

Lesson 11: How an LA90 works – The Jackhammer Example

An LA90 is not a real noise – it's a statistic. It is the statistical lowest 10% level over a period of noise monitoring.

A wind farm acoustician will never tell you the real noise you hear; the noise level they give you is just a statistic.

People are sleep disturbed by the noise of a wind farm, but an LA90 statistic ignores the high nuisance noise and only provides the statistical lowest levels.

They draw up a graph containing dots with a line through it, and say "the graph shows the wind farm is compliant for noise".

To learn more about these LA90 graphs, go to [wind farm acoustic training for beginners and lawyers](#)

An LA90(10min) statistic involves 10-minute blocks of noise recordings.

Each 10-minute block of noise is a data point. Data points are the dots you see on an LA90 graph.

Each 10-minute block of noise is statistically analysed to identify the lowest 10% level.

So each dot on a graph represents the lowest noise in each 10-minutes of noise monitoring.

90% of the noise is above this level.

The real noise people hear is not shown on a graph.

They never tell people that the dots on the graph are not the real noise they hear.

They will always say.. "Our wind farm complies with the limit".

An LA90 makes jackhammer noise look quiet.

Here's how an LA90 works with jackhammer noise.

- A jackhammer is operating next door on and off intermittently throughout the night.
- The operator works the jackhammer in 10-minute blocks.
- Every 10 minutes, it works for 9 minutes, then it rests for 1 minute.
- The noise recorded is 130 dB when it is working, and 20 dB when it is stopped.
- So, in every 10 minutes, 130 dB is recorded for 9 minutes, and 20 dB is recorded for 1 minute.
- Or, for 90% of the time, the noise level is 130 dB, and for 10% of the time, the noise level is 20 dB.
- The LA90 level for this jackhammer is 20dB LA90(10min).
- The highest noise people hear (the real noise) is 130dB.
- But the company will tell you the noise level is 20 dB and claim it complies with the limit.
- This is because, although the jackhammer works predominantly (90% of the time) at 130 dB, only the lowest 10% level is recorded in an LA90.
- They will tell you there is no noise problem; it's all in your head, your sleep disturbance is not caused by the jackhammer.
- And, although for 90% of the time the jackhammer works at a noise level of 130 dB, the written reports submitted to the authorities will show the noise level was only 20dB LA90.

LA90 Example 1: Jackhammer Noise on Paper.

A building developer is operating a jackhammer next door to a residential home.

The jackhammer emits noise between 130 dB – 140 dB (decibels) throughout the day, starting very early in the mornings and sometimes working late into the night.

Before the building works, the neighbours enjoyed a peaceful sleep. Now they are sleep disturbed.

In every 10-minutes, it works for 9 minutes, and stops for 1 minute.

When stopped, the noise level is between 20 dB - 30 dB (decibels).

In an LA90(10min) statistic, the noise is analysed in 10-minute blocks called data points.

Each data point is 10-minutes of statistically processed noise.

In this example, each 10-minute data point consists of the following:

- Nine minutes of a working jackhammer.

Noise levels 130 - 140 dB

(90% of the noise)
- One minute of rest.

Noise levels 20-30 dB

(10% of the noise)

The LA90(10min) data point is the lowest 10% level in each 10-minute block.

The data points are plotted as dots on a graph.

In an LA90, the high noise is ignored, and only the lowest 10% level is recorded on the graph.

This is what an LA90 does to noise.

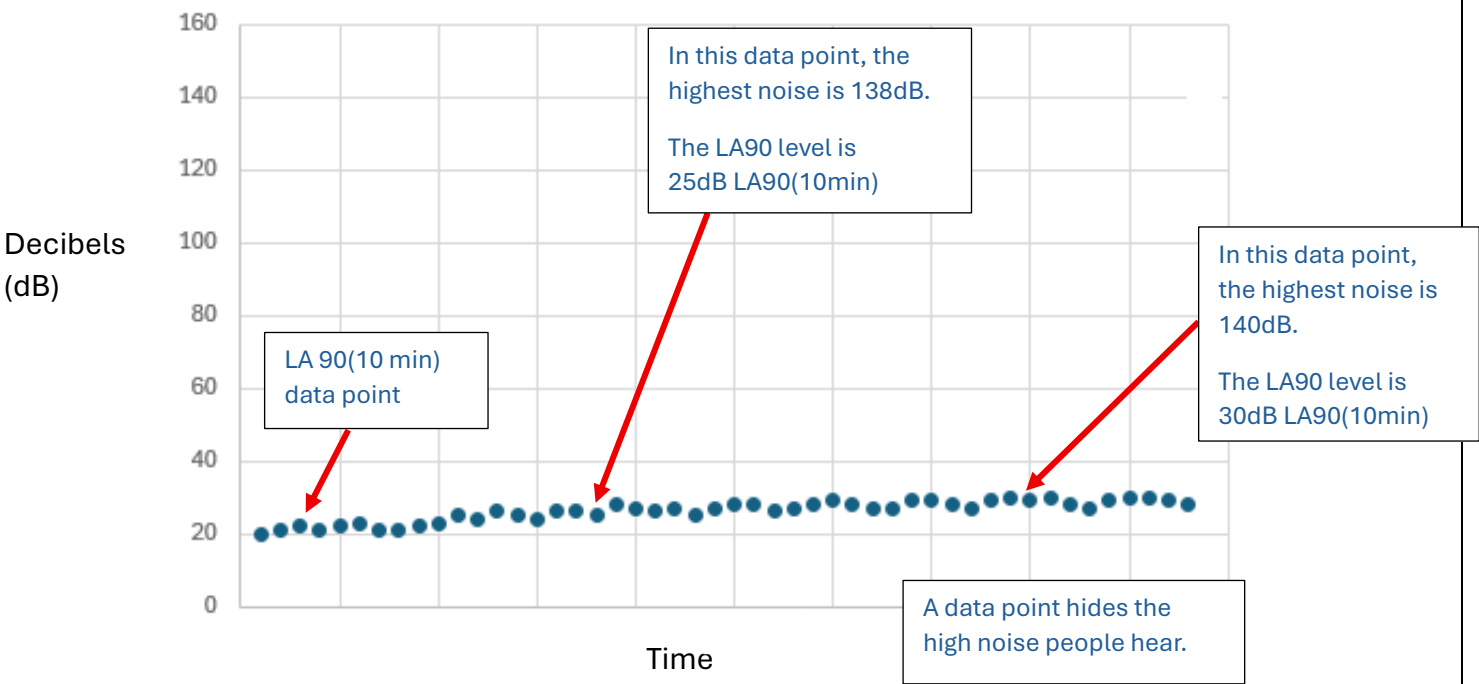
It ignores the high noise.

The company will say the jackhammer complies with the noise limit; there is no noise problem.

When the jackhammer is operating, the real noise people hear is up to 140 dB.

But on paper, the noise is shown at levels between 20dB and 30dB.

An operating Jackhammer – LA90(10min)



LA90 Example 2: Wind farm Noise on Paper

A wind farm is built one kilometre from a neighbour's home.

The turbines emit intermittent noise up to 80dB in a regular (unnatural) pattern.

It operates all day and all night, and the whoosh-whoosh-whoosh noise seems to penetrate the bedroom walls.

It is louder when the wind is blowing the noise towards the house, or during the winter months and on icy mornings.

Before the wind farm was built, the neighbours enjoyed a peaceful sleep. Now they are sleep disturbed.

The noise doesn't impact them as much during the day; the main complaint is the ongoing lack of sleep. The wind

farm was shut down for a few weeks, which reminded the neighbours what it was like to get a good night's sleep.

In Victoria, wind farm noise compliance is based on a 40dB LA90(10min) statistic regression line analysis.

Each 10 minutes of noise monitoring is statistically analysed and the lowest 10% of noise is identified (data point).

The 10-minute data points are plotted on a graph and a line of best fit is then drawn through the dots.

Noise compliance testing was carried out over many weeks between December and March (summer months).

The acoustician then deleted "extraneous noise" such as thunderstorms, rain, and early morning insect chorus.

The data is never disclosed, so no one can check if data was deleted correctly, or if turbine noise was deleted.

All noise monitored over the many weeks, including night and day noise, was plotted on a single graph. And, although

the real noise people hear causes sleep disturbance, and although many LA90 data points are above the 40dB

LA90(10min), on paper, the acoustician's line of best fit (regression line) shows the wind farm complies with the limit.

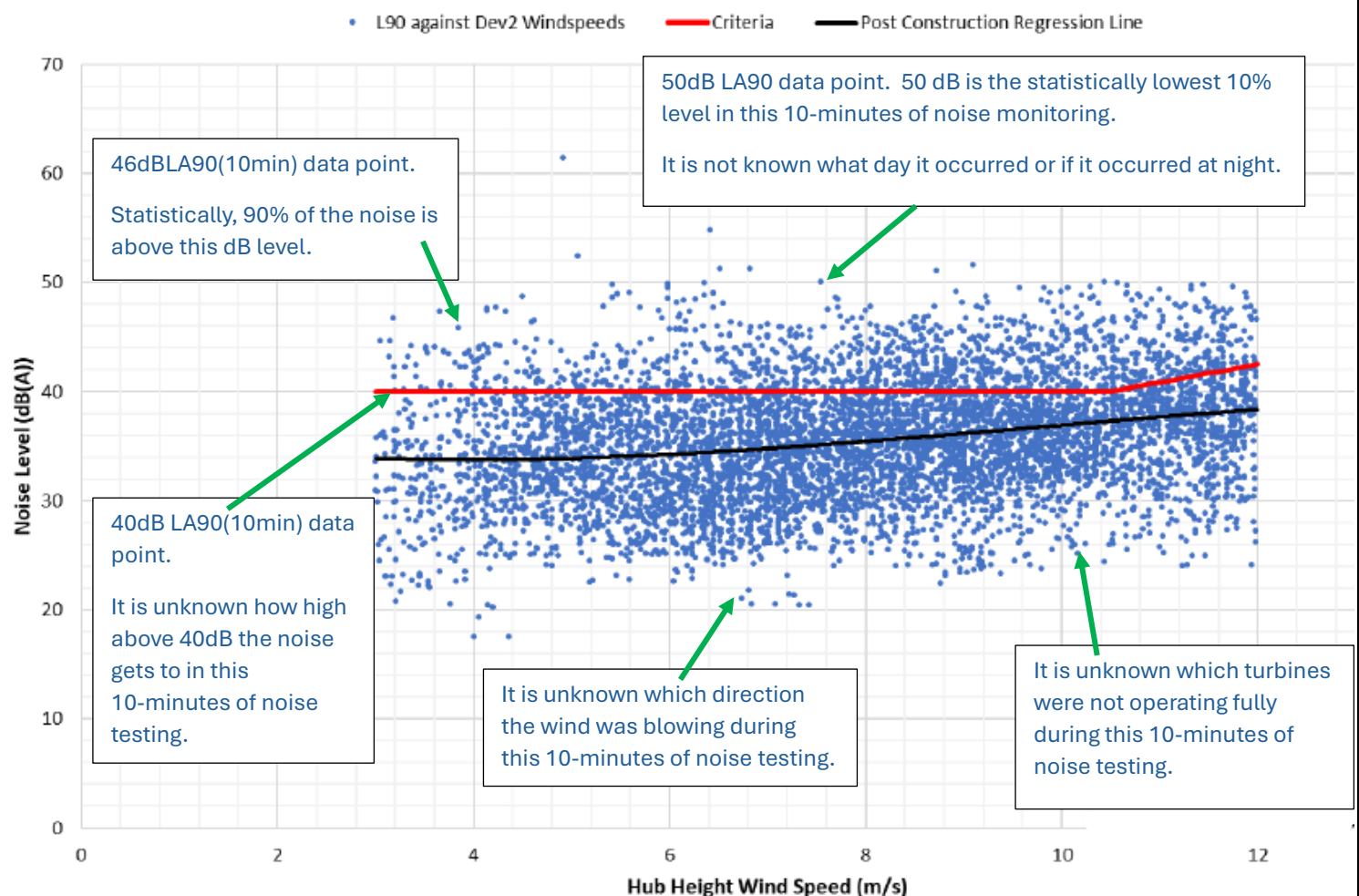


Figure 9: H51 - Filtered L90 Noise Level Correlations to Mast 2 Windspeeds