

A Data Collection Noise Level Case Study Methodology for an Expert Witness

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Abstract: One popular activity in the southern Appalachian Mountains is skeet, trap, and sport clay shooting. During the summer months, the owner of a small mountain ski area practices skeet shooting on a private skeet range on the ski area property in the afternoons between 4:30 and 6:00 PM. Residents in two communities, located more than 800 meters from the range, filed legal action to stop the shooting. Upon the defendant's request, the authors developed a methodology, collected data, and prepared an expert witness affidavit. The primary research instrument used was a GenRad Sound Level Meter Model 1565-13 and the secondary instrument was a Quest Electronic Micro-15 Permissible Noise Dosimeter. Data was collected at three different sites on 22 August 2014. Since the shooter custom loaded his own shells, data was collected on shots with both a low load (less gun powder) and a normal load (standard amount of gun powder). The shot (report) mean for all rounds fired, regardless of data location, was 47.8 dBA ($\sigma = 4.05$ dBA) for the low load and 51.9 dBA ($\sigma = 4.82$ dBA) for the normal load. The difference between these two means is 4.10 dBA suggesting that, depending on frequency, the normal load can be between 2 to 3 times louder. All readings are below the nuisance level. The lawsuit was dismissed without prejudice several years ago and not re-filed within one year. Thus the case was resolved in favor of the defendants.

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