

5th March 2010

Mr W Cockerell  
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Dear Will

### **Proposed Development of Sainsbury's Saffron Walden - Revised Air Quality Predictions**

Following your email of 9<sup>th</sup> December 2009 regarding your response to the air quality assessment that was submitted with the planning application for the proposed Sainsbury's store in Saffron Walden, we write with details of further dispersion modelling that we have recently completed.

Since the planning application was submitted, DEFRA has published revised background pollution concentrations maps, revised emission factors and a revised calculator for converting oxides of nitrogen (NO<sub>x</sub>) to nitrogen dioxide (NO<sub>2</sub>). In addition to this, there have been changes to the traffic flow data used as an input into the dispersion modelling.

The changes to the traffic flow data are as a result of a review of the Transport Assessment and Travel Plan submitted with the planning application by Essex County Council (ECC) and their consultants Mouchel. Following discussions with ECC, Savell Bird and Axon (SBA) has re-evaluated their assessments to console both the decay and diversion of trips along with trip origin in more detail. The results of this re-evaluation provide a realistic and robust assessment of traffic flows relevant to assessment of the application, in contrast to the more conservative approach that was presented within the Transport Assessment. SBA has set out this re-evaluation within an Addendum Statement, which describes the changes and background in detail.

As certain assumptions are still under discussion between SBA and ECC, two Development Scenarios have been considered in our further dispersion modelling. Scenario One uses the SBA trip rates (as per the submitted Transport Assessment) with certain assumptions regarding trip types and Scenario Two uses ECC trip rates (as per the submitted Transport Assessment) with more conservative assumptions regarding trip types. Both scenarios result in fewer trips passing through the Thaxted Road/Radwinter Road junction than previously suggested in the submitted Transport Assessment, which along with the proposed junction Improvements will result in nil detriment in traffic terms. Further details are included in the Addendum Transport Statement.

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Furthermore, an error had been identified in calculations made in the derivation of the baseline traffic flow data for the October 2009 assessment, which meant that the baseline Annual Average Daily Traffic flows were less than they should have been.

We therefore write with details of the updated dispersion modelling that has been undertaken with this revised traffic (presented in **Appendix A**) and DEFRA's new air quality assessment tools. The methodology for the air quality assessment is the same as described in the October 2009 Air Quality Assessment report.

### **Background Concentrations**

Table 1 shows the updated background concentrations for NO<sub>x</sub>, NO<sub>2</sub> and particulate matter not exceeding 10µm in diameter (PM<sub>10</sub>) that were used in the assessment. These are slightly higher than those used previously in the case of NO<sub>x</sub> and NO<sub>2</sub>, but slightly lower for PM<sub>10</sub>.

**Table 1: Estimated background concentrations used in the assessment (µg/m<sup>3</sup>)**

Pollutant	2009	2011
NO <sub>x</sub>	18.60	16.38
NO <sub>2</sub>	12.72	11.36
PM <sub>10</sub>	17.09	16.60

### **Verification**

As for the October 2009 Air Quality Assessment, model verification has been undertaken following the methodology specified in Annex 3 of LAQM.TG(09) using the revised NO<sub>x</sub>:NO<sub>2</sub> calculator available from the UK Air Quality Archive (UKAQA) to calculate the roadside NO<sub>x</sub> component of the annual mean NO<sub>2</sub> concentrations measured at the automatic monitoring site located at the Fire Station in Saffron Walden. PM<sub>10</sub> concentrations are also measured at this monitoring station. The road traffic data for 2009 was used in the verification process in the absence of data for 2008; however the emission factors used were for 2008.

A factor of 14.1 was obtained during the verification process for NO<sub>x</sub> and applied to the modelled NO<sub>x</sub> roads component before addition of the relevant background NO<sub>x</sub> concentrations and conversion to total annual mean NO<sub>2</sub> concentrations.

A factor of 7.9 was obtained during the verification process for PM<sub>10</sub> and applied to the modelled PM<sub>10</sub> roads component before addition of the relevant background PM<sub>10</sub> concentrations to obtain total annual mean PM<sub>10</sub> concentrations.

### **Results**

Concentrations of NO<sub>2</sub> and PM<sub>10</sub> were predicted at the same locations as for the October 2009 Air Quality Assessment, and impact significance assessed against the same significance criteria. Results of the dispersion modelling using for Scenario One are presented in **Appendix B**, whilst the results calculated for Scenario Two are shown in **Appendix C**. A summary of the assessment

results is presented below. The decreases in concentrations predicted at some of the receptor locations are as a result of the redistribution of the local traffic flows that will occur as a result of trip diversions from Tesco and the town centre to the proposed development.

#### *Annual mean NO<sub>2</sub> concentrations*

The objective for annual mean NO<sub>2</sub> concentrations is 40µg/m<sup>3</sup> to be achieved by the end of 2005 and thereafter. The results of the assessment show that in the 2009 baseline scenario, concentrations meet this objective at all of the assessment receptors. The highest predicted concentration in 2009 is 27.44µg/m<sup>3</sup>, predicted at a property in East Street (receptor number 15).

As before, the concentrations predicted in 2009 at the receptors (receptor numbers 1, 2, and 16 to 19 inclusive) where the Council undertake diffusion tube monitoring are lower than monitored concentrations. The main reason for this is considered to be the absence of any road traffic data for a number of key roads off the High Street near to the diffusion tube sites, and Chaters Hill adjacent to diffusion tube site UT5. Furthermore, the diffusion tube sites are situated close to the road edge, near to busy road junctions, which are inherently difficult to model. However, despite this it is considered that the predicted impact of the proposed development traffic will still be valid.

By 2011, the anticipated opening year of the proposed development, predicted concentrations at all of the receptors both with and without development are reduced from the 2009 baseline case using both sets of "with development" traffic data. The highest concentration in the "without development" scenario, of 24.08µg/m<sup>3</sup> is again predicted at a property adjacent to East Street (receptor number 15). For the "with development" scenario and using the traffic flows for Scenario One, the highest concentration is 23.39µg/m<sup>3</sup>, predicted at a property adjacent to East Street (receptor number 15). Using the traffic flows calculated for Scenario Two, the highest concentration is 23.67µg/m<sup>3</sup>, again predicted at a property adjacent to East Street (receptor number 15).

#### Changes in Concentrations (Scenario One)

For this Scenario, the proposed development is predicted to cause a change in concentrations at all but one of the assessment receptors. Increases in concentrations are predicted at 14 receptors, whilst decreases are predicted at 11. The greatest increase in concentrations at a location where the objective would apply is 2.38µg/m<sup>3</sup> predicted at a property in Mount Pleasant Road (receptor number 26). The greatest decrease in concentrations at a location where the objective would apply is 0.98µg/m<sup>3</sup> predicted at a property adjacent to Radwinter Road (receptor number 10).

At receptor locations in the High Street/George Street Air Quality Management Area (AQMA) (receptors 16 -19) impacts range from **minor adverse** to **minor beneficial** according to the impact significance criteria and given the results of the monitoring undertaken by Uttlesford District Council (UDC) in this AQMA; however given their small magnitude they could be considered to be **insignificant**.

At receptor locations in the Radwinter Road/Thaxted Road AQMA (receptor numbers 2 and 9) the impact is classed as **minor beneficial** (given the results of the monitoring undertaken by UDC in this AQMA); however given their small magnitude they could be considered to be **insignificant**.

Elsewhere, at locations where the objective will apply, the impacts are considered to be **minor adverse** to **insignificant**.

#### Changes in Concentrations (Scenario Two)

For this Scenario, the proposed development is predicted to cause a change in concentrations at all of the assessment receptors. Increases in concentrations are predicted at 17 receptors, whilst decreases are predicted at 9. The greatest increase in concentrations at a location where the objective would apply is  $3.90\mu\text{g}/\text{m}^3$  predicted at a property in Mount Pleasant Road (receptor number 26). The greatest decrease in concentrations at a location where the objective would apply is  $0.41\mu\text{g}/\text{m}^3$  predicted at a property adjacent to East Street (receptor number 15).

At receptor locations in the High Street/George Street AQMA (receptors 16 -19) the impacts are considered to be **minor adverse** according to the impact significance criteria and given the results of the monitoring undertaken by UDC in this AQMA; however given their small magnitude they could be considered to be **insignificant**.

At receptor locations in the Radwinter Road/Thaxted Road AQMA (receptor numbers 2 and 9) the impact is classed as **minor beneficial** (given the results of the monitoring undertaken by UDC in this AQMA) however given their small magnitude they could be considered to be **insignificant**.

Elsewhere, at locations where the objective will apply, the impacts are considered to be **minor adverse** to **insignificant**.

#### *Hourly mean NO<sub>2</sub> concentrations*

In 2011, both with and without the proposed development, concentrations predicted at all of the existing assessment receptors using both sets of "with development" traffic data were below  $60\mu\text{g}/\text{m}^3$  and therefore exceedences of the hourly mean NO<sub>2</sub> concentration objective are unlikely to occur.

#### *Annual mean PM<sub>10</sub> concentrations*

The objective for annual mean PM<sub>10</sub> concentrations is a concentration of  $40\mu\text{g}/\text{m}^3$  to be achieved by the end of 2004 and thereafter. The results of the assessment show that in the 2009 baseline scenario, concentrations meet this objective at all of the assessment receptors. The highest predicted concentration in 2009 is  $19.43\mu\text{g}/\text{m}^3$ , predicted at a property in East Street (receptor number 15).

By 2011, the anticipated opening year of the proposed development, predicted concentrations at all of the receptors both with and without development are reduced from the 2009 baseline case using both sets of "with development" traffic data. The highest concentration in the "without development" scenario, of  $18.82\mu\text{g}/\text{m}^3$  is again predicted at a property adjacent to East Street (receptor number 15).

For the "with development" scenario and using the traffic flows for Scenario One, the highest concentration is  $18.69\mu\text{g}/\text{m}^3$ , predicted at a property adjacent to East Street (receptor number 15). Using the traffic flows calculated for Scenario Two, the highest concentration is  $18.75\mu\text{g}/\text{m}^3$ , again predicted at a property adjacent to East Street (receptor number 15).

### Changes in Concentrations (Scenario One)

For this Scenario, the proposed development is predicted to cause a change in concentrations at all but one of the assessment receptors. Increases in concentrations are predicted at 14 receptors, whilst decreases are predicted at 11. The greatest increase in concentrations at a location where the objective would apply is  $0.44\mu\text{g}/\text{m}^3$  predicted at a property in Mount Pleasant Road (receptor number 26). The greatest decrease in concentrations at a location where the objective would apply is  $0.18\mu\text{g}/\text{m}^3$  predicted at a property adjacent to Radwinter Road (receptor number 10).

Therefore, the impact of the proposed development on annual mean  $\text{PM}_{10}$  concentrations is considered to be **insignificant** to **neutral**.

### Changes in Concentrations (Scenario Two)

For this Scenario, the proposed development is predicted to cause a change in concentrations at all of the assessment receptors. Increases in concentrations are predicted at 17 receptors, whilst decreases are predicted at 9. The greatest increase in concentrations at a location where the objective would apply is  $0.72\mu\text{g}/\text{m}^3$  predicted at a property in Mount Pleasant Road (receptor number 26). The greatest decrease in concentrations at a location where the objective would apply is  $0.08\mu\text{g}/\text{m}^3$  predicted at a property adjacent to East Street (receptor number 15).

Therefore, the impact of the proposed development on annual mean  $\text{PM}_{10}$  concentrations is considered to be **insignificant**.

### *24 hour mean $\text{PM}_{10}$ concentrations*

The objective for 24 hourly mean  $\text{PM}_{10}$  concentrations is  $50\mu\text{g}/\text{m}^3$  to be exceeded no more than 35 times a year by the end of 2004 and thereafter. The results of the dispersion modelling show that in the 2009 baseline scenario the number of exceedences is a maximum of 2 days, which is below the objective.

The number of days of exceedences remains at 2 in 2011, both with and without the proposed development, using both sets of "with development" traffic flows, which is also below the objective.

The impact of the proposed development on 24 hour mean  $\text{PM}_{10}$  concentrations is therefore considered to be **neutral**.

### ***Response to Memo dated 9<sup>th</sup> December 2009***

On the 9<sup>th</sup> December 2009 you emailed with details of your comments on the submitted air quality assessment. Your main concerns were:

- Traffic associated with the proposed development would cause queuing and congestion at the junctions of Thaxted Road/Peaslands Road and Mount Pleasant Road/Debden Road, which would lead to an exceedence of the UK Air Quality Strategy objective for annual mean  $\text{NO}_2$  concentrations; and
- Increased nitrogen dioxide levels within the existing AQMA (Thaxted Road/Radwinter Road), at an area of existing concern at the Debden Road/London Road Junction.

With regard to the first point, the predicted impact at the assessment receptors (receptor numbers 6 and 23) located at these junctions are  $1.41\mu\text{g}/\text{m}^3$  and  $0.93\mu\text{g}/\text{m}^3$  respectively for Scenario One and  $2.21\mu\text{g}/\text{m}^3$  and  $1.57\mu\text{g}/\text{m}^3$  respectively for Scenario Two. The proposed installation of traffic signals at these junctions will assist in managing queue lengths and minimising congestion, which will be of benefit to local air quality.

In response to the second point, the results of the revised dispersion modelling show that there will be little change in concentrations at the Thaxted Road/Radwinter Road AQMA as a result of the proposed development based on either scenario. Furthermore, improvements to this junction are also proposed to improve the flow of traffic and reduce congestion, which will be of benefit to local air quality. In respect of the potential air quality impacts at the Debden Road/London Road junction, the predicted increase in concentrations at the nearest receptor location (receptor 20) is  $0.57\mu\text{g}/\text{m}^3$  or  $1.02\mu\text{g}/\text{m}^3$  respectively for Scenarios One and Two.

The annual mean  $\text{NO}_2$  concentration measured in 2008 at the diffusion tube site near to the junction was  $47.7\mu\text{g}/\text{m}^3$ , which is above the objective. Assuming the concentrations predicted at receptor 20, are representative of the change that could occur at the diffusion tube site due to the proposed development, the percentage increase would be 1% or 2% depending on which traffic flow data is used, which is a small increase.

### **Conclusions**

Sainsbury's submitted a planning application in November 2009 to redevelop the former Granite Site (which benefits from an existing outline consent to be redeveloped) to construct a new supermarket. The planning application included an Air Quality Assessment. Since the completion of the assessment, there have been changes to the background air quality pollution data and prediction tools available on the UKAQA for use in the assessment of air quality, in addition to changes in the traffic flow data used in the assessment. As a result, the operational phase air quality impact assessment has been revised.

The conclusions that can be drawn from the revised assessments are that concentrations predicted using the "with development" traffic data derived from either Scenario are broadly the same, although Scenario Two gives greater impacts. Furthermore, the predicted impact for both Scenarios is lower than previously predicted, which is a reflection of the overly conservative nature of the traffic flow data that was used before.

Table 2 provides a summary of the assessment results in terms of the significance of the changes on local air quality at the assessment receptors.

**Table 2: Summary of Assessment Results**

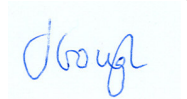
	Pollutant	High Street/George Street AQMA	Radwinter Road/Thaxted Road AQMA	Elsewhere
<b>Scenario One</b>	Annual Mean NO <sub>2</sub>	Insignificant	Insignificant	Minor Adverse to Insignificant
	Hourly Mean NO <sub>2</sub>	Insignificant	Insignificant	Insignificant
	Annual Mean PM <sub>10</sub>	Insignificant to Neutral	Insignificant to Neutral	Insignificant to Neutral
	Daily Mean PM <sub>10</sub>	Neutral	Neutral	Neutral
<b>Scenario Two</b>	Annual Mean NO <sub>2</sub>	Insignificant	Insignificant	Minor Adverse to Insignificant
	Hourly Mean NO <sub>2</sub>	Insignificant	Insignificant	Insignificant
	Annual Mean PM <sub>10</sub>	Insignificant	Insignificant	Insignificant
	Daily Mean PM <sub>10</sub>	Neutral	Neutral	Neutral

It should be noted that that Council has published an Air Quality Action Plan, which details a number of measures to reduce pollution concentrations within the AQMAs in the town. These include School Travel Plans, improved road signage for car users, the development of a Sustainable Distribution Strategy to address the movement of HGVS within the town, etc.

Furthermore, all predicted adverse impacts are minor and will be further reduced by the transportation mitigation measures that are proposed, such as Travel Plan implementation, improvements to public transport services, and pedestrian network improvements, as detailed in the Transport and Air Quality Assessments submitted with the planning application.

We hope that the above information is useful, and addresses your concerns. However, should you have any queries regarding the revised air quality assessment please do not hesitate to contact the undersigned.

Yours sincerely



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Appendix A – Traffic Flow Data used in the Assessment  
Appendix B – Results (Scenario One)  
Appendix C - Results (Scenario Two)

Cc. Michael Morris – Sainsbury's Plc  
Leanne Croft – Indigo Planning  
David Lawal – Riley Consulting  
Graham Pickering – Canon House Properties Ltd  
Andrew Murdoch - SBA

## APPENDIX A - TRAFFIC DATA USED IN THE ASSESSMENT

### 2009 Baseline

Road link	Speed (km/hour)	Annual Average Hourly Flows (AAHT)	%HGV	Emission g/km/veh		rate
				NOx	PM <sub>10</sub>	
B184 Thaxted Road south of Site	48	270	0.5%	0.25811	0.03410	
B184 Thaxted Road northth of Site	48	307	0.7%	0.25761	0.03403	
B184 Thaxted Road north of Peaslands	40	410	0.9%	0.26016	0.03428	
B1053 Radwinter Road	32	466	1.6%	0.27364	0.03510	
A1052 East Street west of Thaxted	32	397	1.7%	0.27411	0.03515	
Debden Road	40	202	1.0%	0.26032	0.03430	
Peasland Road (west of Thaxted Rd)	40	330	0.9%	0.26034	0.03431	
Mount Pleasant Road	40	234	1.3%	0.26085	0.03435	
Site Access	16	83	1.2%	0.38332	0.04069	
B184 High Street south of George St	32	497	1.6%	0.27354	0.03509	
B184 High Street north of George St	32	350	0.8%	0.27341	0.03512	
B184 Thaxted Road south of Radwinter	32	426	1.1%	0.27331	0.03509	

### 2011 Baseline

Road link	Speed (km/hour)	Annual Average Hourly Flows (AAHT)	%HGV	Emission g/km/veh		rate
				NOx	PM <sub>10</sub>	
B184 Thaxted Road south of Site	48	275	0.8%	0.20197	0.03211	
B184 Thaxted Road northth of Site	48	313	0.7%	0.20180	0.03209	
B184 Thaxted Road north of Peaslands	40	419	0.9%	0.20518	0.03234	
B1053 Radwinter Road	32	477	1.6%	0.21765	0.03307	
A1052 East Street west of Thaxted	32	405	1.7%	0.21728	0.03301	
Debden Road	40	208	1.0%	0.20495	0.03230	
Peasland Road (west of Thaxted Rd)	40	337	0.9%	0.20525	0.03235	
Mount Pleasant Road	40	240	1.3%	0.20507	0.03230	
Site Access	16	84	1.2%	0.31087	0.03783	
B184 High Street south of George St	32	508	1.6%	0.21724	0.03301	
B184 High Street north of George St	32	358	0.8%	0.21728	0.03307	
B184 Thaxted Road south of Radwinter	32	435	1.1%	0.21703	0.03301	

2011 With Development (Scenario One)

Road link	Speed (km/hour)	Annual Average Hourly Flows (AAHT)	%HGV	Emission g/km/veh		rate
				NOx	PM <sub>10</sub>	
B184 Thaxted Road south of Site	48	326	0.9%	0.20209	0.03212	
B184 Thaxted Road northth of Site	48	586	0.4%	0.20191	0.03212	
B184 Thaxted Road north of Peaslands	40	470	0.8%	0.20543	0.03238	
B1053 Radwinter Road	32	411	1.9%	0.21746	0.03303	
A1052 East Street west of Thaxted	32	379	1.9%	0.21773	0.03307	
Debden Road	40	237	0.8%	0.20500	0.03232	
Peasland Road (west of Thaxted Rd)	40	485	0.6%	0.20528	0.03237	
Mount Pleasant Road	40	341	0.9%	0.20542	0.03238	
Site Access	16	447	0.4%	0.31012	0.03779	
B184 High Street south of George St	32	506	1.6%	0.21740	0.03304	
B184 High Street north of George St	32	368	0.8%	0.21695	0.03302	
B184 Thaxted Road south of Radwinter	32	412	1.1%	0.21741	0.03307	

2011 With Development (Scenario Two)

Road link	Speed (km/hour)	Annual Average Hourly Flows (AAHT)	%HGV	Emission g/km/veh		rate
				NOx	PM <sub>10</sub>	
B184 Thaxted Road south of Site	48	370	0.8%	0.20176	0.03208	
B184 Thaxted Road northth of Site	48	681	0.3%	0.20177	0.03210	
B184 Thaxted Road north of Peaslands	40	503	0.8%	0.20523	0.03236	
B1053 Radwinter Road	32	454	1.7%	0.21739	0.03303	
A1052 East Street west of Thaxted	32	388	1.8%	0.21738	0.03302	
Debden Road	40	259	0.8%	0.20506	0.03233	
Peasland Road (west of Thaxted Rd)	40	581	0.5%	0.20501	0.03234	
Mount Pleasant Road	40	402	0.8%	0.20549	0.03240	
Site Access	16	629	0.3%	0.31028	0.03782	
B184 High Street south of George St	32	509	1.6%	0.21761	0.03307	
B184 High Street north of George St	32	379	0.8%	0.21714	0.03305	
B184 Thaxted Road south of Radwinter	32	454	1.0%	0.21703	0.03301	

**APPENDIX B – RESULTS (SCENARIO ONE)**







**APPENDIX C – RESULTS (SCENARIO TWO)**