



Korea
National Oil Corporation

Appendix B5

Baseline, Application and Planned Development Model Predictions

**APPENDIX B5: BASELINE APPLICATION AND PLANNED
DEVELOPMENT MODEL PREDICTIONS
TABLE OF CONTENTS**

| | | PAGE |
|------------|------------------------------|--------------|
| 1.0 | INTRODUCTION..... | B5-1 |
| 2.0 | LITERATURE CITED..... | B5-24 |

LIST OF TABLES

| | | |
|-------------|--|-------|
| Table B5-1: | Predicted Sulphur Dioxide Concentrations in the AQRSA | B5-2 |
| Table B5-2: | Predicted Nitrogen Dioxide Concentrations in the AQRSA | B5-7 |
| Table B5-3: | Predicted Particulate Matter Concentrations in the AQRSA..... | B5-12 |
| Table B5-4: | Predicted Carbon Monoxide Concentrations in the AQRSA | B5-17 |
| Table B5-5: | Annual Potential Acid Deposition Predicted by CALPUFF for the Baseline Scenario | B5-22 |
| Table B5-6: | CALPUFF Predicted One-Degree Averaged Potential Acid Input (PAI) Values | B5-22 |
| Table B5-7: | Annual Nitrogen Deposition Predicted by CALPUFF | B5-23 |

1.0 INTRODUCTION

As required by Alberta Environment modelling guidelines, the highest receptor value of a pollutant at the required rank and averaging period was extracted from results of each modelling year. At each receptor, the maximum among the five modelling years was determined. In this appendix, [Tables B5-1 to B5-4](#) provides the model predictions for ground level pollutant concentrations at the maximum point of impingement, as well as the discrete receptors chosen for this assessment. The list of discrete receptors includes the Wood Buffalo Environmental Association (WBEA) air monitoring locations as well as specific community and recreational locations. Results are provided for the absolute maxima, as well as the values on which the Alberta Ambient Air Quality Objectives and Guidelines (AAAQO) are based to eliminate outlying data (e.g., 9th highest value, expressed as 99.9th percentile for 1-hour concentrations) as required by Alberta Environment modeling guidance (AENV 2009).

PAI and nitrogen deposition results are provided and the results are compared to the monitoring loads for PAI (CASA and AENV 1999) and critical loads for nitrogen (WHO 2000).

Table B5-1: Predicted Sulphur Dioxide Concentrations in the AQRSA

| Receptor | Baseline ($\mu\text{g}/\text{m}^3$) | Application ($\mu\text{g}/\text{m}^3$) | Planned Development ($\mu\text{g}/\text{m}^3$) | Application over Baseline (%) | Planned Development over Baseline (%) |
|---|--|---|--|-------------------------------------|---|
| Maximum 1-h | | | | | |
| Overall Maximum (MPOI) | 895 | 895 | 909 | 0.0 | 1.6 |
| AMS #1 (Fort McKay) | 228 | 228 | 305 | 0.0 | 33.8 |
| AMS #2 (Mildred Lake) | 535 | 535 | 557 | 0.0 | 4.1 |
| AMS #4 (Buffalo Viewpoint) | 281 | 281 | 285 | 0.0 | 1.4 |
| AMS #5 (Mannix) | 608 | 608 | 618 | 0.0 | 1.6 |
| AMS #6 (Patricia McInnes) | 144 | 144 | 153 | 0.0 | 6.3 |
| AMS #7 (Athabasca Valley) | 105 | 105 | 115 | 0.0 | 9.5 |
| AMS #8 (Fort Chipewyan) | 37 | 37 | 43 | 0.0 | 16.2 |
| AMS #10 (Albian Mine) | 235 | 235 | 272 | 0.0 | 15.7 |
| AMS #11 (Lower Camp) | 759 | 760 | 760 | 0.1 | 0.1 |
| AMS #12 (Millennium) | 166 | 166 | 182 | 0.0 | 9.6 |
| AMS #13 (Syncrude UE1) | 236 | 236 | 413 | 0.0 | 75.0 |
| AMS #14 (Anzac) | 135 | 135 | 136 | 0.0 | 0.7 |
| AMS #15 (Horizon) | 204 | 204 | 204 | 0.0 | 0.0 |
| R01: Trapper's Cabin | 237 | 237 | 238 | 0.0 | 0.4 |
| R02: Camp Site | 323 | 323 | 323 | 0.0 | 0.0 |
| R03: Fish Plant (Winefred Lake) | 55 | 55 | 55 | 0.0 | 0.0 |
| R04: Cabin (Winefred Lake) | 61 | 61 | 63 | 0.0 | 3.3 |
| R05: Cabin (NW Kirby Lake) | 145 | 146 | 146 | 0.7 | 0.7 |
| R06: West Hay Lake | 146 | 147 | 147 | 0.7 | 0.7 |
| R07: Cabins (North Hay Lake) | 169 | 169 | 170 | 0.0 | 0.6 |
| R08: Martin's Cabins | 152 | 152 | 152 | 0.0 | 0.0 |
| R09: Metis Trailer Camp | 178 | 178 | 179 | 0.0 | 0.6 |
| R10: Conklin | 71 | 71 | 71 | 0.0 | 0.0 |
| R11: Cabins (NW Christina Lake) | 72 | 72 | 72 | 0.0 | 0.0 |
| R12: Medicinal Plants | 128 | 128 | 128 | 0.0 | 0.0 |
| R13: Cabins near Gravel Pit | 48 | 48 | 55 | 0.0 | 14.6 |
| R14: Cabins | 72 | 72 | 72 | 0.0 | 0.0 |
| R15: Leismer | 39 | 39 | 46 | 0.0 | 17.9 |
| R16: East Chard | 43 | 43 | 48 | 0.0 | 11.6 |
| R17: Pingle | 54 | 54 | 60 | 0.0 | 11.1 |
| R18: Chard School | 39 | 39 | 44 | 0.0 | 12.8 |
| R19: Janvier | 38 | 38 | 43 | 0.0 | 13.2 |
| R20: IR 194B | 74 | 75 | 75 | 1.4 | 1.4 |
| R21: IR 194A | 44 | 44 | 51 | 0.0 | 15.9 |
| R22: Fishing Camp (Christina Lake) | 184 | 185 | 186 | 0.5 | 1.1 |
| R23: Fire Lookout 1 | 36 | 39 | 40 | 8.3 | 11.1 |
| R24: Fire Lookout 2 | 52 | 52 | 62 | 0.0 | 19.2 |
| R25: AltaGas House | 116 | 117 | 118 | 0.9 | 1.7 |
| R26: MEG Worker's Camp | 255 | 255 | 353 | 0.0 | 38.4 |
| R27: Grave Site (Christina Lake) | 138 | 141 | 142 | 2.2 | 2.9 |
| R28: Grave Site (Winefred Lake) | 110 | 111 | 111 | 0.9 | 0.9 |
| R29: Grist Lake Lodge 1 | 35 | 35 | 40 | 0.0 | 14.3 |
| R30: Grist Lake South | 36 | 36 | 40 | 0.0 | 11.1 |
| R31: Winefred Lake Lodge 1 | 43 | 45 | 46 | 4.7 | 7.0 |
| R32: Winefred Lake West | 80 | 80 | 81 | 0.0 | 1.3 |
| R33: EnCana Camp | 262 | 262 | 264 | 0.0 | 0.8 |
| R34: Winifred Cabin/Station/Lookout | 37 | 39 | 41 | 5.4 | 10.8 |
| R35: Campground (Christina Lake) | 86 | 86 | 86 | 0.0 | 0.0 |
| R36: Wild Rice Operation 1 | 46 | 47 | 48 | 2.2 | 4.3 |
| R37: Wild Rice Operation 2 | 89 | 89 | 89 | 0.0 | 0.0 |
| R38: Fire Lookout Tower | 94 | 95 | 95 | 1.1 | 1.1 |
| R39: Devenish | 89 | 94 | 94 | 5.6 | 5.6 |
| R40: Old Cabins & Settlement Area (Wiau Lake) | 66 | 66 | 68 | 0.0 | 3.0 |
| AAAQO | - | - | - | - | - |



| Receptor | Baseline ($\mu\text{g}/\text{m}^3$) | Application ($\mu\text{g}/\text{m}^3$) | Planned Development ($\mu\text{g}/\text{m}^3$) | Application over Baseline (%) | Planned Development over Baseline (%) |
|---|--|---|--|-------------------------------------|--|
| 99.9th Percentile 1-h | | | | | |
| Overall Maximum (MPOI) | 322 | 322 | 343 | 0.0 | 6.5 |
| AMS #1 (Fort McKay) | 108 | 108 | 117 | 0.0 | 8.3 |
| AMS #2 (Mildred Lake) | 314 | 314 | 315 | 0.0 | 0.3 |
| AMS #4 (Buffalo Viewpoint) | 218 | 218 | 219 | 0.0 | 0.5 |
| AMS #5 (Mannix) | 247 | 247 | 251 | 0.0 | 1.6 |
| AMS #6 (Patricia McInnes) | 67 | 67 | 80 | 0.0 | 19.4 |
| AMS #7 (Athabasca Valley) | 58 | 58 | 82 | 0.0 | 41.4 |
| AMS #8 (Fort Chipewyan) | 24 | 24 | 28 | 0.0 | 16.7 |
| AMS #10 (Albian Mine) | 104 | 104 | 128 | 0.0 | 23.1 |
| AMS #11 (Lower Camp) | 322 | 322 | 343 | 0.0 | 6.5 |
| AMS #12 (Millennium) | 91 | 91 | 104 | 0.0 | 14.3 |
| AMS #13 (Syn crude UE1) | 138 | 138 | 143 | 0.0 | 3.6 |
| AMS #14 (Anzac) | 68 | 68 | 69 | 0.0 | 1.5 |
| AMS #15 (Horizon) | 88 | 88 | 95 | 0.0 | 8.0 |
| R01: Trapper's Cabin | 81 | 81 | 83 | 0.0 | 2.5 |
| R02: Camp Site | 59 | 60 | 61 | 1.7 | 3.4 |
| R03: Fish Plant (Winefred Lake) | 38 | 38 | 42 | 0.0 | 10.5 |
| R04: Cabin (Winefred Lake) | 31 | 32 | 35 | 3.2 | 12.9 |
| R05: Cabin (NW Kirby Lake) | 67 | 67 | 72 | 0.0 | 7.5 |
| R06: West Hay Lake | 69 | 69 | 72 | 0.0 | 4.3 |
| R07: Cabins (North Hay Lake) | 67 | 67 | 69 | 0.0 | 3.0 |
| R08: Martin's Cabins | 54 | 54 | 54 | 0.0 | 0.0 |
| R09: Metis Trailer Camp | 57 | 57 | 58 | 0.0 | 1.8 |
| R10: Conklin | 41 | 41 | 41 | 0.0 | 0.0 |
| R11: Cabins (NW Christina Lake) | 42 | 42 | 43 | 0.0 | 2.4 |
| R12: Medicinal Plants | 45 | 52 | 53 | 15.6 | 17.8 |
| R13: Cabins near Gravel Pit | 32 | 32 | 34 | 0.0 | 6.3 |
| R14: Cabins | 30 | 30 | 32 | 0.0 | 6.7 |
| R15: Leismer | 29 | 29 | 33 | 0.0 | 13.8 |
| R16: East Chard | 25 | 25 | 30 | 0.0 | 20.0 |
| R17: Pingle | 30 | 30 | 36 | 0.0 | 20.0 |
| R18: Chard School | 26 | 26 | 30 | 0.0 | 15.4 |
| R19: Janvier | 25 | 25 | 30 | 0.0 | 20.0 |
| R20: IR 194B | 41 | 43 | 43 | 4.9 | 4.9 |
| R21: IR 194A | 29 | 29 | 35 | 0.0 | 20.7 |
| R22: Fishing Camp (Christina Lake) | 68 | 69 | 70 | 1.5 | 2.9 |
| R23: Fire Lookout 1 | 24 | 25 | 29 | 4.2 | 20.8 |
| R24: Fire Lookout 2 | 35 | 35 | 43 | 0.0 | 22.9 |
| R25: AltaGas House | 70 | 70 | 70 | 0.0 | 0.0 |
| R26: MEG Worker's Camp | 217 | 217 | 299 | 0.0 | 37.8 |
| R27: Grave Site (Christina Lake) | 57 | 57 | 57 | 0.0 | 0.0 |
| R28: Grave Site (Winefred Lake) | 42 | 43 | 44 | 2.4 | 4.8 |
| R29: Grist Lake Lodge 1 | 25 | 25 | 27 | 0.0 | 8.0 |
| R30: Grist Lake South | 24 | 24 | 27 | 0.0 | 12.5 |
| R31: Winefred Lake Lodge 1 | 28 | 28 | 31 | 0.0 | 10.7 |
| R32: Winefred Lake West | 48 | 48 | 50 | 0.0 | 4.2 |
| R33: EnCana Camp | 118 | 118 | 120 | 0.0 | 1.7 |
| R34: Winifred Cabin/Station/Lookout | 25 | 25 | 28 | 0.0 | 12.0 |
| R35: Campground (Christina Lake) | 46 | 46 | 46 | 0.0 | 0.0 |
| R36: Wild Rice Operation 1 | 28 | 28 | 32 | 0.0 | 14.3 |
| R37: Wild Rice Operation 2 | 39 | 39 | 40 | 0.0 | 2.6 |
| R38: Fire Lookout Tower | 55 | 58 | 58 | 5.5 | 5.5 |
| R39: Devenish | 39 | 39 | 40 | 0.0 | 2.6 |
| R40: Old Cabins & Settlement Area (Wiau Lake) | 24 | 24 | 27 | 0.0 | 12.5 |
| AAAQO | 450 | 450 | 450 | - | - |

| Receptor | Baseline ($\mu\text{g}/\text{m}^3$) | Application ($\mu\text{g}/\text{m}^3$) | Planned Development ($\mu\text{g}/\text{m}^3$) | Application over Baseline (%) | Planned Development over Baseline (%) |
|---|--|---|--|-------------------------------------|--|
| Maximum 24-h | | | | | |
| Overall Maximum (MPOI) | 105 | 105 | 105 | 0.0 | 0.0 |
| AMS #1 (Fort McKay) | 35 | 35 | 47 | 0.0 | 34.3 |
| AMS #2 (Mildred Lake) | 95 | 95 | 96 | 0.0 | 1.1 |
| AMS #4 (Buffalo Viewpoint) | 60 | 60 | 61 | 0.0 | 1.7 |
| AMS #5 (Mannix) | 85 | 85 | 88 | 0.0 | 3.5 |
| AMS #6 (Patricia McInnes) | 36 | 36 | 42 | 0.0 | 16.7 |
| AMS #7 (Athabasca Valley) | 39 | 39 | 53 | 0.0 | 35.9 |
| AMS #8 (Fort Chipewyan) | 12 | 12 | 15 | 0.0 | 25.0 |
| AMS #10 (Albian Mine) | 48 | 48 | 63 | 0.0 | 31.3 |
| AMS #11 (Lower Camp) | 105 | 105 | 105 | 0.0 | 0.0 |
| AMS #12 (Millennium) | 38 | 38 | 41 | 0.0 | 7.9 |
| AMS #13 (Syn crude UE1) | 41 | 41 | 46 | 0.0 | 12.2 |
| AMS #14 (Anzac) | 26 | 26 | 29 | 0.0 | 11.5 |
| AMS #15 (Horizon) | 40 | 40 | 47 | 0.0 | 17.5 |
| R01: Trapper's Cabin | 25 | 25 | 26 | 0.0 | 4.0 |
| R02: Camp Site | 30 | 30 | 30 | 0.0 | 0.0 |
| R03: Fish Plant (Winefred Lake) | 16 | 16 | 18 | 0.0 | 12.5 |
| R04: Cabin (Winefred Lake) | 15 | 15 | 16 | 0.0 | 6.7 |
| R05: Cabin (NW Kirby Lake) | 27 | 27 | 28 | 0.0 | 3.7 |
| R06: West Hay Lake | 25 | 25 | 28 | 0.0 | 12.0 |
| R07: Cabins (North Hay Lake) | 24 | 24 | 27 | 0.0 | 12.5 |
| R08: Martin's Cabins | 19 | 19 | 19 | 0.0 | 0.0 |
| R09: Metis Trailer Camp | 18 | 18 | 19 | 0.0 | 5.6 |
| R10: Conklin | 15 | 15 | 17 | 0.0 | 13.3 |
| R11: Cabins (NW Christina Lake) | 15 | 15 | 18 | 0.0 | 20.0 |
| R12: Medicinal Plants | 23 | 23 | 28 | 0.0 | 21.7 |
| R13: Cabins near Gravel Pit | 14 | 14 | 17 | 0.0 | 21.4 |
| R14: Cabins | 15 | 15 | 17 | 0.0 | 13.3 |
| R15: Leismer | 15 | 15 | 18 | 0.0 | 20.0 |
| R16: East Chard | 13 | 13 | 15 | 0.0 | 15.4 |
| R17: Pingle | 14 | 14 | 16 | 0.0 | 14.3 |
| R18: Chard School | 14 | 14 | 17 | 0.0 | 21.4 |
| R19: Janvier | 15 | 15 | 18 | 0.0 | 20.0 |
| R20: IR 194B | 19 | 19 | 20 | 0.0 | 5.3 |
| R21: IR 194A | 16 | 16 | 19 | 0.0 | 18.8 |
| R22: Fishing Camp (Christina Lake) | 31 | 31 | 31 | 0.0 | 0.0 |
| R23: Fire Lookout 1 | 13 | 13 | 15 | 0.0 | 15.4 |
| R24: Fire Lookout 2 | 18 | 18 | 21 | 0.0 | 16.7 |
| R25: AltaGas House | 34 | 34 | 35 | 0.0 | 2.9 |
| R26: MEG Worker's Camp | 53 | 53 | 72 | 0.0 | 35.8 |
| R27: Grave Site (Christina Lake) | 27 | 27 | 28 | 0.0 | 3.7 |
| R28: Grave Site (Winefred Lake) | 23 | 23 | 24 | 0.0 | 4.3 |
| R29: Grist Lake Lodge 1 | 12 | 12 | 15 | 0.0 | 25.0 |
| R30: Grist Lake South | 12 | 12 | 15 | 0.0 | 25.0 |
| R31: Winefred Lake Lodge 1 | 14 | 14 | 16 | 0.0 | 14.3 |
| R32: Winefred Lake West | 22 | 22 | 24 | 0.0 | 9.1 |
| R33: EnCana Camp | 29 | 29 | 30 | 0.0 | 3.4 |
| R34: Winifred Cabin/Station/Lookout | 13 | 13 | 15 | 0.0 | 15.4 |
| R35: Campground (Christina Lake) | 15 | 15 | 18 | 0.0 | 20.0 |
| R36: Wild Rice Operation 1 | 14 | 14 | 15 | 0.0 | 7.1 |
| R37: Wild Rice Operation 2 | 14 | 14 | 17 | 0.0 | 21.4 |
| R38: Fire Lookout Tower | 26 | 26 | 29 | 0.0 | 11.5 |
| R39: Devenish | 15 | 15 | 18 | 0.0 | 20.0 |
| R40: Old Cabins & Settlement Area (Wiau Lake) | 12 | 12 | 14 | 0.0 | 16.7 |
| AAAQO | - | - | - | - | - |



| Receptor | Baseline ($\mu\text{g}/\text{m}^3$) | Application ($\mu\text{g}/\text{m}^3$) | Planned Development ($\mu\text{g}/\text{m}^3$) | Application over Baseline (%) | Planned Development over Baseline (%) |
|---|--|---|--|-------------------------------------|--|
| 99.9th Percentile 24-h | | | | | |
| Overall Maximum (MPOI) | 92 | 92 | 95 | 0.0 | 3.3 |
| AMS #1 (Fort McKay) | 33 | 33 | 38 | 0.0 | 15.2 |
| AMS #2 (Mildred Lake) | 92 | 92 | 92 | 0.0 | 0.0 |
| AMS #4 (Buffalo Viewpoint) | 54 | 54 | 55 | 0.0 | 1.9 |
| AMS #5 (Mannix) | 75 | 75 | 76 | 0.0 | 1.3 |
| AMS #6 (Patricia McInnes) | 25 | 25 | 31 | 0.0 | 24.0 |
| AMS #7 (Athabasca Valley) | 24 | 24 | 36 | 0.0 | 50.0 |
| AMS #8 (Fort Chipewyan) | 9 | 9 | 11 | 0.0 | 22.2 |
| AMS #10 (Albian Mine) | 38 | 38 | 58 | 0.0 | 52.6 |
| AMS #11 (Lower Camp) | 92 | 92 | 95 | 0.0 | 3.3 |
| AMS #12 (Millennium) | 33 | 33 | 39 | 0.0 | 18.2 |
| AMS #13 (Syn crude UE1) | 32 | 32 | 34 | 0.0 | 6.3 |
| AMS #14 (Anzac) | 23 | 23 | 24 | 0.0 | 4.3 |
| AMS #15 (Horizon) | 36 | 36 | 41 | 0.0 | 13.9 |
| R01: Trapper's Cabin | 24 | 24 | 25 | 0.0 | 4.2 |
| R02: Camp Site | 17 | 17 | 18 | 0.0 | 5.9 |
| R03: Fish Plant (Winefred Lake) | 15 | 15 | 16 | 0.0 | 6.7 |
| R04: Cabin (Winefred Lake) | 12 | 12 | 14 | 0.0 | 16.7 |
| R05: Cabin (NW Kirby Lake) | 22 | 22 | 23 | 0.0 | 4.5 |
| R06: West Hay Lake | 20 | 20 | 21 | 0.0 | 5.0 |
| R07: Cabins (North Hay Lake) | 24 | 25 | 26 | 4.2 | 8.3 |
| R08: Martin's Cabins | 15 | 15 | 17 | 0.0 | 13.3 |
| R09: Metis Trailer Camp | 17 | 17 | 17 | 0.0 | 0.0 |
| R10: Conklin | 12 | 12 | 14 | 0.0 | 16.7 |
| R11: Cabins (NW Christina Lake) | 11 | 11 | 13 | 0.0 | 18.2 |
| R12: Medicinal Plants | 13 | 15 | 15 | 15.4 | 15.4 |
| R13: Cabins near Gravel Pit | 12 | 12 | 15 | 0.0 | 25.0 |
| R14: Cabins | 12 | 12 | 15 | 0.0 | 25.0 |
| R15: Leismer | 12 | 12 | 12 | 0.0 | 0.0 |
| R16: East Chard | 9 | 10 | 12 | 11.1 | 33.3 |
| R17: Pingle | 11 | 11 | 15 | 0.0 | 36.4 |
| R18: Chard School | 10 | 11 | 14 | 10.0 | 40.0 |
| R19: Janvier | 11 | 11 | 15 | 0.0 | 36.4 |
| R20: IR 194B | 14 | 14 | 16 | 0.0 | 14.3 |
| R21: IR 194A | 14 | 14 | 18 | 0.0 | 28.6 |
| R22: Fishing Camp (Christina Lake) | 25 | 25 | 25 | 0.0 | 0.0 |
| R23: Fire Lookout 1 | 9 | 9 | 12 | 0.0 | 33.3 |
| R24: Fire Lookout 2 | 16 | 16 | 20 | 0.0 | 25.0 |
| R25: AltaGas House | 31 | 31 | 31 | 0.0 | 0.0 |
| R26: MEG Worker's Camp | 39 | 40 | 53 | 2.6 | 35.9 |
| R27: Grave Site (Christina Lake) | 23 | 23 | 23 | 0.0 | 0.0 |
| R28: Grave Site (Winefred Lake) | 17 | 17 | 20 | 0.0 | 17.6 |
| R29: Grist Lake Lodge 1 | 10 | 10 | 12 | 0.0 | 20.0 |
| R30: Grist Lake South | 10 | 10 | 12 | 0.0 | 20.0 |
| R31: Winefred Lake Lodge 1 | 11 | 11 | 13 | 0.0 | 18.2 |
| R32: Winefred Lake West | 14 | 14 | 15 | 0.0 | 7.1 |
| R33: EnCana Camp | 23 | 23 | 24 | 0.0 | 4.3 |
| R34: Winifred Cabin/Station/Lookout | 10 | 10 | 12 | 0.0 | 20.0 |
| R35: Campground (Christina Lake) | 11 | 11 | 14 | 0.0 | 27.3 |
| R36: Wild Rice Operation 1 | 10 | 11 | 13 | 10.0 | 30.0 |
| R37: Wild Rice Operation 2 | 14 | 14 | 14 | 0.0 | 0.0 |
| R38: Fire Lookout Tower | 14 | 15 | 17 | 7.1 | 21.4 |
| R39: Devenish | 13 | 13 | 16 | 0.0 | 23.1 |
| R40: Old Cabins & Settlement Area (Wiau Lake) | 9 | 9 | 10 | 0.0 | 11.1 |
| AAAQO | 150 | 150 | 150 | - | - |

| Receptor | Baseline ($\mu\text{g}/\text{m}^3$) | Application ($\mu\text{g}/\text{m}^3$) | Planned Development ($\mu\text{g}/\text{m}^3$) | Application over Baseline (%) | Planned Development over Baseline (%) |
|---|--|---|--|-------------------------------------|--|
| Annual | | | | | |
| Overall Maximum (MPOI) | 13.6 | 13.6 | 14.9 | 0.0 | 9.6 |
| AMS #1 (Fort McKay) | 5.5 | 5.5 | 7.4 | 0.0 | 34.5 |
| AMS #2 (Mildred Lake) | 13.6 | 13.6 | 14.9 | 0.0 | 9.6 |
| AMS #4 (Buffalo Viewpoint) | 5.8 | 5.8 | 6.8 | 0.0 | 17.2 |
| AMS #5 (Mannix) | 9.7 | 9.7 | 11.2 | 0.0 | 15.5 |
| AMS #6 (Patricia McInnes) | 3.4 | 3.4 | 4.3 | 0.0 | 26.5 |
| AMS #7 (Athabasca Valley) | 4.7 | 4.7 | 7.8 | 0.0 | 66.0 |
| AMS #8 (Fort Chipewyan) | 0.7 | 0.7 | 0.9 | 0.0 | 28.6 |
| AMS #10 (Albian Mine) | 7.6 | 7.6 | 9.3 | 0.0 | 22.4 |
| AMS #11 (Lower Camp) | 7.5 | 7.5 | 8.4 | 0.0 | 12.0 |
| AMS #12 (Millennium) | 3.9 | 3.9 | 4.9 | 0.0 | 25.6 |
| AMS #13 (Syn crude UE1) | 5.1 | 5.1 | 6.0 | 0.0 | 17.6 |
| AMS #14 (Anzac) | 2.5 | 2.5 | 3.1 | 0.0 | 24.0 |
| AMS #15 (Horizon) | 5.5 | 5.5 | 6.4 | 0.0 | 16.4 |
| R01: Trapper's Cabin | 2.8 | 3.0 | 3.2 | 7.1 | 14.3 |
| R02: Camp Site | 2.7 | 3.0 | 3.2 | 11.1 | 18.5 |
| R03: Fish Plant (Winefred Lake) | 1.9 | 2.0 | 2.2 | 5.3 | 15.8 |
| R04: Cabin (Winefred Lake) | 1.8 | 1.8 | 2.1 | 0.0 | 16.7 |
| R05: Cabin (NW Kirby Lake) | 2.8 | 2.9 | 3.1 | 3.6 | 10.7 |
| R06: West Hay Lake | 2.9 | 3.0 | 3.2 | 3.4 | 10.3 |
| R07: Cabins (North Hay Lake) | 3.3 | 3.4 | 3.6 | 3.0 | 9.1 |
| R08: Martin's Cabins | 2.5 | 2.7 | 3.0 | 8.0 | 20.0 |
| R09: Metis Trailer Camp | 2.4 | 2.7 | 3.0 | 12.5 | 25.0 |
| R10: Conklin | 1.4 | 1.4 | 1.7 | 0.0 | 21.4 |
| R11: Cabins (NW Christina Lake) | 1.6 | 1.7 | 2.0 | 6.3 | 25.0 |
| R12: Medicinal Plants | 1.6 | 1.7 | 1.9 | 6.3 | 18.8 |
| R13: Cabins near Gravel Pit | 1.3 | 1.4 | 1.6 | 7.7 | 23.1 |
| R14: Cabins | 1.3 | 1.3 | 1.6 | 0.0 | 23.1 |
| R15: Leismer | 1.4 | 1.4 | 1.7 | 0.0 | 21.4 |
| R16: East Chard | 1.4 | 1.4 | 1.7 | 0.0 | 21.4 |
| R17: Pingle | 1.5 | 1.5 | 1.9 | 0.0 | 26.7 |
| R18: Chard School | 1.5 | 1.6 | 2.0 | 6.7 | 33.3 |
| R19: Janvier | 1.6 | 1.7 | 2.2 | 6.3 | 37.5 |
| R20: IR 194B | 2.3 | 2.3 | 2.6 | 0.0 | 13.0 |
| R21: IR 194A | 1.5 | 1.6 | 1.9 | 6.7 | 26.7 |
| R22: Fishing Camp (Christina Lake) | 3.2 | 3.3 | 3.6 | 3.1 | 12.5 |
| R23: Fire Lookout 1 | 1.3 | 1.3 | 1.5 | 0.0 | 15.4 |
| R24: Fire Lookout 2 | 1.7 | 1.8 | 2.2 | 5.9 | 29.4 |
| R25: AltaGas House | 3.2 | 3.3 | 3.6 | 3.1 | 12.5 |
| R26: MEG Worker's Camp | 4.8 | 4.9 | 5.6 | 2.1 | 16.7 |
| R27: Grave Site (Christina Lake) | 3.1 | 3.2 | 3.5 | 3.2 | 12.9 |
| R28: Grave Site (Winefred Lake) | 2.3 | 2.4 | 2.7 | 4.3 | 17.4 |
| R29: Grist Lake Lodge 1 | 1.3 | 1.3 | 1.5 | 0.0 | 15.4 |
| R30: Grist Lake South | 1.3 | 1.3 | 1.5 | 0.0 | 15.4 |
| R31: Winefred Lake Lodge 1 | 1.6 | 1.6 | 1.9 | 0.0 | 18.8 |
| R32: Winefred Lake West | 2.4 | 2.5 | 2.7 | 4.2 | 12.5 |
| R33: EnCana Camp | 5.0 | 5.2 | 5.4 | 4.0 | 8.0 |
| R34: Winifred Cabin/Station/Lookout | 1.3 | 1.3 | 1.5 | 0.0 | 15.4 |
| R35: Campground (Christina Lake) | 1.5 | 1.5 | 1.8 | 0.0 | 20.0 |
| R36: Wild Rice Operation 1 | 1.5 | 1.6 | 1.8 | 6.7 | 20.0 |
| R37: Wild Rice Operation 2 | 1.9 | 2.0 | 2.3 | 5.3 | 21.1 |
| R38: Fire Lookout Tower | 1.4 | 1.5 | 1.7 | 7.1 | 21.4 |
| R39: Devenish | 1.2 | 1.2 | 1.4 | 0.0 | 16.7 |
| R40: Old Cabins & Settlement Area (Wiau Lake) | 0.8 | 0.9 | 1.0 | 12.5 | 25.0 |
| AAAQO | 30 | 30 | 30 | - | - |

Notes: AAAQO = Alberta Ambient Air Quality Objectives and Guidelines
MPOI = Maximum point of impingement

Table B5-2: Predicted Nitrogen Dioxide Concentrations in the AQRSA

| Receptor | Baseline ($\mu\text{g}/\text{m}^3$) | Application ($\mu\text{g}/\text{m}^3$) | Planned Development ($\mu\text{g}/\text{m}^3$) | Application over Baseline (%) | Planned Development over Baseline (%) |
|---|--|---|--|-------------------------------------|---|
| Maximum 1-h | | | | | |
| Overall Maximum (MPOI) | 1 012 | 1012 | 1031 | 0.0 | 1.9 |
| AMS #1 (Fort McKay) | 294 | 294 | 296 | 0.0 | 0.7 |
| AMS #2 (Mildred Lake) | 303 | 303 | 303 | 0.0 | 0.0 |
| AMS #4 (Buffalo Viewpoint) | 325 | 325 | 335 | 0.0 | 3.1 |
| AMS #5 (Mannix) | 269 | 269 | 274 | 0.0 | 1.9 |
| AMS #6 (Patricia McInnes) | 183 | 183 | 184 | 0.0 | 0.5 |
| AMS #7 (Athabasca Valley) | 137 | 137 | 170 | 0.0 | 24.1 |
| AMS #8 (Fort Chipewyan) | 110 | 110 | 111 | 0.0 | 0.9 |
| AMS #10 (Albian Mine) | 640 | 640 | 658 | 0.0 | 2.8 |
| AMS #11 (Lower Camp) | 285 | 285 | 286 | 0.0 | 0.4 |
| AMS #12 (Millennium) | 297 | 297 | 298 | 0.0 | 0.3 |
| AMS #13 (Syncrude UE1) | 311 | 311 | 314 | 0.0 | 1.0 |
| AMS #14 (Anzac) | 150 | 150 | 152 | 0.0 | 1.3 |
| AMS #15 (Horizon) | 861 | 861 | 872 | 0.0 | 1.3 |
| R01: Trapper's Cabin | 121 | 121 | 122 | 0.0 | 0.8 |
| R02: Camp Site | 114 | 114 | 117 | 0.0 | 2.6 |
| R03: Fish Plant (Winefred Lake) | 113 | 113 | 114 | 0.0 | 0.9 |
| R04: Cabin (Winefred Lake) | 113 | 113 | 114 | 0.0 | 0.9 |
| R05: Cabin (NW Kirby Lake) | 113 | 113 | 114 | 0.0 | 0.9 |
| R06: West Hay Lake | 115 | 115 | 116 | 0.0 | 0.9 |
| R07: Cabins (North Hay Lake) | 118 | 118 | 119 | 0.0 | 0.8 |
| R08: Martin's Cabins | 113 | 113 | 116 | 0.0 | 2.7 |
| R09: Metis Trailer Camp | 113 | 113 | 115 | 0.0 | 1.8 |
| R10: Conklin | 123 | 123 | 123 | 0.0 | 0.0 |
| R11: Cabins (NW Christina Lake) | 119 | 119 | 120 | 0.0 | 0.8 |
| R12: Medicinal Plants | 113 | 113 | 115 | 0.0 | 1.8 |
| R13: Cabins near Gravel Pit | 120 | 120 | 121 | 0.0 | 0.8 |
| R14: Cabins | 118 | 118 | 119 | 0.0 | 0.8 |
| R15: Leismer | 118 | 118 | 119 | 0.0 | 0.8 |
| R16: East Chard | 117 | 117 | 119 | 0.0 | 1.7 |
| R17: Pingle | 119 | 119 | 120 | 0.0 | 0.8 |
| R18: Chard School | 124 | 124 | 126 | 0.0 | 1.6 |
| R19: Janvier | 125 | 125 | 127 | 0.0 | 1.6 |
| R20: IR 194B | 123 | 123 | 129 | 0.0 | 4.9 |
| R21: IR 194A | 138 | 138 | 139 | 0.0 | 0.7 |
| R22: Fishing Camp (Christina Lake) | 119 | 119 | 121 | 0.0 | 1.7 |
| R23: Fire Lookout 1 | 108 | 108 | 110 | 0.0 | 1.9 |
| R24: Fire Lookout 2 | 141 | 141 | 142 | 0.0 | 0.7 |
| R25: AltaGas House | 119 | 119 | 121 | 0.0 | 1.7 |
| R26: MEG Worker's Camp | 119 | 119 | 121 | 0.0 | 1.7 |
| R27: Grave Site (Christina Lake) | 120 | 120 | 122 | 0.0 | 1.7 |
| R28: Grave Site (Winefred Lake) | 123 | 123 | 133 | 0.0 | 8.1 |
| R29: Grist Lake Lodge 1 | 105 | 105 | 111 | 0.0 | 5.7 |
| R30: Grist Lake South | 106 | 106 | 111 | 0.0 | 4.7 |
| R31: Winefred Lake Lodge 1 | 111 | 111 | 113 | 0.0 | 1.8 |
| R32: Winefred Lake West | 125 | 125 | 126 | 0.0 | 0.8 |
| R33: EnCana Camp | 118 | 118 | 120 | 0.0 | 1.7 |
| R34: Winifred Cabin/Station/Lookout | 109 | 109 | 110 | 0.0 | 0.9 |
| R35: Campground (Christina Lake) | 118 | 118 | 119 | 0.0 | 0.8 |
| R36: Wild Rice Operation 1 | 111 | 111 | 113 | 0.0 | 1.8 |
| R37: Wild Rice Operation 2 | 115 | 115 | 117 | 0.0 | 1.7 |
| R38: Fire Lookout Tower | 147 | 147 | 148 | 0.0 | 0.7 |
| R39: Devenish | 106 | 106 | 110 | 0.0 | 3.8 |
| R40: Old Cabins & Settlement Area (Wiau Lake) | 79 | 79 | 84 | 0.0 | 6.3 |
| AAAQO | - | - | - | - | - |



| Receptor | Baseline ($\mu\text{g}/\text{m}^3$) | Application ($\mu\text{g}/\text{m}^3$) | Planned Development ($\mu\text{g}/\text{m}^3$) | Application over Baseline (%) | Planned Development over Baseline (%) |
|---|--|---|--|-------------------------------------|--|
| 99.9th Percentile 1-h | | | | | |
| Overall Maximum (MPOI) | 748 | 748 | 761 | 0.0 | 1.7 |
| AMS #1 (Fort McKay) | 212 | 212 | 213 | 0.0 | 0.5 |
| AMS #2 (Mildred Lake) | 225 | 225 | 227 | 0.0 | 0.9 |
| AMS #4 (Buffalo Viewpoint) | 219 | 219 | 220 | 0.0 | 0.5 |
| AMS #5 (Mannix) | 194 | 194 | 195 | 0.0 | 0.5 |
| AMS #6 (Patricia McInnes) | 147 | 147 | 147 | 0.0 | 0.0 |
| AMS #7 (Athabasca Valley) | 129 | 129 | 155 | 0.0 | 20.2 |
| AMS #8 (Fort Chipewyan) | 91 | 91 | 101 | 0.0 | 11.0 |
| AMS #10 (Albian Mine) | 368 | 368 | 385 | 0.0 | 4.6 |
| AMS #11 (Lower Camp) | 180 | 180 | 181 | 0.0 | 0.6 |
| AMS #12 (Millennium) | 232 | 232 | 232 | 0.0 | 0.0 |
| AMS #13 (Syn crude UE1) | 181 | 182 | 183 | 0.6 | 1.1 |
| AMS #14 (Anzac) | 114 | 114 | 116 | 0.0 | 1.8 |
| AMS #15 (Horizon) | 748 | 748 | 761 | 0.0 | 1.7 |
| R01: Trapper's Cabin | 68 | 68 | 79 | 0.0 | 16.2 |
| R02: Camp Site | 78 | 78 | 83 | 0.0 | 6.4 |
| R03: Fish Plant (Winefred Lake) | 80 | 80 | 86 | 0.0 | 7.5 |
| R04: Cabin (Winefred Lake) | 74 | 74 | 93 | 0.0 | 25.7 |
| R05: Cabin (NW Kirby Lake) | 66 | 66 | 74 | 0.0 | 12.1 |
| R06: West Hay Lake | 64 | 65 | 78 | 1.6 | 21.9 |
| R07: Cabins (North Hay Lake) | 71 | 71 | 80 | 0.0 | 12.7 |
| R08: Martin's Cabins | 70 | 70 | 80 | 0.0 | 14.3 |
| R09: Metis Trailer Camp | 67 | 67 | 79 | 0.0 | 17.9 |
| R10: Conklin | 93 | 113 | 113 | 21.5 | 21.5 |
| R11: Cabins (NW Christina Lake) | 89 | 103 | 108 | 15.7 | 21.3 |
| R12: Medicinal Plants | 88 | 95 | 105 | 8.0 | 19.3 |
| R13: Cabins near Gravel Pit | 90 | 109 | 110 | 21.1 | 22.2 |
| R14: Cabins | 80 | 80 | 83 | 0.0 | 3.8 |
| R15: Leismer | 72 | 72 | 75 | 0.0 | 4.2 |
| R16: East Chard | 74 | 74 | 81 | 0.0 | 9.5 |
| R17: Pingle | 80 | 80 | 88 | 0.0 | 10.0 |
| R18: Chard School | 80 | 80 | 88 | 0.0 | 10.0 |
| R19: Janvier | 86 | 86 | 94 | 0.0 | 9.3 |
| R20: IR 194B | 79 | 79 | 112 | 0.0 | 41.8 |
| R21: I*R 194A | 70 | 70 | 82 | 0.0 | 17.1 |
| R22: Fishing Camp (Christina Lake) | 75 | 75 | 84 | 0.0 | 12.0 |
| R23: Fire Lookout 1 | 53 | 53 | 62 | 0.0 | 17.0 |
| R24: Fire Lookout 2 | 87 | 90 | 95 | 3.4 | 9.2 |
| R25: AltaGas House | 74 | 74 | 81 | 0.0 | 9.5 |
| R26: MEG Worker's Camp | 91 | 110 | 110 | 20.9 | 20.9 |
| R27: Grave Site (Christina Lake) | 74 | 74 | 85 | 0.0 | 14.9 |
| R28: Grave Site (Winefred Lake) | 87 | 87 | 113 | 0.0 | 29.9 |
| R29: Grist Lake Lodge 1 | 46 | 46 | 62 | 0.0 | 34.8 |
| R30: Grist Lake South | 48 | 48 | 62 | 0.0 | 29.2 |
| R31: Winefred Lake Lodge 1 | 62 | 62 | 70 | 0.0 | 12.9 |
| R32: Winefred Lake West | 70 | 70 | 84 | 0.0 | 20.0 |
| R33: EnCana Camp | 71 | 71 | 83 | 0.0 | 16.9 |
| R34: Winifred Cabin/Station/Lookout | 50 | 50 | 61 | 0.0 | 22.0 |
| R35: Campground (Christina Lake) | 90 | 110 | 110 | 22.2 | 22.2 |
| R36: Wild Rice Operation 1 | 61 | 61 | 68 | 0.0 | 11.5 |
| R37: Wild Rice Operation 2 | 74 | 74 | 86 | 0.0 | 16.2 |
| R38: Fire Lookout Tower | 94 | 113 | 114 | 20.2 | 21.3 |
| R39: Devenish | 70 | 70 | 78 | 0.0 | 11.4 |
| R40: Old Cabins & Settlement Area (Wiau Lake) | 40 | 42 | 50 | 5.0 | 25.0 |
| AAAQO | 400 | 400 | 400 | - | - |

| Receptor | Baseline ($\mu\text{g}/\text{m}^3$) | Application ($\mu\text{g}/\text{m}^3$) | Planned Development ($\mu\text{g}/\text{m}^3$) | Application over Baseline (%) | Planned Development over Baseline (%) |
|---|--|---|--|-------------------------------------|--|
| Maximum 24-h | | | | | |
| Overall Maximum (MPOI) | 323 | 323 | 326 | 0.0 | 0.9 |
| AMS #1 (Fort McKay) | 143 | 143 | 146 | 0.0 | 2.1 |
| AMS #2 (Mildred Lake) | 128 | 128 | 129 | 0.0 | 0.8 |
| AMS #4 (Buffalo Viewpoint) | 120 | 120 | 121 | 0.0 | 0.8 |
| AMS #5 (Mannix) | 128 | 128 | 129 | 0.0 | 0.8 |
| AMS #6 (Patricia McInnes) | 97 | 97 | 98 | 0.0 | 1.0 |
| AMS #7 (Athabasca Valley) | 96 | 96 | 110 | 0.0 | 14.6 |
| AMS #8 (Fort Chipewyan) | 73 | 73 | 84 | 0.0 | 15.1 |
| AMS #10 (Albian Mine) | 194 | 194 | 199 | 0.0 | 2.6 |
| AMS #11 (Lower Camp) | 111 | 111 | 112 | 0.0 | 0.9 |
| AMS #12 (Millennium) | 145 | 145 | 145 | 0.0 | 0.0 |
| AMS #13 (Syn crude UE1) | 124 | 124 | 128 | 0.0 | 3.2 |
| AMS #14 (Anzac) | 62 | 62 | 69 | 0.0 | 11.3 |
| AMS #15 (Horizon) | 323 | 323 | 326 | 0.0 | 0.9 |
| R01: Trapper's Cabin | 31 | 31 | 42 | 0.0 | 35.5 |
| R02: Camp Site | 31 | 32 | 41 | 3.2 | 32.3 |
| R03: Fish Plant (Winefred Lake) | 34 | 35 | 42 | 2.9 | 23.5 |
| R04: Cabin (Winefred Lake) | 35 | 35 | 45 | 0.0 | 28.6 |
| R05: Cabin (NW Kirby Lake) | 36 | 36 | 46 | 0.0 | 27.8 |
| R06: West Hay Lake | 37 | 37 | 47 | 0.0 | 27.0 |
| R07: Cabins (North Hay Lake) | 38 | 39 | 48 | 2.6 | 26.3 |
| R08: Martin's Cabins | 32 | 33 | 42 | 3.1 | 31.3 |
| R09: Metis Trailer Camp | 33 | 33 | 42 | 0.0 | 27.3 |
| R10: Conklin | 52 | 52 | 57 | 0.0 | 9.6 |
| R11: Cabins (NW Christina Lake) | 41 | 41 | 48 | 0.0 | 17.1 |
| R12: Medicinal Plants | 40 | 40 | 47 | 0.0 | 17.5 |
| R13: Cabins near Gravel Pit | 33 | 34 | 37 | 3.0 | 12.1 |
| R14: Cabins | 29 | 29 | 35 | 0.0 | 20.7 |
| R15: Leismer | 31 | 31 | 37 | 0.0 | 19.4 |
| R16: East Chard | 33 | 33 | 38 | 0.0 | 15.2 |
| R17: Pingle | 33 | 33 | 40 | 0.0 | 21.2 |
| R18: Chard School | 36 | 36 | 45 | 0.0 | 25.0 |
| R19: Janvier | 37 | 37 | 50 | 0.0 | 35.1 |
| R20: IR 194B | 34 | 35 | 54 | 2.9 | 58.8 |
| R21: IR 194A | 43 | 43 | 46 | 0.0 | 7.0 |
| R22: Fishing Camp (Christina Lake) | 32 | 32 | 40 | 0.0 | 25.0 |
| R23: Fire Lookout 1 | 30 | 30 | 41 | 0.0 | 36.7 |
| R24: Fire Lookout 2 | 46 | 46 | 51 | 0.0 | 10.9 |
| R25: AltaGas House | 32 | 32 | 41 | 0.0 | 28.1 |
| R26: MEG Worker's Camp | 42 | 42 | 47 | 0.0 | 11.9 |
| R27: Grave Site (Christina Lake) | 32 | 32 | 40 | 0.0 | 25.0 |
| R28: Grave Site (Winefred Lake) | 37 | 37 | 54 | 0.0 | 45.9 |
| R29: Grist Lake Lodge 1 | 32 | 32 | 42 | 0.0 | 31.3 |
| R30: Grist Lake South | 32 | 32 | 42 | 0.0 | 31.3 |
| R31: Winefred Lake Lodge 1 | 35 | 35 | 45 | 0.0 | 28.6 |
| R32: Winefred Lake West | 34 | 34 | 49 | 0.0 | 44.1 |
| R33: EnCana Camp | 30 | 30 | 39 | 0.0 | 30.0 |
| R34: Winifred Cabin/Station/Lookout | 30 | 30 | 41 | 0.0 | 36.7 |
| R35: Campground (Christina Lake) | 54 | 54 | 57 | 0.0 | 5.6 |
| R36: Wild Rice Operation 1 | 34 | 34 | 45 | 0.0 | 32.4 |
| R37: Wild Rice Operation 2 | 30 | 30 | 37 | 0.0 | 23.3 |
| R38: Fire Lookout Tower | 42 | 42 | 54 | 0.0 | 28.6 |
| R39: Devenish | 35 | 35 | 41 | 0.0 | 17.1 |
| R40: Old Cabins & Settlement Area (Wiau Lake) | 21 | 21 | 28 | 0.0 | 33.3 |
| AAAQO | - | - | - | - | - |

| Receptor | Baseline ($\mu\text{g}/\text{m}^3$) | Application ($\mu\text{g}/\text{m}^3$) | Planned Development ($\mu\text{g}/\text{m}^3$) | Application over Baseline (%) | Planned Development over Baseline (%) |
|---|--|---|--|-------------------------------------|--|
| 99.9th Percentile 24-h | | | | | |
| Overall Maximum (MPOI) | 279 | 279 | 287 | 0.0 | 2.9 |
| AMS #1 (Fort McKay) | 116 | 116 | 118 | 0.0 | 1.7 |
| AMS #2 (Mildred Lake) | 114 | 114 | 114 | 0.0 | 0.0 |
| AMS #4 (Buffalo Viewpoint) | 117 | 117 | 117 | 0.0 | 0.0 |
| AMS #5 (Mannix) | 116 | 116 | 116 | 0.0 | 0.0 |
| AMS #6 (Patricia McInnes) | 92 | 92 | 93 | 0.0 | 1.1 |
| AMS #7 (Athabasca Valley) | 95 | 95 | 104 | 0.0 | 9.5 |
| AMS #8 (Fort Chipewyan) | 38 | 38 | 43 | 0.0 | 13.2 |
| AMS #10 (Albian Mine) | 179 | 179 | 181 | 0.0 | 1.1 |
| AMS #11 (Lower Camp) | 110 | 110 | 111 | 0.0 | 0.9 |
| AMS #12 (Millennium) | 132 | 132 | 133 | 0.0 | 0.8 |
| AMS #13 (Syn crude UE1) | 110 | 110 | 112 | 0.0 | 1.8 |
| AMS #14 (Anzac) | 60 | 60 | 68 | 0.0 | 13.3 |
| AMS #15 (Horizon) | 279 | 279 | 287 | 0.0 | 2.9 |
| R01: Trapper's Cabin | 28 | 28 | 36 | 0.0 | 28.6 |
| R02: Camp Site | 27 | 27 | 36 | 0.0 | 33.3 |
| R03: Fish Plant (Winefred Lake) | 34 | 34 | 39 | 0.0 | 14.7 |
| R04: Cabin (Winefred Lake) | 28 | 28 | 39 | 0.0 | 39.3 |
| R05: Cabin (NW Kirby Lake) | 29 | 29 | 36 | 0.0 | 24.1 |
| R06: West Hay Lake | 32 | 33 | 41 | 3.1 | 28.1 |
| R07: Cabins (North Hay Lake) | 33 | 33 | 43 | 0.0 | 30.3 |
| R08: Martin's Cabins | 28 | 28 | 40 | 0.0 | 42.9 |
| R09: Metis Trailer Camp | 28 | 28 | 40 | 0.0 | 42.9 |
| R10: Conklin | 48 | 48 | 53 | 0.0 | 10.4 |
| R11: Cabins (NW Christina Lake) | 34 | 34 | 41 | 0.0 | 20.6 |
| R12: Medicinal Plants | 34 | 34 | 42 | 0.0 | 23.5 |
| R13: Cabins near Gravel Pit | 31 | 32 | 36 | 3.2 | 16.1 |
| R14: Cabins | 23 | 24 | 30 | 4.3 | 30.4 |
| R15: Leismer | 27 | 27 | 33 | 0.0 | 22.2 |
| R16: East Chard | 31 | 31 | 37 | 0.0 | 19.4 |
| R17: Pingle | 33 | 33 | 39 | 0.0 | 18.2 |
| R18: Chard School | 35 | 35 | 43 | 0.0 | 22.9 |
| R19: Janvier | 37 | 37 | 46 | 0.0 | 24.3 |
| R20: IR 194B | 29 | 29 | 42 | 0.0 | 44.8 |
| R21: IR 194A | 30 | 30 | 34 | 0.0 | 13.3 |
| R22: Fishing Camp (Christina Lake) | 28 | 28 | 33 | 0.0 | 17.9 |
| R23: Fire Lookout 1 | 21 | 21 | 28 | 0.0 | 33.3 |
| R24: Fire Lookout 2 | 33 | 33 | 38 | 0.0 | 15.2 |
| R25: AltaGas House | 28 | 28 | 33 | 0.0 | 17.9 |
| R26: MEG Worker's Camp | 39 | 39 | 46 | 0.0 | 17.9 |
| R27: Grave Site (Christina Lake) | 28 | 28 | 34 | 0.0 | 21.4 |
| R28: Grave Site (Winefred Lake) | 28 | 28 | 47 | 0.0 | 67.9 |
| R29: Grist Lake Lodge 1 | 25 | 25 | 33 | 0.0 | 32.0 |
| R30: Grist Lake South | 25 | 25 | 33 | 0.0 | 32.0 |
| R31: Winefred Lake Lodge 1 | 29 | 29 | 39 | 0.0 | 34.5 |
| R32: Winefred Lake West | 31 | 31 | 37 | 0.0 | 19.4 |
| R33: EnCana Camp | 27 | 27 | 34 | 0.0 | 25.9 |
| R34: Winifred Cabin/Station/Lookout | 21 | 21 | 27 | 0.0 | 28.6 |
| R35: Campground (Christina Lake) | 34 | 34 | 41 | 0.0 | 20.6 |
| R36: Wild Rice Operation 1 | 27 | 27 | 36 | 0.0 | 33.3 |
| R37: Wild Rice Operation 2 | 27 | 27 | 35 | 0.0 | 29.6 |
| R38: Fire Lookout Tower | 35 | 35 | 40 | 0.0 | 14.3 |
| R39: Devenish | 27 | 27 | 33 | 0.0 | 22.2 |
| R40: Old Cabins & Settlement Area (Wiau Lake) | 18 | 18 | 23 | 0.0 | 27.8 |
| AAAQO | 200 | 200 | 200 | - | - |



| Receptor | Baseline ($\mu\text{g}/\text{m}^3$) | Application ($\mu\text{g}/\text{m}^3$) | Planned Development ($\mu\text{g}/\text{m}^3$) | Application over Baseline (%) | Planned Development over Baseline (%) |
|---|--|---|--|-------------------------------------|--|
| Annual | | | | | |
| Overall Maximum (MPOI) | 110 | 110 | 113 | 0.0 | 2.7 |
| AMS #1 (Fort McKay) | 76.9 | 76.9 | 77.9 | 0.0 | 1.3 |
| AMS #2 (Mildred Lake) | 76.6 | 76.6 | 76.8 | 0.0 | 0.3 |
| AMS #4 (Buffalo Viewpoint) | 46.8 | 46.8 | 49.3 | 0.0 | 5.3 |
| AMS #5 (Mannix) | 68.2 | 68.6 | 71.3 | 0.6 | 4.5 |
| AMS #6 (Patricia McInnes) | 17.9 | 18.1 | 21.3 | 1.1 | 19.0 |
| AMS #7 (Athabasca Valley) | 32.9 | 32.9 | 52.8 | 0.0 | 60.5 |
| AMS #8 (Fort Chipewyan) | 2.8 | 2.8 | 3.2 | 0.0 | 14.3 |
| AMS #10 (Albian Mine) | 82.5 | 82.5 | 83.1 | 0.0 | 0.7 |
| AMS #11 (Lower Camp) | 49.6 | 49.6 | 52.0 | 0.0 | 4.8 |
| AMS #12 (Millennium) | 69.7 | 69.7 | 72.0 | 0.0 | 3.3 |
| AMS #13 (Syn crude UE1) | 61.1 | 61.6 | 65.2 | 0.8 | 6.7 |
| AMS #14 (Anzac) | 7.2 | 7.2 | 9.4 | 0.0 | 30.6 |
| AMS #15 (Horizon) | 109.7 | 109.7 | 113.2 | 0.0 | 3.2 |
| R01: Trapper's Cabin | 4.6 | 4.7 | 5.8 | 2.2 | 26.1 |
| R02: Camp Site | 4.6 | 4.8 | 5.9 | 4.3 | 28.3 |
| R03: Fish Plant (Winefred Lake) | 5.4 | 5.5 | 6.6 | 1.9 | 22.2 |
| R04: Cabin (Winefred Lake) | 5.4 | 5.4 | 6.6 | 0.0 | 22.2 |
| R05: Cabin (NW Kirby Lake) | 5.2 | 5.3 | 6.4 | 1.9 | 23.1 |
| R06: West Hay Lake | 4.8 | 4.9 | 6.0 | 2.1 | 25.0 |
| R07: Cabins (North Hay Lake) | 5.0 | 5.1 | 6.2 | 2.0 | 24.0 |
| R08: Martin's Cabins | 4.4 | 4.6 | 5.7 | 4.5 | 29.5 |
| R09: Metis Trailer Camp | 4.4 | 4.6 | 5.7 | 4.5 | 29.5 |
| R10: Conklin | 5.7 | 5.7 | 6.8 | 0.0 | 19.3 |
| R11: Cabins (NW Christina Lake) | 5.3 | 5.3 | 6.5 | 0.0 | 22.6 |
| R12: Medicinal Plants | 4.6 | 4.7 | 5.9 | 2.2 | 28.3 |
| R13: Cabins near Gravel Pit | 6.9 | 6.9 | 8.2 | 0.0 | 18.8 |
| R14: Cabins | 5.1 | 5.1 | 6.3 | 0.0 | 23.5 |
| R15: Leismer | 4.7 | 4.8 | 6.2 | 2.1 | 31.9 |
| R16: East Chard | 3.9 | 3.9 | 5.4 | 0.0 | 38.5 |
| R17: Pingle | 4.2 | 4.2 | 5.9 | 0.0 | 40.5 |
| R18: Chard School | 5.0 | 5.0 | 7.2 | 0.0 | 44.0 |
| R19: Janvier | 5.6 | 5.7 | 8.6 | 1.8 | 53.6 |
| R20: IR 194B | 5.5 | 5.5 | 8.1 | 0.0 | 47.3 |
| R21: IR 194A | 4.0 | 4.1 | 5.4 | 2.5 | 35.0 |
| R22: Fishing Camp (Christina Lake) | 5.0 | 5.2 | 6.4 | 4.0 | 28.0 |
| R23: Fire Lookout 1 | 3.2 | 3.3 | 4.1 | 3.1 | 28.1 |
| R24: Fire Lookout 2 | 4.4 | 4.5 | 6.0 | 2.3 | 36.4 |
| R25: AltaGas House | 5.1 | 5.2 | 6.5 | 2.0 | 27.5 |
| R26: MEG Worker's Camp | 8.0 | 8.1 | 9.7 | 1.3 | 21.3 |
| R27: Grave Site (Christina Lake) | 5.0 | 5.2 | 6.5 | 4.0 | 30.0 |
| R28: Grave Site (Winefred Lake) | 5.6 | 5.7 | 7.6 | 1.8 | 35.7 |
| R29: Grist Lake Lodge 1 | 3.5 | 3.6 | 4.4 | 2.9 | 25.7 |
| R30: Grist Lake South | 3.5 | 3.5 | 4.4 | 0.0 | 25.7 |
| R31: Winefred Lake Lodge 1 | 4.6 | 4.7 | 5.8 | 2.2 | 26.1 |
| R32: Winefred Lake West | 5.2 | 5.3 | 6.5 | 1.9 | 25.0 |
| R33: EnCana Camp | 5.5 | 5.7 | 6.9 | 3.6 | 25.5 |
| R34: Winifred Cabin/Station/Lookout | 3.2 | 3.3 | 4.1 | 3.1 | 28.1 |
| R35: Campground (Christina Lake) | 5.0 | 5.1 | 6.2 | 2.0 | 24.0 |
| R36: Wild Rice Operation 1 | 4.2 | 4.3 | 5.4 | 2.4 | 28.6 |
| R37: Wild Rice Operation 2 | 4.9 | 5.1 | 6.4 | 4.1 | 30.6 |
| R38: Fire Lookout Tower | 4.7 | 4.7 | 5.9 | 0.0 | 25.5 |
| R39: Devenish | 3.1 | 3.1 | 4.0 | 0.0 | 29.0 |
| R40: Old Cabins & Settlement Area (Wiau Lake) | 2.3 | 2.3 | 3.0 | 0.0 | 30.4 |
| AAAQO | 60 | 60 | 60 | - | - |

Notes: AAAQO = Alberta Ambient Air Quality Objectives and Guidelines
MPOI = Maximum point of impingement

Table B5-3: Predicted Particulate Matter Concentrations in the AQRSA

| Receptor | Baseline ($\mu\text{g}/\text{m}^3$) | Application ($\mu\text{g}/\text{m}^3$) | Planned Development ($\mu\text{g}/\text{m}^3$) | Application over Baseline (%) | Planned Development over Baseline (%) |
|---|--|---|--|-------------------------------------|---|
| Maximum 1-h | | | | | |
| Overall Maximum (MPOI) | 645 | 645 | 646 | 0.0 | 0.2 |
| AMS #1 (Fort McKay) | 101 | 101 | 138 | 0.0 | 36.6 |
| AMS #2 (Mildred Lake) | 62 | 62 | 62 | 0.0 | 0.0 |
| AMS #4 (Buffalo Viewpoint) | 60 | 60 | 63 | 0.0 | 5.0 |
| AMS #5 (Mannix) | 66 | 66 | 69 | 0.0 | 4.5 |
| AMS #6 (Patricia McInnes) | 84 | 84 | 162 | 0.0 | 92.9 |
| AMS #7 (Athabasca Valley) | 285 | 285 | 553 | 0.0 | 94.0 |
| AMS #8 (Fort Chipewyan) | 6 | 6 | 13 | 0.0 | 116.7 |
| AMS #10 (Albian Mine) | 229 | 229 | 233 | 0.0 | 1.7 |
| AMS #11 (Lower Camp) | 98 | 98 | 99 | 0.0 | 1.0 |
| AMS #12 (Millennium) | 104 | 104 | 104 | 0.0 | 0.0 |
| AMS #13 (Syncrude UE1) | 98 | 98 | 99 | 0.0 | 1.0 |
| AMS #14 (Anzac) | 45 | 45 | 77 | 0.0 | 71.1 |
| AMS #15 (Horizon) | 645 | 645 | 646 | 0.0 | 0.2 |
| R01: Trapper's Cabin | 14 | 14 | 14 | 0.0 | 0.0 |
| R02: Camp Site | 8 | 8 | 12 | 0.0 | 50.0 |
| R03: Fish Plant (Winefred Lake) | 8 | 8 | 10 | 0.0 | 25.0 |
| R04: Cabin (Winefred Lake) | 7 | 7 | 11 | 0.0 | 57.1 |
| R05: Cabin (NW Kirby Lake) | 7 | 7 | 10 | 0.0 | 42.9 |
| R06: West Hay Lake | 8 | 8 | 12 | 0.0 | 50.0 |
| R07: Cabins (North Hay Lake) | 8 | 8 | 11 | 0.0 | 37.5 |
| R08: Martin's Cabins | 7 | 7 | 13 | 0.0 | 85.7 |
| R09: Metis Trailer Camp | 7 | 7 | 11 | 0.0 | 57.1 |
| R10: Conklin | 9 | 9 | 12 | 0.0 | 33.3 |
| R11: Cabins (NW Christina Lake) | 9 | 9 | 13 | 0.0 | 44.4 |
| R12: Medicinal Plants | 8 | 8 | 13 | 0.0 | 62.5 |
| R13: Cabins near Gravel Pit | 11 | 11 | 15 | 0.0 | 36.4 |
| R14: Cabins | 11 | 11 | 15 | 0.0 | 36.4 |
| R15: Leismer | 12 | 12 | 17 | 0.0 | 41.7 |
| R16: East Chard | 11 | 11 | 15 | 0.0 | 36.4 |
| R17: Pingle | 11 | 11 | 18 | 0.0 | 63.6 |
| R18: Chard School | 13 | 13 | 22 | 0.0 | 69.2 |
| R19: Janvier | 21 | 21 | 42 | 0.0 | 100.0 |
| R20: IR 194B | 12 | 13 | 25 | 8.3 | 108.3 |
| R21: IR 194A | 24 | 24 | 33 | 0.0 | 37.5 |
| R22: Fishing Camp (Christina Lake) | 9 | 9 | 11 | 0.0 | 22.2 |
| R23: Fire Lookout 1 | 6 | 6 | 8 | 0.0 | 33.3 |
| R24: Fire Lookout 2 | 25 | 25 | 33 | 0.0 | 32.0 |
| R25: AltaGas House | 9 | 9 | 11 | 0.0 | 22.2 |
| R26: MEG Worker's Camp | 9 | 9 | 11 | 0.0 | 22.2 |
| R27: Grave Site (Christina Lake) | 9 | 9 | 11 | 0.0 | 22.2 |
| R28: Grave Site (Winefred Lake) | 14 | 14 | 29 | 0.0 | 107.1 |
| R29: Grist Lake Lodge 1 | 6 | 6 | 9 | 0.0 | 50.0 |
| R30: Grist Lake South | 6 | 6 | 8 | 0.0 | 33.3 |
| R31: Winefred Lake Lodge 1 | 8 | 8 | 12 | 0.0 | 50.0 |
| R32: Winefred Lake West | 13 | 13 | 16 | 0.0 | 23.1 |
| R33: EnCana Camp | 9 | 9 | 11 | 0.0 | 22.2 |
| R34: Winifred Cabin/Station/Lookout | 6 | 6 | 8 | 0.0 | 33.3 |
| R35: Campground (Christina Lake) | 9 | 9 | 12 | 0.0 | 33.3 |
| R36: Wild Rice Operation 1 | 8 | 8 | 12 | 0.0 | 50.0 |
| R37: Wild Rice Operation 2 | 9 | 9 | 14 | 0.0 | 55.6 |
| R38: Fire Lookout Tower | 10 | 10 | 14 | 0.0 | 40.0 |
| R39: Devenish | 8 | 8 | 12 | 0.0 | 50.0 |
| R40: Old Cabins & Settlement Area (Wiau Lake) | 5 | 5 | 7 | 0.0 | 40.0 |
| AAAQO | - | - | - | - | - |



| Receptor | Baseline ($\mu\text{g}/\text{m}^3$) | Application ($\mu\text{g}/\text{m}^3$) | Planned Development ($\mu\text{g}/\text{m}^3$) | Application over Baseline (%) | Planned Development over Baseline (%) |
|---|--|---|--|-------------------------------------|--|
| 99.9th Percentile 1-h | | | | | |
| Overall Maximum (MPOI) | 560 | 560 | 560 | 0.0 | 0.0 |
| AMS #1 (Fort McKay) | 54 | 55 | 81 | 1.9 | 50.0 |
| AMS #2 (Mildred Lake) | 53 | 53 | 53 | 0.0 | 0.0 |
| AMS #4 (Buffalo Viewpoint) | 36 | 36 | 37 | 0.0 | 2.8 |
| AMS #5 (Mannix) | 48 | 48 | 49 | 0.0 | 2.1 |
| AMS #6 (Patricia McInnes) | 55 | 55 | 106 | 0.0 | 92.7 |
| AMS #7 (Athabasca Valley) | 228 | 228 | 444 | 0.0 | 94.7 |
| AMS #8 (Fort Chipewyan) | 5 | 5 | 8 | 0.0 | 60.0 |
| AMS #10 (Albian Mine) | 116 | 116 | 121 | 0.0 | 4.3 |
| AMS #11 (Lower Camp) | 44 | 44 | 44 | 0.0 | 0.0 |
| AMS #12 (Millennium) | 66 | 66 | 66 | 0.0 | 0.0 |
| AMS #13 (Syn crude UE1) | 34 | 34 | 37 | 0.0 | 8.8 |
| AMS #14 (Anzac) | 12 | 12 | 22 | 0.0 | 83.3 |
| AMS #15 (Horizon) | 560 | 560 | 560 | 0.0 | 0.0 |
| R01: Trapper's Cabin | 4 | 4 | 5 | 0.0 | 25.0 |
| R02: Camp Site | 4 | 4 | 5 | 0.0 | 25.0 |
| R03: Fish Plant (Winefred Lake) | 4 | 4 | 5 | 0.0 | 25.0 |
| R04: Cabin (Winefred Lake) | 4 | 4 | 6 | 0.0 | 50.0 |
| R05: Cabin (NW Kirby Lake) | 4 | 4 | 5 | 0.0 | 25.0 |
| R06: West Hay Lake | 3 | 3 | 5 | 0.0 | 66.7 |
| R07: Cabins (North Hay Lake) | 4 | 4 | 5 | 0.0 | 25.0 |
| R08: Martin's Cabins | 4 | 4 | 5 | 0.0 | 25.0 |
| R09: Metis Trailer Camp | 4 | 4 | 5 | 0.0 | 25.0 |
| R10: Conklin | 4 | 4 | 5 | 0.0 | 25.0 |
| R11: Cabins (NW Christina Lake) | 4 | 4 | 5 | 0.0 | 25.0 |
| R12: Medicinal Plants | 4 | 4 | 5 | 0.0 | 25.0 |
| R13: Cabins near Gravel Pit | 4 | 4 | 5 | 0.0 | 25.0 |
| R14: Cabins | 4 | 4 | 5 | 0.0 | 25.0 |
| R15: Leismer | 4 | 4 | 5 | 0.0 | 25.0 |
| R16: East Chard | 4 | 4 | 6 | 0.0 | 50.0 |
| R17: Pingle | 5 | 5 | 7 | 0.0 | 40.0 |
| R18: Chard School | 8 | 8 | 16 | 0.0 | 100.0 |
| R19: Janvier | 15 | 15 | 31 | 0.0 | 106.7 |
| R20: IR 194B | 6 | 6 | 11 | 0.0 | 83.3 |
| R21: IR 194A | 5 | 5 | 6 | 0.0 | 20.0 |
| R22: Fishing Camp (Christina Lake) | 5 | 5 | 6 | 0.0 | 20.0 |
| R23: Fire Lookout 1 | 3 | 3 | 4 | 0.0 | 33.3 |
| R24: Fire Lookout 2 | 6 | 6 | 8 | 0.0 | 33.3 |
| R25: AltaGas House | 4 | 4 | 6 | 0.0 | 50.0 |
| R26: MEG Worker's Camp | 5 | 5 | 6 | 0.0 | 20.0 |
| R27: Grave Site (Christina Lake) | 5 | 5 | 6 | 0.0 | 20.0 |
| R28: Grave Site (Winefred Lake) | 6 | 6 | 12 | 0.0 | 100.0 |
| R29: Grist Lake Lodge 1 | 3 | 3 | 5 | 0.0 | 66.7 |
| R30: Grist Lake South | 3 | 3 | 5 | 0.0 | 66.7 |
| R31: Winefred Lake Lodge 1 | 3 | 3 | 5 | 0.0 | 66.7 |
| R32: Winefred Lake West | 4 | 4 | 6 | 0.0 | 50.0 |
| R33: EnCana Camp | 4 | 4 | 6 | 0.0 | 50.0 |
| R34: Winifred Cabin/Station/Lookout | 3 | 3 | 4 | 0.0 | 33.3 |
| R35: Campground (Christina Lake) | 4 | 4 | 5 | 0.0 | 25.0 |
| R36: Wild Rice Operation 1 | 3 | 3 | 5 | 0.0 | 66.7 |
| R37: Wild Rice Operation 2 | 4 | 4 | 6 | 0.0 | 50.0 |
| R38: Fire Lookout Tower | 4 | 4 | 5 | 0.0 | 25.0 |
| R39: Devenish | 3 | 3 | 5 | 0.0 | 66.7 |
| R40: Old Cabins & Settlement Area (Wiau Lake) | 3 | 3 | 4 | 0.0 | 33.3 |
| AAAQO | 80 | - | - | - | - |

| Receptor | Baseline ($\mu\text{g}/\text{m}^3$) | Application ($\mu\text{g}/\text{m}^3$) | Planned Development ($\mu\text{g}/\text{m}^3$) | Application over Baseline (%) | Planned Development over Baseline (%) |
|---|--|---|--|-------------------------------------|--|
| Maximum 24-h | | | | | |
| Overall Maximum (MPOI) | 195 | 195 | 258 | 0.0 | 32.3 |
| AMS #1 (Fort McKay) | 30 | 30 | 48 | 0.0 | 60.0 |
| AMS #2 (Mildred Lake) | 25 | 25 | 25 | 0.0 | 0.0 |
| AMS #4 (Buffalo Viewpoint) | 15 | 15 | 16 | 0.0 | 6.7 |
| AMS #5 (Mannix) | 24 | 24 | 24 | 0.0 | 0.0 |
| AMS #6 (Patricia McInnes) | 26 | 26 | 51 | 0.0 | 96.2 |
| AMS #7 (Athabasca Valley) | 133 | 133 | 258 | 0.0 | 94.0 |
| AMS #8 (Fort Chipewyan) | 4 | 4 | 5 | 0.0 | 25.0 |
| AMS #10 (Albian Mine) | 44 | 44 | 46 | 0.0 | 4.5 |
| AMS #11 (Lower Camp) | 18 | 18 | 20 | 0.0 | 11.1 |
| AMS #12 (Millennium) | 35 | 35 | 35 | 0.0 | 0.0 |
| AMS #13 (Syn crude UE1) | 18 | 18 | 22 | 0.0 | 22.2 |
| AMS #14 (Anzac) | 5 | 5 | 8 | 0.0 | 60.0 |
| AMS #15 (Horizon) | 195 | 195 | 196 | 0.0 | 0.5 |
| R01: Trapper's Cabin | 2 | 2 | 3 | 0.0 | 50.0 |
| R02: Camp Site | 2 | 2 | 3 | 0.0 | 50.0 |
| R03: Fish Plant (Winefred Lake) | 2 | 2 | 3 | 0.0 | 50.0 |
| R04: Cabin (Winefred Lake) | 2 | 2 | 3 | 0.0 | 50.0 |
| R05: Cabin (NW Kirby Lake) | 2 | 2 | 3 | 0.0 | 50.0 |
| R06: West Hay Lake | 2 | 2 | 3 | 0.0 | 50.0 |
| R07: Cabins (North Hay Lake) | 2 | 2 | 3 | 0.0 | 50.0 |
| R08: Martin's Cabins | 2 | 2 | 3 | 0.0 | 50.0 |
| R09: Metis Trailer Camp | 2 | 2 | 3 | 0.0 | 50.0 |
| R10: Conklin | 2 | 2 | 3 | 0.0 | 50.0 |
| R11: Cabins (NW Christina Lake) | 2 | 2 | 3 | 0.0 | 50.0 |
| R12: Medicinal Plants | 2 | 2 | 3 | 0.0 | 50.0 |
| R13: Cabins near Gravel Pit | 2 | 2 | 3 | 0.0 | 50.0 |
| R14: Cabins | 2 | 2 | 2 | 0.0 | 0.0 |
| R15: Leismer | 2 | 2 | 3 | 0.0 | 50.0 |
| R16: East Chard | 2 | 2 | 3 | 0.0 | 50.0 |
| R17: Pingle | 2 | 2 | 4 | 0.0 | 100.0 |
| R18: Chard School | 5 | 5 | 9 | 0.0 | 80.0 |
| R19: Janvier | 7 | 7 | 14 | 0.0 | 100.0 |
| R20: IR 194B | 2 | 2 | 4 | 0.0 | 100.0 |
| R21: IR 194A | 2 | 2 | 4 | 0.0 | 100.0 |
| R22: Fishing Camp (Christina Lake) | 2 | 2 | 3 | 0.0 | 50.0 |
| R23: Fire Lookout 1 | 2 | 2 | 3 | 0.0 | 50.0 |
| R24: Fire Lookout 2 | 3 | 3 | 4 | 0.0 | 33.3 |
| R25: AltaGas House | 2 | 2 | 3 | 0.0 | 50.0 |
| R26: MEG Worker's Camp | 2 | 2 | 3 | 0.0 | 50.0 |
| R27: Grave Site (Christina Lake) | 2 | 2 | 3 | 0.0 | 50.0 |
| R28: Grave Site (Winefred Lake) | 3 | 3 | 4 | 0.0 | 33.3 |
| R29: Grist Lake Lodge 1 | 2 | 2 | 3 | 0.0 | 50.0 |
| R30: Grist Lake South | 2 | 2 | 3 | 0.0 | 50.0 |
| R31: Winefred Lake Lodge 1 | 2 | 2 | 3 | 0.0 | 50.0 |
| R32: Winefred Lake West | 2 | 2 | 4 | 0.0 | 100.0 |
| R33: EnCana Camp | 2 | 2 | 3 | 0.0 | 50.0 |
| R34: Winifred Cabin/Station/Lookout | 2 | 2 | 3 | 0.0 | 50.0 |
| R35: Campground (Christina Lake) | 2 | 2 | 3 | 0.0 | 50.0 |
| R36: Wild Rice Operation 1 | 2 | 2 | 3 | 0.0 | 50.0 |
| R37: Wild Rice Operation 2 | 2 | 2 | 3 | 0.0 | 50.0 |
| R38: Fire Lookout Tower | 2 | 2 | 3 | 0.0 | 50.0 |
| R39: Devenish | 2 | 2 | 2 | 0.0 | 0.0 |
| R40: Old Cabins & Settlement Area (Wiau Lake) | 1 | 1 | 2 | 0.0 | 100.0 |
| AAAQO | - | - | - | - | - |



| Receptor | Baseline ($\mu\text{g}/\text{m}^3$) | Application ($\mu\text{g}/\text{m}^3$) | Planned Development ($\mu\text{g}/\text{m}^3$) | Application over Baseline (%) | Planned Development over Baseline (%) |
|---|--|---|--|-------------------------------------|--|
| 98th Percentile 24-h | | | | | |
| Overall Maximum (MPOI) | 164 | 164 | 164 | 0.0 | 0.0 |
| AMS #1 (Fort McKay) | 29 | 29 | 38 | 0.0 | 31.0 |
| AMS #2 (Mildred Lake) | 23 | 23 | 23 | 0.0 | 0.0 |
| AMS #4 (Buffalo Viewpoint) | 13 | 13 | 14 | 0.0 | 7.7 |
| AMS #5 (Mannix) | 19 | 19 | 20 | 0.0 | 5.3 |
| AMS #6 (Patricia McInnes) | 24 | 24 | 45 | 0.0 | 87.5 |
| AMS #7 (Athabasca Valley) | 81 | 81 | 157 | 0.0 | 93.8 |
| AMS #8 (Fort Chipewyan) | 2 | 2 | 3 | 0.0 | 50.0 |
| AMS #10 (Albian Mine) | 38 | 38 | 39 | 0.0 | 2.6 |
| AMS #11 (Lower Camp) | 14 | 14 | 15 | 0.0 | 7.1 |
| AMS #12 (Millennium) | 27 | 27 | 27 | 0.0 | 0.0 |
| AMS #13 (Syn crude UE1) | 15 | 15 | 17 | 0.0 | 13.3 |
| AMS #14 (Anzac) | 5 | 5 | 8 | 0.0 | 60.0 |
| AMS #15 (Horizon) | 164 | 164 | 164 | 0.0 | 0.0 |
| R01: Trapper's Cabin | 2 | 2 | 2 | 0.0 | 0.0 |
| R02: Camp Site | 2 | 2 | 2 | 0.0 | 0.0 |
| R03: Fish Plant (Winefred Lake) | 2 | 2 | 2 | 0.0 | 0.0 |
| R04: Cabin (Winefred Lake) | 2 | 2 | 3 | 0.0 | 50.0 |
| R05: Cabin (NW Kirby Lake) | 2 | 2 | 2 | 0.0 | 0.0 |
| R06: West Hay Lake | 2 | 2 | 3 | 0.0 | 50.0 |
| R07: Cabins (North Hay Lake) | 2 | 2 | 3 | 0.0 | 50.0 |
| R08: Martin's Cabins | 2 | 2 | 2 | 0.0 | 0.0 |
| R09: Metis Trailer Camp | 2 | 2 | 2 | 0.0 | 0.0 |
| R10: Conklin | 2 | 2 | 2 | 0.0 | 0.0 |
| R11: Cabins (NW Christina Lake) | 2 | 2 | 2 | 0.0 | 0.0 |
| R12: Medicinal Plants | 2 | 2 | 2 | 0.0 | 0.0 |
| R13: Cabins near Gravel Pit | 2 | 2 | 3 | 0.0 | 50.0 |
| R14: Cabins | 2 | 2 | 2 | 0.0 | 0.0 |
| R15: Leismer | 2 | 2 | 3 | 0.0 | 50.0 |
| R16: East Chard | 2 | 2 | 3 | 0.0 | 50.0 |
| R17: Pingle | 2 | 2 | 3 | 0.0 | 50.0 |
| R18: Chard School | 3 | 3 | 6 | 0.0 | 100.0 |
| R19: Janvier | 6 | 6 | 12 | 0.0 | 100.0 |
| R20: IR 194B | 2 | 2 | 3 | 0.0 | 50.0 |
| R21: IR 194A | 2 | 2 | 3 | 0.0 | 50.0 |
| R22: Fishing Camp (Christina Lake) | 2 | 2 | 3 | 0.0 | 50.0 |
| R23: Fire Lookout 1 | 1 | 1 | 2 | 0.0 | 100.0 |
| R24: Fire Lookout 2 | 3 | 3 | 4 | 0.0 | 33.3 |
| R25: AltaGas House | 2 | 2 | 3 | 0.0 | 50.0 |
| R26: MEG Worker's Camp | 2 | 2 | 3 | 0.0 | 50.0 |
| R27: Grave Site (Christina Lake) | 2 | 2 | 3 | 0.0 | 50.0 |
| R28: Grave Site (Winefred Lake) | 2 | 2 | 4 | 0.0 | 100.0 |
| R29: Grist Lake Lodge 1 | 2 | 2 | 3 | 0.0 | 50.0 |
| R30: Grist Lake South | 2 | 2 | 3 | 0.0 | 50.0 |
| R31: Winefred Lake Lodge 1 | 2 | 2 | 3 | 0.0 | 50.0 |
| R32: Winefred Lake West | 2 | 2 | 3 | 0.0 | 50.0 |
| R33: EnCana Camp | 2 | 2 | 3 | 0.0 | 50.0 |
| R34: Winifred Cabin/Station/Lookout | 1 | 1 | 2 | 0.0 | 100.0 |
| R35: Campground (Christina Lake) | 2 | 2 | 2 | 0.0 | 0.0 |
| R36: Wild Rice Operation 1 | 2 | 2 | 3 | 0.0 | 50.0 |
| R37: Wild Rice Operation 2 | 2 | 2 | 3 | 0.0 | 50.0 |
| R38: Fire Lookout Tower | 1 | 1 | 2 | 0.0 | 100.0 |
| R39: Devenish | 1 | 1 | 2 | 0.0 | 100.0 |
| R40: Old Cabins & Settlement Area (Wiau Lake) | 1 | 1 | 2 | 0.0 | 100.0 |
| AAAQO | 30 | 30 | 30 | - | - |



| Receptor | Baseline ($\mu\text{g}/\text{m}^3$) | Application ($\mu\text{g}/\text{m}^3$) | Planned Development ($\mu\text{g}/\text{m}^3$) | Application over Baseline (%) | Planned Development over Baseline (%) |
|---|--|---|--|-------------------------------------|--|
| Annual | | | | | |
| Overall Maximum (MPOI) | 31.3 | 31.3 | 38.4 | 0.0 | 22.7 |
| AMS #1 (Fort McKay) | 7.2 | 7.3 | 12.2 | 0.0 | 31.0 |
| AMS #2 (Mildred Lake) | 4.3 | 4.3 | 4.6 | 0.0 | 0.0 |
| AMS #4 (Buffalo Viewpoint) | 2.3 | 2.3 | 2.5 | 0.0 | 7.7 |
| AMS #5 (Mannix) | 3.6 | 3.6 | 4.0 | 0.0 | 5.3 |
| AMS #6 (Patricia McInnes) | 2.6 | 2.6 | 4.5 | 0.0 | 87.5 |
| AMS #7 (Athabasca Valley) | 16.9 | 16.9 | 32.4 | 0.0 | 93.8 |
| AMS #8 (Fort Chipewyan) | 0.2 | 0.2 | 0.3 | 0.0 | 50.0 |
| AMS #10 (Albian Mine) | 5.0 | 5.0 | 5.4 | 0.0 | 2.6 |
| AMS #11 (Lower Camp) | 2.6 | 2.6 | 2.8 | 0.0 | 7.1 |
| AMS #12 (Millennium) | 4.0 | 4.0 | 4.5 | 0.0 | 0.0 |
| AMS #13 (Syn crude UE1) | 2.6 | 2.6 | 2.9 | 0.0 | 13.3 |
| AMS #14 (Anzac) | 0.9 | 0.9 | 1.4 | 0.0 | 60.0 |
| AMS #15 (Horizon) | 31.3 | 31.3 | 32.0 | 0.0 | 0.0 |
| R01: Trapper's Cabin | 0.2 | 0.2 | 0.3 | 0.0 | 0.0 |
| R02: Camp Site | 0.2 | 0.2 | 0.3 | 0.0 | 0.0 |
| R03: Fish Plant (Winefred Lake) | 0.2 | 0.2 | 0.3 | 0.0 | 0.0 |
| R04: Cabin (Winefred Lake) | 0.2 | 0.2 | 0.3 | 0.0 | 50.0 |
| R05: Cabin (NW Kirby Lake) | 0.2 | 0.2 | 0.3 | 0.0 | 0.0 |
| R06: West Hay Lake | 0.2 | 0.2 | 0.3 | 0.0 | 50.0 |
| R07: Cabins (North Hay Lake) | 0.2 | 0.2 | 0.3 | 0.0 | 50.0 |
| R08: Martin's Cabins | 0.2 | 0.2 | 0.3 | 0.0 | 0.0 |
| R09: Metis Trailer Camp | 0.2 | 0.2 | 0.3 | 0.0 | 0.0 |
| R10: Conklin | 0.2 | 0.2 | 0.3 | 0.0 | 0.0 |
| R11: Cabins (NW Christina Lake) | 0.2 | 0.2 | 0.3 | 0.0 | 0.0 |
| R12: Medicinal Plants | 0.2 | 0.2 | 0.3 | 0.0 | 0.0 |
| R13: Cabins near Gravel Pit | 0.2 | 0.2 | 0.4 | 0.0 | 50.0 |
| R14: Cabins | 0.2 | 0.2 | 0.3 | 0.0 | 0.0 |
| R15: Leismer | 0.2 | 0.2 | 0.4 | 0.0 | 50.0 |
| R16: East Chard | 0.2 | 0.2 | 0.4 | 0.0 | 50.0 |
| R17: Pingle | 0.2 | 0.2 | 0.4 | 0.0 | 50.0 |
| R18: Chard School | 0.7 | 0.7 | 1.5 | 0.0 | 100.0 |
| R19: Janvier | 1.3 | 1.3 | 2.6 | 0.0 | 100.0 |
| R20: IR 194B | 0.3 | 0.3 | 0.5 | 0.0 | 50.0 |
| R21: IR 194A | 0.2 | 0.2 | 0.4 | 0.0 | 50.0 |
| R22: Fishing Camp (Christina Lake) | 0.2 | 0.2 | 0.4 | 0.0 | 50.0 |
| R23: Fire Lookout 1 | 0.2 | 0.2 | 0.2 | 0.0 | 100.0 |
| R24: Fire Lookout 2 | 0.3 | 0.3 | 0.4 | 0.0 | 33.3 |
| R25: AltaGas House | 0.2 | 0.2 | 0.4 | 0.0 | 50.0 |
| R26: MEG Worker's Camp | 0.3 | 0.3 | 0.5 | 0.0 | 50.0 |
| R27: Grave Site (Christina Lake) | 0.2 | 0.2 | 0.4 | 0.0 | 50.0 |
| R28: Grave Site (Winefred Lake) | 0.3 | 0.3 | 0.5 | 0.0 | 100.0 |
| R29: Grist Lake Lodge 1 | 0.2 | 0.2 | 0.2 | 0.0 | 50.0 |
| R30: Grist Lake South | 0.2 | 0.2 | 0.2 | 0.0 | 50.0 |
| R31: Winefred Lake Lodge 1 | 0.2 | 0.2 | 0.3 | 0.0 | 50.0 |
| R32: Winefred Lake West | 0.2 | 0.2 | 0.3 | 0.0 | 50.0 |
| R33: EnCana Camp | 0.2 | 0.2 | 0.4 | 0.0 | 50.0 |
| R34: Winifred Cabin/Station/Lookout | 0.2 | 0.2 | 0.2 | 0.0 | 100.0 |
| R35: Campground (Christina Lake) | 0.2 | 0.2 | 0.3 | 0.0 | 0.0 |
| R36: Wild Rice Operation 1 | 0.2 | 0.2 | 0.3 | 0.0 | 50.0 |
| R37: Wild Rice Operation 2 | 0.2 | 0.2 | 0.4 | 0.0 | 50.0 |
| R38: Fire Lookout Tower | 0.2 | 0.2 | 0.3 | 0.0 | 100.0 |
| R39: Devenish | 0.2 | 0.2 | 0.3 | 0.0 | 100.0 |
| R40: Old Cabins & Settlement Area (Wiau Lake) | 0.1 | 0.2 | 0.3 | 0.0 | 100.0 |
| AAAQO | - | - | - | - | - |

Table B5-4: Predicted Carbon Monoxide Concentrations in the AQRSA

| Receptor | Baseline ($\mu\text{g}/\text{m}^3$) | Application ($\mu\text{g}/\text{m}^3$) | Planned Development ($\mu\text{g}/\text{m}^3$) | Application over Baseline (%) | Planned Development over Baseline (%) |
|---|--|---|--|-------------------------------------|---|
| Maximum 1-h | | | | | |
| Overall Maximum (MPOI) | 7 265 | 7 265 | 7 265 | 0.0 | 0.0 |
| AMS #1 (Fort McKay) | 1 618 | 1 618 | 1 850 | 0.0 | 14.3 |
| AMS #2 (Mildred Lake) | 1 747 | 1 747 | 1 747 | 0.0 | 0.0 |
| AMS #4 (Buffalo Viewpoint) | 1 284 | 1 284 | 1 288 | 0.0 | 0.3 |
| AMS #5 (Mannix) | 1 311 | 1 311 | 1 323 | 0.0 | 0.9 |
| AMS #6 (Patricia McInnes) | 709 | 709 | 966 | 0.0 | 36.2 |
| AMS #7 (Athabasca Valley) | 1 675 | 1 675 | 3 227 | 0.0 | 92.7 |
| AMS #8 (Fort Chipewyan) | 89 | 89 | 102 | 0.0 | 14.6 |
| AMS #10 (Albian Mine) | 4 911 | 4 911 | 5 066 | 0.0 | 3.2 |
| AMS #11 (Lower Camp) | 1 969 | 1 969 | 1 981 | 0.0 | 0.6 |
| AMS #12 (Millennium) | 2 271 | 2 271 | 2 283 | 0.0 | 0.5 |
| AMS #13 (Syncrude UE1) | 2 572 | 2 572 | 2 600 | 0.0 | 1.1 |
| AMS #14 (Anzac) | 575 | 575 | 641 | 0.0 | 11.5 |
| AMS #15 (Horizon) | 6 536 | 6 536 | 6 544 | 0.0 | 0.1 |
| R01: Trapper's Cabin | 164 | 164 | 173 | 0.0 | 5.5 |
| R02: Camp Site | 171 | 172 | 178 | 0.6 | 4.1 |
| R03: Fish Plant (Winefred Lake) | 107 | 107 | 124 | 0.0 | 15.9 |
| R04: Cabin (Winefred Lake) | 103 | 103 | 126 | 0.0 | 22.3 |
| R05: Cabin (NW Kirby Lake) | 113 | 113 | 118 | 0.0 | 4.4 |
| R06: West Hay Lake | 123 | 123 | 130 | 0.0 | 5.7 |
| R07: Cabins (North Hay Lake) | 123 | 123 | 136 | 0.0 | 10.6 |
| R08: Martin's Cabins | 156 | 156 | 159 | 0.0 | 1.9 |
| R09: Metis Trailer Camp | 185 | 185 | 188 | 0.0 | 1.6 |
| R10: Conklin | 347 | 347 | 360 | 0.0 | 3.7 |
| R11: Cabins (NW Christina Lake) | 257 | 257 | 262 | 0.0 | 1.9 |
| R12: Medicinal Plants | 488 | 488 | 493 | 0.0 | 1.0 |
| R13: Cabins near Gravel Pit | 447 | 447 | 451 | 0.0 | 0.9 |
| R14: Cabins | 810 | 810 | 819 | 0.0 | 1.1 |
| R15: Leismer | 231 | 231 | 233 | 0.0 | 0.9 |
| R16: East Chard | 165 | 165 | 189 | 0.0 | 14.5 |
| R17: Pingle | 158 | 158 | 178 | 0.0 | 12.7 |
| R18: Chard School | 188 | 188 | 215 | 0.0 | 14.4 |
| R19: Janvier | 214 | 214 | 258 | 0.0 | 20.6 |
| R20: IR 194B | 173 | 173 | 284 | 0.0 | 64.2 |
| R21: IR 194A | 333 | 333 | 389 | 0.0 | 16.8 |
| R22: Fishing Camp (Christina Lake) | 131 | 131 | 159 | 0.0 | 21.4 |
| R23: Fire Lookout 1 | 78 | 78 | 94 | 0.0 | 20.5 |
| R24: Fire Lookout 2 | 380 | 380 | 428 | 0.0 | 12.6 |
| R25: AltaGas House | 133 | 133 | 161 | 0.0 | 21.1 |
| R26: MEG Worker's Camp | 225 | 225 | 226 | 0.0 | 0.4 |
| R27: Grave Site (Christina Lake) | 136 | 136 | 164 | 0.0 | 20.6 |
| R28: Grave Site (Winefred Lake) | 164 | 164 | 318 | 0.0 | 93.9 |
| R29: Grist Lake Lodge 1 | 71 | 71 | 91 | 0.0 | 28.2 |
| R30: Grist Lake South | 72 | 72 | 90 | 0.0 | 25.0 |
| R31: Winefred Lake Lodge 1 | 101 | 101 | 126 | 0.0 | 24.8 |
| R32: Winefred Lake West | 173 | 173 | 203 | 0.0 | 17.3 |
| R33: EnCana Camp | 120 | 120 | 151 | 0.0 | 25.8 |
| R34: Winifred Cabin/Station/Lookout | 80 | 80 | 96 | 0.0 | 20.0 |
| R35: Campground (Christina Lake) | 271 | 271 | 277 | 0.0 | 2.2 |
| R36: Wild Rice Operation 1 | 101 | 101 | 126 | 0.0 | 24.8 |
| R37: Wild Rice Operation 2 | 190 | 190 | 193 | 0.0 | 1.6 |
| R38: Fire Lookout Tower | 1 335 | 1 335 | 1 344 | 0.0 | 0.7 |
| R39: Devenish | 442 | 442 | 448 | 0.0 | 1.4 |
| R40: Old Cabins & Settlement Area (Wiau Lake) | 72 | 72 | 82 | 0.0 | 13.9 |
| AAAQO | - | - | - | - | - |

Notes: AAAQO = Alberta Ambient Air Quality Objectives and Guidelines
MPOI = Maximum point of impingement

| Receptor | Baseline ($\mu\text{g}/\text{m}^3$) | Application ($\mu\text{g}/\text{m}^3$) | Planned Development ($\mu\text{g}/\text{m}^3$) | Application over Baseline (%) | Planned Development over Baseline (%) |
|---|--|---|--|-------------------------------------|--|
| 99.9th Percentile 1-h | | | | | |
| Overall Maximum (MPOI) | 5 556 | 5 556 | 5 663 | 0.0 | 1.9 |
| AMS #1 (Fort McKay) | 905 | 905 | 972 | 0.0 | 7.4 |
| AMS #2 (Mildred Lake) | 1 002 | 1 002 | 1 003 | 0.0 | 0.1 |
| AMS #4 (Buffalo Viewpoint) | 775 | 775 | 778 | 0.0 | 0.4 |
| AMS #5 (Mannix) | 942 | 942 | 973 | 0.0 | 3.3 |
| AMS #6 (Patricia McInnes) | 414 | 414 | 653 | 0.0 | 57.7 |
| AMS #7 (Athabasca Valley) | 1 350 | 1 350 | 2 579 | 0.0 | 91.0 |
| AMS #8 (Fort Chipewyan) | 66 | 66 | 81 | 0.0 | 22.7 |
| AMS #10 (Albian Mine) | 2 488 | 2 488 | 2 573 | 0.0 | 3.4 |
| AMS #11 (Lower Camp) | 783 | 783 | 788 | 0.0 | 0.6 |
| AMS #12 (Millennium) | 1 351 | 1 351 | 1 352 | 0.0 | 0.1 |
| AMS #13 (Syn crude UE1) | 641 | 641 | 673 | 0.0 | 5.0 |
| AMS #14 (Anzac) | 155 | 155 | 199 | 0.0 | 28.4 |
| AMS #15 (Horizon) | 5 556 | 5 556 | 5 663 | 0.0 | 1.9 |
| R01: Trapper's Cabin | 70 | 71 | 80 | 1.4 | 14.3 |
| R02: Camp Site | 81 | 81 | 87 | 0.0 | 7.4 |
| R03: Fish Plant (Winefred Lake) | 54 | 54 | 63 | 0.0 | 16.7 |
| R04: Cabin (Winefred Lake) | 55 | 55 | 82 | 0.0 | 49.1 |
| R05: Cabin (NW Kirby Lake) | 57 | 59 | 66 | 3.5 | 15.8 |
| R06: West Hay Lake | 57 | 58 | 67 | 1.8 | 17.5 |
| R07: Cabins (North Hay Lake) | 61 | 63 | 71 | 3.3 | 16.4 |
| R08: Martin's Cabins | 90 | 91 | 96 | 1.1 | 6.7 |
| R09: Metis Trailer Camp | 116 | 116 | 121 | 0.0 | 4.3 |
| R10: Conklin | 126 | 126 | 133 | 0.0 | 5.6 |
| R11: Cabins (NW Christina Lake) | 133 | 133 | 134 | 0.0 | 0.8 |
| R12: Medicinal Plants | 149 | 149 | 155 | 0.0 | 4.0 |
| R13: Cabins near Gravel Pit | 149 | 149 | 167 | 0.0 | 12.1 |
| R14: Cabins | 152 | 152 | 166 | 0.0 | 9.2 |
| R15: Leismer | 108 | 108 | 113 | 0.0 | 4.6 |
| R16: East Chard | 61 | 61 | 73 | 0.0 | 19.7 |
| R17: Pingle | 67 | 67 | 78 | 0.0 | 16.4 |
| R18: Chard School | 65 | 65 | 119 | 0.0 | 83.1 |
| R19: Janvier | 93 | 94 | 181 | 1.1 | 94.6 |
| R20: IR 194B | 67 | 67 | 125 | 0.0 | 86.6 |
| R21: IR 194A | 62 | 62 | 78 | 0.0 | 25.8 |
| R22: Fishing Camp (Christina Lake) | 66 | 66 | 77 | 0.0 | 16.7 |
| R23: Fire Lookout 1 | 47 | 47 | 57 | 0.0 | 21.3 |
| R24: Fire Lookout 2 | 68 | 68 | 85 | 0.0 | 25.0 |
| R25: AltaGas House | 64 | 64 | 76 | 0.0 | 18.8 |
| R26: MEG Worker's Camp | 92 | 92 | 106 | 0.0 | 15.2 |
| R27: Grave Site (Christina Lake) | 66 | 66 | 75 | 0.0 | 13.6 |
| R28: Grave Site (Winefred Lake) | 73 | 73 | 136 | 0.0 | 86.3 |
| R29: Grist Lake Lodge 1 | 47 | 47 | 60 | 0.0 | 27.7 |
| R30: Grist Lake South | 47 | 47 | 59 | 0.0 | 25.5 |
| R31: Winefred Lake Lodge 1 | 46 | 46 | 64 | 0.0 | 39.1 |
| R32: Winefred Lake West | 57 | 57 | 78 | 0.0 | 36.8 |
| R33: EnCana Camp | 62 | 62 | 76 | 0.0 | 22.6 |
| R34: Winifred Cabin/Station/Lookout | 46 | 46 | 54 | 0.0 | 17.4 |
| R35: Campground (Christina Lake) | 123 | 123 | 126 | 0.0 | 2.4 |
| R36: Wild Rice Operation 1 | 46 | 46 | 64 | 0.0 | 39.1 |
| R37: Wild Rice Operation 2 | 110 | 110 | 117 | 0.0 | 6.4 |
| R38: Fire Lookout Tower | 626 | 626 | 637 | 0.0 | 1.8 |
| R39: Devenish | 270 | 270 | 279 | 0.0 | 3.3 |
| R40: Old Cabins & Settlement Area (Wiau Lake) | 55 | 55 | 60 | 0.0 | 9.1 |
| AAAQO | 15 000 | 15 000 | 15 000 | - | - |



| Receptor | Baseline ($\mu\text{g}/\text{m}^3$) | Application ($\mu\text{g}/\text{m}^3$) | Planned Development ($\mu\text{g}/\text{m}^3$) | Application over Baseline (%) | Planned Development over Baseline (%) |
|---|--|---|--|-------------------------------------|--|
| Maximum 8-h | | | | | |
| Overall Maximum (MPOI) | 3 991 | 3 991 | 4 146 | 0.0 | 3.9 |
| AMS #1 (Fort McKay) | 526 | 526 | 606 | 0.0 | 15.2 |
| AMS #2 (Mildred Lake) | 581 | 581 | 581 | 0.0 | 0.0 |
| AMS #4 (Buffalo Viewpoint) | 322 | 322 | 345 | 0.0 | 7.1 |
| AMS #5 (Mannix) | 755 | 755 | 767 | 0.0 | 1.6 |
| AMS #6 (Patricia McInnes) | 216 | 216 | 380 | 0.0 | 75.9 |
| AMS #7 (Athabasca Valley) | 924 | 924 | 1797 | 0.0 | 94.5 |
| AMS #8 (Fort Chipewyan) | 60 | 60 | 74 | 0.0 | 23.3 |
| AMS #10 (Albian Mine) | 1909 | 1909 | 1986 | 0.0 | 4.0 |
| AMS #11 (Lower Camp) | 511 | 511 | 533 | 0.0 | 4.3 |
| AMS #12 (Millennium) | 1362 | 1362 | 1371 | 0.0 | 0.7 |
| AMS #13 (Syn crude UE1) | 405 | 405 | 413 | 0.0 | 2.0 |
| AMS #14 (Anzac) | 75 | 75 | 97 | 0.0 | 29.3 |
| AMS #15 (Horizon) | 3991 | 3991 | 4146 | 0.0 | 3.9 |
| R01: Trapper's Cabin | 40 | 40 | 53 | 0.0 | 32.5 |
| R02: Camp Site | 44 | 48 | 53 | 9.1 | 20.5 |
| R03: Fish Plant (Winefred Lake) | 38 | 38 | 52 | 0.0 | 36.8 |
| R04: Cabin (Winefred Lake) | 46 | 46 | 71 | 0.0 | 54.3 |
| R05: Cabin (NW Kirby Lake) | 40 | 45 | 57 | 12.5 | 42.5 |
| R06: West Hay Lake | 38 | 38 | 56 | 0.0 | 47.4 |
| R07: Cabins (North Hay Lake) | 39 | 39 | 58 | 0.0 | 48.7 |
| R08: Martin's Cabins | 43 | 44 | 54 | 2.3 | 25.6 |
| R09: Metis Trailer Camp | 56 | 59 | 63 | 5.4 | 12.5 |
| R10: Conklin | 65 | 65 | 67 | 0.0 | 3.1 |
| R11: Cabins (NW Christina Lake) | 64 | 64 | 65 | 0.0 | 1.6 |
| R12: Medicinal Plants | 45 | 45 | 59 | 0.0 | 31.1 |
| R13: Cabins near Gravel Pit | 74 | 74 | 83 | 0.0 | 12.2 |
| R14: Cabins | 217 | 217 | 223 | 0.0 | 2.8 |
| R15: Leismer | 70 | 70 | 72 | 0.0 | 2.9 |
| R16: East Chard | 43 | 43 | 51 | 0.0 | 18.6 |
| R17: Pingle | 42 | 42 | 50 | 0.0 | 19.0 |
| R18: Chard School | 59 | 59 | 102 | 0.0 | 72.9 |
| R19: Janvier | 67 | 67 | 118 | 0.0 | 76.1 |
| R20: IR 194B | 41 | 41 | 57 | 0.0 | 39.0 |
| R21: IR 194A | 45 | 45 | 54 | 0.0 | 20.0 |
| R22: Fishing Camp (Christina Lake) | 43 | 43 | 56 | 0.0 | 30.2 |
| R23: Fire Lookout 1 | 28 | 28 | 39 | 0.0 | 39.3 |
| R24: Fire Lookout 2 | 48 | 48 | 58 | 0.0 | 20.8 |
| R25: AltaGas House | 43 | 43 | 57 | 0.0 | 32.6 |
| R26: MEG Worker's Camp | 44 | 44 | 59 | 0.0 | 34.1 |
| R27: Grave Site (Christina Lake) | 44 | 44 | 57 | 0.0 | 29.5 |
| R28: Grave Site (Winefred Lake) | 41 | 41 | 63 | 0.0 | 53.7 |
| R29: Grist Lake Lodge 1 | 31 | 31 | 45 | 0.0 | 45.2 |
| R30: Grist Lake South | 32 | 32 | 45 | 0.0 | 40.6 |
| R31: Winefred Lake Lodge 1 | 38 | 38 | 55 | 0.0 | 44.7 |
| R32: Winefred Lake West | 40 | 40 | 54 | 0.0 | 35.0 |
| R33: EnCana Camp | 41 | 41 | 55 | 0.0 | 34.1 |
| R34: Winifred Cabin/Station/Lookout | 28 | 28 | 39 | 0.0 | 39.3 |
| R35: Campground (Christina Lake) | 54 | 54 | 57 | 0.0 | 5.6 |
| R36: Wild Rice Operation 1 | 37 | 37 | 57 | 0.0 | 54.1 |
| R37: Wild Rice Operation 2 | 44 | 44 | 58 | 0.0 | 31.8 |
| R38: Fire Lookout Tower | 431 | 431 | 434 | 0.0 | 0.7 |
| R39: Devenish | 91 | 91 | 93 | 0.0 | 2.2 |
| R40: Old Cabins & Settlement Area (Wiau Lake) | 31 | 31 | 41 | 0.0 | 32.3 |
| AAAQO | - | - | - | - | - |



| Receptor | Baseline ($\mu\text{g}/\text{m}^3$) | Application ($\mu\text{g}/\text{m}^3$) | Planned Development ($\mu\text{g}/\text{m}^3$) | Application over Baseline (%) | Planned Development over Baseline (%) |
|---|--|---|--|-------------------------------------|--|
| 99.9th Percentile 8-h | | | | | |
| Overall Maximum (MPOI) | 2 835 | 2 835 | 2 838 | 0.0 | 0.1 |
| AMS #1 (Fort McKay) | 451 | 451 | 558 | 0.0 | 23.7 |
| AMS #2 (Mildred Lake) | 458 | 458 | 458 | 0.0 | 0.0 |
| AMS #4 (Buffalo Viewpoint) | 297 | 297 | 301 | 0.0 | 1.3 |
| AMS #5 (Mannix) | 594 | 594 | 600 | 0.0 | 1.0 |
| AMS #6 (Patricia McInnes) | 189 | 189 | 367 | 0.0 | 94.2 |
| AMS #7 (Athabasca Valley) | 884 | 884 | 1 717 | 0.0 | 94.2 |
| AMS #8 (Fort Chipewyan) | 54 | 54 | 62 | 0.0 | 14.8 |
| AMS #10 (Albian Mine) | 1 277 | 1 278 | 1 295 | 0.1 | 1.4 |
| AMS #11 (Lower Camp) | 320 | 320 | 324 | 0.0 | 1.3 |
| AMS #12 (Millennium) | 811 | 811 | 819 | 0.0 | 1.0 |
| AMS #13 (Syn crude UE1) | 315 | 315 | 318 | 0.0 | 1.0 |
| AMS #14 (Anzac) | 69 | 69 | 93 | 0.0 | 34.8 |
| AMS #15 (Horizon) | 2 835 | 2 835 | 2 838 | 0.0 | 0.1 |
| R01: Trapper's Cabin | 34 | 34 | 50 | 0.0 | 47.1 |
| R02: Camp Site | 37 | 39 | 50 | 5.4 | 35.1 |
| R03: Fish Plant (Winefred Lake) | 34 | 34 | 48 | 0.0 | 41.2 |
| R04: Cabin (Winefred Lake) | 38 | 38 | 54 | 0.0 | 42.1 |
| R05: Cabin (NW Kirby Lake) | 36 | 36 | 50 | 0.0 | 38.9 |
| R06: West Hay Lake | 37 | 37 | 55 | 0.0 | 48.6 |
| R07: Cabins (North Hay Lake) | 37 | 37 | 54 | 0.0 | 45.9 |
| R08: Martin's Cabins | 38 | 39 | 49 | 2.6 | 28.9 |
| R09: Metis Trailer Camp | 40 | 40 | 54 | 0.0 | 35.0 |
| R10: Conklin | 48 | 48 | 49 | 0.0 | 2.1 |
| R11: Cabins (NW Christina Lake) | 46 | 46 | 58 | 0.0 | 26.1 |
| R12: Medicinal Plants | 44 | 44 | 53 | 0.0 | 20.5 |
| R13: Cabins near Gravel Pit | 49 | 50 | 59 | 2.0 | 20.4 |
| R14: Cabins | 54 | 54 | 57 | 0.0 | 5.6 |
| R15: Leismer | 50 | 50 | 55 | 0.0 | 10.0 |
| R16: East Chard | 38 | 38 | 50 | 0.0 | 31.6 |
| R17: Pingle | 35 | 35 | 47 | 0.0 | 34.3 |
| R18: Chard School | 47 | 47 | 83 | 0.0 | 76.6 |
| R19: Janvier | 57 | 57 | 113 | 0.0 | 98.2 |
| R20: IR 194B | 34 | 34 | 49 | 0.0 | 44.1 |
| R21: IR 194A | 39 | 39 | 48 | 0.0 | 23.1 |
| R22: Fishing Camp (Christina Lake) | 37 | 37 | 52 | 0.0 | 40.5 |
| R23: Fire Lookout 1 | 25 | 25 | 32 | 0.0 | 28.0 |
| R24: Fire Lookout 2 | 43 | 43 | 53 | 0.0 | 23.3 |
| R25: AltaGas House | 37 | 37 | 52 | 0.0 | 40.5 |
| R26: MEG Worker's Camp | 41 | 41 | 54 | 0.0 | 31.7 |
| R27: Grave Site (Christina Lake) | 37 | 37 | 52 | 0.0 | 40.5 |
| R28: Grave Site (Winefred Lake) | 36 | 36 | 57 | 0.0 | 58.3 |
| R29: Grist Lake Lodge 1 | 25 | 25 | 34 | 0.0 | 36.0 |
| R30: Grist Lake South | 25 | 25 | 34 | 0.0 | 36.0 |
| R31: Winefred Lake Lodge 1 | 30 | 30 | 40 | 0.0 | 33.3 |
| R32: Winefred Lake West | 36 | 36 | 49 | 0.0 | 36.1 |
| R33: EnCana Camp | 35 | 35 | 50 | 0.0 | 42.9 |
| R34: Winifred Cabin/Station/Lookout | 25 | 26 | 33 | 4.0 | 32.0 |
| R35: Campground (Christina Lake) | 44 | 44 | 52 | 0.0 | 18.2 |
| R36: Wild Rice Operation 1 | 28 | 28 | 38 | 0.0 | 35.7 |
| R37: Wild Rice Operation 2 | 36 | 36 | 49 | 0.0 | 36.1 |
| R38: Fire Lookout Tower | 214 | 214 | 216 | 0.0 | 0.9 |
| R39: Devenish | 69 | 69 | 81 | 0.0 | 17.4 |
| R40: Old Cabins & Settlement Area (Wiau Lake) | 30 | 30 | 39 | 0.0 | 30.0 |
| AAAQO | 6 000 | - | - | - | - |

| Receptor | Baseline ($\mu\text{g}/\text{m}^3$) | Application ($\mu\text{g}/\text{m}^3$) | Planned Development ($\mu\text{g}/\text{m}^3$) | Application over Baseline (%) | Planned Development over Baseline (%) |
|---|--|---|--|-------------------------------------|--|
| Annual | | | | | |
| Overall Maximum (MPOI) | 328.3 | 328.3 | 358.0 | 0.0 | 9.0 |
| AMS #1 (Fort McKay) | 78.3 | 78.3 | 108.2 | 0.0 | 38.2 |
| AMS #2 (Mildred Lake) | 69.8 | 69.8 | 72.8 | 0.0 | 4.3 |
| AMS #4 (Buffalo Viewpoint) | 34.7 | 34.7 | 37.6 | 0.0 | 8.4 |
| AMS #5 (Mannix) | 58.5 | 58.5 | 62.4 | 0.0 | 6.7 |
| AMS #6 (Patricia McInnes) | 24.9 | 25.0 | 37.8 | 0.4 | 51.8 |
| AMS #7 (Athabasca Valley) | 106.6 | 106.6 | 197.9 | 0.0 | 85.6 |
| AMS #8 (Fort Chipewyan) | 2.5 | 2.5 | 3.4 | 0.0 | 36.0 |
| AMS #10 (Albian Mine) | 83.0 | 83.0 | 88.5 | 0.0 | 6.6 |
| AMS #11 (Lower Camp) | 41.3 | 41.3 | 43.8 | 0.0 | 6.1 |
| AMS #12 (Millennium) | 74.4 | 74.4 | 79.1 | 0.0 | 6.3 |
| AMS #13 (Syn crude UE1) | 39.8 | 39.8 | 43.4 | 0.0 | 9.0 |
| AMS #14 (Anzac) | 9.3 | 9.3 | 14.3 | 0.0 | 53.8 |
| AMS #15 (Horizon) | 328.4 | 328.4 | 358.0 | 0.0 | 9.0 |
| R01: Trapper's Cabin | 4.2 | 4.3 | 5.6 | 2.4 | 33.3 |
| R02: Camp Site | 4.6 | 4.8 | 6.1 | 4.3 | 32.6 |
| R03: Fish Plant (Winefred Lake) | 4.4 | 4.5 | 5.7 | 2.3 | 29.5 |
| R04: Cabin (Winefred Lake) | 4.3 | 4.4 | 5.6 | 2.3 | 30.2 |
| R05: Cabin (NW Kirby Lake) | 4.5 | 4.6 | 5.8 | 2.2 | 28.9 |
| R06: West Hay Lake | 4.3 | 4.4 | 5.6 | 2.3 | 30.2 |
| R07: Cabins (North Hay Lake) | 4.4 | 4.5 | 5.8 | 2.3 | 31.8 |
| R08: Martin's Cabins | 4.3 | 4.5 | 5.8 | 4.7 | 34.9 |
| R09: Metis Trailer Camp | 4.4 | 4.7 | 6.0 | 6.8 | 36.4 |
| R10: Conklin | 5.6 | 5.6 | 7.1 | 0.0 | 26.8 |
| R11: Cabins (NW Christina Lake) | 5.2 | 5.3 | 6.8 | 1.9 | 30.8 |
| R12: Medicinal Plants | 5.1 | 5.2 | 6.7 | 2.0 | 31.4 |
| R13: Cabins near Gravel Pit | 6.5 | 6.5 | 8.4 | 0.0 | 29.2 |
| R14: Cabins | 5.9 | 5.9 | 7.4 | 0.0 | 25.4 |
| R15: Leismer | 5.0 | 5.0 | 6.8 | 0.0 | 36.0 |
| R16: East Chard | 4.2 | 4.2 | 6.1 | 0.0 | 45.2 |
| R17: Pingle | 4.3 | 4.3 | 6.3 | 0.0 | 46.5 |
| R18: Chard School | 7.3 | 7.3 | 12.4 | 0.0 | 69.9 |
| R19: Janvier | 10.5 | 10.5 | 19.2 | 0.0 | 82.9 |
| R20: IR 194B | 4.7 | 4.8 | 7.3 | 2.1 | 55.3 |
| R21: IR 194A | 3.9 | 3.9 | 5.5 | 0.0 | 41.0 |
| R22: Fishing Camp (Christina Lake) | 4.6 | 4.7 | 6.2 | 2.2 | 34.8 |
| R23: Fire Lookout 1 | 2.9 | 2.9 | 3.8 | 0.0 | 31.0 |
| R24: Fire Lookout 2 | 4.3 | 4.4 | 6.2 | 2.3 | 44.2 |
| R25: AltaGas House | 4.6 | 4.8 | 6.2 | 4.3 | 34.8 |
| R26: MEG Worker's Camp | 7.5 | 7.6 | 9.4 | 1.3 | 25.3 |
| R27: Grave Site (Christina Lake) | 4.7 | 4.8 | 6.3 | 2.1 | 34.0 |
| R28: Grave Site (Winefred Lake) | 4.8 | 4.9 | 6.9 | 2.1 | 43.8 |
| R29: Grist Lake Lodge 1 | 3.0 | 3.1 | 4.0 | 3.3 | 33.3 |
| R30: Grist Lake South | 3.0 | 3.0 | 4.0 | 0.0 | 33.3 |
| R31: Winefred Lake Lodge 1 | 3.8 | 3.9 | 5.1 | 2.6 | 34.2 |
| R32: Winefred Lake West | 4.4 | 4.5 | 5.8 | 2.3 | 31.8 |
| R33: EnCana Camp | 4.7 | 4.8 | 6.2 | 2.1 | 31.9 |
| R34: Winifred Cabin/Station/Lookout | 2.9 | 2.9 | 3.8 | 0.0 | 31.0 |
| R35: Campground (Christina Lake) | 5.1 | 5.2 | 6.6 | 2.0 | 29.4 |
| R36: Wild Rice Operation 1 | 3.6 | 3.6 | 4.8 | 0.0 | 33.3 |
| R37: Wild Rice Operation 2 | 4.9 | 5.1 | 6.7 | 4.1 | 36.7 |
| R38: Fire Lookout Tower | 9.4 | 9.5 | 10.9 | 1.1 | 16.0 |
| R39: Devenish | 4.0 | 4.0 | 5.2 | 0.0 | 30.0 |
| R40: Old Cabins & Settlement Area (Wiau Lake) | 2.7 | 2.7 | 3.9 | 0.0 | 44.4 |
| AAAQO | - | - | - | - | - |

Notes: AAAQO = Alberta Ambient Air Quality Objectives and Guidelines
MPOI = Maximum point of impingement



**Table B5-5: Annual Potential Acid Deposition
Predicted by CALPUFF for the Baseline Scenario**

| Deposition Parameter | Baseline | Application | Planned Development |
|---|----------|-------------|---------------------|
| Maximum Annual Average Deposition in the AQRSA (keq H ⁺ /ha/y) | 13.13 | 13.13 | 13.24 |
| Maximum Annual Average Deposition in the AQLSA (keq H ⁺ /ha/y) | 0.59 | 0.60 | 0.63 |
| Area above 0.17 keq H ⁺ /ha/y (ha) | 3 090 | 3 112 | 4 058 |
| Area above 0.22 keq H ⁺ /ha/y (ha) | 2 006 | 2 016 | 2 713 |
| Area above 0.25 keq H ⁺ /ha/y (ha) | 1 683 | 1 687 | 2 184 |
| Area above 0.50 keq H ⁺ /ha/y (ha) | 633 | 634 | 734 |
| Area above 1.00 keq H ⁺ /ha/y (ha) | 297 | 297 | 324 |

**Table B5-6: CALPUFF Predicted
One-Degree Averaged Potential Acid Input (PAI) Values**

| Latitude (°) | Longitude (°) | Baseline (keq H ⁺ /ha/y) | Application (keq H ⁺ /ha/y) | Planned Development (keq H ⁺ /ha/y) |
|--------------|---------------|-------------------------------------|--|--|
| 109 | 54 | 0.037 | 0.037 | 0.042 |
| 110 | 54 | 0.064 | 0.065 | 0.073 |
| 111 | 54 | 0.046 | 0.046 | 0.053 |
| 112 | 54 | 0.030 | 0.030 | 0.034 |
| 109 | 55 | 0.084 | 0.085 | 0.106 |
| 110 | 55 | 0.177 | 0.215 | 0.256 |
| 111 | 55 | 0.122 | 0.127 | 0.162 |
| 112 | 55 | 0.066 | 0.066 | 0.079 |
| 109 | 56 | 0.113 | 0.113 | 0.136 |
| 110 | 56 | 0.215 | 0.215 | 0.271 |
| 111 | 56 | 0.311 | 0.311 | 0.381 |
| 112 | 56 | 0.151 | 0.151 | 0.175 |
| 113 | 56 | 0.094 | 0.095 | 0.106 |
| 109 | 57 | 0.115 | 0.115 | 0.127 |
| 110 | 57 | 0.282 | 0.282 | 0.305 |
| 111 | 57 | 1.356 | 1.357 | 1.444 |
| 112 | 57 | 0.165 | 0.165 | 0.183 |
| 113 | 57 | 0.058 | 0.058 | 0.064 |
| 109 | 58 | 0.074 | 0.074 | 0.081 |
| 110 | 58 | 0.102 | 0.102 | 0.111 |
| 111 | 58 | 0.094 | 0.094 | 0.102 |
| 112 | 58 | 0.057 | 0.057 | 0.063 |
| 113 | 58 | 0.035 | 0.035 | 0.038 |
| 109 | 59 | 0.032 | 0.032 | 0.035 |
| 110 | 59 | 0.045 | 0.045 | 0.049 |
| 111 | 59 | 0.045 | 0.045 | 0.049 |
| 112 | 59 | 0.035 | 0.035 | 0.037 |
| 113 | 59 | 0.023 | 0.023 | 0.024 |



Table B5-7: Annual Nitrogen Deposition Predicted by CALPUFF

| Deposition Parameter | Baseline | Application | Planned Development |
|--|-----------------|--------------------|----------------------------|
| Maximum Annual Average Deposition in the AQRSA (kg/ha/y) | 172 | 172 | 174 |
| Maximum Annual Average Deposition in the AQLSA (kg/ha/y) | 4.1 | 4.1 | 4.5 |
| Area above 5 kg/ha/y (ha) | 676 | 676 | 779 |
| Area above 10 kg/ha/y (ha) | 344 | 344 | 366 |
| Area above 15 kg/ha/y (ha) | 239 | 239 | 254 |
| Area above 20 kg/ha/y (ha) | 162 | 162 | 173 |

2.0 LITERATURE CITED

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