

**WRAP – Oil and Gas Work Group
Call Agenda & Notes**

Tuesday, October 8, 2019 (90 minutes)
10:00 am (AK), 11:00 am (PT), Noon (MT), 2:00 pm (ET)

1. Welcome/Introductions (Amanda Brimmer)

- a. Rotating Call Note Taker – Andrea Stacy
- b. Roll Call - Amanda Brimmer, Curt Taipale, Angela Seligman, David Stroh, Mark Jones, Sheila Vance, Sharay Dixon, Erik Vernon, Jennifer Snyder, Leslie Vaculik, Ann Mebane, Collins Catherine, Debbie Miller, Andrea Stacy, Ryan Templeton, Jay Baker, Mike Barna, Tom Moore, Mary Uhl, John Grant, Barkley Sive

2. Review Agenda (Amanda Brimmer)

3. Announcements

- a. *October 1 OGWG Analysis and Planning work outreach session (Tom Moore)*
Thank you to all who participated.
- b. *MJO 2016 Platform Collaborative Effort (Tom Moore)*

Notes: Work by folks at OAQPS, WESTAR/WRAP & states involved in sector workgroups. Robust process, they are working to integrate work of WRAP OGWG into national platform. 2016 alpha platform, developed from 2014. 2016 beta platform includes 2028 projections & supports national regional haze modeling. Working across all sectors to develop v1 2016 platform available in October. Will be available on the data warehouse.

Questions: Oil and gas inventory portion not incorporated into V1 yet? A: Correct, it will be incorporated as modular pieces to plug into V1 platform.

- c. *Other announcements from work group members / advisors*

NM moving forward with developing and submitting comments on proposed new changes to OOOO and OOOOa. CO will be commenting on the federal reg. revision as well.

4. OGWG Road Map Phase II (John Grant & Amnon Bar-Ilan – Ramboll Environ)

Slide 3 – Baseline inventory overview. All info available on WRAP OGWG webpage. Corrections to Williston Basin casinghead gas estimates. SMOKE inputs developed from the 2014 inventory for WRAP modeling.

a. *Task 2 - Forecast Scenarios (OTB & OTW controls)*

Slide 4: now calling scenario 1 “continuation of historical trends.” Draft report released September 20th. Received comments from numerous agencies including states, BLM and NPS.

Will be updating the future activity forecasts for the ND portion of Williston basin based on input from ND that activity may be higher than predicted in draft. No changes will be made to estimates in MT, this is based on geology of the basin dictating where development is occurring.

There will be additional updates to the draft future year inventory based on comments from CO, ND, & BLM. NPS made similar comments re: activity forecasts, but data available at the time went through 2017 and forecasts are based on averages – methods will be better explained in the report. No additional updates to the inventory will be made based on NPS comments.

Plan to complete the final inventory, report and SMOKE-ready inventory file by the end of this week.

b. *Task 3 - Forecast Scenarios (Additional Reasonable controls)*

Slide 5: Developing Scenarios 2&3 (low and high scenario). Reports for these scenarios will be ready for review in November timeframe.

Slide 6: Control scenario report: Will look at additional reasonable controls for O & G sources with substantial NOx emissions. Addresses sources that fall under the purview of state permitting programs (i.e., not drill rigs and fracturing engines). Deliverable available in November. Methodology will be a tool kit for states to use when assessing four statutory factors and provide decision framework for emission control decisions. Regionally consistent control matrix for regional haze planning. There may be other what-if factors that FLMs or states want to look at (i.e., mobile drill rig and completion engines).

c. *Task 4 - Agency Program Review*

Emphasis on describing state and local programs. Existing 2013 comprehensive write up of state oil and gas programs – outline for new report will use 2013 report as starting point. Intend to develop outline for what agency program document will include. Will be asking each agency for input on their programs in the November time frame. Be on the lookout for this.

Questions: None.

d. *Status, Schedule, & Looking Ahead*

5. **National Park Service Monitoring Studies (Barkley Sive – NPS ARD)**

High level overview of Carlsbad Caverns 6 week air monitoring field campaign. Presenting preliminary data today – not finalized.

Slide 2: Study Objectives: NO_x budgets, contributions to ozone formation, contributions to aerosol formation.

Slide 3: Study location – Carlsbad Caverns NP & some monitoring at Guadalupe Mountains NP.

Slide 4: Ozone exceedances in region: City of Carlsbad falls in third place in terms of the number of ozone exceedances in 2019; rural area but ozone exceedances similar to larger metropolitan areas. Study question: what is driving this high ozone in the Carlsbad region?

Slide 5: Oil and gas activity in Permian. How does this affect air quality we are seeing?

Slide 7: Intensive air quality study. Comprehensive suite of gaseous and physical pollutant parameters.

Slide 8: Additional Measurement: Addition VOC canisters. Several precipitation events which affect canister measurements.

Slide 9: Instrumentation overview.

Slide 10 & 11: Temporal distributions. Grey shaded areas are those time periods where 8-hr ozone exceedances were observed. Ozone NAAQS is shown in dashed red line. Typically observed highest ozone levels when winds are out of SE. Very contrasting air masses when winds are out of the NW.

Slide 11: Methanol indicator of agriculture. Ethane is a robust oil and gas marker. Methyl ethyl ketone is a marker of photochemical processing. Ethyne is mobile source/combustion tracer.

Slide 12: Sample chromatogram trace of light hydrocarbons. Want to understand what is impacting air quality in park – pollutant mix. Shows extremely high levels of light hydrocarbons. It is a qualitative/quantitative look showing that light hydrocarbon mix (oil and gas) is dominating air mass in region. Average levels of these pollutants in Carlsbad area are orders of magnitude greater than background levels.

Slide 13: Comparison with 2017 results. Collected canister samples every third day over several months. Ethane at other sites is closer to background levels (e.g. Joshua Tree, Great Basin). VOC i/n-pentane ratios less than 1 indicative of strong oil and gas signature. Only way to shift i/n-pentane ratios is to shift the source signatures. Use

alkyl-nitrates and parent hydrocarbons to age the air mass that is impacting site – data shows that we are accurately aging air mass based on plots of alkyl-nitrates and parent hydrocarbons. Carlsbad NP air mass ages in 1-day time frame – these air masses are not being transported long distances – it appears local sources and local photochemistry are primarily affecting the park.

Slide 14: Winds transported predominately from SE during high PM2.5, ozone, ethane and NOy days.

Slide 15: Ozone enhancements - getting highest ozone levels when winds are from SE.

Slide 16: NOx enhancements. Highest levels again seen when wind from the SE. See signature of daytime traffic and typical diurnal profiles.

Slide 17: Time series of inorganic ions. Sulfate dominates mass. Often see Ca peak with SO4 in late evening in early mornings.

Slide 18 -20: Residence time plots - 2 day back trajectories for study period for hours. Slide 18, Left hand plot – 2 day back trajectories for study period for hours that correspond to peak ozone levels throughout entire study period. Right hand plot is overall RT for all ozone values.

Slide 19: Green stars are drill rigs active during study period. Ozone is coming from areas that are influenced by activity in region on highest ozone days.

Slide 20: HRTs for methane& ethane. Both methane (~10 year atmospheric lifetime) and ethane (few months atmospheric lifetime). Again shows air masses that are influencing park air quality are coming from SE. Air masses and AQ look very different when air comes from NW.

Slide 21: Summary. Multiple 8-hour ozone exceedances during study period. PM levels were also on the high end during campaign. Significant work remains, but suite of data should assist in understanding air quality at the park.

Questions:

Q: Any plans to work with anyone to get additional data or do a longer study (1-year or more)? A. NPS now has a long term regulatory monitor in the park. Short term intensive measurements are driven by funding and people.

How will it be made publically available for use in conjunction with reg data and is it flying under the radar? A: Area has been hovering under standard. Rig activity is high in SE region. Tony – also where highway 285. Are oil and gas commissions keeping track of rig activity and emissions in the area?

Q: Did you say there is not a FRM ozone monitor at Carlsbad Caverns? A: There is now.

Q: What are you doing to get buy-in from scientific community – are you pushing this out to other agencies? A: Still preliminary, but trying to be proactive in letting other agencies know what we are doing (e.g., EPA R6), want to reach out to state agencies. Hoping to disseminate widely. There have been a lot of studies on O & G but these were geared somewhat differently – NPS study is very comprehensive in terms of measurements and attempts to look at issue holistically.

Q: Carbone II plant in Mexico which came online in 1993 – are you looking at back trajectories from that? A: We haven't look that far and it is something else to think about. Guessing Carbone has not changed much since 1993, but given that we've seen dramatic changes in the last few years, we likely wouldn't point to that first. Additionally, in looking at photochemistry, we are seeing more rapid photochemical production, so speculating that most of issue is from near-by/local sources based on photochemical age of air masses observed.

Comment: It would be helpful to bring Texas to the next call to discuss oil and gas impacts.

6. Next Steps & Planning for Next Calls (Mark Jones)

- a. Next Call December 10, 2019 10:00 am (AK), 11:00 am (PT), Noon (MT), 2:00 pm (ET) – 90 minutes
- b. Volunteer Call Note Taker – volunteer needed
- c. Topics – Please provide any agenda items you have
- d. Website Posting OGWG Materials – www.wrapair2.org/OGWG.aspx