

**Doc. No. SSE/16/a  
Case Ref. 2032278**

Appeal by BAA Ltd and Stansted Airport Ltd following the refusal by Uttlesford District Council of planning application UTT/0717/06/FUL

## **Proof of Evidence on behalf of Stop Stansted Expansion**

### **Water Impacts**

Ian Bruce

30 April 2007



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## **1 INTRODUCTION**

### **1.1 Personal details**

- 1.1.1 My name is Ian Bruce and I appear at the Public Inquiry on behalf of Stop Stansted Expansion ('SSE').

### **1.2 Qualifications and experience**

- 1.2.1 MA (Cantab) Mechanical Sciences.
- 1.2.2 I have spent 33 years working in the field of computer systems including analysing and specifying requirements for new systems, generating and analysing bids and proposals, designing, implementing, testing and modelling systems in North America and Europe. I have also spent four years oil well logging.

## **2 SCOPE OF EVIDENCE**

### **2.1 Core evidence**

- 2.1.1 SSE's evidence relating to water impacts was originally set down in Chapter 11 of Volume 1 of SSE's submission to UDC, July 2006 [CD/201] which addressed the information provided by BAA in Volume 14 of its Environmental Statement [CD/17].
- 2.1.2 Further evidence on water impacts was included in Volume 3 of SSE's submission to UDC, November 2006<sup>1</sup> dealing with the additional information provided by BAA in response to a Regulation 19 Notice from UDC [CD/22].
- 2.1.3 That evidence is superseded by this submission which incorporates more recent data now available and further analysis carried out.
- 2.1.4 In preparing the research and analysis underlying this evidence I have been assisted by other members of SSE.

## **3 WATER RESOURCES**

### **3.1 Regional context**

- 3.1.1 To enable a proper assessment of the water consumption implications of BAA's proposed development it is necessary to take account of the indirect and induced effects of the proposed development and to consider all of this airport-related demand in the wider context of the demands that will be placed upon water resources across the East of England as a whole arising from the major housing and other development planned for the period through to 2021 (and beyond).

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<sup>1</sup> CD/203, para 4.16.

- 3.1.2 The East of England RSS<sup>2</sup> will contain an unprecedented scale of planned new housing development with more than 500,000 new homes to be built in the Region by 2021. To put this in context: the East of England currently has 2.3m homes and a population of 5.5m<sup>3</sup>. By 2021, the number of homes will have risen to about 2.7m (allowing for those that have already been built since the start of the Plan period) and the population will be about 6.4m. In other words we are looking at about 17% more houses and 16% more people in the space of just 14 years.
- 3.1.3 The outlook on the supply side also needs to be considered. The East of England is the driest region in the UK (and Essex is the driest county) and it is predicted that by 2050 as a result of climate change, the Region will experience a reduction of between 30% and 40% in summer rainfall, partially offset by an increase of between 10% and 15% in winter rainfall.<sup>4</sup> The overall effect is estimated to be a 19% reduction in annual rainfall by 2050.
- 3.1.4 The extra water demands of the airport need to be considered in the wider context of the East of England where 27,000 new homes are due to be built every year for the next 15 years.
- 3.1.5 A reply received by SSE from DEFRA in June 2003, in response to a letter to the Secretary of State acknowledged that:
- 'within the Anglian Region, Essex has the most pressing challenges in terms of water resource availability';*  
and  
*'Additional growth as proposed at Stansted and other parts of the region will require careful planning to ensure that development does not proceed ahead of secure water supplies.'*<sup>5</sup>
- 3.1.6 The letter advised that issues under consideration for the future included:
- piping water from other regions;
  - desalination plants;
  - re-use of 'grey water' and recycled effluent;
  - widespread household metering;
  - investment to increase reservoir capacity.

## 3.2 Stansted context

- 3.2.1 The 2002 SERAS environmental impact study by Halcrow<sup>6</sup> on behalf of the Department for Transport ('DfT'), highlighted water supply as a major issue in relation to maximum use of the Stansted runway. It concluded:

*'Large increases in passenger numbers significantly increase the airport's demand for water, and also within the surrounding residential areas that provide the human resource base for the airport. Without any further water*

<sup>2</sup> Regional Spatial Strategy. This is still in gestation – see documents CD/74 to CD/76.

<sup>3</sup> 2001 Census data updated to 2003 by the Office of National Statistics (ONS).

<sup>4</sup> 'Climate Change Scenarios for the United Kingdom: The UKCIP02 Briefing Report' April 2002, prepared by the UK Climate Impacts Programme in conjunction with Hadley Centre and Tyndall Centre on behalf of DEFRA [CD/252].

<sup>5</sup> Letter from Water Supply and Regulation Division, DEFRA, 12 June 2003 [SSE/16/c Appendix 1].

<sup>6</sup> 'SERAS Stage Two Appraisal Findings Report'. Halcrow (on behalf of DfT), April 2002, [CD/235].

*resource development or effort to manage demand, the resource zone that supplies Stansted Airport would have a deficit. Assuming that water companies maximise existing strategic links and their use of existing and planned licensed resources between resource zones, the Stansted resource zone would still have a slight deficit. This also assumes that companies will achieve their leakage reduction targets, and also allows for environmental demands. Abstraction recovery for the benefit of the environment will be a significant impact upon Three Valleys Water.'*<sup>7</sup>

*'It may be difficult to meet the significant increase in demand even through supply and demand management and water saving technology.'*<sup>8</sup>

- 3.2.2 Volume 11 of the BAA Environmental Statement [CD/14] addresses water impacts but is narrowly focused. BAA confines itself to assessing only the impact of the proposed development on Stansted Airport's water supply and the adequacy of the current contractual arrangements and existing infrastructure to cope with that.
- 3.2.3 Three Valleys Water ('TVW'), which serves Stansted Airport, relies on abstraction from local boreholes for most of its water and it is clear from the Panel's report referred to above (which reflected evidence from the Environment Agency) that the current level of abstraction in the East of England is unsustainable.
- 3.2.4 BAA's Environmental Statement does not consider the indirect and induced effects of the proposed development – either in relation to water consumption or waste water. Whilst BAA has quantified the indirect and induced employment effects of the proposed development,<sup>9</sup> it has disregarded the related water impacts. (In our evidence relating to employment and housing impacts [SSE/10/a] we refer to housing implications.)
- 3.2.5 It is not even clear whether BAA has addressed the issue of *indirect on-airport* water consumption arising from the proposed development i.e. whether on-site water users such as hotels, offices and all the various other airport support activities are included in the assessment.
- 3.2.6 When the aggregate and cumulative impacts are properly assessed, it would be helpful to obtain advice from TVW on the demand and supply implications, also taking account of the planned housing development in the TVW area over the period to 2021. Similarly it would be helpful to obtain advice from Thames Water Utilities Ltd ('TWUL') on the waste water/sewage implications.
- 3.2.7 BAA should also be asked to provide seasonality data for water demand and supply. The airport's peak demand is likely to be at its highest during the summer at which time the Region's water resources are most stretched.
- 3.2.8 BAA should also be asked to explain what actions it proposes to take to deal with the excess of demand above the 3.0m litres per day ('MLD') allowed for in the TVW resource plan.<sup>10</sup> Even if substantial efficiency improvements were to be achieved (and BAA states that there is no further scope for efficiency improvement<sup>11</sup>), airport water consumption would exceed 3.0 MLD under our 2014 projection.

<sup>7</sup> Ibid, para 9.7.01, p301.

<sup>8</sup> Ibid, Table 9.20, p302.

<sup>9</sup> CD/11, Table 22.

<sup>10</sup> BAA Environmental Statement, Vol. 14, para 8.2.4 [CD/17].

<sup>11</sup> CD/17, para 6.1.1.

### 3.3 BAA projections for water consumption

3.3.1 BAA claims that 'The Airport has experienced significant improvements in water efficiency in recent years'.<sup>12</sup> This is true in terms of usage per passenger although the total water usage of Stansted Airport has doubled since 1999 and now stands at 2 MLD. Moreover, the efficiency improvements went into reverse in 2005/06 with the result that airport water consumption increased 14% compared to only a 5% increase in passengers over the previous year.<sup>13</sup>

**Table 1: Stansted Airport water consumption (actual)**

	2003/04	2004/05	2005/06
Water consumption (million litres)	623.4	625.3	714.9
<i>Million litres per day (MLD)</i>	<i>1.71</i>	<i>1.71</i>	<i>1.96</i>
Passengers handled (million)	19.4	21.2	22.2
<i>Litres per passenger</i>	<i>32.1</i>	<i>29.5</i>	<i>32.2</i>

Source: BAA annual 'Corporate Responsibility'/'Towards Sustainability' reports and BAA passenger statistics.<sup>14</sup>

3.3.2 For the 25mppa scenario, BAA projects airport water usage of 2.02 MLD and for the 35mppa scenario BAA projects 2.83 MLD.<sup>14</sup> This is precisely 40% more than BAA's projection for 25mppa and therefore assumes no efficiency improvements. In fact, BAA states [CD/17] that further efficiencies are unlikely to 2014 'as these would require significant alterations to existing facilities'.<sup>15</sup>

3.3.3 Using 2005/06 Stansted Airport water consumption data as the baseline (the most recent information available to us) and assuming no efficiency gains, results in the following projections:

**Table 2: Stansted Airport water consumption (SSE projections)**

	Actual 2005/06	25mppa Base Case	35mppa 2014	40mppa 2014	45mppa 2021	50mppa 2030
Water consumption (MLD)	1.96	2.20	3.08	3.52	3.96	4.40
<i>Litres per passenger</i>	<i>32.2</i>	<i>32.1</i>	<i>32.1</i>	<i>32.1</i>	<i>32.1</i>	<i>32.1</i>

Source: Based on 2005/06 data from latest BAA Corporate Responsibility report – assumes no efficiency gains.

<sup>12</sup> Ibid.

<sup>13</sup> BAA Stansted Corporate Responsibility Report, 2005/06, Table 6, p19 [CD/161] shows the 14% year on year increase in water consumption and the 5% increase in passengers is shown in BAA traffic statistics at: [http://www.stanstedairport.com/assets/B2CPortal/Static%20Files/Traffic\\_March\\_06.pdf](http://www.stanstedairport.com/assets/B2CPortal/Static%20Files/Traffic_March_06.pdf)

<sup>14</sup> BAA Environmental Statement, Vol 14, Table 3, p11, [CD/17].

<sup>15</sup> Ibid, para 6.1.1.

3.3.4 BAA's own projections are as follows:

**Table 3: Stansted Airport water consumption (SSE projections)**

	Actual 2005/06	25mppa Base Case	35mppa 2014	40mppa 2014	45mppa 2021	50mppa 2030
Water consumption (MLD)	1.96	2.02	2.83	3.23	n/a	n/a
<i>Litres per passenger</i>	32.2	29.5	29.5	29.5	n/a	n/a

Source: BAA Environmental Statement Vol 14 [CD/17], Table 3 (page 11) and para 8.71 (page 13).

3.3.5 It is clear, even from BAA's own projections that the proposed development would not meet the water efficiency target of 'at least 25%' referred to in paras 3.4.4 and 3.4.5 below. Indeed, BAA states that it would not achieve any per capita reduction at all. In view of the scarcity of water resources in Essex and the East of England as a whole, and the inevitability of this becoming a more serious problem in the future, BAA's application should be refused on these grounds alone. The national, regional and local importance of water outweighs the national, regional and local importance of permitting Stansted to provide more leisure flights.

3.3.6 In relation to the 35mppa case BAA states:

*'The effect of the 35mppa case has a minimal effect upon regional water supplies. Improving efficiencies in water use over the last decade has meant that the provision made for the original Airport of 3.0 MLD will not be exceeded by the 35mppa case in 2014.'*<sup>16</sup>

We refute this conclusion. Without further efficiency gains Stansted's water usage would be 3.08 MLD a day at 35mppa and 3.52 MLD at 40mppa. And assuming passenger throughput on the existing runway continued to grow beyond 2014, water usage would increase to 3.96 MLD at 45mppa and to 4.40 MLD at 50mppa.

3.3.7 In relation to the 40mppa case, BAA states:

*'Increasing passenger throughput to 40 mppa is predicted to increase average daily consumption of water at the Airport to 3.23 MLD. This is an increase of 0.4 MLD over the 35 mppa case but only represents 9.2% of the planned increase in demand within the local resource zone and only just exceeds the provision made for the original Airport. The impact therefore continues to be minor adverse and requires no additional mitigation from the statutory water supplier.'*<sup>17</sup>

Having previously placed such emphasis upon its ability to work within its 3 MLD 'allocation', BAA dismisses the 'overshoot', in much the same way as it disregards the wider water problems faced by the Region. In fact the 'overshoot' would arise at a passenger throughput of 37mppa.

3.3.8 No account has been taken of indirect and induced effects in our projections above. Higher projections would emerge if these effects were included, namely, increased water usage arising from the additional employment (with knock-on implications for housing) and commercial development which BAA states would stem from airport expansion.<sup>18</sup> Thus BAA is selective in presenting the 'benefits' of indirect and induced employment but is silent on the related adverse impacts.

<sup>16</sup> BAA Environmental Statement, Volume 14, para 8.3.4 [CD/17, p11].

<sup>17</sup> Ibid, para 8.7.1[CD/17, p13].

<sup>18</sup> BAA Environmental Statement, Volume 6, Table 27 [CD/9, p27].

### 3.4 Planning context

3.4.1 The East of England already has difficulties in meeting the demand for water at certain times of the year and given that demand will increase significantly over the coming years whilst the underlying source of supply (i.e. precipitation) will decline, the importance of making best use of scarce water resources is a key issue in relation to this planning application.

- The Environment Agency, in its evidence to the Examination in Public ('EiP') of the Draft East of England Plan, stated:

*'The East of England is the driest region in England and Wales. There are limited indigenous water resources. Most resources are already committed to the needs of the environment and existing users. ... The most immediate pressures are in the south of the region (Essex and Hertfordshire) served by Essex and Suffolk Water, Three Valleys Water and Thames Valley Utilities.'*

3.4.2 The Panel's report following the EiP of the Draft Regional Plan identified the shortage of water as a key strategic issue for the East of England Region. Amongst the points made in the report are:

*'The issues concerning water require special mention, as they affect the East of England more than most other regions.'*<sup>19</sup>

*For water resources, for example ... additional growth at higher levels beyond 2016 or 2021 is likely to necessitate additional sources of water supply. As we understand it there is no reason to expect increasing rainfall in the East of England. Water supply to the region will depend on new water resource infrastructure, with not only high investment costs but also strategically significant developments, and their associated environmental impacts, in other regions. A question that will arise, indeed many are asking it now, is how far it will remain sensible in future to move increasing amounts of water into the driest region to support more growth, or whether it is practicable or sustainable to steer more growth to places where water supply is not a problem.'*<sup>20</sup>

*'The EA's pre-EiP presentation advised that a twin-track approach to water-resource planning needs to be adopted in order to avert the arrival of a 'water deficit' in some areas within five years. This involves coupling early completion of all currently-planned new resource development with a 'step-change' in the level of demand management and water efficiency. Even under that approach the proposed growth of population and housing will return some areas to deficit by the late 2020s without the development of additional new resources, and other pressures such as climate change and environmental needs/statutory requirements could advance that date. According to EA new resource development beyond current plans (such as further inter-catchment transfers, new reservoirs, desalination etc) may be technically feasible but will become increasingly costly and pose additional environmental risks.'*<sup>21</sup>

<sup>19</sup> East of England Plan, Examination in Public, Report of the Panel, Jun 2006, [CD/75, p3, para 2.4].

<sup>20</sup> Ibid, para 3.21, p18.

<sup>21</sup> Ibid, para 9.34, p155.

3.4.3 It is clear that the growth in population, housing and other development in the East of England can only be sustained if the issues of water supply and demand are carefully managed; this will include the need for significant water efficiency gains.<sup>22</sup>

3.4.4 The Panel's Report, following the EiP, stated:

*'It was clear from our seminar presentation by the Environment Agency that increasingly unsustainable water abstraction and constraints on supply are serious issues for the region as a whole but are especially critical in some of the central and southern parts in line for considerable development. We reiterate here the essential point that, by whatever route it is achieved, all new development in the region must secure water savings of at least 25% over current consumption.'*<sup>23</sup>

3.4.5 The Government's 'Proposed Changes to the Draft East of England Plan' published in December 2006 endorse the water efficiency target of '**at least 25%**' for all new development – and 'at least 8%' for existing development – but suggest that it is impractical to monitor the two separately.<sup>24</sup> Separate monitoring may indeed be impractical for the domestic sector but it will generally be less problematic in relation to large commercial water users such as Stansted Airport. In any event, whether separately monitored or not, any proposed new development should be required to meet the efficiency target and the appropriate time to apply this test must be in the course of the planning process.

3.4.6 The Environment Agency report prepared for the EiP of the East of England Plan includes the results of modelling a number of scenarios to supply water to an extra 505,500 homes in the East of England up to 2030. The modelling looked at a range of water saving measures and water companies' 25 year plans, including new water resources and infrastructure and the Environment Agency's report concluded:

*'New resource and infrastructure development beyond 2015 is uncertain. Further new resource development is technically feasible (e.g. water transfers into the region from the River Trent, new reservoirs, desalination etc). However, this will become increasingly costly and pose additional risks to the environment in our region or adjacent regions where water transfer is planned.'*

...

*'demand management (principally water efficiency) is key to ensuring that new development is sustainable in the long term.'*

...

*'Delivery of the ODPM's sustainable communities target of reducing water consumption by 25% in all new properties. Technologies exist to achieve this without significant cost. This would delay the need to develop new resources by up to 10 years from about 2015 onwards.'*<sup>25</sup>

3.4.7 The Government has endorsed the water efficiency target of 'at least 25%' for all new development and 'at least 8%' for existing development although suggests that it is impractical to monitor the two separately. The Government's proposed wording of the water efficiency policy in the RSS (WAT1) is to the effect that it will work with

<sup>22</sup> Ibid, para 9.41, p157.

<sup>23</sup> Ibid, para 2.4, p4.

<sup>24</sup> Government's Proposed Changes to the Draft East of England Plan, Policy WAT1 [CD/76].

<sup>25</sup> 'A Report to Inform the Environment Agency's Response to RSS14 Consultations', Environment Agency, July 2005, Section 4.2, p41, 42.



the Environment Agency, water companies, OFWAT, and regional stakeholders to ensure that development provided for in the RSS is matched with improvements in water efficiency. The supporting text states that the target should be to achieve (per capita) savings in water use compared with 2006 levels equivalent to at least 25% in new development and at least 8% in existing development.<sup>26</sup>

3.4.8 In responding to the Government's Proposed Changes to Plan, the East of England Regional Assembly ('EERA') makes the valid point that 'the absence of separate monitoring of the water efficiency targets 'may make the policy easier to monitor but more difficult to implement'.<sup>27</sup>

3.4.9 If the water efficiency targets are not achieved – and it may be several years before an informed view can be taken on the prospect of achieving them, especially if a 'broad brush' approach to monitoring is applied – this will accelerate the need for costly investment including for example, water transfers into the Region from the River Trent and, possibly, desalination plants. Such options will, incidentally, be energy intensive and make carbon reduction targets more difficult to achieve.

3.4.10 The Environment Agency provided the following advice to the EiP Panel:

*'The success of a water efficiency policy has the biggest impact in the later years of the planning periods. It relies on the accumulation of measures being installed in all new properties over the complete planning horizon, starting immediately. The effectiveness of water efficiency will therefore be diminished should there be a delay in the implementation, or some dilution of the scenarios presented here.'*<sup>28</sup>

3.4.11 The Environment Agency's advice emphasises the importance of 'immediate implementation' of the targets and of avoiding dilution if the medium-term and long-term targets are to be achieved. The alternative is that there would either need to be major investment in costly and energy intensive water infrastructure projects – or water rationing. In addition, if monitoring of progress on water efficiency is slow or ineffective, this may result in problems not being discovered until it is too late to avoid a serious water supply problem. These are all reasons why the planning process must play a key role in helping to ensure that the targets are met. The ability of a new development to meet the 25% water efficiency target must be a pre-condition for approval of the development. This will be particularly important in the case of major water-intensive developments, such as an airport.

### **3.5 Waste water and sewage**

3.5.1 The waste water from Stansted Airport is processed at two sewage treatment works ('STW'). 'Trade waste' from the runways and the de-icing of aircraft is processed both at Rye Meads STW and Bishops Stortford STW and household-like sewage is processed at Bishops Stortford STW.

3.5.2 Like most sewage treatment works in the southern part of the Region these are operating at, or close to, their capacity and will also need to provide for the substantial increase in new housing that is planned for the coming years.

<sup>26</sup> Government's Proposed Changes to the Draft East of England Plan, Policy WAT1, para 10.6 [CD/76].

<sup>27</sup> EERA Response to the Government's Proposed Changes to the Draft East of England Plan, March 2007.

<sup>28</sup> 'A Report to Inform the Environment Agency's Response to RSS14 Consultations', Environment Agency, July 2005, Section 4.2, p42.

- 3.5.3 Go-East, the Environment Agency and EERA, in partnership with Thames Water and Anglian Water commissioned Halcrow to produce a report:

*'to assess the ability of existing wastewater infrastructure and receiving watercourses within the East of England to accommodate the growth levels proposed in the Panel Report (July 2006) on the East of England Plan.'*<sup>29</sup>

- 3.5.4 In its summary for the Stansted/M11 Sub-Region the Halcrow report states:

*'Harlow and the majority of East Hertfordshire drain to Rye Meads STW which is covered in detail in section 5.2. More information is required to assess the capacity of Saffron Walden and Bishops Stortford STW. ...;*

*Further investigation is required into the expansion of Stansted Airport and the potential implications upon Rye Meads STW ...'*<sup>30</sup>

- 3.5.5 It seems clear from the above that there are potential capacity problems at Rye Meads STW and that there *may* also be a capacity problem with Bishop's Stortford STW. Both of these STWs are relied upon by Stansted Airport. It also seems clear that investment projects to increase capacity could not commence until 2010 at the earliest and that these projects would take a minimum of 18 months for smaller projects and up to ten years for major projects.

- 3.5.6 BAA has not adequately addressed this issue in its Environmental Statement and it is apparent from the Halcrow report that there may be difficulties. Potentially very significant adverse impacts could arise if the local STWs upon which the airport depends were unable to cope with the additional scale of airport waste water/ sewage which would arise if the planning application were to be approved on top of the additional waste water/sewage that would stem from the new housing and other development planned for their catchment areas.

- 3.5.7 BAA advises that:

*'Under the existing discharge consent TWUL [Thames Water Utilities Ltd] are obliged to take all foul discharges from the Airport as long as the Airport remains a single runway Airport. Taken with other regional development TWUL may need to carry out development of their treatment works to do so.'*<sup>31</sup>

- 3.5.8 In relation to the 35mppa case, BAA concludes in its Environmental Statement:

*'Due to the 40% increase in discharge to TWUL, the effect of the primary assessment case is considered as moderate adverse.'*<sup>32</sup>

and for the 40mppa 'sensitivity test', BAA concludes:

*'Therefore the effect of increasing DWF [Dry Weather Flow] for the 40 mppa case over that of the 35 mppa case is considered minor for the overall performance of the foul system.'*<sup>33</sup>

The use of the term 'minor' for the 40mppa case is misleading because it describes only the additional impact – over and above the 35mppa impact. However, the

<sup>29</sup> 'East of England Capacity Delivery Strategy Study: Phase 1 Final Report', Halcrow, Dec 2006, p1, Section 1.

<sup>30</sup> Ibid, p34, Section 5.5.8.

<sup>31</sup> CD/17, para 9.2.8.

<sup>32</sup> Ibid.

<sup>33</sup> Ibid, para 9.6.5.

35mppa impact is itself described as 'moderate adverse' and so the 40mppa impact must be at least 'moderate adverse'; it may in fact be 'high adverse'.

3.5.9 BAA's planning application is not, of course, for 35mppa or 40mppa but for there to be no passenger limit and as we have shown elsewhere in our evidence<sup>34</sup> we believe that 45mppa is likely by 2021 rising to 50mppa by 2030. The impacts in this area would be proportionately greater with higher levels of passenger throughput.

3.5.10 The Halcrow report states:

***'The scale of the investment programme to deliver the required capacity in waste water infrastructure will be significant. With much of the sewer network and the sewage treatment works within the region operating at or close to capacity, the scale and rate of the proposed development will often necessitate the expansion of infrastructure within the next five year regulatory planning cycle, beginning in 2007 for implementation between 2010 - 2015.'***<sup>35</sup> [our emphasis]

and:

*'some expansion is likely to be required. Until further analysis is carried out, the necessary scale of this expansion cannot be accurately predicted. Typical delivery times for expansion works are as follows: 18 months to 3 years for small sewer and sewage treatment work upgrades, 3 to 5 years for large upgrades, up to ten years for major expansion projects.'*<sup>36</sup>

3.5.11 Thus, if there is a need to upgrade facilities at Rye Meads and Bishops Stortford STWs the work could not start until 2010. The timescale for completion obviously depends on the scale of the works involved which at this stage we do not know. However, the indications given by Halcrow are that small upgrades require up to three years, large upgrades up to five years and major upgrades up to ten years.

3.5.12 Clearly there is a potential issue here. The application could not be approved if the local sewage/waste water infrastructure was unable to cope with the cumulative impact of airport expansion as proposed by BAA (including the indirect and induced impacts) and the major housing and other development that is planned for the local catchment area over the coming years. SSE does not have the resources to undertake the inquiries necessary to establish the facts. We believe that at this stage UDC is perhaps best equipped to establish the facts and report these to the Inquiry. In addition, representatives from Halcrow and/or TWUL should be asked to give evidence to the Inquiry on this point.

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<sup>34</sup> SSE/4/a.

<sup>35</sup> Ibid, p1, Section 1, 2nd para.

<sup>36</sup> Ibid, p37, Section 6.1.

## 4 CONCLUSIONS

- 4.1 BAA appears to be suggesting that the possession of a contract with TVW (made many years ago) provides a guarantee that its water needs for the proposed development will be met. This is an untenable position in today's circumstances because it fails to take account of the wider regional context in relation to both supply and demand. This application must be considered in that wider context, taking account of the large number of new homes and other development planned for the Region (much of it locally) to 2021 as well as the predicted decline in regional precipitation over the same period arising from climate change.
- 4.2 BAA cannot be exempt from the need to make best use of scarce water resources within the Region and the water efficiency targets emerging from the RSS process must be a material planning consideration.
- 4.3 BAA's has understated the increase in water consumption that would arise from its proposed development both in relation to the 35mppa base case and the 40mppa sensitivity. Indirect and induced effects have been ignored and the current baseline has been understated.
- 4.4 BAA's conclusion that the water impacts of its proposed development would be 'minor adverse' is unreliable and not supported by the evidence. It is also worth noting that Halcrow's 2002 report for SERAS (not to be confused with its 2006 report for Go-East, the Environment Agency and EERA) concluded that the impact of maximum use of Stansted's existing runway for water resources would be 'high adverse'.<sup>37</sup>
- 4.5 No assessment has been carried out in relation to growth beyond 40mppa. We estimate that, if the application were to be approved, passenger throughput on the existing runway would be about 45mppa by 2021 rising to about 50mppa by 2030.
- 4.6 Potentially very significant adverse impacts could arise if the local STWs did not have the capacity to deal with a substantial increase in waste water and sewage outflows from Stansted Airport taking account also of other planned development in their local catchment areas – both airport-related and non airport related. This issue requires to be investigated as a matter of urgency.

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<sup>37</sup> 'SERAS Stage Two Appraisal Findings Report'. Halcrow (on behalf of DfT), April 2002, Table 9.20. [CD/235].

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## **1 INTRODUCTION**

### **1.1 Personal details**

- 1.1.1 My name is Ian Bruce and I appear at the Public Inquiry on behalf of Stop Stansted Expansion ('SSE').
- 1.1.2 In preparing the research and analysis underlying this evidence I have been assisted by other members of SSE.

### **1.2 Qualifications and experience**

- 1.2.1 MA (Cantab) Mechanical Sciences.
- 1.2.2 I have spent 33 years working in the field of computer systems.

## **2 SCOPE OF EVIDENCE**

### **2.1 Core evidence**

- 2.1.1 SSE's evidence relating to water impacts was originally set down in Chapter 11 of Volume 1 of SSE's submission to UDC, July 2006 [CD/201] which addressed the information provided by BAA in Volume 14 of its Environmental Statement [CD/17].
- 2.1.2 Further evidence on water impacts was included in Volume 3 of SSE's submission to UDC, November 2006<sup>1</sup> dealing with the additional information provided by BAA in response to a Regulation 19 Notice from UDC [CD/22].
- 2.1.3 That evidence is superseded by SSE/16/a which incorporates more recent data now available and further analysis carried out. This is a summary of SSE/16/a.

## **3 WATER RESOURCES**

### **3.1 Regional context**

- 3.1.1 To enable a proper assessment of the water consumption implications of BAA's proposed development it is necessary to take account of the indirect and induced effects of the proposed development and to consider all of this airport-related demand in the wider context of the demands that will be placed upon water resources across the East of England as a whole arising from the major housing and other development planned for the period through to 2021 (and beyond).
- 3.1.2 The East of England RSS<sup>2</sup> will contain an unprecedented scale of planned new housing development with more than 500,000 new homes to be built in the Region

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<sup>1</sup> CD/203, para 4.16.

<sup>2</sup> Regional Spatial Strategy. This is still in gestation [CD/74 - CD/76].

by 2021. To put this in context: we are looking at about 17% more homes and 16% more people in the East of England Region in a space of just 14 years.

- 3.1.3 The outlook on the supply side also needs to be considered. The East of England is the driest region in the UK (and Essex is the driest county) and it is predicted that as a result of climate change, the Region will experience a 19% reduction in annual rainfall by 2050.
- 3.1.4 The Government's Proposed Changes to the Draft East of England Plan support a water efficiency target of 'at least 25%' for all new development and 'at least 8%' for existing development.

### 3.2 Stansted context

- 3.2.1 The 2002 SERAS environmental impact study by Halcrow<sup>3</sup> on behalf of the Department for Transport ('DfT'), highlighted water supply as a major issue in relation to maximum use of the Stansted runway. It concluded:

*'It may be difficult to meet the significant increase in demand even through supply and demand management and water saving technology.'*<sup>4</sup>

- 3.2.2 The 2002 Halcrow report defined the impact of allowing maximum use of Stansted's existing runway on water resources as 'high adverse' and BAA now describes this as 'moderate adverse.'<sup>5</sup> This appears incongruous because, since 2002, the scale of housing development planned for the Region has increased whilst the predictions for less rainfall in future have become firmer.
- 3.2.3 Three Valleys Water ('TVW'), which serves Stansted Airport, relies on abstraction from local boreholes for most of its water and it is clear from evidence provided by the Environment Agency at the Examination in Public ('EiP') of the Draft East of England Plan<sup>6</sup> that the current level of abstraction in the East of England is unsustainable.
- 3.2.4 The BAA Environmental Statement ('ES Vol 11') [CD/14] is narrowly focused upon assessing only the impact of its proposed development on Stansted Airport's water supply and the ability of existing arrangements and infrastructure to cope with that.

### 3.3 BAA projections for water consumption

- 3.3.1 BAA claims that *'The Airport has experienced significant improvements in water efficiency in recent years'*.<sup>7</sup> This may (until recently) have been true in terms of usage per passenger but the total water usage of Stansted Airport has doubled since 1999 and now stands at about 2 million litres per day ('MLD'). Efficiency improvements went into reverse in 2005/06 and airport water consumption rose 14% compared to only a 5% increase in passengers over the previous year.<sup>8</sup>
- 3.3.2 BAA's assertion that there is no scope for efficiency gains over the plan period results in projections for Stansted's water consumption higher than the projections

<sup>3</sup> 'SERAS Stage Two Appraisal Findings Report'. Halcrow (on behalf of DfT), April 2002, [CD/235].

<sup>4</sup> Ibid, Table 9.20, p302.

<sup>5</sup> CD/17, para 9.2.8.

<sup>6</sup> CD/74.

<sup>7</sup> CD/17, para 6.1.1.

<sup>8</sup> BAA Stansted Corporate Responsibility Report, 2005/06, Table 6, p19 [CD/161].

shown in ES Vol 14 [CD17]. The 3 MLD supply which BAA relies upon would be exceeded at a passenger throughput of 37.1mppa.

- 3.3.3 We refute BAA's conclusion that the effect of the 35mppa case has a minimal effect upon regional water supplies.
- 3.3.4 BAA does not consider the water supply or waste impacts arising from indirect and induced effects of the proposed development – in contrast to the approach taken by BAA in assessing economic and employment impacts.

### **3.4 Planning context**

- 3.4.1 The planning process will be expected to play a key role in ensuring that the Region's water efficiency targets are met and the ability of any new development to meet the water efficiency target of 'at least 25%' must be a pre-condition for planning consent. This will be particularly important in the case of major water-intensive developments, such as an airport.
- 3.4.2 It is clear even from BAA's projections that the proposed development would not meet the water efficiency target of 'at least 25%'. Indeed, BAA states that it does not anticipate achieving any further efficiency improvements.<sup>9</sup> In view of the scarcity of water resources in Essex and the East of England as a whole, and the inevitability of this becoming a more serious problem in the future, BAA's application should be refused on these grounds alone. The national, regional and local importance of water far outweighs the national, regional and local importance of permitting Stansted to provide more leisure flights.

### **3.5 Waste water/sewage**

- 3.5.1 Waste water from Stansted Airport is processed at two sewage treatment works ('STW'), Rye Meads and Bishops Stortford, which are operating at or close to their capacity and will also need to accommodate substantial new housing development.
- 3.5.2 A recent report by Halcrow<sup>10</sup> indicated potential capacity problems at Rye Meads in particular and potentially lengthy timescales for increasing its capacity.

## **4 CONCLUSIONS**

- 4.1 BAA appears to be suggesting that the possession of a contract with TVW (made many years ago) provides a guarantee that its water needs for the proposed development will be met. This is an untenable position in today's circumstances because it fails to take account of the wider regional context in relation to both supply and demand. This application must be considered in that wider context, taking account of the large number of new homes and other development planned for the Region (much of it locally) to 2021 as well as the predicted decline in regional precipitation over the same period arising from climate change.
- 4.2 BAA cannot be exempt from the need to make best use of scarce water resources within the Region and the water efficiency targets emerging from the RSS process must be a material planning consideration.

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<sup>9</sup> CD/1, para 6.1.1.

<sup>10</sup> East of England Capacity Delivery Strategy Study: Phase 1 Final Report', Halcrow, Dec 2006.



- 4.3 BAA has understated the increase in water consumption that would arise from its proposed development both in relation to the 35mppa base case and the 40mppa sensitivity. Indirect and induced effects have been ignored and the current baseline has been understated.
- 4.4 BAA's conclusion that the water impacts of its proposed development would be 'minor adverse' is unreliable and not supported by the evidence. It is also worth noting that Halcrow's 2002 report for SERAS (not to be confused with its 2006 report for Go-East, the Environment Agency and EERA) concluded that the impact of maximum use of Stansted's existing runway for water resources would be 'high adverse'.<sup>11</sup>
- 4.5 No assessment has been carried out in relation to growth beyond 40mppa. We estimate that, if the application were to be approved, passenger throughput on the existing runway would be about 45mppa by 2021 rising to about 50mppa by 2030.
- 4.6 Potentially very significant adverse impacts could arise if the local STWs did not have the capacity to deal with a substantial increase in waste water and sewage outflows from Stansted Airport taking account also of other planned development in their local catchment areas – both airport-related and non airport related. This issue requires to be investigated as a matter of urgency.

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<sup>11</sup> 'SERAS Stage Two Appraisal Findings Report'. Halcrow (on behalf of DfT), April 2002, Table 9.20. [CD/235].