

**Questar Market Resources
Sublette County, Wyoming**

Ozone Contingency Plan

December 2009

Contents

1.0 Purpose

2.0 General Operational Information

3.0 Overview

- 3.1 What is Ozone?
- 3.2 How is Ground-Level Ozone Formed?
- 3.3 What are the Effects on Human Health and the Environment?
 - 3.3.1 Health Effects
 - 3.3.2 Environmental Effects
- 3.4 What is an Ozone Advisory?
 - 3.4.1 Ozone Health Advisory Levels
- 3.5 When is an Ozone Advisory Issued?
- 3.6 When is an Ozone Advisory Lifted?

4.0 Preplanning

- 4.1 Awareness Training
- 4.2 Inspection and Maintenance
 - 4.2.1 Leak Detection Surveillance
 - 4.2.2 Production Operations Surveillance

5.0 Notification Procedures

- 5.1 Notification System
- 5.2 Test of Action Plan Notification System

6.0 Control Measures

- 6.1 Short Term
- 6.2 Accelerated Activities
- 6.3 Activities Considered; But Not implemented
- 6.4 Recordkeeping

7.0 Periodic Evaluation

Appendices

- Appendix A Letter to Local Officials from John Corra, Director, WDEQ
- Appendix B Ozone Advisory Health Information (Fact Sheet from Wyoming Department of Health)
- Appendix C News Release from WDEQ: Ozone Advisory in Sublette County (Example)
- Appendix D Notification Process Flow Diagram
- Appendix E Ozone Alert Checklist

Figures

- Figure 1 Well Pad and Lease Location Map

Acronyms

| | |
|----------|--|
| BLM | Bureau of Land Management |
| BTEX | Benzene, Toluene, Ethylbenzene, Xylene |
| EPA | Environmental Protection Agency |
| FLIR | Forward Looking Infrared (imaging device) |
| LEPC | Local Emergency Planning Committee |
| NOx | Oxides of Nitrogen |
| PAPA | Pinedale Anticline Project Area |
| ppb | Parts Per Billion |
| ROD | Record of Decision |
| SERC | State Emergency Response Commission |
| UV | Ultraviolet |
| VOC | Volatile Organic Compound |
| WDEQ-AQD | Wyoming Department of Environmental Quality – Air Quality Division |

1.0 Purpose

The following Ozone Contingency Plan is for Questar Market Resources (Questar) for its natural gas development and production operations in the Pinedale Anticline field in Sublette County, Wyoming. The purpose of this plan is to identify emission control measures and operating limitations that can be implemented upon a 1 day notice of a high ozone forecast from the Wyoming Department of Environmental Quality's Air Quality Division (WDEQ-AQD) to reduce volatile organic compounds (VOC) and oxides of nitrogen (NO_x).

The BLM's Record of Decision (ROD) in September 2008 for the Pinedale Anticline Project Area (PAPA) Supplemental Environmental Impact Statement states in Section 4.1.2 that "Within 90 days of the signing of this ROD, and on an annual basis thereafter, until such time as BLM and WDEQ deem it is no longer necessary, individual contingency plans will be developed by the Operators with WDEQ-AQD and BLM to address avoidance of wintertime ozone exceedances. Failure to comply by any individual company will result in BLM withholding approvals for that company and/or reducing the pace of development and/or production." This Ozone Contingency Plan is intended as a guide to contingency procedures for Questar employees and contractors in the event of an Ozone Advisory from the WDEQ-AQD. This plan applies to all Questar natural gas development and production operations in the Pinedale Field in Sublette County.

A formal written Ozone Contingency Plan will be maintained at the Questar Pinedale Field Office and will be available electronically on an internal web site. This written plan is available, upon request, to Questar employees, their designated representatives, Questar contractors, and any BLM, Environmental Protection Agency (EPA) or WDEQ officials.

2.0 General Operational Information

The address of Questar is:

Questar
120 South Cole
Pinedale, WY 82941
(307) 367-7001

Questar has operated on the Pinedale Anticline since 1963 and development activities include construction, pipelines, drilling, completion, compression and production. As of November 2009, Questar produces natural gas from 427 producing wells at approximately 69 locations. Questar currently operates a fleet of 6 drilling rigs.

The main types of emissions from Questar operations include NO_x and VOC. Largest NO_x emission sources include the diesel drilling rig engines, natural gas compressors, and completion/production activities. The main sources of VOC emissions are from production operations including gas dehydration, pneumatic pumps and controls, and fugitive leakage from our production facilities.

Our workforce includes a mix of Questar personnel and contractors. Questar personnel are split between the Pinedale office and working in the field supporting the different development and production activities. Most contractor firms support the field operations like drilling, completions, pipelines, compression and construction, some living locally and others commuting from neighboring cities and states. Typical work hours for field operators and control room operators are 7 days per week, 8 hours per day. Drilling and completions operations are 24 hours per day.

Environmental Contact: Kathryn Fontaine, Senior Environmental Engineer

Questar
1050 17th Street, Suite 500
Denver, CO 80265
Office: (303) 672-6982
Cell: (303) 775-8624
Email: kathryn.fontaine@questar.com

Casey Hensley, Environmental Engineer

Questar
1050 17th Street, Suite 500
Denver, CO 80265
Office: (303) 308-3064
Cell: (720) 273-3734
Email: casey.hensley@questar.com

Pinedale Site Contact: Kevin Williams, Pinedale District Manager

Questar
120 South Cole
Pinedale, WY 82941
Office: (307) 367-3941
Cell: (307) 354-7138
Email: kevin.williams@questar.com

3.0 Overview

3.1 What is Ozone?

Ozone (O₃) is a gas composed of three oxygen atoms that occurs both in the Earth's upper atmosphere and at ground level. Ozone has the same chemical structure whether it occurs miles above the earth or at ground level. Ozone occurs naturally in the stratosphere approximately 10 to 30 miles above the earth's surface and forms a layer that protects life on earth from the sun's harmful rays. In the earth's troposphere or lower atmosphere, ground-level ozone is considered an air pollutant.

3.2 How is Ground-Level Ozone Formed?

Ozone is not usually emitted directly into the air, but at ground-level is created by a chemical reaction between oxides of nitrogen (NO_x) and volatile organic compounds (VOC) in the presence of sunlight. Motor vehicle exhaust, industrial emissions, electric utilities, gasoline vapors, and chemical solvents as well as natural sources emit NO_x and VOC that help form ozone. Ground-level ozone is the primary constituent of smog. Sunlight and hot weather cause ground-level ozone to form in harmful concentrations in the air. As a result, it is known as a summertime air pollutant. Although many urban areas tend to have high levels of ozone, rural areas are subject to increased ozone levels because wind carries ozone and pollutants that form ozone hundreds of miles from their original sources.

Unlike urban areas which experience ground-level ozone in the summertime, elevated ground-level ozone in Sublette County occurs during the winter. Ultraviolet (UV) energy from the sun is required to produce ozone. When the ground is highly reflective, such as during the winter when there is snow on the ground, UV energy is doubled which can elevate the level of ozone. In addition to snow and sunshine, elevated ozone is also produced from temperature inversion, still air and ozone precursors (NO_x and VOCs). Sources of ozone precursors in Sublette County are vehicles, drill rigs, well completion activities, gas production/compression/transmission, community/residential emissions, emissions from natural sources, and transported emissions via winds.

Additional information about ozone, its formation in the Greater Green River Basin and WDEQ's involvement is discussed in a letter from John Corra, Director of WDEQ to Mayor Steve Smith of Pinedale shown in Appendix A. See also Appendix B for an Ozone Fact Sheet from the Wyoming Department of Health.

3.3 What are the Effects on Human Health and the Environment?

Breathing ozone may trigger a variety of health problems including chest pain, coughing, throat irritation, and congestion. It may worsen bronchitis, emphysema, and asthma. Ground-level ozone also may reduce lung function and inflame the linings of the lungs. Repeated exposure may permanently scar lung tissue.

The Clean Air Act requires EPA to set air quality standards to protect both public health and the public welfare (e.g. crops and vegetation). Ground-level ozone affects both.

3.3.1 Health Effects

People with lung disease, children, older adults, and people who are active may be affected when ozone levels are unhealthy. Breathing ozone may trigger a variety of health problems, including:

- Airway irritation, coughing, and pain when taking a deep breath,
- Wheezing and breathing difficulties during exercise or outdoor activities,
- Inflammation, which is much like a sunburn on the skin,

- Aggravation of asthma and increased susceptibility to respiratory illnesses like pneumonia and bronchitis,
- Permanent lung damage with repeated high level exposures.

3.3.2 Environmental Effects

Ground-level ozone may have detrimental effects on plants and ecosystems. These effects include:

- Interfering with the ability of sensitive plants to produce and store food, making them more susceptible to certain diseases, insects, other pollutants, competition and harsh weather,
- Damaging the leaves of trees and other plants, negatively impacting the appearance of urban vegetation, as well as vegetation in national parks and recreation areas, and
- Reducing forest growth and crop yields, potentially impacting species diversity in ecosystems.

3.4 What is an Ozone Advisory?

An Ozone Advisory is issued by the WDEQ-AQD on days when ground-level ozone concentrations are expected to be above the ozone standard (health based standard) based upon an evaluation of weather forecasts and ozone monitoring data. An advisory indicates the potential for elevated 8-hour ozone levels. The advisory will remain in effect for 1 day; but may be reissued on consecutive days.

3.4.1 Ozone Health Advisory Levels

The National Ambient Air Quality Standard for ozone for 8-hour exposure durations is 75 parts per billion (ppb) as established by the EPA. WDEQ-AQD uses the EPA's Air Quality Index guidance and advisory levels to inform sensitive groups and the general public of potential health risks associated with exposures to elevated levels of ozone. The table below describes the specific ozone values, the associated Air Quality Index health concern levels and an explanation of each value/level.

Ozone Health Advisory Levels

| Ozone Value (8-hour average) | Air Quality Index Levels of Health Concern | Meaning |
|------------------------------|--|---|
| 0-59 ppb | Good | Air quality is considered satisfactory, and air pollution poses little or no risk. No health impacts are expected when air quality is in this range. |
| 60-75 ppb | Moderate | Air quality is acceptable; however, for some pollutants there may be a moderate health concern for a very small number of people who are unusually sensitive to air pollution. |
| 76-95 ppb | Unhealthy for Sensitive Groups | Members of sensitive groups may experience health effects. The following groups should limit prolonged outdoor exertion: <ul style="list-style-type: none"> • People with lung disease, such as asthma • Children and older adults • People who are active outdoors The general public is not likely to be affected. |

| Ozone Value (8-hour average) | Air Quality Index Levels of Health Concern | Meaning |
|------------------------------|--|---|
| 96 ppb or greater | Unhealthy | <p>Everyone may begin to experience health effects; members of sensitive groups may experience more serious health effects. The following groups should avoid prolonged outdoor exertion:</p> <ul style="list-style-type: none"> • People with lung disease, such as asthma • Children and older adults • People who are active outdoors <p>Everyone else should limit prolonged outdoor exertion.</p> |

3.5 When is an Ozone Advisory Issued?

From mid January through March WDEQ-AQD will conduct in-house weather forecasting to determine if conditions are favorable for ozone formation. If conditions are favorable, WYDEQ-AQD will issue an ozone advisory for a 24-hour period. The WDEQ-AQD issues the advisories to the media, individuals, local governments and businesses via a variety of methods including telephone, email, a printed news release, internet (e.g. www.pinedaleonline.com), newspapers, television, and radio. Alerts will also be posted on the WYDEQ website <http://deg.state.wy.us> and available from the WYDEQ hotline at 1-888-WYO-WDEQ (1-888-996-9337). The Wyoming State Emergency Response Commission (SERC) and the Sublette County Local Emergency Planning Committee (LEPC) will assist with notifications. See Appendix C for an example of an ozone advisory from the WDEQ-AQD for Sublette County in the form of a news release. The ozone advisory will identify a specific locale, such as the Upper Green River Basin, and the duration of the advisory.

Following procedures from last year and announcements from the WYDEQ, an ozone advisory will be issued no later than 12:00 noon for the following day via e-mail and recorded phone message to Questar's identified contact(s). This allows the operators to plan activities accordingly in order to minimize the creation of ozone precursors. If conditions are favorable for ozone formation on consecutive days, a new ozone advisory will be issued for each affected day.

3.6 When is an Ozone Advisory Lifted?

Ozone Advisories will be issued for one (1) day periods by the WDEQ-AQD and as such no notification of the lifting of an Ozone Advisory will be issued.

4.0 Preplanning

4.1 Awareness Training

Awareness training for this Ozone Contingency Plan will be conducted on an annual basis for all applicable Questar personnel and winter-time contractors. The content of the training will follow the outline of this plan with a focus on the control measures described in Section 6.0. The first training session of this plan will be conducted in January 2010. This training will also be given at the following times:

- When a new winter-time employee or contractor is hired in the PAPA,
- When an existing employee or contractor is initially assigned to a winter-time job in the PAPA, and
- Whenever the plan has substantial changes.

4.2 Inspection and Maintenance

4.2.1 Leak Detection Surveillance

Prior to and during the wintertime ozone season, the following inspection and maintenance measures for purposes of gas leak detection will be undertaken. Note that these activities are above and beyond routine inspection and maintenance activity.

- Perform leak detection surveillance by the end of January to identify leaking equipment.
- Repair leaking equipment if possible in preparation of ozone advisories.

4.2.2 Production Operations Surveillance

Prior to and during the wintertime ozone season, the following production operations surveillance measures will be undertaken. Note that these activities are above and beyond routine inspection and maintenance activity.

- Check for proper operation of field equipment:
 - Are VOC and BTEX combustors operational?
 - Are VOC and BTEX combustors operating at proper temperature?

5.0 Notification Procedures

5.1 Notification System

A Notification Process Flow Diagram that describes the communication of an Ozone Advisory from its issuance by WDEQ-AQD to its receipt and subsequent communication to all necessary personnel by Questar is shown as Appendix E. Immediately following plan implementation in response to an ozone advisory, Questar will send an email confirmation to Kelly Bott (kbott@wyo.gov) to document that our communication plan was implemented successfully. This reporting action allows Questar and WDEQ to address potential communication issues immediately.

5.2 Test of Action Plan Notification System

Prior to the 2010 ozone season, on December 18, 2009, an initial test of the notification system will be conducted by the WDEQ. Questar, in turn, will then conduct its own initial test of its internal notification system and make updates to our internal contact list, as necessary.

6.0 Control Measures

This Ozone Contingency Plan will be implemented upon notification by the WDEQ-AQD of an Ozone Advisory for Sublette County, Wyoming.

This section of the Ozone Contingency Plan addresses control measures relative to Ozone Advisories issued by WDEQ-AQD that arise from episodic and elevated levels of ground-level ozone in the winter. Upon notification from the WDEQ of an Ozone Advisory for Sublette County, Wyoming, Questar will implement specific contingency measures. Proposed control measures are described in this section.

6.1 Short Term

During an Ozone Advisory, discretionary activities that could otherwise be rescheduled at a later date with better meteorological conditions will be limited. The following activities will be conducted in response to the ozone advisory.

- **Production Operations:**
 - Suspend and reschedule non-critical maintenance activities that would result in venting of gas.
 - Postpone/reschedule the blow down of wells that are needed for operational, maintenance or construction purposes where possible.
 - Turn down heat trace pumps to minimum temperatures with the result of lower VOC emissions during this period.
 - Increased surveillance of combustors, both in the control room and in the field, to ensure proper operation.
 - Shut-in uncontrolled facilities (e.g. single well facility with no control on the dehydrators) when environmentally and safely feasible.
- **Drilling Operations:**
 - Limit ancillary equipment idle time.
 - Minimize use of or turn off engines (e.g. water pumps, light plants) during daylight hours.
 - Refuel diesel tanks after dusk as possible, when emissions are less likely to produce ozone.
- **Completion Operations:**
 - Not initiating completion activities that lead to VOC or NOx emissions when safely feasible.
 - Minimize use of or turn off engines (e.g. water pumps, light plants) during daylight hours.
 - Between operators, share best management practices for flareless completion techniques in order to reduce emissions.
- **Other Control Measures:**

- Shut off all vehicle engines when activities would involve idling time greater than 5 minutes and would not put worker safety at risk.
- Where possible, perform maintenance activities that generate emissions later in the day when conditions are less favorable for the production of ozone.
- Establish a traffic minimization program and implement specific activities in the field by delaying trips, combining tasks into one trip, carpooling, or busing.
 - Reduce speed limits on the field and lease roads by 5 mph to reduce air pollution.
 - Postpone/reschedule non-critical vehicle trips to locations by Questar employees and contractors.
 - Keep vehicles tuned up and tires well inflated to increase mileage and reduce the need for refueling.
 - Do not overfill fuel tanks when re-fueling. Fuel creates ozone-causing vapors as it evaporates.
 - Tighten fuel caps after refueling.
 - Refuel cars and trucks after dusk, when emissions are less likely to produce ozone.
- Suspend and reschedule use of gasoline or diesel powered maintenance or construction equipment where possible.
- Use environmentally safe paints, cleaning products and other chemicals whenever possible.
- Follow manufacturers' recommendations to use and properly seal cleaners, paints, and other chemicals so smog-forming chemicals can't evaporate.

6.2 Accelerated Activities

As the WDEQ learns more about what is driving the formation of ozone in the area with their ongoing study, the following accelerated activities have helped or may help reduce the ozone forming emissions and future impacts:

- Added 96 additional wells to Liquids Gathering System since November 2008 preventing the installation of new production tanks and eliminating over 74,000 tanker truck trips,
- Replaced all winter drilling Tier 0 and Tier I rig engines with Tier II engines by November 2006 – over 1 year early compared to February 1, 2008 deadline in Questar's 2004 Year-Round Drilling EA (50% rig engine NOx reduction),
- Installed Tier II rig engines on all Pinedale summer drilling rigs since May 2007 (50% rig engine NOx reduction); not required,
- Converted all rig boilers from diesel to natural gas in winter 2006-07 (40% winter diesel fuel reduction); not required,
- Began utilizing Ultra Low Sulfur Diesel (ULSD) on all drilling rigs in 2006; not required until 2009,
- Began replacing mechanical rigs replaced with SCR rigs by 2009 for more efficient engine utilization,

- Bussing company swapped out diesel busses for cleaner gasoline-powered vehicles and swapped to smaller busses for crew change (2007); not required,
- Built onsite mud plants and installed piping system to and from all winter pad rigs to reduce trucking of drilling fluids; not required,
- Converted all six frac pumps to Tier II engines in June 2008 (not required); 50% NOx reduction,
- Perform flareless completions over 99% of the time for all workover and completion operations (90% is required),
- Performed 24-hour frac operations since 2005 which reduces trucking and emissions; not required,
- Successfully tested new non-bleed dump valve controllers and replaced all continuous bleed controllers summer 2009,
- Currently testing a solar powered methanol injection pump with favorable results (2009),
- Began testing Selective Catalytic Reduction Technology on Tier II rig engines (June 2008), not required,
- Continued production emission control equipment surveillance and improvements,
- Reduced transportation related emissions, and
- Electrification of certain locations within the field.

6.3 Activities Considered; But Not implemented

Questar has also reviewed whether to shut-in producing wells and/or drilling operations during an ozone advisory. To temporarily shut down drilling operations, Questar could subject onsite personnel to a variety of safety concerns and also potentially cause down hole problems ranging from risk of a blow out to sticking pipe in the well. Some of these concerns are detailed below. Questar believes the emissions associated with shutting down a drilling rig would be greater than what would be incurred by operating the rig. These concerns are also discussed below.

- Shut-in production field wide: As the advisories will be issued the day before, it is uncertain from a safety and environmental standpoint whether the field could be shut-in within this time period. It would take many hours with multiple crews working in cold weather and possibly nighttime conditions to get all wells shut-in and the lines and equipment winterized in advance of an ozone advisory. Equipment and lines subject to freezing would have to be blown down adding VOC emissions to the atmosphere prior to the potential ozone event. Upon start-up, there is an increased safety and environmental release risk due to the formation of hydrate plugs and line/equipment fitting failure due to freezing. Instead, as specified above, Questar will concentrate its efforts on assuring that the required emission control equipment installed on all facilities is operating correctly and well within the WDEQ control efficiency requirements.
- Complete shut down of drilling rigs: Completely shutting down a rig (including heaters and boiler) will most likely result in freezing of critical rig components, including well control equipment and would require use of the backup nitrogen bottles. This would eliminate a layer of well control redundancy required by Onshore Order 2. Shutting a rig down also eliminates the ability to agitate the mud to prevent barite settling out in the tanks which could result in an artificially low mud weight that could lead to a well control situation. If shutting down during actual drilling, we would have to trip up into the casing as a preventative measure to getting stuck. Tripping is a high horsepower operation which would generate more emissions at a point when emission reduction is the goal.

- Partial shutdown of drilling rigs: A partial shutdown means that a rig engine, boiler, and rig heater would remain running to supply heat and power to the rig. The actual operation (directional drilling, running casing, logging, etc.) at the time of an advisory results in different operational and safety risks related to even a partial shut down. If an advisory occurs while a rig is in the intermediate hole section (roughly 1000'-9000' in depth) the main risk is sticking pipe (drill string or casing). There is also the ever real risk of freezing during the winter months. Even with draining and blowing down all lines, freezing can be an issue especially during start-up of operation. . The primary risk in the production hole is a well control situation. If the well begins to flow, operations must be resumed regardless of an advisory and flaring will occur. Questar has learned from experience that a maximum safe time is 40 hours off bottom and we utilize this time limit when we are running various types of logs or coring.

6.4 Recordkeeping

Hard-copy records (and electronic records where available) associated with this Ozone Contingency Plan will be maintained by Questar staff in its Pinedale, WY field office. An internal audit of these records and recordkeeping practices will be conducted on an annual basis. A list of these records is as follows:

- Documentation of Questar's communication to its personnel of an Ozone Advisory,
- Annual awareness training presentations and sign-in sheets each January that Plan is in effect,
- Leak detection surveillance records, including:
 - Equipment leak repairs performed during Ozone Advisory,
 - Tank hatch gasket and tank vent inspections during Ozone Advisory;
- Production operations surveillance records, including:
 - Records of VOC and BTEX combustor inspections, and
 - Any other inspections of field equipment for proper operation;
- Documentation of the initial test of the notification system for the Ozone Contingency Plan.

A daily record of all control measures that are conducted during an ozone advisory will be kept. These records include completed documentation forms detailing short term control measures from section 6.0 implemented during the advisory.

A checklist has been developed to be used during ozone alerts to identify the control measures that were used, when they were initiated, duration of the control measure and the responsible party. The checklist can be found in Appendix E.

7.0 Periodic Evaluation

BLM's ROD requires an annual review of the Ozone Contingency Plan (for adequacy of the actions being implemented). Evaluation of the effectiveness of the Ozone Contingency Plan includes several key strategies to ensure a robust plan. Strategies included: review of the effectiveness/appropriateness of ongoing control strategies, consideration of new/additional control options, discussions with WDEQ and other operators in the PAPA (i.e., Shell, Ultra) regarding Ozone Contingency Plan updates and protocols, review of the established emission inventory and identification of new emission sources, review of the ozone advisory protocol and notification records, , etc.

Questar will review the effectiveness of its Ozone Contingency Plan and modify it, as necessary, each year that the BLM requires an Ozone Contingency Plan to be submitted.

Appendix A

Letter to Local Officials from John Corra, Director, WDEQ

February 26, 2008

Mayor Steve Smith
Town of Pinedale

Commissioners Joel Bousman, William Cramer and John Linn
Sublette County Commission

Gentlemen:

I'm writing to give you a heads up to an air quality alert which may generate inquiries to your offices. I wanted you to have some background on this matter before you may be contacted by your constituents.

The Air Quality Division of Wyoming's Department of Environmental Quality is issuing an air pollution advisory beginning Wednesday, February 27, for the Upper Green River Basin, in Sublette County. The advisory is for ozone, which is an air pollutant that can cause respiratory health impacts especially to children, the elderly and people with existing respiratory conditions. People in these sensitive groups should limit strenuous or extended outdoor activities, especially in the afternoon. This advisory is expected to be in effect for several days, and DEQ will issue another advisory when conditions change and ozone levels return to normal.

DEQ is currently studying wintertime ozone formation in the Basin, and believes that the following conditions can lead to higher than normal ozone formation: strong temperature inversions, coupled with periods of low wind speeds, snow-covered ground and bright sunlight. These conditions are expected to occur beginning Wednesday, February 27, and to continue for several days. Predictions of elevated ozone are based on evaluation of weather forecasts, and are therefore only as reliable as those forecasts. We encourage individuals who have concerns about current conditions to consult the Air Quality Division's air monitoring web site, www.wyvisnet.com. This web site displays current ozone levels at the Daniel, Boulder and Jonah air monitor stations, and contains information about health effects of ozone.

Ozone is formed in the atmosphere through chemical reactions of volatile organic compounds and oxides of nitrogen, in the presence of sunlight. Both of these air pollutants are emitted from natural gas drilling and production activities, and there is some smaller contribution of these pollutants from community activities like operating motor vehicles and heating buildings. Ozone is normally found in larger cities during the summertime, and its formation in those areas is primarily caused by tailpipe

emissions from cars and trucks. DEQ first detected moderately elevated ozone levels at its Sublette County monitors primarily during February in both 2005 and 2006. Since elevated ozone concentrations are unexpected during the winter, DEQ began a formal study to determine the causes of these conditions in the Basin. Although the study is not yet complete, monitor data from the past three years suggest that elevated winter ozone levels are limited to times when the specific weather conditions (inversions, low winds, snow cover, and bright sunlight) are all present, and do not persist once those conditions change.

Ozone is measured in DEQ's monitors once every 15 minutes, and we display both an hourly average value, and an eight-hour average value on our web site. Eight-hour values on the Division's web site that are less than 85 parts per billion (ppb) are generally considered safe. EPA has reevaluated ozone health effects data, however, and has proposed to lower the ozone standard to a new limit between 70 and 80 ppb. For your reference, EPA suggests that states issue health advisories to "sensitive groups" when eight hour ozone values are 85 ppb or higher, and to the general public when values are 105 ppb or higher. Data from the Division's monitors show several instances during the last two weeks where the Jonah and Boulder monitors exceeded 85 ppb for an eight hour average, and two days where the Boulder monitor exceeded 105 ppb (the highest eight hour value recorded at Boulder was 122 ppb on February 21). I must caution that these recent monitor values are subject to change after the Division completes its quality assurance checks on the data.

Since natural gas drilling and production activities contribute to ozone-forming pollution in Sublette County, DEQ is considering options to limit emissions from this industry sector to reduce public exposure to elevated levels of ozone.

If you have any questions or concerns, please feel free to contact me at 777-7937, or Dave Finley, Administrator of the Air Quality Division, at 777-7391.

Sincerely,

John C. Corra
Director
Wyoming Department of Environmental Quality

Appendix B

Ozone Advisory Health Information (Fact Sheet from Wyoming Department of Health)

From the Wyoming Department of Health

OZONE FACT SHEET

WHAT IS OZONE?

- The ozone layer, miles above the surface of the earth, protects us from cancer-causing solar ultraviolet radiation.
- Ground level ozone is formed through a complex chemical reaction involving hydrocarbons, nitrogen oxides and sunlight when weather conditions are optimal.
- Increased ground level ozone may cause shortness of breath, coughing, wheezing, and eye and nose irritation and is especially dangerous to older adults, children, asthmatics and persons with other chronic respiratory ailments.

WHO IS AT RISK?

- When ozone levels are significantly elevated everyone who works, plays or spends time outdoors may feel some symptoms. However, these effects are increased for people with asthma, children and the elderly.

ASTHMATICS

- Ozone can aggravate asthma, causing more asthma attacks, increased use of medication, more medical treatment and more visits to hospital emergency rooms.

CHILDREN

- Pound for pound, children breathe more air (and ozone) than adults.
- Children spend more time outdoors than adults.
- Children's respiratory systems are still developing.

ELDERLY

- Ozone presents an increased risk to the elderly because it can aggravate pre-existing respiratory diseases.
- The elderly experience reduced sensitivity to symptoms of ozone; therefore, early warning signs of the harmful effects of ozone may be ignored.

PROTECT YOURSELF

- Individuals with asthma and other respiratory diseases should be aware that on high ozone days they are more susceptible to shortness of breath, coughing, wheezing, and eye and nose irritation.

WATCH FOR OZONE ADVISORIES

- Air pollution advisories may be called when weather forecasters predict weather conditions likely to cause high ozone.

LIMIT TIME OUTDOORS

- People at risk should try to limit their time outdoors on high-ozone days to reduce the risk of exposure to ozone and stay indoors.

CONTACT YOUR DOCTOR

- Those experiencing symptoms such as tightness in the chest, coughing, wheezing and shortness of breath should contact a medical professional.

For more information visit these related websites:

<http://www.epa.gov/Ozone/> & <http://deq.state.wy.us/>

Appendix C

**News Release from WDEQ: Ozone Advisory in Sublette County
(Example)**



Wyoming Department of Environmental Quality

John Corra, Director
Herschler Building • 122 West 25th St. • Cheyenne, Wyoming 82002

WYOMING

NEWS RELEASE

FOR IMMEDIATE RELEASE

March 23, 2008

MEDIA CONTACT: Keith Guille
(307) 777-6105; Fax: (307) 777-5973
kguill@state.wy.us

Ozone Advisory in Sublette County

Upper Green River Basin, Wyo. - The Air Quality Division (AQD) of Wyoming's Department of Environmental Quality (DEQ), in conjunction with the Wyoming Department of Health (WDH), is issuing an ozone advisory for **Monday, March 24, 2008**, for the Upper Green River Basin, in Sublette County.

Ozone is an air pollutant that can cause respiratory health effects especially to children, the elderly and people with existing respiratory conditions. People in these sensitive groups should limit strenuous or extended outdoor activities, especially in the afternoon and evening. More information on ozone and the health effects of ozone are available at the Wyoming Department of Health website, <http://www.health.wyo.gov>.

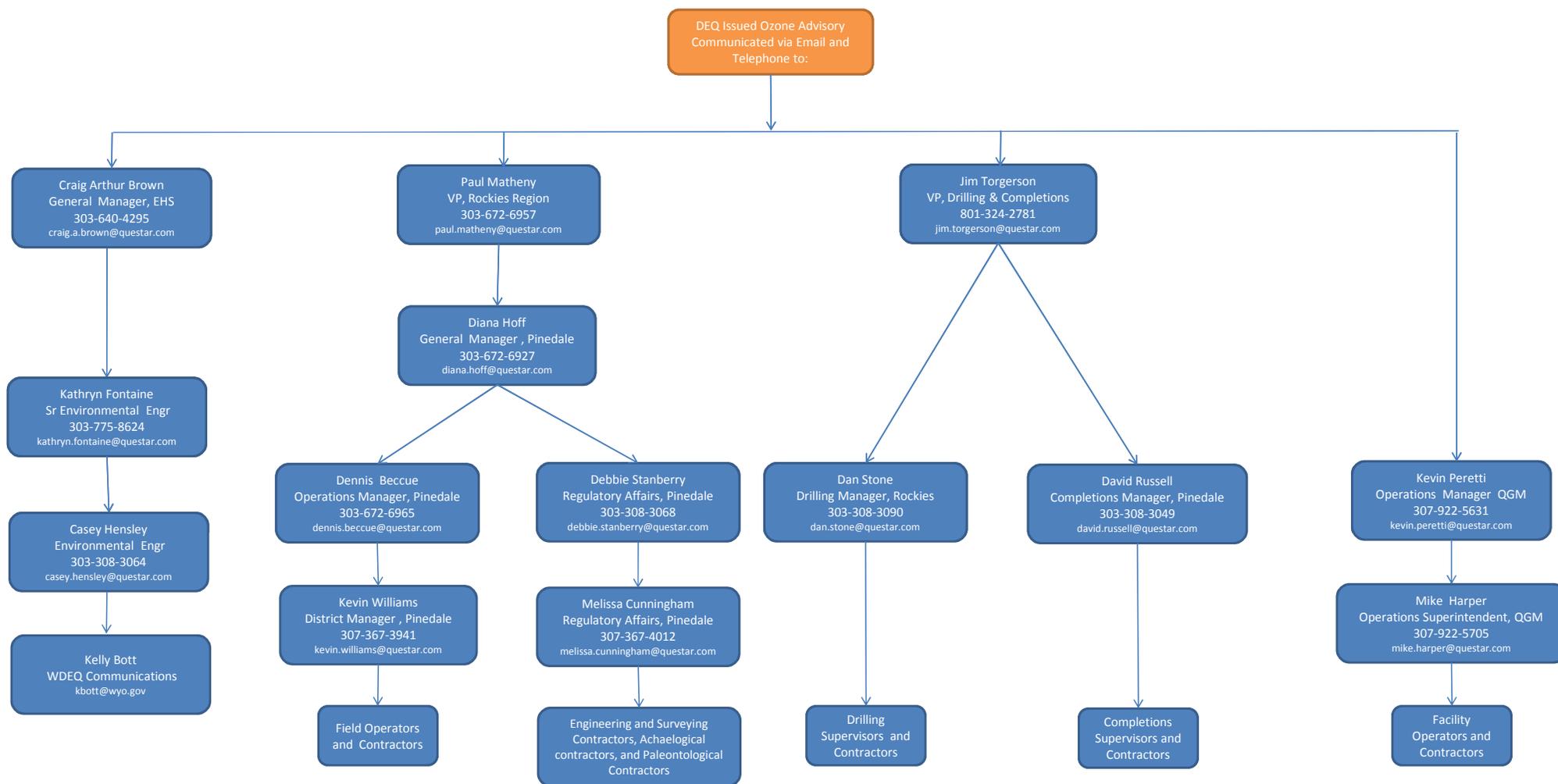
Predictions of elevated ozone are based on evaluation of weather forecasts, and are therefore only as reliable as those forecasts. DEQ is conducting an intensive study of wintertime ozone formation in the Upper Green River Basin. Ozone appears to be elevated in the Basin when there are strong temperature inversions, low winds, snow cover, and bright sunlight.

Current information on ozone levels at the Air Quality Division's monitoring stations at Daniel, Jonah, and Boulder can be found at www.wyvisnet.com.

###

Appendix D

Notification Process Flow Diagram



Appendix E

Ozone Advisory Checklist

Ozone Alert Checklist

Date of Alert: _____

Name: _____

Company: _____

| Control Measures Used | Time Initiated | Duration of Control Measure | Responsible Party |
|---|----------------|-----------------------------|-------------------|
| Production Operations | | | |
| Suspend and reschedule non-critical maintenance activities that would result in venting of gas | | | |
| Shut off all vehicle engines when activities would involve idling time greater than 5 minutes and would not | | | |
| Postpone/reschedule the blow down of wells that are needed for operational, maintenance or | | | |
| Turn down heat trace pumps to minimum temperatures with the result of lower VOC emissions during | | | |
| Increased surveillance of combustors, both in the control room and in the field, to ensure proper operation | | | |
| Shut in uncontrolled facilities when environmentally and safely feasible | | | |
| Completion Operations | | | |
| Not initiating completion activities that lead to VOC or NOx emissions when safely feasible | | | |
| Minimize use of or turn off engines during daylight hours | | | |
| Between operators, share BMP for flareless completion techniques in order to reduce emissions | | | |
| Reduce idling of vehicles | | | |
| Drilling Operations | | | |
| Limit vehicle and ancillary equipment idle time | | | |
| Minimize use of or turn off engines during daylight hours | | | |
| Refuel diesel tanks after dusk as possible | | | |

| Control Measures Used | Time Initiated | Duration of Control Measure | Responsible Party |
|--|----------------|-----------------------------|-------------------|
| Other | | | |
| Perform maintenance activities that generate emissions later in the day | | | |
| Reduce speed limits on the field and lease roads by 5 mph | | | |
| Postpone/reschedule non-critical vehicle trips to locations by Questar employees and contractors | | | |
| Keep vehicles tuned up and tires well inflated | | | |
| Do not overfill fuel tanks when refueling | | | |
| Tighten fuel caps after refueling | | | |
| Refuel cars and trucks after dusk | | | |
| Suspend and reschedule use of gasoline or diesel powered maintenance or construction | | | |
| Use environmentally safe paints, cleaning products and other chemicals | | | |
| Follow manufacturers' recommendations to use and properly seal cleaners, paints and | | | |

Figure 1

Questar Well Pad/Lease Locations

1050 17th, Suite 500
Denver, Colorado
80265
303 672-6900



Orthophoto and PAPA Outlines

| | |
|------------------------|--|
| Date: 7 December, 2009 | Geologist: DCA |
| Landman: | Geophysicist: |
| Engineer: | File: Pinedale_SFCSSyW est1983USurveyFL_01_27_06:Pinedale Current - ["DCA Orthophoto and PAPA outlines.gmp"] |

