



Department of Environmental Quality



To protect, conserve and enhance the quality of Wyoming's environment for the benefit of current and future generations.

Dave Freudenthal, Governor

John Corra, Director

September 8, 2009

Chuck Otto
Field Office Manager
Pinedale BLM
1625 West Pine
PO Box 768
Pinedale, WY 82941

RE: Pinedale Anticline Record of Decision Visibility Threshold

Dear Mr. Otto:

The Pinedale Anticline Record of Decision (ROD) describes three visibility milestones. The first milestone is described on page 25 of the ROD:

"Within 12 months [or by September 12, 2009] after signing of this ROD modeled project related visibility impacts will be no greater than 40 days of visibility impairment over 1 [deciview (dv)] at the Bridger Wilderness Area."

The ROD requires that: *"Demonstrations of progress in meeting these milestones will be provided annually by the Operators (ROD, p. 25)."*

During development of the Pinedale Anticline Supplemental Environmental Impact Statement (SEIS), maximum field-wide emissions associated with various phases of mitigation were modeled to determine the days of visibility impacts over 1 dv. Phase 1 mitigation included reducing field-wide emissions to 2005 emission levels. This phase of mitigation resulted in a modeled visibility impact of 40 days over 1 dv at the Bridger Wilderness Area. These emission levels, which are presented in Table 4.1, page 37 of the Air Quality Impact Analysis Technical Support Document associated with the Pinedale Anticline Final SEIS are reflected below:

Emissions	Phase 1 Mitigation [tons per year]
NO _x	3809.3
SO ₂	233.7
PM ₁₀	872.5
PM _{2.5}	295.7

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These emission totals account for NO_x emissions from field compression, including the Pinedale, Falcon and Paradise Compressor Stations. They also include NO_x emissions from the Granger Gas Plant, as well as, NO_x, SO₂, PM₁₀ and PM_{2.5} emissions from drilling rigs, and emissions from production sources, which are characterized in the Final SEIS as “Fugitives.”

The Air Quality Division (AQD) believes that the Operators can demonstrate progress in meeting the visibility milestones described in the ROD by submitting emissions inventories, and determining if the field-wide emissions are lower than those associated with the Phase 1 modeling. Further, the AQD believes that it is acceptable to use 2008 emissions inventory information to verify that this requirement has been met.

Under the Wyoming Air Quality Standards and Regulations (WAQSR), applicants for permits are required to demonstrate to the AQD Administrator, that “the proposed facility will not prevent the attainment or maintenance of any ambient air quality standard (WAQSR Chapter 6, Section 2(c)(ii)).” The Interim Policy of Demonstration of Compliance with WAQSR Chapter 6, Section 2(c)(ii) for Sources in Sublette County, which was issued by the AQD on July 21, 2008, describes options that AQD will consider as an adequate WAQSR Chapter 6, Section 2(c)(ii) demonstration for permit applications for new or modified emissions sources in Sublette County. Those options include:

- a. Ambient ozone modeling for any application requesting increases in VOCs and/or NO_x emissions;
- b. Emission reductions for VOCs and/or NO_x emissions; or
- c. Applicants may propose alternative innovative Demonstrations to the AQD.

Option b requires that new source permit applications received after August 1, 2008, be offset for NO_x on a 1.1:1 ratio for any emissions increase as a result of the permitting action.

All of the operators working under and bound by conditions set forth in the Pinedale Anticline ROD, including Ultra Resources, Inc. (Ultra), Shell Exploration and Production Company (Shell), Questar Market Resources including Wexpro Company (Questar), Anschutz Pinedale Corporation (Anschutz), Yates Petroleum Corporation (Yates), and Newfield Production Company (Newfield), have chosen to offset NO_x emissions for their Chapter 6, Section 2(c)(ii) demonstration. Therefore, emissions inventories associated with each of these companies’ production sources will be lower in 2009 than were reported to AQD for 2008. Consequently, utilizing 2008 inventory data to verify that the visibility threshold has been met in 2009 may lead to some slight over-estimation with respect to production emissions.

The 2008 emissions inventory data submitted by Ultra, Shell, Questar, Anschutz, Yates and Newfield has been reviewed and verified by AQD, and is available in its entirety upon request by contacting Brian Bohlmann (307.777.6993 or bbohlmann@wyo.gov). Emissions inventories are under continual improvement and the overall emissions are subject to change. However, the AQD does not have any reason to believe that future changes to the 2008 data will be significant. The emissions totals by source for each pollutant are presented in Tables 1 through 3.

Table 1: 2008 NO_x Emissions (tpy)							
Source	Ultra	Shell	Questar	Anschutz	Yates	Newfield	Total
Stationary Engines	0.00	18.65	4.91	0.00	2.58	0.00	26.13
Heaters	197.18	97.43	142.21	2.25	7.08	7.64	453.78
Tanks	115.46	89.00	0.98	0.07	0.65	1.87	208.04
Dehydrations Units	60.17	35.59	19.51	0.32	1.12	1.51	118.22
Pneumatic Pumps	0.65	1.77	1.85	0.22	0.01	14.42	18.93
Drill Rigs	1173.85	860.56	418.69	0.00	38.78	0.57	2492.45
Completions	232.53	92.01	107.76	0.60	19.70	0.00	452.60
Construction Mobile	0.00	0.00	0.00	0.13	1.59	0.00	1.71
Total	1779.85	1195.01	695.91	3.59	71.50	26.01	3771.87

Table 2: 2008 SO₂ Emissions (tpy)							
Source	Ultra	Shell	Questar	Anschutz	Yates	Newfield	Total
Stationary Engines	0.00	1.22	0.00	0.00	0.00	0.00	1.22
Heaters	1.18	0.58	0.85	0.01	0.04	0.05	2.72
Drill Rigs	28.35	19.72	0.44	0.00	8.56	0.01	57.09
Completions	1.71	0.68	0.00	0.18	4.29	0.00	6.87
Construction Mobile	0.00	0.00	0.00	0.00	0.26	0.00	0.26
Total	31.25	22.21	1.29	0.19	13.15	0.06	68.15

Table 3: 2008 PM Emissions (tpy)							
Source	Ultra	Shell	Questar	Anschutz	Yates	Newfield	Total
Stationary Engines	0.00	1.48	0.00	0.00	0.00	0.00	1.48
Heaters	14.99	7.40	10.81	0.17	0.54	0.58	34.49
Drill Rigs	16.63	6.08	14.85	0.00	1.21	0.00	38.77
Completions	7.85	3.13	0.00	0.03	0.61	0.00	11.62
Construction Mobile	0.00	0.00	0.00	0.00	0.05	0.00	0.05
Total	39.47	18.09	25.65	0.21	2.40	0.58	86.41

In addition to production site emissions, the modeling conducted during development of the SEIS incorporated NO_x emissions from the Granger Gas Plant and the Pinedale, Paradise and Falcon Compressor Stations. The 2008 annual actual NO_x emissions for those facilities as reported to AQD are listed in Table 4.

Table 4: 2008 NO _x Emissions [tpy]	
Facility	
Granger Gas Plant	238.50
Pinedale Compressor Station	119.70
Paradise Compressor Station	157.90
Falcon Compressor Station	164.00
Total	680.10

The total field wide 2008 actual emissions as submitted to AQD and Phase I mitigated modeled emissions are presented in Table 5. The actual SO₂ emissions reported to AQD in 2008 are well below those which were modeled in the SEIS as Phase I Mitigation. SO₂ emissions are not expected to increase in the field above 2008 actual levels. Similarly, the 2008 Actual PM emissions are far below levels modeled as Phase I Mitigation.

Table 5: Field Wide Emissions [tpy]		
	2008 Actual	Phase I Mitigation
Field Compression		
NO _x	441.6	379.7
Granger Gas Plant		
NO _x	238.5	301.7
Drill Rigs		
NO _x	2492.45	2632.2
SO ₂	57.09	222.9
PM	38.77	141.6
Production Sources		
NO _x	1279.42	495.7
SO ₂	11.06	10.8
PM	47.64	730.9
Total		
NO _x	4451.97	3809.3
SO ₂	68.15	233.7
PM	86.41	872.5

The NO_x emissions reported to AQD in 2008 are higher than what was modeled in the SEIS as Phase I mitigation. The AQD believes it is appropriate to consider upgrades to drilling rig engines that occurred prior to September 12, 2009, but which could not be included in the 2008 actual annual emissions inventory. Ultra, Shell and Questar installed emission control technologies such as Selective Catalytic

Reduction (SCR) on several drill rigs in 2009, which led to significant reductions in NO_x emissions prior to September 12, 2009.

The AQD requested additional information of Ultra, Shell and Questar regarding 2009 drilling rig upgrades including an estimate of emissions from drilling rigs as of September 12, 2009. The resultant 2009 projected actual drilling rig NO_x emissions are presented in Table 6. The complete submission is included as Attachment 1 ('Ultra Shell Questar 2009 Projected actual drill rig NO_x emissions.xls').

Ultra installed the SCR system on two Tier 2 drilling rigs in the first quarter of 2009. Shell had the SCR system installed on one drilling rig in 2008. The remainder of Shell's active fleet was upgraded to include the SCR system in the first quarter of 2009. Shell also reported 2009 projected drilling rig emissions for two Tier 1 rigs. However, those rigs had minimal operations in 2009 and are not currently operating in the field. Questar's fleet consists primarily of Tier 2 engines. An SCR system was installed on one drilling rig in the 3rd quarter of 2009.

Table 6. 2009 Projected Actual Drilling Rig NO _x Emissions (Ultra, Shell & Questar) [tpy]	
Company	NO _x
Ultra	467.2
Shell	130.0
Questar	427.1
Total	1024.3

It was noted by AQD that the 2009 Projected Actual Drill Rig NO_x Emissions projections submitted by Ultra, Shell and Questar reflected reductions in the pace of drilling and fewer active rigs in 2009 than were operational in 2008.

Please note that Attachment 1 reflects emission inventory data supplied by Ultra, Shell and Questar at AQD's request, to allow for an evaluation of NO_x reductions, which result from the installation of drilling rig emission controls in 2009, but which were not accounted for in the 2008 emission inventory. AQD notes that Questar and Shell calculated rig engine emissions based upon emission factors, and Ultra based their calculations on fuel usage data, both of which are acceptable methods. Ultra, Shell and Questar are asserting that their 2009 emission inventory data as summarized in Attachment 1 reflect NO_x emissions from all rig engines as of September 12, 2009.

The 2009 emission inventory data submitted by Ultra, Shell and Questar represents the estimated actual drilling rig NO_x emissions, but does not reflect allowable NO_x emission from these sources. AQD is reviewing voluntary drilling rig permit applications submitted by Ultra, Shell, Questar and Anschutz, which would allow for the establishment of regulatory emission limits for NO_x and other pollutants from drilling rig engines which will be operating in the Pinedale Anticline Project Area. The permitted emission limits are likely to be different that the levels in Attachment 1.

The combined NO_x emissions including 2008 actual emissions and 2009 projected actual drilling rig NO_x emissions for Ultra, Shell and Questar are reflected in Table 7.

Table 7: Field Wide NO _x Emissions [t/y]		
	NO _x	Phase I Mitigation
Field Compression, 2008 Actual	441.6	379.7
Granger Gas Plant, 2008 Actual	238.5	301.7
Drilling Rigs		2632.2
2008 Actual (Anschutz, Yates & Newfield)	39.35	
2009 Projected Actual (Ultra, Shell & Questar)	1024.3	
Production Sources, 2008 Actual	1279.42	495.7
Total	3023.17	3809.3

Based on the information submitted to AQD and contained in this letter, the AQD believes there is sufficient data to enable the BLM to ascertain whether the Operators have satisfied the requirement that they have demonstrated progress in meeting the visibility milestone for 2009 as described in the ROD.

Any questions specific to the 2008 annual actual emissions inventory can be directed to Brian Bohlmann, Emissions Inventory Supervisor (307.777.6993 or bbohlman@wyo.gov). Questions specific to the Operators' submitted 2009 Projected Actual Drilling Rig Emissions can be directed to Margaret Spearman (mspearman@spearmanco.com). Please direct all other questions to Kelly Bott, Planning Engineer (307.777.6088 or kbott@wyo.gov).

Regards,


David A. Finley
Administrator
Air Quality Division

cc: John Corra
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