by the Project.*

#### 7.3.2.3 2024 Annual Dustfall

Total annual dustfall for 2024 was calculated for all sites and each area in the Project RSA (Table 7-5, Figure 7-7, Figure 7-8). Annual dustfall quantities were based on those observed during monitoring and included predicted amounts (*) for sites that were sampled partially during the year (i.e., less than 365 days). For the latter sites, the total observed dustfall quantity was summed with the predicted dustfall during winter months when sampling did not occur. Those predictions were based on a model-based approach that estimated the quantity of dustfall during winter at sites at various distances from the Mine Site, Milne Inlet Port, and the Tote Road. The predicted quantities that were added to observed quantities of dustfall depended on the temporal coverage of each site during 2024. The following equation was used to calculate annual dustfall (g/m²/year) in Table 7-5:

$$Annual.Dust_{Total} = Annual.Dust_{Observed} + (Daily.Dust_{Predicted} \times [365 - Days.Sampled])$$

**Table 7-5. Annual dustfall accumulation for sites sampled throughout 2024.[1]**

| Site | Area | Distance from PDA (km) | Model-predicted Annual Dustfall (g/m²/year) | Measured Annual Dustfall (g/m²/year) | Difference Between Predicted and Measured Dustfall (g/m²/year) |
|---|---|---|---|---|---|
| DF-M-01 | Mine Site | 0.00 | 38.6 | 50.99 | 12.39 |
| DF-M-02 | Mine Site | 0.00 | 356.0 | 74.62 | -281.38 |
| DF-M-03 | Mine Site | 0.00 | 19.5 | 85.60 | 66.1 |
| DF-M-04 | Mine Site | 9.23 | 5.5 | 5.81* | 0.31 |
| DF-M-05 | Mine Site | 9.23 | 5.5 | 5.82* | 0.32 |
| DF-M-06 | Mine Site | 1.18 | 5.5 | 20.97* | 15.47 |
| DF-M-07 | Mine Site | 1.23 | 5.5 | 20.09* | 14.59 |
| DF-M-08 | Mine Site | 4.09 | 5.5 | 12.97* | 7.47 |
| DF-M-09 | Mine Site | 3.35 | 5.5 | 13.55* | 8.05 |
| DF-P-03 | Milne Inlet Port | 3.27 | 5.5 | 3.60* | -1.9 |
| DF-P-04 | Milne Inlet Port | 0.00 | 21.3 | 16.72 | -4.58 |
| DF-P-05 | Milne Inlet Port | 0.00 | 524.0 | 79.96 | -444.04 |
| DF-P-06 | Milne Inlet Port | 0.00 | 69.4 | 10.58 | -58.82 |
| DF-P-07 | Milne Inlet Port | 0.00 | 497.5 | 10.12 | -487.38 |
| DF-P-08 | Milne Inlet Port | 0.08 | 25.9 | 34.89 | 8.99 |
| DF-P-09 | Milne Inlet Port | 1.00 | 14.0 | 9.65* | -4.35 |
| DF-P-10 | Milne Inlet Port | 0.00 | 55.0 | 32.69* | -22.31 |
| DF-P-11 | Milne Inlet Port | 1.17 | 5.5 | 6.05* | 0.55 |
| DF-P-12 | Milne Inlet Port | 1.35 | 5.5 | 5.87* | 0.37 |
| DF-RS-01 | Road South | 6.02 | - | 4.43* | - |
| DF-RS-02 | Road South | 0.63 | - | 10.92* | - |
| DF-RS-03 | Road South | 0.07 | - | 88.70 | - |
| DF-RS-04 | Road South | 0.00 | - | 311.93 | - |
| DF-RS-05 | Road South | 0.00 | - | 225.95 | - |

**Table 7-5. Annual dustfall accumulation for sites sampled throughout 2024.[1]**

| Site | Area | Distance from PDA (km) | Model-predicted Annual Dustfall ($g/m^2/year$) | Measured Annual Dustfall ($g/m^2/year$) | Difference Between Predicted and Measured Dustfall ($g/m^2/year$) |
|---|---|---|---|---|---|
| DF-RS-06 | Road South | 0.00 | - | 64.88 | - |
| DF-RS-07 | Road South | 0.95 | - | 5.72* | - |
| DF-RS-08 | Road South | 6.67 | - | 3.94* | - |
| DF-RN-01 | Road North | 4.54 | 5.5 | 5.61* | 0.11 |
| DF-RN-02 | Road North | 1.00 | 3.8 | 5.62* | 1.82 |
| DF-RN-03 | Road North | 0.07 | 122.4 | 49.36 | -73.04 |
| DF-RN-04 | Road North | 0.00 | 270.4 | 121.75 | -148.65 |
| DF-RN-05 | Road North | 0.01 | 138.4 | 138.88 | 0.48 |
| DF-RN-06 | Road North | 0.09 | 63.1 | 68.64 | 5.54 |
| DF-RN-07 | Road North | 0.98 | 2.9 | 8.19* | 5.29 |
| DF-RN-08 | Road North | 5.92 | 5.5 | 4.90* | -0.60 |
| DF-RR-01 | Tote Road | 13.99 | - | 2.09* | - |
| DF-RR-02 | Tote Road | 14.00 | - | 2.07* | - |
| DF-TR-25E | Tote Road | 1.19 | 2.3 | 5.74* | 3.44 |
| DF-TR-25W | Tote Road | 1.01 | 6.5 | 8.15* | 1.65 |
| DF-TR-56E | Tote Road | 0.90 | - | 8.53* | - |
| DF-TR-56W | Tote Road | 1.14 | - | 7.73* | - |
| DF-TR-75E | Tote Road | 1.00 | - | 6.81* | - |
| DF-TR-75W | Tote Road | 1.07 | - | 10.75* | - |

[1] Annual accumulations are reported for the period January 23, 2024, to December 22, 2024.

* Extrapolated (winter) dustfall predictions were added to the observed dustfall amount. The amount added to the observed quantity was inversely proportional to the number of sampling days (i.e., lower total sampling days resulted in greater amounts added to observed dustfall quantities).

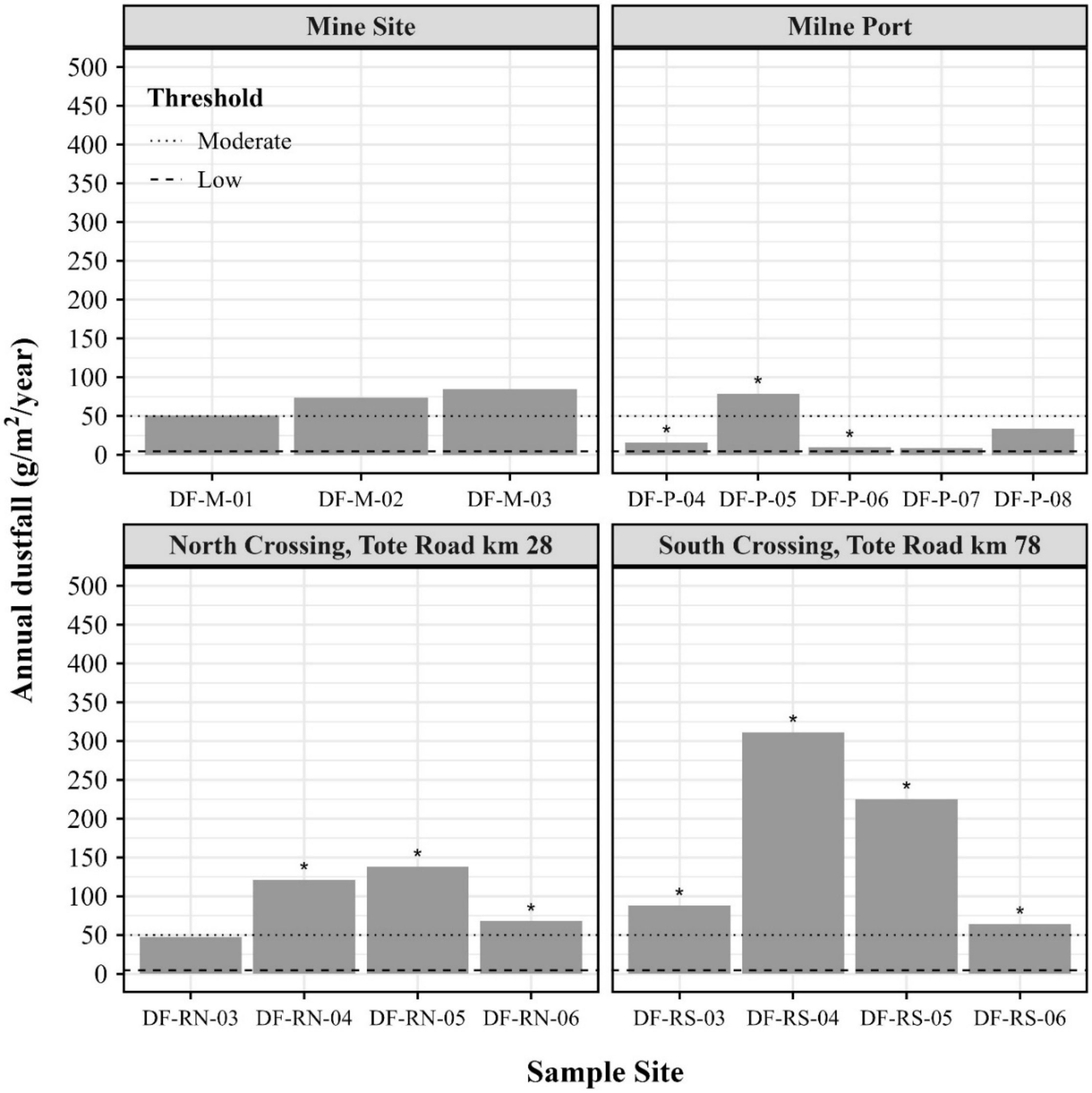



**Figure 7-7. Annual dustfall (g/m²/year) for stations sampled year-round at the Mine Site, Milne Port, the Tote Road north crossing (KM 28), and the Tote Road south crossing (KM 78).**

*The dashed horizontal lines show low, moderate, and high dust isopleth upper limits. The asterisk (*) denotes that the annual dustfall was greater than projected by the predicted isopleth.*

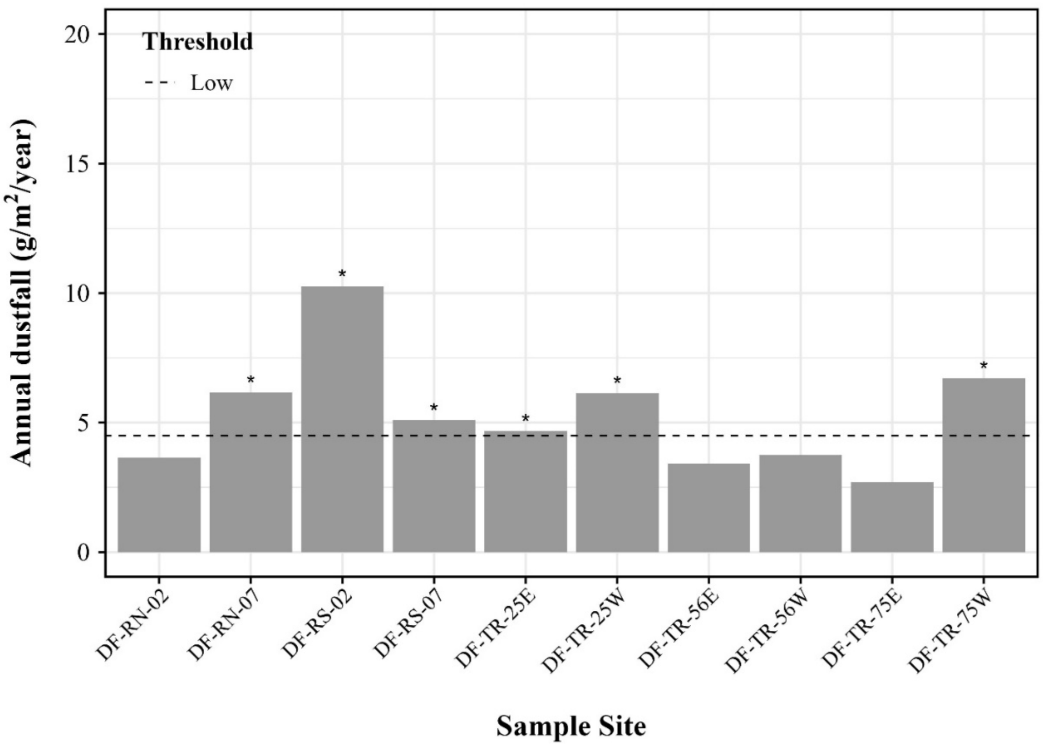



**Figure 7-8. Total annual dustfall (g/m²/year) at the Tote Road sites located 1,000 m distance from the centreline.** *The dashed horizontal line shows low dust isopleth upper limits. The asterisk (*) denotes that the annual dustfall was greater than projected by the predicted isopleth.*

## 7.3.3 INTER-ANNUAL TRENDS

### 7.3.3.1 Seasonal Dustfall

**Mine Site** — Inter-annual patterns across time were best represented by differences in months ($AIC_c$ = 1,024.58) rather than year-specific fluctuations ($\Delta AIC_c$ = 34.92) or a common fluctuation across time ($\Delta AIC_c$ = 19.22). The strongest evidence was for the effect of month ($F_{11}$ = 6.78, $P$ < 0.0001). Although an effect of year was evident ($F_9$ = 2.12, $P$ = 0.03; Figure 7-9), greater statistical support was present for a month-only model over a model with both month and year effects ($AIC_c$ = 1,024.58 versus 1,027.10, respectively). The greatest mean differences were between August versus March, April, and May (all $P$ < 0.0001). Geometric mean daily dustfall rates were consistently highest in March, April, and May in each year. Among years, geometric mean daily dustfall rates were highest in 2016, 2021, and 2022 and lowest in 2015, 2019, and 2024 (Figure 7-9). Geometric mean daily dustfall rates in 2024 were lower than most years during peak months (i.e., 2.42 [95% CI = 1.02–5.75] mg/dm²·day in March to 2.73 [95% CI = 1.13–6.64] mg/dm²·day in May).

**Milne Port** — Sites DF-P-01 and DF-P-08 were removed from inter-annual dustfall analyses at Milne Port. Site DF-P-01 was located within 100 m of ore stockpiles from 2013 to 2019 and was decommissioned as a site in May 2019. Site DF-P-08 replaced DF-P-01 as a sample unit but was placed at distances >1,000 m from the PDA, which are expected to experience lower dust quantities than sites at the PDA. Therefore, both sites were removed from analyses because inclusion of both would bias the inter-annual estimates of dustfall by erroneously indicating a sudden decrease in mean dustfall in 2020 and 2021. Inter-annual patterns were best represented by differences in months and years ($AIC_c$ = 959.03) rather than year-specific fluctuations ($\Delta AIC_c$ = 14.39) or a common fluctuation across time ($\Delta AIC_c$ = 16.79). Both the month ($F_{11}$ = 8.72, $P < 0.0001$) and year ($F_9$ = 3.95, $P < 0.0001$) effects were statistically significant. Geometric mean daily dustfall rates were consistently highest in April and October in each year. Among years, geometric mean daily dustfall rates were highest in 2016, 2019, and 2019 and lowest in 2015, 2021, and 2024 (Figure 7-10). Geometric mean daily dustfall rates in 2024 were lower than most years during peak months (i.e., 1.40 [95% CI = 0.24–8.16] mg/dm²·day in April and 0.91 [95% CI = 0.16–5.39] mg/dm²·day in October).

**Tote Road** — Dustfall along the Tote Road has been consistently elevated from April through October. This corresponds with early spring melt, summer, and early fall freeze-up. During the winter season when conditions are consistently frozen, dustfall is markedly less.

**North Crossing, Tote Road KM 28** — Inter-annual patterns across time were best represented by differences in months and years ($AIC_c$ = 1,090.72) rather than year-specific fluctuations ($\Delta AIC_c$ = 51.57) or a common fluctuation across time ($\Delta AIC_c$ = 65.09)[9]. Strong evidence for an effect of month ($F_{11}$ = 64.78, $P < 0.0001$; Figure 7-11) and year ($F_9$ = 4.58, $P < 0.0001$) was present with a two-way analysis of variance (ANOVA), but normality and homoscedasticity assumptions were violated. Pairwise Wilcoxon tests revealed that the greatest differences in dustfall were between February and May, June, and July (all $P < 0.0001$). Geometric mean daily dustfall rates were consistently highest in June and July in each year. Among years, geometric mean daily dustfall rates were highest in 2015, 2020, and 2022 and lowest in 2016, 2018, and 2019 (Figure 7-11). Geometric mean daily dustfall rates in 2024 were lower than most years during peak months (i.e., 5.06 [95% CI = 4.18–6.11] mg/dm²·day in June and 4.28 [95% CI = 3.70–5.06] mg/dm²·day in July).

**South Crossing, Tote Road KM 78** — Inter-annual patterns across time were best represented by differences in months and years ($AIC_c$ = 1,127.43) rather than year-specific fluctuations ($\Delta AIC_c$ = 65.15) or a common fluctuation across time ($\Delta AIC_c$ = 93.69). Strong evidence for an effect of month ($F_{11}$ = 107.56, $P < 0.0001$) and year ($F_9$ = 8.10, $P < 0.0001$) was present with a two-way ANOVA, but normality and homoscedasticity assumptions were violated. Pairwise Wilcoxon tests revealed that the greatest differences in dustfall were between June and January, February, November, and December (all $P < 0.0001$). Geometric mean daily dustfall rates were consistently highest in May, June, and July in every year. Among years, geometric mean daily dustfall rates were highest in 2020, 2022, and 2024 and lowest in 2016, 2017, and 2018 (Figure 7-12). Geometric mean daily dustfall rates in 2024 were higher than most years during peak months (i.e., 8.72 [95% CI = 7.31–10.62] mg/dm²·day in July to 11.84 [95% CI = 10.20–13.76] mg/dm²·day in June).

[9] Though year-specific fluctuations (interaction term) yielded a better overall fit than common fluctuations, model predictions for certain years were very inaccurate; thus, Figure 7-11 provides the common fluctuation (sinusoidal function).

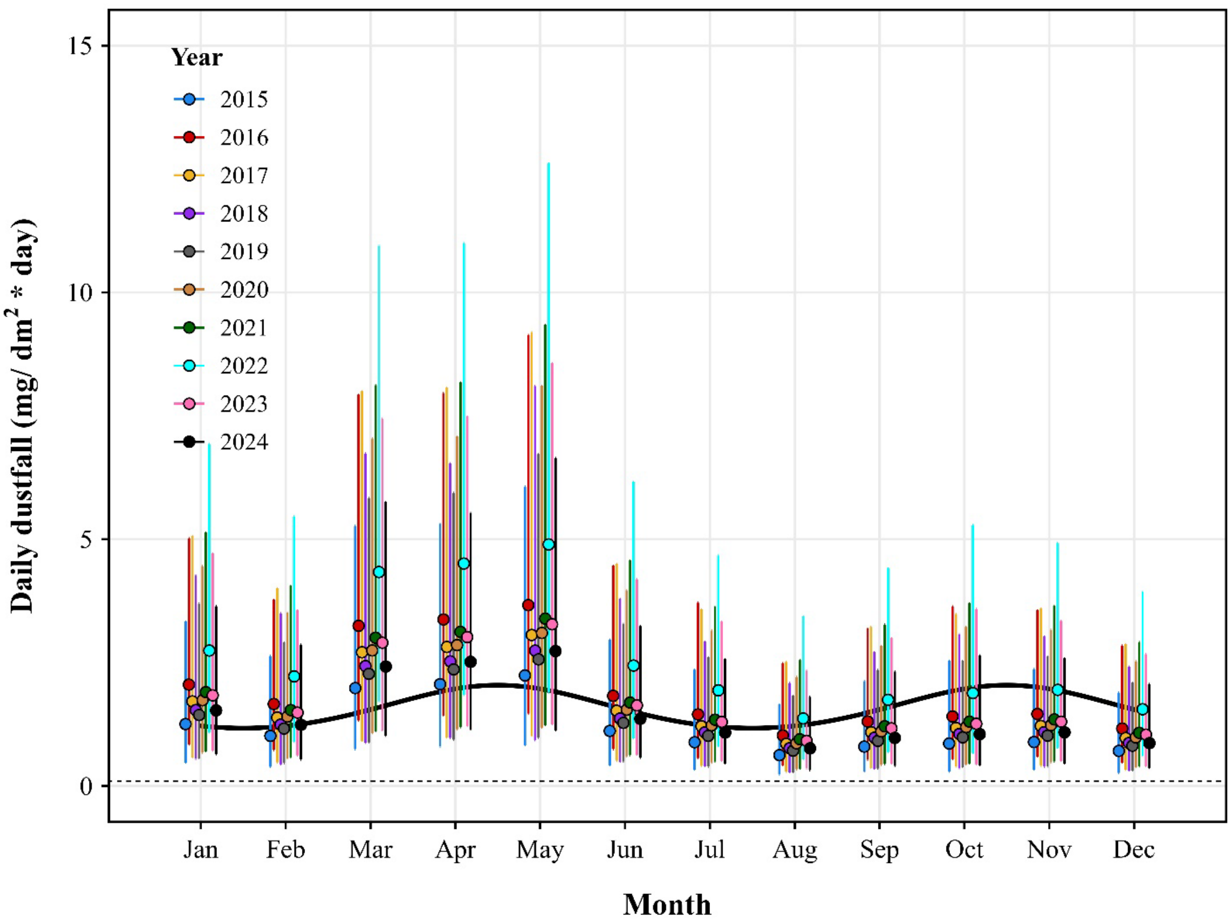



**Figure 7-9. Inter-annual mean daily dustfall (mg/dm²·day) at the Mine Site (2015 to 2023).**
*Points show geometric mean daily dustfall with 95% confidence intervals. Confidence intervals are asymmetrical because dust data were analyzed on the $log_e$ scale and back-transformed to the natural scale. The dashed horizontal line indicates the minimum detection limit for dust samples and the maximum dustfall rate at Reference sites unaffected by the Project.*

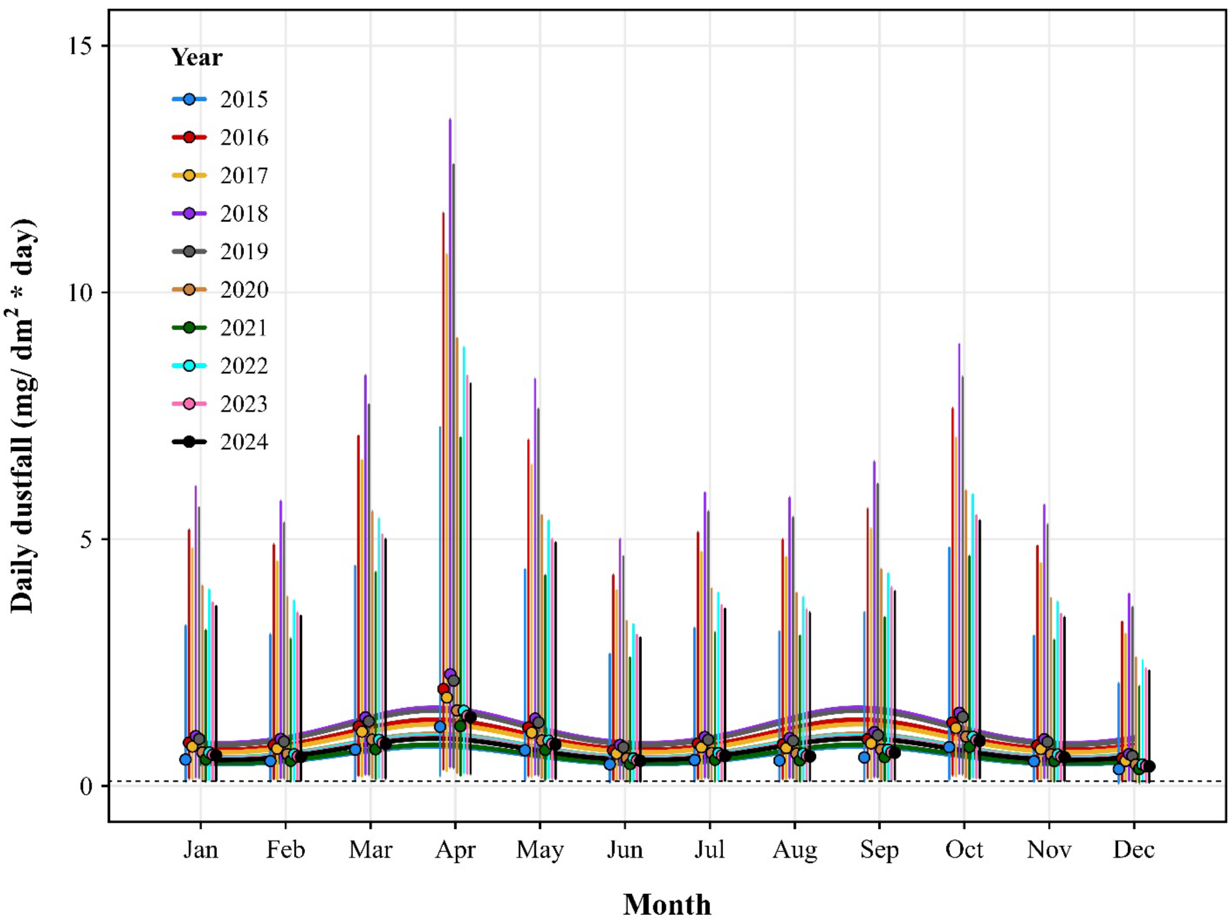



**Figure 7-10. Inter-annual mean daily dustfall (mg/dm²·day) at Milne Port (2015 to 2023).**
*Points show geometric mean daily dustfall with 95% confidence intervals. Confidence intervals are asymmetrical because dust data were analyzed on the $\log_e$ scale and back-transformed to the natural scale. Lines correspond with sinusoidal functions relative to each year. The dashed horizontal line indicates the minimum detection limit for dust samples and the maximum dustfall rate at Reference sites unaffected by the Project.*

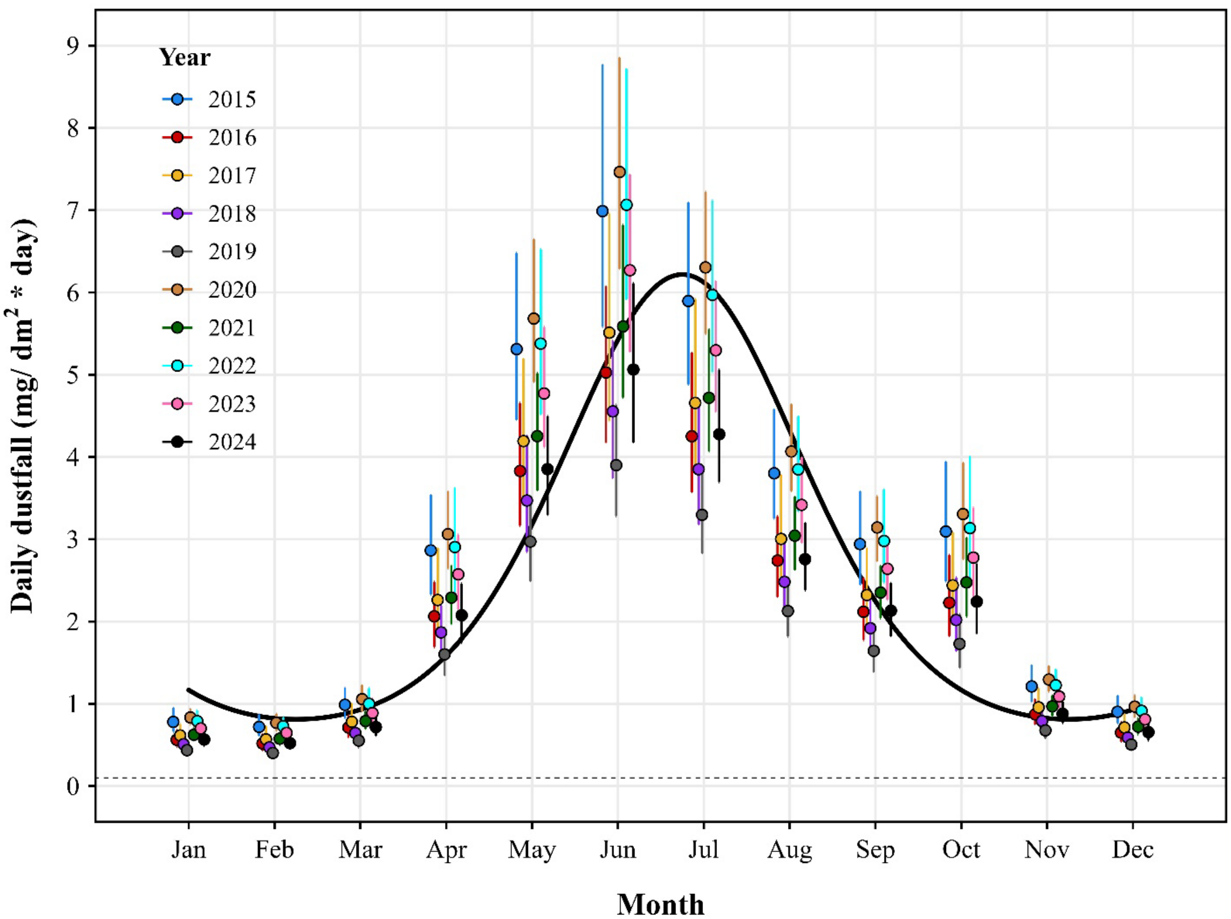



**Figure 7-11. Inter-annual mean daily dustfall (mg/dm²·day) at the Tote Road north crossing (KM 28; 2015 to 2023).** *Points show geometric mean daily dustfall with 95% confidence intervals. Confidence intervals are asymmetrical because dust data were analyzed on the $log_e$ scale and back-transformed to the natural scale. The dashed horizontal line indicates the minimum detection limit for dust samples and the maximum dustfall rate at Reference sites unaffected by the Project.*

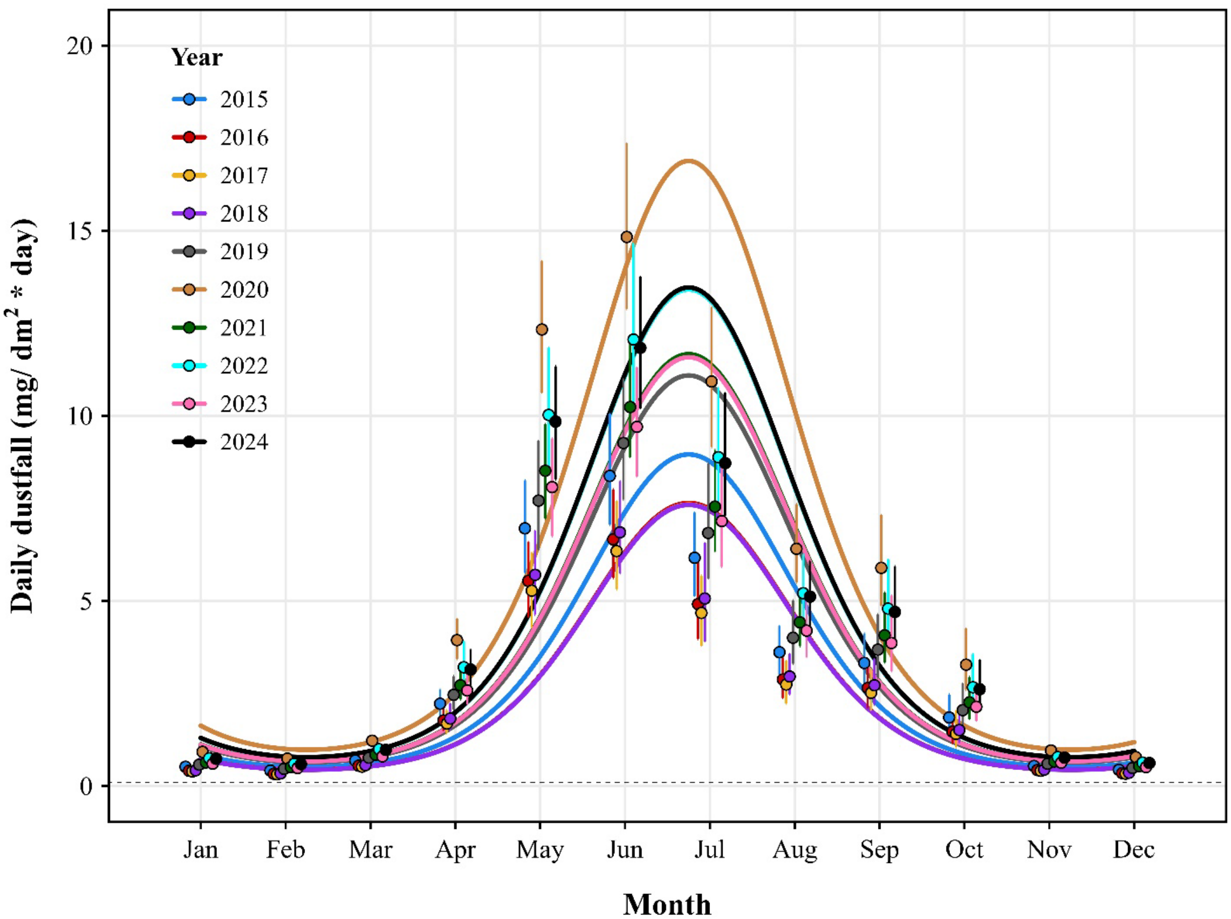



**Figure 7-12. Inter-annual mean daily dustfall (mg/dm²·day) at the Tote Road south crossing (KM 78; 2015 to 2023).** *Points show geometric mean daily dustfall with 95% confidence intervals. Confidence intervals are asymmetrical because dust data were analyzed on the $\log_e$ scale and back-transformed to the natural scale. The dashed horizontal line indicates the minimum detection limit for dust samples and the maximum dustfall rate at Reference sites unaffected by the Project.*

#### 7.3.3.2 Total Annual Dustfall

From 2014 to 2016, dustfall across the PDA increased, corresponding with an increase in mine production. In 2016, production increased from 0.5 to 2.5 million tonne per annum, corresponding with increased dustfall; however, from 2016 to 2020, dustfall generally plateaued with only modest increases/decreases in some Project areas. Post-2016 decreases in dustfall appear to correspond with the implementation of additional dustfall mitigation strategies, though there continues to be some 'noise' that is believed to be associated with climate variations, specifically the number of days with measurable rainfall. Dustfall deposition in 2024 showed a generally decreasing trend across all Project areas.

Mine Site dustfall monitoring station DF-M-01 has recorded variable dustfall throughout all monitoring years. An increasing trend was observed from 2019 to 2021, followed by a decrease in 2022 and again in 2023 and 2024. Dustfall at DF-M-02 and DF-M-03 remained relatively consistent from 2018 to 2021, increased in 2022, and then decreased substantially in 2023, a trend that continued in 2024 (Figure 7-13).

Dustfall deposition at the Milne Port monitoring sites has remained relatively consistent since 2020. Dustfall at DF-P-05 decreased from 2018 to 2021 and increased slightly from 2022 to 2024. Dustfall has remained consistent at DF-P-04, DF-P-06, DF-P-07, and DF-P-08.

Dustfall along the Tote Road at the north crossing (KM 28) monitoring stations has remained relatively constant since 2019. Dustfall along the Tote Road at the south crossing (KM 78) monitoring stations 30 m from the road has been variable over the years but shows no consistent increasing or decreasing trends. Dustfall at the monitoring stations 100 m from the road has been consistent since 2015, the first full year of dustfall monitoring during mine operations. Dustfall at both crossing locations decreased from 2023 to 2024.

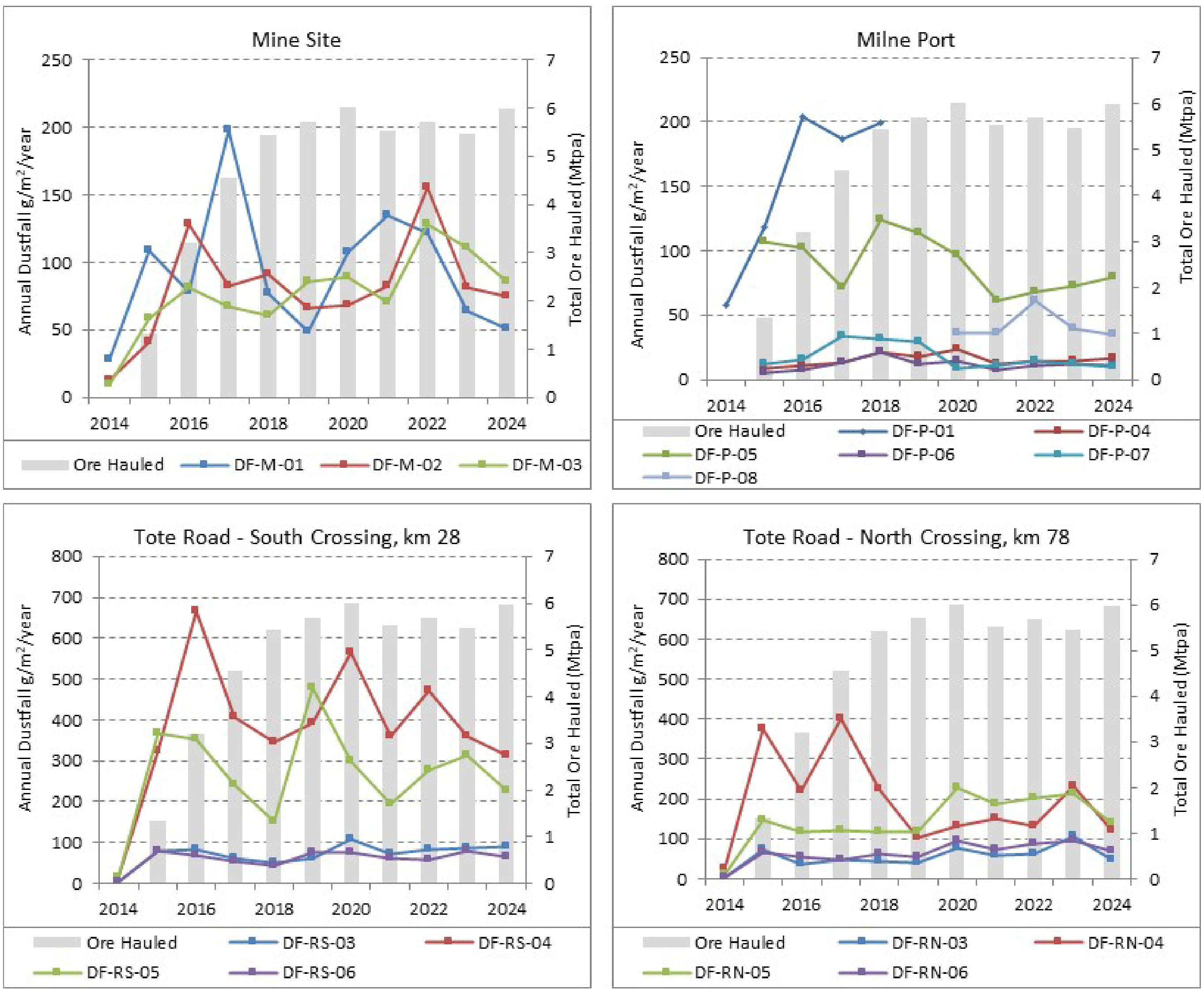



**Figure 7-13. Year-over-year annual dustfall (g/m²/year) in relation to total ore mined and hauled to Milne Port.**

## 7.4 DUSTFALL IMAGERY ANALYSIS

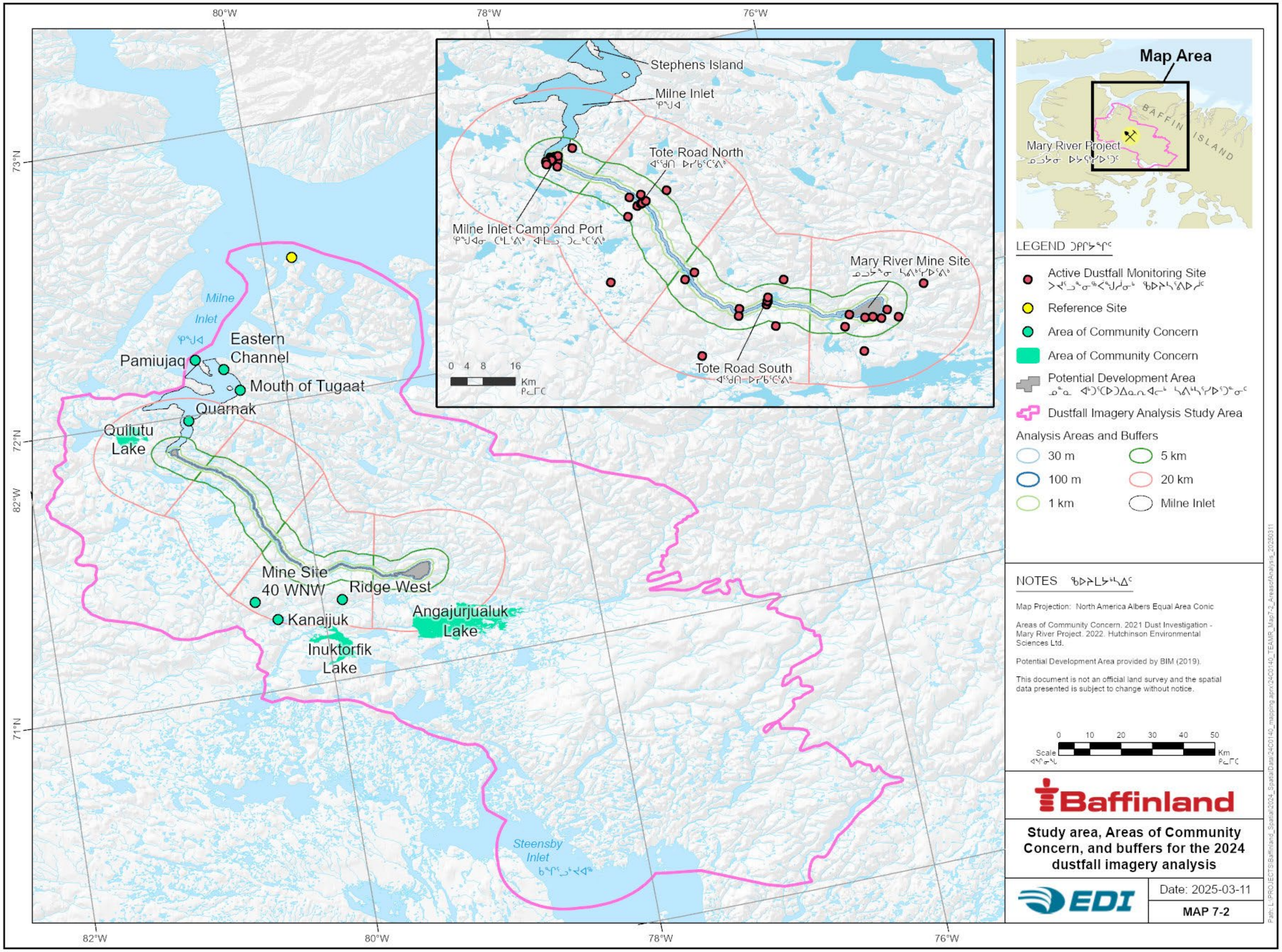
### 7.4.1 METHODS

Analysis of remotely sensed imagery was deemed appropriate and beneficial for estimating the spatial extents of dustfall at the Project, given (1) the high contrast and visibility of dust on the landscape[10] and (2) the detectability of dust using multispectral analysis. Dust and snow have different spectral characteristics affecting light absorption/reflection of different wavelengths. Multispectral bands (e.g., visible, near-infrared, and shortwave) of satellite imagery can differentiate dust and snow reflectance values, allowing for automated extraction of pixels representing dust coverage using comparisons of the various multispectral bands (i.e., band ratios).

#### 7.4.1.1 Study Area

Dustfall imagery analysis has been used to estimate dustfall extent at the Project since 2020. The current Study Area (Map 7-2), developed in 2022, includes the 2008 RSA and identified Areas of Community Concern in the 2021 Dust Investigation report (Hutchinson Environmental Sciences Ltd. 2022). Areas of analysis include the PDA and 30 m, 100 m, 1 km, 5 km, and 20 km buffers. The buffers were divided into five component areas: Mine Site, Milne Port, the Tote Road north, the Tote Road south, and Milne Inlet, including the inlet up to the north end of Stephens Island (Map 7-2).

[10] At ground level, dust on the snow can be visible at dustfall deposition levels as low as 0.1 to 0.2 $g/m^2$ (Li et al. 2013).


Stephens Island
Milne Inlet
Tote Road North
Milne Inlet Camp and Port
Mary River Mine Site
Tote Road South
Map Area
Mary River Project
BAFFIN ISLAND
LEGEND
Active Dustfall Monitoring Site
Reference Site
Area of Community Concern
Area of Community Concern
Potential Development Area
Dustfall Imagery Analysis Study Area
Analysis Areas and Buffers
30 m
5 km
100 m
20 km
1 km
Milne Inlet
Milne Inlet
Pamiujaq
Eastern Channel
Mouth of Tugaat
Quarnak
Qullutu Lake
Mine Site 40 WNW
Ridge West
Kanajjuk
Angajurjualuk Lake
Inuktorfik Lake
Steensby Inlet
NOTES
Map Projection: North America Albers Equal Area Conic
Areas of Community Concern. 2021 Dust Investigation - Mary River Project. 2022. Hutchinson Environmental Sciences Ltd.
Potential Development Area provided by BIM (2019).
This document is not an official land survey and the spatial data presented is subject to change without notice.
Scale
Km
Baffinland
Study area, Areas of Community Concern, and buffers for the 2024 dustfall imagery analysis
EDI
Date: 2025-03-11
MAP 7-2

### 7.4.1.2 Imagery Acquisition

Imagery from Landsat 8 Operational Land Imager (OLI), Landsat 9 Operational Land Imager-2 (OLI-2), and Sentinel-2 Multispectral Instrument (MSI) sensors were used in the dustfall imagery analysis (Table 7-6). Landsat data are available from the United States Geological Survey and have a revisit time of eight days with the combined satellites (US Geological Survey 2022). Sentinel-2 data are available from the European Space Agency and have a revisit time of five days (European Space Agency 2020a). Images between March 15 and May 15, 2024, were selected for the dustfall imagery analysis. This period was chosen for extensive snow cover and available light. Where available, multiple images covering the same area were chosen to account for dustfall extent variability due to snowfall events that regularly bury dust and snowmelt that can cause dust to accumulate on the snow surface (Li et al. 2013).

Surface reflectance products were downloaded from the United States Geological Survey EarthExplorer website (US Geological Survey 2024) and the Copernicus Open Access Hub (European Space Agency 2024). The surface reflectance product contains georeferenced images corrected for topography and atmospheric conditions, giving reflectance values for each pixel as they appear at the Earth's surface (European Space Agency 2020b, Jenkerson 2023). Landsat images came with pixel quality masks identifying pixels representing clouds, cloud shadows, snow, and saturated pixels. Sentinel-2 images came with a classification mask, including categories for saturated/defective pixels, clouds and cloud shadows, water, vegetation, non-vegetated areas, and snow.

**Table 7-6. Summary of satellite imagery used for dustfall extent imagery analysis.**

| Mission | Analysis Years | Sensor | Image Tiles | Bands[1] | Resolution |
|---|---|---|---|---|---|
| Landsat 5 | 2004–2011 (baseline) | Thematic Mapper (TM) | 26-11, 27-10, 27-11, 28-10, 28-11, 29-10, 30-09, 30-10, 31-09, 31-10, 32-09, 32-10, 33-09 and 34-09 | Band 2: G 0.52–0.60 µm<br>Band 3: R 0.63–0.69 µm | 30 m<br>30 m |
| Landsat 8 | 2013 (baseline)<br>2014–2024 | Operational Land Imager (OLI) | 26-11, 27-10, 27-11, 28-10, 28-11, 29-10, 30-09, 30-10, 31-09, 31-10, 32-09, 32-10, 33-09 and 34-09 | Band 3: G 0.53–0.59 µm<br>Band 4: R 0.64–0.67 µm | 30 m<br>30 m |
| Landsat 9 | 2022–2024 | Operational Land Imager-2 (OLI-2) | 26-11, 27-10, 27-11, 28-10, 28-11, 29-10, 30-09, 30-10, 31-09, 31-10, 32-09, 32-10, 33-09 and 34-09 | Band 3: G 0.53–0.59 µm<br>Band 4: R 0.64–0.67 µm | 30 m<br>30 m |
| Sentinel-2 | 2019–2024 | Multispectral Instrument (MSI) | 16WFE, 16XFF, 17WMV, 17WNT, 17WNU, 17WNV, 17WPT, 17WPU, 17WPV, 17XMA, 17XNA, 18WVC, 18WVD, and 18WVE | Band 3: G 0.54–0.58 µm<br>Band 4: R 0.65–0.68 µm | 20 m<br>20 m |

[1] G = Green and R = Red.

#### 7.4.1.3 Image Preprocessing

R version 4.2.2 (R Development Core Team 2023) and ArcGIS Pro 3.4 (ESRI 2024) were used to process and analyze the images. Saturated pixels were excluded from the analysis using the provided masks. Saturated pixels occur when the high reflectance of the surface (e.g., fresh snow) is beyond the sensor's range, causing sensor saturation. For Landsat images, saturated pixel masks were derived from the radiation saturation quality band and cloud masks were generated from the pixel quality band. For Sentinel-2 images, the provided classification masks were used to remove all pixels not classified as snow. Cloud masks were generally not adequate to remove clouds. A visual check was conducted to remove images with identifiable clouds (i.e., images that could skew data analysis). Sentinel-2 images with a zenith angle >70° were also excluded from analysis as recommended in the technical guide (Louis and L2A Team 2021).

The surface reflectance values of the red and green bands were also corrected for topographic illumination. The terrain correction was based on an illumination angle raster derived from the sun's position, slope, and aspect (Civco 1989, Colby 1991, Hantson and Chuvieco 2011) and was used in the C-correction method (Teillet et al. 1982, Hantson and Chuvieco 2011) to create a new raster for the red and green bands with topographically corrected reflectance values (EDI Environmental Dynamics Inc. 2024). The resulting image database represented high-quality satellite images within the Study Area from mid-March to mid-May for 2024, when dust should be detectable against a snow-covered landscape with minimal spectral or atmospheric interference.

#### 7.4.1.4 Image Analysis

The 2024 dustfall imagery analysis focused on identifying, extracting, and quantifying mineral dust produced from mining activities at the Project. The image bands used for the analysis represent ranges of wavelengths on the electromagnetic spectrum. Features such as snow, rock, and vegetation absorb and reflect at different wavelengths. These distinct absorption and reflection characteristics can be used to identify and extract features from the imagery using combinations of bands. The SDI, (red−green)/(red+green), was used in the analysis as it was explicitly created to extract mineral dust on snow from imagery and can provide a relative estimation of mineral dust magnitude (Mauro et al. 2015). The SDI values ranged from -1 to 1, with positive values representing dust.

An SDI layer was calculated for each image from the original red and green bands and the terrain-corrected red and green bands. A mask of waterbodies and flat areas was created to combine the two SDI layers because flat areas do not require terrain correction. The resulting single SDI layer used the original SDI values within the mask and the terrain-corrected SDI values for all other areas.

#### 7.4.1.5 Dustfall Extent and Magnitude

Satellite-derived dustfall concentration was estimated from the relationship between dustfall accumulation calculated from the dustfall deposition rates measured by the passive dustfall monitors and the SDI values from the imagery analysis. For each satellite image, a period of dustfall was determined, where the start date was the last snowfall event, and the end date was the date of the image. Snowfall events were determined from daily recorded weather observations (2022 to 2024) or as days where precipitation was measured at the Mine Site or Milne Port weather stations, and the temperature was below freezing (2014 to 2021). Dustfall accumulation (g/m²) was calculated as the sum of the daily dustfall over each image period. Snow Darkening Index values were extracted from each image at dustfall monitor sites (Map 7-2) and compared with the calculated dustfall accumulation.

Landsat and Sentinel-2 images were processed separately because the SDI values between the two image datasets were determined to be significantly different (mean difference = 0.0099 [CIs = 0.0096–0.0102]; $t_{2161} = 57.65$, $P < 0.0001$) in the 2022 Terrestrial Environment Annual Monitoring Report (EDI Environmental Dynamics Inc. 2023c). Linear regression models were developed for each dataset and applied to the individual SDI layers. The resulting dustfall concentration layers from all images (Sentinel-2 and Landsat) were combined into a 2024 composite dataset, taking the maximum concentration at each pixel. The 2024 composite dataset represented the maximum dustfall extent and concentration within the Study Area between March 14 and May 16, 2024. Composite datasets were also recreated for the pre-baseline (2004 to 2013) and post-baseline (2014 to 2023) years using the updated linear regression models that incorporated the 2024 data.. Composite datasets and subsequent analysis were conducted using the North American Albers Equal Area Conic spatial reference and a 30 m pixel size.

A baseline dustfall concentration layer was created from the mean concentration of the composite datasets from 2004 to 2011 and 2013, representing the mean background dust extent and concentration before construction of the Project. The baseline dataset was subtracted from the 2024 and previous post-baseline (2014 to 2023) dustfall concentration datasets to convey the spatial extent and estimated dustfall concentrations possibly produced by Project activities. To represent annual variability in the baseline dataset, dustfall concentration datasets were created for a high concentration and extent year (2004) and a low concentration and extent year (2013). The baseline dataset was subtracted from the high and low baseline years to allow for comparison with the post-baseline datasets.

Mean dustfall concentration was calculated within the PDA and the 30 m, 100 m, 1 km, 5 km, and 20 km buffers for the Mine Site, Milne Port, Milne Inlet, the Tote Road north, and the Tote Road south areas (Map 7-2). For the Areas of Community Concern, mean dustfall concentration was calculated within the lake boundaries or a 100 m buffer around a point feature to sample multiple pixels in the area.

Dustfall concentrations were classified into seven classes (i.e., <1, 1–4.5, 4.5–10, 10–20, 20–40, 40–50, and >50 g/m²) and analyzed for each component of the Study Area (i.e., Mine Site, Milne Port, Milne Inlet, the Tote Road north, and the Tote Road south). The area was calculated by multiplying the number of pixels within each class by the area of the pixel (i.e., 900 m² for a 30 m pixel resolution).

#### 7.4.1.6 Snow Sampling Pilot Study

Calculated dustfall accumulation from the passive dustfall monitor deposition rates can estimate dustfall concentration to apply to the SDI values. This approach assumes no redistribution of dust after deposition and relies on estimating the period over which accumulation occurs. However, the SDI is a measure of the magnitude of mineral dust concentration on the snow surface at the time of image acquisition, which is influenced by dust deposition and redistribution.

To investigate a potential method for estimating the dust concentration visible in the imagery, surface snow samples were collected based on the methods of Mauro et al. (2015). Improving on the surface snow sampling in 2022 and 2023, samples were collected in 2024 between May 20 and 29 on cloud-free days, using the dates and locations of satellite imagery acquisitions to guide efforts. The following procedures were conducted during field sampling to provide quality assurance and quality control (Baffinland Iron Mines Corporation 2022b):

- The 2.5 gallon high-density polyethylene pails used for sample collection were rinsed with deionized water three times.
- New nitrile gloves were worn during each sample collection and sample set collections.
- A 1.4 m x 1.4 m (2 $m^2$) square was measured on the snow surface, and the top 5 cm of the snowpack was transferred to a plastic pail using a plastic shovel.
- Samples were melted under cool conditions (≤4°C).
- Samples were stirred and agitated using a clean spatula.
- Bottles were rinsed three times with melt water before being filled, and a new syringe (no filter) was used for each site to fill the bottles.
- Field duplicates, field blanks, travel blanks, and equipment blanks were collected.

Sample bottles, duplicates, and blanks were sent to the ALS Environmental Laboratory in Waterloo, Ontario, to analyze Total Suspended Solids (units of mg/L) and a suite of metals. Only the Total Suspended Solids measurements were used for comparison with SDI values.

Snow Darkening Index values were extracted from Landsat and Sentinel-2 images acquired on the same date as the surface snow samples. A non-linear regression was created using R version 4.2.2 (R Development Core Team 2023) and the rational function from Mauro et al. (2015) for mineral dust versus SDI measured from hyperspectral data collected from a spectroradiometer.

$$f(x) = \frac{p_1 x + p_2}{x + q_1}$$

A range of starting values were used for $p_1$ (0.05 to 0.5), $p_2$(-10.5 to -0.5), and $q_1$(0 to 1,000) and the mean of the resulting coefficients was used as the final starting value for the model. Residual diagnostic plots were examined to confirm assumptions of normality and equality of variance in the residuals.

### 7.4.2 RESULTS AND DISCUSSION

#### 7.4.2.1 Scene Distribution

Sixty-three suitable Sentinel-2 images were acquired over 18 unique dates in 2024, comparable to 2023 (Table 7-7). The number of suitable Landsat images decreased from 56 to 26 and were acquired over 18 unique dates in 2024. For 2024, Sentinel-2 images were distributed across the acquisition period, with late April having the lowest number (Figure 7-14A). The number of suitable Landsat images was highest in late March (Figure 7-14A). Both satellite image datasets had good spatial coverage and multiple images for all areas within the Study Area (Figure 7-14B).

**Table 7-7. Remote sensing sources used for dustfall imagery analysis.**

| Satellite | Unique Counts | Baseline (2004 to 2013) | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Landsat 5 | Dates | 59 | – | – | – | – | – | – | – | – | – | – | – |
| | Images | 75 | – | – | – | – | – | – | – | – | – | – | – |
| Landsat 8 | Dates | 10 | 14 | 18 | 12 | 8 | 10 | 9 | 17 | 11 | 9 | 19 | 10 |
| | Images | 12 | 19 | 25 | 15 | 15 | 16 | 11 | 26 | 16 | 12 | 28 | 14 |
| Landsat 9 | Dates | – | – | – | – | – | – | – | – | – | 7 | 17 | 8 |
| | Images | – | – | – | – | – | – | – | – | – | 12 | 28 | 12 |
| Sentinel-2 | Dates | – | – | – | – | – | – | 8 | 29 | 2 | 9 | 16 | 18 |
| | Images | – | – | – | – | – | – | 28 | 106 | 13 | 37 | 67 | 63 |

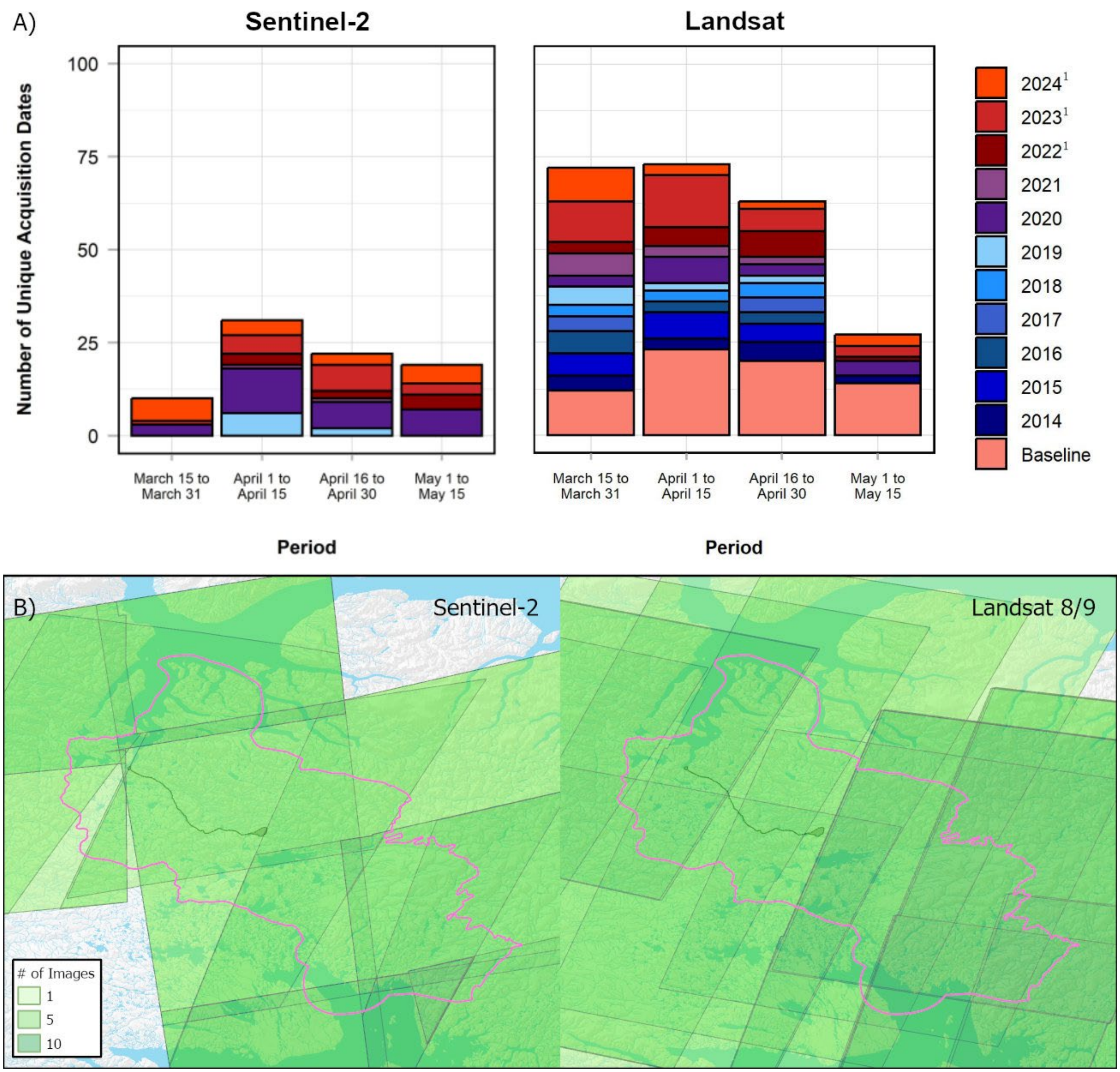



**Figure 7-14. A) Sentinel-2 and Landsat unique acquisition dates per year for dustfall imagery analysis (March 15 to May 15) and B) the spatial coverage of the 2024 imagery.**

*1 Landsat imagery included Landsat 8 and 9 data.*

### 7.4.2.2 Dustfall Concentration Estimation

The linear regression models used dustfall accumulation between the image acquisition date and the last snowfall event using the deposition rates from the passive dustfall monitoring sites. The 2021 data were excluded due to issues with the precipitation measurements. The relationship between the dustfall accumulation $Df$ and the SDI values from Landsat imagery $SDI_L$ is presented in Figure 7-15; the equation is provided below ($F_{1308} = 144.5$, $P < 0.0001$, $R^2 = 0.10$).

$$SDI_L = 0.00140 \times Df \ + 0.00630$$

The relationship between the dustfall accumulation $Df$ and the SDI values from Sentinel-2 imagery $SDI_{S2}$ is presented in Figure 7-16; the equation is provided below ($F_{331} = 141.8$, $P < 0.0001$, $R^2 = 0.30$).

$$SDI_{s2} = 0.00335 \times Df \ + 0.0166$$

The Sentinel-2 linear model had a higher $R^2$ value than the Landsat linear model but was limited to lower dustfall accumulation values. The weak relationships may indicate other factors involved, such as dust dispersion. However, the linear models can estimate dust concentration using the SDI values derived from satellite imagery to identify general spatial variability and temporal trends.

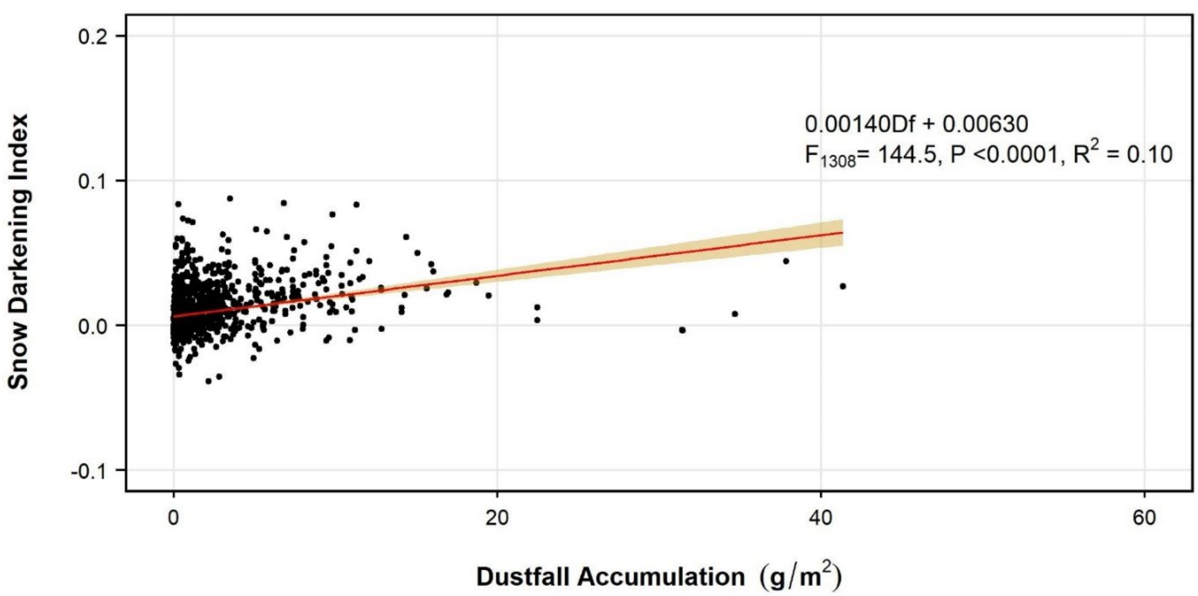



**Figure 7-15. Relationship between calculated dustfall accumulation from passive dustfall deposition rates and Landsat 8/9 Snow Darkening Index.**

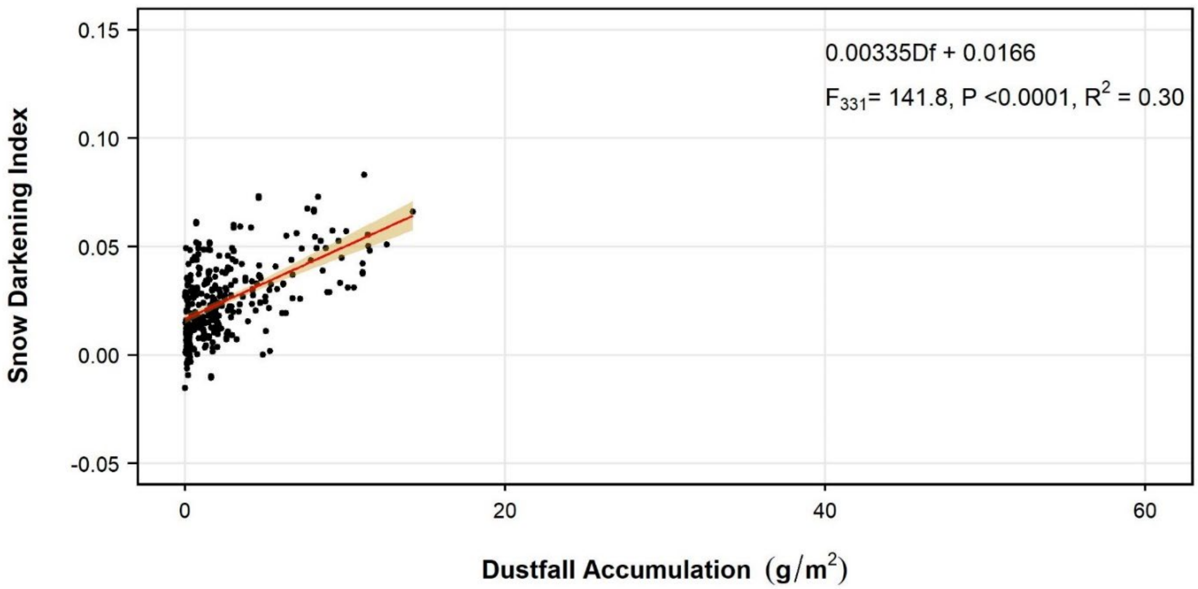



**Figure 7-16. Relationship between calculated dustfall accumulation from passive dustfall deposition rates and Sentinel-2 Snow Darkening Index.**

### 7.4.2.3 Magnitude and Extent of 2024 Dustfall

The 'extracted' dustfall extents and concentrations represent possible mineral dust accumulated on the snow cover. Dustfall extents and concentrations derived from Sentinel-2 and Landsat images were combined to reduce the effect of low image coverage from one satellite and to provide a more consistent dataset for inter-annual comparisons. Dust concentrations from remote sensing are estimates and represent the total dustfall accumulation over the satellite image capture period (i.e., mid-March to mid-May). These values are not equivalent to annual dustfall deposition.

Map 7-3 and Map 7-4 represent 2024 dustfall extents and concentrations above baseline values, where baseline values are the mean dustfall concentrations calculated between 2004 and 2013. Identification and contributions from dust sources cannot be determined solely from the satellite imagery analysis presented herein. Possible dust sources across the landscape include naturally exposed/unvegetated ground, wind-exposed ridges, and mining operations (e.g., stockpiles, road traffic, and mining). Trends in dustfall extent and concentration around Project infrastructure (e.g., Milne Port, Map 7-3 and Map 7-4) suggest that the primary source of dust is related to mining operations, as expected. In the outer surrounding terrain away from existing Project infrastructure, dustfall extents and concentrations likely occur and originate from multiple naturally occurring sources and/or are indicative of south-facing slopes and exposed bare ground as they were present in the baseline period.

The 2024 dustfall extent covered 12.71% of the Study Area (Table 7-8 and Figure 7-17). Dust concentrations of <1 g/m² and 1 to 4.5 g/m² accounted for the largest areas at 3.99% and 5.47%, respectively, followed by 4.5 to 10 g/m² at 2.16%. Areas with concentrations >10 g/m² accounted for 1.08% of the Study Area. The Tote Road south and Mine Site had the largest percentage of dust extent at 28.20% and 19.86%, respectively, followed by Milne Port at 16.33%. The Tote Road north and Milne Inlet had the lowest percentage of dust extent at 9.64% and 6.93%, respectively. These values decreased from 2023 except for the Tote Road south area, but follow a similar pattern across the concentration classes.

Dustfall concentrations were highest at all sites within the PDA and decreased with distance from the Project (Figure 7-18), as reflected in the passive dustfall monitors (Section 7.3). The Milne Port area had the highest mean dustfall concentrations within the PDA, followed closely by the Tote Road south area. Outside of the PDA up to 30 m, Milne Inlet had the highest mean dustfall concentrations. The Tote Road north area had the lowest mean dustfall concentrations outside of the PDA.

**Mine Site** — Dustfall extended to the northwest and southwest, reflecting the predominant winds from the southeast to northeast and uncommon but strong easterly winds (Map 7-3 and Map 7-4; Section 4). Dustfall extended beyond the modelled TSP isopleths, primarily to the northwest. Dustfall extent was greatest for the 1 to 4.5 g/m² dustfall concentration class at 8.46% of the Mine Site area and decreased from 4.12% to 0.14% for concentration classes >4.5 g/m² (Table 7-8 and Figure 7-17). Mean dustfall concentrations decreased from 15.6 g/m² within the PDA to 1.1 g/m² within the 5 to 20 km buffer (Figure 7-18).

**Milne Port** — Around Milne Port (excluding Milne Inlet), dustfall extended to the north and southwest (Map 7-3). Dustfall extended beyond the modelled TSP isopleths in these directions. Dustfall extent mirrored the Mine Site with the greatest extent in the 1 to 4.5 g/m² (6.85%) dustfall concentration class, followed by a decrease in dustfall extent for concentration classes >4.5 g/m², dropping from 2.95% to 0.03% (Table 7-8 and Figure 7-17). Mean dustfall concentrations decreased from 26.7 g/m² within the PDA to 1.0 g/m² within the 5 to 20 km buffer (Figure 7-18).

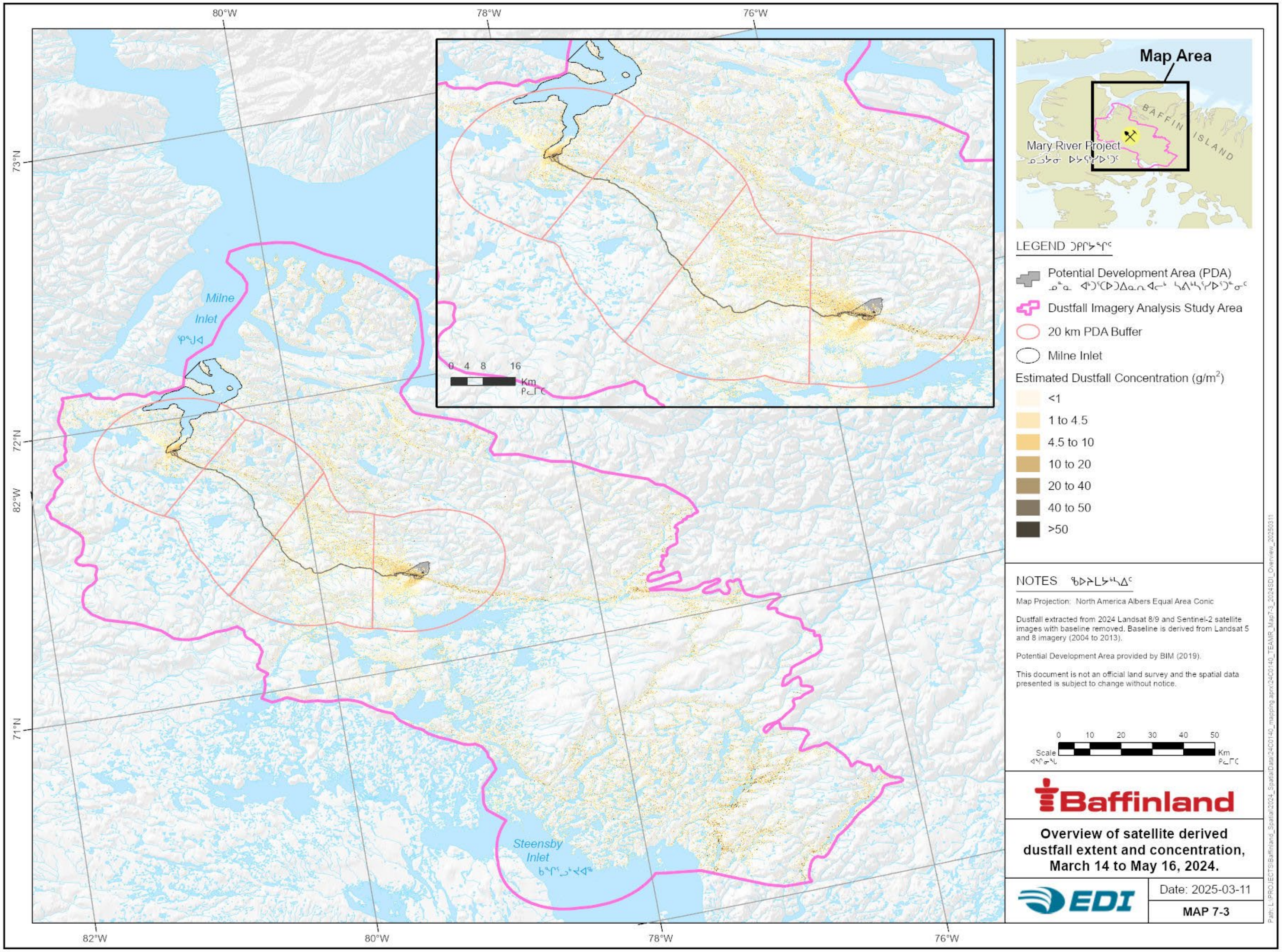
**Milne Inlet** — Dustfall extended northeast along Milne Inlet, beyond the modelled TSP isopleths, most likely carried by strong southwest winds (Map 7-3 and Map 7-4; Section 4). Milne Inlet had the lowest percent area in concentration classes <4.5 g/m². Dustfall extent peaked at the 1 to 4.5 g/m² (2.29%) dustfall concentration class, followed by a decrease in dustfall extent for concentration classes >4.5 g/m², dropping from 1.18% to 0.00% (Table 7-8 and Figure 7-17). Mean dustfall concentrations decreased from 16.0 g/m² within the PDA to 0.0 g/m² within the 5 to 20 km buffer (Figure 7-18) but were higher further from the PDA (>30 m) than the other areas.

**The Tote Road North** — Dustfall extent along the road was within the modelled TSP isopleths. Dust was also present on the southern slopes of the terrain to the northeast (Map 7-3 and Map 7-4). Dustfall extent was greatest for the 1 to 4.5 g/m² dustfall concentration class at 3.93% and decreased to 0.01% with increasing concentration class (Table 7-8 and Figure 7-17). Mean dustfall concentrations decreased from 19.5 g/m² within the PDA to 0.8 g/m² within the 5 to 20 km buffer (Figure 7-18).

**The Tote Road South** — Dustfall extended past the modelled TSP isopleths to the north between the Mine Site and the south crossing of passive dustfall monitors (km 78), as well as to the southwest where the Tote Road turns northwest to Milne Port (Map 7-3 and Map 7-4). Dustfall extent for the Tote Road south area was the greatest by percent and also had the highest geometric mean daily dustfall rates from the dustfall monitors (Figure 7-1). Dustfall extent peaked at the 1 to 4.5 g/m² (12.75%) dustfall concentration class, followed by a decrease in dustfall extent for concentration classes >4.5 g/m², dropping from 4.32% to 0.02% (Table 7-8 and Figure 7-17). Mean dustfall concentrations decreased from 22.7 g/m² within the PDA to 1.8 g/m² within the 5 to 20 km buffer (Figure 7-18).

**Areas of Community Concern**[11] — The Ridge West site had the highest mean dustfall concentration at 6.00 g/m², followed by the Eastern Channel site at 3.50 g/m² (Table 7-9, Map 7-5). The remaining locations had mean dustfall concentrations <0.5 g/m². The lakes had mean dustfall concentrations below 0.20 g/m², with maximum values between 50.25 and 19.44 g/m², generally along the shoreline. Inuktorfik Lake, to the southwest of the Mine Site, had the highest mean dustfall concentration of the lakes at 0.16 g/m².

[11] As informed by the QIA. Non-lake locations were digitized from Figure 11 in the 2021 Dust Investigation report (Hutchinson Environmental Sciences Ltd. 2022) at a scale of 1:750,000. Mapped locations are representative but hold some inherent variability.


Map Area
Mary River Project
BAFFIN ISLAND
LEGEND
Potential Development Area (PDA)
Dustfall Imagery Analysis Study Area
20 km PDA Buffer
Milne Inlet
Estimated Dustfall Concentration (g/m2)
<1
1 to 4.5
4.5 to 10
10 to 20
20 to 40
40 to 50
>50
NOTES
Map Projection: North America Albers Equal Area Conic
Dustfall extracted from 2024 Landsat 8/9 and Sentinel-2 satellite images with baseline removed. Baseline is derived from Landsat 5 and 8 imagery (2004 to 2013).
Potential Development Area provided by BIM (2019).
This document is not an official land survey and the spatial data presented is subject to change without notice.
Scale
0 10 20 30 40 50
Km
Baffinland
Overview of satellite derived dustfall extent and concentration, March 14 to May 16, 2024.
EDI
Date: 2025-03-11
MAP 7-3
Milne Inlet
Steensby Inlet
0 4 8 16
Km
80°W
78°W
76°W
82°W
73°N
72°N
71°N

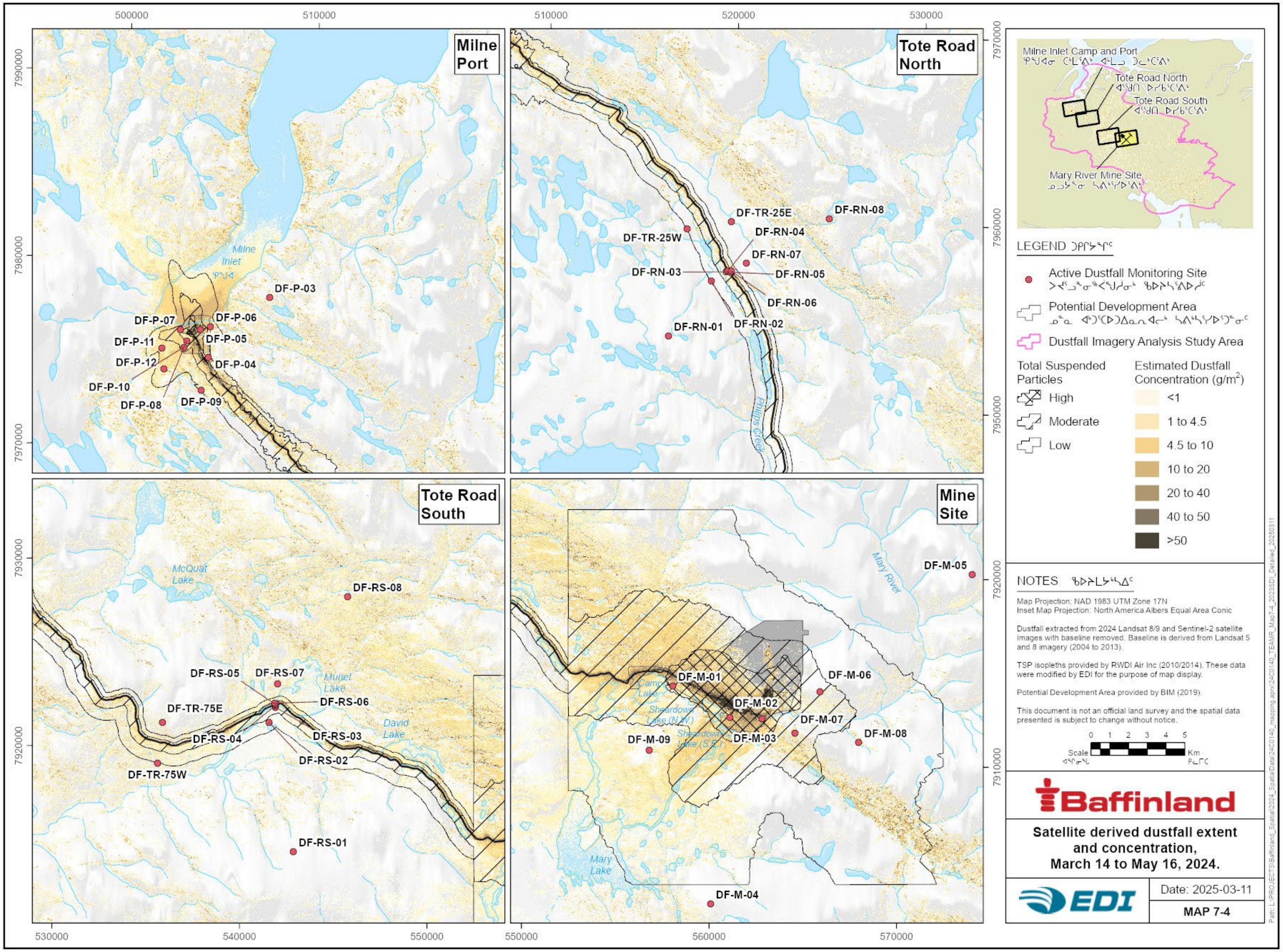

Milne Port
Tote Road North
Tote Road South
Mine Site
Milne Inlet
DF-P-03
DF-P-04
DF-P-05
DF-P-06
DF-P-07
DF-P-08
DF-P-09
DF-P-10
DF-P-11
DF-P-12
DF-TR-25E
DF-TR-25W
DF-RN-01
DF-RN-02
DF-RN-03
DF-RN-04
DF-RN-05
DF-RN-06
DF-RN-07
DF-RN-08
Phillips Creek
McQuat Lake
Muriel Lake
David Lake
DF-RS-01
DF-RS-02
DF-RS-03
DF-RS-04
DF-RS-05
DF-RS-06
DF-RS-07
DF-RS-08
DF-TR-75E
DF-TR-75W
Mary River
Camp Lake
Sheardown Lake (NW)
Sheardown Lake (SE)
Mary Lake
DF-M-01
DF-M-02
DF-M-03
DF-M-04
DF-M-05
DF-M-06
DF-M-07
DF-M-08
DF-M-09
500000
510000
520000
530000
540000
550000
560000
570000
7990000
7980000
7970000
7960000
7950000
7930000
7920000
7910000
Milne Inlet Camp and Port
Tote Road North
Tote Road South
Mary River Mine Site
LEGEND
Active Dustfall Monitoring Site
Potential Development Area
Dustfall Imagery Analysis Study Area
Total Suspended Particles
High
Moderate
Low
Estimated Dustfall Concentration (g/m²)
<1
1 to 4.5
4.5 to 10
10 to 20
20 to 40
40 to 50
>50
NOTES
Map Projection: NAD 1983 UTM Zone 17N
Inset Map Projection: North America Albers Equal Area Conic
Dustfall extracted from 2024 Landsat 8/9 and Sentinel-2 satellite images with baseline removed. Baseline is derived from Landsat 5 and 8 imagery (2004 to 2013).
TSP isopleths provided by RWDI Air Inc (2010/2014). These data were modified by EDI for the purpose of map display.
Potential Development Area provided by BIM (2019).
This document is not an official land survey and the spatial data presented is subject to change without notice.
0 1 2 3 4 5
Scale
Km
Baffinland
Satellite derived dustfall extent and concentration, March 14 to May 16, 2024.
EDI
Date: 2025-03-11
MAP 7-4

**Table 7-8. 2024 dustfall area extent (km² and %) by concentration classes derived from Landsat and Sentinel-2 imagery.**

| Concentration Class | Units | Study Area | Mine Site | Milne Port | Milne Inlet | Tote Road South | Tote Road North |
|---|---|---|---|---|---|---|---|
| <1 g/m² | km² | 1072.10 | 70.81 | 52.21 | 5.35 | 134.32 | 47.95 |
| | % | 3.99 | 5.09 | 5.13 | 1.91 | 9.47 | 3.31 |
| 1 to 4.5 g/m² | km² | 1470.46 | 117.62 | 69.73 | 6.40 | 180.87 | 56.96 |
| | % | 5.47 | 8.46 | 6.85 | 2.29 | 12.75 | 3.93 |
| 4.5 to 10 g/m² | km² | 581.96 | 57.25 | 30.01 | 5.07 | 61.22 | 22.26 |
| | % | 2.16 | 4.12 | 2.95 | 1.81 | 4.32 | 1.54 |
| 10 to 20 g/m² | km² | 221.01 | 20.21 | 10.90 | 2.44 | 18.64 | 9.24 |
| | % | 0.82 | 1.45 | 1.07 | 0.87 | 1.31 | 0.64 |
| 20 to 40 g/m² | km² | 59.27 | 7.24 | 2.69 | 0.11 | 4.30 | 2.74 |
| | % | 0.22 | 0.52 | 0.26 | 0.04 | 0.30 | 0.19 |
| 40 to 50 g/m² | km² | 5.55 | 1.14 | 0.28 | 0.01 | 0.40 | 0.26 |
| | % | 0.02 | 0.08 | 0.03 | 0.00 | 0.03 | 0.02 |
| >50 g/m² | km² | 5.56 | 1.92 | 0.34 | 0.01 | 0.35 | 0.12 |
| | % | 0.02 | 0.14 | 0.03 | 0.00 | 0.02 | 0.01 |
| **Total Extent** | **km²** | **3415.91** | **276.19** | **166.16** | **19.39** | **400.10** | **139.53** |
| | **%** | **12.71** | **19.86** | **16.33** | **6.93** | **28.20** | **9.64** |

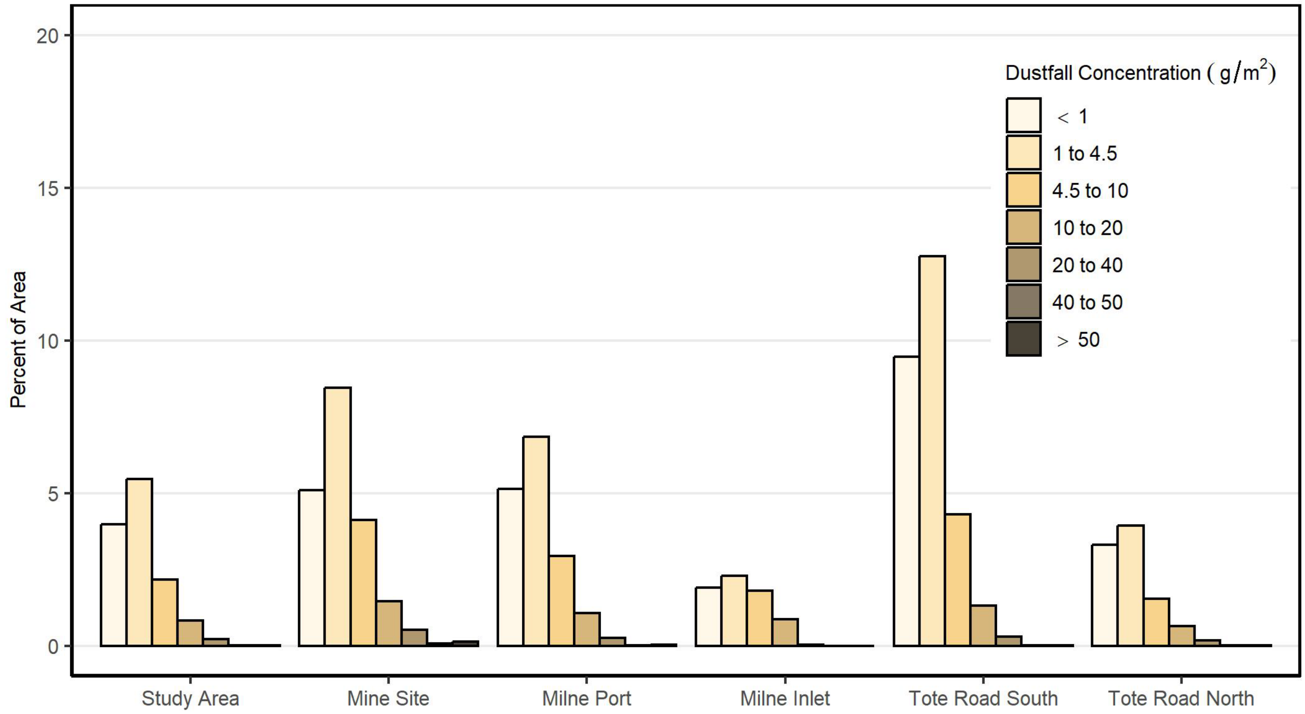



**Figure 7-17. Percent dustfall area by concentration class within the Study Area for 2024.**
*The mean baseline has been removed from the data.*

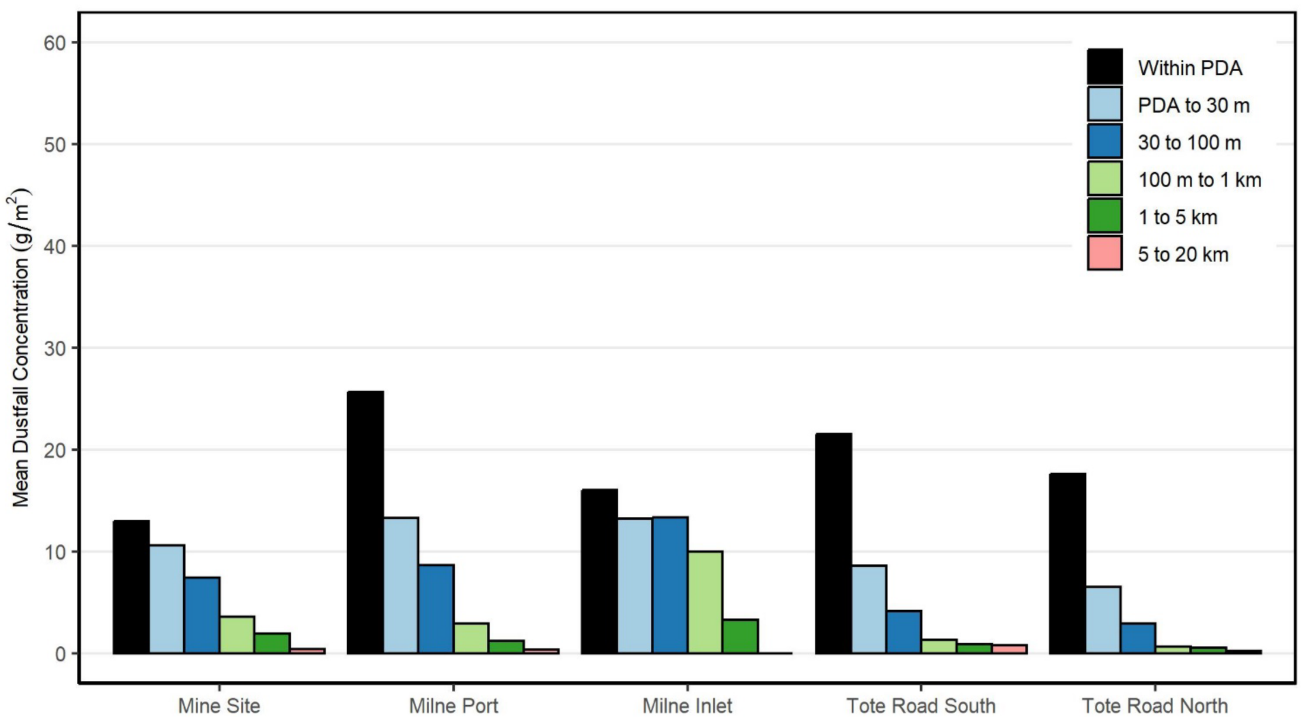
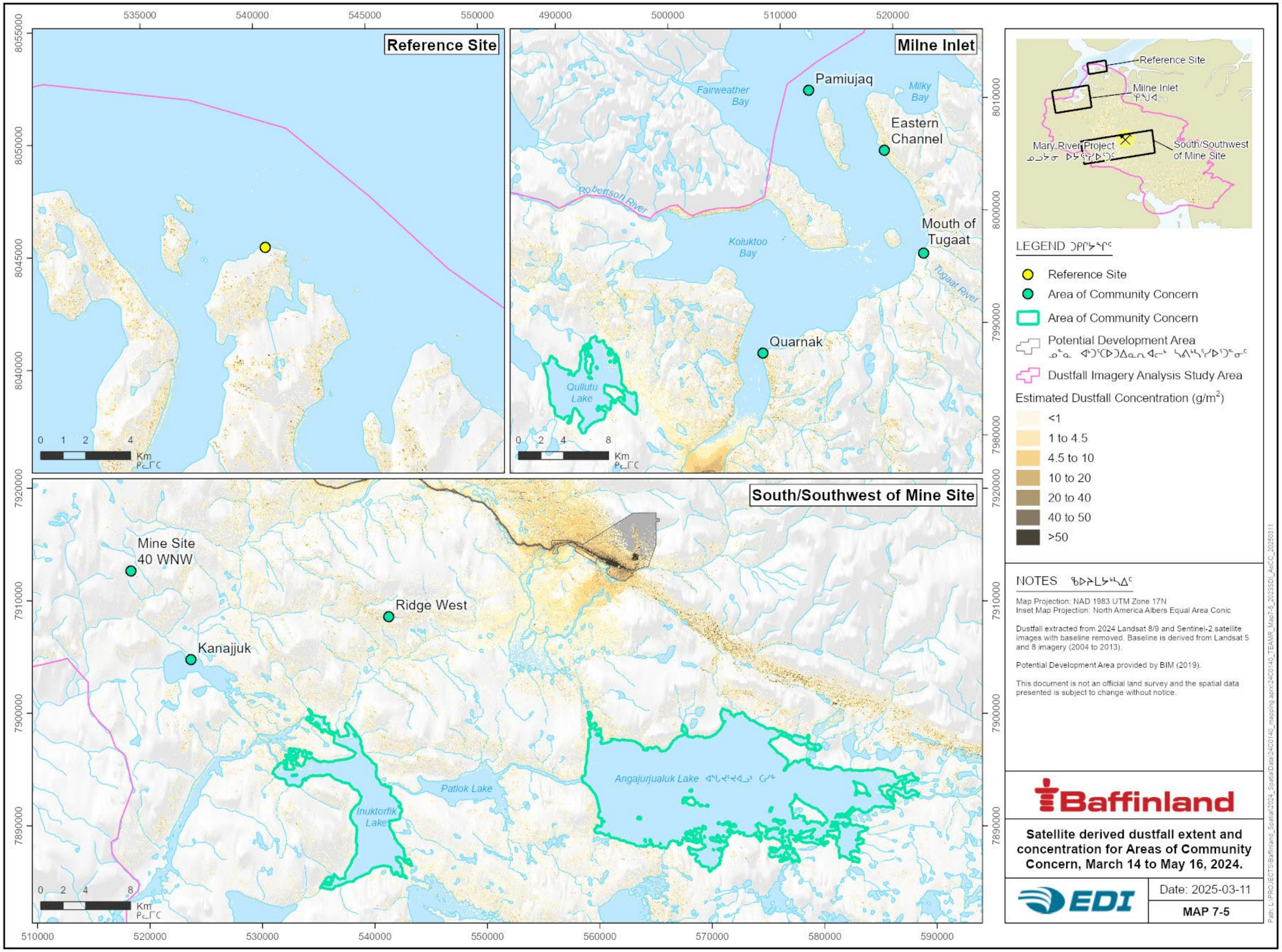



**Figure 7-18. Mean dustfall concentrations within the Potential Development Area and 30 m, 100 m, 1 km, 5 km, and 20 km buffers for 2024.**
*The mean baseline has been removed from the data.*

**Table 7-9. Estimated 2024 mean, minimum, and maximum dustfall concentrations in Areas of Community Concern.**

| Location | Mean Dustfall Concentration ($g/m^2$) | Standard Deviation ($g/m^2$) | Minimum Dustfall Concentration ($g/m^2$) | Maximum Dustfall Concentration ($g/m^2$) |
|---|---|---|---|---|
| Pamiujaq | 0.00 | 0.00 | 0.00 | 0.00 |
| Eastern Channel | 3.50 | 3.05 | 0.00 | 8.52 |
| Mouth of Tugaat | 0.00 | 0.00 | 0.00 | 0.00 |
| Quarnak | 0.13 | 0.47 | 0.00 | 2.21 |
| Mine Site 40 WNW | 0.50 | 1.72 | 0.00 | 8.20 |
| Kanajjuk | 0.00 | 0.00 | 0.00 | 0.00 |
| Ridge West | 6.00 | 4.73 | 0.00 | 15.88 |
| Qullutu Lake | 0.04 | 0.45 | 0.00 | 19.44 |
| Angajurjualuk Lake | 0.08 | 0.74 | 0.00 | 26.53 |
| Inuktorfik Lake | 0.16 | 1.04 | 0.00 | 50.25 |
| Reference | 0.00 | 0.00 | 0.00 | 0.00 |


Reference Site
Milne Inlet
South/Southwest of Mine Site
Pamiujaq
Fairweather Bay
Milky Bay
Eastern Channel
Robertson River
Koluktoo Bay
Mouth of Tugaat
Tugaat River
Quarnak
Qullutu Lake
Mine Site 40 WNW
Ridge West
Kanajjuk
Patlok Lake
Inuktorfik Lake
Angajurjualuk Lake
Reference Site
Milne Inlet
Mary River Project
South/Southwest of Mine Site
LEGEND
Reference Site
Area of Community Concern
Area of Community Concern
Potential Development Area
Dustfall Imagery Analysis Study Area
Estimated Dustfall Concentration (g/m²)
<1
1 to 4.5
4.5 to 10
10 to 20
20 to 40
40 to 50
>50
NOTES
Map Projection: NAD 1983 UTM Zone 17N
Inset Map Projection: North America Albers Equal Area Conic
Dustfall extracted from 2024 Landsat 8/9 and Sentinel-2 satellite images with baseline removed. Baseline is derived from Landsat 5 and 8 imagery (2004 to 2013).
Potential Development Area provided by BIM (2019).
This document is not an official land survey and the spatial data presented is subject to change without notice.
Satellite derived dustfall extent and concentration for Areas of Community Concern, March 14 to May 16, 2024.
Date: 2025-03-11
MAP 7-5

### 7.4.3 INTER-ANNUAL TRENDS

Dustfall extents across all areas had a small peak in 2014/2015 followed by a larger peak in 2019, primarily in the <4.5 g/m² dustfall concentration classes (Figure 7-19). A visual review of the 2019 images showed less snow cover than images in the same year with less extensive dust and images in 2020 around the same dates. Baffin Island experienced lower than normal snow depths and early snow melt in 2019 (Richter-Menge et al. 2019), which may contribute to the reduced snow cover in the images. Less snow cover could result in more exposed ground, a possible source of dust, and potential misclassification of ground as dust. No peaks in total annual ore hauled or Tote Road traffic in 2019 compared to 2018 and 2020 (Figure 6-1).

The 2024 Study Area dustfall extent was comparable to 2023, with an increase in extent in the Tote Road south area, balanced by decreases in the other areas. The post-baseline years before 2018 and 2021/2022 in some areas (e.g., the Tote Road) had overall dustfall extents similar to or lower than the 2004 baseline year, but larger extents in the higher dustfall concentration classes (>20 g/m²).

The pattern of dustfall extent on the landscape was similar from 2014 to 2024 for all areas, with the highest concentrations near the Project and dustfall extending northeast along Milne Inlet, west and south of the Mine Site, and southwest of the Tote Road south crossing (km 78) in the direction of prevailing and/or strong winds (Map 7-6 to Map 7-13). Extensive dust occurred across all areas in 2019.

Satellite-derived mean dustfall concentrations across all areas generally increased from 2014 to 2020 in line with increased ore production (Figure 7-20 and Figure 7-15, Section 7.3). The mean dustfall concentration decreased in 2021. All areas showed increased mean dustfall concentrations in 2022 and 2023, followed by a decrease in 2024. The dustfall monitor data also observed a decrease in daily dustfall rates in 2024 compared to previous years (Section 7.3.3.1).

The overall trends between the satellite-derived late winter mean dustfall concentrations and the annual dustfall from the passive dustfall monitors were similar for the Tote Road and Mine Site, capturing most of the same fluctuations, but the trends were different for Milne Port (Figure 7-13).

**Areas of Community Concern** — The Reference site mean dustfall concentrations remained <1 g/m² for all years, with peaks at ~0.8 g/m² in 2018 and 2022. Most Areas of Community Concern also had mean dustfall concentrations <1 g/m² for all years (Pamiujaqa and Mine Site 40 WNW) or all years except for 2019 (Mouth of Tugaat, Qullutu Lake, Kanajjuk, Inuktorfik Lake, and Angajurjualuk Lake; Table 7-10 and Table 7-11). The mean dustfall concentrations at the Eastern Channel and Ridge West sites went over <1 g/m² more frequently (5 and 4 years, respectively), with one time during the 2004 baseline year. The Quarnak site, which generally falls within the dustfall extent from Milne Port out along Milne Inlet, reached mean dustfall concentrations of over 4 g/m² in 2018 and 2019.

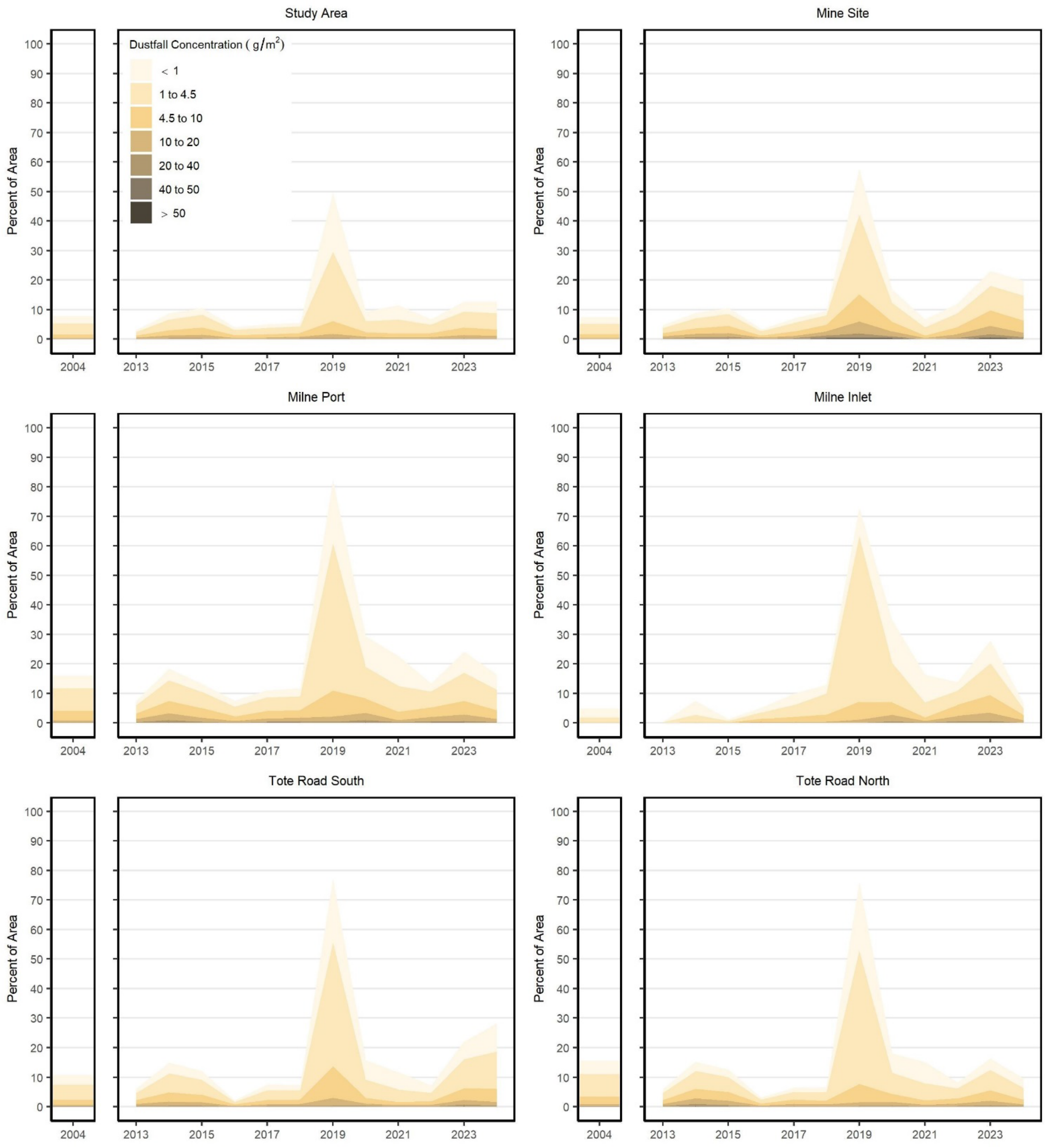
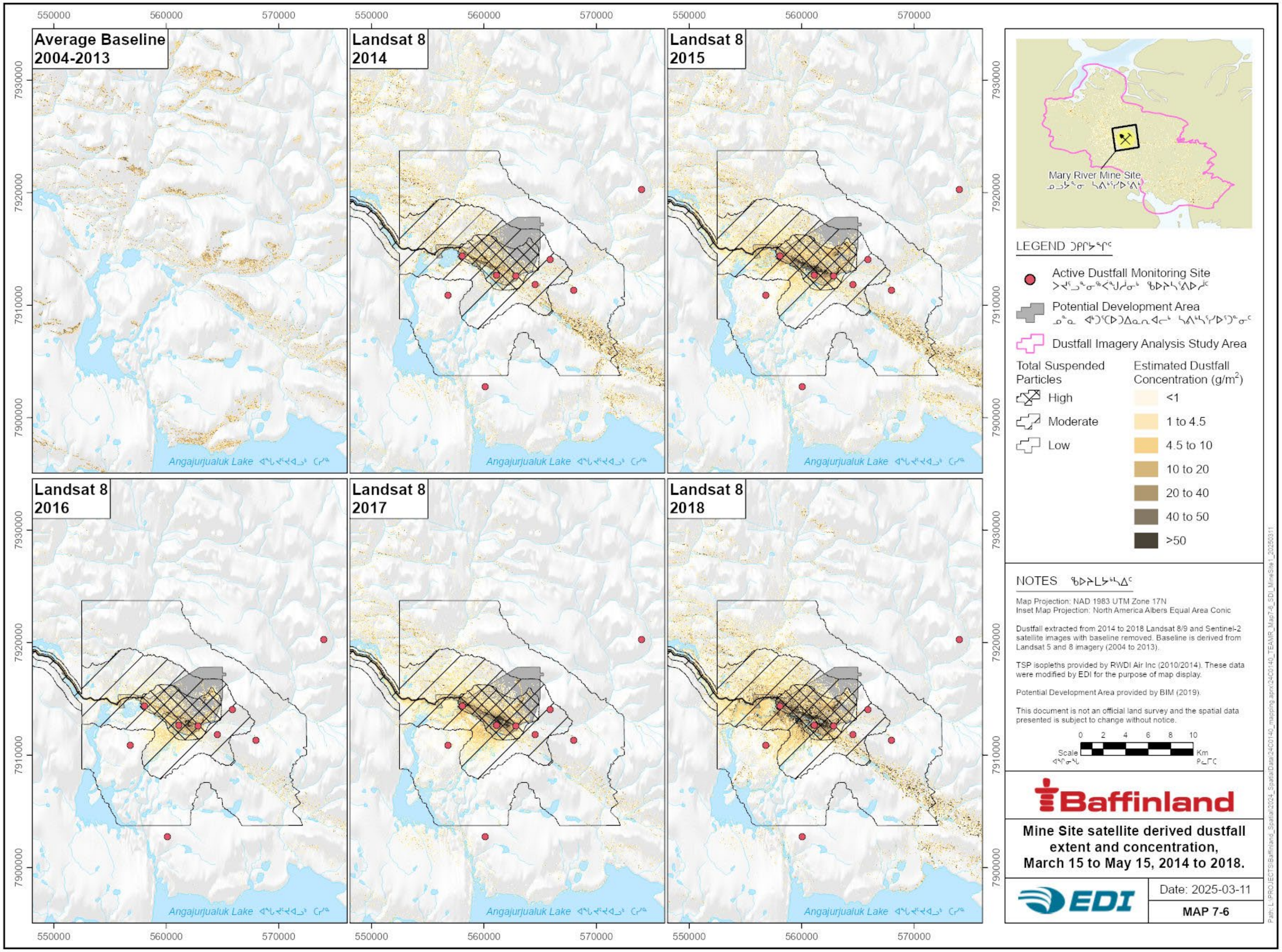
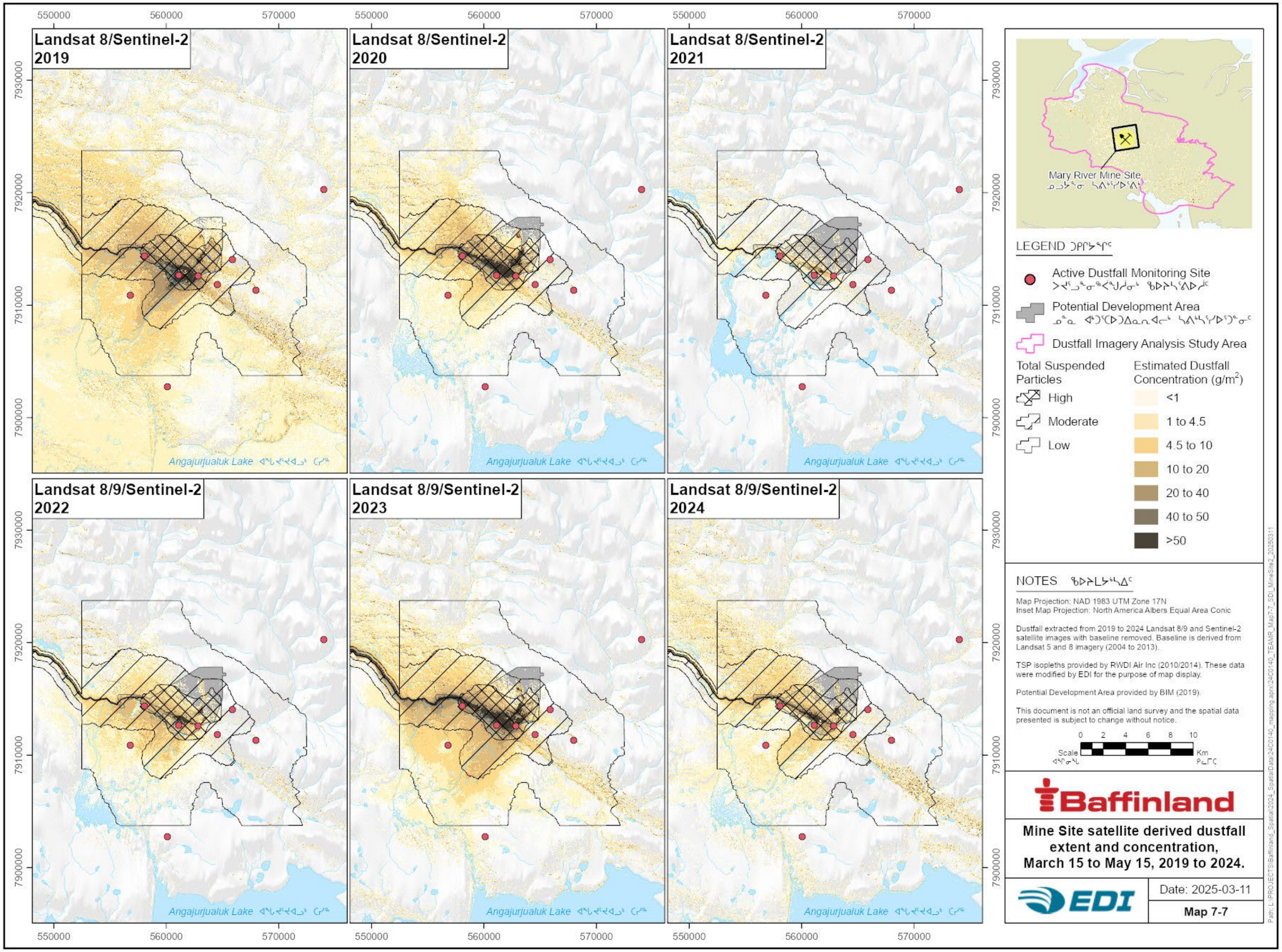
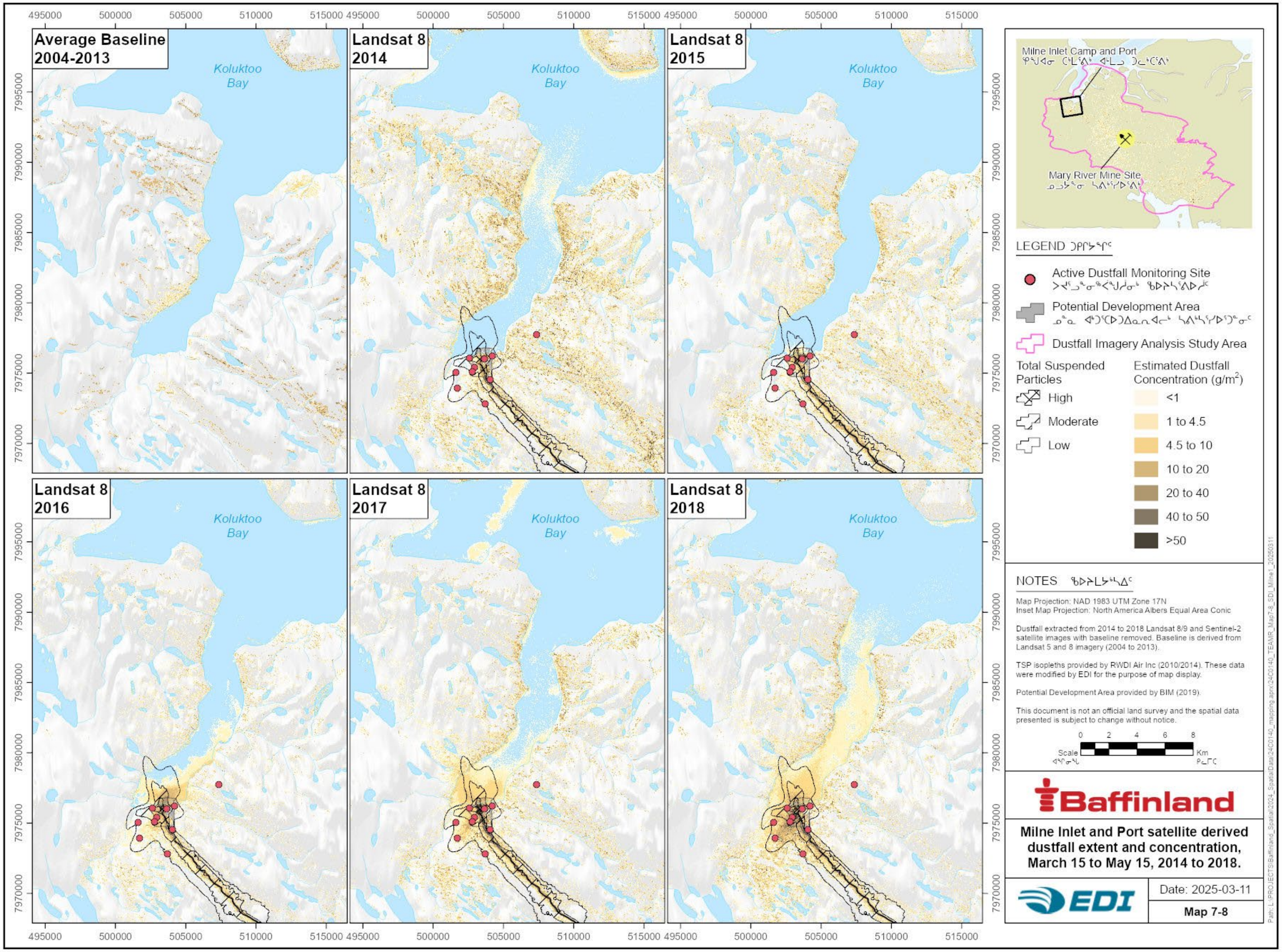
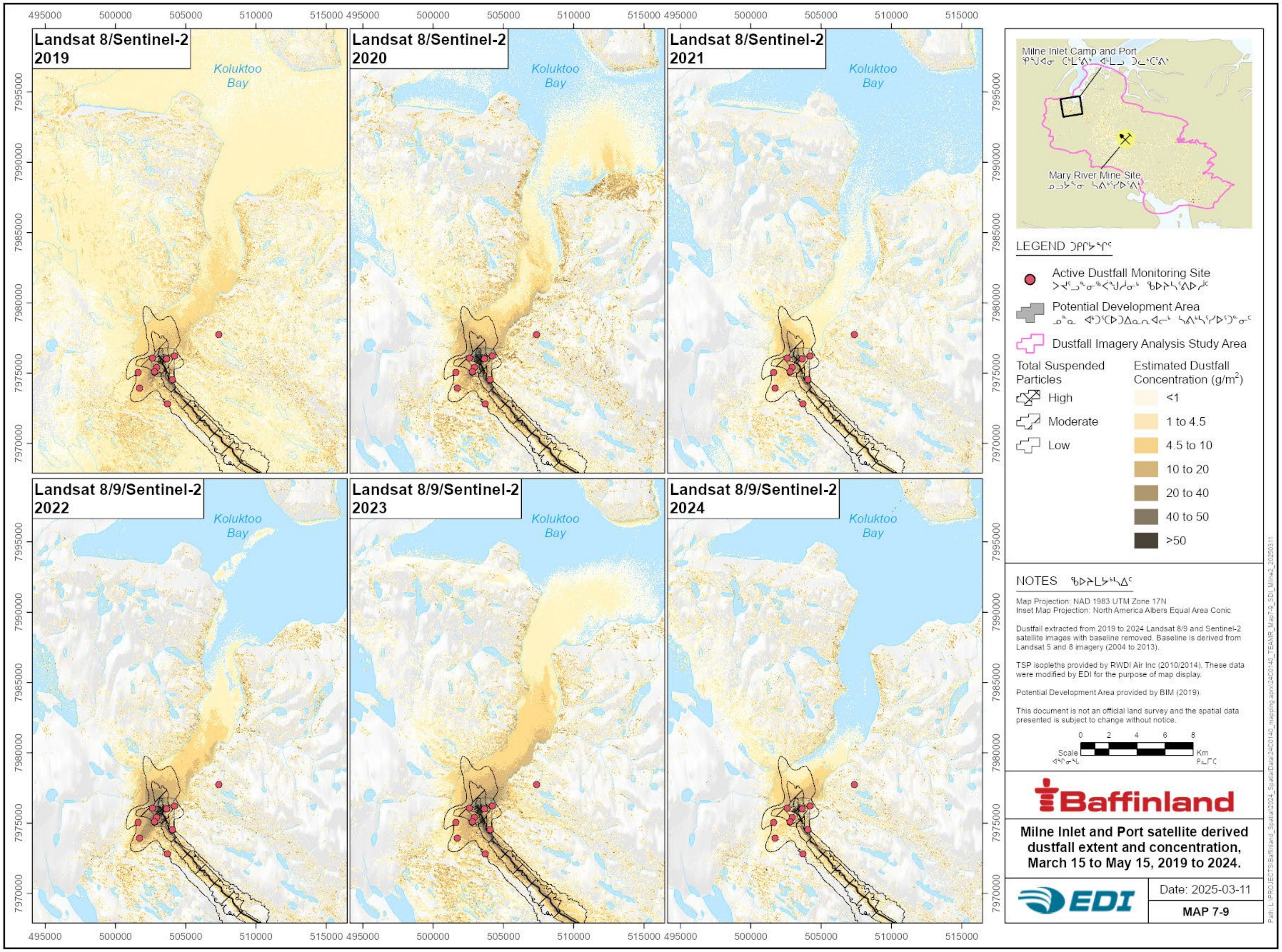


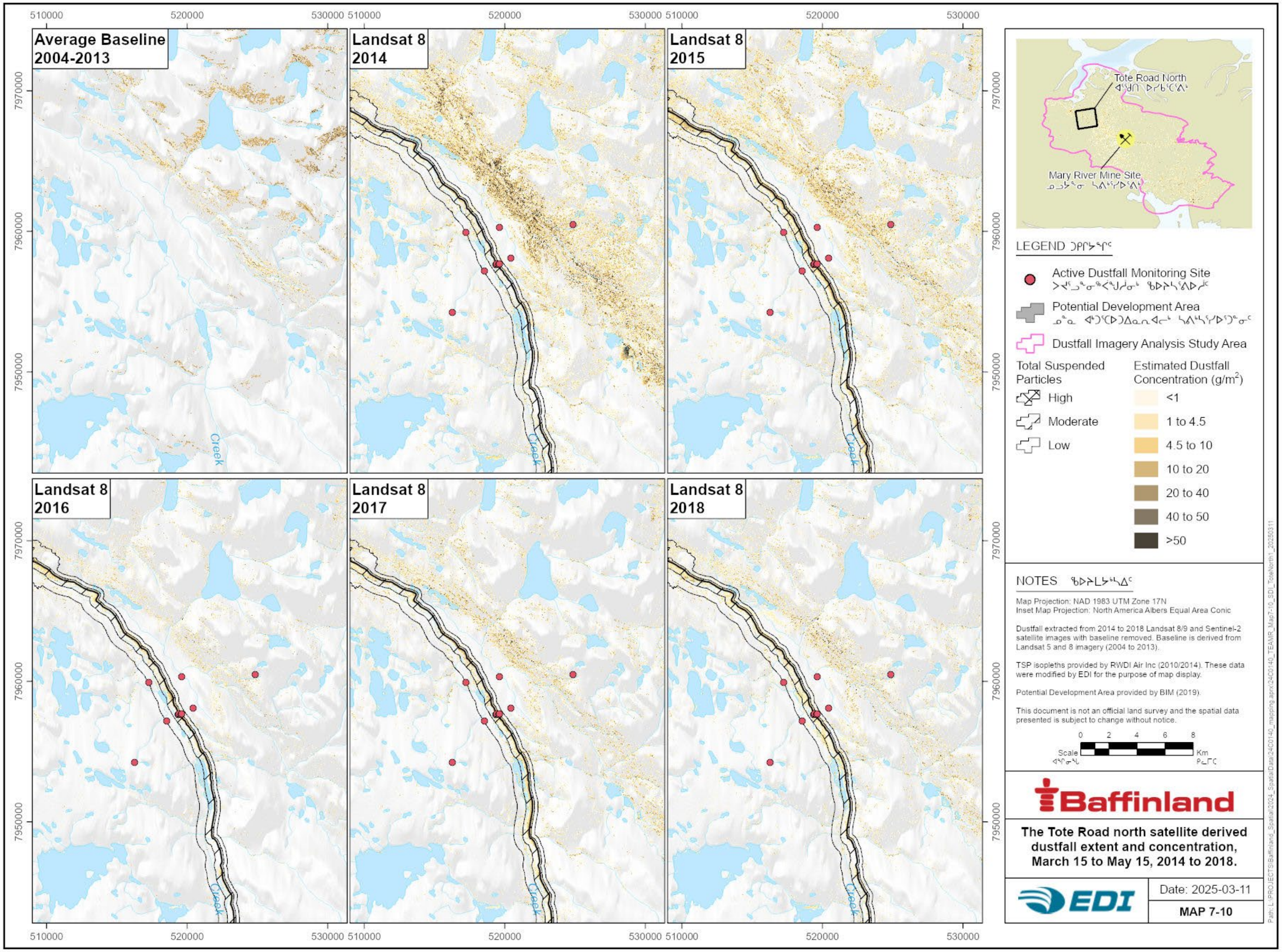

**Figure 7-19.** **Satellite-derived dustfall extents from 2014 to 2024 with baseline years 2004 and 2013.** *The mean baseline has been removed from the data.*

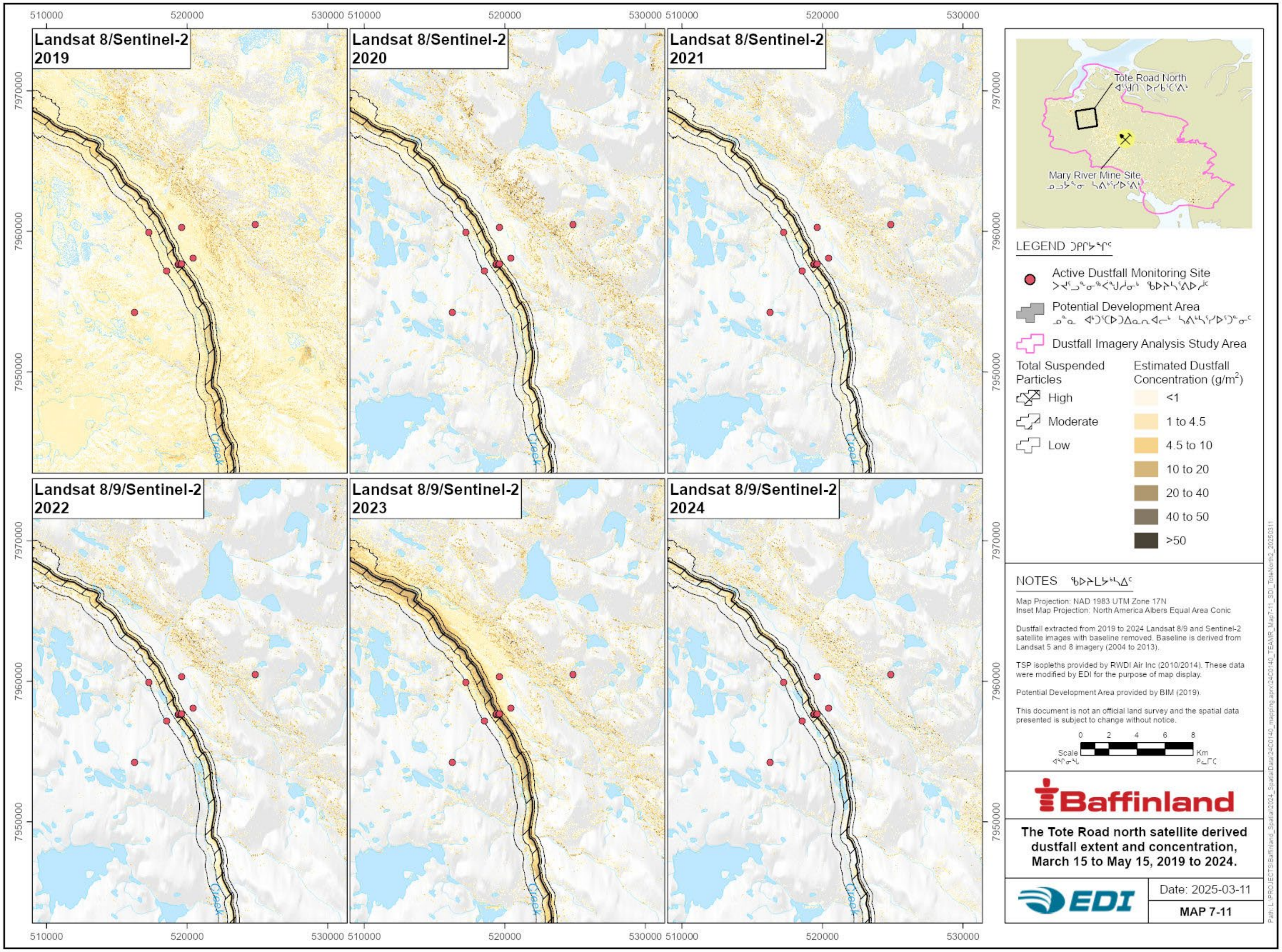

Average Baseline 2004-2013
Landsat 8 2014
Landsat 8 2015
Landsat 8 2016
Landsat 8 2017
Landsat 8 2018
550000
560000
570000
7930000
7920000
7910000
7900000
Angajurjualuk Lake
Mary River Mine Site
LEGEND
Active Dustfall Monitoring Site
Potential Development Area
Dustfall Imagery Analysis Study Area
Total Suspended Particles
High
Moderate
Low
Estimated Dustfall Concentration (g/m2)
<1
1 to 4.5
4.5 to 10
10 to 20
20 to 40
40 to 50
>50
NOTES
Map Projection: NAD 1983 UTM Zone 17N
Inset Map Projection: North America Albers Equal Area Conic
Dustfall extracted from 2014 to 2018 Landsat 8/9 and Sentinel-2 satellite images with baseline removed. Baseline is derived from Landsat 5 and 8 imagery (2004 to 2013).
TSP isopleths provided by RWDI Air Inc (2010/2014). These data were modified by EDI for the purpose of map display.
Potential Development Area provided by BIM (2019).
This document is not an official land survey and the spatial data presented is subject to change without notice.
0 2 4 6 8 10
Scale
Km
Baffinland
Mine Site satellite derived dustfall extent and concentration, March 15 to May 15, 2014 to 2018.
EDI
Date: 2025-03-11
MAP 7-6

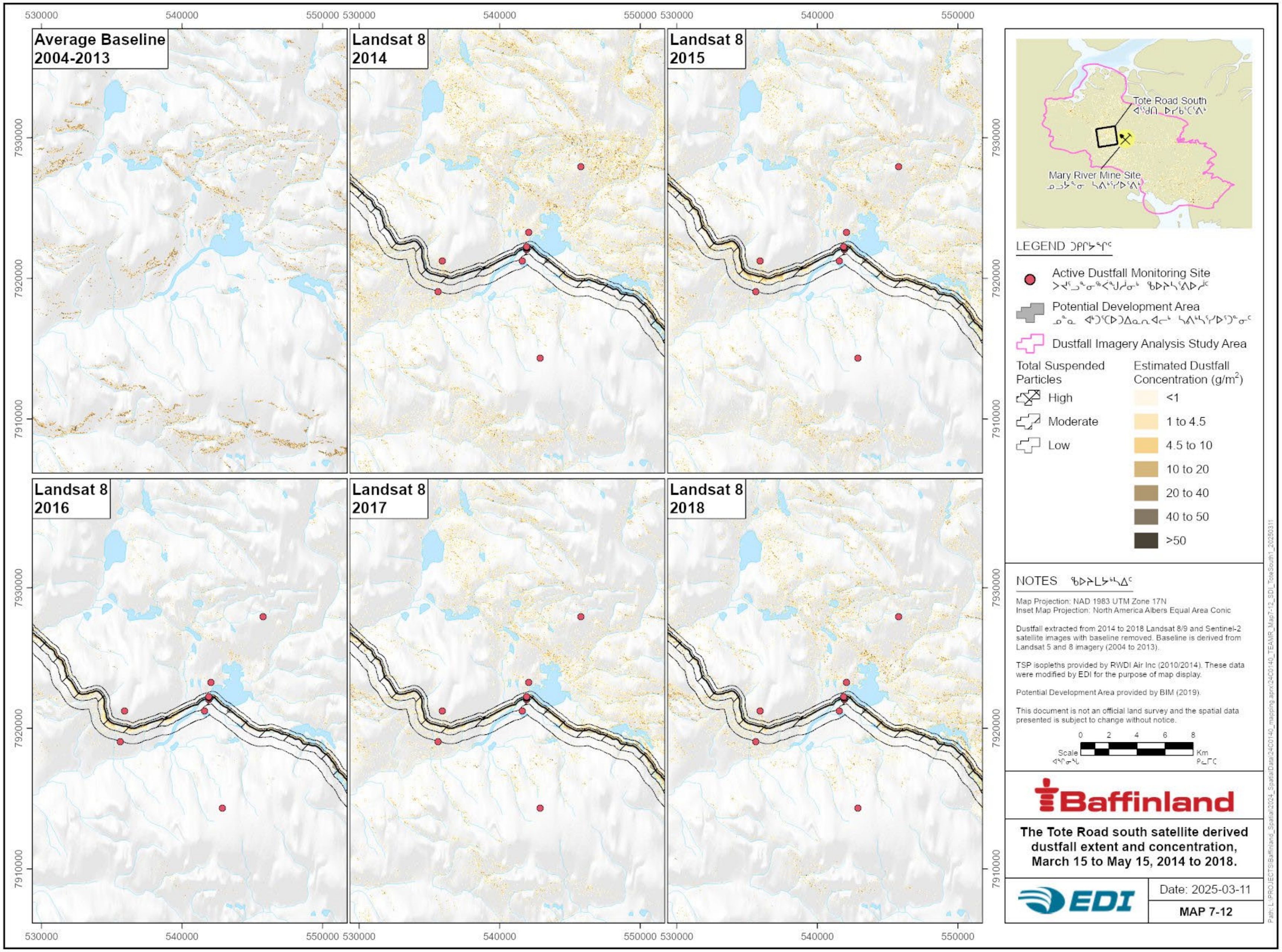

Landsat 8/Sentinel-2 2019
Landsat 8/Sentinel-2 2020
Landsat 8/Sentinel-2 2021
Landsat 8/9/Sentinel-2 2022
Landsat 8/9/Sentinel-2 2023
Landsat 8/9/Sentinel-2 2024
550000
560000
570000
7930000
7920000
7910000
7900000
Angajurjualuk Lake
Mary River Mine Site
LEGEND
Active Dustfall Monitoring Site
Potential Development Area
Dustfall Imagery Analysis Study Area
Total Suspended Particles
High
Moderate
Low
Estimated Dustfall Concentration (g/m²)
<1
1 to 4.5
4.5 to 10
10 to 20
20 to 40
40 to 50
>50
NOTES
Map Projection: NAD 1983 UTM Zone 17N
Inset Map Projection: North America Albers Equal Area Conic
Dustfall extracted from 2019 to 2024 Landsat 8/9 and Sentinel-2 satellite images with baseline removed. Baseline is derived from Landsat 5 and 8 imagery (2004 to 2013).
TSP isopleths provided by RWDI Air Inc (2010/2014). These data were modified by EDI for the purpose of map display.
Potential Development Area provided by BIM (2019).
This document is not an official land survey and the spatial data presented is subject to change without notice.
0 2 4 6 8 10
Scale
Km
Baffinland
Mine Site satellite derived dustfall extent and concentration, March 15 to May 15, 2019 to 2024.
EDI
Date: 2025-03-11
Map 7-7

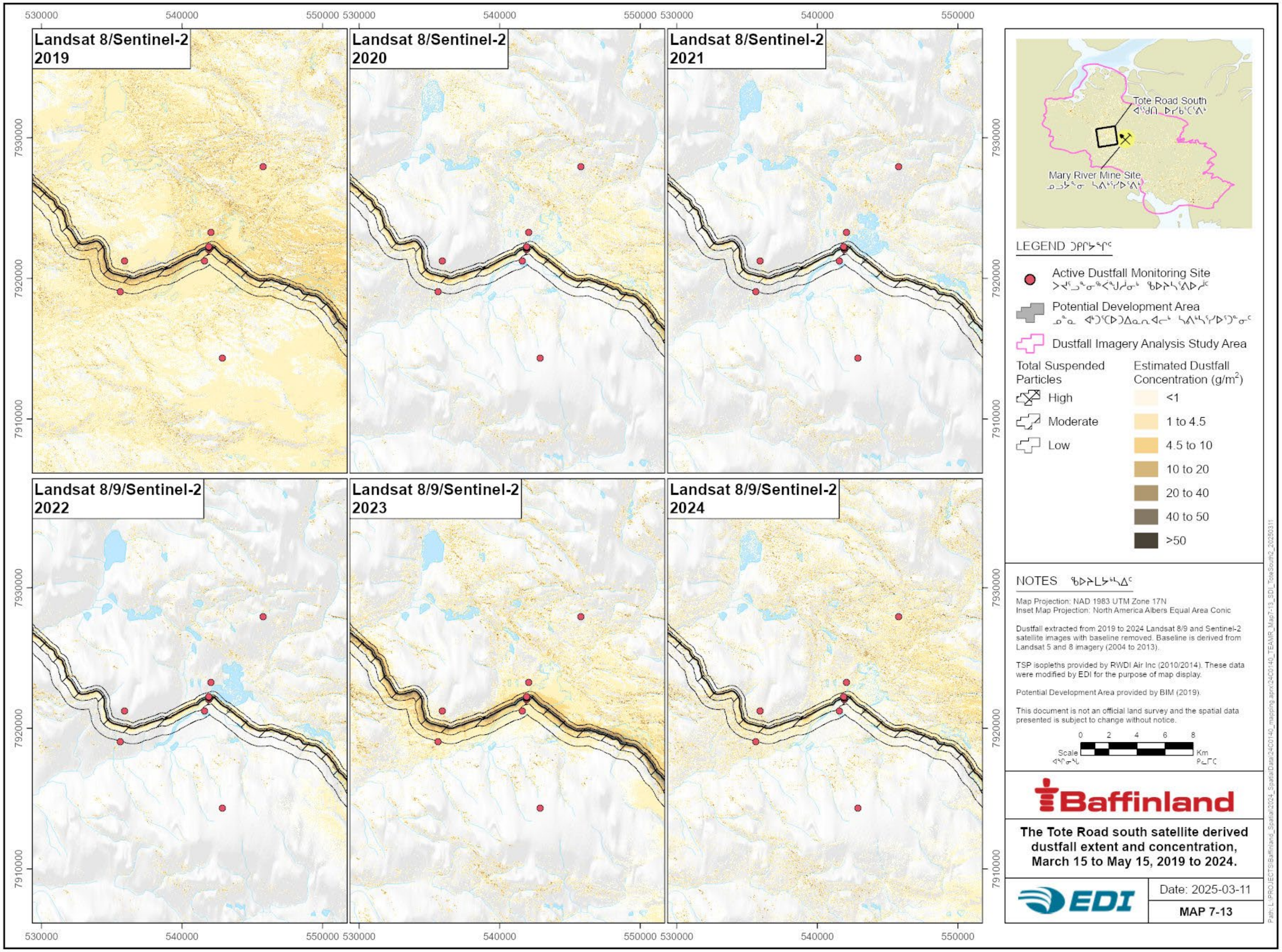

Average Baseline 2004-2013
Landsat 8 2014
Landsat 8 2015
Landsat 8 2016
Landsat 8 2017
Landsat 8 2018
Koluktoo Bay
495000
500000
505000
510000
515000
7970000
7975000
7980000
7985000
7990000
7995000
Milne Inlet Camp and Port
Mary River Mine Site
LEGEND
Active Dustfall Monitoring Site
Potential Development Area
Dustfall Imagery Analysis Study Area
Total Suspended Particles
High
Moderate
Low
Estimated Dustfall Concentration (g/m2)
<1
1 to 4.5
4.5 to 10
10 to 20
20 to 40
40 to 50
>50
NOTES
Map Projection: NAD 1983 UTM Zone 17N
Inset Map Projection: North America Albers Equal Area Conic
Dustfall extracted from 2014 to 2018 Landsat 8/9 and Sentinel-2 satellite images with baseline removed. Baseline is derived from Landsat 5 and 8 imagery (2004 to 2013).
TSP isopleths provided by RWDI Air Inc (2010/2014). These data were modified by EDI for the purpose of map display.
Potential Development Area provided by BIM (2019).
This document is not an official land survey and the spatial data presented is subject to change without notice.
Scale
Km
0 2 4 6 8
Baffinland
Milne Inlet and Port satellite derived dustfall extent and concentration, March 15 to May 15, 2014 to 2018.
Date: 2025-03-11
Map 7-8


Landsat 8/Sentinel-2 2019
Landsat 8/Sentinel-2 2020
Landsat 8/Sentinel-2 2021
Landsat 8/9/Sentinel-2 2022
Landsat 8/9/Sentinel-2 2023
Landsat 8/9/Sentinel-2 2024
Koluktoo Bay
495000
500000
505000
510000
515000
7970000
7975000
7980000
7985000
7990000
7995000
Milne Inlet Camp and Port
Mary River Mine Site
LEGEND
Active Dustfall Monitoring Site
Potential Development Area
Dustfall Imagery Analysis Study Area
Total Suspended Particles
High
Moderate
Low
Estimated Dustfall Concentration (g/m²)
<1
1 to 4.5
4.5 to 10
10 to 20
20 to 40
40 to 50
>50
NOTES
Map Projection: NAD 1983 UTM Zone 17N
Inset Map Projection: North America Albers Equal Area Conic
Dustfall extracted from 2019 to 2024 Landsat 8/9 and Sentinel-2 satellite images with baseline removed. Baseline is derived from Landsat 5 and 8 imagery (2004 to 2013).
TSP isopleths provided by RWDI Air Inc (2010/2014). These data were modified by EDI for the purpose of map display.
Potential Development Area provided by BIM (2019).
This document is not an official land survey and the spatial data presented is subject to change without notice.
0 2 4 6 8
Scale
Km
Baffinland
Milne Inlet and Port satellite derived dustfall extent and concentration, March 15 to May 15, 2019 to 2024.
EDI
Date: 2025-03-11
MAP 7-9


Average Baseline 2004-2013
Landsat 8 2014
Landsat 8 2015
Landsat 8 2016
Landsat 8 2017
Landsat 8 2018
510000
520000
530000
7970000
7960000
7950000
Creek
Tote Road North
Mary River Mine Site
LEGEND
Active Dustfall Monitoring Site
Potential Development Area
Dustfall Imagery Analysis Study Area
Total Suspended Particles
High
Moderate
Low
Estimated Dustfall Concentration (g/m2)
<1
1 to 4.5
4.5 to 10
10 to 20
20 to 40
40 to 50
>50
NOTES
Map Projection: NAD 1983 UTM Zone 17N
Inset Map Projection: North America Albers Equal Area Conic
Dustfall extracted from 2014 to 2018 Landsat 8/9 and Sentinel-2 satellite images with baseline removed. Baseline is derived from Landsat 5 and 8 imagery (2004 to 2013).
TSP isopleths provided by RWDI Air Inc (2010/2014). These data were modified by EDI for the purpose of map display.
Potential Development Area provided by BIM (2019).
This document is not an official land survey and the spatial data presented is subject to change without notice.
0 2 4 6 8
Scale
Km
Baffinland
The Tote Road north satellite derived dustfall extent and concentration, March 15 to May 15, 2014 to 2018.
EDI
Date: 2025-03-11
MAP 7-10


Landsat 8/Sentinel-2
2019
Landsat 8/Sentinel-2
2020
Landsat 8/Sentinel-2
2021
Landsat 8/9/Sentinel-2
2022
Landsat 8/9/Sentinel-2
2023
Landsat 8/9/Sentinel-2
2024
510000
520000
530000
7970000
7960000
7950000
Creek
Tote Road North
Mary River Mine Site
LEGEND
Active Dustfall Monitoring Site
Potential Development Area
Dustfall Imagery Analysis Study Area
Total Suspended Particles
High
Moderate
Low
Estimated Dustfall Concentration (g/m2)
<1
1 to 4.5
4.5 to 10
10 to 20
20 to 40
40 to 50
>50
NOTES
Map Projection: NAD 1983 UTM Zone 17N
Inset Map Projection: North America Albers Equal Area Conic
Dustfall extracted from 2019 to 2024 Landsat 8/9 and Sentinel-2 satellite images with baseline removed. Baseline is derived from Landsat 5 and 8 imagery (2004 to 2013).
TSP isopleths provided by RWDI Air Inc (2010/2014). These data were modified by EDI for the purpose of map display.
Potential Development Area provided by BIM (2019).
This document is not an official land survey and the spatial data presented is subject to change without notice.
0 2 4 6 8
Scale
Km
Baffinland
The Tote Road north satellite derived dustfall extent and concentration, March 15 to May 15, 2019 to 2024.
EDI
Date: 2025-03-11
MAP 7-11


Average Baseline 2004-2013
Landsat 8 2014
Landsat 8 2015
Landsat 8 2016
Landsat 8 2017
Landsat 8 2018
530000
540000
550000
7930000
7920000
7910000
Tote Road South
Mary River Mine Site
LEGEND
Active Dustfall Monitoring Site
Potential Development Area
Dustfall Imagery Analysis Study Area
Total Suspended Particles
High
Moderate
Low
Estimated Dustfall Concentration (g/m2)
<1
1 to 4.5
4.5 to 10
10 to 20
20 to 40
40 to 50
>50
NOTES
Map Projection: NAD 1983 UTM Zone 17N
Inset Map Projection: North America Albers Equal Area Conic
Dustfall extracted from 2014 to 2018 Landsat 8/9 and Sentinel-2 satellite images with baseline removed. Baseline is derived from Landsat 5 and 8 imagery (2004 to 2013).
TSP isopleths provided by RWDI Air Inc (2010/2014). These data were modified by EDI for the purpose of map display.
Potential Development Area provided by BIM (2019).
This document is not an official land survey and the spatial data presented is subject to change without notice.
0 2 4 6 8
Scale
Km
Baffinland
The Tote Road south satellite derived dustfall extent and concentration, March 15 to May 15, 2014 to 2018.
EDI
Date: 2025-03-11
MAP 7-12


Landsat 8/Sentinel-2
2019
Landsat 8/Sentinel-2
2020
Landsat 8/Sentinel-2
2021
Landsat 8/9/Sentinel-2
2022
Landsat 8/9/Sentinel-2
2023
Landsat 8/9/Sentinel-2
2024
530000
540000
550000
7930000
7920000
7910000
Tote Road South
Mary River Mine Site
LEGEND
Active Dustfall Monitoring Site
Potential Development Area
Dustfall Imagery Analysis Study Area
Total Suspended Particles
High
Moderate
Low
Estimated Dustfall Concentration (g/m2)
<1
1 to 4.5
4.5 to 10
10 to 20
20 to 40
40 to 50
>50
NOTES
Map Projection: NAD 1983 UTM Zone 17N
Inset Map Projection: North America Albers Equal Area Conic
Dustfall extracted from 2019 to 2024 Landsat 8/9 and Sentinel-2 satellite images with baseline removed. Baseline is derived from Landsat 5 and 8 imagery (2004 to 2013).
TSP isopleths provided by RWDI Air Inc (2010/2014). These data were modified by EDI for the purpose of map display.
Potential Development Area provided by BIM (2019).
This document is not an official land survey and the spatial data presented is subject to change without notice.
0 2 4 6 8
Scale
Km
Baffinland
The Tote Road south satellite derived dustfall extent and concentration, March 15 to May 15, 2019 to 2024.
EDI
Date: 2025-03-11
MAP 7-13

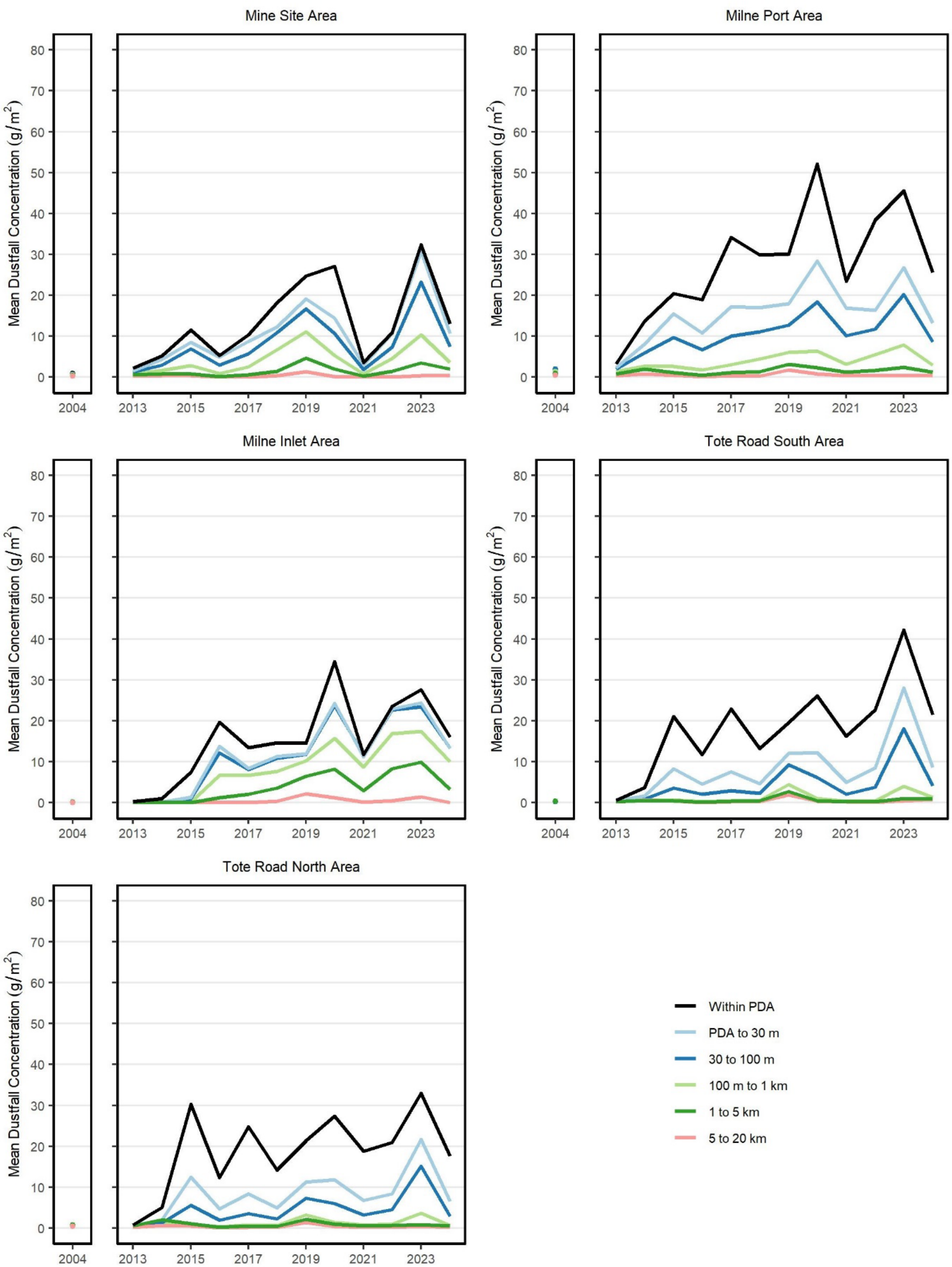



**Figure 7-20. Satellite-derived mean dustfall concentrations from 2014 to 2024 with baseline years 2004 and 2013.**
*The mean baseline has been removed from the data.*

**Table 7-10. Estimated mean dustfall concentrations (and standard deviations) in Areas of Community Concern around Milne Inlet, 2004 and 2013 to 2024.**

| Year | Reference ($g/m^2$) | Pamiujaq ($g/m^2$) | Eastern Channel ($g/m^2$) | Mouth of Tugaat ($g/m^2$) | Quarnak ($g/m^2$) | Qullutu Lake ($g/m^2$) |
|---|---|---|---|---|---|---|
| 2004 | 0.00 (0.00) | 0.00 (0.00) | 0.95 (1.34) | 0.05 (0.17) | 0.38 (0.82) | 0.01 (0.21) |
| 2013 | 0.08 (0.36) | 0.00 (0.00) | 0.70 (1.04) | 0.00 (0.00) | 0.00 (0.00) | 0.01 (0.30) |
| 2014 | 0.00 (0.00) | 0.00 (0.00) | 5.21 (5.87) | 0.12 (0.57) | 1.15 (0.59) | 0.03 (0.59) |
| 2015 | 0.00 (0.00) | 0.00 (0.00) | 0.65 (1.20) | 0.08 (0.39) | 0.00 (0.00) | 0.01 (0.34) |
| 2016 | 0.07 (0.34) | 0.00 (0.00) | 0.89 (1.62) | 0.06 (0.30) | 0.00 (0.00) | 0.00 (0.16) |
| 2017 | 0.60 (2.14) | 0.00 (0.00) | 0.68 (1.22) | 0.00 (0.00) | 0.04 (0.16) | 0.01 (0.26) |
| 2018 | 0.80 (2.54) | 0.00 (0.00) | 1.14 (1.46) | 0.00 (0.00) | 4.00 (0.81) | 0.04 (0.63) |
| 2019 | 0.00 (0.00) | 0.00 (0.00) | 0.00 (0.00) | 1.63 (0.67) | 4.11 (0.71) | 1.38 (0.80) |
| 2020 | 0.13 (0.32) | 0.00 (0.00) | 0.24 (0.76) | 0.18 (0.35) | 0.44 (0.76) | 0.09 (0.41) |
| 2021 | 0.00 (0.00) | 0.00 (0.00) | 0.05 (0.16) | 0.02 (0.09) | 0.31 (0.41) | 0.02 (0.15) |
| 2022 | 0.72 (1.81) | 0.00 (0.00) | 0.43 (0.81) | 0.00 (0.00) | 3.74 (0.71) | 0.16 (1.18) |
| 2023 | 0.12 (0.54) | 0.00 (0.00) | 1.46 (1.36) | 0.00 (0.00) | 3.09 (0.72) | 0.02 (0.44) |
| 2024 | 0.00 (0.00) | 0.00 (0.00) | 3.50 (3.05) | 0.00 (0.00) | 0.13 (0.47) | 0.04 (0.45) |

**Table 7-11. Estimated mean dustfall concentrations (and standard deviations) in Areas of Community Concern south/southwest of the Mine Site, 2004 and 2013 to 2024.**

| Year | Reference ($g/m^2$) | Mine Site 40 WNW ($g/m^2$) | Kanajjuk ($g/m^2$) | Ridge West ($g/m^2$) | Inuktorfik Lake ($g/m^2$) | Angajurjualuk Lake ($g/m^2$) |
|---|---|---|---|---|---|---|
| 2004 | 0.00 (0.00) | 0.00 (0.00) | 0.00 (0.00) | 5.11 (12.98) | 0.03 (0.46) | 0.04 (0.45) |
| 2013 | 0.08 (0.36) | 0.09 (0.41) | 0.00 (0.00) | 0.04 (0.15) | 0.07 (0.72) | 0.02 (0.39) |
| 2014 | 0.00 (0.00) | 0.24 (1.11) | 0.00 (0.00) | 0.98 (3.14) | 0.11 (0.98) | 0.05 (0.62) |
| 2015 | 0.00 (0.00) | 0.00 (0.00) | 0.00 (0.00) | 0.59 (1.54) | 0.08 (0.73) | 0.06 (0.64) |
| 2016 | 0.07 (0.34) | 0.00 (0.00) | 0.00 (0.00) | 0.00 (0.00) | 0.00 (0.06) | 0.01 (0.28) |
| 2017 | 0.60 (2.14) | 0.00 (0.01) | 0.00 (0.00) | 0.04 (0.19) | 0.05 (0.62) | 0.03 (0.45) |
| 2018 | 0.80 (2.54) | 0.00 (0.00) | 0.00 (0.00) | 0.00 (0.00) | 0.01 (0.21) | 0.04 (0.73) |
| 2019 | 0.00 (0.00) | 0.57 (1.79) | 1.52 (0.74) | 1.02 (1.71) | 1.02 (1.18) | 1.58 (1.96) |
| 2020 | 0.13 (0.32) | 0.08 (0.39) | 0.00 (0.00) | 1.12 (2.71) | 0.04 (0.47) | 0.02 (0.31) |
| 2021 | 0.00 (0.00) | 0.07 (0.32) | 0.00 (0.00) | 0.23 (0.85) | 0.05 (0.56) | 0.03 (0.36) |
| 2022 | 0.72 (1.81) | 0.00 (0.00) | 0.00 (0.00) | 0.41 (1.88) | 0.03 (0.41) | 0.01 (0.28) |
| 2023 | 0.12 (0.54) | 0.04 (0.17) | 0.00 (0.00) | 0.64 (2.03) | 0.10 (0.83) | 0.07 (0.69) |
| 2024 | 0.00 (0.00) | 0.50 (1.72) | 0.00 (0.00) | 6.00 (4.73) | 0.16 (1.04) | 0.08 (0.74) |

### 7.4.4 SNOW SAMPLING PILOT STUDY

Improved alignment of 2024 snow sampling with satellite acquisition and an extended sampling period (into late May) resulted in all 10 surface snow sample sites corresponding to Landsat and Sentinel-2 images taken on the same day (Table 7-12 and Table 7-13). The samples also spanned a wide range of concentrations (<212, 700 mg/L). The SDI values of the corresponding images were extracted at the sample sites and combined with the surface snow samples from previous years, for a total sample size of 33 for Landsat and 11 for Sentinel-2 (Map 7-14).

Using the rational equation presented in Mauro et al. (2015) for mineral dust versus SDI measured from hyperspectral data, a non-linear regression model was fit to the Landsat data with significant coefficients ($P > 0.1$, residual standard error = 0.0151; Figure 7-21).

$$SDI_L = \frac{0.0445 \times Conc - 2.5803}{Conc + 234.9602}$$

A non-linear regression model did not fit to the Sentinel-2 data. Additional samples may be required to increase the sample size. Models are needed for Landsat and Sentinel-2 data to have full coverage of the study area for each year of analysis. The continuation of the pilot study is being evaluated in relation to the need for and viability of improvements to experimental design and comparison with the current method using the passive dustfall monitoring data.

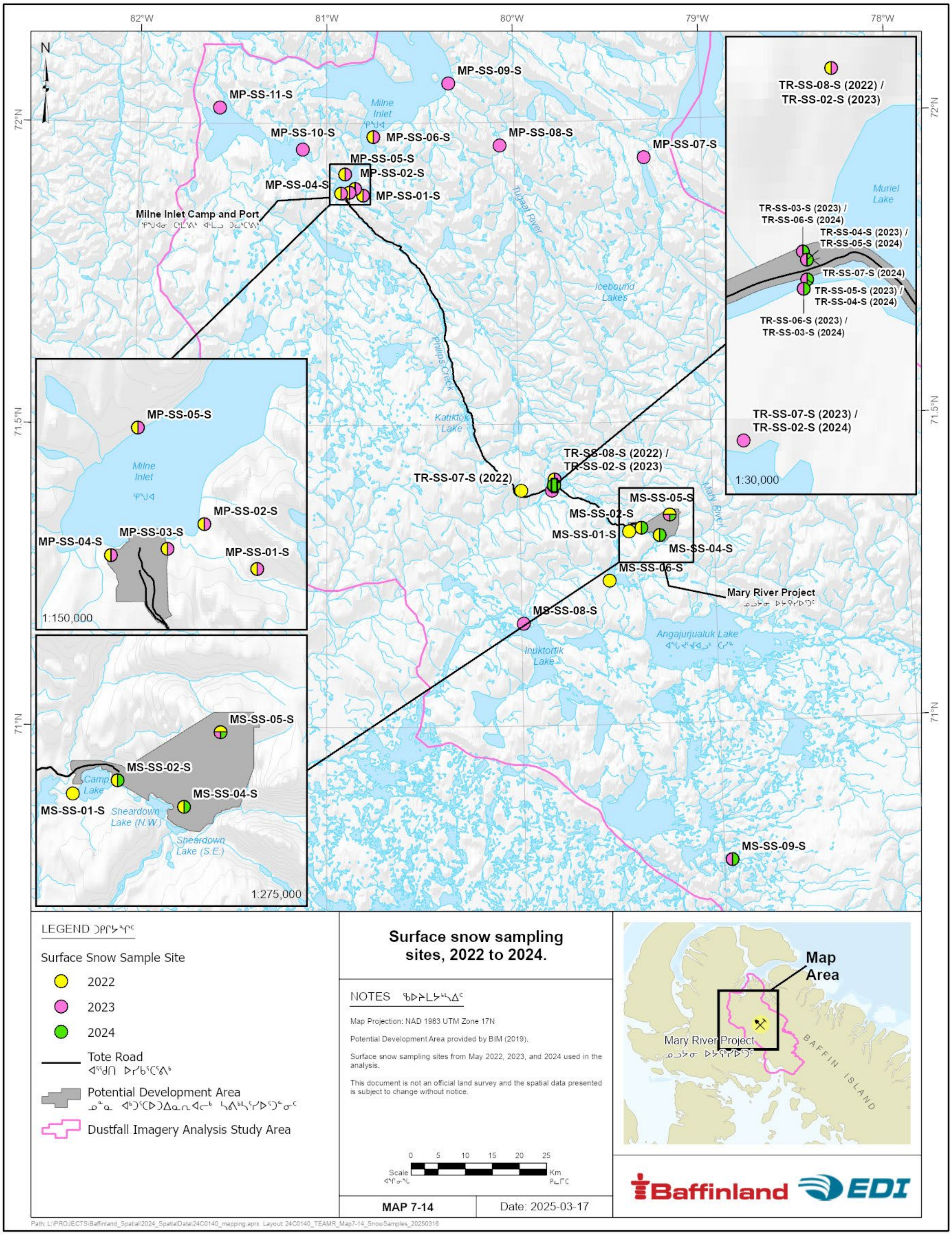
**Table 7-12. Surface snow samples and corresponding Sentinel-2 Snow Darkening Index values from satellite imagery used in the analysis, 2022 to 2024.**

| Sample ID | Date | Easting | Northing | Total Suspended Solids (mg/L) | Snow Darkening Index | Satellite |
|---|---|---|---|---|---|---|
| TR-SS-07-S | 2022-05-01 | 535893 | 7921188 | 5.4 | 0.010 | Sentinel-2 |
| TR-SS-03-S | 2024-05-20 | 541919 | 7922046 | 4670 | 0.032 | Sentinel-2 |
| TR-SS-02-S | 2024-05-20 | 541587 | 7921214 | 749 | 0.017 | Sentinel-2 |
| TR-SS-07-S | 2024-05-20 | 541959 | 7922215 | 407 | 0.036 | Sentinel-2 |
| TR-SS-06-S | 2024-05-20 | 541889 | 7922262 | 7910 | 0.043 | Sentinel-2 |
| TR-SS-05-S | 2024-05-20 | 541960 | 7922219 | 12700 | 0.038 | Sentinel-2 |
| TR-SS-04-S | 2024-05-20 | 541904 | 7922127 | 6760 | 0.029 | Sentinel-2 |
| MS-SS-02-S | 2024-05-21 | 558069 | 7914394 | 1580 | 0.040 | Sentinel-2 |
| MS-SS-04-S | 2024-05-22 | 561443 | 7913005 | 8560 | 0.012 | Sentinel-2 |
| MS-SS-05-S | 2024-05-22 | 563312 | 7916808 | 88.6 | -0.011 | Sentinel-2 |
| MS-SS-09-S | 2024-05-29 | 574861 | 7853164 | 4.4 | -0.008 | Sentinel-2 |

**Table 7-13. Surface snow samples and corresponding Landsat Snow Darkening Index values from satellite imagery used in the analysis, 2022 to 2024.**

| Sample ID | Date | Easting | Northing | Total Suspended Solids (mg/L) | Snow Darkening Index | Satellite |
|---|---|---|---|---|---|---|
| TR-SS-07-S | 2022-05-01 | 535893 | 7921188 | 5.4 | -0.002 | Landsat 9 |
| TR-SS-08-S | 2022-05-01 | 542052 | 7923280 | 5.1 | -0.006 | Landsat 9 |
| MP-SS-05-S | 2022-05-09 | 503339 | 7979591 | 151 | 0.004 | Landsat 8 |
| MP-SS-05-S | 2022-05-09 | 503339 | 7979591 | 151 | 0.001 | Landsat 8 |
| MP-SS-02-S | 2022-05-09 | 505212 | 7976892 | 17.6 | -0.003 | Landsat 8 |
| MP-SS-02-S | 2022-05-09 | 505212 | 7976892 | 17.6 | -0.006 | Landsat 8 |
| MP-SS-01-S | 2022-05-09 | 506661 | 7975666 | <2[1] | -0.018 | Landsat 8 |
| MP-SS-01-S | 2022-05-09 | 506661 | 7975666 | <2[1] | -0.015 | Landsat 8 |
| MS-SS-06-S | 2022-05-01 | 552214 | 7904596 | 4.5 | -0.002 | Landsat 9 |
| MS-SS-01-S | 2022-05-01 | 555807 | 7913700 | 157 | 0.017 | Landsat 9 |
| MS-SS-04-S | 2022-05-02 | 561454 | 7913021 | 746 | 0.065 | Landsat 8 |
| MS-SS-02-S | 2022-05-02 | 558081 | 7914370 | 170 | 0.029 | Landsat 8 |
| MS-SS-05-S | 2022-05-02 | 563308 | 7916817 | 14.5 | -0.006 | Landsat 8 |
| MP-SS-01-S | 2023-05-11 | 506675 | 7975667 | 105 | -0.001 | Landsat 9 |
| MP-SS-02-S | 2023-05-11 | 505210 | 7976908 | 124 | 0.006 | Landsat 9 |
| MP-SS-05-S | 2023-05-11 | 503370 | 7979583 | 667 | -0.001 | Landsat 9 |
| MP-SS-06-S | 2023-05-11 | 508569 | 7986481 | 10.4 | -0.005 | Landsat 9 |
| MP-SS-08-S | 2023-05-11 | 531889 | 7984932 | 3.5 | -0.007 | Landsat 9 |
| MP-SS-11-S | 2023-05-11 | 480269 | 7991947 | 2.3 | -0.012 | Landsat 9 |
| MS-SS-08-S | 2023-05-12 | 536359 | 7896650 | 11.2 | -0.009 | Landsat 8 |
| MS-SS-09-S | 2023-05-12 | 574911 | 7853193 | 4 | -0.013 | Landsat 8 |
| TR-SS-02-S | 2023-05-12 | 542055 | 7923282 | 89.4 | -0.001 | Landsat 8 |
| TR-SS-03-S | 2024-05-20 | 541919 | 7922046 | 4670 | 0.038 | Landsat 9 |
| TR-SS-02-S | 2024-05-20 | 541587 | 7921214 | 749 | 0.004 | Landsat 9 |
| TR-SS-07-S | 2024-05-20 | 541959 | 7922215 | 407 | 0.056 | Landsat 9 |
| TR-SS-06-S | 2024-05-20 | 541889 | 7922262 | 7910 | 0.051 | Landsat 9 |
| TR-SS-05-S | 2024-05-20 | 541960 | 7922219 | 12700 | 0.056 | Landsat 9 |
| TR-SS-04-S | 2024-05-20 | 541904 | 7922127 | 6760 | 0.062 | Landsat 9 |
| MS-SS-02-S | 2024-05-21 | 558069 | 7914394 | 1580 | 0.037 | Landsat 8 |
| MS-SS-02-S | 2024-05-21 | 558069 | 7914394 | 1580 | 0.040 | Landsat 8 |
| MS-SS-04-S | 2024-05-22 | 561443 | 7913005 | 8560 | 0.006 | Landsat 9 |
| MS-SS-05-S | 2024-05-22 | 563312 | 7916808 | 88.6 | 0.000 | Landsat 9 |
| MS-SS-09-S | 2024-05-29 | 574861 | 7853164 | 4.4 | -0.016 | Landsat 9 |

[1] < denotes below the detection limit.


MP-SS-09-S
MP-SS-11-S
MP-SS-10-S
MP-SS-06-S
MP-SS-08-S
MP-SS-07-S
MP-SS-05-S
MP-SS-02-S
MP-SS-04-S
MP-SS-01-S
Milne Inlet Camp and Port
Milne Inlet
Tugaat River
Phillips Creek
Icebound Lakes
Katiktok Lake
TR-SS-07-S (2022)
TR-SS-08-S (2022) / TR-SS-02-S (2023)
MS-SS-05-S
MS-SS-02-S
MS-SS-01-S
MS-SS-04-S
MS-SS-06-S
MS-SS-08-S
MS-SS-09-S
Mary River Project
Mary River
Angajurjualuk Lake
Inuktorfik Lake
Muriel Lake
TR-SS-03-S (2023) / TR-SS-06-S (2024)
TR-SS-04-S (2023) / TR-SS-05-S (2024)
TR-SS-07-S (2024)
TR-SS-05-S (2023) / TR-SS-04-S (2024)
TR-SS-06-S (2023) / TR-SS-03-S (2024)
TR-SS-07-S (2023) / TR-SS-02-S (2024)
1:30,000
MP-SS-03-S
1:150,000
Camp Lake
Sheardown Lake (N.W.)
Sheardown Lake (S.E.)
1:275,000
82°W
81°W
80°W
79°W
78°W
72°N
71.5°N
71°N
N
LEGEND
Surface Snow Sample Site
2022
2023
2024
Tote Road
Potential Development Area
Dustfall Imagery Analysis Study Area
Surface snow sampling sites, 2022 to 2024.
NOTES
Map Projection: NAD 1983 UTM Zone 17N
Potential Development Area provided by BIM (2019).
Surface snow sampling sites from May 2022, 2023, and 2024 used in the analysis.
This document is not an official land survey and the spatial data presented is subject to change without notice.
0 5 10 15 20 25
Scale
Km
Map Area
Mary River Project
BAFFIN ISLAND
Baffinland
EDI
MAP 7-14
Date: 2025-03-17
Path: L:\PROJECTS\Baffinland_Spatial\2024_SpatialData\24C0140_mapping.aprx Layout: 24C0140_TEAMR_Map7-14_SnowSamples_20250316

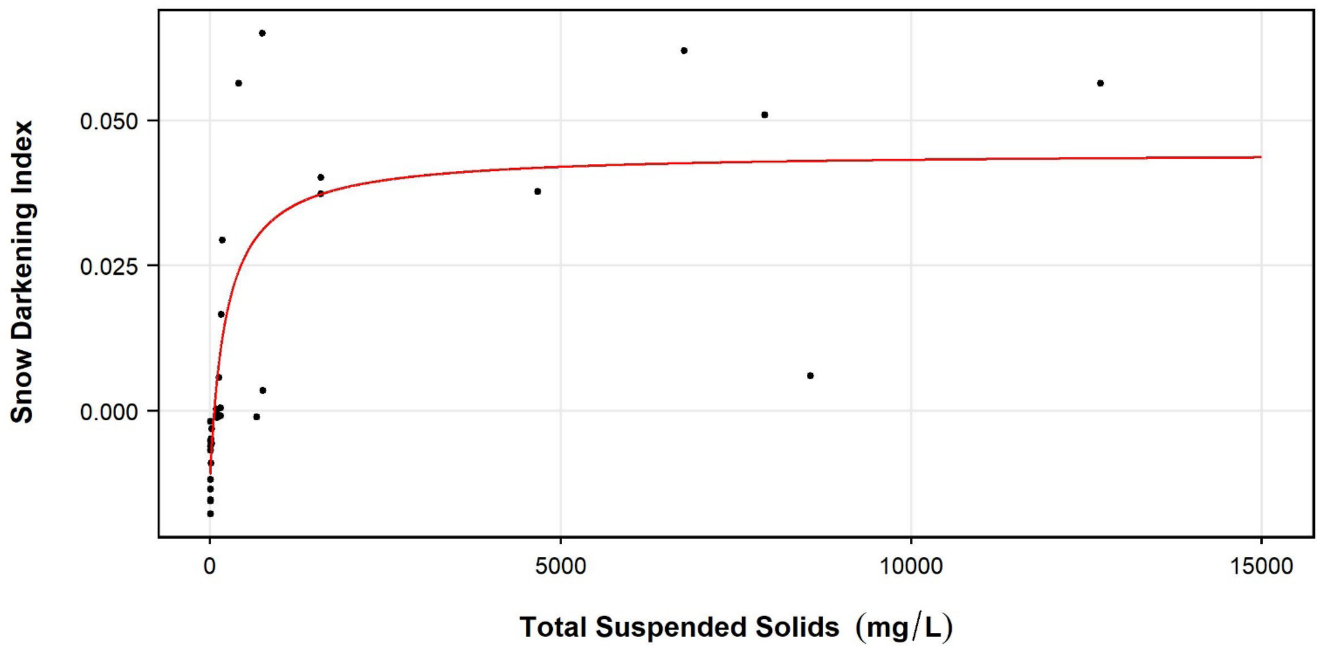



Figure 7-21. Non-linear regression (rational fit) between Total Suspended Solids and Landsat 8/9 Snow Darkening Index.

# 8 VEGETATION

Baffinland Iron Mines Corporation (Baffinland) is committed to monitoring the potential effects of the Mary River Project (the Project) on vegetation abundance, diversity, and health. Based on the committed monitoring frequency of three to five years delineated in the Terrestrial Environment Mitigation and Monitoring Plan (Baffinland Iron Mines Corporation 2016a), the 2024 monitoring program focused on exotic invasive vegetation.

**Vegetation Summary**

No exotic invasive vegetation species were recorded during the 2024 surveys. Monitoring for exotic invasive vegetation is expected to occur again between 2027 and 2029 (or as informed by ongoing incidental monitoring).

## 8.1 EXOTIC INVASIVE VEGETATION MONITORING

Conditions under the Nunavut Impact Review Board Project Certificate (Nunavut Impact Review Board 2012) were developed to address concerns about the potential introduction and spread of exotic invasive vegetation from Project-related activities. In 2014, Baffinland established a long-term program to monitor the possible introduction of exotic invasive vegetation species. This commitment directly relates to the following Project Conditions (PCs):

- **PC #32** *The Proponent shall ensure that equipment and supplies brought to the Project sites are clean and free of soils that could contain plant seeds not naturally occurring in the area. […]*
- **PC #37** *The Proponent shall incorporate protocols for monitoring for the potential introduction of invasive vegetation species (e.g. surveys of plant populations in previously disturbed areas) into its Terrestrial Environment and Monitoring Plan. […]*

The Terrestrial Environment and Mitigation and Monitoring Plan outlines the measures at the Project for mitigating and monitoring exotic invasive vegetation. The primary objective is to prevent the establishment and proliferation of potential exotic invasive plant species within the Project footprint and adjacent areas. Targeted surveys of exotic invasive plant species are completed every three to five years, or as triggered by incidental observations, to verify the status of exotic invasive plants at the Project and evaluate the effectiveness of these mitigations (Baffinland Iron Mines Corporation 2016a).

### 8.1.1 METHODS

#### 8.1.1.1 History of Exotic Invasive Vegetation Monitoring at the Project

Exotic invasive vegetation monitoring was initiated in 2014 and repeated every three to five years, along with ongoing incidental monitoring during the growing season. The following bullet points summarize the findings of exotic invasive vegetation monitoring at the Project.

- **2014 —** Comprehensive survey of disturbed areas and Project boundaries at the Mine Site, Milne Inlet, and along the Tote Road. No exotic or invasive plant species were observed.
- **2019 —** Comprehensive survey of disturbed areas and Project boundaries at the Mine Site, Milne Inlet, and along the Tote Road. One exotic plant species (garden tomato) was observed growing at the Mine Site below the sewage/effluent discharge pipe.
- **2020 —** Follow-up monitoring of previously identified exotic plant species at the sewage/effluent discharge pipe. No exotic or invasive plant species were observed.
- **2024 —** Comprehensive survey of disturbed areas and Project boundaries at the Mine Site, Milne Inlet, and along the Tote Road. No exotic or invasive plant species were observed (findings described hereafter).

#### 8.1.1.2 Survey Methods and Search Areas

Standardized survey procedures were used to determine the presence/absence and abundance (where applicable) of potential exotic invasive species following methods described in *Guidelines for Rare Plant Surveys in Alberta* (Alberta Native Plant Council 2012) and *2016 Survey of Exotic Plants Along NWT Highways* (Oldham and Delisle-Oldham 2016). Surveys focused on previously disturbed areas within and adjacent to the Project footprint and along Project boundaries where exotic invasive plants are most likely to occur (e.g., along Project infrastructure, road margins, and laydown areas). Site surveys considered the level of ground disturbance (i.e., exposed soil can be more prone to the establishment of invasive vegetation) and proximity to Project activities and vehicle traffic (i.e., vehicle traffic is a vector for the proliferation of invasive vegetation). Surveys focused on listed invasive species per *Non-Native and Invasive Species in Nunavut* (Government of Nunavut 2020).

Exotic invasive vegetation surveys were completed by two qualified botanists and two Inuit assistants, occasionally under the supervision of Baffinland Environmental Staff to support access and safety. Surveys differentiated between three focal areas at the Project: the Mine Site, Milne Inlet, and along the Tote Road. The Mine Site, Milne Inlet, and laydowns along the Tote Road were primarily surveyed on foot to the extent safely accessible. Project margins along the Tote Road were surveyed by vehicle travelling at slow speeds. Areas of active construction, heavy equipment use, and blasting were not accessible.

### 8.1.2 RESULTS AND DISCUSSION

Exotic invasive vegetation surveys were completed in July 2024. The timing of the surveys was intended to coincide with vegetation ‘green-up’ and early/mid-summer flowering to optimize plant species observation and identification. Survey locations and search efforts are summarized in Table 8-1 and presented in Map 8-1. Surveys targeted disturbance areas within and adjacent to the Project footprint where exotic invasive plants could potentially occur (i.e., through incidental introduction), such as areas with frequent human and/or vehicle activity (Photo 8-1 to Photo 8-3). The total survey effort was 163 hours and 29 minutes, completed by two to five personnel, depending on the survey location.

No exotic invasive vegetation species were recorded during the 2024 surveys. The Terrestrial Environment and Mitigation and Monitoring Plan prescribes the survey frequency for monitoring exotic invasive vegetation (three to five years, pending findings from ongoing incidental monitoring). Monitoring for exotic invasive vegetation is expected to occur again between 2027 and 2029.

**Table 8-1. Summary of the 2024 exotic invasive vegetation monitoring program.**

| Survey Area | | Date | Start to Stop Time | No. Pers. | Person Hrs. (hh:mm) | Exotic Invasives |
|---|---|---|---|---|---|---|
| Mine Site | Effluent Discharge | 5 Jul 2024 | 09:45 to 11:30 | 5 | 08:45 | — |
| | Landfill | 5 Jul 2024 | 12:25 to 14:05 | 4 | 06:40 | — |
| | 104 Laydown | 5 Jul 2024 | 14:50 to 15:30 | 4 | 02:40 | — |
| | Mobile Maintenance | 5 Jul 2024 | 15:33 to 15:40 | 2 | 00:14 | — |
| | Mine Site Complex, Fuel Farm | 5 Jul 2024 | 15:44 to 16:45 | 5 | 05:05 | — |
| | Sailiivik Camp, Wastewater Treatment Plant | 6 Jul 2024 | 08:45 to 11:05 | 4 | 09:20 | — |
| | Warehouse Laydown | 6 Jul 2024 | 12:08 to 13:10 | 4 | 04:08 | — |
| | OHT Laydown | 6 Jul 2024 | 13:20 to 13:40 | 5 | 01:40 | — |
| | Quarry | 6 Jul 2024 | 13:56 to 14:48 | 5 | 04:20 | — |
| | Fueling Area, Mine Site Complex Water | 6 Jul 2024 | 15:25 to 16:23 | 4 | 03:52 | — |
| | Airstrip Perimeter | 7 Jul 2024 | 09:07 to 10:55 | 4 | 07:12 | — |
| | Aerodrome Laydown | 7 Jul 2024 | 11:30 to 11:45 | 4 | 01:00 | — |
| | Weatherhaven | 7 Jul 2024 | 13:20 to 14:34 | 5 | 06:10 | — |
| | Helipad, Hangar | 7 Jul 2024 | 15:00 to 15:12 | 4 | 00:48 | — |
| | Water Treatment Ponds | 7 Jul 2024 | 15:17 to 15:42 | 4 | 01:40 | — |
| | Incinerator | 7 Jul 2024 | 16:13 to 16:37 | 4 | 01:36 | — |
| | Site Services | 8 Jul 2024 | 09:40 to 10:27 | 5 | 03:55 | — |
| | Warehouse | 8 Jul 2024 | 10:40 to 11:15 | 5 | 02:55 | — |
| | MS08 Water Treatment Plant, Weather Station | 8 Jul 2024 | 14:00 to 15:48 | 5 | 09:00 | — |
| | Haul Road, Magazine Laydown | 8 Jul 2024 | 15:49 to 16:41 | 5 | 04:20 | — |
| Tote Road | km 100 to km 60, Laydowns, Pullouts | 9 Jul 2024 | 08:33 to 13:10 | 4 | 18:28 | — |
| | km 60 to Milne Port, Laydowns, Pullouts | 13 Jul 2024 | 09:45 to 14:45 | 4 | 20:00 | — |
| Milne Inlet | LP3 Pad, Helipad | 14 Jul 2024 | 07:56 to 08:44 | 4 | 03:12 | — |
| | LP5, LP6, W10a and W10b Laydowns | 14 Jul 2024 | 09:13 to 10:16 | 4 | 04:12 | — |
| | 380 Camp, Wastewater Treatment Plant | 14 Jul 2024 | 11:18 to 12:04 | 4 | 03:04 | — |
| | OHT, W14 and W3 Laydowns | 14 Jul 2024 | 12:22 to 12:57 | 5 | 02:55 | — |
| | Port Site Camp, Environment Buildings, Site Services, Incinerator, ERT Building | 14 Jul 2024 | 14:50 to 15:12 | 5 | 01:50 | — |
| | B1 Pad, East Beach | 14 Jul 2024 | 15:23 to 16:35 | 4 | 04:48 | — |
| | R3 Laydown | 16 Jul 2024 | 08:09 to 08:40 | 5 | 02:35 | — |
| | Ore Pad | 16 Jul 2024 | 08:42 to 09:05 | 5 | 01:55 | — |
| | Quarry, MP04a Pond, Snow Dump | 16 Jul 2024 | 10:14 to 10:57 | 5 | 03:35 | — |
| | D2 Laydown | 16 Jul 2024 | 11:08 to 11:29 | 5 | 01:45 | — |
| | Warehouse, Warehouse Laydown | 16 Jul 2024 | 11:42 to 12:24 | 5 | 03:30 | — |
| | East Beach Effluent Discharge | 16 Jul 2024 | 14:00 to 14:34 | 5 | 02:50 | — |

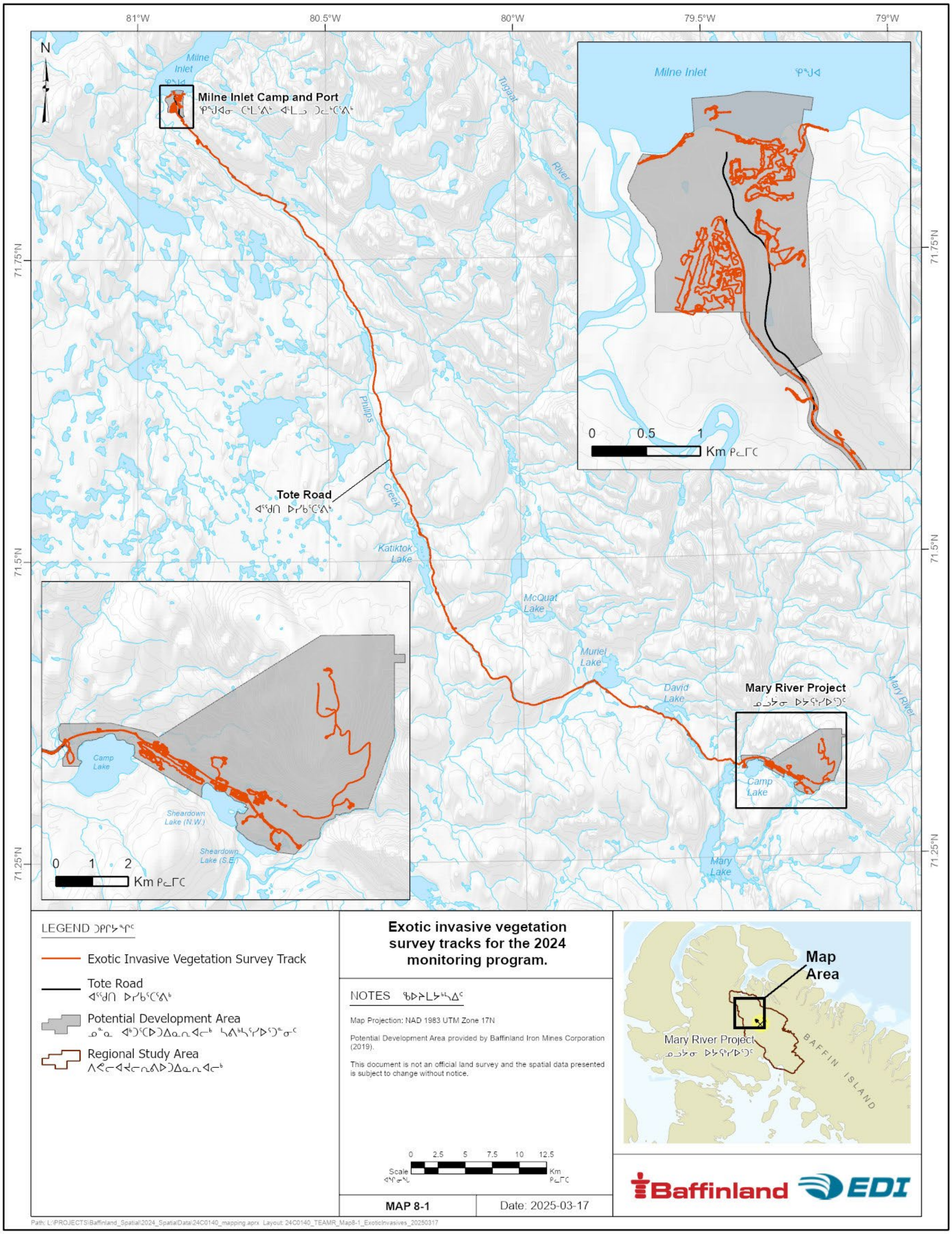
Table 8-1. Summary of the 2024 exotic invasive vegetation monitoring program.

| Survey Area | | Date | Start to Stop Time | No. Pers. | Person Hrs. (hh:mm) | Exotic Invasives |
|---|---|---|---|---|---|---|
| | Ship Loader, Ore Docks | 16 Jul 2024 | 14:43 to 15:00 | 5 | 01:25 | — |
| | West Beach | 16 Jul 2024 | 15:09 to 15:34 | 5 | 02:05 | — |
| | | | | **Total Survey Hours** | **163:29** | |

Photo 8-1. Representative survey areas at the Mine Site.

Photo 8-2. Representative survey areas along the Tote Road and within roadside pullouts/laydowns.

**Photo 8-3. Representative survey areas at Milne Inlet.**


Milne Inlet Camp and Port
Tote Road
Milne Inlet
Tugaat River
Phillips Creek
Katiktok Lake
McQuat Lake
Muriel Lake
David Lake
Mary River Project
Mary River
Camp Lake
Mary Lake
Sheardown Lake (N.W.)
Sheardown Lake (S.E.)
81°W
80.5°W
80°W
79.5°W
79°W
71.75°N
71.5°N
71.25°N
LEGEND
Exotic Invasive Vegetation Survey Track
Tote Road
Potential Development Area
Regional Study Area
Exotic invasive vegetation survey tracks for the 2024 monitoring program.
NOTES
Map Projection: NAD 1983 UTM Zone 17N
Potential Development Area provided by Baffinland Iron Mines Corporation (2019).
This document is not an official land survey and the spatial data presented is subject to change without notice.
Map Area
Baffin Island
MAP 8-1
Date: 2025-03-17
Baffinland
EDI

#### 8.1.2.1 Ancillary Observations

Native vegetation can be mistakenly recorded as potential exotic invasive species. During the field survey, two native species of dandelion—horned dandelion (*Taraxacum ceratophorum)* and northern dandelion (*Taraxacum phymatocarpum*)—were observed occurring sporadically along the Tote Road and along the perimeter of disturbed areas at the Mine Site (Photo 8-4). Arctic chamomile (*Tripleurospermum maritima* ssp. *Phaeocephala)* was found at Milne Inlet on a sandy bluff along the western side of East Beach (Photo 8-5). Voucher specimens for these species were collected for further characterization and species confirmation.

**Photo 8-4. Northern dandelion observed along the perimeter of Sailiivik Camp at the Mine Site; July 6, 2024.**

**Photo 8-5. Arctic chamomile observed along East Beach at Milne Inlet; July 16, 2024.**

# 9 MAMMALS

Using multiple indicators and approaches, surveillance monitoring of mammals at the Mary River Project (the Project) is intended to understand better, predict, and mitigate potential mammal interactions within and/or near the Potential Development Area (PDA).

Caribou (*Rangifer tarandus*)—a keystone species in the North Baffin Island ecosystem—is recognized as a key wildlife indicator because of its ecological and social significance. However, in 2019, North Baffin Island caribou were at a low point in their 60 to 80- year population cycle (Government of Nunavut 2019). Caribou observations from site personnel are recorded infrequently, incidentally, or during surveys.

## Mammal Summary

Ground-based surveys continue to monitor potential wildlife interactions with the Project. These include snow track surveys, snowbank height surveys, Height of Land (HOL) surveys, remote camera monitoring, and incidental sighting reports from on-site personnel. The following are key findings from 2024 monitoring activities on mammals at the Project.

**Snow Track Surveys** — Twelve snow track surveys were completed in 2024. No caribou, Arctic wolf, or other large mammal tracks were observed. Arctic fox, red fox, lemming, Arctic hare, and ptarmigan tracks were noted during the various surveys. Ptarmigan had the highest percentage of tracks that crossed or were noted on the Tote Road, while foxes most frequently travelled parallel to the Tote Road. Lemmings had the highest deflection response and Arctic hare meandered the most.

**Snowbank Height Monitoring** — Snowbank height monitoring was completed between January and December 2024. An average of 86% compliance with the 100 cm snowbank height threshold was recorded in 2024. Since 2020, survey locations have been randomized (instead of repeated kilometre locations) to improve representativeness and reduce bias.

**Height of Land Surveys** — Height of Land surveys were completed during the caribou calving season (early June 2024). All HOL stations were visited (minus one) at least twice between May 29 and June 10, 2024. The total observation time was 32 hours and 25 minutes, with an average observation time of 40 minutes per station. Fifteen individual caribou were observed during the HOL surveys in 2024 on June 3, 4, 5, and 8. Before the 2024 HOL surveys, the last time a caribou was observed on a HOL survey was in 2013.

**Remote Cameras** — Remote cameras documented a combination of birds (e.g., ptarmigan, raptors, and songbirds), Arctic hare, and Arctic fox between January 1 and December 28, 2024. Fifteen detections of caribou were noted on a single camera (i.e., Baffin-11). No wolves or bears were observed in any reviewed images. This supports the current observation of low caribou numbers and movement in the PDA, despite increased observation during the monitoring period.

**Aerial Caribou Survey**[12] — An aerial caribou survey occurred in March 2023 before caribou calving. During the survey, 112 caribou across 36 groups were observed. All observed caribou occurred in the southern subregion of the wildlife Regional Study Area (RSA), and only two groups (nine individuals total) occurred in an overlapping portion of the northern subregion. No aerial surveys occurred in 2024.

**Caribou Tote Road Observations** — Twenty two observation events of caribou occurred along the Tote Road in 2024. No adverse behaviour from caribou was observed in response to the Tote Road or its traffic.

**Incidental Observations** — Two incidental observations of three caribou occurred near the Mine Site, and 97 observations (possibly repeated observations) occurred along the Tote Road. Forty-three caribou were noted outside the PDA.

**Hunter and Visitor Logs** — Baffinland Security monitors land use and the presence of land users in the PDA via hunter and visitor logs that document travel or hunting within the PDA. Overall log numbers slightly decreased from 2022 but were similar to 2018 and above pre-COVID counts.

## 9.1 SNOW TRACK SURVEYS

The following Project Conditions (PCs) address concerns regarding potential caribou crossings of linear features (i.e., train or vehicle traffic) and constraining of wildlife movement across roadways (Nunavut Impact Review Board 2020):

- **PC #54dii** *"The Proponent shall provide an updated Terrestrial Environmental Management and Monitoring Plan which shall include…Snow track surveys during construction and the use of video-surveillance to improve the predictability of caribou exposure to the railway and Tote Road. Using the result of this information, an early warning system for caribou on the railway and Tote Road shall be developed for operation."*
- **PC #58f** *"Within its annual report to the NIRB, the Proponent shall incorporate a review section which includes… Any updates to information regarding caribou migration trails. Maps of caribou migration trails, primarily obtained through any new collar and snow tracking data, shall be updated (at least annually) in consultation with the Qikiqtani Inuit Association and affected communities, and shall be circulated as new information becomes available."*

Snow track surveys were completed from March to November 2023 to address these PCs. Surveys focused on the surveillance of potential wildlife movement (including caribou and other species) near roadways and documentation of behavioural responses to human activities near the Project.

[12] This section was first reported in the 2023 Terrestrial Environment Annual Monitoring Report (EDI Environmental Dynamics Inc. 2024). The Result and Discussion section has been updated and reissued for completeness.

### 9.1.1 METHODS

The purpose of snow track surveys is to monitor patterns of movement and response of caribou and other wildlife to Project-related activities based on observable tracks in proximity to roadways. Snow track surveys were completed within 24 to 48 hours following a fresh snowfall. Surveys were led by two or three Baffinland Iron Mines Corporation (Baffinland) personnel along the Tote Road from a light truck at a speed of ~30 km/hr. If/when wildlife tracks were suspected, personnel further investigated on foot to confirm species identification and follow the tracks (to or from the roadway) to document movement patterns, behaviour, and habitat use (if/where possible). The following information was recorded:

- georeferencing (latitude and longitude) at the location of the tracks/wildlife crossing;
- species identity;
- number of distinct sets of tracks (i.e., group size);
- description of track behaviour in response to the road (e.g., crossed, on road, parallel to road, deflection, meander; Figure 9-1);
- height of snowbank measured at either the crossing point or likely point of deflection (i.e., the point where the animal redirected its path away from the road); and,
- site photo documentation and other miscellaneous survey observations (if/where applicable).

Potential factors influencing data capture and species identification included deterioration of snow conditions (i.e., from sun or wind) and visibility for initial detection. These factors were recorded during each survey and allocated a 'condition score' ranging from poor (limited visibility) to good (visibility adequate, some limitations) to excellent (no limitations on visibility).

Based on discussions during Terrestrial Environment Working Group (TEWG) meetings regarding snow track frequency, Baffinland agreed to implement snow track surveys and will make best efforts to conduct these surveys at a frequency of once per week along the Tote Road. Surveys will occur during snow cover seasons when environmental conditions permit the surveys to be completed effectively and safely[13]. The criteria for conditions include fresh snowfall (within the last 48 hours) and suitable light conditions. Table 9-1 outlines when snow track surveys were completed based on suitable survey conditions and safety.

[13] Survey condition criteria will be the ultimate driver of the number of surveys completed each month and may be less than a frequency of once per week. Surveys will not generally be possible in December, January, or February due to darkness.

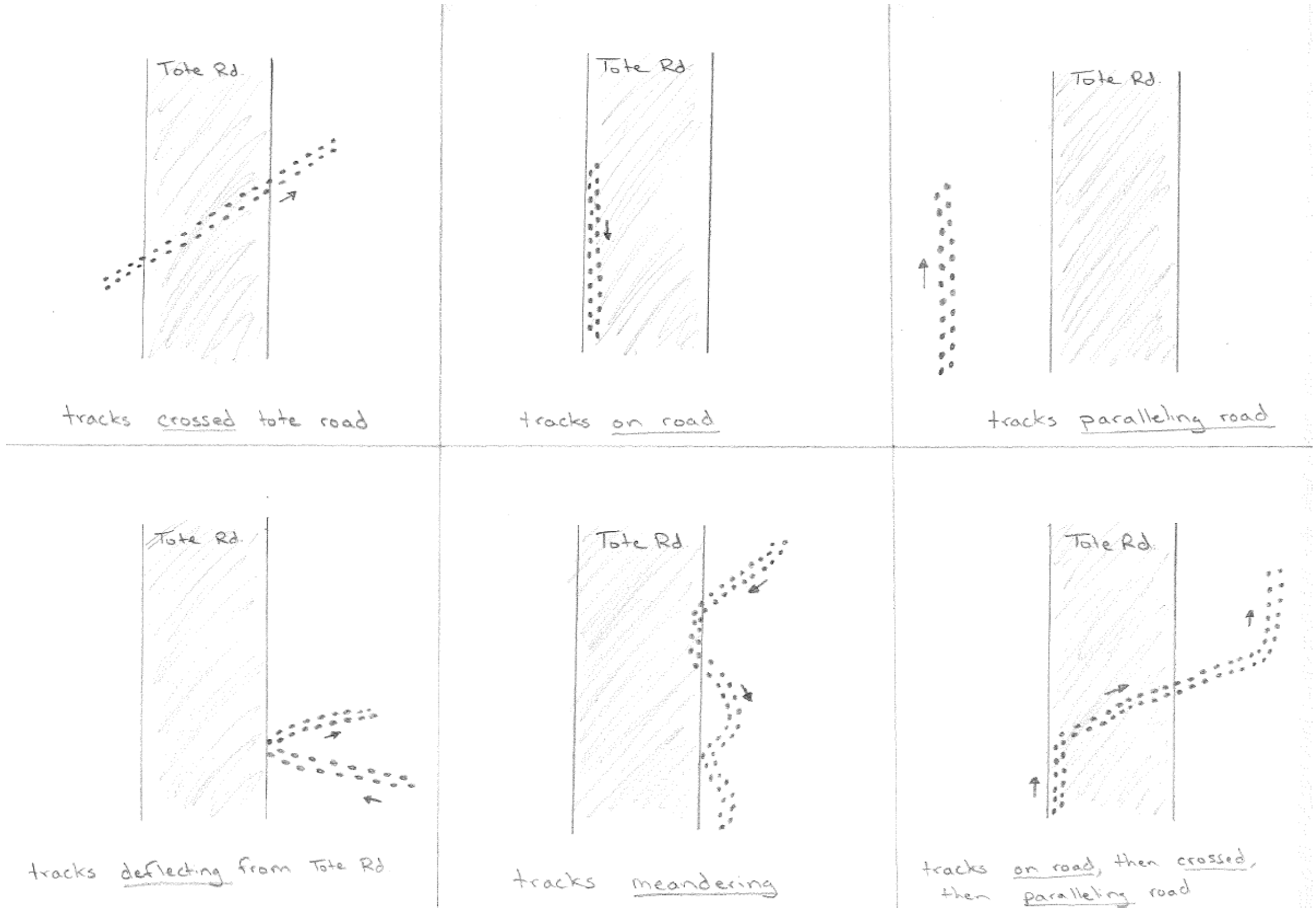



**Figure 9-1. Various behaviours observed along the Tote Road based on tracks.**

### 9.1.2 RESULTS AND DISCUSSIONS

Two hundred and seventy-three tracks were observed during 12 surveys completed after recent snowfall between February and November 2024[14] (Table 9-1). Of the 273 tracks recorded, 131 were noted as 'fresh tracks' (<24 hours old). Fox tracks (either Arctic fox [*Vulpes lagopus*] or red fox [*Vulpes vulpes*] as it is difficult to distinguish between their tracks) accounted for 86% of fresh tracks. Arctic hare (*Lepus arcticus*) accounted for 2% of fresh tracks. 'Other tracks' (i.e., lemming, Common Raven, unknown, and ptarmigan combined) accounted for 12% of fresh tracks. Based on the 2024 snow track survey results (Figure 9-2, Table 9-2), ptarmigan crossed the Tote Road or were noted on the Tote Road the most frequently, while foxes travelled parallel to the Tote Road the most frequently. Lemmings had the highest deflection response of all species, and Arctic hare meandered the most.

[14] On February 8, February 24, March 7, March 19, March 29, April 11, April 17, April 24, April 30, May 25, October 28, October 29, and November 12, 2024.

Table 9-1. Weekly snow track compliance tracker, rationale log, and observations.

| Week Start Date | Week End Date | Day Completed | Justification if Incomplete | Snow Age (hrs) | Snow Cover (%) | 24 hr Wind History | Track Observations |
|---|---|---|---|---|---|---|---|
| 31-Dec-23 | 06-Jan-24 | Not completed | Insufficient light | n/a | n/a | n/a | n/a |
| 07-Jan-24 | 13-Jan-24 | Not completed | Insufficient light | n/a | n/a | n/a | n/a |
| 14-Jan-24 | 20-Jan-24 | Not completed | Insufficient light | n/a | n/a | n/a | n/a |
| 21-Jan-24 | 27-Jan-24 | Not completed | Insufficient light | n/a | n/a | n/a | n/a |
| 28-Jan-24 | 03-Feb-24 | Not completed | Insufficient light | n/a | n/a | n/a | n/a |
| 04-Feb-24 | 10-Feb-24 | **08-Feb-23** | n/a | 36 | 85 | 2–15 km/hr | No tracks observed |
| 11-Feb-24 | 17-Feb-24 | **15-Feb-23** | n/a | 36 | 90 | 2–15 km/hr | Fox tracks (4 total) |
| 18-Feb-24 | 24-Feb-24 | Not completed | No fresh snowfall | n/a | n/a | n/a | n/a |
| 25-Feb-24 | 02-Mar-24 | Not completed | No fresh snowfall | n/a | n/a | n/a | n/a |
| 03-Mar-24 | 09-Mar-24 | **07-Mar-24** | n/a | 36 | 80 | 15–30 km/hr | Fox tracks (8 total) |
| 10-Mar-24 | 16-Mar-24 | Not completed | No fresh snowfall | n/a | n/a | n/a | n/a |
| 17-Mar-24 | 23-Mar-24 | **19-Mar-24** | n/a | 24 | 100 | None | Fox, lemming, ptarmigan, and unknown tracks (40 total) |
| 24-Mar-24 | 30-Mar-24 | **29-Mar-24** | n/a | 24 | 100 | None | Fox, lemming, Common Raven, and unknown tracks (27 total) |
| 31-Mar-24 | 06-Apr-24 | Not completed | Daily snow, no 24 hr period for prints to accumulate | n/a | n/a | n/a | n/a |
| 07-Apr-24 | 13-Apr-24 | **11-Apr-24** | n/a | 36 | 100 | 2–15 km/hr | Fox and lemming tracks (30 total) |
| 14-Apr-24 | 20-Apr-24 | **17-Apr-24** | n/a | 24 | 100 | 2–15 km/hr | Fox, Arctic hare, and Common Raven tracks (39 total) |
| 21-Apr-24 | 27-Apr-24 | **24-Apr-24** | n/a | 24 | 100 | 2–15 km/hr | Fox and Arctic hare tracks (20 total) |
| 28-Apr-24 | 04-May-24 | **30-Apr-24** | n/a | 24 | 100 | 2–15 km/hr | Fox, Arctic hare, and unknown tracks (25 total) |
| 05-May-24 | 11-May-24 | Not completed | No fresh snowfall | n/a | n/a | n/a | n/a |
| 12-May-24 | 18-May-24 | Not completed | No fresh snowfall | n/a | n/a | n/a | n/a |
| 19-May-24 | 25-May-24 | **25-May-24** | n/a | 36 | 75 | 2–15 km/hr | Fox and Arctic hare tracks (11 total) |
| 26-May-24 | 01-Jun-24 | Not completed | No fresh snowfall | n/a | n/a | n/a | n/a |

Table 9-1. Weekly snow track compliance tracker, rationale log, and observations.

| Week Start Date | Week End Date | Day Completed | Justification if Incomplete | Snow Age (hrs) | Snow Cover (%) | 24 hr Wind History | Track Observations |
|---|---|---|---|---|---|---|---|
| 02-Jun-24 | 08-Jun-24 | Not completed | No fresh snowfall | n/a | n/a | n/a | n/a |
| 09-Jun-24 | 15-Jun-24 | Not completed | No fresh snowfall | n/a | n/a | n/a | n/a |
| 16-Jun-24 | 22-Jun-24 | Not completed | No fresh snowfall | n/a | n/a | n/a | n/a |
| 23-Jun-24 | 29-Jun-24 | Not completed | No fresh snowfall | n/a | n/a | n/a | n/a |
| 30-Jun-24 | 06-Jul-24 | Not completed | No fresh snowfall | n/a | n/a | n/a | n/a |
| 07-Jul-24 | 13-Jul-24 | Not completed | No fresh snowfall | n/a | n/a | n/a | n/a |
| 14-Jul-24 | 20-Jul-24 | Not completed | No fresh snowfall | n/a | n/a | n/a | n/a |
| 21-Jul-24 | 27-Jul-24 | Not completed | No fresh snowfall | n/a | n/a | n/a | n/a |
| 28-Jul-24 | 03-Aug-24 | Not completed | No fresh snowfall | n/a | n/a | n/a | n/a |
| 04-Aug-24 | 10-Aug-24 | Not completed | No fresh snowfall | n/a | n/a | n/a | n/a |
| 11-Aug-24 | 17-Aug-24 | Not completed | No fresh snowfall | n/a | n/a | n/a | n/a |
| 18-Aug-24 | 24-Aug-24 | Not completed | No fresh snowfall | n/a | n/a | n/a | n/a |
| 25-Aug-24 | 31-Aug-24 | Not completed | No fresh snowfall | n/a | n/a | n/a | n/a |
| 01-Sep-24 | 07-Sep-24 | Not completed | No fresh snowfall | n/a | n/a | n/a | n/a |
| 08-Sep-24 | 14-Sep-24 | Not completed | No fresh snowfall | n/a | n/a | n/a | n/a |
| 15-Sep-24 | 21-Sep-24 | Not completed | No fresh snowfall | n/a | n/a | n/a | n/a |
| 22-Sep-24 | 28-Sep-24 | Not completed | No fresh snowfall | n/a | n/a | n/a | n/a |
| 29-Sep-24 | 05-Oct-24 | Not completed | No fresh snowfall | n/a | n/a | n/a | n/a |
| 06-Oct-24 | 12-Oct-24 | Not completed | No fresh snowfall | n/a | n/a | n/a | n/a |
| 13-Oct-24 | 19-Oct-24 | Not completed | No fresh snowfall | n/a | n/a | n/a | n/a |
| 20-Oct-24 | 26-Oct-24 | Not completed | No fresh snowfall | n/a | n/a | n/a | n/a |
| 27-Oct-24 | 02-Nov-24 | **28-Oct-24** | n/a | 24 | 100 | 2–15 km/hr | Fox, Arctic hare, lemming, ptarmigan, and Common Raven tracks (43 total) |
| 03-Nov-24 | 09-Nov-24 | Not completed | Daily snow, no 24 hr period for prints to accumulate | n/a | n/a | n/a | n/a |
| 10-Nov-24 | 16-Nov-24 | **12-Nov-24** | n/a | 35 | 90 | 15–30 km/hr | Fox, Arctic hare, and lemming tracks (26 total) |

Table 9-1. Weekly snow track compliance tracker, rationale log, and observations.

| Week Start Date | Week End Date | Day Completed | Justification if Incomplete | Snow Age (hrs) | Snow Cover (%) | 24 hr Wind History | Track Observations |
|---|---|---|---|---|---|---|---|
| 17-Nov-24 | 23-Nov-24 | Not completed | Insufficient light | n/a | n/a | n/a | n/a |
| 24-Nov-24 | 30-Nov-24 | Not completed | Insufficient light | n/a | n/a | n/a | n/a |
| 01-Dec-24 | 07-Dec-24 | Not completed | Insufficient light | n/a | n/a | n/a | n/a |
| 08-Dec-24 | 14-Dec-24 | Not completed | Insufficient light | n/a | n/a | n/a | n/a |
| 15-Dec-24 | 21-Dec-24 | Not completed | Insufficient light | n/a | n/a | n/a | n/a |
| 22-Dec-24 | 28-Dec-24 | Not completed | Insufficient light | n/a | n/a | n/a | n/a |
| 29-Dec-24 | 04-Jan-25 | Not completed | Insufficient light | n/a | n/a | n/a | n/a |

**Table 9-2. Species track response to the Tote Road from February to November 2024.**

| Species | % Crossed | % On Road | % Parallel to Road | % Deflection | % Meander |
|---|---|---|---|---|---|
| Arctic Hare | 45 | 9 | 27 | 0 | 18 |
| Fox | 40 | 11 | 35 | 11 | 3 |
| Lemming | 25 | 5 | 25 | 30 | 15 |
| Ptarmigan | 67 | 33 | 0 | 0 | 0 |
| Common Raven | 50 | 25 | 25 | 0 | 0 |
| Unknown | 67 | 0 | 33 | 0 | 0 |

Representative site survey conditions and observed tracks are shown in Photo 9-1 to Photo 9-4. Observed track locations and direction of travel in relation to the Tote Road are presented in Map 9-1. Snow track surveys will continue regularly after snowfalls and will be completed more frequently if/when caribou are observed near the Project—to be informed by other monitoring inputs, including HOL monitoring data, incidental monitoring data, and/or observations during aerial surveys.

**Inter-annual Trend** — No caribou, Arctic wolf (*Canis lupus*), or large mammal tracks were observed during snow track surveys completed between 2014 and 2024. Species track composition was similar to previous years, but there was a significant increase in the overall numbers of fox tracks. The increase in fox tracks may be a result of their mobile nature combined with increased tracking frequency in 2024 (Figure 9-3).

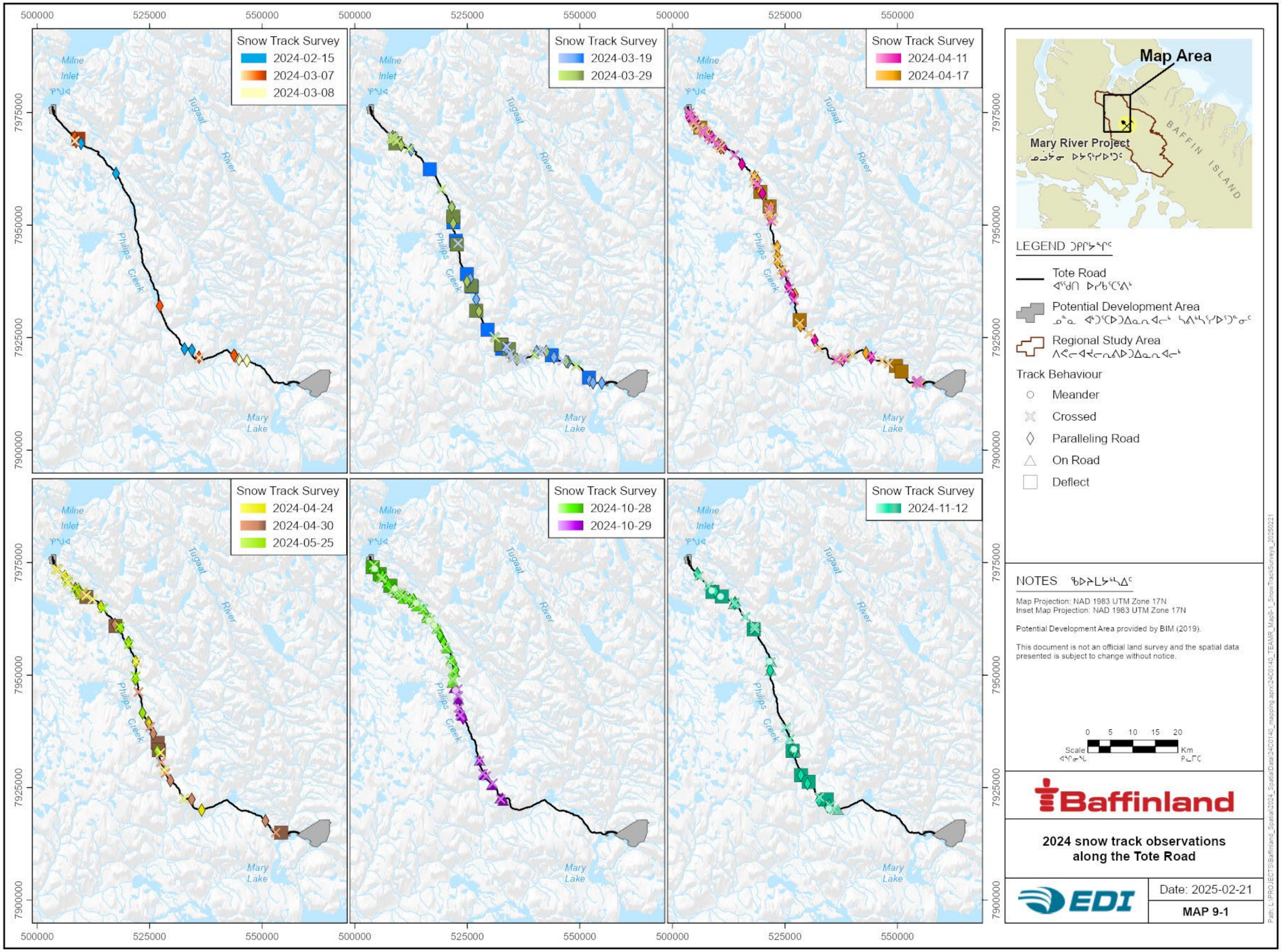

Snow Track Survey
2024-02-15
2024-03-07
2024-03-08
2024-03-19
2024-03-29
2024-04-11
2024-04-17
2024-04-24
2024-04-30
2024-05-25
2024-10-28
2024-10-29
2024-11-12
Milne Inlet
Tugaat River
Phillips Creek
Mary Lake
Map Area
Mary River Project
BAFFIN ISLAND
LEGEND
Tote Road
Potential Development Area
Regional Study Area
Track Behaviour
Meander
Crossed
Paralleling Road
On Road
Deflect
NOTES
Map Projection: NAD 1983 UTM Zone 17N
Inset Map Projection: NAD 1983 UTM Zone 17N
Potential Development Area provided by BIM (2019).
This document is not an official land survey and the spatial data presented is subject to change without notice.
Scale
0 5 10 15 20
Km
Baffinland
2024 snow track observations along the Tote Road
EDI
Date: 2025-02-21
MAP 9-1

**Photo 9-1. Fox tracks parallel to the Tote Road.**

**Photo 9-2. Baffinland staff completing track survey and recording old hare tracks.**

**Photo 9-3. Fresh Arctic hare tracks alongside the Tote Road.**

**Photo 9-4. Small mammal track deflecting from the Tote Road.**

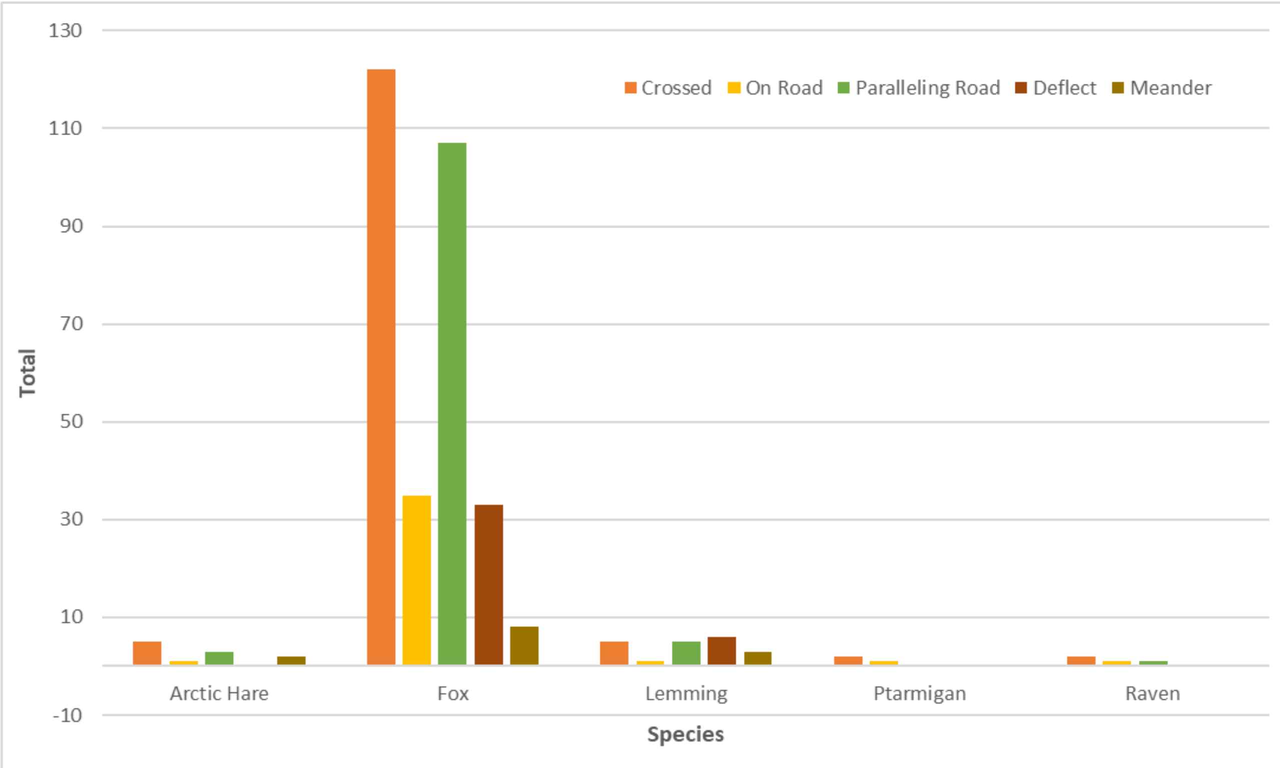



**Figure 9-2. 2024 Tote Road snow track response based on species.**

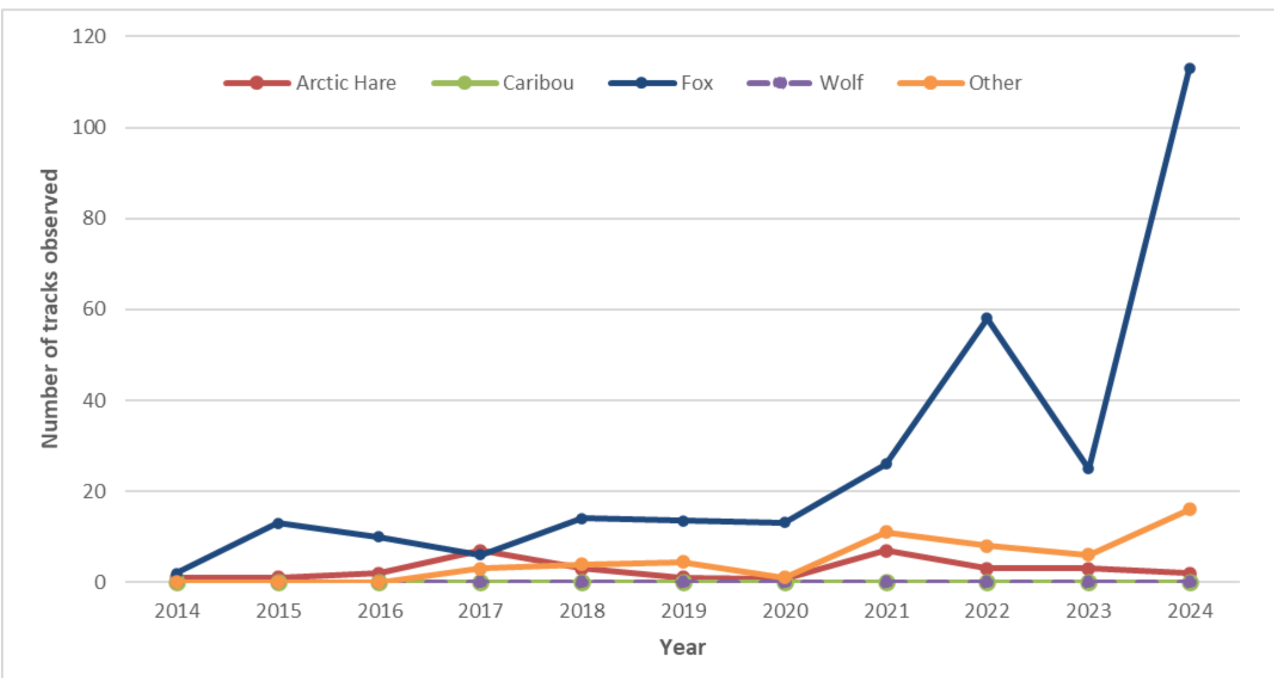



**Figure 9-3. 2024 inter-annual trends — snow track survey (2014 to 2024).**
*"Fox" includes both red and Arctic foxes as it is difficult to distinguish based only on tracks. 'Other' refers to ptarmigan and small mammals such as lemmings and ermines.*

## 9.2 SNOWBANK HEIGHT MONITORING

The following PCs address uncertainty in the Final Environmental Impact Statement (Baffinland Iron Mines Corporation 2012) and Early Revenue Program Final Environmental Impact Statement (Baffinland Iron Mines Corporation 2013a) concerning caribou movement (Nunavut Impact Review Board 2020):

- **PC #53ai** *"Specific measures intended to address the reduced effectiveness of visual protocols for the Milne Inlet Tote Road and access roads/trails during times of darkness and low visibility must be included."*
- **PC #53c** *"The Proponent shall demonstrate consideration for…Evaluation of the effectiveness of proposed caribou crossing over the railway, Milne Inlet Tote Road and access roads as well as the appropriate number."*

To address these PCs, Baffinland committed to various mitigation measures to facilitate effective caribou crossings of the Tote Road and reduce potential barriers to caribou movement. Mitigation measures include snowbank management by (1) maintaining snowbank heights at <100 cm along roadways and (2) smoothing/contouring snowbanks along the edges of roadways to reduce the probability of drifting snow. These mitigations were designed to minimize barriers to caribou crossing the Tote Road, improve driver visibility, and reduce potential wildlife-vehicle collisions. In conjunction with the snow track surveys (Section 9.1), snowbank height monitoring was implemented to verify that these mitigation measures are effective.

### 9.2.1 METHODS

Snowbank height monitoring was completed monthly on one day in January, February, March, April, November, and December 2024. During each survey, Baffinland personnel measured snowbank heights at up to 50 randomized kilometre marker locations along the Tote Road (e.g., KM5.8, KM16, and KM42), being mindful of safety and access[15]. In response to input from the TEWG, survey locations were randomly chosen to eliminate potential survey biases and to better capture/verify snowbank conditions along the Tote Road. At each survey location, Baffinland personnel took two snowbank height measurements (east- and west-side snowbanks), photographed site conditions, and recorded any other relevant information (Photo 9-5 to Photo 9-7). Due to vehicle traffic and safety considerations, anywhere from 65 to 98 measurements were captured during each monitoring survey and deemed either 'compliant' (≤100 cm) or 'non-compliant' (>100 cm).

[15] Occasionally, measurements could not be taken due to low visibility by ore haul truck drivers and/or high traffic at a given location. Safety concerns were the primary reason for not stopping at a survey location to take measurements (e.g., the Tote Road was too narrow to pull over and park while still allowing ore haul trucks to safely pass).

### 9.2.2 RESULTS AND DISCUSSIONS

Snowbank measurements across all surveys ranged from 0 to 200+ cm in height. Compliance of snowbank height ranged from 76 to 97% (per survey) and averaged 86% for all surveys combined (Table 9-3). Mean snowbank height per survey typically ranged between 34 to 59 cm. Snowbank height typically increased throughout winter because of cumulative snowfall. To reduce snowbank height and drifting, efforts were made to 'feather' (i.e., push back and redistribute) large snow piles after substantial snowfalls (Photo 9-7). Snowbanks that exceeded the 100 cm height threshold (Figure 9-4) typically occurred where snow could not be adequately redistributed for safety and/or operational reasons (e.g., steep or uneven topography, narrow or winding road segments).

**Inter-annual Trend** — Most snowbank height measurements collected between 2014 and 2024 complied with the 100 cm height limit. Snowbank height compliance was similar during the 2014 to 2016 and 2018 to 2024 monitoring periods, ranging between 80 to 97%. Snowbank heights in 2017 had the lowest overall compliance rate at 66% (Figure 9-5).

**Table 9-3. 2024 Tote Road snowbank height monitoring.**

| Survey Date | Number of Measurements | Compliances | Exceedances | Percent Compliance |
|---|---|---|---|---|
| January 12, 2024 | 70 | 56 | 7 | 80% |
| February 20, 2024 | 76 | 69 | 10 | 91% |
| March 12, 2024 | 83 | 65 | 8 | 78% |
| April 19, 2024 | 78 | 76 | 9 | 97% |
| November 4, 2024 | 88 | 83 | 11 | 94% |
| December 15, 2024 | 94 | 71 | 2 | 76% |
| **2024 Total** | **489** | **420** | **47** | **86%** |

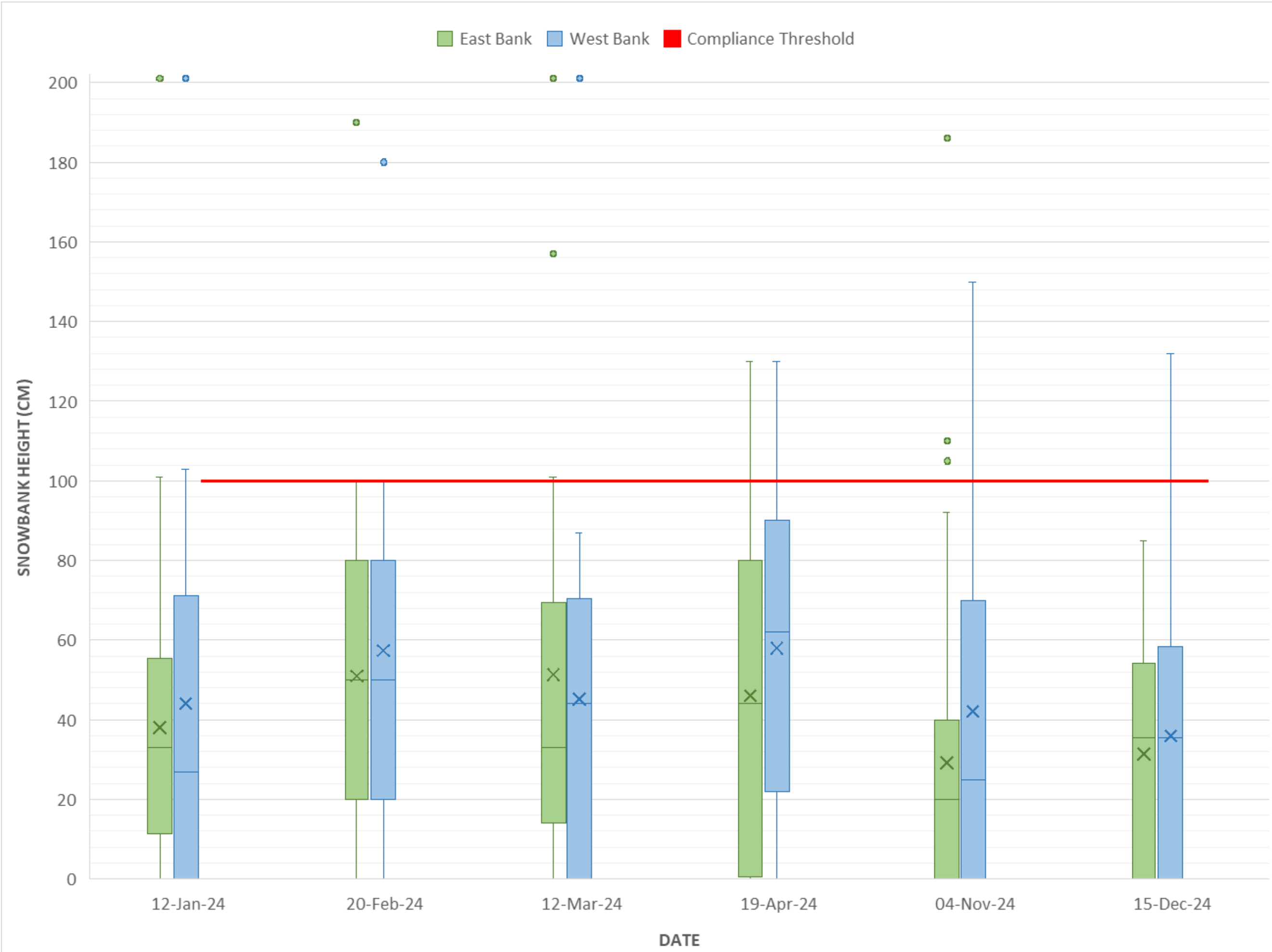



**Figure 9-4.** **2024 snowbank height monitoring time series and distribution for snowbank heights.**
*'X' represents the mean snowbank height for each survey. The horizontal line represents the median. The box represents the first and third quartiles. The whiskers represent the minimum and maximum values within 1.5 times the interquartile range.*


**Photo 9-5. Compliant snowbank (40 cm) at KM25.**

**Photo 9-6. Compliant snowbank (0 cm) with indications of snowbank management (feathering).**

**Photo 9-7. Snowbank management (in progress) to facilitate wildlife crossing and improve driver visibility.**

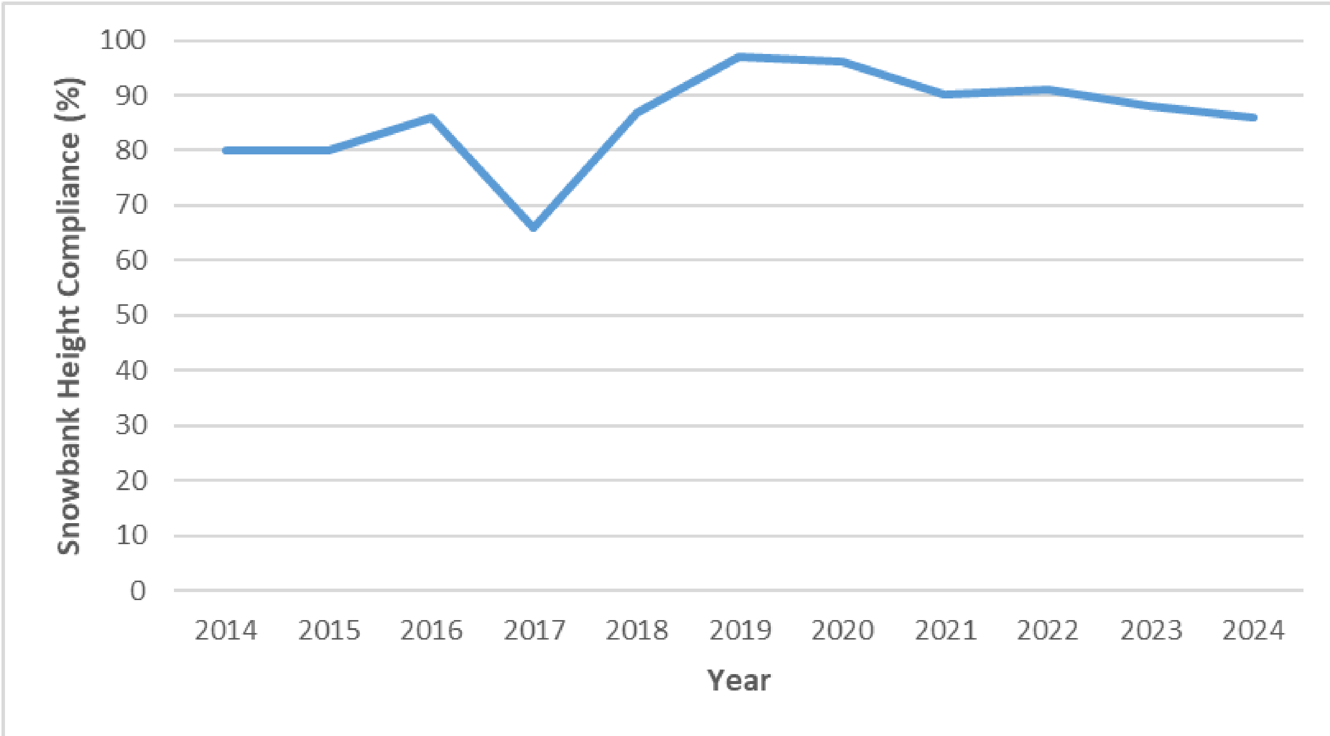



**Figure 9-5. 2024 inter-annual trends — snowbank height compliance monitoring (2014 to 2024).**

## 9.3 HEIGHT OF LAND SURVEYS

The following PCs were developed to monitor and mitigate potential disturbance to caribou calving near or interacting with the Project (Nunavut Impact Review Board 2020):

- **PC #53b** *"Monitoring and mitigation measures at points where the railway, roads, trails, and flight paths pass through caribou calving areas, particularly during caribou calving times."*
- **PC #54b** *"Monitoring for caribou presence and behaviour during railway and Tote Road construction."*
- **PC #58b** *"A detailed analysis of wildlife responses to operations with emphasis on calving and post-calving caribou behaviour and displacements (if any), and caribou responses to and crossing of the railway, the Milne Inlet Tote Road and associated access roads/trails."*

To address these PCs, HOL surveys were initiated in 2013 to study caribou habitat use and behavioural reactions to human activities near the Project footprint—particularly during the calving season (i.e., May and June). Behaviour sampling can provide insight into responses to environmental stimuli (Martin and Bateson 1993). The HOL surveys are intended to examine if/how caribou (especially cows with calves) respond to Project-related activities and infrastructure. As of 2019, North Baffin caribou were at a low point in their 60 to 80-year population cycle (Government of Nunavut 2019), and caribou observations during surveys or recorded incidentally are infrequent. The HOL surveys will support long-term surveillance monitoring of caribou behaviour throughout the life of the Project and provide information to verify predicted Project-related effects on caribou movement and habitat use.

### 9.3.1 METHODS

The HOL survey methods were developed in consultation with the TEWG (specifically the Mittimatalik Hunters and Trappers Organization [MHTO]) and incorporated Inuit Qaujimajatuqangit into strategies for detecting caribou (EDI Environmental Dynamics Inc. 2019). The HOL surveys comprise observations from a high point of land (i.e., to increase the observable area) for a prescribed amount of time using binoculars and a spotting scope. The objective is to detect and record caribou in proximity to Project infrastructure. The 2024 HOL surveys were completed in early summer (May 29 to June 10, 2024) to observe caribou during the calving period. Opportunistic late-winter HOL surveys were not completed in 2024.

Surveys were completed at pre-established HOL stations (#1 to 24) distributed throughout the Project footprint, typically at the highest points of the landscape, to optimize the viewshed (Map 9-2). Project components (e.g., the Tote Road, accommodation complexes, Deposit No. 1) were visible from each station; however, a 360-degree viewshed was seldom achieved due to obstruction from landscape/terrain. The locations of the stations were selected based on strategic positioning along the Project footprint, elevation gain (i.e., for improved viewshed), and accessibility during spring conditions. Since the initiation of HOL surveys, stations 1 to 16 have generally been accessed on foot, whereas stations 17 to 24 have generally been accessed via helicopter (e.g., due to water bodies, terrain, and travel distances).

#### 9.3.1.1 Data Collection

Two qualified biologists from EDI Environmental Dynamics Inc. (EDI) completed the 2024 HOL surveys with the participation of Baffinland personnel and two Inuit assistants. The survey procedure involved one observer scanning the viewshed with a spotting scope (i.e., focusing on the distant landscape) and three observers scanning the viewshed with binoculars (i.e., focusing on the intermediate and near landscape). The aim was to conduct a minimum of two surveys at each HOL station for at least 40 minutes per survey. Using field forms, the following information was recorded:

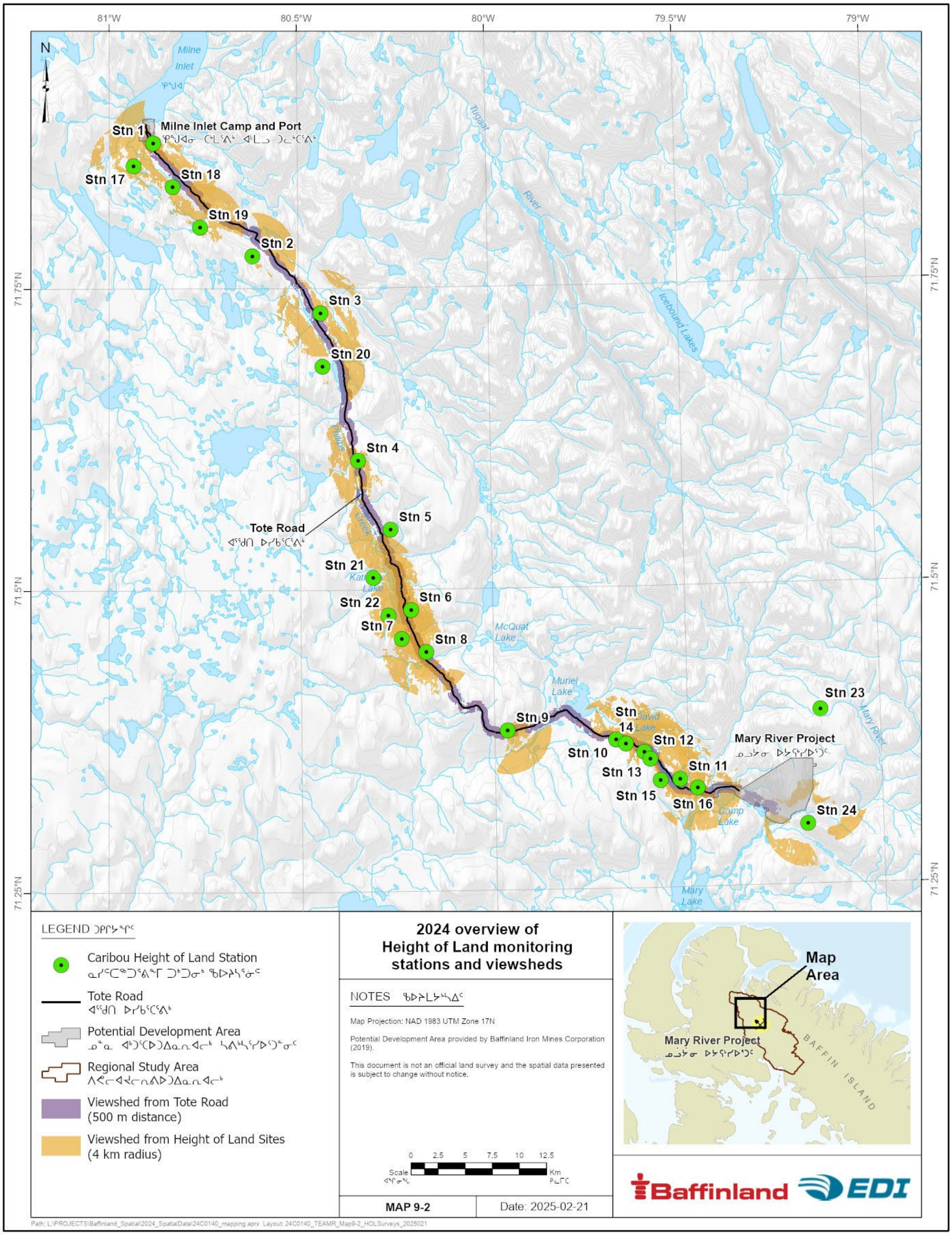
- station number (with georeferencing);
- location description (direction from road, aspect, terrain, other identifying features);
- general habitat description (vegetation and soil, if/where possible);
- presence of snow cover on landscape;
- photograph numbers (taken from multiple cardinal directions); and,
- survey observation timeframe (start/end times).

If caribou were observed, the survey team monitored behaviour following established protocols described in the 2013 Annual Monitoring Report (Baffinland Iron Mines Corporation 2019). Depending on the number of caribou, observations were made as either a scan or focal sample (Martin and Bateson 1993). Activity categories (e.g., walking, foraging, running, bedded) were assigned and tallied at two-minute intervals for scan sampling. For focal sampling, activity observations were recorded at two-minute intervals. Project-related activities or events (e.g., truck travel along the Tote Road) were also recorded to document any unique responses. Distances and directions of the observed individual or group to and from Project infrastructure were estimated (if/where applicable) and ground-truthed using a Geographic Positioning System (GPS).

#### 9.3.1.2 Modifications to Survey Procedures

In 2016, viewshed modelling and mapping were completed to determine the amount of viewable area at each HOL survey station. A total of 227 km² were surveyed within the viewshed area, with viewshed ranging from 5 to 22 km² at each HOL station (Map 9-2). Refer to Section 4.3.1 of the 2016 Annual Monitoring Report for a detailed description of viewshed modelling and mapping (EDI Environmental Dynamics Inc. 2017).

During the June 2019 TEWG meeting, the MHTO suggested that HOL station locations be re-evaluated to incorporate historic migration, calving patterns, and any new information relevant to HOL goals and methodologies. In 2020, the survey time was increased (to what it is presently) by completing at least two station visits for 40 minutes (previously 20 minutes). To date, Baffinland has not been able to confirm alternate locations for the HOL stations with the MHTO, but will continue to consult with MHTO representatives on the program via the TEWG and other engagement methods.


81°W
80.5°W
80°W
79.5°W
79°W
71.75°N
71.5°N
71.25°N
N
Milne Inlet
Milne Inlet Camp and Port
Stn 1
Stn 17
Stn 18
Stn 19
Stn 2
Stn 3
Stn 20
Stn 4
Tote Road
Stn 5
Stn 21
Katiktok Lake
Stn 22
Stn 6
Stn 7
Stn 8
McQuat Lake
Muriel Lake
Stn 9
Stn 10
Stn 14
David Lake
Stn 12
Stn 13
Stn 15
Stn 11
Stn 16
Camp Lake
Mary River Project
Stn 23
Stn 24
Mary River
Mary Lake
Tugaat River
Iceboound Lakes
Phillips Creek
LEGEND
Caribou Height of Land Station
Tote Road
Potential Development Area
Regional Study Area
Viewshed from Tote Road (500 m distance)
Viewshed from Height of Land Sites (4 km radius)
2024 overview of Height of Land monitoring stations and viewsheds
NOTES
Map Projection: NAD 1983 UTM Zone 17N
Potential Development Area provided by Baffinland Iron Mines Corporation (2019).
This document is not an official land survey and the spatial data presented is subject to change without notice.
0 2.5 5 7.5 10 12.5
Scale
Km
MAP 9-2
Date: 2025-02-21
Map Area
Mary River Project
BAFFIN ISLAND
Baffinland
EDI
Path: L:\PROJECTS\Baffinland_Spatial\2024_SpatialData\24C0140_mapping.aprx Layout: 24C0140_TEAMR_Map9-2_HOLSurveys_2025021

### 9.3.2 RESULTS AND DISCUSSIONS

Fifteen caribou were observed during the HOL surveys in 2024 on June 3, 4, 5, and 8. Caribou were observed at four HOL stations (i.e., 12, 13, 14, and 24) in groups ranging from one to eight individuals. Although it was not possible to accurately sex and age the caribou due to observation distances, no 2024 calves were noted in the groups. No other indicators of caribou (i.e., fecal matter, hair, or evidence of foraging such as cratering) were observed during the HOL surveys.

In total, 32 hours and 25 minutes of HOL surveys were completed in 2024 with a targeted minimum of 40 minutes of survey time per station. Surveys were completed in early summer (May 29 to June 10, 2024) during the peak calving season. All stations except HOL station 23 (due to poor visibility) had two visits completed.

Visibility conditions during the HOL surveys were 'excellent' or 'good' during all surveys. Most stations had high snow cover (ranging from 80 to 100%) across the landscape.

**Inter-annual Trend** — Fifteen caribou were observed in the PDA during the HOL surveys in 2024. This is the first time since 2013 that caribou observations have coincided with the HOL surveys (Figure 9-6). This trend has previously been consistent (year-over-year) despite changes to survey procedures (i.e., increased survey time/effort) and supplementary/ancillary data capture (e.g., via deployment of remote cameras). The change in observations in 2024 may suggest caribou numbers are beginning to increase, and more caribou may be seen in the Project footprint in coming years.

As mentioned, the current caribou ecology on North Baffin Island (i.e., low population numbers and low movement) is a primary factor contributing to a lack of caribou observations. Caribou densities in the region would need to be considerably higher to evaluate potential change in caribou behaviour and/or habitat use due to the Project (EDI Environmental Dynamics Inc. 2022b). In the interim, HOL surveys provide important data on individual-level caribou response to Project interactions and inform potential mitigations.

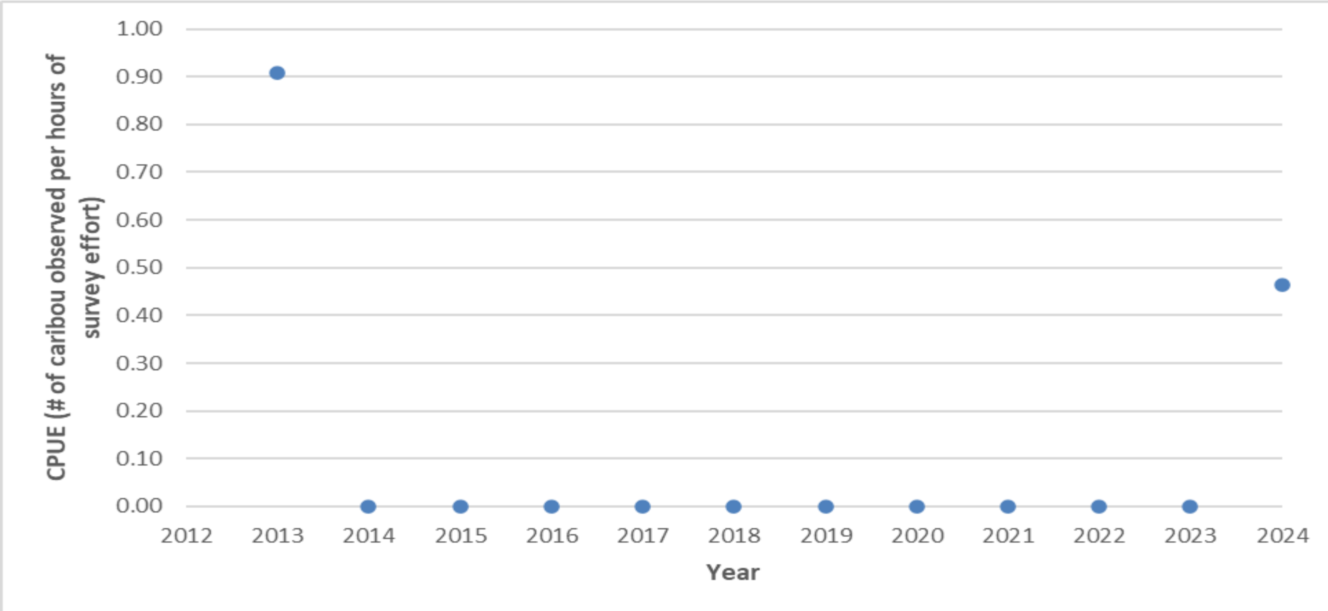



**Figure 9-6. 2024 inter-annual trends — Height of Land surveys (2013 to 2024 – post-baseline).**
*Note: CPUE = Catch per unit effort (i.e., number of caribou observed per hour of survey effort).*

## 9.4 REMOTE CAMERAS

The following PC was developed to address concerns regarding potential caribou crossings of linear features (i.e., train or vehicle traffic) and constraining of wildlife movement across roadways (Nunavut Impact Review Board 2020):

- **PC #54dii** *"The Proponent shall provide an updated Terrestrial Environmental Management and Monitoring Plan which shall include…Snow track surveys during construction and the use of video-surveillance to improve the predictability of caribou exposure to the railway and Tote Road. Using the result of this information, an early warning system for caribou on the railway and Tote Road shall be developed for operation."*

To address this PC—and related comments/recommendations from the MHTO and other TEWG members to increase the capacity for wildlife surveillance at the Project—a remote camera monitoring program was initiated in the summer of 2021. The program involves the deployment of remote cameras at HOL survey stations (described in Section 9.3) to supplement data capture and evaluation of caribou movement at the Project. Remote cameras provided a continuous observation alternative from January 2024 to December 2024.

### 9.4.1 METHODS

In the summer of 2021, EDI and Baffinland personnel deployed 12 Reconyx HP2x HyperFire 2 Professional Cover IR remote cameras (two per station) at strategic locations corresponding with HOL survey stations (i.e., stations 1, 3, 4, 6, 10, and 16; Map 9-2; Appendix D) to optimize wildlife observations along the Tote Road. Remote camera stations are shown on Map 9-2, and photo documentation of the camera stations (site conditions and installations) is provided in Appendix D.

Cameras were distributed across an open landscape with relatively few obstacles. Due to the large field of view, the image quality and detectability deteriorate further from the camera, reducing the ability to identify and locate distant wildlife accurately. Wildlife in the PDA do not necessarily have established and/or defined 'usage' trails. Therefore, predicting higher usage areas and movement corridors for larger wildlife species to inform camera deployment relied on knowledge of the Project setting and previous survey observations.

Baffinland personnel were responsible for camera care and maintenance (i.e., battery and SD card exchanges). The remote camera stations were accessed via helicopter, vehicle, or foot. Most cameras were established within 500 m of an access trail or road. Cameras were installed using a rock drill to anchor the units to the ground using a steel/rebar tripod affixed with steel clamps. Cameras were set approximately chest high and positioned to capture an optimal viewshed. Cameras were programmed[16] before deployment and tested/checked on site (after installation) to verify proper function and viewshed.

After initial deployment in 2021, cameras were periodically checked (two to four times annually) to provide controls for camera malfunctions, realignment, and servicing of batteries and SD cards. Efforts were made to schedule checks at regular intervals to prevent large-scale data loss and, at times conducive to site personnel for logistical and safety reasons (i.e., avoidance of extreme cold temperatures and large distances from vehicles during winter). All cameras were checked by Baffinland staff in December 2023 and again by EDI staff in June 2024, in conjunction with the HOL surveys.

Data were relayed to EDI personnel for photo analysis of any/all wildlife observations, focusing on caribou and large carnivores. Wildlife activities were carefully investigated and documented. Data analysis applied image pre-screening using "EcoAssist": an open-sourced AI incorporating the MegaDetector[17] model to identify animals, people, and vehicles in camera images. After pre-screening, photo analysis was streamlined using the third-party analytical software program Timelapse2 (Saul 2022). This program, and its sister software program, Timelapse Template Editor, facilitated the development of a custom template that extracted specified metadata from images and defined the Project-specific data collection. The image collection was filtered to review only wildlife, people, or vehicles, or set date ranges. Set date ranges of known caribou

[16] The Reconyx HP2X HyperFire 2 Professional Covert IR cameras are motion and infrared triggered and were set to take three consecutive photos when activated ('Rapidfire' mode) with no delay between triggered events. The cameras were programmed to capture time-lapse photos each hour, 24 hours per day, to document baseline environmental conditions and surrounding landscape. Each photo was 'timestamped' (time/date/temperature).

[17] This model is trained on several million images from a variety of ecosystems, and is especially useful in the data analysis workflow for eliminating blank images from datasets (i.e., images without animals, people, or vehicles), thus increasing the efficiency of image processing and data extraction (Fennell et al. 2022, Addax Data Science and Smart Parks).

occurrences as recorded by Tote Road users and site personnel were also used to refine selected images. The final image collection was then reviewed by a Qualified Wildlife Specialist who evaluated and recorded data metrics were recorded for each wildlife detection, including site ID, date and time, temperature, species, age, sex (where possible), number of individuals, behaviour, image trigger, sequence, episode, and general comments. If/when a cluster of interrelated wildlife detections were recorded, the set of images was classified as the same event when the images were taken less than 10 minutes apart. This allowed reviewers to determine minimum total counts that may include multiple sets of triggers and animals as they moved past a camera or an individual that was active in front of a camera for a long period of time.

### 9.4.2 RESULTS AND DISCUSSIONS

Over 336,000 photos (approximately 106 GB) were captured from the 12 remote cameras between January 2024 and December 2024. Table 9-4 summarizes the remote camera data returns at each HOL/camera station. Variability in the data capture was attributed to obstructions of the field of view (e.g., due to blowing snow, ice crystals, or fog) or camera stoppage (e.g., loss of power or exceedance of information storage capacity).

Fifty-eight wildlife detections were captured across all combined cameras. Nine species of mammals and birds were identified from the 12 remote cameras. No wildlife were recorded at the Baffin-8 or Baffin-12 remote cameras. As seen in Figure 9-7, the highest number of wildlife detections was tied between unidentified bird species and caribou (15 detections each), followed by Arctic hare (10 detections) and Arctic fox (7 detections). Observations of smaller mammals and birds were consistent with snow track and HOL surveys from 2024 and previous years (Figure 9-2, Figure 9-3). No carnivores (i.e., wolves or bears) were captured in photos taken by the remote cameras. Larger carnivores and ungulates are not commonly seen on site, and, therefore, have a low probability of being detected on the remote cameras.

The Baffin-6 remote camera recorded the highest species richness at six species (Figure 9-8). The Baffin-11 remote camera recorded the first images of caribou (Photo 9-8 to Photo 9-11) since the remote camera program was initiated in 2021. These images were flagged after manual vetting using known date ranges where caribou were seen and reported adjacent to the Tote Road (Section 9.7). All caribou images were manually vetted and flagged because the EcoAssist software did not successfully identify the caribou in the distance.

The Baffin-8 and Baffin-11 remote cameras stopped recording images before camera servicing in late May 2024 and again in early January 2025, likely because nearby vehicle traffic triggered excessive photo captures and drained the batteries.

Table 9-4. 2024 remote camera survey summary of remote camera data returns.

| Site Name | Camera ID | Year 3 – Start Date | Year 3 – End Date | # Species Recorded | # Photos | Notes |
|---|---|---|---|---|---|---|
| HOL 6 | Baffin-1 | December 28, 2023 | January 5, 2025 | 2 | 12,322 | — |
| HOL 16 | Baffin-2 | December 25, 2023 | January 2, 2025 | 1 | 10,064 | — |
| HOL 1 | Baffin-3 | December 24, 2023 | January 5, 2025 | 1 | 9,294 | — |
| HOL 1 | Baffin-4 | December 24, 2023 | January 5, 2025 | 2 | 12,754 | — |
| HOL 6 | Baffin-5 | December 28, 2023 | January 5, 2025 | 2 | 9,055 | — |
| HOL 16 | Baffin-6 | December 25, 2023 | January 2, 2025 | 6 | 30,137 | Lots of road traffic triggers. |
| HOL 3 | Baffin-7 | December 28, 2023 | January 5, 2025 | 1 | 9,132 | — |
| HOL 4 | Baffin-8 | December 25, 2023 | October 20, 2024 | 0 | 101,823 | Excessive triggers from road traffic drained batteries (February 27, 2024) before June 2024 check. |
| HOL10 | Baffin-9 | December 25, 2023 | January 2, 2025 | 2 | 9,060 | — |
| HOL 4 | Baffin-10 | December 25, 2023 | January 4, 2025 | 1 | 9,163 | — |
| HOL 10 | Baffin-11 | December 25, 2023 | October 18, 2024 | 2 | 114,930 | Excessive triggers from road traffic drained batteries (March 14, 2024) before June 2024 check. |
| HOL 3 | Baffin-12 | December 28, 2023 | January 5, 2025 | 0 | 8,967 | — |

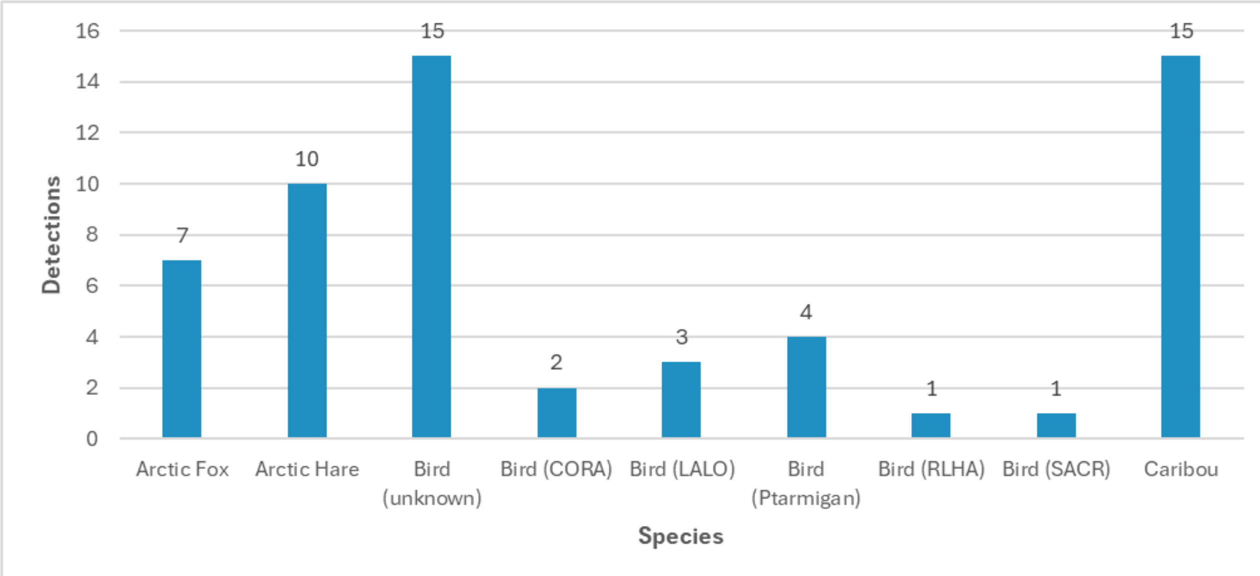



Figure 9-7. January to December 2024 remote camera survey – total wildlife detections per species.

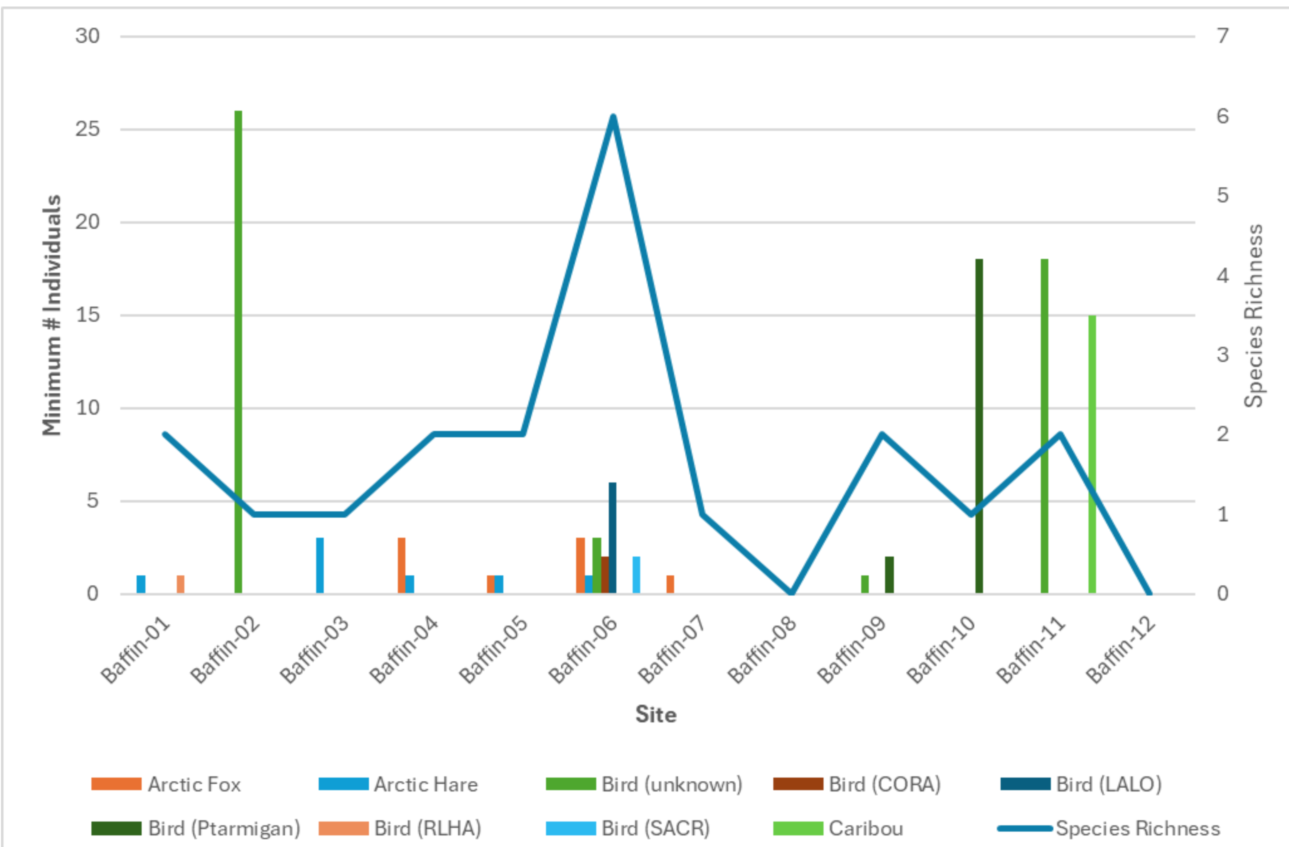



Figure 9-8. January to December 2024 remote camera survey – minimum number of species observations per camera station (bars) and species richness for each camera station (line).

*Note: bird species codes = Common Raven (CORA), Lapland Longspur (LALO), Rough-legged Hawk (RLHA), and Sandhill Crane (SACR).*


**Photo 9-8.** **Three caribou foraging near the Tote Road on June 25, 2024. Site enviro truck stationed at the pull out on the left to monitor caribou response to traffic and make sure traffic is slowing down and following correct caribou response procedures.**

**Photo 9-9.** **Enlarged image of caribou seen in Photo 9-8 near the Tote Road on June 25, 2024.**


Photo 9-10. A group of three caribou seen adjacent to the Tote Road via remote camera. The three caribou were first noted on June 25, 2024 (13:07) and were documented in various locations in the remote camera's field of view until June 26, 2024 (11:27). During the 22-hour window, a minimum of 39 B-Trains, five heavy pieces of equipment, and three light trucks were recorded on the cameras.


Photo 9-11. A group of three caribou seen adjacent to the Tote Road via remote camera. The three caribou were first noted on June 25, 2024 (13:07) and were documented in various locations in the remote camera's field of view until June 26, 2024 (11:27).

## 9.5 AERIAL CARIBOU SURVEY

The following PCs were developed to monitor and mitigate potential disturbance to caribou calving near or interacting with the Project (Nunavut Impact Review Board 2020):

- **PC #53b** *"Monitoring and mitigation measures at points where the railway, roads, trails, and flight paths pass through caribou calving areas, particularly during caribou calving times."*
- **PC #54b** *"Monitoring for caribou presence and behaviour during railway and Tote Road construction."*
- **PC #58b** *"A detailed analysis of wildlife responses to operations with emphasis on calving and post-calving caribou behaviour and displacements (if any), and caribou responses to and crossing of the railway, the Milne Inlet Tote Road and associated access roads/trails."*

In early 2020, the TEWG discussed the status of caribou populations at the Project. Baffinland then proposed a decision framework and defined numerical triggers[18] to initiate more comprehensive caribou monitoring (i.e., a GPS collar program to evaluate caribou movements and habitat selection in relation to the Project), which would be informed by an aerial survey of the wildlife RSA (EDI Environmental Dynamics Inc. 2022b). A late-winter (March 2023) aerial survey was completed to assess the occurrence (presence/absence), distribution, and total counts of North Baffin caribou within the wildlife RSA and nearby areas of interest (Map 9-3). The objective of this aerial survey was to estimate the abundance and density of North Baffin caribou in the northern (i.e., active) and southern (i.e., planned/future) subregions of the wildlife RSA (EDI Environmental Dynamics Inc. 2022b).

**Note:** This section was first reported in the 2023 Terrestrial Environment Annual Monitoring Report (EDI Environmental Dynamics Inc. 2024). The Result and Discussion section has been updated and reissued to ensure the completeness of the public record.

[18] The decision framework emerged from the findings of a technical study on the barriers to caribou movement and potential indirect loss of caribou habitat (EDI Environmental Dynamics Inc. 2022b). The report identified two subregions within the Project area to independently assess potential effects based on active (northern) and planned (southern) phases of the Project. It was concluded that at least 35 collared caribou were necessary to complete robust statistical analyses on movement and habitat effects. To make sure that these 35 caribou are a representative sample of the subpopulation, >350 caribou (or >35 groups of caribou) should be present in the southern and northern subregions. Further monitoring will be initiated in a subregion only if the trigger is met in that subregion. This sample size trigger for each subregion was deemed reasonable in practice (i.e., in relation to the necessary field implementation effort) and necessary to facilitate appropriate statistical analyses.

### 9.5.1 METHODS

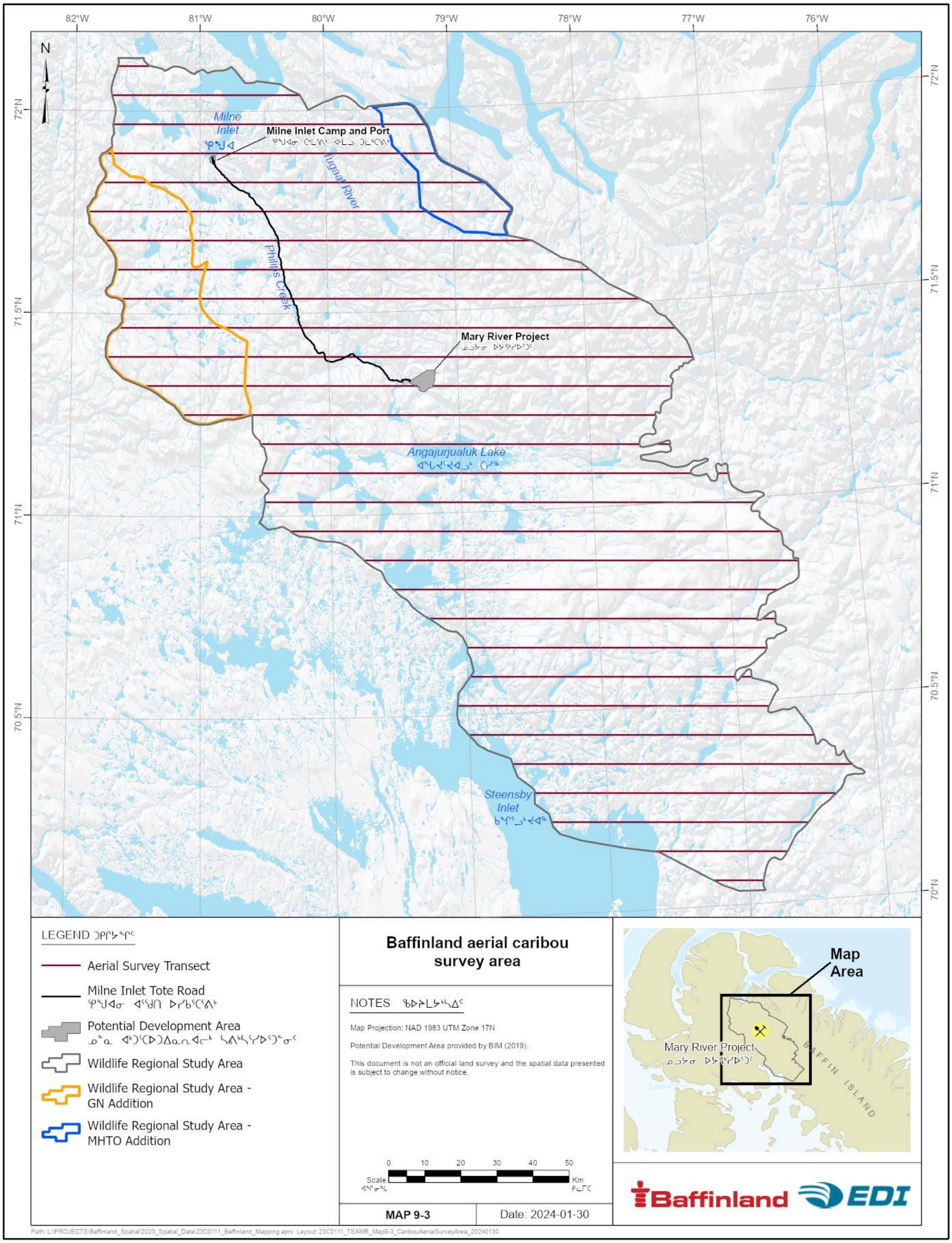
#### 9.5.1.1 Study Area

The survey area (23,445 km²) is based on the Project's wildlife RSA (described in EDI Environmental Dynamics Inc. 2012). Based on ongoing discussions with the TEWG, two additions were made to the study area for the aerial survey: (1) an area to the north and west was added as requested by the Government of Nunavut (GN) to make sure enough area was surveyed beyond the potential zone of influence of the northern transportation corridor (i.e., the Tote Road; TEWG June 23, 2022 meeting minutes; Baffinland Iron Mines Corporation 2022); and (2) the Ikaluit Lake area on the wildlife RSA's north and east corner was added as requested by the MHTO at the February 2023 TEWG meeting (Baffinland Iron Mines Corporation 2023c). Both TEWG-requested additions were added to the wildlife RSA and are illustrated in (Map 9-3)

The survey area follows ecological and topographical boundaries. It overlaps portions of two population survey strata previously used in government surveys and management plans (Campbell et al. 2015, Government of Nunavut 2019). These overlapping subregions provide equal coverage of the mine footprint, per the study design recommendations discussed in EDI Environmental Dynamics Inc. (2022).

The *Caribou Monitoring: Triggers and Recommendations*[19] report (EDI Environmental Dynamics Inc. 2022b) further identifies a northern subregion (11,706 km², corresponding with the active Project area) and a southern subregion (15,735 km², corresponding with the planned/future Project area) that are considered in further analyses and future monitoring activities, as discussed in that report.

[19] This report more comprehensively describes the ecological setting, delineation of the Project's zone of influence, and investigative pathways (including baseline research, surveillance programs, and effects monitoring programs) needed to further inform mitigations and adaptive management at the Project (if/where necessary).


Milne Inlet
Milne Inlet Camp and Port
Tugaat River
Phillips Creek
Mary River Project
Angajurjualuk Lake
Steensby Inlet
82°W
81°W
80°W
79°W
78°W
77°W
76°W
72°N
71.5°N
71°N
70.5°N
70°N
N
LEGEND
Aerial Survey Transect
Milne Inlet Tote Road
Potential Development Area
Wildlife Regional Study Area
Wildlife Regional Study Area - GN Addition
Wildlife Regional Study Area - MHTO Addition
Baffinland aerial caribou survey area
NOTES
Map Projection: NAD 1983 UTM Zone 17N
Potential Development Area provided by BIM (2019).
This document is not an official land survey and the spatial data presented is subject to change without notice.
Scale
0 10 20 30 40 50
Km
MAP 9-3
Date: 2024-01-30
Map Area
Mary River Project
BAFFIN ISLAND
Baffinland
EDI
Path: L:\PROJECTS\Baffinland_Spatial\2023_Spatial_Data\23C0111_Baffinland_Mapping.aprx Layout: 23C0111_TEAMR_Map9-3_CaribouAerialSurveyArea_20240130

#### 9.5.1.2 Survey Design and Protocols

The aerial survey was completed from March 24 to 27, 2023, in a fixed-wing Caravan equipped with a radar altimeter to maintain elevation at 122 m (400 ft) above ground level (agl) and travel at 150 km/hr. The survey design consisted of the 'fly-over' of 29 linear transects oriented east-to-west and spaced 8 km apart within the wildlife RSA. Transect lengths varied (minimum = 9 km, maximum = 163 km). The survey design did not include stratified flight lines for the northern and southern subregions. Instead, an equal survey effort was applied across the wildlife RSA, and the subregions were stratified *post hoc* during modelling and statistical analysis.

For continuity and alignment with previous aerial surveys, the survey design used methods that the GN applied during the March 2014 regional survey of the North Baffin strata (including the Mary River stratum, Campbell et al. 2015). The survey timeframe was also applied so that observations were made before calving (i.e., to minimize disturbance) and snow cover was more extensive on the landscape (thereby standardizing the observational setting and improving the detection of caribou on the landscape). In consultation with the GN's regional wildlife biologist, the survey was planned to occur before the GN's collaring activity (March/early April 2023) in the North Baffin region (Ringrose 2023).

A double-observer pair configuration (cf. Figure 8 in Campbell et al. 2015; Figure 9-9) was used to optimize wildlife detections on both sides of the aircraft. The field team (seven personnel and two pilots) was comprised of EDI wildlife specialists, alternating Qikiqtani Inuit Association (QIA) environmental monitors, and other Inuit participants (Photo 9-12):

- primary observers — Justine Benjamin (EDI Field Lead), Sean Munro (EDI Wildlife Specialist);
- secondary observers — Joe Bruce Nakoolak (QIA Monitor) / Tom Williamson (QIA Monitor), Victor Kadloo (Inuit Observer);
- tertiary observers — Joel MacFabe (EDI Wildlife Specialist), Jayko Tatatuapik (Inuit Observer); and,
- data recorder — Joel MacFabe (EDI Wildlife Specialist).

The observation and detection of caribou followed a distance sampling (DS) protocol whereby observations were classified according to five distance bins (i.e., 0–200 m, 200–400 m, 400–600 m, 600–1,000 m, and 1,000–1,500 m) that were marked on wing struts (cf. Figure 7 in Campbell et al. 2015; Figure 9-10). Figure 9-9 and Figure 9-10 demonstrate how the observer configuration and distance bin markers were implemented in the field. The primary observer called out caribou detections, including the number of individuals[20], locations, and distances, when they occurred at approximately 90-degree angles from the plane (i.e., perpendicular at either 9 o'clock [left] or 3 o'clock [right] off the transect line). To minimize duplicate observations and potential data artifacts, the primary observer had priority (to the extent possible) to 'call out' sightings ahead of secondary and tertiary observers. Secondary and tertiary observers had to wait until caribou had passed the 9 o'clock [left] or 3 o'clock [right] mark to confirm the sightings and/or 'call out' any additional sightings the primary observer may have missed. All observers then discussed the number of caribou detected to reconcile potential discrepancies in the data capture.

[20] Caribou individuals or clusters within ~100 m of each other were deemed to be a single group.

The recorder documented and categorized all observations using a standard data collection form. Key information included:

- spatial identifiers (latitude and longitude coordinates);
- group size and composition (if possible, adult/calf and sex);
- side of the plane (left or right), distance bin, observer(s) (primary, secondary, and tertiary); and,
- field-based habitat observations, including:
    - survey conditions (percent snow, percent cloud cover, and visibility [poor, good, or excellent]); and,
    - terrain (slope [flat, moderate, or steep] and topography [flat, moderate, or steep]).

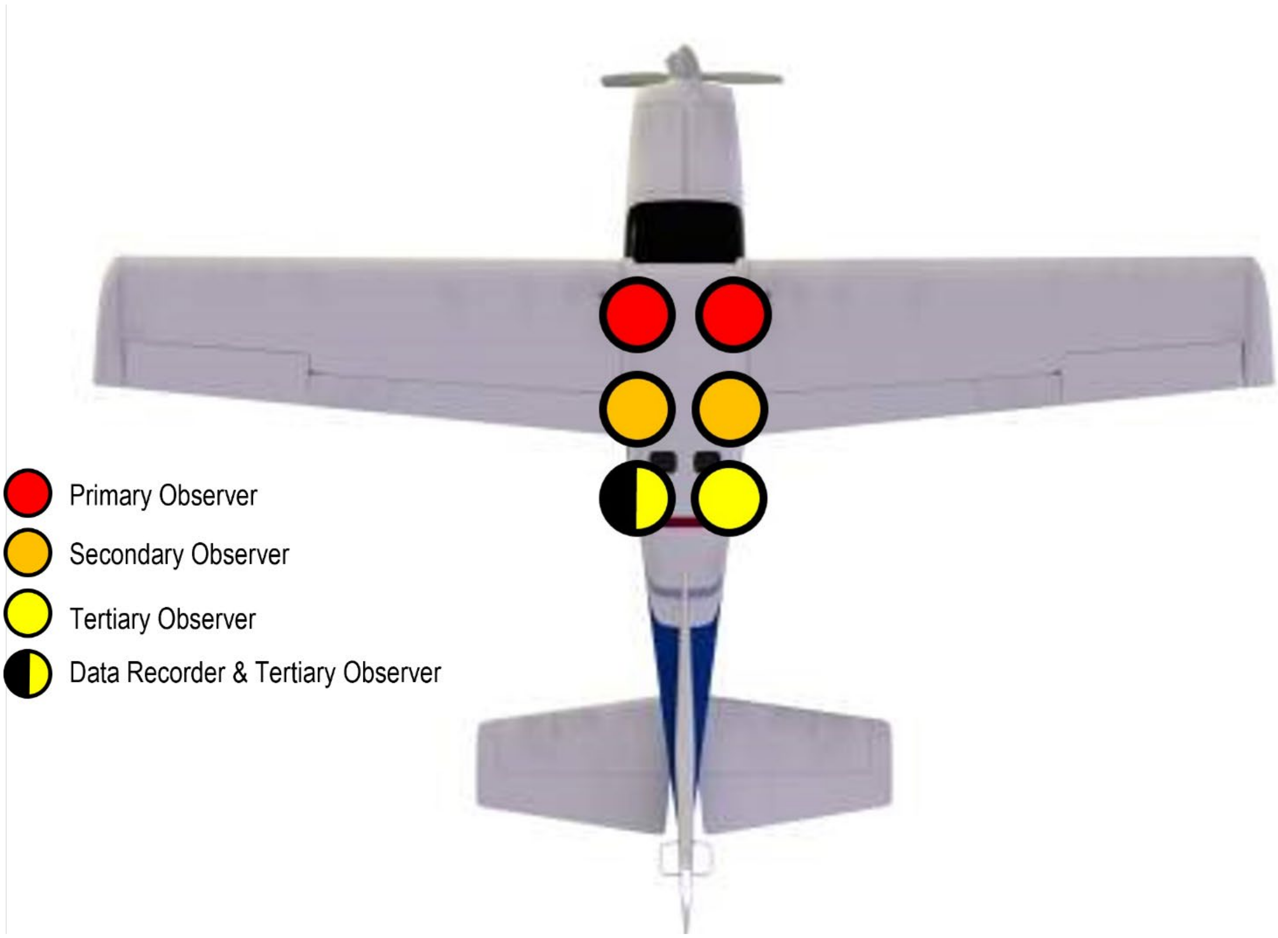



**Figure 9-9. Schematic diagram of double-observer configuration.**
*Adapted from Figure 8 in Campbell et al. (2015).*

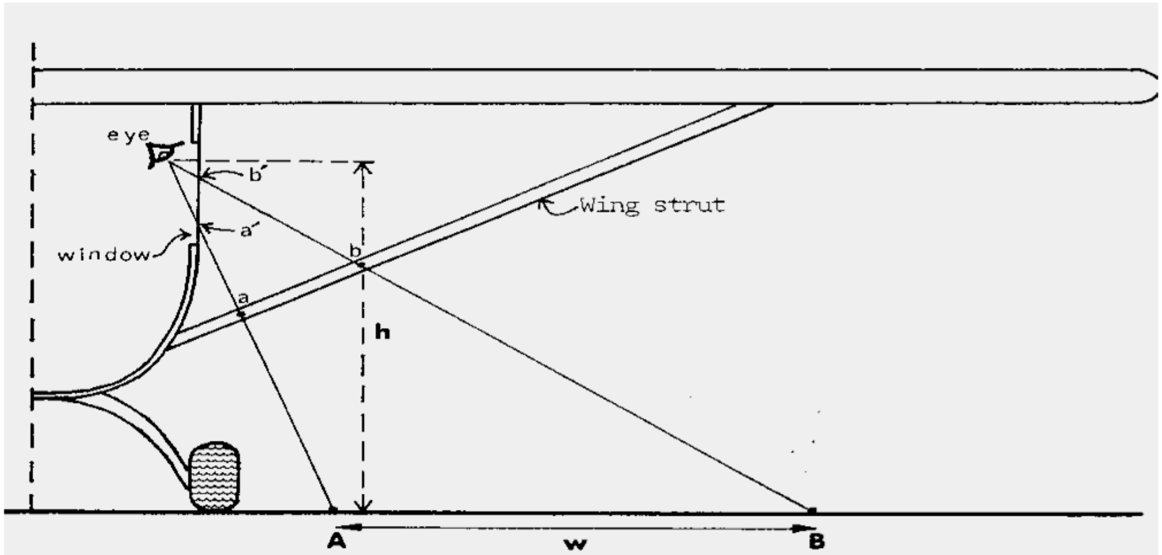



**Figure 9-10. Schematic diagram of wing strut markings to identify distance bins from the aircraft.**
*Source: Norton-Griffiths 1978*

**Photo 9-12. Aerial caribou survey crew members on March 25, 2023.**
*From left to right: Joel MacFabe, Joe Bruce Nakoola, Jayko Tatatuapik, Sean Munro, and Victor Kadloo. Photo by Justine Benjamin. Missing: Tom Williamson.*

#### 9.5.1.3 Population Estimates

*Analytical Framework*

Two components were used to estimate the abundance and density of North Baffin caribou in the wildlife RSA:

- a model of the detection process (i.e., the probability that caribou are detected on the landscape); and,
- an unbiased estimator of abundance/density that accounts for the detection process.

The detection process considers the uncertainty in observing caribou when they are present. The detection process is estimated using observational data and then applied to an estimator (equation) to calculate abundance and density estimates. A mutual detection function was developed for the northern and southern subregions of the wildlife RSA. Estimates of abundance/density were stratified *post hoc* by subregion.

To model the detection process of caribou on the landscape, DS and mark-recapture (MR) methods were combined, termed mark-recapture distance sampling (MRDS). This approach combines two methods to calculate abundance while addressing shortfalls when either method is used independently. Mark-recapture distance sampling models have been successfully used to model caribou abundance on Baffin Island (Campbell et al. 2015). Distance sampling, a method commonly used to estimate wildlife populations, models animal detection as a function of distance from a transect line. Mark-recapture methods model abundance as a function of the portion of marked animals that are detected on a survey.

Two key assumptions of DS are often violated in population surveys: (1) animals on the transect are certain to be detected, and (2) animals are detected at their original location. As for MR models, the assumption that all animals are equally likely to be detected is often violated. By combining both MR and DS methods, these assumptions can be checked or addressed to remove bias in the abundance estimation. The MR model can check the assumption that all animals on the transect are detected and, if needed, model detection on the transect. The DS model can account for reduced detection farther from the transect. Mark-recapture distance sampling combines an MR model with a DS model. In this application, the MR component estimates the detection probability of caribou on/near the transect line, and the DS component estimates the decreased probability of detection at greater distances off the transect.

The 'marking' of animals for the MR model was done using a double-observer survey (Figure 9-9). The primary observer was considered 'Observer 1' and the secondary/tertiary observers were considered 'Observer 2'. Animals were 'marked' when observed by one observer and 'recaptured' if observed by the other observer.

An MRDS model was developed with the following assumptions: (1) independence of observations made by the primary and secondary observers and (2) point independence. The independent observer configuration can be assumed when two observers search independently of each other and when animals are unlikely to have moved between detections made by those observers (i.e., no duplicate observations). Duplicate observations are less likely when both observers are in the same plane, as in this survey. Point independence assumes that detections of caribou by observers are likely independent at any given location along a transect but become more correlated at farther distances. See Buckland et al. (2004) and Burt et al. (2014) for further details.

Under the point independence assumption, the overall detection probability is obtained by combining the MR model's intercept and the DS model's shape (Burt et al. 2014). In other words, the average detection probability was calculated for the MR (intercept) and DS (across distances) components, and the product of these probabilities equalled the overall MRDS detection probability.

The overall detection probability was used in a Horvitz-Thompson-like estimator (Buckland et al. 2004) to approximate the abundance and density of (a) individual caribou and (b) groups of caribou in the northern and southern subregions of the wildlife RSA.

All statistical analyses were completed in R software for statistical computing, version 4.2.1 (R Core Team 2022), using the package 'mrds' (Laake et al. 2022).

*Model Fit and Assessment*

A two-stage process was used to fit the combined MRDS model and estimate the overall detection probability of caribou on the landscape. First, an MR model was fit to the data while assuming full independence in observations. Second, a DS model was fit to the data alongside the chosen MR model while assuming point independence. In other words, the second step modified the DS model using the MR model to account for imperfect detection along and near the transect line.

Animals are not always visible. Terrain features may conceal an animal from observers. To account for factors that may alter the detection of caribou on the landscape, several covariates were included in the MR and DS models: percent snow, visibility, terrain ruggedness (terrain ruggedness index; Riley et al. 1999), and slope (degrees). Three additional non-landscape covariates were considered: distance bin (categorical), group size (numeric), and observer (categorical, primary [reference level], and secondary). Caribou group size may influence detectability because larger groups are more likely to be visible on the landscape than smaller groups. The effect of observer and distance (bin) accounted for the differences in detection between primary/secondary observers and the reduced detection of caribou at greater distances, respectively. The observer and distance covariates were explicit in the MR model but implicit in the DS model (i.e., not directly specified as covariates in model formulas).

In several combinations, covariates were included in the MR and DS models, and the most parsimonious model structures were chosen using Akaike's Information Criteria (AICc; Burnham and Anderson 2002). Model development was completed in an exploratory way with no *a priori* hypotheses considered. First, the best MR model structure was chosen from many covariate combinations. Then, that MR model structure was held constant while iterating through several covariate combinations for the DS model structure to develop and select the combined MRDS model.

The MR model was estimated using a logistic regression with a logit-link function to assess the probability of detection on the transect line.

The DS model considered two forms or 'key functions', which can predict detection probabilities as either half-normal or hazard-rate parametric functions (Buckland et al. 2004). An additional 'key adjustment' term (e.g., cosine or polynomial) is commonly used to modify the shape of the detection function to better fit observations across the distances sampled. However, Miller and Thomas (2015) advise caution when using key adjustments and covariates because including both cannot guarantee a monotonic non-increasing detection function (i.e., a function that does not continuously decrease with distance). Key functions were included in the MRDS model if they yielded sensible detection functions and improved model fit and parsimony (i.e., lower AICc score).

Before estimating abundance and density, the combined MRDS detection function was assessed using a chi-square goodness-of-fit test and a quantile-quantile plot of fitted versus empirical cumulative density functions.

## 9.5.2 RESULTS AND DISCUSSION

### 9.5.2.1 Field Observations

Thirty-six groups of caribou were observed during the aerial survey, with 112 individual caribou observed across all groups (Photo 9-13). All observed caribou occurred in the southern subregion of the wildlife RSA. Due to the elevation (122 magl), speed (150 km/hr), and intent of the survey (i.e., this was not a composition survey), no observations were classified by sex or age. Only two groups (nine individuals total) occurred in an overlapping portion of the northern subregion (Map 9-4). Detections of caribou occurred primarily in areas with exposed, windswept ground rather than areas of expansive snow cover. Weather and visibility on the first three days (March 24 to 26) were excellent, with clear skies and sunny conditions allowed observers to spot tracks and wildlife easily. The final day (March 27) had cloud cover periods, making detecting tracks and caribou more challenging at low light levels.

Information collected in each subregion was used to formulate a detection function for caribou across the landscape. One observation of three caribou (ObsID #50) in the southern subregion did not have recorded field-based covariate values; data imputation was required to include this observation in the analysis. Covariate values from a separate observation (ObsID #51) at the same time and location were assigned to ObsID #50 on different sides of the plane.

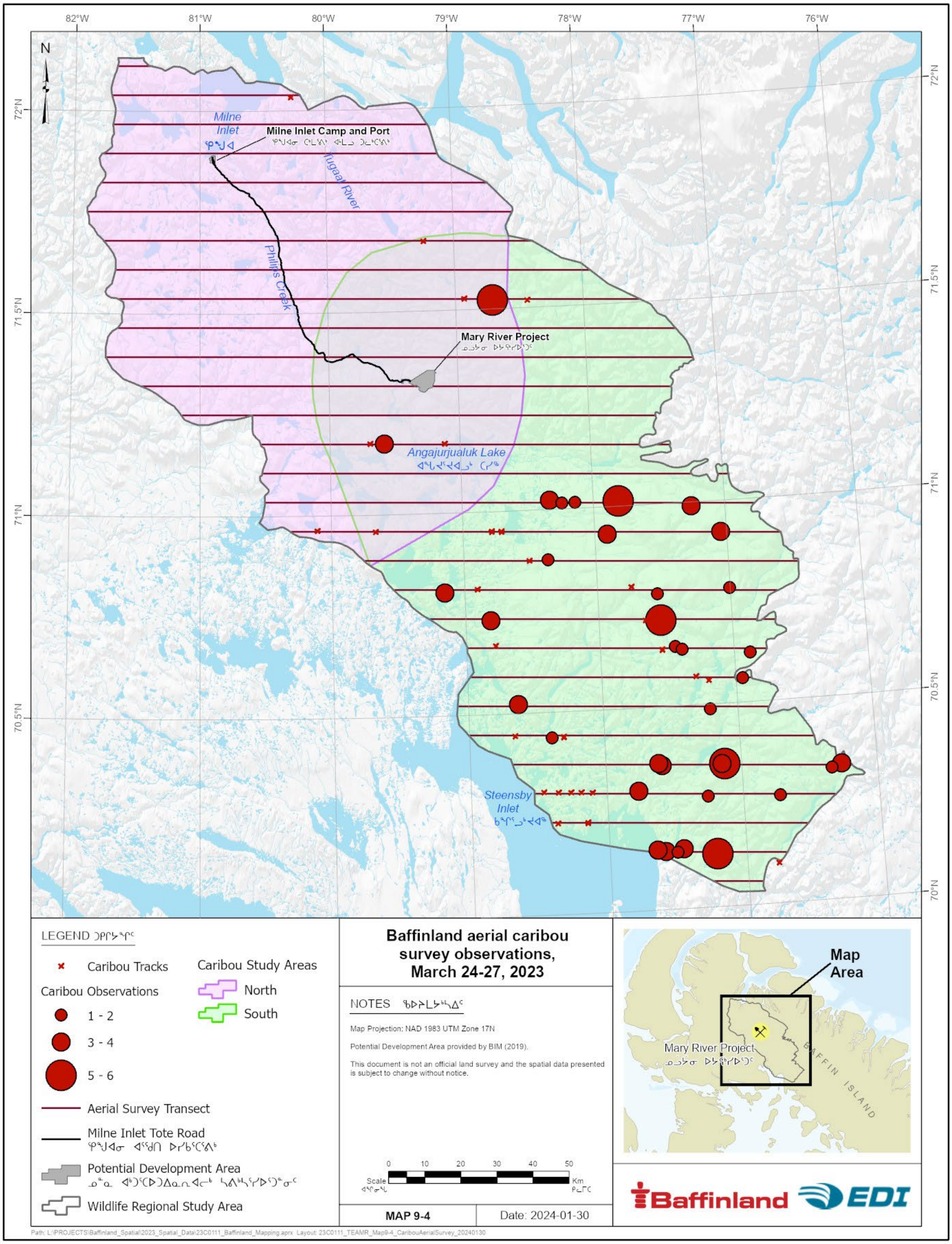

82°W
81°W
80°W
79°W
78°W
77°W
76°W
72°N
71.5°N
71°N
70.5°N
70°N
N
Milne Inlet
Milne Inlet Camp and Port
Tugaat River
Phillips Creek
Mary River Project
Angajurjualuk Lake
Steensby Inlet
LEGEND
Caribou Tracks
Caribou Observations
1 - 2
3 - 4
5 - 6
Aerial Survey Transect
Milne Inlet Tote Road
Potential Development Area
Wildlife Regional Study Area
Caribou Study Areas
North
South
Baffinland aerial caribou survey observations, March 24-27, 2023
NOTES
Map Projection: NAD 1983 UTM Zone 17N
Potential Development Area provided by BIM (2019).
This document is not an official land survey and the spatial data presented is subject to change without notice.
0 10 20 30 40 50
Scale
Km
MAP 9-4
Date: 2024-01-30
Map Area
Mary River Project
BAFFIN ISLAND
Baffinland
EDI

**Photo 9-13. Caribou observed during the aerial survey.**

#### 9.5.2.2 Modelling Outcomes

The selected MR model included observer, group size, and percent cloud cover as covariates. It was chosen out of several candidates with similar AICc scores (ΔAIC <2 relative to the 1st-ranked model) because it had the best model fit (i.e., log-likelihood; Table 9-5). The top DS model, modified by the selected MR model, included group size and percent cloud cover scaled with a hazard-rate key function (Table 9-6). Although ranked 4th according to the information criterion, it had the highest log-likelihood and a ΔAIC <2 compared to the 1st-ranked model. To determine whether key adjustments (e.g., cosine and polynomial functions) were necessary to improve fit, 3rd-order cosine and 4th-order polynomial terms were included. However, these attempts either resulted in nonmonotonic detection functions or required too many parameters to estimate based on the number of distance bins used during the survey.

The combined MRDS detection function fit well with the observed data and matched theoretical expectations. Figure 9-11 shows the predicted detection probabilities for all (pooled) observers. The detection function curve follows the decrease in detection frequency at greater distances from the transect line. Generally, the primary observer had a high detection probability across distance categories and rarely missed observations made by the secondary observer (Figure 9-12). A chi-square goodness-of-fit test demonstrated a good match between observed and expected (theoretical) detections across the distance categories ($\chi^2_6 = 9.13$, $P = 0.17$), and a quantile-quantile plot of fitted versus empirical cumulative density functions met theoretical expectations (i.e., fell along the diagonal line of unity; Figure 9-13).

**Table 9-5. Double observer, full independence mark-recapture (MR) model selection.**

| # | Model Structure | K | AICc | ΔAIC | Log-likelihood |
|---|---|---|---|---|---|
| 1 | MR: ~observer + cloud | 3 | 196.47 | 0.00 | -95.24 |
| **2** | **MR: ~observer +group size + cloud** | **4** | **197.03** | **0.56** | **-94.51** |
| 3 | MR: ~observer | 2 | 197.57 | 1.10 | -96.79 |
| 4 | MR: ~cloud | 2 | 198.33 | 1.85 | -97.16 |
| 5 | MR: ~distance + observer | 3 | 198.34 | 1.86 | -96.17 |
| 6 | MR: ~observer + group size | 3 | 198.45 | 1.98 | -96.23 |
| 7 | MR: ~group size + cloud | 3 | 198.88 | 2.41 | -96.44 |
| 8 | MR: ~observer + TRI | 3 | 199.23 | 2.76 | -96.62 |
| 9 | MR: ~1 | 1 | 199.43 | 2.95 | -98.71 |
| 10 | MR: ~observer + slope | 3 | 199.46 | 2.99 | -96.73 |

**Table 9-6. Double observer, point independence joint mark-recapture (MR) and distance sampling (DS) model selection.**

| # | Model Structure | Key Function | K | AICc | ΔAIC | Log-likelihood |
|---|---|---|---|---|---|---|
| 1 | MR: ~observer + group size + cloud<br>DS: ~cloud | hr | 6 | 174.08 | 0.00 | -81.04 |
| 2 | MR: ~observer + group size + cloud<br>DS: ~cloud | hn | 5 | 174.26 | 0.18 | -82.13 |
| 3 | MR: ~observer + group size + cloud<br>DS: ~group size + cloud | hn | 6 | 174.34 | 0.26 | -81.17 |
| **4** | **MR: ~observer + group size + cloud<br>DS: ~group size + cloud** | **hr** | **7** | **174.37** | **0.29** | **-80.19** |
| 5 | MR: ~observer + group size + cloud<br>DS: ~1 | hn | 4 | 174.59 | 0.51 | -83.30 |
| 6 | MR: ~observer + group size + cloud<br>DS: ~ group size + TRI | hn | 6 | 174.63 | 0.55 | -81.32 |
| 7 | MR: ~observer + group size + cloud<br>DS: ~group size + slope | hn | 6 | 174.67 | 0.58 | -81.33 |
| 8 | MR: ~observer + group size + cloud<br>DS: ~TRI | hn | 5 | 175.46 | 1.38 | -82.73 |
| 9 | MR: ~observer + group size + cloud<br>DS: ~1 | hr | 5 | 175.51 | 1.42 | -82.75 |
| 10 | MR: ~observer + group size + cloud<br>DS: ~group size | hn | 5 | 175.53 | 1.44 | -82.76 |

The MR model was held constant across all DS model iterations. Only the top 10 models are provided. Hazard-rate (hr) and half-normal (hn) key functions were tested for the DS model component. The selected model, parameters, and statistics are **bolded**.

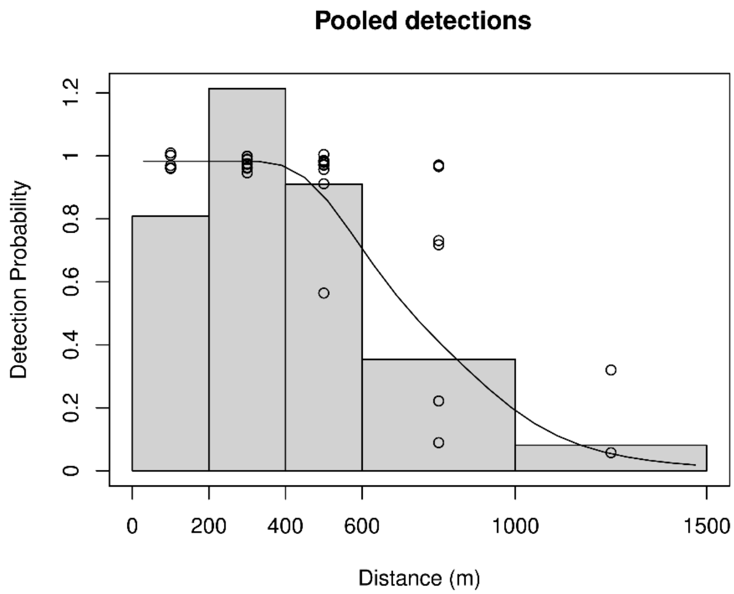



Figure 9-11. Pooled detection probabilities of caribou at increasing distance from the transect line.

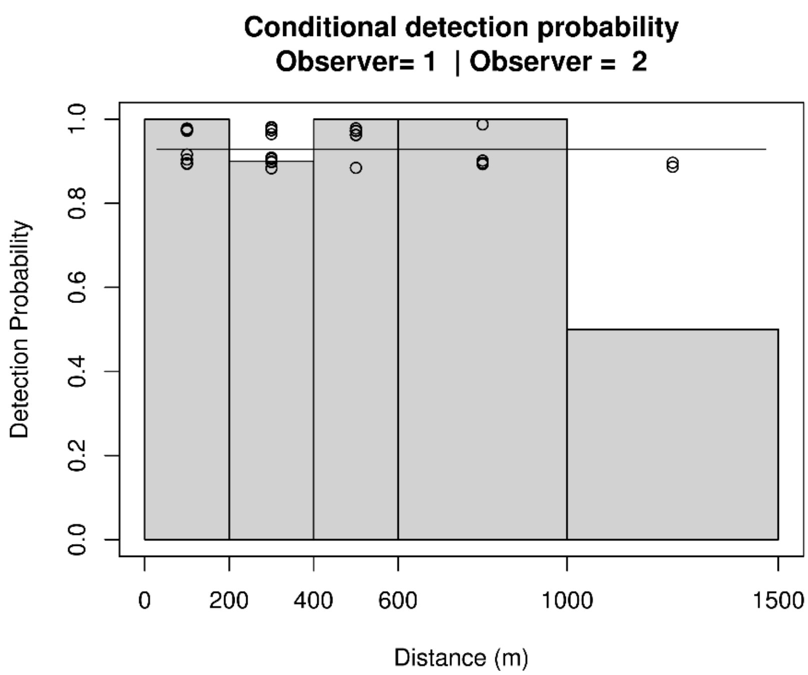



Figure 9-12. Conditional detection probabilities of the primary observer detecting caribou at increasing distance from the transect line.

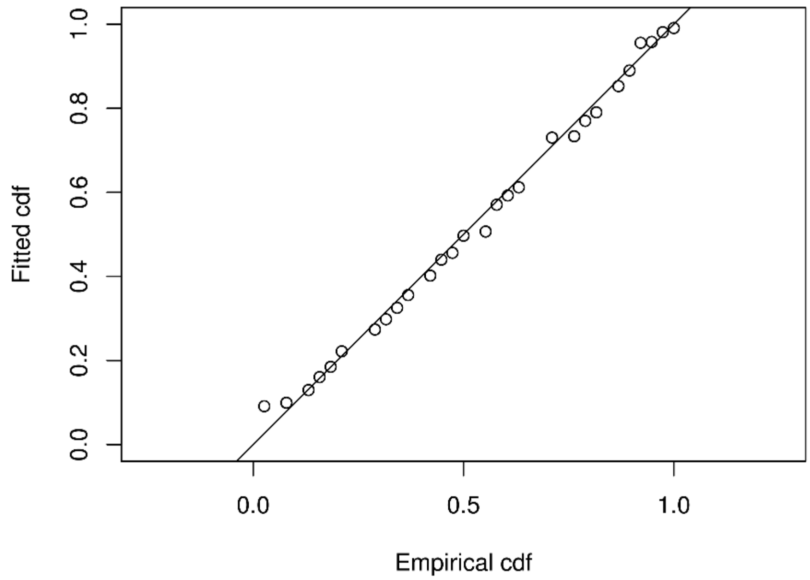



**Figure 9-13. The quantile-quantile plot of fitted versus empirical cumulative density functions for the fitted mark-recapture distance sampling detection function.**

#### 9.5.2.3 Caribou Abundance and Density

The estimated abundance and density of caribou individuals and groups in the wildlife RSA were greater and more precise in the southern subregion than in the northern subregion (Table 9-7 and Table 9-8). The southern subregion was occupied by an estimated 613 caribou (95% CI = 314–1,198) in 189 groups (95% CI = 103–346) during March 2023, which yielded an average group size of 3.24±0.25 caribou. In contrast, only 44 caribou (95% CI = 11–182) from nine groups (95% CI = 2–35) were estimated in the northern subregion during March 2023, with an average group size of 4.68±1.09 caribou. The variation in abundance estimates can be compared using the coefficient of variation (CV = std. deviation / mean * 100). Estimates in the southern subregion had less variation ($CV_{South}$ = 0.34) than the northern subregion ($CV_{North}$ = 0.76). This was not surprising given that all caribou detections occurred in the southern subregion, but only two groups were detected in an overlapping portion of the northern subregion. Based on the estimated abundances and size of the respective subregions, the densities of caribou in the southern and northern subregions were 38.94 caribou/1,000 km² (95% CI = 19.93–76.11) and 3.74 caribou/1,000 km² (95% CI = 0.90–15.51), respectively. The estimated densities of groups were 12.00 groups/1,000 km² (95% CI = 6.54–22.01) in the southern subregion and 0.80 groups/1,000 km² (95% CI = 0.21–3.03) in the northern subregion.

A previous survey and analysis by Campbell et al. (2015) estimated an abundance of 224 caribou and a density of 5.69 caribou/1,000 km² from a count of 49 caribou in the Mary River stratum (39,357 km²). The Mary River stratum encompassed a much broader area beyond the wildlife RSA. Due to differences in surveyed areas and caribou densities across the Mary River stratum, this survey is not directly comparable to the 2014 survey by Campbell et al. (2015), nor was it intended to be directly comparable. Caution is warranted when comparing abundances and densities to make inferences on trends. The March 2014 estimates were much higher than the current March 2023 abundance (44 caribou) and density (3.74 caribou/1,000 km²) estimates for the northern subregion (11,706 km²; count = 9 caribou). But the March 2023 abundance (613 caribou) and density (38.94 caribou/1,000 km²) estimates for the southern subregion (15,735 km²; count = 112 caribou) were substantially greater than those from March 2014.

**Table 9-7. Estimated abundance of caribou individuals and groups in the northern and southern subregions.**

| Type | Subregion | Count | Abundance Estimate | Std. Error | CV | 95% LL | 95% UL |
|---|---|---|---|---|---|---|---|
| Individual | South | 112 | 613 | 206 | 0.34 | 314 | 1198 |
| | North | 9 | 44 | 33 | 0.76 | 11 | 182 |
| Group | South | 36 | 189 | 57 | 0.30 | 103 | 346 |
| | North | 2 | 9 | 7 | 0.70 | 2 | 35 |

CV = Coefficient of Variance; 95% LL = Lower Confidence Interval Value; 95% UL = Upper Confidence Interval Value.

**Table 9-8. Estimated density of caribou individuals and groups per 1,000 km² in the northern and southern subregions.**

| Type | Subregion | Area | Density Estimate | Std. Error | CV | 95% LL | 95% UL |
|---|---|---|---|---|---|---|---|
| Individual | South | 15,735 km² | 38.94 | 13.09 | 0.34 | 19.93 | 76.11 |
| | North | 11,706 km² | 3.74 | 2.86 | 0.76 | 0.90 | 15.51 |
| Group | South | 15,735 km² | 12.00 | 3.64 | 0.30 | 6.54 | 22.01 |
| | North | 11,706 km² | 0.80 | 0.56 | 0.70 | 0.21 | 3.03 |

CV = Coefficient of Variance; 95% LL = Lower Confidence Interval Value; 95% UL = Upper Confidence Interval Value.

### 9.5.2.4 Summary Findings

During the survey, 112 caribou across 36 groups were observed. All observed caribou occurred in the southern subregion of the wildlife RSA, and only two groups (nine individuals total) occurred in an overlapping portion of the northern subregion. The application of MRDS methods led to estimates of approximately 44 caribou (3.74 caribou/1,000 km²) in the northern subregion and 613 caribou (38.94 caribou/1,000 km²) in the southern subregion of the wildlife RSA during the survey period.

## 9.6 INCIDENTAL WILDLIFE OBSERVATIONS

Incidental wildlife observations are recorded by on-site personnel via wildlife logs posted in various areas. These logs indicate wildlife species that occur near Project infrastructure or areas where exploration or monitoring occurs. Table 9-9 summarizes the 2024 incidental wildlife observations. Per the TEMMP (Baffinland Iron Mines Corporation 2016a). Increases in incidental wildlife observations trigger follow-up investigations by Baffinland personnel; follow-up action may include behavioral monitoring (refer to Section 9.7).

**Caribou** — A total of 141 caribou were recorded from 59 observations (commonly by haul truck drivers) between May 21 and August 26, 2024. Two observations were made near the Mine Site, where two caribou were observed south of the Dyno Plant (May 30, 2024). In total, 97 caribou were seen across 34 observations from the Tote Road between May 21 and August 16, 2024. Group size ranged from one to nine individuals. No caribou were noted northwest of the kilometre 59 marker. Most groups were observed browsing adjacent to the Tote Road. The remaining 43 caribou were observed in remote or exploration areas southeast of the Project in July and August, generally during helicopter transport.

**Birds** — Twenty-eight bird species were recorded in the incidental wildlife logs in 2024. Examples of the most common species reported include: Sandhill Crane, ptarmigan, Common Raven, Snow Bunting (*Plectrophenax nivalis*), Snow Goose, Canada Goose, Rough-legged Hawk (*Buteo lagopus*), Long-tailed Duck (*Clangula hyemalis*), Cackling Goose (*Branta hutchinsii*), Peregrine Falcon (*Falco peregrinus tundrius*), Red-throated Loon (*Gavia stellata),* American Pipit (*Anthus rubescens*), Arctic Tern (*Sterna paradisaea*), Baird's Sandpiper (*Calidris bairdii*), Common Merganser (*Mergus merganser*), Greater White-fronted Goose (*Anser albifrons*), Gyrfalcon (*Falco rusticolus*), Horned Lark (*Eremophila alpestris*), Pacific Loon (*Gavia pacifica*), Semipalmated Plover (*Charadrius semipalmatus*), Snowy Owl (*Bubo scandiacus*), Tundra Swan (*Cygnus columbianus*), and Yellow-billed Loon (*Gavia adamsii*).

**Table 9-9. 2024 incidental wildlife observations in the Potential Development Area (Mine Site, the Tote Road, and Milne Port) and remote areas (based on wildlife logs).**

| Common Name | Scientific Name | Number of Observations | | | |
|---|---|---|---|---|---|
| | | Mine Site | Tote Road | Milne Port | Remote Areas |
| Arctic hare | *Lepus arcticus* | 30 | 4 | 11 | 2 |
| Arctic fox | *Vulpes lagopus* | 68 | 10 | 22 | 1 |
| Canine spp. | *n/a* | 0 | 1 | 2 | 0 |
| Fox spp. | *Vulpes* spp. | 14 | 0 | 5 | 0 |
| Lemming | *Lemmus* spp. | 1 | 0 | 2 | 0 |
| Caribou | *Rangifer tarandus groenlandicus* | 3 | 95 | 0 | 43 |
| Polar Bear | *Ursus maritimus* | 0 | 6 | 1 | 1 |
| Arctic Wolf | *Canis lupus* | 0 | 0 | 0 | 0 |

## 9.7 CARIBOU TOTE ROAD OBSERVATIONS

The following PCs were developed to monitor and mitigate potential disturbance to caribou calving near or interacting with the Project (Nunavut Impact Review Board 2020):

- **PC #53b** *"Monitoring and mitigation measures at points where the railway, roads, trails, and flight paths pass through caribou calving areas, particularly during caribou calving times."*
- **PC #54b** *"Monitoring for caribou presence and behaviour during railway and Tote Road construction."*
- **PC #58b** *"A detailed analysis of wildlife responses to operations with emphasis on calving and post-calving caribou behaviour and displacements (if any), and caribou responses to and crossing of the railway, the Milne Inlet Tote Road and associated access roads/trails."*

To address these PCs, a combination of surveys such as incidental observations, snow track surveys, HOL surveys, snowbank height monitoring, remote camera deployment, and aerial surveys have been used to study caribou habitat use and behavioural reactions to human activities — particularly along the Tote Road. Behaviour sampling can provide insight into responses to environmental stimuli (Martin and Bateson 1993). Specific observations of caribou along the Tote Road are intended to examine if/how caribou (especially cows with calves) respond to Project-related activities and infrastructure. As of 2019, North Baffin caribou were at a low point in their 60 to 80-year population cycle (Government of Nunavut 2019)Caribou observations during surveys or recorded incidentally were generally infrequent. That said, incidental caribou observations at the project increased in 2024, thereby triggering follow-up investigations and behavioural monitoring (refer to Section 9.7).

### 9.7.1 METHODS

Caribou occurrences at or near the PDA are monitored through HOL monitoring (refer to Section 9.3) during the caribou calving period and through on-the-ground monitoring through continual incidental sightings (often by haul truck drivers; refer to Section 9.6). Where caribou are observed on or near the Tote Road, the caribou decision framework (Figure 9-14) comes into effect and guides the action of road users (Baffinland Iron Mines Corporation 2023d). Site personnel are informed of the caribou decision framework and trained to respond appropriately to these scenarios. Concurrently, the Environment Staff are notified of near-project observations and complete follow-up behavioural monitoring. The TEMMP (Baffinland Iron Mines Corporation 2016a) describes the data capture protocols and inputs for behavioural monitoring, and documents causes/effects and caribou response to traffic or construction, including:

- location description (direction from road, aspect, terrain, other identifying features);
- survey observation timeframe (start/end times);
- number of individuals, their sexes and behavioural responses.

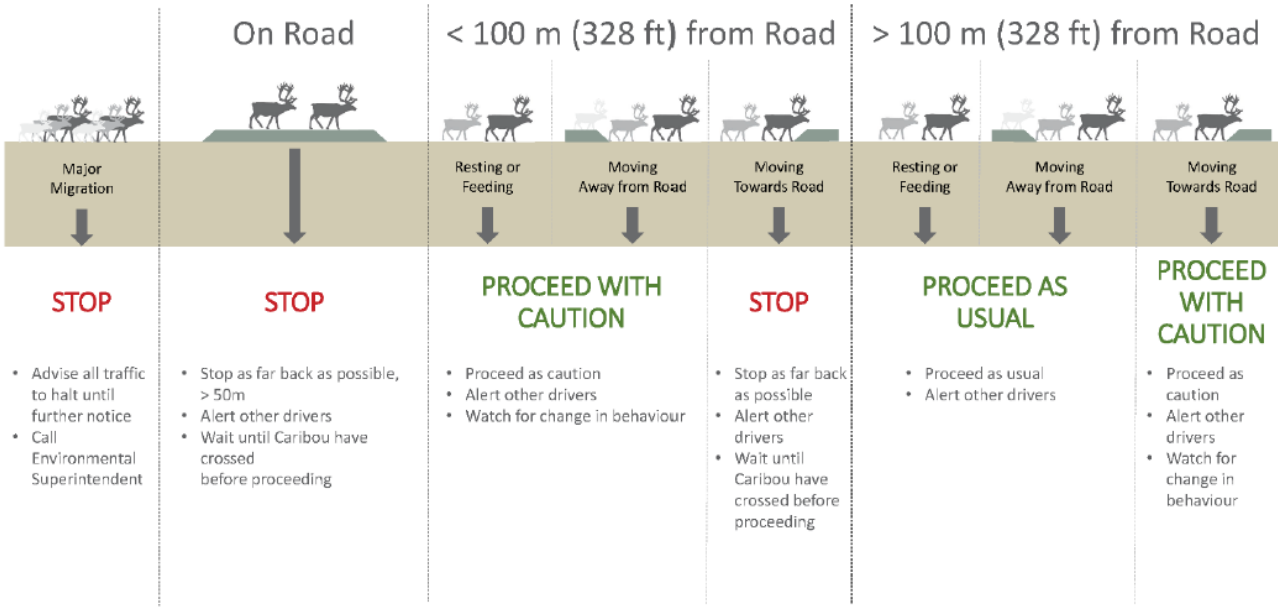



**Figure 9-14. Caribou decision framework specific for the Tote Road as outlined in the Terrestrial Environment Mitigation and Monitoring Plan (2023).**

## 9.7.2 RESULTS AND DISCUSSIONS

Fifty-one caribou incidental observations during 22 monitoring events were recorded along the Tote Road in 2024. As shown in Figure 9-15, most caribou observations (43) occurred in June, but also in May (5), October (2), and August (1). Caribou were observed as near as 20 m and as far as 4 km from the Tote Road (Photo 9-14 and Photo 9-15). No adverse behaviour toward the Tote Road and passing vehicles was noted during the 22 monitoring events. Behaviours noted included foraging/feeding, bedded animals, and animals travelling at a 'walking pace'.

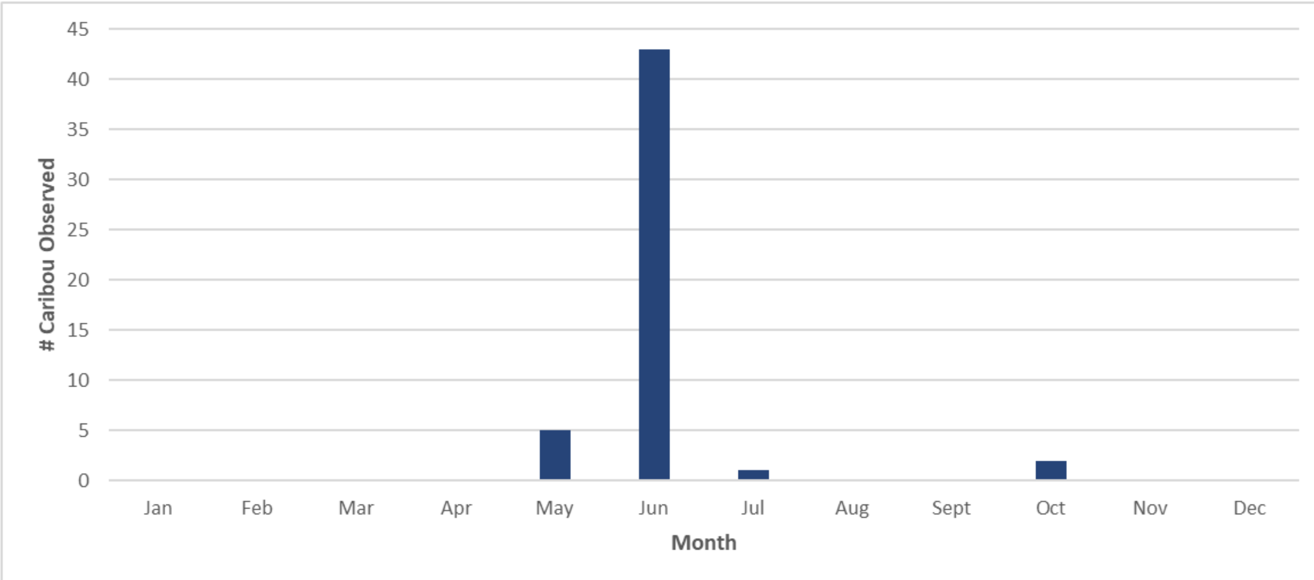



Figure 9-15. Caribou observations along the Tote Road by month in 2024.

Photo 9-14. Caribou observed along the Tote Road.

Photo 9-15. Caribou observed along the Tote Road.

## 9.8 HUNTER AND VISITOR LOG

Baffinland Security monitors land use and the presence of land users in the PDA via hunter and visitor logs that document travel or hunting within the PDA. This is an indirect and incomplete land use record, given that individuals are only required to populate the visitor logs if/when interacting with or using Baffinland facilities.

Four hundred and sixty-nine individual entries were recorded between January 1 and December 31, 2024:

- Mine Site camp: 136 individuals in 29 groups; and,
- Milne Port accommodations complex: 333 individuals in 75 groups.

Group size primarily ranged from 1 to 10 individuals, with the exception of one group of 49 individuals[21]. These hunter/visitors were typically hunting, fishing, or travelling between communities (Figure 9-16, Figure 9-17). Baffinland provided food, beverages, transportation, tools, supplies, fuel, and mechanical assistance to hunters and visitors, if requested and safe to do so. Log numbers decreased slightly from 2022 but were similar to 2018 and above pre-COVID counts.

In 2024, Baffinland assisted or was on standby in four separate search-and-rescue incidents (January 9, April 27, August 26, and October 30, 2024) for people reported missing or in distress. The incidents were often due to inclement weather, snowmobile mechanical breakdowns, or becoming stranded. One incident involved a medical emergency where Baffinland provided helicopter transport to site and assisted in arranging a medivac to the Iqaluit Hospital. In most cases, Baffinland provided aircraft support, staging, fuel, food, and accommodations.

**Inter-annual Trend** — The number of visitors recorded has increased since 2014. Substantial fluctuations occurred from 2019 to 2022 (Figure 9-18), coinciding with the COVID pandemic, but may begin to level out based on 2023 and 2024 data. The number of visitors each year often represents repeat groups at the start and end of their trips, making multiple trips within the year. Given that hunter and visitor registration is not mandatory, values do not represent all potential land users at the Project.

[21] This group was passing through as part of the Nunavut Quest dog sled race.

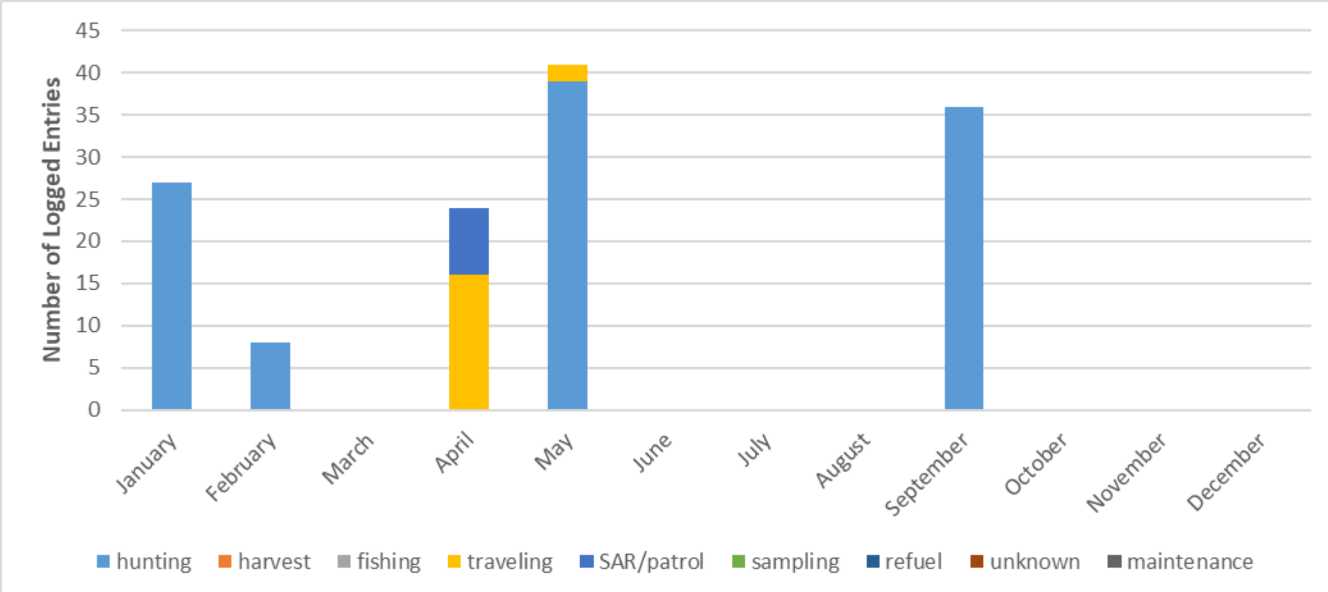



Figure 9-16. Mine Site visitor breakdown by month with check-in rationale.

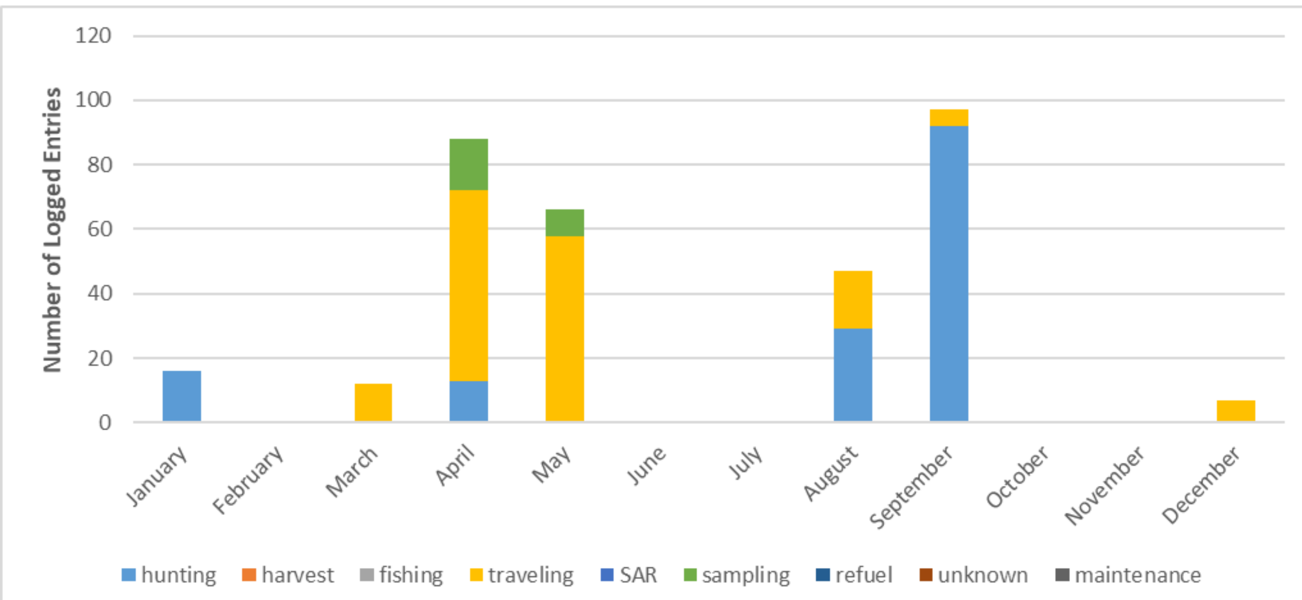



Figure 9-17. Milne Port visitor breakdown by month with check-in rationale.

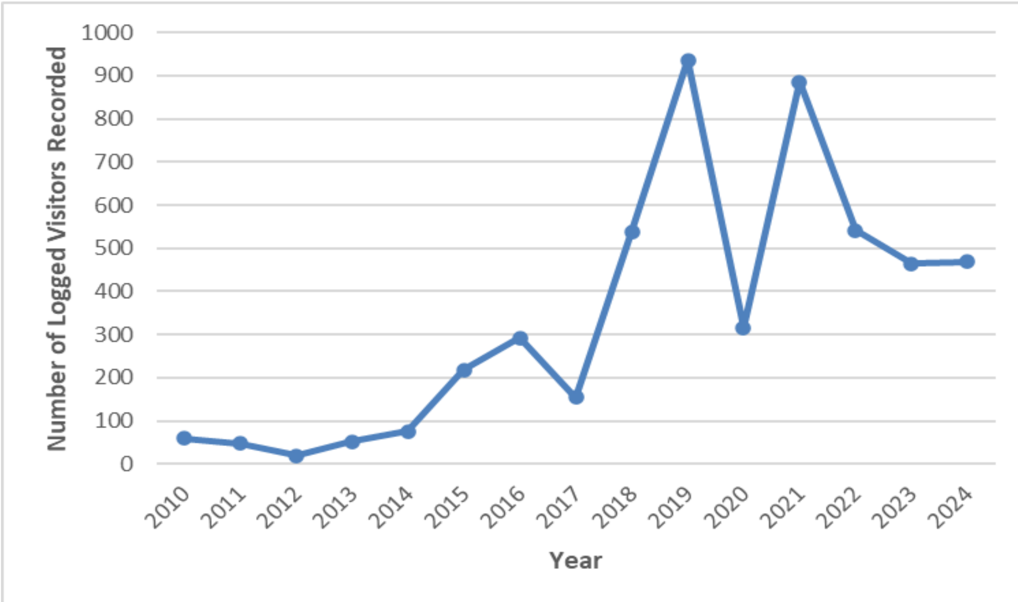



**Figure 9-18. 2024 inter-annual trends in visitors recorded in hunter and visitor logs (2010 to 2024).**
** The COVID pandemic resulted in little to no Inuit participation to minimize its spread.*

# 10 BIRDS

The following Project Condition (PC) addresses concerns regarding migratory birds and raptors at the Mary River Project (the Project) (Nunavut Impact Review Board 2020):

- **PC #74** *"The Proponent shall continue to develop and update relevant monitoring and management plans for migratory birds […] key indicators for follow up monitoring […] will include: Peregrine Falcon, Gyrfalcon, Common and King Eider, Red Knot, seabird migration and wintering, and songbird and shorebird diversity."*

To address this PC, bird surveys at the Project have historically included effects monitoring of songbirds and shorebirds. Based on the 2012 and 2013 analyses of the Program for Regional and International Shorebird Monitoring (PRISM) plots and 2013 analyses of the bird encounter transects, it was identified that the level of detection for Project-related effects on songbirds and shorebirds was low due to the low number of birds present. In consultation with the Terrestrial Environment Working Group and Canadian Wildlife Service (CWS), it was resolved that effects monitoring for tundra breeding birds could be discontinued. Instead, Baffinland Iron Mines Corporation (Baffinland) would commit to the following:

- completing 20 PRISM plots every five years to contribute to regional monitoring efforts (completed in 2018; next scheduled for 2024 and to be led by Environment and Climate Change Canada);
- completing coastline nesting surveys of the identified islet near the proposed Steensby Port Site before the construction of the port;
- completing Active Migratory Bird Nest Surveys (AMBNS) before any vegetation clearing or surface disturbance during the nesting season; and,
- continuing monitoring programs for cliff-nesting raptors (annual occupancy and productivity) and inland waterfowl (roadside waterfowl surveys) when qualified biologists are available and on site (paused indefinitely since 2021 since no Project-related trends have been observed).

In 2024, bird surveys at the Project focused on AMBNS for active migratory bird nests (if/when necessary, before vegetation clearing or surface disturbance).

## Birds Summary

Baffinland is committed to a range of surveys and monitoring programs designed to enhance baseline data and evaluate the effects of Project-related activities on birds. These programs include AMBNS to verify that no active nests are present before vegetation clearing or surface disturbance occurs. The following list highlights key findings from the bird monitoring programs completed at the Project in 2024.

- Four AMBNS were completed, covering approximately 41,927 m². No nests were detected.
- Raptor monitoring (completed from 2011 to 2020 in collaboration with Arctic Raptors Inc.) has been paused based on no evidence of Project-related effects on raptors.
- The PRISM plots were scheduled to be led and completed by Environment and Climate Change Canada in 2024 (awaiting results and report).

## 10.1 ACTIVE MIGRATORY BIRD NEST SURVEYS

The following PCs address concerns regarding migratory birds (Nunavut Impact Review Board 2020):

- **PC #66** *"If Species at Risk or their nests and eggs are encountered during Project activities or monitoring programs, the primary mitigation measure must be avoidance. The Proponent shall establish clear zones of avoidance based on the species-specific nest setback distances outlined in the Terrestrial Environment Management and Monitoring Plan."*
- **PC #70** *"The Proponent shall protect any nests found (or indicated nests) with a buffer zone determined by the setback distances outlined in its Terrestrial Environment Mitigation and Monitoring Plan, until the young have fledged. If it is determined that observance of these setbacks is not feasible, the Proponent will develop nest-specific guidelines and procedures to ensure bird's nests and their young are protected."*

Active Migratory Bird Nest Surveys were completed before vegetation clearing or surface disturbance to verify that no active bird nests were near the Potential Development Area (Baffinland Iron Mines Corporation 2016a). To the extent possible, Baffinland resolved to pre-emptively clear areas designated for development before the breeding bird window (i.e., May 17 to August 19) to avoid or minimize potential effects on nesting birds. This section summarizes the methods and results of the 2024 AMBNS.

### 10.1.1 METHODS

In June 2024, EDI Environmental Dynamics Inc. facilitated on-site training for Baffinland personnel for AMBNS, applying search methods developed by the CWS (Baffinland Iron Mines Corporation 2016b). Methods included 'rope-drags' and identification indicators for common species known to occur in the Potential Development Area. Rope-drag equipment was constructed following the template provided by the CWS (Rausch 2015).

Active Migratory Bird Nest Surveys were completed by at least two Baffinland searchers/observers in areas scheduled for approved construction activities during the breeding bird window (i.e., May 17 to August 19). During each survey, rope-drag equipment was systematically pulled across the search area as observers surveyed for potential breeding bird activities. Areas were surveyed for active nests up to five days before land clearing activities and one of the following mitigations were applied:

- if active nests were found, land clearing activities were postponed until the nests or nesting areas were no longer active;
- if no active nests were found, land clearing activities proceeded; or,
- if no land clearing activities occurred within the five-day survey window, the surveys were repeated.

If/where applicable, observers documented behavioural signs of nesting birds, including broken wing displays, alarm calls, and/or carrying food items or nesting materials. Species identifications varied depending on observer experience.

### 10.1.2 RESULTS AND DISCUSSION

To the extent possible, Baffinland prioritized land clearing activities outside of the breeding bird window in areas directly undisturbed by the Project. Four land disturbance/construction activities occurred during the breeding bird window, with four AMBNS completed within the breeding bird window (i.e., May 27, July 1, July 10, and August 3, 2024). No active or inactive nests were detected during the 2024 AMBNS. Approximately 41,927 m² (4.2 ha) of land were disturbed during three land clearing activities in 2024 (Table 10-1) within the disturbance window for Project infrastructure.

**Table 10-1. Disturbed area in relation to the 2024 Active Migratory Bird Nest Survey (AMBNS) disturbance window.**

| AMBNS Disturbance Window | Disturbance Area ($m^2$) |
|---|---|
| Within (May 17 to August 19, 2024) | 41,927 |
| Outside (August 20, 2023, to May 16, 2024) | **1,881** |
| **Total** | **43,808** |

# 11 WILDLIFE INTERACTIONS

Wildlife interactions and mortalities related to the Mary River Project (the Project) are uncommon. However, despite mitigation measures, wildlife interactions and mortalities may occur. Any incidents are recorded and carefully investigated to document leading causes and underlying circumstances.

**Wildlife Interactions Summary**

Baffinland Iron Mines Corporation (Baffinland) is committed to monitoring activities and mitigation measures to minimize wildlife interactions and mortalities at the Project. Wildlife incident and mortality logs note human-wildlife conflicts to identify and minimize current and potential wildlife-related issues. Since 2014, there have been no noticeable trends in wildlife interactions and mortalities, with relatively stable low numbers given the size of the Project. The following items highlight key findings and actions regarding wildlife interactions.

- In 2024, 10 individual wildlife mortality incidents were reported involving six species: four Arctic fox, one Arctic hare, one loon, two ptarmigan, one Snow Bunting, and one unknown songbird.
- Vehicle collisions were confirmed or suspected in all except three mortalities; two were unknown, and one was a result of incidental catch while completing other surveys.
- Baffinland continues to mitigate wildlife interactions in the Potential Development Area by training, enforcing, and monitoring waste management practices and guidelines and integrating preventive measures into road maintenance, infrastructure design, and the Environment Protection Plan (EPP).

## 11.1 WILDLIFE INTERACTIONS AND MORTALITIES

In 2024, ten individual wildlife mortality incidents were reported involving six different species:

- Arctic fox (4);
- Arctic hare (1);
- loon (1);
- ptarmigan (2);
- Snow Bunting (1); and,
- unknown songbird (1).

Vehicle collisions were confirmed or suspected in the Arctic fox, and Arctic hare, and mortalities. All avian mortalities were likely associated with building or infrastructure collisions.

## 11.2 WILDLIFE INTERACTIONS AND MORTALITY PREVENTION

Baffinland mitigates wildlife interactions at the Project through training, implementation, waste management practices, and guideline monitoring. All Project personnel (including managers, supervisors, and contract staff) attend mandatory EPP training. The EPP includes mitigations and protection measures for Arctic wolf, polar bear (*Ursus maritimus*), Arctic fox, and caribou, and waste management guidelines that are regularly reviewed, updated, and implemented. No major changes to policies and procedures occurred in 2024. Previous policy and procedure changes are described below.

**Waste Management** — Incineration and proper waste sorting are the most prominent deterrents used at the Project. Wildlife attractants such as food scraps and human waste are sorted and sealed in animal-proof containers and incinerated on site. Waste sorting guidelines clearly define where food and other attractants should be placed and are posted around each site.

**Fencing** — Significant effort was made in 2018 and 2019 to improve on-site waste management infrastructure to minimize human-wildlife interactions at the landfill. Site visits by the Nunavut Impact Review Board before 2018 resulted in recommendations to improve fencing at the landfill facility to reduce occurrences of windblown debris escape. A 275 m fence was installed on the landfill's west side (downwind) in the fall of 2018 to address these concerns. The fence also repurposed over 800 used tires as part of Baffinland's used tire disposal and recycling initiative. The fence effectively captures windblown debris from the landfill.

**Other Prevention Measures** — Wire skirting is used under the main camps at both sites, preventing wildlife (e.g., foxes and hares) from creating dens. As part of Baffinland's driver training, honking the horn before starting the vehicle helps scare off wildlife hiding in or near equipment. Wildlife have the right of way on all roadways unless they create a safety hazard. Snowbanks along the Tote Road are reduced where feasible by feathering back snow with equipment to ensure personnel along the Tote Road can view wildlife crossing the road. Feeding wildlife is strictly prohibited, and workers found to be feeding wildlife will face disciplinary action.

## 11.3 INTER-ANNUAL TRENDS

Inter-annual trends regarding wildlife interactions and mortalities are tracked at the Project. Most mortalities on site between 2014 and 2024 were attributed to collisions with vehicles or infrastructure (Figure 11-1). The increased number of building collisions in 2023 was attributed to a large group (13) of King Eiders striking the ship loader during the night in November. The first Arctic wolf mortality was recorded in 2023, likely struck by a vehicle. No inter-annual trends were identified for wildlife mortalities. No caribou mortalities have occurred thus far due to the Project (Figure 11-2).

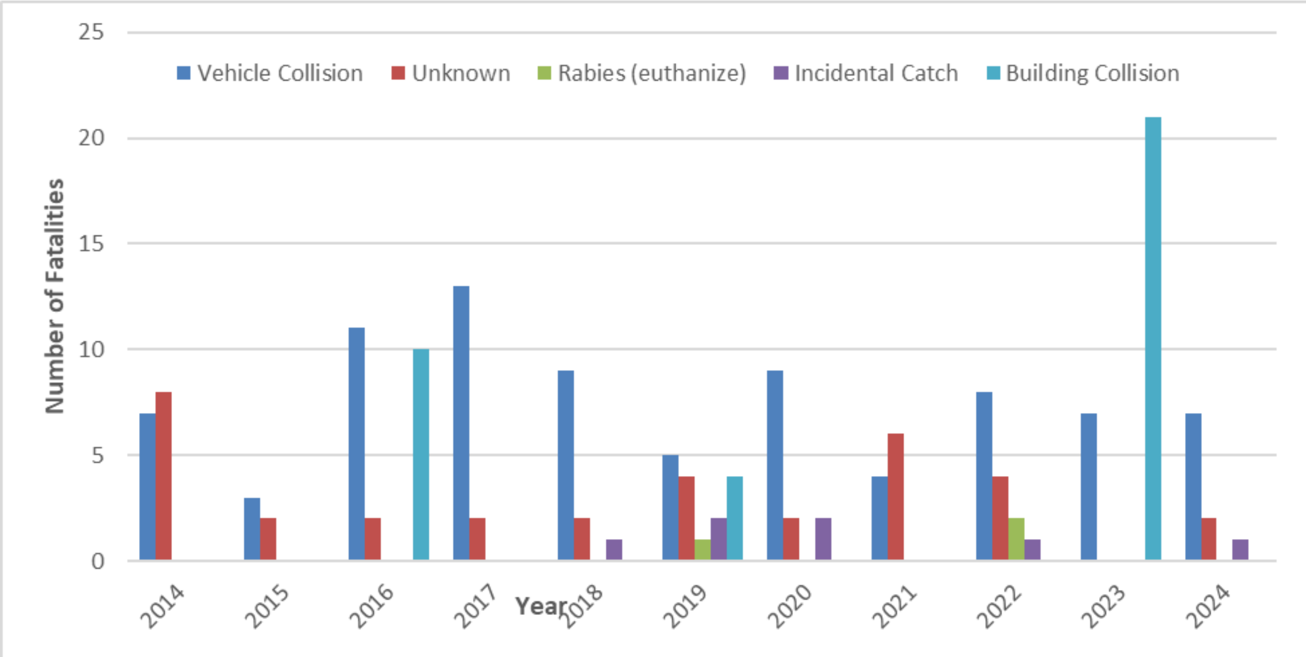



Figure 11-1. 2024 wildlife interactions – inter-annual mortality trends by cause of death (2014 to 2024).

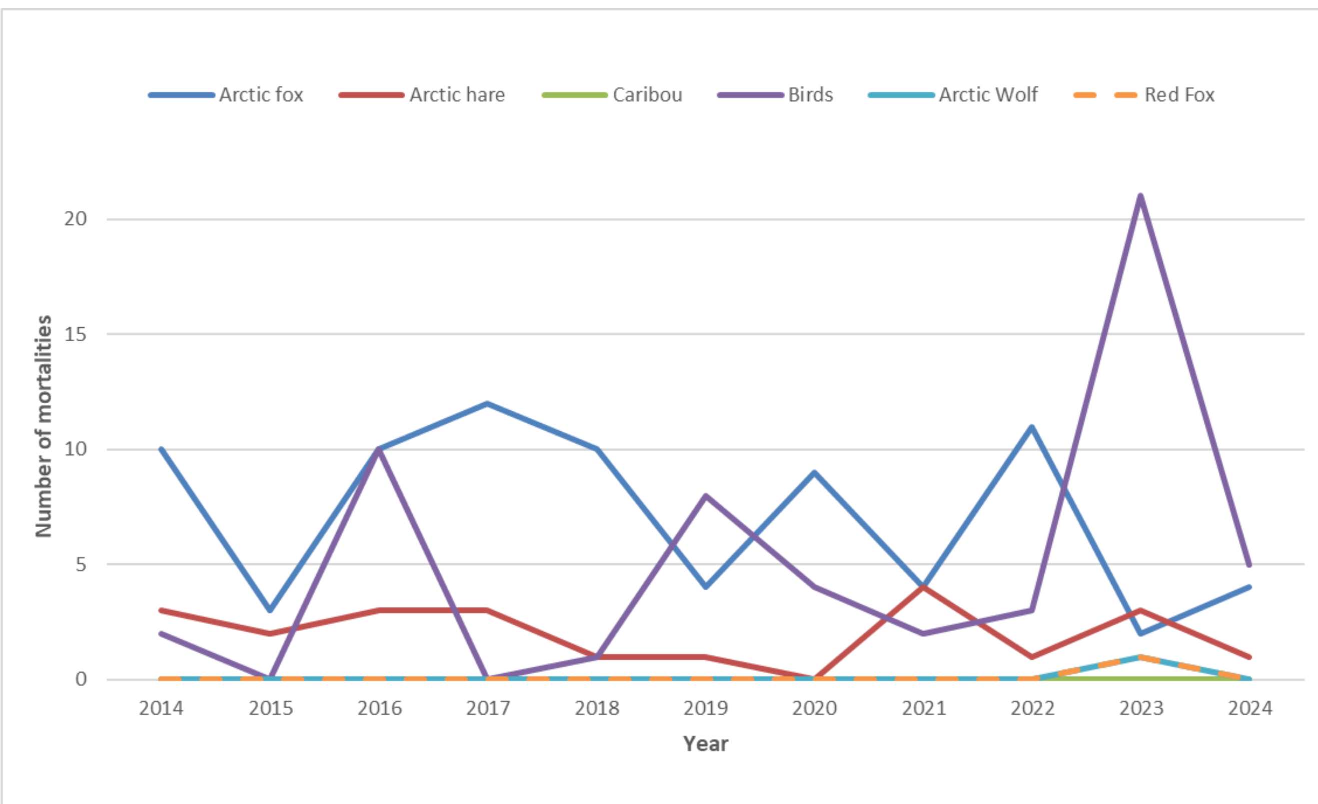



Figure 11-2. 2024 wildlife interactions – inter-annual mortality trends by species (2014 to 2024).

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# APPENDICES

# APPENDIX A 2023 TEAMR COMMENTARY AND BAFFINLAND RESPONSES

**Table A.1: Response to Comments on Baffinland's 2023 Annual Report to the NIRB**

| Cmt. # | QIA Cmt. # | Reviewer's Detailed Comment | QIA Recommendations | Reference Section | Baffinland's Response |
|---|---|---|---|---|---|
| **DUSTFALL** | | | | | |
| 4 | **QIA 2023 NIRB DF#1.** | Table 7-4 of the Terrestrial Environment Annual Report shows annual accumulations of dustfall from January 16, 2023, to January 7, 2024. The document states that "Extrapolated (winter) dustfall predictions were added to the observed dustfall amount." No further information on the method for extrapolating summer annual dustfall data, or considerations of factors affecting dustfall deposition rates is mentioned (i.e., through comparisons of particle size in winter vs. summer, longer transport distances in winter vs. summer, etc.). For example, seasonal differences in particle size dispersion (if present) will affect extrapolation methods. | QIA requests that the proponent provide further justification for extrapolating summer dustfall monitoring data to the rest of the year. | **Document Name:** Baffinland NIRB Annual Report, Appendix G.5.1 Terrestrial Environment 2023 Annual Monitoring Report<br><br>**Section:** Table 7-4 Annual dustfall accumulation for sites sampled throughout 2023<br><br>**Page:** 73 | As is described in the 2023 TEAMR, dustfall monitoring stations that are >1km away from Project infrastructure are not visited monthly during winter due to accessibility and safety. Consequently, winter dustfall data are unavailable at stations >1km from the Project. A modeling approach was developed to extrapolate winter dustfall predictions to farther distances to address this data gap. Winter dustfall predictions are not made from summer dustfall data. Winter predictions for sites >1km are estimated using (1) mean dustfall during winter, and (2) the range of available data at each location (Mine, Milne Port, Tote Road); a linear slope across distance values that is either the same (i.e., a common slope term) or different (i.e., a season-by-distance interaction term) from summer dustfall predictions. This methodology is further detailed in a memo shared with and accepted by the QIA in February 2022 (EDI Environmental Dynamics Inc 2023).<br><br>**Reference**<br>EDI Environmental Dynamics Inc. 2023. Mary River Project — Winter Dustfall Predictions at Distance Monitoring Sites. Technical Memorandum. EDI File # 23Y0273. Prepared for Baffinland Iron Mines Corporation. 5 pp. |

| Cmt. # | QIA Cmt. # | Reviewer's Detailed Comment | QIA Recommendations | Reference Section | Baffinland's Response |
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| 5 | **QIA 2023 NIRB DF#2.** | In Section 4.6.2, Baffinland noted that dustfall has exceeded FEIS predictions in some locations, but dust does not appear to have measurable impacts in other environmental media (e.g., vegetation, freshwater quality). There is no further discussion regarding the assessments that have been completed to evaluate dust-related impacts. Baffinland referred to PC No. 58 for more information about dustfall. From review of PC No. 58, there is further reference to PC No. 10, No. 34, and No. 54 for discussion of dustfall impacts on environmental media. Thus, the reviewer is redirected twice (i.e., once to PC No. 58 then again to PC No. 10, No. 34, and No. 54) before finding a discussion on the evaluation of dust impacts on environmental media. In the recommendations/lessons learned for PC No. 10, Baffinland noted: "Baffinland will continue with a number of projects to fully consider the 2023 Dust Audit Report (NunamiStantec, 2023) suggestions with assessment/implementation of accepted recommendations from the independent Dust Audit at the earliest opportunity." The timeline for implementing these recommendations, any anticipated mitigative effect of implementing the recommendations to reduce dust impacts to those predicted within the FEIS, or the relative impact of the recommendations is not provided in the NIRB annual report. Further, Baffinland indicated for PC No. 27 and PC No. 187 that a follow-up report will be issued by the Dust Audit Committee in Q2 of 2024. It is unclear if and how this follow-up report will be used to inform actions to mitigate dust impacts at the project. Baffinland discussed dustfall monitoring programs for the project in PC No. 10 (dust monitoring and management as part of the Air Quality and Noise Abatement Management Plan and Roads Management Plan), PC No. 21 (Dustfall | With respect to Section 4.6.2:<br><br>1. Clarify what assessments have been completed to support the claim that there are no measurable impacts to environmental media from dustfall.<br><br>With respect to PC No. 10, No. 27, and No. 187:<br><br>1. Clarify if the implementation of recommendations from the 2023 Dust Audit Report are anticipated to return dustfall to FEIS predictions?<br><br>2. Clarify whether the follow-up report from the Dust Audit Committee will be used to inform dust mitigations in 2024.<br><br>With respect to PC No. 10, No. 21, and No. 50:<br><br>1. Discuss how the results of the Dust Audit outcomes will be used to inform the Dust Monitoring Program and whether updates to the Dust Monitoring Program are needed based on the Dust Audit results. | **Document Name:** Project Certificate Term and Condition No. 10, No. 21, No. 27, No. 34, No. 50, No. 54, and No. 187 (Section 4.6.2, 4.6.5, 4.6.6, 4.6.8, and 4.8.5) | With respect to Section 4.6.2:<br><br>1. The Terrestrial Environment monitoring program evaluates multiple endpoints of the receiving environment, including changes in vegetation abundance and composition, and soil and vegetation base metals. These monitoring programs have not identified any measurable impacts or unifying trends.<br><br>With respect to PC No. 10, No. 27, and No. 187:<br><br>1. Implementation of recommendations from the 2023 Dust Audit Report and any independent dustfall mitigation activities identified by BIM will help the project decrease project-related dustfall. Mitigations do not each have related quantifiable predicted decreases in dustfall; therefore, it cannot be predicted if dustfall is anticipated to return to FEIS predictions.<br><br>2. BIM evaluates all follow-up communications from the Dust Audit Committee and uses their input to inform dust mitigations.<br><br>With respect to PC No. 10, No. 21, and No. 50:<br><br>1. BIM appreciates the Dust Audit Committee's feedback and has gained valuable insights from the Inuit Qaujimajatuqangit and community knowledge shared to date. BIM is open to adjustments to the Dustfall Monitoring Program when valid gaps are identified, and (where applicable) approved methodologies exist that can be implemented to bridge these gaps. These suggestions for revision may come from the Dust Audit Committee or other interested parties. |

| Cmt. # | QIA Cmt. # | Reviewer's Detailed Comment | QIA Recommendations | Reference Section | Baffinland's Response |
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| | | Monitoring Program as part of the Aquatic Effects Monitoring Plan), and PC No. 50 (dustfall monitoring as part of the Terrestrial Environment Mitigation and Monitoring Plan). Baffinland did not discuss how the results of the Dust Audit may impact dust monitoring programs at the site. It is unclear whether the results of the Dust Audit have been considered in relation to dust monitoring at site and whether updates to the monitoring programs are needed based on the Dust Audit results | | | |
| 10 | **QIA 2023 NIRB DF #7.** | Baffinland used mixed effects models to test the relationship between distance from Project infrastructure and daily dustfall. These models appear to have included both distance from mine site and distance from road as variables, but Baffinland does not mention whether the collinearity of variables were assessed (e.g., via Spearman rank correlations) | QIA requests Baffinland confirm whether they tested for collinearity of variables used in their mixed effects models. | **Document Name:** Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board; Appendix G.5.1;<br>**Section:** Section 7.3.1.3<br>**Page:** p. 57 | The mixed effects models used to test the relationship between distance from Project infrastructure and daily dustfall did not include distance from the mine site and road as variables; the model included the nearest distance to infrastructure, whether the road, mine or port.<br>Since only one distance variable was used, no collinearity of variables was tested. |
| 11 | **QIA 2023 NIRB DF #8.** | Within section 7.3.2.3, Baffinland notes that "The annual dustfall values were compared with the annual EIS predictions, however, this modelling was updated in 2023, and presented as part of the Sustaining Operations Proposal (SOP) Air Quality Assessment (Nunami Stantec Ltd. 2023). As this proposal was approved in late 2023, the annual dustfall data for 2024 will be compared with the updated dustfall predictions." (p. 72). Baffinland notes that the 2024 dustfall data will be compared with this new modelling, but does not note whether there will still be a comparison to the FEIS predictions. | QIA requests that Baffinland include a comparison to both the FEIS predictions and the updated dustfall model as part of the 2024 TEAMR. This will help to ensure that any dustfall impacts above those predicted in the FEIS are noted, and that Baffinland efforts to improve the current understanding of dust dispersion and impacts are shown. | **Document Name:** Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board; Appendix G.5.1;<br>**Section:** Section 7.3.2.3<br>**Page:** p. 72 | The 2024 annual dustfall data presented in the 2024 TEAMR will be discussed in comparison with the FEIS predictions and the updated modelling results presented in the Sustaining Operations Proposal 2 (SOP2) Air Quality Assessment (Nunami Stantec Ltd. 2023). |

| Cmt. # | QIA Cmt. # | Reviewer's Detailed Comment | QIA Recommendations | Reference Section | Baffinland's Response |
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| 12 | **QIA 2023 NIRB DF #9.** | Within Table 7-4, Baffinland shows the annual dustfall accumulation for monitoring sites in 2023, which includes dustfall deposition above the FEIS predictions at 24 of the 43 dustfall monitoring sites.<br>Continued dustfall deposition above the levels predicted within the FEIS continues to be a significant concern for QIA. QIA acknowledges that Baffinland has undertaken actions to improve dust mitigations and limit dustfall deposition, but notes that more actions can still be undertaken reduce dustfall deposition.<br>As well in Tables 7-8 and 7-10, Baffinland notes the mean dustfall concentrations in areas of community concern based on satellite imagery analysis with Quarnak showing elevated dustfall concentrations relative to baseline and reference site concentrations. | QIA requests that Baffinland commit to the following:<br>1. QIA requests that Baffinland continue to monitor lichen-metal concentrations more frequently than currently scheduled, annually, so that if thresholds noted in the Terrestrial Environment Mitigation and Monitoring Plan (TEMMP) are exceeded that suitable responses can be undertaken. QIA notes that they are still working with Baffinland on requested changes to the current draft of the TEMMP to address outstanding concerns which are related to thresholds and responses.<br>2. Committing to undertaking a meeting with the QIA before September 2024 to resolve outstanding issues related to the isopleth modelling for the Project since February 2023.<br>3. Baffinland to provide a review of operational and infrastructure controls that can be implemented throughout the ore handling chain to minimize dustfall by August 2024.<br>4. Baffinland to commit to having a meeting with QIA to discuss proposed responses to threshold exceedances for dustfall before September 2024. | **Document Name:** Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board; Appendix G.5.1;<br>**Section:** Section 7.3.2.3; Table 7-4; Section 7.4.2; Table 7-8; 7-10<br>**Page:** p. 72-73; p. 102 | 1. Table 1-1 of the 2023 TEAMR summarizes the frequency of previous and next anticipated Terrestrial Environment Monitoring components. As defined in the TEMMP, both soil/vegetation base metals sampling and vegetation abundance monitoring are conducted per 3–5 year intervals; BIM has either met or exceeded the prescribed monitoring frequency for these components, which BIM will continue to do into the future.<br>Based on the most recent soil/vegetation base metal monitoring campaign (2022 TEAMR), soil metals predominantly indicated no significant change or were significantly lower than baseline values across all Project areas and sample distances. Many mean lichen-metals concentrations across Project areas and sample distances showed no significant changes from baseline values, although some discrete increases have been recorded (i.e., attributed to occasional 'spikes' in metal concentration, sample variability, and/or proximity to Project operations). These findings suggest that soil/vegetation base metals currently present a low environmental and human health risk.<br>2. Baffinland will discuss this with QIA. Baffinland requests that QIA provide a consolidated summary of comments on the isopleth model prior to the meeting occurring.<br>3. Baffinland will continue to work with the QIA and is providing a written response to previous commitments to QIA around implementation of dust controls at the Project.<br>4. Baffinland will discuss this with QIA |
| 13 | **QIA 2023 NIRB DF #10.** | Within section 7.4.1.5, Baffinland notes that the dustfall concentrations for the imagery analysis were classified into 6 classes: 40 g/m2 . QIA notes that the FEIS predictions include 1–4.5, 4.6– 50, and ≥50 g/m2 , which differ from the classes provided by Baffinland and means that direct comparisons are difficult. | QIA requests that for future reporting on satellite imagery analysis that Baffinland using the following classes:<br><1, 1–4.5, 4.5–10, 10–20, 20–40, 40-50 and ≥50 g/m2. BY actioning this change, Baffinland will make it easier to make comparisons to FEIS predictions and | **Document Name:** Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board; Appendix G.5.1;<br>**Section:** Section 7.4.1.5<br>**Page:** p. 87 | Baffinland uses the dustfall concentration classes <1, 1–4.5, 4.5–10, 10–20, 20–40, and ≥40 g/m$^2$ for the dustfall satellite imagery analysis. The >40 g/m$^2$ class can be split into two classes, 40–50 g/m$^2$ and >50 g/m$^2$, as recommended by QIA, will be used in the 2024 reporting for easier comparison with the FEIS predictions. |

| Cmt. # | QIA Cmt. # | Reviewer's Detailed Comment | QIA Recommendations | Reference Section | Baffinland's Response |
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| | | | increase the utility of the satellite imagery analyses. | | |
| **TERRESTRIAL ENVIRONMENT** | | | | | |
| 53 | **QIA 2023 NIRB TE #3.** | Within section 5.2.1, Baffinland notes that "Non-compliant flights were primarily related to transits to Steensby Inlet." (p. 23). In section 5.2.3, Baffinland notes that "…2023 had more flight hours within the Snow Geese area at 48.04 hours, second only to 2015 at 50.84 hours." (p. 33). As Steensby Port and southern railway construction are proposed to occur in the near future, this association between non-compliant flights and transit to Steensby Inlet, and increase in flights in the snow goose moulting area are worrying as presumably the number of flights to Steensby Inlet will continue to increase.<br><br>Within Section 5.2.2, Baffinland notes with regards to the increase in low level flights associated with poor weather days in the snow goose moulting area that "This increase is contrary to the mitigation protocol implemented in 2021 (summarized in EDI Environmental Dynamics Inc. 2022), which requires helicopters to travel around the Snow Geese area during the moulting season on days with poor weather. Further investigation into leading causes is recommended." (p. 31). Baffinland does not provide any details of the investigative actions that will be undertaken to address this issue.<br><br>QIA recognizes that health and safety is paramount and that there may not be feasible alternative measures to key project operations (such as slinging), but additional efforts must be made to investigate the impact this is having on breeding migratory birds and moulting Snow Geese. As shown on p. | 1. QIA requests that Baffinland undertake proactive awareness training with pilots in advance of the moulting season to address non-compliance from helicopter flights.<br><br>2. QIA requests that Baffinland provide their proposed investigation methods for review by the TEWG, to ensure that the investigation will identify the root causes of non-compliance.<br><br>3. QIA requests that Baffinland provide the results of their investigation, and corrective actions they will undertake to determine why their mitigation protocol was not being followed correctly and how they can prevent this from occurring in the future. QIA expects that corrective actions will include:<br><br>4. Moulting season orientation with pilots to emphasize the need to travel around the Snow Geese area during the moulting season on days with poor weather; and | **Document Name:** Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board; Appendix G.5.1<br><br>**Section:** 5.2.2 Compliance Rationale; 5.2.3 Inter-annual Trends<br><br>**Page:** p. 31; p. 33<br><br>**Document Name:** Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board<br><br>**Section:** Section 4.6.8; Project Certificate Term and Condition No. 59<br><br>**Page:** p. 228-234 | 1. Baffinland undertakes proactive awareness training annually when pilots arrive onsite. In addition, Baffinland's Helicopter Guidelines were developed to provide information to pilots performing work for environmental, Projects and exploration programs at the Project. The guidelines outline the areas around the Project site that may have flight restrictions that must be considered when flying, including wildlife zones, sensitive environmental monitoring equipment, archeologic resources, blasting zones, and aircraft zones. All pilots who will be working at the Project, and all personnel who will be flying in a helicopter are required to review Baffinland's Helicopter Guidelines and to sign-off that they have read and understood the requirements.<br>2. Investigation methods will be included in the 2025 TEAMR following consultation and review with a third-party subject matter expert.<br>3. Results of the investigation will be discussed in the 2024 TEAMR.<br>4. Baffinland commits to completing moulting season orientation with pilots to re-emphasize the need to travel around the Snow Geese area during the moulting season on days with poor weather.<br>5. Baffinland commits to completing a mid-moulting season assessment of pilot compliance and discussions with any pilots that have breached compliance of the 2021 migration protocol.<br>6. The recommendation for helicopter overflight research is a reiteration of QIA 2022 NIRB TE#16, and has already been addressed by Baffinland (Baffinland 2023). Baffinland acknowledges that overflights below recommendations might be disturbing some birds and moulting snow geese.<br><br>**References** |

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| | | 233, Baffinland has no plans to study migratory bird and snow goose response to helicopter disturbance. | 5. Mid-moulting season assessment of pilot compliance and discussions with any pilots that have breached compliance of the 2021 mitigation protocol.<br><br>6. QIA requests that Baffinland conduct research on the effects of both non-compliance and "compliance with rationale" flights on migratory bird breeding and snow goose moulting. An appropriate study design should be used to avoid additional impacts, particularly during the snow geese moulting season. This commitment to conduct research should be captured in the "Recommendations / Lessons Learned" section of Section 4.6.8, PC Condition 59. Until this research has been conducted and findings demonstrate no significant impact of low-level flying, Baffinland must continue to conservatively assume and disclose that its operations are harmful to breeding migratory birds and snow goose moulting. | | Baffinland Iron Mines Corporation. 2023. Baffinland Response to Reviewer Comments on the 2022 NIRB Annual Report. NIRB Registry Document #346627. 222 pp. |
| 54 | **QIA 2023 NIRB TE #4.** | Baffinland has not provided reporting of helicopter flights routes relative to walrus haulout locations. This is concerning to QIA as potential disturbance from aircraft could lead to adverse effects on walrus and details of flight routes relative to these locations should be provided. | QIA requests that Baffinland provide mapping of the helicopter flights routes relative to walrus haulout locations in future annual reports.<br><br>QIA expects that Baffinland will provide the results of their investigative and corrective measures within the 2024 Terrestrial Environment Annual Monitoring Report. | **Document Name:** Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board; Appendix G.5.1<br><br>**Section:** General Comment<br><br>**Page:** N/A | In 2023 Baffinland did not fly near any walrus haul outs, thus a map was not created. The walrus haul outs remain the same, and Baffinland did not fly near these areas. Baffinland can provide mapping of the helicopter flights routes relative to walrus haulout locations in future annual reports. |
| 55 | **QIA 2023 NIRB TE #5.** | Within Section 5, Baffinland notes that "No locations or boundaries of areas prescribed explicitly by the TEWG or areas of observed concentrations of other migratory birds were identified in 2023." (p. 22). It's currently unclear how | 1. QIA requests that Baffinland provide details on the documentation process that Baffinland will follow when | **Document Name:** Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board; Appendix G.5.1 | 1. If concentrations of migratory birds are observed, the area will be investigated to verify and delineate. Data and proposed locations will be submitted to TEWG members for comment. |

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| | | information of observed concentrations of other migratory birds would be documented by Baffinland and how this documentation would lead to eventual implementation of helicopter avoidance areas. | concentrations of other migratory birds are observed.<br>2. QIA requests that Baffinland provide details on the reporting and mitigation process that would follow this documentation, including details of who reported observations will be sent to, how they will determine if an avoidance area is needed, and the timeline for this process overall. | **Section:** Section 5 Helicopter Overflights<br><br>**Page:** p. 22 | 2. Observations of concentrations of migratory birds within the Project area can be reported to BIM Environment staff, who will pass along information to the appropriate personnel. Areas will then be assessed, and similar standards for current avoidance areas will be applied, if applicable. If the TEWG collaborates on reasonable and informed approaches, new avoidance areas could be applied within 12 months of initial reporting. |
| 57 | **QIA 2023 NIRB TE #7.** | Table 5 of the Snow Management Plan provides information on snow clearing along the Tote Road, and states that snow clearing will "*avoid or minimize barrier effects on wildlife movement*" (P13). No specific triggers or mitigative actions are provided in the document, although references to snowbank height monitoring (as part of the Terrestrial Environment Mitigation and Monitoring Plan - TEMMP) and the Roads Management Plan are provided. It is difficult to evaluate any potential impacts of the Tote Road snow clearing on wildlife mobility without specific information from the TEMMP snowbank height monitoring and Roads Management Plan. This information should be included in Table 5 of the Snow Management Plan, for ease of review and document completeness, providing a single streamlined document that can be consulted if snowbank height or Tote | QIA requests that Baffinland provide a more specific reference to the TEMMP snowbank height monitoring and Roads Management Plan, or provide pertinent information about the specific mitigative actions that will be taken if snowbanks on the Tote Road are found to be high enough to disrupt wildlife migration. | **Document Name:** Baffinland NIRB Annual Report, Appendix G.8.8 Snow Management Plan<br><br>**Section:** Table 5<br><br>**Page: 13** | Snowbanks along the Tote Road are 'feathered' (i.e. pushed back and redistributed) out into the tundra to minimize snow bank height to ensure impacts to wildlife are minimized. This is completed on an as-needed basis and as weather conditions allow. Safety and topographical conditions are considered in the reduction of snow bank heights throughout the winter.<br>References to applicable sections of the TEMMP, Roads Management Plan, and Snow Management Plan are as follows:<br>• Terrestrial Environment Mitigation and Monitoring Plan (TEMMP), BAF-PH1-830-P16-0027, Rev. 1, pages 52-53<br>• Roads Management Plan, BAF-PH1-830-P16-0023, Rev. 7, page 15<br>Snow Management Plan, BIM-5200-PLA-0006, Rev. 7 |

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| | | Road snow clearing are found to be disruptive to wildlife migration. | | | |
| 58 | **QIA 2023 NIRB TE #8.** | Within Table 0 of the Summary section, Baffinland notes that wildlife mortalities "…were low overall and represented a very small proportion of overall populations, consistent with impact predictions." (p. xix). Baffinland noted that 13 King Eider mortalities were recorded, and 4 additional avian mortalities (3 snow bunting and an unknown songbird), for a total of 17 avian mortalities, which is not a low number of mortalities, especially relative to previous years. Within the FEIS, it is noted that "Potential influences on mortality for Eider within the terrestrial RSA will be similar to those described above for Snow Goose." (p. 105), and under residual project effects to snow geese it is noted that "Direct mortality of any individual Snow Goose due to Project activities is not expected…" (p. 102). The mortalities of 13 King Eiders is concerning especially relative to FEIS predictions.<br><br>As well, Baffinland has provided no explanation how it is tracking King Eider, and songbird abundance to substantiate its claim regarding a small proportion of the overall population. As well, Baffinland notes that "All avian mortalities were likely associated with building or infrastructure collisions." (p. 194). Baffinland does not indicate whether a retrospective review of building strike mitigations will take place, nor do they provide any details on enhanced mitigations that might be used to mitigate building collisions. | 1. QIA requests that Baffinland provide further details to explain how they determined the 17 mortalities represents small proportions of the overall populations, with reference to appropriate population estimates.<br><br>2. QIA requests that Baffinland provide a summary of the existing mitigations to prevent bird strikes on buildings and provide options for possible enhanced mitigations to reduce bird strikes (e.g. American Bird Conservancy Bird Tape for windows to reduce possible window strikes associated with buildings) | **Document Name:** Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board; Appendix G.5.1;<br><br>**Section:** Summary, Table 0; Section 11 Wildlife Interactions<br><br>**Page:** p. xix; pp. 191-194<br><br>**Document Name:** Baffinland Iron Mines 2012 Mary River Project Final Environmental Impact Statement Volume 6 Terrestrial Environment<br><br>**Section:** Section 4.7 Common and King Eider; Section 4.6 Snow Goose<br><br>**Page:** pp. 99-104 | 1. Population estimates for King Eider and snow bunting are available on public online data sources. The population estimate for King Eider in Canada is 600,000 birds (Government of Canada 2015a). The 13 mortalities represent 0.002% of the population in Canada. The population estimate for snow bunting is 5,000,000 –50,000.000 adults (Government of Canada 2015b). The two mortalities represent 0.00% of the Canadian population.<br>2. The event which resulted in thirteen (13) King Eider mortalities as a result of contact with the shiploading structure at Milne Port was a unique event. High winds and blowing snow likely reduced visibility, resulting in the collision. The shiploading structure includes a large conveyor and steel frame tower structures with lighting that is angled to minimize potential for attracting birds or other wildlife. Following completion of the 2023 shipping season, the shiploader was winterized and therefore the lighting was significantly reduced. Baffinland reviewed documentation of wildlife interactions and found no previous mortalities at the shiploader have occurred. Should this event be repeated for this facility, additional mitigation measures will be considered in accordance with Baffinland's Terrestrial Environment Mitigation and Monitoring Plan (TEMMP).<br><br>Additionally, general site mitigation measures to limit Project effects on bird species are implemented across the Project as per section of 3.2.1 of the TEMMP.<br><br>**References:**<br><br>Terrestrial Environment Mitigation and Monitoring Plan (TEMMP), BAF-PH1-830-P16-0027, Rev. 1, pages 44-45<br><br>Government of Canada. 2015a. Population Status: King Eider (*Somateria spectabilis*). (https://wildlife-species.canada.ca/bird-status/tendance-trend-eng.aspx?sY=2019&sL=e&sB=KIEI&sM=p1&sT=f3852f38-83b4-4a30-9432-57f27231100e). Accessed July 25, 2024.<br><br>Government of Canada. 2015b. Snow Bunting (*Plectrophenax nivalis*). (https://wildlife-species.canada.ca/bird-status/oiseau-bird-eng.aspx?sY=2019&sL=e&sM=a&sB=SNBU&wbdisable=false). Accessed July 25, 2024. |

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| 59 | **QIA 2023 NIRB TE #9.** | Within Section 11, Baffinland notes that there were 13 King Eider, 3 snow bunting, and 1 unknown songbird mortalities in 2023, and that the 17 bird mortalities were likely associated with building/infrastructure collisions. In figure 11-1 Baffinland notes for 2023 that there were more than 20 building collision mortalities, and 7 vehicle collision mortalities. The difference between the number of mortalities noted in Section 11 and Figure 11-1 is concerning, as it's unclear which accurately reflects the mortalities that occurred. | QIA requests that Baffinland revise section 11 or figure 11-1 to reflect the true number of building collision mortalities. | **Document Name:** Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board; Appendix G.5.1;<br><br>**Section:** Section 11; Figure 11-1;<br><br>**Page:** p. 191-193 | Figure 11-1 will be updated to reflect Project –related mortalities. |
| 60 | **QIA 2023 NIRB TE #10.** | Within Table 1-1, Baffinland notes that caribou fecal pellets were collected in 2011–2014 and 2020. Baffinland does not provide any details on the analyses or reporting that were completed as part of the fecal pellet collection programs. | QIA requests that Baffinland share the results of the caribou fecal pellet programs and associated reporting. | **Document Name:** Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board; Appendix G.5.1;<br><br>**Section:** Table 1-1,<br><br>**Page:** p. 2 | No analyses were conducted on the fecal pellets collected in 2011–2014 because the age of the pellets was unknown. No relevant information to the project effects was to be gained from an analysis of the 2020 fecal pellets. |
| 61 | **QIA 2023 NIRB TE #11.** | Baffinland notes in Section 9.1.1 that "If/when wildlife tracks were suspected, personnel would further investigate on foot to confirm the identity of the species and follow the tracks (to or from the roadway) to document the patterns of movement, behaviour, and habitat use (if/where possible)." (p. 148-149). Baffinland does not indicate how far personnel travelled to monitor the deflection.<br><br>Baffinland noted results of the track surveys as either deflections, parallelling, or crossing. QIA notes that it is possible for wildlife to be deflected from the road, cross it eventually, or parallel the road until it connects with the mine site or Milne port. From the details provided from Baffinland it's unclear for what distance tracks were followed to confirm the ultimate response of the individual wildlife (i.e. were tracks followed until the animal crossed the road, turned away, or for a specified distance). | QIA requests that Baffinland clarify whether or not staff follow the tracks until the tracks indicate the animal crossed the road, turned away from the road or for a specified distance (e.g. 1 km). QIA would expect that Baffinland staff would be undertaking these surveys to ensure all efforts are being made to document possible deflections through following tracks until they cross the road, are deflected or until 1 km of paralleling has been reached. | **Document Name:** Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board; Appendix G.5.1;<br><br>**Section:** Section 9.1.1,; Section 9.1.2<br><br>**Page:** pp. 148-149, pp. 149-152 | Baffinland confirms that snow track survey staff follow tracks to document animal patterns of movement (i.e. to identify whether animals deflected, travelled along, or crossed the road). Snow tracks observed along the Tote Road are followed on foot within a reasonable distance to document patterns of movement, as well as, animal behaviour, and habitat use (if/where possible). Surveys are completed after all snowfall events and all tracks are documented on foot unless it is unsafe to do so (i.e. where the road is narrow or where there are blind corners or dips). If tracks are seen travelling along the Tote Road for longer distances, generally >100m when safe conditions exist), the survey crew will follow the tracks in a light truck traveling at a speed of ~30 km/hr untill the tracks either cross the road or veer off into the Tundra. |
| 62 | **QIA 2023 NIRB TE #12.** | Regarding height of land surveys in 2023, Baffinland notes that "Efforts were made to visit all sites a second time but due to helicopters being grounded for safety reasons, a full second round was not able to be completed." (p. 160). | QIA requests that Baffinland provide more details on the safety reasons that led to helicopter being grounded, which impacted the completion of a second round of height of land surveys. Further to this, QIA request that Baffinland plan for | **Document Name:** Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board; Appendix G.5.1; | Baffinland appreciates the QIA's comments on survey logistics and contingency planning, and can assure QIA that all reasonable efforts are made to plan for unexpected circumstances. We can confirm that contingency planning for inclement weather is always accounted for when planning field programs. |

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| | | Baffinland does not provide a rationale as to why the full second round was not able to be completed. This is concerning as it would be beneficial to understand why surveys were limited in 2023, so that the same situation can be planned for and avoided during subsequent years. | these possible eventualities in the future, so that a second round of surveys can be completed (e.g. planning to have a couple extra/spare days in case of bad weather to ensure staff and equipment are available). | **Section:** Section 9.3.1.1<br><br>**Page:** page 160 | In this specific case, an aviation incident that caused significant damage to one of the helicopters onsite resulted in the extended grounding of the entire fleet until a full investigation could be completed. The time required to complete the investigation **which included the Transportation Safety Board** far exceeded the contingency planning room within multiple field program schedules. **Of importance, in order to resume grounded helicopter operations, all rotary winged aircraft must be released/approved by the Transportation Safety Board and Transport Canada.** We hope the QIA can appreciate that this kind of event is not possible to plan for. |
| 63 | **QIA 2023 NIRB TE #13.** | Regarding incidental wildlife, Baffinland provides a list of common species recorded on wildlife log in 2023 and notes piping plover (*Charadrius melodus*) among the common species observed. Baffinland provides no further details of the observations of piping plovers.<br><br>QIA notes that both subspecies of piping plover (*Charadrius melodus circumcinctus* and *Charadrius melodus melodus*) are list as Endangered under the *Species at Risk Act* (ECCC, 2022; EC 2006), and that further details should be provided on these observations, as the current known range of piping plover in Canada does not include Nunavut, and potential impacts of the project on piping plover were not assessed as part of the FEIS. | QIA requests that Baffinland provide further details on the incidental observations of piping plovers (e.g. location of observations, timing, photos or descriptive details).<br><br>QIA also requests what Baffinland provide details of what measures were taken once piping plovers were identified to reduce potential disturbance of individuals and their habitat. | **Document Name:** Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board; Appendix G.5.1;<br><br>**Section:** Section 9.6<br><br>**Page:** p. 183<br><br>**Other Documents:**<br><br>Environment and Climate Change Canada. (2022). "Recovery Strategy (Amended) and Action Plan for the Piping Plover melodus subspecies (*Charadrius melodus melodus*) in Canada." *Species at Risk Act* Recovery Strategy Series. Environment and Climate Change Canada, Ottawa. viii + 124 pp.<br><br>Environment Canada. (2006). "Recovery Strategy for the Piping Plover (*Charadrius melodus circumcinctus*) in Canada." *Species at Risk Act* Recovery Strategy Series. Environment Canada, Ottawa. vi + 30 pp. | Baffinland thanks QIA for bringing this observation forward. Incidental observations are made by staff at site, including non-expert observers. There are inherent limitations to characterizing species, age, or sex of bird or wildlife groups or individuals. The requested information is not available. Upon reflection, the birds were unlikely piping plover because Mary River is completely outside of the range but BIM will endeavour to be as accurate in the incidental observations as possible. |
| 64 | **QIA 2023 NIRB TE #14.** | Within Section 9.6, Baffinland notes that 103 caribou were recorded as part of the incidental wildlife observations in 2023. Baffinland does not provide a map of the location of these caribou observations, nor do they provide details on the group sizes for all of the caribou observations. QIA notes that further details on the location of caribou (e.g. a map), and group sizes would be provide greater clarity on the | QIA requests that Baffinland provide mapping of the location of caribou observations and details on groups sizes for these observations made during 2023, as well as previous years where possible. For future annual reports QIA requests that Baffinland record the approximate locations of wildlife observed as part of | **Document Name:** Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board; Appendix G.5.1;<br><br>**Section:** Section 9.6 | The incidental observation logs are intended to capture awareness of and general observations of wildlife by project personnel at the Project. Some observations are made well outside the terrestrial RSA (e.g., during travel to/from exploration areas). For caribou group sizes and observations, the 2023 aerial survey or other surveys specific to caribou (i.e., having clearly defined methodology and data collection and |

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| | | context of the observations, and contribute to informative data on trends in caribou observations over the life of the project. | the incidental wildlife monitoring and include mapping of observations within the annual reports, and details of the different group sizes observed. | **Page:** p. 183-184 | analysis procedures) should be reviewed to quantify the details requested by the QIA. |
| 65 | **QIA 2023 NIRB TE #15.** | Within Section 10, Baffinland notes that as part of activities to address PC 74 "In consultation with the Terrestrial Environment Working Group and Canadian Wildlife Service (CWS), it was resolved that effects monitoring for tundra breeding birds could be discontinued. Instead, Baffinland Iron Mines Corporation (Baffinland) would commit to the following:<br>• completing coastline nesting surveys of the identified islet near the proposed Steensby Port Site before the construction of the port;<br>• continuing monitoring programs for cliff-nesting raptors (annual occupancy and productivity) and inland waterfowl (roadside waterfowl surveys) when qualified biologists are available and on site (paused indefinitely since 2021 since no Project-related trends have been observed)." (p. 188)<br><br>With the construction of the southern railway and Steensby Port due to commence in the near future, QIA is concerned about potential project-related impacts to cliff nesting raptors and waterfowl, and that important components of the bird monitoring programs are currently not planned in the future. QIA notes that while Baffinland previously completed cliff nesting raptor and roadside waterfowl surveys, these were associated with the Milne Port, Tote Road and Mine site, the construction and operation of the southern railway and Steensby Port may produce different effects on cliff nesting raptors and waterfowl and should be monitored. As it currently stands with no monitoring in place for future years, adverse effects may occur and there would be no mitigative response.<br><br>Additionally, within Table 1-1, Baffinland notes that no surveys are scheduled but that they "may reassess in future years" (p. 2). QIA notes that the cliff nesting raptor surveys | QIA requests that Baffinland undertake the following monitoring in future years:<br>• Updated coastline nesting surveys of the identified islet near the proposed Steensby Port Site;<br>• Cliff-nesting raptors (annual occupancy and productivity) surveys around the Mine site, southern railway route, and Steensby Port;<br>• Peregrine nesting (annual occupancy and productivity) surveys around the Tote Road, and Milne Port; and<br>• Roadside/railside waterfowl surveys around the Mine site, southern railway route, and Steensby Port.<br><br>By undertaking these surveys, Baffinland will help to ensure that potential project related effects on birds are being monitored and that mitigative measures can be implemented if needed. | **Document Name:** Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board; Appendix G.5.1;<br><br>**Section:** Section 10; Table 1-1<br><br>**Page:** p. 188; p. 2 | Baffinalnd offers the following in response to QIA's request:<br>• The islet survey will be conducted before southern commercial shipping begins.<br>• Cliff-nesting raptor surveys are unlikely to be re-instituted. The disturbances associated with the southern operation are either no different or less than those observed in the northern operation.<br>• Peregrine falcon occupancy and productivity surveys will not be continued along the Tote Road or Milne Port. The data collection and analyses to date were sufficient to illustrate no relationship between occupancy and productivity and distance to disturbance.<br>As the potential to develop the Steensby Component approaches with more certainty, Baffinland will engage the QIA and TEWG to carry out thorough discussions on this topic to ensure that all parties understand the results of monitoring programs to date and their applicability to southern operations effects monitoring. |

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| | | appeared to show a slight declining trend in peregrine falcon nest occupancy before the program was discontinued.<br><br>As well, QIA notes that the coastline nesting surveys were last completed in 2012 and that conditions may have changed in the past 12 years, which could lead to a mischaracterization of project effects on coastline nesting birds. An updated coastline nesting survey would provide a more robust assessment of current conditions for coastline nesting birds, which future monitoring could compare against to assess potential project effects. | | | |
| 66 | **QIA 2023 NIRB TE #16.** | Within Section 4.6.6, Baffinland provides an overview of the terms and conditions related to vegetation and the associated vegetation monitoring they undertake, including lichen-metal sampling. Baffinland notes that lichen-metal sampling was not undertaken in 2023, but that the next sampling period would be between 2025 and 2027. QIA remains concerned by the statistically significant increases in lichen-metal concentrations relative to baseline levels shown in 2022 (i.e. arsenic, cadmium, copper, lead, selenium), especially with some far sampling sites (e.g. arsenic, cadmium, and selenium at the Mine Site far sampling sites) and one reference sampling site (i.e. selenium at the Tote Road reference sampling site) showing these statistically significant increases for certain contaminants of potential concern.<br><br>QIA is concerned that, by not having consistent annual monitoring, potential statistically significant increases or increases above lichen indicator values could occur and there would be no timely mitigative response engaged. | QIA requests that Baffinland continue to monitor lichen-metal concentrations more frequently than currently scheduled, annually so if thresholds noted in the Terrestrial Environment Mitigation and Monitoring Plan (TEMMP) are exceeded that suitable responses can be undertaken.<br><br>QIA notes that they are still working with Baffinland on requested changes to the current draft of the TEMMP to address outstanding concerns which are related to thresholds and responses. | **Document Name:** Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board;<br><br>**Section:** Section 4.6.6, Project Certificate Term and Condition No.<br><br>**Page:** p. 147<br><br>**Document Name:** Baffinland Iron Mines Corporation Mary River Project 2022 Annual Report to the Nunavut Impact Review Board; Appendix G.5.1 – 2022 Final Terrestrial Environment Annual Monitoring Report<br><br>**Section:** Table 9-16<br><br>**Page:** p. 163 | This QIA Comment/Recommendation relates to the 2022 TEAMR, and reiterates QIA 2023 NIRB DF #9, bullet #1 (above).<br><br>As defined in the TEMMP, both soil/vegetation base metals sampling and vegetation abundance monitoring are conducted per 3-5 year intervals; BIM has either met or exceeded the prescribed monitoring frequency for these components. Increasing the sampling frequency is not warranted.<br><br>Based on the most recent soil/vegetation base metal monitoring campaign (2022 TEAMR), soil metals predominantly indicated no significant change or were significantly lower than baseline values across all Project areas and sample distances. Many mean lichen-metals concentrations across Project areas and sample distances showed no significant changes from baseline values. However, some discrete increases have been recorded (i.e., being attributed to occasional 'spikes' in metal concentration, sample variability, and/or proximity to Project operations). Altogether, these findings suggest that soil/vegetation base metals currently present a low environmental and human health risk. |
| 67 | **QIA 2023 NIRB TE #17.** | Regarding Term and Condition No. 35, Baffinland notes that, for the potential launch of a caribou tissue sampling program based out of the Mine Site and Milne Port, "Teeth aging would be completed at Matson's Lab in Montana, USA, as no Canadian facilities currently offer this analysis." (p. 157). QIA | 1. QIA suggests that Baffinland explore potentially looking at Canadian options for teeth aging such as the Wildlife Analytics Lab at Lethbridge College (led by Dr. Everett Hanna), | **Document Name:** Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board; | 1. Baffinland thanks the QIA for the suggestion.<br>2. Baffinland has consulted with the Government of Nunavut and industry specialists and is using the same methods, payment, and analysis as the GN program. There are parameters (blood, hair and skin) that the GN collected that Baffinland is not collecting and therefore the price is commensurate with |

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| | | notes that there are Canadian facilities that offer this analysis.<br><br>As well, Baffinland notes that, regarding compensation for samples, "Baffinland confirms that it does not intend to offer increased compensation for the proposed on site caribou tissue sampling program under discussion, as this may deter participation from other regional monitoring programs." (p. 157). QIA remains concerned by the low number of samples submitted to the GN and NCP programs, and notes that compensation should be at a minimum on par with those two programs. | who offer fee-for-service cementum analysis of wildlife teeth.<br><br>2. QIA requests that Baffinland provide at a minimum $120 for sampling kits submitted through their proposed on site caribou tissue sampling program so it is on par with the compensation for GN and NCP sampling kits. | **Section:** Section 4.6.6; Project Certificate Term and Condition No. 35<br><br>**Page:** p. 157 | what the GN paid for the same samples (liver, kidney, teeth, muscle). Baffinland is looking specifically at metal accumulation and the liver and kidney. Baffinland is also testing muscle, as it is a primary food source and teeth for aging. |
| 68 | **QIA 2023 NIRB TE #18.** | Term and Condition No. 53 stipulates that Baffinland shall consider the "Development of a surveillance system along the railway corridor to identify the presence of caribou in proximity to the train tracks and operational protocols for the train to avoid collisions and enable caribou to cross the train tracks unimpeded." (p. 205). Baffinland notes that the TEMMP "…will include an updated surveillance system once the railway becomes viable." (p. 207). Baffinland does not provide details of the timeframe that corresponds with railway viability. As well, Baffinland does not indicate when the operational protocols will be developed.<br><br>This is concerning to the QIA: to ensure adverse impacts to caribou are avoided, a surveillance program and operational protocols should be developed well in advance of railway operations. The details of the surveillance plan and operational protocols should be provided to the QIA for review and comment in advance of railway operations to ensure that the program is sufficiently robust and protective of caribou. | QIA requests that Baffinland provide details of the planned timing of the development of the surveillance program and operational protocols relative to the initiation of railway operations. QIA expects at a minimum that Baffinland will provide the proposed surveillance program and operational protocols to the QIA and TEWG within two years in advance of the operation of the railway for their review and comment. | **Document Name:** Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board;<br><br>**Section:** Section 4.6.8; Project Certificate Term and Condition No. 53<br><br>**Page:** p. 205-207 | Baffinland commits to providing the caribou surveillance program and operational protocols related to caribou for the Steensby Railway to the QIA and TEWG for review in advance of the start of railway operations. At present, experimental design for this monitoring activity has not yet been formalized. Program details will be shared at the appropriate time/venue. |
| 69 | **QIA 2023 NIRB TE #19.** | Term and Condition No. 55 notes that Baffinland will "…develop an adaptive management plan applicable to wolves and wolf habitat…" (p. 214), and that considers: | QIA requests that Baffinland:<br><br>• Provide estimates for the available esker habitats within the RSA and PDA; and | **Document Name:** Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board; | Baffinland (2012) FEIS Appendix 6F highlighted that there is low abundance of wolves in the RSA. As the potential to develop the Steensby Component approaches with more certainty, Baffinland will undertake the work to develop baseline information along the southern railway corridor and Steensby Port location.<br><br>Reference: Baffinland (2012). Final Environmental Impact Statement. Volume 6 – Terrestrial Environment. Appendix 6F Terrestrial Wildlife Baseline Report. Feb. 2012. |

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| | | B. "Estimating the available (glacio-fluvial materials) esker habitat within the Regional Study Area/PDA and identifying such habitat as ecologically sensitive;" (p. 214)<br>C. "Developing "wolf indices" for presence/abundance of wolves (by conducting<br>studies) to set a baseline pre-construction baseline;" (p. 214)<br><br>QIA is not aware of the estimation of esker habitat or the development of indices for presence/relative abundance of wolves.<br><br>With the construction of the southern railway proposed to occur as noted in Sustaining Operations Proposal 2 (SOP2), QIA is concerned by the lack of progress made on estimating the available esker habitat within the RSA and PDA, and development of a wolf indices for presence/abundance of wolves to set a baseline. QIA notes that the results of the 2023 caribou survey showed that caribou numbers have increased to meet the threshold for a potential collaring program; based on this increase it is plausible that wolf numbers have also increased or will increase in the near future. | • Undertake work to develop baseline information and associated indices for wolf presence / abundance particularly along the southern railway corridor / Steensby Port area. | **Section:** Section 4.6.8; Project Certificate Term and Condition No. 53<br><br>**Page:** p. 214-215 | |
| 70 | **QIA 2023 NIRB TE #20.** | Regarding Term and Condition No. 74, Baffinland notes that "Upon the recommendation of CWS-ECCC, Red Knot monitoring using ARUs will resume before increasing activities in the southern transportation corridor." (p. 263). Baffinland does not provide details on:<br><br>• Number of ARUs that will be deployed;<br>• Length of deployment of the ARUs;<br>• ARU deployment timing; and<br>• Location ARUs will be deployed.<br><br>Without these details it is difficult to determine how effective the proposed monitoring program will be at detecting red knots. | The QIA requests that Baffinland provide the methods for the proposed ARU deployment for their review and comment in advance of undertaking the program so that their comments and concerns can be addressed before the ARUs are deployed. Specifically, QIA requests that the methods include the following details:<br><br>• Number of ARUs that will be deployed;<br>• Length of deployment of the ARUs;<br>• ARU deployment timing;<br>• Location ARUs will be deployed;<br>• Proposed data analysis approach | **Document Name:** Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board;<br><br>**Section:** Section 4.6.9; Project Certificate Term and Condition No. 74<br><br>**Page:** p. 262-263 | Baffinland welcomes discussion on this topic with the TEWG, particularly seeking input from ECCC-CWS and their thoughts on the utility of this program and the likelihood/concern with finding Red Knots in the southern portion of the RSA |

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<tr><th>Cmt. #</th><th>QIA Cmt. #</th><th>Reviewer's Detailed Comment</th><th>QIA Recommendations</th><th>Reference Section</th><th>Baffinland's Response</th></tr>
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<td>71</td>
<td>QIA 2023 NIRB TE #21.</td>
<td>Baffinland continues to avoid sharing information on the directional orientation of the remote cameras selected for this program as well as information on proximity of remote cameras to project components (e.g., X m west of the Tote Road). It would be useful for Baffinland to start reporting on this information to assist with interpreting the results.<br><br>Using the detection range provided (i.e. 30 meters / 100 feet) as per QIA's request in 2022, it would be useful for Baffinland to quantify the maximum area covered by remote cameras, similar to the viewshed modelling and analysis that has been provided for HOL surveys. This context is necessary to interpret the results of remote camera monitoring, and whether study design is sufficient to maximize the potential for detection of caribou and other wildlife species.<br><br>QIA notes that this unknown information contributes to QIA's overarching concerns regarding the effectiveness of Baffinland's overall program to monitor the potential effects of the project on caribou, including their avoidance of project components and calving areas. Until this issue and other deficiencies related to the caribou monitoring program are addressed, QIA does not consider Baffinland to be in compliance with Term and Condition 53</td>
<td>To better understand how remote camera monitoring results provide insight on caribou avoidance of the project area and improve compliance with Term and Condition 53, Baffinland Is requested to report on and analyze the following for the 2024 remote camera monitoring program:<br><br>• orientation of each remote camera deployed (e.g., north, east south, west);<br><br>• if relevant, proximity of each remote camera / HOL station to project components, including distance and type of component. QIA notes that project components within at least 500m should be reported; and<br><br>• use the detection range provided to quantify a maximum total viewshed for each camera and HOL station (a map of each remote camera viewshed, relative to the HOL viewshed would be also ideal) to assist with interpreting the findings of remote camera monitoring, including its spatial limitations.</td>
<td>Document Name: Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board; Appendix G.5.1<br><br>Section: Section 4.6.8; Project Certificate Term and Condition No. 53; Section 9.4<br><br>Page: p. 205-210; 164-170</td>
<td>Baffinland would like to remind QIA that their comments/recommendations on the Wildlife Remote Camera program have been discussed at length (cf. Comments on 2022 TEAMR/NIRB report, QIA 2022 NIRB TE# 8). The current/ongoing remote camera program was also discussed at the 13-14 December 2023, TEWG meetings.<br><br>Experimental design parameters (and limitations) are described in the 2022 Terrestrial Environment Annual Monitoring Report (TEAMR; EDI, 2023; refer to 10.4 Remote Cameras, 10.4.1 Methods; pg.226-227). Remote Camera Locations are described in Appendix D, including HOL Site Name, Camera ID, Location (Tote Road Marker), Camera Orientation, Latitude/Longitude coordinates, and representative Site Photo. Distance to/from Project Infrastructure can be added as part of future reporting.<br><br>
<table>
<tr><th>HOL #</th><th>Camera</th><th>Distance to PDA (m)</th><th>Height</th><th>Lati</th><th>Longitude</th><th>Direction</th></tr>
<tr><td>1</td><td>Baffin-3</td><td>0.0</td><td>1.4</td><td>71.87102</td><td>-80.8828</td><td>NE</td></tr>
<tr><td>1</td><td>Baffin-4</td><td>0.0</td><td>1.4</td><td>71.87102</td><td>-80.8828</td><td>SW</td></tr>
<tr><td>3</td><td>Baffin-7</td><td>482.2</td><td>1.4</td><td>71.72974</td><td>-80.4418</td><td>NE</td></tr>
<tr><td>3</td><td>Baffin-12</td><td>482.2</td><td>1.4</td><td>71.72974</td><td>-80.4418</td><td>SW</td></tr>
<tr><td>4</td><td>Baffin-8</td><td>55.8</td><td>1.4</td><td>71.60734</td><td>-80.347</td><td>E</td></tr>
<tr><td>4</td><td>Baffin-10</td><td>55.8</td><td>1.4</td><td>71.60734</td><td>-80.347</td><td>W</td></tr>
<tr><td>6</td><td>Baffin-1</td><td>593.6</td><td>1.4</td><td>71.48321</td><td>-80.213</td><td>NE</td></tr>
<tr><td>6</td><td>Baffin-5</td><td>593.6</td><td>1.4</td><td>71.48321</td><td>-80.213</td><td>SW</td></tr>
<tr><td>10</td><td>Baffin-9</td><td>142.8</td><td>1.4</td><td>71.3732</td><td>-79.6859</td><td>N</td></tr>
<tr><td>10</td><td>Baffin-11</td><td>142.8</td><td>1.4</td><td>71.3732</td><td>-79.6859</td><td>S</td></tr>
<tr><td>16</td><td>Baffin-2</td><td>96.4</td><td>1.4</td><td>71.33213</td><td>-79.4779</td><td>NW</td></tr>
<tr><td>16</td><td>Baffin-6</td><td>96.4</td><td>1.4</td><td>71.33213</td><td>-79.4779</td><td>SE</td></tr>
</table>
<br>Viewshed analysis is provided below (refer to inset figure) based on the camera manufacturer's specifications. It is unclear if/how QIA recommendation/request regarding viewshed would assist or improve data interpretation.</td>
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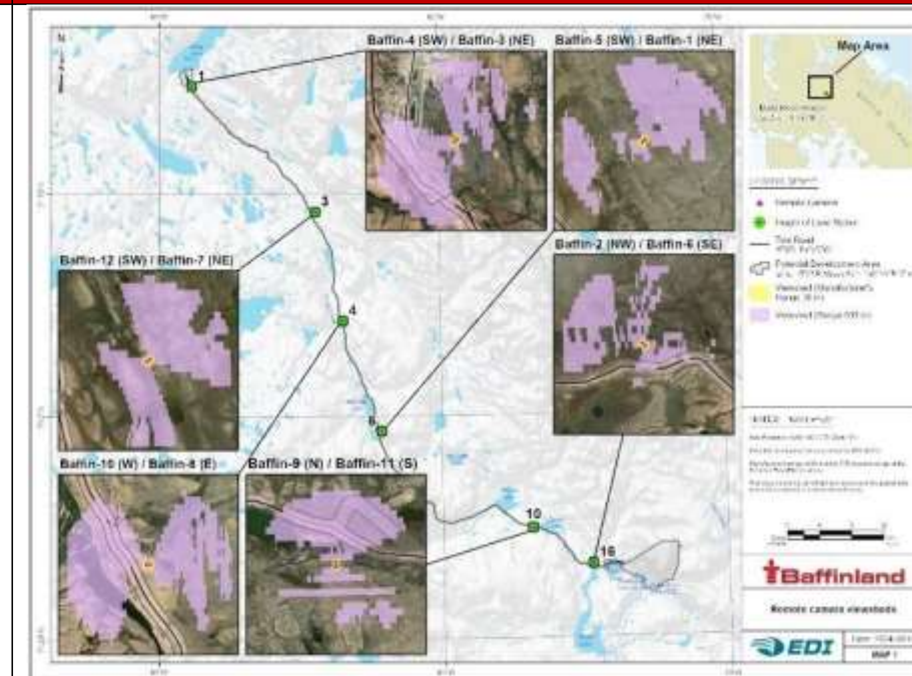
| | | | | | <br>**References:**<br>Environmental Dynamics Inc. (EDI), 2022. 2021 Mary River Project Terrestrial Environment Annual Monitoring Report - Prepared for Baffinland Iron Mines Corporation. April 2022.<br>Environmental Dynamics Inc. (EDI), 2023. 2022 Final Mary River Project Terrestrial Environment Annual Monitoring Report - Prepared for Baffinland Iron Mines Corporation. April 28, 2023. |
| 72 | **QIA 2023 NIRB TE #22.** | QIA has previously recommended that Baffinland take reasonable measures to prevent field of view obstructions due to blowing snow, ice, or fog. Examples provided to Baffinland in response to the 2021 and 2022 TEAMR included installing a cover or shelf or a protective case, using silica gel packs to prevent moisture build-up in cases, and applying anti-fogging products. There is no indication in Section 9.4 of the 2023 TEAMR that Baffinland attempted any of these measures.<br><br>In the 2023 TEAMR (Appendix E), Baffinland reasoned that "there are limitations to implementation due to the project setting and climate." Baffinland has failed to provide explicit | To maximize remote camera monitoring data to provide insight on caribou avoidance of the project area and improve compliance with Term and Condition 53, Baffinland is requested to implement measures to minimize field of view obstructions due to snow, ice, or fog, including:<br><br>• installing a protective case and shade on each deployed camera | **Document Name:** Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board; Appendix G.5.1 – 2023 Final Terrestrial Environment Annual Monitoring Report<br><br>**Section:** Section 4.6.8; Project Certificate Term and Condition No. 53; Section 9.4<br><br>**Page:** p. 205- 210 of 623; 159-163 | Baffinland would like to remind QIA that their comments/recommendations on the Wildlife Remote Camera program have been discussed at length (cf. Comments on 2022 TEAMR/NIRB report, QIA 2022 NIRB TE# 9. The current/ongoing remote camera program was also discussed at the 13-14 December 2023, TEWG meetings.<br>1. As highlighted in the BIM response to QIA 2023 NIRB TE #21 (above), weather-related obstruction of the camera view field appears specific to only two (2) camera locations and represents a localized issue. BIM will review the proposed mitigation to minimize the accumulation of fog and ice. BIM will improve the log we have and can review it with QIA onsite monitors at their request.<br>• Cameras are already contained in a protective case<br>• Viability of anti-moisture packs will be evaluated. |

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| | | rationale for what these limitations are and explain why each of QIA's provided suggestions would be ineffective. As shown in Table 9-2 (p. 167), cameras positioned at HOL station 6 still incurred a high number of days where the camera field of view was obstructed. Baffinland commented on the high occurrence of view obstruction in Appendix E stating that "...only 2 cameras (Baffin-a, Baffin-5 at HOL 6) were excessively affected by fog and ice crystals suggesting that this issue may be localized." If the issue is localized, what is Baffinland doing to avoid this issue in the future? What modifications, if any, will be undertaken to ensure cameras at HOL station 6 have less view obstructions in subsequent survey periods?<br><br>While QIA acknowledges that weather events are beyond Baffinland's control, Baffinland should at least attempt to implement easy potential solutions or provide rationale and evidence that the proposed solution has not worked in the past in similar contexts. If the measures do not work, then this can be reported on in the following year's TEAMR. In addition, in Section 9.4.1, it is generally stated that cameras are to be periodically checked (2-4 times annually), but there is not reporting on how frequently each remote camera was checked in Section 9.4.2 or in Table 9-2, making it difficult to assess the level of reasonable effort to minimize non-active days.<br><br>QIA notes that these issues contribute to the integrity of Baffinland's overall program to monitor the potential effects of the project on caribou, including their avoidance of project components and calving areas. Until this, and other deficiencies related to the caribou monitoring program are addressed, QIA does not consider Baffinland to be in compliance with Term and Condition 53. | • using silica gel packs to prevent moisture build-up within cases<br>• applying anti-fog products to camera lenses<br><br>If Baffinland is unable to implement any of the above measures, Baffinland must provide an explicit rationale for why each suggestion provided is not viable, based on an experimental period, or evidence that the proposed solution has not worked in the past in similar contexts.<br><br>QIA also requests Baffinland report on the number of times (and date) when each remote camera was checked (on a per camera basis), whether servicing was required, and if so, what type (e.g. removal of obstruction, battery replacement, SD card collection, etc.). | | • Viability of applying anti-fog products to camera lenses.<br>2. BIM will highlight any relevant outcomes in future reporting and as part of the TEWG forum. |
| 73 | **QIA 2023 NIRB TE #23.** | In response to the 2021 and 2022 TEAMR, QIA requested that Baffinland deploy remote cameras at all 24 HOL stations (vs. a sample of only 6), or if this was not possible, to select locations based on the best available IQ and western science. Since the purpose of the remote camera monitoring is to capture supplemental data on caribou movement in relation to the Project, locations should be selected based on maximizing the potential for detecting caribou. Baffinland | To respond to study design concerns regarding remote camera monitoring and improve compliance with PC Condition 53, Baffinland is requested to provide the following information:<br><br>Baffinland to confirm whether or not MHTO was asked to comment on the use | **Document Name:** Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board; Appendix G.5.1 – 2023 Final Terrestrial Environment Annual Monitoring Report | Baffinland would like to remind QIA that their comments/recommendations on the Wildlife Remote Camera program have been discussed at length (cf. Comments on 2022 TEAMR/NIRB report, QIA 2022 NIRB TE# 10). The current/ongoing remote camera program was also discussed at the 13-14 December 2023 TEWG meetings.<br>1. The remote cameras were deployed at stations to address GN and QIA concerns that the duration of HOL surveys insufficiently covered the time that caribou are expected to be in the area. The Remote Camera program was |

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| | | responded that it was not feasible to deploy cameras at all 24 HOL stations due to accessibility considerations, mainly with ongoing maintenance requirements in mind.<br><br>In the 2023 TEAMR (Appendix E), Baffinland reasoned that that HOL stations 1, 3 ,4, 6,10 and 16 were selected "to provide a regular distribution along/at the Project," claiming that "Methods/experimental design are appropriate for current regional low-density of caribou." QIA continues to ask whether Baffinland explicitly verified these locations with MHTO prior to deploying cameras. In addition, are these six HOL stations the only ones that can be accessed as required for maintenance (per Baffinland, 2-4 times per year)? QIA notes that HOL stations 1 – 16 are generally accessed on foot (Section 9.3.1). Has Baffinland considered deploying remote cameras at HOL stations subject to access constraints in an effort to capture at least some data (e.g., during seasons when caribou are known to be calving or migrating)? QIA notes that all HOL stations are at least accessible during some portions of the year (i.e., when HOL monitoring typically occurs in June) and that remote cameras could be deployed at this time with the intention of collecting at least some data.<br><br>QIA notes that these study design questions regarding remote camera locations contribute to QIA's overarching concerns regarding the effectiveness of Baffinland's overall program to monitor the potential effects of the project on caribou, including their avoidance of project components and calving areas. Until this, and other deficiencies related to the caribou monitoring program are addressed, QIA does not consider Baffinland to be in compliance with Term and Condition 53 | of HOL stations 1, 3, 4, 6, 10, and 16 prior to remote camera program initiation.<br><br>Baffinland to clarify whether HOL stations 1, 3, 4, 6, 10 and 16 are the only ones that can be accessed 2-4 times a year, as needed for remote camera maintenance.<br><br>Baffinland is further requested to make additional effort to deploy remote cameras at as many HOL stations as possible, even if this means only collecting data for limited periods of the year (due to maintenance inaccessibility). | **Section:** Section 4.6.8; Project Certificate Term and Condition No. 53; Section 9.4<br><br>**Page:** p. 205-210; 164-170 | developed with input from the Terrestrial Environment Working Group (TEWG), inclusive of MHTO Membership. Pond Inlet elders are also instrumental in establishing the height of land program and by extension site selection.<br>2. Sites 1, 3, 4, 6, 10 and 16 were selected to provide a regular distribution along/at the Project; this approach was deemed appropriate for current regional low- density of caribou. Considerations for logistics and safety were also considered.<br>3. Based on monitoring outcomes to date, additional Camera deployment is not warranted. BIM will consider if/when caribou population numbers at the project were to increase.<br><br>**References:**<br>Environmental Dynamics Inc. (EDI), 2023. 2022 Final Mary River Project Terrestrial Environment Annual Monitoring Report - Prepared for Baffinland Iron Mines Corporation. April 28, 2023. |
| 74 | **QIA 2023 NIRB TE #24.** | As expressed in the past, QIA remains concerned that snow track surveys are insufficient for several reasons. This is a good example of a broader pattern where Baffinland has been dismissive of, or unwilling to implement, reasonable and relatively minor adjustments proposed by QIA. We reiterate the following concerns (and reasonable, minor | To address concerns regarding snow track survey deficiencies and improve compliance with Term and Condition 53, Baffinland is requested to commit to the following, in relation to snow track surveys for the next monitoring period (i.e., fall 2024): | **Document Name:** Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board; Appendix G.5.1 – 2023 Final Terrestrial Environment Annual Monitoring Report | Snow track surveys are observational surveys intended to characterize wildlife presence/absence at the Project.<br>• It is not clear what the QIA are suggesting for 'testing survey efficacy'. For example, searcher efficiency assessments typically refer to wildlife mortality surveys and carcass persistence assessments. This is not the intent of the snow track surveys. |

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| | | recommendations), which were not effectively addressed by Baffinland in response to the 2022 TEAMR.<br>First, QIA remains concerned about the study design of snow track surveys. QIA previously requested that Baffinland test the efficacy of these surveys by completing two simultaneously and comparing the results. Baffinland's response to this related to the need to complete surveys around the deposit of fresh snow. However, from QIA's perspective, instructions can be provided to surveyors to ensure they do not disrupt snowfall to the point that tracks are not identifiable. QIA maintains that efficacy testing should be done to assuage concerns related to these results. There is no indication in Section 9.1 that Baffinland completed efficacy testing for snow track surveys.<br>Second, QIA has requested that Baffinland determine species-specific thresholds at which deflections from roads can be considered significant for each species. Again, there is no consideration of significance in Section 9.1.2, which limits the usefulness of these findings.<br>QIA notes that these deficiencies related to snow track surveys contribute to QIA's overarching concerns regarding the effectiveness of Baffinland's overall program to monitor the potential effects of the project on caribou, including their avoidance of project components and calving areas. Until this, and other deficiencies related to the caribou monitoring program are addressed, QIA does not consider Baffinland to be in compliance with Term and Condition 53. | • test the efficacy of snow track surveys by completing two simultaneously and comparing the results; and<br>• conduct research regarding wildlife road crossings and significance thresholds and analyze survey results relative to these to improve the usefulness of this survey. This emphasizes the need for a<br><br>These commitments were already proposed to Baffinland by QIA in 2022 and none were acknowledged in the 2023 report. | **Section:** Section 4.6.8; Project Certificate Term and Condition No. 53; Section 9.1<br>**Page:** p. 205-210; 148-154 | • Baffinland can review literature regarding wildlife crossing. However, as above, snow track surveys are observational surveys; QIA should clarify what is the purpose of 'efficacy testing' and associated thresholds.<br>Note: The QIA comment/recommendation appears to be incomplete or truncated |
| 75 | **QIA 2023 NIRB TE #25.** | QIA remains concerned about the absence of monitoring for potential effects of blasting on wildlife. In the 2023 report on compliance with PC Condition 60, Baffinland states that "no wildlife has been knowingly harmed or disturbed by blasting activities during construction". However, there is no information to substantiate this claim and nothing in the 2023 TEAMR to indicate that Baffinland makes an effort to monitor for potential effects of blasting on wildlife, including to caribou during sensitive timing windows (e.g., calving, post-calving). Baffinland states that personnel are required to scan for and report the presence of wildlife sightings, but no such log has been provided or summarized. This makes QIA concerned that it is possible these effects are occurring and Baffinland is simply unaware of it due to monitoring program constraints. | 1. Baffinland is requested to provide data logs to substantiate their claims that project personnel scan for and report wildlife presence (prior to blasting proceeding).<br>2. Baffinland must also commit to undertaking targeted engagements with MHTO to evaluate concerns about the impacts of explosive use of caribou and identify periods when explosives may not be used. | **Document Name:** Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board; Appendix G.5.1 – 2023 Final Terrestrial Environment Annual Monitoring Report<br>**Section:** Section 4.6.8; Project Certificate Term and Condition No. 60<br>**Page:** p. 235 | 1. A Quarry Blasting Caribou Mitigation Hierarchy was developed to inform decision-making and procedures to minimize potential adverse effects on caribou related to quarry blasting. This includes a caribou observation form to be used to characterize caribou behavior/responses and applied mitigation measures.<br>2. Baffinland welcomes engagement with the MHTO on blasting procedures/concerns should they request it. To date blasting has been discussed mostly with respect to dust through the Dust Audit Committee and Baffinland is implementing the recommendations received. Baffinland is also amenable to adding this to a future TEWG agenda and expects it to be a subject explored through the QIA's North Baffin Caribou Study.<br>Reference: EDI (2023). Internal Memo/Guidance. |

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| | | QIA has repeatedly requested Baffinland to provide evidence that wildlife are not harmed by blasting and to work with the MHTO and TEWG to evaluate concerns about the impacts of explosives on caribou and identify periods when explosive use is not permitted. Similarly to Baffinland's responses to many other concerns raised by QIA, there's no indication that Baffinland has made any targeted effort (e.g., outside of limited TEWG meetings that already have full agendas) to have these discussions in order to ensure compliance with Term and Condition 60. | | | |
| 76 | **QIA 2023 NIRB TE #26.** | In 2023, QIA requested that Baffinland address item (h) in the annual report. Item (h) states that, among others, the Proponent must annually report the following information:<br>"h. A discussion of any proposed changes to the monitoring survey methodologies, statistical approaches or proposed adaptive management stemming from the results of the monitoring program."<br>Reporting specific to condition (h) remains absent in the current 2023 NIRB report. | Baffinland to report on proposed changes to terrestrial monitoring survey methodologies, statistical approaches or proposed adaptive management stemming from the results of the monitoring program. | **Document Name:** Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board<br>**Section:** 4.6.8, Project Certificate Term and Condition No. 57<br>**Page:** p. 217-220 | This request has been addressed in the 2022 TEAMR (EDI, 2023), which describes methods, assumptions, and adaptive management approaches for multiple TEMMP components. Historical changes to and progression of assessment protocols are also outlined in opening subsections of most Terrestrial Environment monitoring components in the TEAMR. Per the 2023 TEAMR, examples include:<br>• Section 5.1.1 (Helicopter Overflights) Monitoring History and Changes in Analytical Procedures (pg.19)<br>• Section 7.1 History of Dustfall Monitoring at the Project (pg.42)<br>• Section 7.2 Dustfall Suppression and Mitigation (pg.44)<br>• 8.1.1.1 (Vegetation and Soil Base Metals Monitoring) Monitoring History and Changes in Sampling Procedures (pg. 121)<br>Methodological rationale and assumptions are also described in the TEAMR for each topic/discipline-specific methods section.<br>**References:**<br>Environmental Dynamics Inc. (EDI), 2024. 2023 Final Mary River Project Terrestrial Environment Annual Monitoring Report - Prepared for Baffinland Iron Mines Corporation. |
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| 138 | **QIA 2023 NIRB CRLU/IQ #5.** | Baffinland has designed and is implementing terrestrial environment monitoring programs. For several years, QIA has requested that Baffinland describe if and how IQ has informed terrestrial environment monitoring design, analysis and interpretation of results, as well as conclusions.<br><br>In Baffinland's response to QIA comments respecting the 2021 Annual Monitoring Report, Baffinland identified that "*as part of the Phase 2 submission, Baffinland summarized how Inuit Qaujimajatuqangit has been incorporated throughout the project, including monitoring programs*" (Baffinland Response to Comments Received for the 2021 Annual Monitoring Report PDF p. 27). This response suggests that IQ has been incorporated into monitoring programs; however, the inclusion of IQ is not evident from the 2022 or 2023 Annual Monitoring Reports. Baffinland provided no response to QIA's comments regarding the inclusion of IQ in 2023.<br><br>In the 2023 Terrestrial Environment Annual Monitoring Report, Inuit Qaujimajatuqangit is mentioned only two times–<br><br>1. "Work completed for the Terrestrial Environment Monitoring Program is guided by Inuit Qaujimajatuqangit and the Terrestrial Environment Mitigation and Monitoring Plan" (Appendix G.5.1, p. 1 of 201),<br>2. "The HOL survey methods were developed in consultation with the TEWG… and incorporated Inuit Qaujimajatuqangit into strategies for detecting caribou" (Appendix G.5.1, p 160 of 201). | As requested numerous times in the past, Baffinland is requested to include in its Annual Monitoring Report indication of which terrestrial, marine, and freshwater monitoring programs are designed with IQ, and which ones utilize IQ for analysis and interpretation of results. An explanation of how IQ shaped the monitoring program and supported interpretation of the results should be included in an overview section as a component of compliance with this requirement, which appears in numerous PCCs. Baffinland should also indicate how IQ is being used, confirm that it meets Inuit expectations re: Ownership, Control, Access and Possession (OCAP) and from where that IQ was obtained. | **Document Name:** Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board<br><br>**Section:** 4.6.8 Project Certificate Term and Condition No. 49 through 64<br><br>**Page:** 190-243<br><br>**Document Name:** Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board; Appendix G.5.1<br><br>**Section:** Table 0; Section 0; Section 9.3<br><br>**Pages:** xv – xix; p. 1.; p. 160 | Baffinland has provided an adequate response to this request each year it has been issued, explaining in detail how various terrestrial, marine, freshwater, atmospheric and socio-economic programs have been developed in the past with consideration for IQ and community knowledge. This information is readly presented in the VC specific annual reports and in the associated management plans. If a reference is absent in a report and its analysis it is possible IQ or community knowledge was not provided to Baffinland in that year that it was applicable, or the information is not explicitly described as being Inuit Qaujimajatuqangit (IQ) and its simply labeled as community knowedlge, Inuit input, Inuit feedback, etc. IQ is not the sole source of relevant information that can come from Inuit as it is generally referred to as what Inuit have always known, and may not capture more contemporary or every day information. Baffinland suggests path forward here may be through QIA's review of Baffinlands IQ Framework, which has been publically available for review since May 2023. Many of the items raised by QIA that relate to IQ could be answered by that document in its current form, or through edits and additions could be addressed. |

| Cmt. # | QIA Cmt. # | Reviewer's Detailed Comment | QIA Recommendations | Reference Section | Baffinland's Response |
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| | | QIA recognizes that IQ has been used to develop and implement monitoring programs; however, this is repeatedly not reflected in Baffinland's Annual Monitoring Reports. Most of Baffinland's discussion is centered on western science integration into terrestrial, freshwater, and marine environment monitoring programs. Given that, as Baffinland states, IQ is a valuable component to the development of these programs, more information on how IQ has been incorporated into them should be included in Annual Monitoring Reports. | | | |
| 139 | **QIA 2023 NIRB CRLU/IQ #6.** | Terms and Conditions 39 and 40 relate to measures that Baffinland should take to develop progressive revegetation of disturbed areas that are no longer required for project operations (e.g., use of test plots, reseeding, replanting, erosion control considerations). While it is not an explicit requirement of PC Conditions 39 or 40, QIA has previously requested that Baffinland involve Inuit and use IQ to inform reclamation pilot research, including defining reclamation goals, end land uses, reclamation techniques, and criteria/measurements to determine success. However, in Baffinland's reports on compliance with PC Conditions 39 and 40, there is no indication that they made any effort to involve Inuit or consider IQ in the 2023 revegetation surveying and reclamation pilot work. Appendix G.5.2. provides more detailed reporting on revegetation survey and preliminary reclamation trial activities completed in 2023, but again, does not include any indication that Inuit involvement or IQ was considered. Within the recommendations / lessons learned sections for these reports, there is no indication that Baffinland intends to do so in the future. | QIA requests Baffinland consider IQ and Inuit involvement in progressive and end of life reclamation planning activities. Baffinland is requested to identify whether and how Inuit will be involved in this work in subsequent years. | **Document Name:** Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board; Appendix G.5.2 (General)<br><br>**Section:** Section 4.6.6 Project Certificate Term and Condition No. 39, 40<br><br>**Page:** 164-170 | Baffinland agrees that Inuit involvement and IQ are important considerations in closure planning for the Project. Baffinland is currently engaged in preparing a new revision of the Interim Closure and Reclamation Plan (ICRP) for the Project. Specific discussions have been held with QIA on plans for future engagements with Inuit regarding closure, and the next revision of the ICRP will include further details on the engagement strategy that Baffinland will implement to support closure planning.<br><br>The Reclamation Pilot Study (EDI 2024) was intended to identify early successional patterns and biophysical constraints to reclamation in the Canadian High Arctic. Project-specific definition of end-land use objectives are not addressed in this Study.<br><br>The Project has already committed to engagement/consultation with stakeholders/rights holders and integration of IQ in life of mine/end-land use planning. The revised/DRAFT Interim Closure and Reclamation Plan (ICRP) describes BIM's approach to integrating IQ into the Project's reclamation strategy.<br><br>**References:**<br><br>Environmental Dynamics Inc. (EDI), 2024. Mary River Project Reclamation Pilot Study: Revegetation Survey & Preliminary Reclamation Trial (2023 Project Update). EDI File # 22Y0273. |

**Table A.2: Response to GN Comments on Baffinland's 2023 Annual Report to the NIRB**

| Cmt. # | GN Cmt. # | Reviewer's Detailed Comment | GN Recommendation | Reference Section | Baffinland's Response |
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| **CARIBOU AERIAL SURVEY** | | | | | |
| 2 | **GN AR #02** | As described in Section 9.5 Aerial Caribou Survey of Appendix G.5.1 (Baffinland, 2024), the stated objective of the caribou aerial survey was to estimate the abundance and density of North Baffin caribou within the survey study area. However, the GN notes that this result is not reported. Additionally, the GN requests clarity on the Proponent's modeling process, specifically, the stated assumption of independence of observations made by the primary and secondary observers.<br><br>The objective of the aerial survey conducted by the Proponent and described in Section 9.4 of Appendix G.5.1 was:<br><br>*[to] estimate the abundance and density of North Baffin caribou in the northern (i.e., active Project area) and southern* | The GN recommends the following regarding the above concerns:<br><br>1. The Proponent should revise Appendix G.5.1 to include the results on caribou abundance and density.<br><br>2. The Proponent should provide justification (or additional clarification) for the assumption of independence of observations made by the primary and secondary observers. | **53b, 54b, 58b (Project Certificate No. 005, Amendment No. 004)**<br><br>Baffinland Iron Mines Corporation. Appendix G.23 –Mary River Project 2021 Annual Report, Caribou Monitoring Triggers and Recommendations Report. (March 2022)<br><br>Baffinland Iron Mines Corporation. Appendix G.5.1 – Mary River Project Terrestrial Environment 2023 Annual Monitoring Report. (March 2024) | 1. Regrettably, Section 9.5 Aerial Caribou Survey of Appendix G.5.1 was missing results on abundance and density estimates. The 2023 TEAMR has been revised to include this missing information and reissued to the NIRB public record.<br><br>Note: A stand-alone version of the Aerial Caribou Survey summary report (with complete results) was circulated to the QIA for preliminary review in June 2023.<br><br>**Reference:**<br><br>*EDI 2023. Mary River Project: 2023 Late-Winter Aerial Caribou Survey. EDI File # 23C0111, June 2023, Prepared for Baffinland Iron Mines Corp. Pg.28.*<br><br>2. Baffinland re-iterates that the methods followed for the aerial survey were the same as those used by the GN – including those for the primary and secondary observers. |

| Cmt. # | GN Cmt. # | Reviewer's Detailed Comment | GN Recommendation | Reference Section | Baffinland's Response |
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| | | *(i.e. planned/future Project area) subregions of the wildlife RSA (EDI Environmental Dynamics Inc. 2022b). (Page 171; Baffinland, 2024)*<br><br>However, Appendix G.5.1 appears to lack a subsection discussing the estimated abundance and density of caribou resulting from this aerial survey. The GN notes that the last subsection presented on this topic in Appendix G.5.1 is section 9.5.2.2 Modelling Outcomes. While this omission may be an editorial oversight, the GN emphasizes that providing complete information in annual reports is essential for a thorough review and promotes transparency for all stakeholders. Additionally, the GN wishes to highlight the relevancy of these results with respect to Baffinland's 2022 Caribou Monitoring Triggers and Recommendations Report which states:<br><br>*… a sample of 35 collared caribou per year is most likely required for a study informing potential Project impacts on caribou. The collaring program and analyses require at least 350 caribou, or 35 groups, to be present within the study area(s) (Baffinland, 2022).*<br><br>In section 9.5.1.3 of Appendix G.5.1, the Proponent states "An MRDS model was developed with the following assumptions: (1) independence of observation made by the primary and secondary observers and (2) point independence" (Page 176; Baffinland, 2024). The GN requests justification for this approach as the detections made by one observer may influence the detections of the other observer in double-observer studies through various modalities like body language. | | | To the degree possible, primary and secondary observers made independent observations of caribou. Specific caribou observations were not discussed during surveys. We acknowledge that there is potential for error in this process, as the GN suggests. There are two common options to deal with the double-observer protocol in mark-recapture distance sampling (MRDS): (1) primary and secondary observers search with complete independence, and (2) a trial configuration whereby the secondary observer generates 'trials' for the primary observer (Burt et al. 2014). It is likely that survey protocols fell somewhere in between these two options. For future aerial surveys, Baffinland is open to discussing the pros/cons of the 'independent observer' versus 'trial configuration' protocols to develop MRDS functions and estimate abundance/density of caribou. |
| **PASSIVE DUSTFALL MONITORING** | | | | | |

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| 4 | **GN AR #4.** | Appendix G.5.1 presents results of the Project's passive dustfall sampling in 2023. Results indicate that annual dustfall exceeded predictions at most monitoring sites. However, these exceedances and their causes are not discussed in the Appendix G.5.1.<br><br>Table 7-4. Annual dustfall accumulation for sites sampled throughout 2023 of Appendix G.5.1 shows that annual dustfall exceeded dustfall modelling predictions at 24 of 43 (56%) of monitoring sites in 2023 (Pages 72-73; Baffinland, 2024). The frequency of these exceedances suggests significant deficiencies in the dustfall modeling for the Project, resulting in inaccurate predictions.<br><br>Additionally, discussion of the above exceedances is concerningly absent from text presented elsewhere in<br><br>Appendix G.5.1. For example, Table 0. Summary of environmental effects monitoring and research activities at the Mary River Project in 2023 in Appendix G.5.1. does not cite the exceedances at monitoring sites. Instead, Table 0 concludes that "2023 dustfall results were consistent with predictions that the highest dustfall would be within the PDA" (Page xvi; Baffinland, 2024). | The GN recommends the following regarding the above concerns:<br>1. That the Proponent provide an explanation as to what deficiencies or invalid assumptions in the Project's dustfall modelling could have resulted in the exceedances presented in Table 7-2.<br>2. That the Proponent provide an explanation as to how future dustfall modelling FOR THE Project will be modified to account for the current inaccuracy that exists. | **36, 50, 54d, 58c, 187, and 188 (Project Certificate No. 005, Amendment No. 004).**<br><br>• Baffinland Iron Mines Corporation. Appendix G.5.1 – Mary River Project Terrestrial Environment 2023 Annual Monitoring Report. (March 2024) | In general, it is difficult to make comparisons between air dispersion modelling results, especially from 2013, and dustfall monitoring results of an active mine site from 10 years later in 2023. Updated air dispersion model results for dustfall are available in the Mary River Project – Sustaining Operations Proposal Air Quality Assessment (Nunami Stantec Limited 2023). Nunami Stantec Limited 2023 includes comparisons between the air dispersion model predictions for dustfall and measured annual dustfall between 2018 and 2021. Air dispersion models are based on a number of assumptions and are typically expected to agree with actual ambient air quality measurements within a factor of two (US EPA 1992). In addition, the U.S. EPA and other regulatory agencies have conducted extensive testing of the CALPUFF model, including evaluating uncertainties in input values, limitations of model physics, and representation of the random nature of the atmosphere by a model, leading to the accepted use of the CALPUFF in regulatory decisions. For assessments that cannot complete a model performance evaluation, the US EPA (2005) recommends decision makers use modelling as a 'best estimate' of effects based on understanding that the assessment follows a sound modelling methodology and used representative inputs for the Project.<br><br>References<br><br>United States Environmental Protection Agency (US EPA). 1992. Protocol for Determining the Best Performing Model. United States Environmental Protection Agency (US EPA). Office of Air Quality, Planning and Standards. Research Triangle Park, NC 27711. EPA-454/R-92-025. December 1992.<br><br>US EPA. 2005. 40 CFR (Code of Federal Regulations) Part 51 Revision to the Guideline on Air Quality Models: Adoption of a Preferred General Purpose (Flat and Complex Terrain) Dispersion Model and Other Revisions; Final Rule. Available at: https://www.epa.gov/sites/default/files/2020-09/documents/appw_17.pdf. Accessed February 2024. |

| Cmt. # | GN Cmt. # | Reviewer's Detailed Comment | GN Recommendation | Reference Section | Baffinland's Response |
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| **DUSTFALL IMAGERY ANALYSIS** | | | | | |
| 5 | **GN AR #5.** | As detailed in section 7.4 Dustfall Imagery Analysis of Appendix G.5.1, the Project's dust fall monitoring program includes conducting studies which examine dust fall extent in the vicinity of the Project through satellite imagery. The use of imagery is being developed by calibrating the satellite-derived Snow Darkening Index (SDI) against two methods of direct 'on-the-ground' dust fall measurement; (a) dust fall (g/m2) from passive collection canisters, and (b) Total Suspended Solids (TSS) (mg/L) from snow samples. In reviewing the Project's annual report regarding dust fall monitoring, the GN notes the following:<br><br><u>Interannual Trends</u><br><br>Figure 7-23 presents satellite-derived dustfall extents from 2004; 2013-2023 which illustrates a spike in 2019 (Baffinland, 2024, figure 7-23). However, Appendix G.5.1 does not discuss or investigate potential factors that may have contributed to this peak in 2019. Information that contributed to this spike in 2019 could inform future dust monitoring and mitigation and should be presented. | The GN recommends the following regarding the above concerns:<br><br>1. That the Proponent provide discussion, further investigation, and supporting evidence regarding factors which may have contributed to the sharp peak in dustfall extent detected in 2019 by satellite imagery.<br><br>2. That the Proponent continue the snow sampling pilot study in 2024. In 2024, more samples should be collected during a broader sampling period. Additionally, the GN recommends that snow sampling should target days with minimal cloud cover. | **36, 50, 54d, 58c, 187, and 188 (Project Certificate No. 005, Amendment No. 004).**<br><br>Baffinland Iron Mines Corporation. Appendix G.5.1 – Mary River Project Terrestrial Environment 2023 Annual Monitoring Report (March 2024).<br><br>Government of Nunavut. Government of Nunavut Comments on the Mary River Project 2022 Annual Report (July 2022). | 1. Several 2019 satellite images had extensive dust in classes <4.5 g/m² (as extracted by the Snow Darkening Index and converted to g/m²). A visual review of these images showed less snow cover than (a) images in the same year with less extensive dust and (b) images in 2020 on or within a day of the same date. Less snow cover could result in more exposed ground, a possible source of dust, and potential misclassification of ground as dust. There were no peaks in total annual ore hauled or Tote Road traffic in 2019 compared to 2018 and 2020. Further investigation and discussion will be provided in the 2024 TEAMR.<br><br>2. The snow sampling pilot study was continued in the Spring of 2024. Samples were collected between May 18 and 22. Image footprints and corresponding image acquisition dates up to the end of May were provided to the sampling field crew to better align sampling and imagery. Samples were collected on days with minimal cloud cover. Baffinland will take the GN's recommendation into consideration for the 2025 sampling program. |

| Cmt. # | GN Cmt. # | Reviewer's Detailed Comment | GN Recommendation | Reference Section | Baffinland's Response |
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| | | Snow Sampling Pilot Study<br><br>An update on the pilot study exploring at the relationship between the satellite image-derived SDI and measurements of TSS in snow samples is provided in 7.4.4 Snow Samling Pilot Study of Appendix G.5.1 (Baffinland, 2024). A significant relationship between these two metrics was not detected, despite pooling data from 2022 and 2023 (Page 117; Baffinland, 2024). The GN notes, that the sample size used in this study to date has been limited by the total number of snow samples collected, the availability of satellite images corresponding to the dates of snow sampling and cloud cover on sampling days (Page 117; Baffinland, 2024). Additionally, the GN notes that, as demonstrated in Figure 7-25, sampling in the higher portion of the range of TSS measured to date (i.e., > 200 mg/L) has been limited to only two data points (Page 117; Baffinland, 2024).<br><br>Furthermore, Section 7.4.4 of the report states that:<br><br>Continuation of the pilot study is being evaluated in relation to the need for and viability of improvements to experimental design, including increased data/image capture and improved geolocation of snow sampling in relation to available satellite imagery. (Page 117; Baffinland, 2024)<br><br>The GN maintains its position, as noted in comments on Baffinland's 2022 Annual Report (GN-AR-03; GN, 2023), that this pilot should continue, and that increasing sample size is a viable means to improve the study design. Additional sampling is needed to increase sample size and provide more data points in the higher part of TSS range. The GN believes this could be achieved by increasing the overall number of snow samples collected, broadening the sampling window to spread sampling over a range of dates greater than in 2022 (May 1 to 9) and 2023 (May 6 to May 15), as well as focusing sampling on days with minimal cloud cover. | | | |
| **HELICOPTER TRAFFIC** | | | | | |
| 6 | **GN AR #6.** | Section 5 Helicopter Overflights of Appendix G.5.1 summarizes helicopter traffic supporting Project operations | The GN recommends the following regarding the above concerns: | **59, 71 and 72 (Project Certificate No. 005, Amendment No. 004)** | 1. The meaning of the terms "unreasonable" and "impractical" are at the discretion of the pilot as described in Table5-6. List of rationale was discussed January 5, 2023 with the GN and presented and discussed at the February 14, |

| Cmt. # | GN Cmt. # | Reviewer's Detailed Comment | GN Recommendation | Reference Section | Baffinland's Response |
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| | | in 2023. After reviewing this section, the GN has three key comments regarding this material. These concerns include:<br>1) the number of low-level flights;<br>2) the definition used to justify short distance flights; and,<br>3) the need for a review of helicopter flight corridors to incorporate areas that may be of significance for caribou.<br><br>1) **Low-level Flights**<br>In 2023, between May and September, 1,799 helicopter flights (totalling 1,041 hours of flying) were made to support Project-related activities (Tables 5-2 and 5-3; Baffinland 2024). Table 5-5 illustrates that of these flights, 72.53% were below the minimum altitudes set by Project terms and conditions for reducing disturbance of migratory birds and other wildlife (e.g., Term and Conditions 71) and established in the TEMMP (Baffinland, 2016) and draft TEMMP (Baffinland, 2023) to avoid disturbance of other wildlife. However, ~68% of these low-level flights had a rationale for flying below minimum altitude thresholds. Consequently, the Proponent deemed these flights to be compliant with Project terms and conditions. Nevertheless, low-level helicopter flights are a potential source of disturbance to wildlife such as caribou (e.g., Wilson and Wilmhurst, 2019; Wolfe et al., 2000).<br>With respect to helicopter traffic reported in 2023, the GN notes several comments as follows.<br>2) **Short Distance Flights**<br>In Appendix G.5.1, the Proponent provides a summary of the various rationales provided by pilots to justify flying below the minimum altitude thresholds. As per Table 5-7, the second most common justification provided was the short distance of a flight; this justification accounted for ~19% of total flight hours in 2023 (Page 33; Baffinland, 2024). In Table 5-6, the Proponent provides pilot rationales for low-level | 1. The Proponent should provide additional details on what is meant by "unreasonable" and "impractical" in the justifications for low-level flights in Table 5-6 of the Appendix G.5.1.<br>2. In this, and future annual reports, the Proponent should ensure that the category for short distance flights is subdivided to distinguish between flights where low-level flying is: (a) Itself a specific regulatory requirement of the activity being undertaken; (b) Necessary for safety; (c) Necessary to collect the samples, themselves, during a monitoring activity; (d) Being justified solely on the preference to save time, fuel or other factors.<br>3. In this and future annual reports, the Proponent should provide data summarizing the distance of low-level flights that are classified as short distance according to the subdivisions specified in the above recommendation. Pursuant to this recommendation, the Proponent should provide the mean, maximum and minimum distances of low-level flights.<br>4. In collaboration with the TEWG, the Proponent should undertake an evaluation of the Project's helicopter flight corridors in relation to the distribution and movements of caribou. Using Inuit Qaujimatuqangit and Inuit Qaujimaningit and recent scientific data (collected via aerial surveys and satellite collaring) the TEWG should determine whether | Baffinland Iron Mines Corporation. Appendix G.5.1 – Mary River Project Terrestrial Environment 2023 Annual Monitoring Report (March 2024).<br>Baffinland Iron Mines Corporation. Terrestrial Environment Mitigation and Monitoring Plan, BAFPH-830-P16-0027 (March 2016).<br>Baffinland Iron Mines Corporation. Draft Terrestrial Environment Mitigation and Monitoring Plan, BAFPH-830-P16-0027 (March 2023).<br>Wolfe, S.A., Griffith, B. & Wolfe, C.A.G. (2000). Response of reindeer and caribou to human activities. Polar Research,19, 63–13. https://doi.org/10.1111/j.1751-8369.2000.tb00329.x<br>Wilson, S. F., & Wilmshurst, J. F. (2019). Behavioural responses of southern mountain caribou to helicopter and skiing activities. Rangifer, 39(1), 27–42. https://doi.org/10.7557/2.39.1.4586 | 2023 TEWG meeting (Meeting ID T-16022023). Item (Action ID T-28042022-2) was designated as complete at the December 13-14, 2023 meeting (Meeting ID T-13122023).<br>2. At the request of the GN, the pilot rationale table was reviewed in 2023, and the action item completed as detailed in 1. This request for further detail is unreasonable and unlikely to lead to improvements to overflight mitigation.<br>3. The pilot rationale table was reviewed in 2023, and the action item completed as detailed in 1.<br>4. Baffinland will consider this request. |

| Cmt. # | GN Cmt. # | Reviewer's Detailed Comment | GN Recommendation | Reference Section | Baffinland's Response |
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| | | flights. In this table, the description for short distance flights is as follows:<br>*At the discretion of the pilot who is operating the aircraft during the flight, by considering the distance travelled during a flight as well as other contributing factors, it is determined that gaining an altitude of 650 magl is unreasonable, unsafe, or impractical. These types of trips are generally associated with specific monitoring programs that are MANDATORY and there are no other practical ways of completing them (e.g., water sampling locations not accessible by foot or boat, dustfall sampling, wildlife observations, noise sampling, prospecting) (Page 32; Baffinland, 2024).*<br>The GN notes that the description of this category of low-level flights appears to combine activities where low-level flying is either a safety or regulatory requirement with those where it is preferred by the Proponent for time and cost savings. Consequently, this category should be subdivided into flights where low-level flying is specifically required for safety, regulatory purposes, or to complete an aerial-based monitoring activity, versus those where it is done solely for efficiency.<br>For instance, it is the GN's understanding that activities listed in Table 5-6, such as dustfall sampling, water sampling, and noise sampling, do not typically require low-level flying, as the sampling itself is not conducted while airborne. In contrast, some aerial-based wildlife monitoring (e.g., aerial surveys) specifically requires low-level flying to maintain detection probabilities. Distinguishing between low-level flights that are necessary, versus those that are preferred by the Proponent, is essential for reviewers and the NIRB to fully understand the trade-offs being made by the Proponent in terms of operational efficiency versus wildlife disturbance.<br>**<u>Flight Corridors</u>**<br>Term and condition 59 of the Project Certificate states that:<br>*The Proponent shall ensure that aircraft maintain, whenever possible (except for specified operational purposes such as drill moves, take offs and landings), and subject to pilot* | areas of significant wildlife importance can be delineated and avoided. | | |

| Cmt. # | GN Cmt. # | Reviewer's Detailed Comment | GN Recommendation | Reference Section | Baffinland's Response |
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| | | *discretion regarding aircraft and human safety, a cruising altitude of at least 610 metres during point-to-point travel when in areas likely to have migratory birds, and 1,000 metres vertical and 1,500 metres horizontal distance from observed concentrations of migratory birds (or as otherwise prescribed by the Terrestrial Environment Working Group) and use flight corridors to avoid areas of significant wildlife importance…*<br><br>With respect to the flight corridors for avoiding areas of significant wildlife importance, section 5.2.1 of the report states that:<br><br>*Only the key moulting area for Snow Geese was identified for helicopter avoidance in 2023. No locations or boundaries of areas prescribed explicitly by the TEWG or areas of observed concentrations of other migratory birds were identified in 2023 (Baffinland, 2024).*<br><br>The Project has accumulated 9 years of helicopter flight corridor data. Given the ongoing concerns about the status of North Baffin caribou combined with the availability of current data on caribou distribution and movements provided by the Proponent's recent aerial survey (e.g., 9.5 Aerial Survey; Baffinland, 2024) and the GN's collaring program, flight corridors currently used by the project should be evaluated to ensure they are avoiding areas of highest caribou use. This evaluation should be undertaken by the Proponent in collaboration with the Terrestrial Environment Working Group (TEWG). | | | |

**Table A.3: Response to ECCC Comments on Baffinland's 2022 Annual Report to the NIRB**

| Cmt. # | ECCC Cmt. # | Reviewer's Detailed Comment | ECCC Recommendations | Reference Section | Baffinland's Response |
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| | | **NON-COMPLIANT FLIGHTS OVER SNOW GEESE MOULTING AREA** | | | |
| 1 | **ECCC #2.** | The Proponent reported a 72% compliance rate with flight heights in snow goose areas during the moulting season (July-August). While ECCC understands that compliance is not always possible subject to pilot discretion, to verify the reported rates of compliance, reviewers need to know the acceptable and approved operational purposes which constitutes rationale for categorizing an otherwise non-compliant flight as complaint. A list of these rationale is provided in Table 4.18 of the 2023 Annual Report Main Document.<br><br>Further, rationale for flights within a horizontal distance of <1500m from Snow Goose Moulting Area have not been included in Table 4.18. Rationale is provided in the 2023 Terrestrial Environment Annual Monitoring Report (TEAMR) (Footnote 8, pg. 23):<br><br>*"…this 1,500 m horizontal buffer is not always practical as it results in longer flight times and prolongs potential disturbance. Alternatively, pilots occasionally fly over the eastern edge of the Snow Geese area to reduce flight time and minimize potential disturbance."*<br><br>It is not clear whether the rationale to reduce flight time by flying over the Snow Goose Moulting Area has been approved by the Terrestrial Environment Working Group (TEWG) and the NIRB, and where this approval has been recorded. It is not clear whether flights over the Snow Goose Moulting Area were classified as compliant with rationale, non-compliant, or compliant. | 1. ECCC recommends that the Proponent clarify how flights over the Snow Goose Moulting Area were classified, and how this is represented in reported rates of compliance.<br><br>2. ECCC recommends that the Proponent confirm whether the list of rationale for low level flights in Table 4.18, and the rationale for close vertical flights in the TEAMR, have been accepted by the TEWG and the NIRB.<br><br>3. ECCC recommends that the Proponent record all flight non-compliance rationale in the next version of the Terrestrial Environment Mitigation and Monitoring Plan (TEMMP), which is currently under revision, and share that plan with reviewers. | • 2023 Annual Report to the NIRB Main Document (Baffinland; May 3, 2024)<br>  ○ Table 4.18: Descriptions of Pilot Rationales Given for Low-Level Flights<br>• NIRB Appendix G.5.1: 2023 Terrestrial Environment Annual Monitoring Report (Environmental Dynamics Inc.; March 2024) | 1. Flights over the Snow Goose area include the 1,500 m horizontal buffer in July and August (moulting season) when the Snow Goose area applies (2023 TEAMR, section 5.1.2 pg 20-21 and 2023 NIRB Section 4 pg 230). These flights are broken down into compliant, compliant with rational and non-compliant as described in Table 5-1 (2023 TEAMR pg 22) and Table 4.19 (2023 NIRB pg 230). The compliance results for the Snow Goose area are presented in Section 5.2 of the 2023 TEAMR and in tables 5-3, and 5-12 under the ≥1,100 magl Cruising Altitude Requirement heading and a breakdown of the compliant with rationale flights in table 5-7 (also under ≥1,100 magl heading), A subset is presented in Section 4 of the 2023 NIRB and Table 4.20 (rationale breakdown under the ≥1,100 magl heading) and Figure 4.12.<br><br>2. The list of rationale was discussed Jan 5, 2023 with the GN and presented and discussed at the February 14, 2023 TEWG meeting (Meeting ID T-16022023). Item (Action ID T-28042022-2) was designated as complete at the December 13-14, 2023 meeting (Meeting ID T-13122023).<br><br>3. The table of non-compliance rationale will be considered for inclusion in the next version of the TEMMP. |
| | | **EIDER SPECIES AND MORTALITIES** | | | |
| 2 | **ECCC #3.** | The 2023 TEAMR states that 13 King Eider mortalities were documented in 2023, all individual mortalities.<br><br>Canadian Wildlife Service (CWS)-ECCC received an email notification from Todd Swenson of Baffinland on November 2, 2023 (with a follow up on January 25, 2024), which reported 13 Common Eider mortalities occurred during a | 1. ECCC recommends that the Proponent add the mortalities of the 13 Common Eiders.<br><br>2. ECCC recommends that the Proponent summarize, in future annual reports, any corrective | • NIRB Appendix G.5.1: 2023 Terrestrial Environment Annual Monitoring Report (Environmental Dynamics Inc.; March 2024)<br>• Re: Mary River Project - Bird Mortality Notification. (Email from | 1. In fact, the 13 King (not Common) Eider mortalities were documented in section 11.1 (Wildlife Interactions and Mortalities) of the 2023 TEAMR. Regrettably, 'common eider' was incorrectly listed in the notification to ECCC (Nov 2023).<br><br>2. A description of corrective measures following wildlife mortalities can be included in future monitoring. |

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| | | single incidence with the same cause of death for all individuals (ship loading infrastructure collision following winterization and reduced lighting). This mortality event has not been captured in the 2023 TEAMR.<br>More information about corrective measures taken following multiple mortalities can help to inform the effectiveness of corrective measures. | measures taken following wildlife mortalities, and whether any further mitigations are being proposed, considered, or implemented to reduce further mortality events. | Todd Swenson <todd.swenson@baffinland.com> to CWS North (ECCC) <cwsnorth-scfnord@ec.gc.ca>; January 25, 2024) | |
| **PROGRAM FOR REGIONAL AND INTERNATIONAL SHOREBIRD MONITORING** | | | | | |
| 4 | **ECCC #5** | THE Proponent's TEMP identified songbirds and shorebirds as a Key Indicator (KI) for follow-up monitoring. Section 2.2 Birds states (pg. 42 of 128): "*Baffinland will assist in regional-level monitoring by the Canadian Wildlife Service (CWS) looking at regional diversities of songbirds and shorebirds*."<br>Section 4.4 Birds Monitoring further states (pg. 65 of 128) that Baffinland has "*… committed to assisting the CWS in regional baseline research and monitoring of these species. The monitoring program involves 20 PRISM plots conducted within the RSA every five years (Table 4-7).*" This is part of Term and Condition #73 and #74.<br>The 2023 Annual Report states that the previous Program for Regional and International Shorebird Monitoring (PRISM) survey was held more than 5 years ago, in 2018, and it consisted of 14 plots. While Covid-19 restrictions have been a challenge for maintaining monitoring programs, the collection of baseline data is still valuable and should be reinitiated. | ECCC recommends that the Proponent re-initiate PRISM surveys to monitor shorebirds and provide an update on when the next PRISM surveys are planned. | ○ Terrestrial Environment Mitigation and Monitoring Plan (Baffinland; 2016) | Baffinland can discuss PRISM plot surveys with ECCC-CWS at their convenience. The intent was to support ECCC's ongoing PRISM monitoring programme. |

| DUST MANAGEMENT AND MONITORING | | | | | |
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| 1 | CIRNAC #1 | In the last three Mary River Annual Reports (2020 to 2022), CIRNAC recommended that Baffinland consider including the following measures to increase the quality of monitoring activities:<br>a) Testing the chemical composition of soil base sites for bioavailable metal loadings from the dust, resulting from contact with surface water/soil moisture (for example, acidity, leachable metals, sulphate, nitrate).<br>CIRNAC acknowledges that Baffinland will include leachability studies as a response option if soil metal concentrations are higher than baseline or Canadian Council of Ministers of the Environment (CCME) guideline values over two consecutive years. This measure would address ongoing concerns regarding the generation of dust by Project components and the potential effects of dustfall on aquatic receiving environments, which are reiterated in the Dust Audit Committee Report (2023).<br>CIRNAC recognizes that seasonal dustfall rates are provided in the 2023 TEAMR; however, dust analytical data is absent in the reporting. The vegetation and soil base metals sampling program was not carried out in the 2023 season. The data would support the assessment of the impacts of dust on surface water and sediment quality.<br>CIRNAC reiterates its 2022 Annual Review comment that, while bulk chemistry (including metals) soil sampling is a good measure of the spatial extent of dustfall related to the Project Development Area (PDA), it is not an indicator of contaminant mobility within aquatic receiving environments. Baffinland should determine if dustfall rates correlate with direct or indirect contaminant loading into aquatic environments based on geochemical testing of dust-impacted soil and sediment.<br>To characterize contaminant mobility and potential impacts on aquatic environments, CIRNAC suggests pairing bulk metal soil sampling with leachability sampling to better understand the soluble constituents in the dustfall. Characterizing the leachability would help Baffinland understand the indirect transport pathways of dissolved soluble constituents to aquatic receptors, as dissolved soluble constituents are | CIRNAC recommends that Baffinland consider improvements to the quality of monitoring activities, which could include the following measures:<br>a) Develop a dustfall impact CSM to summarize and evaluate the sources and extent of contamination and transportation pathways while considering meteorological variables, and where impacts to receptors may be occurring within the PDA.<br>b) Indicate how dustfall rates correlate with direct or indirect contaminant loading into aquatic environments based on geochemical testing of dust- impacted soil and sediment.<br>Implement leachability studies in the Terrestrial Environment Mitigation and Monitoring Plans adaptive management action toolkit if soil metal concentrations are higher than baseline or CCME guideline values over two (2) consecutive years. | • Project Certificate No. 005 (Amendment 05) (November 17, 2023) Terms and Conditions #10, 21<br>• Baffinland Iron Mines Corporation (Baffinland) 2023 Annual Report to the Nunavut Impact Review Board (NIRB) (May 03, 2024):<br>○ Section 4.6.2 Air Quality<br>○ Section 4.6.5 Groundwater & Surface Water<br>○ Section 4.6.6 Vegetation<br>• Baffinland. 2024. The NIRB's 2022-2023 Annual Monitoring Report for the Mary River Project – Updates to Parties Comments on the 2022-2023 Annual Report (NIRB File No. 08MN053)<br>• EDI Environmental Dynamics Inc. (EDI) 2024. Mary River Project Terrestrial Environment 2023 Annual Monitoring Report (TEAMR) (March 2024)<br>• Nunami Stantec Limited (Nunami). 2023 Annual Air Quality, Dustfall and Meteorology Report. (April 30, 2024)<br>• Nunami Stantec Limited and Independent Dust Audit Committee Members (Dust Audit Committee). 2023. Baffinland Dust Audit Final Recommendations Report. (February 8, 2023) | a. Dustfall impacts and mitigations are already being overseen by the Dustfall Audit Committee. Further, dust deposition at the Project is already evaluated via dust isopleth modelling (revised/updated in 2023). Potential effects to the Terrestrial Environment are evaluated and interpreted in relation to trends from passive dustfall monitoring. It is not clear how a supplementary Conceptual Site Model (CSM) would further inform dust modelling at the Project beyond existing studies and monitoring programs.<br>b. Evaluation of increasing trends in parameter concentrations in water and sediment into aquatic environments are considered, which would reflect potential effects from dustfall<br>c. This CIRNAC Comment/Recommendation reiterates CIRNAC Comment #9 on the 2022 TEAMR, bullets (c) and (d).<br>Baffinland already monitors and investigates potential trends in increased dustfall generation with soil contamination in the various mine site areas. A long-term vegetation and soil base metals monitoring program was initiated in 2012, as described in the Terrestrial Environment Mitigation and Monitoring Plan (TEMMP) (Baffinland, 2016). The objectives of the vegetation and soil base metals monitoring program are to monitor metal concentrations in vegetation and soil, particularly caribou forage (i.e., lichen), and verify that metal concentrations are within the acceptable range for established soil quality guidelines and relevant vegetation indicator values.<br>The most recent soil-metal concentration data, collected in 2022 at the Project, predominantly indicated no significant change, or concentrations were significantly lower relative to baseline values. Concentrations were below or within an acceptable range for soil-metal concentrations. Further, it was noted that there was a significant negative relationship between metal concentrations in dustfall and metal concentrations in soil for all CoPCs except cadmium; for all CoPCs, this appeared to be mediated by a significant positive relationship with soil pH. No unifying trend has been drawn from the analysis (EDI, 2023).<br>Undertaking leachability and geochemical testing is not presently warranted given that soil sampling data collected in 2022 predominantly indicated concentrations were below or within an acceptable range for soil-metal concentrations. The TEMMP/Trigger-Action Response Plan would guide future adaptive management response "If monitoring indicates increasing concentrations of metals over time".<br>**References:**<br>Baffinland Iron Mines Corporation (Baffinland), 2023. Terrestrial Environment Mitigation and Monitoring Plan. Ref. No. BAF-PH1-830-P16-0027, DRAFT. May 15, 2023. |

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| | | generally more bioavailable to aquatic receptors.<br>To visualize and evaluate the sources and extent of metal contamination within the PDA, Baffinland should consider developing a dustfall impact Conceptual Site Model (CSM). The CSM should be a living document that is used to continually evaluate the sources of contamination, and direct and indirect dustfall transport pathways and identify where impacts to aquatic receptors may be occurring throughout the PDA. This CSM could be included in Appendix G.5.3: Program for Identifying Conditions with High Risk for Dust Dispersion. | | | EDI Environmental Dynamics Inc. (EDI). 2023. Mary River Project: 2022 Terrestrial Environment Annual Monitoring Report. Prepared for Baffinland Iron Mines Corporation, Oakville, Ontario, Canada. 426 pp. |

Table A.4: Response to CIRNAC Comments on Baffinland's 2023 Annual Report to the NIRB

| | CIRNAC Cmt. # | Reviewer's Detailed Comment | CIRNAC Recommendation | Reference Section | Baffinland's Response |
|---|---|---|---|---|---|

| Cmt. # | | | | | |
|---|---|---|---|---|---|
| DUST MANAGEMENT AND MONITORING | | | | | |

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| 1 | CIRNAC #1 | In the last three Mary River Annual Reports (2020 to 2022), CIRNAC recommended that Baffinland consider including the following measures to increase the quality of monitoring activities:<br>a) Testing the chemical composition of soil base sites for bioavailable metal loadings from the dust, resulting from contact with surface water/soil moisture (for example, acidity, leachable metals, sulphate, nitrate).<br>CIRNAC acknowledges that Baffinland will include leachability studies as a response option if soil metal concentrations are higher than baseline or Canadian Council of Ministers of the Environment (CCME) guideline values over two consecutive years. This measure would address ongoing concerns regarding the generation of dust by Project components and the potential effects of dustfall on aquatic receiving environments, which are reiterated in the Dust Audit Committee Report (2023).<br>CIRNAC recognizes that seasonal dustfall rates are provided in the 2023 TEAMR; however, dust analytical data is absent in the reporting. The vegetation and soil base metals sampling program was not carried out in the 2023 season. The data would support the assessment of the impacts of dust on surface water and sediment quality.<br>CIRNAC reiterates its 2022 Annual Review comment that, while bulk chemistry (including metals) soil sampling is a good measure of the spatial extent of dustfall related to the Project Development Area (PDA), it is not an indicator of contaminant mobility within aquatic receiving environments. Baffinland should determine if dustfall rates correlate with direct or indirect contaminant loading into aquatic environments based on geochemical testing of dust-impacted soil and sediment. | CIRNAC recommends that Baffinland consider improvements to the quality of monitoring activities, which could include the following measures:<br>c) Develop a dustfall impact CSM to summarize and evaluate the sources and extent of contamination and transportation pathways while considering meteorological variables, and where impacts to receptors may be occurring within the PDA.<br>d) Indicate how dustfall rates correlate with direct or indirect contaminant loading into aquatic environments based on geochemical testing of dust-impacted soil and sediment.<br>e) Implement leachability studies in the Terrestrial Environment Mitigation and Monitoring Plans adaptive management action toolkit if soil metal concentrations are higher than baseline or CCME guideline values over two (2) consecutive years. | • Project Certificate No. 005 (Amendment 05) (November 17, 2023) Terms and Conditions #10, 21<br>• Baffinland Iron Mines Corporation (Baffinland) 2023 Annual Report to the Nunavut Impact Review Board (NIRB) (May 03, 2024):<br>○ Section 4.6.2 Air Quality<br>○ Section 4.6.5 Groundwater & Surface Water<br>○ Section 4.6.6 Vegetation<br>• Baffinland. 2024. The NIRB's 2022-2023 Annual Monitoring Report for the Mary River Project – Updates to Parties Comments on the 2022-2023 Annual Report (NIRB File No. 08MN053)<br>• EDI Environmental Dynamics Inc. (EDI) 2024. Mary River Project Terrestrial Environment 2023 Annual Monitoring Report (TEAMR) (March 2024)<br>• Nunami Stantec Limited (Nunami). 2023 Annual Air Quality, Dustfall and Meteorology Report. (April 30, 2024)<br>• Nunami Stantec Limited and Independent Dust Audit Committee Members (Dust Audit Committee). 2023. Baffinland Dust Audit Final Recommendations Report. (February 8, 2023) | d. Dustfall impacts and mitigations are already being overseen by the Dustfall Audit Committee. Further, dust deposition at the Project is already evaluated via dust isopleth modelling (revised/updated in 2023). Potential effects to the Terrestrial Environment are evaluated and interpreted in relation to trends from passive dustfall monitoring. It is not clear how a supplementary Conceptual Site Model (CSM) would further inform dust modelling at the Project beyond existing studies and monitoring programs.<br>e. Evaluation of increasing trends in parameter concentrations in water and sediment into aquatic environments are considered, which would reflect potential effects from dustfall<br>f. This CIRNAC Comment/Recommendation reiterates CIRNAC Comment #9 on the 2022 TEAMR, bullets (c) and (d).<br>Baffinland already monitors and investigates potential trends in increased dustfall generation with soil contamination in the various mine site areas. A long-term vegetation and soil base metals monitoring program was initiated in 2012, as described in the Terrestrial Environment Mitigation and Monitoring Plan (TEMMP) (Baffinland, 2016). The objectives of the vegetation and soil base metals monitoring program are to monitor metal concentrations in vegetation and soil, particularly caribou forage (i.e., lichen), and verify that metal concentrations are within the acceptable range for established soil quality guidelines and relevant vegetation indicator values.<br>The most recent soil-metal concentration data, collected in 2022 at the Project, predominantly indicated no significant change, or concentrations were significantly lower relative to baseline values. Concentrations were below or within an acceptable range for soil-metal concentrations. Further, it was noted that there was a significant negative relationship between metal concentrations in dustfall and metal concentrations in soil for all CoPCs except cadmium; for all CoPCs, this appeared to be mediated by a significant positive relationship with soil pH. No unifying trend has been drawn from the analysis (EDI, 2023).<br>Undertaking leachability and geochemical testing is not presently warranted given that soil sampling data collected in 2022 predominantly indicated concentrations were below or within an acceptable range for soil-metal concentrations. The TEMMP/Trigger-Action Response Plan would guide |

| Cmt. # | CIRNAC Cmt. # | Reviewer's Detailed Comment | CIRNAC Recommendation | Reference Section | Baffinland's Response |
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| | | To characterize contaminant mobility and potential impacts on aquatic environments, CIRNAC suggests pairing bulk metal soil sampling with leachability sampling to better understand the soluble constituents in the dustfall. Characterizing the leachability would help Baffinland understand the indirect transport pathways of dissolved soluble constituents to aquatic receptors, as dissolved soluble constituents are generally more bioavailable to aquatic receptors.<br><br>To visualize and evaluate the sources and extent of metal contamination within the PDA, Baffinland should consider developing a dustfall impact Conceptual Site Model (CSM). The CSM should be a living document that is used to continually evaluate the sources of contamination, and direct and indirect dustfall transport pathways and identify where impacts to aquatic receptors may be occurring throughout the PDA. This CSM could be included in Appendix G.5.3: Program for Identifying Conditions with High Risk for Dust Dispersion. | | | future adaptive management response "If monitoring indicates increasing concentrations of metals over time".<br><br>**References:**<br><br>Baffinland Iron Mines Corporation (Baffinland), 2023. Terrestrial Environment Mitigation and Monitoring Plan. Ref. No. BAF-PH1-830-P16-0027, DRAFT. May 15, 2023.<br><br>EDI Environmental Dynamics Inc. (EDI). 2023. Mary River Project: 2022 Terrestrial Environment Annual Monitoring Report. Prepared for Baffinland Iron Mines Corporation, Oakville, Ontario, Canada. 426 pp. |

# APPENDIX B TEWG WRITTEN REQUESTS AND BAFFINLAND RESPONSES

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August 16, 2024 EDI Project No: 24C0140

Baffinland Iron Mine Corporation (Baffinland)
2275 Upper Middle Road East, Suite 300
Oakville, ON, L6H 0C3

Attention: Cortney Oliver, Jesse Manufor

**RE: MARY RIVER PROJECT | Revisiting the Definition of 'Deflection'**

During the review of the Sustained Operations Proposal and as identified in the Nunavut Impact Review Board's reconsideration report (Nunavut Impact Review Board 2023), the Qikiqtani Inuit Association (QIA) requested that Baffinland work with the Terrestrial Environment Working Group (TEWG) to redefine caribou deflections. This commitment is stated in Technical Comment QIA TE-2(1). Further discussion in the body of the report was not given to place the request in context. Presently, the Terrestrial Environment Mitigation and Monitoring Plan (TEMMP) defines 'deflection' as "…*(any) caribou that fail to cross the North Railway or Tote Road after approaching it*" (Baffinland Iron Mines Corporation 2023).

| Commitment/ Intervenor | | Sustained Operations Proposal Technical Comment(s) | Commitment |
|---|---|---|---|
| 3 | QIA | QIA TE-2 (1) | Baffinland commits to work with the TEWG to redefine deflections to include repeated caribou balking in the Project area by November 30, 2024, to ensure that a new definition of deflections is included in an updated Terrestrial Environment Mitigation and Monitoring Plan filed with the 2024 Annual Report to NIRB. |

From Appendix D, List of Commitments in Respect of theSusatined Operations Proposal, Nunavut Impact Review Board. 2023. Reconsideration Report and Recommendations for Baffinland's Sustaining Operations Proposal. NIRB Public Registry No. 347145. Cambridge Bay, Nunavut, Canada. 164 pp.

During the 31st Terrestrial Environment Working Group (TEWG) meeting on May 22, 2024, Baffinland requested that the QIA lead the discussion on their request. However, further discussion on this topic did not occur. Instead, the QIA requested that Baffinland review the definitions used in different projects and provide a summary report of those definitions to the TEWG. This memo summarizes the proposed definitions.

Please do not hesitate to contact the undersigned should you have any questions or commentary.

Justine Benjamin, PBiol,
Wildlife Specialist MS/PA

## REVIEW

A review of relevant literature about the interaction between caribou and industrial developments such as mining, oil and gas infrastructure, and transportation corridors in northern or Arctic settings was conducted to evaluate what "deflection" implies regarding caribou response. For context, Merriam-Webster Dictionary (2024) defines **deflection** as "*a turning aside or off course*", and avoidance is defined as "*an action of emptying, vacating, or clearing away*". Several scientific literature sources apply 'avoidance' when describing caribou behaviour to industrial infrastructure (Wilson et al. 2014, Russell and Gunn 2017, Boulanger et al. 2021, Prichard et al. 2022, Severson et al. 2023). 'Deflection' is also applied, but no further specification is provided. Project-specific applications of terminology and related specifications and/or limitations when defining caribou response behaviours are provided from the following mining Projects.

### *Red Dog Mine, Alaska*

The Red Dog Mine in northwest Alaska is within the range of the western Arctic caribou herd. Portions of the herd migrate through the project area (US Environmental Protection Agency and US Department of the Interior 1984, Garry et al. 2018). A specific definition or investigation of deflections related to the mine from follow-up monitoring could not be found. A study on the effects of roads on caribou movement at the Red Dog Mine in Alaska classified slow and normal crossers using spatial analysis techniques and collared caribou data (Wilson et al. 2016). The study noted the issues of scale to which deflections occur and did not provide further definition of the term.

### *Diavik Diamond Mine, Northwest Territories*

The Diavik Diamond Mine in the Northwest Territories is within the range of the Bathurst Caribou herd, and the facilities interact with migration to and from their calving grounds (Diavik Diamond Mines Inc. 2012). Although deflection of caribou was predicted, no further definition of this term was provided. East versus west deflections were monitored and reported at the Diavik Diamond Mine in 2020. As part of their wildlife monitoring, they reported the number of deflections to the east or the west concerning caribou migration to and from calving grounds (Management and Solutions in Environmental Sciences 2021). It was determined that monitoring west versus east deflections yielded low explanatory information and had little value for continuing "deflection" monitoring.

### *Ekati Diamond Mine, Northwest Territories*

The Ekati Diamond Mine in the Northwest Territories interacts with seasonal migration of the Bathurst, and to a lesser extent the Beverly/Ahiak caribou herds. Deflection for that project is described as caribou "…*hesitating or changing path of motion at road*" (Arctic Canadian Diamond Company 2022). For a remote camera program at the Ekati Diamond Mine, caribou response to roads was broken down as crossing or deflecting, with deflected behaviour described as changes in the path of motion and not fully crossing the road or hesitating (Arctic Canadian Diamond Company 2022). Poole et al. (2021) define the deflection of collared caribou at the Eakti Diamond Mine as collared caribou changing direction by at least 60° between two steps, where steps refer to the plotting of individual movement paths from pairs of telemetry locations separated by a specific time interval (i.e., 1hr, 8hr, 24hr).

### *Meliadine Mine, Nunavut*

The Meliadine Mine near Rankin Inlet, Nunavut, interacts with migrating mainland barren ground caribou. Monitoring identifies caribou behaviour to infrastructure as either 'deflection' or 'paralleling'. Deflection was defined as observations of caribou movements parallel to the road or adjusting their route away (at any angle) from the road (WSP Canada Inc. 2023a). A more detailed definition for Integrated Step Selection Analysis included "…*a turning angle >/= 60° between the heading of the step and the average heading of the individual caribou's movement*." "Paralleling" was defined as any steps a caribou took to avoid getting closer to the Mine and infrastructure, such as when caribou are seen walking alongside or parallel to the infrastructure. (WSP Canada Inc. 2023b).

## PROPOSED DEFINITIONS

The review of available sources and definitions show that a tiered/graded system of classifying caribou movement (e.g., 2 or 3 categories) in relation to Project infrastructure is commonly used. Categories may include:

- **Unimpeded crossing.** No noticeable response; caribou unaffected and continue on their way.
- **Delayed crossing.** Caribou may hesitate, travel parallel, or even deflect before crossing.
- **No crossing.** Caribou may hesitate, travel parallel or deflect, but ultimately no crossing occurs.

The proposed terms and descriptors for caribou behavioural responses to infrastructure at the Mary River Project are summarized in Table 1. Considerations for defining caribou 'deflection' versus 'delay' should include caribou persistence or the number of steps taken (e.g., using estimates from collar data analysis) before returning in the original direction.

**Table 1. Proposed Terms and Descriptors | Caribou Behavioural Response to Infrastructure.**

| Term | Behavioural Response | Descriptor/Definition |
|---|---|---|
| Deflect | No Crossing | Caribou approaches Project infrastructure (i.e., rail line or Tote Road) but does not continue on its path (i.e., no crossing) while showing a distinct mechanism-related behavioural response (e.g., step change associated with a disturbance measure such as traffic pass, snowbank height). |
| Delay | Delayed Crossing | Caribou approaches Project infrastructure but does not immediately continue its path (i.e., no immediate crossing). Behaviour includes briefly stopping or slowing down (relative to previous travel time), travelling parallel to the feature, circling, and turning around before crossing at the original location or an alternate location. |
| Cross | Unimpeded Crossing | Caribou approaches Project infrastructure and crosses with no noticeable behavioural response. |

## CLOSURE

The QIA requested that Baffinland commit to working with the TEWG to redefine deflections. Baffinland opened the discussion at the May 22, 2024 TEWG meeting. At that meeting, the QIA directed Baffinland to provide this summary report on how deflections are defined at other mining sites. The definitions were found to align with the intentions of the Terrestrial Environment Mitigaton and Monitoring Plan (TEMMP), and the revised descriptors described in this memo will be applied to the Project when characterizing caribou behavioural responses to infrastructure.

## REFERENCES

Arctic Canadian Diamond Company. 2022. Ekati Diamond Mine 2022 Wildlife Management and Monitoring Plan.

Baffinland Iron Mines Corporation. 2023. Mary River Project — Terrestrial Environment Mitigation and Monitoring Plan. 140 pp.

Boulanger, J., Poole, K.G., Gunn, A., Adamczewski, J., and Wierzchowski, J. 2021. Estimation of trends in zone of influence of mine sites on barren-ground caribou populations in the Northwest Territories, Canada, using new methods. Wildlife Biology 2021(1). DOI: 10.2981/wlb.00719. (https://bioone.org/journals/wildlife-biology/volume-2021/issue-1/wlb.00719/Estimation-of-trends-in-zone-of-influence-of-mine-sites/10.2981/wlb.00719.full)

Diavik Diamond Mines Inc. 2012. Wildlife Monitoring Program Report - 2011. ENV-185-0312 R0. 116 pp.

Encyclopedia Britannica Company. 2024. Dictionary. (https://www.merriam-webster.com/). Accessed June 12, 2024.

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Nunavut Impact Review Board. 2023. Mary River Project — Issuance of NIRB's Project Certificate No. 005 Amendment 005 for Baffinland Iron Mines Corporation's "Sustaining Operations Proposal" for the Mary River Iron Ore Project. November 17, 2023 email.

Poole, K.G., Gunn, A., and Pelchat, G. 2021. Influence of the Ekati Diamond Mine on migratory tundra caribou movements. Prepared for Independent Environmental Monitoring Agency. Yellowknife, NWT. 60 pp.

Prichard, A.K., Welch, J.H., and Lawhead, B.E. 2022. The Effect of Traffic Levels on the Distribution and Behaviour of Calving Caribou in an Arctic Oilfield. ARCTIC 75(1):1–19. DOI: 10.14430/arctic74609

Russell, D. and Gunn, A. 2017. Assessing caribou vulnerability to oil and gas exploration and development in Eagle Plains, Yukon. Prepared for Yukon Government, Energy Mines and Resources. Shadow Lake, Yukon. 101 pp.

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August 16, 2024 EDI Project No: 24C0140

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Attention: Cortney Oliver, Jesse Manufor

**RE: MARY RIVER PROJECT**
**Considerations for Pellet-Based DNA Mark-Recapture for Caribou Abundance**

During the Qikiqtani Inuit Association's (QIA's) review of the Sustained Operations Proposal, and as identified in the Nunavut Impact Review Board's reconsideration report (Nunavut Impact Review Board 2023), the QIA requested that Baffinland work with the Terrestrial Environment Working Group (TEWG) to explore whether mark-recapture using pellets could be used to estimate caribou population abundance across the regional study area (RSA). This commitment is stated in Technical Comment QIA TE-2(2):

| Commitment/ Intervenor | | Sustained Operations Proposal Technical Comment(s) | Commitment |
|---|---|---|---|
| 4 | QIA | QIA TE-2 (2) | Baffinland commits to working with the TEWG to explore whether marked-recapture using pellets is an approach that could be used to estimate caribou abundance across the regional study area, including whether this method would be acceptable to Inuit, and provide a report with recommendations to TEWG by November 30, 2024 on potential use of this method. Whether this program is a viable alternative will be considered if 1) the information is required, 2) the information provided would not be duplicative of another program that is running, and 3) the potential impact of additional flights is acceptable. |

From Appendix D, List of Commitments in Respect of the Sustained Operations Proposal, Nunavut Impact Review Board. 2023. Reconsideration Report and Recommendations for Baffinland's Sustaining Operations Proposal. NIRB Public Registry No. 347145. Cambridge Bay, NU, Canada. pp.164

During the 31st TEWG meeting on May 22, 2024, Baffinland suggested that the QIA lead the discussion and provide rationale on their request. However, further discussion on this request did not occur. Although pellet counts have been used to estimate relative abundance of ungulate populations, pellet counts alone can be imprecise and unreliable (Smart et. al. 2003, as cited in Brinkman et. al. 2011). To meet this Project commitment, this memo provides a review of mark-recapture using DNA techniques and considers the viability of a pellet-based DNA mark-recapture program as an alternative method to estimate the abundance of barren ground caribou (*Rangifer tarandus groenlandicus*) in the RSA.

Please do not hesitate to contact the undersigned with any questions or comments.

Jay Brogan, MSc, RPBio, Senior Biologist MS/PA

# MARK-RECAPTURE USING DNA

The mark-recapture technique is a method used to estimate the size of a population where it is impractical to count every individual. The mark-recapture population estimation (Krebs 2014) is based on the following:

(1) Capturing and marking a subset of individuals.
(2) Releasing these individuals into the population.
(3) Capturing a subsequent subset of individuals to determine the proportion of marked individuals.
(4) Applying assumptions to estimate the broader population.

This technique assumes that all of the individuals are equally likely to be captured (i.e., a mark does not increase or reduce the likelihood of being recaptured); the population is closed (i.e., no recruitment or immigration, and no loss of marked individuals or emigration); there is sufficient time between the first and second capture events to permit individuals to mix randomly within the population; and, marked individuals are not lost (Pollock 1981, Krebs 2014).

Pellet-based DNA sampling is suggested because it provides a non-intrusive population estimate for some species and Project settings. The method follows the same principles defined above for the marked-recapture technique, although fecal pellets are used to identify the individuals (Kohn and Wayne 1997). Before pellet-based DNA sampling can occur, a reconnaissance flight of the RSA is required to locate caribou and caribou tracks (Poole et al. 2011, Hettinga et al. 2012). These locations are then sent to a second/independent team tasked with surveying each area in search of fresh pellets (Hettinga et al. 2012). The surveying and collection of pellets would then be repeated to obtain a subset of pellets for determining the proportion of marked to unmarked individuals. All pellet samples would be carefully handled/prepared and sent to a laboratory for microsatellite genotyping (i.e., DNA sequencing) which is used as markers to identify individuals.

## Applying DNA Mark-Recapture to Estimate Caribou in the Regional Study Area

*"…considered if 1) the information is required, and 2) the information provided would not be duplicative of another program that is running."*

**1) Distribution information of caribou in the Project RSA is required (but not necessarily the number of caribou).**

**2) Yes, the method is duplicative of other programs.**

Using aerial surveys is the standard approach for estimating the abundance and distribution of barren ground caribou on Baffin Island. An aerial survey of Baffin Island was conducted by the Government of Nunavut in 2014, and an aerial survey of the Project RSA was conducted by Baffinland in March 2023. These surveys used the aerial distance sampling method preferred by the Government of Nunavut (Campbell et al. 2015). This method is also a standard approach in other jurisdictions such as Alberta and British Columbia, and is deemed to provide reliable and comparable estimates.

Following Baffinland's 2023 aerial survey of the Project RSA, a caribou population estimate was calculated, as reported in *2023 Mary River Project Terrestrial Environment Annual Monitoring Report*, (Baffinland Iron Mines Corporation 2023). Based on aerial survey transects of the southern subregion which includes the planned Project area, and the northern subregion which includes the current Project area, the 2023 study estimated 613 caribou (95% CI = 314–1,198; 38.94 caribou/1,000 km²) in the southern subregion and 44 caribou (95% CI = 11–182; 3.74 caribou/1,000 km²) in the northern subregion of the RSA.

*For Consideration:*

The aerial distance sampling methods and pellet-based DNA mark-recapture programs have strengths and weakness for estimating wildlife populations:

- Aerial distance sampling is considered a cost-effective option for population estimates of ungulates (Grignolio et al. 2020). Aerial distance sampling is more effective in homogeneous habitats. It is less effective for aggregating and/or low-density populations and species with few detection events (e.g., sheep and goats) (Found and Patterson 2020).

- Pellet-based DNA sampling is costly. Accounting for personnel, field effort/logistic and analytical procedures, it is estimated to cost six times more than aerial surveys (Poole et al. 2011). DNA mark-recapture is better applied to closed populations (or those in discrete blocks, such as peninsula-based populations), small populations, and/or habitats that are easily accessible or have low sightability (Poole et al. 2011, Found and Patterson 2020). Pellet DNA mark-recapture is not preferred for low-density populations, large survey areas, and/or densely aggregating species (Found and Patterson 2020).

*"…considered if… 3) the potential impact of additional flights is acceptable."*

**3) Baffinland is committed to minimizing its impact on the landscape, and therefore does not support additional flight disturbance (unless warranted).**

As described above, a reconnaissance flight of the RSA is required before mark-recapture pellet-based DNA sampling can occur, followed by two rounds of surveying in search of fresh pellets. These activities will require increasing helicopter flights and the proportion of low-level flying in the study area, which will increase anthropogenic presence on the landscape.

## CONCLUSION

At the 31st TEWG meeting (May 22, 2024) Baffinland opened discussion on the viability of using pellet-based DNA mark-recapture methods to estimate the caribou population in the RSA. Upon review of available literature and considerations for the Project setting and other related survey programs, the pellet-based DNA mark-recapture method is unlikely to be a viable method for abundance estimation given the large area and moving population. This approach would duplicate estimates of caribou populations in relation to the Project that were obtained from aerial distance sampling completed in 2023. This approach would also increase anthropogenic presence on the landscape while incurring significant costs.

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September 27, 2024

EDI Project No: 24C0140

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Attention: Cortney Oliver, Jesse Manufor

**RE: Southern Rail Caribou Baseline Data Collection**

## Background

The Qikiqtani Inuit Association (QIA) submitted a draft recommendation to the Terrestrial Environment Working Group on February 6, 2024, for caribou baseline data collection in the Southern Rail Regional Study Area (RSA) (QIA 2024). The Southern Rail RSA corresponds to the 'Southern Transport Corridor' study area identified in the technical report *Caribou Monitoring | Triggers and Recommendations* (EDI Environmental Dynamics Inc. 2022).

The QIA recommended that Baffinland Iron Mines Corp. (Baffinland) implement one or more monitoring programs to assess (a) caribou presence and movement before construction and (b) a zone of influence (ZOI) and movement deflections during construction and operation. Camera traps were suggested as the least invasive method, minimizing disturbance to caribou compared to alternatives like GPS collaring and ground- or aerial-based surveys. Though the QIA supports GPS collaring to assess caribou movement and ZOIs, they suggest that Baffinland implement alternative programs if the Hunters and Trappers Organizations (HTOs) do not support collaring.

EDI Environmental Dynamics Inc. (EDI) evaluated the efficacy of baseline data collection methods to address the monitoring objectives highlighted by the QIA while considering the potential impacts on caribou, data resolution and quality, logistics and effort, and financial cost. This evaluation is consistent with Term and Condition No. 50 of Project Certificate No. 005 (Nunavut Impact Review Board 2012), which requires Project-specific monitoring that is continuously refined to aid in adaptive management responses.

## Method Evaluation

The Mary River Project has three key objectives and associated metrics for monitoring caribou: (1) predict the potential for interaction with the Project using regional caribou abundance/density and distribution; (2) assess whether Project infrastructure poses a barrier to caribou movement based on crossings and deflections (see EDI Environmental Dynamics Inc. 2024a for a discussion on these movement-related terminologies); and (3) assess the presence and magnitude of a Project ZOI based on altered caribou space use and habitat selection. These objectives pose different questions about Project-related effects and may require different study designs.

Estimates of abundance and density in the Project area require a survey with broad spatial coverage, independent counts of caribou, and analytical techniques that account for imperfect detection; e.g., see Section 9.5 *Aerial Caribou Survey* in *Mary River Project Terrestrial Environment 2023 Annual Monitoring Report* (EDI Environmental Dynamics Inc 2024). Estimating changes to space use from a ZOI also requires a broad study extent to assess how the Southern Rail might be altering habitat selection near it compared to locations farther away; e.g., see *Caribou Monitoring | Triggers and Recommendations* (EDI Environmental Dynamics Inc. 2022). Understanding movement and caribou responses to the Southern Rail requires fine-resolution spatial and temporal data. Data collection should occur locally (near the proposed footprint) and frequently (multiple times per day) to capture caribou responses to the Southern Rail before, during, and after construction.

Overall, three methods were considered to address monitoring objectives: (1) camera traps, (2) GPS collaring, and (3) aerial surveys. These methods vary in their potential effects on caribou behaviour, data resolution, and associated analytical techniques. Each method is discussed in detail (below) to inform the selection of the right approach(s) for each monitoring objective. Other methods exist to answer caribou-related monitoring questions but are not discussed here, e.g., the QIA's suggested consideration of a pellet-based DNA mark-recapture, which was evaluated in EDI Environmental Dynamics Inc. (2024).

### Camera Traps

Camera traps are a non-intrusive method for documenting wildlife presence and movement patterns. They can capture location information at broad (distribution) and fine (interaction) scales, assuming animals use areas the cameras sampled. Cameras can also collect data at a fine temporal resolution as they can be set to trigger at pre-defined intervals or by motion. However, many cameras are needed to cover large study areas and detect broad spatial trends. For example, the number of cameras required to estimate a ZOI would be cost-prohibitive and could disturb wildlife from the many helicopter flights required to deploy, service, and retrieve data. Yet camera programs have been used for ZOI-related studies. A camera program was employed by Agnico Eagle at the Hope Bay (formerly Madrid-Boston) Gold Mine in Nunavut to verify the 2–10 km ZOI predicted in the Final Environmental Impact Statement. Sixty (60) cameras were placed broadly across three distance zones from the Project (<2 km, 2–10 km, and >10 km) to assess how frequently caribou were photographed in each zone (ERM Consultants Canada Ltd. 2024). This study design was sufficient to *verify* a ZOI. Still, it would not capture the resolution needed to *estimate* a precise ZOI, which requires many more cameras at equally spaced distance intervals around mining infrastructure.

Camera traps are ideal for collecting fine-scale spatiotemporal data to assess caribou-infrastructure interactions. Camera traps were effectively used at Agnico Eagle's Meadowbank Complex (Nunavut) to capture interactions between caribou and project roads to assess crossing events, road permeability for caribou, and movement/behavioural responses to road physical parameters (Agnico Eagle Mines Limited 2024). Furthermore, camera traps at Agnico Eagle's Meliadine Mine (Nunavut) could detect 350% more crossings than GPS collar data alone (ERM Consultants Canada Ltd. 2021). Camera studies also facilitate systematic placement of cameras that are better suited to detect the presence and absence of caribou and can be used to test the affect of specific road features (ERM Consultants Canada Ltd. 2021).

### GPS Collaring

GPS collaring is a standard method for caribou monitoring because it provides location information at broad (distribution) and fine (interaction) scales and typically at a fine temporal resolution (2- to 4-hour fix rates based on modern technology). Data gathered from GPS-collared caribou have been used extensively to address questions related to movement (Wilson et al. 2016, Prichard et al. 2020, Fullman et al. 2021, Severson et al. 2023, Boulanger et al. 2024) and ZOIs (Polfus et al. 2011, Johnson and Russell 2014, Johnson et al. 2020, Boulanger et al. 2021). GPS collars and ground-based observations tend to be correlated (e.g., Meliadine Mine; WSP Canada Inc. 2023). However, there are still hazards and limitations to this method. Collaring is invasive and can lead to caribou injury and mortality (e.g., Government of Nunavut 2021). Collared caribou may comprise only a small proportion of a targeted herd and may not always be a representative sample of on-the-ground conditions, including project interactions. For example, GPS collars could not capture caribou presence in the Meliadine Narrows (July 3, 2020), while ground observations confirmed their presence (Agnico Eagle Mines Limited 2023). If GPS-collared caribou are limited in their interaction with mining infrastructure, any effects estimates will be imprecise (e.g., All-Weather Access Road; WSP Canada Inc. 2023). In such cases, monitoring would need to be supplemented with location-specific observations.

### Aerial Surveys

Aerial surveys are an effective method for evaluating caribou abundance/density and space use. Baffinland has already used this method to determine whether caribou interact with the Project (EDI Environmental Dynamics Inc 2024). Fixed-wing and helicopter-based aerial surveys have also been used at the Meliadine Mine to document seasonal distribution, habitat associations, and abundance of caribou (Agnico Eagle Mines Ltd. and Golder Associates Ltd. 2014). With the appropriate study design, aerial surveys can help estimate ZOIs. Boulanger et al. (2021) used aerial survey data (4- to 8-km transects) to estimate ZOIs at the Ekati-Diavik Complex and found that caribou presence was required in at least 140/7,865 (1.8%) 1-km cells in their study area; more presence improved the precision of ZOI estimates. Intensive surveys with closer-spaced transects (e.g., 1–2 km) could yield higher resolution data and more precise ZOI estimates. Autonomous drones (e.g., Superwake — https://www.superwake.ca) can complete such surveys while causing less disturbance to wildlife due to their smaller size (5.5 m by 3 m) and limited auditory disturbance compared to fixed-wing or helicopter aircrafts. However, even with higher resolution data from drones, aerial surveys only provide a snapshot of ecological conditions and would not be ideal for continuously assessing caribou interaction with infrastructure.

## Recommendation

GPS collaring is the most frequently used method to assess caribou movement and ZOIs. However, due to HTO concerns (presumed to be related to possible invasiveness and harm caused by GPS collaring), the QIA suggested that Baffinland seek alternative monitoring programs. In lieu of GPS collaring occurring, EDI recommends the two alternative monitoring programs for the Southern Rail baseline data collection.

1. Intensive aerial surveys using either long-range autonomous drones or fixed-wing aircraft to (a) estimate abundance/density and (b) assess changes to space use and habitat selection due to a ZOI from the Southern Rail. These intensive surveys can simultaneously answer (a) and (b) using the same survey protocols.
2. Camera traps to evaluate caribou interaction with the Southern Rail, including behaviour, crossings, and deflections. Camera arrays would be deployed along caribou migration routes and trails that intersect the Southern Rail corridor, as identified by Inuit Qaujimajatuqangit knowledge and surveys during the Project's baseline studies (EDI Environmental Dynamics Inc. 2012).

Both programs could be implemented in 2025 and might occur before, during, and after the construction of the Southern Rail. If GPS collaring is supported by the Terrestrial Environment Working Group, and research permits are approved, then intensive aerial surveys would not be required. Instead, GPS collar data would be used to answer questions related to movement and ZOIs, and traditional fixed-wing aerial surveys would be conducted at pre-determined intervals (based on caribou density and variability) to assess caribou abundance/density and distribution broadly.

Yours truly,

**EDI Environmental Dynamics Inc.**

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# APPENDIX C CLIMATE DATA

Appendix Table C-1. Mine Site climate data.

| Year | Month | Average Air Temperature (°C) | Average Wind Speed (m/s) | Total Precipitation (mm) |
|---|---|---|---|---|
| 2005 | Jun | – | 5.0 | 13.9 |
| 2005 | Jul | 8.4 | 4.4 | 112.5 |
| 2005 | Aug | 8.6 | 4.2 | 37.1 |
| 2005 | Sep | -0.2 | 5.0 | 5.1 |
| 2005 | Oct | – | 2.7 | – |
| Gap in Data | | | | |
| 2006 | Jun | 3.5 | 4.8 | 22.1 |
| 2006 | Jul | 9.7 | 4.2 | 94.8 |
| 2006 | Aug | 9.1 | 4.1 | 74.5 |
| 2006 | Sep | 2.4 | 3.3 | 25.4 |
| 2006 | Oct | -4.8 | 4.0 | 4.2 |
| 2006 | Nov | -19.8 | 2.8 | 0.0 |
| 2006 | Dec | -29.7 | 2.5 | 0.0 |
| 2007 | Jan | -32.3 | 1.4 | 0.0 |
| 2007 | Feb | -26.2 | 2.6 | 0.0 |
| 2007 | Mar | -31.0 | 2.5 | 0.0 |
| 2007 | Apr | -20.0 | 1.9 | 0.0 |
| 2007 | May | -11.7 | 3.6 | 0.1 |
| 2007 | Jun | 3.6 | 4.2 | 0.9 |
| 2007 | Jul | 13.2 | 4.3 | 37.8 |
| 2007 | Aug | 9.6 | 3.3 | 57.4 |
| 2007 | Sep | -0.9 | 2.9 | 9.3 |
| 2007 | Oct | -12.4 | 3.3 | 0.1 |
| 2007 | Nov | -21.5 | 4.3 | 0.0 |
| 2007 | Dec | -30.6 | 1.6 | 0.1 |
| 2008 | Jan | -29.6 | 4.1 | 0.0 |
| 2008 | Feb | -35.3 | 2.1 | 0.0 |
| 2008 | Mar | -27.8 | 4.5 | 0.0 |
| 2008 | Apr | -15.2 | 4.7 | 0.0 |
| 2008 | May | -0.8 | 3.2 | 23.8 |
| 2008 | Jun | – | 6.5 | 0.0 |
| 2008 | Jul | – | 5.0 | 11.4 |
| 2008 | Aug | – | 3.2 | 30.4 |
| 2008 | Sep | – | 4.9 | 8.8 |
| 2008 | Oct | -11.8 | 4.5 | 0.1 |
| 2008 | Nov | -22.4 | 3.4 | 0.0 |
| 2008 | Dec | -29.9 | 2.5 | 0.0 |
| 2009 | Jan | -27.8 | 2.6 | 0.0 |

Appendix Table C-1. Mine Site climate data.

| Year | Month | Average Air Temperature (°C) | Average Wind Speed (m/s) | Total Precipitation (mm) |
|---|---|---|---|---|
| 2009 | Feb | -31.3 | 1.4 | 0.0 |
| 2009 | Mar | -27.8 | 3.1 | 0.0 |
| 2009 | Apr | -17.8 | 2.7 | 3.1 |
| 2009 | May | -6.4 | 2.6 | 3.1 |
| 2009 | Jun | 4.3 | 5.1 | 35.2 |
| 2009 | Jul | 12.5 | 3.2 | 28.4 |
| 2009 | Aug | 8.6 | 3.3 | 36.2 |
| 2009 | Sep | – | 4.7 | 26.6 |
| 2009 | Oct | – | 4.4 | 0.1 |
| 2009 | Nov | – | 2.6 | 0.0 |
| 2009 | Dec | – | 5.4 | 0.0 |
| 2010 | Jan | -32.1 | 3.9 | 0.0 |
| 2010 | Feb | – | 4.5 | 0.0 |
| 2010 | Mar | – | 3.5 | 0.0 |
| 2010 | Apr | – | 3.0 | 1.0 |
| 2010 | May | – | 4.8 | 8.4 |
| 2010 | Jun | – | 4.6 | 8.2 |
| 2010 | Jul | – | 2.2 | 1.9 |
| Gap in Data | | | | |
| 2013 | Aug | 2.0 | 2.8 | 0.4 |
| 2013 | Sep | -1.8 | 4.8 | 4.0 |
| 2013 | Oct | -8.4 | 4.8 | 1.1 |
| 2013 | Nov | -27.2 | 2.1 | 0.0 |
| 2013 | Dec | -31.2 | 2.0 | 0.0 |
| 2014 | Jan | -28.5 | 2.5 | 0.0 |
| 2014 | Feb | -31.7 | 1.5 | 0.0 |
| 2014 | Mar | -29.0 | 1.8 | 0.0 |
| 2014 | Apr | -18.2 | 4.2 | 0.1 |
| 2014 | May | -7.8 | 2.9 | 7.5 |
| 2014 | Jun | 2.7 | 4.8 | 43.8 |
| 2014 | Jul | 11.5 | 2.8 | 36.1 |
| 2014 | Aug | 6.0 | 4.0 | 67.8 |
| 2014 | Sep | -2.1 | 3.2 | 3.1 |
| 2014 | Oct | -10.6 | 3.8 | 0.4 |
| 2014 | Nov | -20.9 | 2.5 | 0.0 |
| 2014 | Dec | -29.9 | 2.1 | 0.0 |
| 2015 | Jan | -35.4 | 1.3 | 0.0 |

Appendix Table C-1. Mine Site climate data.

| Year | Month | Average Air Temperature (°C) | Average Wind Speed (m/s) | Total Precipitation (mm) |
|---|---|---|---|---|
| 2015 | Feb | -37.0 | 1.2 | 0.0 |
| 2015 | Mar | -30.3 | 1.8 | 0.2 |
| 2015 | Apr | -22.6 | 1.8 | 0.0 |
| 2015 | May | -6.1 | 4.5 | 3.2 |
| 2015 | Jun | 4.3 | 4.1 | 18.2 |
| 2015 | Jul | 12.2 | 4.2 | 34.6 |
| 2015 | Aug | 7.1 | 4.2 | 41.8 |
| 2015 | Sep | 0.2 | 4.9 | 48.5 |
| 2015 | Oct | -10.3 | 3.9 | 5.0 |
| 2015 | Nov | -23.5 | 2.8 | 0.0 |
| 2015 | Dec | -32.0 | 3.4 | 0.0 |
| 2016 | Jan | -25.9 | 2.5 | 0.0 |
| 2016 | Feb | -31.6 | 2.3 | 0.0 |
| 2016 | Mar | -29.4 | 0.5 | 0.0 |
| 2016 | Apr | -15.4 | 4.1 | 2.8 |
| 2016 | May | -4.2 | 5.2 | 6.0 |
| 2016 | Jun | 5.8 | 3.3 | 17.4 |
| 2016 | Jul | 11.8 | 4.1 | 31.8 |
| 2016 | Aug | 10.6 | 3.6 | 59.9 |
| 2016 | Sep | -1.9 | 4.8 | 51.5 |
| 2016 | Oct | -11.2 | 5.0 | 0.2 |
| 2016 | Nov | -16.8 | 3.6 | 0.0 |
| 2016 | Dec | -29.4 | 2.0 | 0.0 |
| 2017 | Jan | -26.4 | 3.5 | 0.0 |
| 2017 | Feb | -31.2 | 1.6 | 0.0 |
| 2017 | Mar | -30.6 | 2.8 | 0.0 |
| 2017 | Apr | -15.4 | 4.4 | 1.0 |
| 2017 | May | -5.6 | 3.9 | 1.4 |
| 2017 | Jun | 4.2 | 4.2 | 21.9 |
| 2017 | Jul | 7.2 | 5.4 | 67.8 |
| 2017 | Aug | 8.6 | 3.4 | 56.7 |
| 2017 | Sep | -0.3 | 4.1 | 1.6 |
| 2018 | Jan | -32.2 | 0.6 | 0.0 |
| 2018 | Feb | -34.6 | 2.0 | 0.0 |
| 2018 | Mar | -25.3 | 3.4 | 0.0 |
| 2018 | Apr | -17.6 | 3.2 | 1.7 |
| 2018 | May | -8.5 | 3.2 | 0.6 |

Appendix Table C-1. Mine Site climate data.

| Year | Month | Average Air Temperature (°C) | Average Wind Speed (m/s) | Total Precipitation (mm) |
|---|---|---|---|---|
| 2018 | Jun | 4.8 | 4.3 | 26.0 |
| 2018 | Jul | 7.5 | 4.4 | 51.3 |
| 2018 | Aug | 6.4 | 4.0 | 2.0 |
| 2018 | Sep | -2.1 | 4.7 | 25.1 |
| 2018 | Oct | -14.2 | 3.3 | 0.0 |
| 2018 | Nov | -25.4 | 2.0 | 0.0 |
| 2018 | Dec | -26.5 | 2.9 | 0.0 |
| 2019 | Jan | -31.4 | 3.0 | 0.0 |
| 2019 | Feb | -33.6 | 0.8 | 0.0 |
| 2019 | Mar | -27.8 | 2.9 | 0.0 |
| 2019 | Apr | -20.6 | 3.3 | 0.1 |
| 2019 | May | -0.1 | 4.1 | 7.1 |
| 2019 | Jun | 6.4 | 4.4 | 45.2 |
| 2019 | Jul | 11.0 | 4.0 | 54.4 |
| 2019 | Aug | 11.2 | 4.0 | 22.6 |
| 2019 | Sep | 2.4 | 4.4 | 20.6 |
| 2019 | Oct | 3.0 | 4.8 | *2.4* |
| 2019 | Nov | -8.9 | 3.1 | *0.1* |
| 2019 | Dec | -14.9 | 3.7 | *0.0* |
| 2020 | Jan | -33.1 | 1.0 | *0.0* |
| 2020 | Feb | -32.4 | 0.6 | *0.0* |
| 2020 | Mar | -25.9 | 2.3 | *0.0* |
| 2020 | Apr | -13.9 | 1.5 | *0.0* |
| 2020 | May | -6.1 | 2.9 | *0.1* |
| 2020 | Jun | 5.8 | 1.8 | *0.2* |
| 2020 | Jul | 14.1 | 2.2 | *0.4* |
| 2020 | Aug | 8.5 | 2.2 | *0.9* |
| 2020 | Sep | 5.3 | 2.5 | *0.0* |
| 2020 | Dec | -19.6 | 4.8 | *0.0* |
| 2021 | Jan | -21.9 | 3.6 | *0.0* |
| 2021 | Feb | -26.2 | 4.0 | *0.0* |
| 2021 | Mar | -29.9 | 3.3 | *0.0* |
| 2021 | Apr | -13.9 | 5.6 | *0.0* |
| 2021 | May | -4.9 | 3.9 | *0.1* |
| 2021 | Jun | 6.2 | 4.5 | *1.5* |
| 2021 | Jul | 7.0 | 4.5 | *2.2* |
| 2021 | Aug | 6.6 | 5.3 | *11.8* |

Appendix Table C-1. Mine Site climate data.

| Year | Month | Average Air Temperature (°C) | Average Wind Speed (m/s) | Total Precipitation (mm) |
|---|---|---|---|---|
| 2021 | Sep | -1.6 | 3.8 | 13.0 |
| 2021 | Oct | -2.5 | 5.9 | 22.6 |
| 2021 | Nov | -20.0 | 2.3 | 0.0 |
| 2021 | Dec | -21.6 | 3.4 | 0.0 |
| 2022 | Jan | -29.0 | 2.1 | 0.0 |
| 2022 | Feb | -33.7 | 2.1 | 0.0 |
| 2022 | Mar | -25.0 | 2.4 | 0.0 |
| 2022 | Apr | -17.8 | 4.5 | 0.0 |
| 2022 | May | -8.7 | 3.6 | 1.6 |
| 2022 | Jun | 3.4 | 4.1 | 33.2 |
| 2022 | Jul | 13.4 | 3.4 | 7.4 |
| 2022 | Aug | 8.0 | 3.8 | 32.0 |
| 2022 | Sep | 1.1 | 5.5 | 35.8 |
| 2022 | Oct | -10.6 | 5.2 | 10.8 |
| 2022 | Nov | -26.9 | 2.4 | 0.0 |
| 2022 | Dec | -23.3 | 5.0 | 0.0 |
| 2023 | Jan | -34.8 | 2.4 | 0.0 |
| 2023 | Feb | -40.1 | 1.3 | 0.0 |
| 2023 | Mar | -23.6 | 2.1 | 0.0 |
| 2023 | Apr | -16.0 | 2.4 | 0.0 |
| 2023 | May | -7.0 | 4.9 | 0.0 |
| 2023 | Jun | 1.5 | 5.0 | 28.2 |
| 2023 | Jul | 10.3 | 3.9 | 27.6 |
| 2023 | Aug | 8.9 | 5.0 | 84.6 |
| 2023 | Sep | 0.9 | 5.3 | 43.6 |
| 2023 | Oct | -9.0 | 4.1 | 3.2 |
| 2023 | Nov | -12.9 | 6.4 | 0.0 |
| 2023 | Dec | -22.9 | 4.0 | 0.0 |
| 2024 | Jan | -25.9 | 2.8 | 0.0 |
| 2024 | Feb | -29.6 | 2.6 | 0.0 |
| 2024 | Mar | -24.2 | 3.0 | 0.0 |
| 2024 | Apr | -14.0 | 4.7 | 0.0 |
| 2024 | May | -7.6 | 3.4 | 0.2 |
| 2024 | Jun | 4.3 | 3.5 | 14.0 |
| 2024 | Jul | 9.2 | 4.7 | 84.0 |
| 2024 | Aug | 7.2 | 4.5 | 62.4 |
| 2024 | Sep | 3.9 | 5.2 | 155.2 |

### Appendix Table C-1. Mine Site climate data.

| Year | Month | Average Air Temperature (°C) | Average Wind Speed (m/s) | Total Precipitation (mm) |
|---|---|---|---|---|
| 2024 | Oct | -3.0 | 6.2 | 22.6 |
| 2024 | Nov | -16.4 | 3.8 | 0.0 |
| 2024 | Dec | -29.1 | 1.8 | 0.0 |

*Italicized grey text* indicates precipitation data were recorded during time periods with a potentially blocked rain gauge.

### Appendix Table C-2. Milne Inlet climate data.

| Year | Month | Average Air Temperature (°C) | Average Wind Speed (m/s) | Total Precipitation (mm) |
|---|---|---|---|---|
| 2006 | Jun | – | 5.6 | 1.5 |
| 2006 | Jul | 8.6 | 5.5 | 76.5 |
| 2006 | Aug | 8.1 | 6.4 | 35.8 |
| 2006 | Sep | 1.6 | 5.0 | 52.3 |
| 2006 | Oct | -4.8 | 5.0 | 0.3 |
| 2006 | Nov | -19.1 | 4.9 | 0.0 |
| 2006 | Dec | -28.2 | 3.7 | 0.0 |
| 2007 | Jan | -30.6 | 2.4 | 0.0 |
| 2007 | Feb | -25.3 | 4.7 | 0.0 |
| 2007 | Mar | -30.9 | 4.0 | 0.0 |
| 2007 | Apr | -18.6 | 4.2 | 0.0 |
| 2007 | May | -10.7 | 2.8 | 0.0 |
| 2007 | Jun | 2.8 | 5.0 | 0.0 |
| 2007 | Jul | 9.9 | 5.4 | 16.1 |
| 2007 | Aug | 7.8 | 5.1 | 24.7 |
| 2007 | Sep | -1.0 | 5.0 | 7.2 |
| 2007 | Oct | -10.5 | 5.3 | 0.0 |
| 2007 | Nov | -22.9 | 5.2 | 0.0 |
| 2007 | Dec | -29.7 | 3.5 | 0.0 |
| 2008 | Jan | -28.0 | 4.4 | 0.0 |
| 2008 | Feb | -34.2 | 3.0 | 0.0 |
| 2008 | Mar | -29.9 | 4.8 | 0.0 |
| 2008 | Apr | -17.3 | 5.3 | 0.0 |
| 2008 | May | -4.6 | 4.9 | 0.0 |
| 2008 | Jun | – | 5.1 | 14.4 |
| 2008 | Jul | 9.9 | 5.5 | 82.2 |
| 2008 | Aug | – | 3.7 | 3.9 |
| 2008 | Sep | – | 5.3 | 0.0 |
| 2008 | Oct | -11.3 | 5.3 | 0.0 |
| 2008 | Nov | -21.9 | 3.5 | 0.0 |

Appendix Table C-2. Milne Inlet climate data.

| Year | Month | Average Air Temperature (°C) | Average Wind Speed (m/s) | Total Precipitation (mm) |
|---|---|---|---|---|
| 2008 | Dec | -28.8 | 5.2 | 0.0 |
| 2009 | Jan | -27.7 | 4.5 | 0.0 |
| 2009 | Feb | -31.0 | 2.6 | 0.0 |
| 2009 | Mar | -27.9 | 4.6 | 0.0 |
| 2009 | Apr | -17.9 | 3.2 | 0.0 |
| 2009 | May | -7.5 | 3.8 | 0.0 |
| 2009 | Jun | 3.5 | 5.7 | 0.0 |
| 2009 | Jul | 11.5 | 5.8 | 0.0 |
| 2009 | Aug | – | 6.3 | 0.0 |
| 2009 | Sep | – | 4.5 | 0.0 |
| 2009 | Oct | – | 4.5 | 0.0 |
| 2009 | Nov | – | 4.5 | 0.0 |
| 2009 | Dec | – | 4.5 | 0.0 |
| 2010 | Jan | – | – | – |
| 2010 | Feb | – | – | – |
| 2010 | Mar | – | 13.9 | 26.2 |
| Gap In Data | | | | |
| 2013 | Aug | 2.1 | 5.2 | 37.4 |
| 2013 | Sep | -1.8 | 6.2 | 0.6 |
| 2013 | Oct | -7.9 | 5.1 | 1.4 |
| 2013 | Nov | -25.7 | 3.1 | 0.0 |
| 2013 | Dec | -30.2 | 2.8 | 0.0 |
| 2014 | Jan | -29.2 | 4.2 | 0.0 |
| 2014 | Feb | -31.2 | 3.8 | 0.0 |
| 2014 | Mar | -29.0 | 2.4 | 0.0 |
| 2014 | Apr | -19.4 | 4.8 | 1.0 |
| 2014 | May | -7.5 | 4.3 | 1.8 |
| 2014 | Jun | 1.8 | 5.0 | 13.9 |
| 2014 | Jul | 10.5 | 4.0 | 8.9 |
| 2014 | Aug | 5.4 | 5.7 | 10.3 |
| 2014 | Sep | -2.3 | 4.0 | 3.0 |
| 2014 | Oct | -10.6 | 3.6 | 0.2 |
| 2014 | Nov | -21.3 | 2.1 | 0.0 |
| 2014 | Dec | -29.2 | 4.3 | 0.0 |
| 2015 | Jan | -33.8 | 2.6 | 0.0 |
| 2015 | Feb | -35.3 | 2.5 | 0.0 |
| 2015 | Mar | -29.5 | 3.0 | 0.0 |

Appendix Table C-2. Milne Inlet climate data.

| Year | Month | Average Air Temperature (°C) | Average Wind Speed (m/s) | Total Precipitation (mm) |
|---|---|---|---|---|
| 2015 | Apr | -23.7 | 3.6 | 0.0 |
| 2015 | May | -8.3 | 5.2 | 1.1 |
| 2015 | Jun | 2.5 | 4.9 | 10.1 |
| 2015 | Jul | 10.0 | 4.8 | 8.0 |
| 2015 | Aug | 6.0 | 5.5 | 7.7 |
| 2015 | Sep | -0.1 | 5.9 | 10.1 |
| 2015 | Oct | -9.5 | 5.8 | 6.5 |
| 2015 | Nov | -21.6 | 4.5 | 0.0 |
| 2015 | Dec | -30.5 | 6.8 | 0.0 |
| 2016 | Jan | -25.3 | 4.9 | 0.0 |
| 2016 | Feb | -31.6 | 3.3 | 0.2 |
| 2016 | Mar | -29.3 | 2.5 | 0.0 |
| 2016 | Apr | -16.8 | 5.7 | 1.2 |
| 2016 | May | -5.8 | 5.8 | 5.3 |
| 2016 | Jun | 4.0 | 4.0 | 8.8 |
| 2016 | Jul | 9.9 | 5.4 | 22.7 |
| 2016 | Aug | 8.7 | 5.3 | 39.8 |
| 2016 | Sep | -1.6 | 6.2 | 18.5 |
| 2016 | Oct | -10.6 | 5.5 | 0.1 |
| 2016 | Nov | -16.8 | 5.1 | 0.0 |
| 2016 | Dec | -27.0 | 3.2 | 0.0 |
| 2017 | Jan | -25.7 | 4.9 | 0.0 |
| 2017 | Feb | -30.7 | 3.4 | 0.0 |
| 2017 | Mar | -30.4 | 4.0 | 0.0 |
| 2017 | Apr | -16.7 | 5.3 | 0.0 |
| 2017 | May | -6.9 | 4.4 | 0.0 |
| 2017 | Jun | 3.1 | 5.0 | 0.0 |
| 2017 | Jul | 6.9 | 6.2 | 34.1 |
| 2017 | Aug | 7.0 | 4.9 | 10.8 |
| 2017 | Sep | -0.7 | 6.5 | 8.9 |
| 2018 | Jan | -31.0 | 21.5 | 0.0 |
| 2018 | Feb | -35.1 | 16.7 | 0.0 |
| 2018 | Mar | -26.9 | 5.4 | 0.0 |
| 2018 | Apr | -19.4 | 6.9 | 0.1 |
| 2018 | May | -9.8 | 4.8 | 0.0 |
| 2018 | Jun | 3.3 | 5.6 | 19.3 |
| 2018 | Jul | 6.7 | 6.3 | 74.8 |

Appendix Table C-2. Milne Inlet climate data.

| Year | Month | Average Air Temperature (°C) | Average Wind Speed (m/s) | Total Precipitation (mm) |
|---|---|---|---|---|
| 2018 | Aug | 4.9 | 5.9 | 52.5 |
| 2018 | Sep | -11.8 | 6.0 | 18.1 |
| 2018 | Oct | -23.4 | 6.8 | 0.0 |
| 2018 | Nov | -35.3 | 2.5 | 0.0 |
| 2018 | Dec | -34.2 | 14.4 | 0.0 |
| 2019 | Jan | -40.9 | 11.5 | 0.0 |
| 2019 | Feb | -41.1 | 30.5 | 0.0 |
| 2019 | Mar | -36.2 | 5.0 | 0.0 |
| 2019 | Apr | -31.3 | 6.0 | 0.5 |
| 2019 | May | -12.0 | 6.0 | 2.8 |
| 2019 | Jun | -4.4 | 5.5 | 30.5 |
| 2019 | Jul | -0.3 | 6.3 | 50.1 |
| 2019 | Aug | 0.3 | 5.7 | 30.4 |
| 2019 | Sep | -8.1 | 2.9 | 41.3 |
| 2019 | Oct | -8.2 | – | 1.0 |
| 2019 | Nov | -19.1 | – | 0.0 |
| 2019 | Dec | -25.1 | – | 0.0 |
| 2020 | Jan | -35.3 | – | 0.0 |
| 2020 | Feb | -34.7 | – | 0.0 |
| 2020 | Mar | -29.3 | – | 0.0 |
| 2020 | Apr | -17.9 | – | 0.0 |
| 2020 | May | -7.9 | – | 0.2 |
| 2020 | Jun | 4.4 | 0.0 | 31.0 |
| 2020 | Jul | 11.5 | 0.0 | 20.9 |
| 2020 | Aug | 6.6 | 0.1 | *0.0* |
| 2020 | Sep | -1.4 | 2.5 | *0.3* |
| 2020 | Oct | -6.8 | 4.6 | *0.0* |
| 2020 | Nov | -22.1 | 5.6 | *0.0* |
| 2020 | Dec | -22.4 | 5.5 | *0.0* |
| 2021 | Jan | -22.5 | 4.8 | *0.0* |
| 2021 | Feb | -28.1 | 5.1 | *0.0* |
| 2021 | Mar | -29.2 | 5.3 | *0.0* |
| 2021 | Apr | -15.3 | 5.4 | *0.0* |
| 2021 | May | -6.1 | 4.7 | *0.0* |
| 2021 | Jun | 4.3 | 5.5 | *0.4* |
| 2021 | Jul | 5.9 | 6.2 | *0.4* |
| 2021 | Aug | 5.2 | 6.6 | *9.2* |

Appendix Table C-2. Milne Inlet climate data.

| Year | Month | Average Air Temperature (°C) | Average Wind Speed (m/s) | Total Precipitation (mm) |
|---|---|---|---|---|
| 2021 | Sep | -1.3 | 5.2 | 10.6 |
| 2021 | Oct | -2.4 | 8.6 | 15.2 |
| 2021 | Nov | -18.9 | 3.3 | 0.0 |
| 2021 | Dec | -22.2 | 5.3 | 0.0 |
| 2022 | Jan | -29.4 | 3.4 | 0.0 |
| 2022 | Feb | -33.4 | 3.1 | 0.0 |
| 2022 | Mar | -25.8 | 4.1 | 0.0 |
| 2022 | Apr | -18.7 | 6.3 | 0.0 |
| 2022 | May | -9.3 | 5.5 | 0.4 |
| 2022 | Jun | 2.4 | 5.3 | 6.8 |
| 2022 | Jul | 11.3 | 4.7 | 2.4 |
| 2022 | Aug | 6.9 | 5.7 | 13.6 |
| 2022 | Sep | 0.7 | 6.5 | 39.0 |
| 2022 | Oct | -10.3 | 6.0 | 0.2 |
| 2022 | Nov | -24.8 | 3.7 | 0.0 |
| 2022 | Dec | -23.7 | 6.2 | 0.0 |
| 2023 | Jan | -33.5 | 3.7 | 0.0 |
| 2023 | Feb | -37.5 | 4.3 | 0.0 |
| 2023 | Mar | -25.7 | 3.2 | 0.0 |
| 2023 | Apr | -18.9 | 2.3 | 0.0 |
| 2023 | May | -7.3 | 6.4 | 0.0 |
| 2023 | Jun | 0.9 | 6.2 | 12.8 |
| 2023 | Jul | 8.4 | 4.7 | 10.4 |
| 2023 | Aug | 7.9 | 6.8 | 58.6 |
| 2023 | Sep | 0.6 | 6.3 | 37.6 |
| 2023 | Oct | -8.2 | 4.7 | 0.4 |
| 2023 | Nov | -13.6 | 6.2 | 0.0 |
| 2023 | Dec | -22.9 | 5.2 | 0.0 |
| 2024 | Jan | -26.6 | 4.4 | 0.0 |
| 2024 | Feb | -27.5 | 4.3 | 0.0 |
| 2024 | Mar | -25.0 | 5.2 | 0.0 |
| 2024 | Apr | -14.9 | 6.7 | 0.0 |
| 2024 | May | -8.0 | 5.8 | 5.2 |
| 2024 | Jun | 2.8 | 4.1 | 4.2 |
| 2024 | Jul | 7.7 | 6.2 | 61.4 |
| 2024 | Aug | 6.4 | 6.3 | 61.4 |
| 2024 | Sep | 3.7 | 7.9 | 54.8 |

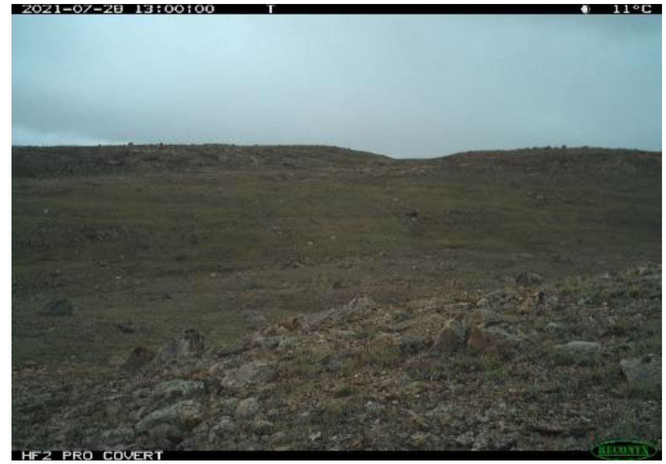
Appendix Table C-2. Milne Inlet climate data.

| Year | Month | Average Air Temperature (°C) | Average Wind Speed (m/s) | Total Precipitation (mm) |
|---|---|---|---|---|
| 2024 | Oct | -2.9 | 7.1 | 13.4 |
| 2024 | Nov | -16.1 | 4.6 | 0.0 |
| 2024 | Dec | -27.3 | 3.3 | 0.0 |

*Italicized grey text* indicates precipitation data were recorded during time periods with a potentially blocked rain gauge.

# APPENDIX D REMOTE CAMERA LOCATIONS

| Site Name | Camera Name | Location | Latitude / Longitude | Access | Site Photo |
|---|---|---|---|---|---|
| HOL 6 | Baffin-1 | KM 57 | 71.4832, -80.213 | Helicopter, vehicle, foot |  |
| HOL 16 | Baffin-2 | KM 95 | 71.3321, -79.4779 | Helicopter, vehicle, foot |  |

| Site Name | Camera Name | Location | Latitude / Longitude | Access | Site Photo |
|---|---|---|---|---|---|
| HOL 1 | Baffin-3 | KM 4 | 71.8710, -80.8828 | Helicopter, vehicle, foot |  |
| HOL 1 | Baffin-4 | KM 4 | 71.8710, -80.8828 | Helicopter, vehicle, foot |  |

| Site Name | Camera Name | Location | Latitude / Longitude | Access | Site Photo |
|---|---|---|---|---|---|
| HOL 6 | Baffin-5 | KM 57 | 71.4832, -80.213 | Helicopter, vehicle, foot |  |
| HOL 16 | Baffin-6 | KM 95 | 71.3321, -79.4779 | Helicopter, vehicle, foot |  |

| Site Name | Camera Name | Location | Latitude / Longitude | Access | Site Photo |
|---|---|---|---|---|---|
| HOL 3 | Baffin-7 | KM 27 | 71.7297, -80.4418 | Helicopter, vehicle, foot |  |
| HOL 4 | Baffin-8 | KM 42 | 71.6073, -80.347 | Helicopter, vehicle, foot |  |

| Site Name | Camera Name | Location | Latitude / Longitude | Access | Site Photo |
|---|---|---|---|---|---|
| HOL 10 | Baffin-9 | KM 85.5 | 71.3732, -79.6859 | Helicopter, vehicle, foot |  |
| HOL 4 | Baffin-10 | KM 42 | 71.6073, -80.347 | Helicopter, vehicle, foot |  |

| Site Name | Camera Name | Location | Latitude / Longitude | Access | Site Photo |
|---|---|---|---|---|---|
| HOL 10 | Baffin-11 | KM 85.5 | 71.3732, -79.6859 | Helicopter, vehicle, foot |   |
| HOL 3 | Baffin-12 | KM 27 | 71.7297, -80.4418 | Helicopter, vehicle, foot |   |