4 Summary of Assessments on Health in Battlement Mesa

Eight potential stressors to health were identified and assessed: air quality; water and soil quality; traffic and transportation; noise/vibration/lighting; community wellness; employment /economy; health system infrastructure; and accidents/malfunctions. These assessments take into account Antero's proposed control plans and mitigation strategies, to the extent that they are known (from public presentations, Surface Use Agreements, and other information provided by Antero). Any significant deviation from the currently available information will not necessarily be reflected in this assessment. Scientific literature describing known impact of stressors to health was reviewed.

Each stressor was qualitatively characterized based on seven attributes relevant to public health: direction of health effects; geographic extent; likelihood; vulnerable populations; duration of exposure; frequency of exposure; and magnitude/severity of health effects. For each attribute, consistent definitions were created as shown in the tables below. The characterization consists of describing and ranking each potential health impact in terms of each attribute and prioritizing (low, medium, and high) the potential stressor as it relates to other potential stressors.

Direction of Potential Health Effects

Positive	Changes that may improve health in the community
Negative	Changes that may detract from health in the community

Geographic Extent of Health Effects

Localized	Effects mainly occur in close proximity to drilling or other related activities
Community-wide	Effects occur across most or all of the Battlement Mesa PUD

Presence of Vulnerable or Benefited Populations within Battlement Mesa

Yes	There are subpopulations that are more susceptible to adverse health impacts (e.g. children, the elderly or people with pre-existing health conditions) or will benefit more than the rest of the population
No	Affects all subpopulations evenly

Duration of Exposure

Short	Lasts less than one month

Medium	Lasts at least one month but less than one year
Long	Lasts one year or more

Frequency of Exposure

Infrequent	Occurs sporadically or rarely
Frequent	Occurs constantly, recurrently and/or numerously

Likelihood of Health Effects

Unlikely	There is little evidence that health effects will occur as a result of the Antero drilling in the PUD
Possible	Evidence suggests that health effects may occur, but are not common in similar situations
Likely	Evidence suggests that health effects commonly occur in projects of this type

Magnitude/Severity of Negative Health Effects

Low	Potential to cause health effects unlikely or that can be quickly and easily managed or do not require treatment
Medium	Potential to cause health effects that necessitate treatment or medical management and are reversible
High	Potential to cause health effects that are chronic, irreversible or fatal

Magnitude of Positive Health Effects

Low	Potential to improve health unlikely or minor
Medium	Potential to make some improvements to health
High	Potential to make major improvements to health

EXAMPLE:

The following characterization of a hypothetical health impact from Antero's plan illustrates how attribute levels are assigned.

Impact	Direction of health effects	Geographical Extent of exposure	Vulnerable/ Benefited populations	Duration of exposure	Frequency of exposure	Likelihood of health effects as a result of Project	Magnitude of health effects	Priority
Hypothetical	Negative	Localized	No	Short	Infrequent	Unlikely	Low	Low

The hypothetical health impact may produce **negative health effects** only in areas in close proximity to the development areas and is **localized.** No particular population is more vulnerable to the health effect. The duration of the hypothetical impact is expected to be less than a month, **short,** and only occur once, **infrequent**. It is **unlikely** to occur and any health

effects could be easily managed at home and would be **low**. The hypothetical health impact has a **low** priority compared to other potential stressors.

4.1 Summary of Health Assessments

The following table summarizes the characterization of stressors and the numerical ranking of impacts on the health in Battlement Mesa. By prioritizing the stressors we are able to conclude that air quality, traffic, and accidents/malfunction are more likely to negatively impact the public health of residents throughout the community than other stressors. Other stressors that may produce relatively important health impacts include noise and community stress. We have prioritized community stress as medium but recognize that the impacts to the community depend in a large part on the mitigation of other stressors. If mitigation of air, traffic and noise are not sufficient then the sense of community will be negatively impacted, associated stress will increase, and steps to protect community wellness should take a high priority. Compromise of water supplies could produce important effects to health but are not likely to occur. There will be some positive impacts associated with employment and possibly community wellness. We have prioritized accidents and malfunctions as high but note that incidents of this nature are difficult to predict. Recent events have demonstrated that although accidents and malfunctions are infrequent, on rare occasions they can be devastating; therefore, significant care should be taken to prevent them.

Assessment	**Direction of health effects**	**Geographical Extent of exposure**	**Vulnerable/ Benefited populations**	**Duration of exposure**	**Frequency of exposure**	**Likelihood of health effects as a result of Project**	**Magnitude of health effects**	**Priority**
Air Quality	Negative	Local to Community-wide	Yes	Long	Frequent	Likely	Moderate to High	High
Water and Soil Quality	Negative	Community-wide	Yes	Long	Infrequent	Unlikely	Moderate to High	Medium
Traffic	Negative	Community-wide	Yes	Long	Frequent	Possible	Low to high	High
Noise, Vibration, Light	Negative	Local	Yes	Long	Frequent	Possible	Low-Medium	Medium
Community Wellness	Positive	Community wide	Yes	Long	Frequent	Possible	Low	Low
Community Wellness	Negative	Community wide	Yes	Long	Frequent	Possible	Low to High	Medium-High
Economy, employment and property value	Positive	Community wide	Yes	Long	Infrequent	Unlikely	Low	Low

Assessment	Direction of health effects	Geographical Extent of exposure	Vulnerable/ Benefited populations	Duration of exposure	Frequency of exposure	Likelihood of health effects as a result of Project	Magnitude of health effects	Priority
Economy, employment and property value	Negative	Community wide	Yes	Long	constant	Likely	Low to high	Low
Health Infrastructure	Positive	Community-wide	Yes	Long	Infrequent	Unlikely	Low	Low
Health Infrastructure	Negative	Community-wide	Yes	Long	Infrequent	Unlikely	Low	Low
Accidents and malfunctions	Negative	Local or Community wide	Yes	Short	Infrequent	Possible	Low to high	High