Baffinland Iron Mines

2024 Annual Air Quality, Dustfall and Meteorology Report

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ᐊᐅᓚᑦᑎᔨᓂᖓᓖᖅᓯᒪᔪᑦ ᓇᐃᓈᖅᓯᒪᔪᑦ

ᑖᓐᓇ ᐊᕿᕋᒍᑕᒫᖅᓯᐅᑎ ᐅᓂᒃᑳᖅ ᓴᖅᑮᔪᖅ ᓇᐃᓈᖅᓯᒪᔪᓂᒃ ᐊᓂᖅᓵᖅᐸᒃᑕᕗᑦ ᖃᓄᐃᑦᑑᓂᖓ, ᐳᔪᕋᖅ ᓯᐊᒻᒪᒃᐸᒃᑐᖅ, ᓯᓚᓕᕆᓂᕐᒧᑦ ᖃᐅᔨᓴᕈᑏᑦ ᑲᑎᑕᐅᓯᒪᔪᑦ ᐊᑐᖅᑎᓪᓗᒋᑦ 2024-ᒥ ᓄᓘᔾᖓᓂ ᐱᓕᕆᐊᒥ (ᐱᓕᕆᐊᖅ) ᐹᕙᓖᓐ ᓴᕕᒃᓴᓂᒃ ᐅᔭᕋᖓᓂᐊᖅᑏᑦ ᑯᐊᐳᓇᓴᓐᓂᑦ. ᑎᑎᖅᑲᓄᑦ, ᐊᓂᖅᓵᖅᐸᒃᑕᕗᑦ ᖃᓄᐃᑦᑑᓂᖓᓄᑦ ᖃᐅᔨᓴᕈᑏᑦ ᖃᓄᐃᓐᓂᖅᓴᐅᓂᖔᓄᑦ ᕿᒥᕐᕈᔭᐅᓯᒪᔪᑦ ᒪᓕᒐᖅᑎᒍᑦ ᒪᓕᒃᑕᐅᒐᔪᒃᑐᓄᑦ ᐊᒻᒪ ᑐᕌᒐᐅᔪᓄᑦ ᐊᓂᖅᓵᖅᐸᒃᑕᑦᑕ ᖃᓄᐃᑦᑑᓂᖓᓄᑦ ᒐᕙᒪᒃᑯᓐᓂ ᓄᓇᕗᒻᒥ ᐊᒻᒪ ᒐᕙᒪᒃᑯᓐᓂ ᓄᓇᑦᓯᐊᒥ. 2024-ᒥ ᐳᔪᕋᖅ ᓯᐊᒻᒪᒃᐸᒃᑐᒥᒃ ᖃᐅᔨᓴᖅᐸᓪᓕᐊᖏᓐᓇᕐᓂᕐᓂ ᖃᐅᔨᓴᕈᑎᕕᓃᑦ ᕿᒥᕐᕈᔭᐅᓚᐅᖅᑐᑦ ᐊᒃᑐᐊᓂᖃᕐᒪᖔᑕ ᒪᕐᕉᖕᓄᑦ ᓯᓚᓕᕆᓂᕐᒧᑦ ᐊᓯᔾᔨᖅᑕᖅᑐᓄᑦ ᐃᒪᕐᓂᓴᖅ ᐊᒃᑐᐃᓂᖃᕐᔪᐊᖅᓯᒪᔪᑦ ᓴᖅᑭᐸᓪᓕᐊᓂᖏᓐᓄᑦ ᑎᒃᑕᐅᕙᒃᑐᑦ ᐳᔪᕋᖅ ᐊᒻᒪ ᐳᔪᕋᖅ ᓯᐊᒻᒪᒃᐸᒃᑐᒧᑦ: ᐊᓄᕋᕐᓂᖓ ᐊᒻᒪ ᒪᕐᑯᖃᑦᑕᕐᓂᖓᓂᑦ. ᐱᓕᕆᐊᒥ 2024-ᒥ ᓯᓚᓕᕆᓂᕐᒧᑦ ᖃᐅᔨᓴᕈᑎᕕᓃᑦ ᖃᓄᐃᓐᓂᖅᓴᐅᓂᖔᓄᑦ ᕿᒥᕐᕈᔭᐅᓚᐅᕐᒥᔪᑦ 2024-ᒥ ᖃᐅᔨᓴᕈᑎᕕᓂᕐᓂ ᖃᓂᙱᓄᑦ ᓯᓚᒥᒃ ᖃᐅᔨᓴᖅᐸᓪᓕᐊᖏᓐᓇᕐᓂᕐᒧᑦ ᖃᐅᔨᓴᕐᕕᖕᓂ ᐊᐅᓚᑕᐅᔪᑦ ᐊᕙᑎᓕᕆᓂᕐᒥᑦ ᐊᒻᒪ ᓯᓚᒥᒃ ᐊᓯᔾᔨᖅᐸᓪᓕᐊᓂᕐᒧᑦ ᑲᓇᑕᒥᒃᑯᑦ (ECCC) (ᒥᑦᑎᒪᑕᓕᒃ Δ) ᐊᒻᒪ ᓄᑖᙳᖓᑦ ᐊᑐᐃᓐᓇᐅᔪᑦ 30-ᓄᑦ ᐊᕿᒍᓄᑦ ᓯᓚᒧᑦ ᐱᐅᓯᐅᕙᒃᑐᑦ (1991-2020) ᒥᑦᑎᒪᑕᓕᖓᒧᑦ.

ᐊᓂᖅᓵᖅᐸᒃᑕᕗᑦ ᖃᓄᐃᑦᑑᓂᖓ ᑲᑎᑕᐅᓯᒪᔪᑦ ᒪᕿᑦᑐᓐᓂ ᐹᕙᓖᓐᑯᑦ ᐃᓂᖔᓂᒃ ᑕᐃᓪᓗᓂᕝᔪᒃ ᐅᔭᕋᖓᓂᐊᕐᕕᖓᒥ ᐃᒡᓗᕐᔪᐊᖅ (MSC) ᐊᒻᒪ ᑐᓚᒃᑕᕐᕕᖓᒥ ᓇᔪᒐᐃᒃ ᐃᒡᓗᕐᔪᐊᑦ (PSC). ᖃᐅᔨᓴᕈᑏᑦ ᑲᑎᑕᐅᓯᒪᔪᑦ ᐊᓂᖅᓵᖅᐸᒃᑕᑦᑎᓐᓂ ᓱᑉᕐᓇᖅᑐᑦ (NO2) ᐊᒻᒪ ᐳᓪᓚᓕᒃ (SO2) ᐊᑐᖅᓱᑎᒃ ᐱᓕᕆᔾᔪᑎᓂᒃ ᐊᓂᖅᓵᖅᐸᒃᑕᑦᑎᓐᓂ ᓱᑉᕐᓇᖅᑐᑦ (NOx) ᐊᒻᒪ ᐳᓪᓚᓕᖓᓂᒃ (SO2) ᕿᒥᕐᕈᔾᔪᑏᑦ ᐋᖅᑭᐅᒪᑎᑕᐅᖏᓐᓇᖅᑐᑦ ᐊᒻᒪᓗ ᐋᖅᑭᒋᐊᖅᑕᐅᕙᒃᓱᑎᒃ ᑕᖅᑮᑦ ᐱᖓᓱᑦ ᐊᓂᒍᕐᖓᓚ ᓇᓗᓇᐃᖅᑕᐅᕙᒃᓱᑎᒡᓗ ᓯᐊᒻᒪᒃᐸᓪᓕᐊᓂᕐᒧᑦ ᓱᓪᓗᓄᑦ ᐱᓕᕆᔾᔨᑎᓄᑦ. ᖃᐅᔨᓴᕈᑎᓂᒃ ᐱᓂᖅ ᐱᓕᕆᐊᖑᓚᐅᖅᑐᖅ ᐊᑐᖅᓱᑎᒃ ᖃᓇᓴᐅᔾᑦ "ᐃᐊᓐᕕᑕᔅ" ᖃᐅᔨᓴᕈᑎᓂᒃ ᐱᔪᓐᓇᐅᑏᑦ ᖃᓇᓴᐅᔭᑎᒍᑦ ᐃᓂᐊᓂ ᖃᓇᓴᐅᔾᔾᑯᑦ ᐱᓕᕆᔾᔨᑎᑎᒍᑦ ᐃᓂᖃᖅᑐᖅ ᐃᓱᒪᕆᓪᓗᑎᑦ ᐊᓂᖅᓵᖅᐸᒃᑕᑦᑕ ᖃᓄᐃᑦᑑᓂᖓᓄᑦ ᖃᐅᔨᓴᖅᐸᓪᓕᐊᖏᓐᓇᕐᕕᖕᓂ. ᓄᓇᒥ ᕐᑖᓐᑕᒃᑯᑦ ᐱᓕᕆᐊᖃᖃᑦᑕᖅᑐᑦ ᑕᖅᑮᑦ ᐱᖓᓱᑦ ᐊᓂᒍᕐᖓᓚ ᑕᒻᒪᖅᓯᒪᔪᖅᓯᐅᕐᓂᕐᒥᒃ ᓇᓗᓇᐃᖅᑕᐅᕐᑯᓪᓗᒋᑦ ᖃᐅᔨᓴᕈᑏᑦ ᐊᒻᒪ ᐱᕐᑯᑏᑦ ᐊᐅᓚᓂᖏᑦ.

ᖃᓄᐃᑉᐸᓪᓕᐊᓂᖏᑦ ᐱᔾᔪᑎᒋᓪᓗᒋᑦ, ᖃᐅᔨᓴᖅᐸᓪᓕᐊᖏᓐᓇᕐᓂᕐᒧᑦ ᖃᐅᔨᓴᕈᑏᑦ ᑕᒪᒃᑯᓄᖓ ᐊᓂᖅᓵᖅᐸᒃᑕᑦᑎᓐᓂ ᓱᑉᕐᓇᖅᑐᑦ (NOx) ᐊᒻᒪ ᐳᓪᓚᓕᖓᓄᑦ (SO2) ᖃᓄᐃᓐᓂᖅᓴᐅᖕᒪᖔᑕ ᕿᒥᕐᕈᔭᐅᓚᐅᖅᑐᑦ ᐃᒻᒪᕐᓂᓴᓄᑦ ᖃᐅᔨᓴᕈᑎᓄᑦ ᐊᑐᐃᓐᓇᕈᖅᑕᐅᓯᒪᔪᑦ ᑭᖑᓂᖓᓖᑦᑎᓐᓂ RWDI-ᑯᓐᓂ ᐋᖅᑭᒃᓯᒪᓪᓗᑎᒃ ᐊᕿᕋᒍᑕᒫᑦ ᓇᐃᓪᓕᑎᖅᓯᒪᓪᓗᑎᒃ ᐅᓂᒃᑳᑦ (RWDI 2016, 2018, 2019) ᐊᒻᒪ ᓄᓇᒥ ᕐᑖᓐᑕᒃᑯᑦ (2022, 2023, 2024). ᑖᒃᑯᐊ 2024-ᒥ ᖃᐅᔨᓴᕈᑎᕕᓃᑦ ᑲᑎᑕᐅᔪᑦ ᐅᔭᕋᖓᓂᐊᕐᕕᖓᒥ ᐃᒡᓗᕐᔪᐊᖅ (MSC) ᐊᒻᒪ ᑐᓚᒃᑕᕐᕕᖓᒥ ᓇᔪᒐᐃᒃ ᐃᒡᓗᕐᔪᐊᑦ (PSC) ᒪᓕᑐᐃᓐᓇᖅᓯᒪᔪᑦ ᐃᒻᒪᕐᓂᓴᕐᓂᒃ RWDI-ᑯᑦ ᐊᒻᒪ ᓄᓇᒥ ᕐᑖᓐᑕᒃᑯᑦ ᖃᐅᔨᓴᕈᑎᖏᓐᓄᑦ ᐃᓕᖅᑯᓯᐅᓯᒪᔪᓄᑦ, ᐱᑕᖃᖖᒍᓯᒪᔪᑦ ᐊᓂᖅᓵᖅᐸᒃᑕᑦᑎᓐᓂ ᓱᑉᕐᓇᖅᑐᑦ (NOx) ᐊᒻᒪ ᐳᓪᓚᓕᖓᓄᑦ (SO2) ᐱᑕᖃᓕᖅᓯᒪᔪᑦ ᐅᑭᒃᑯᑦ ᑕᖅᑭᓂ ᐊᒻᒪ ᐱᑕᖃᕈᓐᓃᒃᑲᓪᓚᒃᓯᒪᓪᓗᑎᒃ ᐊᐅᔭᒃᑯᑦ. ᐄᓐᓇᕈᓗᒃ ᐊᓂᖅᓵᖅᐸᒃᑕᕗᑦ ᓯᐊᒻᒪᒃᓯᒪᓇᔭᕐᓂᖓᓄᑦ ᐋᖅᑭᙳᐊᖅᓯᒪᔪᑦ ᐱᔭᕇᖅᑕᐅᓚᐅᖅᑐᑦ ᐱᓕᕆᐊᒧᑦ ᓇᓗᓇᐃᖅᓯᔪᑦ ᑲᑎᑲᑦᑕᕐᓂᖏᓐᓂᒃ ᐅᑭᐅᖑᑎᓪᓗᒍ ᐊᒻᒪ ᐊᒃᐸᓯᖓᓂᖅᓴᐅᓪᓗᑎᒃ ᐊᐅᔭᒃᑯᑦ ᐊᒻᒪ ᑕᒪᓐᓇ ᐋᓂᖅᓵᖅᐸᒃᑕᑦᑕ ᖃᓄᐃᓕᖓᓂᖏᑦ ᓴᖅᑮᓂᓇᔭᖅᑐᑦ ᖁᕝᕙᓯᖓᓂᖅᓴᓂ ᐆᒃᑐᕋᖅᑕᐅᓯᒪᔪᓂ ᐊᓂᖅᓵᖅᐸᒃᑕᑦᑎᓐᓂ ᓱᑉᕐᓇᖅᑐᑦ (NOx) ᐊᒻᒪ ᐳᓪᓚᓕᖓᓂᒃ (SO2) ᐱᑕᖃᐅᕐᕕᖏᓐᓂ ᐅᑭᐅᒃᑯᑦ. ᐱᑕᖃᕐᓂᖏᑦ ᓴᙱᔪᕐᒥᒃ ᐅᑎᖅᐸᓪᓕᐊᖃᑦᑕᕐᓂᖏᓐᓄᑦ ᓄᕗᔭ ᐊᑦᑎᒃᑎᓪᓗᒍ ᓇᒨᕚᐅᔾᔭᐃᖅᓯᓯᒪᔪᓐᓇᖅᑐᑦ ᓱᑉᕐᓇᖅᑐᓂᒃ ᐱᑕᖃᓕᖅᑐᓂᒃ ᐊᓂᖅᓵᖅᐸᒃᑕᑦᑎᓐᓂ ᐊᑯᓐᓂᖏᓐᓂ ᓄᓇᐅᐸ ᐊᒻᒪ ᐅᑎᕐᕕᐅᕙᒃᑐᒥ; ᑕᒪᓐᓇ ᐱᕙᓪᓕᐊᓂᖓ ᒪᓂᖅᑲᒥ ᐊᓂᖅᓵᖅᐸᒃᑕᑦᑎᓐᓂ ᐱᑕᖃᐅᓂᑦ ᐊᒃᑐᐊᓂᖓᑦ ᐱᑕᖃᙱᓐᓂᖏᓐᓄᑦ ᐅᑎᕐᓂᕐᒧᑦ ᕐᑯᓕᓈᖑᕙᒃᑕᓂ (ᓄᓇᒥ ᕐᑖᓐᑕᒃ 2023Δ)

ᐸᐃᑕ ᐊᓂᖅᓵᖅᐸᒃᑕᑦᑎᓐᓂ ᑕᖏᓕᖓᓂᒃ ᖃᐅᔨᓴᖅᐸᓪᓕᐊᖏᐅᓇᕈᑏᑦ (BAM) ᐋᖅᑭᒃᑕᐅᓚᐅᖅᑐᑦ ᑎᓯᐱᓇ ᐱᒋᐊᓕᖅᓵᖅᑎᓪᓗᒍ 2021-ᒥ ᐅᔭᕋᖓᓂᐊᕐᕕᖓᒥ ᐃᒡᓗᕐᔪᐊᓂᑦ (MSC) ᐊᒻᒪ ᑐᓚᒃᑕᕐᕕᖓᒥ ᓇᔪᒐᐃᒃ ᐃᒡᓗᕐᔪᐊᓂᑦ (PSC) ᖃᐅᔨᓴᕐᕕᖓᓂ ᐆᒃᑐᕋᖅᑕᐅᖁᓪᓗᖓᑦ ᐊᓂᖅᓵᖅᐸᒃᑕᑦᑎᓐᓂ ᐱᑕᖃᐅᖅᑐᑦ ᑲᑎᖕᒋᑦ ᖃᖓᑦᑕᖃᑦᑕᖅᑐᑦ ᑕᖏᓖᑦ (TSP) ᐊᒻᒪ ᓂᐅᕈᓐᓇᖅᑕᕗᑦ ᒥᑭᔪᕋᖏᑦ ᑕᖏᓖᑦ ᒥᑭᓐᓂᖅᓴᐅᔪᑦ 2.5 μm ᒥᑭᑎᒋᔭᖏᓐᓂ ᑐᖖᓂᔫᓃᑦ (PM2.5). ᑕᒪᕐᒦᖓ ᖃᐅᔨᓴᕐᕕᐅᔪᓂ, ᐆᒃᑐᕋᖅᑕᐅᓯᒪᔪᑦ ᑲᑎᖕᒋᑦ ᖃᖓᑦᑕᖃᑦᑕᖅᑐᑦ ᑕᖏᓖᑦ (TSP) ᐊᒻᒪ PM2.5 ᐱᑕᖃᐅᕐᕕᖏᑦ ᕿᕝᕙᓯᖓᖑᖃᑦᑕᖅᓯᒪᔪᑦ ᕚᕝᕗᐊᕆᒥ ᐊᒻᒪ ᒫᔨᒥ, ᐊᒃᐸᖅᐸᓪᓕᐊᓕᖅᐸᒃᓱᑎᒃ ᐅᐱᕐᖔᒃᑯᑦ ᐊᒻᒪ ᖁᕝᕙᖅᐸᓪᓕᐊᒃᑳᓂᓕᖅᓱᑎᒃ ᓄᕕᐱᕆᒥ, ᑎᓯᐱᕆᒥ 2024-ᒥ.

ᐱᒻᒪᕆᐅᔪᖅ ᓇᓗᓇᐃᕐᓗᒍ ᑕᐃᒃᑯᐊ ᐃᓅᑦ ᑕᒪᕐᒥᙵᓂ ᐅᔾᕋᖕᓂᐊᕐᕕᖕᒥ ᐃᒡᓗᕐᔪᐊᓂᑦ (MSC) ᐊᒻᒪ ᑐᓚᒃᑕᕐᕕᖕᒥ ᓇᔪᒐᐃᒃ ᐃᒡᓗᕐᔪᐊᓂᑦ (PSC) ᐱᓕᕆᐊᑉ ᐱᕙᓪᓕᐊᖁᕕᖏᓐᓂ ᐃᓂᐊᓅᑦᑐᑦ (PDA), ᐊᒻᒪ ᑕᐃᒪᐃᓐᓂᖓᓄᑦ ᑭᒡᓕᖃᑐᐃᓐᓇᖏᑦᑐᑦ ᐃᓂᓄᑦ ᐊᑕᖏᖅᓯᒪᔪᒥᒃ ᕿᒥᕐᕈᓂᕐᒧᑦ ᒪᓕᒐᖅᑎᒍᑦ ᒪᓕᖕᓂᕐᒧᑦ ᐱᓕᕆᐊᒥ ᐊᑐᖅᑕᐅᒐᔪᑦᑐᓄᑦ. ᐊᑐᖅᑕᐅᖕᒋᕈᓐᓇᖅᑐᑦ ᐃᓅᑦ ᐋᖅᑭᒃᓯᓂᕐᒧᑦ ᐊᓂᖅᓵᖅᐸᒃᑕᑦᑕ ᖃᓄᐃᑦᑑᓂᖓᓄᑦ ᖃᐅᔨᓴᖅᐸᓪᓕᐊᖏᓐᓇᕐᕕᐅᔪᓂᒃ ᐃᓱᒪᒋᖃᓯᐅᔅᓴᐅᔪᑦ; ᑭᓯᐊᓂᓕ; ᐆᒻᒪᖅᑯᑎᖃᕈᓐᓇᕐᓂᖅ ᐊᒻᒪ ᐊᕐᕋᒍᓗᒃᑖᖅ-ᐅᐸᒃᑕᐅᔫᓐᓇᕐᓂᖏᑦ ᑐᓗᕈᑕᐅᓪᓗᑎᒃ ᐱᔾᔪᑕᐅᔫᒃ.

ᐅᔾᕋᖕᓂᐊᕐᕕᖕᒥ ᐃᒡᓗᕐᔪᐊᓂᑦ (MSC), ᑕᒪᒃᑯᓂᖓ ᑲᑎᕝᕆᑦ ᖃᖓᑦᑕᖃᑦᑕᖅᑐᑦ ᑕᖏᓕᖕᓂᒃ (TSP) ᖃᐅᔨᓴᖅᐸᓪᓕᐊᖏᓐᓇᕐᓂᕐᒧᑦ ᖃᐅᔨᓯᐅᔪᑦ (ᐃᓗᐊᓂ ᐱᓕᕆᐊᑉ ᐱᕙᓪᓕᐊᕝᕕᖓᑕ (PDA) ᑭᒡᓕᖏᓐᓂ) ᖃᓄᐃᓐᓂᖅᓴᐅᓂᖏᓐᓄᑦ ᕿᒥᕐᕈᓯᐅᓪᓗᑎᒃ ᐱᓕᕆᐊᒥ ᒪᓕᒃᑕᐅᒐᔪᑦᑐᓄᑦ ᖃᐅᔨᒪᔾᔪᑕᐅᓪᓗᑎᒃ ᐊᐅᓚᑦᑎᔾᔪᑎᓄᑦ ᐱᓕᕆᓂᐅᔪᓄᑦ ᓴᐳᔾᔭᐅᓯᒪᕐᑯᓪᓗᒍ ᐊᓂᖅᓵᖅᐸᒃᑕᑦᑕ ᖃᓄᐃᑦᑑᓂᖓ. ᑕᕝᕙᓂ, ᐆᒃᑐᕋᖅᑕᐅᓯᒪᔪᑦ ᑲᑎᕝᕆᑦ ᖃᖓᑦᑕᖃᑦᑕᖅᑐᑦ ᑕᖏᓕᖕᓂᒃ (TSP) ᐱᑕᖃᕐᕕᐅᔪᑦ ᐅᓄᕐᓂᖅᓴᐅᓯᒪᔪᑦ ᑖᒃᑯᓇᓛᑦ "ᐱᓕᕆᐊᒥ ᒪᓕᒃᑕᐅᒐᔪᑦ ᑲᑎᕝᕆᑦ ᖃᖓᑦᑕᖃᑦᑕᖅᑐᑦ ᑕᖏᓕᖕᓂᒃ (TSP) 24-ᓄᑦ ᐃᑲᕋᓄᑦ ᐱᑕᖃᕐᕕᐅᔪᓂ" (120 µg/ᒦᑕᑦ ᑭᐸᕚᓇᒃᑐᑦ) ᑖᒃᑯᓄᖓ 59-ᓄᑦ ᐱᓕᕆᓂᐅᔪᓄᑦ ᐱᑕᖃᖅᑐᑦ 25.1%-ᒥᒃ ᐊᑐᐃᓐᓇᐅᔪᓂ ᐱᓕᕆᓂᐅᔪᓂ ᑎᑎᕋᖅᑕᐅᓯᒪᔪᓂ (5,560 ᐃᑲᕋᑦ). ᐆᒃᑐᕋᖅᑕᐅᓯᒪᔪᑦ PM2.5 ᐱᑕᖃᕐᕕᐅᔪᓂᑦ ᐊᖏᓂᖅᓴᐅᓚᐅᖅᑐᑦ "ᐱᓕᕆᐊᒥ ᒪᓕᒃᑕᐅᒐᔪᑦ ᑲᑎᕝᕆᑦ ᖃᖓᑦᑕᖃᑦᑕᖅᑐᑦ ᑕᖏᓕᖕᓂᒃ (TSP) 24-ᓄᑦ ᐃᑲᕋᓄᑦ ᐱᑕᖃᕐᕕᐅᔪᓂ" 17-ᓂ ᐱᓕᕆᓂᐅᔪᓂ ᐃᓗᓕᖃᖅᑐᑦ 6.6%-ᒥᒃ ᐊᑐᐃᓐᓇᐅᔪᓂ ᐱᓕᕆᓂᐅᔪᓂ ᑎᑎᕋᖅᓯᒪᔪᓂ (6,122 ᐃᑲᕋᑦ).

2024-ᒥ ᐅᒃᑐᕋᖅᑕᐅᒐᔪᓚᐅᖅᑐᖅ PM2.5 ᐱᑕᖃᐅᕐᓂᖓ ᐅᔾᕋᖕᓂᐊᕐᕕᖕᒥ ᐃᒡᓗᕐᔪᐊᓂᑦ (MSC) ᐊᑐᐃᓐᓇᐅᔪᑦ ᑎᑎᕋᖅᑕᐅᕙᓪᓕᐊᓂᐅᔪᓄᑦ (13.65 µg/m3), ᐊᖏᓂᖅᓴᐅᓚᐅᖅᑐᖅ ᐱᓕᕆᐊᒥ ᐊᕐᕌᒍᑕᒪᖅᓯᐅᑎᖏᓐᓂᑦ ᐊᑐᖅᑕᐅᖕᒐᔪᑦᑐᓂ (10 µg/m3).

ᐃᓚᖏᓐᓄᑦ 2024-ᒥ ᐆᒃᑐᕋᖅᑕᐅᓯᒪᔪᑦ ᑲᑎᕝᕆᑦ ᖃᖓᑦᑕᖃᑦᑕᖅᑐᑦ ᑕᖏᓕᖕᓂᒃ (TSP) ᐊᒻᒪᓗ PM2.5 ᐱᑕᖃᐅᕐᓂᖏᑦ ᐅᔾᕋᖕᓂᐊᕐᕕᖕᒥ ᐃᒡᓗᕐᔪᐊᓂᑦ (MSC) ᒪᓕᙱᑐᐃᓐᓇᕆᐊᓖᑦ ᖃᓄᐃᓐᓂᖏᓐᓄᑦ ᐅᔾᔨᕆᔭᐅᔪᑦ ᐅᔾᕋᖕᓂᐊᕐᕕᖕᒥ ᐹᕙᓛᓐᑯᑦ ᐃᖅᑲᓇᐃᔭᖅᑎᖏᓐᓂᒃ. ᐹᕙᓛᓐᑯᑦ ᖃᐅᔨᓴᕐᓂᐊᖅᑐᑦ ᐱᔾᔪᑎᐅᑐᐃᓐᓇᕆᐊᓕᖏᒥᒃ ᓇᓗᓇᖅᑰᔾᔮᙱᑦᑐᑦ 2024-ᒥ ᖃᐅᔨᓴᕈᑎᓂᑦ ᓴᓂᖅᑯᑦᑎᓯᒪᔪᑦ ᐊᒻᒪ ᖃᐅᔨᓴᕐᓃᑦ ᖃᓄᒃᑯᓐᓂᑦ ᓇᓗᓇᐃᖅᑕᐅᔫᓇᕐᒪᖕᒫᑕ ᑲᑎᕝᕆᑦ ᖃᖓᑦᑕᖃᑦᑕᖅᑐᑦ ᑕᖏᓕᖕᓂᒃ (TSP) ᐊᒻᒪ PM2.5 ᐱᑕᖃᐅᕐᓂᐅᔪᑦ ᐆᒃᑐᕋᖅᑕᐅᓂᒃᓴᖏᓐᓄᑦ 2025-ᒥ.

ᑐᓚᒃᑕᕐᕕᖕᒥ ᓇᔪᒐᐃᒃ ᐃᒡᓗᕐᔪᐊᓂᑦ (PSC), 2024-ᒥ, ᐅᒃᑐᕋᖅᓯᒪᔪᖃᓚᐅᖏᑦᑐᖅ 24 ᐃᑲᕋᓂ ᑲᑎᕝᕆᑦ ᖃᖓᑦᑕᖃᑦᑕᖅᑐᑦ ᑕᖏᓕᖕᓂᒃ (TSP) ᐱᖃᕐᓂᐅᒐᔪᒃᑐᓄᑦ ᐊᖏᓂᖅᓴᐅᓚᐅᖅᑐᑦ ᐱᓕᕆᐊᕐᕕᖕᒥ ᒪᓕᒃᑕᐅᒐᔪᒃᑐᓂᒃ (120 µg/m3). ᐅᒃᑐᕋᖅᑕᐅᓯᒪᔪᖃᖏᓐᖑᓂ 24-ᓄᑦ ᐃᑲᕋᓄᑦ ᐱᖃᕐᓂᐅᖕᒐᔪᒃᑐᓂ PM2.5 ᐱᖃᕐᓂᐅᒐᔪᒃᑐᓂ ᐊᖏᓂᖅᓴᐅᓚᐅᖅᑐᑦ ᐱᓕᕆᐊᕐᕕᖕᒥ ᒪᓕᒃᑕᐅᒐᔪᒃᑐᓂᒃ (30 µg/m3). ᐊᑕᐅᑦᑎᒃᑯᑦ ᐱᓕᕆᓂᖃᕐᓗᒋᑦ, ᐱᖃᕐᓂᐅᒐᔪᒃᑐᓂᒃ ᐆᒃᑐᕋᐃᓂᖅ PM2.5 ᐱᖃᕐᕕᐅᔪᒥ ᑐᓚᒃᑕᕐᕕᖕᒥ ᓇᔪᒐᐃᒃ ᐃᒡᓗᕐᔪᐊᓂᑦ (PSC) ᐊᓂᖅᓵᖅᑐᖅᐸᕐᑕᑦᑕ ᖃᓄᐃ5ᑦᑑᓂᖓᓄᑦ ᖃᐅᔨᓴᖅᐸᓪᓕᐊᖏᓐᓇᕐᓂᕐᒧᑦ ᖃᐅᔨᓴᖅᕕᒃ ᐊᑐᐃᓐᓇᐅᔪᓄᑦ ᑎᑎᕋᖅᑕᐅᕙᓪᓕᐊᔪᓄᑦ (3.3 µg/m3) ᒥᑭᓂᖅᓴᐅᓚᐅᖅᑐᖅ ᐱᓕᕆᐊᒥ ᐊᕐᕌᒍᓕᒫᒧᑦ ᒪᓕᒃᑕᐅᒐᔪᒃᑐᓄᑦ (10 µg/m3).

ᓯᓚᓕᕆᓂᕐᒧᑦ ᖃᐅᔨᓴᕈᑏᑦ ᑲᑎᑕᐅᓚᐅᖅᑐᑦ ᐱᖓᓱᓂ ᐃᓂᐅᔪᓂ (ᓄᓘᔮᖕᓂ, ᕿᙵᐊᓂ ᑐᓚᒃᑕᕐᕕᖕᒥ ᐊᒻᒪ ᐃᒃᐱᑭᑦᑐᕐᔪᐊᒥ ᓯᓚᓐᓂᐊᕐᕕᖕᓂ). ᑲᑎᑕᐅᔪᑦ ᖃᐅᔨᓴᕈᑏᑦ ᐱᖃᓯᐅᔾᔨᔪᑦ ᐊᓂᖅᓵᖅᐸᒃᑕᑦᑕ ᓂᒡᓚᓱᖕᓂᖓᓂᒃ, ᒪᓴᐅᓂᖓᓂ, ᒪᕐᑯᖃᑦᑕᕐᓂᖓᓂᒃ, ᐊᓄᕋᖅᐸᖕᓂᖓᓂᒃ ᐊᒻᒪ ᓇᑭᖓᔮᖅᐸᖕᓂᖓᓂᒃ, ᓯᕿᓂᕐᒥᖖᒋᖅᑐᓪᓗ ᐆᓇᖅᑐᑦ. ᖃᐅᔨᓴᕈᑏᑦ ᖃᓄᐃᓐᓂᖅᓴᐅᖕᒪᖖᒋᑕ ᕿᒥᕐᕈᔭᐅᓪᓗᑎᒃ ᐱᖓᓱᓄᑦ ᐊᕐᕌᒎᓯᒪᔪᓄᑦ ᖃᐅᔨᓴᕈᑎᓂᑦ ᖃᐅᔨᓴᒐᒃᓴᓕᐊᖑᓯᒪᔪᓄᑦ ᓄᓇᒥ ᓵᓐᑖᒃᑯᓐᓂ (ᓄᓇᒥ ᓵᓐᑖᒃ, 2022, 2023ᐱ, 2024), ᐊᒻᒪᓗᑦᑕᐅᖅ ᑭᖑᓂᖖᒋᑦᑎᓐᓂ ᓄᓇᐅᑉ ᐊᕙᑎᐊᓂᒃ ᐊᕐᕌᖑᑕᒫᑦ ᖃᐅᔨᓴᖅᐸᓪᓕᐊᖏᓐᓇᕐᓂᕐᒧᑦ ᐅᓂᒃᑳᑦ (TEAMR) ᑖᒃᑯᓇᓛᑦ ᐊᕙᑎᓕᕆᓕᕐᓂᑦᒍ ᑕᐃᓅᒥᒃᓴ ᐃᒃᑯᐊᐳᕆᑎᑦ (EDI) (EDI 2018, 2019, 2021, 2022, 2023, 2024, 2025) ᐊᒻᒪ ᓇᐃᑦ ᐲᓯᑦ (2016). ᖁᒃᑲᓂᐊᒍᑦ, ᐱᐅᓯᐅᓕᖅᐸᒃᑐᑦ ᖃᓄᐃᓐᓂᖅᓴᐅᓂᖏᓐᓄᑦ ᕿᒥᕐᕐᑯᔭᐅᓪᓗᑎᒃ 30-ᓄᑦ ᐊᕐᕌᒍᓄᑦ (1991 to 2020) ᓯᓚᐅᑦ ᐃᓕᖅᑯᓯᑐᐃᓐᓇᕆᕙᒃᑕᖏᓐᓄᑦ ᐊᑐᐃᓐᓇᕈᖅᑕᐅᓯᒪᔪᑦ ᐊᕙᑎᓕᕆᓂᕐᒥᑦ ᐊᒻᒪ ᓯᓚᒥᒃ ᐊᓯᔾᔨᖅᐸᓪᓕᐊᓂᕐᒧᑦ ᑲᓇᑕᒥᒃᑯᑦ (ECCC) ᒥᑦᑎᒪᑕᓕᖕᓂ ᒥᕝᕕᖓᓂ ᓯᓚᓐᓂᐊᕐᕕᖕᒧᑦ.

ᐊᕐᕌᒍᓚᐅᖅᑐᓄᑦ, ᓂᒡᓚᓱᖕᓂᓇᒐᔪᓚᐅᖅᑕᖕᒐᓄᑦ ᐃᓕᖅᑯᓯᐅᓯᒪᔪᑦ 2024-ᒥ ᐊᔾᔨᕐᓚᒋᔭᖏᑦᐃᓕᖅᑯᓯᐅᕚᒃᑐᓄᑦ ᓯᓚᒐᔫᒃᓯᒪᔪᑦ ᖃᐅᔨᓴᕈᑎᖏᓐᓄᑦ ᓄᓇᓄᑦ ᐊᕕᒃᑐᖅᓯᒪᔪᓄᑦ. ᓂᒡᓚᓱᓖᖅ ᐅᑭᐅᒃᑯᑦ ᐊᕐᕌᒍᒥ (ᑎᓯᐱᕆᒥᑦ ᒫᔾᔨᒧᑦ), ᓂᒡᓚᓱᙱᓖᙳᕙᒃᑐᓂ ᔪᓚᐃᒥ ᐋᒡᒋᓯᒧᑦ. ᖃᐅᑕᒫᑦ ᓂᒡᓚᓱᖕᓂᐅᓚᐅᖅᑐᖅ ᖁᕝᕙᓯᖕᓂᖅᓴᐅᓚᐅᖅᖢᓂ ᐃᓕᖅᑯᓯᐅᕚᒃᑐᓂᑦ ᓇᓗᓇᐃᖅᓯᔪᖅ ᓯᓚᐅᓚᔫᒃᑐᖅ ᐊᕐᕌᒍᓗᒃᑖᐸᓗᖕᒧᑦ, ᑭᑭᑕᐅᓯᒪᓪᓗᓂ ᐊᑯᓐᓂᖓᓂ ᔫᓂᒥ ᐊᒻᒪ ᐋᒡᒋᓯᒥ. ᐱᓗᐊᖅᑐᒥ, ᑕᒪᐃᓐᓄᒃ ᓂᒡᓚᓱᓖᑦ ᓄᓘᔭᖕᓂ ᕿᙳᐊᓂ ᑐᓚᒃᑕᕐᕕᖕᒥᓗ ᐅᖅᑰᓂᖅᓵᕐᔩᓪᓗᓂ 2023-ᒥᓂᑦ, ᑭᓯᐊᓂᓕ ᒪᓕᒃᑐᖅ 2002-ᒥ ᖃᐅᔨᓴᕈᑎᕕᓂᕐᓄᑦ, ᐊᒪᓐᓂᒃ ᐅᖅᑰᓖᙳᔪᓯᒪᔪᑦ ᓂᒡᓚᓱᖕᓂᖅᓵᕐᔩᓪᓗᑎᒃ 2023-ᒥ, ᒪᓕᖕᓂᖅᓴᐅᔪᑦ 2018-ᒥ ᖃᐅᔨᓴᕈᑎᓄᑦ.

ᐊᒃᑐᐊᓂᖓᑦ ᒪᓴᐅᕙᖕᓂᖕᒐᓄᑦ ᐃᓕᖅᑯᓯᐅᕚᒃᑐᑦ ᓇᓗᓇᐃᕈᑕᐅᔪᑦ ᓯᖕᔭᒥ ᓯᓚᐅᕚᒃᑐᓂᒃ, ᐊᒃᑐᐊᓂᖓᑦ ᒪᓴᐅᓂᕐᒧᑦ ᖃᓄᑎᒋᐅᓂᖏᑦ ᐊᔾᔨᒌᖃᑦᑕᙱᑦᑐᑦ ᐊᑯᓐᓂᖓᓂ 63% (ᓄᓘᔭᖕᓂ, ᕖᕝᕗᐊᕆᒥ) ᐊᒻᒪ 88% (ᐃᒃᐱᑭᑦᑐᕐᔪᐊᓂ, ᓯᑎᐱᕆᒥ). 2024-ᒥ ᐊᒃᑐᐊᓂᖓᑦ ᒪᓴᐅᓂᕐᒧᑦ ᖃᓄᑎᒋᐅᓂᖏᑦ ᑎᑎᕋᖅᑕᐅᓯᒪᔪᑦ ᕿᙳᐊᓂ ᑐᓚᒃᑕᕐᕕᖕᒥ ᓯᓚᓐᓂᐊᕐᕕᖕᒧᑦ ᐊᑯᓐᓂᖓᓃᓯᒪᔪᑦ ᒪᓴᐅᙱᓈᙳᕙᒃᑐᓂ ᑎᑎᕋᖅᑕᐅᓯᒪᔪᖅ ᓄᓘᔭᖕᓂ ᐊᒻᒪ ᒪᓴᐅᓛᙳᔪᑦ ᑎᑎᕋᖅᑕᐅᓯᒪᔪᑦ ᐃᒃᐱᑭᑦᑐᕐᔪᐊᓄᑦ. ᐃᓕᖅᑯᓯᐅᕚᒃᑐᖅ ᐊᔾᔨᐸᓗᒋᔭᖏᑦ ᓯᓚᐅᓚᔫᒃᑐᑦ ᖃᐅᔨᓴᕈᑎᕕᓂᖏᓐᓂ, ᑭᓯᐊᓂᓕ ᐃᓂᒍᒃᑖᐸᓗᐃᑦ ᑲᑕᒃᑳᓪᓚᖃᑦᑕᖅᓯᒪᔪᑦ ᐊᒃᑐᐊᓂᖓᑦ ᒪᓴᐅᓂᖕᒐᓄᑦ ᔪᓚᐃᒥ.

ᒪᕐᑯᓕᔪᖃᑦᑕᖅᓯᒪᔪᑦ ᐊᑯᓐᓂᖓᓂ ᔪᓚᐃ ᐊᒻᒪ ᐅᑐᐱᕆ, ᐊᔾᔨᐸᓗᒋᓪᓗᒋᑦ ᐊᕐᕌᒎᓯᒪᔪᓄᑦ, ᐊᒻᒪ ᒪᓕᑐᐃᓐᓇᖅᐳᓂ ᓯᓚᐅᓚᔫᒃᑐᓄᑦ ᖃᐅᔨᓴᕈᑎᓄᑦ ᒥᑦᑎᒪᑕᓕᖕᒥ, ᒪᕐᑯᓕᔪᖃᖅᑕᖅᑐᑦ ᔫᓂᒥ ᓯᑎᐱᕆᒧᑦ. ᒪᕐᑯᓗᐊᒪᔾᔭᖃᑦᑕᖅᑐᑦ ᓯᑎᐱᕆᒥ ᓄᓘᔭᖕᓂ, ᒪᕐᑯᖕᓂᖃᖅᑎᕆᓪᓗᓂ 160 ᒥᓕᒦᑕᓂᒃ, ᒪᕐᑯᓗᐊᒪᔾᔭᕐᓂᖅᓴᐅᓪᓗᓂ ᓯᓚᐅᓚᔫᒃᓯᒪᔪᑦ ᖃᐅᔨᓴᕈᑎᓄᑦ.

ᐊᑯᓂᐅᓛᖑ 24-ᐃᑲᕐᑦ ᒪᕐᑯᓛᓇᓯᒪᔭᖑ ᑎᑎᕋᖅᑕᐅᓯᒪᔪᑦ ᓄᓘᔭᖕᓂ ᓯᓚᓐᓂᐊᕐᕕᖕᒥ ᐊᑐᖅᑎᓪᓗᒍ ᓯᑎᐱᕆ 20-ᒥᒃ 21-ᒧᑦ, 2024-ᒥ, 82.2 ᒥᓕᒦᑕᐅᓪᓗᓂ. ᐱᒋᐊᕈᑕᐅᔪᑦ ᕿᒥᕐᕈᓂᑦ ᐱᓕᕆᐊᖑᔪᓯᒪᔪᑦ ᓄᓇᒥ-ᔅᑖᓐᑕᒃ ᐃᒪᓕᕆᓂᕐᒧᑦ ᓇᓗᓇᐃᖅᓯᓯᒪᔪᑦ 24-ᐃᑲᕐᓄᑦ ᒪᕐᑯᓗᐊᒪᔾᔭᖃᑦᑕᕐᓂᖑ ᐱᓂᖅᓴᐅᓚᐅᖅᑐᖅ 1:1,000-ᐊᕐᕌᒍᒧᑦ ᒪᕐᑯᖃᑦᑕᕐᓃᑦ ᐱᔭᐅᓪᓗᑎᒃ 2013-ᒥᑦ 2023-ᒧᑦ ᒪᕐᑯᖃᑦᑕᕐᓂᕐᒧᑦ ᑎᑎᕋᖅᑕᐅᓯᒪᔪᓂ.

ᐊᓄᕌᕐᓂᐅᓚᒨᒃᑐᑦ ᐊᓄᕋᓗᐊᒪᔾᔭᕐᓂᖅᓴᐅᖅᑰᔾᔨᒪᔪᑦ ᓯᓚᐅᓚᔫᒃᑐᓂᑦ ᖃᐅᔨᓴᕈᑎᕕᓂᕐᓄᑦ ᓄᓘᔭᖕᓂ, ᕿᙳᐊᓂ ᑐᓚᒃᑕᕐᕕᖕᒥ ᐊᒻᒪ ᐃᒃᐱᑭᑦᑐᕐᔪᐊᓂ, ᐃᒃᐱᑭᑦᑐᕐᔪᐊᑦ ᐊᓄᕋᕐᔪᐊᓛᙳᔪᓂ. ᑕᒪᓇ ᐃᓕᖅᑯᓯᐅᔪᖅ ᒪᓕᑐᐃᓐᓇᖅᑐᑦ ᖃᐅᔨᓴᕈᑎᕕᓂᕐᓄᑦ ᐊᕐᕌᒎᓯᒪᔪᓄᑦ. ᓇᑭᖕᒐᔭᖃᑦᑕᕐᓂᖕᒐᓄᑦ ᖃᐅᔨᓴᕈᑎᕕᓂᕐᓄᑦ ᐊᒻᒪ ᑐᓴᐅᒪᔾᔪᑎᓄᑦ ᓄᓘᔭᖕᓂ ᐊᒻᒪ ᕿᙳᐊᓂ ᑐᓚᒃᑕᕐᕕᖕᒥ ᒪᓕᑐᐃᓐᓇᖅᓯᒪᔪᑦ ᐊᕐᕌᒎᓯᒪᔪᓄᑦ. ᑕᐃᒪᙵᓂᑦ ᐃᒃᐱᑭᑦᑐᕐᔪᐊᒥ ᐊᑐᖅᓯᒪᔪᑦ ᖃᐅᔨᓴᕈᑎᓂᒃ ᐊᓯᐅᔾᔭᕐᔪᐊᖅᓯᒪᔪᑦ ᐊᑯᓐᓂᖓᓂ ᔫᓄᐊᕆ ᐊᒻᒪ ᔪᓚᐃ 2024-ᒥ, ᖃᐅᔨᓴᕈᑎᖃᑐᐃᓐᓇᓕᖅᐳᑎᒃ ᐱᒋᐊᖅᐳᑎᒃ ᐋᒡᒋᓯᒥ ᓈᒻᒪᒃᑐᓂᒃ ᐃᑲᕐᕋᖅᐳᑎᒃ ᑎᑭᐅᑎᔭᓇᖅᐳᑎᒃ 90%-ᒥᒃ ᐱᔭᕇᖅᑕᐅᓯᒪᔭᕆᐊᓕᖕᓄᑦ, ᐊᓄᕌᕐᓂᕆᕚᒃᑕᖕᒐᓄᑦ ᖃᐅᔨᓴᕐᑏᑦ ᑕᐃᑲᙵᑦ ᐱᔭᕇᖅᑕᐅᓯᒪᙱᑦᑐᑦ, ᑭᒃᑲᖅᑐᐃᔭᐃᓇᐅᙱᑦᑐᑦ 2024-ᒥ ᐊᒻᒪ ᖃᓄᐃᓐᓂᖅᓴᐅᓂᖏᓐᓄᑦ ᕿᒥᕐᕈᔭᐅᔦᓇᙱᑦᑐᑦ ᐊᕐᕌᒎᓯᒪᔪᓄᑦ.

ᓯᕿᓂᐅᑉ ᐆᓇᕐᓂᖑᓂᒃ ᐅᔾᔨᖅᓱᕐᓂᖅ ᑎᑎᕋᖅᑐᖃᑦᑕᖅᑕᓯᒪᔪᑦ ᐱᖑᓱᓂ ᖃᐅᔨᓴᕐᕕᖕᓂ ᒪᓕᒃᑐᐃᓐᓇᖅᓯᒪᓪᓗᑎᒡᓗ, ᐅᔾᔨᕆᔭᐅᓛᖑᔪᓯᒪᔪᖅ ᐆᓇᕐᓂᖑᓂᒃ ᐱᑕᖅᓯᒃᑳᓪᓚᖃᑦᑕᖅᓯᒪᔪᖅ ᒪᐃᒥᑦ ᔪᓚᐃᒧᑦ ᓄᓘᔭᖕᓄᑦ, ᕿᙳᐊᓂ ᑐᓚᒃᑕᕐᕕᖕᒥ, ᐊᒻᒪ ᐃᒃᐱᑭᑦᑐᕐᔪᐊᓄᑦ. ᖃᓄᐃᓐᓂᖅᓴᐅᓂᖏᑦ ᕿᒥᕐᕈᓕᖅᑐᒋᑦ 2023-ᒧᑦ ᖃᐅᔨᓴᕈᑎᓄᑦ, ᓯᕿᓂᐅᑉ ᐆᓇᕐᓂᖑᓂᖓᓛᖅᓯᒪᔪᑦ ᖃᓄᑎᒋᐅᓂᖏᑦ ᒪᓕᒃᑐᐃᓐᓇᖅᓯᒪᔪᑦ.

ᑭᑭᑕᐅᓯᒪᓪᓗᑎᒃ ᒪᕐᑯᖃᑦᑕᓗᐊᔾᔭᕐᓂᑦ ᑎᑎᕋᖅᑕᐅᓯᒪᔪᑦ ᐊᑐᖅᑎᓪᓗᒍ ᐱᖑᔪᕆᓕᖅᑕᖑᓂ ᐱᓇᓱᐊᕈᓯᖑᓂ ᓯᑎᐱᕆ 2024-ᒥ, ᓯᓚᓐᓂᐊᕈᑏᑦ ᖃᐅᔨᓴᕈᑏᑦ ᑲᑎᑕᐅᓯᒪᔪᑦ 2024-ᒥ ᒪᓕᑐᐃᓐᓇᖅᑐᑦ ᐃᑦᑕᕐᓂᓴᓄᑦ ᖃᐅᔨᓴᕈᑎᓄᑦ. ᐊᖏᓯᓐᓄᑦ ᒪᕐᑯᓗᐊᒪᔾᔭᕐᓂᕐᓄᑦ, ᐱᑕᖅᑐᖅ ᖃᐅᔨᓴᕈᑎᓂᒃ ᐊᔾᔨᒌᙱᑦᑐᕐᔪᐊᖅᓯᒪᓕᕐᓗᑎᑦ ᐃᒪᕐᓂᓴᕐᓄᑦ ᖃᐅᔨᓴᕈᑎᓄᑦ, ᑭᓯᐊᓂᓕ ᑕᐃᒃᑯᐊ ᕿᒪᐃᓯᒪᓂᑦ ᐃᓗᐊᓃᑦᑐᑦ ᑕᐃᒪᓐᓇᑕᐃᓐᓇᖅ ᐊᔾᔨᒌᙱᑦᑐᕐᔪᐊᖅᑕᖅᑐᑦ ᓂᕈᐅᕆᔭᐅᓯᒪᔪᑦ ᐊᑐᖅᓯᒪᔪᓂ ᐊᒥᓱᓕᖕᓂ-ᐊᕐᕌᖑᓂ ᖃᐅᔨᓴᖅᐸᓪᓕᐊᖑᓇᕐᓂᕐᒧᑦ ᐱᓕᕆᐊᓄᑦ.

2024-ᒥ ᐳᔪᖅ ᓯᐊᒻᒪᒃᐸᓪᓕᐊᔪᒥᒃ ᖃᐅᔨᓴᖅᐸᓪᓕᐊᖑᓇᕐᓂᕐᓂᑦ ᖃᐅᔨᔭᐅᔪᑦ ᐊᒻᒪᓗ ᐃᓕᖅᑯᓯᐅᕚᒃᑕᑐᒥᒃ ᕿᒥᕐᕈᓂᑦ ᐊᑐᐃᓐᓇᐅᔪᑦ ᓄᓇᐅᑉ ᐊᕙᑎᖑᓄᑦ ᐊᕐᕌᒍᑕᒫᖅᓯᐅᑏᑦ ᖃᐅᔨᓴᖅᐸᓪᓕᐊᖑᓇᕐᓂᕐᒧᑦ ᐅᓂᒃᑳᓂ (TEAMR) (EDI 2025) ᑐᓂᔭᐅᓂᐊᖅᑐᑦ 2024 ᐊᕐᕌᒍᑕᒫᖅᓯᐅᑏᑦ ᐅᓂᒃᑳᓂ ᓄᓇᕗᒻᒥ ᐊᕙᑎᓕᕆᔨᒃᑯᑦ ᑲᑎᒪᔨᖏᓐᓄᑦ (NIRB).

ᐊᕐᔾᒋᓐᖏᑦᑐᑎᒍᑦ ᐱᓕᕆᐊᑎᒍᑦ ᐱᓕᕆᐊᖑᕙᓪᓕᐊᓇᓱᒃᑐᑦ ᐳᕝᕋᖅᑲᐅᐊᖅᑕᐃᓕᓃᑦ. ᐸᕙᓂᖏᑦ ᐅᖓᑖᓂ 30 ᐱᓂᐊᕐᓂᕋᕈᑎᖃᖅᑐᑦ ᐊᒃᑐᐊᓂᓃᑦ ᐳᕝᕋᕐᒧᑦ ᐋᖅᑭᒃᓯᒪᓕᖅᖢᑎᒃ ᐃᓚᒋᔭᐅᓪᓗᑎᒃ ᐅᔾᕋᖕᓂᐊᕈᓐᓇᐅᑎ ᓈᓴᐅᑖ 005 ᐋᖅᑭᒋᐊᕈᑎ ᓈᓴᐅᑖ 005 ᑐᓂᔭᐅᓯᒪᔪᖅ ᓄᓇᕗᒻᒥ ᐊᕙᑎᓕᕆᔨᒃᑯᑦ ᑲᑎᒪᔨᖏᓐᓂ (NIRB) ᓄᕕᐱᕆ 17, 2023-ᒥ. ᐅᕐᔨᕆᔭᐅᔭᕆᐊᓕᒃ, ᑖᓐᓇ ᐅᔾᕋᖕᓂᐊᕈᓐᓇᐅᑎ ᐊᕐᔨᐸᓗᒋᖓᒍ ᐊᓂᖅᖠᖅᐸᒃᑕᑦᑕ ᖃᓄᐃᑦᑑᓂᖓᓄᑦ ᐱᔪᓐᓇᐅᑏᑦ ᐊᓯᖏᓐᓂ ᐱᔪᓇᕐᓂᖃᕐᕕᐅᔪᓂ. 2021-ᒥ, ᐸᕙᓂᖏᑦ ᑮᓇᐅᔭᖃᖅᑎᑦᑎᓚᐅᖅᑐᑦ ᓯᓚᑖᒍᑦ-ᐱᓕᕆᔪᓂᒃ ᐳᕝᕋᓕᕆᓂᕐᒧᑦ, ᐱᖃᓯᐅᕐᔨᓯᒪᔪᑦ ᓴᖅᑭᑕᐅᓂᖏᑦ ᐃᓛᒃᑰᖅᑐᑦ ᐳᕝᕋᓕᕆᔾᔩᑦ ᑲᑎᒪᔨᐊᒦᑦ ᐃᓐᓄᒃᑕᐅᓯᒪᓪᓗᑎᒃ ᑭᒡᒐᖅᑐᐃᔾᔨᓂᑦ ᑕᓪᓕᒪᓂᑦ ᖁᑭᖅᑖᓘᑉ ᐅᐊᖕᓇᖓᓂ ᓄᓇᓕᐅᔪᓂ. ᐃᓚᒋᔭᐅᓪᓗᓂ ᑕᒪᑐᒫᖓ ᐱᓕᕆᐊᒧᑦ, ᐳᕝᕋᓕᕆᔾᔪᒃᑯᑦ ᐱᓕᕆᐊᖃᖅᓯᒪᔪᑦ ᐅᔾᕋᖕᓂᐊᕐᕕᖕᒥ ᖃᐅᔾᔮᖅᖢᑎᒃ ᐅᑐᐱᕆ 2021-ᒥ, ᐊᒻᒪ ᕿᒃᑲᓂᐊᒍᑦ ᑲᑎᒪᖃᑎᖃᖃᑦᑕᕐᓂᒃᑯᑦ ᐱᓕᕆᓃᑦ ᐱᓕᕆᐊᖑᓚᐅᖅᖢᑎᒃ 2022 ᐊᑐᖅᑎᓪᓗᒍ. ᐊᐃᑉᐸᖓᓂ ᐳᕝᕋᓕᕆᔾᔪᒃᑯᑦ ᐅᔾᕋᖕᓂᐊᕐᕕᖕᒥ ᖃᐅᔾᔨᕐᓃᑦ ᐱᔭᕇᖅᑕᐅᓚᐅᖅᑐᑦ ᐊᑐᖅᑎᓪᓗᒍ ᐊᐃᕐᕆᓕ 2022. ᒣᓐᓇᓚᐅᑲᒃ ᐳᕝᕋᓕᕆᓂᕐᒧᑦ ᐅᓂᒃᑳᖅ ᑐᓂᔭᐅᓚᐅᖅᑐᖅ ᐸᕙᓂᓐ ᓴᕕᒃᓴᓂᒃ ᐅᔾᕋᖕᓂᐊᖅᑎᓄᑦ ᓄᓇᓕᖕᓂ ᑐᓴᐅᒪᔪᓕᕆᔾᔪᒃᑯᓐᓂᓄᑦ ᓄᓇᓕᖕᓄᓪᓗ ᓯᑎᐱᕆ 2022-ᒥ. ᖃᐅᔾᔭᐅᔪᑦ ᖃᐅᔾᔨᓴᕐᓂᕐᒥ ᑎᑎᕋᖅᑕᐅᓯᒪᓚᐅᖅᑐᑦ ᑭᖑᓪᓕᖅᐹᕐᒥᒃ ᐊᑐᓕᕐᑯᔾᔪᑎᓄᑦ ᐅᓂᒃᑳᒥ ᑐᓂᔭᐅᓚᐅᖅᑐᑦ ᓄᓇᕗᒻᒥ ᐊᕙᑎᓕᕆᔨᒃᑯᑦ ᑲᑎᒪᔨᖏᓐᓄᑦ ᓅᕙᐃᕆ 16, 2023-ᒥ (ᓄᓇᕗᒻᒥ ᐊᕙᑎᓕᕆᔨᒃᑯᑦ ᑲᑎᒪᔨᖏᑦᑕ ᑎᑎᕋᖅᑕᐅᓯᒪᕝᕕᖓᓂ ᓈᓴᐅᑖ 342950). ᑭᖑᓪᓕᖅᐹᖅᓯᐅᑏᑦ ᐊᑐᓕᕐᑯᔾᔪᑎᒧᑦ ᐅᓂᒃᑳᑦ ᖃᒥᕐᕈᓯᒪᔪᑦ ᐋᑎᖃᕐᒪᖔᑕ ᒣᓐᓇ ᐱᓕᕆᔾᔫᑦ ᐊᒻᒪ ᑐᓂᓯᓯᒪᓪᓗᑎᒃ ᐊᑐᓕᕐᑯᔾᔪᑎᓂᒃ ᐊᑐᖅᑕᐅᖕᖎᕈᓐᓇᖅᑐᓂᓪᓗ ᓯᐊᒻᒪᒍᐊᕐᑯᓇᒍ ᐊᒻᒪ ᐊᒃᑐᐃᓂᖃᒍᐊᕐᑯᓇᒍ ᐳᕝᕋᖅ ᐱᓕᕆᕝᕕᖕᒥ ᐱᓕᕆᓂᕐᓂᑦ. 2023-ᒥ ᐱᖓᓱᐃᖅᖢᑎᒃ ᐳᕝᕋᓕᕆᔾᔪᒃᑯᑦ ᑲᑎᒪᓚᐅᖅᑐᑦ ᖁᒥᕐᕈᕐᑯᓪᓗᒋᑦ ᐊᑐᓕᕐᑯᔾᔪᑕᐅᔪᓂᒃ ᐳᕝᕋᖅᑲᐅᐊᕐᑯᓇᒍ. ᐱᖓᔪᐊᓐᓂ ᐅᔾᕋᖕᓂᐊᕐᕕᖕᒧᑦ ᖃᐅᔾᔨᕆᐊᓂᖅ ᐳᕝᕋᓕᕆᔾᔪᓐᓂᑦ ᐱᔭᕇᖅᑕᐅᓚᐅᖅᑐᑦ ᐊᐃᕐᕆᓕ 2024-ᒥ ᐊᒻᒪ ᐊᐃᑉᐸᕆᓕᖅᑕᖓᓂᒃ ᐊᕐᕌᒍᑕᒦᖅᓯᐅᑎᓄᑦ ᐅᓂᒃᑳᑦ ᐅᓂᔭᐅᓚᐅᖅᖢᑎᒃ ᓄᓇᕗᒻᒥ ᐊᕙᑎᓕᕆᔨᒃᑯᑦ ᑲᑎᒪᔨᖏᓐᓄᑦ 2025-ᒥ. ᕿᒃᑲᓂᐊᒍᑦ, ᑎᑎᖅᑲᖅ ᓇᐃᓪᓕᑎᕆᓯᒪᔪᖅ ᖃᓄᐃᓕᖓᓕᕐᓂᖏᓐᓄᑦ ᐳᕝᕋᓕᕆᔾᔪᑦ ᐊᑐᓕᕐᑯᔭᐅᓐᓄᑦ ᑐᓂᔭᐅᓚᐅᖅᑐᑦ 2024-ᒥ (ᓄᓇᕗᒻᒥ ᐊᕙᑎᓕᕆᔨᒃᑯᑦ ᑲᑎᒪᔨᖏᑦᑕ ᑎᑎᕋᖅᓯᓯᒪᕝᕕᐊᓂ ᓈᓴᐅᑖ 350260). ᐱᓕᕆᔭᐅᓪᓗᓂ ᑕᒪᑐᒫᖓ ᐱᕙᓪᓕᐊᓂᐅᔪᒧᑦ, ᐸᕙᓂᖏᑦ ᐱᕙᓪᓕᐊᑎᑦᑎᓯᒪᔪᑦ ᐊᐅᓚᑦᑎᓂᕐᒧᑦ ᐱᓕᕆᔾᔫᑦ (SOPs) ᐳᕝᕋᖅᑲᐅᐊᖅᑕᐃᓕᑎᑦᑎᕐᔪᑎᓄᑦ ᐱᓕᕆᐊᓂᒃ ᐅᔾᕋᖕᓂᐊᕐᕕᖕᒥ ᐅᓯᑲᖅᑕᖅᐱᑦ ᐊᖅᑯᑖᓂ ᐊᒻᒪ ᐅᔾᕋᖕᓂᐊᕐᕕᖕᒥ ᐊᐅᓚᓂᐅᔪᓂ, ᐱᖃᓯᐅᑎᓪᓗᒋᑦ ᑎᖕᒥᒃᑳᖅᑎᑦᑎᕐᔪᐱᑦ (DusTreat) ᐱᓕᕆᔾᔫᑦ ᐊᐅᓚᑦᑎᓂᕐᒧᑦ ᐱᓕᕆᔾᔫᑦ (SOPs) (ᓱᖃᓕᑦᑎᕙᖕᒥ ᐊᐅᓚᓃᑦ), ᓴᕙᒃᓴᓂᒃ ᑲᑎᖅᓱᐃᕝᕙᖕᒥ ᐳᕝᕋᕐᒥᒃ ᐊᐅᓚᑦᑎᓂᖅ ᑎᖕᒥᒃᑳᖅᑎᑦᑎᕐᔪᐱᑦ (DusTreat), ᐊᒻᒪ ᐳᕝᕋᖅᑲᐅᐊᖅᑕᐃᓕᑎᑦᑎᕐᔪᐱᑦ ᐃᒥᖅᑕᐅᑎ (ᒥᕝᕙᖕᒥ). ᓇᓕᐊᒻᒪᑦᑖᑦ ᐸᓚᐅᒪᑎᑦᑎᓇᓲᐱᑦ ᐱᓕᕆᔾᔫᑦ ᐊᑐᓕᖅᑎᑕᐅᓯᒪᔪᑦ 2024-ᒥ ᐱᖃᓯᐅᕐᔨᔪᑦ ᐅᑯᓂᖓ: ᖄᒐᐃᑦᑎᐊᕐᓂᖅ, ᐃᒪᖅᑎᑦᑕᐅᕙᒃᓲᓂ ᐅᔾᕋᖕᓂᐊᕐᕕᖕᒥ ᐅᓯᑲᖅᑕᖅᐱᑦ ᐊᖅᑯᑖ, ᐳᕝᕋᖅᑲᐅᐊᕐᔭᐃᒃᑰᑎᑦ ᖃᐅᔾᔭᖅᑕᐅᔪᑦ ᓱᖃᓕᑦᑎᕙᒃ ᑎ-ᒥ, ᑕᐃᒪᖕᖓᓂᑦ ᓴᖅᑮᓯᒪᔪᖅ ᓱᕐᕋᖕᖏᑦᑐᒥᒃ ᐳᕝᕋᖅᑲᐅᐊᖅᑕᐃᓕᑎᑦᑎᓂᕐᒧᑦ ᑎᖕᒥᒃᑳᖅᑎᑦᑎᓂᖅ ᑕᐅᕙᓂ, ᐊᒻᒪ ᐊᑐᖅᑕᐅᓪᓗᑎᒃ ᑕᕆᐅᖅᑎᕆᓃᑦ ᐊᒻᒪ ᒪᓴᒃᑎᕆᓃᑦ ᐳᕝᕋᖅᑲᐅᐊᕐᑯᓇᒍ ᑕᐅᕙᖕᓇ ᐅᓯᑲᖅᑕᖅᐱᑦ ᐊᖅᑯᑖᓂ.

Executive Summary

This annual report presents a summary of the ambient air quality, dustfall, and meteorology data collected during 2024 for the Mary River Project (the Project) by Baffinland Iron Mines Corporation. For context, the ambient air quality data are compared with regulatory standards and objectives for ambient air quality from the Government of Nunavut and the Government of Northwest Territories. The 2024 dustfall monitoring data are assessed for possible correlation with the two meteorological variables that historically have had the strongest influence on the generation of fugitive dust and dustfall: wind speed and precipitation in the form of rain. The Project's 2024 meteorology data are also compared with 2024 data from the nearest climate monitoring station operated by Environment and Climate Change Canada (ECCC) (Pond Inlet A) and with the latest available 30-year Climate Normals dataset (1991-2020) for Pond Inlet.

Ambient air quality data were collected at two Baffinland sites referred to as the Mine Site Complex (MSC) and Port Site Complex (PSC). The data were collected for NO_2 and SO_2 using Teledyne NOx and SO_2 analyzers maintained and calibrated quarterly and verified with onboard Permeation (perm) tube technology. Data acquisition was done using "Envidas" data acquisition software with on-site computer systems located in the respective ambient air quality monitoring stations. Nunami Stantec conducted quarterly audits to verify data and equipment operation.

For trending purposes, the monitoring data for NO_2 and SO_2 were compared to historical data provided previously by RWDI in the form of annual summary reports (RWDI 2016, 2018, 2019) and by Nunami Stantec (2022, 2023, 2024). The 2024 data collected at MSC and PSC were consistent with the historical RWDI and Nunami Stantec data trends, with the highest SO_2 and NO_2 concentrations occurring during the winter months and falling sharply during the summer periods. Recent air dispersion modelling completed for the Project indicated that the mixing heights during winter are lower than during summer and this atmospheric condition could result in higher measured SO_2 and NO_2 concentrations during the winter. The presence of a strong atmospheric inversion with a low ceiling can trap contaminants discharged into the atmosphere in the layer between the surface and the base of the inversion layer; this can increase ground-level ambient concentrations relative to the absence of an inversion layer (Nunami Stantec 2023a).

Beta attenuation monitors (BAMs) were installed in early December 2021 at both the PSC and MSC stations to measure ambient concentrations of total suspended particulates (TSP) and respirable particulate matter with particles that are 2.5 µm in diameter and less ($PM_{2.5}$). At both stations, the measured TSP and $PM_{2.5}$ concentrations were highest in February and March, trending downward in the spring and rising again in November, December 2024.

It is important to note that the locations of both PSC and MSC are within the Project Development Area (PDA), and therefore not strictly in locations to fully assess regulatory compliance with the Project Standards. Alternate locations for the installation of the ambient air quality monitoring stations are being considered; however, power availability and year-round access are constraining factors.

At the MSC, the TSP monitoring results (inside the PDA boundary) are compared to the Project Standards to guide management actions for the protection of ambient air quality. Here, the measured TSP concentrations were greater than the "Project Standard TSP 24-hour concentration" (120 µg/m^3) for 59 events comprising 25.1% of the available period of record (5,560 hours). The measured $PM_{2.5}$ concentrations were greater than the "Project Standard $PM_{2.5}$ 24-hour concentration" (30 µg/m^3) for 17 events comprising 6.6% of the available period of record (6,122 hours).

The 2024 average measured $PM_{2.5}$ concentration at MSC for the available period of record (13.65 µg/m^3), was greater than the Project annual Standard (10 µg/m^3).

There are some periods in 2024 when the measured TSP and $PM_{2.5}$ concentrations at the MSC do not seem to be in agreement with the conditions observed by the on-site Baffinland staff. Baffinland will be investigating potential causes for the apparent 2024 data anomalies and investigating additional ways of validating the TSP and $PM_{2.5}$ concentration measurements in 2025.

At the PSC, in 2024, there were no measured 24-hour TSP average concentrations that were greater than the Project Standard (120 µg/m^3). There were no measured 24-hour average $PM_{2.5}$ concentrations that were greater than the Project Standard (30 µg/m^3). During the same time period, the average measured $PM_{2.5}$ concentration at the PSC ambient air quality monitoring station for the available period of record (3.3 µg/m^3) was less than the Project annual Standard (10 µg/m^3).

Meteorological data were gathered at three sites (Mary River, Milne Port and Steensby meteorology stations). Gathered data included air temperature, relative humidity, rainfall precipitation, wind speed and direction, and solar radiation. Data were compared to three previous years of data sampling by Nunami Stantec (Nunami Stantec 2022, 2023b, 2024), as well as for the previous Terrestrial Environment Annual Monitoring Reports (TEAMR) from Environmental Dynamics Inc. or EDI (EDI 2018, 2019, 2021, 2022, 2023, 2024, 2025) and Knight Piesold (2016). Additionally, trends were compared to the 30-year (1991 to 2020) Climate Normals dataset as provided by ECCC for the Pond Inlet Airport climate station.

As with previous years, the general temperature trends in 2024 are similar to the trends of the Climate Normal data in the region. Minimum temperatures occur during winter months in the year (December through March), and maximum temperatures occurred in July and August. The daily average air temperatures tended to be higher than the trend indicated in the Climate Normal for most of the year, except between June and August where the daily average air temperatures were similar. The data trends are consistent with previous years. Specifically, both of the lowest minimum temperatures at Mary River and Milne Port site are slightly warmer than in 2023, but aligns with 2022 data, and both of the highest maximum temperatures are slightly cooler in 2023, aligning more closely with 2018 data.

Relative humidity trends are indicative of a coastal climate, with relative humidity values varying between 63% (Mary River, in February) and 88% (Steensby, in September). The 2024 relative humidity values recorded at the Milne Port meteorology station were between the minimum value recorded at Mary River and the maximum value recorded at Steensby. The trend is similar to the Climate Normal data, but most sites have a dip in relative humidity during July.

Rainfall tended to occur mainly between July and October, which is similar with previous years, and consistent with the Climate Normals data at Pond Inlet, though rainfall typically occurred between June and September. Peak rainfall occurred in September at Mary River site, at a value of 160 mm, which is greater than the Climate Normal data.

The maximum 24-hour extreme rainfall event recorded by the Mary River meteorology station during September 20 to 21, 2024, was 82.2 mm. A preliminary analysis conducted by Nunami-Stantec hydrologists indicated that this 24-hour extreme rainfall event was greater than the 1:1,000-year event based on the 2013 to 2023 rain records.

Average wind speeds tended to be higher than the Climate Normals data at Mary River, Milne Port and Steensby, with the Steensby site having the highest windspeeds. This trend is consistent with data from previous years. Wind direction data and information at the Mary River and Milne Port sites were consistent with previous years. Since the Steensby site experienced significant data loss between January and July 2024, leaving only the data from August onward with enough hours to meet the 90% completeness requirement, the wind direction data from there is not complete, is not fully representative of 2024 and cannot be compared to previous years.

Solar radiation observations recorded at the three stations were consistent, with the largest observed radiative fluxes occurring between May and July for Mary River, Milne Port, and Steensby. When compared to 2023 data, the maximum solar radiation levels were consistent.

With the exception of the extreme rainfall events recorded during the third week of September 2024, the meteorological data collected during 2024 are consistent with the historical data. Other than the extreme rainfall, there are some data that depart slightly from the historical trends, but those departures are within the natural variation that would be expected over a multi-year monitoring program.

The 2024 dustfall monitoring results and trend analyses are available in the Terrestrial Environment Annual Monitoring Report (EDI 2025) that will be submitted with the 2024 Annual Report for the Nunavut Impact Review Board (NIRB).

A variety of programs are underway to reduce dust emissions. Baffinland has more than 30 commitments related to dust that now form part of the Project Certificate No. 005 Amendment No. 005 that was issued by the Nunavut Impact Review Board (NIRB) November 17, 2023. Note, this Certificate is similar to an air quality permit in other jurisdictions. In 2021, Baffinland commissioned a third-party Dust Audit, which includes the establishment of an independent Dust Audit Committee comprised of representatives from the five North Baffin communities. As part of this work, the Dust Audit Committee undertook an on-site investigation in October 2021, and additional engagement activities were conducted during 2022. The second Dust Audit Committee on-site investigation was completed during April 2022. An interim Dust Audit report was issued to the Baffinland Iron Mines community liaison officers and the communities in September 2022. The results of the audit have been captured in a Final Recommendations Report that was submitted to NIRB on February 16, 2023 (NIRB Registry No. 342950). The Final Recommendations Report assessed the effectiveness of the current measures and put forward recommendations and options to reduce the spread and effects of dust from the project activities. In 2023 there were three Dust Audit Committee meetings to review recommendations to reduce dust emissions. A third on-site investigation for the Dust Audit Committee was completed in April 2024 and the second annual Dust Audit report will be submitted to NIRB in 2025. In addition, a memo summarizing the status of the Dust Audit Committee recommendations was submitted in 2024 (NIRB Registry No. 350260). As part of this process, Baffinland has developed standard operating procedures (SOPs) for dust suppression activities on mine haul roads and mine operations, including: DusTreat system SOP (crusher operations), ore stockpile dust management (DusTreat), and a dust suppression tanker trailer (airstrip). The specific mitigation measures

that were implemented in 2024 include the following: blast optimization, watering of the Mine Haul Road, dust suppressant trial at Crusher C, which has since resulted in consistent dust suppression application in this area, and use of calcium chloride and water dust suppressants along the Tote Road.

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Abbreviations

AQNAMP	Air Quality and Noise Abatement Management Plan
Baffinland	Baffinland Iron Mines Corporation
BAM	Beta Attenuation Monitor
CAAQS	Canadian Ambient Air Quality Standards
CAC	Common Air Contaminants
CCME	Canadian Council of Ministers of the Environment
CO	Carbon Monoxide
e.g.	example
ECCC	Environment and Climate Change Canada
EDI	Environmental Dynamics Inc.
FEIS	Final Environmental Impact Statement
GIS	Geographic Information System
GN	Government of Nunavut
GNWT	Government of Northwest Territories
GPS	Global Positioning System
MPO	Manufactured, Processed or Otherwise used
MSC	Mine Site Complex
NAAQS	Nunavut Ambient Air Quality Standards
NIRB	Nunavut Impact Review Board
NO_2	Nitrogen dioxide
NO_x	Nitrogen oxides
NWTAAQS	Northwest Territories Ambient Air Quality Standards
PDA	Project Development Area
PM	Particulate matter
$PM_{2.5}$	Particulate matter with particles having an aerodynamic diameter of less than 2.5 micrometers
PMT	photo multiplier tube
ppb	parts per billion
Project	Mary River Project

PSC ..... Port Site Complex

RWDI ..... Rowan Williams Davies & Irwin Inc.

SO_2 ..... Sulphur dioxide

SOP ..... Standard operating procedure

SWE ..... snow-water-equivalent

TBRG ..... Tipping bucket rain gauge

TEAMR ..... Terrestrial Environment Annual Monitoring Report

TEMMP ..... Terrestrial Environment Mitigation and Monitoring Plan

TSP ..... Total Suspended Particulates

US EPA ..... United States Environmental Protection Agency

UTC ..... Coordinated Universal Time

1 Introduction

Nunami Stantec Limited (Nunami Stantec) was retained by Baffinland Iron Mines Corporation (Baffinland) to compile an annual report for the 2024 air quality, dustfall and meteorology monitoring programs at the Mary River Mine Project (the Project). These monitoring programs include:

- continuous ambient air quality monitoring for sulphur dioxide (SO_2), nitrogen oxides (NO_x) and nitrogen dioxide (NO_2) at Port Site Complex (PSC) and the Mine Site Complex (MSC) accommodation buildings;
- continuous ambient air quality monitoring for total suspended particulates (TSP) and respirable particulates 2.5 µm in diameter and less ($PM_{2.5}$) at the PSC and MSC (see Section 2 for more details);
- passive dustfall monitoring at Milne Port, the Mine Site, and along the Tote Road; and
- automated meteorology stations at Milne Port, Mine Site and Steensby Port.

The background and ambient air quality (including dustfall) objectives are summarized below. Section 2 contains a more detailed description of the ambient air quality monitoring program and results. Section 3 contains a detailed description of the meteorology monitoring program and results. Section 4 contains a detailed description of the dustfall monitoring and results. Section 5 presents an overall summary. Section 6 contains the references.

1.1 Background and Objectives

Continuous monitoring of gaseous SO_2 and NO_2 is undertaken at the MSC and PSC, in accordance with Project Certificate No. 005 issued by the Nunavut Impact Review Board (NIRB), Conditions #7 and #8. No air quality monitoring is undertaken at Steensby Port as that component of the Project has not yet been constructed. Continuous ambient air quality monitoring for SO_2 and NO_2 would normally be done at the Project Development Area (PDA) boundary; however, because there are no power sources available along the PDA boundary, the SO_2 and NO_2 monitors are located in an active area of the facility (e.g., at the accommodation and office facilities). The results from the monitoring of gaseous SO_2 and NO_2 are compared to ambient air quality standards and objectives for Nunavut as shown in Table 1.1.

Ambient air quality standards and objectives are non-statutory limits (i.e., not legally binding) used to assess ambient air quality and guide air management decisions. Ambient air is defined as the outdoor air, in this case outside (beyond) a PDA boundary. The PDA boundary is often referenced in industry as a property fenceline where public access is restricted. The PDA boundary in this case is not a physical fenceline; rather it is industry terminology for the boundaries at the edge of the Project areas for the Mine Site and Port Site where public access is restricted. Ambient air quality standards are established to protect the outdoor air in publicly accessible areas.

The air quality inside of the PDA boundary is considered from an occupational workplace perspective and is assessed using thresholds or standards that are different from the ambient air quality standards. In Nunavut, workplace air quality is protected by the Schedule O Contamination Limits provided in the

Nunavut Occupational Health and Safety Regulations (NU Reg 003-2016, http://canlii.ca/t/52qsb). For this report, the SO_2 and NO_2 monitoring data at the PSC and MSC are being compared to the Nunavut Ambient Air Quality Standards (NAAQS), even though those two monitoring locations are inside the PDA boundary.

The Government of Nunavut (GN) has established the NAAQS for several common air contaminants (CACs) including total suspended particulate matter (TSP), particulate matter with an aerodynamic diameter of <2.5 µm ($PM_{2.5}$), NO_2 and SO_2 (GN 2011). The NAAQS did not include an annual standard for $PM_{2.5}$, therefore the Northwest Territories Ambient Air Quality Standard (NWTAAQS) was adopted for this study.

Table 1.1 presents the air quality guidelines and objectives adopted by the Project for the CACs, referred to as the Project Standards as well as the Canadian Ambient Air Quality Standards (CAAQS). The current CAAQS reference standard is the 2020 guideline, which is being replaced with more stringent guidelines in 2025. The 2020 and 2025 Guidelines are presented for reference in Table 1.1. As explained by the CCME (2019), the CAAQS were established for the management of the larger air zones and are not intended for use at a specific facility PDA boundary. Nevertheless, they are presented here for context and comparison.

Table 1.1 Standards and Objectives for Ambient Air Quality

Common Air Contaminant	Averaging Time	Units	NAAQS[a]	NWT AAQS[b]	2020 CAAQS[c]	2025 CAAQS[d]	Project Standard[e]
SO_2	1 hr	µg/m^3	450 (172 ppb)	-	183 (70 ppb)	170 (65 ppb)	450
	24 hr	µg/m^3	150 (57 ppb)	-	-	-	150
	Annual	µg/m^3	30 (11 ppb)	-	13.1 (5 ppb)	10.5 (4.0 ppb)	30
NO_2	1 hr	µg/m^3	400 (213 ppb)	-	113 (60 ppb)	79 (42 ppb)	400
	24 hr	µg/m^3	200 (106 ppb)	-	-	-	200
	Annual	µg/m^3	60 (32 ppb)	-	32.0 (17 ppb)	22.6 (12.0 ppb)	60
TSP	24 hr	µg/m^3	120	-	-	-	120
	Annual	µg/m^3	60	-	-	-	60
$PM_{2.5}$	24 hr	µg/m^3	30	-	27	-	30
	Annual	µg/m^3	-	10	8.8	-	10

Common Air Contaminant	Averaging Time	Units	NAAQS[a]	NWT AAQS[b]	2020 CAAQS[c]	2025 CAAQS[d]	Project Standard[e]

Notes:

[a] GN (2011). [b] GNWT (2014).

[c] 2020 Canadian Ambient Air Quality Standards (2020 CAAQS); CCME (2014). Provided for context, not intended for use at facility PDA boundary for compliance.

[d] 2025 Canadian Ambient Air Quality Standards (2025 CAAQS); CCME (2019). Provided as reference to new standard coming into effect in 2025.

[e] Project Standards are from Nunavut Standards where available, or otherwise the most stringent available from a Territorial Government.

The CAAQS were established as objectives under sections 54 and 55 of the *Canadian Environmental Protection Act*, 1999 on May 25, 2013. The 2020 CAAQS are not intended as facility-level regulatory standards that are to be enforced at a PDA boundary. The 2020 CAAQS are summarized in Table 1.1 for comparison purposes, although the adopted Project Standard for each CAC is based on the Nunavut standards or a provincial or Health Canada surrogate.

The CAAQS were developed by the Canadian Council for the Ministers of the environment (CCME) to manage air emissions and ambient air quality concentrations in a regional airshed; CAAQS are not intended to determine compliance at the PDA boundary for an industrial facility (CCME 2019). The CAAQS are best suited as a tool to manage air emissions in regional airsheds that have multiple industrial sources with the objective of driving continuous improvement of air quality in Canada. Regional airsheds typically have sensitive receptors (i.e., vulnerable populations such as infants, the elderly, and those with respiratory ailments), major industrial air emissions, and opportunities for achievable emission reductions. These airsheds often have multi-pollutant management needs. Regional airsheds differ based on the unique characteristics of local geography, meteorological conditions, and composition of human activity, including industrial activity.

Baffinland has committed to advancing an ambient air quality monitoring framework for the current operations (4.2 million tonnes per year of production) in consultation with both the GN and ECCC. Section 2 describes the additional continuous monitoring equipment for measuring the TSP and $PM_{2.5}$ concentrations at the MSC and PSC. The particulate monitoring equipment was installed and calibrated/verified in December 2021. TSP and $PM_{2.5}$ official data collection began in April 2022 following several months of calibrating and data review. The potential applicability of the 2020 CAAQS to the Project was considered as part of the monitoring framework and Baffinland determined that the 2020 CAAQS would be used for comparison purposes only in agreement with the CCME objective to “keep clean areas clean” with respect to ambient air quality.

Passive sampling of dustfall is undertaken at sampling sites at Milne Port, the Mine Site, and along the Tote Road (North and South Crossings). This program forms part of the Terrestrial Environment Mitigation and Monitoring Plan (TEMMP) because of its linkage to monitoring of metals concentrations in soil and vegetation and monitoring of vegetation abundance and diversity programs also presented in the TEMMP. The locations and methodology used for the dustfall monitoring stations are summarized in the 2024 Terrestrial Environment Annual Monitoring Report (TEAMR, EDI 2025) that will be submitted with the 2024 Annual Report for NIRB.

1.2 Monitoring Locations

Table 1.2 and Figure 1.1 to Figure 1.3 summarize the locations for the two (2) ambient air quality monitoring stations and the four (4) automated meteorology monitoring stations.

Table 1.2 Summary of Baffinland Ambient Air Quality and Meteorology Stations and the Pond Inlet Airport Climate Station

Station	Location	Data Period	Distance to PDA (km)	Easting (m, UTM Zone 17 W)	Northing (m, UTM Zone 17 W)
Port Site Complex (PSC) Ambient Air Quality Monitoring Station	Port Site	year-round	Within PDA	503930	7976078
Mine Site Complex (MSC) Ambient Air Quality Monitoring Station	Mine Site	year-round	Within PDA	561398	7913332
Mary River Meteorology Station [a]	Mine Site	year-round	Within PDA	558095	7914345
Milne Port Meteorology Station [a]	Port Site	year-round	1.6	505831	7975274
Steensby Meteorology Station [a]	Mine Site	year-round	Within PDA	593120	7799108
Pond Inlet Airport Climate Station [b]	Pond Inlet Airport	year-round	130 from the Port Site Complex	401435	8068271

Notes:
[a] Based-on information from Baffinland
[b] Based on Environment and Climate Change Canada (ECCC 2023) and on UTM Zone 18

LEGEND

Monitoring Station

- Continuous Ambient Air Quality
- MET
- Dustfall Monitoring Site

- Current Infrastructure
- Project Development Area
- Commercial Lease Boundary
- Borrow Area
- Quarry Area

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MARY RIVER PROJECT

Mine Site Air Quality and MET Stations

Projection: NAD 1983 UTM ZONE 17N.
Base Map: © 2024 Digital Globe, Inc.
Imagery and Infrastructure are representative as of July 2023.

0 220 440 880 Meters
Scale 1:38,000

N

Baffinland

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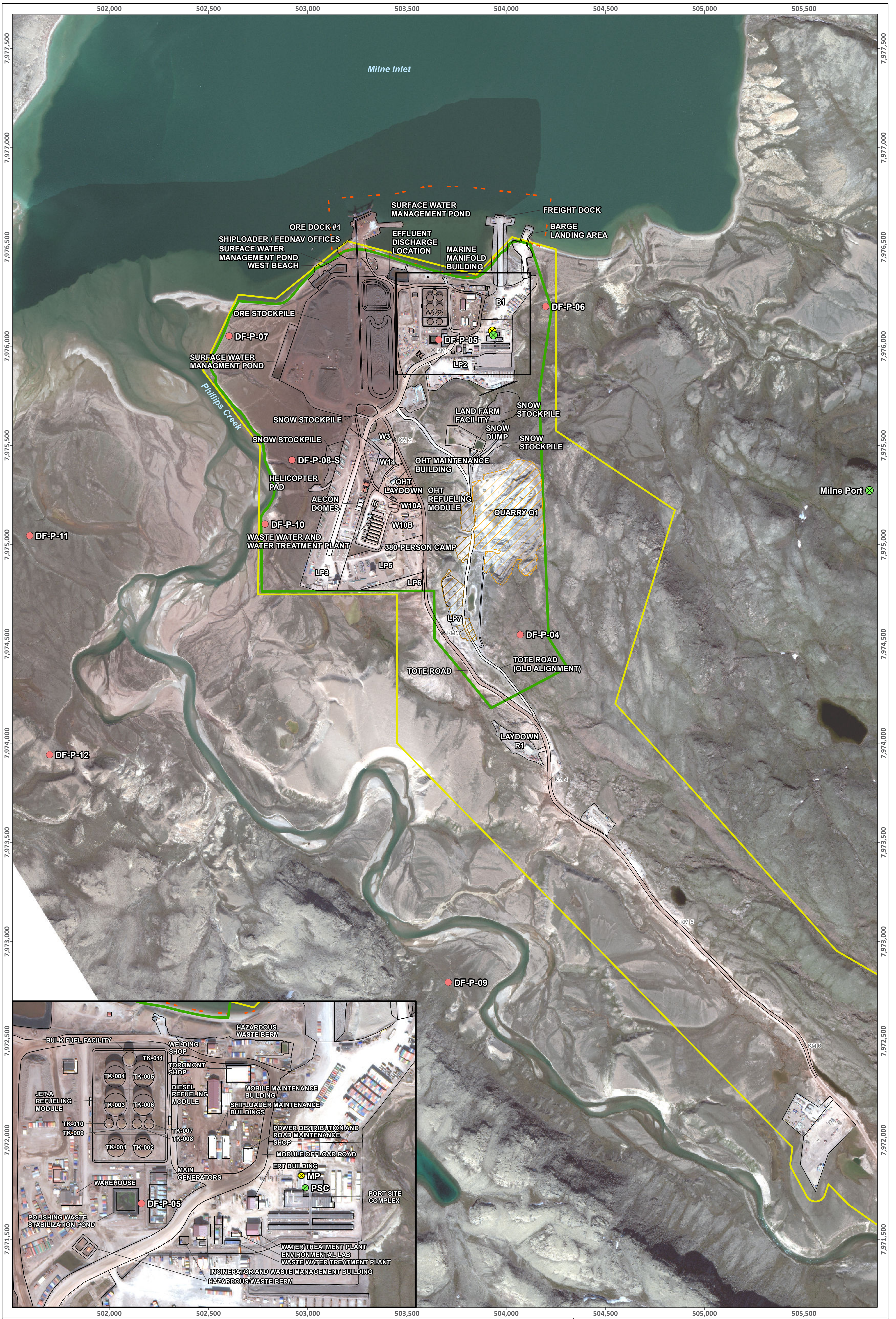
FIGURE 1.1

SAVED: C:\Users\katie.mcguire\Documents\4 - Maps\External\Stantec\Air Quality Report_04032112023\BIM_Fig 1-1 Mine Site.mxd: 05-Mar-24



LEGEND

Monitoring Station

- Continuous Ambient Air Quality
- MET
- Dustfall Monitoring Site
- Foreshore Lease Boundary
- Current Infrastructure
- Borrow Area
- Quarry Area
- Project Development Area
- Commercial Lease Boundary

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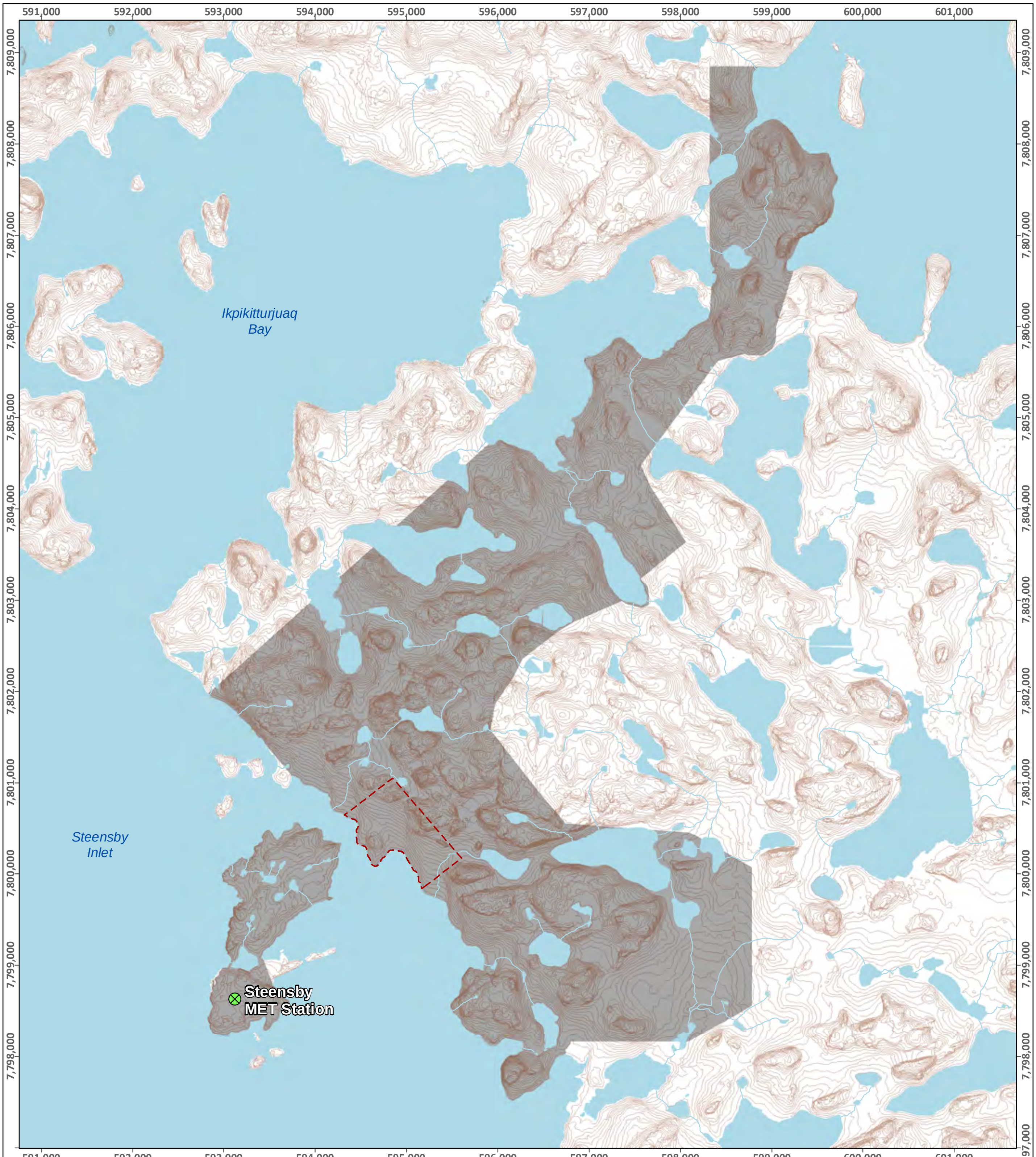
Milne Port Air Quality and MET Stations

Projection: NAD 1983 UTM ZONE 17N.
Base Map: © 2024 Digital Globe, Inc.
Imagery and Infrastructure are representative as of July 2023.

0 65 130 260 390 520 Meters
Scale 1:18,000
N

Baffinland

ᑎᑎᕋᐅᔭᕐᓯᒪᔪᖅ **FIGURE** **1.2**



LEGEND

- Lease Boundary
- Contour (20 m Interval)
- Crown Land
- Project Development Area

Monitoring Station

- MET

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Steensby Port MET Station

Projection: NAD 1983 UTM ZONE 17N.
Base Map: © Queen's Printer for Ontario, 2020.

0 300 600 1,200 Meters
Scale 1:60,000

N

Baffinland

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FIGURE **1.3**

SAVED: C:\Users\katie.mcguire\Documents\4 - Maps\External\Stantec\Air Quality Report_040321\BIM_Fig 1-3 Steensby Site.mxd; Mar 08, 2021 3:01 PM

1.2.1 Mary River Mine Site

There is one (1) automated meteorology station at the Mary River Mine Site located near the Weatherhaven structure. Photo 1.1 shows the Mary River meteorology station.

Photo 1.2 shows the continuous gas analyzers at the MSC. The ENVIDAS computer that controls the data collection is the grey device at the bottom of the rack. The device below the computer display is the Teledyne dilution calibrator.

Photo 1.3 and Photo 1.4 show the continuous ambient air quality monitors for TSP and $PM_{2.5}$. Photo 1.5 shows the location of the Mine Site ambient air quality monitoring station in relation to nearby buildings.

Photo 1.6 shows a dustfall station near the Mine Site.

Photo 1.1 The Mary River Meteorology Station looking towards the north.

Photo 1.2 **The rack-mounted Teledyne T100 (SO_2) and T200 (NOx-NO_2) continuous gas analyzers at the MSC.**

Photo 1.3 The $PM_{2.5}$ BAM analyzer at the MSC.

Photo 1.4 **The TSP and $PM_{2.5}$ roof mount outlets and cutter heads.**

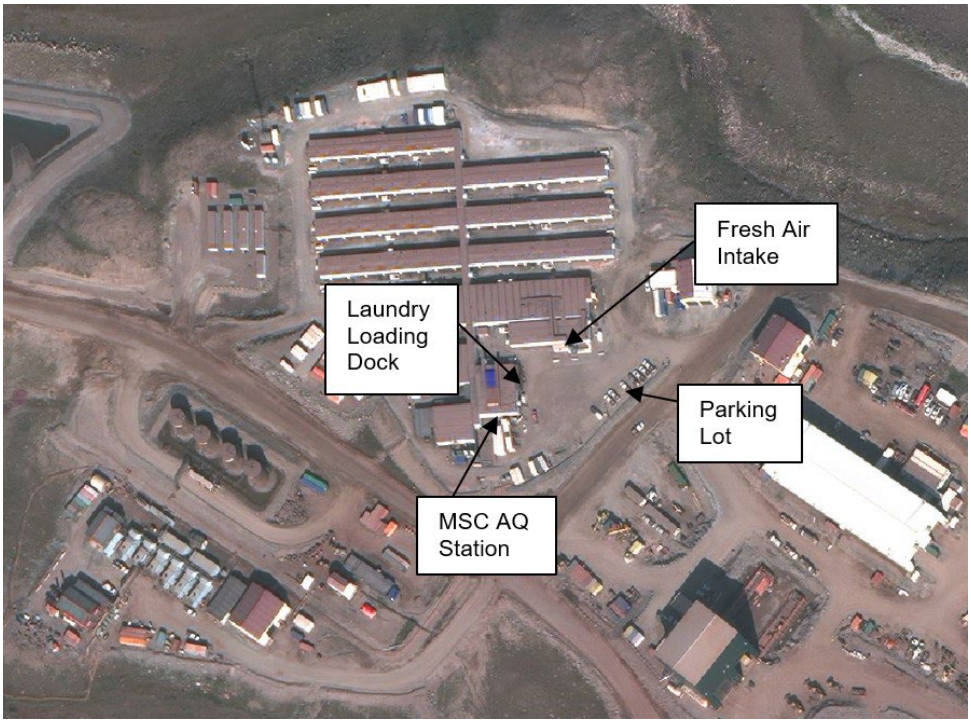


Photo 1.5 **Plan view showing the location of the ambient air quality (AQ) monitoring station for SO_2 and NO_2 at the MSC (identified as MS or Mine Site in this photo).**

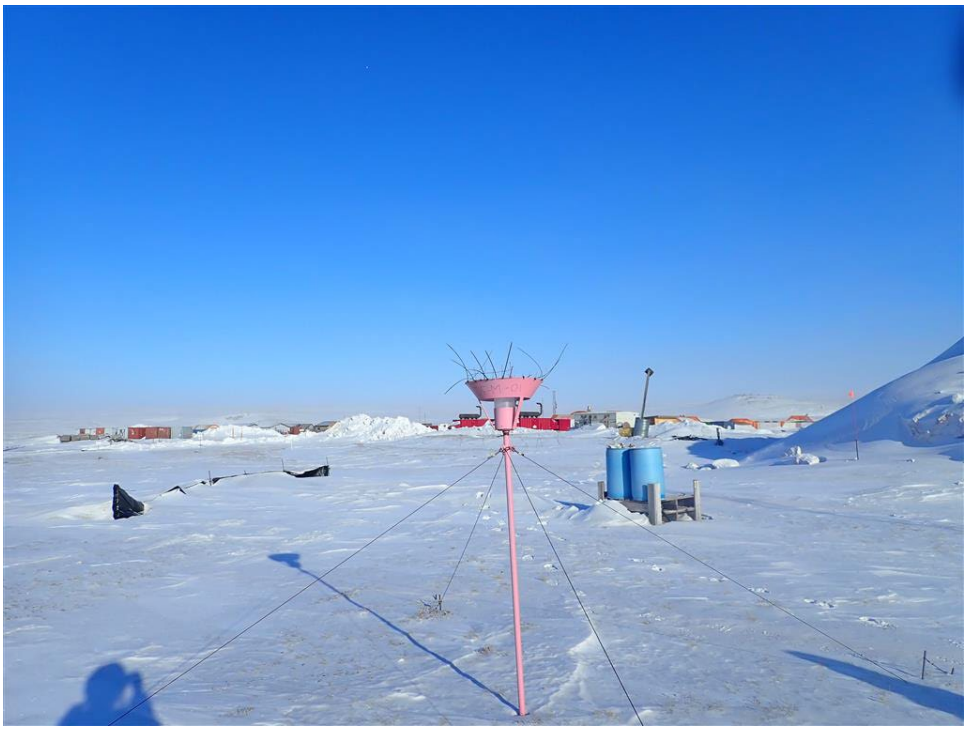


Photo 1.6 **Dustfall station DF-M-01 (March 20, 2021) near the Mine Site is located approximately 250 m south of the airstrip and 250 m east of Camp Lake.**

1.2.2 Milne Port

Photo 1.7 shows the Milne Port Meteorology Station located approximately 1.6 km east of the Milne Port infrastructure. Photo 1.8 shows the continuous gas analyzers at the PSC and the BAM 1020 continuous analyzer for TSP. The ENVIDAS computer that controls the data collection is the grey device at the bottom of the rack. The device below the computer display is the Teledyne dilution calibrator. Photo 1.9 shows the location of the PSC ambient air quality monitoring station in relation to nearby buildings. Photo 1.10 shows dustfall monitoring station DF-P-04 near Milne Port.

Photo 1.7 Milne Port Meteorology Station (September 9, 2021).

Photo 1.8 **The rack-mounted Teledyne T100 (SO_2) and T200 (NOx-NO_2) continuous gas analyzers at the PSC. The BAM 1020 analyzer for TSP is at the top of the rack.**

Photo 1.9 **The plan view showing the location of the ambient air quality (AQ) monitoring station for SO_2 and NO_2 at the PSC (identified as Milne Port or MP in this photo).**

Photo 1.10 **Dustfall station DF-P-04 (February 17, 2021) near Milne Port is located approximately 300 m south of Quarry Q1 and 300 m east of the Tote Road.**

1.2.3 Steensby

The Steensby automated meteorology station shown in Photo 1.11 is located approximately 120 km southeast from the Mary River Mine Site. As the Mary River mine site increases production, a railway is to be constructed to the southeast to transport ore to a port at Steensby Inlet which would operate year-round to ship ore to market.

Photo 1.11 The Steensby Port Meteorology Station looking towards the west.

2 Ambient Air Quality Monitoring

2.1 Methods

2.1.1 Continuous Monitoring for Nitrogen Oxides, Nitrogen Dioxide and Sulphur Dioxide at Mary River and Milne Port

The Teledyne API Model T200 NOx analyzer shown below uses a photo multiplier tube (PMT) to detect the amount of chemiluminescence created in the Reaction Cell. Photons from the reaction are filtered by an optical high-pass filter which enter the PMT and strike a negatively charged photo cathode causing it to emit electrons. A high voltage potential across these focusing electrodes directs the electrons toward the array of high voltage dynodes. The dynodes in the T200 are designed so that each stage multiplies the number of emitted electrons by emitting multiple, new electrons. This activity increases the number of electrons emitted which are collected by the anode to create a useable current signal. The Signal is then interpreted across the PMT board and translated to numerical data through the motherboard to be displayed on the unit's display panel and transmitted to collection software. (Operation Manual Model T200 NO/NO_2/NO_X Analyzer, Teledyne API 2018a)

The Teledyne API Model T100 UV Fluorescence SO_2 Analyzer shown here determines the concentration of SO_2 in the ambient air by drawing in a continuous sample through the instrument. The sample gas is exposed to ultraviolet (UV) light which causes the SO_2 molecules to change to an excited state (SO_2*). As the molecules decay into SO_2 they emit a photon. The reaction enters a PMT which increases the number of electrons emitted (as in the T200). The Signal is then interpreted across the PMT board and translated to numerical data through the motherboard to be displayed on the units display panel and transmitted to collection software. (Operation Manual Model T100 UV Fluorescence Analyzer, Teledyne API 2018b)

The NOx and SO_2 analyzers are calibrated and maintained in accordance with the manufacturer-recommended calibration methods and the United States Environmental Protection Agency (US EPA) calibration standards in compliance with 2020 CAAQS and CCME (2014).

2.1.2 Continuous Monitoring for Particulate Matter at Mary River and Milne Port

The BAM 1020 air quality monitoring instrument collects and analyzes atmospheric dust (TSP or respirable particulate matter, $PM_{2.5}$, with an aerodynamic diameter of less than 2.5 micrometers) concentrations in ambient air. The BAM 1020 has been widely used over the last 18 years by ECCC at their nation-wide National Air Pollution Surveillance (NAPS) monitoring stations.

The BAM 1020 measures dust particle mass through the principal of beta ray attenuation across the sampling medium (filter tape). A small C-14 (Carbon 14) element emits a constant source of high-energy electrons known as beta rays. The BAM 1020 first conducts a beta ray count across the clean filter tape, records the value internally, and then proceeds to draw ambient air through the filter tape. Dust particles are collected on the filter tape at the primary record location and scintillation counts are conducted to measure the beta attenuation and calculate the PM concentration in micrograms per cubic metre (µg/m³). Particle size differentiation is carried out utilizing a splitter head (size selective inlet or "SSI") mounted on the end of the sample inlet tube/pipe. The SSI creates a calculated flow change which cause heavier particles to drop out of the flow path, delivering only the pre-determined particle size to the BAM analyzer. Photo 2.1 shows the BAM 1020 continuous ambient air quality monitor at the PSC.

Photo 2.1 BAM 1020 for Continuous TSP Monitoring at the PSC – Nunami Stantec Limited.

The TSP and $PM_{2.5}$ concentration data are collected using the Envidas data acquisition software. The measured TSP and $PM_{2.5}$ concentrations are compared to the NAAQS, and the CAAQS. Any exceedances noted during the previous monitoring period are flagged and recorded during the analysis. Four quarterly 2024 calibrations and audits are conducted on the monitors as part of the quality control program to verify the accuracy of the data. In addition to the flow verifications, an exceedance report is generated weekly through the Envidas Ultimate software and the exceedance data are checked against the hourly data for consistency. The hourly concentrations for each monitor (NO_x, SO_2, TSP or

$PM_{2.5}$) from Envidas Ultimate software are also verified by comparing with the data trends from each monitor for data correlations and anomalies.

It is important to note, however, there are some periods in 2024 when the measured TSP and $PM_{2.5}$ concentrations at the MSC do not seem to be in agreement with the visual observations of the air quality conditions made by the on-site staff. Baffinland will be investigating potential causes for these apparent data anomalies and investigating additional methods of validating these measurements in 2025. The additional methods may include more frequent cleaning of the TSP and $PM_{2.5}$ sampler inlets, submitting BAM filter material and BAM data outputs to the analytical laboratory for verification, installation of a camera looking towards the sampler inlets, and assessing the potential influence of the natural gas furnace exhaust at the MSC.

2.2 SO_2 and NO_2 Results and Discussion

The ambient air quality monitoring results for 2024 for SO_2 and NO_2 are presented below separately for the MSC and PSC monitoring locations.

2.2.1 MSC Ambient Air Quality Monitoring Station

2.2.1.1 *Sulphur Dioxide*

The SO_2 data at the MSC ambient air quality monitoring station had 79.3% valid data for 2024 with a low of 6.32% for December due to an internal pump failure, where the pump was repaired but a voltage surge caused a main board short resulting in the analyzer being shut down. The analyzer is currently down waiting to be diagnosed and repaired or replaced. July was also below 50% (42.6%) valid data due to dirt infiltration into the system, blocking the flow path. An in-line filter apparatus was installed to mitigate excess dust from entering the system

The SO_2 concentrations remained very low throughout 2024 and did not exceed the hourly (172 ppb), 24-hour (57 ppb) or annual (11 ppb) NAAQS (GN 2011) during the period of active operation. The maximum hourly recorded concentration (48.85 ppb) recorded in July 2024 was 85.7% of the NAAQS 1-hour standard. The maximum 24-hour average SO_2 concentration occurred on February 3, 2024, was 4.78 ppb, which is 8.4% of the NAAQS 24-hour standard. The 2024 annual average SO_2 concentration is 1.25 ppb which is 11.4% of the NAAQS annual concentration standard. The measured 1-hour value for SO_2 (i.e., the 3-year average of the annual 99th percentile of the SO_2 daily maximum 1-hour average) was 7.26 ppb (10.4% of the 1-hour CAAQS[1]). Negative values observed in the data set reflect background noise in the system when the ambient air SO_2 levels fall below detectable limits. The system calibrations were maintained and fell within the operational limits of the analyzer.

[1] Mary River MSC data based on 6966 valid data points (hourly readings) for SO_2 and 8278 valid data points for NO_2.

Table 2.1 Hourly Summary of SO_2 Concentrations for MSC Ambient Air Quality Monitoring Station (measured in parts per billion, ppb)

	JAN	FEB	MAR	APRIL	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	ANNUAL	2022-2024
Mean	1.29	2.15	1.17	0.49	0.92	1.02	1.52	1.09	1.17	1.53	1.58	0.65	1.25	0.58
Median	1.01	1.86	1.16	0.33	0.54	0.92	1.30	1.07	1.13	1.48	1.54	0.55	1.13	0.59
Mode	0.53	1.42	1.13	0.22	0.71	0.81	1.41	0.71	0.95	1.67	1.51	n/a	0.87	1.05
Range	47.73	30.81	42.28	40.02	13.45	42.04	48.19	2.59	1.97	3.55	17.55	1.83	48.85	48.85
Minimum	0.0	0.0	0.0	0.0	0.0	0.45	0.66	0.53	0.33	0.22	0.78	0.21	0.0	0.0
Maximum	47.73	30.81	42.28	40.02	13.45	42.48	48.85	3.13	2.30	3.77	18.33	2.04	48.85	48.85
Count	626	655	685	684	659	499	317	714	691	715	674	47	6966	21790
% Valid	84.14 %	97.47%	92.07%	95.00%	88.58%	69.31%	42.61%	95.97%	95.97%	96.10%	93.61%	6.32%	79.30%	82.84%

Notes:

Negative values reflect normal noise in the analyzer and are changed to zero

Nunavut Air Quality Standards: 1-hour 172 ppb, 24-hour 57 ppb, annual 11 ppb.

2022-2024 column is three-year total hourly averaged data. The three-year average of the annual 99th percentile of the daily maximum 1-hour average SO_2 concentrations is 7.26 ppb. The average over a single calendar year of all 1-hour average SO_2 concentrations is 0.40 ppb.

CAAQS 2020: 1-hour 70 ppb, annual 5.0 ppb

The SO_2 maximum concentrations were highest in the winter and early spring (January-May) with an additional spike in June and a gradual decrease throughout July. Valid data during July was 42.61%, lowering the trend; however, data validity is based on a quarterly measure (CCME 2020). Data are considered valid for inclusion in the calculations when there are at least 75% valid data for each quarter. Although the data validity fell below 75% (42.61%) during July, the quarterly data (July to September) was 78.18% and is therefore included in the calculations and analyses (CCME 2020). Levels remained low during the summer and rose again in the fall (October-November) months (Figure 2.1) consistent with historical trends (RWDI 2015, 2017, 2018; Nunami Stantec 2021, 2022, 2023b, 2024). The likely cause of the highest concentrations in winter may be the SO_2 emissions from diesel mine trucks operating in and near the MSC ambient air quality monitoring station. Signs are posted near the MSC ambient air quality monitoring station to request that operators refrain from idling their diesel trucks.

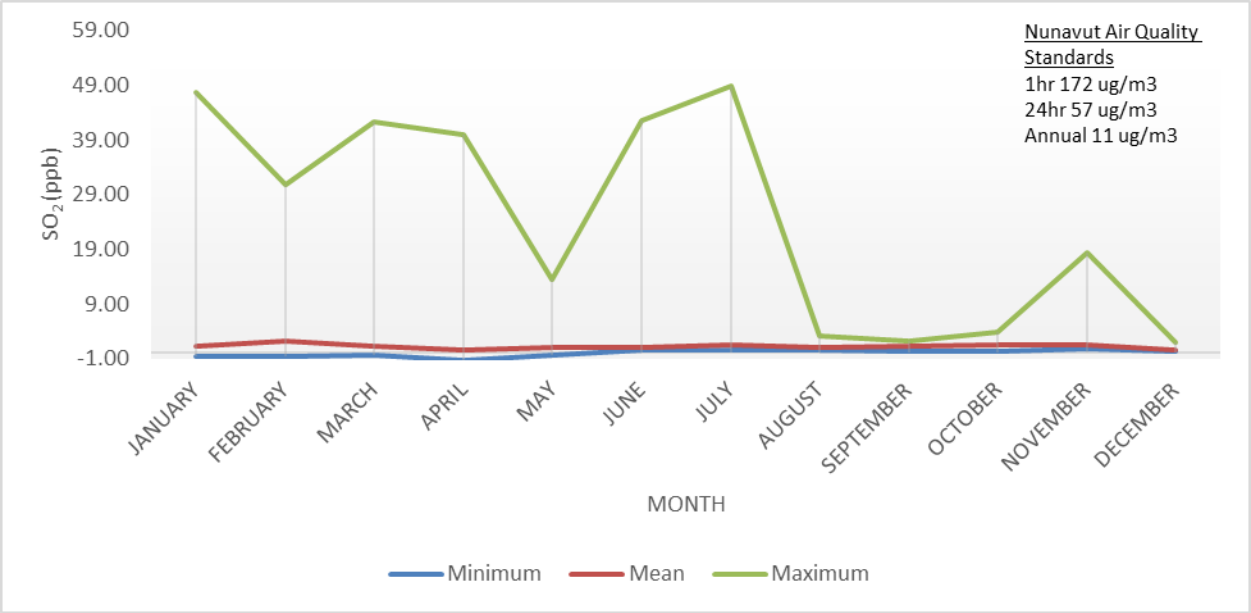


Figure 2.1 MSC Hourly SO_2 Concentration (ppb) Summaries by Month

The 3-year average of the annual 99th percentile of the daily maximum 1-hour average concentrations for MSC for SO_2 was 7.26 ppb which is less than the CAAQS 2020 (70 ppb) and the CAAQS 2025 (65 ppb). The average over a single calendar year of all 1-hour average concentrations (highest yearly average for three years (2022 to 2024)), is 0.40 ppb, which is less than the CAAQS 2020 annual (5 ppb) and the CAAQS 2025 annual (4 ppb).

2.2.1.2 *Nitrogen Dioxide*

The measured NO_2 data at the Mary River MSC ambient air quality monitoring station had 64.9% valid data for 2024. The NO_2 analyzer was adjusted out of specification in May and remained out of specification until August, resulting in four months with low or no valid data (Table 2.2). The NO_2 concentrations did not exceed the hourly (213 ppb), 24-hour (106 ppb) or annual (32 ppb) NAAQS (GN 2011) with maximum concentrations of 194.72 ppb (Figure 2.2), 78.7 ppb and 17.8 ppb, respectively. The highest average hourly maximum occurred on February 20, 2024 (194.72 ppb). The CAAQS 2020 limits are 60 ppb for the 1- hour averaging time (the three-year average of the annual 98th percentile of the daily maximum 1-hour average concentrations), and 17.0 ppb for the annual averaging time (annual average of all 1-hour average concentrations) (CCME 2014). The CAAQS 2020 are being used for comparison purposes only in agreement with the CCME objective to “keep clean areas clean” and the most relevant NO_2 standard for comparison is the NAAQS. The annual mean NO_2 concentration (i.e., the average over a single calendar year of all 1-hour average concentrations (highest yearly average)) was 17.65 ppb which is slightly higher than the annual CAAQS 2020 (17.0 ppb). The 1-hour NO_2 value (i.e., the three-year average of the annual 98th percentile of the daily maximum 1-hour average NO_2 concentrations) is 100.16 ppb which is greater than the 1-hour CAAQS 2020 (60 ppb). The maximum recorded values may be attributed to vehicles or other diesel combustion equipment occasionally operating at locations near the MSC ambient air quality monitoring station. The minimum values present in the data reflect the level of zero air noise in the analyzer and remained consistent between calibrations.

Table 2.2 Hourly Summary NO_2 Concentrations for MSC Ambient Air Quality Monitoring Station (ppb)

	JAN	FEB	MAR	APRIL*	MAY*	JUNE*	JULY*	AUG	SEP	OCT	NOV	DEC	ANNUAL	2022-2024
Mean	29.15	36.99	25.70	13.61	N/A	N/A	2.52	3.54	4.91	7.71	19.99	33.70	17.80	16.00
Median	30.13	38.30	22.48	13.10	N/A	N/A	1.29	1.57	3.65	5.06	19.18	35.01	17.00	9.57
Mode	49.10	50.26	3.26	N/A	N/A	N/A	-0.17	2.30	1.89	1.78	4.05	50.39	-0.17	0.64
Range	86.89	194.33	73.14	22.82	N/A	N/A	13.73	22.96	32.18	41.89	65.07	112.94	194.72	194.72
Minimum	0.17	0.39	0.44	2.11	N/A	N/A	0.0	0.0	0.0	0.0	0.03	0.0	0.0	0.0
Maximum	87.06	194.72	73.57	24.92	N/A	N/A	13.73	22.96	32.18	41.89	65.09	112.94	194.72	194.72
Count	655	668	702	102	0	0	122	714	690	715	675	653	5696.00	24982
% Valid	88.0%	99.4%	94.4%	14.17%	0%	0%	16.4%	96.0%	95.8%	96.1%	93.8%	87.8%	64.9%	95.0%

Notes:
Negative values reflect normal noise in the analyzer and are changed to zero.
Nunavut Air Quality Standards: 1-hour 213 ppb, 24-hour 106 ppb, annual 32 ppb
2022-2024 column is three-year total hourly averaged data

The three-year average of the annual 98th percentile of the daily maximum 1-hour average NO_2 concentrations is 100.16 ppb. The three-year average of all 1-hour average NO_2 concentrations is 17.65 ppb.

*On April 5 at 10:00 AM a station check accidently adjusted the zero /span with atmospheric gases resulting in low negative values (-5 to -40 ppb) for the period of April 5, 2024, at 10:00 AM to July 26, 2024, at 08:00 AM. The data for that period were invalidated and the monitor was calibrated and brought back online on July 26th at 17:00

The NO_2 concentrations were highest in the winter and trended down in the late spring, Data from April 5 to July 26 were invalidated due to a station check error so late spring/early summer trends cannot be considered in the analysis. NO_2 Concentration rose in August and through to the end of December (Figure 2.2) consistent with historical trends (RWDI 2015, 2018; Nunami Stantec 2021, 2022, 2023b, 2024). The likely cause of the highest concentrations in winter may be the NO_2 emissions from diesel generators, heating systems and mine trucks, operating in and near the MSC ambient air quality monitoring station. Signs are posted near the MSC ambient air quality monitoring station to request that operators refrain from idling their diesel trucks.

Figure 2.2 MSC Hourly NO_2 Concentrations (ppb) by Month

The 3-year average of the annual 98th percentile of the daily maximum 1-hour average concentrations for MSC for NO_2 was 100.16 ppb which is greater than the CAAQS 2020 (60 ppb) and the 2025 CAAQS (42 ppb). The average over a single calendar year of all 1-hour average concentrations (highest yearly average for three years (2022 to 2024), is 17.65 ppb, which is greater than the CAAQS 2020 and CAAQS 2025 numerical values of 17 ppb and 12 ppb respectively. Historical trends decrease through the spring and summer; Invalidated data from April 5 to July 26 may have artificially increased the statistical trends for 2024 by removing the lower levels that are usually found throughout that time period.

2.2.2 PSC Ambient Air Quality Monitoring Station

2.2.2.1 *Sulphur Dioxide*

The SO_2 data at the PSC ambient air quality monitoring station had 93.3% valid data for 2024 (Table 2.3). The SO_2 concentrations remained very low (0 to 7.74 ppb) throughout 2024 and did not exceed the hourly (172 ppb), 24-hour (57 ppb) or annual (11 ppb) NAAQS (GN 2011). The maximum hourly recorded concentration was 4.2% of the NAAQS 1-hour standard, 13.6% of the NAAQS for 24-hours and 5.6% of the NAAQS annual standard. Negative values reflect the level of zero air noise in the analyzer and remained consistent between calibrations once the internal pump was replaced and the system stabilized. The SO_2 concentrations were highest in the winter and lowest in the summer months (Figure 2.3).

Table 2.3 Hourly Summary SO_2 Concentrations for PSC Ambient Air Quality Monitoring Station (ppb)

	JAN	FEB	MAR	APRIL	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	ANNUAL	2022-2024
Mean	1.16	0.77	0.45	0.93	0.88	1.22	1.55	0.72	0.77	1.08	1.03	1.20	0.98	0.62
Median	1.00	0.63	0.37	0.87	0.89	1.25	1.56	0.68	0.71	1.02	1.00	1.10	0.92	0.63
Mode	0.89	0.12	0.42	0.92	0.84	1.02	1.43	0.77	0.69	0.87	1.10	1.02	0.87	-0.10
Range	4.33	4.25	2.81	3.28	4.18	1.57	4.72	7.57	1.66	2.67	2.35	3.15	7.74	7.74
Minimum	0.0	0.0	0.0	0.0	0.28	0.55	0.40	0.16	0.24	0.43	0.31	0.27	0.0	0.0
Maximum	4.33	4.25	2.81	3.28	4.45	2.12	5.12	7.74	1.90	3.09	2.66	3.42	7.74	7.74
Count	705	668	706	592	713	658	707	716	689	713	674	655	8196	22953
% Valid	94.8%	99.4%	94.9%	82.2%	95.8%	91.4%	95.0%	96.2%	95.7%	95.8%	93.6%	88.0%	93.3%	87.3%

Notes:

Negative values reflect normal noise in the analyzer and are changed to zero.

Nunavut Air Quality Standards: 1-hour 172 ppb, 24-hour 57 ppb, annual 11 ppb.

2022-2024 column is the three-year total hourly averaged data. The three-year average of the annual 99th percentile of the SO_2 daily maximum 1-hour average SO_2 concentrations is 1.72 ppb. The three-year average of all 1-hour average SO_2 concentrations is 0.31 ppb.

CAAQS 2020: 1-hour 70 ppb, annual 5.0 ppb

The SO_2 concentrations remained low throughout the year and with a spike in July, and August (during peak loader operations) then trended upward slightly in December (Figure 2.3) consistent with historical trends (RWDI 2015, 2018; Nunami Stantec 2021, 2022, 2023b, 2024). The likely cause of the highest concentrations in winter may be the SO_2 emissions from generators, heating systems and diesel mine trucks operating in and near the PSC ambient air quality monitoring station. The elevate concentrations during the summer months may be associated with vessel loading activities.

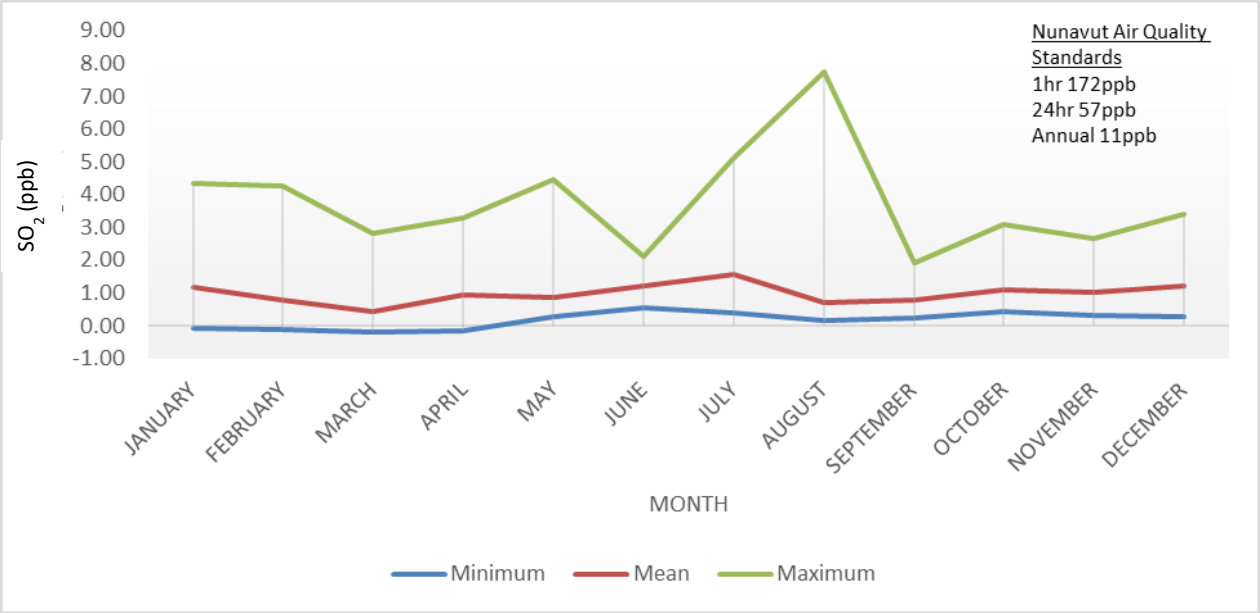


Figure 2.3 PSC Hourly SO_2 Concentrations (ppb) by Month

The 3-year average of the annual 99th percentile of the daily maximum 1-hour average concentrations for PSC for SO_2 was 1.72 ppb which is less than the CAAQS 2020 (70 ppb) and the 2025 CAAQS (65 ppb). The average over a single calendar year of all 1-hour average concentrations (highest yearly average for three years (2022 to 2024), is 0.31 ppb, which is less than the CAAQS 2020 (5 ppb) and the CAAQS 2025 (4 ppb).

2.2.2.2 *Nitrogen Dioxide*

The NO_2 data at the Milne Port PSC had 93.1% valid data for 2024 with a low of 91% for December (Table 2.4). The NO_2 concentrations were less than the hourly (213 ppb), 24-hour (106 ppb) or annual (32 ppb) NAAQS (GN 2011) with concentrations of 108.0 ppb, 90.9 ppb and 11.4 ppb, respectively (Figure 2.4). The CAAQS 2020 limits are 60 ppb (hourly), and 17.0 ppb (annual arithmetic mean) (CCME 2014). The NO_2 concentrations did not exceed the 1-hour CAAQS (45.3 ppb) and were less than the annual CAAQS in 2024 with a concentration of 7.2 ppb. The CAAQS are being used for comparison purposes only in agreement with the CCME objective to “keep clean areas clean” and the most relevant NO_2 standard for comparison is the NAAQS. The three-year average one hour mean NO_2 concentration was 7.2 ppb which is 42% of the annual CAAQS 2020 arithmetic mean (17 ppb). The maximum recorded values may be attributed to vehicles or other diesel combustion equipment occasionally operating at locations near the ambient air quality monitoring stations.

Negative values present in the data reflect the level of zero air noise in the analyzer when the ambient gas concentrations are below the analyzer detection limits.

Table 2.4 Hourly Summary of NO_2 Concentrations for PSC Ambient Air Quality Monitoring Station (ppb)

	JAN	FEB	MAR	APRIL	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	ANNUAL	2022-2024
Mean	22.20	28.59	16.42	5.23	3.99	1.85	1.62	5.07	3.94	6.35	16.52	26.26	11.44	12.33
Median	17.12	30.31	10.10	2.11	2.77	0.78	0.81	3.53	1.93	3.32	12.39	27.64	3.57	3.74
Mode	0.03	25.94	0.86	0.85	1.42	0.47	0.33	0.33	0.54	0.72	1.18	31.97	0.33	0.53
Range	103.97	107.58	69.58	79.20	48.83	16.56	26.84	29.97	27.55	56.64	67.63	97.17	107.99	131.35
Minimum	0.0	0.41	0.21	0.12	0.07	0.0	0.0	0.15	0.04	0.08	0.13	0.14	0.0	0.0
Maximum	103.97	107.99	69.79	79.33	48.90	16.56	26.84	30.13	27.59	56.72	67.76	97.31	107.99	131.35
Count	707	668	706	592	713	658	707	716	689	713	656	655	8180	24753
% Valid	95.4%	95.5%	95.0%	94.4%	96.9%	91.8%	97.6%	96.0%	92.4%	98.5%	96.0%	91.0%	93.1%	94.1%

Notes:

Negative values reflect normal noise in the analyzer and are changed to zero.

Nunavut Air Quality Standards: 1-hour 213 ppb, 24-hour 106 ppb, annual 32 ppb

2022-2024 column is the three-year total hourly averaged data. The 3-year average of the annual 98th percentile of the daily maximum 1-hour average NO_2 concentrations is 45.32 ppb. The three-year average of all 1-hour average NO_2 concentrations is 7.2 ppb.

CAAQS 2020: 1-hour 60 ppb, annual 17.0 ppb

The NO_2 concentrations were highest in the winter and lowest in the summer months (Figure 2.4), consistent with historical trends (RWDI 2015, 2017, 2018; Nunami Stantec 2021, 2022, 2023b, 2024). The likely cause of the highest concentrations in winter may be the NO_2 emissions from diesel mine trucks occasionally operating at locations near the PSC ambient air quality monitoring station.

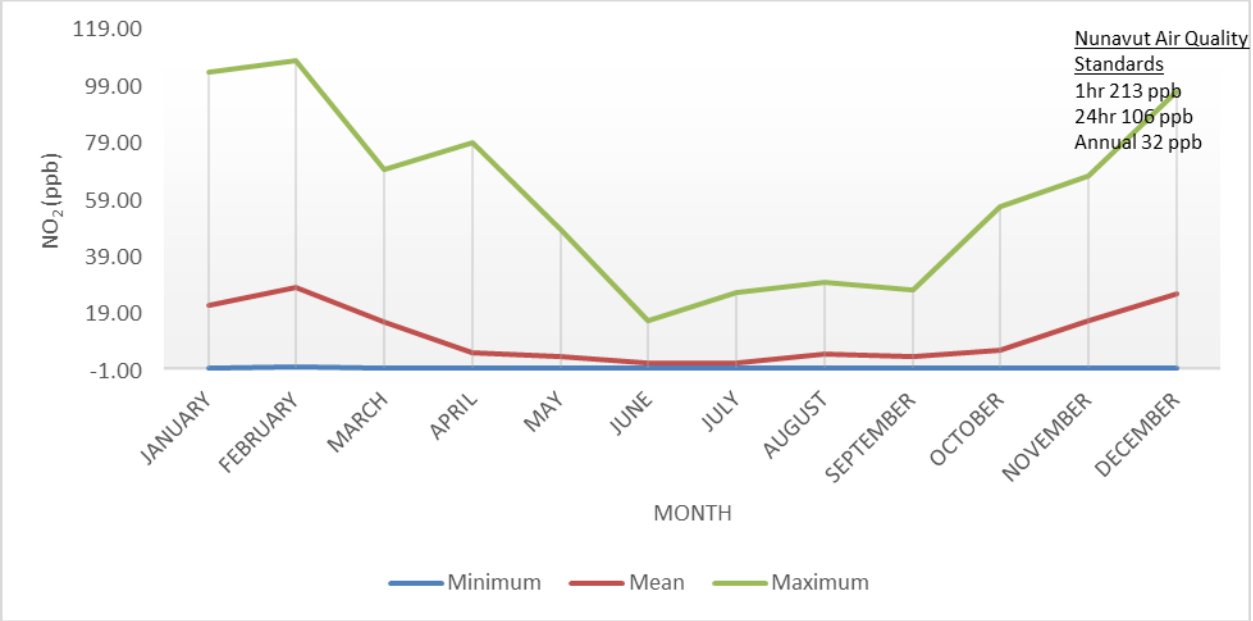


Figure 2.4 PSC Hourly NO_2 Concentrations (ppb) by Month

The 3-year average of the annual 98th percentile of the daily maximum 1-hour average concentrations for PSC for NO_2 was 45.32 ppb which is less than the CAAQS 2020 (60 ppb) and greater than the 2025 CAAQS (42 ppb). The average over a single calendar year of all 1-hour average concentrations (highest yearly average for three years (2022 to 2024), is 7.2 ppb, that is less than the CAAQS 2020 (17 ppb) and the CAAQS 2025 (12 ppb).

2.2.3 Quality Assurance and Quality Control

Three quarterly site visits were conducted by Nunami Stantec in 2024 (January 12-14, 2024, March 21-26, 2024, and July 26-29, 2024). The scope of work for the site visits included, quarterly audits, trouble shooting and calibrating the NOx/SO_2 analyzers, monitor annual maintenance, chamber extraction and cleaning, as well as filter and component replacements.

Additional in-person training sessions were conducted in 2024 with the on-site technicians. Training included weekly and monthly equipment maintenance best practices and a review of the manufacturer-recommended component replacement intervals.

Table 2.5 summarizes the maintenance and calibration activities that were completed for the gas analyzers during the 2024 quarterly visits.

Table 2.5 2024 Quarterly Gas Analyzer Calibration and Maintenance Summary

Continuous Ambient Air Quality Monitoring Station	Calibration and Maintenance Completed	Maintenance not Completed and Requiring Additional Work
MSC Teledyne T100 analyzer for SO_2 Teledyne T200 analyzer for NO/NO_2/NOx	• Rebuilt reaction chamber for T100 and T200 • Rebuilt pumps for T200 • Replaced internal filters for T100 and T200 • Replaced sintered filters and flow orifices for T100 and T200 • Conducted pre-burn calibration on T100, T200 • Conducted follow-up calibration check after 5 to 7 day “burn in” • Installed inline filter on sample flow inlet	• not applicable, the required 2024 maintenance was completed • SO_2 analyzer (T100) shut down in December 2024, and remains offline pending manufacturer diagnosis and repair
PSC Teledyne T100 analyzer for SO_2 Teledyne T200 analyzer for NO/NO_2/NOx	• Rebuilt reaction chamber for T100 and T200 • Replaced internal filters for T100 and T200 • Replaced sintered filters and flow orifices for T100 and T200 • Conducted post-burn calibration on T100, T200 as per manufacturers recommendations • rebuilt NO_2 pump	• not applicable, the required 2024 maintenance was completed

2.2.3.1 *Permeation (Span) and Zero Daily Quality Assurance*

Perm tubes coupled with zero span daily checks are used to assess if a gas analyzer has had a failure during the previous 23-hour cycle. If the daily level changes significantly over the observed daily trend (sudden spikes or dips), then technicians conduct an on-site calibration check of the analyzer in question to ensure that the unit is operating within the calibration validation limits (<15% of previous months

calibration values, <6% analyzer operational limits). Once the checks are completed, the analyzer data are validated, and ongoing perm/zero checks are monitored for changes.

2.2.3.2 *Sulphur Dioxide*

MSC

The SO_2 concentrations remained very low throughout 2024 and did not exceed the hourly (172 ppb), 24-hour (57 ppb) or annual (11 ppb) NAAQS (GN 2011) during the period of active operation (Figure 2.5). Negative values present in the data, between February and August, indicate background noise in the system typical for ambient levels with zero detectable concentrations. The monitor was offline in July due to an internal line blockage; the lines were replaced during the Q3 quarterly, and the in-line filter on the inlet supply was added and the analyzer was brought back online.

Zero and span data showed a consistent uniform equipment response through 2024 (Figure 2.6). Data were verified monthly during calibration cycles. The analyzer was shut down in July due to a pump failure, and again in December due to a system wide SO_2 analyzer failure. The loss of data is reflected in the July and December 2024 data and trends (Figure 2.5). The internal flow lines were replaced during the Q3 quarterly and an external in-line filter was added to the system to prevent excess dust from entering the system. Baffinland is still assessing the current MSC SO_2 analyzer failure.

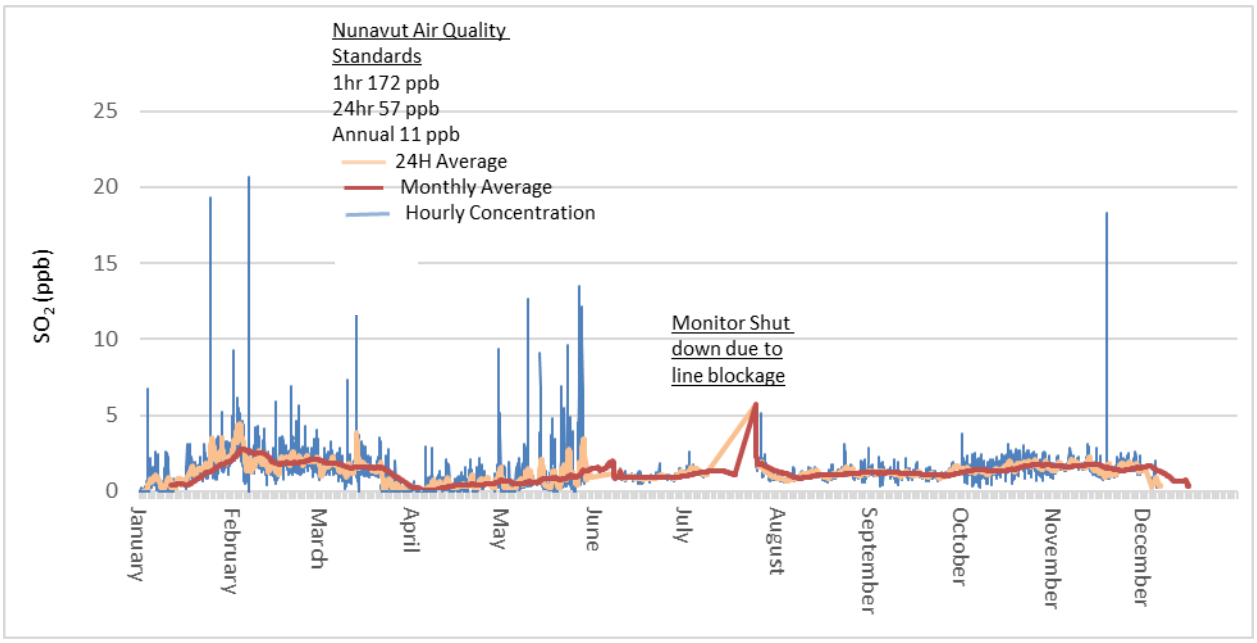


Figure 2.5 MSC Hourly SO_2 Concentrations with 24-hour and Monthly Average Trends

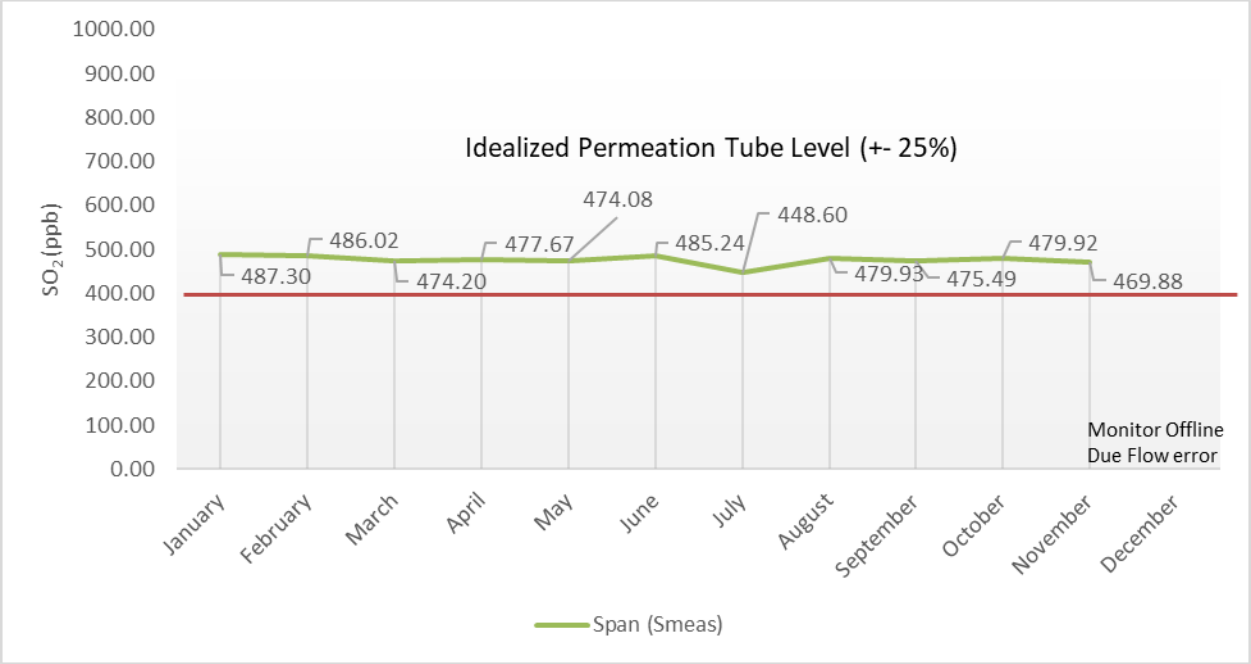


Figure 2.6 MSC Hourly SO_2 Annual Permeation Tube Span and Zero Data

PSC

The SO_2 concentrations remained very low throughout 2024 and did not exceed the hourly (172 ppb), 24-hour (57 ppb) or annual (11 ppb) NAAQS (GN 2011) during the period of active operation (Figure 2.7). Negative values present in the data, mostly during the summer months, indicate background noise in the system typical for ambient levels with zero detectable concentrations (Figure 2.7).

Zero and Span data were consistent with uniform equipment response and no significant spikes. (Figure 2.6). Data were verified monthly during the calibration cycles.

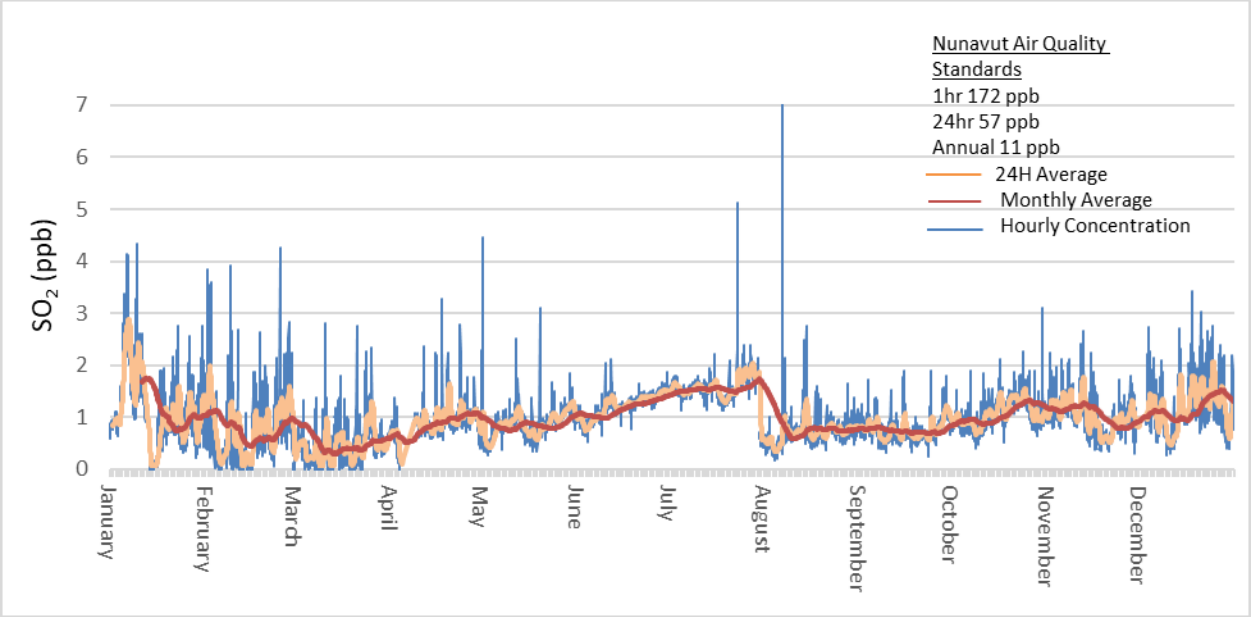


Figure 2.7 PSC Hourly SO_2 Concentrations with 24-hour and Monthly Average Trends

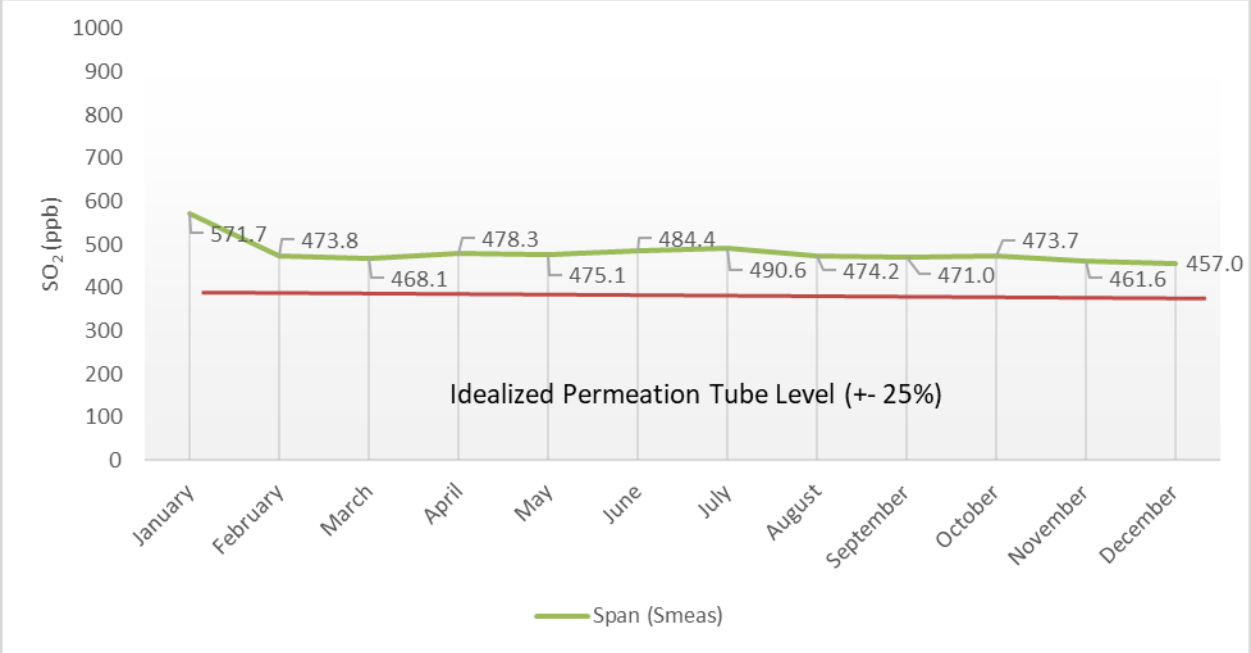


Figure 2.8 PSC SO_2 Permeation Tube Data Span/Zero

2.2.3.3 *Nitrogen Dioxide*

MSC

The NO_2 concentrations trend higher during the winter months and begin to trend down in March. The analyzer was reset in error on April 5, 2024, resulting in negative readings between April 5 and July 27, 2024. The data from that time period were invalidated and removed from the data set, leaving available data for 2024 as January 1-April 5 and July 28-December 31. The monitor was calibrated during the quarterly and brought back online on July 27, 2024. The NO_2 concentrations were low in August and September and then rose in the fall through to the end of 2024, (Figure 2.9). The resulting data (where available) are consistent with historical trends (RWDI 2016, 2018; Nunami Stantec 2021, 2022, 2023b, 2024).

The perm span values remained consistent, through 2024 indicating linear data response from month to month (Figure 2.10), Including the time frame from April 5 to July 27, 2024. The monthly calibration cycles and daily perm span diagnostics confirm accurate diagnostic checks and verify data validity during the cycles.

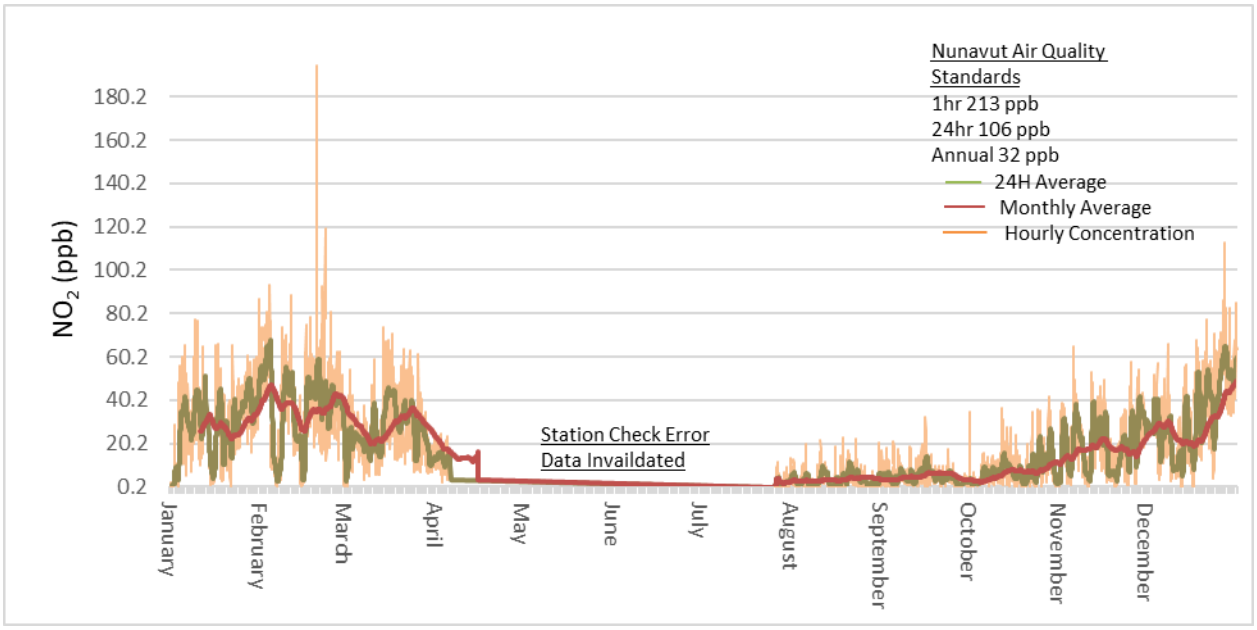


Figure 2.9 MSC Hourly NO_2 Concentrations with 24-hour and Monthly Average Trends

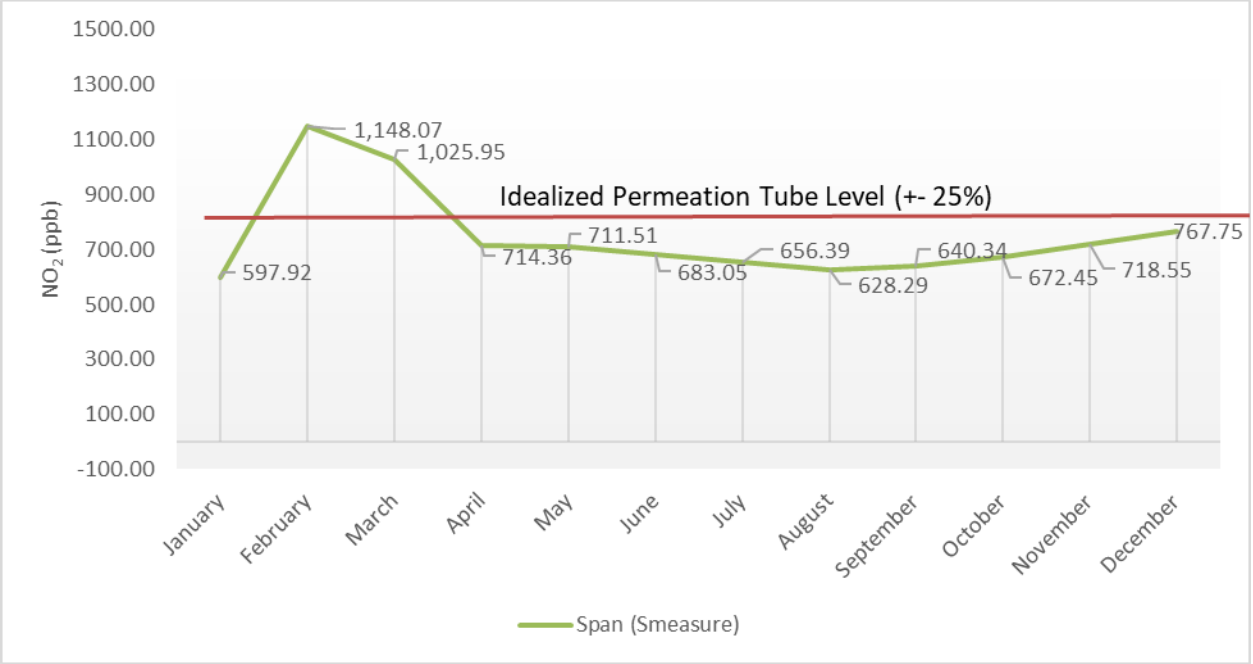


Figure 2.10 MSC NO_2 Annual Permeation Tube Data Span/Zero

PSC

The NO_2 concentrations were highest in the winter and lowest in the summer months (Figure 2.11), consistent with historical trends (RWDI 2015, 2017, 2018; Nunami Stantec 2021, 2022, 2023b, 2024).

The NO_2 span values declined through March due to an expired perm tube; once replaced the NO_2 concentrations remained consistent through the remainder of 2024 with no significant spikes or data anomalies from permeation gas latency or extinction in the system. The perm tube range remains very high and may be supplied with a permeation rate that has been set for a 1,000 ppb range system (Figure 2.12). Since the monitor range is set at 500 ppb instead of 1,000 a new permeation tube with a 400 ppb range should be ordered and installed to reflect 80% of the range of the monitor.

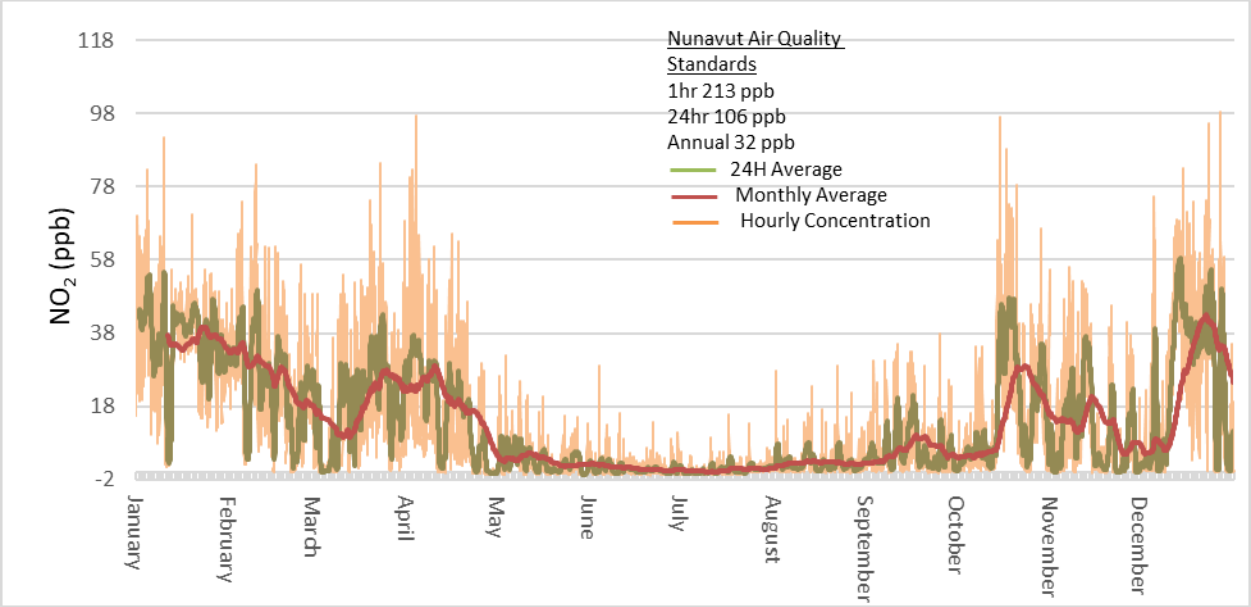


Figure 2.11 PSC Hourly NO_2 Concentrations with 24 hour and Monthly Average Trends

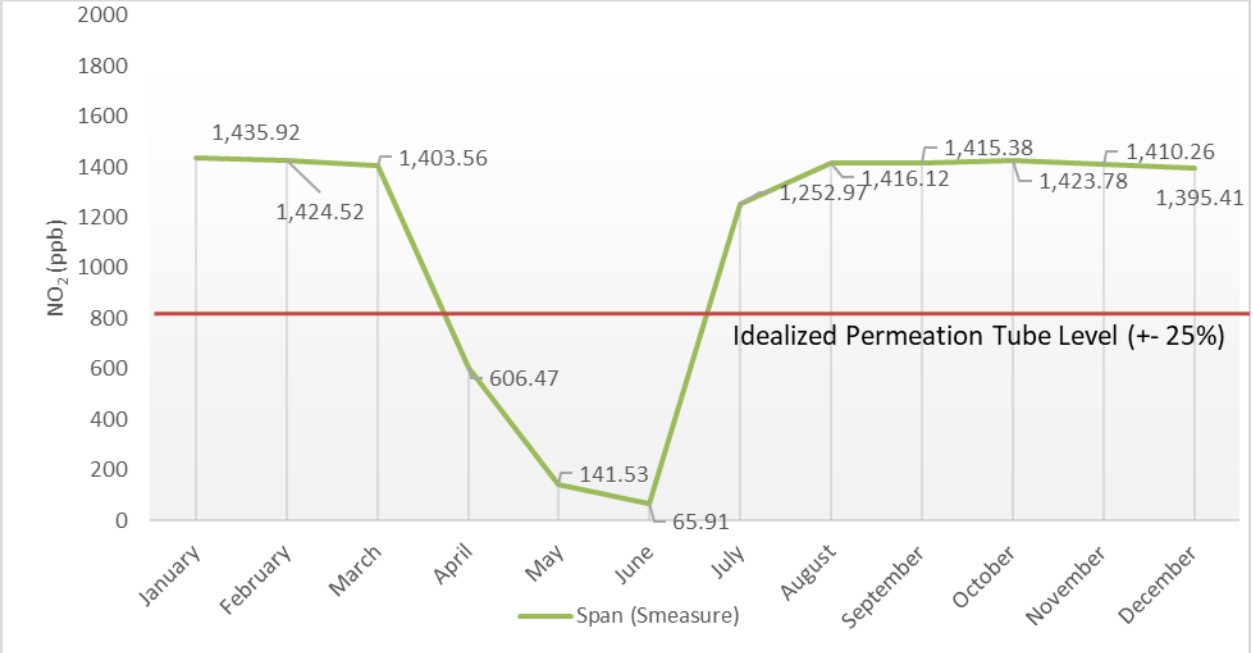


Figure 2.12 PSC NO_2 Annual Permeation Tube Data Span/Zero (red horizontal line indicates the average new manufactured perm tube level ± 25%)

2.3 Particulate Matter Results and Discussion

Particulate matter monitoring results for 2024 (TSP and $PM_{2.5}$) are presented below separately for the MSC and PSC monitoring locations, following a discussion of quality assurance and quality control.

Following an in-depth data review and preliminary investigation, there are some periods during 2024 when the measured TSP and $PM_{2.5}$ concentrations at the MSC do not seem to be reasonable or accurate based on visual air quality observations made by the on-site staff. Baffinland will be investigating potential causes for these apparent data anomalies and investigating additional methods of validating these measurements during 2025. The additional methods may include more frequent cleaning of the TSP and $PM_{2.5}$ sampler inlets, submitting BAM filter material and BAM data outputs to the analytical laboratory for verification, installation of a camera looking towards the sampler inlets, and assessing the potential influence of the natural gas furnace exhaust at the MSC.

2.3.1 Quality Assurance and Quality Control

In 2024, Nunami Stantec Limited conducted quarterly audits and calibrations during the periods of January 12-14, 2024; March 21-26, 2024, and July 26-29, 2024. The scope of work for the site visit included audits, trouble shooting flow control replacement and calibrating the $PM_{2.5}$ and TSP analyzers, annual maintenance of the monitors, head (inlet) removal and cleaning, as well as filter and component replacements.

Additional training sessions were conducted with the on-site technicians during the site visits. Training included weekly and monthly equipment maintenance best practices and a review of the manufacturer-recommended component replacement intervals (Met-One 2020).

Table 2.6 summarizes the maintenance and calibration activities that were completed for the BAM units during 2024. Baffinland continues to work with Met-One to identify the cause of BAM equipment failures. Baffinland has purchased BAM backup air temperature sensors as well as additional pumps and wearable components to minimize future equipment downtime.

Table 2.6 2024 Quarterly Beta Attenuation Monitor Calibration and Maintenance Summary

Continuous Ambient Air Quality Monitoring Station	Calibration and Maintenance Completed	Maintenance not Completed and Requiring Additional Work
MSC BAM – $PM_{2.5}$ BAM – TSP	• Replaced $PM_{2.5}$ Flow controller • Replaced internal filters for $PM_{2.5}$ and TSP • Checked and verified flow path • Checked and verified internal sensors (relative humidity (RH), temperature, pressure) • Conducted audits, calibrations and training on $PM_{2.5}$ and TSP • Removed and cleaned $PM_{2.5}$ head and inlet tube • Rotary pumps replaced with Medo pumps	Not applicable (N/A), maintenance was completed as planned
PSC BAM – $PM_{2.5}$ BAM – TSP	• Replaced internal filters for $PM_{2.5}$ and TSP • Checked and verified flow path • Checked and verified internal sensors (RH, temperature, pressure) • Conducted audits, calibrations and training on $PM_{2.5}$ and TSP • Removed and cleaned $PM_{2.5}$ head and inlet tube • $PM_{2.5}$ flow failure – replaced flow controller with backup from MSC • Rotary Pumps replaced with Medo Pumps	N/A; maintenance was completed as planned

2.3.2 Total Suspended Particulates (TSP)

2.3.2.1 *MSC*

The BAM TSP data at the MSC ambient air quality monitoring station had 63.3% valid data for 2024. The TSP analyzer rotary vane pump failed on March 22, 2024, and the analyzer was offline for Q2. The pump was replaced with a Medo Pump on July 26, 2024; the analyzer was calibrated and put back into operation on July 27, 2024 (Table 2.7). The hourly TSP concentrations ranged from 0 to 5,217 µg/m^3 (Figure 2.13). The 24-hour averages shown in Figure 2.13 are for data collected midnight to midnight and the monthly average is a rolling 30-day average. During the period that the analyzer was actively recording, fifty-nine of the 24-hour averages (25.1%) were greater than the Project Standard TSP 24-hour concentration (120 µg/m^3). February and March contained the highest frequency of recorded values that were greater than the Project standard (14 and 15, respectively); September had the lowest number of 24-hour average concentrations that were greater than the Project Standard (2 occurrences). Due to the extended downtime of the instrument, a comparison through Q2 cannot be made. The measured 24-hour average TSP concentrations ranged from 0 µg/m^3 to 2,909 µg/m^3.

The Project Standards for ambient air quality are applicable to areas along the PDA boundary and outwards. The TSP BAM at the MSC is located inside the PDA boundary and is therefore not in a location to establish regulatory compliance with the Project Standards. The comparison of these MSC TSP monitoring results (inside the PDA boundary) to the Project Standards is being done to guide management actions for the protection of ambient air quality. The ambient air quality within the PDA

boundary is managed using occupational (workplace) air quality standards that are different than the NAAQS that were the basis for developing the Project Standards.

The highest levels were hourly spikes and may be associated with wind causing the inlet tubes to vibrate on the roof top inlets or direct operation and maintenance interactions with the analyzer (Figure 2.13).

The hourly TSP concentrations were the highest in the winter and historically fall off through the summer. The TSP BAM at MSC has been operating since April 2022. There is not a long-term historical data set to compare with the current years TSP data; however, based on the available 2022 and 2023 data the TSP concentrations, over the 3 years, were generally higher during the winter with increasing concentrations in the spring during the freshet when dust from roadways cannot be managed with dust suppressants (water) due to freezing temperatures and obvious safety concerns. TSP concentrations usually decline through the summer. The TSP concentrations are variable throughout the rest of the year rising and falling based on rainfall, and site activities that were happening near the MSC ambient air quality monitoring station (Figure 2.11) (Nunami Stantec, 2023b, 2024). The TSP BAM was offline during the spring thaw and into the summer; historically there is a seasonal spike during spring freshet, and since the TSP BAM was offline during those time periods that data was not captured in the 2024 data set. Back up pumps and rebuild kits are now kept in inventory at the Project site to minimize extended down time in the future (Figure 2.14). Note the two different scales on the y-axis in Figure 2.14.

The measured annual average TSP concentration 148.5 µg/m^3 was greater than the Project Standard annual average concentration (60 µg/m^3) for the available period of record. The Project Standards for ambient air quality are applicable to areas along the PDA boundary and outwards. The TSP BAM at the MSC is located inside the PDA boundary and is therefore not in a location to determine compliance with the Project Standards. Nevertheless, controls should be implemented to limit the amount of dust that escapes during the ore crushing and transportation activities at the mine site.

There are some periods during 2024 when the measured TSP and $PM_{2.5}$ concentrations at the MSC do not seem to be reasonable or accurate based on visual air quality observations made by the on-site staff. Baffinland will be investigating potential causes for these apparent data anomalies and investigating additional methods of validating these measurements during 2025. The additional methods may include more frequent cleaning of the TSP and $PM_{2.5}$ sampler inlets, submitting BAM filter material and BAM data outputs to the analytical laboratory for verification, installation of a camera looking towards the sampler inlets, assessing the potential vibration interference from extended inlet tubes, and assessing the potential influence of the natural gas furnace exhaust at the MSC.

Table 2.7 Hourly Summary TSP Concentrations for MSC Ambient Air Quality Monitoring Station (µg/m^3)

	JAN	FEB	MAR	APRIL	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	ANNUAL
Mean	215.2	291.0	462.3	N/A	N/A	N/A	24.0	56.4	11.0	78.0	56.3	135.1	148.5
Median	93.6	120.6	242.4	N/A	N/A	N/A	8.3	11.1	7.0	27.8	36.7	53.1	41.8
Mode	49.9	55.3	57.5	N/A	N/A	N/A	4.5	5.0	5.7	3.6	13.8	59.3	4.5
Range	4415.1	5212.0	3863.2	0.0	0.0	0.0	298.6	1929.8	243.3	1326.4	400.7	2173.4	5217.9
Minimum	6.2	5.9	13.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	3.3	0.0
Maximum	4421.3	5217.9	3876.5	0.0	0.0	0.0	298.6	1929.8	243.3	1326.4	401.2	2176.7	5217.9
Count	710	654	529	0	0	0	154	741	719	647	711	695	5560
% Valid	95.4%	97.3%	71.1%	0.0%	0.0%	0.0%	20.7%	99.6%	100.0%	87.0%	98.8%	93.4%	63.3%

Note:
N/A – not available; analyzer offline during recording period
Negative values reflect normal noise in the analyzer and are changed to zero

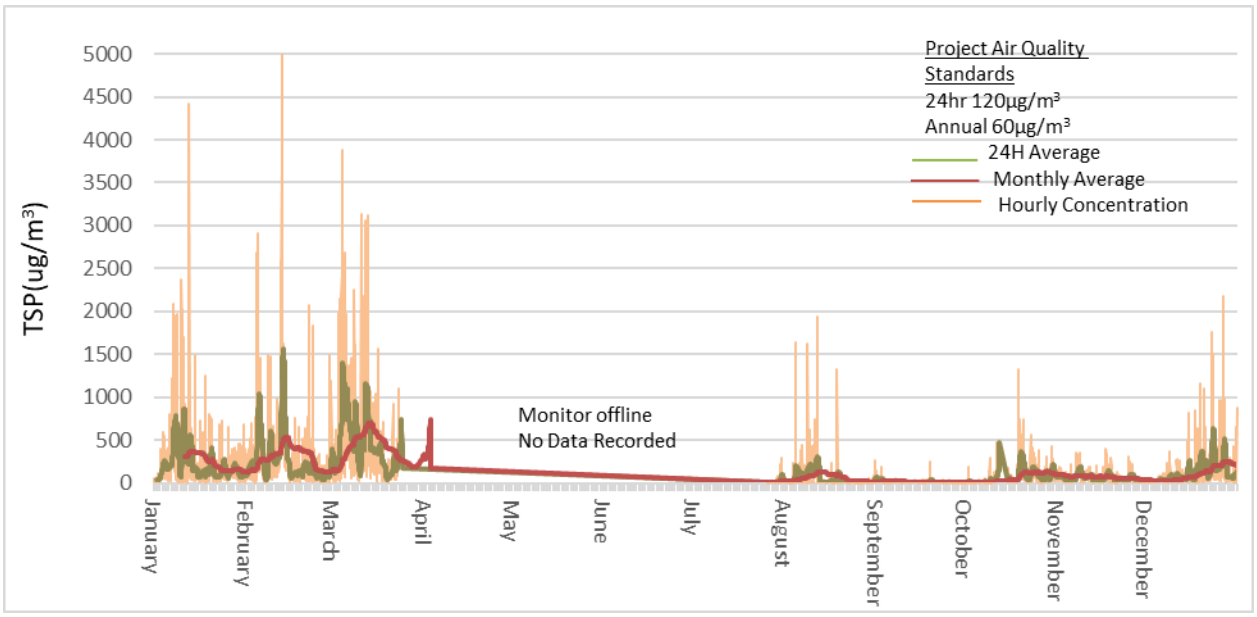


Figure 2.13 MSC Hourly TSP Concentrations with 24 hour and Monthly Average Trends

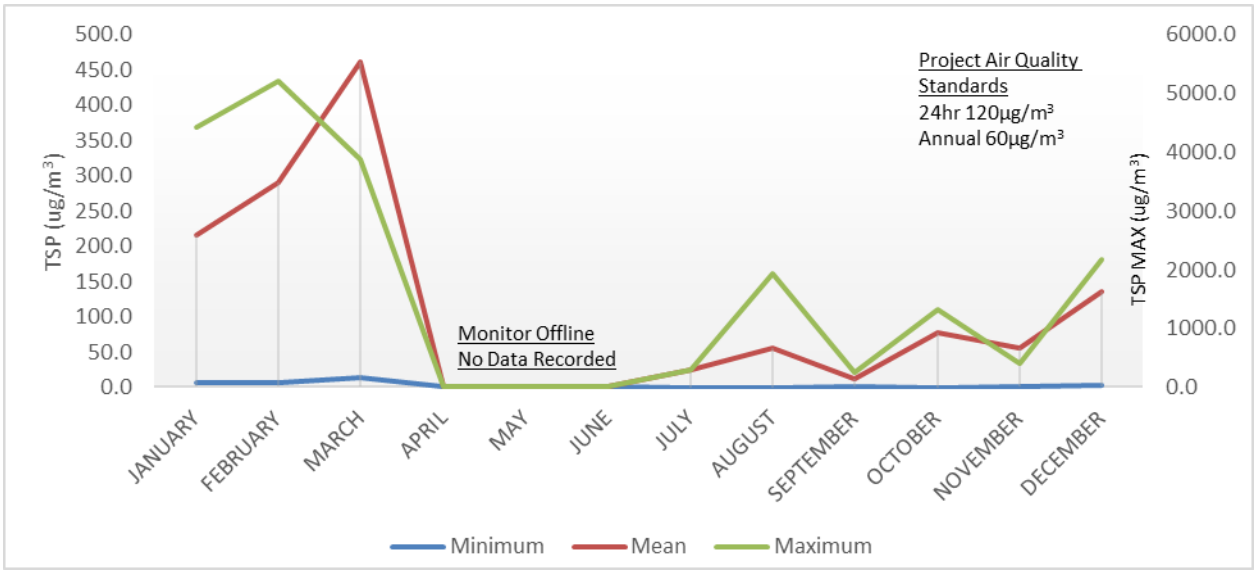


Figure 2.14 MSC TSP 24-hour Concentrations (µg/m³) by Month

(Note: TSP max on the right-side Y-axis with separate scale)

2.3.2.2 *PSC*

The BAM TSP data at the PSC ambient air quality monitoring station had 58.0% valid data for 2024. For the available period of record, the hourly TSP concentration ranged from 0 to 324.7 µg/m^3 (Figure 2.15). The 24-hour averages shown in Figure 2.15 are for data collected midnight to midnight and the monthly average is a rolling 30-day average. One 24-hour average concentration was greater than the 24-hour Project Standard (120 µg/m^3) with a value of 153 µg/m^3, occurring on March 26, 2024. The measured annual average TSP concentration (11.8 µg/m^3) was less than the annual Project Standard concentration (60 µg/m^3) for the available period of record. The TSP concentrations remained low throughout the early part of the year and showed an increase in late spring prior to the pump failure. The pump was replaced in July capturing the late season increase while vessel loading was still underway. The measured TSP concentrations were reduced in September and variable through October, November and December (Figure 2.16). Note the two different scales on the y-axis in Figure 2.16.

The TSP BAM at PSC has been operating since April 2022. There is not a long-term historical data set to compare with the current years TSP data; however, based on the available 2022 and 2023 data the TSP concentrations at PSC and MSC indicate a similar trend over the three years. In all three years, the TSP concentrations are higher during the winter and the concentrations increase in the spring during the freshet when dust from roadways cannot be managed with dust suppressants (water) due to freezing temperatures and obvious safety concerns. TSP concentrations usually decline through the summer. The TSP concentrations are variable throughout the year rising and falling based on rainfall, and site activities happening near the PSC ambient air quality monitoring station (Figure 2.11) (Nunami Stantec, 2023b, 2024).

Table 2.8 Hourly Summary TSP Concentrations for PSC Ambient Air Quality Monitoring Station (µg/m³)

	JAN	FEB	MAR	APRIL	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	ANNUAL
Mean	11.0	13.1	19.6	12.1	N/A	N/A	7.3	11.2	5.2	9.0	10.3	13.9	11.8
Median	8.3	9.9	12.4	4.8	N/A	N/A	7.0	6.9	4.4	4.9	6.5	8.2	7.3
Mode	4.7	7.4	9.6	4.3	N/A	N/A	7.2	6.7	3.9	6.9	2.6	7.1	6.7
Range	120.8	95.2	191.4	324.7	N/A	N/A	21.1	324.4	31.8	189.7	242.9	122.3	324.7
Minimum	0.0	0.0	0.0	0.0	N/A	N/A	0.0	-0.0	0.0	0.0	0.0	0.0	0.0
Maximum	120.8	95.2	191.4	324.7	N/A	N/A	21.1	324.4	31.8	189.7	242.9	122.3	324.7
Count	490	610	616	348	0	0	46	741	407	631	711	493	5093
% Valid	65.9%	90.8%	82.8%	48.3%	0.0%	0.0%	6.2%	99.6%	56.5%	84.8%	98.8%	66.3%	58.0%

Note:
N/A – not available; analyzer offline during recording period. Range may exceed Maximum value when there are negative values present.
Negative values reflect normal noise in the analyzer and are changed to zero

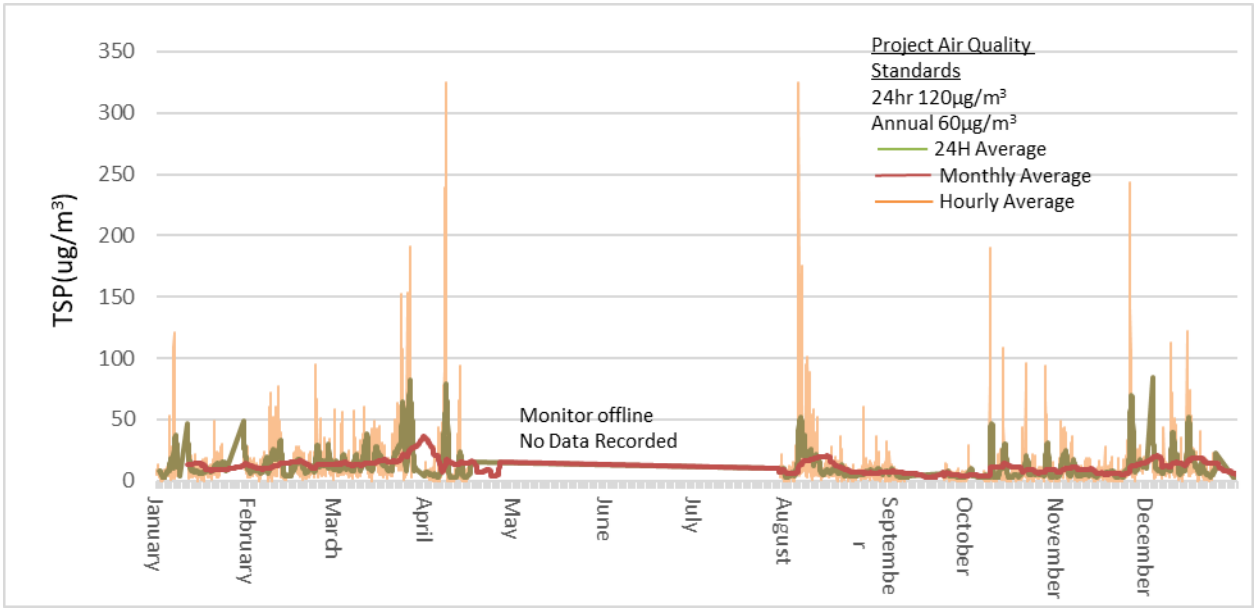


Figure 2.15 PSC Hourly TSP Concentrations with 24 hour and Monthly Average Trends

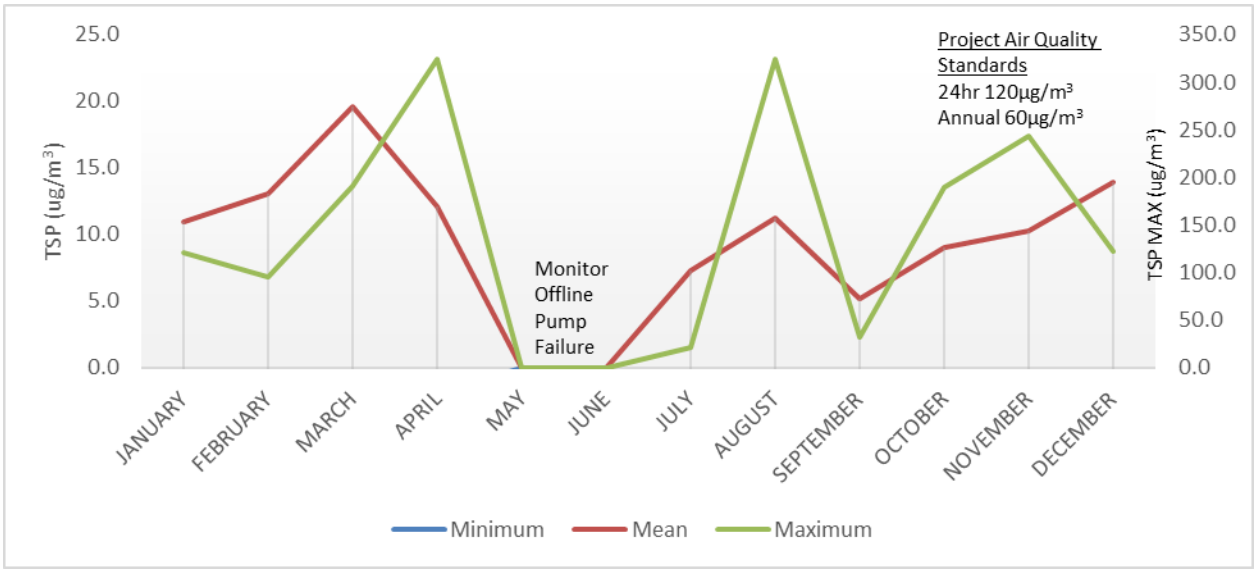


Figure 2.16 PSC TSP 24 Hour Concentrations (µg/m³) by Month

(Note: TSP max on the right-side Y-axis with separate scale)

2.3.3 Respirable Particulates 2.5 µm in Diameter and Less ($PM_{2.5}$)

2.3.3.1 *MSC*

The BAM $PM_{2.5}$ data at the MSC ambient air quality monitoring station had 69.7% valid data for 2024 with 6,122 recorded hours (Table 2.9). There are 97 occurrences where the measured hourly $PM_{2.5}$ were greater than the stations associated TSP measured concentration.

The measured hourly $PM_{2.5}$ concentration values that were greater than the measured hourly TSP concentration for the same hour were marked as invalid and excluded from the analysis. The cause of the abnormal values may have been associated with wind or other events vibrating or disturbing the sampler inlet head. Excessive disturbances in the high dust environment can cause trapped dust in the cutter head ($PM_{2.5}$ cyclone) to be liberated and deposited on the filter paper.

The hourly $PM_{2.5}$ concentrations ranged from 0.0 to 1,275.6 µg/m^3 (Figure 2.17). The vacuum pump failed in May 2024 and was brought back online in July when new medo pumps arrived on-site. Backup pumps and rebuild kits are now maintained in inventory to prevent data gaps due to pump failure.

Due to the wind events and other disturbances causing the measured $PM_{2.5}$ to be greater than the measured TSP values, ongoing, frequent cleaning and maintenance of the inlet tube and sampler needs to be conducted. During 2024 there were seventeen recorded events that were greater than the 24-hour $PM_{2.5}$ Project Standard (30 µg/m^3). The measured 24-hour $PM_{2.5}$ concentrations that were greater than the Project Standard ranged from 39.4 to 643.6 µg/m^3. Four of the seventeen occurrences were in February and the remaining events were in March. The measured $PM_{2.5}$ concentrations in 2024 were highest in February and March falling rapidly in April. The analyzer was offline from April 22 to July 26, 2024. When the analyzer came back online, the measured $PM_{2.5}$ concentrations remained low throughout the remainder of 2024 (Figure 2.18). The average measured $PM_{2.5}$ concentration, for the available period of record (13.7 µg/m^3), was greater than the Project Standard annual average concentration (10 µg/m^3), the overall high concentrations were mostly due to peaks recorded during February and March 2024. The $PM_{2.5}$ BAMs have been operating since April 2022. There is not a long-term historical data set to compare the current years data to; however, based on the 2022 and 2023 data the trends in the $PM_{2.5}$ concentrations at the MSC are consistent with trends in the TSP concentrations. Higher $PM_{2.5}$ concentrations are recorded during the winter than the summer with an increase in the concentrations during the spring during freshet when dust from roadways cannot be managed with dust suppressants (water) due to freezing temperatures and obvious safety concerns. The $PM_{2.5}$ concentrations usually decline through the summer. The $PM_{2.5}$ concentrations are variable throughout the year rising and falling based on rainfall, and site activities occurring near the MSC ambient air quality monitoring station (Figure 2.11) (Nunami Stantec, 2023b, 2024).

There are some periods during 2024 when the measured TSP and $PM_{2.5}$ concentrations at the MSC do not seem to be reasonable or accurate based on visual air quality observations made by the on-site staff. Baffinland will be investigating potential causes for these apparent data anomalies and investigating additional methods of validating these measurements during 2025. The additional methods may include more frequent cleaning of the TSP and $PM_{2.5}$ sampler inlets, submitting BAM filter material and BAM data outputs to the analytical laboratory for verification, installation of a camera looking towards the sampler inlets, assessing the potential interference from vibrations from extended inlet tubes and assessing the potential influence of the natural gas furnace exhaust at the MSC.

Table 2.9 Hourly Summary $PM_{2.5}$ Concentrations for MSC Ambient Air Quality Monitoring Station (µg/m^3)

	JAN	FEB	MAR	APRIL	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	ANNUAL
Mean	5.0	45.6	57.0	4.6	N/A	N/A	1.5	1.1	0.9	2.0	2.7	5.6	13.7
Median	4.0	15.6	21.2	3.7	N/A	N/A	0.5	0.4	0.5	0.7	2.3	4.2	3.2
Mode	3.9	8.4	9.2	3.1	N/A	N/A	1.5	1.4	-0.1	0.0	2.6	1.4	0.0
Range	34.8	1158.7	1275.6	158.8	N/A	N/A	122.6	14	17.9	46.4	43.8	81.9	1275.6
Minimum	0.0	0.0	0.0	0.0	N/A	N/A	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Maximum	34.8	1158.7	1275.6	158.8	N/A	N/A	122.6	14	17.9	46.4	43.8	81.9	1275.6
Count	711	640	703	388	0	0	132	741	657	712.	712	726	6122
% Valid	95.6%	95.2%	94.5%	53.9%	0.0%	0.0%	17.7%	99.6%	91.3%	95.7%	99.0%	97.6%	69.7%

Note:
N/A – not available; monitor offline during recording period
Negative values reflect normal noise in the analyzer and are changed to zero

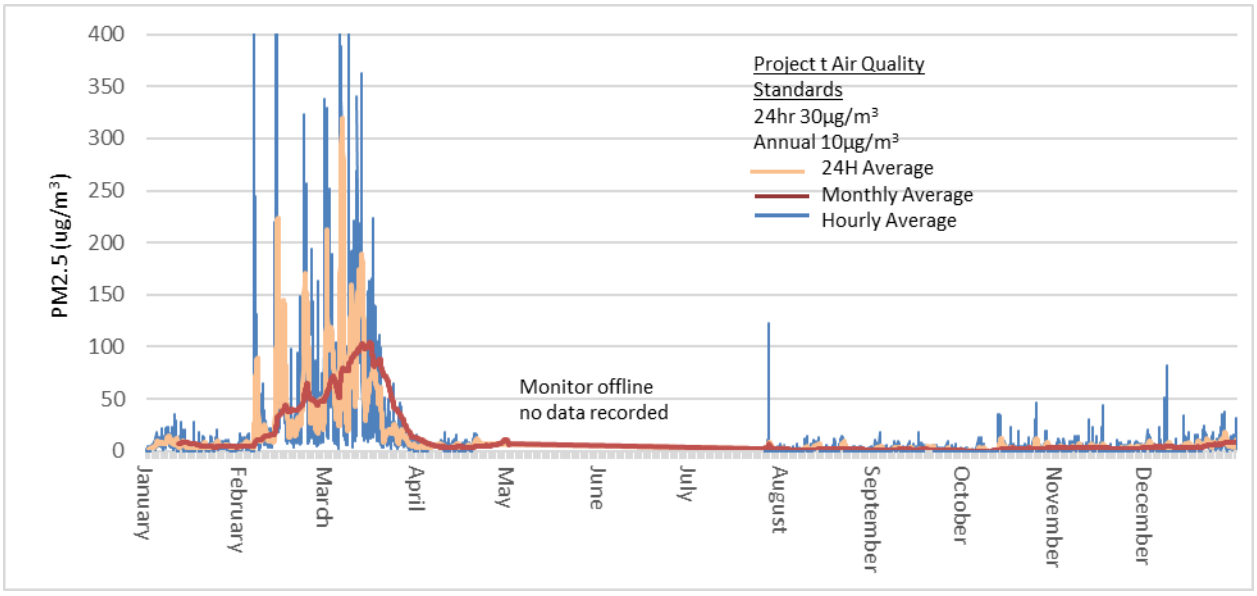


Figure 2.17 MSC Hourly $PM_{2.5}$ Concentrations with 24 hour and Monthly Average Trends

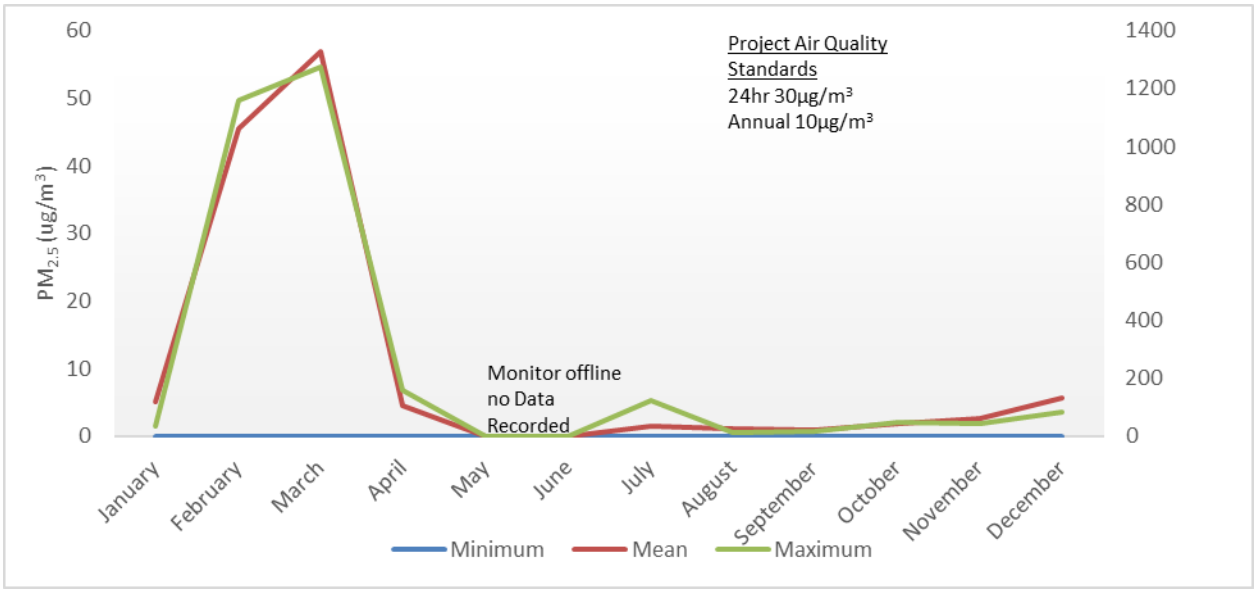


Figure 2.18 MSC $PM_{2.5}$ Hourly Concentrations (µg/m³) by Month

(Note: $PM_{2.5}$ maximum on Y-axis 2 with separate scale)

Continuous $PM_{2.5}$ concentration monitoring began in April 2022 and three years of data are not yet available for comparison to the 2020 CAAQS.

2.3.3.2 *PSC*

The BAM $PM_{2.5}$ concentration data at the PSC ambient air quality monitoring station had 73.3% valid data for 2024.The $PM_{2.5}$ analyzer pump failed on April 27 and was back online on July 29, 2024 after a replacement pump was installed (Table 2.10).

The valid hourly measured $PM_{2.5}$ concentrations ranged from -6.2 to 54.5 µg/m^3 (Figure 2.19). The 24-hour averages shown in Figure 2.19 are for data collected midnight to midnight and the monthly average is a rolling 30-day average. The BAM successfully recorded 6,435 hours of data in 2024. During the 2024 operational period, there were no measured 24-hour $PM_{2.5}$ concentrations that were greater than the 24-hour $PM_{2.5}$ Project Standard (30 µg/m^3).

The monthly average $PM_{2.5}$ concentrations were highest in quarter 1, 2024. The analyzer was offline from April 27 to July 29, 2024, so a trend during that period is not available. Valid $PM_{2.5}$ concentrations were recorded from August to October and began to trend upward in November through to the end of 2024. (Figure 2.20). The average annual $PM_{2.5}$ concentration for the available period of record (3.3 µg/m^3) was less than the Project Standard (10 µg/m^3). The $PM_{2.5}$ BAM at PSC has been operating since April 2022. There is not a long-term historical data set to compare the current years data to, however, based on the available 2022 and 2023 data the trend in the $PM_{2.5}$ concentrations at the PSC are consistent with the TSP concentrations. The $PM_{2.5}$ concentrations trend higher during the winter than the summer with a rise in concentrations in the spring during freshet when dust from roadways cannot be managed with dust suppressants (water) due to freezing temperatures and obvious safety concerns. The $PM_{2.5}$ concentrations usually then decline through the summer. The $PM_{2.5}$ concentrations remains variable throughout the rest of the year rising and falling based on rainfall, and site activities occurring near the PSC ambient air quality monitoring station (Figure 2.11) (Nunami Stantec, 2023b, 2024).

Table 2.10 Hourly Summary $PM_{2.5}$ Concentrations for PSC Ambient Air Quality Monitoring Station (µg/m³)

	JAN	FEB	MAR	APRIL	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	ANNUAL
Mean	5.1	4.9	4.0	3.8	N/A	N/A	0.3	2.2	1.3	1.7	3.2	4.3	3.3
Median	4.3	4.2	3.5	3.1	N/A	N/A	0.2	1.9	1.2	1.5	2.8	4.0	2.8
Mode	3.8	3.3	3.1	3.0	N/A	N/A	0.5	1.5	2.4	1.1	2.3	3.9	2.4
Range	37.1	41.1	21.5	26.8	N/A	N/A	6.7	16.2	15.9	54.5	21.7	21.7	54.5
Minimum	0.0	0.0	0.0	0.0	N/A	N/A	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Maximum	37.1	41.1	21.5	26.8	0	0	6.7	16.2	15.9	54.5	21.7	21.7	54.5
Count	702	692	712	636	0	0	53	741	719	725	715	740	6435
% Valid	94.4%	99.4%	95.7%	88.3%	0.0%	0.0%	7.1%	99.6%	99.9%	97.5%	99.3%	99.5%	73.3%

Note:
N/A – Data were invalid during this period due to equipment malfunction (i.e., external pump failure)
Negative values reflect normal noise in the analyzer and are changed to zero

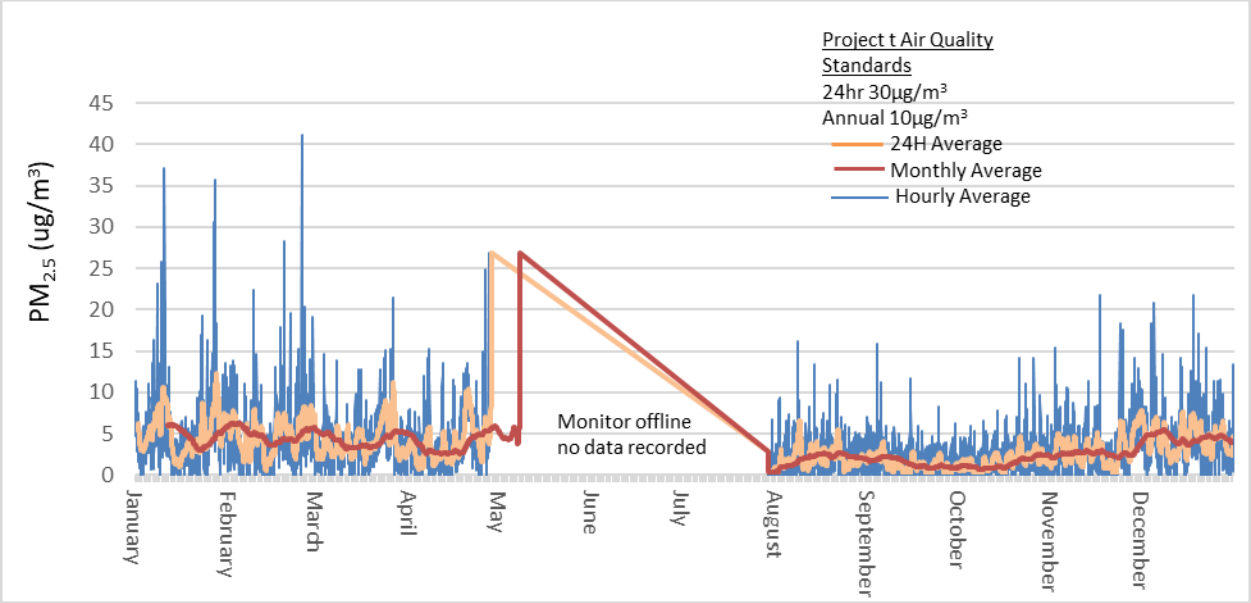


Figure 2.19 PSC Hourly $PM_{2.5}$ Concentrations with 24 hour and Monthly Average Trends

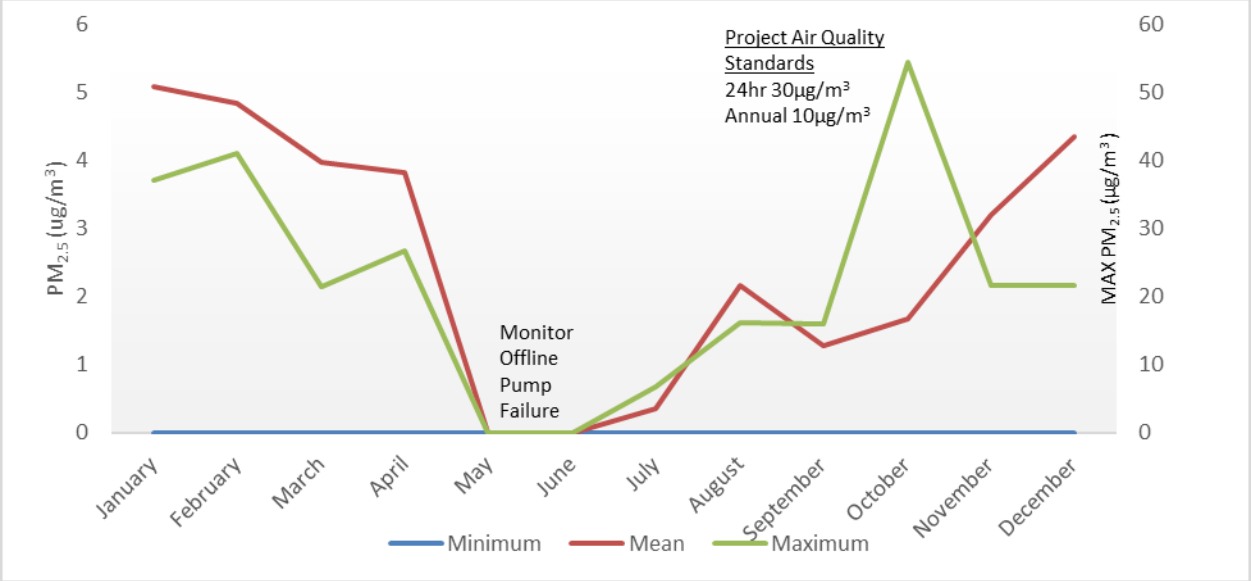


Figure 2.20 PSC $PM_{2.5}$ Concentrations (µg/m³) by Month

(Note: $PM_{2.5}$ max on right-hand Y-axis with a separate scale)

Continuous monitoring for $PM_{2.5}$ concentrations at PSC began in April 2022. Three years of continuous measured $PM_{2.5}$ concentration data are not available at the PSC, therefore comparison to the 2020 CAAQS is not possible.

3 Meteorology

The Mary River, Milne Port, and Steensby meteorology monitoring stations are equipped to collect a suite of measurements, which are summarized in Table 3.1. Additionally, the measurements provided at the Pond Inlet Airport Climate Station are also provided in summary form for comparison. In general, each station provides measurements of ambient temperature, relative humidity, rain precipitation, and wind speed/direction.

The meteorology stations at Mary River, Milne Port, and Steensby also record measurements of solar radiation. Although the climate station at the Pond Inlet Airport does not collect solar radiation data, the three (3) meteorology stations at the Project can be compared to each other. The data collected from the meteorological stations are used to establish an ongoing climatic record in key project areas.

Table 3.1 Summary of Data Collected at Each Baffinland Meteorology Station and the Pond Inlet Airport Climate Station in 2024

Station	Temperature	Relative Humidity	Rainfall Precipitation	Solar Radiation	Wind Speed/Wind Direction
Mary River Meteorology Station	✓	✓	✓	✓	✓
Milne Port Meteorology Station	✓	✓	✓	✓	✓
Steensby Meteorology Station	✓	✓	✓	✓	✓
Pond Inlet Airport Climate Station	✓	✓	✓		✓

3.1 Methods

The three meteorology stations at the Project are each equipped with a datalogger and several sensors, which are consistent across the three sites as indicated in Table 3.1. Until 2020, Campbell Scientific Canada provided annual meteorology station maintenance services. These services have been provided by Nunami Stantec since 2020. A summary of the probes currently installed at each site is provided in Table 3.2.

Each meteorology station is equipped with an enclosure that stores the datalogger, charger, and communications hardware. The enclosure is sealed after maintenance and contains a desiccant to prevent the buildup of moisture. The datalogger receives input from the sensors, which are stored and synched with offsite data storage via Iridium satellite communications (Campbell Scientific Canada 2015).

Table 3.2 Summary of Data Collection Equipment at Each Baffinland Meteorology Station

Station	Sensors	Datalogger	Communications
Mary River Meteorology Station	HC2-S3-XT Rotronics Temp and Relative Humidity Probe	CR 1000-55	9522B Iridium Satellite Modem
	05103 RM Young Wind Monitor		COM9522B Satellite Modem Interface
	SP Lite2 Kipp & Zonen Solar Radiation Sensor		SC932A CS I/O Interface
	SBS 500 Tipping Bucket Rain Gauge		
Milne Port Meteorology Station	HC2-S3-XT Rotronics Temp and Relative Humidity Probe	CR 1000-55	9522B Iridium Satellite Modem
	05108 RM Young Wind Monitor		COM9522B Satellite Modem Interface
	SP Lite2 Kipp & Zonen Solar Radiation Sensor		SC932A CS I/O Interface
	SBS 500 Tipping Bucket Rain Gauge		
Steensby Meteorology Station	HC2-S3-XT Rotronics Temp and Relative Humidity Probe	CR 1000-55	9522B Iridium Satellite Modem
	05108 RM Young Wind Monitor		COM9522B Satellite Modem Interface
	SP Lite2 Kipp & Zonen Solar Radiation Sensor		SC932A CS I/O Interface
	SBS 500 Tipping Bucket Rain Gauge		

The gathered data were post processed to provide monthly averages for 2024. These datasets were then compared to the Canada Climate Normal data, which are a set of monthly averages taken across a 30-year span beginning in 1991 and ending in 2020. This comparison provides context for year-over-year trends when compared to the 2024 dataset.

Additionally, ECCC provides guidance on data gathering and completeness for each type of data monitored (ECCC 2023). Data that do not adhere to the completeness standards can still be reported but will receive a code indicating that they are incomplete. In general, data with code A adhere to the listed completeness criteria, data with code B contain at least 25 years (83% of the 30-year Climate Normal data requirement), data with code C contain at least 20 years (67% of the 30-year Climate Normal data requirement), data with code D contain at least 15 years (50% of the 30-year Climate Normal data requirement), data with code E contain at least 10 years (33% of the 30-year Climate Normal data requirement), data with code F contain at least 5 years (17% of the 30-year Climate Normal data requirement), and data with code G contain less than five years of data.

For reference, the Climate Normal data for Pond Inlet Airport are predominantly code C. Data that do not adhere to code A are noted in the tabulated results (ECCC 2023).

3.1.1 Quality Assurance and Quality Control

Table 3.3 summarizes the annual 2024 maintenance work completed for the three Baffinland meteorological stations. The tasks that could not be completed due to the lack of some specific items at site are also listed with a note on the additional work needed.

Table 3.3 Summary of the 2024 Annual Maintenance Completed for the Meteorological Stations

Meteorology Station	Maintenance Completed	Maintenance Not Completed and Requiring Additional Work
Mary River	• Mary River meteorology station tipping bucket rain gauge (TBRG) mechanism was cleaned, the sensor cables and power supply system were checked (especially the solar panel charge controller). The desiccant inside the datalogger enclosure was replaced, the solar panel was cleaned.	The planned 2024 maintenance was completed.
Milne Port	• Milne Port meteorology station TBRG mechanism was cleaned, the sensor cables and power supply system (especially the solar panel charge controller) were checked. The desiccant inside the datalogger enclosure was replaced, the solar panel was cleaned.	The planned 2024 maintenance was completed.
Steensby	• Steensby meteorology station maintenance included re-installation of TBRG that had been removed in Fall 2023 for safety, replacing wind screen around the TBRG, replacing single battery with two external 12-volt batteries, replacing the new solar panel charge controller, grounding wire and desiccant inside the datalogger enclosure, rewiring the vandalized Iridium satellite antenna, and cleaning solar panel	Replace external batteries and check the performance of the solar panels; if necessary, replace the solar panels and the associated charge controllers.

3.2 Results and Discussion

As presented below, the 2024 meteorology data recorded at each meteorology station are compared with data from the Pond Inlet Airport Climate Station as well as the Canadian Climate Normals (1991-2020).

The meteorology stations are situated in the Northern Arctic Ecozone. The climate is semi-arid with relatively little precipitation. Monthly mean temperatures at long-term ECCC climate stations range from approximately -34ºC in February at Pond Inlet to about 7ºC in July at Igloolik. Mean monthly precipitation at long-term ECCC climate stations range from 4 mm in February at Pond Inlet, Sanirajak, and Nanisivik, to about 64 mm in August at Dewar Lakes. Variability in precipitation at the long-term ECCC stations ranges from about 5 mm in January to about 30 mm in August (Baffinland 2018).

Generally, snow melt occurs in late June and frost–free conditions last until late August. The onset of snow melt usually begins around early to mid-June when daytime temperatures are consistently above 0ºC. Following the onset of snow melt, air temperatures rise, and the amount of daylight increases, triggering plant growth and green-up (Baffinland 2018).

3.2.1 ECCC Recommendations

When processing meteorological information, ECCC recommends that a climatological day be taken from 6:00 Coordinated Universal Time (UTC) one day to 6:00 UTC the following day. For the site of interest as agreed upon (and for a large portion of Canada), one climatological day will start at approximately midnight one day and end at midnight the following day (ECCC 2023).

ECCC defines mean temperature data completeness for the Canadian Climate Normal by the 3-and-5 rule (ECCC 2023). Months with more than three consecutive days without data or more than five total days without data are considered incomplete.

Definitions of completeness for humidity data, and wind data require a 90% completeness of hourly data per month (ECCC 2023). For precipitation data, 100% monthly collection is required for completeness for airport stations that support flight operations (ECCC 2023).

3.2.2 Air Temperature

Currently, all three stations (Mary River, Milne Port, and Steensby) record an hourly minimum and maximum air temperature reading. Therefore, the daily minimum and maximum values were taken from the hourly minimum and maximum values over the course of the climatological day. For the average air temperature, the hourly air temperature readings are averaged over the entire monthly period.

Summaries of the monthly averages for the daily minimum, daily maximum and average air temperatures are presented in Table 3.4, Table 3.5, and Table 3.6, respectively. The trends are presented graphically in Figure 3.1, Figure 3.2, and Figure 3.3, respectively.

The datasets from each of the Project meteorology stations are compared to the 2024 data retrieved from the Pond Inlet Airport Climate Station, as well as the Canadian Climate Normal data (taken from Pond Inlet Airport). As indicated in Table 3.4, the Steensby meteorological station experienced

intermittent data outages from January to April 2024 due to low battery voltage. No data were recorded during May and June 2024 as the station was completely offline. Data recording resumed in late July after two external batteries were replaced during a visit to conduct maintenance. A total of 4,817 hours of data were missing between January and July: 707 hours in January, 631 hours in February, 648 hours in March, 685 hours in April, and all data for May and June, with an additional 682 hours missing in July. The average air temperatures for January to July 2024 at Steensby are therefore not complete as they do not meet the requirements of the ECCC recommended 3-and-5 rule.

The trends of lowest and highest recorded air temperatures are summarized in Table 3.7 and Table 3.8, respectively. The stations with recorded data are Mary River and Milne Port. The meteorological data summary for 2006–2015 was provided by Knight Piesold (Knight Piesold 2016). Data for 2018 and 2019, as well as the baseline data were provided in the 2018 and 2019 EDI TEAMR (EDI 2018, 2019).

For 2024, the results presented for average minimum, maximum and daily air temperatures indicate that each station follows the same general trend when compared to the Canadian Climate Normal for the Pond Inlet Airport. Peak low air temperatures occur during the winter of the year (December through March), with peak high air temperatures occurring during July and August. The daily average air temperatures tended to be higher than the trend indicated in the Climate Normal for most of the year, except between June and August where the daily average air temperatures were similar. The trend of the station temperatures (Mary River, Milne Port, and Steensby) remained close to the Pond Inlet Climate Normals throughout the year, with the exception of periods from May to August and in December, when they deviated.

At Mary River, the lowest recorded 2024 air temperature was -47.3°C in January (Table 3.7). Typically, the minimum air temperature had been recorded in February in 2020, 2021 and 2023 and December in 2022, which is consistent with 2024. Although it is slightly warmer than the previous years, it falls within the temperature range of 2022 and 2023, staying within a few degrees. Overall, it remains consistent with the past couple of years. The highest air temperature recorded in 2024 was 19.2°C, which is consistent with previous yearly data as it also occurred in July. Compared to 2023, the 2024 maximum air temperature at Mary River was lower, aligning more closely with 2018 data. In general, summer air temperatures at the Mary River were highest during June, July and August (according to the averages presented in Figure 3.1 through Figure 3.3), which is consistent with 2023 data.

At Milne Port, the lowest recorded air temperature in 2024 was -41.8°C, recorded in late January, similar to prior years when minimum occurred in February. The 2024 minimum temperature aligns with 2022 values, which is slightly warmer than in 2023. The highest air temperature recorded in 2024 was 18.9°C, similar to the Mary River site and occurred in July. This is consistent with previous years, although slightly cooler than in 2023.

Table 3.4 Summary of 2024 Daily Minimum Temperature at the Baffinland Meteorology Stations and the Pond Inlet Airport Climate Station

Station	Daily Minimum Temperature (°C)												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Mary River Meteorology Station	-30.2	-33.3	-28.7	-19.2	-11.5	1.3	5.6	3.8	1.6	-5.6	-20.7	-33.8	-14.2
Milne Port Meteorology Station	-29.4	-30.1	-28.0	-18.1	-11.1	0.4	4.6	3.9	1.9	-4.8	-19.2	-29.9	-13.3
Steensby Meteorology Station [a]	-	-	-	-	-	-	-	3.5	2.2	-3.0	-14.9	-29.3	-8.3
Pond Inlet Airport Climate Station [b]	-29.8	-30.3	-28.8	-17.8	-10.6	-0.2	3.1	3.6	1.9	-4.4	-16.2	-29.6	-13.2
Pond Inlet Airport Climate Station [c]	-35.5	-36.5	-33.4	-25.1	-11.9	0.0	3.2	2.3	-3.3	-11.5	-23.8	-30.5	-17.2

Notes:

"-" means data were incomplete or missing

[a] A total of 4,817 hours of data were missing from January to July: 707 hours in January, 631 hours in February, 648 hours in March, 685 hours in April, all data in May and June, and 682 hours in July.

[b] Based on 2024 hourly data: data missing on Jun. 03 at 1:00 PM and 3:00 PM, Jun. 22 at 4:00 PM to Jun. 23 at 5:00 PM, Jun. 29 at 6:00 PM, Aug. 08 at 7:00 PM, Sep. 24 at 4:00 AM to 10:00 AM, Nov.11 at 12:00 PM to Nov. 12 at 11:00 AM, Nov. 22 at 9:00 PM to Nov. 23 at 2:00 PM, 2024

[c] Based on 1991 to 2020 Climate Normal data

Table 3.5 Summary of 2024 Daily Maximum Temperature at the Baffinland Meteorology Stations and the Pond Inlet Airport Climate Station

Station	Daily Maximum Temperature (°C)												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Mary River Meteorology Station	-22.0	-25.7	-19.4	-9.8	-4.3	7.1	12.7	10.6	6.1	-1.0	-13.2	-24.4	-6.9
Milne Port Meteorology Station	-23.8	-24.4	-21.7	-11.5	-5.3	5.3	11.3	9.5	5.7	-1.0	-12.9	-24.3	-7.8
Steensby Meteorology Station [a]	-	-	-	-	-	-	-	8.7	5.2	0.2	-9.7	-22.1	-3.5
Pond Inlet Airport Climate Station [b]	-25.7	-25.5	-23.4	-12.1	-5.7	3.6	9.2	8.3	5.6	-0.6	-11.8	-24.9	-8.6
Pond Inlet Airport Climate Station [c]	-28.9	-29.7	-25.7	-16.6	-4.3	5.9	11.1	8.7	1.8	-5.5	-16.6	-23.6	-10.3

Notes:

"-" means data were incomplete or missing

[a] A total of 4,817 hours of data were missing from January to July: 707 hours in January, 631 hours in February, 648 hours in March, 685 hours in April, all data in May and June, and 682 hours in July.

[b] Based on 2024 hourly data: data missing on Jun. 03 at 1:00 PM and 3:00 PM, Jun. 22 at 4:00 PM to Jun. 23 at 5:00 PM, Jun. 29 at 6:00 PM, Aug. 08 at 7:00 PM, Sep. 24 at 4:00 AM to 10:00 AM, Nov.11 at 12:00 PM to Nov. 12 at 11:00 AM, Nov. 22 at 9:00 PM to Nov. 23 at 2:00 PM, 2024

[c] Based on 1991 to 2020 Climate Normal data

Table 3.6 Summary of 2024 Average Daily Temperature at the Baffinland Meteorology Stations and the Pond Inlet Airport Climate Station

Station	Daily Average Temperature (°C)												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Mary River Meteorology Station	-25.9	-29.6	-24.2	-14.0	-7.6	4.3	9.2	7.2	3.9	-3.0	-16.4	-29.1	-10.4
Milne Port Meteorology Station	-26.6	-27.5	-25.0	-14.9	-8.0	2.8	7.7	6.4	3.7	-2.9	-16.1	-27.2	-10.6
Steensby Meteorology Station [a]	-	-	-	-	-	-	-	5.5	3.5	-1.3	-12.0	-26.0	-6.1
Pond Inlet Airport Climate Station [b]	-27.8	-27.8	-25.9	-14.6	-7.8	1.8	6.3	6.1	3.8	-2.1	-14.1	-27.2	-10.8
Pond Inlet Airport Climate Station [c]	-32.2	-33.1	-29.4	-20.9	-8.1	3.0	7.2	5.6	-0.7	-8.5	-20.3	-27.2	-13.7

Notes:

"-" means data were incomplete or missing

[a] A total of 4,817 hours of data were missing from January to July: 707 hours in January, 631 hours in February, 648 hours in March, 685 hours in April, all data in May and June, and 682 hours in July.

[b] Based on 2024 hourly data: data missing on Jun. 03 at 1:00 PM and 3:00 PM, Jun. 22 at 4:00 PM to Jun. 23 at 5:00 PM, Jun. 29 at 6:00 PM, Aug. 08 at 7:00 PM, Sep. 24 at 4:00 AM to 10:00 AM, Nov.11 at 12:00 PM to Nov. 12 at 11:00 AM, Nov. 22 at 9:00 PM to Nov. 23 at 2:00 PM, 2024

[c] Based on 1991 to 2020 Climate Normal data

Table 3.7 Summary of 2005 to 2024 Lowest Temperature Trends at the Baffinland Meteorology Stations

Station	Minimum Temperature (°C)								
	2005–2010 Baseline [a]	2006-2015 Summary [b]	2018 [c]	2019 [a]	2020 [d]	2021 [d]	2022 [d]	2023 [d]	2024 [d]
Mary River Meteorology Station	-59.1	-46.6	-45.8	-40.3	-40.1	-44.9	-45.3	-48.9	-47.3
Milne Port Meteorology Station	-46.9	-44.2	-44.4	-50.2	-45.5	-43.2	-41.6	-43.9	-41.8

Notes:
[a] excluding erroneous readings of extreme lows below -60°Celsius (EDI 2023)
[b] excluding an erroneous low of -73°Celsius in September 2014 (EDI 2023).
[c] EDI (2018)
[d] Taken from absolute minimum temperature in recorded data

Table 3.8 Summary of 2005 to 2024 Highest Temperature Trends at the Baffinland Meteorology Stations

Station	Maximum Temperature (°C)								
	2005-2010 Baseline [a]	2006-2015 Summary [b]	2018 [c]	2019 [a]	2020 [d]	2021 [d]	2022 [d]	2023 [d]	2024 [d]
Mary River Meteorology Station	22.8	22.8	19.4	21.3	33.0	16.9	24.1	21.3	19.2
Milne Port Meteorology Station	22.3	22.3	18.7	10.7	22.6	16.3	22.6	19.6	18.9

Notes:
[a] EDI (2019)
[b] Knight Piesold (2016)
[c] EDI (2018)
[d] Taken from absolute maximum temperature in recorded data

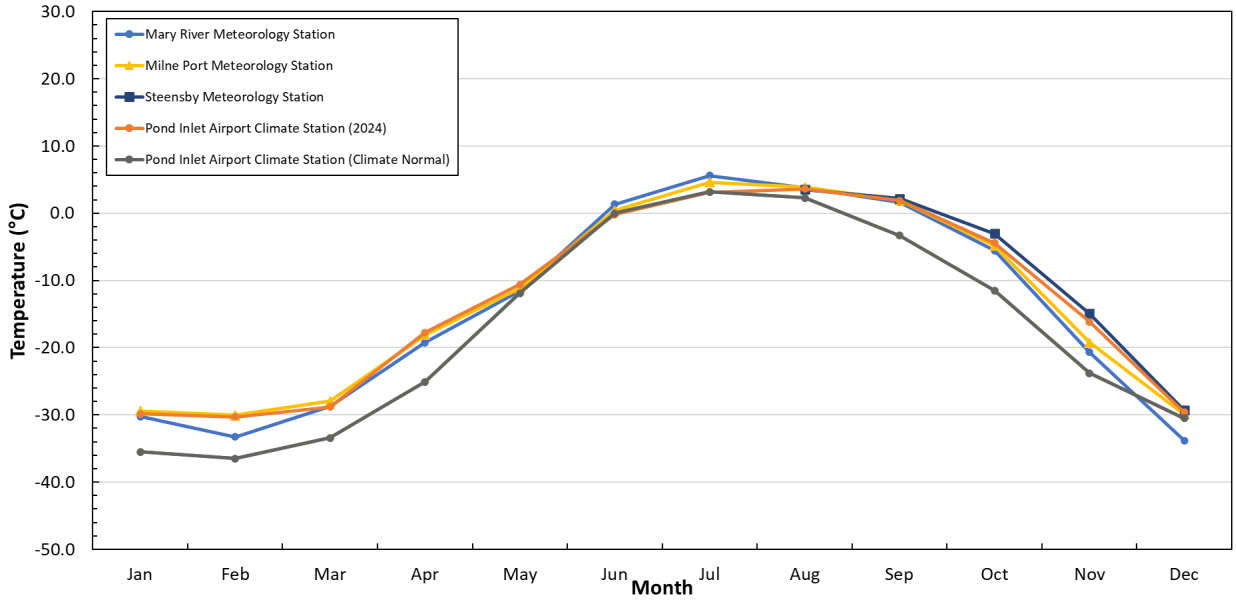


Figure 3.1 Summary of 2024 Daily Minimum Temperature at the Baffinland Meteorology Stations and the Pond Inlet Airport Climate Station

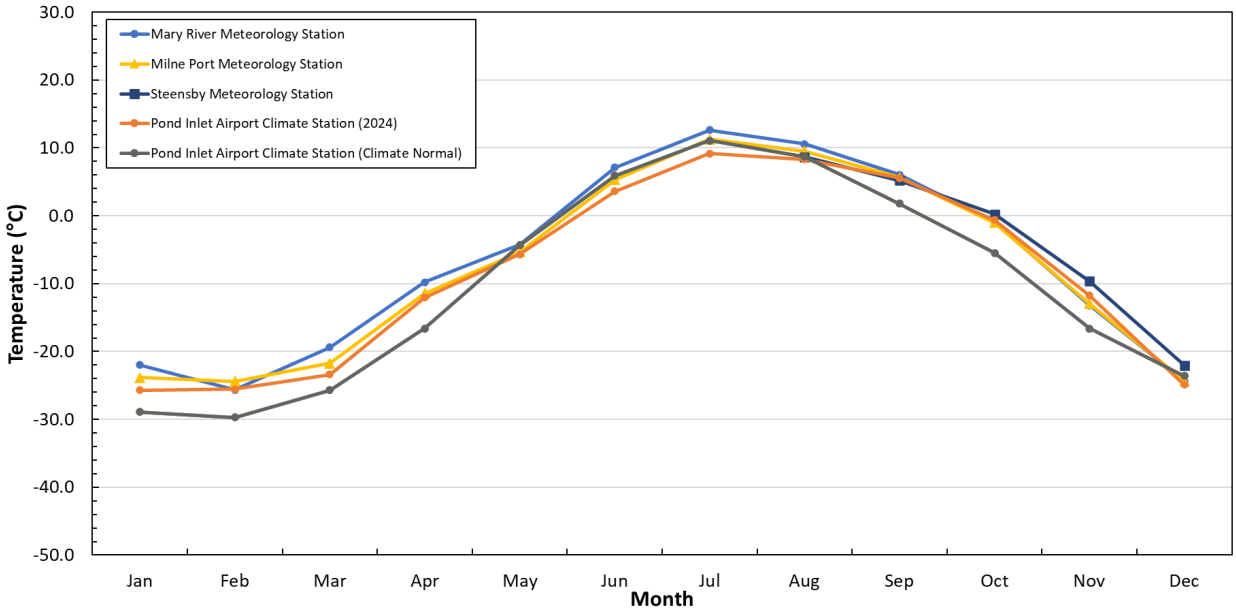


Figure 3.2 Summary of 2024 Daily Maximum Temperature at the Baffinland Meteorology Stations and the Pond Inlet Airport Climate Station

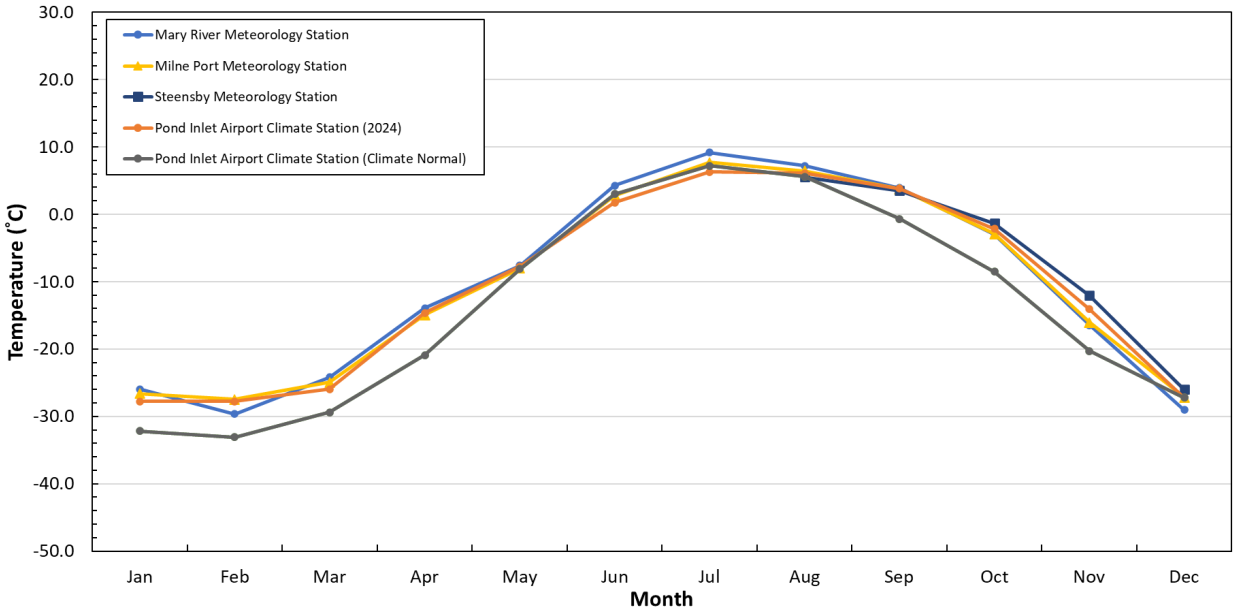


Figure 3.3 Summary of 2024 Average Daily Temperature at the Baffinland Meteorology Stations and the Pond Inlet Airport Climate Station

3.2.3 Relative Humidity

Summaries of the monthly averages for the relative humidity are presented in Table 3.9. The trends are presented graphically in Figure 3.4. Each meteorology station is compared to the 2024 data retrieved from the Pond Inlet Airport Climate Station, as well as the Canadian Climate Normal data (taken from Pond Inlet Airport).

The 2024 data from the three meteorology stations and the data from the Pond Inlet Airport Climate Station were processed in the same way. The hourly relative humidity data was averaged by month. For the Climate Normal data, however, only the relative humidity at 6:00 LST and 15:00 LST are provided. In this case, the average was taken between the two values and presented.

As indicated in Table 3.9, a total of 93 hours of data with relative humidity exceeding 100% were excluded from the October 2024 dataset at the Mary River meteorological station. Therefore, the average relative humidity for October 2024 could not be considered complete as the records did not meet the requirements of the ECCC recommended 90% rule.

The Steensby meteorological station experienced intermittent data outages from January to April 2024 due to low battery voltage. During May and June 2024, the station was completely offline, and no data were recorded. Data recording resumed in late July after two external batteries were replaced during site visit. Between January and July, a total of 4,817 hours of data were missing: 707 hours in January, 631 hours in February, 648 hours in March, 685 hours in April, and all data for May and June, and 682 hours missing in July. As a result, the average relative humidity for January to July 2024 at Steensby could not be considered complete as the records did not meet the requirements of the ECCC recommended 90% rule.

At the Pond Inlet Airport site, a total of 311 hours of data were missing between June and November 2024: 42 hours in June, 14 hours in July, 55 hours in August, 91 hours in September, 58 hours in October and 51 hours in November. Therefore, the average relative humidity for September 2024 at Pond Inlet could not be considered complete as the records did not meet the requirements of the ECCC recommended 90% rule.

The results indicate that there was not much variation in the relative humidity over the course of 2024, with the minimum average value approximately 62.4% (Mary River, in February), and the maximum at 88.0% (Steensby, in September). High relative humidity is common on islands and near the coastline. In general, the trends presented at the meteorological stations tend to match the trends observed for the Climate Normal, with lower values at the beginning and the end of the 2024 year. The values are clustered around the Climate Normal and are likely due to variations of terrain and elevation at individual sites.

When compared to 2023 data, humidity during the summer (July) of 2024 did not reduce by as much when compared to the rest of the year.

Table 3.9 Summary of 2024 Average Relative Humidity at the Baffinland Meteorology Stations and the Pond Inlet Airport Climate Station

Station	Relative Humidity (%)												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Mary River Meteorology Station [a]	63.3	62.4	66.8	78.9	75.3	72.2	70.7	77.5	86.7	-	80.4	65.2	72.7
Milne Port Meteorology Station	71.9	72.1	72.8	79.7	76.2	77.2	74.0	78.2	85.2	84.4	81.6	73.2	77.2
Steensby Meteorology Station [b,c]	-	-	-	-	-	-	-	82.4	88.0	85.9	76.9	63.9	79.4
Pond Inlet Airport Climate Station [d]	78.3	75.8	78.6	84.3	80.8	85.7	79.4	81.4	-	83.9	83.0	76.3	80.7
Pond Inlet Airport Climate Station [e]	66.6	66.85	67.55	72.55	79.15	76.9	75.85	78.95	79.5	81.55	74.3	69.65	74.1

Notes:

"-" means data were incomplete or missing

[a] Total 93 hours data with relative humidity above 100% were removed in October (completeness < 90%

[b] A total of 4,817 hours of data were missing from January to July (completeness < 90%): 707 hours in January, 631 hours in February, 648 hours in March, 685 hours in April, all data in May and June, and 682 hours in July.

[c] Total 3 hours data with relative humidity above 100% were removed in September

[d] Based on 2024 hourly data, a total of 311 hours of data were missing: 42 hours in June, 14 hours in July, 55 hours in August, 91 hours in September (completeness < 90%), 58 hours in October and 51 hours in November.

[e] Based on 1991 to 2020 Climate Normal data.

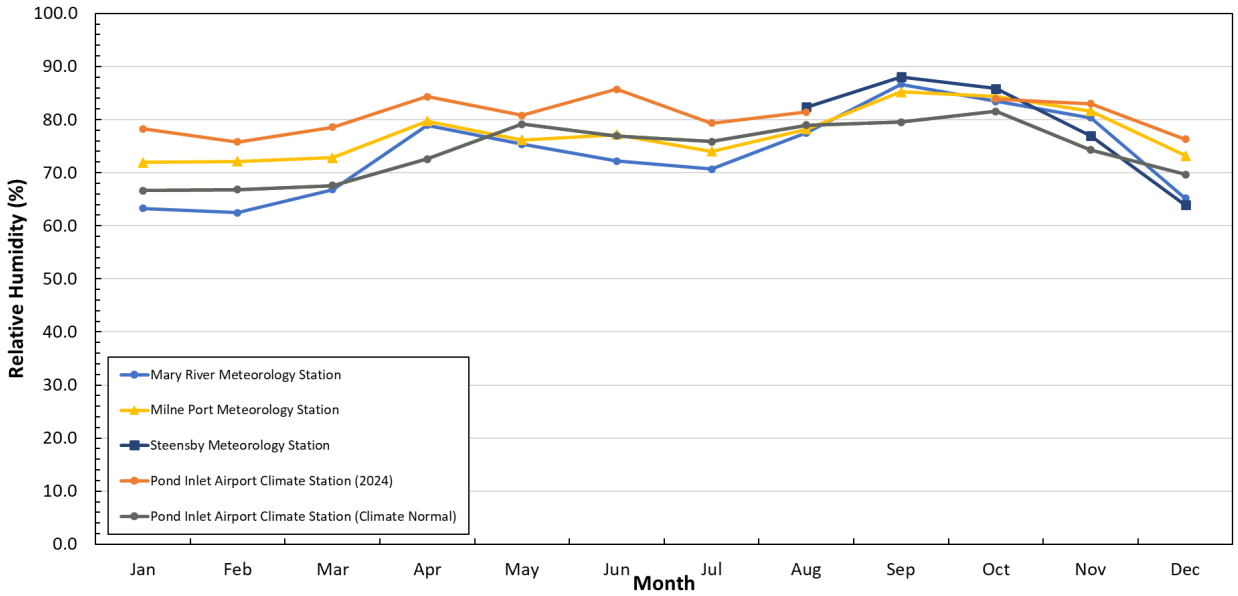


Figure 3.4 Summary of 2024 Average Monthly Relative Humidity at the Baffinland Meteorology Stations and the Pond Inlet Airport Climate Station

3.2.4 Rainfall Precipitation

Summaries of the monthly rainfall totals are presented in Table 3.10. The trends are presented graphically in Figure 3.5. Each meteorology station is compared to the 2024 data retrieved from the Pond Inlet Airport Climate Station, as well as the Canadian Climate Normal data (taken from Pond Inlet Airport).

The data from the three meteorology stations and the 2024 data from the Pond Inlet Airport Climate Station were processed in the same way. The hourly rainfall quantity was summed for each day, and then for each month. In the case where comments or flags in the data were provided, hours with snow were neglected since the Baffinland meteorology station sensors were not designed to measure snow-water-equivalent (SWE) precipitation.

Steensby meteorological station experienced intermittent data outages from January to April 2024 due to low battery voltage. No data were recorded during May and June 2024 as the station was completely offline. Data collection resumed in late July following the replacement of batteries during maintenance. A total of 4,817 hours of data were missing between January and July: 707 hours in January, 631 hours in February, 648 hours in March, 685 hours in April, and all data for May and June, and 682 hours missing in July. As a result, the January to July 2024 period did not meet the criteria for 100% completeness as proposed by ECCC.

Although rainfall patterns varied across the monitored sites in 2024, the general trends indicate that peak rainfall occurred between July and September for all sites. This is consistent with the Climate Normals data at Pond Inlet, though rainfall typically occurred between June and September. The quantity of rainfall was larger at all sites, when compared to the Climate Normals data. However, this also included the 2024 data for Pond Inlet.

At Mary River, most rainfall occurred between June and October, with lower rainfall during August (where humidity was also low and started trending up during August). Rainfall peaked in September, at a value of 160 mm, which was greater than the rainfall recorded at the other sites. The maximum 24-hour extreme rainfall event recorded at the Mary River meteorology station during September 20 to 21, 2024, was 82.2 mm. A preliminary analysis conducted by Nunami-Stantec hydrologists indicated that this 24-hour extreme rainfall event was greater than the 1:1,000-year event based on the 2013 to 2023 rain records.

At Milne Port, rainfall was observed from May to October, with August again showing lower rainfall levels. Based on available data, rainfall at Steensby was recorded primarily in August and September, with no rainfall observed in October, November, or December. However, due to the data loss from January to July, the full rainfall pattern at Steensby during 2024 cannot be determined.

Table 3.10 Summary of 2024 Total Rainfall at the Baffinland Meteorology Stations and the Pond Inlet Airport Climate Station

Station	Total Rainfall (mm)												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Mary River Meteorology Station	0.0	0.0	0.0	0.0	0.2	14.0	84.0	62.4	155.2	22.6	0.0	0.0	338.4
Milne Port Meteorology Station	0.0	0.0	0.0	0.0	5.2	4.2	61.4	61.4	54.8	13.4	0.0	0.0	200.4
Steensby Meteorology Station[a,b]	-	-	-	-	-	-	-	45.6	3.8	0.0	0.0	0.0	49.4
Pond Inlet Airport Climate Station[c]	0.0	0.0	0.0	0.0	0.0	6.3	50.5	53.3	86.6	8.4	0.0	0.0	205.1
Pond Inlet Airport Climate Station[d]	0.0	0.0	0.0	0.0	0.0	11.9	25.5	32.0	5.7	0.0	0.0	0.0	75.1

Notes:

"-" means data were incomplete or missing,

[a] The 19 mm of rainfall recorded on Jul. 29 at 10:00 AM were removed because the tipping bucket rain gauge was cleaned on July 29, 2024; the 1mm mm of rainfall recorded on Nov. 30 at 7:00 AM and the 1mm mm of rainfall recorded on Nov. 30 at 3:00 PM were removed because the hourly maximum air temperatures were -23.4 and -23.89 degrees Celsius, respectively and no rain should have been recorded during freezing air temperatures

[b] A total of 4,817 hours of data were missing from January to July (completeness < 90%): 707 hours in January, 631 hours in February, 648 hours in March, 685 hours in April, all data in May and June, and 682 hours in July.

[c] Based on 2024 hourly data, a total of 75 hours of data were missing: 26 hours in June, 1 hours in August, 7 hours in September and 41 hours in November. Months with >90% data are considered valid for analysis and included in the table.

[d] Based on 1991 to 2020 Climate Normal data.

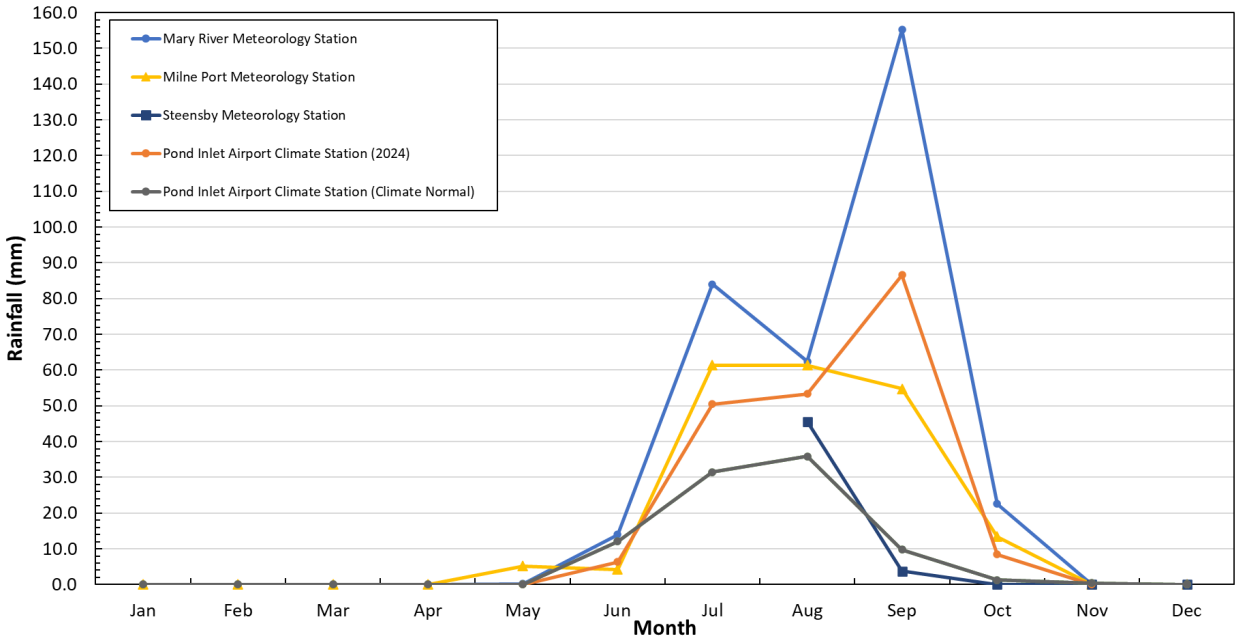


Figure 3.5 Summary of 2024 Total Monthly Rainfall at the Baffinland Meteorology Stations and the Pond Inlet Airport Climate Station

3.2.5 Wind Speed and Direction

Summaries of the monthly averages and monthly maximums (gusts) for the wind speed are presented in Table 3.11 and Table 3.12, respectively. The trends of monthly average and monthly maximum are presented graphically in Figure 3.6 and Figure 3.7, respectively. Each meteorology station is compared to the 2024 data retrieved from the Pond Inlet Airport Climate Station, as well as the Canadian Climate Normal data (taken from Pond Inlet Airport).

Although there were months with data collection errors at the Mary River and Milne Port sites, the total number of hours with valid data was greater than 90% of all monthly hours being recorded, allowing the data to be presented. However, the Steensby site experienced significant data loss between January and July 2024, leaving only the data from August onward with enough hours to meet the 90% completeness requirement. At the Pond Inlet Airport site, 1,078 hours were missing, with only January, March, October, November, and December meeting the ECCC-required completeness threshold (>90%).

The results from the available data indicate that the average wind speeds at the Mary River and Milne Port sites were consistently higher than the Climate Normal data, which is consistent with 2023 dataset. However, maximum windspeeds were generally close to the Climate Normal levels. The wind speed trends across all sites were similar, with average wind speeds tended to be lower in the middle of the year. At Steensby site, the wind speeds are substantially higher than Mary River and Milne Port and Pond Inlet.

Table 3.11 Summary of 2024 Average Wind Speed at Baffinland Meteorology Stations and Pond Inlet Airport Climate Station

Station	Average Wind Speed (m/s)												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Mary River Meteorology Station[a]	2.8	2.6	3.0	4.7	3.4	3.5	4.7	4.5	5.2	6.2	3.8	1.8	3.9
Milne Port Meteorology Station[b]	4.4	4.3	5.2	6.7	5.8	4.1	6.2	6.3	7.9	7.1	4.6	3.3	5.5
Steensby Meteorology Station[c,d]	-	-	-	-	-	-	-	9.5	10.4	12.0	10.1	5.2	9.4
Pond Inlet Airport Climate Station[e]	2.6	-	2.4	-	-	-	-	-	-	4.1	3.6	2.6	3.0
Pond Inlet Airport Climate Station[f]	1.9	1.8	2.1	2.1	2.4	2.8	2.7	2.8	3.4	4.1	2.9	2.2	2.6

Notes:

"-" means data were incomplete or missing

[a] Total 13 hours data with zero wind speed and wind direction due to rime ice buildup and other unknown root causes were removed from analysis: 1 hour in Jan, 1 hour in Mar, 5 hours in Nov and 6 hours in Dec.

[b] Total 177 hours data with zero wind speed and wind direction due to rime ice buildup and other unknown root causes were removed from analysis: 27 hours in Jan, 31 hours in Feb, 39 hours in Mar, 2 hours in Apr, 3 hours in May, 3 hours in Jun, 3 hours in Jul, 1 hour in Sep, 1 hour in Oct, 19 hours in Nov and 48 hours in Dec.

[c] 15 hours data with zero wind speed and wind direction due to rime ice buildup, a faulty wind sensor cable, and other unknown root causes were removed from analysis: 10 hours in Nov and 5 hours in Dec

[d] A total of 4,817 hours of data were missing from January to July (completeness < 90%): 707 hours in January, 631 hours in February, 648 hours in March, 685 hours in April, all data in May and June, and 682 hours in July.

[e] Based on 2024 hourly data: Total 1078 hours data without wind direction data. These hourly records were removed from the analysis. January, February, October, November and December were the only months that achieved the > 90% data completeness threshold.

[f] Based on 1991 to 2020 Climate Normal data

Table 3.12 Summary of 2024 Maximum Wind Speed at the Baffinland Meteorology Stations and the Pond Inlet Airport Climate Station

Station	Maximum Wind Speed (m/s)												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Mary River Meteorology Station[a]	19.8	20.2	20.3	19.5	12.3	18.8	17.8	18.2	20.8	25.1	18.4	16.3	19.0
Milne Port Meteorology Station[b]	33.7	21.0	24.5	21.4	25.7	19.1	15.8	23.8	24.4	33.7	29.6	23.2	17.4
Steensby Meteorology Station[c,d]	-	-	-	-	-	-	-	29.4	37.8	36.1	34.5	24.6	32.5
Pond Inlet Airport Climate Station[e]	13.3	-	8.3	-	-	-	-	-	-	16.4	9.7	5.0	16.4
Pond Inlet Airport Climate Station[f]	21.1	19.4	18.1	20.6	19.4	17.5	19.4	19.4	20.6	20.6	25.3	25.8	20.6

Notes:

"-" means data were incomplete or missing

[a] Total 13 hours data with zero wind speed and wind direction due to rime ice buildup and other unknown root causes were removed from analysis: 1 hour in Jan, 1 hour in Mar, 5 hours in Nov and 6 hours in Dec.

[b] Total 177 hours data with zero wind speed and wind direction due to rime ice buildup and other unknown root causes were removed from analysis: 27 hours in Jan, 31 hours in Feb, 39 hours in Mar, 2 hours in Apr, 3 hours in May, 3 hours in Jun, 3 hours in Jul, 1 hour in Sep, 1 hour in Oct, 19 hours in Nov and 48 hours in Dec.

[c] 15 hours data with zero wind speed and wind direction due to rime ice buildup, a faulty wind sensor cable, and other unknown root causes were removed from analysis: 10 hours in Nov and 5 hours in Dec

[d] A total of 4,817 hours of data were missing from January to July (completeness < 90%): 707 hours in January, 631 hours in February, 648 hours in March, 685 hours in April, all data in May and June, and 682 hours in July.

[e] Based on 2024 hourly data: Total 1078 hours data without wind direction data. These hourly records were removed from the analysis. January, February, October, November and December were the only months that achieved the > 90% data completeness threshold.

[f] Based on 1991 to 2020 Climate Normal data

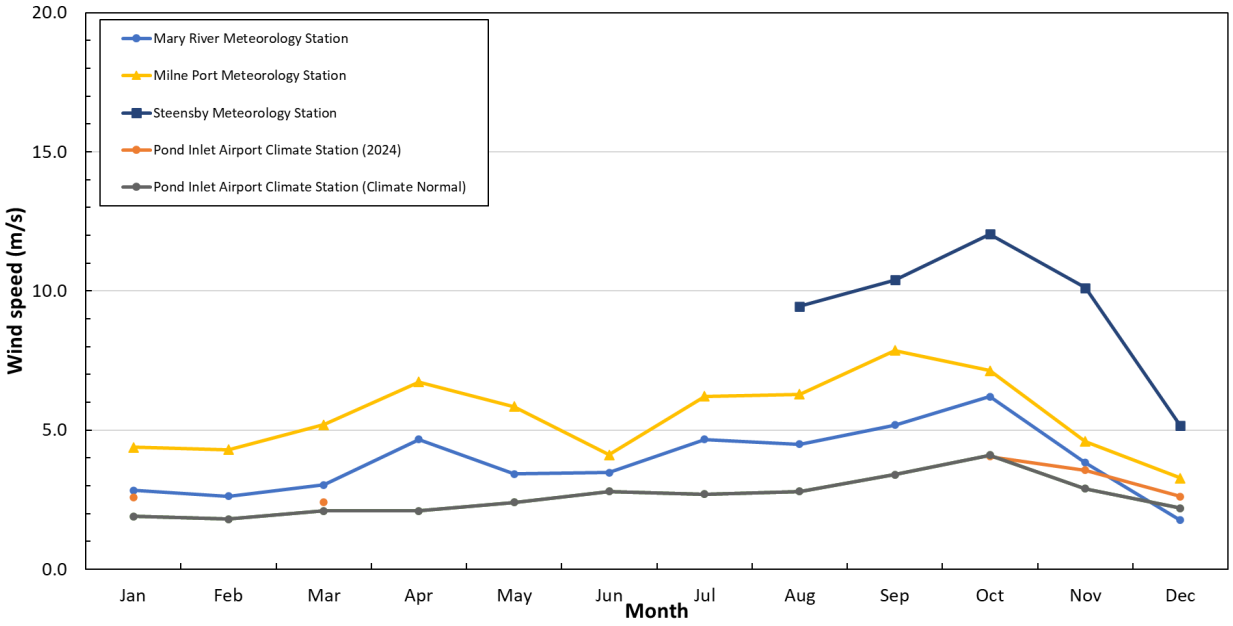


Figure 3.6 Summary of 2024 Average Monthly Wind Speed at the Baffinland Meteorology Stations and the Pond Inlet Airport Climate Station

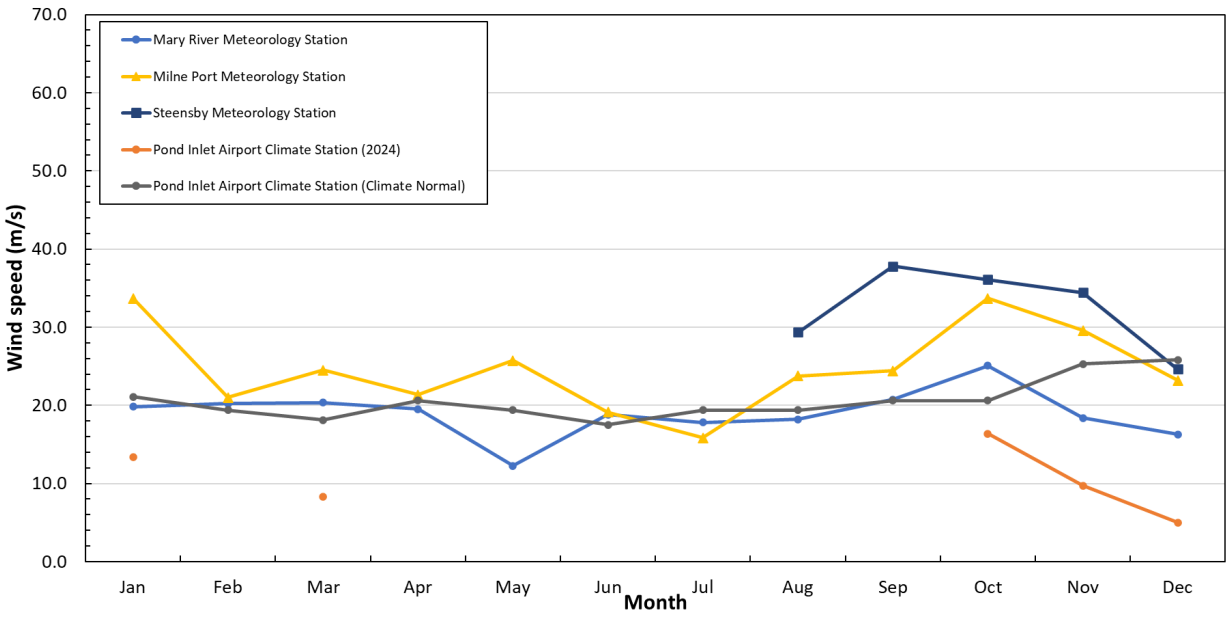


Figure 3.7 Summary of 2024 Maximum Monthly Wind Speed at the Baffinland Meteorology Stations and the Pond Inlet Airport Climate Station

Summaries of prevalent wind direction and wind speed class frequency distributions are presented in Figure 3.8, Figure 3.9, Figure 3.10, and Figure 3.11 for Mary River, Milne Port, Steensby, and the Pond Inlet Airport, respectively. The sites are not directly comparable to the Climate Normal because the

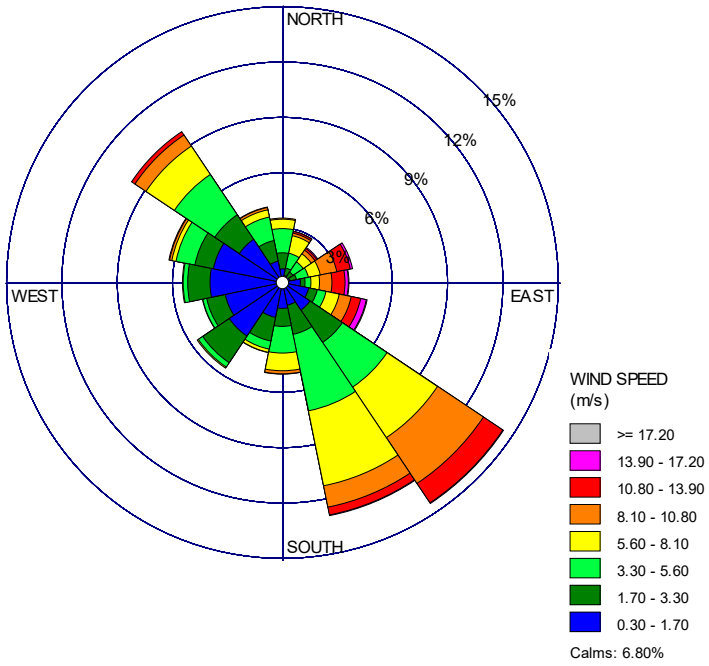
wind direction will not be as consistent across the geographical distances as the other meteorological variables.

At Mary River, south-easterly winds were prevalent during 2024, which is consistent with the observed trends from previous years (2020 - 2023).

At Milne Port, south-westerly winds were prevalent during 2024, which is also similar to previous years (2020 to 2023).

At Steensby, north-westerly and south-easterly winds were prevalent during 2024. This is partially consistent with 2023, which north-westerly winds were prevalent. However, since 4,817 hours of data were missing from January to July 2024, resulting in data completeness of less than 90%, these months were not considered in the wind rose analysis. As a result, the prevailing winds may not be representative of 2024.

At the Pond Inlet Airport, southerly winds were prevalent during 2024, which is consistent with previous years (2020 to 2023). This is also consistent with the Canadian Climate Normal for the climate station location, which indicates that southerly winds are the most common. However, only January, February, October, November and December achieved the more than 90% data completeness and were included in the wind rose analysis.



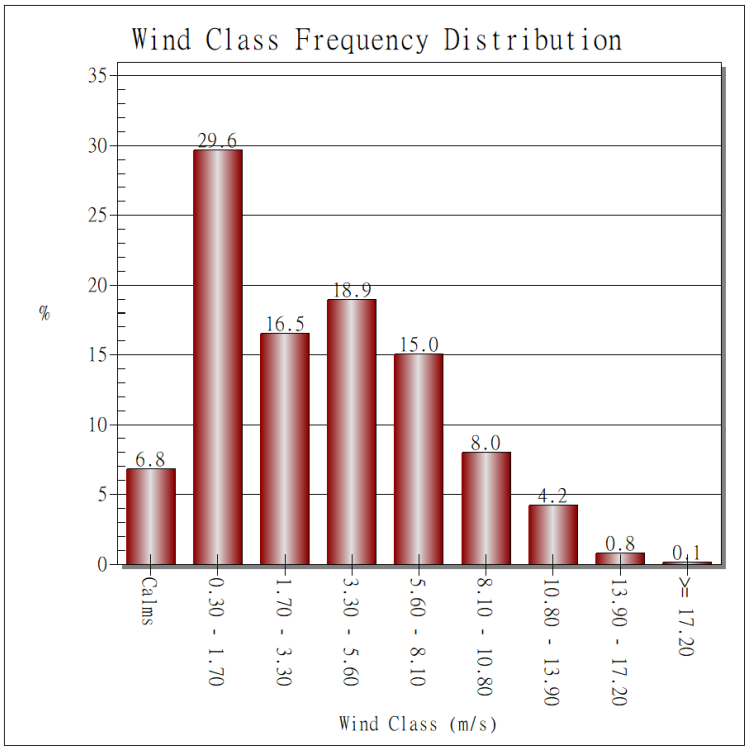
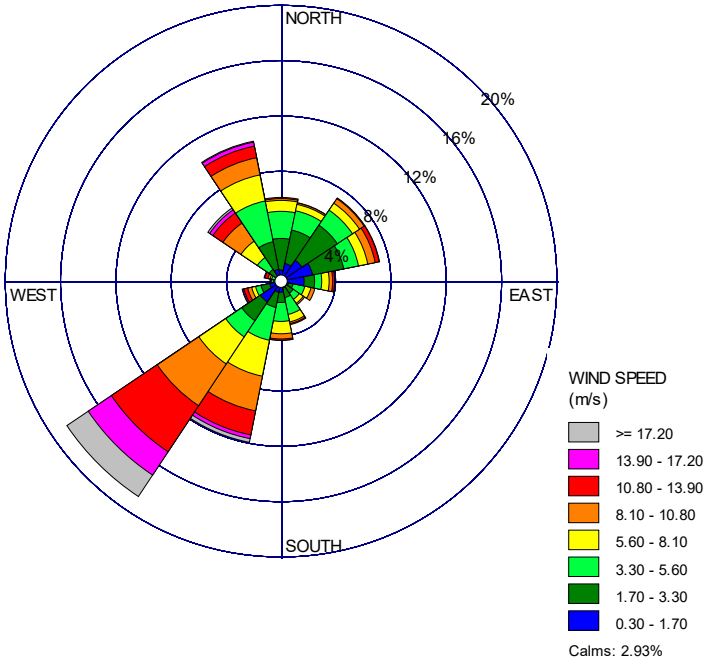


Figure 3.8 2024 Wind Rose and Wind Class Frequency Distribution at the Mary River Meteorology Station



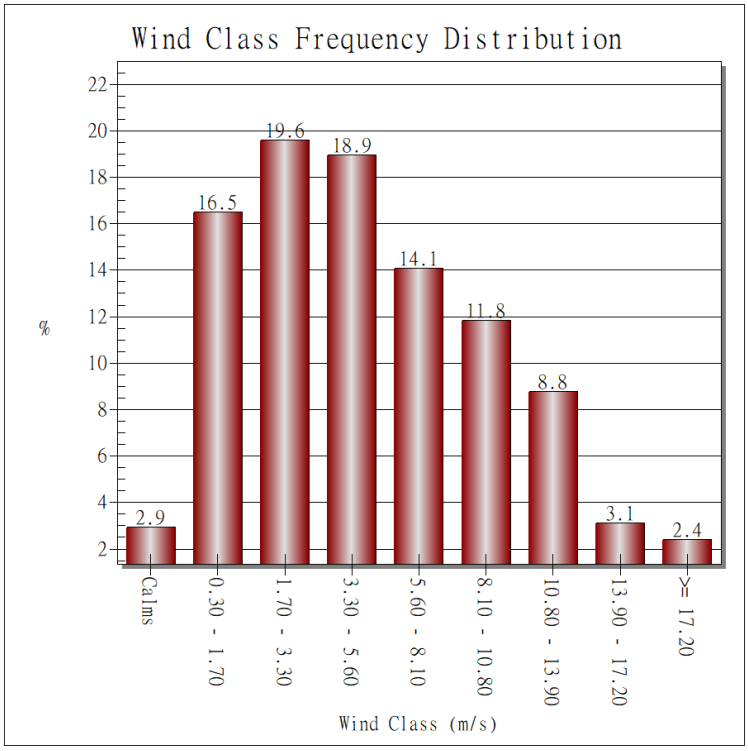
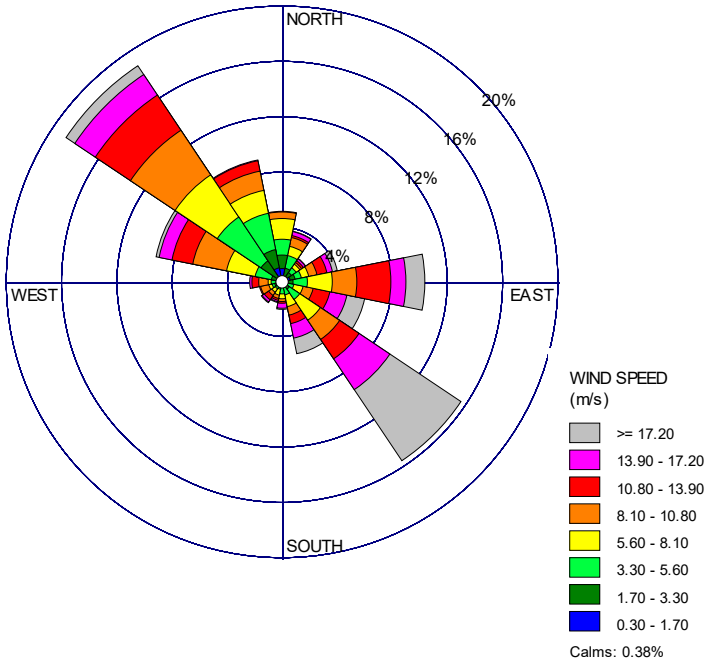


Figure 3.9 2024 Wind Rose and Wind Class Frequency Distribution at the Milne Port Meteorology Station



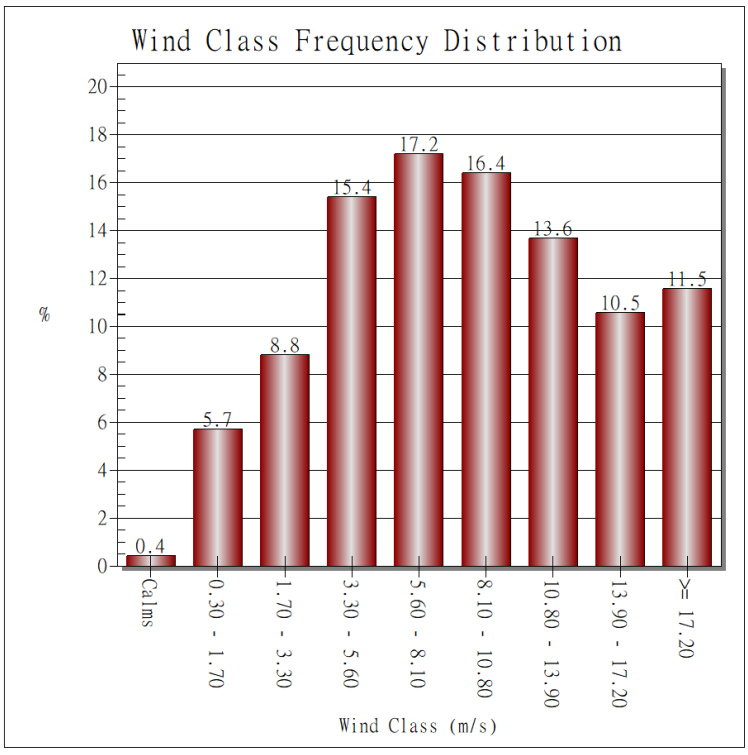
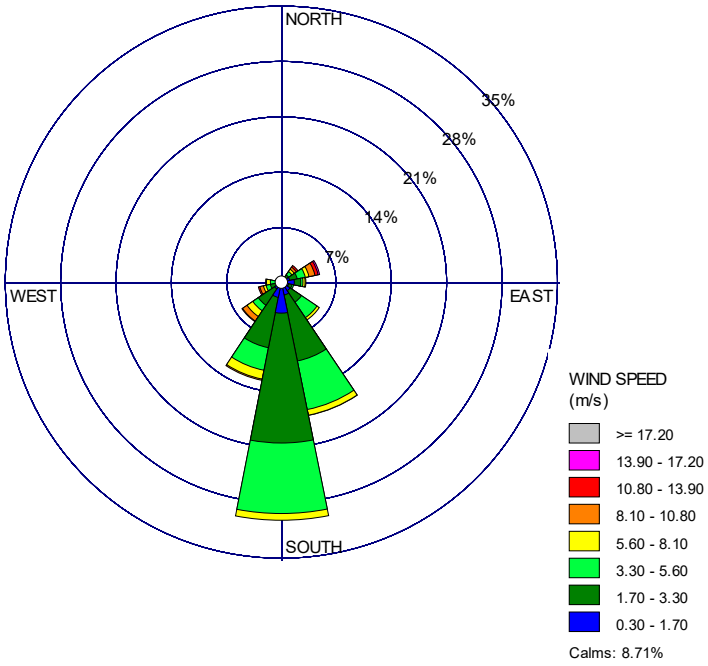


Figure 3.10 2024 Wind Rose and Wind Class Frequency Distribution at the Steensby Port Meteorology Station



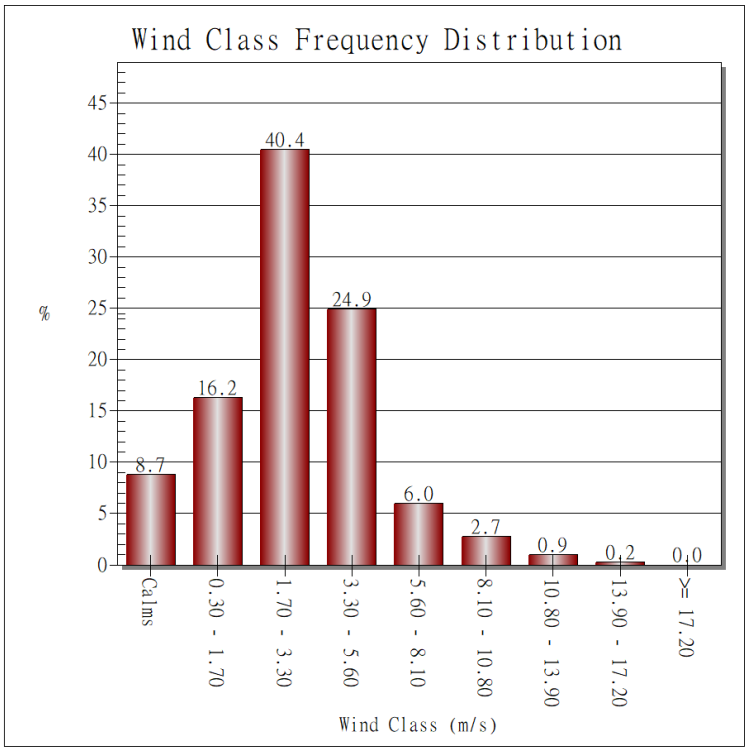


Figure 3.11 2024 Wind Rose and Wind Class Frequency Distribution at the Pond Inlet Airport Climate Station

3.2.6 Solar Radiation

Summaries of the monthly averages for solar radiation are presented in Table 3.13. The trends are presented graphically in Figure 3.12. Currently, the Pond Inlet Airport Climate Station does not record average solar radiation, so values were not compared to the Climate Normals.

The data from the three meteorology stations were processed in the same way. The hourly average solar radiation was averaged each month. At the Steensby site, significant data loss from January to July left only data from August onward with enough hours to meet the 90% completeness threshold.

The results indicate similar trends to previous years, with solar radiation low during the winter months (November through February), and then increased until the early summer (May, June, and July), where it peaked during May, consistent with 2023. Overall solar radiation levels were similar to previous years. In 2024, the Mary River site peaked at around 252 W/m^2, compared to 255 W/m^2 in 2023. At Milne Port site, the peak solar radiation was 180 W/m^2 in 2024, compared to 177 W/m^2 in 2023. At the Steensby site, insufficient data from January to July 2024 prevented a comparison to the 2023 peak value of 275 W/m², which typically occurs in May. Comparisons between sites indicate that solar radiation at Milne Port was consistently lower than at Mary River, consistent with 2023 observations.

Table 3.13 Summary of 2024 Monthly Average Solar Radiation at the Baffinland Meteorology Stations

Station	Solar Radiation (W/m^2)												
	Jan	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Annual**
Mary River Meteorology Station	0.3	15.2	74.4	157.9	251.9	234.1	191.0	132.0	49.0	20.0	1.7	0.0	94.0
Milne Port Meteorology Station	0.2	9.3	46.0	105.9	179.9	163.9	131.5	82.1	32.5	11.3	1.0	0.0	63.6
Steensby Meteorology Station [a]	-	-	-	-	-	-	-	140.4	62.7	19.5	2.1	0.1	45.0

Notes:

"-" means data were incomplete or missing

[a] A total of 4,817 hours of data were missing from January to July (completeness < 90%): 707 hours in January, 631 hours in February, 648 hours in March, 685 hours in April, all data in May and June, and 682 hours in July.

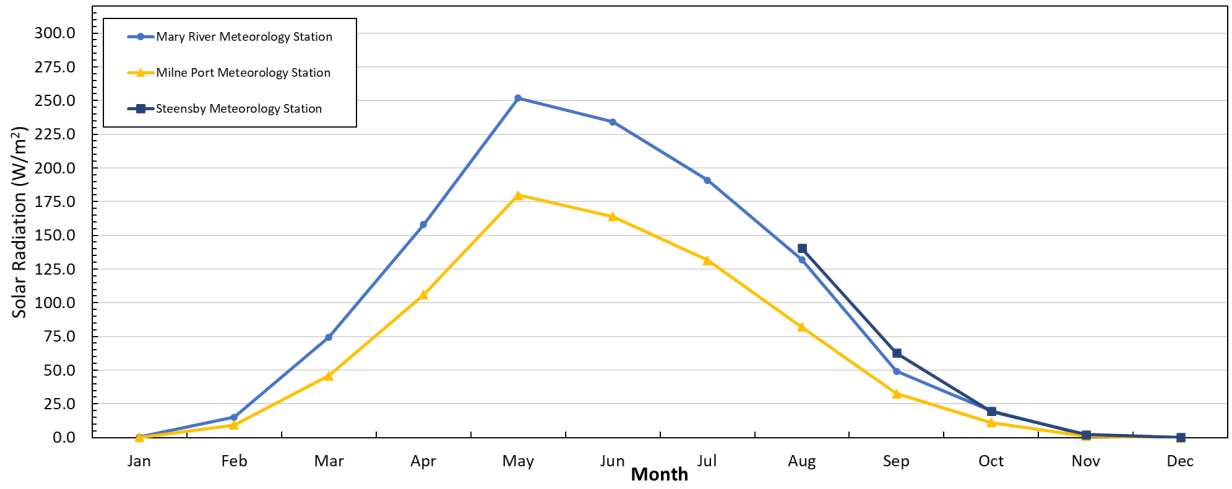


Figure 3.12 Summary of 2024 Monthly Average Solar Radiation at the Baffinland Meteorology Stations

4 Dustfall

The dustfall monitoring program used a total of 43 passive dustfall collectors in 2024 to measure dust deposition related to Project activities, following the same methodology and analysis as in previous years (EDI 2025). Thirty (30) of these collectors are changed out monthly, while the rest (thirteen) are changed out during summer months due to their remote locations. Figure 1.1 shows the location of the 2024 dustfall monitoring stations at the Mine Site. Figure 1.2 shows the location of the 2024 dustfall monitoring stations at Milne Port. The dustfall monitoring stations that are not shown on Figure 1.1 and Figure 1.2 are several kilometres outside the map extents, those dustfall stations are shown in the 2024 TEAMR prepared by Environmental Dynamics Inc. (EDI 2025).

The methodology, including analytical methods for the passive dustfall monitors, is described in the 2024 TEAMR (EDI 2025). EDI (2025) summarized the magnitude and extent of the 2024 dustfall, seasonal comparisons, and the inter-annual trends for seasonal and total annual dustfall The data and summary in EDI (2025), to be included in the 2024 Annual Report submitted to NIRB, will present the 2024 dustfall monitoring results and will determine what correlations can be made with the 2024 meteorology data. The two meteorology variables that have the most influence on the generation of fugitive dust and dustfall are wind speed and rain precipitation.

5 Summary

5.1 Ambient Air Quality Monitoring Program

Ambient air quality data were collected at the MSC and the PSC in 2024. Ambient air quality data for SO_2, NO_2, NO, and NO_x were recorded using Teledyne API SO_2/NO_x analyzers. The concentrations of TSP and $PM_{2.5}$ in ambient air were measured using BAM 1020 monitors at MSC and PSC. This was the second year of monitoring for TSP and $PM_{2.5}$ concentrations in ambient air. The 2024 SO_2 and NO_2 data were tabulated and compared to past annual reports to assess historical trends. The following summary observations are provided in relation to 2024 ambient air quality data:

- The measured concentrations of NO_2 and SO_2 at the MSC and PSC were below the Nunavut NAAQS (the Project Standards) for 2024.
- The 2024 measured concentrations of NO_2 and SO_2 at MSC and PSC were highest in the winter and lowest in the summer, consistent with the previously reported historical trends.
- During 2024, the SO_2 and NOx analyzers at the MSC monitoring station had 79.5% and 64.9% valid data with 6,966 and 5,696 valid data points, respectively.
- During 2024 the SO_2 and NOx analyzers at the PSC monitoring station had 93.6% and 93.4% valid data respectively for the year, with 8,196 and 8,180 valid data points each.
- Permeation data results indicate consistent calibration cycles for each of the analyzers.
- The MSC NOx analyzers slope and offset values were inadvertently adjusted during an on-site monthly visit, when Baffinland was performing a monthly check on the monitor. This adjustment was in error, and it resulted in data anomalies from April 5 to July 26, 2024. Those data for the period April 5th to July 26th were therefore invalidated.
- The TSP and $PM_{2.5}$ BAM measured concentrations at the MSC ambient air quality monitoring station had 69.7% and 63.3% valid data for 2024, respectively.
- The PSC $PM_{2.5}$ data were not available from January to April due to flow controller and AT sensor and all four of the rotary vane pumps failed on the BAM units (MSC and PSC) resulting in data loss from April to July 2024 when replacement medo pumps were installed. Baffinland has retained spare pumps and rebuild kits in inventory to prevent data gaps from pump failure in the future.
- The 24-hour average TSP concentrations measured at MSC were greater than the Project Standard TSP 24-hour concentration (120 µg/m^3) for 59 events during the year, comprising 25.1% of the available period of record.
- The annual average TSP concentration measured at MSC (148.5 µg/m^3) in 2024, for the available period of record, was greater than the Project Standard (60 µg/m^3).
- The annual average $PM_{2.5}$ concentration measured at MSC (13.7 µg/m^3) in 2024, for the available period of record, was greater than the Project annual standard (10 µg/m^3).

- Additional controls to limit the amount of fugitive dust that escapes during ore crushing and transportation activities at the mine site should be considered and implemented where possible.
- At the MSC monitoring station, the elevated ambient concentrations for NO_2, SO_2, TSP and $PM_{2.5}$ observed. Ambient air quality mitigative measures should be assessed and implemented when undertaking construction activities.
- The BAM $PM_{2.5}$ and TSP data at the PSC ambient air quality monitoring station had 73.3% and 58.0% valid data for 2024, respectively.
- The $PM_{2.5}$ and TSP concentrations measured at PSC were highest in the spring then decreased and remained relatively low through the remainder of the year, noting that no data were recorded from April through July.
- The average annual $PM_{2.5}$ concentration measured at the PSC ambient air quality monitoring station (3.3 µg/m^3) for the available period of record was less than the Project Standard (10 µg/m^3).
- The annual average TSP concentration measured at the PSC ambient air quality monitoring station (11.8 µg/m^3) was less than the annual Project Standard concentration (60 µg/m^3) for the available period of record

It is important to note that the PSC and MSC ambient air monitoring stations are both within the PDA, and therefore not in locations to formally assess or determine compliance with the Project Standards. Nevertheless, the particulate matter monitoring results (inside the PDA boundary) are compared to the Project Standards to help understand and guide management actions for the protection of ambient air quality beyond the PDA boundaries.

5.2 Meteorology

Meteorological data were collected at three meteorology stations in 2024 (Mary River, Milne Port and Steensby). Data collected included ambient air temperature, relative humidity, rainfall precipitation, wind speed and wind direction, and solar radiation.

The data collected at the three stations were compared to data recorded at the ECCC Pond Inlet Airport Climate Station in 2024, as well as to the 30-year Climate Normal data (1991-2020) produced by the station. The following summary observations are provided in relation to 2024 meteorological data.

- Average temperatures in 2024 tended to be similar or slightly higher than the Pond Inlet Airport Climate Normal for most of the year, except between June and August where the daily average air temperatures were similar.
- Both Mary River and Milne Port observed higher minimum temperatures and lower maximum temperatures when compared with the previous year.
- The trend of reduced relative humidity in the summer (July and August), when compared to the Climate Normal data, continued in 2024.
- Rainfall was observed between June and October, which is a similar trend with the previous years, and consistent with the Climate Normals data at Pond Inlet, though rainfall typically

occurred between June and September. However, the rainfall recorded at PSC and MSC during 2024 was higher than Pond Inlet.

- The maximum 24-hour extreme rain event recorded by the Mary River meteorology station during September 20-21, 2024, was 82.2 mm. A preliminary analysis was conducted by Nunami-Stantec hydrologists indicated that this 24-hour extreme rainfall event was greater than the 1:1,000 event based on 2013 to 2023 rain records.
- The average wind speeds for the Mary River, Milne Port, and Steensby sites tended to be higher when compared to the Pond Inlet Airport Climate Normal dataset. The wind speeds at the Steensby were significantly higher in 2024.
- Wind directions at Mary River and Milne Port sites seemed generally consistent with the previous yearly datasets.
- There is no solar radiation dataset in the Pond Inlet Climate Normal for comparison, but the solar radiation appears to be consistent among the Mary River, Milne Port, and Steensby sites. The maximum solar radiation values observed (May to July) were consistent with the previous year.
- Steensby had 4,817 hours of missing data between January and July, leaving only the data from August onward with enough hours to meet the 90% completeness requirement.

5.3 Dustfall

The 2024 TEAMR (EDI 2025) summarizes the magnitude and extent of the measured 2024 dustfall, seasonal comparisons, and the inter-annual trends for the seasonal and total annual dustfall. EDI (2025), will be included in the 2024 Annual Report submitted to NIRB, also presents a summary of the 2024 meteorology data and how it influenced dustfall. The two meteorology variables that have the most influence on the generation of fugitive dust and dustfall are wind speed and rain precipitation.

5.4 Summary of 2024 Monitoring Comparison to FEIS Predictions

This section provides a comparison of the 2024 ambient air quality monitoring results at MSC and PSC to air dispersion modeling results reported in the 2012 Final Environmental Impact Statement (FEIS) and the 2013 FEIS Addendum for the Mary River Project. The 2013 FEIS Addendum is considered the most comprehensive source of air dispersion model results because it included additional activities at the Mine Site (loading ore into trucks, ore haulage truck fleet and maintenance facilities) and at Milne Port (e.g., ore stockpiling and loading onto ships) and ore haulage along the Tote Road.

Dispersion modeling results for SO_2 were not presented in the FEIS or the FEIS Addendum although baseline data for SO_2 and NO_2 were collected over 49 days in 2007 (Baffinland FEIS, Volume 5, Atmospheric Environment 2012).

Taking into account the assumptions and considerations outlined in the 2013 FEIS Addendum, the potential residual effects to air quality (based on the 2024 ambient air quality monitoring program) are summarized below:

- The maximum 24-hour average TSP concentration measured/recorded at the MSC in 2024, was 2,909.5 µg/m^3. The FEIS Addendum air dispersion model predicted maximum TSP concentration at the MSC ambient air quality monitoring was >3,000 µg/m^3. The 2024 measured 24-hour average maximum TSP concentrations at MSC are in general agreement with the air dispersion model predictions in the FEIS Addendum for the Mine Site accommodations building. There are some periods during 2024 when the measured TSP and $PM_{2.5}$ concentrations at the MSC do not seem to be reasonable or accurate based on visual air quality observations made by the on-site staff. Baffinland will be investigating potential causes for these apparent data anomalies and investigating additional methods of validating these measurements during 2025. The additional methods may include more frequent cleaning of the TSP and $PM_{2.5}$ sampler inlets, submitting BAM filter material and BAM data outputs to the analytical laboratory for verification, installation of a camera looking towards the sampler inlets, assessing the potential vibration interference from extended inlet tubes, and assessing the potential influence of the natural gas furnace exhaust at the MSC.
- The 2024 measured 24-hour average maximum TSP concentration at the PSC was 153 µg/m^3. The FEIS Addendum air dispersion model predicted maximum 24-hour average TSP concentration at the Milne Port accommodations building ranging from 50 to 120 µg/m^3. Thus, the measured TSP concentrations at PSC in 2024 are similar to but greater than the air dispersion model predicted concentrations in the FEIS Addendum for the Milne Port accommodations building. The FEIS Addendum maximum 24-hour average TSP concentrations predicted by the air dispersion model were under worst-case meteorological and maximum operating conditions, which will occur during the summer shipping season.
- The 2024 measured 24-hour average maximum $PM_{2.5}$ concentration at the MSC was 643.6 µg/m^3. The FEIS Addendum air dispersion model predicted maximum 24-hour average $PM_{2.5}$ concentration at the MSC ambient air quality monitoring station ranged from 100 to 500 µg/m^3. The measured 2024 24-hour maximum $PM_{2.5}$ concentrations are slightly greater than the FEIS Addendum air dispersion model predictions for the Mine Site accommodations building. The $PM_{2.5}$ emissions mitigation measures outlined in the FEIS Addendum for the Mary River Mine Site included emissions controls on the fugitive emissions sources and additional mitigations presented in the Air Quality and Noise Abatement Management Plan presented in FEIS Addendum Appendix 10A.
- The 2024 measured 24-hour average maximum $PM_{2.5}$ concentration at the PSC was 15.3 µg/m^3. The FEIS Addendum air dispersion model predicted maximum 24-hour average $PM_{2.5}$ concentration at the PSC ambient air quality monitoring station ranging from 10 to 30 µg/m^3. The 2024 measured 24-hour average maximum $PM_{2.5}$ concentrations are similar to the FEIS Addendum air dispersion model predictions for the Milne Port accommodations building.

- The 2024 measured 1-hour average maximum NO_2 concentration at the MSC was 366.1 µg/m^3. The FEIS Addendum air dispersion model predicted maximum 1-hour concentration at the MSC ambient air quality monitoring station was greater than 500 µg/m^3. The 2024 measured 1-hour average maximum NO_2 concentration at MSC is less than FEIS Addendum air dispersion model prediction for the Mine Site accommodations building.
- The 2024 measured 1-hour average maximum NO_2 concentration at the PSC was 203.0 µg/m^3. The FEIS Addendum air dispersion model predicted maximum 1-hour NO_2 concentration at the Milne Port accommodations building ranged from 125 to 150 µg/m^3. Thus, the 2024 measured 1-hour average maximum NO_2 concentration at PSC is similar to but greater than the FEIS Addendum air dispersion model prediction for the Milne Port accommodations building.

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