St Anne's & St. Peter's Ball - May 13th 2017 - Noise Management Plan V4

Sherbourne Park

Warwick CV35 8AN

Prepared by: Chris Beale / SPLtrack Limited Saturday, 15 April 2017

Contents

1. INTRODUCTION

1.1. The event comprises a University May Ball with 1250 guests from St. Anne's and St. Peter's Colleges, Oxford. It has been organised by the College Ball Committee led by president Tegan Eldridge.

1.2. The responsible licensing authority is Warwick District Council (WDC).

1.3. SPLtrack Limited (SPL) is a company specialising in environmental noise, dust and vibration monitoring and real-time environmental management.

1.4. The event is to be held from 18:00 hours on the 13th May 2017 to 03:00 hours on the 14th May 2017. Music sound sources will operate only between 19:00 hours and 24:00 hours on the 13th May 2017.

1.5. This noise management plan explains the procedures for the control of music noise levels and strategies for the prevention of public nuisance.

1.6. This is a live document and is subject to updates that will be version tracked.

2. ENVIRONMENT

2.1. Sherbourne Park is a private estate situated to the south of Junction 15 of the M40 motorway. It lies adjacent to the hamlet of Sherbourne with properties to the west of the event area. The village of Barford lies approximately 600m to the south east of the site. A small number of residential properties are situated to the north east at a distance of approximately 550m.

2.2. A working plan has been prepared showing the arena configuration. This plan has been superimposed upon a Google Earth view showing the location of the nearest noise sensitive receptors (NSR). The path length and topography from each music system to each receptor has been plotted and the information has been incorporated into the propagation calculations contained within in this document.

2.3. The operational version of the environment plan will be available at the Event Office during the festival.

2.4. The following image illustrates the event configuration and location of NSR's. A larger rendering is provided in Appendix 1.

3. VENUE APPLIED HOURS

Stage 1: Live Music: 19:30-24:00 Silent Disco: 00:00-03:00

Stage 2: Live Music: 19:00-24:00

Stage 3: Comedy/Jazz Piano: 19:00-24:00

4. LOCAL AREA WEATHER

4.1. A summary of Warwick area weather conditions for May for the last three years is shown in appendix 4.

4.2. Prevailing winds have been westerly to north westerly in the main with moderate wind speeds. It is unlikely that temperature inversions will occur during the event.

4.3. Weather conditions (real time and forecast) will be available at the Event Office during the festival.

5. SITE PLAN

5.5. The Site Plan showing music stage positions is shown in appendix 2. The entertainment comprises:

5.5.1. A main entertainment marquee with live artists and featuring a silent disco after 24:00 hours

5.5.2. A small outdoor stage with live artists and DJ

5.5.3. A covered stage featuring spoken word performances.

6. SOUND SYSTEMS

6.1. Sound systems in each arena will be designed to ensure that the lowest sound power necessary to entertain the audience is utilised.

6.2. Fairground attractions will not be permitted to use sound systems for either music or voice.

6.3. Unauthorised sound systems will be excluded from the event.

7. NOISE MONITORING SYSTEMS

7.1. A web based noise management system will be deployed. Class 2 noise monitoring stations will be deployed at the mix positions of the primary noise sources.

7.2. Class 1 logging meters will be deployed at representative offsite monitoring locations.

7.3. The system will provide real-time display of levels at all locations and will guide the mix engineers if sound levels approach the limits proscribed by the licence.The noise monitoring stations connect to the central control point by either the site network, the Internet via local broadband or by 3G/4G and deliver real-time data and audio that will enable the sound conditions at each location to be controlled. A summary of the system is shown in appendix 7.

8. ENFORCEMENT

8.1. The noise team will comprise two monitoring staff and will utilise the SPLtrack remote noise monitoring platform.

8.2. Offsite noise meters will be deployed at selected locations. The locations will be agreed with WDC prior to the event and will take into consideration expected weather conditions and any other relevant factors.

8.3. Onsite noise meters with 'head-up' displays will be located at each of the principle noise sources on the site.

8.4. WDC will be provided with live views of the noise meters throughout the event.

8.5. Any noise sources that are not permanently monitored will be individually risk assessed for noise. A series of notices will be posted at

all venues explaining the noise management process and the responsibilities of the operators in each case.

8.6. A briefing and review policy will be operated throughout the event for environmental control staff, festival organisers and WDC officers.

8.7. Security staff will be been briefed to identify unauthorised sound systems and will remove them..

9. PUBLIC COMMUNICATION

9.1. A Local Resident Enquiry Line telephone number will be distributed by leaflet to local residents.

9.2. The telephone will be manned on the following schedule:

Period:	Dates:	Line manned:	Line manned by:
Event Build:	9-12th May	09:00-18:00	Site manager
Event:	13-14th May	24 hour	Event manager
Event Break:	15-16th May	09:00-18:00	Site manager

9.3. Arrangements will be made with WDC and the Police Service to ensure that complaints received by those agencies can be immediately referred to the Local Resident Enquiry Line.

10. LICENSING CONDITIONS

10.1. The organisers undertake to comply with the licensing conditions set out by the Licensing Authority prior to the event.

10.2. The licensing conditions (when available) will be appended to this document. They will be posted at each noise source in view of all sound system operators.

11. NOISE PROPAGATION PREDICTIONS

11.1. Predictions for music noise propagation have been prepared and are shown in Appendix 3.

11.2. The predictions assume standard meteorological conditions:

11.2.1. Density 1.225 kg/m^3 (0.00237 slug/ft^3)

11.2.2. Pressure 1013.25 hPa (14.7 lb/ in^2)

11.2.3. Temperature 15 °C (59 °F)

11.2.4. Wind direction/speed 0/0

12. GENERAL MANAGEMENT PROCEDURES

12.1. System Design

12.1.1. Loudspeaker system design shall be undertaken by a competent person with an understanding of environmental noise matters. The systems shall be designed with consideration to directivity of loudspeaker arrays

12.1.2. System design shall be conducted with reference to the topography of the site.

12.1.3. System design shall be undertaken with understanding of the location of the environment including the locations of nearest affected properties (NSR's).

12.1.4. Each sound system shall be equipped with a suitable limiting device in order that the maximum MNL and the max SPL attainable from each system may be preset. Access to the limiting device shall be permitted to authorised persons only.

12.1.5. Only suitably experienced personnel shall operate sound systems.

12.2. Sound system control and level reference points

12.2.1. SPL will identify the locations at which the sound levels are directly controlled and adjusted and ensure that all parties are familiar with the means of access to these positions.

12.2.2. A reference location shall be identified for each sound system being the point at which the sound level will be monitored. This will normally be the front of house sound mix position. If there is no mix position located in the house, a point on the centre line of the room 40m from the downstage edge (or two thirds of the distance from the downstage edge to the rear of the venue if the room is less than 40m deep) shall be deemed to be the reference location.

12.3. Monitoring equipment

12.3.1. Class 1 networked monitoring units shall be installed at each of the appointed NSP monitoring stations.

12.3.2. Class 2 networked monitoring units will be installed at the mix positions of the primary noise sources.

12.4. Verification of the performance of sound systems

12.4.1. The sound contractor shall supply a certificate of completion when the system has been installed and tested.

12.4.2. At a time agreed by the parties SPL will conduct a propagation test.

12.4.3. The propagation test shall utilise program music typical of the genre that will be performed at the event, transmitted from each system in turn for a period of 1 minute and measured at the reference location for that system.

12.4.4. A further test will be conducted with all systems operating concurrently.

12.4.5. Offsite measurements will be related to the sound levels set at the control positions during the test and an attenuation figure will be calculated. From this figure a maximum level for the control position will be set for the duration of the event.

12.4.6. The MNL (Music Noise Level) limit set at the console shall in any case not exceed 98dBLAeq(15 min) and the maximum sound pressure level at any point in the audience shall not exceed 137dB.

12.5. Briefing of sound personnel

12.5.1. All sound operators will be briefed prior to the event by the SMC. Sound operators and artist's sound engineers will be contracted to comply with the festival noise management process.

12.6. Self-monitoring

12.6.1. Sound operators will be provided with a head-up live display connected to the network noise meters located at each stage.

12.6.2. The SPLtrack monitoring system will have authority over any third party noise meter. Sound providers carrying their own noise metering systems will be required to conceal them from guest sound operators.

12.7. Ad Hoc monitoring

12.7.1. Portable monitoring by the SMC may take place at intervals on or around the site.

12.7.2. For this purpose a Class 1 sound level meter will be used.

12.8. Maintenance of Records

12.8.1. Records will be kept and will be available for inspection by stakeholders.

12.8.2. Records will be retained for a period of five years

12.9. Receipt of complaints

12.9.1. Appendix 4 details the process for receipt of complaints.

12.9.2. The methods of communication between noise monitoring personnel, sound operators and event stakeholders are:

12.9.3. By use of the messaging system within the SPLtrack display

12.9.4. Person to Person or by walkie-talkies with earphones for use in high noise environments

12.9.5. By mobile telephone. All mobile numbers will be collated on an information sheet prior to the event and distributed at the briefing.

12.10. Event Sound Control Desk

12.10.1. The promoter shall provide suitable office space for the noise control team.

13. POST EVENT

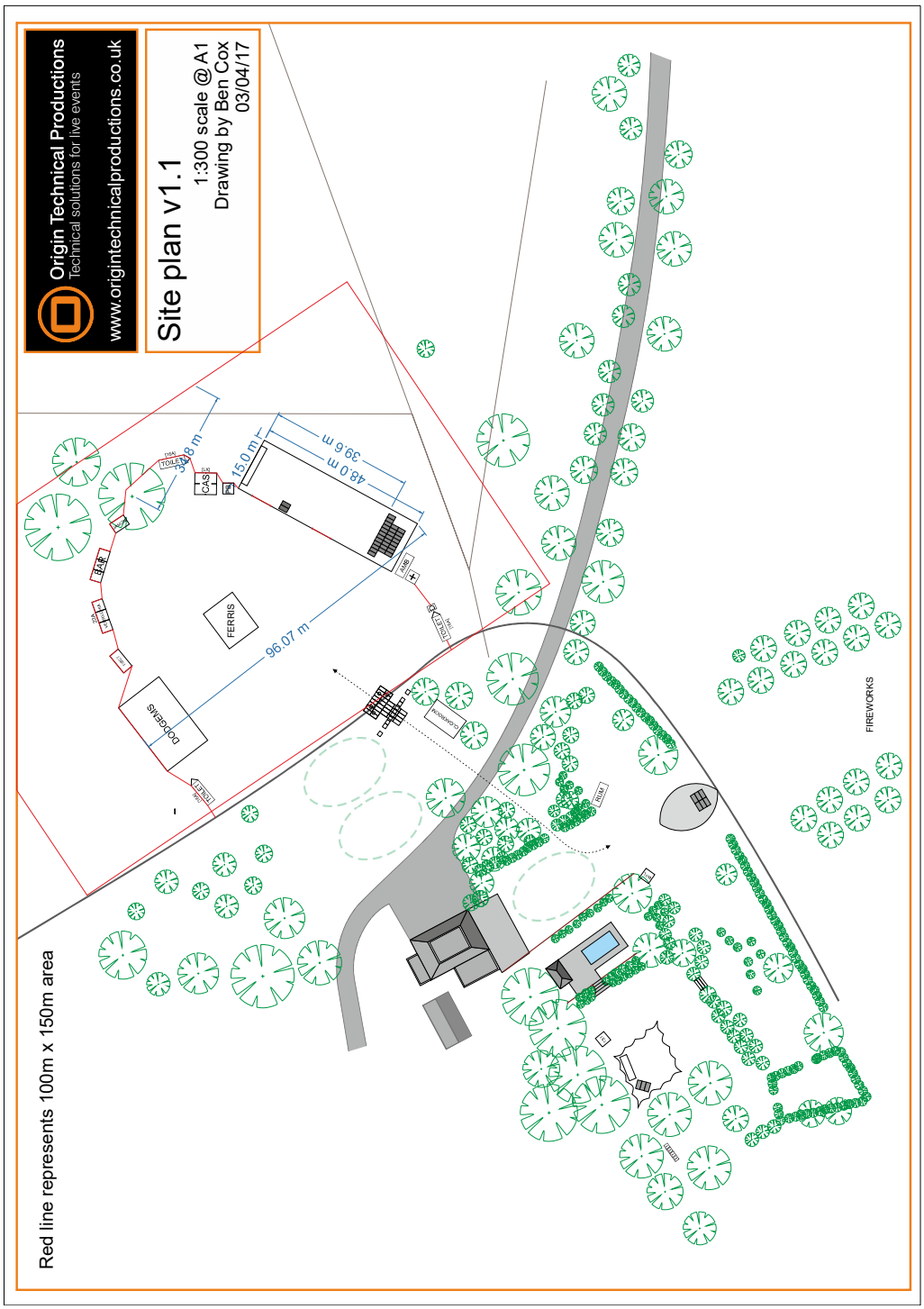
13.1. A review of sound levels and the event noise log will be submitted within 14 days following the event.

13.2. A full report will be submitted within 30 days of the event.

13.3. SPL will attend a debriefing session at a time and date set by the organisers if and when required.

APPENDIX 1 – ENVIRONMENT

APPENDIX 2 – SITE PLAN



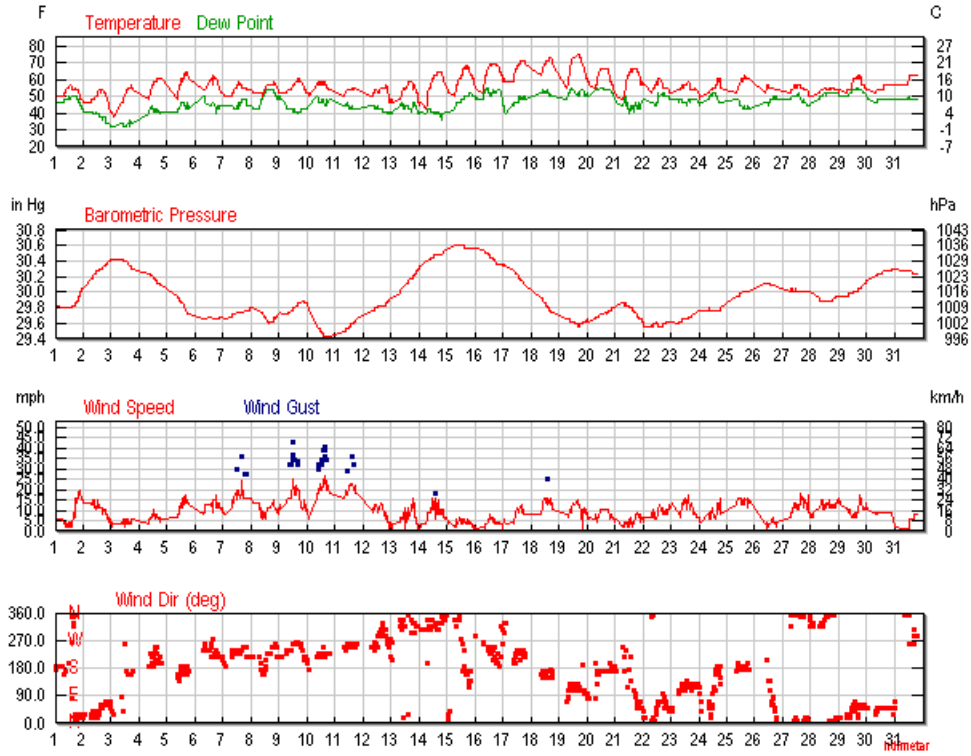
APPENDIX 3 - NOISE PROPAGATION PREDICTIONS

Receptors (see environment map)		**A**	**B**	**C**
Main Stage				
Range to receptor	Metres	247	438	595
Audience depth	metres	30	30	30
Design level at zone margin	dBLAeq(15)	94	94	94
Predicted contribution to MNL at receptor	dBLAeq(15)	**54**	**56**	**48**
Stage 2				
Range to receptor	Metres	248	536	588
Audience depth	metres	15	15	15
Design level at zone margin	dBLAeq(15)	94	94	94
Predicted contribution to MNL at receptor	dBLAeq(15)	**56**	**43**	**45**
Sunken Garden				
Range to receptor	Metres	204	537	661
Audience depth	metres	10	10	10
Design level at zone margin	dBLAeq(15)	92	92	92
Predicted contribution to MNL at receptor	dBLAeq(15)	**48**	**41**	**43**
Sum of sound sources - Predicted daytime MNL	dBLAeq(15)	**59**	**56**	**50**

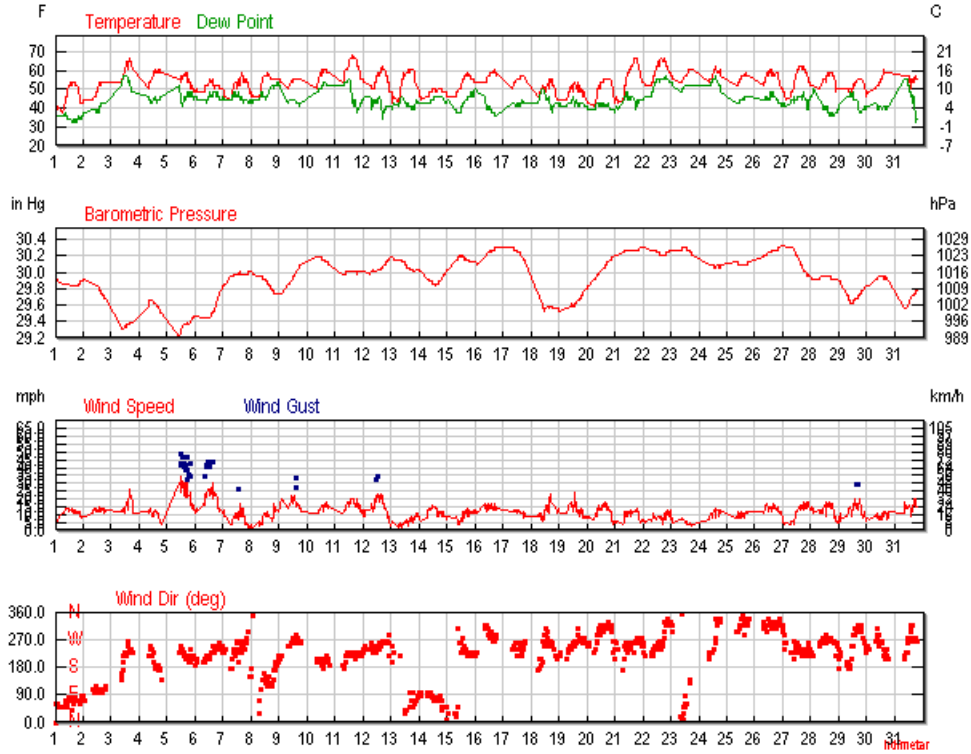
The calculations factor the following criteria:

1. Distance from source to receptor
2. Depth of audience area
3. Equivalent sound level at the audience margin
4. Directivity of sound systems
5. Effect of intervening structures and woodland
6. Soft ground attenuation
7. Free air absorption ISO 9613-1:1993

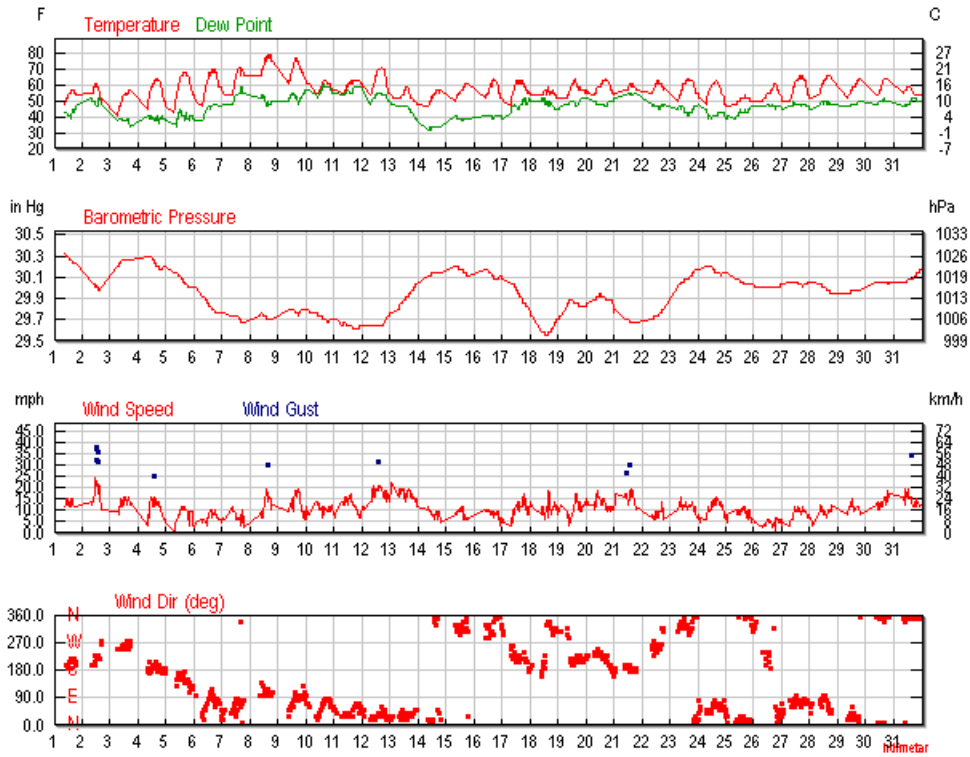
APPENDIX 4 - WEATHER HISTORY



Warwick area May 2014



Warwick area May 2015



Warwick area May 2016

APPENDIX 5 - COMPLAINT RECEIVING AND ACTION PROCEDURE

1.The flow chart below summarises the procedure for receipt and response to complaints.

1.1. Incoming calls are received by the Resident's Enquiry Line or via other agencies.

1.2. On receipt of a noise complaint, the Sound Management Consultant (SMC) is able to refer to the remote and onsite meters in real time to confirm noise levels in the area from which the call originated. Audio from the offsite meters can be auditioned and is recorded.

1.3. The SMC will make an immediate assessment and may contact the complainant.

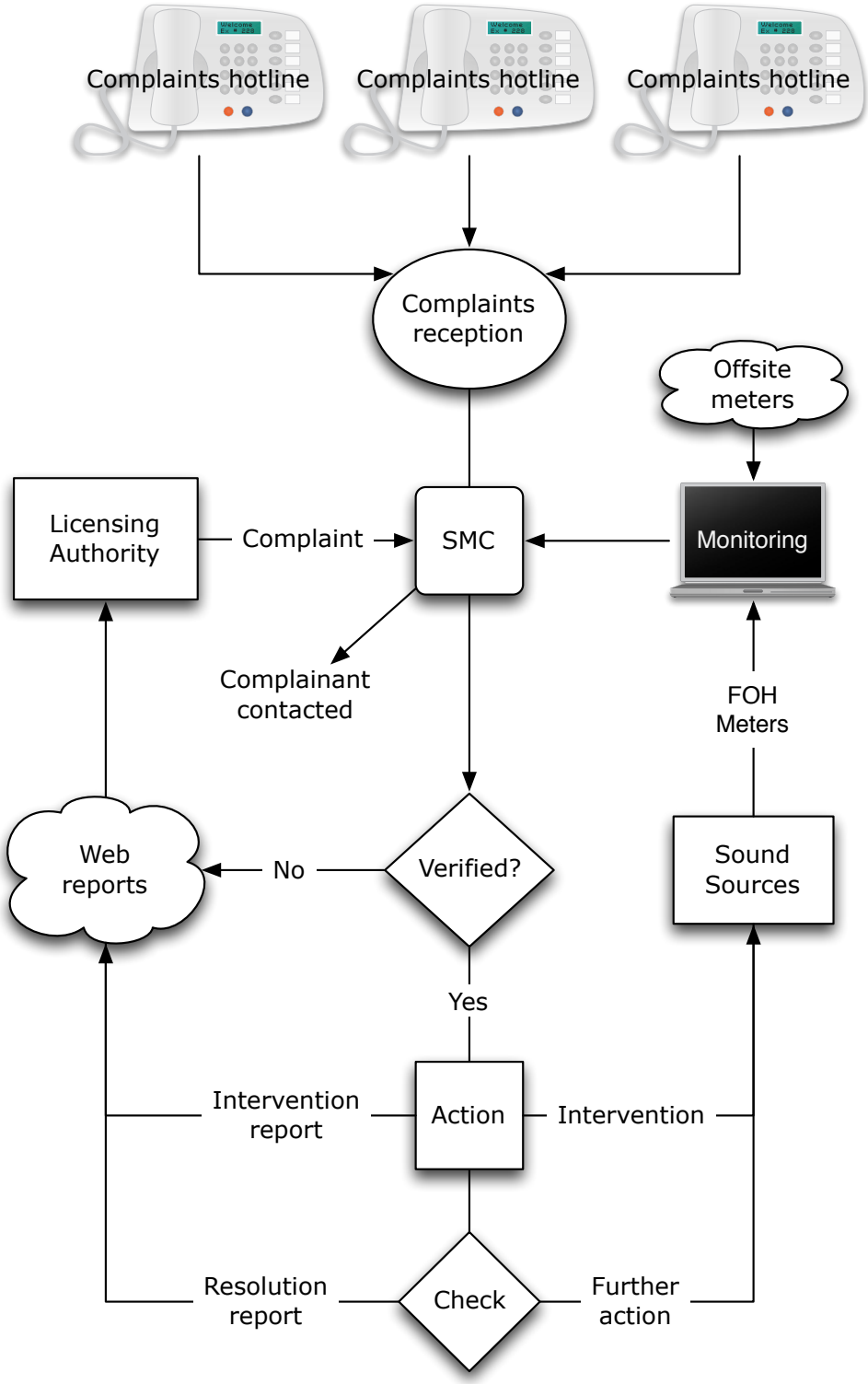
1.4. If the noise levels are within permitted licence levels this will be explained to the complainant. If there is need for action noise levels will be reduced by the quickest means, using the remote monitors and communication network.

1.5. When noise levels have been confirmed to be within licence conditions the complainant will be notified. The location will be continually monitored thereafter.

1.6. All activities are logged.

1.7. Complaints will be reviewed regularly throughout the event.

APPENDIX 6 - COMPLAINTS FLOWCHART



APPENDIX 7 – LIVE MANAGEMENT SYSTEM

1.The real-time environmental noise management system is called 'SPLtrack'. The system consists of two types of meter/logger:

1.1. Offsite unit: A waterproof case containing the logger with microphone support.The microphone is house in a weatherproof unit with 150mm windshield.All components are certified to BS- EN61672-3 Class 1.The loggers are powered by local AC supplies or by battery/solar power. They connect to the Internet either by utilising point to point links, resident's broadband or by 3G/4G.

1.2. Onsite unit: Kiosk style case containing a TFT screen and Class 2 microphone.The unit is positioned in the eye-line of the sound system operator and reports the current sound level, the cumulative sound level for the current measurement period and the remaining level available relative to a preset limit.This enables the engineer to know before the end of the measurement period whether the limit is likely to be reached and to adjust the sound level accordingly. A 31 band spectrum analyser is also provided with clear indication of 63Hz and 125Hz octave levels and limits.The onsite meter is connected to the Internet via the site wireless network.

2.All units are locked to a single time server and are synchronised to an accuracy of +/- 0.01s.The system reports any error or anomaly in the meters including tampering.

3.Each meter/logger is fully accessible via the Internet using any web browser (except Microsoft Internet Explorer prior to version 8).The features available via the interface are as follows:

3.1. Real-time live display showing current, cumulative and remaining LAeq for each measurement period, the record history for the previous eight measurements and progress through the current period.

3.2. Real time 1/3 octave analyser with octave band limits and remaining indicators at 63Hz and 125Hz.The analyser can be switched on the fly to show LAS or LAF and may be paused for ease of analysis.The analyser display also shows the cumulative LZeq for the current period for all frequencies.

3.3. Automatic comparison of sound sources with receptors. This enables the system to identify the origin of the noise impacting any particular receptor. Noise management staff are then able to respond more quickly and accurately to deal with any issues.

3.4. On the fly reports in HTML or Excel for the current day up to the last complete period measured or for a range of up to seven days. In addition up to seven days data may be exported as a single file in raw form for analysis.

3.5. Audio streaming in real time and audio recoding of any period when threshold limits have been exceeded. The audio can be played on demand at the computer being used to view the logger in question and may be listened to using headphones or the computer's own loudspeakers.

3.6. E-mail warnings based upon level limit. Full reports are sent at the end of any period in which threshold limits have been exceeded.

3.7. Direct messaging to the live screens at the mixer positions and traffic light threshold warnings at the mixer positions.

3.8. Voice communication between noise control and the mixer positions via the wireless network.

3.9. Lmax over limit incident count. This is not a required measurement however it is helpful to identify beats and pulses that can contribute to disturbance.

3.10. Noise level records will be delivered automatically to specified e-mail addresses. This is in addition to on-demand reports that can be obtained at any time.

APPENDIX 8 - GLOSSARY OF TERMS

Local Authority	Warwick District Council
Stakeholders	Event Organisers, Local Authority, Blue Light Authorities and other persons or organisations with direct interest in the operation of the event.
Noise Sensitive Receptors (NSR)	Inhabited locations within the environment local to the event that have been identified as being likely to receive noise levels due to amplified music generated at the event.
Music Noise Level (MNL)	The sound level at any NSR that is attributable to music noise from the event. The value is expressed in dBLAeq(15) for wide band noise or by dBLZEq(15) in the case of low frequency noise.
Ambient Noise	The total encompassing sound in a given situation at a given time, usually composed of sound from many sources far and near
A-weighted sound pressure, p_A	Value of overall sound pressure, measured in pascals (Pa), after the electrical signal derived from a microphone has been passed through an A-
A-weighted sound pressure level, L_{pA}	Quantity of A-weighted sound pressure, given by the following formula in
Background Noise Level, $L_{A90,T}$	The A weighted sound pressure level of the residual noise at the assessment position that is exceeded for 90% of a given time interval, T, measured using time weighting, F, and quoted to the nearest whole number of decibels
Daytime Decibel (dB)	The period 09:00-24:00 hours
Decibel (dB)	A unit of level derived from the logarithm of the ratio between the value of a quantity and a reference value. It is used to describe the level of many different quantities. For sound pressure levels the reference quantity is 20 uPa. The threshold of normal hearing is in the region of 0 dB and 140 dB is the threshold of pain. A change of 1 dB is only perceptible under controlled conditions
dB(A), L_{Ax}	Decibels measured on a sound level meter incorporating a frequency weighting (A weighting) which differentiates between sounds of different frequency (pitch) in a similar way to the human ear. Measurements in dB(A) broadly agree with people's assessment of loudness. A change of 3 dB(A) is the minimum perceptible under normal conditions, and a change of 10 dB(A) corresponds roughly to halving or doubling the loudness of a sound. The background noise in a living room may be about 30 dB(A); normal conversation about 60 dB(A) at 1 metre; heavy road traffic about 80 dB(A) at 10 metres; the level near a pneumatic drill about 100 dB(A)
Façade level	Sound pressure level measured 1 m in front of the façade of a property.
$L_{A10,T}$	The A weighted noise level exceeded for 10% of the measurement period, T.
$L_{A90,T}$	The A weighted noise level exceeded for 90% of the measurement period, T. This is defined in BS 4142 as the background noise level.

L_{AE}	The sound exposure level – the level of a sound with a period of 1 second that has the same sound energy as the event considered.
$L_{Aeq,T}$	The equivalent continuous A-weighted sound pressure level is the value of the A-weighted sound pressure level in decibels (dB) of a continuous, steady sound, that within a specified time interval, T, has the same mean squared sound pressure as the sound under consideration that varies with time.
LAmax	The highest A weighted noise level recorded during a noise event. The time weighting (slow or fast) should be stated.
Night time	The period 24:00-09:00 hours.
Octave band	Band of frequencies in which the upper limit of the band is twice the frequency of the lower limit.
Third octave band	Band of frequencies in which the upper limit of the band is 2 times the frequency of the lower limit.
Residual noise	The ambient noise remaining at a given position in a given situation when the specific noise source is suppressed to a degree such that it does not contribute to the ambient noise.
Sound Power Level, L_W	An absolute parameter widely used for rating and comparing sound sources. Sound power is a physical property of the source alone, independent of any external or environmental factors.
Sound Pressure, p	Root-mean-square value of the variation in air pressure measured in pascals (Pa), above and below atmospheric pressure, caused by the sound.
Sound Pressure Level, L_p	Quantity of sound pressure, in decibels (dB).
Specific Noise Level, $L_{Aeq,Tr}$	The equivalent continuous A-weighted sound pressure level at the assessment position produced by the specific noise source over a given reference time interval.
Specific Noise Source	The noise source under investigation.