Military operations at Fort Riley create noise. The noise created is not continuous and different kinds of noises are created by different military operations (e.g. aircraft rotor noise, vehicle engine noise and large caliber weapons firing noise). All noise is measured in decibels (dB), but there are a variety of descriptors for the various kinds of noises. One widely accepted descriptor of noise created by large caliber weapons firing and other loud blast noise is the Day-Night Level (DNL) metric. Another is the single blast event peak noise metric, PK 15(met).

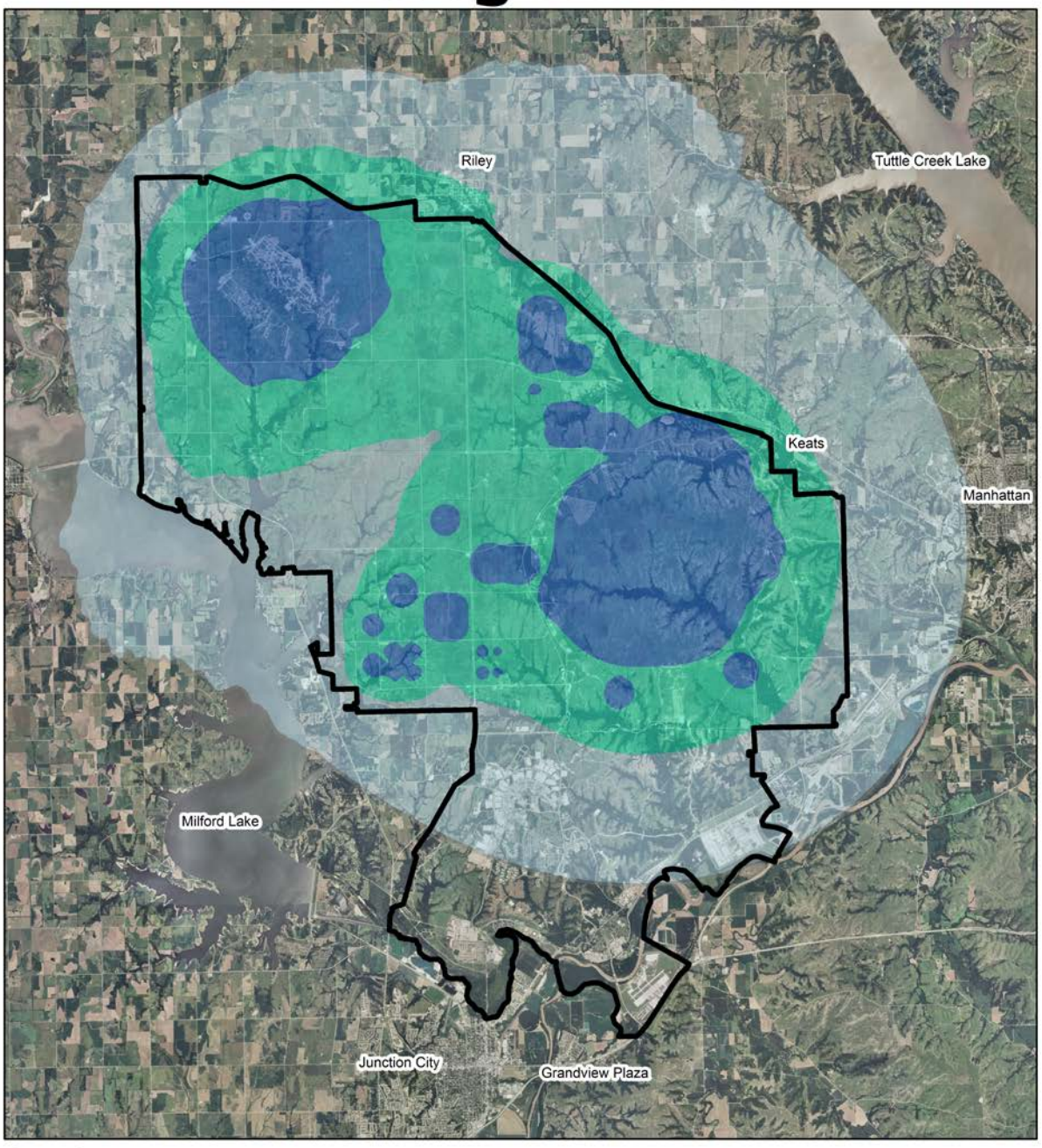
Day-Night Level (DNL) Blast Noise Metric:

Blast noise from large caliber weapons is noise of short duration (typically less than one second) of especially high intensity, with abrupt onset and rapid decay. Though the impulsive noise associated with large weapons systems can cause vibration that may make nearby buildings shake, the noise is air-borne. Vibration is not transmitted through the ground as a result of mortar or artillery impact on Fort Riley, but instead travels through the air as a shock wave. It is this wave that causes vibration and windows to rattle. People tend to find large caliber blast noise more annoying than small arms noise.

Blast noise from large caliber weapons is created both during the day and during the night at Fort Riley as the large weapons are sometimes fired around the clock. To account for that, blast noise from large caliber weapons averaged over all hours of the day is frequently described using the day-night level (DNL) of that noise. The DNL adds a 10 dB penalty to blast noise created at night because the large caliber weapons fired at night are frequently more easily heard than those firing during the day when there is more other noise that partially masks the sound of the large caliber weapons being fired.

The Army's Public Health Center used Fort Riley's weapons firing data from October 1, 2011 through September 30, 2013 to create this noise zone map. The noise zones on this map represent the average noise levels (i.e. the average dB DNL) generated by large caliber weapons firing at Fort Riley over the course of that entire period. The zones reflect that there were times of relative quiet - periods when weapons were not being fired - as well as times when weapons were fired on Fort Riley, sometimes around the clock, seven days a week. That general pattern of firing will very likely to continue though the frequency of firing will also very likely ebb and flow from year to year.

Average Noise



Legend

- Fort Riley Boundary
- LUPZ
- Zone II
- Zone III

0 1.25 2.5 5 7.5 10 Miles

Created By: Fort Riley DPW, Environmental Division
Created: 2016
Source: 2015 Installation Operational Noise Management Plan: CDNL Noise Zones
Imagery Date: 2010

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The following provides explanation of the various noise zones shown on the “Day-Night Noise Zones” map:

Noise Zone III. This zone consists of an area in which the noise from explosives detonations and large caliber weapons firing averaged over the course of a year (i.e., the DNL measurement) exceeded 70 dB. The average large caliber weapons firing noise level in this zone is generally considered to conflict with almost all activities and to, particularly conflict with sensitive land uses, such as housing, schools, medical facilities, and places of worship. Noise Zone III currently does not occur off the installation.

Noise Zone II. This zone consists of an area where the noise from explosives detonations and large caliber weapons firing averaged over the course of a year was between 62 and 70 dB. The Army recommends limiting the use of land in this to activities that are not noise-sensitive - such as industry, manufacturing, transportation and agriculture.

Noise Zone I. This zone includes areas where explosives detonations and large caliber weapons firing noise averaged over the course of a year was less than 62 dB. This zone is usually suitable for all types of land use activities and does not appear as a specific noise zone on the map.

Land Use Planning Zone. The noise environment at the installation varies daily and seasonally because operations are not consistent 365 days a year. To provide a planning tool that can be used to account for days of higher than average operations, a Land Use Planning Zone (LUPZ), the zone where the explosives detonations and large caliber weapons firing noise averaged over the course of a year was less than 62 dB but was greater than 57 dB, is included on this noise zone map. The LUPZ encompasses areas where, during periods of increased military operations, community annoyance levels can reach those associated with Zone II.

The LUPZ can offer a prediction of noise impacts when levels of operations are above average. While residential and other noise sensitive land uses may generally be compatible with the typical noise levels present within a LUPZ, potential increased annoyance levels during training operations may warrant the utilization of design and structural measures, to reduce interior noise levels during periods of increased military operations. Additionally, low residential densities are warranted within the LUPZ to reduce the likelihood of potential future land use conflicts.

Single Blast Event Peak Noise (PK 15(met)) Metric:

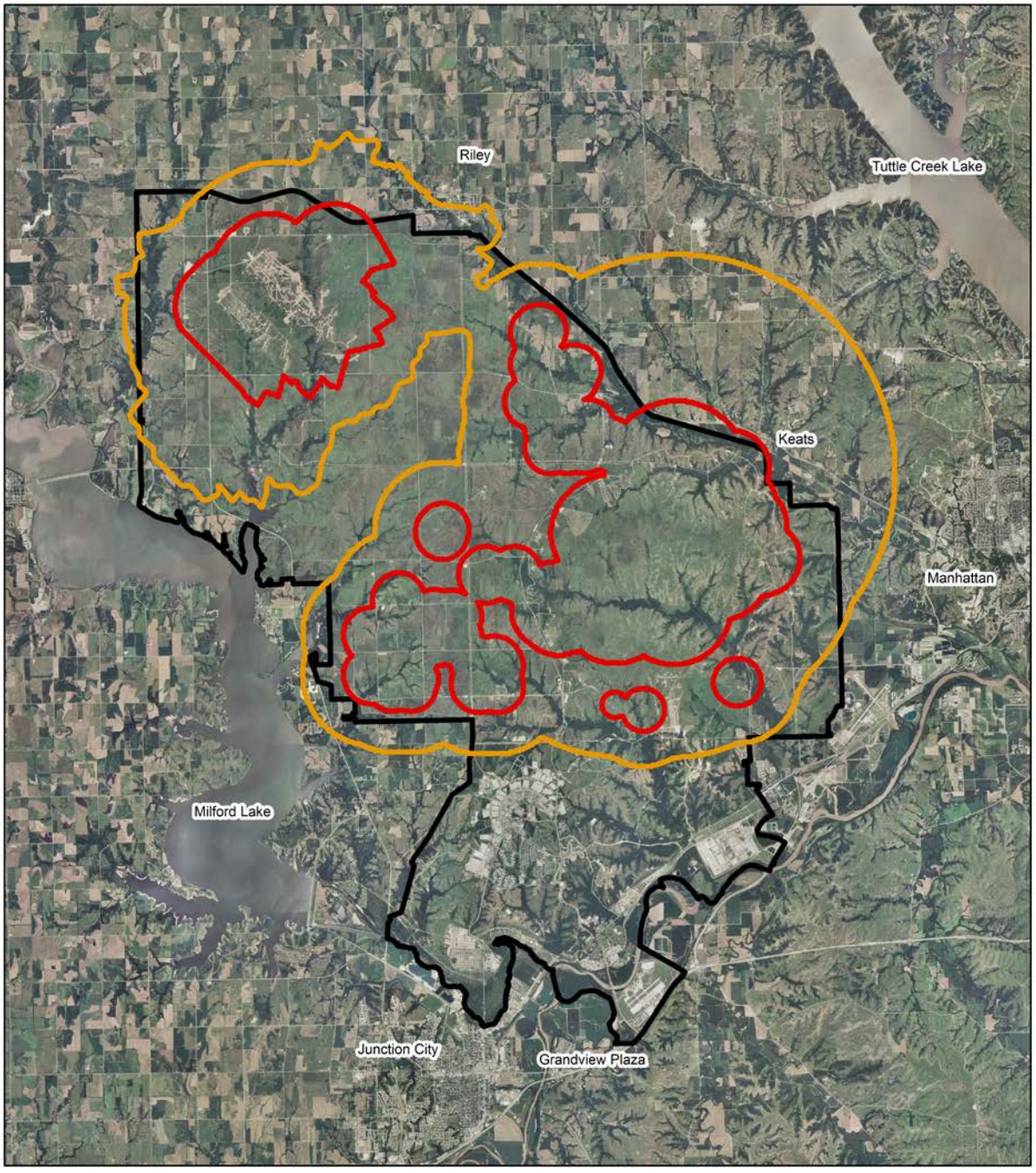
Another useful tool for understanding impacts of noise created by the firing of weapons is the PK15(met) metric. The PK15(met) metric is the single-event peak noise level from firing a single weapon one time from a particular location when wind conditions are conducive to transmitting sound from the location where the weapon is fired to the point from which it is heard. The noise zones on the “Fort Riley Peak Noise Levels” map represent peak noise levels that were created by the noisiest large caliber

weapon firing at each firing location on Fort Riley from October 2011 through September 2013. The actual noise level is expected to have occasionally (i.e. 15% of the time) exceeded the PK15(met) noise level shown because of the effects of weather and other meteorological conditions on noise propagation.

It is generally believed that the probability of community noise complaints being generated from an instance of firing a large caliber weapon is low if the peak level of that noise is less than 115 dB; the probability of complaints is medium if the Peak is 115 to 130 dB; the probability is high if the Peak is 130 to 140 dB: and above 140 dB PK15(met), risk of physiological damage to unprotected human ears and structural damage claims exist (source: Army Regulation 200-1, Environmental Protection and Enhancement). The PK15(met) from large caliber weapons firing reached 115-130 dB level only in three areas beyond the installation's boundaries: less than 500 meters beyond the boundary in an area west of the town of Riley; less than 1,000 meters beyond in an area west of Keats; and, less than 400 meters beyond north of Ogden. A PK15(met) greater than 130 dB did not exist off the installation . As for the Day-Night Level (CDNL) Blast Noise Metric, the precise locations of PK zones will also very likely change over time as locations from where large caliber weapons are fired and where their explosive projectiles impact on the installation change.

It should be noted that the PK 15(met) zones do not give an indication of how frequently the weapons are fired, only the peak noise level that can be expected to be heard when they are.

Peak Noise



Legend

- 115 dB
- 130 dB
- Fort Riley Boundary

Created By: Fort Riley DPW, Environmental Division
Created: 2016
Source: 2016 Noise modeling conducted by
US Army's Public Health Command using firing data from Oct 2011-Sept 2013
Imagery Date: 2010

0 1.25 2.5 5 7.5 10 Miles

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For more information about Fort Riley operations, please contact the Fort Riley Public Affairs Office (PAO) at (785) 239-4310.