

Environmental Factors – Air | Water | Light | Habitat | Noise

Air Quality and Pollution

Air pollution is linked to some negative health side effects, such as respiratory diseases (eg. Asthma), cardiovascular diseases, birth challenges, and premature death.¹ Air pollutants can come from both human-made and natural sources. Human-made sources mainly come from the burning of fuel and fumes while natural sources can include dust and smoke from wildfires. There is indoor and outdoor air pollution, though outdoor air pollution is more often measured. Indoor air pollution can come from gases, household products and chemicals, building materials (asbestos, lead), tobacco smoke, dust, and other allergens such as mold and pollen.² The Air Quality Index (AQI) indicates overall outdoor air quality, taking into account five categories of air pollutants, and provides information on whether there is a health risk for sensitive groups, such as children, the elderly, asthmatics, and those with lung or cardiovascular diseases.³

AQI is based on:⁴

- Carbon monoxide (CO)
- Nitrogen dioxide (NO₂)
- Sulfur dioxide (SO₂)
- Ozone (O₃)
- Particle Pollution: Coarse Particulate Matter (PM₁₀) and Fine Particulate Matter (PM_{2.5})

Combustion from fuels such as gas, natural gas, oil, coal, and wood are sources of CO, NO₂, and SO₂. O₃ can come from the combination of CO₂ and NO from combustion reacting with heat and sunlight. Particle pollution such as dust or smoke can come from a variety of natural and human-made sources, such as combustion (controlled burning, wildfires) or wind picking up particles. CO, NO₂, and SO₂ can irritate the lungs and make breathing difficult. O₃ can decrease breathing capacity and particles can cause asthma-like symptoms such as coughing, wheezing, or shortness of breath.

Albuquerque has monitoring stations for all of the above pollutants.⁵ Because the Village is situated surrounded by Albuquerque, the air quality in Los Ranchos likely mirrors Albuquerque to some extent. Both Albuquerque and the Village are also regulated federally by the Clean Air Act.

The AQI level in Albuquerque is consistently considered Good to Moderate for most days of the year. In Albuquerque, over time there seem to be more days in the year with Good to Moderate AQI levels. Usually only about 0-2 days per year the air in Albuquerque is measured as Unhealthy or Very Unhealthy. Since 2013, there have been 0 days with Unhealthy or Very Unhealthy AQI levels.

Historic trends from 2000-2015 show that Bernalillo County has overall lower levels of AQI pollutants than the southwest region average except for PM₁₀ and PM_{2.5}, which are more than the regional average. SO₂ and NO₂ are consistently below the average while CO and O₃ are more recently below the regional average.⁶ Some measures have been taken in the metropolitan and county area to regulate and reduce air pollution, such as vehicle emissions testing, burn restrictions, asbestos removal, and the requirement of permits.⁷

^{1, 2} National Institute of Environmental Health Sciences. (October 2018). Air Pollution. Retrieved October 2018 from www.niehs.nih.gov/health/topics/agents/air-pollution/index.cfm.

³ Weatherbug. (October 2018). Air Quality Awareness: What is AQI? Retrieved October 2018 from www.weatherbug.com/news/Air-Quality-Awareness-What-is-AQI.

⁴ Environmental Protection Agency. About Air Data Reports. Retrieved October 2018 from www.epa.gov/outdoor-air-quality-data/about-air-data-reports.

⁵ City of Albuquerque. Air Quality Monitoring Data. Retrieved October 2018 from www.cabq.gov/airquality/air-quality-monitoring.

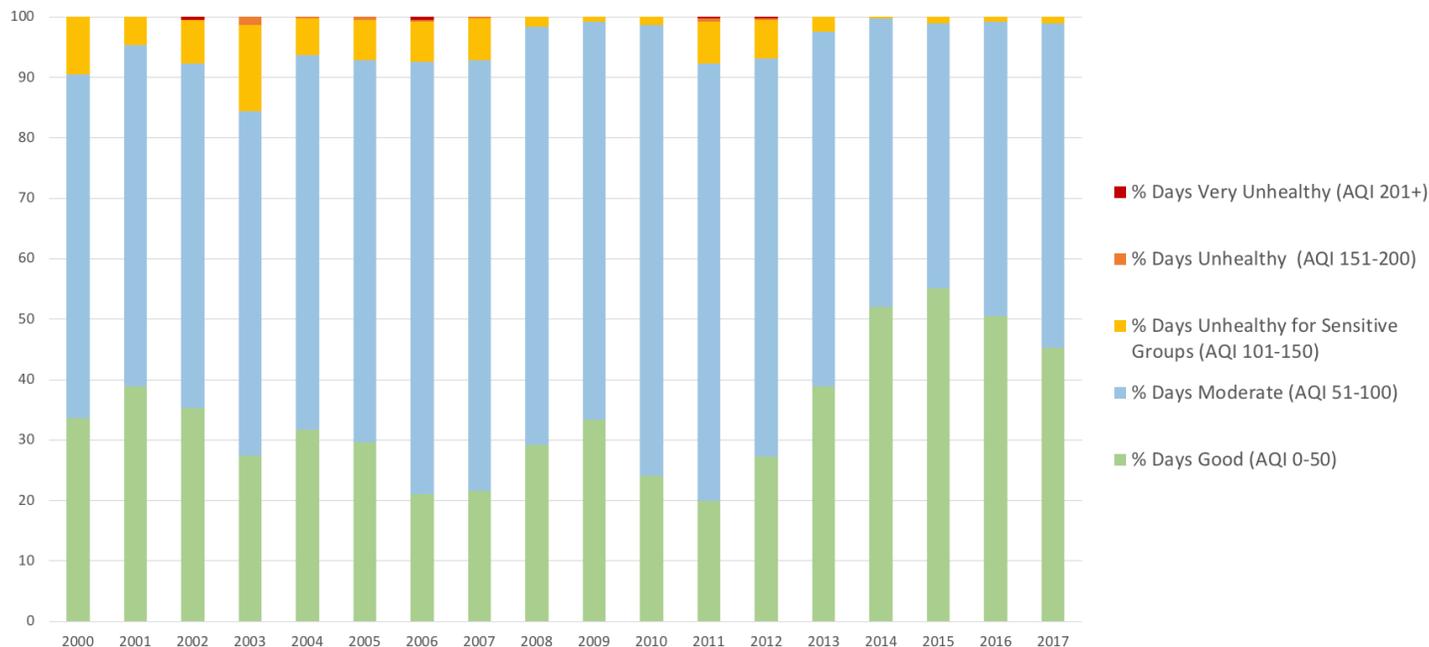
⁶ City of Albuquerque. Air Quality Trends. Retrieved October 2018 from www.cabq.gov/airquality/trends.

⁷ City of Albuquerque. Air Quality. Retrieved October 2018 from www.cabq.gov/airquality.

Percentage of Days AQI Level is Considered Good to Unhealthy

Albuquerque, NM 2000-2017

*Source: EPA Air Quality Index Report



Ozone seems to become more prevalent during the warmer months, likely because it is formed when CO₂ and NO react with heat and sunlight. PM₁₀ and PM_{2.5} levels seem to be higher in both the summer and the winter, likely from particulates from wood stoves and other heating means in the winter and ash and other particulates from wildfires in the summer, though PM₁₀ seems to have a less pronounced pattern.

Overall, the main AQI pollutant in Albuquerque seems to be O₃, as it is consistently the pollutant with the most days annually it is the main pollutant. PM₁₀ and PM_{2.5} do have many days as the main pollutants while NO₂ and SO₂ are almost never the main pollutant for a day.

Pollen

Though not a pollutant, quality of life can be affected for those allergic to tree, grass, and weed pollen carried by the wind. The Albuquerque pollen count is composed of grass, aster, chenopodiaceae,⁸ and sagebrush pollen types, though there are many other types of pollens in the area.⁹

Albuquerque does have a Pollen Control Ordinance (9.12) passed in 1994 that prohibits the selling, importing, planting or growing of certain allergenic trees in Albuquerque.¹⁰ However, it can take time for regulation to take effect as trees grandfathered in (already planted before the ordinance) are around until they die.

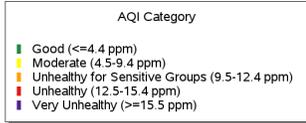
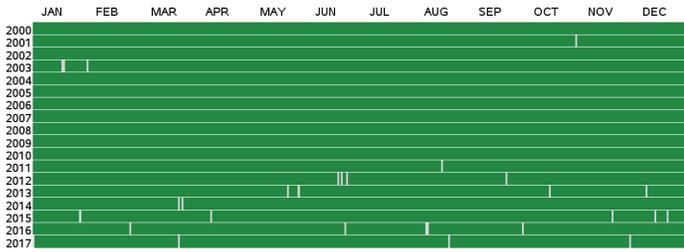
The Landscaping section of the Los Ranchos Codified Ordinances (9.2.19(D)(1)(a)(3)) lists Siberian Elms, Tamarisk (Salt Cedar), and Russian Olive as prohibited plants.

⁸ A plant family with pollen easily spread by wind that includes Russian thistle (thumbleweeds), saltbrush, and related desert native plants.

⁹ City of Albuquerque. Pollen Identification Images. Retrieved October 2018 from www.cabq.gov/airquality/todays-status/pollen/pollen-identification.

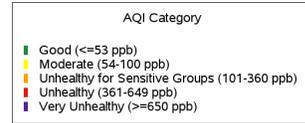
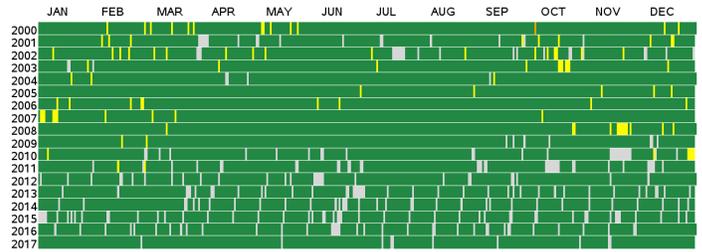
¹⁰ City of Albuquerque, New Mexico Code of Ordinances. Retrieved October 2018 from [library.amlegal.com/nxt/gateway.dll/New%20Mexico/albuqwin/cityofalbuquerque/newmexicocodeofordinanc?f=templates\\$fn=default.htm\\$3.0\\$vid=amlegal:albuquerque_nm_mc](http://library.amlegal.com/nxt/gateway.dll/New%20Mexico/albuqwin/cityofalbuquerque/newmexicocodeofordinanc?f=templates$fn=default.htm$3.0$vid=amlegal:albuquerque_nm_mc).

Carbon Monoxide Daily AQI Values, 2000 to 2017
Albuquerque, NM



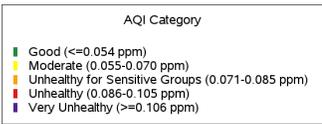
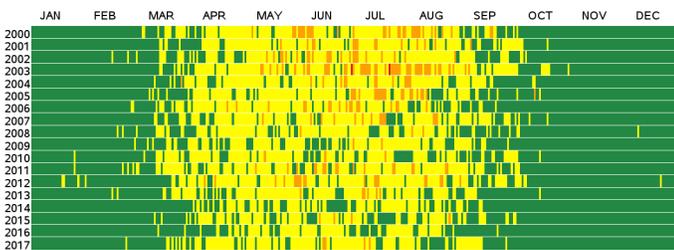
Source: U.S. EPA AirData <<https://www.epa.gov/air-data>>
Generated: October 16, 2018

Nitrogen Dioxide Daily AQI Values, 2000 to 2017
Albuquerque, NM



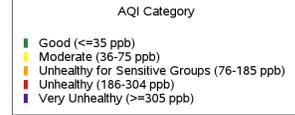
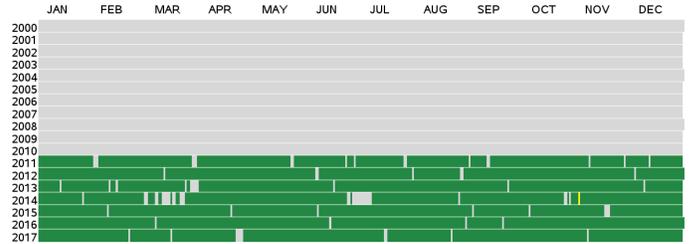
Source: U.S. EPA AirData <<https://www.epa.gov/air-data>>
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Ozone Daily AQI Values, 2000 to 2017
Albuquerque, NM



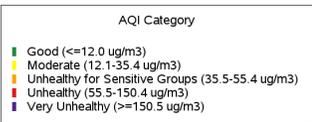
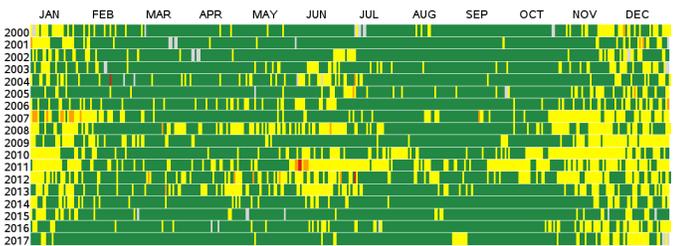
Source: U.S. EPA AirData <<https://www.epa.gov/air-data>>
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Sulfur Dioxide Daily AQI Values, 2000 to 2017
Albuquerque, NM



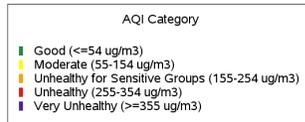
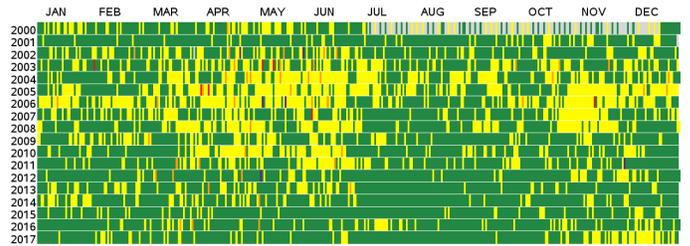
Source: U.S. EPA AirData <<https://www.epa.gov/air-data>>
Generated: October 16, 2018

PM2.5 Daily AQI Values, 2000 to 2017
Albuquerque, NM



Source: U.S. EPA AirData <<https://www.epa.gov/air-data>>
Generated: October 16, 2018

PM10 Daily AQI Values, 2000 to 2017
Albuquerque, NM



Source: U.S. EPA AirData <<https://www.epa.gov/air-data>>
Generated: October 16, 2018

Water Quality and Pollution

The Village's water is provided by the Albuquerque Bernalillo County Water Utility Authority (ABCWUA) and private wells on individual properties. Like Albuquerque, the primary source of the Village's water from ABCWUA comes from the San Juan-Chama project that diverts water from the Colorado River. The use of groundwater from the aquifer is declining alongside overall water use. Water continues to be managed through reuse and conservation and the aquifer is reserved more for times of drought.¹¹

The Village used to be primarily septic systems, but due to increasing density intensifying ground water pollution, much of the Village is now tied into the ABCWUA sanitary sewer system. There are 84 properties in the Village that are on septic systems.

Stormwater

Stormwater is any water from rain, snow melt, or ice melt that seeps into the ground or is drained through drains, ditches, and streets, where it later ends up in the Rio Grande. Contaminated stormwater can affect water quality and can come from industrial and construction activities, as well as from daily life (litter, pet waste, yard waste, pesticides, and automobile fluids).¹² Street sweeping and individual effort to dispose of waste properly can help to prevent stormwater pollution that feeds into the Rio Grande.

The Village is a member, along with other entities, of the entire watershed's Municipal Separate Storm Sewer System (MS4) Permit to regulate surface water quality standards.

Flooding

The Village's location in the Middle Rio Grande Valley offers easier access to water and the green landscape that comes with it. However, that does mean that there is the possibility of flooding. Historically, the Rio Grande would flood occasionally. Human-made introductions of levees and the channelization of the river have managed that risk.

Flooding information from the Federal Emergency Management Agency (FEMA) on the National Flood Hazard Layer (NFHL) map show flooding conditions in the Village.¹³ Because of the lower elevation, the majority of the Village is in FEMA Flood Zone X, an area of moderate flood hazard usually between the limits of 100 and 500 year floods.¹⁴ Pockets of the Village are in FEMA Flood Zone AH, a special flood hazard area with Base Flood Elevation or Depth. This area is subject to inundation by 1% annual chance shallow flooding (usually areas of ponding) where average depths are between one and three feet. Mandatory flood insurance purchase requirements and floodplain management standards apply. The unshaded area of the Village is in Zone X (unshaded), an area of minimal flood hazard. It is outside the 500-year flood and protected by levee from 100-year floods.

¹¹ Albuquerque Bernalillo County Water Utility Authority. Water 2120: Securing Our Water Future. Retrieved October 2018 from www.abcwua.org/uploads/files/Water%202120%20One-Pager_DM%20REV2.pdf.

¹² Bernalillo County. What is stormwater pollution? Retrieved October 2018 from www.bernco.gov/public-works/stormwater-pollution.aspx.

¹³ Federal Emergency Management Agency. FEMA's National Flood Hazard Layer (NFHL) Viewer. Retrieved October 2018 from hazards-fema.maps.arcgis.com/apps/webappviewer/index.html?id=8b0adb51996444d4879338b5529aa9cd.

¹⁴ Federal Emergency Management Agency. Definitions of FEMA Flood Zone Designations. Retrieved October 2018 from snmapmod.snco.us/fmm/document/fema-flood-zone-definitions.pdf.

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

- SPECIAL FLOOD HAZARD AREAS**
 - Without Base Flood Elevation (BFE) Zone A, V, AH9
 - With BFE or Depth Zone AE, AO, AH, VE, AR
 - Regulatory Floodway

- OTHER AREAS OF FLOOD HAZARD**
 - 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
 - Future Conditions 1% Annual Chance Flood Hazard Zone X
 - Area with Reduced Flood Risk due to Levee. See Notes, Zone X
 - Area with Flood Risk due to Levee Zone D

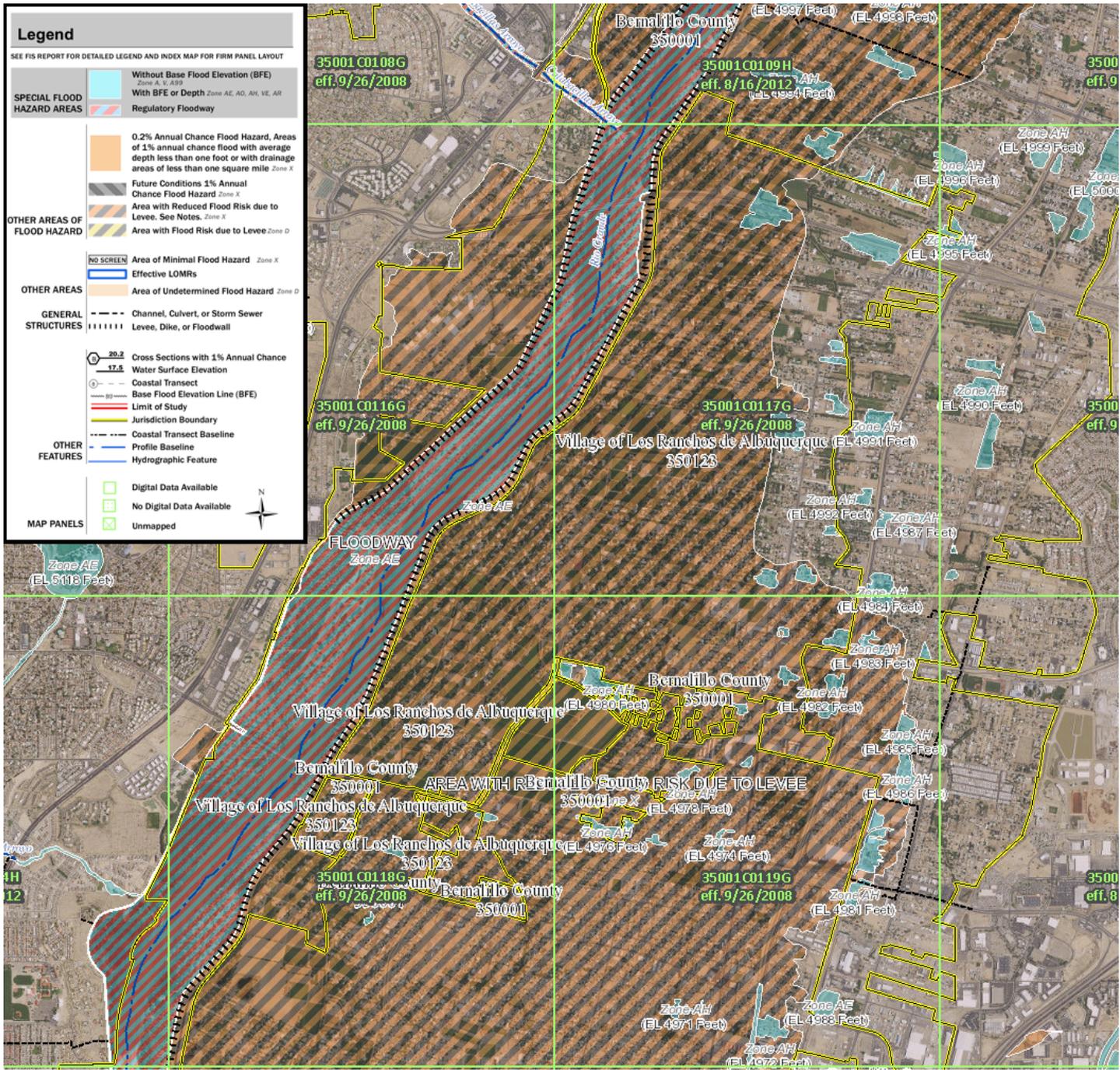
- OTHER AREAS**
 - Area of Minimal Flood Hazard Zone X
 - Effective LOMRs
 - Area of Undetermined Flood Hazard Zone D

- GENERAL STRUCTURES**
 - Channel, Culvert, or Storm Sewer
 - Levee, Dike, or Floodwall

- CROSS SECTIONS**
 - 20.2
 - 17.5

- OTHER FEATURES**
 - Coastal Transect
 - Base Flood Elevation Line (BFE)
 - Limit of Study
 - Jurisdiction Boundary
 - Coastal Transect Baseline
 - Profile Baseline
 - Hydrographic Feature

- MAP PANELS**
 - Digital Data Available
 - No Digital Data Available
 - Unmapped



Light Pollution¹⁵

The Village currently has a dark skies ordinance to maximize the preservation of the “valley” character of the Village and to minimize light pollution for the enjoyment of the citizens of the Village.¹⁶

Components of Light Pollution:

Glare – excessive brightness that causes visual discomfort

Skyglow – brightening night sky over inhabited areas

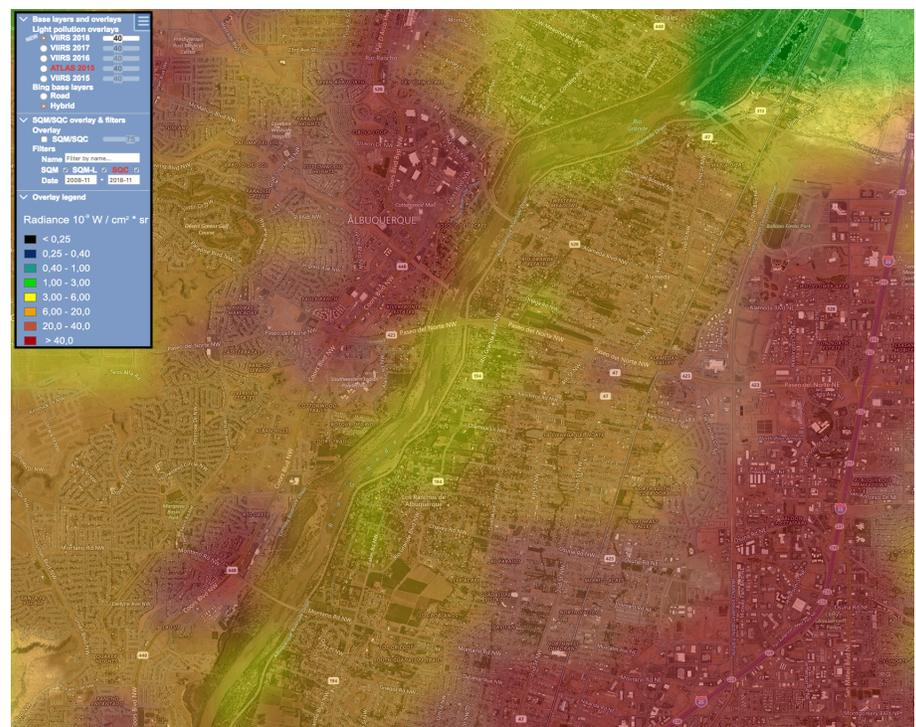
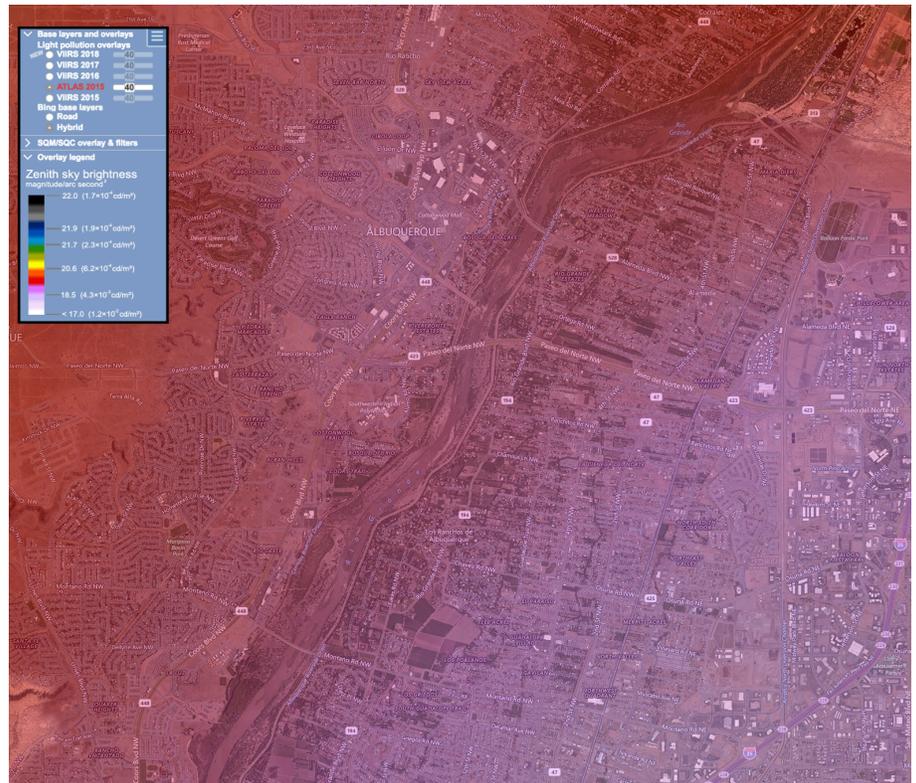
Light trespass – light falling where it is not intended or needed

Clutter – bright, confusing, and excessive groupings of light sources

There is conflicting evidence as to whether increased lighting prevents, increases, or decreases crime. There are differences between urban, suburban, and rural areas, violent vs. property crime, private residential property crime vs. public street crime, and between light and crime vs. light and a sense of safety.

Too much lighting can have adverse effects, such as increased energy consumption, disrupting ecosystems and wildlife (migratory birds are affected by extremely bright lights¹⁷), adverse human health effects, and adverse crime and safety effects¹⁸ (specifically glare from too bright lights decreasing visibility or making it difficult to adjust to low-light conditions).

Maps on light pollution¹⁹ do show a lower zenith sky brightness (artificial night sky brightness) and radiance (light sources) in the Village and in the Rio Grande Valley area compared to the surrounding area and jurisdictions.



^{15, 18} International Dark-Sky Association. Light Pollution. Retrieved October 2018 from darksky.org/light-pollution.

¹⁶ Village of Los Ranchos Codified Ordinances.

¹⁷ Science Daily. (January 2018). City lights setting traps for migrating birds. Retrieved October 2018 www.sciencedaily.com/releases/2018/01/180119125817.htm. Springer Nature. (March 2018). Light pollution is greatest within migration passage areas for nocturnally-migrating birds around the world. Retrieved October 2018 from www.nature.com/articles/s41598-018-21577-6.

¹⁹ Light Pollution Map. Light Pollution Map. Retrieved October 2018 from www.lightpollutionmap.info/#zoom=7&lat=11106734&lon=-16519118&layers=B0FFFFFTFFFF.

Habitat and Wildlife

Given its close proximity to the Rio Grande State Park and its location in the Mid-Rio Grande River Valley, the Village is home to a variety of both permanent and migratory wildlife, such as porcupines, Gambel's quail, coyotes, and bobcats. The bosque can provide habitat for some endangered and vulnerable species, such as the Southwestern Willow Flycatcher, Silvery Minnow, New Mexico Jumping Mouse, Yellow-Billed Cuckoo, and the Eagle.²⁰ The region is part of a major route for migratory birds²¹ such as Sandhill cranes, Ross's geese, Snow geese, Canada geese, and Cooper's hawks.

Noise and Noise Pollution

Noise is a very broad category that includes all sounds people can hear on a daily basis, such as human voices, animals, street traffic from cars/buses/pedestrians/emergency vehicles, trains, construction, aircraft, background music in stores, restaurants, or cafes, household sounds (TV, dishwashers, lawnmowers, etc.), workplace sounds, events, fireworks, and conflicts.²² Noise pollution and excessive noise can be annoying or harmful to human health. There are qualitative and quantitative ways to describe excessive noise.

Qualitatively, it can be described as sound that endangers or injures the safety or health of human beings, or as sound that annoys or is objectionable to a reasonable person of normal sensitivity.²³ There are multiple qualitative definitions of excessive noise.

Quantitatively, noise is measured in decibels (dB) and excessive noise levels are defined differently by different jurisdictions. According to the World Health Organization (WHO), sound levels less than 75 dB are not damaging to living organisms, regardless of length or consistency of exposure. Exposure for over 8 hours to constant noise above 85 dB may be hazardous.²⁴

- The current Los Ranchos noise ordinance considers excessive noise to be over 50 dB during the daytime and over 40 dB at night.
- The current City of Albuquerque noise ordinance considers excessive noise to be between 50-65 dB during daytime and nighttime, with differences between residential and commercial properties generating and receiving the noise. Industrial decibel levels are between 70-75 dB.²⁵
- The current Corrales noise ordinance does not use decibels to describe excessive noise.
- The current Bernalillo County noise ordinance considers excessive noise to be between 45-65 dB during daytime and nighttime, with differences between residential and commercial properties receiving the noise. Industrial decibel levels are between 70-75 dB.²⁶

²⁰ Bernalillo County. Exploring the Bosque. Retrieved October 2018 from www.bernco.gov/uploads/files/OpenSpaces/bosque%20brochure.pdf.

²¹ New Mexico Museum of Natural History. Bird Migration in New Mexico. Retrieved October 2018 from www.nmnaturalhistory.org/sites/default/files/documents/education/BosqueEdGuide/BEG_BirdMigration_ENGLISH_2018_0820_FINALv2.pdf.

^{22, 24} Environmental Pollution Centers. What is Noise Pollution? Retrieved October 2018 from www.environmentalpollutioncenters.org/noise-pollution.

²³ American Planning Association. (2004). A Planners Dictionary.

²⁵ City of Albuquerque, New Mexico Code of Ordinances Chapter 9 Article 9: Noise Control. Retrieved October 2018 [library.amlegal.com/nxt/gateway.dll/New%20Mexico/albuqwin/chapter9healthsafetyandsanitation?f=templates\\$fn=default.htm\\$3.0\\$vid=amlegal:albuquerque_nm_mc\\$anc=JD_Chapter9Article9](http://library.amlegal.com/nxt/gateway.dll/New%20Mexico/albuqwin/chapter9healthsafetyandsanitation?f=templates$fn=default.htm$3.0$vid=amlegal:albuquerque_nm_mc$anc=JD_Chapter9Article9).

²⁶ Bernalillo County, New Mexico Code of Ordinances Chapter 30 Article IV. Noise. Retrieved October 2018 from library.municode.com/nm/bernalillo_county/codes/code_of_ordinances?nodeId=BECOCO_CH30EN_ARTIVNO.

Decibel (dB) Measurement:²⁷

*Decibels are logarithmic, so the numbers double. Each decibel measurement is explained with comparison with a baseline of 70 dB.

20 dB – Whisper, rustling leaves

30 dB – Quiet rural area. “Very quiet”

40 dB – Library, bird calls (44dB), lowest limit of urban ambient sound. 1/8 as loud as 70 dB.

50 dB – Quiet suburb, conversation at home. ¼ as loud as 70 dB.

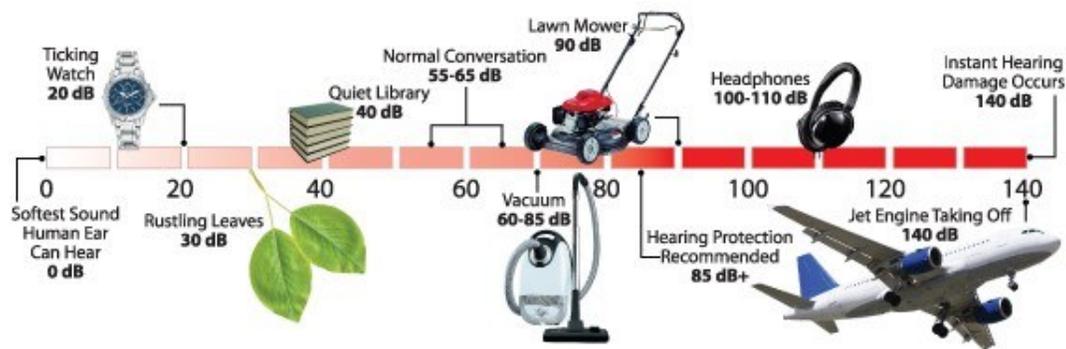
60 dB – Conversation in restaurant, office, background music. Half as loud as 70 dB.

70 dB – Living room music, vacuum cleaner (varies). Upper 70s annoyingly loud to some people.

80 dB – garbage disposal, dishwasher. 2x as loud as 70 dB. Possible damage in 8 hour exposure.

90 dB – motorcycle at 25 ft. 4x as loud as 70 dB. Likely damage in 8 hour exposure.

Image: ²⁸



Dampening or Masking Noise

There are natural techniques to dampen or mask noise that can be applied to exteriors and outdoor areas. Solid walls, fences, berms, and various plants such as dense shrubs, evergreens, bamboo,²⁹ and trees with thick branches at ground level (hollies or junipers) can deflect or absorb sound.³⁰ Plants especially will absorb and scatter sound instead of bouncing the sound back.³¹ Noise can be masked through building materials such as window panes and seals or through interior additions, such as curtains.³² Outdoor noise masking techniques include flowing water through fountains,³³ white noise through rustling leaves,³⁴ and wildlife sounds.³⁵

²⁷ IAC Acoustics. Comparative Examples of Noise Levels. Retrieved October 2018 from www.industrialnoisecontrol.com/comparative-noise-examples.htm.

²⁸ City of Albuquerque. Noise. Retrieved October 2018 from www.cabq.gov/environmentalhealth/noise.

²⁹ Van Leeuwen, H.J.A. (December 2016). Bamboo plants as a noise barrier to reduce road traffic noise. Retrieved October 2018 from www.researchgate.net/publication/312198747_Bamboo_plants_as_a_noise_barrier_to_reduce_road_traffic_noise.

^{30, 33} Carroll, J. Planting Noise Blockers: Best Plants for Noise Reduction in Landscapes. Retrieved October 2018 from www.gardeningknowhow.com/special/spaces/noise-reduction-plants.htm.

³¹ Peters, A. (October 2015). This Living Bamboo Highway Barrier Blocks Traffic Noise While It Sucks Up Pollution. Retrieved October 2018 from www.fastcompany.com/3052375/this-living-bamboo-highway-barrier-blocks-traffic-noise-while-it-sucks-up-pollution.

³² Houzz. (September 2013). Quiet, Please! How To Cut Noise Pollution At Home. Retrieved October 2018 from www.forbes.com/sites/houzz/2013/09/09/quiet-please-how-to-cut-noise-pollution-at-home/#61d6ed6d445b.

³⁴ Alexander, M. Yard Noise-Reduction. Retrieved October 2018 from www.thisoldhouse.com/ideas/yard-noise-reduction.

³⁵ Gilmer, M. Landscape Noise Reduction. Retrieved October 2018 from www.landscapingnetwork.com/landscape-design/noise-reduction.html.