TO: **Laura Peterson**
Southern Utah Wilderness Alliance

FROM: **Megan Williams**
Air Quality Consultant

DATE: **November 2, 2018**

RE: **Comments on the Air Quality Analysis for the December 2018 Competitive Oil and Gas Lease Sale Environmental Assessment (EA) in the Vernal Field Office, Dated September 2018, DOI-BLM-UT-G010-2018-0044-EA**

I have reviewed the September 2018 version BLM's December 2018 Competitive Oil and Gas Lease Sale EA for the Vernal Field Office. Based on my air quality experience, I believe the EA does not include an adequate analysis of air quality impacts. The air impact assessment included in the EA relies on the Air Resource Management Strategy (ARMS) Modeling Project – which shows significant impacts to air quality – and does not assess direct and indirect impacts from development of the proposed lease parcels. The EA does not provide a comprehensive assessment of the environmental and public health impacts resulting from an increase in air pollution in an area already impacted by the adverse effects of increasing development, as demonstrated by EPA's recent designation of portions of Duchesne and Uintah counties as 'nonattainment' for the 2015 ozone National Ambient Air Quality Standard (NAAQS). The predicted significant air quality impacts in the underlying ARMS analysis undercuts BLM's ability to provide a convincing justification for a Finding of No Significant Impact. Accordingly, the BLM should conduct a more specific analysis of development of the proposed leasing and prepare an Environmental Impact Statement in order to address concerns and uncertainties regarding potentially significant air quality impacts. This analysis must account for all past, present, and reasonably foreseeable development in the region. This analysis is mandated by the National Environmental Policy Act (NEPA) and Clean Air Act (CAA), as well as by the Federal Land Policy and Management Act (FLPMA). Without an analysis of this type, the BLM cannot know what the impacts of the proposed lease development will be on air quality, human health and the natural environment or whether the BLM will prevent significant deterioration of air quality, as required by the CAA.

BLM must put forth an alternative that ensures no significant air quality impacts and full compliance with the CAA. This would include one that fully assesses whether there will be unacceptable health risks associated with criteria and hazardous air pollutant impacts, significant cumulative visibility impacts, or significant deterioration of air quality. BLM must also include enforceable mitigation measures designed to ensure no significant air quality impacts.

The EA fails to ensure protection against potential significant impacts and, further, fails to ensure that there are no violations of the applicable CAA requirements (*e.g.*, compliance with the National Ambient Air Quality Standards). BLM must fully assess the potential air quality impacts from the proposed development prior to issuance of a Finding of No Significant Impact (or prepare an Environmental Impact Statement to conduct that analysis). Without such an analysis, the BLM cannot justify a Finding of No Significant Impact. Put differently, if the BLM authorizes the proposed lease sale its actions will not ensure protection of air quality or ensure that impacts from development of the leases are constrained below NEPA's significance threshold, 40 C.F.R. § 1508.27. BLM must improve upon its air quality analysis and then must develop an alternative that ensures no significant air quality impacts. Attached are more detailed comments on the important elements this EA is lacking.

Attachment

ATTACHMENT

Detailed Air Quality Comments on the Vernal Field Office December 2018 Competitive Oil and Gas Lease Sale Environmental Assessment

BLM Must Conduct a Comprehensive Quantitative Analysis of Air Quality Impacts in Order to Satisfy National Environmental Policy Act Requirements and to Accurately Evaluate the Potential Impacts of Air Pollution on Human Health and the Environment

Under NEPA, the BLM has an obligation in this EA to "provide evidence and analysis for determining whether to prepare an environmental impact statement or a finding of no significant impact" where the determination of "significant" impacts includes an analysis of: (1) "the degree to which the proposed action affects public health"; (2) cumulative impacts; and (3) "whether the action threatens violation of Federal, State, or local law or requirements imposed for the protection of the environment". *See* 40 C.F.R. § 1508.27(b)(2), (7) and (10). Specifically, the BLM must ensure compliance with all Clean Air Act (CAA) requirements including compliance with the health-based National Ambient Air Quality Standards (NAAQS) and prevention of significant deterioration of air quality and adverse impacts on air quality related values, such as visibility.

BLM must also ensure all future resource management authorizations and actions conform to the approved Resource Management Plan (RMP). (43 U.S.C. § 1732(a) and 43 C.F.R. § 1610.5-3(a)).

BLM must also fulfill its obligations under NEPA to disclose whether the proposed leasing will cause significant impacts (*e.g.*, CAA violations), and to consider mitigation under NEPA, if needed—as part of an Environmental Impact Statement (EIS)—to prevent any such significant impacts. (40 C.F.R. § 1502.14(f), 40 C.F.R. § 1502.16(h)). If the BLM determines that an EIS is needed, that document "shall include discussions of: (h) [m]eans to mitigate adverse environmental impacts (if not fully covered under § 1502.14(f))" where "[m]itigation includes: (a) avoiding the impact altogether by not taking a certain action or parts of the action; (b) minimizing impacts by limiting the degree or magnitude of the action and its implementation." (40 C.F.R. § 1508.20). In short, the NEPA analysis should assess and report the direct, indirect and cumulative impacts of expected emissions from the proposed leasing on compliance with the NAAQS, prevention of significant deterioration (PSD) increments, and air quality related values (AQRVs), and identify means to mitigate significant environmental impacts, including violations of any CAA requirement, if necessary. (40 C.F.R. § 1508.9(a)(1) and 40 C.F.R. § 1508.9(b))

In its NEPA analysis, the BLM must also include a comprehensive analysis of cumulative effects, including effects of the proposed actions along with all past, present and reasonably foreseeable future actions on the affected environment. (40 C.F.R. §§ 1508.7 and 1508.27(b)(7)).

BLM has failed to meet these requirements of NEPA in this EA. Specifically, the EA does not include a detailed air quality dispersion modeling assessment of the direct impacts of the proposed action alternative on compliance with the NAAQS, on whether there will be significant deterioration of air quality and on whether there will be significant visibility impacts. Instead, the EA relies on the Air Resource Management Strategy Modeling Protocol (ARMS) analysis, which predicts significant ozone and $PM_{2.5}$ impacts throughout the Uinta Basin based on current and future development scenarios and does not ensure prevention of significant deterioration of air quality.

In the past, EPA has taken a strong position on the need for a comprehensive air quality analysis for the region prior to individual development projects. Specifically, in its comments on the modeling protocol for the Uinta Basin Air Quality Study the EPA stated that the BLM "has an obligation under NEPA to fully consider the reasonably foreseeable developments including proposed tar sands and oil shale activities that are likely in the next several decades, as well as the expansion of existing oil and gas operations *regardless of whether or not an application for drilling has been submitted to your office*." [1] (Emphasis added). This position does not support the BLM's approach of waiting until receiving project-specific requests before fully assessing air quality impacts.[2] BLM's approach in the EA is entirely inconsistent with NEPA's precautionary mandate to 'think first, then act.' Given the regional air quality concerns (discussed in more detail in the following section), it is imperative that the BLM include a detailed assessment of potential impacts from development of the proposed leasing.

The 2008 update to the Vernal Field Office Resource Management Plan (RMP) includes monitoring[3] and mitigation requirements,[4] which must be fully incorporated in the EA for leasing. And more broadly, the management plan includes the following air quality goals, objectives and management decisions which must be applied to any proposed leasing in the Vernal Field Office:[5]

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[1] February 8, 2008 letter from Larry Svoboda, EPA region 8, to William Stringer, BLM Vernal Field Office, Re: Draft Modeling Protocol for the Uinta Basin Air Quality Study, p. 1, included as Exhibit 1.

[2] *See, e.g.,* BLM EA at 27: "Should development on the parcels be proposed, and prior to authorizing specific proposed projects on the subject leases, emission inventories would need to be developed. Air quality dispersion modeling may also be required."

[3] *See, e.g.,* Final Vernal Record of Decision/Approved Resource Management Plan, Appendix Q, p. Q-3, October 2008.

[4] *See, e.g.,* Final Price Record of Decision/Approved Resource Management Plan, Appendix O, October 2008.

[5] Final Vernal Record of Decision/Approved Resource Management Plan, pp. 70-71, October 2008.

Goals and Objectives:

• Ensure that authorizations granted to use public lands and the BLM's own management programs comply with and support applicable local, state, and federal laws, regulations, and implementation plans pertaining to air quality.

Management Decisions:

AQ-1

Prescribed burns will be consistent with the Utah Department of Environmental Quality (UDEQ) permitting process and timed to minimize smoke impacts.

AQ-2

The BLM is required to be in compliance with all local, state, federal and tribal air quality regulations and will do so with Utah regulations, including Utah Administrative Code (UAC) Regulations as determined applicable by the State of Utah.

AQ-3

The BLM will be in compliance with sections R307-205-3 and R307-205-4 of the UAC that deal with fugitive dust and offer some dust abatement mechanisms.

AQ-4

UAC R446-1, the best air quality control technology, provided by the Utah Division of Air Quality (UDAQ), will be applied as needed to meet air quality standards.

AQ-5

The BLM will comply with UAC Regulations R307-205-5 through R307-205-7, which prohibit the use, maintenance, or construction of roadways without taking appropriate dust abatement measures. Compliance will be obtained through special stipulations as a requirement on new projects and through the use of dust abatement control techniques in problem areas.

AQ-6

The BLM will comply with the current Smoke Management Memorandum of Agreement (MOA) between the BLM, USFS, and UDAQ. The MOA (in accordance with UAC regulation R446-1-2.4.4), requires reporting size, date of burn, fuel type, and estimated air emissions from each prescribed burn.

AQ-7

The BLM will continue to work cooperatively with state, federal, and tribal entities in developing air quality assessment protocols to address cumulative impacts and regional air quality issues.

AQ-8

The BLM will continue to work cooperatively with the Utah Airshed Group to manage emissions from wildland and prescribed fire activities.

AQ-9

National Ambient Air Quality Standards (NAAQS) are enforced by the Utah Department of Environmental Quality, Division of Air Quality (UDEQ-DAQ), with EPA oversight. Special requirements to reduce potential air quality impacts will be considered on a case-by-case basis in processing land use authorizations.

AQ-10

The BLM will utilize BMPs and site specific mitigation measures, when appropriate, based on site specific conditions, to reduce emissions and enhance air quality. Examples of these types of measures can be found in the Four Corners Air Quality Task Force Report of Mitigation Options, November 1, 2007. A copy of the State of Utah letter regarding air quality mitigation strategies may be found in Appendix O.

AQ-11

Project specific analyses will consider use of quantitative air quality analysis methods (i.e. modeling), when appropriate as determined by the BLM, in consultation with state, federal, and tribal entities.

Given that the above objectives and goals are vague, non-binding and therefore unenforceable, it is important that any future leasing in these areas incorporate all of the specific and enforceable mitigation measures previously established in project-specific development in the area and through the cooperative adaptive management process that is ongoing in the Uinta Basin.

High Background Levels of Air Pollution in the Area Mean that Even Small Increases in Pollution Could Have Significant Impacts on Overall Air Quality in the Region

Given that the ambient background concentrations of several important pollutants in the area are at or exceed the NAAQS and leave little to no room for additional growth in

emissions, it is imperative that the BLM ensure that development of the proposed leases does not contribute to any exceedances of the NAAQS. For the BLM to propose an alternative in the EA that allows for growth in the emissions that contribute to existing air quality concerns does not conform with FLPMA's clear intent.

Ozone concentrations in the planning area continue to regularly exceed the NAAQS, short-term background concentrations of nitrogen dioxide (NO_2) in the area are higher than what is presented in the EA, particulate matter concentrations near oil and gas development continue to be a concern and visibility impairment is an ongoing issue at nearby Class I areas.

Ozone

The importance of protecting the air quality for those people who live in the region, most importantly for sensitive populations, including children, the elderly and those with respiratory conditions is great. Exposure to ozone is a serious concern as it can cause or exacerbate respiratory health problems, including shortness of breath, asthma, chest pain and coughing, decreased lung function and even long-term lung damage.[6] And in 2008 the National Academy of Sciences concluded, "short-term exposure to current levels of ozone in many areas is likely to contribute to premature deaths".[7]

EPA revised the 8-hour ozone standard from 80 parts per billion (ppb) to 75 ppb back in 2008 and in December 2014 proposed even stricter standards, between 60 and 70 ppb.[8] On October 1, 2015 EPA finalized a standard of 70 ppb, at the least protective end of the range recommended by EPA's independent scientific advisors.[9] The Clean Air Scientific Advisory Committee (CASAC) —appointed by the EPA Administrator to recommend revisions to the existing standards, per section 109(d)(2) of the Clean Air Act— recommended as early as 2008 that EPA substantially lower the 8-hour standard. At that time the EPA did not abide by the committee's recommendations. Specifically, the CASAC put forth a unanimous recommendation to lower the 8-hour standard from 80 ppb to somewhere between 60-70 ppb.[10] The committee concluded that there is no scientific justification for retaining the current 8-hour standard and that the EPA needs to substantially reduce the primary 8-hour standard to protect human health, especially

[6] *See* EPA's National Ambient Air Quality Standards for Particulates and Ozone, 62 FR 38,856 (July 18, 1997), included as Exhibit 3.
[7] *See* National Academy of Sciences April 22, 2008 Press Release, available online at http://www8.nationalacademies.org/onpinews/newsitem.aspx?RecordID=12198, and the full report from the National Research Council entitled Estimating Mortality Risk Reduction and Economic Benefits from Controlling Ozone Air Pollution published by the National Academies Press, 2008, available online at http://www.nap.edu/catalog.php?record_id=12198, included as Exhibit 4.
[8] *See* 79 FR 75234, December 17, 2014, included as Exhibit 5.
[9] 80 FR 65292, October 26, 2015, included as Exhibit 6.
[10] EPA-CASAC-LTR-07-001, Clean Air Scientific Advisory Committee's (CASAC) Peer Review of the Agency's 2nd Draft Ozone Staff Paper, October 24, 2006, included as Exhibit 7.

in sensitive populations. Again in 2010, the CASAC expressed its full support for lowering the NAAQS to within the 60-70 ppb range. The CASAC affirmed that, "in proposing this range, EPA has recognized the large body of data and risk analyses demonstrating that retention of the current standard would leave large numbers of individuals at risk for respiratory effects and/or other significant health impacts including asthma exacerbations, emergency room visits, hospital admissions and mortality."[11] Most recently, the CASAC again re-affirmed its recommended range of levels for the primary ozone standard of 70 ppb to 60 ppb but this time highlighted an important distinction in its most recent finding and advice regarding the upper end level of 70 ppb:

> At 70 ppb, there is substantial scientific evidence of adverse effects as detailed in the charge question responses, including decrease in lung function, increase in respiratory symptoms, and increase in airway inflammation. Although a level of 70 ppb is more protective of public health than the current standard, it may not meet the statutory requirement to protect public health with an adequate margin of safety.[12]

The CASAC went on to specifically recommend EPA set the level of the standard "*lower than* 70 ppb within a range down to 60 ppb" [*emphasis added*].[13] So, even ozone concentrations at levels as low as 60 ppb can be considered harmful to human health and the BLM must consider this when evaluating the air impacts from the proposed lease sale development, including by considering, in detail, an alternative in the EA pursuant to NEPA that would constrain impacts to a level lower than 70 ppb, regardless of EPA's current standard, as the BLM has a duty — independent of the CAA — to protect public health and the environment. Based on the recent monitoring data from the planning area, background concentrations of ozone are already at a level of concern with respect to health impacts. The EA discloses a 2015-2017 design value from the Ouray monitor of 88 ppb, over 125% of the NAAQS.[14] In addition, the most recent EPA design values for the Roosevelt (73 ppb) and Myton (77 ppb) monitors in Duchesne County and for the Dinosaur (72 ppb) and Redwash (75 ppb) monitors in Uintah County also exceed 70 ppb.[15] Monitors in the area have recorded numerous high values, as summarized in Table 1, below.[16]

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[11] EPA-CASAC-10-007, Review of EPA's proposed Ozone National Ambient Air Quality Standard, February 19, 2010, included as Exhibit 8.

[12] EPA-CASAC-14-004, CASAC Review of the EPA's *Second Draft Policy Assessment for the Review of the Ozone National Ambient Air Quality Standards*, June 26, 2014 at ii. Available online at: http://yosemite.epa.gov/sab/sabproduct.nsf/5EFA320CCAD326E885257D030071531C/$File/EPA-CASAC-14-004+unsigned.pdf, included as Exhibit 9.

[13] *Id.*

[14] BLM Air Quality and Green House Gas Specialist Report at 1

[15] EPA Design Value Report (July 24, 2018), https://www.epa.gov/air-trends/air-quality-design-values#report, included as Exhibit 10.

[16] EPA Monitor Values Reports 2015-2017, https://www.epa.gov/outdoor-air-quality-data/monitor-values-report, included as Exhibits 10a-10c.

Table 1: Recently Recorded High Ozone Concentrations at Monitors in the Area (Source: EPA AirData)
Note, current NAAQS = 70 ppb

Site	ID	Monitor Notes*	Year	1st High 8hr O_3 [ppb]	4th High 8hr O_3 [ppb]
Ouray	49-047-2003	FRM – Special Purpose	2011	139	116
			2012	74	70
			2013	141**	133**
			2014	91**	79**
			2015	71**	68**
			2016	120	96
			2017	111	103
			2015-2017 avg		*89***
Myton	49-013-7011	FRM – Tribal Monitor	2011	124	111
			2012	No data reported	
			2013	117	108
			2014	76	67
			2015	72**	66**
			2016	95	85
			2017	88	81
			2015-2017 avg		*77***
Price	49-007-1003	FRM – UDEQ Special Purpose	2011	73	67
			2012	76	73
			2013	66	64
			2014	66	65
			2015	74	69
			2016	68	67
			2017	67	65
			2015-2017 avg		*67*
Roosevelt	49-013-0002	FRM – UDEQ Special Purpose	2012	71	67
			2013	110	104
			2014	63	62
			2015	66	60
			2016	96	81
			2017	86	78
			2015-2017 avg		*73*
Redwash	49-047-2002	FRM – Special Purpose	2010	105	98
			2011	125	100
			2012	68	67
			2013	134**	112**
			2014	65**	61**

Site	ID	Monitor Notes*	Year	1st High 8hr O_3 [ppb]	4th High 8hr O_3 [ppb]
			2015	74**	67**
			2016	96	83
			2017	84	76
			2015-2017 avg		*75***
Vernal	49-047-1003	FRM – UDEQ SLAMS	2012	70	64
			2013	114	102
			2014	64	62
			2012-2014 avg		*76*
Whiterock	49-013-7022	FRM – Tribal Monitor	2011	83	68
			2012	No data reported	
			2013	107	95
			2014	67	64
			2015	73**	68**
			2016	86	81
			2017	76	66
			2015-2017 avg		*72***
Dinosaur National Monument	49-047-1002	FRM – NPS CASTNET	2011	106	90
			2012	83**	75**
			2013	126**	114**
			2014	69**	64**
			2015	74	67
			2016	83	75
			2017	77	74
			2015-2017 avg		*72*

TABLE NOTES:

* Monitor notes include information on whether or not the monitor is a Federal Reference Monitor (FRM), the owner (*e.g.*, Utah Department of Environmental Quality (UDEQ), National Park Service (NPS), Environmental Protection Agency (EPA), US Forest Service (USFS)), and the monitor type (*e.g.*, state and local air monitoring stations (SLAMS), Clean Air Status and Trends Network (CASTNET), Special Purpose, etc.).

** Includes exceptional events

Clearly, data collected to date in the area show nonattainment of the NAAQS and unhealthy levels of ozone *at all monitors*. And, in fact, all of the monitors show multiple recent exceedances of the NAAQS, as detailed in Table 2, below.

Table 2: Actual Exceedances of the 8-hour Ozone NAAQS (Source: EPA AirData)

Site	ID	Monitor Notes*	Year	# of Exceedances
Ouray			2015	2**

Site	ID	Monitor Notes*	Year	# of Exceedances
	49-047-2003	FRM – Special Purpose	2016	11
			2017	10
Myton	49-013-7011	FRM – Tribal Monitor	2015	2**
			2016	7
			2017	8
Price	49-007-1003	FRM – UDEQ Special Purpose	2015	2
			2016	0
			2017	0
Roosevelt	49-013-0002	FRM – UDEQ Special Purpose	2015	0
			2016	6
			2017	8
Redwash	49-047-2002	FRM – Special Purpose	2015	2**
			2016	7
			2017	5
Whiterock	49-013-7022	FRM – Tribal Monitor	2015	2**
			2016	7
			2017	1
Dinosaur National Monument	49-047-1002	FRM – NPS CASTNET	2015	2
			2016	5
			2017	6

TABLE NOTES:

* Monitor notes include information on whether or not the monitor is a Federal Reference Monitor (FRM), the owner (*e.g.*, Utah Department of Environmental Quality (UDEQ), National Park Service (NPS), Environmental Protection Agency (EPA), US Forest Service (USFS)), and the monitor type (*e.g.*, state and local air monitoring stations (SLAMS), Clean Air Status and Trends Network (CASTNET), Special Purpose, etc.).

** Includes exceptional events

EPA recently designated areas in Uintah and Duchesne Counties below 6,250 feet nonattainment for the 2015 ozone NAAQS.[17] Essentially, there is no room for growth in emissions that contribute to these harmful levels of ozone pollution in the area—namely, NO_x and VOC emissions. Yet, the proposed leasing acknowledges increases in NO_x and VOC emissions from developing the proposed lease parcels.[18] Even if the estimated ozone precursor emissions increases are relatively small, as indicated in the EA, the BLM must demonstrate as part of the EA that these emissions increases will not cause or contribute to any additional exceedances of the NAAQS.

Air quality studies in the Uinta Basin are ongoing and targeted at finding the most

[17] 83 FR 25776, June 4, 2018, included as Exhibit 2.

[18] BLM EA pp. 27-28.

effective mitigation strategies for the area. Currently, the area's study goals are focused on evaluating the sensitivity of winter ozone concentrations to VOC and NO_x emissions. It is important to consider the evolving knowledge of the ozone issues there given the proximity of the proposed leases, "scattered throughout the Vernal Planning area," in the heart of the Uinta Basin.[19]

In 2009 the International Petroleum Association of Mountain States (IPAMS) issued its final report on the Uinta Basin Air Quality Study, which analyzed ozone concentrations for the years 2006 and 2012 within "the six-county Uinta Basin area".[20] And while some participating agencies in the IPAMS study — notably the EPA, NPS and USFS — identified several important shortcomings in the UBAQS modeling protocols,[21] the UBAQS modeling effort provided an update to regional air emissions and the first attempt at predicting cumulative ozone impacts from oil and gas development in the Uinta Basin. The modeling report identified future year 8-hour ozone design values in the Uinta Basin that exceeded the NAAQS.[22]

Compiled ozone data from the December 2010 through March 2011 Uinta Basin Winter Ozone & Air Quality Study found a high number of 8-hour average ozone NAAQS exceedances at multiple locations throughout the Uinta Basin. Specifically, the final report showed 14 out of 16 monitors in the basin recorded at least one exceedance of the 8-hour NAAQS with no less than 7 of those monitors recording at least 18 exceedances (with the maximum number of exceedances, 25, recorded at two of the 16 monitors).[23] The 2010-2011 study concluded that closer proximity to oil and gas wells resulted in higher ozone concentrations.[24] The parties involved in the air quality studies in the Uinta Basin are in the process of developing a conceptual model of how winter ozone is formed and recognize the need for a validated photochemical modeling analysis of the Basin for simulating winter ozone formation in order to fully understand and quantify the effectiveness of mitigation strategies.

According to the 2012 Uinta Basin Winter Ozone and Air Quality Study, the current best

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[19] BLM EA at 11.

[20] Independent Petroleum Association of Mountain States, Uinta Basin Air Quality Study (UBAQS), June 30, 2009, p. ES-1, included as Exhibit 11.

[21] E.g., EPA expressed concern with the predicted ozone NAAQS exceedances and the ozone performance evaluation and also expressed concern that the model years studied (2006 and 2012), combined with technical concerns, "casts some doubt for [EPA] that we do not fully understand the full impact of development in Eastern Utah and Western Colorado." October 16, 2009, Letter from EPA to BLM Regarding Scoping Comments on the Greater Chapita Wells Natural Gas Infill Project Environmental Impact Statement, Uintah County, Utah, included as Exhibit 12.

[22] *See* Independent Petroleum Association of Mountain States, Uinta Basin Air Quality Study (UBAQS), June 30, 2009, p. OV-11, included as Exhibit 11.

[23] Energy Dynamics Laboratory, Utah State University Research Foundation, Final Report: Uinta Basin Winter Ozone and Air Quality Study December 2010-March 2011, EDL/11-039, June 14, 2011, Table 4-1 at 42, included as Exhibit 13.

[24] *Id.* at 97

estimate is that VOC controls are particularly important in reducing ozone production in the Basin. An emissions inventory developed for the study indicates that oil and gas operations were responsible for 98-99% of VOC emissions emitted from sources within the Basin that were considered in the inventory.[25] These studies indicate a need for close scrutiny of any additional ozone precursor emissions in the area, and particularly emissions of VOC.

Subsequent 2013 data from the multi-phase Uinta Basin winter ozone studies continued to show adverse wintertime ozone levels. Specifically:

> Maximum 8-hour average ozone concentrations measured at Ouray, which typically has among the highest readings in the Basin, reached 142 ppb during the December 2012 – March 2013 winter study, exceeding the EPA 8-hour standard (75 ppb) by 89%. Exceedances of the standard (i.e., a daily maximum 8-hour average in excess of 75 ppb) occurred at 17 of the 20 monitoring sites operating during the study. Monitors in the major Basin population centers exceeded the standard on a total of 22 days at Vernal and 29 days at Roosevelt during 2013 with all of the exceedances occurring between January 9th and March 6th.[26]

The results of the 2014 analysis indicate formaldehyde and other aldehydes are the dominant factors in wintertime ozone formation in the basin.[27] In addition to being directly emitted into the atmosphere, these compounds are also formed in the atmosphere from directly emitted VOCs. According to the study's most recent findings, "[a]romatic VOCs (including toluene and xylene), while less abundant than other VOC species in the Basin, were also found to be particularly important sources of radicals."[28] Other, site-specific data showed that NO_x reductions would also lead to ozone reductions, both individually and in conjunction with VOC reductions.[29]

Any further development of oil and gas resources in the Uinta Basin will require significant mitigation measures for proposed future and existing sources of air pollution in the area. BLM needs to take a comprehensive, coordinated and consistent approach

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[25] Utah State University, Final Report, 2012 Uintah Basin Winter Ozone & Air Quality Study, CRD/13-320.32, February 1, 2013, p. 2, included as Exhibit 14.
[26] ENVIRON, Final Report: 2013 Uinta Basin Winter Ozone Study, March 2014, pp. ES-1 – ES-2. Available online at: http://www.deq.utah.gov/locations/U/uintahbasin/ozone/strategies/studies/UBOS-2013.htm, included as Exhibit 15a.
[27] ENVIRON, Final Report: 2014 Uinta Basin Winter Ozone Study, February 2015, available online at http://www.deq.utah.gov/locations/U/uintahbasin/ozone/docs/2015/02Feb/UBWOS_2014_Final.pdf, included as Exhibit 15b.
[28] *Id.* at ES-2.
[29] *Id.* at ES-2.

to the air quality issues in the Uinta Basin and should seriously consider offsetting any further development with reductions in existing sources of air pollution.

NO_2

In 2010, EPA adopted a new 1-hour average standard (NAAQS) for NO_2 of 100 ppb to protect against respiratory effects that result from elevated short-term exposures.[30] According to EPA, "studies show a connection between breathing elevated short-term NO_2 concentrations, and increased visits to emergency departments and hospital admissions for respiratory issues, especially asthma."[31]

The EA reports a background 1-hour average NO_2 concentration from the monitor in Redwash of 19 ppb that references the year 2017.[32] Recent 1-hour average maximum concentrations of NO_2 in the area have been monitored as high as 95 ppb in Vernal in 2016.[33] Table 3, below, summarizes background monitoring data in the area and shows that nearly every other monitored value exceeds the value presented in the EA:

Table 3: Recently Recorded 1-Hour Average NO_2 Levels at Monitors Nearby (Source: EPA AirData)
(Concentrations in bold exceed the background concentration in the EA)

Site	ID	Monitor Notes*	Year	1st Max 1hr NO_2 [ppb]
Price	49-007-1003	FRM – UDEQ Special Purpose	2015	13
			2016	**70**
			2017	**26**
Ouray	49-047-2003	FRM – Special Purpose	2015	**31**
			2016	**27**
			2017	19
Myton	49-013-7011	FRM – Tribal Monitor	2015	**26**
			2016	**33**
			2017	**24**
Roosevelt	49-013-0002	FRM – UDEQ Special Purpose	2015	**38**
			2016	**33**
			2017	**42**
Redwash	49-047-2002	FRM – Special Purpose	2015	**32**
			2016	**27**

[30] 75 FR 6474, Feb. 9, 2010, included as Exhibit 16.
[31] EPA, http://www.epa.gov/airquality/nitrogenoxides/health.html, included as Exhibit 17.
[32] BLM Air Quality and Green House Gas Specialist Report at 1 Table 1.
[33] EPA Monitor Value Reports 2015-2017 https://www.epa.gov/outdoor-air-quality-data/monitor-values-report, included as Exhibits 19a-19c.

Site	ID	Monitor Notes*	Year	1st Max 1hr NO_2 [ppb]
			2017	**20**
Vernal	49-047-1003	FRM – UDEQ SLAMS	2015	**35**
			2016	**95**
			2017	**48**

TABLE NOTES:

* Monitor notes include information on whether or not the monitor is a Federal Reference Monitor (FRM), the owner (*e.g.*, Utah Department of Environmental Quality (UDEQ), National Park Service (NPS), Environmental Protection Agency (EPA), US Forest Service (USFS)), and the monitor type (*e.g.*, state and local air monitoring stations (SLAMS), Clean Air Status and Trends Network (CASTNET), Special Purpose, etc.).

Particulate Matter

Since the time of the Vernal RMP update, monitors in the Uinta Basin have recorded numerous exceedances of the 24-hour average $PM_{2.5}$ NAAQS. Specifically, the monitor in Roosevelt recorded maximum 24-hour average $PM_{2.5}$ concentrations of: 53.8 µg/m^3 in 2012; 41.7 µg/m^3 in 2013; 35.2 µg/m^3 in 2014; 46.7 µg/m^3 in 2015; and 40.6 µg/m^3 in 2017. [34] The monitor in Ouray recorded a maximum 24-hour average $PM_{2.5}$ concentration of 45.9 µg/m^3 in 2012, 32 µg/m^3 in 2013 and 34.3 µg/m^3 in 2014 (note, no data are available for 2015-2017 from the Ouray monitor).[35] All of these concentrations exceed the 24-hour average $PM_{2.5}$ NAAQS of 35 µg/m^3.

The most recent 98th percentile monitored concentration at the Roosevelt monitor, recorded in 2017, is 32.3 µg/m^3 or 92% of the NAAQS.[36] The 24 µg/m^3 background concentration in the EA does not appear to be representative of current concentrations observed in the Basin.[37]

In 2006, EPA lowered the short-term $PM_{2.5}$ standard from 65 µg/m^3 to 35 µg/m^3 because scientific information showed that the pollutant is a health concern at levels lower than what the previous standard allowed.[38] $PM_{2.5}$ can become lodged deep in the lungs or can enter the blood stream, worsening the health of asthmatics and even

[34] EPA Monitor Value Reports 2015-2017 https://www.epa.gov/outdoor-air-quality-data/monitor-values-report, included as Exhibits 20a-20c.
[35] *Id.*
[36] EPA Monitor Value Reports 2015-2017 https://www.epa.gov/outdoor-air-quality-data/monitor-values-report, included as Exhibits 20a-20c.
[37] BLM Air Quality and Green House Gas Specialist Report at 1 Table 1
[38] 71 FR 61236, effective December 18, 2006, included as Exhibit 22.

causing premature death in people with heart and lung disease. $PM_{2.5}$ is also a major contributor to visibility impairment. *See* the EPA's staff paper on particulate matter (EPA-452/R-05-005a, December 2005) as well as the EPA's Air Quality Criteria Document for Particulate Matter (EPA/600/P-99/002aF and EPA/600/P-99/002bF, October 2004) for more detailed information on the health effects of $PM_{2.5}$.[39] Even $PM_{2.5}$ concentrations lower than the current NAAQS are a concern for human health. The CASAC, in a letter to the EPA on the 2006 revised $PM_{2.5}$ standard, unanimously recommended that the 24-hour $PM_{2.5}$ standard be lowered from 65 $\mu g/m^3$ to 30-35 $\mu g/m^3$ and that the annual standard be lowered from 15 $\mu g/m^3$ to 13-14 $\mu g/m^3$.[40] EPA set the standard on the high end of the CASAC recommended range for the short-term standard and, at the time, chose not to lower the annual standard. In response, the CASAC made it clear that their recommendations were based on "clear and convincing scientific evidence" and, furthermore, that their recommendations were "consistent with the mainstream scientific advice that EPA received from virtually every major medical association and public health organization that provided their input to the Agency".[41] In 2013 EPA finalized a strengthened $PM_{2.5}$ annual standard of 12 $\mu g/m^3$.[42] In its analysis of impacts from the proposed leasing, BLM should consider that significant impacts can occur at 24-hour $PM_{2.5}$ concentrations as low as 30 $\mu g/m^3$. Since $PM_{2.5}$ concentrations at levels below 35 $\mu g/m^3$ can be considered harmful to human health the BLM should consider this when evaluating the air impacts from the proposed lease sale development, including by considering, in detail, an alternative in the EA pursuant to NEPA that would constrain impacts to a level lower than 35 $\mu g/m^3$, regardless of EPA's current standard, as the BLM has a duty — independent of the CAA — to protect public health and the environment.

Visibility

According to the National Park Service (NPS), air pollution is affecting visibility at Arches and Canyonlands National Parks. Overall, the NPS identifies the following condition status for the haze index in these nearby parks:

NPS Park Conditions[43]

	Visibility Impacts
Arches National Park	Moderate Concern
Canyonlands National Park	Moderate Concern

[39] *See* http://www.epa.gov/ttn/naaqs/standards/pm/data/pmstaffpaper_20051221.pdf and http://cfpub2.epa.gov/ncea/cfm/recordisplay.cfm?deid=87903, included as Exhibits 23a and 23b.
[40] EPA-CASAC-LTR-06-003, Clean Air Scientific Advisory Committee Recommendations Concerning the Final National Ambient Air Quality Standards for Particulate Matter, September 29, 2006, http://yosemite.epa.gov/sab/SABPRODUCT.NSF/1C69E987731CB775852571FC00499A10/$File/casac-ltr-06-003.pdf, included as Exhibit 24.
[41] *Id.*
[42] 78 FR 3086, January 15, 2013, included as Exhibit 25.
[43] https://www.nps.gov/subjects/air/park-conditions-trends.htm, included as Exhibit 26a.

In general, haze index thresholds are used to assess the extent of the impact, whereby an impact greater than 0.5 deciview (dv) (approximately a 5% change in light extinction) is considered to contribute to regional haze visibility impairment and an impact that exceeds 1.0 dv (approximately a 10% change in light extinction) is considered to cause visibility impairment.

For Arches National Park, just south of the leasing area, the NPS states that visibility warrants moderate concern based on the 2011-2015 estimated visibility on mid-range days of 2.6 dv above estimated natural conditions.[44]

Similarly, for Canyonlands National Park, the NPS states that that visibility warrants moderate concern based on the 2011-2015 estimated visibility on mid-range days of 2.7 dv above estimated natural conditions.[45] NPS lists the following visibility effects in Canyonlands National Park:

- Reduced visibility, at times, due to human-caused haze from dust and other fine particles of air pollution;
- Reduction of the average natural visual range from about 170 miles (without pollution) to about 130 miles because of airborne pollutants that impact the park's viewshed;
- Reduction of the visual range to below 80 miles on high pollution days.[46]

The recent Greater Chapita Wells Natural Gas Infill Project DEIS predicted cumulative impacts to visibility at Arches and Canyonlands National Parks; BLM's analysis of visibility impacts at Class I areas showed 98th percentile and maximum Δdv greater than zero at, among other places: Arches National Park; and Canyonlands National Park.[47] In addition, several modeling analyses performed by the BLM for Resource Management Plan revisions in Colorado indicate that visibility is threatened by ongoing development that impacts these same National Parks. Specifically, the BLM's Colorado River Valley Field Office RMP revision predicted significant cumulative visibility impacts at Arches National Park.[48] And BLM's White River Field Office RMP revision also predicts direct and cumulative impacts at Arches National Park.[49]

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[44] https://www.nps.gov/subjects/air/park-conditions-trends.htm, included as Exhibit 26a.
[45] https://www.nps.gov/subjects/air/park-conditions-trends.htm, included as Exhibit 26a.
[46] NPS Air Pollution Impacts Canyonlands National Park (Visibility) https://nature.nps.gov/air/Permits/aris/cany/impacts.cfm?tab=0#TabbedPanels1, included as Exhibit 26b.
[47] BLM GCW DEIS at 4.3-31 (March 2018)
[48] BLM CRVFO ARTSD (2011) at Table 4-18
[49] BLM WRFO DRMP (2012) Appendix F

Since NEPA and FLPMA's implementing regulations require that the BLM provide for compliance with all CAA requirements, the BLM must not authorize the development of the leases if it will contribute to adverse impacts to visibility in Class I areas. This is necessary to meet BLM's obligation to comply with the CAA to not only prevent future impairment of visibility, but to also remedy existing impairment. Specifically, under the CAA Congress declares "as a national goal the prevention of any future, and the remedying of any existing, impairment of visibility in mandatory class I Federal areas which impairment results from manmade air pollution."[50] BLM, therefore, cannot allow for any increase in emissions that would contribute to changes in visibility – even if the changes, when considered in isolation, are insignificant – at any location where significant cumulative impacts are predicted.

Ecosystems

According to the NPS, air pollution is affecting ecosystems at Arches and Canyonlands, National Parks. Specifically, NPS reports "nitrogen deposition is approaching levels known to favor invasive, weedy plants that can adversely affect native plant communities, soils, and wildlife habitat."[51] Overall, the NPS identifies the following condition status for wet nitrogen deposition in the nearby parks:

NPS Park Conditions[52]

	N Wet Deposition
Arches National Park	Significant Concern
Canyonlands National Park	Significant Concern

For Arches National Park, just south of the leasing area, the NPS states that:

> Wet nitrogen deposition warrants significant concern at Arches NP. This status is based on … the 2011-2015 estimated wet nitrogen deposition of 1.3 kilograms per hectare per year (kg/ha/yr), a level that normally warrants moderate concern. However, the status has been elevated to significant concern because ecosystems at Arches NP may be very highly sensitive to nitrogen-enrichment effects relative to all Inventory & Monitoring parks (Sullivan et al. 2011c;[53] Sullivan et al. 2011d[54]). Nitrogen deposition may disrupt soil nutrient cycling and affect biodiversity of some plant communities, including alpine, arid and semi-arid, and grassland.[55]

Similarly, for Canyonlands National Park, the NPS states that:

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[50] CAA § 169A(a)(1), 42 U.S.C. 7491(a)(1).
[51] *See, e.g.,* NPS Air Quality at Canyonlands National Park, included as Exhibit 26c.
[52] https://www.nps.gov/subjects/air/park-conditions-trends.htm, included as Exhibit 26a.
[53] https://irma.nps.gov/DataStore/DownloadFile/427566, included as Exhibit 26d.
[54] https://irma.nps.gov/DataStore/DownloadFile/425453, included as Exhibit 27a.
[55] https://www.nps.gov/subjects/air/park-conditions-trends.htm, included as Exhibit 27b.

> Wet nitrogen deposition warrants significant concern at Canyonlands NP. This status is based on … the 2011-2015 estimated wet nitrogen deposition of 1.4 kilograms per hectare per year (kg/ha/yr), a level that normally warrants moderate concern. However, the status has been elevated to significant concern because ecosystems at Arches NP may be very highly sensitive to nitrogen-enrichment effects relative to all Inventory & Monitoring parks (Sullivan et al. 2011c;[56] Sullivan et al. 2011d[57]). Nitrogen deposition may disrupt soil nutrient cycling and affect biodiversity of some plant communities, including alpine, arid and semi-arid, and grassland.[58]

The recent Greater Chapita Wells Natural Gas Infill Project DEIS predicted cumulative ecosystem impacts at numerous Class I and sensitive Class II areas and sensitive lakes, including total annual nitrogen deposition which exceeded the nutrient nitrogen critical loads at Arches National Park.[59]

The Emission Inventory Presented in the EA is Incomplete and Potentially Underestimates Emissions from the Proposed Leasing Activity

The discussion of impacts of the proposed action alternative in the EA includes the following commitment to develop future emission inventories:

> Should development on the parcels be proposed, and prior to authorizing specific proposed projects on the subject leases, emission inventories would need to be developed. Air quality dispersion modeling may also be required. EA at 27.

The EA presents 'anticipated emissions per well' from development of the proposed leases assuming a reasonably foreseeable development (RFD) scenario of 690 wells.[60] The BLM must include a clear and detailed discussion of the inventory assumptions and calculations and must include estimates for all potential well development that could occur under the proposed leasing. BLM must provide a sepcific assessment of the maximum development scenario in order to determine if significant impacts could occur at the maximum development rate. Alternatively, the BLM must include an enforceable measure in the subsequent EIS or FONSI that well development is limited to 690 wells if that is the basis for the conclusion that no significant impacts will occur from the proposed action alternative.

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[56] https://irma.nps.gov/DataStore/DownloadFile/427566, included as Exhibit 27a.
[57] https://irma.nps.gov/DataStore/DownloadFile/425453, included as Exhibit 27b.
[58] https://www.nps.gov/subjects/air/park-conditions-trends.htm, included as Exhibit 26a.
[59] BLM GCW DEIS at 4.3-33 (March 2018)
[60] BLM EA at 27.

The limited information on the inventory assumptions that are included in the EA and the Air Quality and Green House Gas Specialist Report may result in an underestimate of emissions from the proposed lease development. BLM does not provide any detailed information (e.g., assumptions, sources, etc.) for the per-well emissions estimates in the EA; the estimates appear to be the same inventory proposed for previous lease sales.[61] It's not clear if the estimates include all potential emissions sources, e.g., fugitive emissions from well sites and compressor stations, fugitive emissions from well workovers, emissions associated with tanker truck activities that would occur to transport produced oil, etc. It's also not clear if the estimates assume reasonable development factors, e.g., construction activity duration, drilling / completion / testing duration times (including assumptions about directional drilling), etc. BLM must ensure that actual development occurs within the assumed constraints or, alternatively, should establish timeframes that do not result in significant impacts to air quality. These timeframes would need to be based on modeled demonstrations that emissions from these activities over the assumed timeframes are insignificant.

The VOC emission estimate of 9 tons per year per well from the proposed action alternative may greatly underestimates emissions. The many fugitive VOC emissions sources from the oil and gas industry – e.g., from well cleanup operations (liquids unloading), well completion operations, pneumatic devices, storage tanks, dehydrator units, etc. – are difficult to quantify accurately and have been found, recently, to be greatly underestimated. In reality, the many VOC emissions sources in the oil and gas industry are subject to operator error (*e.g.*, if a tank hatch is inadvertently left open), which may result in significant emissions from these sources. Operating practices may account for the discrepancy seen between the bottom-up emissions inventories developed for the Denver-Julesburg basin and the top-down NOAA estimates based on ambient measurements that reported significantly higher emissions.[62] BLM must base its impact analysis on emissions estimates that reflect reasonable expectations for control efficiencies based on current standards and operating practices, including the challenge of operating and maintaining numerous devices and control equipment at remote well sites.

Finally, in addition to underestimating emissions estimates, BLM should ensure that the inventory does not overstate emission reductions from the application of current regulations. Specifically, the EA analysis relies on several lease stipulations and lease notices, such as the Air Quality Lease Stipulation for 2008 RMPs (UT-S-01), the Air Quality Lease Notice mitigation measures for Vernal and Price (UT-LN-96), and the Best Management Practices applicable to regional ozone formation controls (UT-LN-99). These control measures rely on certain control efficiencies and/or operating practices.

[61] E.g., the 2017 and 2014 lease sales in the Vernal and Price FOs included the same emissions estimates.
[62] Pétron, G., et al. (2012), Hydrocarbon emissions characterization in the Colorado Front Range: A pilot study, J. Geophys. Res., 117, D04304, doi:10.1029/2011JD016360, included as Exhibit 28.

However, no consideration is given to the effectiveness of the regulations for assumed controls and operating practices in the inventory. Invariably, regulatory control measures are never 100% effective due to factors such as equipment down-time, upsets and decreases in control efficiency over time. BLM should adjust the inventory to account for a realistic rule effectiveness estimate for the assumed regulatory controls.

BLM Relies on the Impact Analysis for the Monument Butte Oil and Gas Development Project Final EIS Which May Not Reflect Development Scenarios for the Proposed Leasing

BLM relies on the Monument Butte Oil and Gas Development Project Final EIS Alternative A modeling analysis for this leasing EA. The Monument Butte analysis only assessed construction and development impacts from PM emissions (*i.e.,* there is no assessment of NO_x impacts from construction and development activities).

The modeling results for the Monument Butte EIS are based on certain operating scenarios and assumptions and BLM must ensure that the modeling parameters reflect similar operating conditions to what would occur under the leasing alternatives in the EA. For example, for NOx, in order to be able to rely on other modeling analyses BLM should ensure that drill rig engine horsepower, load factor and engine Tier (*e.g.*, Tier 2 vs. Tier 4 emission rates) are consistent, as well as drilling times. For PM, dust suppression rates should be consistent (e.g., the Monument Butte EIS assumes 50% control of fugitive dust), as well as speed limits and miles of unpaved roads.

In relying on the Monument Butte EIS analysis, BLM is failing to consider the cumulative HAP impacts to the exposed population since the Monument Butte EIS analysis only looked at the incremental risk associated with the proposed oil and gas development, which would be imposed on top of existing health risks in the area. This is of greatest concern where new wells could be drilled in close proximity to existing wells (*e.g.*, where the proposed leasing blocks overlap with other large oil and gas development areas). Since existing wells are typically not as well controlled as new production activities would be, consideration should be given to what the impacts would be if new wells are located in close proximity to existing ones.

The Air Resource Management Strategy Relied Upon in the EA Predicts Significant Ozone and $PM_{2.5}$ Impacts in the Uinta Basin

According to the EA

> …the ARMS [Air Resource Management Strategy] project is a cumulative assessment of potential future air quality impacts associated with predicted oil and gas activity in the Uinta Basin. The ARMS is incorporated by reference and predicts the following impacts to air quality and air quality related values. All scenarios predict exceedances of the ozone NAAQS in the Uinta Basin. In the

Uinta Basin, the ozone concentrations are highest during the winter period. EA at 40.

Relying on the Air Resource Management Strategy (ARMS) means that the predicted impacts, as well as the shortcomings, of that analysis must be considered in this EA. The ARMS analysis predicts significant ozone and $PM_{2.5}$ impacts throughout the Uinta Basin based on current and future development scenarios. The modeled scenarios included future year estimates (in 2021) for: (1) "on-the-books" controls; (2) NO_x emission control scenarios; (3) VOC emission control scenarios; and (4) combined NO_x and VOC emission control scenarios. Following are significant impacts for ozone from all modeled scenarios (*i.e.*, 2010 Base Year, 2021 on-the-books controls, 2021 NO_x emissions reductions of 22%, 2021 VOC emissions reductions of 14%, and 2021 NO_x and VOC emissions reductions of 25% and 14%, respectively):[63]

- the highest modeled ozone occurs in the Uinta Basin study area regardless of model scenario
- all scenarios predict exceedances of the ozone NAAQS and state AAQS in the Uinta Basin
- the ozone concentrations are highest during the winter period in the Uinta Basin

The model performance evaluation for ozone indicated a negative model bias during winter, meaning actual concentrations could be even higher than what was predicted in the model.[64] The 2021 model results for the "on-the-books controls" show predicted 8-hour average ozone concentrations as high 117 ppb in the Uinta Basin Study Area in winter (81 ppb in 'Non-Winter') and exceedances of the NAAQS at all monitors included in the analysis (*i.e.*, Ouray, Rangely, Redwash and Dinosaur monitors) as well as and at numerous Class I and sensitive Class II areas including Arches National Park, Canyonlands National Park, Dinosaur National Monument, High Uintas Wilderness Area and Uintah and Ouray Indian Lands.[65]

In addition to the model performance evaluation showing underestimation bias in wintertime, ozone impacts may also be underestimated due to underestimated emissions inputs. Based on findings from a recent study of VOC emissions from oil and

[63] AECOM, Utah Air Resource Management Strategy Modeling Project Impact Assessment Report (October 2014), included as Exhibit 29a https://www.blm.gov/sites/blm.gov/files/program_natural%20resources_soil%20air%20water_airut_quick%20links_ImpactsRpt.pdf

[64] AECOM, Utah Air Resource Management Strategy Modeling Project: Air Quality Model Performance Evaluation at ES-2 (February 2014), included as Exhibit 29b https://www.blm.gov/sites/blm.gov/files/program_natural%20resources_soil%20air%20water_airut_quick%20links_MPEreport030314.pdf

[65] AECOM, Utah Air Resource Management Strategy Modeling Project Impact Assessment Report (October 2014) at 3-30 Table 3-9, included as Exhibit 29a

gas sources along Colorado's Front Range, emission inventories may under-predict fugitive emissions from oil and gas sources.[66] The Colorado Front Range study concludes that fugitive emissions in Weld County in 2008 were likely underestimated by a factor of two.[67] It is also therefore likely that VOC emissions used in inventories during that same time period also underestimate emissions (since they are likely based on similar estimation techniques). The ARMS study is conducted with a 2010 Base Case inventory, however the oil and gas emissions estimates are based on WRAP Phase III data from 2006, scaled to 2010 using oil and gas well count and production rate survey data.[68] Therefore, the potential for underestimated fugitive VOC emissions in the analysis is possible since the ozone modeling was based on emission factors from a similar time period and, therefore, since the inventory data may significantly underestimate VOC emissions from that time period, the model output could also underestimate impacts.

Conclusions regarding ozone impacts presented in the EA must be evaluated with care given the fact that: (1) the ARMS model performance evaluation shows underestimation bias in wintertime; and (2) the ARMS model inventory may significantly underestimate fugitive VOC emissions from oil and gas sources. Given the likelihood that modeled concentrations may underestimate ozone impacts, especially in winter, and the fact that a large number of the lease parcels are in the ozone nonattainment area, and monitored ozone concentrations already consistently exceed 60 ppb in the area, the EA must contain enforceable VOC and NO_x mitigation measures to ensure the proposed lease development will not contribute to adverse ozone impacts.

In addition to ozone, ARMS also predicts the following significant $PM_{2.5}$ impacts:[69]

- Seven monitoring stations within the 4-km domain show daily $PM_{2.5}$ concentrations that exceed the NAAQS and state AAQS in the baseline emissions inventory.
- Results from the MATS tool (which accounts for model performance biases) indicated that $PM_{2.5}$ concentrations may exceed the NAAQS and state AAQS for select monitors and assessment areas in the 2010 Typical year. All 2021 scenarios predict that only one of these monitoring stations would continue to exceed the NAAQS and state AAQS.
- Two unmonitored areas within the Uinta Basin exceed the annual $PM_{2.5}$ NAAQS and state AAQS during the 2010 typical year, and impacts in these areas tend to

[66] Pétron, G., et al. (2012), Hydrocarbon emissions characterization in the Colorado Front Range: A pilot study, J. Geophys. Res., 117, D04304, doi:10.1029/2011JD016360, included as Exhibit 28.

[67] *Id*. at 18

[68] AECOM, Utah State BLM Emissions Inventory Technical Support Document, November 2013 at 2-2 Table 2-1, included as Exhibit 30.

[69] AECOM, Utah Air Resource Management Strategy Modeling Project Impact Assessment Report (October 2014), included as Exhibit 29a

increase under the 2021 Scenarios 1 and 2. Under 2021 Scenarios 3, the annual $PM_{2.5}$ impacts decrease in the Uinta Base due to combustion control measures.

- Under the 2021 scenarios, most assessment areas exceed the 24-hour $PM_{2.5}$ PSD increment.

The predicted cumulative ozone and $PM_{2.5}$ impacts are important to consider, even if direct project impacts from the proposed action contribute a relatively small amount to predicted ozone and $PM_{2.5}$ concentrations, as is indicated in the EA ("It is anticipated that the impact to ambient air quality and air quality related values associated with the Proposed Action would be indistinguishable from and dwarfed by the model and emission inventory scope and margin of error." EA at 40). It is important to recognize that a large number of existing emissions sources in the region already contribute to elevated ozone and $PM_{2.5}$ concentrations, and that the potential direct impacts from individual projects are adding to existing impacts. Even though an analysis of individual projects may show small incremental impacts when considered alone, when the impacts from all the existing and proposed sources are added together, the effects on ozone and $PM_{2.5}$ levels in the region can be substantial.

BLM should consider these recommendations from EPA, which the agency made in comments on the West Tavaputs Plateau DEIS regarding a need for additional mitigation measures to address modeled exceedances of NAAQS:

> It may be appropriate for the BLM to impose specific additional mitigation measures in order to further reduce the project's ozone precursor emissions to assure that this project avoids contributing to the exceedances of the NAAQS necessary to protect public health. Additional emission reductions may be essential to demonstrate compliance with these standards if the results of the cumulative impacts analysis show modeled exceedances or that this project contributes to such exceedance.[70]

BLM must be scrupulous in its cumulative impact analysis for this and future analyses for the area in order to ensure that development is not improperly segmented. That is to say, BLM must not to allow for development that would contribute to cumulative impacts in the area.

BLM's Air Quality Analysis for the EA Does Not Assure the Prevention of Significant Deterioration (PSD) of Air Quality

BLM has not properly analyzed whether the proposed lease development will prevent significant deterioration (PSD) of air quality, as required by the CAA. BLM must complete

[70] May 23, 2008 Letter from EPA to BLM Re: West Tavaputs Plateau Natural Gas Full Field Development Plan, Draft Environmental Impact Statement, Carbon County, Utah CEQ #20080028 at 3-4, included as Exhibit 31.

an analysis to determine how much of the incremental amount of air pollution allowed in clean air areas (*i.e.*, PSD increment) has already been consumed in the affected area and how much additional increment consumption will occur due to the proposed action. Without this analysis, the BLM is not adequately ensuring that air quality will not deteriorate more than allowed under the CAA.

PSD increments are not mentioned in the EA except for the brief discussion of the Monument Butte EIS analysis results ("None of the maximum modeled impacts at Class I and sensitive Class II areas (shown in Table 4.2.1.1.4-1 [of the Monument Butte FEIS]) are greater than the PSD increments.").[71] $PM_{2.5}$, PM_{10} and NO_2 impacts should be tracked with a proper increment consumption analysis – one that includes all increment-affecting sources in the impacted area – and compared to the applicable annual average and 24-hour average increments for these pollutants throughout the impacted area.

In comments on the Vernal RMP, in 2008, the State made it clear that the BLM must perform its own defensible PSD increment analysis as part of the planning process for the area.[72] BLM is required under NEPA to satisfy all CAA requirements, and thus the BLM cannot authorize an action unless it has ensured that the PSD increments will not be exceeded. The PSD increments are separate ambient air quality standards not to be exceeded, as set out in §163 of the CAA, that apply <u>in addition</u> to the national ambient air quality standards in clean air areas. BLM must consider the PSD increments as important and legally binding CAA requirements and it must provide for compliance with these requirements in the EA.

Emissions from major stationary sources which commenced construction or modification after the applicable "major source baseline date" and emissions increases from minor, area and mobile sources that occurred after the relevant "minor source baseline date" affect the allowable increment.[73] BLM should complete an analysis of all increment consuming and increment expanding sources that impact the same area impacted by the proposed action. At a minimum, the BLM should report on how much increment has already been consumed in the affected area so that it can make a reasonable assessment of whether the proposed action will contribute to more deterioration of air quality than is allowed under the CAA.

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[71] BLM EA at 28.

[72] *See* BLM August 2008 Vernal PRMP/FEIS Response to Comments by Resource AQ81 at 25.

[73] The major source baseline dates are January 6, 1975 for SO_2 and PM_{10} and February 8, 1988 for NO_2 (40 CFR 52.21(b)(14)(i)). The minor source baseline dates in Utah differ by pollutant and by [baseline] area and were triggered on the date that a complete PSD permit application was received by the State. See definitions of "major source baseline date", "minor source baseline date" and "baseline area" in 40 CFR 52.21(b)(14)(i), 52.21(b)(14)(ii) and 52.21(b)(15).

The EA Does Not Sufficiently Address Greenhouse Gas Emissions and Potential Climate Change Impacts from the Proposed Leasing

The EA and Air Quality and Green House Gas Specialist Report include greenhouse gas (GHG) emissions estimates from Federal oil well construction and drilling operations, as well as estimates for downstream emissions based on production estimates, by county, and EPA GHG Calculator emission factors for burning oil and gas.[74] There are no estimates of the potential downstream GHG emissions from the transmission and storage of the oil and gas produced; BLM should include estimates of emissions from these downstream emissions in the EA.

Beyond estimating GHG emissions, the BLM should assess mitigation measures for reducing impacts from methane emissions. Natural gas and petroleum systems are the biggest contributor to methane emissions in the United States, accounting for close to one third of all methane emissions.[75] Although it has a relatively short atmospheric lifetime of about a decade, methane is nonetheless a potent greenhouse gas with impacts concentrated in the near-term. EPA assumes that each molecule of methane is 28-36 times as potent as carbon dioxide (CO_2) over a 100-year time horizon *and 84-87 times as potent as CO_2 over a 20-year time horizon.*[76] In the EA, BLM presents a low global warming potential (GWP) for methane of 28 (*i.e.,* indicating methane is 28 times as potent as CO_2 over a 100-year timeframe).[77] Not only must BLM revise the EA to reflect updated data on the GWP (*i.e.,* a 100-year GWP of 28-36 and a 20-year GWP of 87), it must consider the 20-year GWP for methane since shorter timeframes more accurately reflect the climate-forcing impacts of methane emissions. Methane is a prime contributor to short-term climate change over the next few decades and a prime target for near-term GHG reductions. And, in fact, there are many proven technologies and practices already available to reduce significantly the methane emissions from oil and gas operations. These technologies also offer opportunities for significant cost-savings from recovered methane gas. Indeed, reducing methane emissions is important to not only reduce potential impacts to the climate, but to prevent waste of the oil and gas resource itself and the potential loss of economic value, including royalties.

There is a large body of scientific work documenting the adverse impacts to public health and welfare from climate change caused by greenhouse emissions, such as methane. More recently, scientific studies have demonstrated that these same methane

[74] BLM EA at 30-32 and Air Quality and Green House Gas Specialist Report at 7-11
[75] EPA, Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2015. *See* http://www3.epa.gov/climatechange/ghgemissions/gases/ch4.html, included as Exhibit 32.
[76] EPA, http://www3.epa.gov/climatechange/ghgemissions/gwps.html, included as Exhibit 33.
[77] BLM September 2018 Oil and Gas Leasing EA at 35. Note, a compound's GWP refers to its ability, compared to CO_2 (GWP = 1), to trap heat from the sun in the earth's atmosphere.

emissions contribute to the formation of ground-level ozone.[78] Methane reductions have a direct impact on both climate change and ozone pollution. In addition, many of the proven methane emission controls for the oil and gas sector also reduce VOCs and HAPs, as described in the following section. The associated air quality benefits that result from reductions in VOC and HAP emissions are a huge co-benefit of methane reduction technologies.

BLM should include a comprehensive set of actions – including the Best Management Practices listed on page 12 of the Air Quality and Green House Gas Specialist Report – to address greenhouse gas, VOC and HAP emissions and consider these actions in an alternative in the EA that would mandate these actions as a lease stipulation, APD best management practices or conditions of approval. The EA should seriously investigate the many cost-effective alternatives available to avoid or minimize the greenhouse gas impacts from the proposed action (including impacts on ozone concentrations) per 40 C.F.R. § 1508.9(a)(1) and 40 C.F.R. § 1508.27(5) (requiring consideration of the degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks).

And, the recent air quality studies in the Uinta Basin found evidence that elevated methane concentrations from nearby oil and gas operations could be contributing to ozone formation:

> [T]he CH_4 concentrations measured at the Red Wash [air monitoring] site (2.7-5.5 ppm) were significantly above the Northern Hemispheric background levels. CH_4 is usually considered non-reactive due to its relative slow reaction rates, but at levels observed at the Red Wash site, CH_4 could be a significant player in atmospheric photochemistry of ozone formation.[79]

Given the significant impacts to ozone already quantified in the ARMS analysis, BLM should also consider mitigating methane emissions from the proposed development to help address ozone levels in the impacted area, as described in the following section.

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[78] IPCC, 2014: Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Field, C.B., V.R. Barros, D.J. Dokken, K.J. Mach, M.D. Mastrandrea, T.E. Bilir, M. Chatterjee, K.L. Ebi, Y.O. Estrada, R.C. Genova, B. Girma, E.S. Kissel, A.N. Levy, S. MacCracken, P.R. Mastrandrea, and L.L. White (eds.)], Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, 1132 pp. https://ipcc- wg2.gov/AR5/images/uploads/WGIIAR5-PartA_FINAL.pdf. *See* p. 738 and 739, included as Exhibit 34.

[79] Energy Dynamics Laboratory, Utah State University Research Foundation, Final Report: Uinta Basin Winter Ozone and Air Quality Study December 2010-March 2011, EDL/11-039, June 14, 2011, p. 97, included as Exhibit 35.

BLM Must Include Adequate Plans to Protect Air Quality in the Area as Part of This EA

BLM relies on the application of lease stipulation UT-S-01 (Air Quality) and lease notices UT-LN-99 (Regional Ozone Formation Controls) and UT-LN-102 (Air Quality Analysis) as the sole means to address potential impacts from development of the lease parcels. Specifically, the BLM states:

> Application of Stipulation UT-S-01 and Notices UT-LN-96, UT-LN-99, and UT-LN-102 would be adequate for the leasing stage to disclose potential future restrictions within nonattainment areas and to facilitate the reduction of potential impacts. Stipulation UT-S-01 does not apply to parcel 297 because they are outside the Vernal Planning area. Notices UT-LN-96 and UT-LN99 do not apply to the following parcels because they are outside the non-attainment area for ozone: 147, 187, 190, 195, 196, 225, 238, 294, 297, 350, 352, 353, 354, 355, and 357. EA at 29.

Only the following mitigation measures, in UT-S-01 and UT-LN-99, would be "required" mitigation measures for the leased parcels (the actions in UT-LN-102 are discretionary):

> UT-S-01:
>
> - All new and replacement internal combustion gas field engines of less than or equal to 300 design-rated horsepower shall not emit more than 2 grams of NOx per horsepower-hour
> - All new and replacement internal combustion gas field engines of greater than 300 design rated horsepower must not emit more than 1.0 gram of NOx per horsepower-hour.
>
> UT-LN-99:
>
> To mitigate any potential impact oil and gas development emissions may have on regional ozone formation, the following Best Management Practices (BMPs) would be required for any development projects:
>
> - Tier II or better drilling rig engines
> - Stationary internal combustion engine standard of 2g NOx/bhp-hr for engines <300HP and 1g NOx/bhp-hr for engines >300HP
> - Low bleed or no bleed pneumatic pump valves
> - Dehydrator VOC emission controls to +95% efficiency
> - Tank VOC emission controls to +95% efficiency

In addition to making the above measures enforceable requirements, BLM should also require implementation of the ozone-related mitigation measures assessed for the ARMS analysis that were most effective in reducing future year ozone levels – *i.e.*,

Scenario 2. Specifically, Scenario 2 aims to reduce VOC emissions beyond the level required by current regulations, as follows:

> The specific controls adopted as part of this mitigation strategy include the assumption that all dehydrators capture or combust 95 percent of VOC emissions, regardless of size. The rule penetration for dehydrators is assumed to be 95 percent. Similarly, all oil and condensate tanks must capture or combust 95 percent of VOC working, standing and breathing losses, regardless of size or level of emissions. A 100 percent rule penetration is assumed for tanks. Since the emissions from these sources are already controlled to some extent by current regulations, the primary difference between this mitigation strategy and the on-the-books controls is the expansion of the rules to affect all equipment rather than just a subset of equipment.[80]

Additional Mitigation to Reduce NO_x Pollution

Visibility impacts and excessive nitrogen deposition in impacted National Parks and elevated ozone concentrations indicate the need for comprehensive NO_x reductions. This could be achieved through: (1) field electrification; (2) requirement to use Tier 4 drill rigs and Tier 2 or better construction equipment; (3) centralization of well pad production facilities (*e.g.*, to reduce onsite equipment emissions, such as from heaters, etc.);[81] and (4) the best available emission limits for compressors.

The NPS recommended the following NO_x reduction options in order to avoid significant impacts from these sources for the Hayhurst Master Development Plan EA and BLM should consider requiring similar mitigations in order to minimize visibility and ecosystem impacts at nearby National Parks:[82]

> *NO_x Reduction Options for Drilling and Completion Engines:*
>
> - *Use of all Tier 4 compliant engines:* It is important to clarify that we are specifically requesting the BLM and operator consider the feasibility of using Tier 4 compliant *generator sets* for *all* drilling and completion

[80] AECOM Utah State BLM Emission Inventory TSD at 5-4, included as Exhibit 36.

[81] In addition to centralized gas well gathering facilities, which will result in reduced numbers of heaters, operators should be required to meet strict emissions standards for NO_x emissions from heaters. Many California air districts currently impose emission standards for small process heaters (as small as 0.6 mmBTU/hr) limiting NO_x emissions to 30 ppm. These limits are met through a range of controls including lowering temperatures, insulating units and regular tuning to increase combustion efficiency. *See* San Diego County Air Pollution Control District Rule 69.2.1, South Coast Air Quality Management District Rule 1146.1, Ventura County Air Pollution Control District Rule 74.15.1, Santa Barbara County Air Pollution Control District Rule 361, included as Exhibits 37a, 37b, 37c, and 37d.

[82] NPS, August 29, 2016, Memo to BLM from Carlsbad Caverns National Park Superintendent, Subject: National Park Service Comments on the Chevron U.S.A., Inc. Hayhurst Master Development Plan, Environmental Assessment DOI-BLM-NM-P020-2016-1434-EA, included as Exhibit 38.

operations, i.e., this would require the use of generator sets in conjunction with electric motors to power equipment, rather than mechanical engines/rigs [NPS notes that mechanical engines have a NO_x emission factor of 2.6 g/hp-hr]. If this option were implemented, engines would meet the 0.5 g NO_x/hp-hr and would reduce drilling and completion emissions by roughly 90%. This option was deemed feasible by the four corners air quality task force. We recognize that fleet turnover would likely need to occur to fully implement these types of engines; however, due to the large reduction in emissions, we recommend that this option be considered.

- *Retrofit of Tier 2 engines with Selective Catalytic Reduction (SCR):* We note that the addition of SCR systems to generator sets has been successfully demonstrated in the Jonah-Pinedale field in Wyoming, achieving 80% to upwards of 90% reductions in NO_x emissions from these engines. NO_x reduction requirements were implemented in response to concerns regarding visibility impairment in the nearby Wind River Wilderness, a Class I area managed by the USFS. Operators and control system manufacturers have been able to overcome difficulties associated with installing SCR on engines used for drilling operations, including accommodating fluctuating loads and exhaust temperatures, extreme swings in weather conditions and portability. This option was deemed feasible by the four corners air quality task force and we recommend that this technology be considered as part of a NO_x reduction strategy.

- *Use of natural gas-fired or dual-fuel engines:* Both natural gas-fired and dual-fuel engines have proven to be feasible, cost effective options for drilling operations in various basins throughout the United States and Canada. We note that publicly available data shows that EQT, Apache Corporation, Chesapeake Energy, Statoil, Encana Corporation, Cabot Oil and Gas, Antero Resources, CONSOL Energy and Seneca Resources have all successfully employed natural gas-fired or dual-fuel engines for drilling operations. Liquified Natural Gas (LNG) and dual-fuel engines have also been successfully employed in completion (hydraulic fracturing) operations. This is most clearly highlighted by Chesapeake Energy's move in 2011 to transition all of its hydraulic fracturing equipment to LNG. The use of natural gas-fired and dual fuel engines can achieve upwards of an 85% reduction in NOx emissions (relative to Tier 1 engines). We recognize that *natural gas-fired and dual fuel engines* may not be suitable for all operational circumstances; however, given the variety of areas and operations, we strongly recommend that their use be considered.

- *Electrification of drilling operations:* This option would virtually eliminate NO_x emissions from the drilling phase and has been used successfully in

the Marcellus shale by CONSOL Energy. We recommend that electrification of drilling operations be considered for the Hayhurst project given that electric power may be available in the MDP area.

- *Phased drilling approach:* One remaining option is to limit the number of drilling and/or fracturing operations that can occur simultaneously to a level that eliminates the significant adverse effects of nitrogen deposition, as demonstrated through modeling.

The NPS specifically recommended implementing such measures as Conditions of Approval (COAs) through the EA and in subsequent applications for permits to drill (APDs).

To reduce NO_x emissions from compressors, the BLM should require engines that meet a NO_x emission rate of 0.5 grams per horsepower-hour (g/hp-hr). BLM's Chevron EA demonstrated the implementation of well-controlled compressors with emission rates of 0.5 g/hp-hr NO_x for small compressors (1,380 bhp/unit) and 0.3 g/hp-hr for large compressors (5,000 bhp/unit).[83]

Additional Mitigation to Reduce Particulate Matter Pollution

The potential for visibility impacts and PM impacts from construction activities support a need for comprehensive PM reductions. This could be achieved through: (1) steps to minimize traffic (*e.g.*, through centralization of well pad production facilities and centralized gathering facilities to reduce traffic, remote well monitoring to reduce trips to wellsites, etc.); (2) required dust control measures; and (3) use of construction equipment that meets Tier 2 or better engine standards.

Additional Mitigation to Address Hazardous Air Pollution, Ozone, and Climate Change

Concerns about potential exposure to toxic pollutants, ozone impacts, and climate change warrant addressing HAP, fugitive VOC, and methane emissions through implementation of all available cost-effective technologies and practices to reduce emissions. In particular, BLM should require: (1) efficient flaring practices; (2) use of certain compressor technologies and practices; and (2) advanced leak detection and repair protocols.

[83] *See NOx Reduction Options for Compressors in:* NPS, August 29, 2016, Memo to BLM from Carlsbad Caverns National Park Superintendent, Subject: National Park Service Comments on the Chevron U.S.A., Inc. Hayhurst Master Development Plan, Environmental Assessment DOI-BLM-NM-P020-2016-1434-EA, included as Exhibit 38.

Flaring

Formaldehyde concentrations could be minimized by limiting flare emissions and instituting requirements that ensure proper operation of flares. BLM should require the use of high-efficiency (*i.e.*, minimum of 98% VOC destruction efficiency) flares coupled with auto-igniters and surveillance systems. And in addition, BLM should consider setting gas capture targets similar to those established in North Dakota that allow for a greater amount of flaring, initially, (*e.g.*, wildcat flaring at new wells) but decrease allowable flaring as it becomes more economical to capture gas.

Compressors

To help reduce VOC emissions from compressor engines BLM should require operators of centrifugal compressors to either use dry seal systems or collect the wet seal vent gas with a vapor collection system. Systems to capture gas from wet seal degassing is a cost-effective way to reduce methane emissions from centrifugal compressors. EPA's Natural Gas STAR program describes how degassing systems equipped with the proper technology are cost effective and can largely eliminate vented gas from wet seal compressors.[84]

For reciprocating compressors, BLM should require capturing emissions in a vapor collection system or if a source operator cannot install an emissions collection system, periodic rod packing replacements should be employed instead (*e.g.*, replacing rod packing every 26,000 operating hours or every 36 calendar months).

Controlling emissions from compressors in these ways is consistent with EPA's NSPS for the oil and natural gas sector, proposed regulations in California, and new regulations in Ohio.[85]

Leak Detection and Repair

Equipment leak detection and repair programs across all sectors (*i.e.*, processing, production, transmission and storage) can be cost-effective and significantly reduce methane and VOC emissions. Leak detection and repair (LDAR) programs requiring semiannual LDAR (and quarterly LDAR at compressor stations) are vital to addressing fugitive emissions from oil and gas sources. Based on EPA's engineering judgement,

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[84] EPA, Wet Seal Degassing Recovery System for Centrifugal Compressors, 2014, https://www.epa.gov/sites/production/files/2016-06/documents/capturemethanefromcentrifugalcompressionsealoildegassing.pdf, included as Exhibit 39.

[85] *See* CARB Proposed Greenhouse Gas Emissions Standards for Crude Oil and Natural Gas Facilities, §95213(e) and (f) at https://www.arb.ca.gov/cc/oil-gas/meetings/Draft_Regulatory_Language_4-22-15.pdf, included as Exhibit 40a; and Ohio EPA, General Permit 17.1 at http://epa.ohio.gov/dapc/genpermit/ngcs/GP_171.aspx, included as Exhibit 40b.

potential emissions reductions percentages for LDAR programs were estimated, in the NSPS rulemaking, to be 40 percent for annual monitoring, 60 percent for semiannual monitoring, and 80 percent for quarterly monitoring.[86]

The State of Wyoming requires inspections at new and modified facilities located in concentrated development areas and existing sources in the Upper Green River Basin that emit certain levels of emissions. In addition, the State of Colorado requires LDAR at new and existing well production facilities, storage vessels and natural gas compression stations at, or upstream of, natural gas processing plants. Colorado's Air Pollution Control Division predicted that almost 80 percent of repair costs for well facilities will be covered by the value of conserved gas.[87]

Wyoming-based Jonah Energy has been conducting monthly LDAR with infrared camera technology for more than five years, documenting leak reductions of over 75%, "as well as reducing repair times, cutting labor costs, and cutting gas losses significantly."[88] And Anadarko's inspection program in Colorado has, "cut VOC emissions by at least 75 percent while doubling production."[89]

Since parcels in this lease sale are inside the ozone nonattainment area, an Adaptive Management Strategy / Ozone Action Plan should apply to development of these parcels until implementation plan requirements are established for attaining and maintaining the NAAQS. Under this type of strategy, BLM would not approve further development in this area unless and until enhanced ozone adaptive management strategies have been prepared and evaluated and enhanced ozone mitigation measures are attached as COAs. A diligent approach to future development in the area is critical given the significant current and predicted air quality concerns (*e.g.*, impacts to the ozone nonattainment area and existing visibility and ecosystem concerns in nearby National Parks).

BLM Must Demonstrate Conformity in the Ozone Nonattainment Area

In the EA, BLM references conformity requirements by stating that it is required to make a general conformity determination for reasonably foreseeable emissions that result from the action, starting in August 2019.[90]

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[86] EPA Background Technical Support Document for the Final NSPS 40 CFR Part 60, subpart OOOOa, May 2016 at 41, included as Exhibit 41.
[87] Colorado Air Pollution Control Division, Cost-Benefit Analysis for Proposed Revisions to AQCC Regulations No. 3 and 7 (February 7, 2014) Table 30, *available at* http://www.ematrix.erg.com/files/control/BP%20Doc%20Colorado%201.pdf, included as Exhibit 42.
[88] FLIR, June 13, 2016, FLIR Works to Support Oil & Gas Customers Facing New EPA Methane Rule, http://store.flir.com/home/news/details/?ID=76785, included as Exhibit 43.
[89] *Id.*
[90] BLM EA at 12.

General Conformity provisions apply in all nonattainment areas (Clean Air Act Section 176(c)), including in the Uinta Basin marginal nonattainment area.[91] Conformity ensures that federal actions comply with the NAAQS. In order to meet this Clean Air Act requirement to conform with the implementation plan for the ozone nonattainment area (e.g., a Federal Implementation Plan (FIP) or Tribal Implementation Plan (TIP)), BLM must demonstrate conformity in one of four ways:

- Showing that the emission increases caused by the lease development are included in the FIP/TIP[92]
- Demonstrating that the EPA or tribal government agrees to include the emission increases in the FIP/TIP
- Offsetting the lease development emissions in the same or nearby area,
- Mitigation to reduce the emission increase, or in some circumstances,
- An air quality modeling demonstration.

Or, in the absence of an implementation plan for the area, BLM must demonstrate conformity by ensuring there will be no increase in emissions in the nonattainment area from the lease development that will cause or contribute to any new violations of any standard in the area and / or increase the frequency or severity of any existing violation of any standard in the area (*see* Clean Air Act Section 176(c)(1)(B)).

BLM's Air Quality Analysis Does Not Support a Finding of No Significant Impact

BLM is required under FLPMA, 43 C.F.R. § 2920.7(b)(3), to provide for compliance with air quality standards established pursuant to applicable Federal and State law, such as the CAA, and thus the BLM cannot authorize leasing that would allow the NAAQS to be exceeded or air to significantly degrade in clean air areas (*i.e.*, exceed the Prevention of Significant Deterioration (PSD) increments). Yet, the BLM has not thoroughly analyzed – in this EA or anywhere else – whether or not development of the proposed leasing areas will comply with these Clean Air Act Requirements.

BLM must acknowledge the existing air quality concerns in the area impacted by the proposed leasing – e.g., the ozone nonattainment status for some of the lease parcels – and recognize that high background levels of air pollutants can mean that even if the activities qualitatively analyzed in the EA will result in only minor increases in certain

[91] *See* EPA's nonattainment designations, included as Exhibit 2.

[92] For this leasing EA, BLM must consider whether development of all leased parcels in the ozone nonattainment area exceed de minimis levels in 40 C.F.R. 93.153(b)(1) – i.e., 100 tons per year of NOx or VOC.

pollutant emissions, the aggregate level of pollution that could result in the impacted area might have significant detrimental effects on human health and on visibility. The EA includes the following ambiguous statement about air quality impacts:

> It is anticipated that the impact to ambient air quality and air quality related values associated with the Proposed Action would be indistinguishable from and dwarfed by the model and emission inventory scope and margin of error. EA at 40.

BLM cannot authorize actions that will contribute to exceedances of air quality standards. Based on the current nonattainment status for a large number of the lease parcels and BLM's ARMS analysis showing future potential exceedances of air quality standards, the BLM must conduct an EIS and develop an alternative that includes sufficient and enforceable mitigation measures to ensure no exceedances of CAA requirements will occur from development of the proposed lease sale.

BLM Should Consider an Alternative Adopting Additional Mitigations and Management Actions to Better Ensure Protection of Air Quality in the Area

BLM must consider reasonable, feasible alternatives and should develop an alternative adopting the additional mitigation measures identified and discussed in these comments. Given the significant existing and predicted future ozone and $PM_{2.5}$ impacts in the Uinta Basin, BLM must consider an air quality alternative aimed at reducing the potentially significant air quality impacts that could reasonably occur from the resource development of the proposed lease sale parcels. Further, the fact that mitigation under NEPA can include "limiting the degree or magnitude of the action and its implementation," BLM should also consider a requirement as part of a proposed air quality alternative that operators curtail un-essential activities that contribute to VOC and NO_x emissions on days with predicted meteorological conditions conducive to ozone formation (e.g., reduce truck trips during wintertime inversion episodes). Finally, BLM should also consider adopting a requirement in the air quality alternative that would allow for operators to offset any increases in VOC and NO_x emissions from the proposed development by a 1.2–to–1 ratio by implementing additional mitigation measures at other operations it conducts in the Uinta Basin, effectively reducing emissions of these pollutants in the Basin by a minimum of 1.2 units for every unit of emissions from the development of the proposed lease sale parcels.