

# **NOISE ASSESSMENT**

## **Bagby Airfield, Near Thirsk**

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RPS Ref: DLE1566  
Date: 13<sup>th</sup> January 2009

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## Summary

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A planning application is to be submitted for development at Bagby Airfield just outside Thirsk. The application is for some new and replacement hangars/workshops, together with a new building comprising a clubhouse, restaurant/bar and accommodation. The airfield has been operating for more than 30 years and an original planning consent in 1980 approved flight movements of 40 landings and 40 take offs per week. The activities in terms of number of flights at the airfield has been significantly higher than approved for more than 10 years and is currently estimated to be about 5,000 per year (100 per week).

The planning application has raised various local objections from the village of Bagby, which is close to the airfield. One area of objection is existing and potential noise generated from the aeroplanes using the airfield.

# **1 Introduction**

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- 1.1 RPS Planning & Development have been commissioned to undertake a noise impact assessment of the existing noise climate of the area
- 1.1.1 This report describes a noise survey of the site, the subsequent analysis to determine the noise environment and where necessary to propose mitigation measures to ensure acceptable internal and external noise levels.
- 1.3 From flight details supplied by the airfield the noise survey was carried out on a Saturday which is generally a busier day and was therefore likely to represent a “worst case scenario”. The date chosen, 30 August 2008, was chosen as an airfield movements survey was also being carried which would facilitate a reconciliation of data.

## 2 Noise Units, Standards and Guidance

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### a) Noise Units

2.1 Noise is defined as unwanted sound. The range of audible sound is from 0 dB to 140 dB. The frequency response of the ear is usually taken to be about 18 Hz (number of oscillations per second) to 18000 Hz. The ear does not respond equally to different frequencies at the same level. It is more sensitive in the mid-frequency range than the lower and higher frequencies and because of this, the low and high frequency components of a sound are reduced in importance by applying a weighting (filtering) circuit to the noise measuring instrument. The weighting which is most widely used and which correlates best with subjective response to noise is the dB(A) weighting. This is an internationally accepted standard for noise measurements.

2.2 For variable noise sources such as traffic, a difference of 3 dB is just distinguishable. In addition, a doubling of traffic flow will increase the overall noise by 3 dB. The "loudness" of a noise is a purely subjective parameter but it is generally accepted that an increase/decrease of 10 dB corresponds to a doubling/halving in perceived loudness.

2.3 External noise levels are rarely steady but rise and fall according to activities within an area. In an attempt to produce a figure that relates this variable noise level to subjective response, a number of noise indices have been developed. These include:

#### i) The $L_{Amax}$ noise level

2.4 This is the "equivalent continuous A-weighted sound pressure level, in decibels" and is defined in British Standard B.S.7445 [1] as the "value of the A-weighted sound pressure level of a continuous, steady sound that, within a specified time interval, T, has the same mean square sound pressure as a sound under consideration whose level varies with time".

2.5 It is a unit commonly used to describe construction noise and noise from industrial premises and is the most suitable unit for the description of other forms of environmental noise. In more straightforward terms, it is a measure of energy within the varying noise.

#### iii) The $L_{A90}$ noise level

2.5 This is the noise level that is exceeded for 90% of the measurement period and gives an indication of the noise level during quieter periods. It is often referred to as the background noise level and is used in the assessment of disturbance from industrial noise.

## **Noise Standards and Guidelines**

### **Planning Policy Guidance Note 24: Planning and Noise (PPG 24)**

- 1.1 Principles and specific guidelines on noise and planning issues in respect of aircraft noise are given in the Department of Environment Planning Policy Guidance Note 24: Planning and Noise (PPG 24) [CD 7/6]. This document, published by the Department of the Environment, supersedes DoE Circular 10/73 but builds upon advice previously contained within it.
- 1.2 PPG 24 offers guidance on the development of new housing near to existing noise sources, and defines four noise exposure categories, which indicate to what extent noise should be considered in the granting of planning permission. Whilst PPG24 applies to new housing near transportation sources it is considered that the NEC are still applicable when assessing the impact of such sources on existing housing. PPG 24 also defines noise levels for each category, for a variety of noise sources. PPG 24 allows local authorities to reduce or increase the noise levels defined for each category by up to 3 dB in some cases.
- 1.3 PPG 24 recommends that the night-time period is 23:00 hours to 07:00 hours and the daytime period is 07:00 hours to 23:00 hours.
- 1.4 Table 3.1 below reproduces the summary in PPG 24 relating to the recommended noise exposure categories for new dwellings near to existing noise sources.
- 1.5 Apart from PPG24 there is no other specific guidance in respect of aircraft noise.

**Table 3.1 : Summary of PPG 24 Noise Exposure Categories for New Dwellings Near Existing Sources**

| <b>Noise Levels and Advice Corresponding to the Noise Exposure Categories for New Dwellings <math>L_{Aeq,T}</math> dB</b> |   |  |   |   |
|---|---|--|---|---|
| <b>Noise Source</b>   | <b>Noise Exposure Category</b>  |  |   |   |
|   | <b>A</b>  | <b>B</b>   | <b>C</b>  | <b>D</b>  |
| <b>Road Traffic</b><br>07:00 - 23:00<br>23:00 - 07:00   | <55<br><45  | 55 - 63<br>45 - 57   | 63 - 72<br>57 - 66  | >72<br>>66                                      |
| <b>Rail Traffic</b><br>07:00 - 23:00<br>23:00 - 07:00   | <55<br><47  | 55 - 66<br>45 - 59   | 66 - 74<br>59 - 66  | >74<br>>66                                      |
| <b>Air Traffic</b><br>07.00 – 23.00<br>23.00 – 07.00  | <57<br><48  | 57 - 66<br>48 - 57   | 66 – 72<br>57 - 66  | >72<br>>66                                      |
| <b>Mixed Sources</b><br>07:00 - 23:00<br>23:00 - 07:00  | <55<br><45  | 55 - 63<br>45 - 57   | 63 - 72<br>57 - 66  | >72<br>>66                                      |
| <b>Advice</b>   | Noise need not be considered as a determining factor in granting planning permission, although the noise level at the high end of the category should not be regarded as a desirable level. | Noise should be taken into account when determining planning applications and where appropriate, conditions imposed to ensure an adequate level of protection against noise. | Planning permission should not normally be granted. Where it is considered that permission should be given, for example because there are no alternative, quieter sites available, conditions should be imposed to ensure a commensurate level of protection against noise. | Planning permission should normally be refused. |

- 1.6 The guidelines given in PPG 24 correspond to a noise level measured under free field conditions (away from any reflecting facades) and at a height of 1.2 to 1.5 m above ground.

**World Health Organisation Guidance (WHO)**

- 1.7 The WHO considers that, "To protect the majority of people from being seriously annoyed during the daytime, the outdoor sound level from steady, continuous noise should not exceed 55 dB  $L_{Aeq}$  on balconies, terraces and in outdoor living areas. To protect the majority of people from being moderately annoyed during the daytime, the outdoor sound level should not exceed 50 dB  $L_{Aeq}$ ".

- 1.8 In a review of health effects based noise assessment methods undertaken for the DETR just before the issue to the 2000 WHO guidelines, it is noted that “perhaps the main weakness of both the WHO-inspired documents is that they fail to consider the practicality of actually being able to achieve any of the stated guideline values.”
- 1.9 The report goes onto say that, “the percentages exposed above the WHO guideline values could not be significantly reduced without drastic action to virtually eliminate road traffic noise and other forms of transportation noise (including public transport) from the vicinity of houses. The social and economic consequences of such action would be likely to be far greater than any environmental advantages of reducing the proportion of the population annoyed by noise. In addition, there is no evidence that anything other than a small minority of the population exposed at such noise levels find them to be particularly onerous in the context of their daily lives.”
- 1.10 However the WHO guidelines will be considered in this assessment to examine the possible impact of aircraft noise on nearby residents.

### 3 Analysis of Existing Noise Climate

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- 3.1 In order to determine the existing noise climate of the area, noise monitoring was carried out at the residential property adjacent to the site access on Saturday 30<sup>th</sup> August 2008 between 10.48 and 15.48.
- 3.2 The instrumentation used for the on site noise survey was a Norsonic Real Time Analyser NOR-118 Precision Integrating/Logging Sound Level Meter. The instrument was calibrated before and after the monitoring periods and no significant deviations were noted. The instrumentation calibration documentation is included in Appendix A.
- 3.3 During all measurements, the microphone was mounted on a tripod at a height of 1.5m above the site ground level and was set to measure  $L_{Aeq}$ ,  $L_{A90}$ ,  $L_{A10}$  and  $L_{Amax}$  levels.
- 3.4 The weather conditions during the survey period were dry with the wind speed less than 5m/sec and all noise monitoring undertaken was attended by an RPS trained technician.
- 3.5 The following table summarises the average  $L_{Aeq}$  dB values recorded during the day time period, and gives the resulting NEC classification for that periods:

**Table 4.1: Summary of Noise Monitoring Results**

| Location  | Time Period  | $L_{Aeq}$ | NEC Category |
|---|--------------|-----------|--------------|
| Rear garden of property adjacent to access road | 10.48 –14.49 | 57 dB     | B            |

- 3.6 It was noted that the principal sources of noise during the monitoring period was aircraft noise (14 aircraft movements), agricultural machinery (2 combined harvesters) and cars (26 movements). Although only 14 aircraft movements were noticeable at the survey position the airfield movements survey recorded that there were in fact 28 aircraft movements during that period, 29% of which were helicopters, which are noisier than light aircraft, with such a percentage being significantly higher than the average 17.4% recorded during the overall movements survey.

## 4 Conclusions

- 4.1 The 5 hour monitoring put the area into NEC Exposure Category B.
- 4.2 It should be noted also that PPG24 refers to a 16 hour  $L_{Aeq}$  and the airfield operates over the period 08.00 to 20.00 hours. As noise levels reduce in the late evening the actual 16 hour  $L_{Aeq}$  will be less than 57 dB and would approach the WHO guideline of 50 dB an acceptable noise environment.
- 4.3 The current noise from the airfield, even at the worst period, was within the acceptable guidance given in PPG24 and even if this level of activity was carried out over the whole year giving in excess of 14,000 aircraft movements the noise from the airfield would be within acceptable levels given in PPG24.

**Field Notes & Noise Monitoring Results**

**Bagby Airfield  
Bagby, Thirsk**

**10.48 a.m. – 3.48 p.m.**

**1 hour recordings**

**30th August, 2008**

30th August, 2008

**Bagby Airfield, Bagby, Thirsk**

**Meter**                      **Norsonic 118**  
**Calibrator**                **1251**  
**Calibrated at**            **114.0**  
**Weather**                    **Fine but overcast**  
**Temperature**             **21 degrees C**  
**Wind speed**               **Less than 5m/Sec**  
**Wind direction**         **South Easterly**  
**Roads**                      **Dry**  
**Cloud cover**              **80%**  
**Technician**               **Stuart Dobson**

**The meter was sited at least 1.5 meters high and 3.5 meters from all reflective surfaces.**

**Location** - was the back garden of the residential bungalow on Bagby Road which is next to the track leading to the airfield. It is surrounded by fields adjoining the airfield.

|            |  |
|------------|--|
| 10.48 a.m. | Start time   |
| 10.49 a.m. | Helicopter flies overhead  |
| 11.09 a.m. | Car passes on lane to airfield   |
| 11.14 a.m. | Aircraft takes off from airfield   |
| 11.21 a.m. | Aircraft takes off from airfield   |
| 11.29 a.m. | Distant sound of combined harvester  |
| 11.40 a.m. | Distant sound of combined harvester  |
| 11.48 a.m. | File 080830-0001   |
| 11.50 a.m. | Two combined harvesters working on field next to the airfield and behind the property where meter is mounted |
| 12.04 p.m. | Car passes on lane to airfield   |

|            |  |
|------------|--|
| 12.14 p.m. | Tractor passes on lane to airfield   |
| 12.20 p.m. | Helicopter lands at airfield   |
| 12.22 p.m. | Car passes on lane to airfield   |
| 12.30 p.m. | Helicopter arrives and lands at airfield   |
| 12.35 p.m. | Car passes on lane to airfield   |
| 12.37 p.m. | Aircraft leaves airfield   |
| 12.44 p.m. | Aircraft leaves airfield   |
| 12.46 p.m. | Combined harvesters still working in nearby field  |
| 12.47 p.m. | Helicopter takes off from airfield   |
| 12.48 p.m. | File 080830-0002   |
| 12.54 p.m. | Car passes on lane to airfield   |
| 12.59 p.m. | Car passes on lane to airfield   |
| 1.00 p.m.  | Car passes on lane to airfield   |
| 1.01 p.m.  | Car passes on lane to airfield   |
| 1.05 p.m.  | Car passes on lane to airfield   |
| 1.07 p.m.  | Two cars pass on lane to airfield  |
| 1.10 p.m.  | Tractor and car pass on lane to airfield   |
| 1.14 p.m.  | Tractor turning hay in nearby field  |
| 1.15 p.m.  | Next door neighbour across the lane starts to cut grass in his paddock with tractor and attachment |
| 1.16 p.m.  | Aircraft takes off from airfield   |
| 1.18 p.m.  | Helicopter takes off from airfield   |
| 1.22 p.m.  | Two cars pass on lane to airfield  |
| 1.38 p.m.  | Tractor passes on lane to airfield   |

|           |  |
|-----------|--|
|           |  |
| 1.39 p.m. | Car passes on lane to airfield                   |
| 1.46 p.m. | Car passes on lane to airfield                   |
| 1.48 p.m. | File 080830-0003                                 |
| 2.00 p.m. | Combined harvesters are at work in nearby fields |
| 2.03 p.m. | Car passes on lane to airfield                   |
| 2.12 p.m. | Aircraft takes off from airfield                 |
| 2.13 p.m. | Car passes on lane to airfield                   |
| 2.22 p.m. | Car passes on lane to airfield                   |
| 2.26 p.m. | Aircraft lands at airfield                       |
| 2.32 p.m. | Car passes on lane to airfield                   |
| 2.33 p.m. | Car passes on lane to airfield                   |
| 2.35 p.m. | Car passes on lane to airfield                   |
| 2.39 p.m. | Car passes on lane to airfield                   |
| 2.48 p.m. | File 080830-0004                                 |
| 2.52 p.m. | Car passes on lane to airfield                   |
| 2.55 p.m. | Car passes on lane to airfield                   |
| 3.01 p.m. | Car passes on lane to airfield                   |
| 3.16 p.m. | Aircraft takes off from airfield                 |
| 3.20 p.m. | Aircraft takes off from airfield                 |
| 3.35 p.m. | Combined harvester at work in nearby fields      |
| 3.44 p.m. | Next door neighbour using petrol lawn mower      |
| 3.48 p.m. | File 080830-0005                                 |

| File            | Date                          | LAeq         | LAF(max) | LAF(10) | LAF(90) |
|-----------------|-------------------------------|--------------|----------|---------|---------|
| Site            | Bagby Airfield, Bagby, Thirsk |              |          |         |         |
| Date            | 30.8.08                       |              |          |         |         |
| Meter           | Norsonic 118                  |              |          |         |         |
| Calibrator      | 1251                          |              |          |         |         |
| Calibrated at   | 114                           |              |          |         |         |
| Weather         | Fine but overcast             |              |          |         |         |
| Temperature     | 21 degrees C                  |              |          |         |         |
| Wind speed      | Less than 5m/Sec              |              |          |         |         |
| Wind direction  | South Easterly                |              |          |         |         |
| Roads           | Dry                           |              |          |         |         |
| Cloud cover     | 80%                           |              |          |         |         |
| Technician      | Stuart Dobson                 |              |          |         |         |
| 080830_0001.NBF | (2008/08/30 10:48:53.00)      | 55.5         | 74.9     | 58.6    | 48.1    |
| 080830_0002.NBF | (2008/08/30 11:49:02.00)      | 58.8         | 72.4     | 62.1    | 51.8    |
| 080830_0003.NBF | (2008/08/30 12:49:09.00)      | 55.9         | 79.7     | 57.9    | 48.5    |
| 080830_0004.NBF | (2008/08/30 13:49:18.00)      | 57.9         | 72.6     | 62.6    | 48.5    |
| 080830_0005.NBF | (2008/08/30 14:49:41.00)      | 56.8         | 70.9     | 61.4    | 47.6    |
|                 |                               | <b>56.98</b> |          |         |         |