

Stansted Airport

'Generation 1' Inquiry

PINS Ref: APP/C1570/A/06/2032278

Notes for Closing on behalf of The National Trust

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Preface

- (i) The structure of these notes is to reproduce the National Trust's position as outlined in Opening (but not to re-read it) so that various references need not be restated. Thereafter, the evidence which emerged at the Inquiry is reviewed in order to note how – if at all – BAA's failings in analysis and in addressing mitigation have been addressed. In short, the position remains the same as when the National Trust opened its case.*
- (ii) The opportunity has also been taken to bring the original Notes for Opening into line with the Inspectors' guidance notes for presentation of closing submissions.*
- (iii) The National Trust has limited its focus at this Inquiry to the matters which most closely coincide with issues numbered 4 and 6 in the Annex to the notes of the PIM. Plainly those items also have a bearing on issue 10, but the Trust cannot and does not address the overall equation inherent in issue 10 as such.*

Introduction

- 1.1 The body which is known as the National Trust will be well known to the Secretary of State (SoS). Its status and purposes are shortly described in its evidence [NT/1A p1 §§1 - 2]. It was established in order permanently to preserve land and buildings for the benefit of the nation. Within its remit, it is the guardian of that which made England what it is. The Trust has raised a number of important concerns about BAA's G1 proposals, but many have been addressed by others and so the Trust did not add to the material on those other topics. It focussed on the effects on Hatfield Forest

which it owns for the benefit of the nation as a national asset for the nation to enjoy – in perpetuity [NT/1A §2.1, §3.3 and Ax 1].

- 1.2 The Trust had no desire to be here. It has been an unnecessary drain on its limited resources. Its presence and participation at the Inquiry was a direct result of BAA's
- (i) failure to address the importance of Hatfield Forest as a cultural resource or at all, and to assess the effects of its G1 proposals on that resource,
 - (ii) its failure to address adequately or at all the effects of its G1 proposals
 - (a) on the fabric of the Forest (air pollution) and
 - (b) on the experience of its visitors (aircraft noise), and
 - (iii) its failure even to consider possible effective mitigation for any of those effects.

Hatfield Forest – Historical and Social Context

- 2.1 Historically, a Forest is as much a concept as a physical entity: but it is always both. It is not a 'big wood' [NT/1A p4 §4.1]. Forests were places where Forest Law was established to protect the King's deer. A Deer Park was private land. By contrast, a Forest was a place where other interests in the land already existed but where Forest Laws were overlaid. Even though a Forest was a place for deer, it was a comparatively minor use of the land. The main users were the local people who already managed the semi-natural landscape of pre-medieval times. Forest Law added another layer of rights and obligations where other pre-existing rights, interests and obligations already overlapped. The results of the complex interactions of the various competing but complimentary interests have survived for centuries. They shaped the management of the Forest and Hatfield Forest today still displays the historically complete and complex interactions of a medieval Forest. Hatfield Forest is properly described as inherently timeless.
- 2.2 The general physical layout of Hatfield Forest has been established in much the same form for over 1,000 years. Forest Law was established over the area of the Forest in about 1100 – shortly after the Tower of London was completed. I leave some generalised markers of history over the subsequent centuries. Hatfield Forest was over 100 years old when the Magna Carta was signed. Robert the Bruce inherited Hatfield Forest in 1304. It saw the Wars of the Roses and saw Columbus set sail for the Americas. It had already been established for nigh on 500 years when the Spanish Armada set sail for England. It saw the 'Gunpowder Plot', the English Civil War and the Great Plague and the Fire of London. It was here when Captain Cook set

sail for Australia. It saw Napoleon defeated at Waterloo and the effects of the carnage of WWI. It remained, throughout, much as can be seen today. Stansted airfield was constructed more or less overnight in 1942/43 and was first used for charter flights in 1946 [CD/7 p32 §3.6.1-2].

2.3 Hatfield Forest is a place of grassland plains with areas of scrub, coppiced woodland and a wide variety of species of pollarded trees. It is an area where local residents could graze their animals on the grassy plains. They could take the wood from the coppices and pollarded trees for fuel, fencing and building materials. The landowner could take the timber and the game. The deer would shelter in the scrub and coppice and be hunted along the plains – rarely, if ever (it seems) by the King.

2.4 Hatfield Forest is only a little smaller than once it was, but its supreme interest lies in the fact that

“ ... all the elements of a medieval Forest survive: deer, cattle, coppice woods, pollards, scrub, timber trees, grassland and fen, plus a seventeenth-century lodge and rabbit warren.” [Rackham, cited at NT/1A p2 §3.1] (original emphasis)

But that short encapsulation tends to understate the position in relation to the trees. One or more of those elements might be found in a variety of places, but the sheer longevity of the Forest and its trees marks it out. In the western world ancient trees are very rarely found outside England:

“Old trees are a rarity in civilised countries. ... From Boulogne to Athens one rarely sees a tree more than 200 years old [they are cut for timber well within their prime]. ... ” [Rackham, cited NT/1C A^x 5 p240]

There is a special ecological and biodiversity importance to the veteran trees¹ of Hatfield Forest. Neither the trees nor the ecological and social system of which they are part can be recreated without going back hundreds of years. Hatfield Forest, and all its constituent parts and practices, is

“ ... almost certainly unique in England and possibly in the World. [It] is the only place where one can step back into the Middle Ages to see, with only a small effort of the imagination, what a Forest looked like in use.” [Rackham, cited NT/1C A^x 5 p240]

¹ English Nature defined a veteran tree as ‘a tree which, because of its great age, size or condition is of exceptional value culturally, in the landscape or for wildlife’.

... “ *[It] is the unique survival, in full working order, of this aspect of human affairs at the zenith of its complexity.*” [Rackham, cited NT/1C A^x 2 p19]

– with its roots firmly planted in medieval England.

- 2.5 Hatfield Forest is readily accessible to all. The Trust manages it for the benefit of the nation. It is a NNR and a SSSI². Visitors enjoy the comparatively long periods of tranquillity between periods of heightened aircraft activity at STN. They enjoy the Forest for its solitude as well as for its recreational features. It is unique and it is timeless.
- 2.6 BAA is very well aware of Hatfield Forest. But in its appraisal of the effects of its G1 proposals on Hatfield Forest, BAA’s material reveals more paper than assessment, more words than substance and more gloss than analysis.

Hatfield Forest – BAA’s perspective on the Cultural Heritage

- 3.1 BAA produced an ES with a volume called “Archaeology & Cultural Heritage” [CD/7]. This is, as its title suggests, a volume which purports to address cultural heritage as well as archaeology in its narrower sense. It purports specifically to address potential impacts on “*the cultural heritage resource*” [CD/7 §1.1.1] including

“ ... *[I]ndirect effects on historic features, such as Listed Buildings and Scheduled Monuments resulting from material changes in environmental factors such as noise or visual intrusion, occurring largely during operation of the Airport*” [CD/7 §1.1.1]

And

“ ... *including ... direct impacts to settings (reducing the appreciation of the resource such as Listed Buildings and Scheduled Monuments).*” [CD/7 §2.1.2]

It is notable that the criteria adopted for assessing impact include

“intrusion on setting, change in noise or visual ambience.” [CD/7 §5.2.3].

But nowhere in the analysis of effects is the ‘base line’, or the future setting or visual (or other) ambience of Hatfield Forest addressed at all. Is Hatfield Forest and its

² Except for a small area near the visitor centre.

attributes described in the analysis? No. Is Hatfield Forest even mentioned in the assessment of effects? No.

3.2 It is then, remarkable, that without any specific assessment of Hatfield Forest, its ambience, significance or historical or cultural associations, the volume concludes that:

“No direct primary or secondary impacts (including issues of setting) to Designated Sites^[3] within ... the broader [sic] 1km Study Area have been identified from the 35mppa case. This is due to two factors:

- *Most of the proposed facilities are effectively screened at ground height from the land outside of the Airport boundary by topography, vegetation or existing facilities or structures; and*
- *Where potential increases or changes in noise or light have been identified from the proposals the net impact of such potential effects is generally negligible compared to existing impacts from existing facilities.” [CD/7 §10.3.1] (emphasis added)*

Hatfield Forest - BAA's other assessments

4.1 Compare this position with the position described in the Landscape and Visual Impact volume of the ES. Here, its authors (working to a similar limited assessment zone) describe the part of Hatfield Forest closest to the airport as having a

“ ... sense of place ... characterised by an assemblage of rural features, a strong sense of history and a feeling of timelessness. ... Because of the historic and recreational importance of Hatfield Forest, the views from Takeley Hill are probably some of the most sensitive to adverse change in the whole [1 km] study area.” [CD/12 §§11.3.83 - 84]

Where is any of that ‘sense of place’ and ‘strong sense of history’ or ‘feeling of timelessness’ reported in the Cultural Heritage assessment from the cultural heritage perspective? Nowhere. Where are the effects on these factors described? Nowhere.

4.2 The authors of the Landscape and Visual Impact volume of the ES ultimately draw the conclusion that there would be an impact on the Forest within the 1 km zone (from on-airport lighting) but say that the impact would be much the same as the base case [CD/12 §§11.3.83 - 84]. We may differ over the conclusion, but we also note the limitations on the study. Whilst landscape and visual impacts are sometimes inter-

³ As defined in the Glossary in a manner which would embrace Hatfield Forest: [CD/7, at the front].

muddled with landscape character impacts in the assessment, that is not the main point here. The main point is that the effects of the sight (and sound) of aircraft in the air are not addressed (except when they are within the airport perimeter). That is because (it seems) airborne aircraft only enter into the equation when addressing the landscape character of the airport itself. They do not enter the equation when assessing visual impact or impact on the landscape or historical character of areas outside of the airport – not even within the limited 1km study area.

- 4.3 So, if and to the extent that the Cultural Heritage ES draws on the Landscape and Visual impact volume (and it does not so say) it suffers the same failings: impacts on setting, character and ambience of Hatfield Forest from the sight and sound of aircraft in flight have not been addressed. Admiral Lord Nelson was famous for this kind of approach, but it is not appropriate for an ES which is designed to address “*changes in environmental factors such as noise or visual intrusion*” and changes in “*the appreciation of the resource*” and “*intrusion on setting, change in noise or visual ambience.*” At least two of the specific parameters identified in the Cultural Heritage volume (visual ambience and intrusion from the operation of the airport) plainly cannot be imported into the cultural heritage assessment from the Landscape and Visual Impact volume because they were not addressed there either.
- 4.4 But what of air noise in its own right? Once again, the words ‘Hatfield Forest’ do not appear at all in the Air Noise volume of the ES [CD/5]. Despite the assessment of the nature and character of even only a fragment of Hatfield Forest in the Landscape etc volume, Hatfield Forest is not ranked by BAA as being a ‘sensitive use’ for air noise purposes [see eg CD/5 p21 §10.2.6]. It is (subject only to being rolled up in an overall broad brush assessment of the whole area by reference only to the LAeq contours) ignored. It is then specifically ignored as a result of being excluded from the category of ‘sensitive uses’ which do otherwise attract further consideration in this volume [see eg CD/5 p21 §10.2.6].
- 4.5 But what of the air noise assessment itself? In the Air Noise volume of the ES, the main thesis adopted by BAA is that (i) the only material metric is the $L_{Aeq, 16h}$ (LAeq) contour and (ii) anything less than a 3dB change in LAeq will not be noticed. That assessment is wrong in its own right and is, in any event, inadequate for assessing the impact on a resource such as Hatfield Forest. If LAeq is used as the only or main

parameter for assessing the effects of 'air noise', its use can be positively misleading – and BAA will be well aware of this.

- 4.6 BAA will well know that the DfT recognises that a change in 'air noise' reflecting even 'only' ½ dB LAeq can be significant [see NT/3A p21 §5.13]. But yet in its ES BAA still brushes off changes of 1, 2 and up to 3 dB LAeq as 'unnoticeable' without further analysis of character and place – or at all [see eg CD/8 p27 §10.6.1]. This broad brush application of folk lore simply will not do for the purposes of assessing the effects at Hatfield Forest. A singularly important value of Hatfield Forest is the comparative tranquillity which can be experienced in between aircraft 'events' and groups of aircraft 'events'. (Take-offs and landings tend currently to be 'clustered', with gaps between clusters.) Because of the low background sound levels in the Forest, each aircraft will be heard and be a noticeable distraction for longer periods than in an urban context. The tranquillity of the Forest is certainly currently disturbed for the duration of each event. Each event lasts for some little time, so the period of respite between events is less than the number of events would suggest.
- 4.7 But, as the NT demonstrates [NT/3A p41 *et seq*], because of the manner in which the airport currently operates (and as it is expected to operate at 25mppa), there are still comparatively long periods of freedom from 'air noise' at various times of day [NT/3A p41 *et seq*]. An increase in numbers of aircraft movements to the levels postulated by BAA's G1 proposals will involve a marked spreading of the additional movements throughout the day [as confirmed, eg at CD/12 p18 §10.2. 20]. The additional numbers and the manner of accommodating the additional numbers for the G1 proposals will, therefore, have a disproportionate impact on the periods of tranquillity which is so much a feature of the whole experience of the Forest – part of its "*strong sense of history*", its "*timelessness*" and its "*sense of place*". The inevitable changes in "*noise and visual intrusion*" and in the "*appreciation of the resource*" as well as the "*intrusion on setting*" will be patent – but they are all wholly ignored by BAA. So, whilst BAA's planning consultant is lately drawn onto the field as a 'sweeper', and now its air noise witness produces additional material, the BAA die is already cast and these elements are still ignored.
- 4.8 BAA also addresses air quality. It has an Air Quality volume in the ES. What is common ground is that whilst BAA's G1 proposals

“ ... will cause deterioration in air quality [to varying degrees], there are no beneficial effects” [CD/6 §5.3.4]

The Trust has formally raised a series of questions in order the better to understand BAA’s modelling work on air quality so far as it affects Hatfield Forest for the predicted annual mean concentrations of NO_x [see NT/2C Ax 4]. This modelling work is a crucial element in the assessment of impacts on Hatfield Forest’s trees, vegetation, dependent ecology and overall biodiversity.

4.9 But the modelling work and the overall assessment have serious shortcomings for addressing the effects on vegetation. Whilst the Air Quality volume asserts that the modelling work has used “*best practice*” [CD/6 p4 §5.1.1] it emphatically has not in the context of its suitability for assessing effects on vegetation [NT/2A p17 *et seq* §§3.3 - 3.8]. Whilst there are many detailed and other points to be resolved, I focus on the model ‘validation’. BAA’s G1 proposals have been promoted in accordance with its own timetable – it has not been taken by surprise. It has had the opportunity to ensure that that its model was based on (and validated against) a spread of robust baseline data. But it is plain that it has ‘validated’ against an insufficiently robust database – in time and in space. The model, which looks to annual mean NO_x concentrations over a wide area

- (i) has only been ‘validated’ against 7 months’ measured data [NT/2A p14 §3.4],
- (ii) has only been ‘validated’ against one monitoring station within this wide area [NT/2A pp18, 19 §§3.4.2, 3.5.2], and
- (iii) has no reliable cross-checking (or co-location) data against which to check the alignment of measured and modelled results [NT/2A p19 §3.5.1].

The model validation is (expressed at its kindest) weak. The highest that even BAA’s team feels able to report on the validation of the model is that the validation exercise provides something of a “*sanity check*” [NT/2A p18 §3.4.2]. BAA plainly needed more time and data in order to secure a robustly validated model, but appear to have taken no steps to address matters.

4.10 The ecological value of Hatfield Forest is recognised by its status as a NNR and as a SSSI. It is common ground that, at its lowest, it is of European (international) significance [CD/13 p43 §8.12.15]. BAA’s approach to addressing the effects on a site with such attributes using a make-do-and-mend modelling approach is wholly inadequate. It undermines the ability of the ultimate decision-maker to address the

Biodiversity Duty⁴. BAA had and continues to have the resources and the time to carry out an incontrovertibly thorough modelling appraisal which was properly validated and it has not (at least not yet) done it. It would be wholly irresponsible to shelter behind a defective appraisal on the basis that it is 'all that we have got to go on' – the job must be done properly if the biodiversity duty is to be addressed. The tools and the resources are available, but BAA has not deployed them.

- 4.11 But it goes further. The only NO_x concentrations which have been assessed are the annual mean NO_x concentrations. There is no mention at all (still less any assessment) of the NO_x concentrations over shorter time periods than an annual mean: which can be just as, if not more, damaging for vegetation [NT/2A p122 §4.1.1]. The WHO makes recommendations over maximum 24-hour mean atmospheric NO_x concentrations [NT/2A p22 §4.1], but BAA has singularly failed to address that aspect at all.
- 4.12 But there is, says BAA in the ecology volume of the ES, no possible mitigation for NO_x concentrations in any event, other than to monitor the resulting levels [CD/13 §13.2.1] – with no suggested strategy (or controls over airport operations) for addressing or halting any harm which that monitoring reveals. BAA would continue to fiddle while Rome burned. This Forest contains trees (with dependent ecology contributing to a rich biodiversity) which are many centuries old. The balance which has been struck over the centuries deserves more respect.
- 4.13 The potential threats from NO_x concentrations are apparent and real. BAA must demonstrate that the assemblages in Hatfield Forest will not be adversely affected by air pollution from its G1 proposals. A biodiversity resource which is unique in Europe, if not in the World is at stake.

Summary

- 5.1 The obvious place to find a central assessment of the effects of BAA's G1 proposals on Hatfield Forest would be the Cultural Heritage volume of the ES, but there was no such assessment. And save for one reference in the Landscape and Visual Impact volume to one aspect of the effects on Hatfield Forest (within the 1 km zone), BAA has failed to address the quality and the qualities of Hatfield Forest as a whole. The

⁴ Natural Environment and Rural Communities Act 2006 s.40.

conclusions in the Ecology volume of the ES depend upon the work done for Air Quality, and that work is flawed and incomplete. As is the assessment in the Air Noise volume. In short, the individual assessments in the ES for

- Landscape etc (i) Ignored the visual impact and effect on the landscape character of Hatfield Forest associated with the sight and sound of approaching and departing aircraft and (ii) failed to address these effects on the special character of the Forest.
- Cultural Heritage Ignored the effect of the sight and sounds of the airborne aircraft on the setting and ambience of the Forest.
- Air Noise (i) Relied almost exclusively on the LAeq average of averages without (ii) addressing the effect on tranquillity within the Forest and (iii) failed even to acknowledge the Forest as a sensitive place. It also perpetuated (and relied upon) the myth that 3dB universally marks the onset of perception of change for a 16 hour LAeq.
- Air Quality The assessments depended upon an inadequately validated model and were flawed and incomplete.
- Ecology Whilst the ecology ES recites that Hatfield Forest is of “*European significance*”, it relied upon the output of the air quality modelling exercise and is dependent upon its insecure results.

These individual assessments were incomplete where they were not flawed. Whilst BAA has not even attempted to address (or at least, to report) the cumulative effects of these factors on Hatfield Forest, no such assessment can soundly be based upon this material.

The Inquiry

Hatfield Forest

- 6.1 The main attributes of HF are summarised above [§§2.1 - 2.5, drawing from NT/1A sections 3 - 6]. Whilst it offers public amenity, it is an important historical landscape which depends upon the health and well-being of its trees and plants [NT/1A p11 §7.1, p13 §8.2]. In addition to managing the plains, coppices and woodlands [NT/1A p10 §7.1], the NT has expended some considerable resources in improving the facilities at, and the accessibility to, HF for the benefit of all users over the last ten years or so. Save for the effect of the jumbo jet crash in December 1999, the rising visitor numbers

indicate that NT has succeeded in making HF more attractive, accessible and rewarding for visitors. The projects include refurbishing the Shell House, consolidating parking facilities and access roads, creating new picnic and information areas, and providing the 'green stage' for performances. The boardwalk has been laid to aid access for wheelchairs and pushchairs. There are new WC facilities. Two education rooms and a 'discovery room' have been provided in order to help school groups and others in interpreting the importance of HF. New leaflets and guides have been designed and printed. Further projects are being planned [NT/1A p16 §§9.5 - 9.10]⁵. As NT pointed out, it has struck a balance in encouraging people to benefit from HF without actually damaging it in the process. Currently HF attracts more than 200,000 visitors a year and NT has strategies for further controlling parking with a longer term view of moving modern facilities off site [NT/1A p16 §§9.6 - 9.7].

6.2 The significance and importance of HF has not been brought into question at the PI. Its aesthetic, historic, scientific and social values for the past present and future generations have not been doubted or challenged. There was, however, a single oblique criticism of the manner and standard of management of the coppices by NT arising from a report by the former English Nature. It transpires that that apparent criticism arose because there was no category into which HF's unique and historic suite of management practices (with particular regard to the grazed coppice areas) would fit⁶. There was also a reference to the extent of damage caused by deer grazing. That in itself is not new. It is one of the tensions which has been inherent in HF since medieval times: coppice *vs* deer *vs* grazing *vs* timber [see eg NT/1C A^x 6]. What is, however, different is that the recent improvement and realignment of the A120 (brought about to accommodate the growth of the airport) resulted in the installation of deer-proof fencing along both sides of the road. This restricts the movement of the naturally roaming deer herds. The NT and neighbouring landowners are feeling the effects. The NT, for example, has had to double its deerstalking capacity to address the issue⁷.

⁵ And see Turner X, CD/700 07.09.07 p125 line 9 (NB p126, line 16 should read 'closed' to cars), and see p137 line 22.

⁶ Turner X, CD/700 07.09.07 p118, line 18.

⁷ Turner X, CD/700 07.09.07 p119, line 16.

6.3 There is no question but that NT's evidence addressing the significance and importance of HF should be accepted. It has not been contradicted. Indeed, with a modest slip of the tongue over 'woodland', BAA

*" ... agree[s] it is an extremely important woodland. It is everything that the National Trust says it is. There is no case being made by BAA to contradict that,"*⁸

But, it now transpires (albeit largely from ReX) that BAA's position appears to be that there would be no significant impacts upon HF, and that that is why the ES did not reflect any⁹. Such an assertion is untenable. It is untenable because in many respects the ES did not even look for impacts because of the scope of the assessment, or the methodology and the recurrent general limits to the exercise. In other respects the necessary assessment was not even carried out, or was carried out with inadequate tools¹⁰ [see above, eg §§3.1, 4.2, 4.6, 4.8 - 4.9, 4.11 and 5.1]. BAA's 'sustainability appraisal' [CD21.1] suffered from similar failings¹¹. The clear picture which emerged during the XX of BAA on the extent and nature of appraisals was as if HF did not exist¹². There were only two assessments which made any observation about HF. One was the landscape and visual impact assessment [CD/12] which looked out from HF. It did not address the impacts of aircraft movements on an historic landscape nor the visual impact of the aircraft on visitors. It did, at least, recognise something of the special value of HF [see §4.1, above], but neither that assessment nor any other did anything with it. The second volume which addressed HF was the nature conservation volume [CD/13]. But here the conclusions drawn were wholly dependent on the air quality modelling work. That work, so far as affects the modelling of ground level concentrations of NOx ('ground level' in the sense of distinguishing emissions from aircraft at altitude) is insecure [see §4.8 - 4.9 above, and below].

Air Quality and Nature Conservation

General

7.1 The NT found that much of its position in relation to the air quality evidence was mirrored by others at the Inquiry and mirrored to such an extent that formally calling

⁸ Rhodes ReX, CD/700 15.06.07.

⁹ Rhodes ReX, CD/700 15.06.09 p137 line 11 *et seq.*

¹⁰ Eg, the absence of consideration of tranquillity aspects and the failure to address visual and landscape impact or impacts on cultural heritage outside of the airport boundaries. See above §§3.1 - 4.8 and Rhodes XX *passim*, CD/700 14.06.07 and 15.06.07.

¹¹ Rhodes XX, CD/700 14.06.07 eg pp200 – 208..

¹² Rhodes XX, CD/700 14.06.07 eg p200 *et seq* and 15.06.07 pp1-37.

its consultant¹³ to deliver his evidence would effectively be repetition of that which emerged from UDC and from SSE. This evidence remains as a written representation [NT/2 series]. It needs to be read with the other NT evidence to appreciate more of the detail of the ecological importance of HF (none of which was challenged) [see eg NT/1A p13 section 8 and A^xs 8 - 10]¹⁴.

7.2 Whilst the mere reference to HF's status as a SSSI and as a NNR speaks volumes [NT/1A p13 §8.1], a short encapsulation of the position from the NT's summary proof is warranted [derived from the full text at NT/1A p13 §§8.1 - 8.3 and A^x 8]:

*"Hatfield forest is one of the most significant areas of semi-natural habitat in Essex. The ecology is in notably pristine condition largely due to not being ploughed. The ancient trees, often in excess of 600 years old, created by traditional practices encompass much of what is significant about the forest and **each** is unique in the ecosystem it supports. Hatfield forest is biologically of international importance because it provides a superb case study in historical ecology and the survival of the medieval landscape affords a direct link with the primeval vegetation cover of the country and its inhabitants."* [NT/1B p5 §8.1] (emphasis added)

But, whilst the 'ecology' is pristine, it is fragile [NT/1A p13 §8.1]. More particularly, the Ancient Trees which are so symbolic of HF and which are interrelated with the overall ecological interest are vulnerable to stress and can be expected to become more stressed and more vulnerable as the effects of climate change progress [NT/1A p12 §7.6, p13 §8.2, and section 8 *passim*]. The NT has been instrumental in developing ground-breaking arboricultural practices to consolidate the stability of these ancient pollards so that they can act as an ecological 'bridge' to younger (but old) 'new' pollards which NT is creating. This is in order to bridge the generations of veterans so that the rich and scarce (and different) ecological diversity which each of them supports can be protected. This work is vital to their survival [NT/1A p11 §§7.3 - 7.6, p13 §8.2].

7.3 One of the recurrent difficulties with ecology and nature conservation is that the science is often imperfectly understood. The NT gave just one illustration in the

¹³ Dr Haycock, NT/2 series.

¹⁴ And Turner X, CD/700 07.09.07 p120 line 23.

context of HF. It is an important illustration which brings forward a number of points which are self-evident:

"Q. Let us just pick one of them [from NT/2, A^x 9]. At the bottom series of rows, we have lichens and fungi spelled out, and we have the first entry there, for example, the wax cap grassland fungi, 17 species. Can you just take that a little further for the inquiry's benefit?"

*A. Wax caps are a type of fungi. They are called wax caps because they have a very waxy cap to their fruit bodies. They are found mainly in grassland in Britain and there are actually 17 -- getting on for a quarter of the entire UK population, and they are, for instance, only associated, as far as we can tell, with old grassland, undisturbed grassland, and species-rich grassland. Also they highlight some of the complexities with many of the plant species on the forest, that in fact they have some sort of association with bryophytes, which are mosses, and nobody, actually, as far as I understand, really understands the connection; but one of the things about these very old habitats, which have been in existence for possibly over 1,000 years or more, is that there are many associations, and one type of plant can be quite dependant on another. So, for instance, our veteran trees, which you see are of international importance, around their root hairs have things called mychorrizal fungi. They basically break down minerals in the soil which make them available to the trees. Without the fungi, the trees would find it difficult to survive. So it is not just a matter of an individual plant being in isolation. The whole thing is a complex community which interacts with each other."*¹⁵

7.4 Just as with the description of other attributes of HF, there is no issue over these ecology or nature conservation matters, although BAA's sustainability appraisal did not even address the issue of protection of vegetation from air pollution¹⁶. This complex and imperfectly understood assemblage at HF has taken many centuries to reveal to

¹⁵ Turner X, CD/700 07.09.07 p120 line 23.

¹⁶ Rhodes XX, CD/700 p201 line 2.

the nation and to the international community what it reveals today. As understandings improve, it can be expected to reveal, or even to assist in revealing, more of nature's secrets. But the assemblage is vulnerable to modern pressures which have not previously been encountered [NT/1A p12 §7.6, NT/2A p3 §1.2.1].

- 7.5 Whilst some levels of NO_x concentrations are 'naturally' occurring, by far the larger proportion (app^x 80%) stems from human activity [NT/2A p3 § 1.2.1 and A^x 1]. The annual mean air quality limit for protecting vegetation has been derived from studies of agricultural crops [NT/2A p6 §1.4.3]. Ancient Trees and their interrelated ecology, especially bryophytes and lichens can be expected to be more vulnerable [NT/2A p5 §1.3.1, p6 §1.4.3 and NT/2C A^x 1 p4]. There is no demonstrable science on the precise extent or degree of that additional vulnerability, but that is the evidence before the SoS. Whilst physical damage to leaves from unnatural levels of NO_x may be seen if a thorough study is carried out, the damage may manifest itself in much less tangible ways such as by interfering with the very photosynthetic chemical processes upon which the vegetation relies. For older or weaker plants this can have implications for the hydration of the plant and its susceptibility to infection and predation [see eg NT/2A p5 §1.3.1]. UDC has also tendered complimentary evidence which is to the effect that damage caused by elevated NO_x concentrations may well not be immediately apparent and may take a more insidious course¹⁷. Only a thorough survey will reveal whether or not any damage has already been caused and, if so, the extent of it [NT/1A p20 §10.4].
- 7.6 As NT points out, all assessments provided by BAA relate to the annual mean concentrations, but potentially higher and harmful short-term concentrations are not addressed at all [NT/2A p2 §4.1 *et seq*]. The airport's contribution now, at 25mppa and at 35mppa to short term concentrations has simply not been addressed. It is, therefore, impossible from BAA's material to address this issue [§4.11, above and NT/2A p23 § 'conclusion'].
- 7.7 Plainly, a great deal is at stake here if HF suffers from elevated short or long term NO_x concentrations, or even from a postponement of improvements which might otherwise be expected in the absence of BAA's G1 proposals. HF is, in biological terms, incontrovertibly of international significance, let alone its importance to GB. Any risk

¹⁷ Dr Gibson, IQ (no transcript).

inherent in the decision-making process should not fall on HF. It is too important for that.

- 7.8 The NT's position (and that of UDC and SSE) is that BAA has failed to provide a sufficiently robust model for predicting annual mean NO_x concentrations. NT expects that UDC and SSE will make comprehensive submissions on the issue, but the short point is that the model has not been adequately validated [see eg §4.9, above and NT/2A p21 §3.8]. Whilst in other circumstances it might be acceptable to rely on an inadequate tool because it is the only one available, too much is at stake here. It is not even as if all that is required is a 'comparative' model. There are absolute figures given for the protection of vegetation, and a properly validated model is required before definitive conclusions can be drawn in relation to those absolute levels. The SoS will note that BAA's Air Quality volume of the ES is itself cautious about the value of the model for predicting absolute values [CD/6 p12 §6.1.8]. As NT has indicated in another context, there can be no going back.
- 7.9 BAA tendered no nature conservation / ecology witness – and there is room to speculate over the reason. But what is plain is that there a good deal about the ecology of HF where a full understanding of mechanisms, pathways and interrelations is yet to be achieved. The principle point of concern to the SoS will be that the ability to discharge the biodiversity duty [§4.10 above] has been severely compromised by BAA's failure to carry out any sufficient or adequate baseline monitoring of NO_x for the purposes of creating a robust model – or at all.
- 7.10 It is not that the science or the methods are new or difficult, it is simply that BAA did not start early enough. That is not HF's fault and it is not NT's fault. If BAA wants permission for its proposals it must either establish from a demonstrably robust foundation that no harm will result, or accept curbs on its aspirations in the event that the air quality level is or is about to be exceeded. If the precautionary principle is to have any practical application, it would point, in nature conservation and air quality terms, to permitting no further growth at STN until such time as BAA is able to demonstrate that its G1 proposals will cause no additional material harm. A synopsis of the NT's position is coherently and clearly expressed at NT/1A p20 §10.4:

"The need for much more detailed monitoring is vital if changes to this statutorily protected (SSSI) outstandingly important site are to be sufficiently well understood to

ensure that it will not be unacceptably damaged by the present proposals and for it to be adequately protected for the future. Further, without such an understanding it will not be possible for the National Trust to assess whether its statutory purpose of "permanent preservation" for the benefit of the nation can be fulfilled. To date the monitoring of air pollution has been inadequate for there to be an acceptable degree of certainty that material harm is not already being caused by air traffic, and for it to be possible adequately to predict what the impact of additional air traffic will be on Hatfield Forest. The Forest and its ecological interrelations have evolved over many centuries and cannot be recreated. The onus is on BAA to put in place sufficiently comprehensive monitoring to ensure that the position in relation to both existing and proposed emissions is properly clarified so that the results obtained represent an accurate and comprehensive picture." [NT/1A p20 §10,4]

The Inspectors have seen and heard from the author of that passage and will be able to judge (and report) that it will not have been lightly spoken.

Air Quality and Nature Conservation: Conclusion

- 7.11 NT cannot, of course, draw all the various factors for and against these proposals together and urge a specific conclusion based on any such assessment. But what it can and does do, is to impress upon the SoS that the severity of potential impacts from NO_x concentrations on a fragile system (which needs to cope with additional stresses in any event) is high but
- (i) BAA has not demonstrated that they would be avoided and
 - (ii) resists controls in the event that those levels are exceeded
- so that these failures are sufficient to underpin a refusal of permission for BAA's G1 proposals.

The Exclusion Zone

- 7.12 BAA has made it plain in the ES that the 30 µgm⁻³ level is an appropriate yardstick for assessing ecological effects [CD/13 p57 §10.4.4]. But then also asserted that there was, in any event, an 'exclusion zone' so far as affected any legal obligation to contain annual mean NO_x concentrations within that level [CD/6 p62 §11.2.3]. The Exclusion

Zone is a familiar shorthand. In many ways its significance comes mainly to the fore if permission is granted. The paradox here is that if NT (and others) are wrong in their submissions, and there is an exclusion zone, that heightens (i) the need for robust and secure controls to ensure that the 30 $\mu\text{g m}^{-3}$ level is not breached and, if it is breached (or threatened with breach), (ii) the need to ensure that secure and deliverable measures have been planned and will be executed in order to bring concentrations back below that level. Alternatively, of course, if there is no exclusion zone, the SoS may feel the need to ensure that government's ultimate responsibility for compliance is guarded by a similar control over BAA which can be relied upon to discharge the nation's obligation in the event that the level is overtopped.

- 7.13 Whilst, as the Inspectors noted at an early stage of the PI, this issue of whether or not there is an exclusion zone is a matter for submissions rather than evidence, the NT had considered it right to show its hand at an early stage by addressing the matter as part of its submitted material. The position set out in NT/2A section 2 constitutes the NT's submissions on the topic (*NB at p10 §2.3.5, 3rd line, the word 'according' is surplus and should be deleted*). Without detracting from the careful exposition expressed in NT/2A, the short point is that, in NT's submission, the limit value applies to all areas outside of an 'agglomeration' (as defined [see NT/2A p10 §2.3.3] - where the concept is that of a large town or city) whereas it is only in relation to the sampling points for the purposes of reporting to the Commission that the distance parameters do come into play – presumably for the purposes of monitoring 'background' levels over time.

Air Quality: Mitigation

- 7.14 This sub - topic breaks into two parts: first monitoring, and second, controls. BAA's submissions in relation to the draft s.106 so far as it affects monitoring are plainly designed to avoid parameters being fixed. There is, of course, merit in flexibility but, in common with the practice which applies to planning conditions, basic parameters should be identified. The NT also understands the long-standing advice of the SoS to be to the effect that wherever a planning condition can do the job of a s.106 obligation, a planning condition should ordinarily be used to secure the desired result [see now circ 05/05 §B2]. Hence the draft air quality and nature conservation conditions [NT/5.3 pp3 - 5]. Whilst it is the message rather than the precise drafting which is important, the general drift is designed to ensure that whatever else may be approved in order to respond to circumstances at the time, the basic minimum criteria are established now. The NT already has experience from earlier expansion proposals where the monitoring

has been governed by a budget which BAA had set rather than by the requirements of nature conservation [see NT/5.3 p2 §3.1].

7.15 The second element is one of control. It depends, in part on the monitoring, of course, but can be addressed in its own right. BAA offers no mitigation for potential effects of NO_x and resists any controls over its operations in the event that concentrations exceed the values derived in order to protect even 'ordinary' vegetation. But BAA's position was first encapsulated in this exchange:

"Q. ... At a time after the grant of permission in the event that 30 [$\mu\text{g m}^{-3}$] [annual mean NO_x concentration] is found actually to be exceeded within Hatfield Forest as a result or materially as a result of the operations carried out at and in association with Stansted Airport, what would BAA do?"

*A. BAA would fulfil its obligations under its planning consent, whatever they said BAA should do. So if this issue is to be addressed in a planning consent, it would presumably be addressed in a section 106 agreement."*¹⁸

It appears to be common ground that there can be no mitigation, as such, for damage caused by NO_x: the only step which can be taken is to avoid causing the damage in the first place. That is to say, control the source. This accords with the normal approach of looking first to 'avoidance' before addressing 'mitigation' – especially when no mitigation is possible: the next step of 'compensation' is, of course, singularly inapposite for HF which took centuries to evolve.

7.16 As already noted, the NT understands the long-standing advice of the SoS to be to prefer to use conditions rather than s.106 obligations where either could achieve the desired result. In any event, however, nothing by way of controls is on offer from BAA in the draft s.106. The NT has proffered a draft condition (on the usual basis) which calls for BAA to submit a scheme addressing controls [NT5.3 p3 §§1.1, 1.2 (where at §1.2(e) it should be made plain that the concentration relates to the annual mean)]. HF is far too important to leave it without protection in the event that the protection levels are overtopped. As NT has urged in another context, there would for HF, be no turning back [see eg NT/2A p20 §10.4].

¹⁸ Rhodes XX, CD/700 15.06.07 p58 line 9.

7.17 It is right to note that when BAA was asked what it could do if the $30 \mu\text{g m}^{-3}$ level were overtopped, BAA first asserted that little and then that nothing could be done¹⁹. BAA also stated that it was government's position expressed in the ATWP that compensation rather than mitigation was the preferred approach²⁰. That is not how NT reads the Aviation White Paper (ATWP) [CD/87] in relation to NOx limits and standards. (There may be force in the point with reference to NOx as an element in climate change issues when released at altitude, but that is an entirely different point [CD/87 pp39 - 41 esp §3.36 (box) and §3.39]). The ATWP expresses a determination to meet mandatory limits for ground level concentrations and speaks of a non-exhaustive range of potential measures which might be taken in order to meet them [CD/87 p38 §3.31]. It also encapsulates the message in entirely unequivocal terms that:

" we must ensure air quality standards around airports are met." [CD/87 p38 §3.32]

7.18 So government is not shrugging its shoulders over finding ways to meet mandatory levels. It expressly expects the aviation industry to find ways to meet them [see above]. So, even if NT is wrong over the mandatory nature of the $30 \mu\text{g m}^{-3}$ level, the same or similar steps as are contemplated for meeting mandatory levels could be expected to be relied upon in order to be sure of keeping within the $30 \mu\text{g m}^{-3}$ level if it is not already mandatory in its own right. Put more simply, the steps would be the same whether the limit is mandatory or not. BAA must find a way in either case. That is the drift of NT's suggested condition 1.2(e) and it is designed to concentrate resources at an early enough stage to ensure that strategies and mechanisms are available in order to respond to the issue if it arises [NT/5.3 pp3 - 4]. The NT's draft condition fully reflects government's determination to meet air quality challenges head-on and reflects government's express expectation that the aviation industry should and would find ways to resolve them. If the $30 \mu\text{g m}^{-3}$ level is not strictly a mandatory limit, then government will need a clear explanation for the international community if it accepts a lesser degree of protection for this SSSI, NNR and internationally important resource - and the more so if the opportunity to bring controls to bear is missed altogether.

¹⁹ Rhodes XX, CD/700 15.06.07 p55 line 21.

²⁰ Rhodes XX, CD/700 15.06.07 p59 line 21.

Air Noise: General

8.1 The Inspectors will have found BAA's air noise evidence at the PI singularly unconvincing and NT invites such a conclusion to be reported. The scope of the XX by UDC and by SSE of BAA's air noise witness covered sufficient of the ground of importance to NT that there was no need for NT to XX on essentially similar points. But (as with the ES [§4.4, above]) BAA's air noise witness did not, in any event, address HF at all. That was left to BAA's planner who relied on differences between the LAeq contours but, understandably (because he is not qualified in that field), could not really deal with their significance at more than the most superficial level²¹. NT, graciously adopts the thrust of the points made in XX of BAA's air noise evidence by UDC and by SSE relating to HF and to the use of the LAeq metric. NT also anticipates that firm submissions (with fuller references) will be made on those aspects by UDC and SSE (and others) to the extent that there is little to be gained by stating them at any length here beyond setting out some 'markers'.

8.2 In the context of this topic, the first crucial point to emphasise is that sound is energy. A sound pressure level meter measures energy and not 'noise'. 'Noise' is when the sound is unwanted in time, place, intensity, repetition, incongruity or characteristic (for example) [NT/3A p6 §§3.2 - 3.4]. In light of the evidence which had been tendered to the PI by BAA I asked for specific clarification on this aspect from NT's noise consultant:

"Q. Just pausing there, then, are we right always to equate sound with noise?"

A. No, sir.

Q. Are we right always to equate energy with noise?"

A. No, sir, there is no link there. Noise depends on psycho-acoustical factors and a whole range as to what is wanted and unwanted. Sound is the measurement of the energy, so you can equate sound and energy measurement better than you could ever equate noise and energy measurement or LAeq."²²

8.3 Second, the LAeq metric is an average of energy levels over time. (I leave the 'A' in 'LAeq' as a recurrent reminder that these are A-weighted dBs which, as will appear

²¹ See Rhodes XX, CD/700 15.06.09 p38 line 5.

²² Stigwood X, CD/700 07.09.07 p42.

below, do not sufficiently reflect the lower frequency components of aircraft sound energy, especially in a rural environment [NT/3A eg p44 §10.21 - 10.24].) Thus, the LAeq contours are not 'noise contours', they are contours of equal A-weighted energy. Third, the sight of an intruding noise source ('noise' because the sound is unwanted) heightens the invasiveness of the noise. As the NT advised the PI:

" ... It is commonly recognised that visual screening of a noise source can lessen its effect, the equivalent of a 5 dB(A) reduction. It follows that where the source of sound is a large, low-flying aircraft, the impact and intrusion is increased." [NT/3A p10 §3.3]

And lest the point be lost, HF is a Forest – not a 'big wood'. BAA may have temporarily misplaced its recollection of that during XX of NT when dealing with the visual element:

"Q. But a lot of the forest, by virtue of it being a forest, is not open?"

A. It is a forest, sir, and the forest is not a wood.

Q. No.

*A. It has a lot of open areas. A forest is very different to a wood, sir. I think [NT] will deal better with this point, but generally I think it is a misconception to think you will be in trees and not see these things."*²³

8.4 These are all obvious points, but need restating. They will, doubtless be highlighted further by UDC, by SSE and by others.

8.5 There are another two fundamental points which are more specific to the effect on HF. First, the mere presence of aircraft sounds is particularly incongruous in its own right in this historic landscape. Second, each take off or landing is not a short single event. The sound can be heard (and often the aircraft can be seen) for some little time. The duration of intrusive noise is in the order of some 1 minute 20 seconds to 2m 10s for each aircraft on take off [NT/3A p43 'Table 10']. Tranquillity is interrupted for that period. Thus each extra aircraft 'event' has a disproportionate effect on the intervening quiet period beyond that which the mere recitation of numbers would otherwise convey.

²³ Stigwood XX, CD/700 07.09.07 p292 line 20.

8.6 What was foreshadowed in opening and is now plainly demonstrated to the SoS by this PI is that

- (i) BAA's reliance on LAeq as the determining metric was demonstrably unsound,
- (ii) BAA's assertion that changes below 3dB LAeq were immaterial are palpably unsound,
- (iii) BAA had not addressed tranquillity,
- (iv) BAA's insistence that HF is not a sensitive place was not credible,
- (v) BAA's failure rigorously to address the effect on the historic HF and its visitors of the sight and sound of aircraft is uncured, and
- (vi) BAA's failure to address NT's point that an increase in numbers of aircraft has a disproportionate effect on the 'gap' between a/c movements remains.

Each topic calls for further observation in light of the evidence tendered to the PI, although there is an inevitable overlap between topics.

Use of LAeq and assessment of 'differences' as the determinative test

8.7 Plainly UDC and SSE will be making submissions (i) about the sole use of LAeq for assessing the effects of aircraft noise and (ii) on the assessment of effects by looking only to 'differences' between predicted LAeq values and between predicted 16 hour LAeq contours (save for some scattered description of LAMax_{slow}). The NT's evidence mirrored much of the evidence tendered by UDC and SSE on these topics. As already noted, the NT can anticipate the general thrust of those submissions and sees no need to elaborate upon them at any length. A few short 'markers' will suffice. NT addressed the issue in some detail [NT/3 series esp eg NT/3A p6 §3.5 *et seq*, p10 §3.18, p30 sections 8 &9, NT/3D p3 section 2, p11 section 4, p12 §5.5, p16 section 7]. Its evidence drew out the core messages which, doubtless, others will illustrate further. A few samples from NT's evidence bear repetition:

*"A: ... the 3 dB for LAeq does not relate to the character of the noise; it is a acoustician's tool. It is looking at sound, not at noise. We are looking at LAeq, it is just a measure of energy."*²⁴

...

²⁴ Stigwood X, CD/700 07.09.07 p9 line 8.

“Q: ... the inspector at Terminal 5 is recounting that as the department acknowledged, even a difference of half a dB LAeq could be significant. Was that limited to a difference in the LAeq contour?”

A: No, sir, very much not. If you look at both the inspector's conclusions and how he reported the case of the department, it is very clear -- and also the evidence of Dr Ollerhead -- it is very clear that the half a decibel change was half a decibel in the LAeq. So half a decibel change in the 16 [hour] LAeq was significant in that respect.”²⁵

...

“ ... barely perceptibly 'quieter' aircraft permit more aircraft movements for the same average sound pressure level (LAeq). Where intrusion relates to the number of intrusive events and their duration, any quota based on average sound pressure means adverse impact would increase significantly” [NT/3A p35 §9.1]

Tranquillity

8.8 Whilst intrusion by man-made physical static or mobile features can also disrupt 'tranquillity', from a 'noise' perspective NT drew attention to the WHO's approach:

“The WHO identify that disruption of tranquillity relates to the ratio of the unnatural sounds to the natural background. Unwanted noise and disturbance is recognised as harming tranquillity.” [NT/3B p2 §3.1 and see NT/3A p13 § 3.35, p24 §7.8]

It is undeniably true that aircraft can be seen and heard in HF today and that that will remain so for the 25mppa case. But there are gaps between flights and there is a tendency for the flights to be 'bunched'. Sometimes this has been characterised as the 'randomness' of flights, but it is the same point in different language. Whilst sometimes the gap can currently extend to some 20 minutes, expressed as an average in order to get a 'feel' for things, the gaps are a little under some 4 minutes 'today' [NT/2A p43 Table 10]. During that time the inherent timelessness of HF can be appreciated and the sense of history is restored. BAA's case on aircraft movements is,

²⁵ Stigwood X, CD/700 07.09.07 p12 line 12.

of course, that it expects the movements in the 35mppa case to be more regularly spaced and spread throughout the day [see §4.7, above].

8.9 But it is important to re-emphasise the disproportionate effect on the periods of respite which the predicted additional aircraft movements would bring. It is also important to note that whilst much of the debate at the PI focussed (quite properly) on the use of LAeq (and changes of LAeq) as BAA's determining yardstick, there is the additional element of 'tranquillity' which is so central to HF. Away from the immediate vicinity of the Shell House and associated car parking, there are, effectively no 'man-made' sights or sounds in HF other than those which would be familiar to a medieval visitor – except for the aircraft. Each one intrudes on the tranquillity of this very special and otherwise "timeless" place [see §4.1 above]. The intrusiveness was summarised on behalf of NT in this exchange:

"Q: Is the 3 dB point, if I might so characterise it, a matter that is crucial to Hatfield forest, or why are you dealing with it?

*A. Sir, it is not crucial to my assessment of the impact of tranquillity on Hatfield forest. The change in the daily LAeq, or even any movement in the LAeq contour is not the factor which affects the tranquillity in the forest. The factor that affects the tranquillity in the forest is that which I have focused on, which is the loudness and intrusion of events, their duration, their frequency and their characteristics. It is the case, though, of BAA. It is [BAA's] case that the only assessment tool is that of the LAeq contours, and whether there is a change of less than 3 dB."*²⁶

8.10 So whilst there is widespread concern and objection over the increase in aircraft movements from the point of view of annoyance and disturbance, there is an added element of the intrusion into that special and rare sense of tranquillity which HF can offer. There is no doubt but that aircraft already impinge on HF and its unique environment. But, as NT demonstrated, there can currently be periods of up to 20 minutes when aircraft can neither be seen nor heard because of the distribution within the hour(s) [NT/3A p55 §10.68]. The additional movements inherent in the G1

²⁶ Stigwood X, CD/700 07.09.07 p25 line9.

proposals as formulated effectively take the opportunity to experience any significant periods of tranquillity away. It would be an irreversible step change.

- 8.11 This step change is illustrated by comparing the range of the average 'tranquillity gap' in the 25mppa and in the 35mppa cases. The detail is set out in NT's evidence, but to make these submissions more manageable, I take simply the mid-point of the range shown at Table 10 [NT/2A p43], (with the range in parentheses). It would fall from some 1 minute 44 seconds (1'19 - 2'09) to just 58 seconds (0'33 - 1'23). The respite time would be halved or more than halved. Each take off is in itself intrusive for some 1¾ minutes (1'20 - 2'10). So not only will the respite be so dramatically shortened, the duration of the intrusion from the events will become longer than the respite between events if STN grows to 35mppa. The NT's evidence is plain and direct (perhaps even moderate in the circumstances):

"13.3 The increased ATMs proposed will significantly reduce the periods of respite between aircraft movements, disproportionate to the increase in number of movements. This change represents a step change in the impact and demonstrable harm to the amenity of the Forest. Typical respite periods could reduce from about 1 minute 50 seconds now [1 minute 19 for 25mppa] to 33 seconds. I expect there to be an adverse impact upon visitors and a change in the perception of the Forest.

13.4 The increase in ATMs removes the spare capacity for so much randomness and therefore the likely occurrence of longer periods of no aircraft take-offs as presently experienced." [NT/3A p62]

- 8.12 An additional factor, of course, is that the number of larger, heavier aircraft is expected to increase substantially. So the duration of the intrusive noise from these aircraft is likely to be longer and more intrusive, thus adding further to the impact²⁷.

²⁷ Stigwood XX, CD/700 07.09.07 p80 line 3.

8.13 None of this was addressed by BAA. At one point in the XX of the NT's noise consultant there appeared to be a challenge to his integrity. But it appears that that was not intended²⁸. So be it. But it prompted this singularly illuminating response:

*"A. ... I looked at the evidence and saw this waterfall. I saw when I looked at the respite periods I saw the effects. Up to that point I was looking at, as did BAA, at contours, and I saw that there was not a change in those, even though that does not necessarily identify the effects on the soundscape, and I looked at the other effects on the soundscape, and the one that I saw there and was quite concerned -- particularly when calculating it, it jumped out of the page at me -- was this loss of respite, because of this increasing activity. ... "*²⁹

These unchallenged figures set out in Table 10 [NT/3A p43] speak volumes.

8.14 That 'tranquillity gap' has been described as being at a 'tipping point'³⁰ or 'cusp'³¹ at 25mppa, but the disproportionate impact arising from 35mppa (as formulated) would take us 'over the waterfall'³². It would take away that special element of HF's environment and the experience which is available (and kept available) for the nation by NT in perpetuity – for ever.

HF as a 'sensitive use'

8.15 Whilst the omission of HF as a 'sensitive use' in the air noise volume of the ES [CD/5] might have been characterised as an oversight, it is plain from BAA's evidence that a conscious decision has been made that neither HF nor its visitors are 'sensitive' and that that is why no further assessment beyond looking at changes in LAeq was undertaken. And that is why HF did not even feature in the assessment [see §§4.3 - 4.4 above]. This passage from the XX of BAA's planning witness (for it was he, not the air noise witness who addressed noise in HF) demonstrates the issue:

"[Q] That is not quite what I asked. Is Hatfield Forest or more particularly its users within that category which could properly be regarded as being sensitive to noise?"

²⁸ Stigwood ReX, CD/700 07.09.07 pp98 - 99.

²⁹ Stigwood XX, CD/700 07.09.07 p72 line 23.

³⁰ Turner X, CD/700 07.09.07 p134 line 23.

³¹ Stigwood XX, CD/700 07.09.07 p82 line 12.

³² Stigwood XX, CD/700 07.09.07 eg p98 line 17, p99 line 8.

A. *No more than a wide range of other places and users which have not been specifically identified.*"³³

The NT does not seek to 'rank' HF alongside other sensitive uses or sites – that is not the point. BAA's test of sensitivity of use was one which guided the question of whether or not additional assessment beyond LAeq contours was apposite. Whatever may or may not be said about other areas or places, HF is " ... *everything that the National Trust says it is*". It is, for these purposes, undeniably a 'sensitive use' in every material sense, but especially in the sense of calling for detailed examination of the effects of BAA's G1 expansion proposals on this exceptional archaeological, cultural, educational and recreational resource.

- 8.16 BAA should have been aware of the special features of HF and the need to address them [see eg §§3.1, 4.1, 4.3, above]. This makes it all the more startling that BAA does not consider HF to be sensitive to noise so as to warrant further investigation of the effects of expansion upon it. It is the recurrent point: LAeq has been used as the determinative tool for identifying impacts and whether or not further assessment is needed. Its use in this fashion is inadequate, and has led BAA simultaneously to avoid addressing impacts and to understate the impacts which remain concealed within the 16 hour LAeqs.
- 8.17 The NT invites the SoS specifically to reject the suggestion that HF and its visitors are not 'sensitive' in the sense of warranting no further consideration beyond an LAeq sift. After all, the extracts from the ES recited above [§4.1 *et seq*, above] and explored further in XX of BAA³⁴ make the point plainly enough. The NT's evidence demonstrates in more detail why this unique and integral part of the nation's heritage warrants close attention being given to the likely effects of BAA's G1 proposals on the historic landscape, its ambience and value to visitors. A close attention, that is, which BAA has, through its methodology, consciously and deliberately avoided.
- 8.18 NT invites the SoS to conclude that HF warrants close attention to the likely adverse effects of additional aircraft movements, and closer scrutiny than any LAeq assessment can provide in any event.

³³ Rhodes XX, CD/700 14.06.07 p210 line 21.

³⁴ Rhodes XX, CD/700 14.06.07, and 15.06.07 generally.

Sight and sound of aircraft

- 8.19 This can be taken shortly. As NT has explained, the sight and sound of aircraft go hand in hand when addressing impact and intrusion [NT/3A p10 §3.3]. But the sight of aircraft over an historic setting ought also to weigh in the assessment of visual impact and in the assessment of effect on the cultural heritage. As demonstrated in opening [§§4.1 - 4.3, above] and addressed in XX of BAA³⁵, BAA did not carry out that exercise, and (so far as NT is aware) no material supplementing the ES or adding to the evidence was introduced by BAA on these topics: certainly none was drawn to NT's attention. These are important omissions from the ES and from BAA's overall assessment. The SoS should be extremely wary of relying on the conclusions expressed by BAA because the analysis has been omitted altogether. If confirmation is needed of the relevance of the topics as issues, the SoS will see that although the scale of differences will vary from case to case, the Liverpool and Coventry decisions weighed these aspects as important material considerations [for Liverpool see NT/3A p19 section 5.1 for CVT see CD/403 § 20.7 *et seq*]³⁶. The SoS will need to reach a conclusion on those issues aided by the NT's evidence and by the Inspectors' Report.
- 8.20 But it goes further. As was pointed out on behalf of NT, the characteristic of an aircraft's sound make it particularly intrusive – especially in a rural and otherwise peaceful area. The sight of the noise source exacerbates the intrusion [see §8.3, above]. Aircraft noise is already the most annoying transport noise [NT/3A p43 §10.17], but its low frequency content is not well-described by the A-weighted dB metric [NT/3A p18 §§4.19 - 4.21, p44 §10.21 - 10.24] and it also carries further than the mid and higher frequencies³⁷. None of this was addressed by BAA's analyses. BAA's material plainly understates the impacts of its G1 proposals in these respects as well, and NT invites the SoS so to conclude.

Disproportionate effect of numbers

- 8.21 BAA's air noise witness did not, even in rebuttal evidence, address disruption to tranquillity, still less even recognise that an increase in numbers of movements would adversely affect tranquillity. The PI heard from NT's noise consultant on the point. For example:

³⁵ See eg Rhodes XX, CD/700 14.06.07 p201 line 15 - p203.

³⁶ And see Stigwood X, CD/700 p105 line 1 *et seq*.

³⁷ Stigwood XX, CD/700 07.09.07 p89 line 5.

"Q. ... we note first, don't we, that there is no response from [BAA's air noise witness] on your assessment of tranquillity?

A. That is correct, sir.

Q. That is left to [BAA's planner]?

A. Yes.

Q. Is [BAA's planner] qualified in that field?

A. I am not aware of any qualification of [BAA's planner] in the field of acoustics or assessment of environmental impact such as noise." ³⁸

...

" ... There has been no assessment for BAA by an acoustician of the impact on Hatfield forest from aircraft sound or comparison with guidance that would assist such an assessment. ... " [NT/3D p11 §5.2]

...

"[BAA's air noise witness] leaves assessment of the impact upon leisure and culture to [BAA's planner]. He in turn describes it as not substantial, but does not have any information to support or quantify that description, other than LAeq contour data. I have already addressed the inadequacy of that information. ... " [NT/3D p12 §5.3]

...

"At paragraph 9.26 of his evidence [BAA's planner] draws conclusions on the wholly generalised basis [that] a change in LAeq of less than 2 dB is not material. I have shown there is no basis for such a conclusion. ... " [NT/3D p12 §5.5]

8.22 That brings the point about LAeq as the determinative yardstick back into focus, but the short point here is that the NT's assessment of disruption to tranquillity was not challenged: it was merely dismissed as not being a significant issue. The analysis is usefully tabulated at Table 10 [NT/2A p43] and expanded further in NT's oral evidence³⁹. The main messages have already been summarised above. The evidence and analysis on disruption is irrefutable and irrefuted. The disproportionate effect of an

³⁸ Stigwood X, CD/700 07.09.07 p24 line 9.

³⁹ Stigwood X, CD/700 07.09.07 p39 line 1 *et seq.*

increase in numbers has clearly been demonstrated, is not revealed by LAeq comparisons or at all, and would be a serious and irreversible impact on one of this nation's irreplaceable assets – unique in Europe, and possibly in the World [§2.4, above]. We invite the SoS so to conclude.

Air Noise: Conclusion

- 8.23 NT cannot, of course, draw all the various factors for and against these proposals together and urge a specific conclusion based on any such assessment. But what it can and does do, is to impress upon the SoS that the impacts from the sight and sound of aircraft on HF, on its users and, ultimately, on this very nation itself were
- (i) grossly understated by BAA and
 - (ii) are sufficient to underpin a refusal of permission for BAA's G1 proposals.

Air Noise: Mitigation

- 8.24 BAA must now recognise that its proposals will have a damaging effect on HF – this national resource of international importance. Or perhaps it needs to be told in firmer terms yet (i) that assessment by LAeq contours alone is too blunt an instrument and (ii) that impacts cannot simply be brushed off as being small in LAeq terms. For whatever reason, it offers nothing to mitigate the air noise impacts on HF and its users. More than that, it resists strenuously even the principle of exercising control over the number of movements for even a part of the operating day so as to preserve some element of tranquillity in the Forest for the benefit of the nation.
- 8.25 The NT told the PI that, without BAA's G1 proposals it sees the future of HF as being at a "tipping point" (see §8.15 above). That is to say, that with the expected levels and pattern of air traffic there would be just about sufficient gaps between the sight and sound of aircraft for the visitor to get some appreciation of the tranquillity which is so much a feature of the historic and rural ambience of HF. That much, at least, must be conserved. The Trust offered a potential way forward during its 'slot' at the PI⁴⁰ and it was refined in the NT/5 series. This calls for an approach where the aviation industry would need to work within the constraints of the environment and the interests of its neighbours by holding its hourly traffic levels and profile over a part of the day broadly to levels which are to be expected in the 25mppa case. That is the principle which BAA so hotly resists (the actual numbers are not material at this stage). If G1 is to be

⁴⁰ Introduced at CD/700 p4 line 22, p46 line 1 and Stigwood XX, CD/700 07.09.07 p109 line 14 *et seq.*

approved, a way must be found to preserve some of the reason why HF is unique and the opportunity for visitors to experience that uniqueness. There can be no turning back.

- 8.26 What may be surprising to the SoS given BAA's oft-repeated concern for the environment is that BAA has not sought to join with NT in trying to mould the principle of control over ATMs during part of the day in a way which might alleviate the difficulties which it asserts would arise. NT put forward a suggestion (on the usual basis) that levels of air traffic between 1100hrs and 1700hrs (local) should be 'capped'. The objective is to cap broadly to the levels which are to be expected in the 2014 25mppa case. The purpose will be plain enough - to retain something of (i) the spacing between flights and (ii) something of the 'bunching' of flights, so that something like the current pattern of movements is at least retained. Plainly if the same total number of ATMs is to be retained, such a cap would involve a notional redistribution of future extra ATMs ('notional' because these extra ATMs do not yet exist).
- 8.27 BAA told the Inquiry that its forecasting was based on a 'top-down' approach⁴¹. That is to say that it did not forecast and project routes and flight times forward to 2014, it assessed overall growth and then allocated growth to presumed ATMs and times of day for the purposes of assessment. These extra ATMs have not yet happened and will not happen and will not be planned unless and until after permission is granted for these proposals.
- 8.28 The NT has demonstrated that there is 'room' notionally to reschedule ATMs so that the total number remains the same whilst retaining the 'cap' [NT/5 series]. Plainly there will be more aircraft at other times of day as a result. Some 57 ATMs per day would 'move' if the cap were introduced. The NT shows that an average runway movement rate of 48 per hour would emerge in the hours outside of the 'cap' (compared with 43 per hour without a cap) [NT/5.3 A^x1 §3]. The NT has not refined the assessment to look to particular hours where the numbers might more appropriately be above or below this average. It is far too early to address that sort of question. BAA has not forecast 'upwards' from notional schedules and nor, sensibly, can NT. Of course there is concern that 'moving' some movements may result in additional movements in the

⁴¹ See eg Maiden XX, CD/700 21.06.07 p15 line 4, p107 line 15, p133 line 20, p136 line 3.

shoulder hours, but that need not be so. The format of the suggested condition ATM5 permits matters such as that that be addressed in any event.

- 8.29 The Airport Consultative Committee has introduced a response to the NT's draft ATM condition [ACC/124]. At ACC/124 §4 the ACC reminds the SoS that it differs from BAA over the expected pattern of movements in the future. The NT does not enter that debate. The SoS will adjudicate upon that matter (along with others) and will then be able to address the principle of control along the lines of NT's approach. It is also noted in ACC/124 §5 that the figures used to derive NT's draft condition stem from an average July Friday (on BAA's calculation). That is likely to be a busy day and hence a figure derived from a busy day would give considerable scope to BAA to schedule up to the cap for other less busy days (and within those days). ACC/124 §5 does not seek to quantify the extent to which busier days even than a July Friday would place a greater demand on the schedule. But it does also demonstrate that more ATMs than the average, can, of course, be accommodated if the schedule calls for it.
- 8.30 Nevertheless, NT does now better see the force of reintroducing back into its draft condition a reflection of the fact that the figures have been derived from BAA's calculated average movements [ACC/124 §5]. NT resisted inserting 'average' into the draft condition [NT/5.3 p1 §1.2] because there would be uncertainty without a definition of what is to be averaged over what period [NT/5.3 p2 §2.2]. All that is required to meet the point is to insert and define 'average' within the draft condition. The addition of the words " ... *expressed as an average over the scheduling season in which they are scheduled.*" could follow at the end of the sentence. Alternatively the scheme could be expressed to call for " ... *limiting the average number of ATMs scheduled for Fridays in July between 1100hrs and 1700hrs local time to 206 ATMs in the scheduling season in which they are scheduled.*" The purpose of inserting a number is to fix a parameter.
- 8.31 If the SoS agrees that HF warrants the limited, but valuable protection which NT seeks in the event that permission is to be granted, another way would be to remove the number altogether, leaving the condition open as to the constituent elements of the scheme, but making it plain in the DL what the SoS expects to see or to be achieved. What NT is seeking to achieve is the retention of a generally similar pattern of spaces and 'bunching / randomness' as is experienced today and as would, broadly, be expected at 25mppa (albeit based on BAA's expectations for 25mppa). The general

objectives were described to the PI when the NT made its appearance⁴². In this way, some periods, at least, of freedom from regular aircraft events could be secured.

8.32 The point which ACC (and BAA) is missing, however, is that the time has come for the aviation industry to adjust to the environment – not the other way round. The industry regularly overcomes challenges ranging from getting a heavier-than-air machine airborne at all, to addressing the effects of fuel crises, '9/11', engine noise emissions controls and myriad other challenges besides. The time has come for the STN aviation industry to work within constraints designed to protect the environment into which it has so recently been introduced. It did, after all, have to face the time when controls over night-time movements were imposed (doubtless despite resistance) and it now works within those controls. On one view, those night-time controls might be said to be a 'waste' of runway capacity [ACC/124 §6], but the time came when a judgment was made (i) that the capacity available at night should be controlled and (ii) that the capacity available within those controls would represent the 'best' use of the runway taking all factors into account. The position is no different in principle with NT's proposed approach. What is certain is that there will be an irreversible waste of an internationally unique resource if HF is not protected for a long enough period of the day for visitors to appreciate those ecologically and historically unique features which only that resource can provide. Those features are otherwise accessible to all visitors as an educational, cultural, recreational and living representation of medieval England. It can be found nowhere else.

8.33 If, despite the harm which will befall HF, the SoS is minded in principle to approve BAA's proposals, then a way must be found to preserve this unique asset this side of the 'tipping point'.

Overall

9.1 Whatever general support there may be from national or local policy for BAA's proposals, the SoS makes it plain that applications such as this must be assessed according to their own features and a clear determination to protect the environment. In short, the promoter must bring forward a package of proposals which is acceptable. The decision in relation to the Dibden Bay proposals and the recent decision at Coventry Airport both indicate what will happen if the promoter fails to assemble and

⁴² CD/700 07.09.07 eg p46 line 1, p109 line 15.

bring forward appropriately formulated proposals. The harder that BAA resists the imposition of (i) controls over air quality which are designed to protect a unique, but fragile historic landscape and (ii) controls designed to retain some degree of tranquillity for visitors to appreciate and to learn from all its many attributes, the stronger becomes the force of any reason for refusal based on those aspects.

- 9.2 The harm which would be caused and the unguarded risks that would be imposed on HF are severe and, in both cases, irreversible. They would be compelling reasons for refusal against which to consider other aspects contemplated by the Inspectors' topic 10.



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