State Climate and Ozone Status and Objectives

John Putnam,
Director of Environmental Programs
Lead air quality planning agency for the Denver Metro and North Front Range* Nonattainment Area.

Standards in Nonattainment For:
- 2008 (75 ppb) 8-Hour Ozone
- 2015 (70 ppb) 8-Hour Ozone

Standards in Attainment For:
- Previous Ozone Standards
  - 1-Hour (125 ppb)
  - 1997 8-Hour (84 ppb)
- All Other National Ambient Air Quality Standards (NAAQS)

*Lead agency for ozone planning for the North Front Range region.
How Ozone Is Formed

Volatile Organic Compounds (VOCs)

Nitrogen Oxides ($\text{NO}_x$)

Biogenic

Area

Mobile

Off-road

Point

Source: www.montgomerycountymd.gov/DEP/Resources/Images/outreach/air/ozoneformation.jpg

September 6, 2019
### 2019 4th-Maximum 8-Hour Ozone Values

<table>
<thead>
<tr>
<th>Monitor</th>
<th>2019 4th Max (ppb)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chatfield State Park</td>
<td>78</td>
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<tr>
<td>NREL</td>
<td>75</td>
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<tr>
<td>Highland</td>
<td>73</td>
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<td>Welch</td>
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<td>Rocky Flats</td>
<td>72</td>
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<tr>
<td>Fort Collins - West</td>
<td>71</td>
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<td>Boulder Reservoir</td>
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<td>CAMP</td>
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<td>Blackhawk¹</td>
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<td>Aurora East</td>
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<td>Greeley - Weld Tower</td>
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<td>La Casa</td>
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<td>Fort Collins - CSU</td>
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<td>Aspen Park</td>
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<tr>
<td>Welby</td>
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* Data current as of 08/25/2019
** Orange Exceeds 2008 Standard
*** Yellow Exceeds 2015 Standard

*Blackhawk monitor began operating July 3, 2019

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**Note:**
- DV = 4th Max value for 2019
- 8 = North Front Range Metropolitan Planning Organization (NFRMPO)
- = Denver Regional Council of Governments (DRCOG)
- = 8-Hour Ozone 2008 Standard Nonattainment Area

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**September 6, 2019**
2017-2019 Three-Year Average of 4th Max

<table>
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<th>Monitor</th>
<th>Design Value (ppb)</th>
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* Data current as of 08/25/2019

1 Orange Exceeds 2008 Standard
2 Yellow Exceeds 2015 Standard

* = North Front Range Metropolitan Planning Organization (NFRMPO)

DV = 3-Year Average (2017-2019)

= North Front Range Metropolitan Planning Organization (NFRMPO)

= Denver Regional Council of Governments (DRCOG)

= 8-Hour Ozone 2008 Standard Nonattainment Area

= Data current as of 08/25/2019

= North Front Range Metropolitan Planning Organization (NFRMPO)

September 6, 2019
3-Year Design Values in the Denver Metro/North Front Range

8-Hour Ozone Standard: Based on a three-year average of the annual fourth-highest daily 8-hour maximum ozone concentration.
*Current as of 9/5/19.
Sources of VOC Emissions - What is Being Done?

2017 VOC Sources (349 tpd)

- Oil and Gas (154 tpd)
- Emissions Reduced (2011 to 2017) (170 tpd)
- On-Road (55 tpd)
- Non-Road (44 tpd)
- Area (68 tpd)
- Point (28 tpd)

- ✓ New car/truck standards
- ✓ Cleaner fuels/Alternative fuels
- ✓ Inspection/maintenance programs
- ✓ New vehicle technologies
- ✓ Transportation/land use policies
- ✓ Travel reduction programs
- ✓ Oil and Gas (O&G)
  - New regulations established by Air Quality Control Commission in Feb. 2014
- ✓ Lawn and garden equipment change-out programs
Sources of NO\textsubscript{X} Emissions - What is Being Done?

2017 NO\textsubscript{X} Sources (234 tpd)

- Emissions Reduced (2011 to 2017) (86 tpd)
- Oil and Gas (66 tpd)
- Point (40 tpd)
- On-Road (73 tpd)
- Non-Road (55 tpd)

✓ New car/truck standards
✓ Cleaner fuels/ Alternative fuels
✓ Inspection/maintenance programs
✓ Diesel retrofits
✓ New vehicle technologies
✓ Transportation/land use policies
✓ Travel reduction programs
✓ Power Plants
  • *Clean Air Clean Jobs Act*
  • *Regional Haze program*
  • *Renewable energy/ energy efficiency programs*
✓ Small engine standards
✓ Non-road engine standards
✓ Locomotive engine standards
✓ Emissions Standards for Large Engines and Boilers
Ozone Planning Timeline

**75 ppb Standard**

- **Attainment Years - Serious**
- **Reclassification to Serious**
- **Serious SIP Due**
- **Serious Attainment Deadline**
- **Reclassification to Severe**

**70 ppb Standard**

- **Initial Marginal Classification**
- **Marginal Inventory Due**
- **Reclassification to Moderate**
- **Marginal Attainment Deadline**
- **Moderate SIP Due**
- **Moderate Attainment Deadline**

**Attainment Years - Moderate**

- **2018**
- **2019**
- **2020**
- **2021**
- **2022**
- **2023**
- **2024**
- **2025**

Today
2017 NREL – CO SOURCE & REGION CONTRIBUTIONS

Total Ozone for Top 10 Days = 70.7 ppb
Colorado GHG Emissions by Sector with Projections to 2030

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<td>4.2</td>
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<td>127.0</td>
<td>118.2</td>
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THANKS!

More questions?
John Putnam
John.putnam@state.co.us