**2023**

**Air Quality Monitoring Results**

**Air Quality Health Index (AQHI) Ratings**

The AQHI is calculated by the Government of Alberta using data collected at FAP air monitoring stations. The AQHI is a measure of air quality as it pertains to human health. AQHI levels are categorized as low, moderate, high, or very high risk. Risk to health increases as the index level rises. Go to [our website’s AQHI page](http://www.fortair.org/monitoring/health-index/) for more information. Seven of FAP’s 10 continuous air monitoring stations monitor substances whereby the AQHI can be calculated.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **FAP – 2023** | | **Risk Level (% of time in each)** | | | |
| **Station Name** | **Hours Monitored** | **Low** | **Moderate** | **High** | **Very High** |
| Bruderheim | **8486** | **83.93%** | **13.30%** | **1.89%** | **0.88%** |
| Elk Island | **8526** | **86.03%** | **10.22%** | **2.78%** | **0.97%** |
| Fort Saskatchewan | **8406** | **76.21%** | **19.47%** | **3.06%** | **1.26%** |
| Gibbons | **8361** | **81.90%** | **14.40%** | **3.03%** | **0.67%** |
| Lamont | **8523** | **84.96%** | **11.76%** | **2.71%** | **0.57%** |
| Redwater | **8315** | **85.35%** | **10.73%** | **2.65%** | **1.27%** |
| Thorhild County\* | **6624** | **86.22%** | **9.28%** | **2.40%** | **2.10%** |
| **Total Hours** | **57241** | **47760** | **7350** | **1517** | **614** |

**Hours with a High or Very High Risk AQHI Rating**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Event Dates | FAP Continuous Air Quality Monitoring Station  Event  Cause | | | | | | | | | | | | | | | |
| Event Dates | **Bruderheim** | | **Elk Island** | | **Fort Sask.** | | **Gibbons** | | **Lamont** | | **Redwater** | | **Thorhild County\*** | | **Total Hours** | **Attributed Cause** |
| High Risk | Very High Risk | High Risk | Very High Risk | High Risk | Very High Risk | High Risk | Very High Risk | High Risk | Very High Risk | High Risk | Very High Risk | High Risk | Very High Risk |
| Jan 1 |  |  |  |  | 1 |  |  |  |  |  |  |  |  |  | 1 | Wintertime inversion |
| Jan 4 |  |  | 1 |  |  |  |  |  |  |  |  |  |  |  | 1 | Wintertime inversion |
| Jan 9 10,11 | 15 | 3 | 21 |  | 23 |  | 5 |  | 12 |  |  |  |  |  | 79 | Wintertime inversion |
| Jan 15 |  |  |  |  |  |  | 1 |  |  |  |  |  |  |  | 1 | Wintertime inversion |
| Mar 19,20,21 |  |  | 2 |  | 14 |  | 8 |  |  |  | 4 |  |  |  | 28 | Wintertime inversion |
| Nov 11 |  |  |  |  |  |  | 1 |  |  |  |  |  |  |  | 1 | Wintertime inversion |
| Apr 1 |  |  |  |  | 1 |  |  |  |  |  |  |  |  |  | 1 | Regional meteorology conditions |
| May 16-23 | 12 | 60 | 32 | 42 | 34 | 58 | 37 | 19 | 29 | 35 | 20 | 56 | 19 | 54 | 507 | Wildfire smoke and summer- time smog |
| May 27-28, 31 | 3 |  | 3 |  | 1 |  | 2 |  | 6 |  |  |  |  |  | 15 | Wildfire smoke |
| June 7-9 | 7 |  | 20 |  | 16 |  | 11 |  | 12 |  | 5 |  | 5 |  | 76 | Wildfire smoke and summer- time smog |
| Jun 10-16 | 4 |  | 18 |  | 24 |  | 31 |  | 29 | 1 | 40 |  | 24 |  | 171 | Wildfire smoke |
| Jun 19 |  |  | 2 |  | 2 |  |  |  | 1 |  | 1 |  |  |  | 6 | Wildfire smoke |
| Jun 29 |  |  |  |  |  |  |  |  | 2 |  |  |  |  |  | 2 | Summer-time smog |
| Jul | 51 | 12 | 60 | 26 | 60 | 22 | 56 | 22 | 72 | 13 | 60 | 29 | 38 | 48 | 569 | Wildfire smoke and summer- time smog |
| Aug | 3 |  | 4 |  | 17 |  | 18 |  | 7 |  | 20 |  | 11 |  | 80 | Wildfire smoke and summer- time smog |
| Sept | 65 |  | 74 | 15 | 64 | 26 | 84 | 15 | 61 |  | 67 | 20 | 60 | 37 | 588 | Wildfire smoke |
| Jul 2 |  |  |  |  |  |  |  |  |  |  | 3 | 1 |  |  | 4 | Structure fire |
| Sep 18,25 |  |  |  |  |  |  |  |  |  |  |  |  | 2 |  | 2 | Agriculture operations |
| Total Hours | 160 | 75 | 237 | 83 | 257 | 106 | 254 | 56 | 231 | 49 | 220 | 106 | 159 | 139 | 2132 |  |

*\* The FAP Keith Purves Portable station operated in Thorhild County near Newbrook from February 1 to December 31, 2023.*

**Summary of Exceedances**

Air quality measurements are compared continuously to 1, 24-hour and 3-day [Alberta Ambient Air Quality Objectives](https://www.alberta.ca/ambient-air-quality-objectives.aspx) (AAAQO). Any exceedance of an AAAQO is reported to the Alberta Government and the likely cause of the exceedance investigated. The following table details what substances exceeded an AAAQO, when they occurred and if it can be determined, the likely cause.

|  |  |  |  |
| --- | --- | --- | --- |
| One Hour Exceedances | | | |
| Parameter | **Exceedances** | **Date** | **Attributed Cause** |
| PM2.5 | 1 | January 4 | Wintertime inversion |
| Ethylene | 1 | January 9 | Industry coupled with wintertime inversion |
| PM2.5 | 47 | January 9-11 | Wintertime inversion |
| PM2.5 | 1 | January 15 | Wintertime inversion |
| Ozone | 3 | March 20 | Regional meteorological conditions |
| Benzene | 3 | May 12-15 | Under Investigation |
| PM2.5 | 393 | May 16-23 | Wildfire smoke |
| H2S | 1 | May 25 | Undetermined |
| Ozone | 7 | May 19,21 | Wildfire smoke and summertime smog |
| Ozone | 8 | May 27,28 | Wildfire smoke and summertime smog |
| PM2.5 | 101 | June 8-19 | Wildfire smoke |
| Ozone | 28 | June 4-13 | Wildfire smoke and summertime smog |
| Ozone | 1 | June 29 | Summertime smog |
| Benzene | 18 | Jul 21,22,24 Aug 3, Sep 2,8,9,10,11,13 | Under Investigation |
| H2S | 1 | August 6 | Natural due to wetlands |
| H2S | 2 | September 25 | Undetermined |
| Ozone | 1 | August 6 | Summertime smog |
| Ozone | 1 | August 28 | Wildfire smoke and summertime smog |
| PM2.5 | 1253 | July (545 over 6 days),  August (90 over 3 days)  September (618 over 12 days) | Wildfire smoke |
| PM2.5 | 4 | July 2 | Structure fire |
| Styrene | 1 | July 9 | Under Investigation |
| PM2.5 | 2 | September 19, 25 | Agricultural operations |
| H2S | 3 | October 29 | Undetermined |

|  |  |  |  |
| --- | --- | --- | --- |
| 24-Hour Exceedances | | | |
| Parameter | **Exceedances** | **Date** | **Attributed Cause** |
| PM2.5 | 1 | January 4 | Wintertime inversion |
| PM2.5 | 20 | January 8-11 | Wintertime inversion |
| PM2.5 | 4 | January 14-15 | Wintertime inversion |
| PM2.5 | 5 | March 20 | Wintertime inversion |
| PM2.5 | 2 | April 1 | Regional meteorological conditions |
| PM2.5 | 35 | May 16-25 | Wildfire smoke |
| PM2.5 | 6 | June 2-3 | Wildfire smoke |
| PM2.5 | 45 | June 8-14 | Wildfire smoke |
| PM2.5 | 3 | June 16 | Wildfire smoke |
| PM2.5 | 64 | 12 days in July | Wildfire smoke |
| PM2.5 | 41 | 7 days in August | Wildfire smoke |
| PM2.5 | 64 | 12 days in September | Wildfire smoke |
| H2S | 1 | October 29 | Undetermined |

|  |  |  |  |
| --- | --- | --- | --- |
| 3-Day Exceedances | | | |
| Parameter | **Exceedances** | **Date** | **Attributed Cause** |
| Ethylene | 1 | January 7-9 | Industry coupled with wintertime inversion |
| Ethylene | 2 | January 8-10 | Industry coupled with wintertime inversion |
| Ethylene | 2 | January 9-11 | Industry coupled with wintertime inversion |
| Ethylene | 1 | January 10-12 | Industry coupled with wintertime inversion |

Summary Exceedances: 2018-2023

The following table details the number of exceedances for substances measured by FAP across all stations in 2023 and the five years previous.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Parameter Measured** | | **2023** | **2022** | **2021** | **2020** | **2019** | **2018** |
| **Ammonia (NH3)** | 1-hr | - | - | - | - | - | - |
| **Benzene (C6H6)** | 1-hr | 24 | - | - | - | - | - |
| **Carbon Monoxide (CO)** | 1-hr | - | - | - | - | - | - |
| 8-hr | - | - | - | - | - | - |
| **Ethyl Benzene (C6H5CH2CH3)** | 1-hr | - | - | - | - | - | - |
| **Ethylene (C2H4)** | 1-hr | 1 | - | - | - | - | - |
| 3-day | 6 | - | - | - | - | - |
| Annual | - | - | - | - | - | - |
| **Fine Particulate Matter**  **(PM2.5)** | 1-hr | 1745 | 118 | 393 | 6 | 119 | 810 |
| 24-hr | 290 | 53 | 60 | 19 | 38 | 117 |
| **Hydrogen Sulphide (H2S)** | 1-hr | 7 | 19 | 16 | 7 | 9 | 20 |
| 24-hr | 1 | 1 | 1 | 1 | 1 | 4 |
| **Nitrogen Dioxide (NO2)** | 1-hr | - | - | - | - | - | - |
| 24-hr | - | - | - | - | - | - |
| Annual | - | - | - | - | - | - |
| **Ozone (O3)** | 1-hr | 49 | 3 | 3 | - | 24 | 6 |
| **Styrene (C8H8)** | 1-hr | 2 | - | - | - | - | - |
| **Sulphur Dioxide (SO2)** | 1-hr | - | - | - | - | - | - |
| 24-hr | - | - | - | - | - | - |
| 30-day | - | - | - | - | - | - |
| Annual | - | - | - | - | - | - |
| **Toluene (C6H5CH3)** | 1-hr | - | - | - | - | - | - |
| **Xylenes (o-, m- and p- isomers)** | 1-hr | - | - | - | - | - | - |
| **Total** |  | **2125** | **194** | **473** | **33** | **191** | **957** |