Data Source

• For Emissions, NM OCD Production Database, “Other Volumes”
  • Data is reported by as a lump sum grouped by Operator, Property ID, Year, Month, and type of emission (flared, vented, used on lease, lost, etc)
  • For work to date we focus on flared and vented data from 2015-2019

• For Production, NM OCD Production & GIS Databases, various tables incl. oil & gas production, well locations, well information
Data Methods

• For most analyses, Property ID is the most granular we could get.*
• Property ID does not have a geographical location attached, since there may be many “API’s” lumped into a given property. The “largest” property had associated APIs (556 active wells, 14 cancelled). Others have only 1 or no wells
• For mapping, Centroid of locations of all associated APIs was used to create a single property location. Could use a variety of criteria to further refine (eg., centroid for flared properties vs vented, all APIs vs only active wells, etc)
Results – Flaring Trends

- Flaring generally increases towards year end
- Quite a bit of month to month variation
- Flaring generally follows completions or lags slightly (Slide 16 of previous presentation)
Results – Venting Trends

- Venting less volume, larger impact
- Any trend seems to decline during year
- Quite a bit of month to month variation
- Does not seem to be a correlation with completions (Slide 16 of previous presentation)
Venting by Size of Event
Flaring by Size of Event
2016 flared

- <0.10: All - 122
- 0.1-0.5: All - 157
- 0.5-1: All - 87
- 1-2.5: All - 147
- 2.5-5: All - 108
- 5-10: All - 107
- 10-25: All - 125
- 25-50: All - 82
- 50-75: All - 26
- 75-100: All - 16
- 100-250: All - 30
- >250: All - 10

Legend:
- All
- D1
- D2
- D3
2018 flared

- <0.10: 149
- 0.1-0.5: 250
- 0.5-1: 142
- 1-2.5: 205
- 2.5-5: 188
- 5-10: 150
- 10-25: 180
- 25-50: 90
- 50-75: 37
- 75-100: 25
- 100-250: 52
- >250: 21

Legend:
- All
- D1
- D2
- D3
Cumulative Production Compared to Emissions
District 2 Cum Production vs Emissions

- Cum Gas (MMCF)
- Cum Flared (MMCF)
- Cum Oil (MBO)
- Cum Vented (MMCF)
District 3 Cum Production vs Emissions

- Cum Oil (MBO)
- Cum Flared (MMCF)
- Cum Vented (MMCF)
- Cum Gas (MMCF)
Mapped Vent and Flare Events
Mapping Vented Gas

- Vented Gas is greatly reduced in NW NM through 2014-2019
- Vented Gas is greatly increased in SE NM through 2014-2019
Mapping Vented Gas

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- Vented Gas is greatly increased in SE NM through 2014-2019
Mapping Vented Gas

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Mapping Vented Gas

- Vented Gas is greatly reduced in NW NM through 2014-2019
- Vented Gas is greatly increased in SE NM through 2014-2019
Mapping Flared Gas

- Flared gas slightly increases in NW NM through 2014-2019
- Flared gas is greatly increased in SE NM through 2014-2019
Mapping Flared Gas

- Flared gas slightly increases in NW NM through 2014-2019
- Flared gas is greatly increased in SE NM through 2014-2019
Mapping Flared Gas

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Mapping Flared Gas

- Flared gas slightly increases in NW NM through 2014-2019
- Flared gas is greatly increased in SE NM through 2014-2019
District 1
District 1
Flared
District 1
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District 1 Vented (detail)
District 2
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District 2
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(detail)
District 2
Vented
(detail)
District 2
Vented
(detail)
District 2
Vented
(detail)
District 2 Vented (detail of northern part)

*not animated*
District 3
District 3
Flared very little flaring
District 3
Flared
very little
flaring
District 3
Flared
very little
flaring
District 3
Flared
very little
flaring
District 3
Flared
very little flaring
District 3
Vented
District 3
Vented
District 3
Vented
District 3
Vented
District 3
Vented
Data Issues

• Data quality needs improved - properties have no explicit spatial data so the boundaries or a median location can be inferred but this has issues*

• Should we include all APIs or just active wells?

• Data is only by property, so we don’t really know which well(s) would be involved

• Are there emissions from properties that don’t have wells (ie., other types of infrastructure) - and are these in that data set?
Future Work?

• We can do more with this data set if the MAP is so inclined
• We can draw bubble maps for individual flare and venting areas/months to determine if there are problem areas. For example, Cedar Lake has high emissions - can we figure out why
• We could mine the C-115 data along with other well files to see if particular types of processes contribute more to venting than others
• Tie data to OGRID (Plot using proxy ID’s)
• Something else?