

**FELIXSTOWE BRANCH LINE AND IPSWICH YARD IMPROVEMENT
ORDER INQUIRY**

EVIDENCE SUBMITTED BY IPSWICH BOROUGH COUNCIL

PROOF OF EVIDENCE MR GORDON BROWN

NOISE IMPACT

SYNOPSIS:

Ipswich Borough Council believes that the noise impact of the proposed Felixstowe Branch Line and Ipswich Yard Improvement Order has been significantly understated in Technical Report NSOX0025/1 in respect of the effect of operations at the Ipswich Fuel Point on nearby properties. The methodology used to assess the impact of the Order has misrepresented the effect of this aspect of the development by the use of an inappropriate comparison that claims a benefit from changes unconnected with the works. The assessment of operational noise within the Technical Report has been carried out using data based upon unattended monitoring, which has resulted in significant inaccuracies. It is the view of the Council that the evidence produced by the applicants misrepresents the impact of the development and that using an appropriate comparison with noise levels likely to result if the Order is not granted clearly indicates that the works would lead to a further increase the already unacceptable noise impact on local residents, particularly those in Ramsey Park.

1. INTRODUCTION

- 1.1. This evidence has been prepared by Gordon Brown, MCIEH, MIOA, an acoustics consultant appointed by Ipswich Borough Council to examine and evaluate Technical Report NSOX0025/1 prepared for HPUK in response to the Council's objection to the application for the Order.
- 1.2. The application for the Felixstowe Branch Line and Ipswich Yard Improvement Order will result in the intensification of the use of the Ipswich Fuel Point, a facility operated by Freightliner, with a consequent adverse affect on local residents close to the site. This intensification of use is acknowledged in paragraphs 2.5 and 5.1 of the Technical Report.
- 1.3. The Order proposes the dualling of part of the branch line from Ipswich to Felixstowe, which will result in an increased capacity for the line and therefore an increase in train movements to and from Felixstowe Port. In order to cater for this increased number of rail movements it will be necessary for the operators of the freight trains, including Freightliner, to increase the number of locomotives they operate on the line.
- 1.4. Currently, freight trains do not operate on Sundays; it is therefore necessary to stable them from Saturday afternoon until early Monday morning, when they are brought back into service. Freightliner has stated that the only location with the capacity to stable the operational fleet is the sidings attached to the Ipswich Fuel Point.
- 1.5. In order to ensure that the locomotives are capable of operating when required, Freightliner advise that it is necessary for them to be started late on Sunday night and then left to run at idling speed for approximately 2 hours. In addition, during cold weather they may also be started and left to idle early on Monday morning. At present

there may be up to 13 locomotives started then left to idle simultaneously on Sunday nights and Monday mornings.

- 1.6. The fuel point is also used for the re-fuelling of locomotives, basic checks and minor repairs. The facility is used for this purpose during weekdays and is open 24 hours per day.
- 1.7. The Ipswich Fuel Point has been in existence for many years and outline planning consent was granted for a residential development, now known as Ramsey Park, in June 1995 and full consent given in November of the same year. Ramsey Park overlooks the fuel point and associated sidings and some rooms at first and second floor level have uninterrupted line of sight to the sidings. Although noise assessments were carried out as part of the various applications for residential development at Ramsey Park, the issue of high noise emissions from the fuel point and sidings on Sunday nights was not detected. This has led to a situation where the local residents are affected by very high noise levels for prolonged periods, causing sleep disturbance and serious loss of amenity.
- 1.8. Following construction and occupation of the dwellings there have been a number of complaints to the local authority regarding noise from activities at the fuel point. Of particular concern to the local residents is the practice of running of locomotive engines at idling speeds for extended periods of time, especially on Sunday nights and early Monday mornings. At present there may be up to 13 diesel locomotives stabled at the sidings and idling on Sunday nights for periods of at least 2 hours.

1.9. The evidence presented to the inquiry by the applicants and their consultants has been examined and there are significant areas where the Council has very serious concerns. In particular, there is considerable concern at the manner in which the operational noise emissions from the development has been both measured and assessed. The Council considers that the methodology that has been used is incorrect and seriously misrepresents the potential noise impact of the development.

2. EXISTING SITUATION

2.1. The operation of the fuel point at present can be divided into two distinct types of activity; refuelling and minor maintenance of locomotives, and the extended idling of diesel locomotives on Sunday nights. It is this latter operation that is the cause of the majority of complaints to the local authority.

2.2. Two classes of diesel locomotive are currently stabled at the fuel point on Sunday night, these being the Class 57 and Class 66. These engines have two idling modes, high idle and normal idle. The Class 57 engine is undoubtedly much noisier than the Class 66 when the latter is operating in normal idle mode, but when the Class 66 is in high idle mode it is accepted by Bureau Veritas to have a similar noise emission level to the Class 57.

2.3. The manner in which the two classes idle is also different. Class 57 locomotives require the starting key to remain in position for the engine to be kept in high idle mode, whilst the idle mode of the Class 66 is determined by the automatic engine management system of the locomotive itself. The Freightliner employee responsible for starting and

idling the engines on Sunday nights is issued with a single key therefore it is not possible to keep more than one Class 57 locomotive in high idle.

- 2.4. However, the Class 66 engines will idle for a variable time dependant upon their operational state as this is determined by their engine management system. Bureau Veritas quote this time as being 1 minute per hour but site observations indicate that the time varies from engine to engine and a more realistic estimate of this time is 2.5 minutes per engine per hour. As the locomotives are started sequentially, it is possible for up to three Class 66 locomotives to be in a high idle state for the time it takes to start all the stabled engines.
- 2.5. The current mix of locomotives likely to be stabled on Sunday night is stated by Freightliner to be 5 Class 57 and 8 Class 66, but the Class 57 locomotives are due to be taken out of service by April 2008 and replaced with Class 66 engines. **This replacement programme is unconnected with the application for the Improvement Order.**
- 2.6. On weekday nights a limited number of locomotives may be stabled at the fuel point awaiting collection by drivers, but the primary activity that occurs is the refuelling of engines, basic maintenance checks and minor repairs. Whilst a locomotive is being refuelled the engine is left to idle, partly to avoid potential problems in restarting and partly to facilitate maintenance checks that are carried out whilst the refuelling continues. These activities were witnessed during a weekday noise monitoring visit to the fuel point.

2.7. Freightliner has advised that a typical range of activities on a weekday night would involve the refuelling of six locomotives and the starting from cold of two.

3. NOISE EMISSIONS FROM THE SITE

- 3.1. In the process of assessing any application for development that may cause loss of amenity to residential property by virtue of noise emissions, it is essential that a proper survey be carried out that identifies the properties likely to be affected, determines what the existing noise environment is in those areas and what activities are producing the noise. The primary guidance in this respect is PPG24, Planning and Noise, which uses the concept of **Noise-sensitive development**; dwellings, hostels, health buildings, educational establishments, and other similar buildings fall into this category, in order of decreasing sensitivity.
- 3.2. Bureau Veritas Technical Report NSOX0025/1 gives details of noise surveys carried out by the applicant's consultants and includes the results of unattended measurements made at two locations in Ramsey Park. Given the importance of obtaining accurate and complete acoustic data in respect of this application, the use of unattended measurements is not regarded as appropriate. It is extremely important in the evaluation of any acoustic measurements that the raw measurement data be accompanied by details of the activities that were occurring whilst the measurements were being made. Given that there are a number of possible noise sources arising in connection with Ipswich Station, it is essential to know what activities were producing the noise levels measured at Ramsey Park. In the absence of such observations, it is extremely unwise to use the measurements either for predictive or validation purposes. Such information forms an integral part of environmental noise measurements and, in a case such as this, without it the resultant data becomes merely a table of numbers that have very limited meaning.

- 3.3. The proper approach to this type of problem is to carry out detailed observation of those activities or machinery that are actually producing the noise emissions in question and, especially where these are variable in nature, to correlate them to simultaneously measured levels at the receptor site.
- 3.4. In view of this the additional measurements have been carried out on the instructions of the local authority under circumstances where the actual activity at the fuel point and sidings was monitored whilst measurements were made simultaneously. The location used was as close as possible to one of the positions used by Bureau Veritas, in front of 41 Ancaster Road with the microphone positioned 4m above local ground level, which approximates to first floor bedroom level.
- 3.5. Measurements were made on three occasions, these being Friday 12 January, Sunday 14 January and Sunday 21 January 2007. Relatively limited activity took place on the Friday night, but on both Sundays locomotives were idled for extended periods and it was possible to run groups of similar class engines in isolation in order to determine the noise levels produced by a known number of engines in known idle states. Using this information it is then possible to calculate the average noise level produced at the nearby dwellings by the different classes of locomotive and this may then be scaled to allow for different numbers of locomotives at the fuel point. On both Sunday nights the locomotives stabled in the sidings were spread out along the length of the facility, as would be the case if there were more engines present.
- 3.6. The applicant's consultants have used a different approach to the calculation of both existing and future noise levels. They have measured the noise emissions from a single example of each of the two classes of locomotive and using this data in a computer

model they have then attempted to validate the model by reference to their measured levels (para 7.12 of Bureau Veritas report refers).

- 3.7. Whilst this methodology is well established and the computer model employed by Bureau Veritas is one that is in wide use, the output of the model is very heavily dependant upon the input data, especially the sound power level of the noise source.
- 3.8. From the model, Bureau Veritas conclude that the noise level in front of 41 Ancaster Road with 5 Class 57 and 8 Class 66 locomotives idling under a normal idling regime will be 61dB(A). They conclude that this agrees well with their measured noise levels made on the night of Sunday 10th December 2006, when a level of approximately 64dB(A) was recorded with an unknown number and mix of locomotives idling, as shown in the charts in Appendix 2 to the Technical Report.
- 3.9. However, attended measurements indicate that the noise emission levels from individual locomotives can vary very significantly and that the predicted existing noise level of 61dB(A) can be produced by no more 9 Class 66 engines under normal idling.
- 3.10. Analysis of the results of the attended measurements on Sunday nights indicates the following (all noise levels have been corrected to allow for the noise contribution made by other activities in the area, rounded to the nearest decibel, and all relate to a level in front of 41 Ancaster Road).
- Three Class 57 running in normal idle mode produces a level of 63dB(A)
 - One Class 66 running in high idle mode produces a noise level of 56dB(A).
 - One Class 66 running in low idle mode produces a noise level of 51dB(A)
 - Five Class 66 running in normal idle mode produces a noise level of 57dB(A)

- Six Class 66 running in normal idle mode produces a noise level of 59dB(A)
- 3.11. Calculations based upon the above measured noise levels indicate that a mix of 5 Class 57 and 8 Class 66, as modelled by Bureau Veritas, will actually produce a level of 66dB(A) in front of 41 Ancaster Road, in comparison to the 61dB predicted in the Technical Report.
- 3.12. Although other combinations of measurement were made, due to the running characteristics of the Class 66 and the number of engines involved, it was not possible to determine how many were actually running in high idle mode at any one time.
- 3.13. The above noise levels correlate reasonably well to one another in that using the base level of 51dB(A) for a Class 66 in low idle, the calculated noise levels for 5 engines would be 58dB(A) and for 6 would be 59dB(A).
- 3.14. The calculated noise level for the situation that would prevail on Sunday nights after April 2008, when the Class 57 engines will be replaced by Class 66, is 62dB(A), assuming all 13 of the engines are running in normal idle mode. If three were running in high idle mode, which is likely to be the case for a significant length of time during the start up phase, the noise level at 41 Ancaster Road would be 64dB(A). The likelihood of several Class 66 engines running simultaneously in high idle mode is dependant upon the length of time taken between each engine being started and the time it remains in high idle mode. The Class 66 may remain in high idle mode for up to 2.5 minutes and a driver takes approximately 1 minute to start a locomotive then move to the next one. If there are up to 19 engines to be started then for virtually the whole duration of the start up process there will be two running in high idle mode. If an individual engine spends

longer in high idle due to weather conditions or by virtue of some difference in its engine management system, then there may be three Class 66 engines in high idle simultaneously.

- 3.15. The increased number of locomotives will also result in the start up process being extended, leading to a much longer period of high level noise emissions produced by locomotives in high idling mode. Increasing the number of Class 66 locomotives from 13 to 19 would result in an approximately 50% increase in the duration of high idling noise, which represents a significant additional noise impact on local residents.
- 3.16. The Bureau Veritas Sunday night current noise level predictions indicate a noise level of 63dB(A) outside 41 Ancaster Road, but it should be noted that their predictions are based upon a mix of 5 Class 57 and 8 Class 66 locomotives. Examination of their predicted noise levels for 19 Class 66 locomotives (Figure 7.4 in the Bureau Veritas report) shows a level of 54dB(A) at the same location. This clearly cannot be correct as the measured, corrected noise level for 6 Class 66 engines in normal idle mode is 59dB(A).
- 3.17. To put the existing noise levels into context they can be compared with the prevailing background noise level. During weekday nights there are some periods where there is relatively little noise from the fuel point and associated rail network and at these times the background noise level is in the region of 42dB LA_{90,5minutes}, which is considered to be reasonably typical of an urban area. The noise level with 13 Class 66 engines idling is likely to be at least 62dB(A), which is 20dB above background noise level. Were this site to be a conventional industrial or commercial installation there is no doubt

whatsoever that the local authority would be receiving complaints and acting upon them.

4. IMPACT OF THE IMPROVEMENT ORDER

4.1. The effect of the Improvement Order on Sunday night working would be to increase the number of locomotives stabled at the fuel point by at least 6, giving a total of 19 Class 66 engines that would require overnight starting and idling. This is based upon an assumption that Freightliner would win 50% of new business, which does not reflect all potential outcomes. At present, Freightliner has 80% of the freight business on this line and it must be reasonable to model the increase in locomotive stock on the basis of their maintaining this share. It is also possible that they would win 100% of the new business and this possibility should at least be considered and modelled.

4.2. The potential scenarios would therefore involve an increase in numbers of engines stabled at the fuel point of 6, 9 or 12, giving totals of 19, 22 and 25, all assumed to be Class 66 engines.

4.3. This increase in numbers would result in Sunday night noise levels at 41 Ancaster Road as follows. These levels would prevail for at least two hours.

- 13 Class 66 running in low idle mode = 62dB(A).
- 19 Class 66 running in low idle mode = 64dB(A).
- 22 Class 66 running in low idle mode = 65dB(A).
- 25 Class 66 running in low idle mode = 65dB(A).

4.4. Bureau Veritas have claimed that the result of the Improvement Order would be to reduce Sunday night noise levels at Ramsey Park, but this includes a reduction in levels due to replacement of the Class 57 engines that is not associated with the Order. The actual net effect of the order is not a reduction in noise levels by 7 or 8dB, as claimed by Bureau Veritas, but an increase in levels that would otherwise decrease of between 2 and 3dB. Whilst this increase in noise levels is relatively modest, it will represent a worsening of an already unacceptable situation. The confirming of the Order would effectively remove the only hope the residents have of an overall reduction in noise that would result from the replacement of the Class 57 engines.

4.5. In addition and importantly, the increase in locomotive numbers will inevitably result in an intensification of the activities at the fuel point. This aspect has not been addressed at all in the Bureau Veritas report. At present, the operation of the fuel point results in irregular bursts of noise, including the testing of horns, as observed during the visit made to the site on a Friday night. The number of such bursts of noise will increase if the Order is granted, thereby increasing the degree of disturbance caused to local residents on weekday nights.

5. MITIGATION

5.1. In considering methods by which the noise impact of this site may be reduced the relationship between the noise sources, the transmission path and the receivers must be examined.

5.2. In general terms, the most efficient method of reducing the impact of a noise emitter is to reduce the noise at source, as this usually confers the greatest benefit on the greatest

number of receivers. The noise sources in this case are the locomotives themselves and there are clearly very limited opportunities to reduce the emission level of individual engines. The replacement of the Class 57 engines with Class 66 is an example of such an approach, but as has been pointed out, the programme of replacement is unconnected with the Improvement Order. The only other possibility to reduce overall noise levels is to reduce the number of engines stabled at the fuel point on Sunday nights. The stabling of the engines does not appear to require the presence of the fuel point therefore if a similar facility can be made available at a location where it is unlikely to affect local residents, it should be utilised. It is understood that Freightliner have stated that no other suitable facility exists, but given the extent of the impact the existing facility creates, this option should be explored more fully.

5.3. One of the most commonly used methods of environmental noise mitigation is interruption of the noise transmission path by the use of barriers or enclosures, although these may be of limited effectiveness and may also present their own difficulties. In this instance the size of the fuel point and sidings makes this option of noise control potentially very expensive. Freightliner has investigated the possibility of enclosing the facility and have estimated the cost at £3 million, although from a noise control point of view a total enclosure would not be necessary. Provided any partial enclosure completely interrupted line of sight from the house to the engines, significant reductions in noise could be expected and again, this should be more fully explored.

5.4. A partial noise barrier of limited effectiveness has already been installed in the form of a timber fence between Ramsey Park and the fuel point, but this is of such design, location and construction that it provides very little attenuation of noise at first floor level.

- 5.5. The final option for mitigation would be to improve the resistance to noise transmission of the houses in Ramsey Park, but this would rely upon the cooperation of the residents and may not achieve significant improvements if the existing structure performs well. As the houses are recently built, they are fitted with double glazed windows, although it is noted that these are of vertical timber sash design and the glazing appears to be in a 4/12/4 configuration. In addition, each window is fitted with a trickle vent of approximately 400mm x 20mm in size.
- 5.6. This arrangement of windows and ventilation openings does not perform especially well in respect of resistance to noise transmission, the trickle vents being a particular weakness. Sliding sash windows, especially in timber, often do not seal well either at the edges or meeting rails, which will further degrade their performance. Upgrading the windows to properly designed acoustic units will effect significant improvements if the ventilation issue is also addressed. The optimum ventilation system would be one that meets the requirements of the Noise Insulation Regulations 1975, and there are a number of different types of passive and mechanical ventilation that meet this standard.
- 5.7. It is also possible that the roof and ceiling structure form a significant noise transmission route as the roof is covered in Sandtoft Britlock reconstituted slates, which are relatively light in weight. Although the ceiling could not be examined to determine its exact composition, it is unlikely to consist of more than a single layer of 12mm plasterboard. This part of the structure could be improved either by the addition of another layer of plasterboard, which would give a modest improvement, or the installation of a proprietary isolated ceiling, which would be more effective.

- 5.8. Although the above techniques would give an overall improvement in A weighted noise levels within the rooms, it should be noted that the noise from the locomotives contains a high level of low frequency energy that would be attenuated to a much lesser extent than mid and high frequency noise, and it is likely that this would still cause significant disturbance to occupants.
- 5.9. Clearly the most effective mitigation would be to stable locomotives elsewhere at a location where they could not cause disturbance as this would result in the greatest benefit to the greatest number of residents.
- 5.10. An enclosure to the sidings and fuel point would result in a similar degree of benefit, but to a lesser extent, as locomotives would still need an access point, which would constitute an acoustic weakness. There would still be some residents who would be subjected to noise emissions from the facility. There are also considerable technical difficulties to overcome in order to construct such an enclosure and I acknowledge that the cost is likely to be high.
- 5.11. A barrier closer to the sidings may attenuate noise levels significantly, but would need to be high in order to interrupt line of sight and it may be difficult to achieve this with an essentially free standing barrier.

6. CONCLUSIONS

- 6.1. The Council does not accept that the methodology used by the applicant's consultants to assess existing and future noise emission from the site truly represents the impact that this development will have on local residents. Bureau Veritas have carried out computer

modelling that does not reflect the reality at the residential properties and the Council does not consider the unattended measurements to be valid due to the lack of associated source data.

- 6.2. Bureau Veritas have tried to claim a benefit from the replacement of noisy locomotives with a quieter class and this has seriously distorted their assessment of the noise impact of the Improvement Order.
- 6.3. The predictions of noise levels produced by Bureau Veritas appear to have been based on an inaccurate assessment of the sound power levels of the noise sources, as actual site measurements correlated to activity levels at the fuel point clearly demonstrate.
- 6.4. Rather than the development producing a reduction in noise levels of 6 to 7dB, as claimed by the applicant's consultants, the development will produce an increase in noise levels of up to 3dB over the levels that would prevail in the absence of the works. High idling will continue for longer periods due to the increased number of engines and there will be a significant increase in the number of high noise level events on weekday nights, further increasing the noise impact of weekday activities at the fuel point.
- 6.5. The most effective mitigation measure would be to either move the fuel point to another location where it does not impact on residential amenity or, at the very least, to reduce the number of locomotives stabled in the sidings on Sunday nights by storing them at another location, again remote from residential properties.