APPENDIX G.2

Infrastructure and Project Operations Monitoring Reports

APPENDIX G.2.1

2023 Air Quality, Dustfall, and Meteorology Report

Baffinland Iron Mines

2023 Annual Air Quality, Dustfall and Meteorology Report

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ᐊᐅᓚᑦᑎᔾᓂᖅᑳᖅᑐᑦ ᓇᐃᓈᖅᓯᔪᑦ

ᑖᓇ ᐊᕐᕌᒍᑕᒫᑦ ᐅᓂᒃᑳᓕᐊᕆᔭᐅᓲᖅ ᓇᐃᓈᖅᓯᒪᔪᖅ ᐊᓂᖅᓵᖅᐸᒃᑕᑦᑕ ᖃᓄᐃᓕᖓᓂᖓᓄᑦ, ᐳᔪᖅ ᓯᐊᒻᒪᒃᐸᓪᓕᐊᓂᖓᓄᑦ, ᓯᓚᖓᐊᕈᑏᑦ ᑎᑎᖅᑲᖁᑎᖏᑦ ᑲᑎᑕᐅᓂᖏᑦ 2023−ᒥ ᓄᓘᔾᔨᖓᓂ ᐱᓕᕆᐊᒥ (ᐱᓕᕆᐊᖅ) ᐹᕙᓪᓚᖓ ᓴᕕᒃᓯᓂᒃ ᐅᔭᕋᓐᓂᐊᖅᑏᑦ ᑯᐊᐳᕆᓴᒃᑯᓐᓂᑦ. ᐅᖃᐅᓯᖃᖅᑎᓪᓗᑕ, ᐊᓂᖅᓵᖅᐸᒃᑕᑦᑕ ᖃᓄᐃᓕᖓᓂᖓᓄᑦ ᑎᑎᖅᑲᖁᑏᑦ ᖃᓄᐃᓐᓂᖅᓴᐅᖕᒪᖔᑕ ᕿᒥᕐᕈᔭᐅᓪᓗᑎᒃ ᒪᓕᒐᖅᑎᒍᑦ ᒪᓕᒃᑕᐅᒐᔭᒃᑐᓄᑦ ᑎᑭᑕᐅᓇᓱᐊᖅᑐᓄᓪᓗ ᐊᓂᖅᓵᖅᐸᒃᑕᑦᑕ ᖃᓄᐃᑦᑑᓂᖏᓐᓄᑦ ᒐᕙᒪᖏᓐᓂ ᓄᓇᕗᒻᒥ ᐊᒻᒪ ᒐᕙᒪᖏᓐᓂ ᓄᓇᑦᓯᐊᒥ. 2023-ᒥ ᐳᔪᖅ ᓯᐊᒻᒪᖃᑦᑕᖅᑐᒥᒃ ᖃᐅᔨᓴᖅᐸᓪᓕᐊᖏᓐᓇᕐᓂᕐᓂᑦ ᑎᑎᖅᑲᖁᑏᑦ ᕿᒥᕐᕈᔭᐅᓪᓗᑎᒃ ᖃᓄᐃᓐᓂᖅᓴᐅᓂᖏᓐᓄᑦ ᒪᕐᕈᖕᓄᑦ ᓯᓚᓕᕆᓂᕐᒧᑦ ᐊᔾᔨᙱᖃᑦᑕᖅᑐᓄᑦ ᐊᒃᑐᐃᓂᖃᓛᖑᕙᒃᑐᑦ ᐱᕙᓪᓕᐊᓂᖓᓄᑦ ᑎᒃᑕᐅᕙᒃᑐᑦ ᐳᔪᖅ ᐊᒻᒪᓗ ᐳᔪᖅ ᓯᐊᒻᒪᒃᐸᓪᓕᐊᓂᖓᓄᑦ: ᐊᓄᕌᖅᐸᖕᓂᖓ ᐊᒻᒪᓗ ᒪᕐᑯᖃᑦᑕᕐᓂᖓ. ᐱᓕᕿᐊᒥ 2023-ᒥ ᓯᓚᓕᕆᓂᕐᒧᑦ ᑎᑎᖅᑲᖁᑏᑦ ᕿᒥᕐᕈᔭᐅᓕᖃᑦᑕᖅᑐᑦ ᖃᓄᐃᓐᓂᖅᓴᐅᖕᒪᖔᑕ 2023-ᒥ ᑎᑎᖅᑲᖁᑏᑦ ᖃᓂᒌᒧᑦ ᓯᓚᒥᒃ ᖃᐅᔨᓴᕐᕕᖕᓄᑦ ᐊᐅᓚᑕᐅᔪᓄᑦ ᐊᕙᑎᓕᕆᓂᕐᒥᑦ ᐊᒻᒪ ᓯᓚᒥᒃ ᐊᓯᔾᔨᖅᐸᓪᓕᐊᓂᕐᒧᑦ ᑲᓇᑕᒦᒃᑯᓐᓂᑦ (ECCC) ᒥᑦᑎᒪᑕᓕᖕᒥ ᐊᒻ ᓄᑖᙳᓛᑦ ᐊᑐᐃᓐᓇᐅᒧᑦ 30-ᓄᑦ ᐊᕐᕌᒍᓄᑦ ᓯᓚᐅᖕᒐᔭᒃᑐᓄᑦ (1991-2020) ᒥᑦᑎᒪᑕᓕᖕᒧᑦ. ᐃᓚᖏᑦ ᖃᓄᐃᓕᖕᓃᑦ, ᑕᑯᒋᐊᕆᐊᖃᓚᐅᖅᑐᑦ ᐊᑐᕐᓂᑯᓂᒃ ᒥᑦᑎᒪᑕᓕᖕᒥ 30-ᓄᑦ ᐊᕐᕌᒍᓄᑦ ᓯᓚᐅᒐᔭᒃᑐᓂᒃ (1981-2010) ᖃᓄᐃᓐᓂᖅᓴᐅᖕᒪᖔᑕ ᕿᒥᕐᕈᔭᐅᕐᑯᓪᓗᒋᑦ ᖃᖓᓂᓴᐅᓂᖅᓴᖅ ᓯᓚᐅᒐᔭᒃᑐᑦ ᑎᑎᖅᑲᖁᑏᑦ ᐱᖃᓯᐅᔾᔨᓯᒪᙱᒃᑯᑎᒃ ᓇᐃᓈᖅᓯᒪᔪᓂᒃ ᓇᓕᐊᖕᓄᓪᓚᑦᑖᖅ ᓯᓚᓕᕆᓂᕐᒧᑦ ᐊᓯᔾᔨᖅᑕᖅᑐᓄᑦ.

ᐊᓂᖅᓵᖅᐸᒃᑕᑦᑕ ᖃᓄᐃᓕᖓᓂᖏᓐᓄᑦ ᑎᑎᖅᑲᖁᑏᑦ ᑲᑎᑕᐅᓚᐅᖅᑐᑦ ᒪᕐᕉᖕᓂ ᐹᕙᓪᓚᖓᑦ ᐃᓂᓂᒃ ᑕᐃᓯᒪᔭᖏᓐᓂᒃ ᐅᔭᕋᓐᓂᐊᕐᕕᒃᒥ (MSC) ᐊᒻᒪᓗ ᑐᓚᒃᑕᕐᕕᖕᒥ (PSC). ᑎᑎᖅᑲᖁᑏᑦ ᑲᑎᑕᐅᓚᐅᖅᑐᑦ ᐳᓪᓚᖅ ᑕᖅᓴᖃᙱᑦᑐᖅ ᑎᐱᖃᙱᑦᑐᕐᓄᑦ (NO_2) ᐊᒻᒪᓗ ᐳᓪᓚᓕᖕᓄᑦ (SO_2) ᐊᑐᖅᖢᑎᒃ ᐅᖓᓯᒃᑐᒦᖢᑎᒃ ᓴᙱᓂᖏᓐᓂᒃ ᖃᐅᔨᓴᕈᑎᓂᒃ ᐳᓪᓚᖅ ᑕᖅᓴᖃᙱᑦᑐᖅ ᑎᐱᖃᙱᑦᑐᕐᓄᑦ (NO_2) ᐊᒻᒪᓗ ᐳᓪᓚᓕᖕᓄᑦ (SO_2) ᐋᖅᑭᐅᒪᑎᑕᐅᖏᓐᓇᖅᖢᑎᒃ ᑎᒃᑯᐊᖓᒪᑎᑕᐅᕙᒃᖢᑎᒃᓗ ᑕᖅᑭᓄᑦ ᐱᖓᓱᓄᑦ ᐊᒻᒪ ᓇᓗᓇᐃᖅᑕᐅᓪᓚᑦᑖᖅᐸᒃᖢᑎᒃ ᑕᐃᑲᓃᑦᑐᑦ ᐅᓪᓗᑦ ᖃᐅᔨᓴᕈᑎᓄᑦ. ᑎᑎᖅᑲᖁᑏᑦ ᐱᔭᐅᔪᑦ ᐱᔭᕇᖅᑕᐅᓚᐅᖅᑐᑦ ᐊᑐᖅᖢᑎᒃ “ᐃᐊᓐᑲᑖᔅ” ᑎᑎᖅᑲᖁᑖᕐᓇᖅᑐᓂᒃ ᖃᓇᓴᐅᔭᒃᑯᑦ ᐃᓂᐊᓃᑦᑐᓂ ᖃᓇᓴᐅᔭᓕᓇᔅᓯᑎᑎᒍᑦ ᐃᓂᖃᖅᑐᑦ ᐊᒃᑐᐊᔪᓄᑦ ᐊᓂᖅᓵᖅᐸᒃᑕᑦᑕ ᖃᓄᐃᓕᖓᓂᖏᓐᓄᑦ ᖃᐅᔨᓴᖅᐸᓪᓕᐊᖏᓐᓇᕐᕕᐅᔪᓂᑦ. ᐹᕙᓪᓚᖓ ᓴᕕᒃᓯᓂᒃ ᐅᔭᕋᓐᓂᐊᖅᑏᑦ ᐊᕙᑎᓕᕆᔨᖏᑦ ᑐᓂᓯᖃᑦᑕᖅᑐᑦ ᑕᖅᑭᑕᒫᑦ ᐊᓂᖅᓵᖅᐸᒃᑕᑦᑕ ᖃᓄᐃᖅᑑᓂᖓᓄᑦ ᑎᑎᖅᑲᖁᑎᖏᓐᓂ ᐅᓂᒃᑳᓂᒃ ᓄᓇᒥ ᔅᑖᓐᑕᒃᑯᓐᓄ ᕿᒥᕐᕈᔭᐅᕐᑯᓪᓗᒋᑦ ᑎᑎᖅᑲᖁᑏᑦ ᖃᓄᐃᑦᑑᓂᖏᓐᓄᑦ ᐊᒻᒪ ᓇᓗᓇᐃᖅᑕᐅᕐᑯᓪᓗᒋᑦ ᐱᕐᑎᓂᑦ ᐱᓇᐃᓗᑕᐅᑐᐃᓐᓇᓕᐊᓃᑦ/ᐊᔪᓕᖅᓯᒪᑐᐃᓐᓇᓕᐊᓃᑦ. ᓄᓇᒥ ᔅᑖᓐᑕᒃᑯᑦ ᐱᓕᕆᐊᖃᕈᑦ ᑕᖅᑮᑦ ᐱᖓᓱᑦ ᐊᓂᒍᕐᖓᑕ ᑕᒪᒻᒪᖅᓯᒪᔪᖅᓯᐅᕐᓂᕐᒥᒃ ᓇᓗᓇᐃᖅᑕᐅᓪᓚᑦᑖᕐᑯᓪᓗᒋᑦ ᑎᑎᖅᑲᖁᑏᑦ ᐱᕐᑎᓪᓗ ᐅᒃᐱᕐᓇᕐᓂᖏᓐᓂᒃ.

ᖃᓄᐃᓕᖓᓕᖅᐸᓪᓕᐊᔪᓂᒃ ᐱᔾᔪᑎᖃᖅᖢᑎᒃ, ᖃᐅᔨᓴᖅᐸᓪᓕᐊᖏᓐᓇᕐᓂᕐᒧᑦ ᑎᑎᖅᑲᖁᑏᑦ ᐳᓪᓚᖅ ᑕᖅᓴᖃᙱᑦᑐᖅ ᑎᐱᖃᙱᑦᑐᕐᓄᑦ (NO_2) ᐊᒻᒪᓗ ᐳᓪᓚᓕᖕᓄᑦ (SO_2) ᕿᒥᕐᕈᔭᐅᓪᓗᑎᒃ ᖃᓄᐃᓐᓂᖅᓴᐅᖕᒪᖔᑕ ᐃᒻᒪᕐᓂᓴᕐᓄᑦ ᑎᑎᖅᑲᖁᑎᓄᑦ ᑐᓂᔭᐅᓯᒪᔪᑦ RWDI-ᑯᓐᓂ ᐋᖅᑭᒃᓯᒪᓪᓗᑎᒃ ᐋᕐᕌᒍᑕᒫᖅᓯᐅᑎᐅᓪᓗᑎᒃ ᓇᐃᓈᖅᓯᒪᔪᑦ ᐅᓂᒃᑳᑦ (RWDI 2016, 2018, 2019, ᓄᓇᒥ ᔅᑖᓐᑕᒃᑯᑦ 2022, 2023). 2023-ᒥ ᑎᑎᖅᑲᖁᑏᑦ ᑲᑎᑕᐅᔪᑦ ᐅᔭᕋᓐᓂᐊᕐᕕᖕᒥ ᑐᓚᒃᑕᕐᕕᖕᒥᓗ ᒪᓕᑐᐃᓐᓇᖅᑐᑦ ᐃᒻᒪᕐᓂᓴᕐᓄᑦ RWDI-ᑯᑦ ᑎᑎᖅᑲᖁᑎᖏᑦᑕ ᐃᓕᖅᑯᓯᖃᕙᒃᑕᖏᓐᓄᑦ, ᐱᑕᖃᐅᓛᖑᓂᖏᑦ ᐳᓪᓚᖅ ᑕᖅᓴᖃᙱᑦᑐᖅ ᑎᐱᖃᙱᑦᑐᕐᓄᑦ (NO_2) ᐊᒻᒪᓗ ᐳᓪᓚᓕᖕᓄᑦ (SO_2) ᐱᑕᖃᓗᐊᕐᓂᖅᓴᐅᓪᓗᑎᒃ ᐅᑭᐅᒃᑯᑦ ᑕᖅᑭᖏᓐᓂᒃ ᐊᒻᒪᓗ ᑲᑖᒃᓪᓚᖃᑦᑕᖅᖢᑎᒃ ᐊᐅᔭᐅᓕᕋᖓᑦ. ᒫᓇᕋᑖᖅ ᐊᓂᖅᓵᖅᐸᒃᑕᑦᑎᓐᓂᓄᑦ ᓯᐊᒻᒪᒃᑐᓄᑦ ᐋᖅᑭᙳᐊᖅᓯᒪᔪᑦ ᐱᔭᕇᖅᑕᐅᓚᐅᖅᑐᑦ ᐱᓕᕆᐊᒧᑦ ᓇᓗᓇᐃᖅᓯᔪᑦ ᑲᑎᕐᑯᓘᔭᕐᓂᖏᑦ ᐳᖅᑐᔪᓂ ᐅᑭᐅᒃᑯᑦ ᐊᒃᐸᓯᖕᓂᖅᓴᐅᔪᑦ ᐊᐅᔭᐅᓂᖓᓂᒥᑦ ᐊᒻᒪ ᑕᒪᓐᓇ ᐊᓂᖅᓵᖅᐸᒃᑕᑦᑕ ᖃᓄᐃᓕᖓᓂᖓ ᓴᖅᑮᑐᐃᓐᓇᓕᐊᓕᒃ ᖁᕝᕙᓯᖕᓂᖅᓴᓂᒃ ᐆᒃᑐᕋᖅᑕᐅᓯᒪᔪᓂᒃ ᐳᓪᓚᖅ ᑕᖅᓴᖃᙱᑦᑐᖅ ᑎᐱᖃᙱᑦᑐᕐᓄᑦ (NO_2) ᐊᒻᒪᓗ ᐳᓪᓚᓕᖕᓄᑦ (SO_2) ᐱᑕᖃᐅᕐᓂᖏᑦ ᐅᑭᐅᒃᑯᑦ. ᐱᑕᖃᕐᓂᖏᑦ ᖁᑦᑎᒃᑐᒥᒃ ᐊᔪᖅᓯᓯᒪᔪᑦ ᓱᕈᔪᐃᑦ ᐃᓯᐊᕿᑎᑕᐅᔪᑦ ᐊᓂᖅᓵᖅᐸᒃᑕᑦᑎᓐᓄᑦ ᖁᓕᓃᑦ ᐊᑯᓂᖓᓂ ᓄᓇᒥ ᐊᒻᒪᓗ ᐳᖅᑐᓂᖅᓵᖅᔪᖓ ᖁᓕᓃᓂ; ᑕᒪᓇ ᐱᕙᓪᓕᐊᓯᒪᓂᖅᓴᐅᓪᓗᓂ ᒪᓂᕋᕐᒧᑦ-ᖃᓂᓐᓂᖅᓴᓄᑦ ᐊᓂᖅᓵᖅᐸᒃᑕᑦᑎᓐᓂ ᐱᑕᖃᐅᕝᕕᐅᓂᖓᓂ ᐊᒃᑐᐊᓂᓛᑦ ᐱᑕᖃᙱᒃᑯᓂ ᖁᑦᑎᒃᓯᕙᓪᓕᐊᓃᑦ ᖁᓕᓃᑦ.

ᐸᐃᑕ ᖃᐅᔨᓴᕈᑏᑦ (BAMs) ᐃᓕᔭᐅᓚᐅᖅᑐᑦ ᑎᓯᐱᕆ 2021–ᒥ ᑐᓚᒃᑕᕐᕕᖕᒥ ᐅᔭᕋᓐᓂᐊᕐᕕᖕᒥᒎ ᖃᐅᔨᓴᕐᕕᖕᓂ ᖃᐅᔨᓴᖅᑕᐅᕐᑯᓪᓗᒋᑦ ᐊᓂᖅᓵᖅᐸᒃᑕᑦᑎᓐᓂᒃ ᐱᑕᖃᐅᕐᓂᖏᑦ ᑲᑎᙵᕆᑦ ᖃᖓᑦᑕᖅᐸᒃᑐᑦ ᑕᖏᓖᑦ (TSP) ᐊᒻᒪᓗ ᓂᐅᕈᓐᓇᖅᑕᕗᑦ ᑕᖏᓕᕋᒦᑦ 2.5 (µm) ᐊᖏᓂᓖᑦ ᐊᒻᒪᓗ ᑐᙵᓃᕗᑎᒃ ($PM_{2.5}$). ᐆᒃᑐᕋᖅᑕᐅᓯᒪᔪᑦ ᑲᑎᕗᒋᑦ ᖃᖓᑦᑕᖃᑦᑕᖅᑐᑦ ᑕᖏᓖᑦ ᐊᒻᒪᓗ $PM_{2.5}$ ᐱᑕᖃᐅᕐᕕᖏᑦ ᑎᑎᕋᖅᑕᐅᓯᒪᔪᑦ ᐅᓄᕈᙳᓪᓗᑎᒃ ᖃᔅᓯᐅᓂᖏᑦ ᐊᐃᕐᕆᓕᒥ, ᐊᒃᐸᖅᐸᓪᓕᐊᕋᔮᖅᕗᑎᒃ ᐊᐅᔭᒧᑦ ᐊᒻᒪᓗ ᐱᕆᐊᓪᓚᒃᐸᓪᓕᐊᓕᒃᑲᓐᓂᖅᕗᑎᒃ ᓯᑎᐱᕆᒥ ᐅᑐᐱᕆᒥᒎᑦ 2023-ᒥ. ᐅᔭᕋᓐᓂᐊᕐᕕᖕᒥ, ᐆᒃᑐᕋᖅᑕᐅᓯᒪᔪᑦ ᑲᑎᕗᒋᑦ ᖃᖓᑦᑕᖅᐊᒃᑐᑦ ᑕᖏᓖᑦ ᐱᑕᖃᐅᕐᓂᖏᑦ ᐅᓄᖅᓂᖅᓴᐅᓚᐅᖅᑐᑦ "ᐱᓕᕆᐊᒥ ᒪᓕᒃᑕᐅᒐᔪᒃᑐᖅ ᑲᑎᕗᒋᑦ ᖃᖓᑦᑕᖅᐊᒃᑐᑦ ᑕᖏᓖᑦ 24-ᓄᑦ ᐃᑲᕐᕋᓄᑦ ᐱᑕᖃᐅᕐᓂᕐᓂ" (120 µg/m^3) 167-ᓄᑦ ᐱᓕᕆᓂᕐᓄᑦ ᐃᓗᓕᖃᖅᑯᑎᒃ 45.7% ᐊᑐᐃᓐᓇᐅᔪᓂᒃ ᐱᓕᕆᓐᓇᐅᔪᓂᒃ ᑎᑎᖅᑭᕆᓂᕐᒧᑦ. ᐆᒃᑐᕋᖅᑕᐅᓯᒪᔪᖅ $PM_{2.5}$ ᐱᑕᖃᐅᕐᓂᖏᓐᓄᑦ ᐅᓄᕐᓂᖅᓴᐅᓚᐅᖅᑐᖅ "ᐱᓕᕆᐊᒥ ᒪᓕᒃᑕᐅᒐᔪᒃᑐᑦ $PM_{2.5}$ 24-ᓄᑦ ᐃᑲᕐᕋᓄᑦ ᐱᑕᖃᐅᕐᕕᐅᔪᒥ" (30 µg/m^3) 9-ᓄᑦ ᐱᓕᕆᓂᕐᓄᑦ ᐃᓗᓕᖃᖅᑐᑦ 2.6% ᐊᑐᐃᓐᓇᐅᔪᒥ ᑎᑎᖅᑭᕆᕝᕕᐅᔪᒥ.

ᐆᒃᑐᕋᖅᑕᐅᓂᐅᒐᔪᒃᑐᖅ $PM_{2.5}$ ᐱᑕᖃᐅᕐᓂᐅᒐᔪᒃᑐᓄᑦ ᐅᔭᕋᓐᓂᐊᕐᕕᖕᒥ ᐊᑐᐃᓐᓇᐅᔪᑦ ᑎᑎᖅᑭᕆᕝᕕᐅᔪᓄᑦ (6.17 µg/m^3), ᑐᙵᓃᓚᐅᖅᑐᖅ ᐱᓕᕆᐊᒥ ᐊᕐᕋᒍᒧᑦ ᒪᓕᒃᑕᐅᒐᔪᒃᑐᓄᑦ (10 µg/m^3). ᖃᐅᔨᒪᔭᐅᔭᕆᐊᓕᒃ ᑐᓚᒃᑕᕐᕕᖕᒥ ᐅᔭᕋᓐᓂᐊᕐᕕᖕᒥᒎ ᑕᒪᐃᓐᓂᒃ ᐱᓕᕆᐊᒥ ᐱᕙᓪᓕᐊᕝᕕᐅᔪᒦᑦᑐᐃᓈᒃ, ᑕᒪᐃᓐᓂᖔᓄᓪᓗ ᐃᓂᓃᙳᕐᑎᑦᑐᑦ ᓇᒍᓇᐃᖅᑕᐅᓯᒪᔪᓂ ᒪᓕᒐᓕᕆᓂᖅᑎᒍᑦ ᒪᓕᖕᓂᕐᒧᑦ ᐱᓕᕆᐊᒥ ᐊᑐᖅᑕᐅᒐᔪᒃᑐᓂ. ᐃᓂᐅᙱᕈᓐᓇᖅᑐᑦ ᐋᖅᑭᒃᓯᓂᕐᒧᑦ ᐊᓂᖅᓵᖅᐸᒃᑕᑦᑕ ᖃᓄᐃᑦᑑᓂᖓᓂᒃ ᖃᐅᔨᓴᖅᐸᓪᓕᐊᖑᓐᓇᕐᒎᑦ ᐃᓯᒪᕆᖃᓯᐅᔾᔭᐅᓯᒪᔪᑦ; ᕿᓯᐊᓂᓕ ᐆᒪᖅᑯᑎᖃᕈᓐᓇᕐᓂᕐᒧᑦ ᐊᒻᒪᓗ ᐊᕐᖁᑐᓕᒫᖅ ᐅᐸᒃᑕᐅᔪᓐᓇᕐᓂᖏᑦ ᐊᔪᕐᓇᕈᑕᐅᔪᑦ. ᖃᓄᐃᓐᓂᖅᓴᐅᓂᖏᑦ ᕿᒥᕐᕈᔭᐅᓗᒋᑦ ᑕᒻᒪᒃᑯᐊ ᐅᔭᕋᓐᓂᐊᕐᕕᖕᒥ ᑲᑎᕗᒋᑦ ᖃᖓᑦᑕᖃᑦᑕᖅᑐᓂᒃ ᑕᖏᓕᖕᓂᒃ ᖃᐅᔨᓴᖅᐸᓪᓕᐊᖑᓇᕐᓂᖕᒥ ᖃᐅᔨᔭᐅᔪᑦ (ᐃᓗᐊᓂ ᐱᓕᕆᕝᕕᐅᑉ ᐱᕙᓪᓕᐊᕝᕕᖏᑕ ᑭᒡᓕᖏᓐᓂ) ᐱᓕᕆᐊᒥ ᒪᓕᒃᑕᐅᒐᔪᒃᑐᑦ ᐱᓕᕆᐊᖑᕙᓪᓕᐊᔪᑦ ᖃᐅᔨᒪᔾᔪᑕᐅᓗᑎᒃ ᐊᐅᓚᑦᑎᓂᕐᒧᑦ ᐱᓕᕆᐊᒃᓴᓄᑦ ᓴᐳᔾᔭᐅᓯᒪᖁᓪᓗᒋᑦ ᐊᓂᖅᓵᖅᐸᒃᑕᑦᑕ ᖃᓄᐃᑦᑑᓂᖓᓄᑦ. ᑐᓚᒃᑕᕐᕕᖕᒥ, ᐱᑕᖅᑐᑦ 1-ᒥᒃ ᐆᒃᑐᕋᖅᑕᐅᓯᒪᔪᒥᒃ 24-ᓄᑦ ᐃᑲᕐᕋᓄᑦ ᑲᑎᕗᒋᑦ ᖃᖓᑦᑕᖃᑦᑕᖅᑐᑦ ᑕᖏᓖᑦ ᓈᓴᐅᑎᕆᒐᔪᒃᑕᖓ ᐅᓄᕐᓂᖅᓴᐅᓚᐅᖅᑐᑦ ᐱᓕᕆᐊᒥ ᐊᑐᖅᑕᐅᒐᔪᒃᑐᒥ (120 µg/m^3) ᐃᓗᓕᖃᖅᑯᑎᒃ ᑲᑎᕗᑎᒃ ᐅᖃᓕᒫᖅᑕᐅᔪᑦ <4.7% 2023–ᒥ. ᐊᑕᐅᑦᑎᒃᑯᖅᑯᑎᒃ ᓈᓴᐅᑎᐅᒐᔪᒃᑐᑦ ᐆᒃᑐᕋᖅᑕᐅᓯᒪᔪᑦ $PM_{2.5}$ ᐱᑕᖃᕐᓂᖏᑦ ᕿᙵᐊᓂ ᐊᓂᖅᓵᖅᐸᒃᑕᑦᑕ ᖃᓄᐃᑦᑑᓂᖏᓐᓂᒃ ᖃᐅᔨᓴᖅᐸᓪᓕᐊᖑᓇᕐᒎᑦ ᐊᑐᐃᓐᓇᐅᔪᓄᑦ ᑎᑎᕋᖅᑎᑖᕐᕕᐅᓂᐅᔪᒧᑦ (5.02 µg/m^3) ᑐᙵᓃᓚᐅᖅᑐᑦ ᐱᓕᕆᐊᒥ ᐊᕐᕋᒍᑕᒫᖅ ᒪᓕᒃᑕᐅᒐᔪᒃᑐᓂ (10 µg/m^3). ᕿᙵᐊᓂ ᐱᑕᖃᓚᐅᖅᑐᖅ ᒪᕐᕉᓐᓂᒃ ᐆᒃᑐᕋᖅᑕᐅᓯᒪᔪᓂᒃ 24-ᓄᑦ ᐃᑲᕐᕋᓄᑦ ᓈᓴᐅᑎᐅᒐᔪᒃᑐᑦ PM2.5 ᐱᑕᖃᐅᕐᓂᖏᑦ ᐅᓄᕐᓂᖅᓴᐅᓚᐅᖅᑐᑦ ᐱᓕᕆᐊᒥ ᐊᑐᖅᑕᐅᒐᔪᒃᑐᒥ (30 µg/m^3) ᐃᓗᓕᖃᖅᑯᑎᒃ <0.8% ᑲᑎᕗᒋᑦ ᐅᖃᓕᒫᖅᑕᐅᑦᑎᐊᕈᓐᓇᖅᑐᑦ 2023-ᒥ (263).

ᓯᓚᓐᓂᐊᕈᑎᓄᑦ ᑎᑎᖅᑲᖁᑏᑦ ᑲᑎᑕᐅᓯᒪᔪᑦ ᐱᖓᓱᓂ ᐃᓂᓂ (ᓄᓘᔾᔪᓂ, ᕿᙵᐊᓂ ᑐᓚᒃᑕᕐᕕᖕᒥ, ᐃᒃᐱᑭᑦᑐᕐᔪᐊᓂᒎ ᓯᓚᓐᓂᐊᕐᕕᖕᓂ). ᑲᑎᑕᐅᔪᑦ ᑎᑎᖅᑲᖁᑏᑦ ᐱᖃᓯᐅᔾᔨᔪᑦ ᐊᓂᕌᖅᐸᒃᑕᑦᑕ ᓂᓪᓚᓱᖕᓂᖕᒐᓂᒃ, ᐊᒃᑐᐊᔪᑦ ᕿᐅᒃᑲᖕᒐᓂᖕᒐᓂᒃ, ᒪᖁᖃᑦᑕᕐᓂᖕᒐ, ᐊᓄᕋᖅᐸᖕᓂᖕᒐ ᓇᑭᖕᒐᕐᓂᖕᒐᓗ ᐊᓄᕆ, ᐊᒻᒪᓗ ᓯᕿᓂᕐᒥᖕᒐᖅᑐᑦ ᐆᓇᖅᑐᑦ. ᑎᑎᖅᑲᖁᑏᑦ ᖃᓄᐃᓐᓂᖅᓴᐅᖕᒪᖕᒐᑕ ᕿᒥᕐᕈᔭᐅᓪᓗᑎᒃ ᐱᖕᒐᓱᓄᑦ ᐊᕐᕌᒍᓯᒪᔪᓄᑦ ᑎᑎᖅᑲᖁᑎᓂᒃ ᖃᐅᔨᓴᒃᓴᓕᐅᕐᓂᕐᒧᑦ ᓄᓇᒥ ᔅᑖᓐᑕᒃᑯᓐᓂ (ᓄᓇᒥ ᔅᑖᓐᑕᒃ 2021, ᓄᓇᒥ ᔅᑖᓐᑕᒃ 2022, ᓄᓇᒥ ᔅᑖᓐᑕᒃ 2023), ᐊᒻᒪᓗᑦᑕᐅᖅ ᑭᖑᓂᖕᒋᑦᑎᓐᓂ ᓄᓇᐅᑉ ᐊᕙᑎᖕᒐᓄᑦ ᐊᕐᕌᒍᑕᒫᖅᓯᐅᑏᑦ ᖃᐅᔨᓴᖅᐸᓪᓕᐊᖑᓐᓇᕐᓂᕐᒧᑦ ᐅᓂᒃᑳᑦ (TEAMR) ᑖᒃᑯᓇᖕᒐᓪᓚᑦ ᐊᕙᑎᓕᕆᓕᕐᓂᑦᒧ ᑕᐃᓈᒥᒃᓴ ᐃᒃᑯᐊᐳᓈᑎᑦ ᐅᕝᕙᓘᓐᓃᑦ EDI (EDI 2018, EDI, 2019, EDI 2021, EDI, 2022, EDI 2023, EDI 2024) ᐊᒻᒪ ᓇᐃᑦ ᐲᔩᑦ (2016). ᖁᒃᑲᓂᐊᒍᑦ, ᐃᓕᖅᑯᓯᐅᓕᖅᐸᒃᑐᑦ ᖃᓄᐃᓐᓂᖅᓴᐅᓂᖏᑦ ᕿᒥᕐᕈᔭᐅᓪᓗᑎᒃ 30-ᓄᑦ ᐊᕐᕌᒍᓄᑦ ᓯᓚᐅᓯᒪᔪᖅ ᐊᑐᐃᓐᓇᕈᖅᑕᐅᓯᒪᔪᑦ ᐊᕙᑎᓕᕆᓂᕐᒥᑦ ᐊᒻᒪ ᓯᓚᒥᒃ ᐊᓯᔾᔨᖅᐸᓪᓕᐊᓂᕐᒧᑦ ᑲᓇᑕᒥᒃᑯᓐᓂᑦ (ECCC) ᒥᑦᑎᒪᑕᓕᖕᒥ ᒥᑦᑕᕐᕕᖕᒐᓂ ᓯᓚᓐᓂᐊᕐᕕᐊᓂ.

ᐊᕐᖁᑦ ᐊᓂᒍᖅᓯᒪᔪᑦ, ᓂᓪᓚᓱᒐᔪᖕᓂᖕᒐᑕ ᐃᓕᖅᑯᓯᖏᑦ 2023-ᒥ ᐊᔾᔨᐸᓗᒋᓚᐅᖅᑕᖏᑦ ᐃᓕᖅᑯᓯᐅᕚᑦ ᓯᓚᐅᓯᒪᔪᑐᑦ ᑎᑎᖅᑲᖁᑎᓂ ᓄᓇᖁᑖᓄᑦ. ᓂᓪᓚᓯᓖᖅ ᐊᑐᖅᑕᐅᕚᑐᓕ ᓯᕗᓕᖅᐹᓂ ᑕᖅᑭᓚᓐᓂ ᐊᕐᖁᒥ (ᔫᓄᐊᕆ ᐊᒻᒪᓗ ᕖᕝᕗᐊᕆ), ᐊᒻᒪᓗ ᑕᒃᑯᐊ ᐊᒃᐸᓯᓐᓂᖕᒐᐅᓪᓗᑎᒃ ᓯᓚᐅᓯᒪᔪᑦ ᑎᑎᖅᑲᖁᑎᖏᓐᓄᑦ. ᐊᕐᖁᐊᓂ, ᐅᔭᕋᓐᓂᐊᕐᕕᖕᒥ ᓂᓪᓚᓱᓐᓂᐅᒐᔪᒃᑐᑦ ᐅᖕᒐᑕᐅᔾᔨᓯᒫᕐᔭᓚᐅᖅᑐᑦ ᓯᓚᐅᓯᒪᔪᑦ ᑎᑎᖅᑲᖁᑎᖏᓐᓂ. ᐅᖅᑰᖑᖃᑦᑕᖅᑯᓂᒎ ᔭᓚᐃᒥ. ᑎᑎᖅᑲᖁᑏᑦ ᐃᓕᖅᑯᓯᖏᑦ ᒪᓕᑐᐃᓐᓇᖅᑐᑦ ᐊᕐᖁᓯᒪᔪᓂ. ᐱᒍᐊᖅᑐᒥᒃ ᓄᓘᔾᔪᓂ ᐅᔭᕋᓐᓂᐊᕐᕕᒃ ᓂᓪᓚᓯᖑᓪᓗᓂ ᑕᐃᒪᖕᒐᓂᑦ ᐱᕆᐊᕈᑕᐅᔪᑦ ᖃᐅᔨᓴᕈᑎᐅᓚᐅᖅᑎᓪᓗᒋᑦ (2005–2010), ᕿᙵᐊᓂ ᑐᓚᒃᑕᕝ ᓂᓪᓚᓯᖃᓚᐅᕐᒥᔪᖅ ᐊᕐᖁᓘᓴᖅᑐᓂᑦ ᒪᕐᕉᖕᓂ. ᑕᒪᓇ ᓴᖅᑭᓯᒪᑐᐃᓐᓇᕆᐊᓕᒃ ᓂᓪᓚᓱᖕᓂᖅᓴᐅᖃᑦᑕᖅᑎᓪᓗᒍ ᐅᑭᐅᒥ ᐃᓕᖅᑯᓰᑦ ᐅᔾᔨᕆᔭᐅᔪᑦ.

ᐊᒃᑐᐊᓂᓛᑦ ᕿᐅᒃᑲᖓᖃᑦᑕᕐᓂᖓᓄᑦ ᐃᓕᖅᑯᓯᐅᕙᒃᑐᑦ ᓇᓗᓇᐃᖅᓯᔪᑦ ᓯᒡᔭᖓᓂ ᓯᓚ, ᐊᒃᑐᐊᓂᖃᖅᑐᑦ ᕿᐅᒃᑲᖓᓂᕐᒧᑦ ᓈᓴᐅᑏᑦ ᐊᔾᔨᒌᖃᑦᑕᙱᑦᑐᑦ 53% (ᕚᕝᕗᐊᕆ) ᐊᒻᒪ 88% (ᔫᓂ). ᐃᓕᖅᑯᓯᐅᕙᒃᑐᖅ ᐊᔾᔨᐸᓗᒋᔭᖓ ᓯᓚᐅᒪᔪᖃᑦᑕᖅᑐᑦ ᑎᑎᖅᑲᖅᑯᑎᖏᓐᓄᑦ, ᑭᓯᐊᓂᓕ ᐃᓂᓗᒃᑖᐸᓗᑦ ᑲᑕᒃᐹᓕᖅᓯᒪᔪᑦ ᐊᒃᑐᐊᔪᑦ ᕿᐅᒃᑲᖓᓂᕐᒧᑦ ᔪᓚᐃᖑᑎᓪᓗᒍ.

ᒪᖁᒐᔪᕐᓂᖅᓴᐅᓚᐅᖅᐳᖅ ᐊᑯᓂᖓᓂ ᔫᓂᒥ ᐅᑐᐱᕆᒧᑦ, ᒪᓕᑐᐃᓐᓇᖅᐳᓂᓗ ᐊᕐᕌᒎᓯᒪᔪᓂ, ᑭᓯᐊᓂᓕ ᐊᔾᔨᙱᕐᔪᐊᖅᑐᑦ ᖃᓄᐃᓐᓂᖅᓴᐅᓂᖏᑦ ᕿᒥᕐᕈᔭᐅᓗᑎᒃ ᓯᓚᐅᒪᔪᑦ ᑎᑎᖅᑲᖅᑯᑎᖏᓐᓄᑦ. ᒪᖁᓗᐊᒪᔾᔭᖃᑦᑕᖅᓯᒪᔪᖅ ᐋᒡᒋᓯᒥ, ᒪᓕᑐᐃᓐᓇᖅᐳᓂᓗ ᑕᒪᓐᓇ ᓯᓚᐅᒪᔪᑦ ᑎᑎᖅᑲᖅᑯᑎᖏᓐᓄᑦ.

ᐊᓄᓇᐅᒐᔪᒃᑐᖅ ᐊᓄᖄᕐᓂᖅᓴᐅᒐᔪᖃᑦᑕᖅᓯᒪᔪᖅ ᓄᓘᔭᖕᓂ, ᕿᖑᒧᐊᓂ ᑐᓚᒃᑕᕐᕕᖕᒥ ᐊᒻᒪ ᐃᒃᐱᑭᑦᑐᕐᔪᐊᓂ ᓯᓚᐅᒪᔪᑐᓂ ᑎᑎᖅᑲᖅᑯᑎᓂᑦ, ᐃᒃᐱᑭᑦᑐᕐᔪᐊᖅ ᐊᓄᖄᒃᑲᐅᓛᖑᓪᓗᓂ. ᑕᒪᓐᓇ ᐃᓕᖅᑯᓯᐅᕙᒃᑐᖅ ᒪᓕᑐᐃᓐᓇᖅᑐᑦ ᑎᑎᖅᑲᖅᑯᑎᓂᑦ ᐊᕐᕌᒎᓯᒪᔪᓂᑦ. ᐊᓂᓇ ᓇᑭᙶᕐᓂᖓᓄᑦ ᑐᓴᐅᒪᒃᔭᑏᑦ ᐃᓂᓄᑦ ᐱᖓᓱᓄᑦ ᒪᓕᑐᐃᓐᓇᖅᑐᑦ ᐊᕐᕌᒎᓯᒪᔪᓂ.

ᓯᕿᓂᒥᙶᖅᑐᑦ ᐅᔾᔨᕆᔭᐅᔪᑦ ᐱᖓᓱᓂ ᓯᓚᓐᓂᐊᕝᕙᖕᒥ ᒪᓕᑐᐃᓐᓇᖅᑐᑦ, ᐅᔾᔨᕆᔭᐅᓂᖅᐹᔪᓐᓇᖅᑐᓂ ᓯᕿᓂᕐᒥᙳᑲᓪᓚᓪᓚᖃᑦᑕᖅᑐᑦ ᒪᐃᒥ ᔪᓚᐃᒧᑦ ᓄᓘᔭᖕᓂ, ᕿᖑᒧᐊᓂ ᑐᓚᒃᑕᕐᕕᖕᒥ ᐊᒻᒪ ᐃᒃᐱᑭᑦᑐᕐᔪᐊᓂ. ᖃᓄᐃᓐᓂᖅᓴᐅᓂᖏᑦ ᕿᒥᕐᕈᔭᐅᓪᓗᑎᒃ 2022-ᒥ ᑎᑎᖅᑲᖅᑯᑎᓄᑦ, ᓯᕿᓂᕐᒥᙳᐃᖑᔪᑦ ᐊᒃᐊᓯᓐᓂᖅᓴᐅᖕᒑᖅᔪᒃᓯᒪᔪᑦ.

ᑕᑯᔭᐃᓐᓇᑎᓪᓗᒋᑦ, ᓯᓚᓕᓇᓂᕐᒧᑦ ᑎᑎᖅᑲᖅᑯᑏᑦ ᑲᑎᑕᐅᓯᒪᔪᑦ 2023–ᒥ ᒪᓕᑐᐃᓐᓇᖅᑐᑦ ᐃᒻᒪᖅᓂᓴᖅᓄᑦ ᑎᑎᖅᑲᖅᑯᑎᓄᑦ. ᐃᓚᖏᑦ ᑎᑎᖅᑲᖅᑯᑏᑦ ᐊᔾᔨᒋᙱᐊᖅᔭᕐᔪᓂᒋᑦ ᐃᒻᒪᖅᓂᓴᐃᑦ ᐃᓕᖅᑯᓯᖃᕐᓇᖓᓚᐅᖅᑕᖏᓐᓄᑦ, ᑭᓯᐊᓂᓕ ᑖᒃᑯᐊ ᐊᔾᔨᒋᙱᔾᔭᑎᐊᔭᖏᑦ ᓯᓚ ᐃᓗᐊᓃᑦᑐᑦ ᐊᔾᔨᒌᙱᓐᓂᑐᐃᓇᐅᕙᒃᑐᑦ ᓂᕆᐅᒋᔭᐅᓇᔭᖅᓂᖅᑭᓄᑦ ᐊᖏᒍᒪᓚᖕᓂ ᖃᐅᔨᓴᖅᐸᓪᓕᐊᖏᓇᕐᓂᕐᒥ ᐱᓕᕆᐊᒥ.

2023–ᒥ ᐱᑕᖅᑲᐃᓐᓇᖅᑐᑦ ᐳᔪᖅ ᓯᐊᒻᒪᖅᑲᑦᑕᕐᓂᖓᓂᒃ ᖃᐅᔨᓴᖅᐸᓪᓕᐊᖏᓇᕐᓂᕐᓄᑦ ᐱᓕᕆᐊᖅ ᐊᑐᖅᓯᒪᔪᖅ 49-ᓂᒃ ᐱᑕᖅᑲᐃᓐᓇᖅᑐᑦ ᐳᔪᖅ ᓯᐊᒻᒪᖅᑲᑦᑕᕐᓂᖓᓄᑦ ᑲᑎᖅᓯᐃᕝᕕᑦ ᐆᒃᑐᕋᖅᑕᐅᖅᑯᓪᓗᒋᑦ ᐳᔪᖅ ᓯᐊᒻᒪᒃᐸᓪᓕᐊᔪᖅ ᐊᒃᑐᐊᓪᓗᓂ ᐱᓕᕆᐊᒥ ᐱᓕᕆᓂᖅᓄᑦ. 36-ᖑᔪᑦ ᑲᑎᖅᓯᐊᕝᕕᑦ ᖃᐅᔨᓴᓕᒃᓴᓕᐊᖑᔪᑦ ᑕᖅᑭᑖᓕᑦ, ᐊᒥᐊᒃᑯᖓᑦ (13) ᖃᐅᔨᓴᓕᒃᓴᓕᐅᖅᑕᐅᖅᑕᐅᖅᑯᓪᓗᒋᑦ ᐊᐅᔭᒃᑯᑦ ᑕᖅᑭᖓᓂ ᐱᔾᔪᑕᐅᓪᓗᑎᒃ ᐅᖓᓯᒃᑐᒦᓐᓂᖓᓂᒃ. ᑎᑎᖅᑲᖅᑯᑏᑦ ᕿᒥᕐᕈᔭᐅᖅᑯᓪᓗᒋᑦ ᐳᔪᖅ ᓯᐊᒻᒪᖅᑲᑦᑕᖅᑐᓄᑦ ᖃᐅᔨᓴᖅᐸᓪᓕᐊᖏᓇᕐᓂᕐᓄᑦ ᖃᐅᔨᓴᕐᕖᑦ ᕿᒥᕐᕈᔭᐅᓯᒪᔪᑦ ᑎᓴᒪ ᐃᓂᐅᔪᓂ: ᐅᓯᑲᖅᑕᖅᑎᑦ ᐊᖅᑯᑖᓂ ᐅᐊᖕᓇᖓᓂ ᐃᑳᕐᕕᖕᒥ, ᐅᓯᑲᖅᑕᖅᑎᑦ ᐊᖅᑯᑖᓂ ᓂᒋᐊᓂ ᐃᑳᕐᕕᖕᒥ, ᐅᔭᕋᖕᓂᐊᕐᕕᖕᒥ ᐊᒻᒪ ᕿᖑᒧᐊᓂ ᑐᓚᒃᑕᕐᕕᖕᒥ.

ᐅᓯᑲᖅᑕᖅᑎᑦ ᐊᖅᑯᑖᑦᑎᒍᑦ ᐅᐊᖕᓇᖕᓇᓂ ᓂᒋᐊᓂᓗ ᐃᑳᕐᕕᒃ ᐳᔪᖅ ᓯᐊᒻᒪᖅᑲᑦᑕᖅᑐᓄᑦ ᖃᐅᔨᓴᕐᕕᐅᓯᒪᔪᑦ ᓴᖅᑭᔮᖅᑎᑦᑎᓯᒪᔪᑦ ᐱᒥᐊᓪᓚᒃᓯᒪᓂᖅᓂᒃ ᔫᓂᒥ ᔪᓚᐃᒥᓗ 2023-ᒥ (ᐊᔾᔨᙳᐊᖅ 7-6 EDI-ᑯᑦ 2024) ᒪᓕᒃᑐᑦ ᐊᒃᑐᐊᔪᓄᑦ ᐸᓂᖅᑑᓚᐅᖅᓂᖓᓄᑦ ᖃᓄᐃᓕᖓᓐᓂᑦ (ᐊᑯᓂᖓᓂ 7 ᐊᒻᒪ 12 ᐅᓐᓄᑦ ᒪᖅᑯᓚᐅᖅᑐᖅ ᑕᖅᑭᑖᓕᑦ). ᐳᔪᖅ ᓯᐊᒻᒪᖅᑲᑦᑕᖅᑐᑦ ᐅᓯᑲᖅᑕᖅᑎᑦ ᐊᖅᑯᑖᓂ ᐅᐊᖕᓇᖕᓇᓂ ᐃᑳᕐᕕᒃ ᐊᒻᒪ ᐅᓯᑲᖅᑕᖅᑎᑦ ᐊᖅᑯᑖᓂ ᓂᒋᐊᓂ ᐃᑳᕐᕕᖕᒥᓂ ᐳᔪᖅ ᓯᐊᒃᒪᖅᑲᑦᑕᕐᓂᖓᓄᑦ ᖃᐅᔨᓴᕐᕕᖕᒥᓂ ᐊᔾᔨᒋᔭ 2023-ᒥ ᒪᓕᑐᐃᓐᓇᖅᑐᑦ ᒪᓯᐅᓚᑎᑦᑎᓚᐅᖅᑐᒥᒃ (17-18 ᐅᓐᓄᑦ ᒪᖁᒃᐳᓂ). ᐊᒃᑐᐊᓂᖅᑲᓂᕐᕕᒃᑐᖃᓚᐅᙱᑦᑐᖅ ᐊᒃᑐᐊᓂᖅᑲᓂᖅ 2023-ᒥ ᐱᓗᐊᖅᓂᐅᔪᖅ ᑕᖅᕿᑦ ᐳᔪᖅ ᓯᐊᒻᒪᖅᑲᑦᑕᕐᓂᖓᓄᑦ ᓈᓴᐅᑎᓄᑦ ᐅᓯᑲᖅᑕᖅᑎᑦ ᐊᖅᑯᑖᓂ ᐅᐊᖕᓇᖕᓇᓂ ᐃᑳᕐᕕᒃ ᐊᒻᒪ ᓂᒋᐊᒍᑦ ᐃᑳᕐᕕᒃ ᐳᔪᖅ ᓯᐊᒻᒪᖅᑲᑦᑕᕐᓂᖓᓄᑦ ᖃᐅᔨᓴᕐᕕᖕᓂ ᐊᒻᒪ ᖁᕝᕙᓯᖕᓂᖅᓴᐅᓪᓗᑎᒃ ᐊᑐᖅᑕᐅᓯᒪᔪᓂ ᑕᖅᑭᑖᓕᑦ ᐊᓄᖄᕐᓂᐅᕙᒃᑐᓂᒃ ᑎᑎᖅᑲᖅᑕᐅᓯᒪᔪᓂ ᖃᓂᒋᔮ ᓯᓚᓂᐊᓂ.

ᐳᔪᖅ ᓯᐊᒻᒪᖅᑲᑦᑕᕐᓂᖓᓄᑦ ᓈᓴᐅᑏᑦ ᑎᑎᖅᑲᖅᑕᐅᓯᒪᔪᑦ ᐅᔭᕋᖕᓂᐊᕐᕕᖕᒥ ᐊᒻᒪ ᕿᖑᒧᐊᓂ ᖃᐅᔨᓴᕐᕕᖕᓂ ᖃᐅᔨᓴᕐᕕᖕᓂᒃ ᐊᐃᕐᓇᓕ ᒪᐃᒥ 2023-ᒥ ᒪᓕᑐᐃᓐᓇᖅᑐᑦ ᐸᓂᖅᑑᓚᐅᖅᓂᖓᓄᑦ ᑎᑎᖅᑲᖅᑕᐅᓯᒪᔪᑦ ᐅᔭᕋᖕᓂᐊᕐᕕᖕᒥ ᖁᕝᕙᓯᓐᓂᐊᕈᑎᓂ (ᐊᐃᕐᓇᓕ ᒪᐃᒧᑦ 2023-ᒥ ᐆᒃᑐᕋᖅᑕᐅᖅᑯᓪᓗᒋᑦ ᒪᖅᑯᓂᐅᓪᓗᒋᑦ). ᐳᔪᖅ ᓯᐊᒻᒪᓗᐊᖅᓯᒪᙳᖅᑐᖅ ᒪᓕᑐᐃᓐᓇᖅᑐᑦ ᒪᓯᐅᓚᑎᑦᑎᓚᐅᖅᑐᖅ ᐊᐃᕐᓇᓕ 2023-ᒥ. ᐊᒃᑐᐊᓂᖅᑲᓂᕐᕕᒃᑐᖃᓚᐅᙱᑦᑐᑦ ᑕᖅᑭᑖᓕᖅᓯᐅᓂᑦ ᐊᓄᓇᐅᑎᑦ ᐊᒻᒪ ᐳᔪᖅ ᓯᐊᒻᒪᖅᑲᑦᑕᕐᓂᕐᒧᑦ ᓈᓴᐅᑎᑦ ᐅᓯᒐᔪᒃᑐᑦ ᐊᒻᒪ ᕿᖑᒧᐊᓂ ᑐᓚᒃᑕᕐᕕᖕᒥ ᐳᔪᖅ ᓯᐊᒻᒪᖅᑲᑦᑕᕐᓂᖓᓄᑦ ᖃᐅᔨᓴᕐᕕᖕᓂ ᐃᓂᓂ 2023-ᒥ. ᖃᐅᔨᓴᕐᕕᒋᔭᐅᓂᖓᓂ ᖃᐅᔨᓴᖅᐸᓪᓕᐊᔪᓐᓂᑦ ᐊᑐᖅᑕᐅᓂᖓᓄᑦ, 2023-ᒥ ᐆᒃᑐᕋᖅᑕᐅᔪᓐᓇᖅᑐᑦ ᐳᔪᖅ ᓯᐊᒻᒪᖅᑲᑦᑕᖅᑐᑦ ᖃᓄᐃᓕᖓᓐᓂᖏᑦ ᐱᒥᐊᓪᓚᒃᓯᒪᓂᖅᓯᓐᓇᖅᑐᑦ 50 g/m^2/ᐊᕐᕌᒍᒧᑦ ᐊᐅᓚᑦᑎᓂᖓᓄᑦ ᐱᕆᐊᒃᑕᐅᓂᖓᓄᑦ ᖃᓄᐃᓕᖓᓐᓂᖏᓐᓂᑦ ᖃᐅᔨᓴᖅᐸᓪᓕᐊᖏᓇᕐᓂᕐᓄᑦ ᖃᐅᔨᓴᕐᕕᖕᓂ ᐅᔭᕋᖕᓂᐊᕐᕕᖕᒥᓗ, ᕿᖑᒧᐊᓂ ᑐᓚᒃᑕᕐᕕᖕᒧᑦ, ᐅᓯᑲᖅᑕᖅᑎᑦ ᐊᖅᑯᑖᓂ ᐅᐊᖕᓇᖕᓇᓂ ᐃᑳᕐᕕᖕᒥ, ᐊᒻᒪ ᓂᒋᐊᒍᑦ ᐃᑳᕐᕕᖕᒥ (ᐊᔾᔨᙳᐊᖅ 7-9 EDI 2024).

ᐊᔾᔨᒌᙱᑦᑐᑦ ᐱᓕᕆᐊᑦ ᐱᓕᕆᐊᖑᕙᓪᓕᐊᖏᓐᓇᖅᑐᑦ ᐳᔪᕋᖅ ᓯᐊᒻᒪᓗᐊᕐᑯᓇᒍ. ᐸᕙᓐᑏᓐᑯᑦ ᐅᖓᑖᓂ 30 ᐱᓂᐊᕐᓂᕋᕈᑎᓖᑦ ᐊᒃᑐᐊᔪᑦ ᐅᔪᕋᕐᒧᑦ ᐋᖅᑭᓯᒪᓕᖅᑐᑦ ᐃᓚᒋᔭᐅᓪᓗᑎᒃ ᐅᔭᕋᖕᓂᐊᕈᓐᓇᐅᑎ 005-ᒥ ᑐᓂᔭᐅᓯᒪᔪᖅ ᓄᓇᕗᒻᒥ ᐊᕙᑎᓕᕆᔨᒃᑯᑦ ᑲᑎᒪᔨᖏᓐᓂ (NIRB). ᐅᔾᔨᕆᔭᐅᔭᕆᐊᓕᒃ, ᑖᓐᓇ ᐅᔭᕋᖕᓂᐊᕈᓐᓇᐅᑎ ᐊᔾᔨᐸᓗᒋᔭᖕᒐ ᐊᓂᖅᓵᖅᐸᒃᑕᑦᑕ ᖃᓄᐃᑦᑑᓂᖕᒐᓄᑦ ᐱᔪᓐᓇᐅᑎ ᐊᓯᖏᓐᓂ ᐱᔪᓐᓇᓂᖃᕐᕕᐅᔪᓂ. 2021-ᒥ, ᐸᕙᓐᑏᓐᑯᑦ ᑉᐱᓇᐅᔭᖃᖅᑎᑦᑎᓯᒪᔪᑦ ᐱᖓᔪᒋᔭᐅᓪᓗᑎᒃ-ᐃᓚᒋᔭᐅᔪᓂᒃ ᐳᔪᕋᓕᕆᔨᓂᒃ, ᐱᖃᓯᐅᔾᔨᓯᒪᔪᑦ ᓴᖅᑭᑕᐅᓂᖏᑦ ᐃᓛᒃᑰᖅᑐᑦ ᐳᔪᕋᓕᕆᔩᑦ ᑲᑎᒪᔨᐊᓛᑦ ᐱᓕᕆᐊᖃᖅᓯᒪᔪᑦ ᐅᔭᕋᖕᓂᐊᕐᕕᖕᒧᑦ ᑕᑯᔭᖅᑐᖅᓘᑎᒃ ᖃᐅᔨᓴᕆᐊᖅᑐᕐᓂᕐᓂᒃ ᐅᑐᐱᕆ 2021-ᒥ, ᑲᑎᒪᖃᑎᖃᖃᑦᑕᒃᑲᓐᓂᕐᓂᕐᓄᑦ ᐱᓕᕆᓃᑦ ᐱᓕᕆᐊᖑᓯᒪᓪᓗᑎᒃ 2022-ᒥ. ᑭᖑᓪᓕᖅ ᐳᔪᕋᓕᕆᔩᑦ ᐅᔭᕋᖕᓂᐊᕐᕕᖕᒧᑦ ᖃᐅᔨᓴᕆᐊᖅᑐᕐᓂᖕᒐ ᐱᔭᕇᖅᑕᐅᓚᐅᖅᑐᑦ ᐊᐃᕆᓕ 2022-ᒥ. ᒫᓐᓇᓚᐅᑲᒃ ᐳᔪᕋᓕᕆᔨᒃᑯᓐᓂᑦ ᐅᓂᒃᑳᖅ ᑐᓂᔭᐅᓚᐅᖅᑐᖅ ᐸᕙᓐᑏᓐ ᓴᕕᒃᓴᓂᒃ ᐅᔭᕋᖕᓂᐊᖅᐱᑦ ᓄᓇᓕᖕᓂ ᑐᓴᐅᒪᔪᓕᕆᔨᓄᑦ ᐊᒻᒪᓗ ᓄᓇᓕᖕᓄᑦ ᓯᑎᐱᕆ 2022-ᒥ. ᖃᐅᔨᔭᐅᔪᑦ ᕿᒥᕐᕈᓂᕐᒥ ᑎᑎᕋᖅᓯᓯᒪᔪᑦ ᑭᖑᓪᓕᖅᐹᖅᓯᐅᑎᓂᒃ ᐊᑐᓕᕐᑯᔾᔪᑎᓄᑦ ᐅᓂᒃᑲᒥᒃ ᑐᓂᔭᐅᓯᒪᔪᖅ ᓄᓇᕗᒻᒥ ᐊᕙᑎᓕᕆᔨᒃᑯᑦ ᑲᑎᒪᔨᖏᓐᓄᑦ

ᕖᕝᕗᐊᕆ 16, 2023-ᒥ (ᓄᓇᕗᒻᒥ ᐊᕙᑎᓕᕆᔨᒃᑯᑦ ᑲᑎᒪᔨᖏᑦᑕ ᑎᑎᕋᖅᑕᐅᓯᒪᕝᕕᖓᓄᑦ ᓈᓴᐅᑖ 342950). ᑭᖑᓪᓕᖅᐹᖅᓯᐅᑏᑦ ᐊᑐᓕᕐᑯᔾᔪᑎᓄᑦ ᐅᓂᒃᑳᖅ ᕿᒥᕐᕈᔭᐅᓯᒪᔪᖅ ᐊᑑᑎᖃᖅᑑᓪᓗᓂ ᒫᓐᓇ ᐱᓕᕆᔾᔪᓯᕐᓄᑦ ᐊᒻᒪᓗ ᓯᕗᒻᒥᐊᒋᐊᖅᑎᑕᐅᓯᒪᔪᖅ ᐊᑐᓕᕐᑯᔭᐅᔾᔪᑏᑦ ᐊᑐᖅᑕᐅᖖᑮᕈᓐᓇᖅᑐᓪᓗ ᓯᐊᒻᒪᓗᐊᕐᑯᓇᒋᑦ ᐊᒃᑐᐃᓗᐊᕐᑯᓇᒍᓗ ᐳᔪᕋᖅ ᐱᓕᕆᕝᕕᖕᒥ ᐱᓕᕆᓂᕐᓂᑦ. 2023-ᒥ ᐱᖓᓱᓂᒃ ᐳᔪᕋᓕᕆᔨᒃᑯᑦ ᑲᑎᒪᓂᖃᓚᐅᖅᑐᑦ ᕿᒥᕐᕈᔭᐅᕐᑯᓪᓗᒋᑦ ᐊᑐᓕᕐᑯᔭᐅᔪᑦ ᐳᔪᕋᖅ ᓯᐊᒻᒪᓗᐊᕐᑯᓇᒍ. ᐱᖓᔪᖓᑦ ᐅᔭᕋᖕᓂᐊᕐᕕᖕᒧᑦ ᖃᐅᔨᓴᕆᐊᖅᑐᕐᓂᖅ ᐸᕐᓇᒃᑕᐅᓯᒪᔪᖅ ᐳᔪᕋᓕᕆᔨᒃᑯᓐᓄᑦ 2024-ᒥ ᐊᒻᒪᓗ ᑭᖑᓪᓕᖅ ᐊᕐᕌᒍᑕᒫᖅᓯᐅᑏᑦ ᐳᔪᕋᓕᕆᔨᒃᑯᓐᓂᑦ ᐅᓂᒃᑳᖅ ᑐᓂᔭᐅᔪᖅᑐᖅ ᓄᓇᕗᒻᒥ ᐊᕙᑎᓕᕆᔨᒃᑯᑦ ᑲᑎᒪᔨᖏᓐᓄᑦ 2024-ᒥ.

Executive Summary

This annual report presents a summary of the ambient air quality, dustfall, and meteorology data collected during 2023 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 2023 dustfall monitoring data are compared with the two meteorology variables that have the strongest influence on the generation of fugitive dust and dustfall: wind speed and precipitation in the form of rain. The Project's 2023 meteorology data are compared with 2023 data from the nearest climate monitoring station operated by Environment and Climate Change Canada (Pond Inlet) and with the latest available 30-year Climate Normals (1991-2020) for Pond Inlet. In some instances, it was necessary to refer to previous Pond Inlet 30-year Climate Normals (1981-2010) for a comparison to be made if the latter Climate Normals dataset did not include a summary for a specific meteorological variable.

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. The Baffinland Iron Mines Environmental Technicians submitted monthly air quality data reports to Nunami Stantec for review to check data quality and to identify potential equipment issues/deficiencies. Nunami Stantec conducted quarterly audits to verify data and equipment validity.

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, Nunami Stantec 2022, 2023). The 2023 data collected at MSC and PSC were consistent with the historical RWDI 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 during summer and this atmospheric condition could result in higher measured SO_2 and NO_2 concentrations during winter. The presence of an elevated inversion 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 2023).

Beta attenuation monitors (BAMs) were installed in early December 2021 at the PSC and MSC stations to measure ambient concentrations of total suspended particulates (TSP) and respirable particulates 2.5 µm in diameter and less ($PM_{2.5}$). The measured TSP and $PM_{2.5}$ concentrations recorded the highest values in April, falling off through the summer and rising again in September and October 2023. At the MSC, the measured TSP concentrations were greater than the “Project Standard TSP 24-hour concentration” (120 $\mu g/m^3$) for 167 events comprising 45.7% of the available period of record. The measured $PM_{2.5}$ concentrations were greater than the “Project Standard $PM_{2.5}$ 24-hour concentration” (30 $\mu g/m^3$) for 9 events comprising 2.6% of the available period of record.

The average measured $PM_{2.5}$ concentration at MSC for the available period of record (6.17 µg/m^3), was less than the project annual standard (10 µg/m^3). It is important to note the PSC and MSC are both within the PDA, and therefore not in locations to determine 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. 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. At the PSC, there were 17 measured 24-hour TSP average that were greater than the Project Standard (120 µg/m^3) comprising <4.7% of the total readings in 2023. During the same time the average measured $PM_{2.5}$ concentration at the PSC ambient air quality monitoring station for the available period of record (5.02 µg/m^3) was less than the project annual standard (10 µg/m^3). At the PSC there were two measured 24-hour average $PM_{2.5}$ concentrations that were greater than the Project Standard (30 µg/m^3) comprising <0.8% of the total valid readings in 2023 (263 days).

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 2021, Nunami Stantec 2022, Nunami Stantec 2023), as well as for the previous TEAMR reports from Environmental Dynamics Inc. or EDI (EDI 2018, EDI 2019, EDI 2021, EDI 2022, EDI 2023, EDI 2024) and Knight Piesold (2016). Additionally, trends were compared to the 30-year Climate Normal as provided by Environment and Climate Change Canada for the Pond Inlet Airport climate station.

As with previous years, the general temperature trends in 2023 are similar to the trends of the Climate Normal data in the region. Minimum temperatures occur during the first couple of months in the year (January and February), and these are lower than the Climate Normal data. For the rest of the year, site temperatures are at or slightly above the Climate Normal data. The peak temperatures occurred in July. The data trends are consistent with previous years. Specifically, the Mary River site had the lowest minimum temperature since the baseline study (2005–2010), while the Milne Port site had a lower minimum temperature than the previous two years. This may have been a result of the lower winter temperature trends observed.

Relative humidity trends are indicative of a coastal climate, with relative humidity values varying between 53% (February) and 88% (June). The trend is similar to the Climate Normal data, but most sites have a dip in relative humidity during July.

Rainfall tended to occur between June and October, which is consistent with previous years, but with a wider range when compared to the Climate Normal data. Peak rainfall occurred in August, which is consistent with the Climate Normal data.

Average wind speeds tended to be higher at Mary River, Milne Port and Steensby than the Climate Normal data, with the Steensby site having the highest windspeeds. This trend is consistent with data from previous years. Wind direction information at the three sites were consistent with 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 2022 data, the maximum solar radiation was slightly lower.

Overall, the meteorology data collected during 2023 are consistent with the historical data. 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 2023 passive dustfall monitoring program used 49 passive dustfall collectors to measure dust deposition related to the Project activities. Thirty-six collectors are sampled monthly, while the rest (thirteen) are sampled during the summer months due to their remote location. For data evaluation the dustfall monitoring stations are assessed in four areas: Tote Road North Crossing, Tote Road South Crossing, Mine Site, and Milne Port.

Tote Road North Crossing and Tote Road South Crossing dustfall stations showed peaks during June and July 2023 (Figure 7-6 in EDI 2024) which coincided with relatively dry conditions (between 7 and 12 days of rain per month). Dustfall was low at the Tote Road North Crossing and the Tote Road South Crossing dustfall stations during August 2023 which coincided with unusually wet conditions (17 to 18 days with rain). There was no correlation between the 2023 peak monthly dustfall values for the Tote Road North Crossing and the Tote Road South Crossing monitoring stations and higher than average monthly wind speeds recorded at the nearest meteorology station.

Elevated dustfall values recorded at the Mine Site and Milne Port monitoring stations during April and May 2023 coincided with dry conditions recorded at the Mine Site and Milne Port meteorology stations (no days during April and May 2023 with measurable precipitation). Low dustfall values coincided with unusually wet conditions during August 2023. There was no correlation between monthly average wind speeds and dustfall values at the Mine Site and Milne Port monitoring locations during 2023. For the stations sampled year round, the 2023 measured annual dustfall levels were greater than the 50 g/m^2/year management action trigger level for monitoring stations at the Mine Site, Milne Port, Tote Road North Crossing, and Tote Road South Crossing (Figure 7-9 in EDI 2024).

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 that was issued by the Nunavut Impact Review Board (NIRB). 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 is planned for the Dust Audit Committee during 2024 and the second annual Dust Audit report will be submitted to NIRB in 2024.

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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.
GIS	Geographic Information System
GN	Government of Nunavut
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
NOx	Nitrogen oxides
NWTAAQS	Northwest Territories Ambient Air Quality Standards
PDA	Project Development Area
PM	Particulate matter
$PM_{2.5}$	Particulate matter with 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
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

1 Introduction

Nunami Stantec Limited (Nunami Stantec) was retained by Baffinland Iron Mines Corporation (Baffinland) to compile an annual report for the 2023 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 SO_2, NOx and 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. Chapter 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 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 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.

The air quality inside of the PDA boundary is considered from an occupational workplace perspective and is assessed using different 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). The exception to this situation is the comparison of the SO_2 and NO_2 monitoring data at the PSC and MSC that are being compared to the Nunavut Ambient Air Quality Standards (NAAQS).

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 ($PM_{2.5}$), nitrogen dioxide (NO_2) and sulphur dioxide (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 comparison purposes in 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.

Table 1.1 Standards and Objectives for Ambient Air Quality

Common Air Contaminant	Averaging Time	Units	NAAQS[a]	NWTAAQS[b]	2020 CAAQS[c]	Project Standard[e]
SO_2	1 hr	µg/m³	450 (172 ppb)	-	183[5]	450
	24 hr	µg/m³	150 (57 ppb)	-		150
	Annual	µg/m³	30 (11 ppb)	-	13.1[4]	30
NO_2	1 hr	µg/m³	400 (213 ppb)	-	113[4]	400
	24 hr	µg/m³	200 (106 ppb)	-		200
	Annual	µg/m³	60 (32 ppb)	-	32.0[d]	60
TSP	24 hr	µg/m³	120	-	-	120
	Annual	µg/m³	60	-	-	60
$PM_{2.5}$	24 hr	µg/m³	30	-	27	30
	Annual	µg/m³	-	10	8.8	10

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.

e CAAQS for these variables are provided in parts per billion (ppb); these have been converted to µg/m³ by the equation: Concentration (µg/m³) = 0.0409 x Concentration (ppb) x molecular weight (Boguski 2006).

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

The Canadian Ambient Air Quality Standards (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. 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 (6.0 million tonnes per year of production) in consultation with the GN and Environment and Climate Change Canada (ECCC). Section 2 describes the additional continuous monitoring equipment for measuring the TSP and $PM_{2.5}$ concentrations at the MSC and PSC. The new 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 a total of forty-nine (49) 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 location and methodology used for the dustfall monitoring stations is summarized in the 2023 Terrestrial Environment Annual Monitoring Report (TEAMR, EDI 2024).

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	503,930	7,976,078
Mine Site Complex (MSC) Ambient Air Quality Monitoring Station	Mine Site	year-round	Within PDA	561,398	7,913,332
Mary River Meteorology Station [a]	Mine Site	year-round	Within PDA	558,095	7,914,345
Milne Port Meteorology Station [a]	Port Site	year-round	1.6	505,831	7,975,274
Steensby Meteorology Station [a]	Mine Site	year-round	Within PDA	593,120	7,799,108
Pond Inlet Airport Climate Station [b]	Pond Inlet Airport	year-round	130 from the Port Site Complex	401,435	8,068,271

Notes:
[a] Based-on information from Baffinland
[b] Based on Environment and Climate Change Canada (ECCC 2021) and on UTM Zone 18

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LEGEND

Monitoring Station

- Continuous Ambient Air Quality
- MET
- Dustfall Monitoring Site

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

MARY RIVER PROJECT

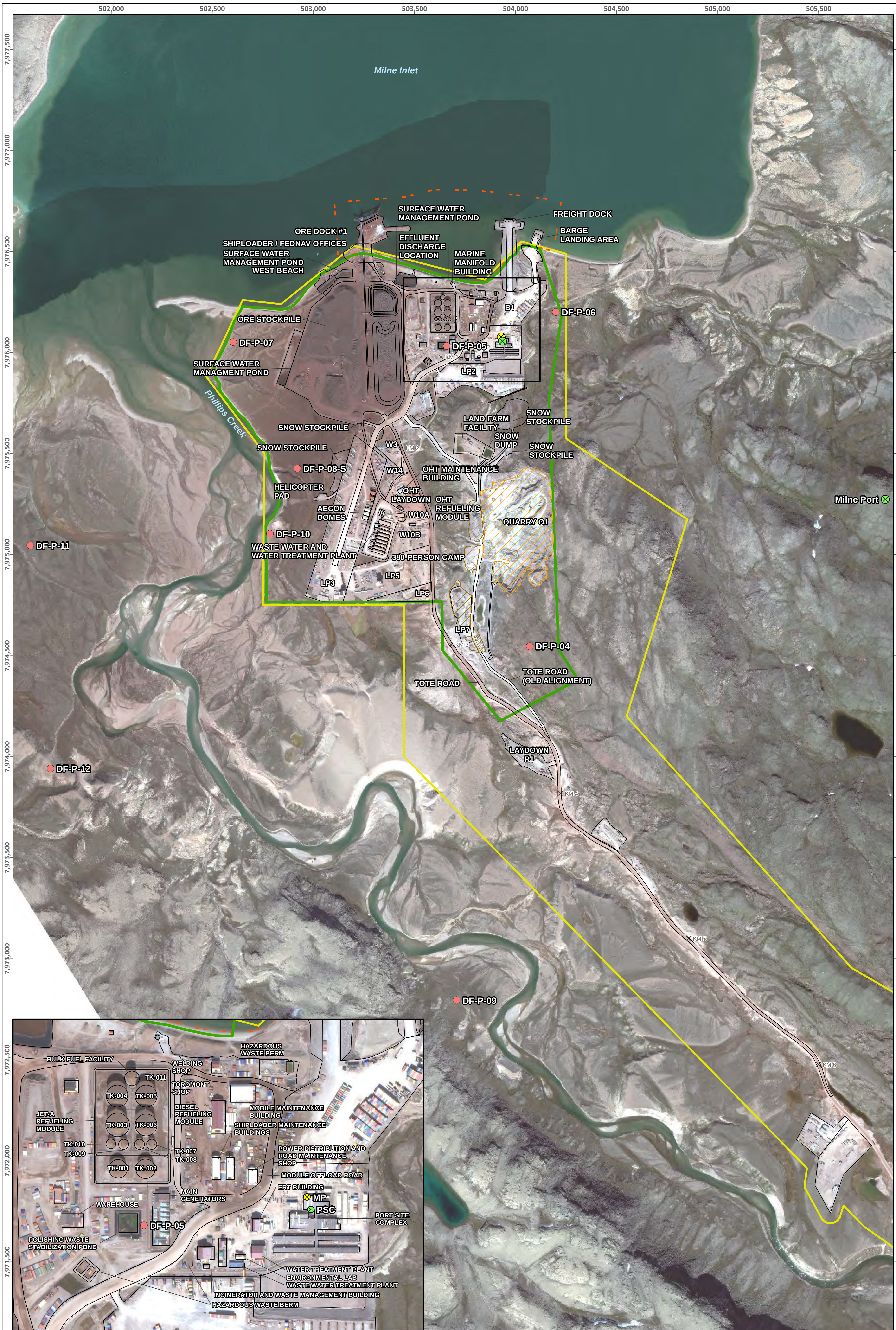
Mine Site Air Quality and MET Stations

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

FIGURE 1.1



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

MARY RIVER PROJECT

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

FIGURE 1.2

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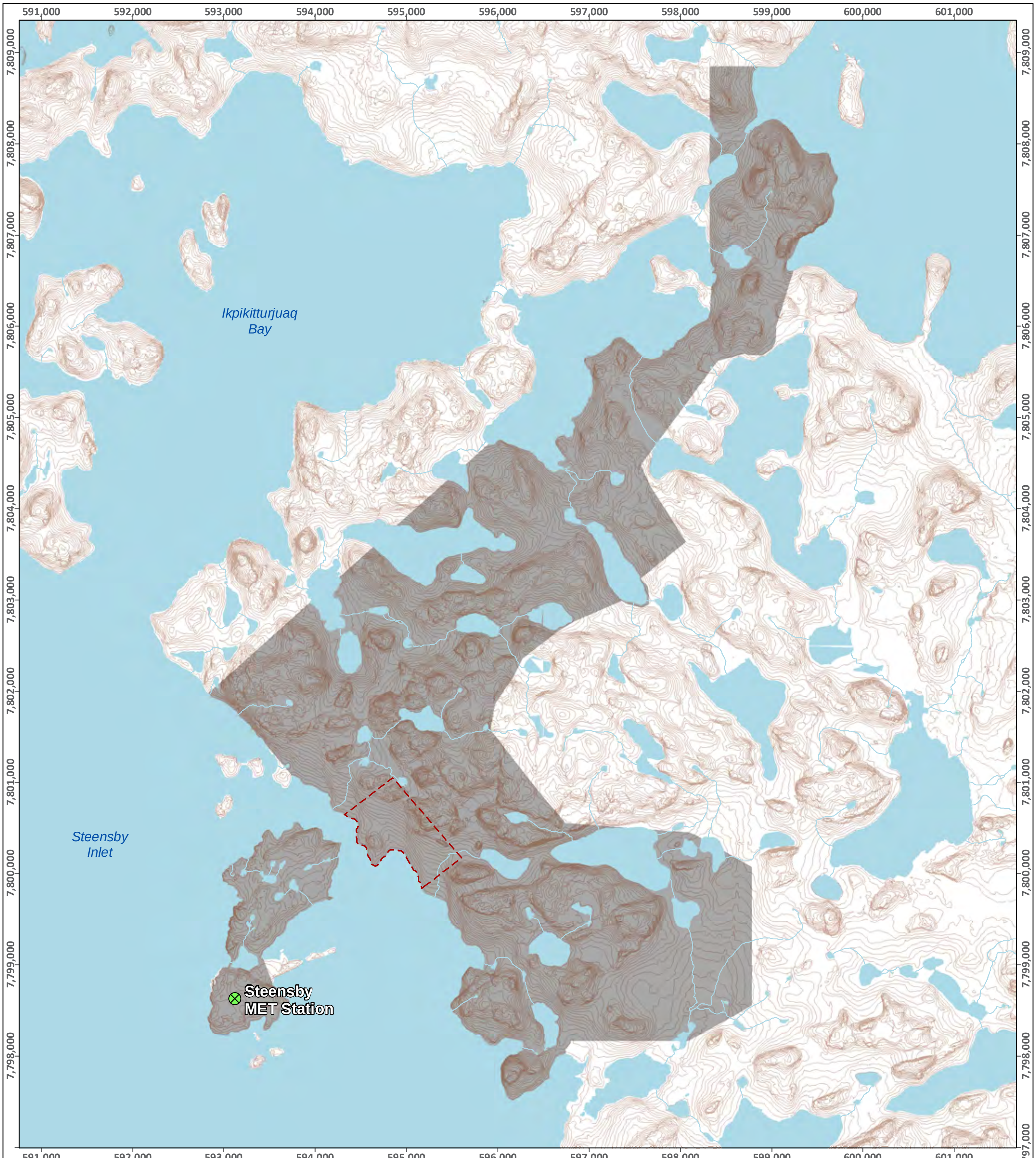

LEGEND

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

Monitoring Station

- MET

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MARY RIVER PROJECT

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**

1.2.1 Mary River Mine Site

There is one (1) automated meteorology station at the 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 (NO_x-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).**

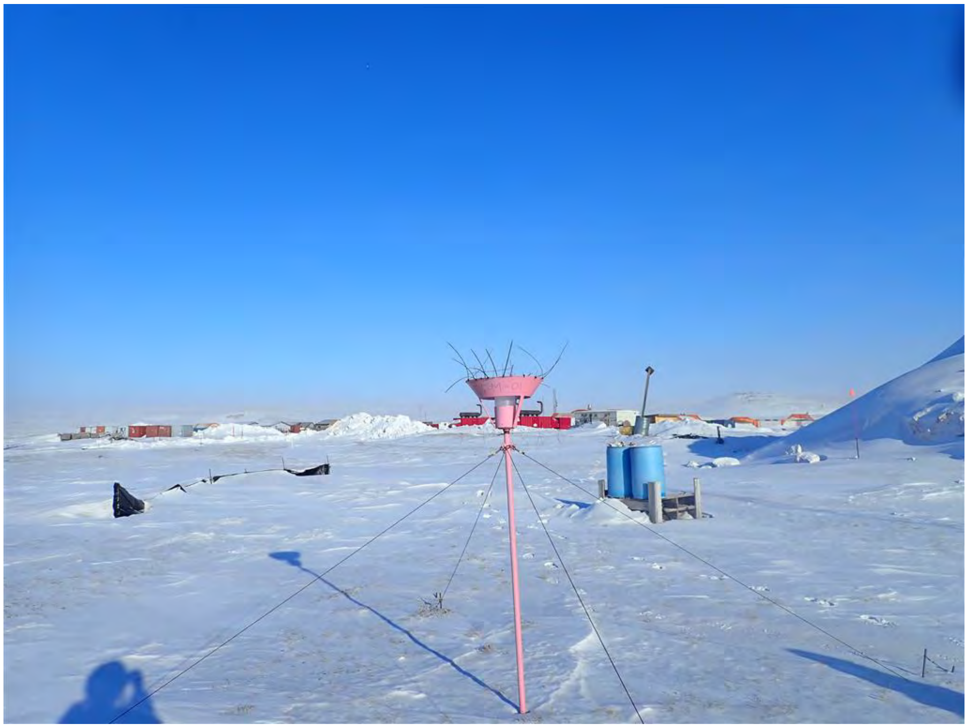


Photo 1.6 **Dustfall station DF-M-01 (March 20, 2021) near the Mine Site is located approximately 250 m south of the airstrip and 250 m east of Camp Lake.**

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 US EPA calibration standards in compliance with 2020 Canadian Ambient Air Quality Standards 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. Quarterly calibrations and audits are conducted on the monitors to verify data validation. 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 (NOx, 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.

2.2 SO_2 and NO_2 Results and Discussion

Ambient air quality monitoring results for 2023 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 82.2% valid data for 2023 with a low of 20.83% for March (and 45.1% for April) due to a failure of the UV light (Table 2.1). A new lamp was installed in May 2023 bringing the monitor back on-line.

The SO_2 concentrations remained very low throughout 2023 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 (15.3 ppb) was 8.9% of the NAAQS 1-hour standard and 10% of the NAAQS 24-hour standard and 9%of the NAAQS annual concentration. The maximum 1-hour SO_2 concentrations was 8% 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 98th percentile of data values; derived from 7845 and 8665 valid data points for SO_2 and NO_2, respectively

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
Mean	1.17	2.17	2.59	0.52	1.07	1.59	1.00	0.85	1.48	0.32	0.10	0.26	1.09
Median	1.02	2.04	2.67	0.48	1.10	1.66	1.33	0.89	1.48	0.15	0.02	0.04	0.30
Mode	0.85	2.22	2.68	0.45	1.15	1.89	1.31	1.22	1.81	0.13	-0.14	-0.11	-1.40
Range	5.61	12.02	4.50	1.26	1.57	2.13	7.51	4.94	8.79	16.38	4.24	7.48	18.14
Minimum	-0.02	0.24	1.16	0.19	0.31	0.71	-2.82	-0.72	-0.63	-1.06	-0.94	-1.24	-2.82
Maximum	5.60	12.25	5.65	1.45	1.88	2.84	4.70	4.21	8.16	15.32	3.30	6.24	15.32
Count	711	637	155	325	512	653	722	714	662	707	680	713	8716
% Valid	95.56%	94.79%	20.83%	45.14%	68.82%	90.69%	97.04%	95.97%	91.94%	95.03%	94.44%	95.83%	82.17%

Notes:
Negative values reflect normal noise in the analyzer and are considered valid “zero” data.
Range may exceed Maximum value when there are negative values present.
Nunavut Air Quality Standards: 1-hour 172 ppb, 24-hour 57 ppb, annual 11 ppb.

The SO_2 maximum concentrations were highest in the winter (January-March) and fall (Sept-November) months (Figure 2.1) consistent with historical trends (RWDI 2015, 2017, 2018; Nunami Stantec 2021, 2022, 2023). 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

2.2.1.2 *Nitrogen Dioxide*

The NO_2 data at the Mary River MSC ambient air quality monitoring station had 95.1% valid data for 2023 with a low of 91.0% for December due to annual equipment maintenance and calibration (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 145.86 ppb (Figure 2.2), 53.9 ppb and 15.4 ppb, respectively. The highest average hourly maximum occurred on May 5, 2023 (145.86 ppb). The CAAQS limits are 113 ppb (hourly), and 32 ppb (annual arithmetic mean) (CCME 2014).The NO_2 concentrations exceeded the 1-hour CAAQS[2] in <1% of the hourly averaged data (6 occurrences) with measured levels ranging from 120.8 to 145.9 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 annual CAAQS mean NO_2 concentration was 15.4 ppb which is 48% of the annual CAAQS arithmetic mean (32 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.

[2] Mary River MSC data based on 98th percentile of data values derived from 8170 valid data points each for SO_2 and NO_2[2]

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
Mean	33.26	34.73	24.05	17.94	5.32	3.40	3.92	3.81	4.84	15.30	13.57	26.49	15.43
Median	33.87	30.85	20.56	13.81	2.96	2.25	2.59	2.58	3.49	8.57	8.24	23.30	7.73
Mode	45.98	38.63	14.59	9.54	0.14	0.95	1.46	0.62	0.28	1.40	1.04	4.85	0.12
Range	131.92	121.88	72.57	66.41	146.28	20.30	20.14	21.65	28.58	73.72	64.07	85.49	165.69
Minimum	-19.83	0.60	0.74	0.76	-0.42	-0.24	-0.27	-0.41	-0.50	-0.24	-0.17	-0.04	-19.83
Maximum	112.09	122.48	73.31	67.18	145.86	20.06	19.87	21.24	28.09	73.49	63.90	85.45	145.86
Count	710	642	707	680	721	661	726	714	665	733	691	677	8327
% Valid	95.43%	95.54%	95.03%	94.44%	96.91%	91.81%	97.58%	95.97%	92.36%	98.52%	95.97%	90.99%	95.06%

Notes:
Negative values reflect normal noise in the analyzer and are considered valid “zero” data.
Range may exceed Maximum value when there are negative values present.
Nunavut Air Quality Standards: 1-hour 213 ppb, 24-hour 106 ppb, annual 32 ppb

The NO_2 concentrations were highest in the winter and lowest in the summer months (Figure 2.2) consistent with historical trends (RWDI 2015, 2018; Nunami Stantec 2021, 2022, 2023). 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.

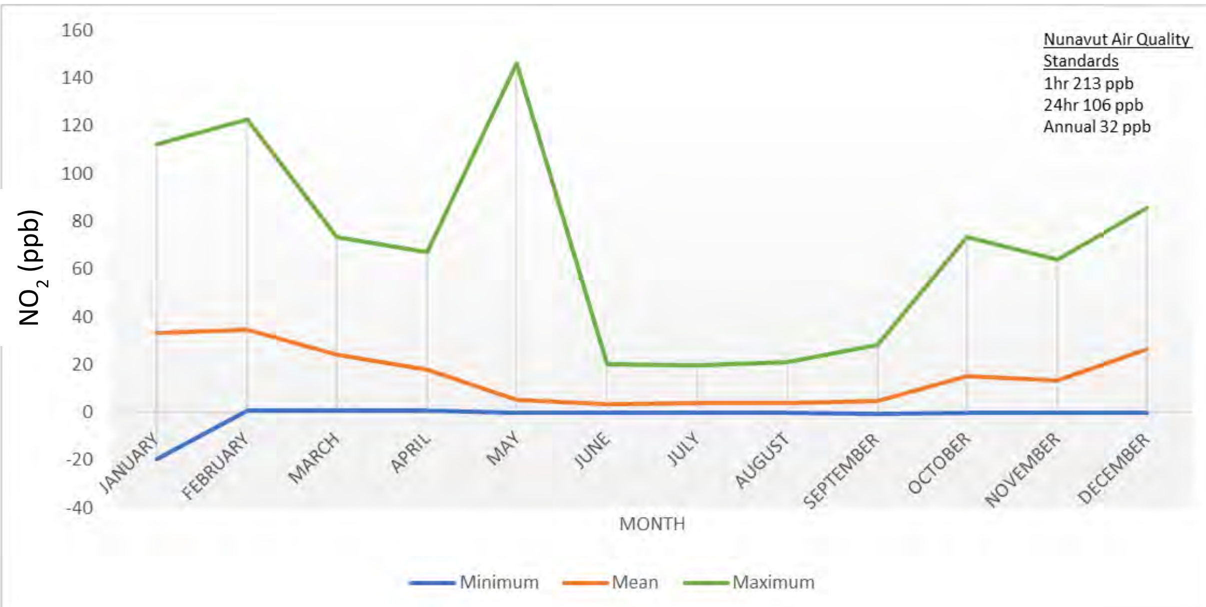


Figure 2.2 MSC Hourly NO_2 Concentrations (ppb) by Month

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 93.8% valid data for 2023 (Table 2.3). The SO_2 concentrations remained very low (0 to 5.35 ppb) throughout 2023 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 3% of the NAAQS 1-hour standard, 1.1% of the NAAQS for 24-hours and 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
Mean	0.48	0.59	0.11	0.26	0.73	0.82	0.81	0.73	0.70	0.48	0.75	1.45	0.66
Median	0.39	0.47	-0.02	0.18	0.66	0.82	0.89	0.74	0.75	0.32	0.75	1.24	0.66
Mode	0.30	0.47	-0.19	0.14	0.53	0.73	0.87	0.71	0.79	0.37	0.92	0.64	0.83
Range	3.07	3.37	3.02	3.69	2.81	1.51	5.27	2.18	3.82	4.19	2.43	3.80	5.95
Minimum	-0.38	-0.13	-0.60	-0.38	-0.12	0.41	0.08	0.14	-0.27	-0.27	0.10	0.08	-0.60
Maximum	2.70	3.24	2.42	3.31	2.69	1.92	5.35	2.31	3.55	3.92	2.53	3.88	5.35
Count	707	620	689	681	664	695	677	716	665	714	673	713	8213
% Valid	95.03%	92.26%	92.61%	94.58%	89.25%	96.53%	90.99%	96.24%	92.36%	95.97%	93.47%	95.83%	93.76%

Note:
Range may exceed Maximum value when there are negative values present.
Nunavut Air Quality Standards: 1-hour 172 ppb, 24-hour 57 ppb, annual 11 ppb.

The SO_2 concentrations remained low throughout the year and trended upward slightly in December (Figure 2.3) consistent with historical trends (RWDI 2015, 2018; Nunami Stantec 2021, 2022, 2023). 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 MSC ambient air quality monitoring station.

Figure 2.3 PSC Hourly SO_2 Concentrations (ppb) by Month

2.2.2.2 *Nitrogen Dioxide*

The NO_2 data at the Milne Port PSC had 93.98% valid data for 2023 with a low of 89.1% for May due to intermittent power failures (May 6 and May 28) (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 98.5 ppb, 57.4 ppb and 13.5 ppb, respectively (Figure 2.4). The CAAQS limits are 113 ppb (hourly), and 32 ppb (annual arithmetic mean) (CCME 2014). The NO_2 concentrations did not exceed the 1-hour CAAQS in 2023. 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 annual mean NO_2 concentration was 13.5 ppb which is 42% of the annual CAAQS arithmetic mean (32 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
Mean	36.39	24.24	18.33	16.11	3.18	0.87	0.71	2.60	6.43	16.58	10.85	25.23	13.52
Median	38.20	24.25	14.52	10.78	1.32	-0.02	0.21	1.06	3.20	8.94	3.95	22.52	4.07
Mode	37.38	30.14	-0.03	12.49	1.64	-0.36	-0.40	1.00	0.29	0.33	0.07	-0.04	-0.04
Range	89.74	83.97	84.41	98.13	32.62	29.93	16.47	29.34	38.03	96.89	56.37	98.61	99.34
Minimum	1.56	-0.07	-0.16	-0.68	-0.76	-0.85	-0.85	-0.17	-0.25	0.06	-0.17	-0.12	-0.85
Maximum	91.29	83.91	84.25	97.45	31.86	29.08	15.62	29.16	37.78	96.95	56.19	98.49	98.49
Count	707	639	688	682	663	696	677	714	667	714	673	714	8233
% Valid	95.03%	95.09%	92.47%	94.72%	89.11%	96.67%	90.99%	95.97%	92.64%	95.97%	93.47%	95.97%	93.98%

Notes:
Range may exceed Maximum value when there are negative values present.
Nunavut Air Quality Standards: 1-hour 213 ppb, 24-hour 106 ppb, annual 32 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, 2023). 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. Signs should be posted near the PSC ambient air quality monitoring station to request that operators refrain from idling their diesel trucks.

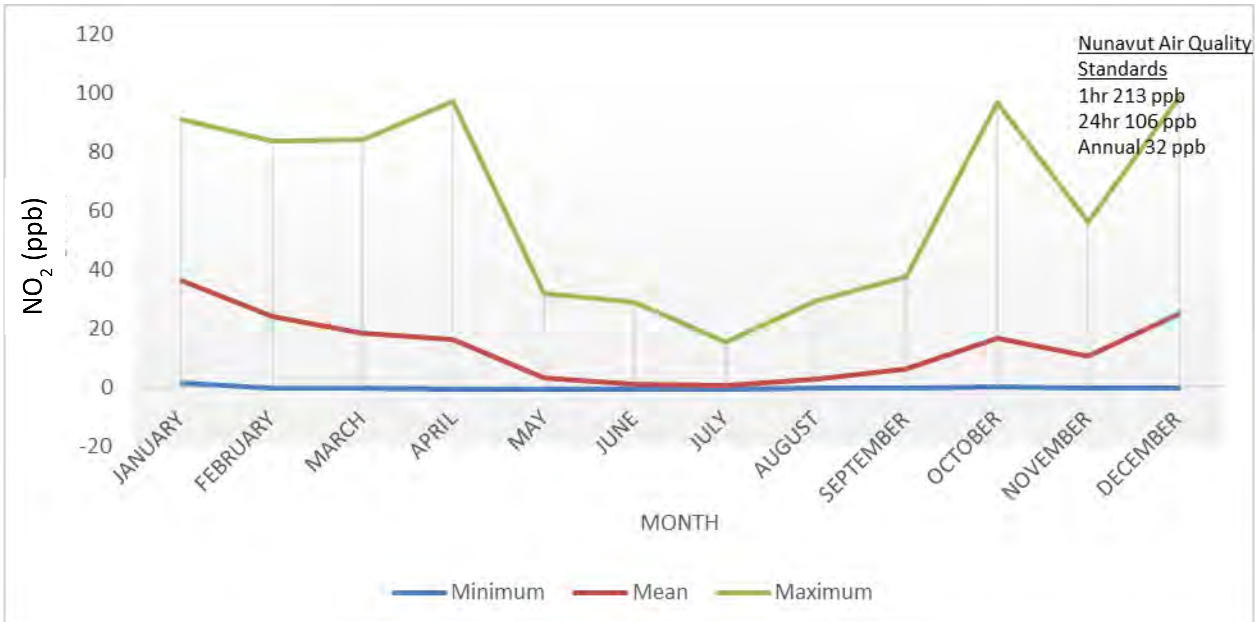


Figure 2.4 PSC Hourly NO_2 Concentrations (ppb) by Month

2.2.3 Quality Assurance and Quality Control

Three quarterly site visits were conducted by Nunami Stantec (April 16-20, 2023, July 20-26, 2023, and September 21-28, 2023). 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 training sessions were conducted in 2023 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 2023 quarterly visits.

Table 2.5 2023 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 T100 and 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"	• If vacuum reaches 10 inches of mercury, then rebuild the pump for the T200
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 pre-burn calibration on T100, T200 • rebuilt SO_2 pump	• If vacuum reaches 10 inches of mercury, then rebuild the pump for the T100

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 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 2023 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.

Zero and span data showed a consistent equipment response with an increase in July and August after UV lamp replacement (Figure 2.6). Data were verified monthly during calibration cycles. The monitor was shut down in April due to an internal UV lamp failure, which is reflected in the loss of data and trends for April/May 2023 (Figure 2.5).

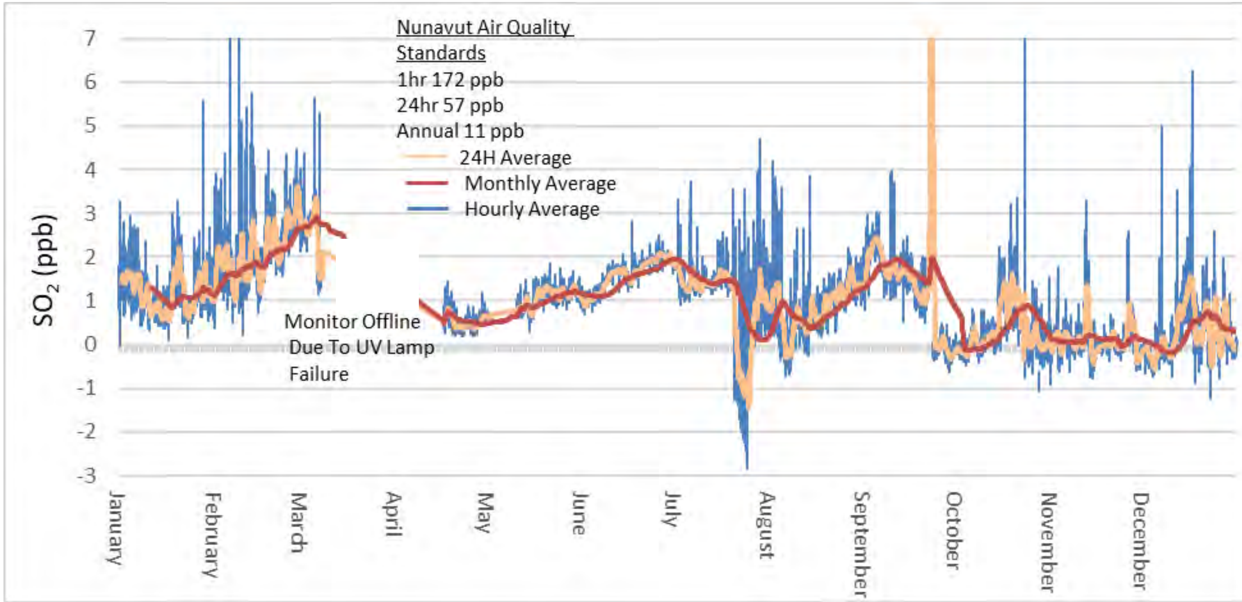


Figure 2.5 **MSC Hourly SO_2 Concentrations with 24-hour and Monthly Average Trends**

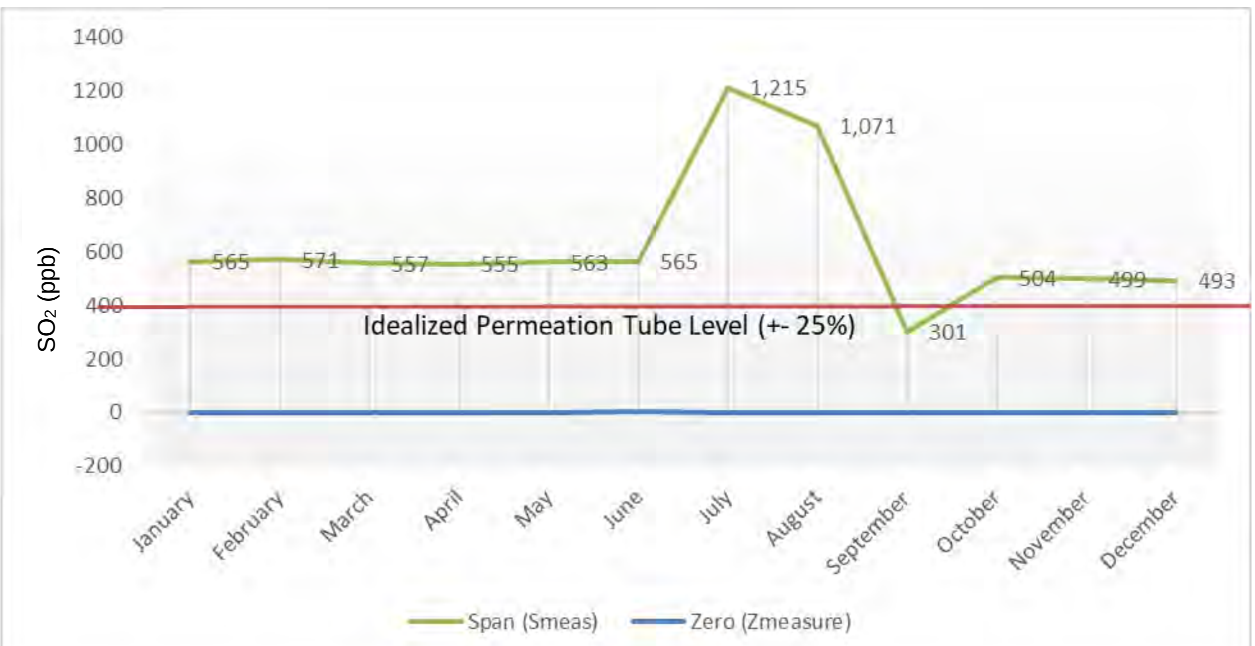


Figure 2.6 **MSC Hourly SO_2 Annual Permeation Tube Span and Zero Data**

PSC

The SO_2 concentrations remained very low throughout 2023 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 good with consistent equipment response. A perm spike was observed in July; the monitor was checked, and data verified when the spike occurred, to check that the monitor was operating within specification (Figure 2.6). Data were verified monthly during calibration cycles.

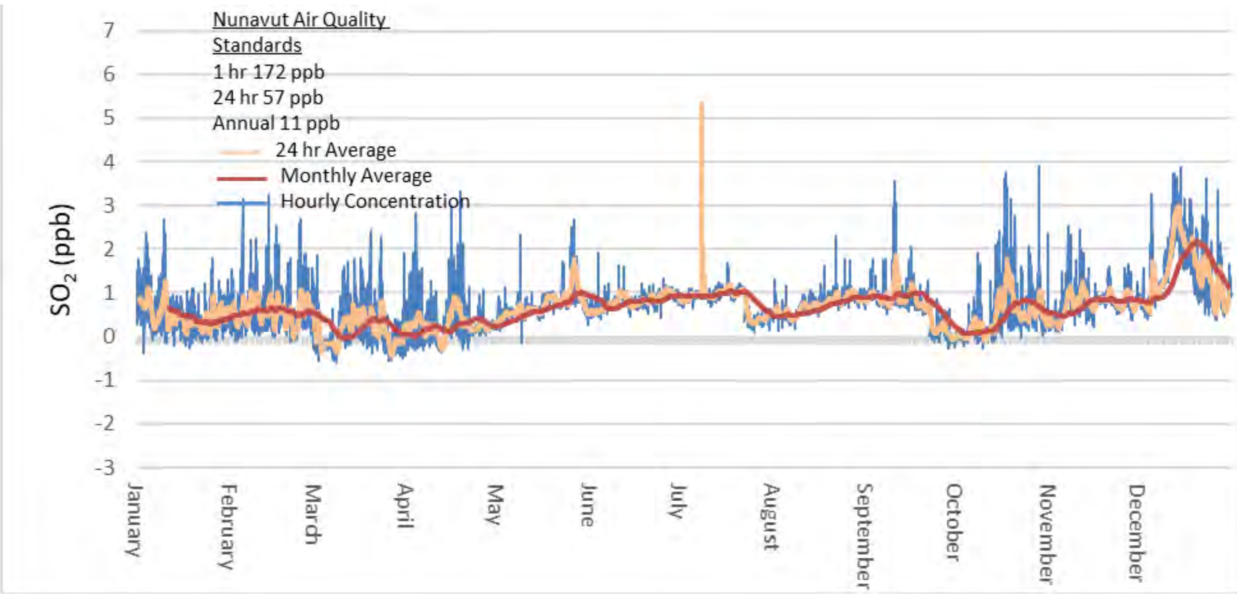


Figure 2.7 PSC Hourly SO_2 Concentrations with 24-hour and Monthly Average Trends

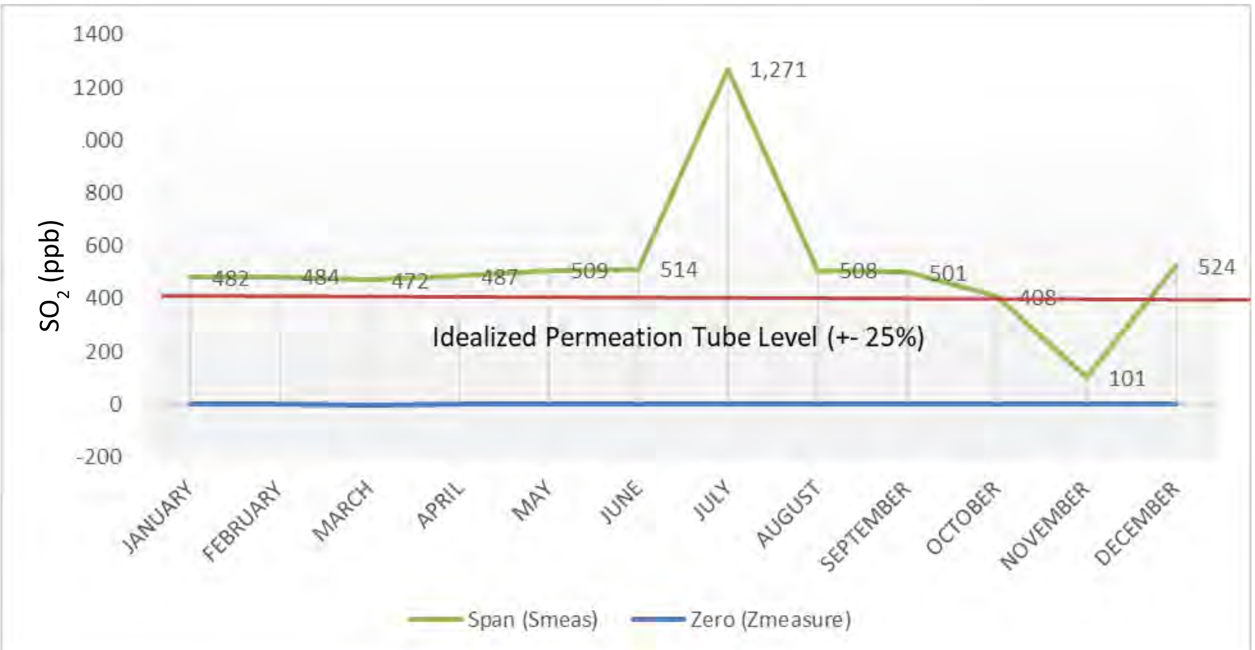


Figure 2.8 PSC SO_2 Permeation Tube Data Span/Zero

2.2.3.3 *Nitrogen Dioxide*

MSC

The NO_2 concentrations trend higher during the winter months and fall during the summer months (Figure 2.9), which is consistent with historical trends (RWDI 2016, 2018; Nunami Stantec 2021, 2022, 2023). The monitor up-time was excellent, recording 8,327 valid points out of a possible 8,760.

The perm span values remained consistent, through 2023 when the perm tube was still operating.
The tube displayed a peak in early May and failed completely in October 2023. During the initial decline the unit was checked for data and monitor integrity and a replacement tube was ordered. The tube arrived in January 2024 and was installed in the monitor. Perm tubes do not affect the operation of the monitor or its ability to collect accurate data. The monthly calibration cycles and daily perm span diagnostics confirm accurate diagnostic checks and verify data validity (Figure 2.10).

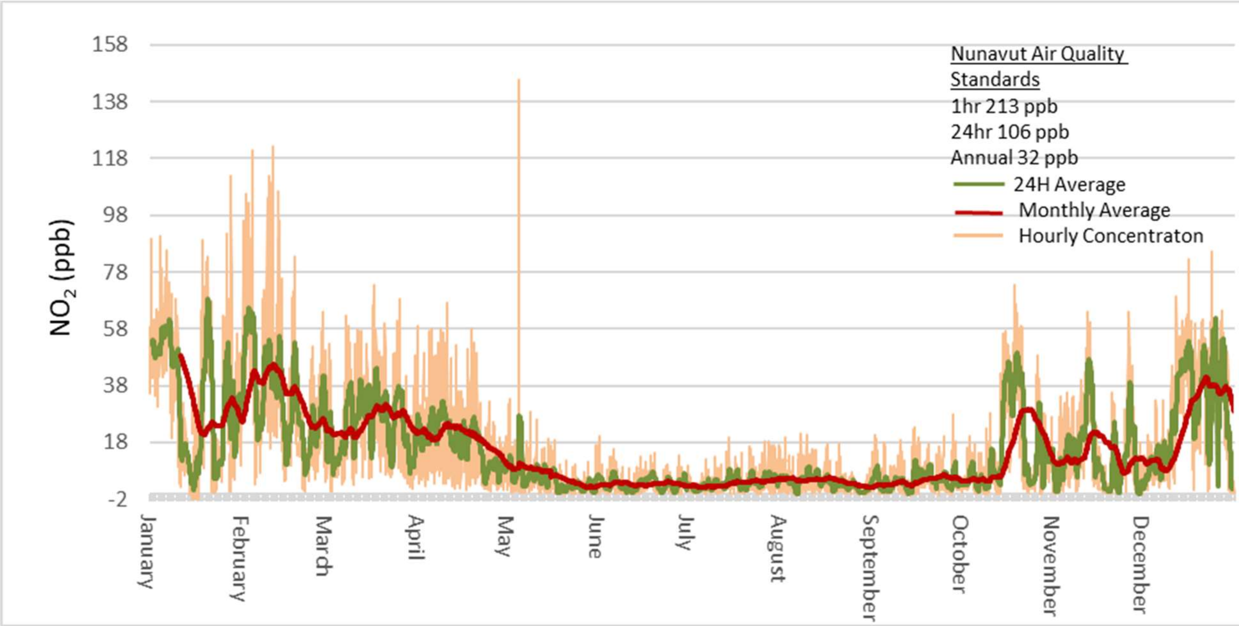


Figure 2.9 MSC Hourly NO_2 Concentrations with 24-hour and Monthly Average Trends

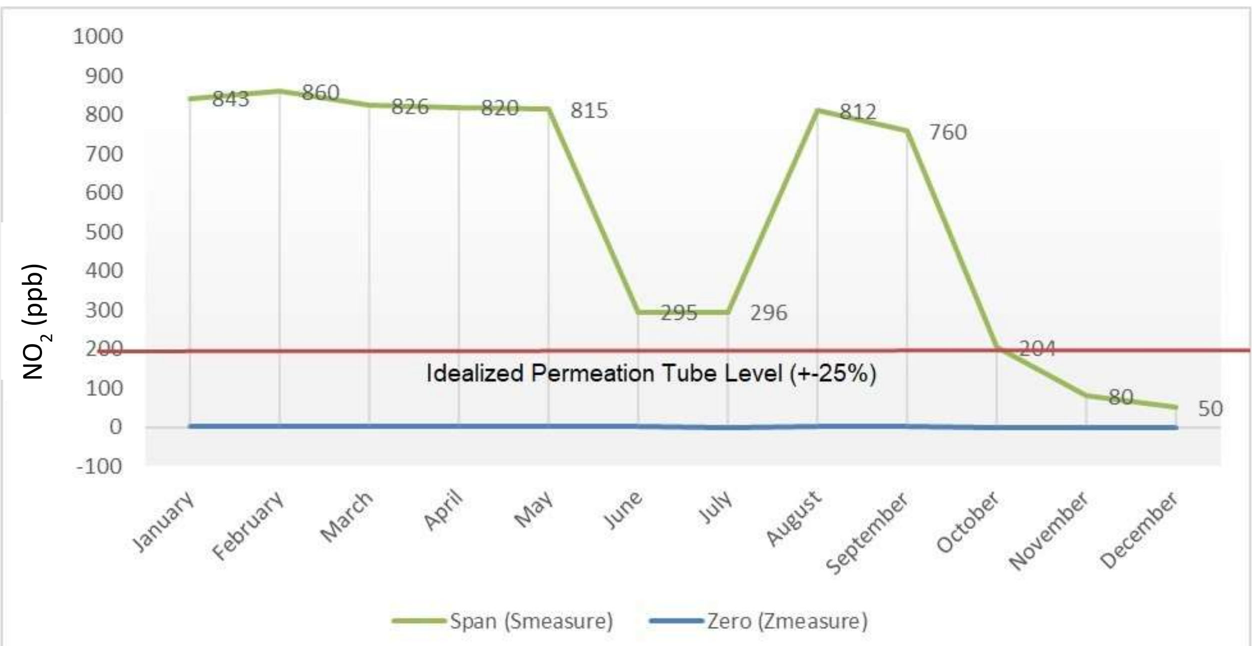


Figure 2.10 MSC NO_2 Annual Permeation Tube Data Span/Zero

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, 2023).
The monitor up-time was excellent, recording 8,233 points resulting in a 94% rate for data capture.

The NO_2 span values remained consistent over 2023 with no spikes or data anomalies from permeation gas latency or extinction in the system. The perm tube range is very high and may be 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.

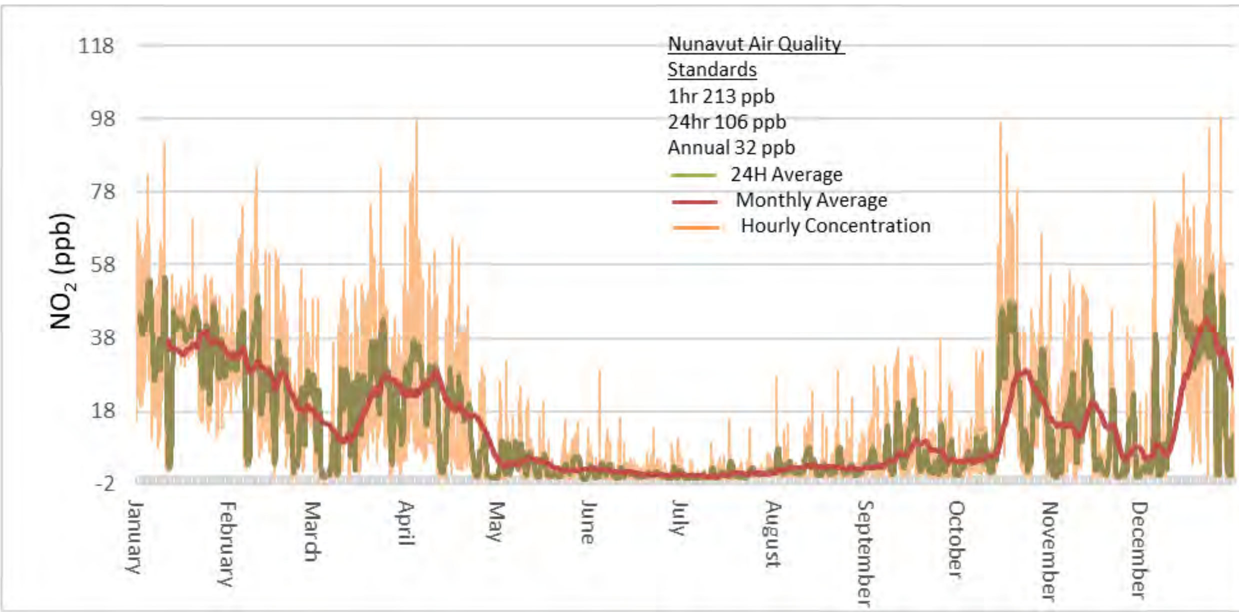


Figure 2.11 PSC Hourly NO_2 Concentrations with 24 hour and Monthly Average Trends

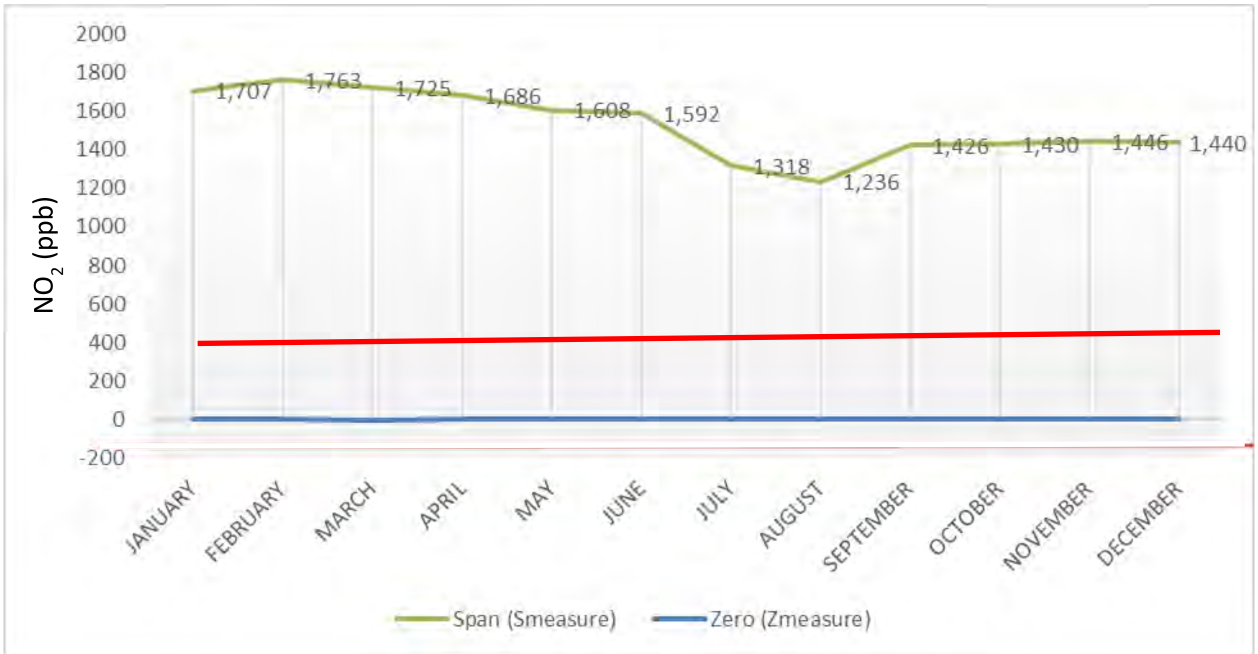


Figure 2.12 PSC NO_2 Annual Permeation Tube Data Span/Zero (red horizontal line indicates the average new manufactured perm tube level ± 25%)

2.3 Particulate Matter Results and Discussion

Particulate matter monitoring results for 2023 (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.

2.3.1 Quality Assurance and Quality Control

In 2023, Nunami Stantec Limited conducted quarterly audits and calibrations during the periods of April 16-20, 2023, July 20-26, 2023 and September 21-28, 2023. The scope of work for the site visit included audits, trouble shooting 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 2023.

Table 2.6 2023 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 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	Not applicable (N/A)
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	N/A

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 88.6% valid data for 2023. Data were not available in February and March during periods of very cold weather causing the air temperature (AT) sensor to go offline (Table 2.7). The hourly TSP concentrations ranged from 0 to 12,363 µg/m³ (Figure 2.13). The TSP monitor successfully recorded 323 days of data in 2023. One hundred and sixty-seven events (45.7%) exceeded the Project Standard TSP 24-hour concentration (120 µg/m³). April and May contained the highest occurrences (29 and 20 respectively); the remaining exceedances ranged throughout the year with the lowest occurrence in June (4 occurrences). The measured 24-hour average TSP concentrations ranged from 77\ µg/m³ to 647 µg/m³.

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 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 Nunavut Ambient Air Quality Standards 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). Exceedances observed throughout the year may be associated with activities near the ambient air quality monitoring station, crusher activity, a prolonged dry period or wind events. The hourly TSP concentrations were the highest in the winter and spring months falling off through the summer with the highest values possibly associated with the spring thaw and associated fugitive dust (Figure 2.14).

The measured TSP concentrations exceeded the Project Standard annual average concentration (60 $\mu g/m^3$) for the available period of record, in which the average TSP concentration was 216 $\mu g/m^3$. 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 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.

Table 2.7 Hourly Summary TSP Concentrations for MSC Ambient Air Quality Monitoring Station (µg/m³)

	JAN	FEB	MAR	APRIL	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	ANNUAL
Mean	233.01	259.12	287.18	674.05	275.80	76.76	174.10	122.36	239.28	112.38	94.79	132.11	216.03
Median	36.3	112.6	143.1	490.2	102.6	15.3	80.7	13.6	39.8	46.85	64.3	61.4	67.95
Mode	8.8	42.5	67.5	285.8	11.1	6.8	7.3	5.6	9.4	28	38.2	9.1	8.7
Range	3274.1	1932.9	3289.5	6524.1	4959.6	4778.8	3774.8	3953.2	12353	3439.3	982.5	2047.5	12353
Minimum	0.2	9.6	8.7	2	2.6	0	0.7	0	0	1.9	0.7	0.2	0
Maximum	3274.3	1942.5	3298.2	6526.1	4962.2	4778	3775.5	3953.2	12353	3441.2	983.2	2047.7	12353
Count	631	397	447	633	737	675	737	707	680	760	689	667	7760
% Valid	84.81%	59.08%	60.08%	87.92%	99.06%	93.75%	99.06%	95.03%	94.44%	100%	95.69%	89.65%	88.58%

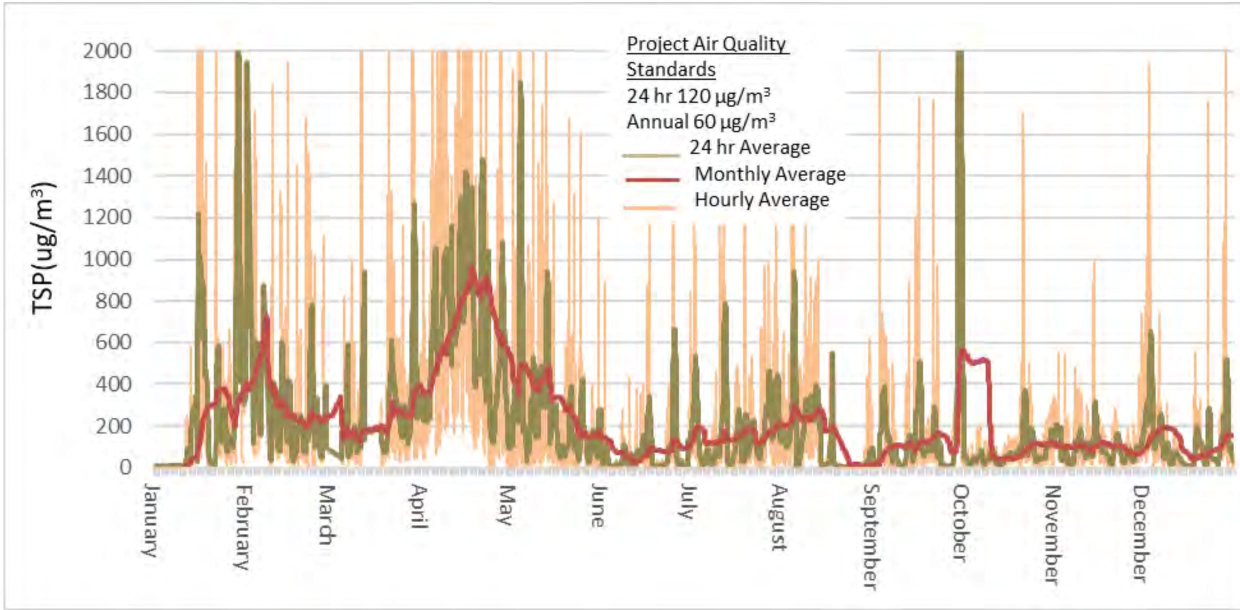


Figure 2.13 MSC Hourly TSP Concentrations with 24 hour and Monthly Average Trends

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

2.3.2.2 *PSC*

The BAM TSP data at the PSC ambient air quality monitoring station had 80.2% valid data for 2023. For the available period of record, the hourly TSP concentration ranged from -6.00 to 1,317 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. Seventeen 24-hour average concentrations exceeded the 24-hour Project Standard (120 µg/m^3) with a range of values from 122 to 304 µg/m^3, occurring in the spring and summer months (April, May, July, August, September). The TSP concentrations did not exceed the annual Project Standard concentration (60 µg/m^3) for the available period of record, with an annual mean concentration of 26.7 µg/m^3. The TSP concentrations remained low throughout the early part of the year and increased during the spring and summer months and fell off in October, November and December (Figure 2.16). Note the two different scales on the y-axis in Figure 2.16.

Additional data validation is in progress and the results were not available prior to report submission. If necessary, an addendum will be issued.

Table 2.8 Hourly Summary TSP Concentrations for PSC Ambient Air Quality Monitoring Station (µg/m^3)

	JAN	FEB	MAR	APRIL	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	ANNUAL
Mean	6.33	5.13	15.39	89.94	51.28	7.59	49.74	27.59	30.65	23.85	16.90	6.82	26.8
Median	4.90	4.30	10.00	17.55	7.00	4.20	11.50	6.80	8.50	8.60	8.20	5.40	6.90
Mode	5.50	4.30	6.90	6.70	5.00	2.40	7.30	5.40	4.50	7.90	8.10	5.60	5.40
Range	65.5	32.2	150	916	1,318	251	617	596	1,213	848	464	72.40	1,323
Minimum	-4.90	-3.00	-2.70	-1.80	-1.50	-3.00	-1.50	-6.00	-3.10	-3.10	-2.00	-3.30	-6.00
Maximum	60.6	29.2	147	914	1,317	248	615	590	1,209	845	462	69.1	1,317
Count	476	527	545	514	634	493	351	718	701	738	597	730	7,024
% Valid	63.98%	78.42%	73.25%	71.39%	85.22%	68.47%	47.18%	96.51%	97.36%	99.19%	82.92%	98.12%	80.18%

Note:
Range may exceed Maximum value when there are negative values present.

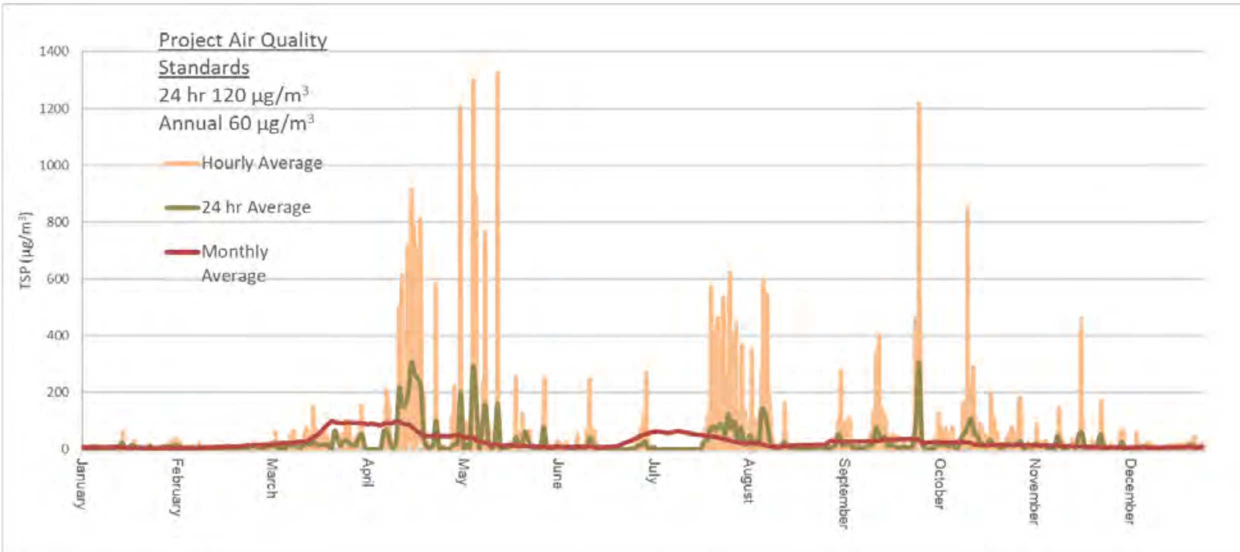


Figure 2.15 PSC Hourly TSP Concentrations with 24 hour and Monthly Average Trends

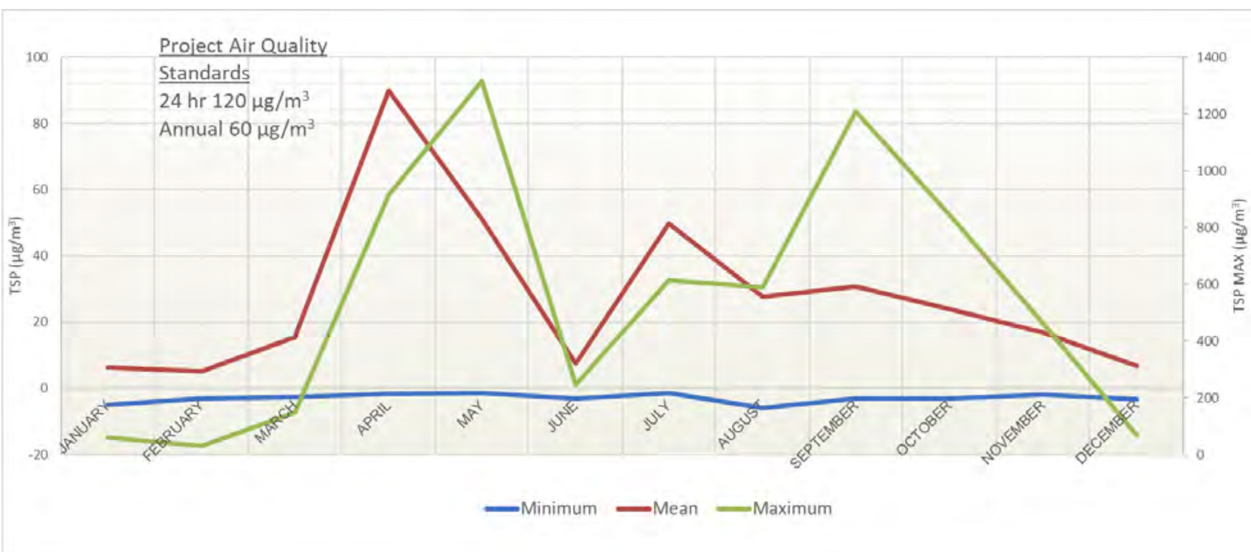


Figure 2.16 PSC TSP 24 Hour Concentrations (μg/m³) by Month

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 92.4% valid data for 2023 with 8,091 recorded hours (Table 2.9). There are 190 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 to 341 µg/m^3 (Figure 2.17). The monitor successfully recorded data for 337 days during 2023. During the recording period not all the days, noted above, contained a full 24 hours of uninterrupted data. The spring melt in April-May as well as higher winds in October, November, and December may have elevated fugitive dust levels during those time periods.

Due to the wind events and other disturbances causing the measured $PM_{2.5}$ to be greater than the measured TSP values, more frequent cleaning and maintenance of the inlet tube and sampler needs to be conducted. During 2023 there were nine recorded events exceeding the 24-hour $PM_{2.5}$ Project Standard (30 µg/m^3). The exceedance $PM_{2.5}$ concentrations ranged from 30.5 to 53.6 µg/m^3. Six of the nine occurrences were associated with a single event from April 8 to 18, 2023. The measured $PM_{2.5}$ concentrations during that event ranged from 30.9 to 53.6 µg/m^3. The final three occurrences were on September 29 to 30, 2023 (39.0 µg/m^3, 31.6 µg/m^3) and October 24, 2023 (30.5 µg/m^3). The measured $PM_{2.5}$ concentrations were highest in the spring and were lower in July and August. The measured $PM_{2.5}$ concentrations rose again in September before falling in November and remaining low through December (Figure 2.18). The measured $PM_{2.5}$ concentrations, for the available period of record (6.17 µg/m^3), did not exceed the Project Standard annual average concentration (10 µg/m^3).

Table 2.9 Hourly Summary $PM_{2.5}$ Concentrations for MSC Ambient Air Quality Monitoring Station (µg/m³)

	JAN	FEB	MAR	APRIL	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	ANNUAL
Mean	6.74	6.22	6.60	19.80	2.93	1.20	3.29	4.77	5.42	4.40	6.89	5.70	6.17
Median	4.70	4.70	5.30	13.70	1.90	0.70	2.40	3.30	2.80	2.90	4.00	4.90	3.60
Mode	4.00	4.50	3.70	6.30	1.00	0.60	-0.90	2.20	1.90	1.70	2.50	5.40	1.20
Range	64.20	50.40	89.30	176.60	62.00	62.30	35.50	108.70	180.80	124.20	326.40	34.70	332.80
Minimum	-3.60	-4.60	-2.80	-4.00	-6.40	-5.70	-5.30	-3.90	-3.20	-4.20	0.00	-3.60	-6.4
Maximum	60.60	45.80	86.50	172.60	55.60	56.60	30.20	104.80	177.60	120.00	326.40	31.10	326.40
Count	674.00	579.00	724.00	698.00	725.00	657.00	719.00	709.00	609.00	711.00	657.00	628.00	8091.00
% Valid	90.59%	86.16%	97.31%	96.94%	97.45%	91.25%	96.64%	95.30%	84.58%	95.56%	91.25%	84.41%	92.36%

Note:
Range may exceed Maximum value when there are negative values present

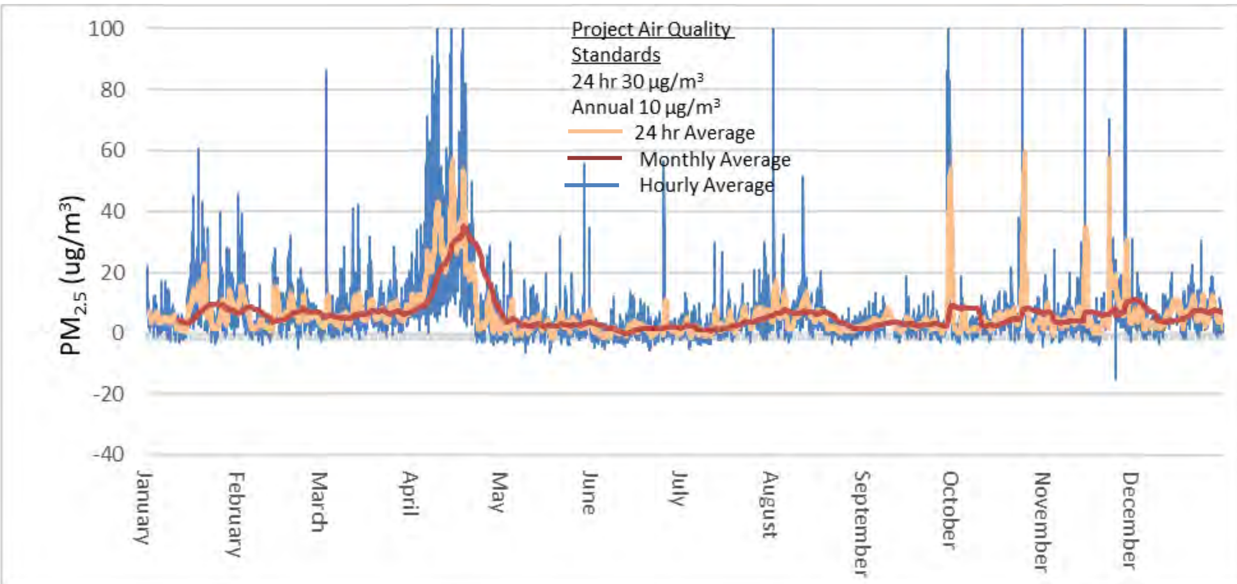


Figure 2.17 MSC Hourly $PM_{2.5}$ Concentrations with 24 hour and Monthly Average Trends

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

2.3.3.2 *PSC*

The BAM $PM_{2.5}$ concentration data at the PSC ambient air quality monitoring station had 56.5% valid data for 2023 with 4,951 recorded hours. The $PM_{2.5}$ unit suffered a flow controller error and AT sensor error due to the extreme cold from January to April which reduced the number of valid data points (Table 2.10). Comparing data from the two air quality monitors (TSP and $PM_{2.5}$), there are 1,138 occurrences in 2023 where the measured hourly $PM_{2.5}$ concentration was greater than the stations associated measured TSP concentration. The $PM_{2.5}$ concentrations that were greater than the 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 flow control errors, 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 valid hourly measured $PM_{2.5}$ concentrations ranged from -4.3 to 126 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 206.3 days of data in 2023. During the 2023 operational period, two 24-hour average exceedances were recorded. The exceedances occurred within a condensed period from April 20 and 21, 2023, ranging from 30.2 to 32.4 µg/m^3.

The monthly average $PM_{2.5}$ concentrations were highest in the spring, then fell and remained relatively low through the remainder of the year (Figure 2.20). The average $PM_{2.5}$ concentration for the available 206.3 day period of record (5.02 µg/m^3) did not exceed the Project Standard (10 µg/m^3).

<u>Additional data validation is in progress and the results of this validation process were not available prior to report submission. If necessary, an addendum will be issued.</u>

Table 2.10 Hourly Summary $PM_{2.5}$ Concentrations for PSC Ambient Air Quality Monitoring Station (µg/m^3)

	JAN	FEB	MAR	APRIL	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	ANNUAL
Mean	N/A	N/A	N/A	14.6	7.45	2.62	3.99	4.41	4.12	3.99	3.84	4.22	5.02
Median	N/A	N/A	N/A	7.35	3.90	2.50	3.25	4.00	3.90	3.55	3.40	3.70	3.6
Mode	N/A	N/A	N/A	4.70	1.50	4.00	3.00	3.10	3.60	2.70	2.40	2.40	2.4
Range	N/A	N/A	N/A	88.1	128	23.0	41.5	29.7	26.4	30.4	19.1	25.3	131
Minimum	N/A	N/A	N/A	-2.30	-1.90	-3.60	-2.40	-1.60	-2.20	-2.70	-3.10	-4.30	-4.30
Maximum	N/A	N/A	N/A	85.8	126	19.4	39.1	28.1	24.2	27.7	16.0	21.0	126
Count	N/A	N/A	N/A	344	559	556	682	551	588	626	632	413	4,951
% Valid	N/A	N/A	N/A	47.78%	75.13%	77.22%	91.67%	74.06%	81.67%	84.14%	87.78%	55.51%	56.52%

Note:
N/A – Data were invalid during this period due to equipment malfunction (i.e., the flow controller and the air temperature sensor)
Range may exceed Maximum value when there are negative values present

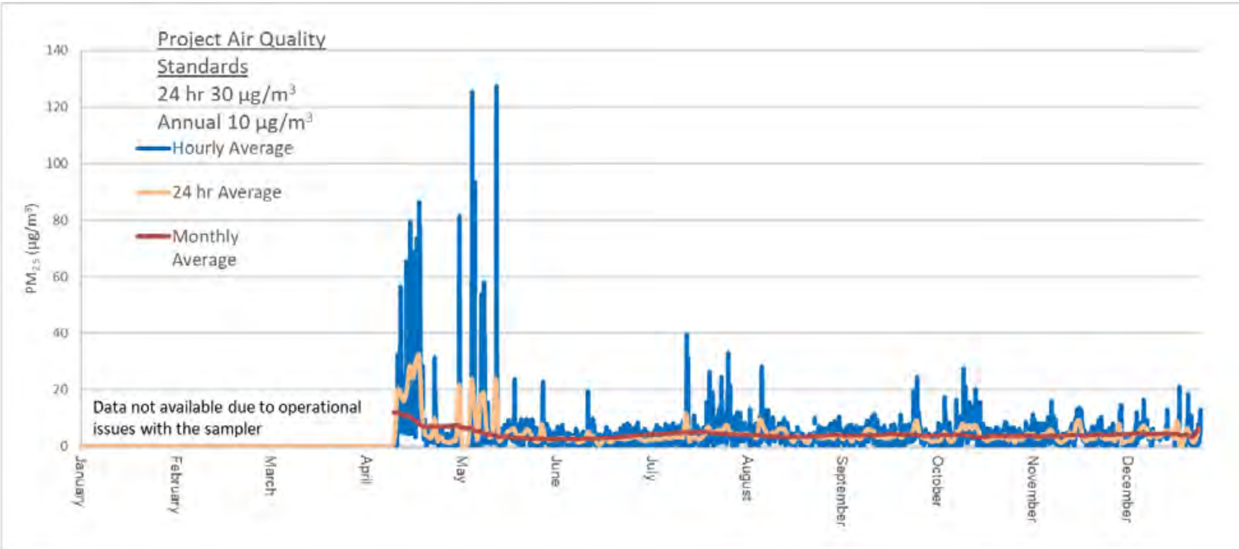


Figure 2.19 PSC Hourly PM $_{2.5}$ Concentrations with 24 hour and Monthly Average Trends

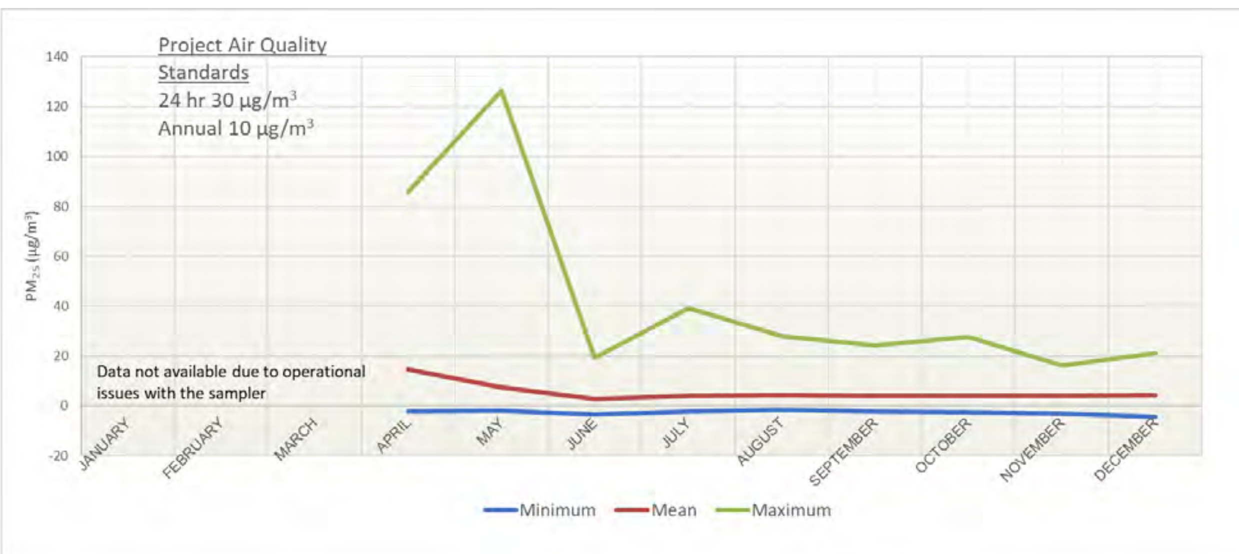


Figure 2.20 PSC $PM_{2.5}$ Concentrations (μg/m^3) by Month

3 Meteorology

The Mary River, Milne Port, and Steensby meteorology 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 summarized. 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 2023

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 2023. 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 2023 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 2023 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 2023 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). A wind screen was installed around the TBRG to improve its capture efficiency (accuracy). The desiccant inside the datalogger enclosure was replaced, the solar panel was cleaned.	
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. A wind screen was installed around the TBRG to increase its capture efficiency (accuracy). The desiccant inside the datalogger enclosure was replaced, the solar panel was cleaned. No equipment problems were discovered.	• The 2023 solar radiation values from Milne Port are lower than Mary River and Steensby. The solar radiation sensor at the Milne Port station should be cleaned and inspected for damage during the 2024 annual maintenance program.
Steensby	• Steensby meteorology station maintenance included replacing desiccant (in the datalogger enclosure), cleaning solar panels and testing the external batteries. Charging for the external batteries is intermittent due to a damaged solar panel charge controller due to a voltage spike when the cables were previously cut/vandalized. A wind screen was installed around the TBRG to increase its capture efficiency (accuracy). The TBRG was removed September 24, 2023 to prevent it from being damaged/vandalized during the 2023/2024 winter.	• Installation of a new solar panel charge controller to improve the performance of the power supply system. • Replace the external deep cycle 12 volt battery. Consideration should be given to adding a second external battery.

3.2 Results and Discussion

As presented below, the 2023 meteorology data received at each meteorology station are compared with data from the Pond Inlet Airport Climate Station as well as the Canadian Climate Normals (1981-2010 or 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 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 (ECCC 2023).

Although solar radiation is no longer a part of the 1991-2020 Climate Normal data, it remains a part of the 1981-2010 Climate Normal data (ECCC 2020).

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 2023 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 had stopped recording on December 26, with approximately 131 hours of data missing. The average air temperatures for December 2023 could therefore not be considered 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 2023, 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 early part of the year (January 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, although the station temperatures remained close for the entire year. The exceptions were the early year (January, February), and the end of year (November, December).

At Mary River, the lowest recorded 2023 air temperature was -48.9°C. Typically, the minimum air temperature had been recorded in February (for 2021 and 2020), but it occurred in December in 2022. In 2023, the minimum temperature was recorded in February, which is similar to prior years. It is slightly colder than data for the previous years but is still warmer than the 2005–2010 baseline. The highest air temperature recorded in 2023 was 21.3°C. This is consistent with previous yearly data as it also occurred in July. The maximum air temperature at Mary River was colder than in 2022, similar to 2019 data. In general, summer air temperatures were highest at the Mary River site (according to the averages presented in Figure 3.1 through Figure 3.3), which is consistent with 2022 data.

At Milne Port, the lowest recorded air temperature in 2023 was -43.9°C, which occurred in February and is consistent with previous data. The minimum temperature in 2023 returns to 2021 values, which is slightly colder than in 2022. The highest air temperature recorded in 2023 was 19.6°C, which was similar to the Mary River site. The value occurred in August, though it was similar in July. This is consistent with previous years, although slightly colder than in 2022. The average daily temperatures indicate a closer alignment with the Canadian Climate Normal data, when compared to Mary River during peak months (minimum and maximum).

Table 3.4 Summary of 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	-39.3	-44.3	-28.7	-21.7	-11.1	-1.0	6.6	5.5	-1.5	-12.3	-16.8	-27.9	-16.0
Milne Port Meteorology Station	-36.5	-40.2	-28.7	-21.8	-10.3	-1.1	5.3	5.3	-1.2	-10.5	-16.6	-26.1	-15.2
Steensby Meteorology Station [a]	-38.6	-40.8	-26.9	-22.8	-12.4	-1.5	4.1	3.7	-0.2	-8.0	-14.8	-	-14.4
Pond Inlet Airport Climate Station [b]	-34.7	-38.4	-30.0	-23.0	-10.7	-0.6	2.7	3.9	-1.9	-8.9	-14.7	-25.3	-15.1
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] Data collection stopped on Dec. 26, 2023, at 12:00, therefore 131 hours of data were missing for Dec.
[b] Based on 2023 hourly data: data missing on Jun. 03, at 8:00 AM to 4:00 PM, Aug. 21, 9:00 PM, Aug. 24, at 5:00 PM, Oct. 12, 12:00 PM, 2023
[c] Based on 1991 to 2020 Climate Normal data

Table 3.5 Summary of 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	-29.8	-35.9	-18.1	-10.2	-3.6	4.1	13.4	11.9	3.2	-5.8	-9.4	-18.6	-8.2
Milne Port Meteorology Station	-30.6	-34.9	-22.1	-15.2	-4.4	3.1	11.8	10.5	2.5	-6.1	-10.4	-19.7	-9.6
Steensby Meteorology Station [a]	-32.5	-35.6	-18.4	-13.7	-4.2	2.6	11.9	9.1	3.0	-3.8	-8.0	-	-8.1
Pond Inlet Airport Climate Station [b]	-30.0	-33.9	-24.6	-17.4	-4.8	3.3	9.1	9.3	2.6	-4.3	-8.6	-19.6	-9.9
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] Data collection stopped on Dec. 26, 2023, at 12:00, therefore 131 hours of data were missing for Dec.
[b] Based on 2023 hourly data: data missing on Jun. 03, at 8:00 AM to 4:00 PM, Aug. 21, 9:00 PM, Aug. 24, at 5:00 PM, Oct. 12, 12:00 PM, 2023
[c] Based on 1991 to 2020 Climate Normal data

Table 3.6 Summary of 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	-34.8	-40.1	-23.6	-16.0	-7.0	1.5	10.3	8.9	0.9	-9.0	-12.9	-22.9	-12.1
Milne Port Meteorology Station	-33.5	-37.5	-25.7	-18.9	-7.3	0.9	8.4	7.9	0.6	-8.2	-13.6	-22.9	-12.5
Steensby Meteorology Station [a]	-35.9	-38.4	-22.8	-18.3	-7.6	0.5	8.0	6.1	1.2	-5.7	-11.2	-	-11.3
Pond Inlet Airport Climate Station [b]	-32.2	-36.3	-27.2	-20.1	-7.1	1.4	5.9	6.6	0.4	-6.2	-11.7	-22.5	-12.4
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] Data collection stopped on Dec. 26, 2023, at 12:00, therefore 131 hours of data were missing for Dec.

[b] Based on 2023 hourly data: data missing on Jun. 03, at 8:00 AM to 4:00 PM, Aug. 21, 9:00 PM, Aug. 24, at 5:00 PM, Oct. 12, 12:00 PM, 2023

[c] Based on 1991 to 2020 Climate Normal data

Table 3.7 Summary of 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]
Mary River Meteorology Station	-59.1	-46.6	-45.8	-40.3	-40.1	-44.9	-45.3	-48.9
Milne Port Meteorology Station	-46.9	-44.2	-44.4	-50.2	-45.5	-43.2	-41.6	-43.9

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 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]
Mary River Meteorology Station	22.8	22.8	19.4	21.3	33.0	16.9	24.1	21.3
Milne Port Meteorology Station	22.3	22.3	18.7	10.7	22.6	16.3	22.6	19.6

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

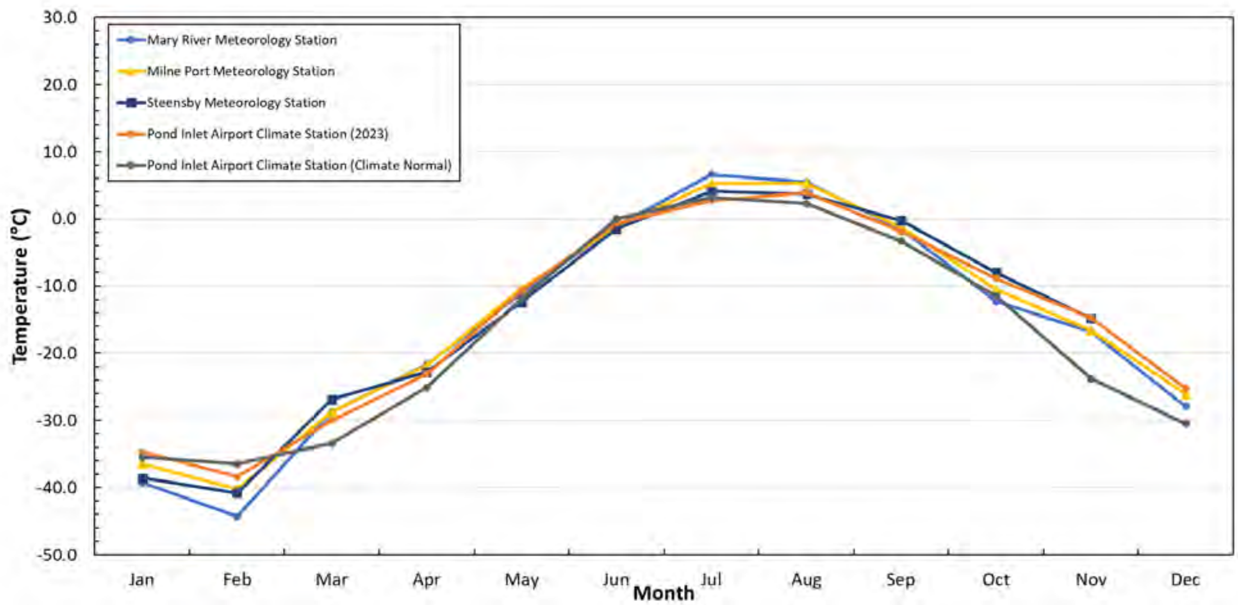


Figure 3.1 Summary of Daily Minimum Temperature at the Baffinland Meteorology Stations and the Pond Inlet Airport Climate Station

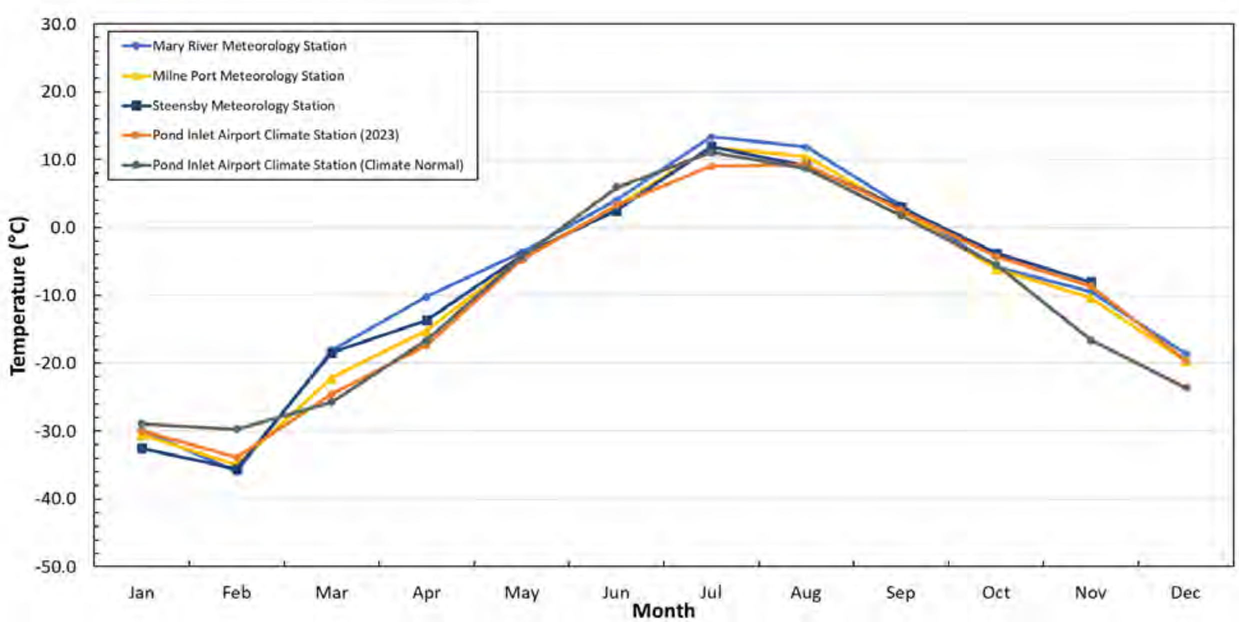


Figure 3.2 Summary of Daily Maximum Temperature at the Baffinland Meteorology Stations and the Pond Inlet Airport Climate Station

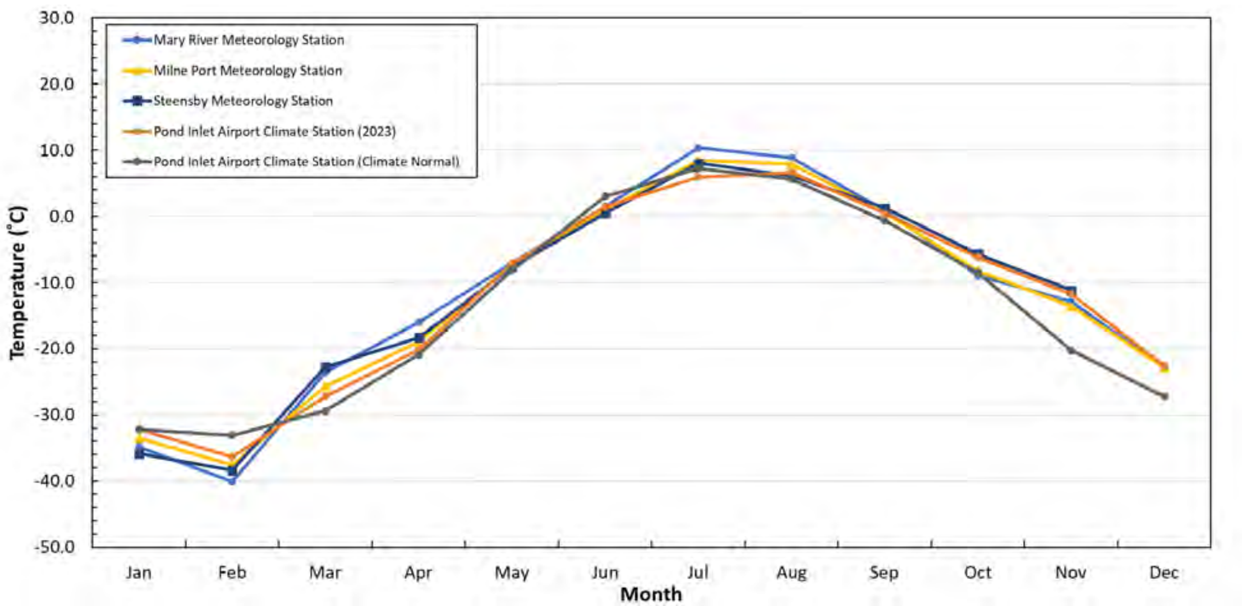


Figure 3.3 Summary of Average Daily Temperature at the Baffinland Meteorology Stations and the Pond Inlet Airport Climate Station

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 2023 data retrieved from the Pond Inlet Airport Climate Station, as well as the Canadian Climate Normal data (taken from Pond Inlet Airport).

The 2023 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, the Steensby meteorological station had stopped recording on December 26 at 12:00, with approximately 131 hours of data missing. The average relative humidity for December could therefore 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 2023, with the minimum average value approximately 52.6% (Steensby, in February), and the maximum at 88.6% (Steensby, in June). 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 2023 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 2022 data, there was a less pronounced reduction in relative humidity at the peak of summer, during July.

Table 3.9 Summary of 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	56.2	52.1	67.7	69.8	77.1	78.5	62.7	73.4	76.6	82.6	76.2	68.6	70.1
Milne Port Meteorology Station	70.2	67.3	73.7	75.4	78.7	82.3	69.2	76.9	78.8	84.4	79.1	74.3	75.9
Steensby Meteorology Station [a]	56.4	52.6	67.1	72.1	80.4	88.6	72.1	83.5	80.4	82.5	75.9	-	73.8
Pond Inlet Airport Climate Station [b]	73.9	69.5	78.2	81.7	84.6	82.8	77.5	82.0	83.3	85.5	82.4	77.6	79.9
Pond Inlet Airport Climate Station [c]	65.1	65.4	65.3	70.7	79.6	78.8	76.6	79.4	79.9	80.5	72.4	67.3	73.4

Notes:
"-" means data were incomplete or missing
[a] Data collection stopped on Dec. 26, 2023, at 12:00, therefore 131 hours were missing for Dec.
[b] Based on 2023 hourly data: data missing on Jun. 03, at 8:00 AM to 4:00 PM, Aug. 21, at 9:00 PM, Aug. 24, at 5:00 PM, 2023
[c] Based on 1981 to 2010 Climate Normal data

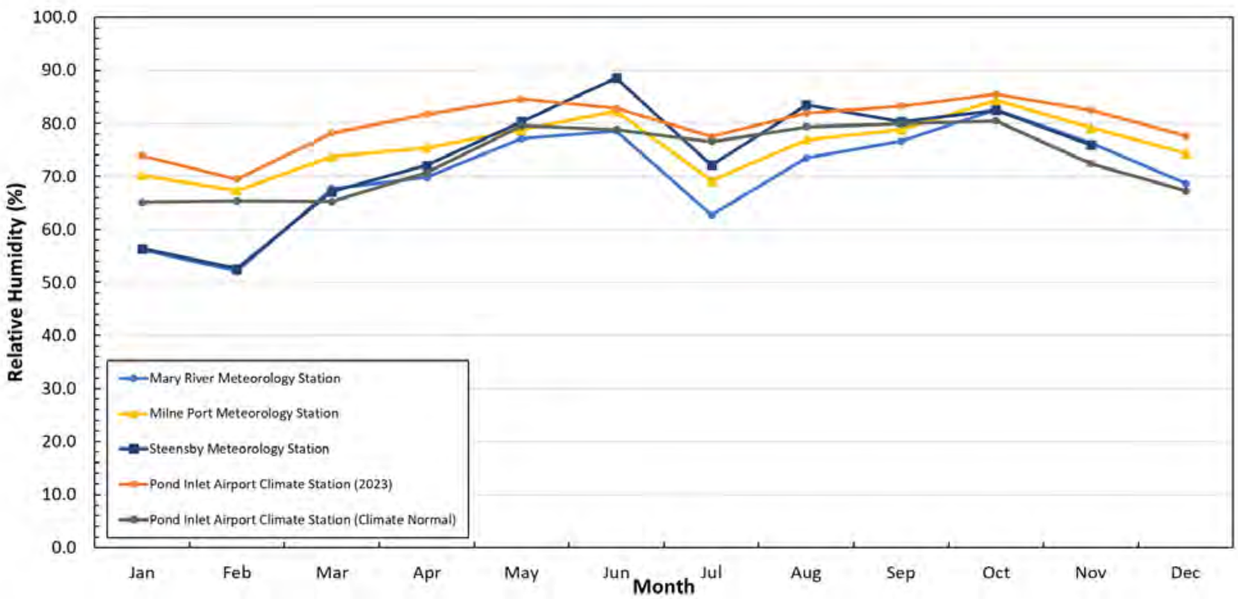


Figure 3.4 Summary of Average Monthly Relative Humidity at the Baffinland Meteorology Stations and the Pond Inlet Airport Climate Station

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 2023 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 2023 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.

At the Steensby site, data collection had stopped on December 26 at 12:00, and therefore there are 131 hours unaccounted for. At the Pond Inlet Airport station, data on June 3, August 21, and August 24 were missing for a few hours. As a result, these dates did not meet the criteria for 100% completeness as proposed by ECCC.

The results indicate that the Mary River site experienced most of its rainfall between June and October 2023, with lower rainfall during June and July (where humidity was also low and started trending up during August). The peak rainfall at Mary River occurred in August, which is similar across all sites and the Climate Normal data. However, rainfall during August at Mary River was substantially higher than the other sites. The Milne Port site experienced rainfall between June and October 2023, also with a lower rainfall in July. The Steensby site experienced rain primarily between July and September, 2023. All three sites had peak rainfall in August. When compared to the Climate Normal, the rainy period includes more months, which indicates more rainfall in the spring/early summer and fall. This trend is consistent with 2022.

Table 3.10 Summary of 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[a]	0.0	0.0	0.0	0.0	0.0	28.2	27.6	84.6	43.6	3.2	0.0	0.0	187.2
Milne Port Meteorology Station	0.0	0.0	0.0	0.0	0.0	12.8	10.4	58.6	37.6	0.4	0.0	0.0	119.8
Steensby Meteorology Station[b]	0.0	0.0	0.0	0.0	0.0	0.0	1.2	46.4	6.8	0.0	0.0	-	-
Pond Inlet Airport Climate Station[c]	0.0	0.0	0.0	0.0	0.0	-	4.7	-	23.2	1.4	0.0	0.0	-
Pond Inlet Airport Climate Station[d]	0.0	0.0	0.0	0.0	0.0	12.1	31.5	35.9	9.8	1.3	0.4	0.0	91.0

Notes:

"-" means data were incomplete or missing,

[a] The 0.2 mm of rainfall recorded on October 4, 2023, at 1:00 PM and the 0.2 mm of rainfall recorded on Oct. 23, 2023, at 1:00 PM were removed because the hourly maximum air temperatures were -0.1 and -5.9 degrees Celsius, respectively and no rain should have been recorded during freezing air temperatures

[b] Data collection stopped on Dec. 26, 2023, at 12:00, therefore 131 hours were missing for Dec.

[c] Based on 2023 hourly data: data missing on Jun. 03, at 8:00 AM to 4:00 PM, Aug. 21, at 9:00 PM, Aug. 24, at 5:00 PM, 2023

[d] Based on 1981 to 2010 Climate Normal data. The 1991 to 2020 Climate Normal data did not include rainfall.

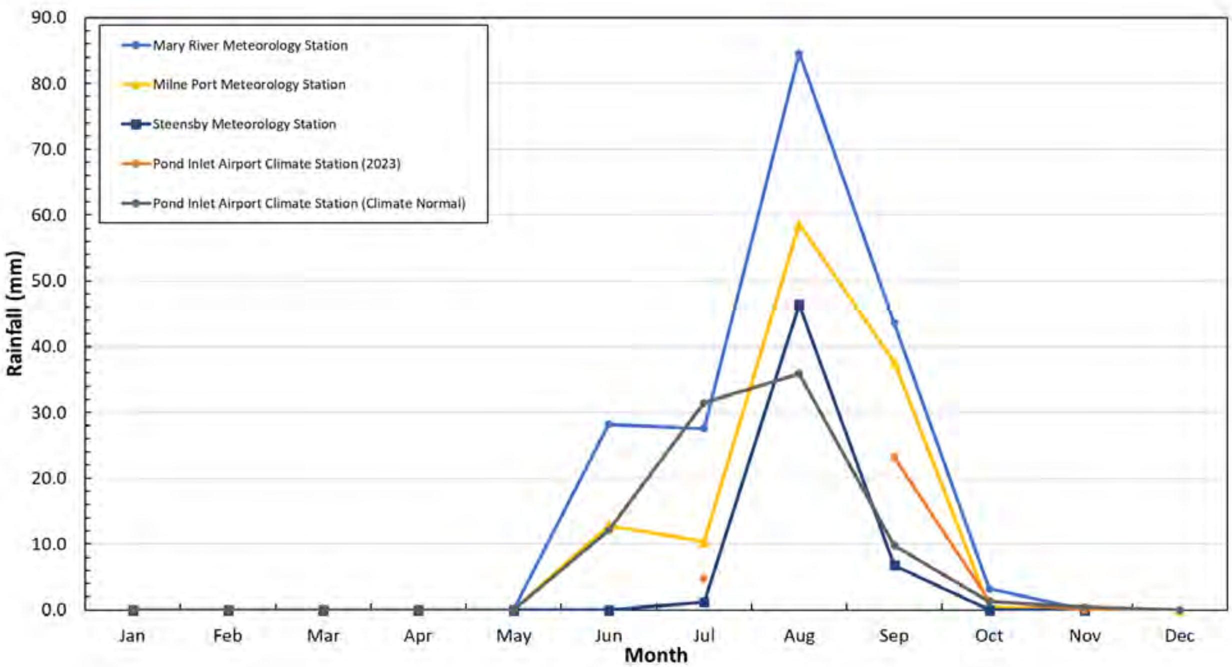


Figure 3.5 Summary of 2023 Total Monthly Rainfall at the Baffinland Meteorology Stations and the Pond Inlet Airport Climate Station

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 2023 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 missing did not result in less than 90% of all monthly hours being recorded. Therefore, the data can be presented. However, for the Steensby site, many hours were lost in December, from December 26 12:00 onwards. The Pond Inlet Airport site had 1,154 missing hours, leaving only January, February, October and November with enough hours to achieve the ECCC required hours (>90%).

The results indicate that the average windspeeds at the Mary River and Milne port sites were consistently higher than the Climate Normal data, which is consistent with 2022. However maximum windspeeds were close to or below the Climate Normal levels. The trends between each site are similar, though the average wind speeds tended to be higher in the middle of the year. For Steensby site data, the wind speeds are substantially higher than Mary River and Milne Port and Pond Inlet.

Table 3.11 Summary of Average Wind Speed at the Baffinland Meteorology Stations and the 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,b]	2.4	1.2	2.0	2.4	4.9	5.0	3.9	5.0	5.3	4.1	6.4	4.0	3.9
Milne Port Meteorology Station[a,c]	3.3	3.5	3.0	2.2	6.4	6.2	4.7	6.8	6.3	4.4	6.2	4.8	4.8
Steensby Meteorology Station[a,d,e]	7.1	6.3	7.7	7.9	10.6	9.1	5.5	9.3	10.4	9.3	12.0	-	-
Pond Inlet Airport Climate Station[a,f]	2.6	2.6	-	-	-	-	-	-	-	3.9	4.1	-	-
Pond Inlet Airport Climate Station[g]	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] Based on 2023 hourly data

[b] There were 66 hours data with zero wind speed and wind direction due to rime ice buildup and other unknown root causes were removed from analysis: 19 hours in Jan., 19 hours in Feb., 19 hours in Mar., 2 hours in Oct., 1 hours in Nov., and 6 hours in Dec.

[c] 375 hours data with zero wind speed and wind direction due to rime ice buildup and other unknow root causes were removed from analysis: 88 hours in Jan., 117 hours in Feb., 37 hours in Mar., 31 hours in Apr., 5 hours in May, 47 hours in Oct., 2 hours in Nov., and 48 hours in Dec.

[d] 6 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: 4 hours in Feb., 1 hour in Apr., 1 hour in May

[e] Data collection stopped on Dec. 26, 2023, at 12:00 PM, therefore 131 hours were missing for Dec.

[f] 1,154 hours without wind direction data. These hourly records were removed from the analysis. January, February, October and November were the only months that achieved the > 90% data completeness threshold.

[g] based on 1991 to 2020 Climate Normal data

Table 3.12 Summary of 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,b]	13.3	10.7	12.7	11.0	15.1	16.0	12.6	16.0	17.5	20.2	19.2	19.9	15.3
Milne Port Meteorology Station[a,c]	22.0	17.8	15.6	10.1	25.7	25.7	12.9	21.9	20.4	22.4	21.0	26.6	20.2
Steensby Meteorology Station[a,d,e]	27.7	20.3	18.7	17.7	28.0	28.0	18.7	26.8	25.9	26.9	33.5	-	-
Pond Inlet Airport Climate Station[a,f]	10.8	11.4	-	-	-	-	-	-	-	13.3	16.1	-	-
Pond Inlet Airport Climate Station[g]	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] Based on 2023 hourly data

[b] There were 66 hours data with zero wind speed and wind direction due to rime ice buildup and other unknown root causes were removed from analysis: 19 hours in Jan., 19 hours in Feb., 19 hours in Mar., 2 hours in Oct., 1 hour in Nov., and 6 hours in Dec.

[c] 375 hours data with zero wind speed and wind direction due to rime ice buildup and other unknow root causes were removed from analysis: 88 hours in Jan., 117 hours in Feb., 37 hours in Mar., 31 hours in Apr., 5 hours in May, 47 hours in Oct., 2 hours in Nov., and 48 hours in Dec.

[d] 6 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: 4 hours in Feb., 1 hour in Apr., 1 hour in May

[e] Data collection stopped on Dec. 26, 2023, at 12:00 PM, therefore 131 hours were missing for Dec.

[f] 1,154 hours without wind direction data. These hourly records were removed from the analysis. January, February, October, and November were the only months that achieved the > 90% data completeness threshold.

[g] based on 1991 to 2020 Climate Normal data

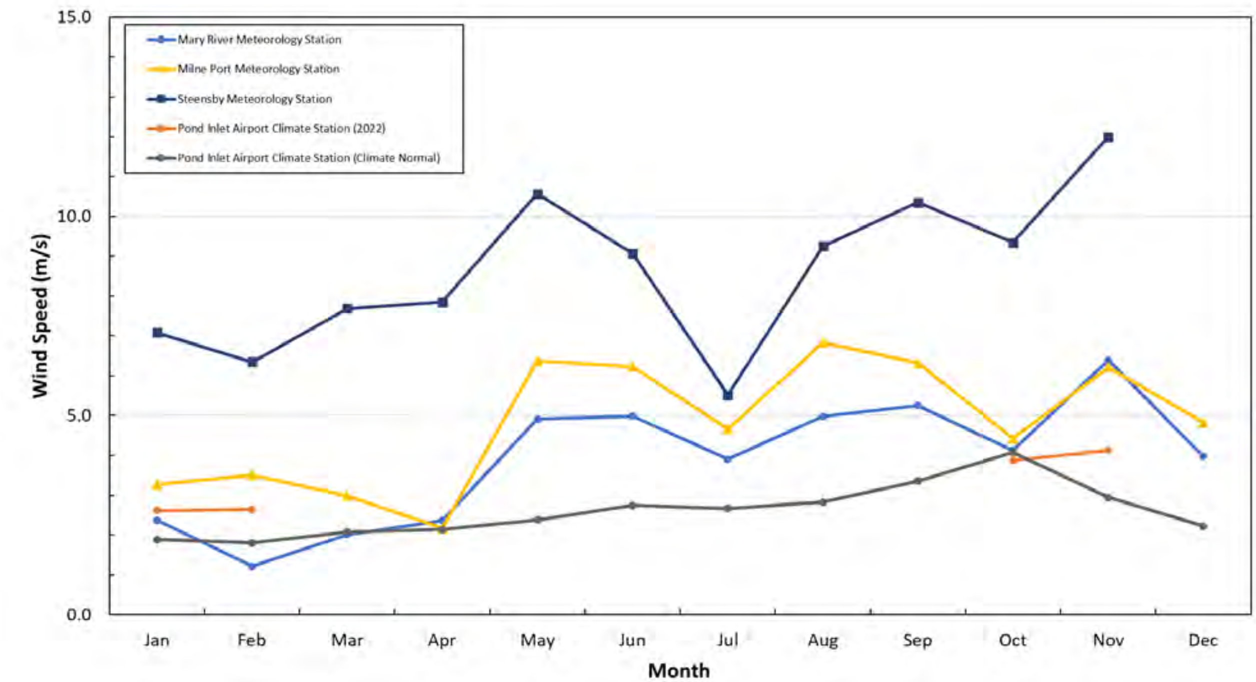


Figure 3.6 Summary of Average Monthly Wind Speed at the Baffinland Meteorology Stations and the Pond Inlet Airport Climate Station

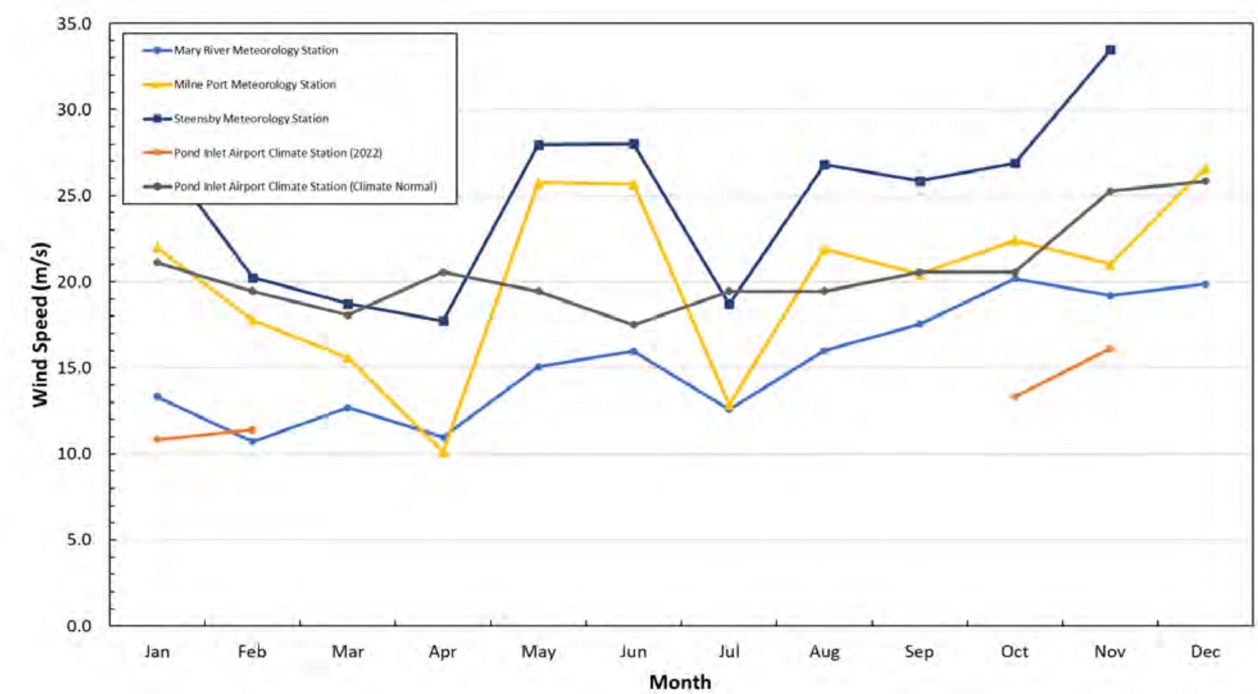


Figure 3.7 Summary of Maximum Monthly Wind Speed at the Baffinland Meteorology Stations and the Pond Inlet Airport Climate Station

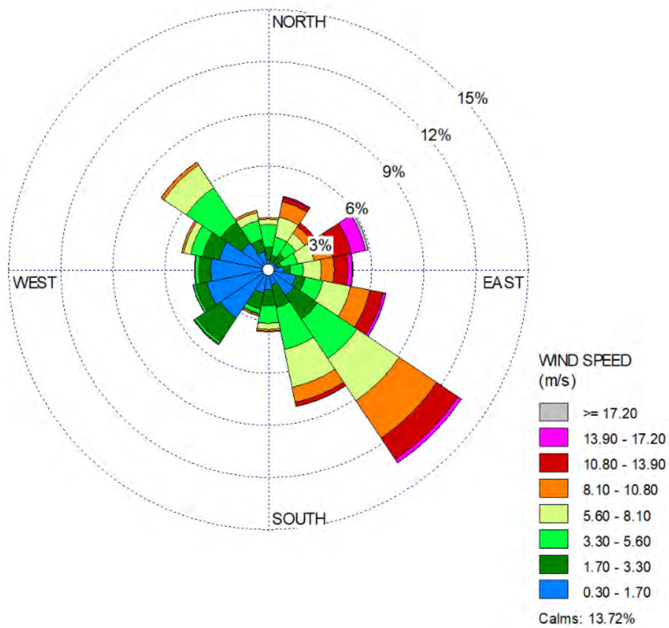
Summaries of prevalent wind direction and wind speed class frequency distributions are presented in Figure 3.8, Figure 3.9, Figure 3.10, and Figure 3.11 for Mary River, Milne Port, Steensby, and the Pond Inlet Airport, respectively. The sites are not directly comparable to the Climate Normal because 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 2023, which is consistent with the observed trends from previous years (2020, 2021 and 2022).

At Milne Port, north-north-westerly and south-westerly winds were prevalent during 2023, which is also similar to previous years (2020, 2021, and 2022).

At Steensby, north-westerly winds were prevalent during 2023. This is partially consistent with 2020, the last year with a complete dataset.

At the Pond Inlet Airport, southerly winds are prevalent during 2023, which is consistent with previous years (2020, 2021, and 2022). This is also consistent with the Canadian Climate Normal for the climate station location, which demonstrates that southerly winds are the most common. However, there were limited data available for 2022.



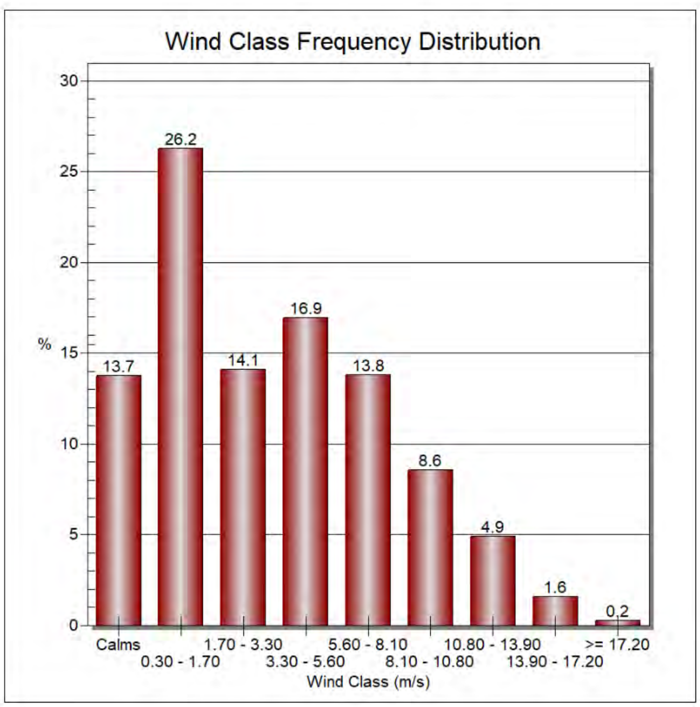
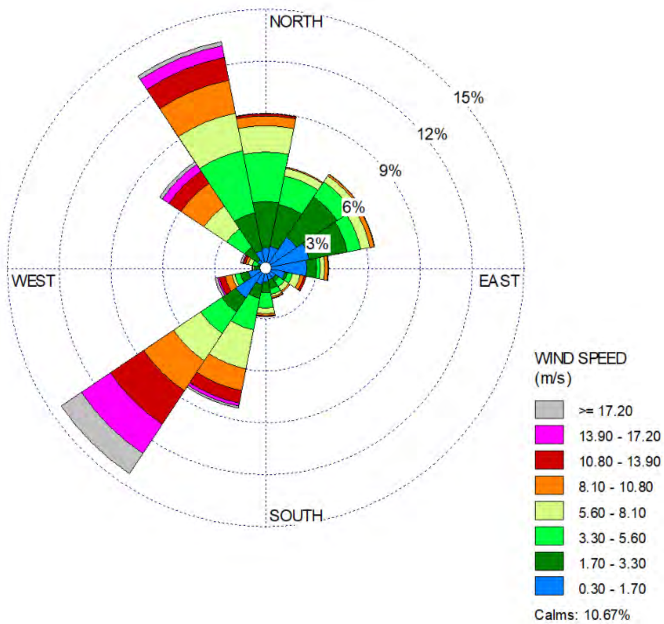


Figure 3.8 2023 Wind Rose and Wind Class Frequency Distribution at the Mary River Meteorology Station



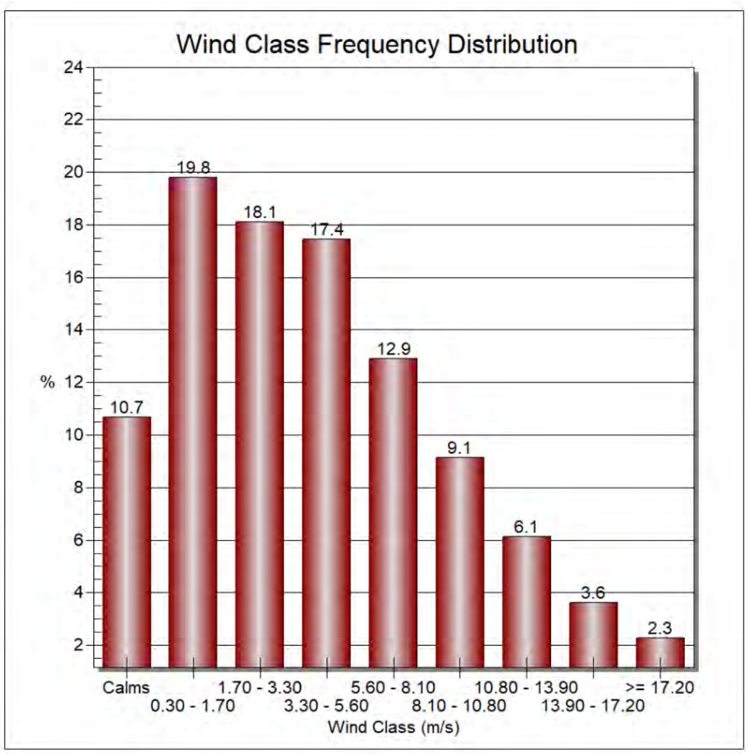
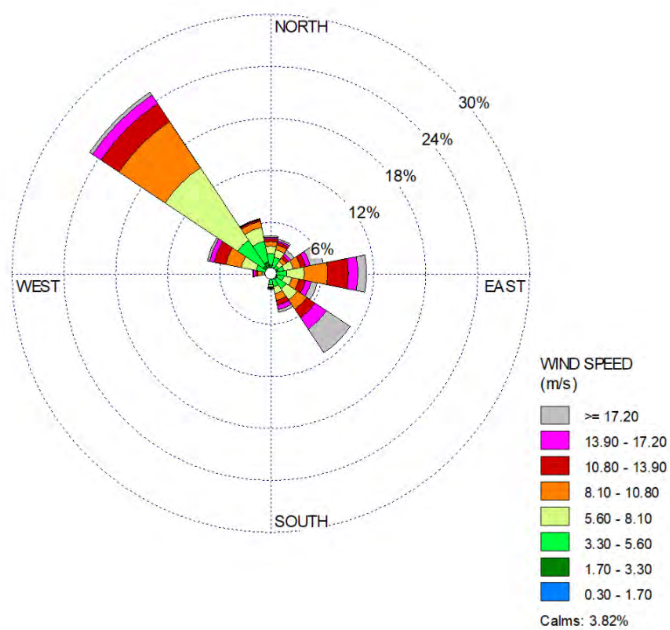


Figure 3.9 2023 Wind Rose and Wind Class Frequency Distribution at the Milne Port Meteorology Station



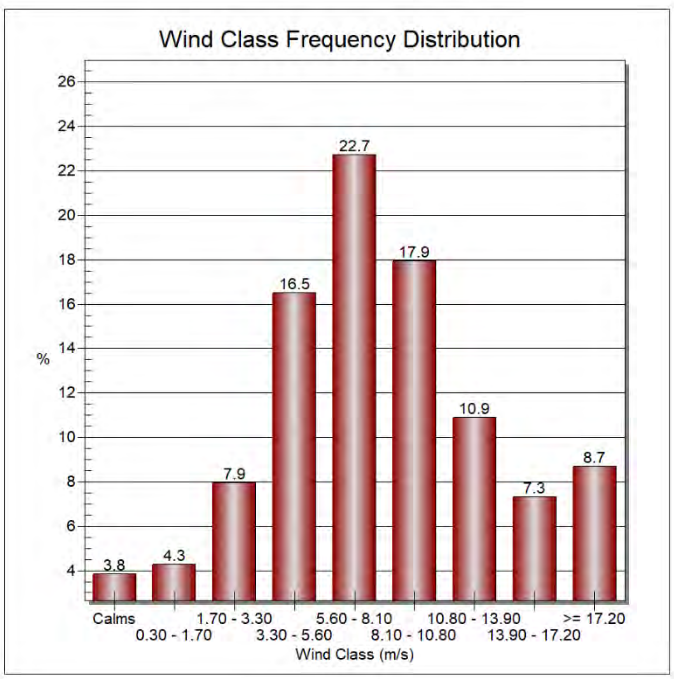
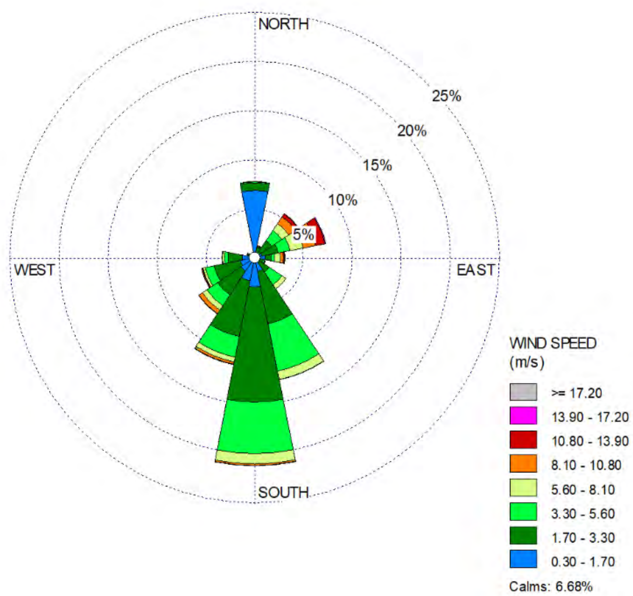


Figure 3.10 2023 Wind Rose and Wind Class Frequency Distribution at the Steensby Port Meteorology Station



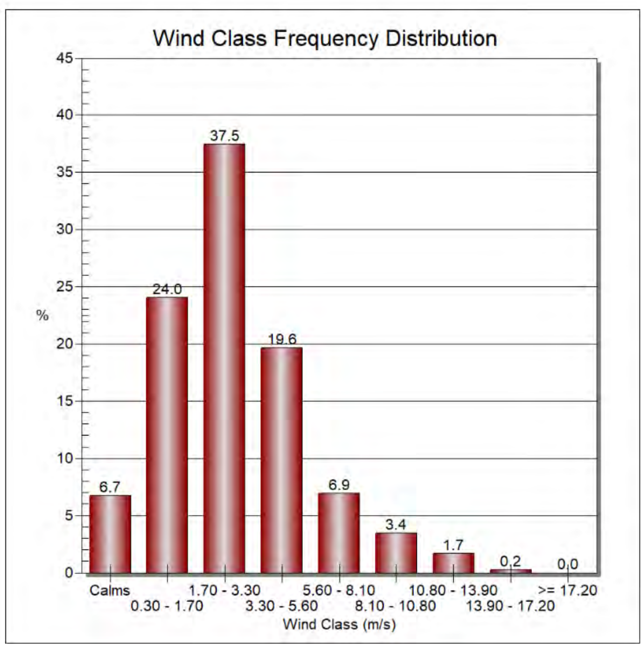


Figure 3.11 2023 Wind Rose and Wind Class Frequency Distribution at the Pond Inlet Airport Climate Station

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 are not compared to a Climate Normal.

The data from the three meteorology stations were processed in the same way. The hourly average solar radiation was averaged each month. For the Steensby site, there were no data available beyond December 26, with 131 hours missing.

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 (as opposed to June or July in previous years). Overall solar radiation was lower than in previous years. In 2022, the Mary River site peaked at around 260 W/m^2, where it is closer to 255 W/m^2 in 2023. For the Milne Port site, the peak solar radiation was only 175 W/m^2 in 2023, compared to 275 W/m^2 in 2022. For the Steensby site, the peak solar radiation was 275 W/m^2 in 2023, compared to a peak over 300 W/m^2 in 2022. Comparisons between sites indicate that the solar radiation at Milne Port was lower than at the other sites, when it had been comparable to Mary River in 2022.

Table 3.13 Summary of 2023 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	0.5	13.7	70.9	169.8	256.2	234.6	226.4	119.8	65.7	23.4	1.7	0.0	98.6
Milne Port Meteorology Station	0.2	10.3	50.1	120.5	177.1	160.5	171.1	87.3	46.9	14.8	1.0	0.0	70.0
Steensby Meteorology Station [a]	0.9	22.2	85.4	190.6	273.0	248.0	237.0	140.3	61.7	23.0	2.3	-	107.0

Notes:
"-" means data were incomplete or missing
[a] Data collection stopped on Dec. 26, 2023, at 12:00, therefore 131 hours were missing for Dec.

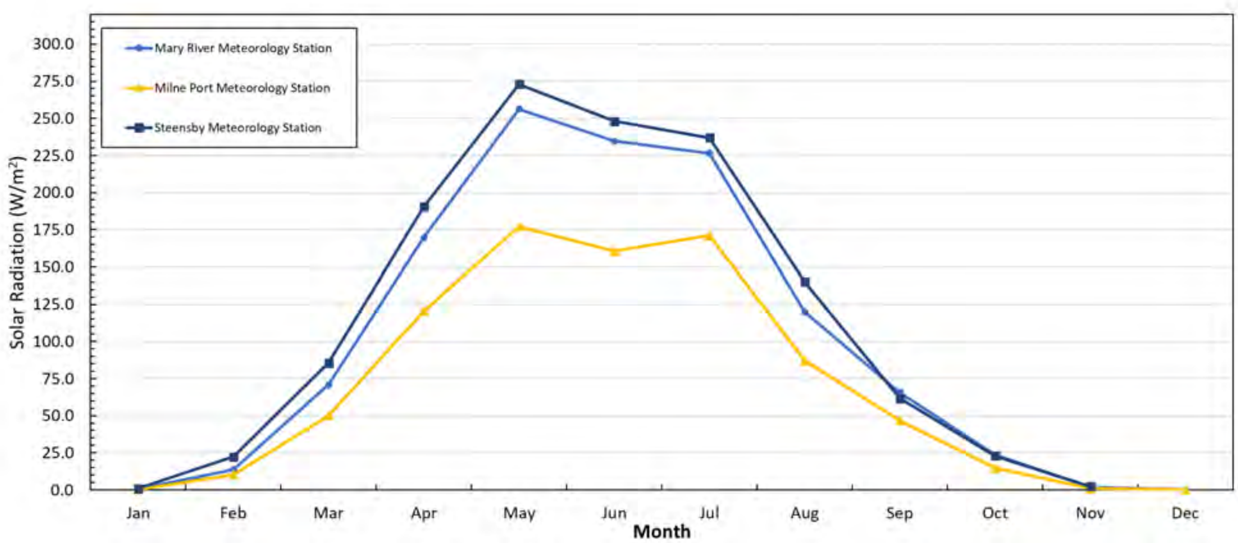


Figure 3.12 Summary of 2023 Monthly Average Solar Radiation at the Baffinland Meteorology Stations

4 Dustfall

The dustfall monitoring program used a total of 49 passive dustfall collectors in 2023 to measure dust deposition related to Project activities (43 at 2.0 m height and six at 0.5 m height), following the same methodology and analysis as in previous years (EDI 2024). Thirty (36) 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 2023 dustfall monitoring stations at the Mine Site. Figure 1.2 shows the location of the 2023 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 2023 TEAMR prepared by Environmental Dynamics Inc. (EDI 2024).

The methodology, including analytical methods for the passive dustfall monitors, is described in the 2023 TEAMR (EDI 2024). EDI (2024) summarized the magnitude and extent of the 2023 dustfall, seasonal comparisons, and the inter-annual trends for seasonal and total annual dustfall. The purpose of this section is to review the 2023 dustfall results presented by EDI (2024) and determine what correlations can be made with the 2023 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.

The results of the 2023 dustfall sampling program for monitoring site with year-round data collection were converted from units of $mg/dm^2 \cdot day$ to $g/m^2/year$. They were compared with the modelled dust deposition isopleths for the Project to determine if deposition rates exceed the predicted range. Data for each month were converted to $g/m^2/day$, and then summed to add up to one year (EDI 2024).

Dustfall deposition remained relatively constant at most year-round sampling locations throughout the Project area in 2023. Wet conditions, particularly in August, likely contributed to decreases in dustfall conditions across the Project area. The magnitude of annual dustfall deposition at the Mine Site sample locations was lower than measured in recent years. While the airstrip has consistently had the highest dustfall deposition at the Mine Site area in all years except 2019, total dustfall was lowest at this location during 2023. The magnitude of dustfall deposition at Milne Port has remained constant, or in some cases has slightly decreased, a trend that began in 2018. Dust deposition along the Tote Road during 2023 was consistent at the North Crossing and South Crossing locations compared with recent years (EDI 2024).

The general correlations between the 2023 dustfall data and the meteorological conditions (e.g., wind speed and rain precipitation) are presented below.

4.1 Results and Discussion

The 2023 dustfall data trends and statistical analysis were summarized by EDI (2024) for four areas within the regional study area:

- Mine Site
- Milne Port

- Tote Road North Crossing (km 28), and
- Tote Road South Crossing (km 80)

The general relationships among the 2023 dustfall results for these four areas are discussed below in the context of 2023 wind speed and rain precipitation data collected at the Mary River and Milne Port automated meteorology stations. In general, dustfall deposition rates did not respond consistently to the changing seasonal wind speed and rain precipitation conditions.

Dustfall monitoring conducted during 2022 and 2023 at two different heights (2.0 and 0.5 m above ground) found no differences. The normal height for dustfall monitoring is 2.0 m above ground (EDI 2024).

4.1.1 Mine Site

Fugitive dust arises from mechanical disturbance of granular material exposed to the air. Dust generated from open sources is termed "fugitive" because it is not discharged to the atmosphere in a confined flow stream. Fugitive dust is generated by:

- pulverization and abrasion of surface materials by application of a mechanical force (e.g., wheels, blades), or
- entrainment of dust particles by the action of turbulent air currents (e.g., wind erosion of an exposed surface by wind speeds greater than 5.3 m/s) (US EPA 1995).

Common sources of fugitive dust include unpaved roads, blasting, and wind erosion of open storage piles. Fugitive dust results in suspended particulate matter in the atmosphere which, under the effects of gravity, settles to the earth's surfaces as dustfall. Rain precipitation provides natural mitigation for the fugitive dust generated by Mine Site vehicle traffic and from open sources that are subject to wind erosion (e.g., storage piles). Snow on the surfaces of unpaved roads and open storage piles also provides natural mitigation for fugitive dust and dustfall.

The 2023 daily dustfall deposition rates at the Mine Site monitoring stations showed peaks during April, July, and September and the rates were substantially lower for the other months, especially August (Figure 7-6 in EDI 2024). No rain was recorded at the Mary River meteorology station during January to May. Hence, April 2023 was dry; however, it should be noted that the Mary River meteorology station does not have the ability to measure snow depth or SWE precipitation, so the total precipitation (i.e., the sum of SWE and rain) is unknown for April 2023. The daily maximum air temperature for April 2023 was -10.2°C and therefore it is not possible that rain occurred. The daily dustfall deposition rates for the Mine Site monitoring stations were steadily decreasing between April and June before increasing in July. The low dustfall during August 2023 could partially be attributed to unusually wet conditions. There were 17 to 18 days with rain in August 2023 (84.6 mm) and the baseline (2006-2010) is twelve days with rain (approximately 18 mm).

The elevated dustfall levels during April, July, and September 2023 did not correlate with elevated wind speeds. The average wind speeds at the Mary River meteorology station during April and July,2023 (2.4 and 3.9 m/s, respectively, see Table 3.11) were less than or equal to the annual average (3.9 m/s).

The average wind speed for September 2023 (5.3 m/s) was greater than the annual average. The month with the greatest average wind speed (November 6.4 m/s) did not coincide with elevated dustfall rates. Hence, the Mine Site monthly dustfall rates did not correlate well with the 2023 average and maximum monthly wind speeds.

4.1.2 Milne Port

The 2023 monthly dustfall values recorded by the Milne Port monitoring stations displayed elevated values during April, and September (Figure 7-6 in EDI 2024). The elevated April, dustfall rates for the Milne Port monitoring stations corresponded with low monthly rainfall at the Milne Port meteorology station. There were no rainfall days recorded during April 2023 and the normal (baseline 2006-2010) is three rainfall days. The elevated September dustfall rates at the Milne Port monitoring stations did not correspond with low monthly rainfall at the Milne Port meteorology station. There were eight days with rain recorded during September and the baseline (2006-2010) is four days with rain. Lower rates of dustfall were recorded by the Milne Port dustfall stations during January, June, and November when there were 0, 9 and 0 days with recordable precipitation, respectively. The wettest month was August 2023 (17 to 18 days with rain); however, August did not have the lowest dustfall values. When there is rain it provides natural mitigation for fugitive dust. The Milne Port meteorology station does not record SWE precipitation which is needed to calculate total precipitation.

The elevated dustfall levels during April were not correlated with elevated wind speeds. The average wind speed at the Milne Port meteorology station (summarized in Table 3.11) during April (2.2 m/s) was less than the annual average (4.8 m/s). The elevated dustfall levels during September were correlated with elevated wind speeds. The average wind speed at the Milne Port meteorology station during September (6.3 m/s) was greater than the annual average (4.8 m/s). The month with the greatest average wind speed (August 2023, 6.8 m/s) did not have the highest overall dustfall rates. Apart from September 2023, there was no correlation between elevated dustfall values and greater than average monthly wind speed.

4.1.3 Tote Road North Crossing

The Tote Road North Crossing dustfall stations recorded elevated values during July 2023 (Figure 7-6 in EDI 2024). The closest meteorology station to the Tote Road North Crossing is at Milne Port. July 2023 had lower than average wind speeds (4.7 m/s, respectively compared to annual average 4.8 m/s) and slightly higher than normal precipitation (9 and 8 days, respectively). The wettest month (August 2023 with 17 to 18 days with rain, baseline (2006-2010) is six days with rain) did not show elevated dustfall rates.

4.1.4 Tote Road South Crossing

The Tote Road South Crossing dustfall stations showed the same trend as the North Tote Road Crossing dustfall stations, with elevated values during July 2023. The closest meteorology station to the Tote Road South Crossing is at the Mine Site. The July 2023 monthly average wind speed (3.9 m/s) was equal to the annual average (3.9 m/s). The wettest month (August 2023 with 17 to 18 days with rain compared to the 2006-2010 baseline with 12 days with rain) did not correlate with the lowest dustfall rates.

5 Summary

5.1 Ambient Air Quality Monitoring Program

Ambient air quality data were collected at the MSC and PSC in 2023. Ambient air quality was analyzed for SO_2, NO_2, NO, and NOx using Teledyne API SO_2/NOx analyzers. TSP and $PM_{2.5}$ in ambient air were analyzed 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 2023 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 2023 ambient air quality data:

- The measured concentrations of NO_2 and SO_2 at the MSC and PSC were below the Nunavut NAAQS for 2023.
- The 2023 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 2023, the SO_2 and NOx analyzers at the MSC monitoring station had 82.2% and 95.1% valid data with 8,716 and 8,327 valid data points, respectively.
- During 2023 the SO_2 and NOx analyzers at the PSC monitoring station had 93.8% and 94.0% valid data respectively for the year, with 8,213 and 8,233 valid data points each.
- Permeation data results indicate consistent calibration cycles. The SO_2 monitor pump at the PSC was replaced in December, 2023. After pump replacement, the meter was calibrated and brought back online to resume data collection.
- The MSC SO_2 monitor had a UV lamp failure resulting in data invalidation in March and April. A new UV lamp was installed in April and the monitor was calibrated and brought back online.
- The TSP and $PM_{2.5}$ BAM measured concentrations at the MSC ambient air quality monitoring station had 88.6% and 92.4% valid data for 2023, respectively.
- The PSC $PM_{2.5}$ data were not available from January to April due to flow controller and AT sensor failures from the extreme cold. BIM continues to work with Nunami Stantec and Met-One to find solutions.
- The 24-hour average TSP concentrations measured at MSC were greater than the Project Standard TSP 24-hour concentration (120 $\mu g/m^3$) for 167 events during the year, comprising 45.7% of the available period of record.
- The average annual TSP concentration measured at MSC (216.03 $\mu g/m^3$) for the available period of record was greater than the Project Standard (60 $\mu g/m^3$).
- The average annual $PM_{2.5}$ concentrations measured at MSC (6.17 $\mu g/m^3$) for the available period of record, were less than the Project annual standard (10 $\mu g/m^3$).
- Additional controls to limit the amount of fugitive dust that escapes during ore crushing and transportation activities at the mine site should be investigated and implemented where possible.

- The BAM $PM_{2.5}$ and TSP data at the PSC ambient air quality monitoring station had 56.5% and 80.2% valid data for 2023, respectively.
- During 2023, the PSC ambient air station measured two 24-hour average $PM_{2.5}$ concentrations greater than the Project Standard. The exceedances occurred in a condensed time frame from April 20 and April 21, 2023, ranging from 30.2 to 32.4 $\mu g/m^3$.
- 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.
- The average annual $PM_{2.5}$ concentration measured at the PSC ambient air quality monitoring station (5.02 $\mu g/m^3$) for the available period of record was less than the project annual standard (10 $\mu g/m^3$).
- There was seventeen 24-hour TSP average value that was greater than the Project Standard (120 $\mu g/m^3$) at the PSC ambient air quality monitoring station comprising <4.7% of the total readings. The annual average TSP concentrations measured at the PSC (26.8 $\mu g/m^3$) for the available period of record was less than the Project Standard for an annual TSP concentration (60 $\mu g/m^3$).

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 comparison of 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.

5.2 Meteorology

Meteorological data were collected at three meteorology stations in 2023 (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 2023 data recorded at the ECCC Pond Inlet Airport Climate Station, as well as the 30-year Climate Normal data (1981-2010 and 1991-2020 datasets) produced by the station. The following summary observations are provided in relation to 2023 meteorological data.

- In general, the trends observed for temperature, relative humidity, and rainfall precipitation matched well with the Climate Normal data set recorded at Pond Inlet.
- Average temperatures in 2023 tended to be similar or slightly higher than the Pond Inlet Airport Climate Normal for most of the year, with a colder January and February.
- Mary River observed lower minimum air temperatures in 2023 than previous trends in the past few years (2018–2022). Milne Port observed lower minimum temperatures when compared with the previous year. Both stations had cooler maximum temperatures than the previous year.
- The trend of reduced relative humidity in the summer (July), when compared to the Climate Normal data, continued into 2023.

- Rainfall was observed between May and October, which is a wider band of rainfall months than the Climate Normal data indicates. In general, the trend indicated peak rainfall in August, which is consistent with the Climate Normal data.
- 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 2023.
- Wind directions at the 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 between Mary River, Milne Port, and Steensby sites. The maximum solar radiation values observed (May to July) were lower than the previous year, though the trend is the same.
- Steensby had 131 hours of missing data in December, which is an improvement over data acquisition in the previous year (443 missing hours).

5.3 Dustfall

During 2023 dustfall was monitored monthly at nine locations at or near the Mine Site, ten locations at or near Milne Port, twenty-two were located along the Tote Road, two reference locations and six “short” dustfall monitoring stations (0.5 m height) that were part of a pilot study. The data from the dustfall stations at Tote Road North Crossing and Tote Road South Crossing showed peak values during July 2023 (Figure 7-6 in EDI 2024) which did not coincide with dry conditions (between 7 and 9 days with rain compared with baseline (2006-2010) between 8 and 11 days with rain). Dustfall was not abnormally low at the Tote Road North Crossing and the Tote Road South Crossing dustfall stations during August 2023 which coincided with unusually wet conditions (17 to 18 days with rain compared to baseline (2006-2010) with 6 to 12 days with rain). There was little correlation between the 2023 peak monthly dustfall values for the Tote Road North Crossing and the Tote Road South Crossing monitoring stations and higher than average monthly wind speeds recorded at the nearest meteorology station.

Elevated dustfall values recorded at the Mine Site and Milne Port monitoring stations during April 2023 coincided with dry conditions recorded at the respective meteorology stations (zero days with rain). Elevated dustfall values recorded at the Mine Site and Milne Port monitoring stations during September 2023 did not coincide with dry conditions recorded at the respective meteorology stations (10 and 8 days with rain, respectively). Low dustfall values at the Mine Site and Milne Port monitoring stations coincided with unusually wet conditions during August 2023.

There was little correlation between monthly average wind speeds and dustfall values at the Mine Site and Milne Port monitoring locations during 2023.

For the 2023 dustfall monitoring program there was a stronger correlation between low measured dustfall values and wet conditions (and high measured dustfall values during dry conditions) than higher than average wind speeds and higher than average monthly measured dustfall values.

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