

# **OZONE IN THE UPPER GREEN RIVER BASIN ...A SUCCESS STORY?**

**Kelly Bott, SVP-ESG, Land & Regulatory**

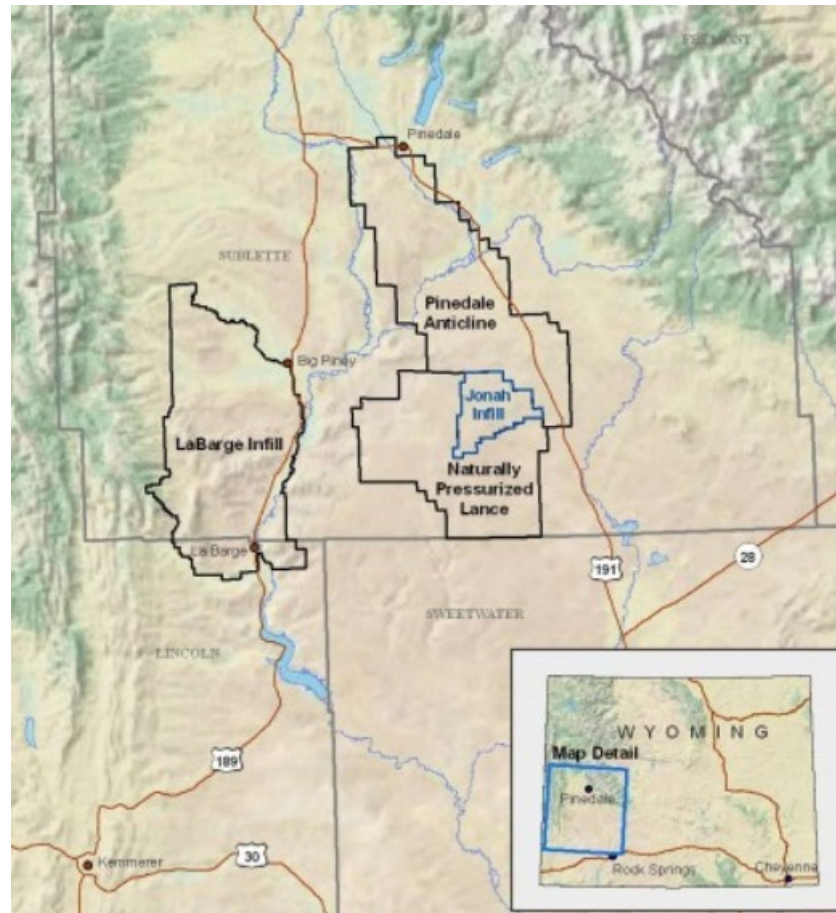
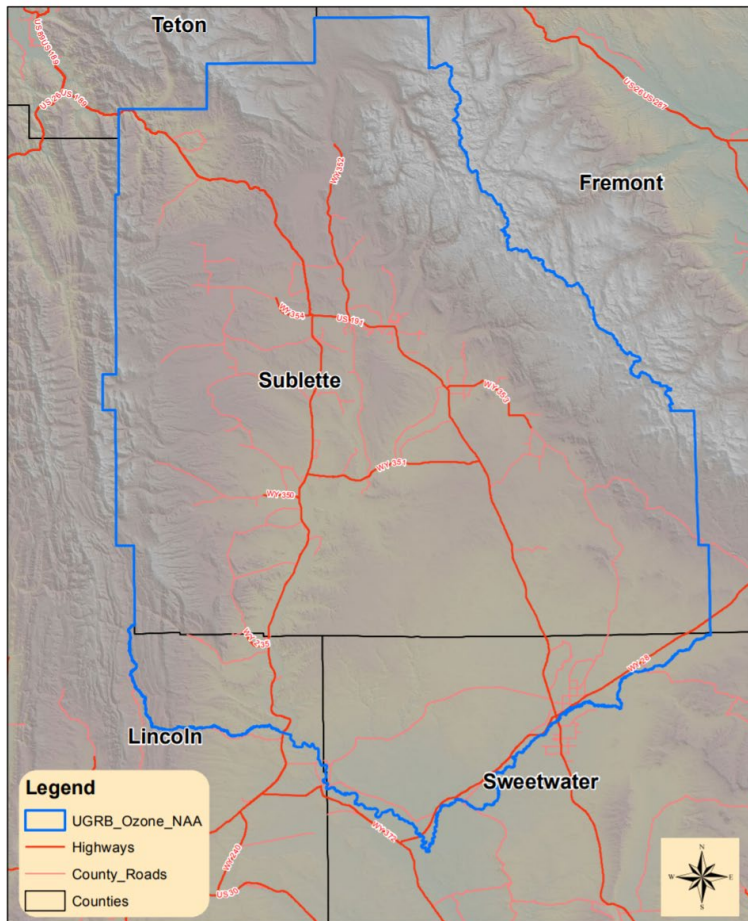
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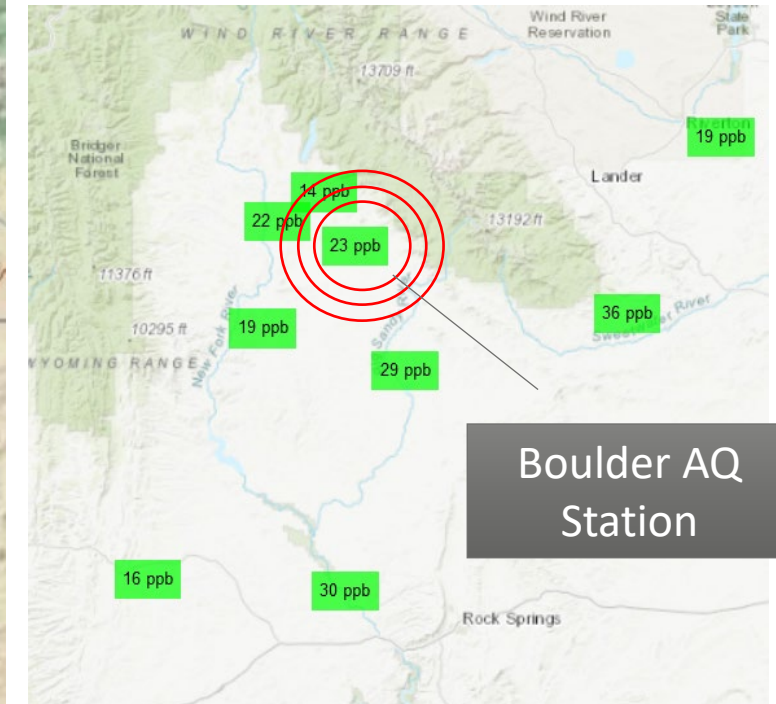
# Background

## OZONE NONATTAINMENT AREA IN RELATION TO OIL AND GAS PROJECTS AND WDEQ MONITORS

Ozone Nonattainment Area Boundary



### WDEQ Regulatory Monitoring Network





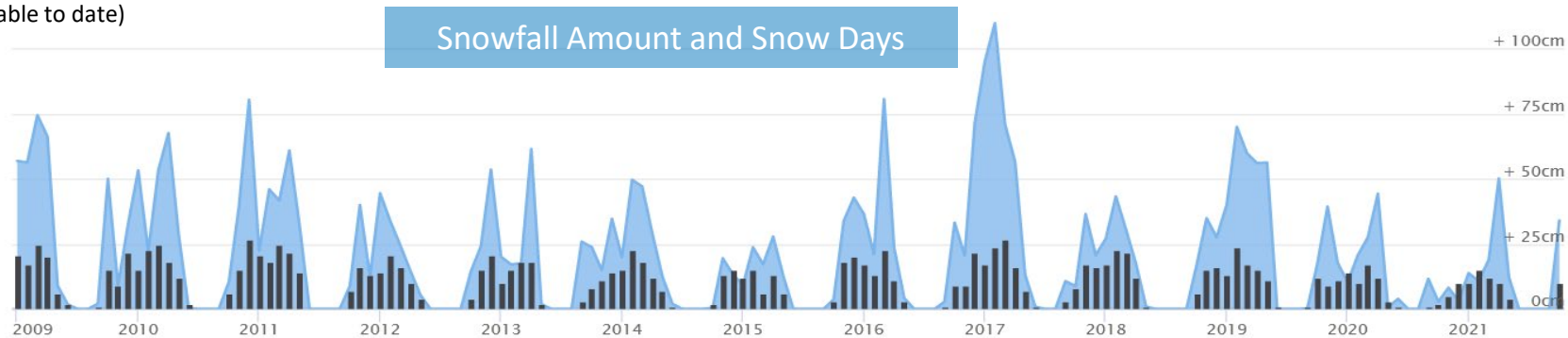
# Monitoring Data – Ozone

(standard: 4<sup>th</sup> high 8-hr daily max, currently 70 ppb)

[wyvisnet.com](http://wyvisnet.com)

Site	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021*	17-'19 avg	18-'20 Avg	19-'21 Avg
Boulder	101	66	67	108	70	61	60	55	57	75	55	85	69	60	72	70	71
Daniel	74	62	63	75	67	63	62	62	63	65	61	65	67	60	64	64	64
Pinedale		56	62	80	67	61	59	59	59	65	61	59	65	54	62	62	59
South Pass	66	83	69	69	71	62	65	63	63	64	64	67	66	59	65	66	64
Big Piney					68	64	60	59	65	66	61	60	67	59	62	63	62
Juel Spring			64	81	66	64	62	60	59	68	62	66	64	61	65	64	64

\*Based on validated data (available to date)

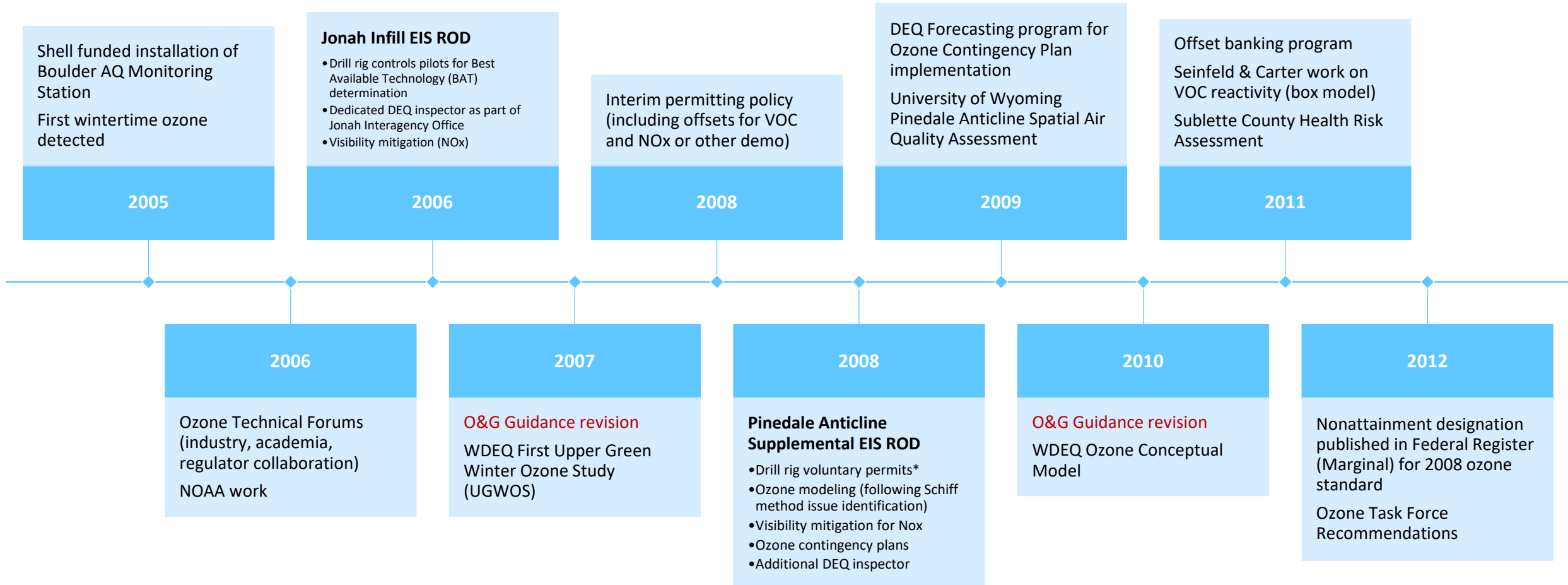


- Snow cover major factor...all years with exceedances had above average snow cover
- Ozone has become more localized to Boulder Station



# Leading up to Nonattainment Designation

## HIGH LEVEL TIMELINE





# Post-Designation Activities

## HIGH LEVEL TIMELINE

### O&G Guidance revision

Initial Ozone Strategy developed by DEQ (in response to task force recommendations)

General Conformity SIP revision

Expansion of Ozone Contingency Plan program

Rappenglueck Ozone Chemistry study

WDEQ Ozone modeling study

2013

Existing Source Rule development

WDEQ Produced water tank study

WDEQ first attempt at combustor study

2015

Existing Source Rule implementation date

Pinedale Anticline Mitigation and Monitoring Fund \$250k set aside for ozone

Area designated as attainment for 2015 ozone standard

2017

WDEQ/EPA Combustor Study v2, round 2

WDEQ Enhanced Maintenance Assurance (EMA) engine testing program

2020

2014

Ozone nonattainment emission inventory rule and SIP revision

2016

### O&G Guidance revision

WDEQ Ozone Advance letter

WDEQ Pond Study

2019

WDEQ/EPA Combustor Study v2, round 1  
Jonah Pinedale Industry Collaboration



### *MEASURES IMPLEMENTED PRIOR TO NONATTAINMENT DESIGNATION*

- Natural gas rig fleet or equipped with SCR technology on the rig engines to significantly reduce NOx emissions
- Installation of Liquids Gathering System
- Conversion of Saltwater Disposal facilities and Central Gathering Facilities to electricity where available
- Optical Gas Imaging (OGI) camera inspections
- Audio – Visual – Olfactory (AVO) inspections
  - Officially conducted quarterly if no camera inspection
  - Unofficially conducted every day at every facility



### *NEW AND ONGOING INITIATIVES TO FURTHER REDUCE EMISSIONS*

- Increased attention to and maintenance of pneumatic controllers (e.g., liquid level controllers)
- Increased surveillance of emissions sources (e.g., SCADA tracking and alarms)
- TrustWell Responsibly Sourced Gas initiative with stationary methane detection planned on all Phase 1 well pads (871 wells, ~40 pads)
- Refinements to Fugitive Emissions Monitoring program
  - Increased inspection frequency
  - Acquisition of new Optical Gas Imaging cameras
  - Inspections done by former lease operators for quick repairs
  - Achieving goal of quarterly OGI inspection of all facilities
- Elimination of pneumatics wherever possible (e.g., using automated well control or solar)
- Line heater bypasses
- Equipment consolidations
- Internal Audit program
- Voluntary participation in WDEQ and EPA studies (e.g., combustor study)
- Increased community outreach
- Internal ozone + met monitoring network
  - Research, not regulatory...want to understand how our day-to-day operations influence ozone given microclimate and terrain effects
  - Improvements to monitoring technology each year
  - Added community-based monitor in Boulder



## Ozone Contingency Measures

### *YEAR-ROUND MEASURES*

- Do not overfill fuel tanks when re-fueling and tighten fuel caps.
- Continue to stick to no-idling policy.
- Defer truck and equipment refueling to evening hours when possible and in a safe manner.
- Keep vehicles tuned up and tires properly inflated to increase mileage and reduce the need for refueling.
- Be vigilant about leak detection and ensure equipment is functioning properly. Report leaks detectable using sensory (sight, smell, hearing) immediately so that repairs can be made quickly.
- Use environmentally safe paints, cleaning products and other chemicals whenever possible.

### *SHORT-TERM MEASURES*

- Minimize the use of ancillary equipment (e.g., water pumps, portable light plants, portable generators).
- Postpone/reschedule the blow down of wells or equipment
- Postpone/reschedule non-critical vehicle trips and miles traveled to the field by PureWest employees and contractors.
- Defer and reschedule non-essential construction activities that involve the use of gasoline or diesel-powered construction equipment.
- Postpone all nonessential maintenance activities.





Kelly Bott  
[kbott@purewest.com](mailto:kbott@purewest.com)



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# 2020 ESG REPORT