Delta-Simons Limited
Suite C1, Josephs Well Offices, Hanover Walk, Leeds LS3 1AB
www.deltasimons.com

Technical Note – Air Quality Mitigation

Chidswell - Air Quality Mitigation

Presented to **Deloitte LLP**

Issued: 13th February 2024

Delta-Simons Project Number: 108314.608545

1.0 Context

An "Air Quality Mitigation Letter" was sent to Kirklees Council (KC) by FA - Real Assets Advisory, Deloitte LLP on October 27, 2023.

Comments were provided by KC's Victor Grayson (Development Management Masterplanner, Majors and Minerals Team on November 27, 2023, as follows:

"*Thanks for this letter, which I have discussed with KC Environmental Health.*

Tables 1, 2 and 3 of the letter set out the inputs used in the relevant calculations, but could we also see your full workings to better understand how the figures totalling £1.5m were arrived at, please? Has a five-year period been factored into the calculation (as per the WYLEG guidance)?

As for the value (in £s) of the mitigation proposals, I think more information is needed. I am unclear as to whether – for example – the amounts you have attributed to travel planning can be relied upon, given we're at outline stage and don't have detailed proposals. As for EV charging, my understanding (from KC Environmental Health) is that this can be counted provided that rapid chargers are used. In table 4, why are the end cells under "Internal Infrastructure" blank?"

Further to the above comments, KC Environmental Health have raised two further points:

- "Deloitte's letter of 27/10/2023 refers to version 9.0 of DEFRA's emission factor toolkit (EFT), however the most up-to-date version (version 12) should be used instead.
- The findings of the further AQIA requested by KC Environmental Health (the need for which is explained in their comments of 16/10/2020: https://www.kirklees.gov.uk/beta/planning-applications/search-for-planning-applications/filedownload.aspx?application_number=2020/92331&file_reference=836251, and colleagues have confirmed today that the relevant condition (currently draft condition 26) is indeed needed) would inform the damage costing exercise you are now seeking to complete. How can the council agree to removing air quality matters from the S106 agreement while the results of that further AQIA are still awaited?"

Delta-Simons has been requested by the Client, to produce a Technical Note to respond to KC's comments and provide evidence for the calculation and costs provided.

2.0 Development of Annual Atmospheric Emissions & Values (in £s) of the mitigation Proposals

Delta-Simons have used the Defra's emission factor toolkit (EFT) to generate the annual development transport emissions (Tonnes) and values (in £s) of the mitigation proposals which are presented in Table 1.

Table 1 – Annual Transport Emissions & Cost of Mitigations

	EFT 2020.V10.1	**EFT2023 V12.0**
Site A – Residential		
NO_x Annual Emissions (tonnes/yr.)	0.684	0.606
$PM_{2.5}$ Annual Emissions (tonnes/yr.)	0.119	0.118
Cost (£)	**£98,651.93**	**£93,557.37**
Site B – Residential		
NO_x Annual Emissions (tonnes/yr.)	5.116	4.533
$PM_{2.5}$ Annual Emissions (tonnes/yr.)	0.890	0.882
Cost (£)	**£737,957.22**	**£699,498.10**
Site B - Commercial		
NO_x Annual Emissions (tonnes/yr.)	4.595	4.102
$PM_{2.5}$ Annual Emissions (tonnes/yr.)	0.812	0.804
Cost (£)	**£668,939.08**	**£635,881.09**

Table 1 presents the annual development transport emissions (Tonnes) as calculated with Defra's EFT 2023 V12.0 as recommended by KC's EHO.

Input traffic data used in Defra's EFT are presented in Table 2.

Table 2 – Traffic Data Used in Defra's EFT

	Site A - Residential	**Site B - Residential**	**Site B - Commercial**
Trip Rate (Total)	1,838	13,749	11,992
%HDV	1.24	1.24	2.97
Trip Rate (HDVs)	23	170	356

Key assumptions and input data for Defra's EFT different scenarios were:

- Average speed of 50km/hr – main road off site has 40mph speed limit, other roads 30mph and likely to be congested;
- %HDVs for Residential Site B = Residential Site A (the PTC had it the same as the commercial uses);
- Selection of "outer conurbation" for the area type;
- 10 km link length;
- Road type – Urban (not London)

- Cost Per Tonne per Pollutant (NO_x (£11,170) and PM (£95,108))

The five-year period was factored (with a 4% uplift for costs) into the calculation (as per the WYLEG guidance (https://www.kirklees.gov.uk/beta/crime-and-safety/pdf/WYLES-air-quality-and-emissions-planning-technical-guide.pdf)) and screenshots of the input data and out data for the EFT are presented in Appendix A.

3.0 Conclusion

The annual development transport emissions (Tonnes) and values (in £s) of the mitigation proposals generated with Defra's EFT 2023 V12.0 are smaller than those calculated with EFT 2020 V10.1, hence the damage costings associated with annual air emissions are lesser than originally calculated.

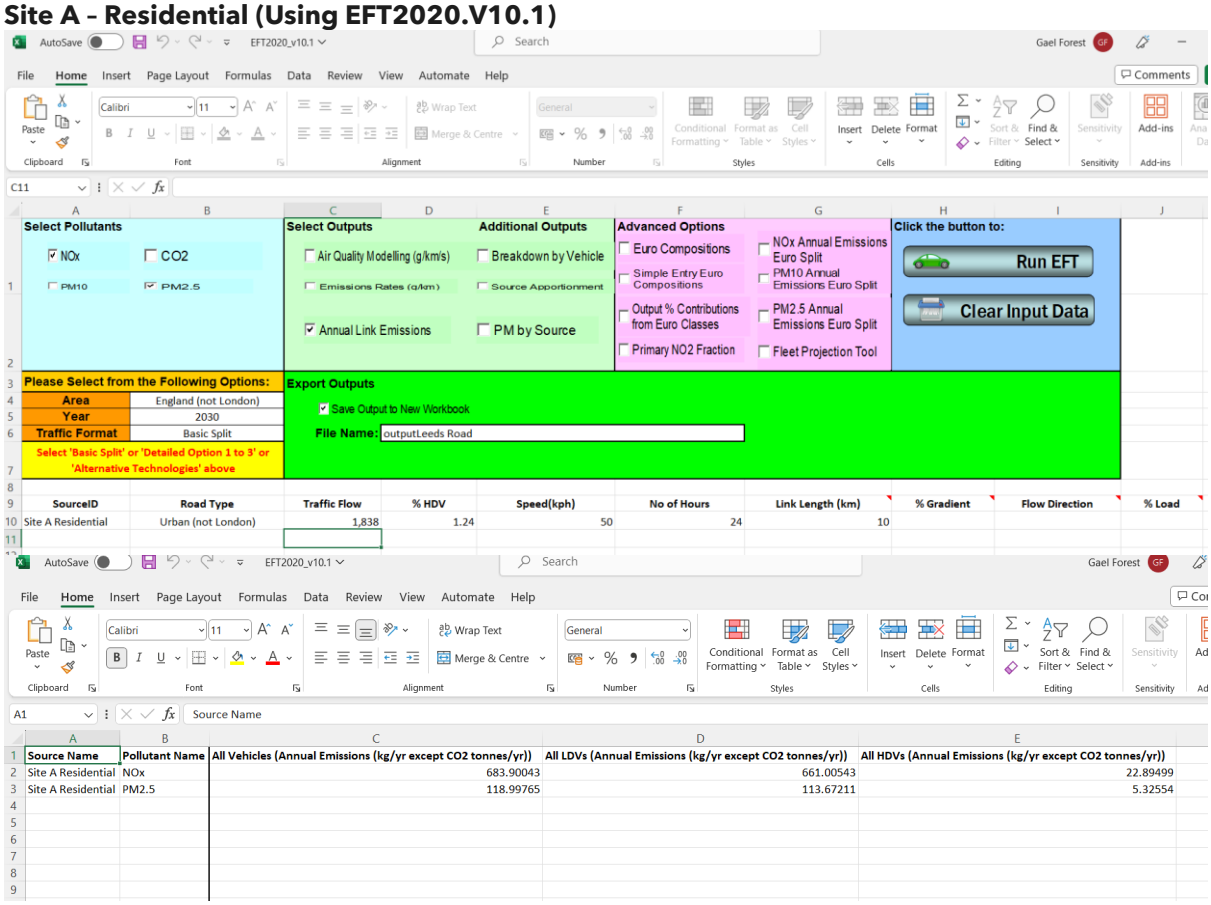
Yours sincerely,

Delta-Simons

Gael Forest, MIAQM CEnv CEng
Service Director
Air Quality

Appendix A

Site A – Residential (Using EFT2020.V10.1)



Select Pollutants		Select Outputs		Additional Outputs	Advanced Options		Click the button to:
☑ NOx	☐ CO2	☐ Air Quality Modelling (g/km/s)		☐ Breakdown by Vehicle	☐ Euro Compositions	☐ NOx Annual Emissions Euro Split	Run EFT
☐ PM10	☑ PM2.5	☐ Emissions Rates (g/km)		☐ Source Apportionment	☐ Simple Entry Euro Compositions	☐ PM10 Annual Emissions Euro Split	Clear Input Data
		☑ Annual Link Emissions		☐ PM by Source	☐ Output % Contributions from Euro Classes	☐ PM2.5 Annual Emissions Euro Split	
					☐ Primary NO2 Fraction	☐ Fleet Projection Tool	

Please Select from the Following Options:	
Area	England (not London)
Year	2030
Traffic Format	Basic Split

Select 'Basic Split' or 'Detailed Option 1 to 3' or 'Alternative Technologies' above

Export Outputs

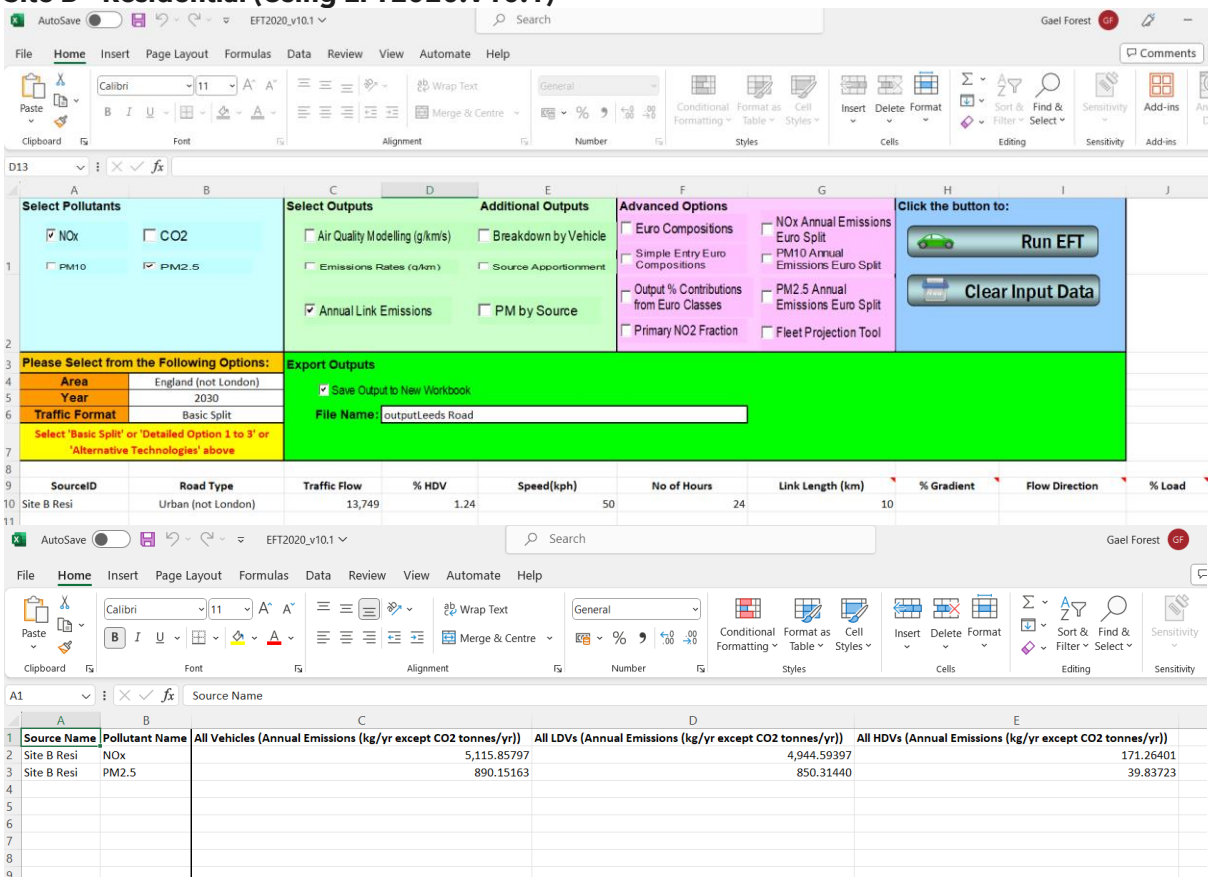
☑ Save Output to New Workbook

File Name: outputLeeds Road

SourceID	Road Type	Traffic Flow	% HDV	Speed(kph)	No of Hours	Link Length (km)	% Gradient	Flow Direction	% Load
Site A Residential	Urban (not London)	1,838	1.24	50	24	10			

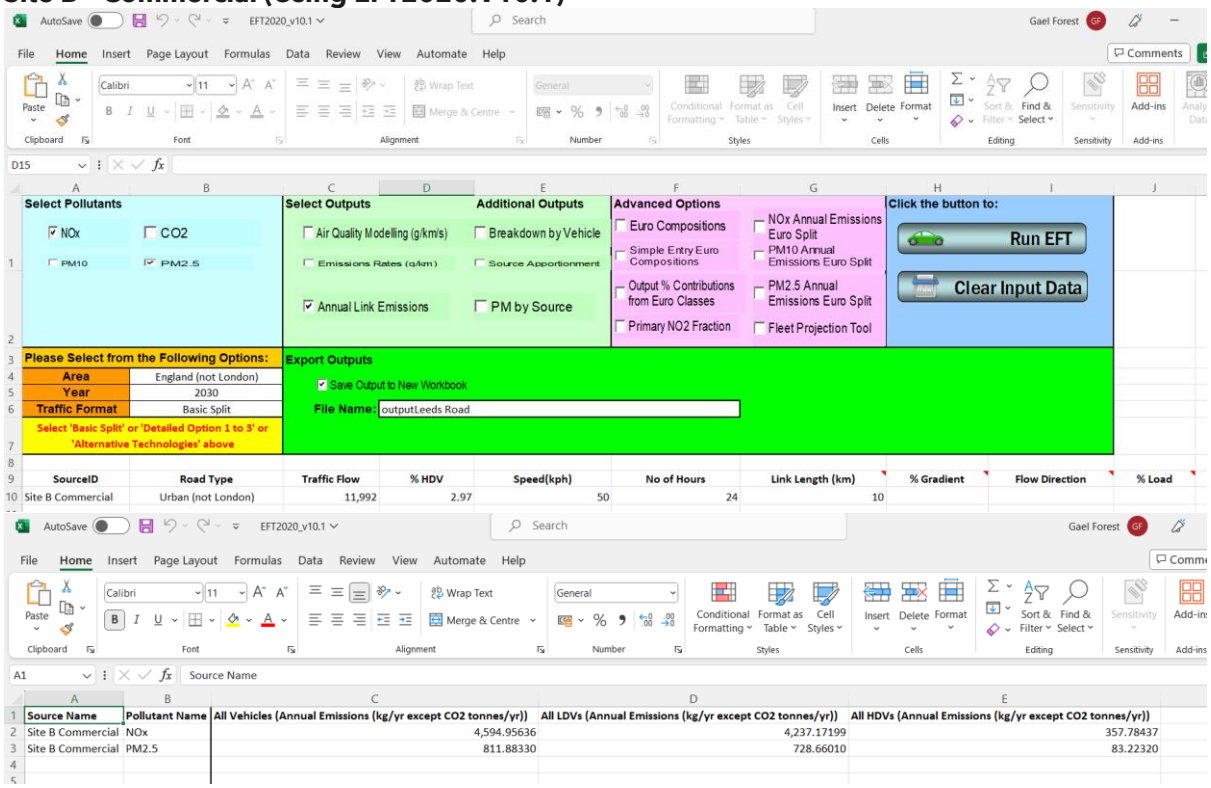
Source Name	Pollutant Name	All Vehicles (Annual Emissions (kg/yr except CO2 tonnes/yr))	All LDVs (Annual Emissions (kg/yr except CO2 tonnes/yr))	All HDVs (Annual Emissions (kg/yr except CO2 tonnes/yr))
Site A Residential	NOx	683.90043	661.00543	22.89499
Site A Residential	PM2.5	118.99765	113.67211	5.32554

Site B – Residential (Using EFT2020.V10.1)



Source Name	Pollutant Name	All Vehicles (Annual Emissions (kg/yr except CO2 tonnes/yr))	All LDVs (Annual Emissions (kg/yr except CO2 tonnes/yr))	All HDVs (Annual Emissions (kg/yr except CO2 tonnes/yr))
Site B Resi	NOx	5,115.85797	4,944.59397	171.26401
Site B Resi	PM2.5	890.15163	850.31440	39.83723

Site B – Commercial (Using EFT2020.V10.1)



Select Pollutants		Select Outputs	Additional Outputs	Advanced Options		Click the button to:
☑ NOx	☐ CO2	☐ Air Quality Modelling (g/km/s)	☐ Breakdown by Vehicle	☐ Euro Compositions	☐ NOx Annual Emissions Euro Split	Run EFT
☐ PM10	☑ PM2.5	☐ Emissions Rates (g/km)	☐ Source Apportionment	☐ Simple Entry Euro Compositions	☐ PM10 Annual Emissions Euro Split	
		☑ Annual Link Emissions	☐ PM by Source	☐ Output % Contributions from Euro Classes	☐ PM2.5 Annual Emissions Euro Split	Clear Input Data
				☐ Primary NO2 Fraction	☐ Fleet Projection Tool	

Please Select from the Following Options:	
Area	England (not London)
Year	2030
Traffic Format	Basic Split

Select 'Basic Split' or 'Detailed Option 1 to 3' or 'Alternative Technologies' above

Export Outputs

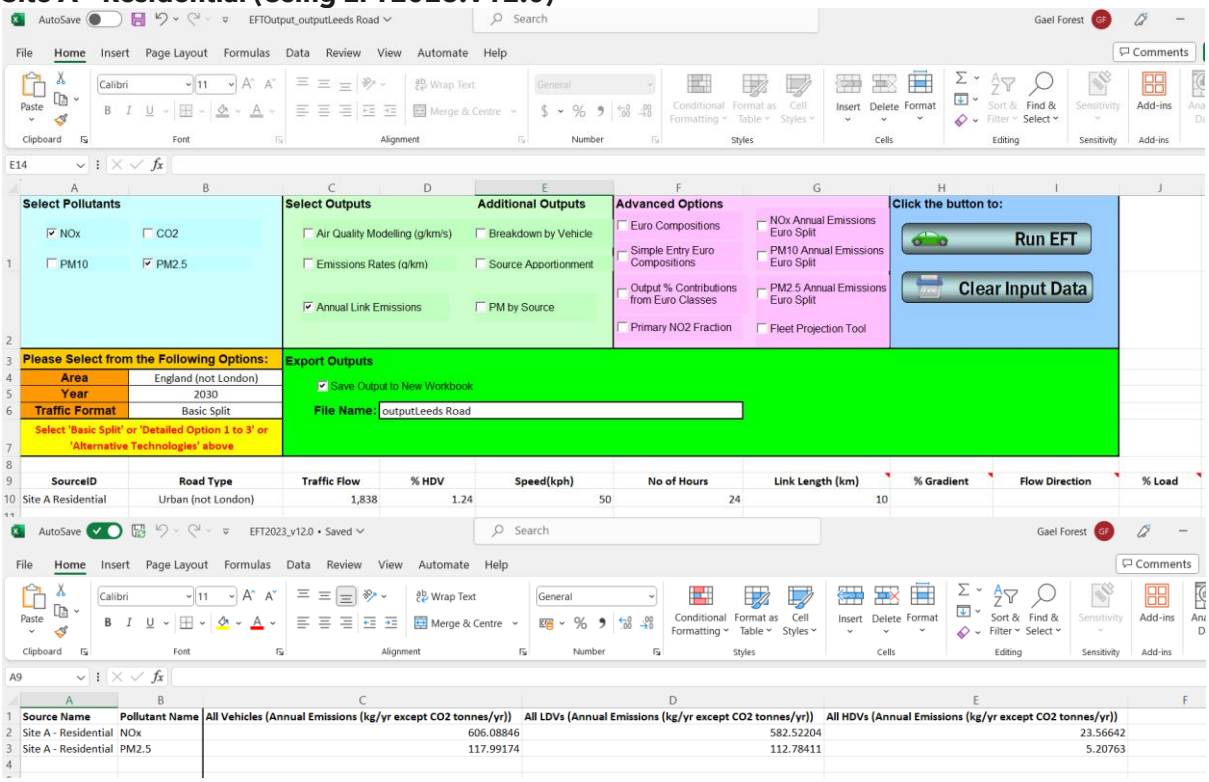
☑ Save Output to New Workbook

File Name: outputLeeds Road

SourceID	Road Type	Traffic Flow	% HDV	Speed(kph)	No of Hours	Link Length (km)	% Gradient	Flow Direction	% Load
Site B Commercial	Urban (not London)	11,992	2.97	50	24	10			

Source Name	Pollutant Name	All Vehicles (Annual Emissions (kg/yr except CO2 tonnes/yr))	All LDVs (Annual Emissions (kg/yr except CO2 tonnes/yr))	All HDVs (Annual Emissions (kg/yr except CO2 tonnes/yr))
Site B Commercial	NOx	4,594.95636	4,237.17199	357.78437
Site B Commercial	PM2.5	811.88330	728.66010	83.22320

Site A – Residential (Using EFT2023.V12.0)



Select Pollutants		Select Outputs	Additional Outputs	Advanced Options		Click the button to:
☑ NOx	☐ CO2	☐ Air Quality Modelling (g/km/s)	☐ Breakdown by Vehicle	☐ Euro Compositions	☐ NOx Annual Emissions Euro Split	Run EFT
☐ PM10	☑ PM2.5	☐ Emissions Rates (g/km)	☐ Source Apportionment	☐ Simple Entry Euro Compositions	☐ PM10 Annual Emissions Euro Split	Clear Input Data
		☑ Annual Link Emissions	☐ PM by Source	☐ Output % Contributions from Euro Classes	☐ PM2.5 Annual Emissions Euro Split	
				☐ Primary NO2 Fraction	☐ Fleet Projection Tool	

Please Select from the Following Options:	
Area	England (not London)
Year	2030
Traffic Format	Basic Split

Select 'Basic Split' or 'Detailed Option 1 to 3' or 'Alternative Technologies' above

Export Outputs

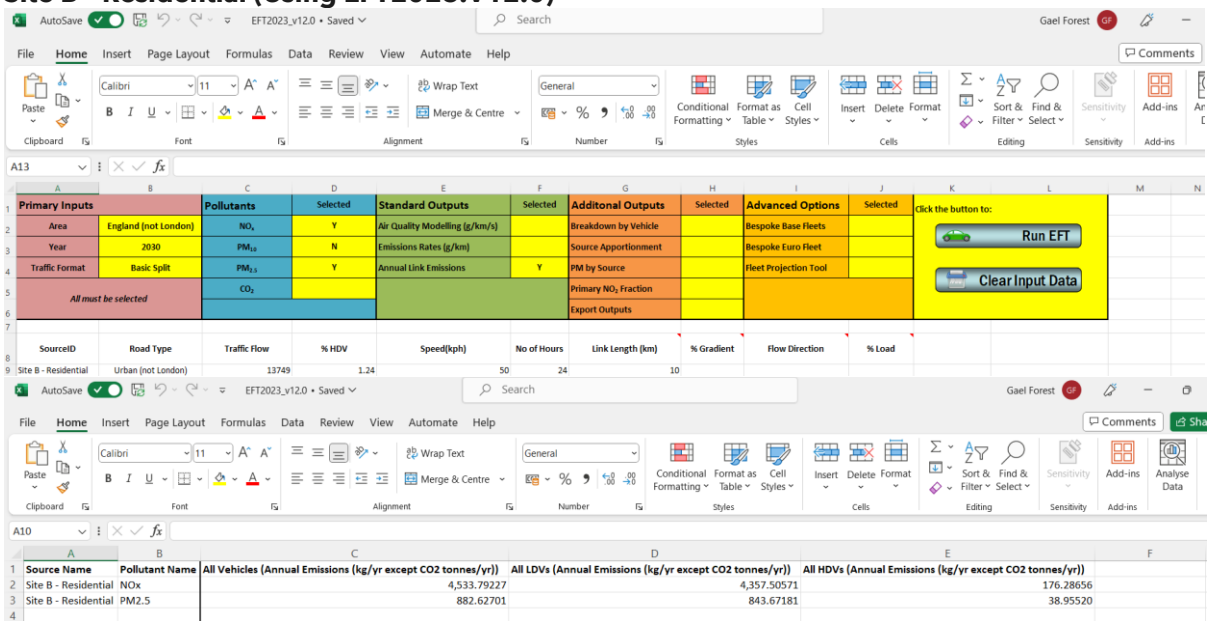
☑ Save Output to New Workbook

File Name: outputLeeds Road

SourceID	Road Type	Traffic Flow	% HDV	Speed(kph)	No of Hours	Link Length (km)	% Gradient	Flow Direction	% Load
Site A Residential	Urban (not London)	1,838	1.24	50	24	10			

Source Name	Pollutant Name	All Vehicles (Annual Emissions (kg/yr except CO2 tonnes/yr))	All LDVs (Annual Emissions (kg/yr except CO2 tonnes/yr))	All HDVs (Annual Emissions (kg/yr except CO2 tonnes/yr))
Site A - Residential	NOx	606.08846	582.52204	23.56642
Site A - Residential	PM2.5	117.99174	112.78411	5.20763

Site B – Residential (Using EFT2023.V12.0)



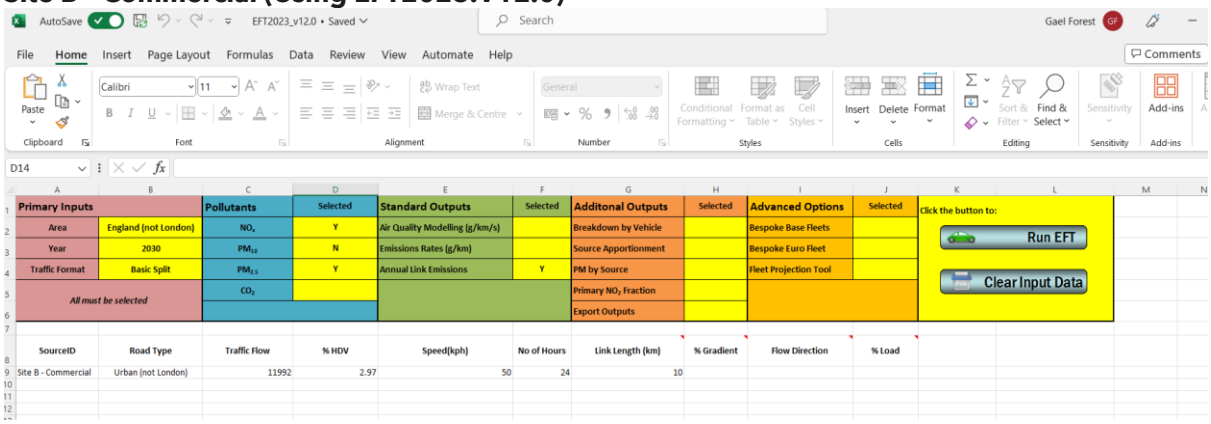
Primary Inputs		Pollutants	Selected	Standard Outputs	Selected	Additonal Outputs	Selected	Advanced Options	Selected
Area	England (not London)	NO_x	Y	Air Quality Modelling (g/km/s)		Breakdown by Vehicle		Bespoke Base Fleets	
Year	2030	PM_{10}	N	Emissions Rates (g/km)		Source Apportionment		Bespoke Euro Fleet	
Traffic Format	Basic Split	$PM_{2.5}$	Y	Annual Link Emissions	Y	PM by Source		Fleet Projection Tool	
All must be selected		CO_2				Primary NO_2 Fraction			
						Export Outputs			

Click the button to: Run EFT / Clear Input Data

SourceID	Road Type	Traffic Flow	% HDV	Speed(kph)	No of Hours	Link Length (km)	% Gradient	Flow Direction	% Load
Site B - Residential	Urban (not London)	13749	1.24	50	24	10			

Source Name	Pollutant Name	All Vehicles (Annual Emissions (kg/yr except CO2 tonnes/yr))	All LDVs (Annual Emissions (kg/yr except CO2 tonnes/yr))	All HDVs (Annual Emissions (kg/yr except CO2 tonnes/yr))
Site B - Residential	NOx	4,533.79227	4,357.50571	176.28656
Site B - Residential	PM2.5	882.62701	843.67181	38.95520

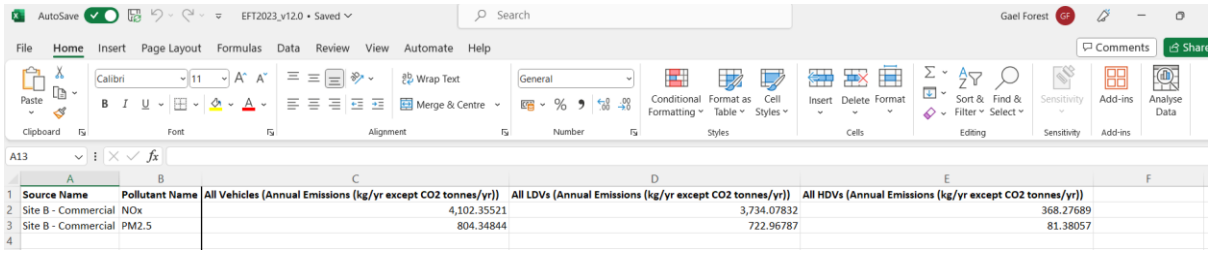
Site B – Commercial (Using EFT2023.V12.0)



Primary Inputs		Pollutants	Selected	Standard Outputs	Selected	Additonal Outputs	Selected	Advanced Options	Selected
Area	England (not London)	NO_x	Y	Air Quality Modelling (g/km/s)		Breakdown by Vehicle		Bespoke Base Fleets	
Year	2030	PM_{10}	N	Emissions Rates (g/km)		Source Apportionment		Bespoke Euro Fleet	
Traffic Format	Basic Split	$PM_{2.5}$	Y	Annual Link Emissions	Y	PM by Source		Fleet Projection Tool	
All must be selected		CO_2				Primary NO_2 Fraction			
						Export Outputs			

Click the button to: Run EFT / Clear Input Data

SourceID	Road Type	Traffic Flow	% HDV	Speed(kph)	No of Hours	Link Length (km)	% Gradient	Flow Direction	% Load
Site B - Commercial	Urban (not London)	11992	2.97	50	24	10			



Source Name	Pollutant Name	All Vehicles (Annual Emissions (kg/yr except CO2 tonnes/yr))	All LDVs (Annual Emissions (kg/yr except CO2 tonnes/yr))	All HDVs (Annual Emissions (kg/yr except CO2 tonnes/yr))
Site B - Commercial	NOx	4,102.35521	3,734.07832	368.27689
Site B - Commercial	PM2.5	804.34844	722.96787	81.38057