1.0 AIR QUALITY ASSESSMENT - TECHNICAL ADDENDUM

Resource and Environmental Consultants (REC) Ltd was commissioned by Royal London Mutual Insurance Society to undertake an Air Quality Assessment (ref: AQ101830r4) in support of a planning application for a proposed mixed use development at New Oxford Street, Camden. The proposals comprise the demolition of the existing building at Castlewood House and the construction of a replacement ten storey mixed-use building plus two basement levels, including the provision of retail (Class A1 and/or A3) and office (Class B1) floor space. External alterations to Medius House are also proposed including partial demolition, retention of the existing façade and two floor extensions to provide 18 affordable housing units (Class C3), together with associated highway improvements, public realm, landscaping, vehicular and cycle parking, bin storage and other associated works.

Following the submission of the assessment to the London Borough of Camden (LBoC) a number of comments have been received. This Technical Addendum addresses those associated with the potential impacts of energy emissions from the proposed development on existing residential receptor locations in the vicinity of the site. This is detailed in the following sections.

1.1 Assessment Inputs

Atmospheric emissions from the proposed boiler units have the potential to result in air quality impacts in the vicinity of the development. At this stage of the application, specific details of the proposed plant were not available for use within this assessment. It is likely that this information will be available at detailed design stage however in order to undertake the following assessment, a number of worst-case assumptions have been made by GDM Partnership, the appointed M&E consultants for this project.

Dispersion modelling using ADMS 5 was therefore undertaken to predict potential increases in NO_2 concentrations at sensitive locations in order to consider subsequent changes as a result of the proposals.

Assessment inputs are described in the following Subsections.

Dispersion Model

Dispersion modelling was undertaken using ADMS 5 (v5.1), which is developed by CERC Ltd. ADMS 5 is a short-range dispersion modelling software package that simulates a wide range of buoyant and passive releases to atmosphere. It is a new generation model utilising boundary layer height and Monin-Obukhov length to describe the atmospheric boundary layer and a skewed Gaussian concentration distribution to calculate dispersion under convective conditions.

The model utilises hourly meteorological data to define conditions for plume rise, transport and diffusion. It estimates the concentration for each source and receptor combination for each hour of input meteorology, and calculates user-selected long-term and short-term averages.

Sensitive Receptor Locations

Receptors sensitive to potential impacts as a result of operational phase energy emissions were identified from a desktop study and are summarised in Table 1. It should be noted that impacts from Castlewood House and Medius House were modelled separately due to the differing flue heights.

Table 1   Residential Receptors

Receptor		NGR (m)		Castlewood House Flue Height (m)	Medius House Flue Height (m)
		X	Y		
R1	Central Point development	529909	181381	45.9	31.7
R2	Central Point development	529926	181362	45.9	31.7
R3	Central Point development	529936	181328	45.9	31.7
R4	Central Point development	529940	181302	45.9	31.7
R5	Matilda Apartments	529959	181337	45.9	31.7
R6	Matilda Apartments	529976	181321	45.9	31.7
R7	Matilda Apartments	529978	181299	45.9	31.7
R8	Matilda Apartments	529960	181318	45.9	31.1

Reference should be made to Figure 1 for a graphical representation of the residential receptors considered within the assessment.

Process Conditions

Process conditions were provided through correspondence with GDM Partnership. Reference should be made to Table 2 for dispersion modelling inputs.

Table 2   Process Conditions

Condition	Unit	Castlewood House Flue 1	Castlewood House Flue 2	Medius House Flue 1
Stack location	NGR	529968, 181377	529969, 181378	529995, 181403
Stack diameter	m	0.65	0.65	0.30
Stack height	m	45.9	45.9	31.7
Flue gas volumetric flow rate	m^3/s	3.318	3.318	0.353
Flue gas efflux velocity	m/s	10	10	5
Temperature	°C	65	65	63

Reference should be made to Figure 2 for a graphical representation of the stack locations.

Emissions

Pollutant emissions were provided through correspondence with GDM Partnership. These are shown in Table3.

Table 3   Mass Emission Rates

Unit	Parameter	Mass Emission Rate (g/s)
Castlewood House Flue 1	NO_x	0.0004312
Castlewood House Flue 2	NO_x	0.0004312
Medius House Flue 1	NO_x	0.0003044

Meteorological Data

Meteorological data used in this assessment was taken from London City Meteorological Station over the period 1st January 2014 to 31st December 2014 (inclusive). This is in line with the parameters used in the Air Quality Assessment (ref: AQ101830r4).

Roughness Length

A z_0 of 1.5m was used in this dispersion modelling study. A z_0 value of 0.3m was used to represent the meteorological station location. This is in line with the parameters used in the Air Quality Assessment (ref: AQ101830r4).

Monin-Obukhov Length

A minimum Monin-Obukhov length of 100m was used to represent the assessment area and meteorological station location. This is in line with the parameters used in the Air Quality Assessment (ref: AQ101830r4).

Building Effects

Analysis of the site layout indicated that a number of structures should be included within the model in order to take account of effects on pollutant dispersion. The location of these buildings are shown in Figure 2 and the input geometries are shown in Table 4.

Table 4   Building Geometries

Building	NGR (m)		Height (m)	Length (m)	Width (m)	Angle (˚)
	X	Y				
Castlewood 1	529951	181378	44.9	39.6	22.7	162.6
Castlewood 2	529969	181386	44.9	34.0	18.3	163.8
Castlewood 3	529978	181375	44.9	10.7	30.3	145.8
Medius House	529999	181407	30.7	12.2	22.9	164.5

Building	NGR (m)		Height (m)	Length (m)	Width (m)	Angle (˚)
	X	Y				
Matilda Apartments	529969	181319	49.5	45.6	19.8	161.3
Centre Point 1	529923	181340	32.0	86.4	19.1	161.9
Centre Point 2	529865	181352	113.4	33.9	15.9	162.6
Building 1	529942	181426	34.0	18.0	112.2	163.1
Building 2	530040	181348	47.0	72.3	42.5	146.8
Building 3	529993	181344	47.0	21.9	38.2	146.7
Building 4	530050	181418	30.0	18.2	24.6	147.6
Building 5	530068	181390	17.2	16.0	18.4	148.8
Building 6	530024	181453	14.5	23.5	32.4	148.0

1.2 Assessment

Predicted Nitrogen Dioxide Impacts at Residential Receptors

Annual mean NO_2 concentrations were predicted for the 2021 DM and DS scenarios and are summarised in Table 5.

Table 5 Predicted Annual Mean NO_2 Concentrations

Sensitive Receptor		Castlewood House			Medius House			Total Change in Annual Mean NO_2 Concentrations ($\mu g/m^3$)
		Predicted Annual Mean NO_2 Concentration ($\mu g/m^3$)			Predicted Annual Mean NO_2 Concentration ($\mu g/m^3$)			
		DM	DS	Change	DM	DS	Change	
R1	Central Point development	48.3742	48.3783	0.0041	47.4371	47.4557	0.0186	0.0227
R2	Central Point development	48.3533	48.3574	0.0041	47.4267	47.4508	0.0242	0.0283
R3	Central Point development	48.3013	48.3044	0.0031	47.4058	47.4168	0.0109	0.0140
R4	Central Point development	48.2596	48.2616	0.0020	47.4058	47.4130	0.0071	0.0091
R5	Matilda Apartments	48.3117	48.3170	0.0053	47.4058	47.4269	0.0211	0.0264
R6	Matilda Apartments	48.2700	48.2700	0.0000	47.3954	47.3954	0.0000	0.0000

Sensitive Receptor		Castlewood House			Medius House			Total Change in Annual Mean NO$_2$ Concentrations (µg/m^3)
		Predicted Annual Mean NO$_2$ Concentration (µg/m^3)			Predicted Annual Mean NO$_2$ Concentration (µg/m^3)			
		DM	DS	Change	DM	DS	Change	
R7	Matilda Apartments	48.2284	48.2310	0.0026	47.3850	47.3916	0.0066	0.0092
R8	Matilda Apartments	48.2804	48.2838	0.0033	47.3954	47.4061	0.0107	0.0140

As indicated in Table 5, predicted annual mean concentrations were exceeded the Air Quality Objective at all residential receptor locations in both the DM and DS scenario. However, it should be noted that no new exceedances were predicted to occur as a result of operational phase energy emissions from both Castlewood House and Medius House. Furthermore, the predicted change in NO$_2$ concentrations are considered to be **not significant**, in accordance with the IAQM and EPUK[1] guidance document.

1.3 Conclusion

Resource and Environmental Consultants (REC) Ltd was commissioned by Royal London Mutual Insurance Society to undertake an Air Quality Assessment (ref: AQ101830r4) in support of a planning application for a proposed mixed use development at New Oxford Street, Camden. Following the submission of the assessment to the London Borough of Camden (LBoC) a number of comments were received.

In order to address these comments, dispersion modelling was undertaken to assess the potential impacts of NO$_2$ emissions associated with energy generating activities during the operational phase of the development. The results of the dispersion modelling indicated that there were no new exceedances of the annual mean Air Quality Objective for NO$_2$ as a result of the proposed development. As such, the impacts are considered to be **not significant** at all residential receptor locations considered.

Note prepared by Charlotte Smith, Senior Air Quality Consultant at REC Ltd, on 2nd May 2017 .

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[1] Land-Use Planning and Development Control: Planning for Air Quality, Environmental Protection UK and Institute of Air Quality Management, 2015.
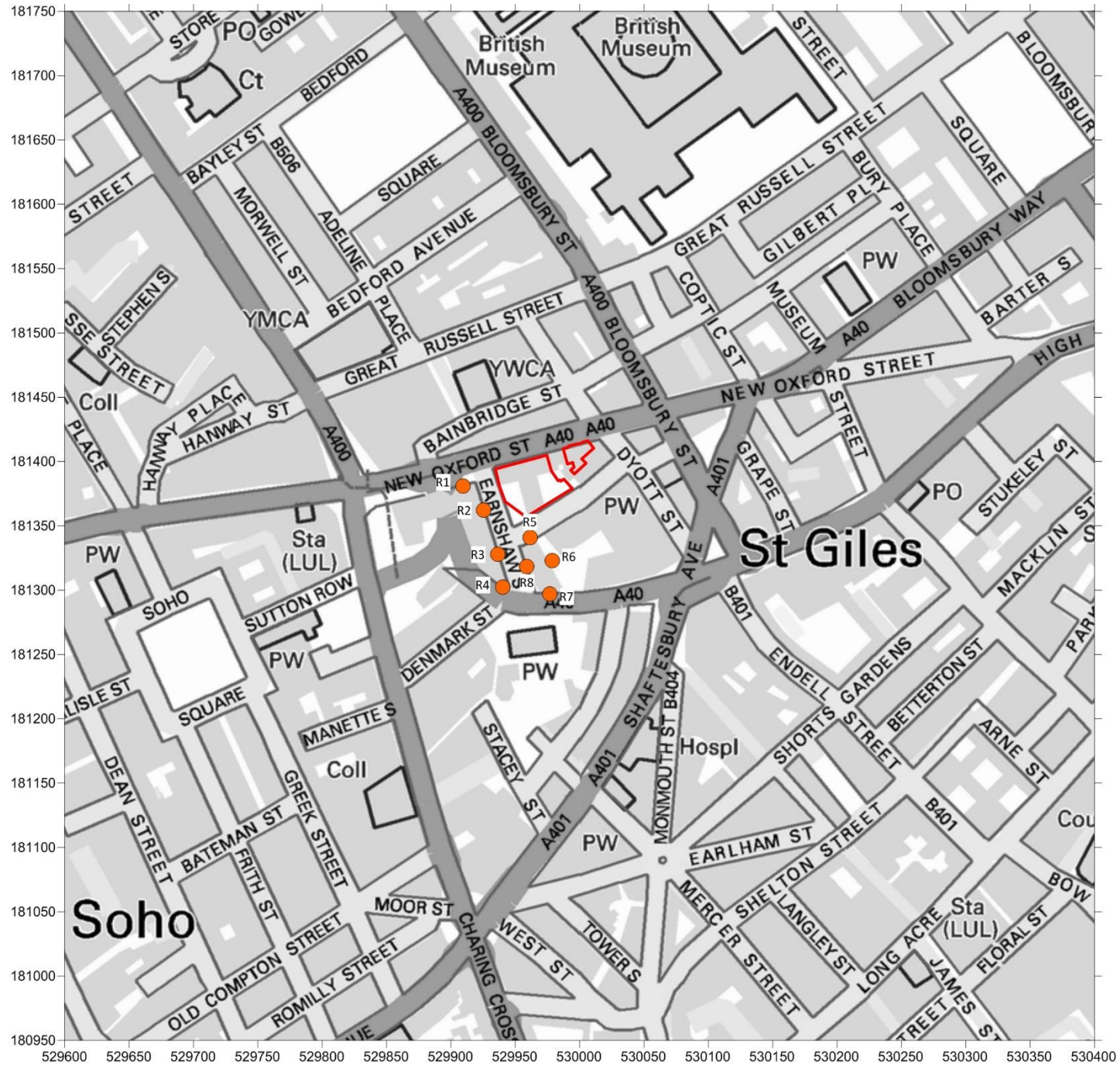
Legend

Site Boundary

Sensitive Receptor Location

Title
Figure 1
Sensitive Receptor Locations

Project
Air Quality Technical Addendum

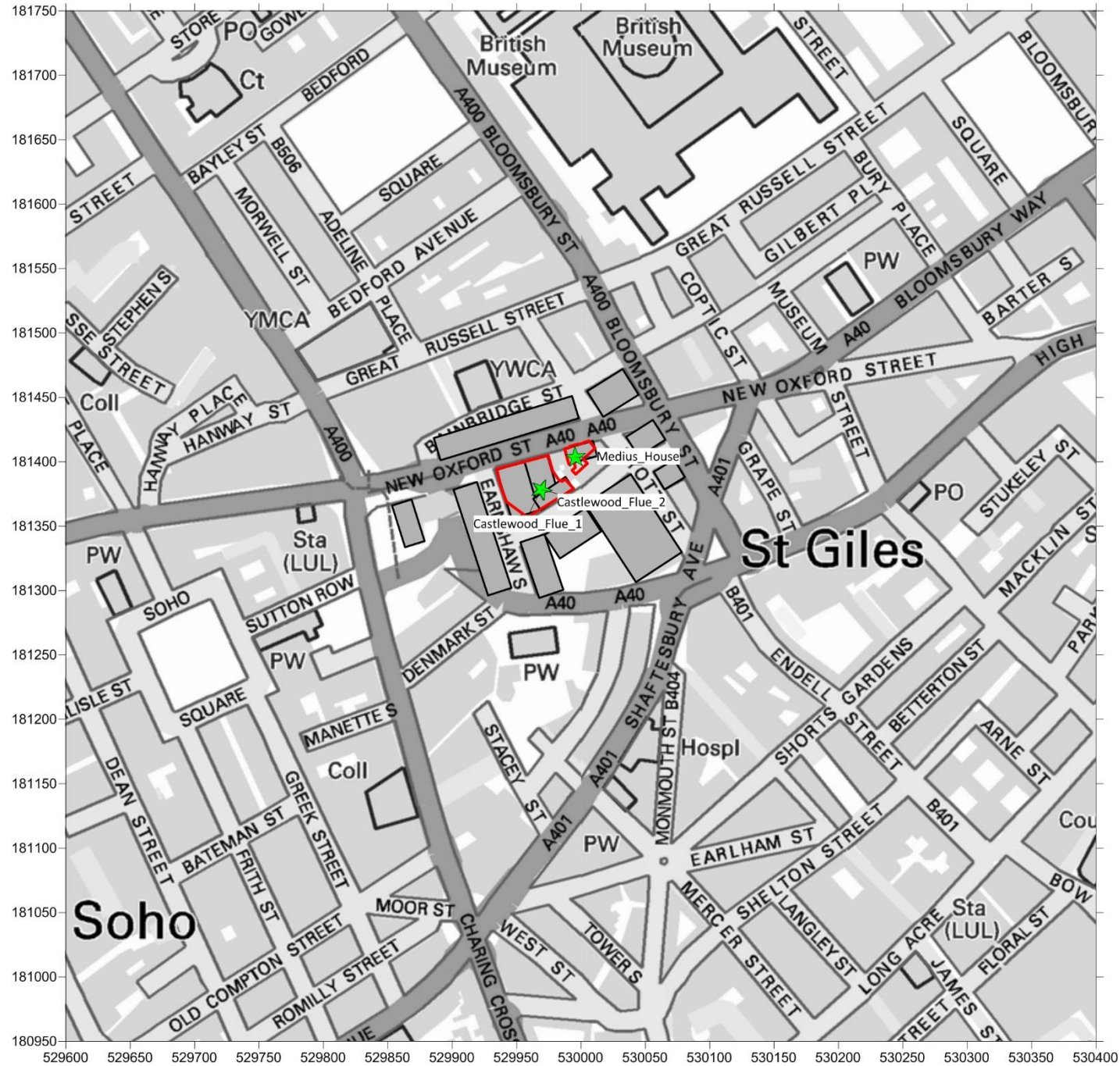Castlewood House and Medius House
New Oxford Street, Camden

Project Number
AQ101830c2

Client
Royal London Mutual Insurance Society

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REC

Resource and Environmental Consultants Ltd
Osprey House, Broadway, Manchester M50 2UE

Tel – 0161 868 1300 Fax – 0161 868 1301
www.recltd.co.uk

Legend

Site Boundary

Building

Flue Location

Title
Figure 2
ADMS 5 Inputs

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