Event:	Triplicity Festival 2017
Location:	Cwm Cayo Farm, Gwehelog, Usk, NP15 1HS (51.72846,-2.90267)
Date of Survey:	2nd May 2017
Date of Event:	1st - 5th June 2017

Background Noise Assesment + Noise Attentuation Survey

The following report is produced by Andrew Cornforth for Triplicity Festival.

The aim of the survey is to establish background noise levels for the event location and neighbouring preoperties, and to establish the 'real world' signal attenuation over the distances and topographical features of the landscape.

For the puropses of the survey, a soundsystem (the same to be used during the event) was installed at the site of the event, playing programme material at a level close to the desired output for the event. Levels were then measured at a distance of 15m from the speakers in the direction of the projected sound, in order to gain a reference. Measurements were also recorded at each of several loaction close to the boundaries of neighbouring properties, both with and without programme material being played, in order to approximate the attenuation and to establish what increase in noise levels were present over the existing ambience of the environment. Measurements were also taken when no programme material was being played.

Using these figures we are able to establish baseline levels to consider as maximum front-of-house levels for both day and night-time.

EXTRA CONSIDERATIONS

SURVEY CONDITIONS.

The survey was conducted on a warm, sunny day. with little to no wind (0-1 beaufort scale). Measurements were taken between 7pm and 9pm on Tuesday 2nd May.

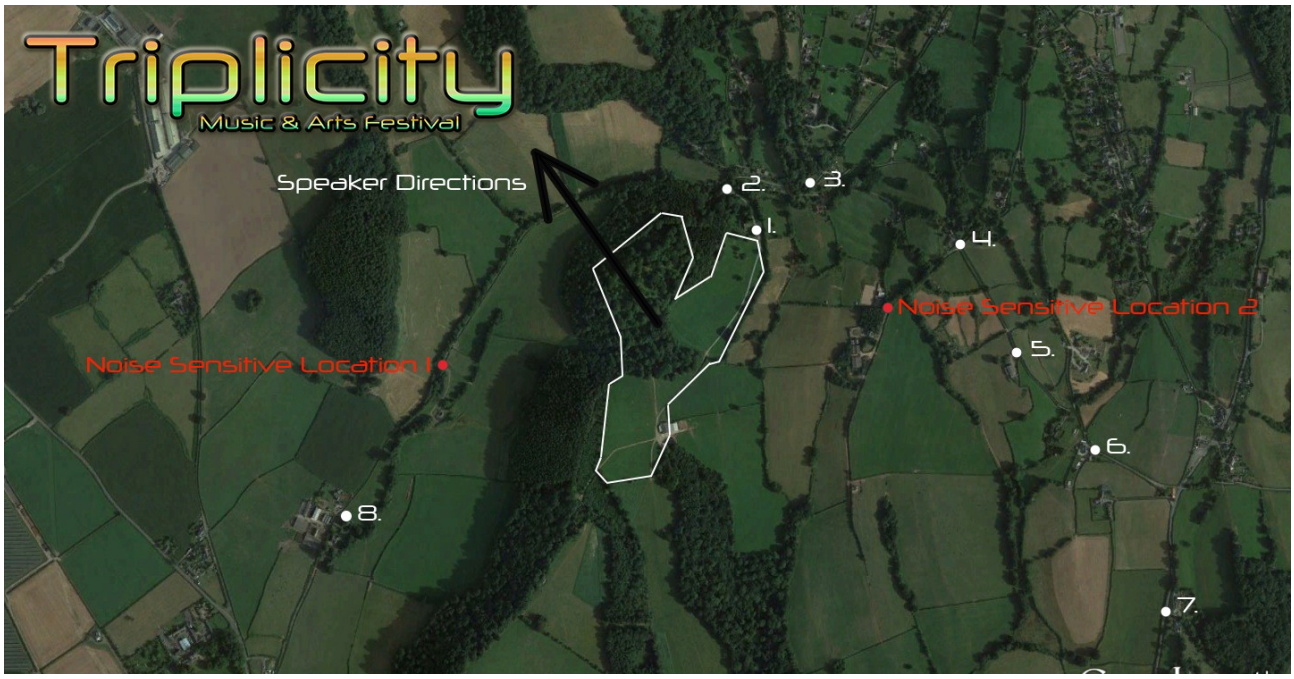
While the lack of wind is very convenient for obtaining a fairly neutral picture of sound propagation from the site, It should be noted that during the event, weather conditions may not be the same. In most cases, sound will carry best in still conditions, so any baselines established here will accommodate most variances in possible conditions. There are however certain edge cases, such as a slow steady breeze in one direction, that could cause sound to

carry further. Off-site teams will be need to be aware of this, and be prepared to implement any necessary reduction in output from the event should these situations arise.

AMBIENT LEVELS

The measurements taken indicated that background levels were similar across all the measured locations, with A-scale averages of between **42-46dB** at the time of the attenuation survey, and 48-52dB earlier in the day (perhaps due to traffic or agricultural machinery) and a C-scale averages **58-60dB**. It is worth noting that traffic on the main roadway during these hours was infrequent but regular and caused peaks of up to **73dB** (A).

LOCATIONS



ECORDED MEASUREMENTS

Location	A-Scale			C-scale[1]		
	avg[2]	max	att[3]	avg	max	att[3]
Front of House @ 15 m	**85dB**	96.7dB	n/a	100dB	109.6dB	n/a
1	**45dB**	50dB	40db	65dB	70dB	35dB
2	**45dB**	50dB	40dB	58dB	65dB	42dB
3 cross roads	**48dB**	53dB	37dB	58dB	62dB	42dB
4	**44dB**	73.2dB[4]	41dB	57dB	61dB	43dB
5 great house farm?	**42dB**	73.3dB[4]	43dB	58dB	62dB	42dB
6	**45dB**	52dB	40dB	57dB	61dB	43dB
7	**45dB**	54dB	40dB	56dB	61dB	44dB
8	**45dB**	55dB	40dB	57dB	60dB	43dB
NSL 1	**48dB**	58dB	37dB	67dB	72.8dB	33dB
NSL 2	**45dB**	48dB	40dB	66dB	75dB	34dB

NOTES

Locations 1 to 8 all showed levels about the same as the ambient levels recorded previously, some levels measured are lower than those recorded previously, and this can only be because the ambient level dropped in the meantime. The readings concur with the empirical observation that while the music could be heard (quietly in the distance), other sources in the nataral soundscape were contributing more significantly to the overall level. As such the impact on these neighbouring properties at the testing level could be described as negligible, certainly in the A weighted scale. On the same scale, the property identified as most sensitive (NSL1) showed an increase over ambient levels of only 2-3dB

SENSITIVE PROPERTIES IDENTIFIED:

The properties identified on the map (NSL1 and NSL2) were revealed to be the most sensitive of those we surveyed, with a measured attenuations of 33dB and 34dB respectively.

Since the nearest of these dwellings is 500m, the expected attenuation is approximately -30dB;

$$\Delta L = 20 \cdot \log\left(\frac{500\,m}{15\,m}\right) = 30.45\,dB$$

1 LA_{EQ} measurements are by definition measured using an A-weighted scale. C-weighted measurements are included here for completeness.

2 Avg sound levels were measured over 10 minutes at each location, using meters that record their readings to memory, these were then graphed by computer, and an integral calculus function applied to give an 'area under the graph' average constituting an LA_{EQ}10min reading

3 Attenutation (reduction in level) found by substracting measured level from FOH readings.

4 High peak reading caused by traffic on the road.

However, because of the slight altitude differences and other factors the recorded attenuation was slightly higher, at 37 and 40 dBA.

CONCLUSIONS AND SUGGESTED APPROACH

Working on the basis of a 30dBA drop in level to the boundary of the most sensitive properties, and therefore allowing some additional headroom, the proposed baseline levels for FOH would be 85dBA daytime and 65dBA at night. However, to factor in the proposal by the organiser to use a straw-bale wall, these levels could be higher. Optimally 100dBA daytime and 80dBA nighttime. This assumes that the placement of such noise mitigation measures and the thickness/density is enough to result in -15dB damping to the most sensitive properties. The effectiveness of these measures will be verified in situ, before the use of these higher levels is considered, With further measurements taken during the event to ensure that we remain within current UK guidelines for this type of event. Additional measurements of the background levels at night need to be obtained in order to ensure that the calculations hold.... we are currently assuming for night time that the ambient levels are approx 30dBA, which our event may exceed by 5dBA