

Lone Tree #4-65 North Pad Noise Modeling Report

January 27, 2021

Prepared for:

Crestone Peak Resources
370 17th Street
Denver, CO 80202

Prepared by:

Behrens and Associates, Inc.
9536 E. I-25 Frontage Road
Longmont, CO 80504



Andrew Truitt
Senior Engineer



Jason Peetz
Engineering Manager



1. Introduction

The purpose of this study is to assess the noise impact of the proposed drilling and fracing operations at the Lone Tree #4-65 North pad located approximately 9,000 feet north of the E Jewell Avenue and approximately 1,400 feet southwest of the Hayesmount Road in Arapahoe County, Colorado as shown in Figure 1-1. Drilling and fracing noise levels have been assessed in terms of the Colorado Oil and Gas Conservation Commission (COGCC) Noise Standards as well as the Oil and Gas Operator Agreement (OA) between Crestone Peak Resources and the City of Aurora, Colorado dated June 5, 2019. To assess the noise impact, a noise model representing the drilling and fracing operations was constructed and compared to the allowable noise levels.

The following is provided in this report:

- A review of the COGCC and OA noise standards.
- The results of noise modeling representing drilling and fracing operations at the site.
- Recommendations for noise mitigation measures to decrease noise emissions of the drilling and fracing operations.

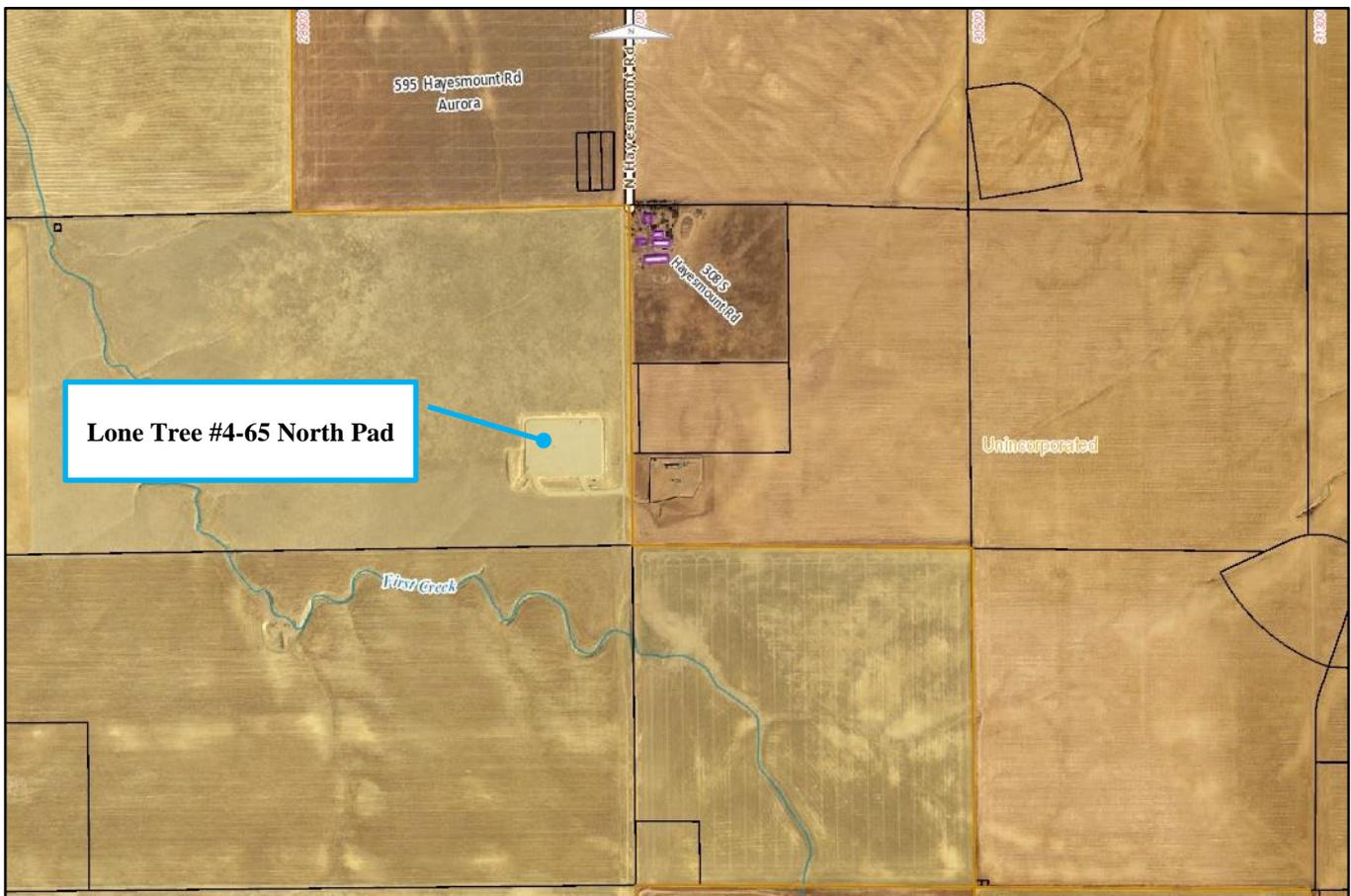
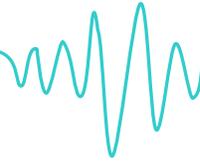


Figure 1-1 Pad Location



2. Noise Fundamentals

Sound is most commonly experienced by people as pressure waves passing through air. These rapid fluctuations in air pressure are processed by the human auditory system to produce the sensation of sound. The rate at which sound pressure changes occur is called the frequency. Frequency is usually measured as the number of oscillations per second or Hertz (Hz). Frequencies that can be heard by a healthy human ear range from approximately 20 Hz to 20,000 Hz. Toward the lower end of this range are low-pitched sounds, including those that might be described as a “rumble” or “boom”. At the higher end of the range are high-pitched sounds that might be described as a “screech” or “hiss”.

Environmental noise generally derives, in part, from a combination of distant noise sources. Such sources may include common experiences such as distant traffic, wind in trees, and distant industrial or farming activities. These distant sources create a low-level "background noise" in which no particular individual source is identifiable. Background noise is often relatively constant from moment to moment, but varies slowly from hour to hour as natural forces change or as human activity follows its daily cycle.

Superimposed on this low-level, slowly varying background noise is a succession of identifiable noisy events of relatively brief duration. These events may include the passing of single-vehicles, aircraft flyovers, screeching of brakes, and other short-term events. The presence of these short-term events causes the noise level to fluctuate. Detailed acoustical definitions are provided in Appendix A.

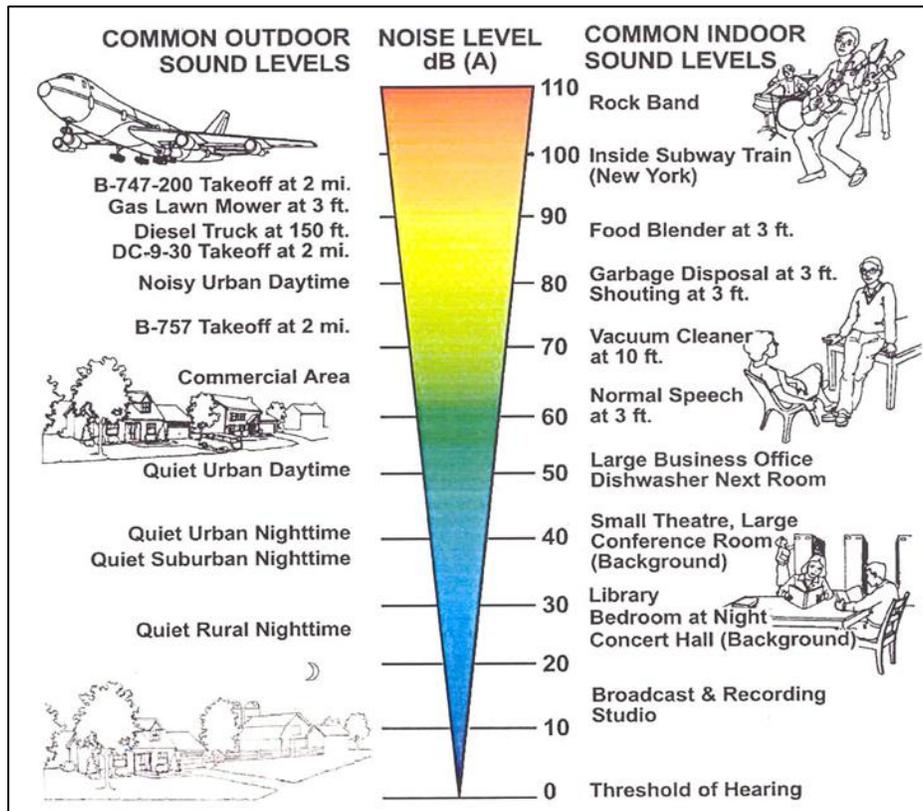


Figure 2-1 Typical Indoor and Outdoor Sound Levels



3. Noise Standards

3.1 Colorado Oil and Gas Conservation Commission (COGCC)

The analysis was developed to evaluate drilling and fracing noise levels at adjacent occupied structures and verify compliance of drilling operations with the Colorado Oil and Gas Conservation Commission (COGCC) Section 423 “Noise” requirements. The COGCC Code lists exterior noise limits for stationary noise sources. The noise limits are provided in Table 3-1.

Table 3-1 COGCC Table 432-1 – Maximum Permissible Noise Levels

Zone	7:00 am to next 7:00 pm	7:00 pm to next 7:00 am
Residential / Rural / State parks	55 dBA	50 dBA
Commercial / Agricultural	60 dBA	55 dBA
Light Industrial	70 dBA	65 dBA
Industrial	80 dBA	75 dBA

Section 423.a.B. of the standard states:

Noise points of compliance will be located at least 350 feet from the Working Pad Surface, and no less than 25 feet from the exterior wall of the Residential Building Unit that is closest to the Working Pad Surface. If a Surface Owner or tenant refuses to provide the Operator with access to install a noise monitor, then the noise point of compliance will be located at either the next-closest Residential Building Unit or an alternative location approximately the same distance and direction from the Working Pad Surface.

Section 423.b.(2) of the standard states:

Unless otherwise required by Rule 423, drilling or completion operations, including Flowback:

- A. In Residential/Rural or Commercial/Agricultural, maximum permissible noise levels will be 60 db(A) in the hours between 7:00 p.m. to 7:00 a.m. and 65 db(A) in the hours between 7:00 a.m. to 7:00 p.m.; and
- B. In all zones maximum permissible noise levels will be 65 db(C) in the hours between 7:00 Section 802(d) of the standard states:

Section 423.c.(2).A of the standard states:

In response to a complaint or at the Director’s request, Operators will measure sound levels at 25 feet from the complainant’s occupied structure towards the noise source for low frequency (dbC) indicated issues. For high frequency (dbA) measurement will be at the nearest point of compliance. For equipment installed at Oil and Gas Locations subject to a Form 2A approved prior to January 15, 2021, after the Commencement of Production Operations, no single piece of equipment will exceed the maximum permissible noise levels listed



in Table 423-1 as measured at a point 350 feet from the equipment generating the noise in the direction from which the complaint was received.

3.2 The Oil and Gas Operator Agreement (OA) Between Crestone Peak Resources and The City of Aurora, Colorado Dated June 5, 2019.

Exhibit C. 2. Noise Mitigation:

2.1 COGCC 800 Series Regulations

Operator shall comply with the sound limitation regulations set forth in the COGCC 800 Series Aesthetic and Noise Control Regulations.

2.2 Noise Baseline Study

Operator shall perform a baseline noise study if a New Well is planned within 2,640 feet of an area with five Residential Building Units or one High Occupancy Building. If the noise study indicates the need for sound mitigation, Operator shall utilize appropriate measures to meet acceptable OSHA and COGCC requirements for A and C scale sound unless Operator obtains waivers from all affected property owners within that distance. Operator shall provide a copy of the noise study to the City.

2.3 Noise Mitigation

During Drilling Phase and Completion Phase, Operator shall use noise mitigation for any New Well located (1) in the Northeast Plains Medium Density Residential Subarea (or equivalent zoning per adoption of the unified development code) and west of the longitudinal line that is parallel with Hudson Road, as shown on Exhibit A-2, or (2) within 1,320 feet of a Residential Building Unit or within 1,500 feet of one High Occupancy Building unless Operator obtains waivers from all affected property owners within that distance.

2.4 Additional Noise Measures

For New Wells within 1,320 feet of Residential Building Unit, Operator may be required to provide for additional noise mitigation based on the following site-specific characteristics: 2.4.1. Nature and proximity of adjacent development (design, location, use); 2.4.2. Prevailing weather patterns, including wind directions; 2.4.3. Type and intensity of the noise emitted; and 2.4.4. Vegetative cover on or adjacent to the site or topography. Based on the foregoing, for New Wells within 1,320 feet of a Residential Building Unit, the City may request additional noise abatement measures or BMPs depending on the site including a noise management plan specifying: the hours of maximum noise and the type, frequency and level of noise emitted, the mitigation methods to be employed to control both A and C scale noise, and restriction on unloading pipe from delivery trucks between 8:00 pm and 7:00 am.

2.5 COGCC Rule 802

The Operator shall comply with all provisions of COGCC Rule 802 on Noise Abatement with respect to the Well Sites; provided, however, that other than during Construction, Drilling, and Completions Phases, the maximum permissible noise levels to be applied under Rule 802 will be the greater of: the levels set forth for the land use type of "Residential/Agricultural/Rural" under Rule 802 if measurements are taken at 1,320 feet from the sound walls at the Well Site; or four dB(A) higher than baseline ambient sound measure at 1,320 feet from the sound walls at the Well Site. All measurements considered for



compliance with this section will be taken by a third-party contractor using industry standard equipment and practices.

2.6 C Scale Noise

The Operator shall address C scale noise/vibration through berming, capable sound walls, and other associated BMPs. During the Drilling and Completion Phases of New Wells within 1,320 feet of a Residential Building Unit or 1,500 feet of a High Occupancy Building, the Operator shall construct a sound mitigating wall or comparable measures to mitigate noise as appropriate on a case-by-case or modeled basis. Additional mitigations must be taken by the Operator if C-scale noise levels are increased the larger of either 5db over ambient or above 65db at 25' from the nearest Residential Building Unit.

2.7 COGCC Measurement Rules

All sound measurements must be taken in accordance with the COGCC Rules and additional considerations including: Wind speed; Proper documenting; Average measurement periods; and Measurements 4 feet off the ground or as close as possible.

2.8 Financial Obligations

All noise mitigation measures shall be paid for by the Operator.

3.3 Site-Specific Noise Requirements

Per Section 2.1 of the OA with The City of Aurora, the Applicant (Crestone Peak Resources) will comply with the sound limitation regulations set forth in the COGCC 800 Series Aesthetic and Noise Control regulations.

Per Section 2.2 of the OA, the Applicant is required to conduct a baseline noise study if a New Well is planned within 2,640' of 5 Residential Building Units (RBU) or 1 High Occupancy Building (HOB). There are less than (5) RBU's within 2,640' of the Lone Tree North Well Site and there are no (0) HOB's within 2,640' of the Lone Tree North Well Site, so a baseline noise study is not required. The Applicant had Behrens and Associates Environmental Noise Control (BAENC), a third-party engineering firm, perform an environmental noise impact assessment and will follow its mitigation recommendations to stay in compliance with the COGCC 800 series requirements. The Applicant will provide Behrens' Noise Modeling Report to the City.

Per Section 2.3 of the OA, Applicant is required to use noise mitigation if a New Well is within the area identified on Exhibit A-2 to the OA or if the New Well is within 1,320' of a RBU or 1,500' of a HOB. There are no (0) RBU's within 1,320' of the Lone Tree North Well Site, and there are no (0) HOB's within 1,500' of the Lone Tree North Well Site. However, the Lone Tree North Well Site is located within the area identified on Exhibit A-2 to the OA, so Applicant will use noise mitigation during the Drilling and Completion Phases for the Lone Tree North Well Site. Applicant will use sound walls to mitigate noise emissions during these phases.

Per Section 2.4 of the OA, Applicant may be required to conduct additional noise mitigation for New Wells within 1,320' of an RBU. As stated above, there are no RBU's within 1,320' of the Lone Tree North Well Site.

Per Section 2.5 of the OA, the Applicant shall comply with all provision of COGCC Rule 802. Based on the COGCC Rule 802 noise regulations, the operational drilling noise levels at the site will be limited to the light industrial limit of 65.0 dBA at 350 feet from the noise sources or the property line of the site (whichever is farther). The operational

Behrens and Associates, Inc.

Environmental Noise Control



fracing noise levels at the site will be limited to the industrial limit of 75.0 dBA at 350 feet from the noise sources or the property line of the site (whichever is farther). An ambient study was not conducted therefore the COGCC dBA noise limits remain the default for drilling and fracing.

Per Section 2.6 of the OA, Applicant is required to address C scale noise/vibration if a New Well is within 1,320' of a RBU or 1,500' of a HOBU. As stated above, there are no (0) RBU's within 1,320' of the Lone Tree North Well Site, and there are no (0) HOBU's within 1,500' of the Lone Tree North Well Site. However, Applicant will already be using noise mitigation during the Drilling and Completion Phases for the Lone Tree North Well Site pursuant to Section 2.3 of the OA.

Section 2.6 also states "Additional mitigations must be taken by the Operator if C-scale noise levels are increased the larger of either 5db over ambient or above 65db." An ambient study was not conducted therefore, an adjustment to the allowable daytime and nighttime COGCC dBC limits is not permissible.

Per Section 2.7 of the OA, all sound measurements will be taken in accordance with the COGCC Rules.

Per Section 2.8 of the OA, the Applicant had Behrens and Associates Environmental Noise Control (BAENC) perform an environmental noise impact assessment.



4. Lone Tree #4-65 North Pad Noise Modeling

The noise impact analysis was conducted with the application of three-dimensional computer noise modeling software. All models in this report are developed with SoundPLAN 8.0 software using the ISO 9613-2 standard. Noise levels are predicted based on the locations, noise levels and frequency spectra of the noise sources, and the geometry and reflective properties of the local terrain, buildings and barriers.

Sound level data utilized in the drilling model was based on file data of the Ensign 140 rig. Rig placement and orientation was coordinated with Crestone Peak Resources and oriented to minimize noise impact when possible. The rig was modeled with the V-door facing north and the backyard equipment positioned on the south side of the pad. The predicted modeling results are dependent on equipment and mitigation orientation as indicated.

Sound level data utilized in the fracing model was based on file data of the Liberty Quiet Pump Trucks. Fleet placement and orientation was coordinated with Crestone Peak Resources and oriented to minimize noise impact when possible. Eleven hydraulic fracturing pump trucks operating simultaneously have been included in the model and were positioned south of the well heads. The predicted modeling results are dependent on equipment and mitigation orientation as indicated.

The noise sensitive receptor locations have been chosen to be consistent with the requirements of the COGCC noise standards. The requirements state that dBA noise levels shall comply with the applicable noise limits as measured at 350 feet from the working pad surface. The requirements state that dBC noise levels shall comply with the applicable noise limits as measured at 25 feet from the exterior wall of nearby residences or occupied structures. Figure 4-1 shows the dBA and dBC noise sensitive receptor locations.

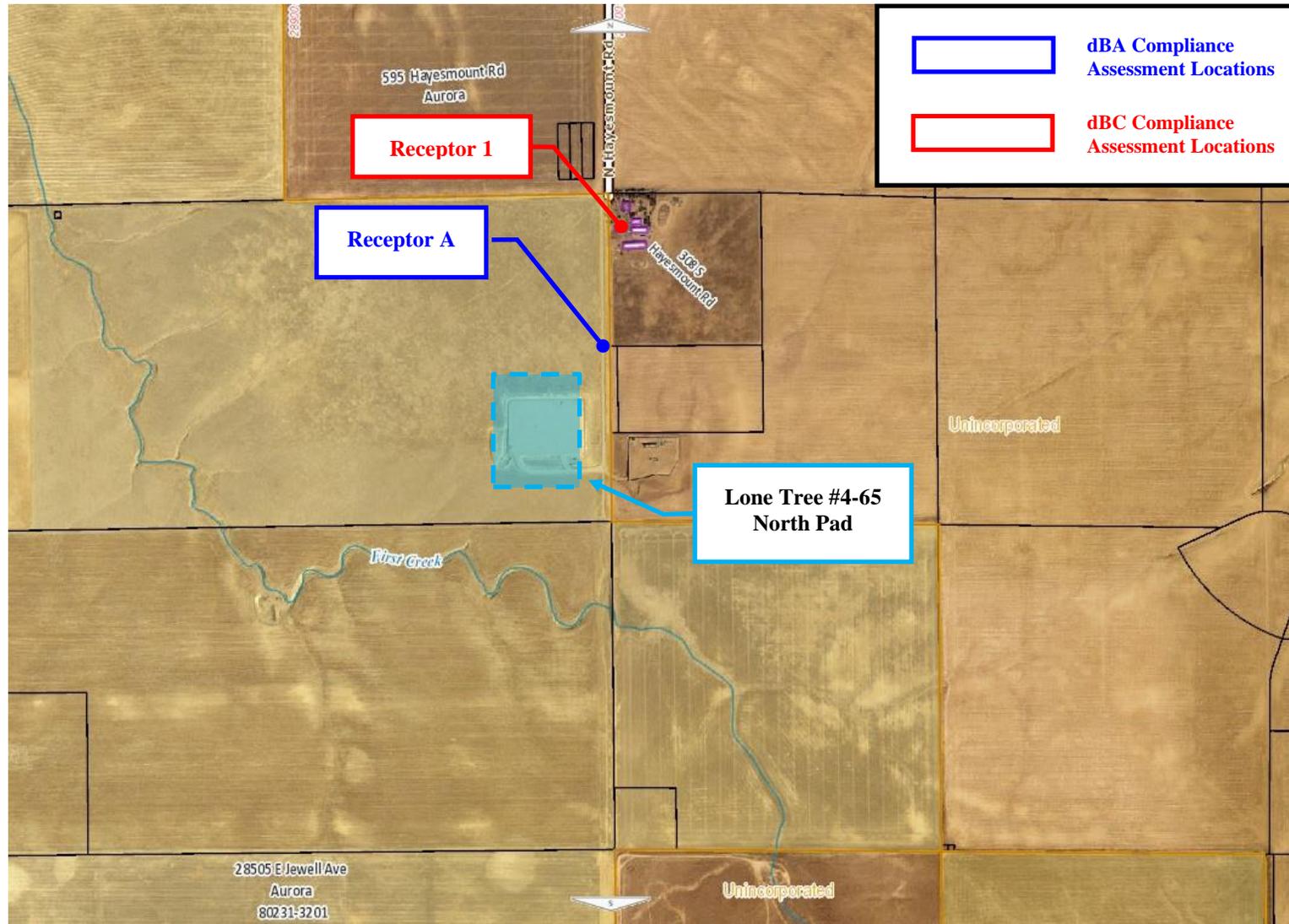


Figure 4-1 Receptor Locations



4.1 Unmitigated Noise Modeling Results

The results of the unmitigated drilling and fracing noise modeling are presented in Table 4-1 and Table 4-2. The locations in the tables correspond to the locations identified in Figure 4-1. The results of the noise modeling are also shown as noise contour maps. Figure 4-2 shows the unmitigated drilling noise contour map in the A-weighted scale and Figure 4-3 shows the unmitigated drilling noise contour map in the C-weighted scale. Figure 4-4 shows the unmitigated fracing noise contour map in the A-weighted scale and Figure 4-5 shows the unmitigated fracing noise contour map in the C-weighted scale. The noise contours are provided in 5 dB increments with the color scale indicating the sound level of each contour.

The predicted noise levels represent only the contribution of the project operations and do not include ambient noise or noise from other facilities. Ambient data is not included in the modeling results due to the fact that ambient data varies by monitoring location and day to day, and therefore will have varying levels of contribution to the overall measured field sound levels depending on the time of day and location. Actual field sound level measurements may vary from the modeled noise levels due to other noise sources such as traffic, other facilities, other human activity, or environmental factors.

The results of the unmitigated noise modeling indicate that modeled receptor is predicted to comply with the A-weighted (dBA) and C-weighted (dBC) COGCC noise limits for both drilling and fracing operations..

Table 4-1 A-Weighted Unmitigated Noise Modeling Results

Receiver	Drilling	Fracing
A	53	59
COGCC Noise Limit	65 dBA Day / 60 dBA Night	

Table 4-2 C-Weighted Unmitigated Noise Modeling Results

Receiver	Drilling	Fracing
1	64	62
COGCC Noise Limit	65 dBC	

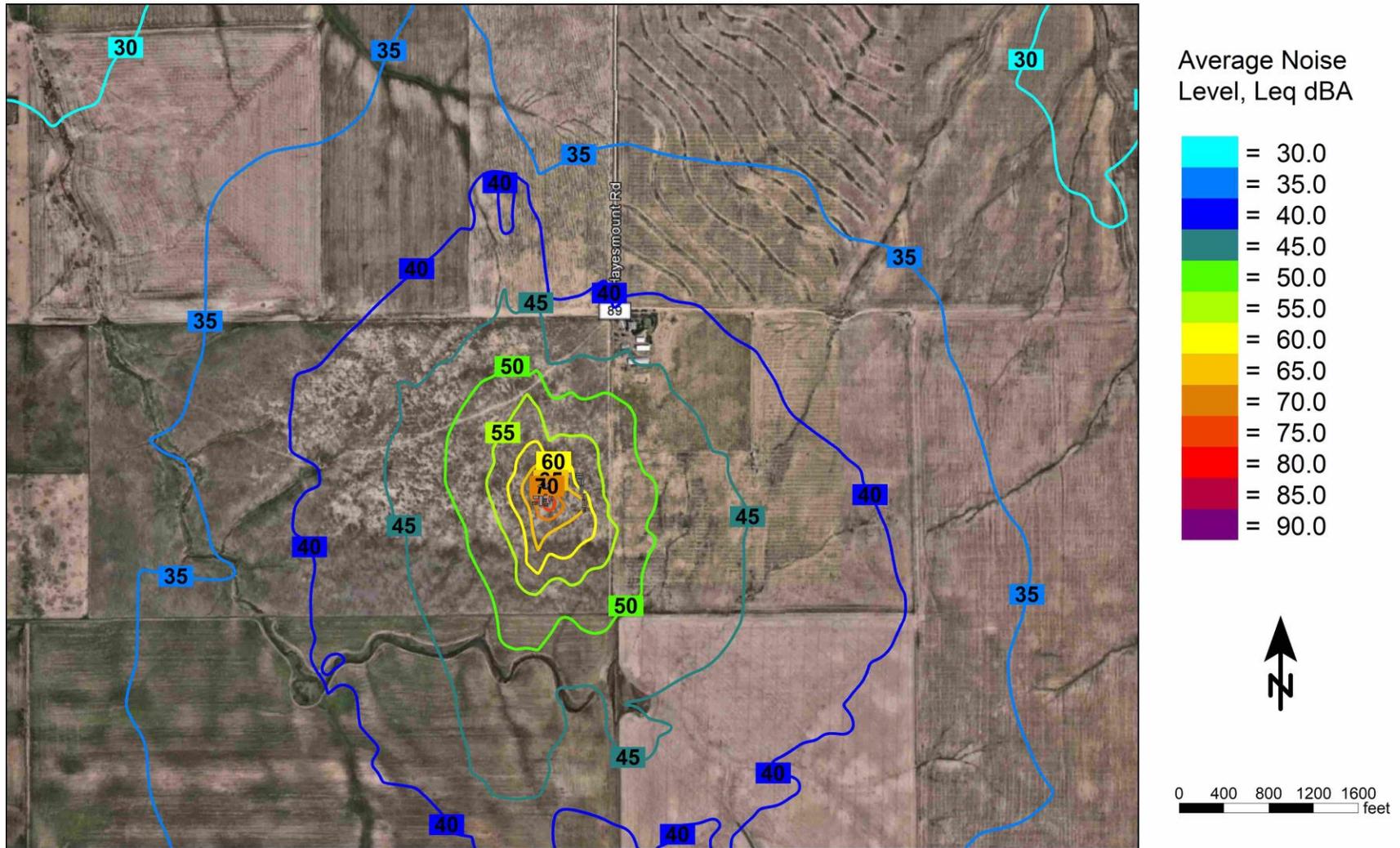


Figure 4-2 Unmitigated Drilling Noise Contour Map (dBA)

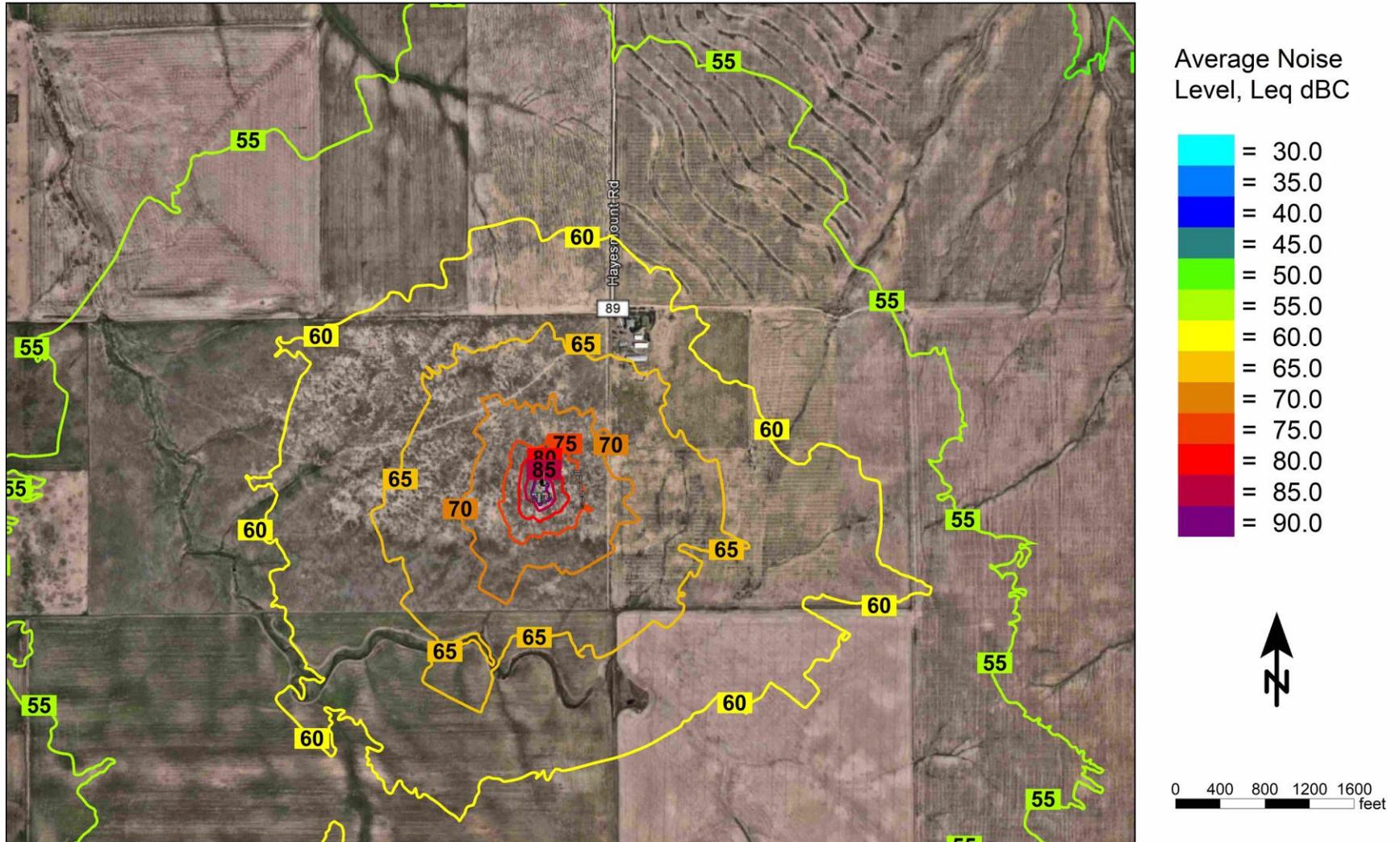


Figure 4-3 Unmitigated Drilling Noise Contour Map (dBC)

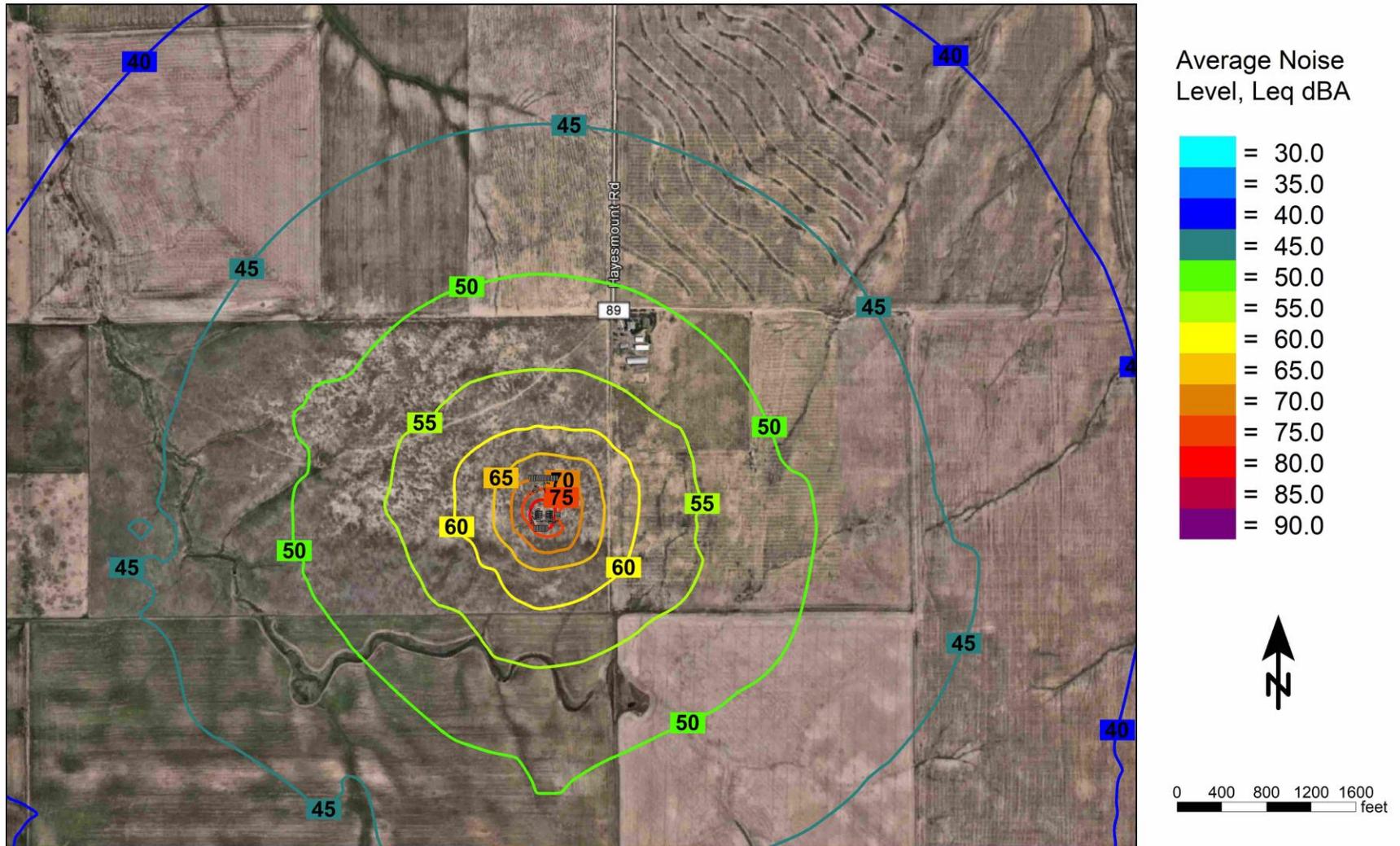


Figure 4-4 Unmitigated Fracing Noise Contour Map (dBA)

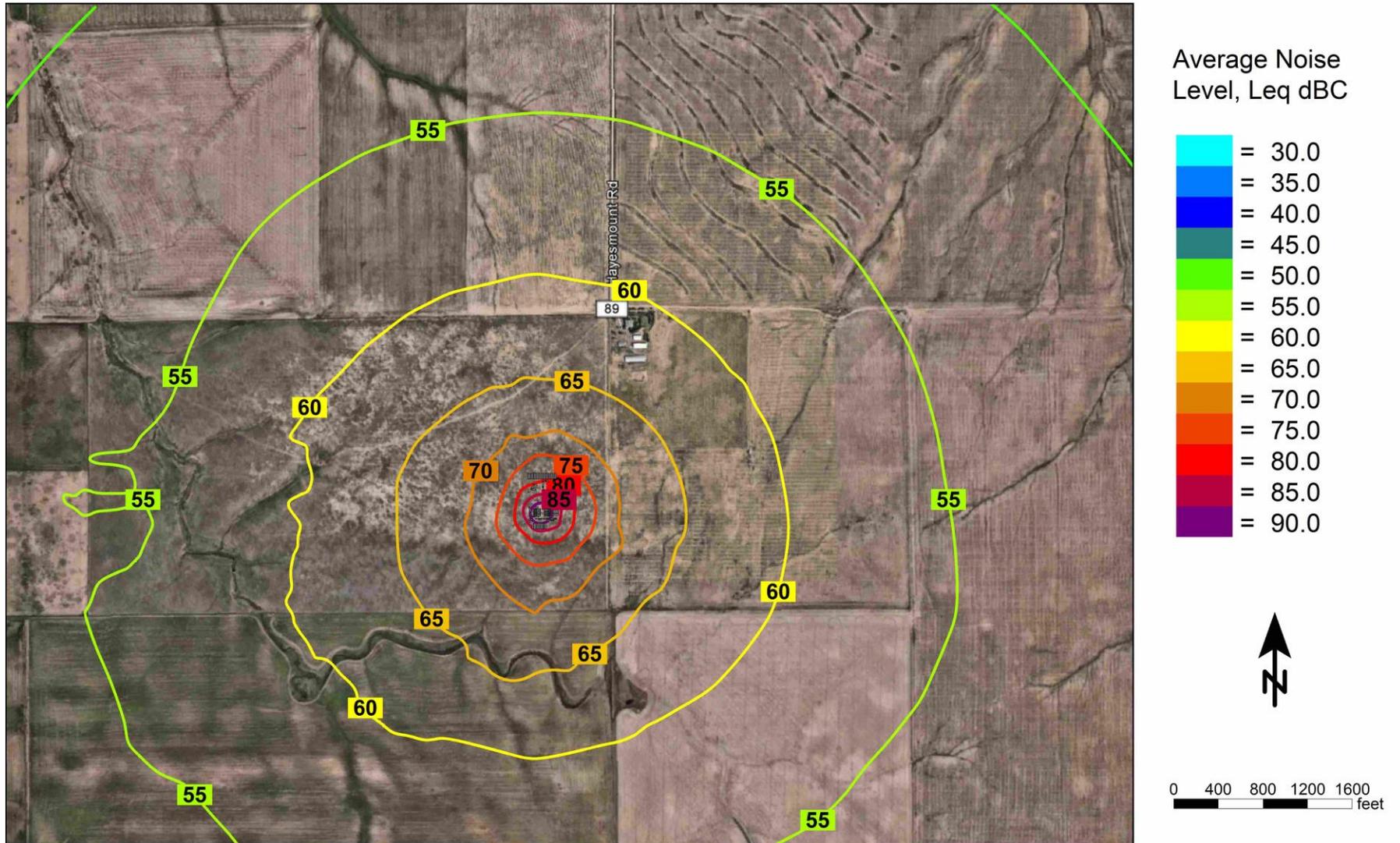


Figure 4-5 Unmitigated Fracing Noise Contour Map (dBC)



4.2 Mitigated Noise Modeling Scenarios

Noise mitigation was added to reduce noise levels at the residences in close proximity to the site in compliance with Section 2.3 of the OA between Crestone Peak Resources and The City of Aurora. The noise mitigation included in the modeling is presented in Table 4-3 and shown in Figure 4-6.

Table 4-3 Modeled Mitigation Scenarios

Modeled Scenario	Description
Drilling / Fracing	<ul style="list-style-type: none"> Approximately 1,100 linear feet of 40-foot-high, Sound Transmission Class (STC) 25 acoustical wall installed along the northern and eastern perimeter of the site.

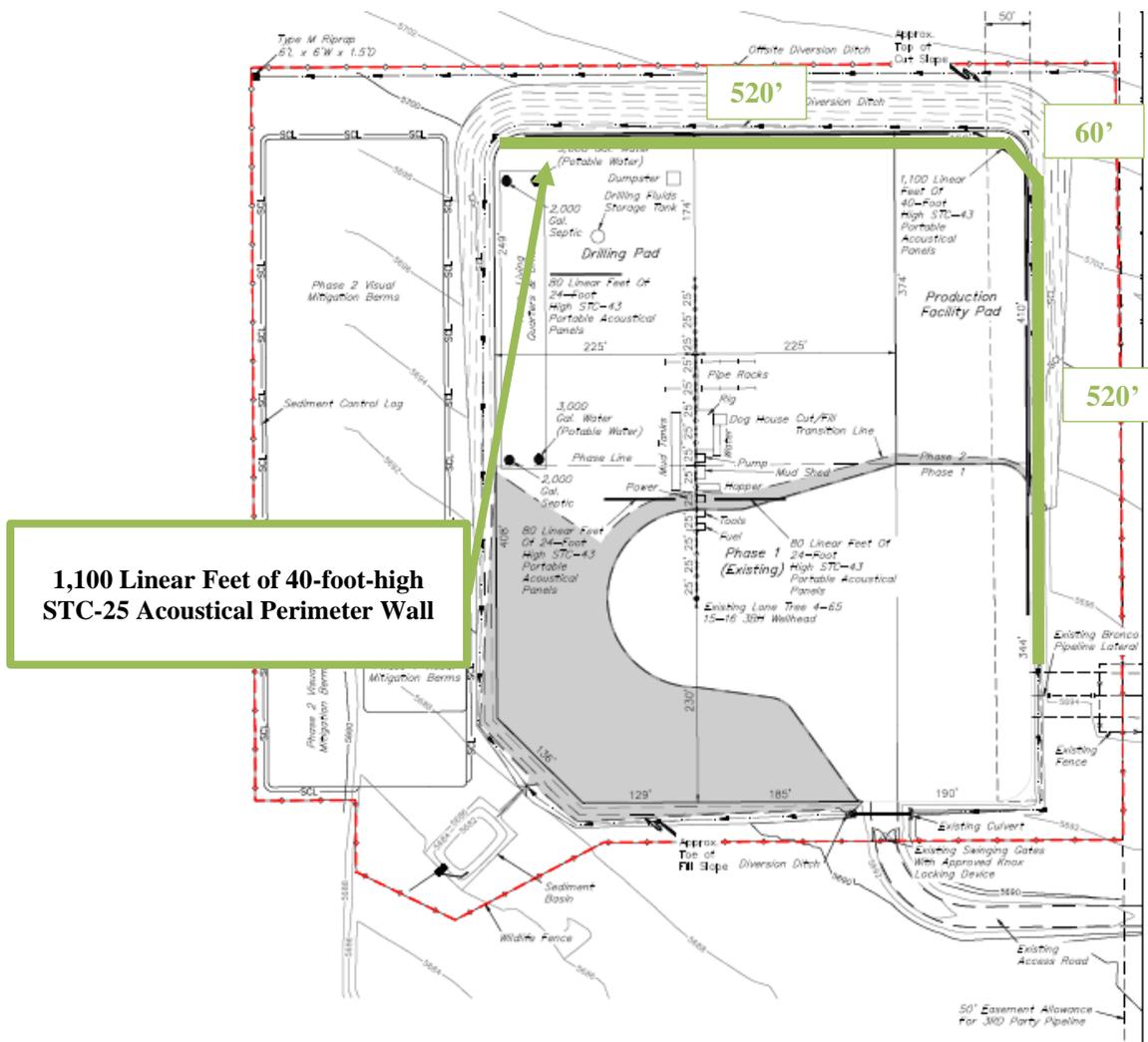


Figure 4-6 Fracing Mitigation Layout



4.3 Mitigated Noise Modeling Results

The results of the mitigated drilling and fracing noise modeling are presented in Tables 4-4 and 4-5. The locations in the tables correspond to the locations identified in Figure 4-1. The results of the noise modeling are also shown as noise contour maps. Figure 4-7 shows the mitigated drilling noise contour map in the A-weighted scale and Figure 4-8 shows the mitigated drilling noise contour map in the C-weighted scale. Figure 4-9 shows the mitigated fracing noise contour map in the A-weighted scale and Figure 4-10 shows the mitigated fracing noise contour map in the C-weighted scale. The noise contours are provided in 5 dB increments with the color scale indicating the sound level of each contour.

The predicted noise levels represent only the contribution of the project operations and do not include ambient noise or noise from other facilities. Ambient data is not included in the modeling results due to the fact that ambient data varies by monitoring location and day to day and therefore will have varying levels of contribution to the overall measured field sound levels depending on the time of day and location. Actual field sound level measurements may vary from the modeled noise levels due to other noise sources such as traffic, other facilities, other human activity, or environmental factors.

The results of the mitigated noise modeling indicate that with implementation of the recommended mitigation measures, the modeled receptor locations are predicted to comply with the A-weighted (dBA) and C-weighted (dBC) COGCC noise limits for both drilling and fracing operations with reductions of up to 7 dBA and 2 dBC offered over the unmitigated scenario.

Table 4-4 A-Weighted Mitigated Noise Modeling Results

Receiver	Drilling	Fracing
A	46	56
COGCC Noise Limit	65 dBA Day / 60 dBA Night	

Table 4-5 C-Weighted Mitigated Noise Modeling Results

Receiver	Drilling	Fracing
1	63	61
COGCC Noise Limit	65 dBC	

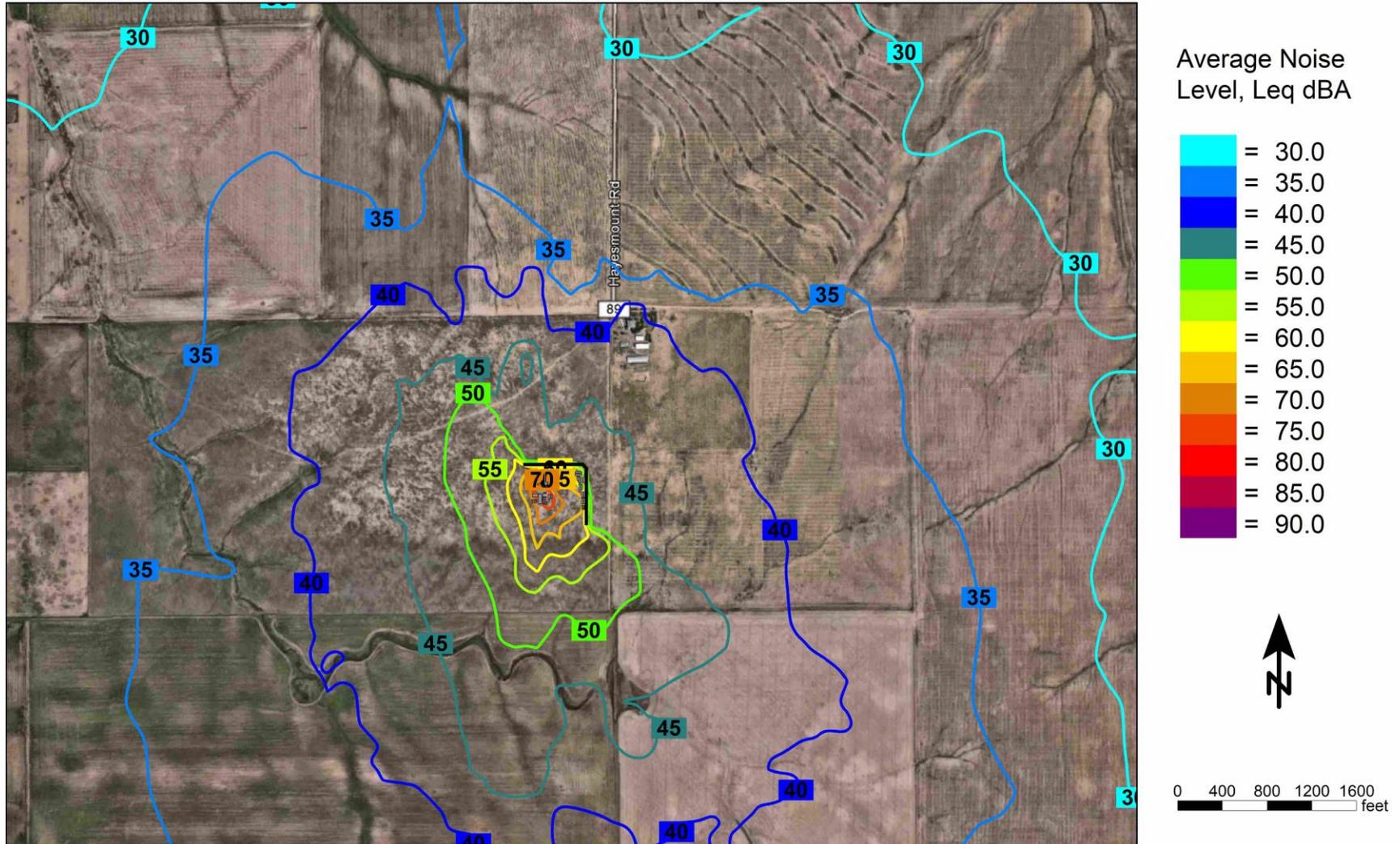


Figure 4-7 Mitigated Drilling Noise Contour Map (dBA)

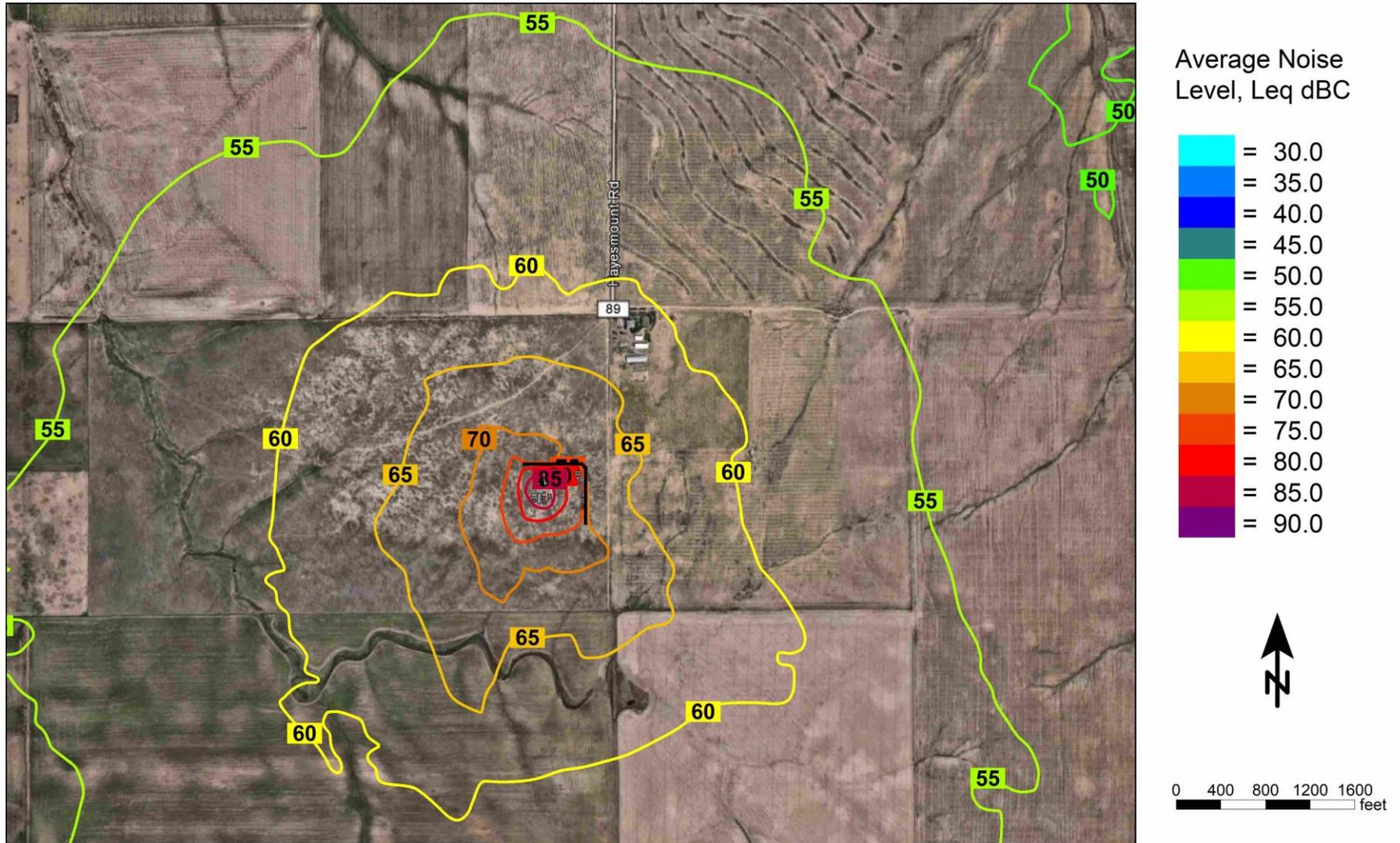


Figure 4-8 Mitigated Drilling Noise Contour Map (dBC)

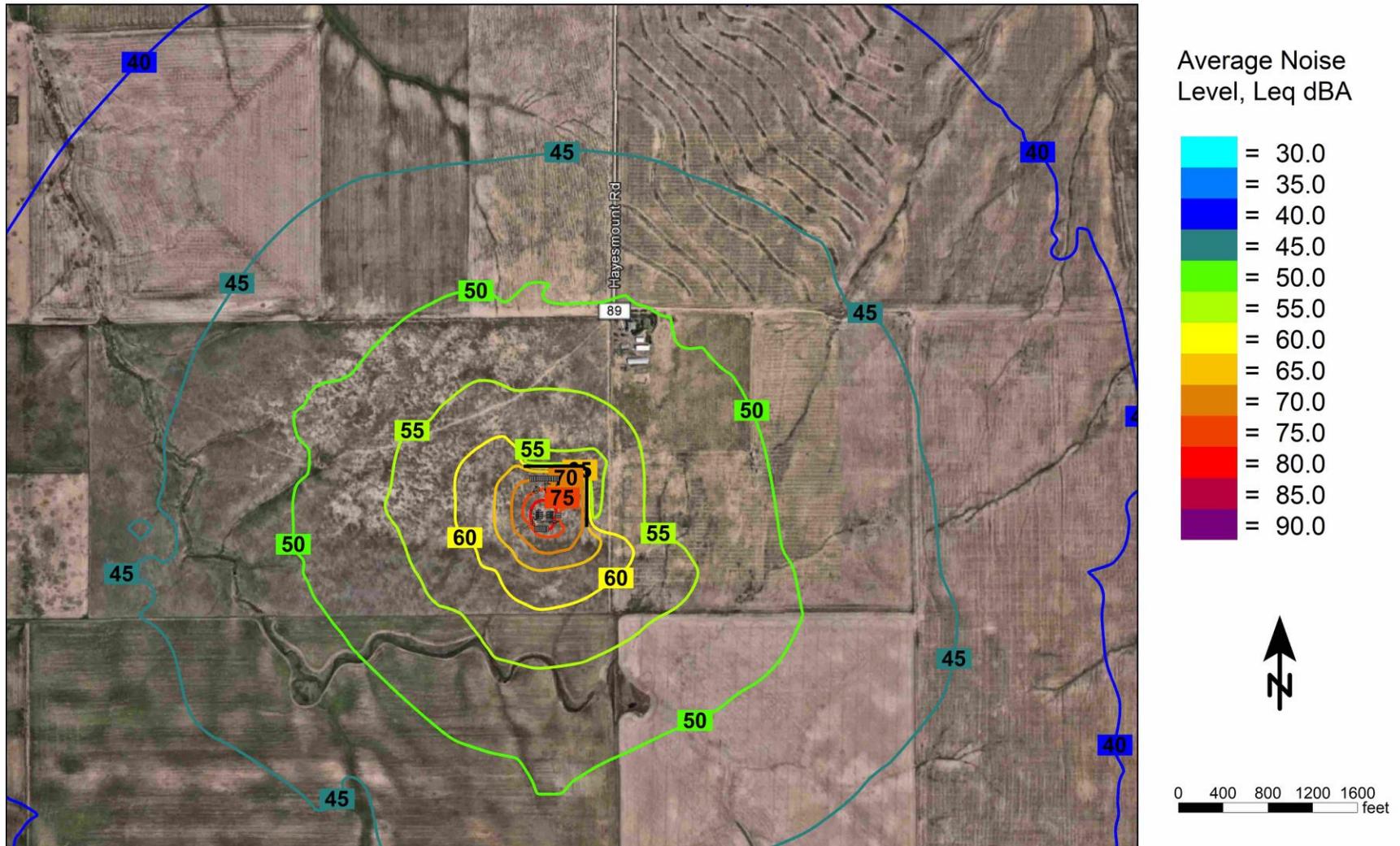


Figure 4-9 Mitigated Facing Noise Contour Map (dBA)

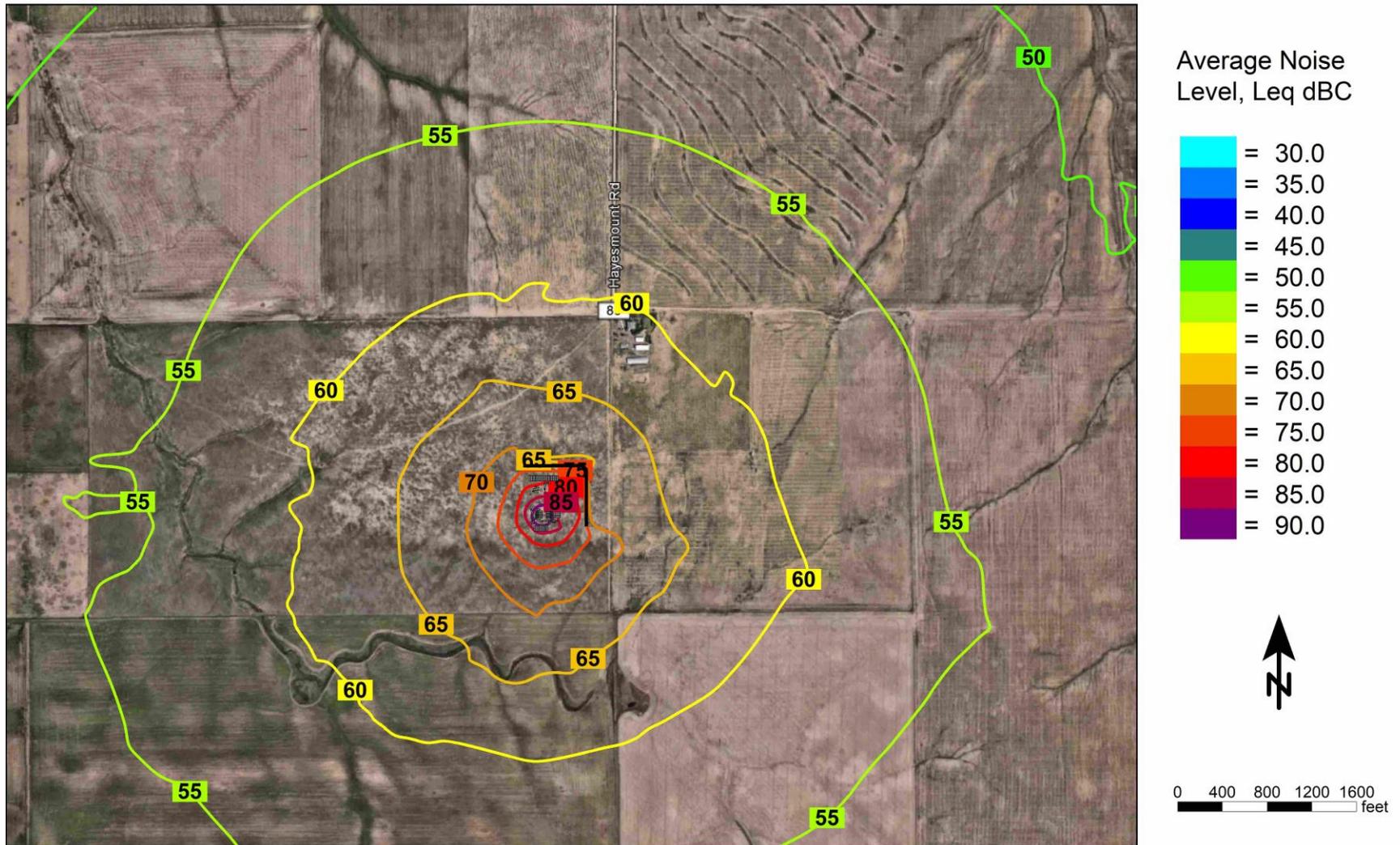


Figure 4-10 Mitigated Fracing Noise Contour Map (dBC)



5. Conclusion

Unmitigated noise models of the proposed drilling and fracing operations were constructed for the Lone Tree #4-65 North pad in Arapahoe County, Colorado. The results of the unmitigated noise modeling indicate that modeled receptor locations are predicted to comply with the A-weighted (dBA) and C-weighted (dBC) COGCC noise limits for both drilling and fracing operations.

Noise mitigation was added to reduce noise levels at the residence in close proximity to the site in compliance with Section 2.3 of the OA between Crestone Peak Resources and The City of Aurora. The noise mitigation included in the modeling is presented in Table 4-3 and shown in Figure 4-6. The results of the mitigated noise modeling indicate that with implementation of the recommended mitigation measures, the modeled receptor locations are predicted to comply with the A-weighted (dBA) and C-weighted (dBC) COGCC noise limits for both drilling and fracing operations with reductions of up to 7 dBA and 2 dBC offered over the unmitigated scenario.



Appendix A Glossary of Acoustical Terms



Ambient Noise

The all-encompassing noise associated with a given environment at a specified time, usually a composite of sound from many sources both near and far.

Average Sound Level

See Equivalent-Continuous Sound Level

A-Weighted Sound Level, dB(A)

The sound level obtained by use of A-weighting. Weighting systems were developed to measure sound in a way that more closely mimics the ear's natural sensitivity relative to frequency so that the instrument is less sensitive to noise at frequencies where the human ear is less sensitive and more sensitive at frequencies where the human ear is more sensitive.

C-Weighted Sound Level, dBC

The sound level obtained by use of C-weighting. Follows the frequency sensitivity of the human ear at very high noise levels. The C-weighting scale is quite flat and therefore includes much more of the low-frequency range of sounds than the A and B scales. In some jurisdictions, C-weighted sound limits are used to limit the low-frequency content of noise sources.

Community Noise Equivalent Level (CNEL)

A 24-hour A-weighted average sound level which takes into account the fact that a given level of noise may be more or less tolerable depending on when it occurs. The CNEL measure of noise exposure weights average hourly noise levels by 5 dB for the evening hours (between 7:00 pm and 10:00 pm), and 10 dB between 10:00 pm and 7:00 am, then combines the results with the daytime levels to produce the final CNEL value. It is measured in decibels, dB.

Day-Night Average Sound Level (Ldn)

A measure of noise exposure level that is similar to CNEL except that there is no weighting applied to the evening hours of 7:00 pm to 10:00 pm. It is measured in decibels, dB.

Daytime Average Sound Level

The time-averaged A-weighted sound level measured between the hours of 7:00 am to 7:00 pm. It is measured in decibels, dB.

Decibel (dB)

The basic unit of measurement for sound level.

Direct Sound

Sound that reaches a given location in a direct line from the source without any reflections.

Divergence

The spreading of sound waves from a source in a free field, resulting in a reduction in sound pressure level with increasing distance from the source.

Energy Basis

This refers to the procedure of summing or averaging sound pressure levels on the basis of their squared pressures. This method involves the conversion of decibels to pressures, then performing the necessary arithmetic calculations, and finally changing the pressure back to decibels.



Equivalent-Continuous Sound Level (Leq)

The average sound level measured over a specified time period. It is a single-number measure of time-varying noise over a specified time period. It is the level of a steady sound that, in a stated time period and at a stated location, has the same A-Weighted sound energy as the time-varying sound. For example, a person who experiences an Leq of 60 dB(A) for a period of 10 minutes standing next to a busy street is exposed to the same amount of sound energy as if he had experienced a constant noise level of 60 dB(A) for 10 minutes rather than the time-varying traffic noise level.

Fast Response

A setting on the sound level meter that determines how sound levels are averaged over time. A fast sound level is always more strongly influenced by recent sounds, and less influenced by sounds occurring in the distant past, than the corresponding slow sound level. For the same non-steady sound, the maximum fast sound level is generally greater than the corresponding maximum slow sound level. Fast response is typically used to measure impact sound levels.

Field Impact Insulation Class (FIIC)

A single number rating similar to the impact insulation class except that the impact sound pressure levels are measured in the field.

Field Sound Transmission Class (FSTC)

A single number rating similar to sound transmission class except that the transmission loss values used to derive this class are measured in the field.

Flanking Sound Transmission

The transmission of sound from a room in which a source is located to an adjacent receiving room by paths other than through the common partition. Also, the diffraction of noise around the ends of a barrier.

Frequency

The number of oscillations per second of a sound wave

Hourly Average Sound Level (HNL)

The equivalent-continuous sound level, Leq, over a 1-hour time period.

Impact Insulation Class (IIC)

A single number rating used to compare the effectiveness of floor/ceiling assemblies in providing reduction of impact-generated sound such as the sound of a person's walking across the upstairs floor.

Impact Noise

The noise that results when two objects collide.

Impulse Noise

Noise of a transient nature due to the sudden impulse of pressure like that created by a gunshot or balloon bursting.

Insertion Loss

The decrease in sound power level measured at the location of the receiver when an element (e.g., a noise barrier) is inserted in the transmission path between the sound source and the receiver.



Inverse Square Law

A rule by which the sound intensity varies inversely with the square of the distance from the source. This results in a 6dB decrease in sound pressure level for each doubling of distance from the source.

L_n Sound Level

Time-varying noise environments may be expressed in terms of the noise level that is exceeded for a certain percentage of the total measurement time. These statistical noise levels are denoted L_n, where n is the percent of time. For example, the L₅₀ is the noise level exceeded for 50% of the time. For a 1-hour measurement period, the L₅₀ would be the noise level exceeded for a cumulative period of 30 minutes in that hour.

Masking

The process by which the threshold of hearing for one sound is raised by the presence of another sound.

Maximum Sound Level (L_{max})

The greatest sound level measured on a sound level meter during a designated time interval or event.

NC Curves (Noise Criterion Curves)

A system for rating the noisiness of an occupied indoor space. An actual octave-band spectrum is compared with a set of standard NC curves to determine the NC level of the space.

Noise Reduction

The difference in sound pressure level between any two points.

Noise Reduction Coefficient (NRC)

A single number rating of the sound absorption properties of a material. It is the average of the sound absorption coefficients at 250, 500, 1000, and 2000 Hz, rounded to the nearest multiple of 0.05.

Octave

The frequency interval between two sounds whose frequency ratio is 2. For example, the frequency interval between 500 Hz and 1,000 Hz is one octave.

Octave-Band Sound Level

For an octave frequency band, the sound pressure level of the sound contained within that band.

One-Third Octave

The frequency interval between two sounds whose frequency ratio is $2^{1/3}$. For example, the frequency interval between 200 Hz and 250 Hz is one-third octave.

One-Third-Octave-Band Sound Level

For a one-third-octave frequency band, the sound pressure level of the sound contained within that band.

Outdoor-Indoor Transmission Class (OITC)

A single number rating used to compare the sound insulation properties of building façade elements. This rating is designed to correlate with subjective impressions of the ability of façade elements to reduce the overall loudness of ground and air transportation noise.

Peak Sound Level (L_{pk})

The maximum instantaneous sound level during a stated time period or event.

**Pink Noise**

Noise that has approximately equal intensities at each octave or one-third-octave band.

Point Source

A source that radiates sound as if from a single point.

RC Curves (Room Criterion Curves)

A system for rating the noisiness of an occupied indoor space. An actual octave-band spectrum is compared with a set of standard RC curves to determine the RC level of the space.

Real-Time Analyzer (RTA)

An instrument for the determination of a sound spectrum.

Receiver

A person (or persons) or equipment which is affected by noise.

Reflected Sound

Sound that persists in an enclosed space as a result of repeated reflections or scattering. It does not include sound that travels directly from the source without reflections.

Reverberation

The persistence of a sound in an enclosed or partially enclosed space after the source of the sound has stopped, due to the repeated reflection of the sound waves.

Room Absorption

The total absorption within a room due to all objects, surfaces and air absorption within the room. It is measured in Sabins or metric Sabins.

Slow Response

A setting on the sound level meter that determines how measured sound levels are averaged over time. A slow sound level is more influenced by sounds occurring in the distant past than the corresponding fast sound level.

Sound

A physical disturbance in a medium (e.g., air) that is capable of being detected by the human ear.

Sound Absorption Coefficient

A measure of the sound-absorptive property of a material.

Sound Insulation

The capacity of a structure or element to prevent sound from reaching a receiver room either by absorption or reflection.

Sound Level Meter (SLM)

An instrument used for the measurement of sound level, with a standard frequency-weighting and standard exponentially weighted time averaging.

Sound Power Level

A physical measure of the amount of power a sound source radiates into the surrounding air. It is measured in decibels.



Sound Pressure Level

A physical measure of the magnitude of a sound. It is related to the sound's energy. The terms sound pressure level and sound level are often used interchangeably.

Sound Transmission Class (STC)

A single number rating used to compare the sound insulation properties of walls, floors, ceilings, windows, or doors. This rating is designed to correlate with subjective impressions of the ability of building elements to reduce the overall loudness of speech, radio, television, and similar noise sources in offices and buildings.

Source Room

A room that contains a noise source or sources

Spectrum

The spectrum of a sound wave is a description of its resolution into components, each of different frequency and usually different amplitude.

Tapping Machine

A device used in rating different floor constructions against impacts. It produces a series of impacts on the floor under test, 10 times per second.

Tone

A sound with a distinct pitch

Transmission Loss (TL)

A property of a material or structure describing its ability to reduce the transmission of sound at a particular frequency from one space to another. The higher the TL value the more effective the material or structure is in reducing sound between two spaces. It is measured in decibels.

White Noise

Noise that has approximately equal intensities at all frequencies.

Windscreen

A porous covering for a microphone, designed to reduce the noise generated by the passage of wind over the microphone.